Outage Improvement Advisory Team

March 17, 2022

Outage Improvement Advisory Team (OIAT)

Overview
&
Meeting Protocols

On Behalf of Mayor Strickland

Doug McGowen, Chief Operating Officer
City of Memphis

Review of team purpose & scope

J. T. Young, MLGW President & CEO

Why are we here?

Mission/Purpose

To provide community-based input that will assist MLGW in assessing options to reduce electrical outage duration and frequency and to improve associated communications and awareness for customers and the general public.

Scope

The team will focus on MLGW s electrical distribution system and its reliability and resilience as these elements pertain to customer impacts. The team will also focus on all facets of MLGW s customer communications during outages. MLGW s electrical transmission system and associated operations will *not* be included in the scope of this initiative.

MLGW Overview

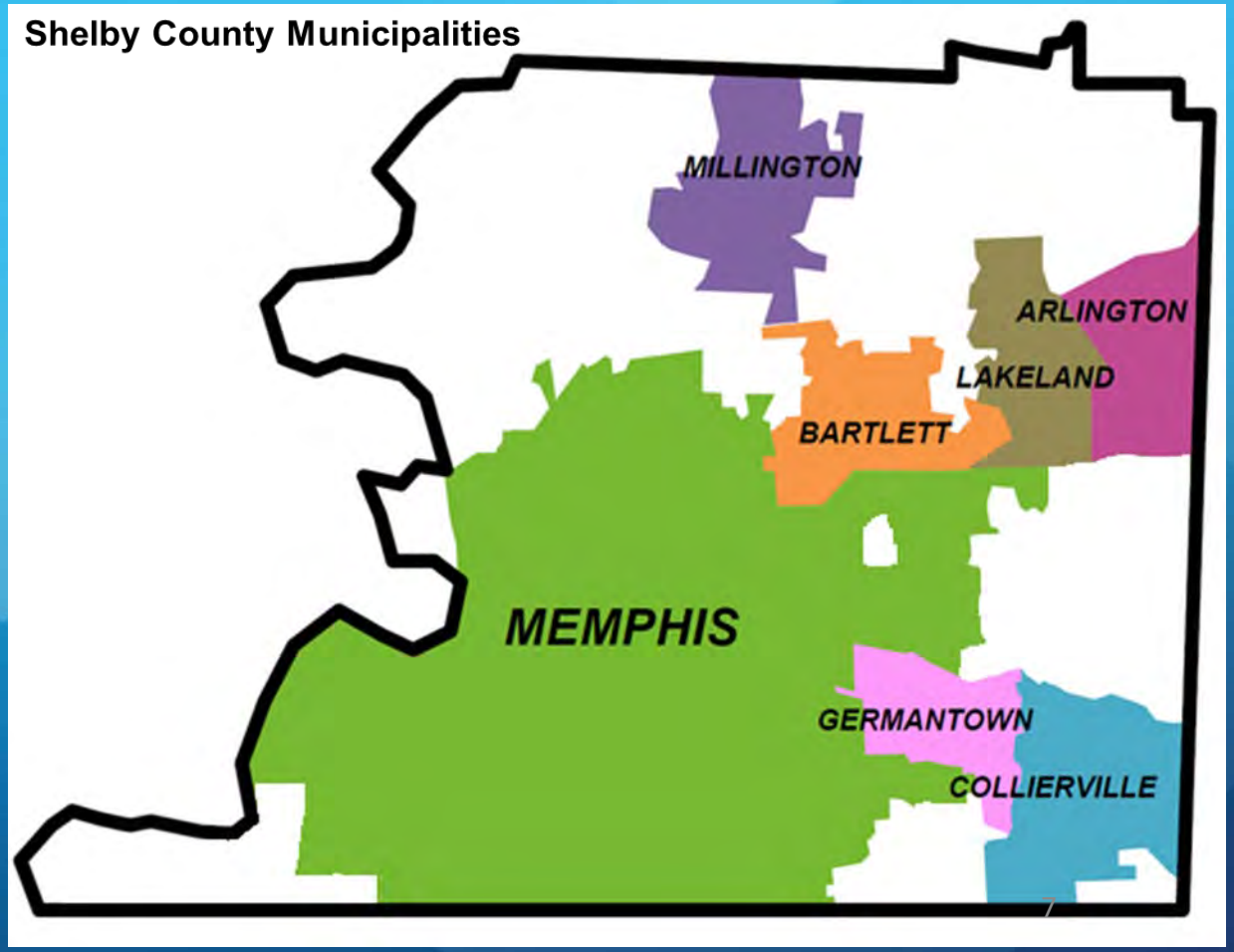
MLGW Service Area

MLGW serves approximately 440,000 customers (electric meters).

MLGW provides electric and gas service to all of Shelby County.

MLGW provides water service to all of Memphis and parts of unincorporated Shelby County, as well as Arlington and Lakeland.

MLGW
SERVING YOU IS WHAT WE DO



Mission

(Why we exist)

To safely deliver services that create and sustain superior customer experiences.

Vision

(Where we're headed)

To be the trusted provider of exceptional customer value in the communities we are privileged to serve.

MLGW

SERVING YOU IS WHAT WE DO

Ground Rules/Meeting Protocols

Brian Solsbee - Facilitator

Executive Director, Tennessee Municipal Electric Power Association

OIAT Ground Rules (in person meetings)

- Meetings will be timely. We will start and end on time each time.
- Only one person may speak at a time; refrain from speaking or interrupting while someone is speaking.
- Only OIAT Team members can speak during meetings. However, there is a provision for public questions/input via a portal.
- Be succinct with your questions/comments so that everyone has an opportunity to speak.
- Rule of 40 Input is expected from the whole team every team member should feel free to participate.
- Focus on the topic(s) currently being discussed; please refrain from side bar or off topic discussions.
- Personal attacks or inappropriate comments do not have a place in these meetings. Respect and decorum will be maintained at all times. Those who don t adhere to these rules will be escorted from the meeting.

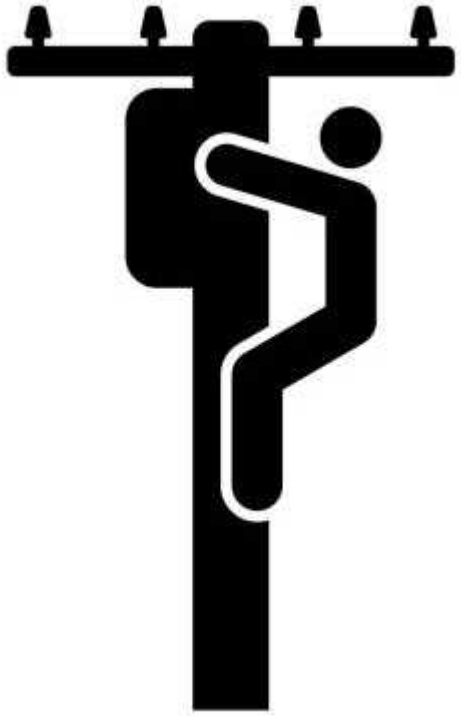
OIAT Ground Rules (virtual meetings)

- Same rules as in person meetings with the following additions:
  - OIAT Team members will be granted Panelists rights to participate and will be able to speak.
  - Please mute if you are not speaking.
  - Questions and/or comments should be submitted either in the Q&A or by raising your hand Speak only when recognized by the facilitator.
  - The public will be able to provide input via the portal. Instructions are forthcoming.
  - The host reserves the right to disconnect those whose comments are not in accordance with good decorum.

Team Thoughts/Questions?

Outline for Today

- Electric System
- Evolution of MLGW s system
- System Reliability & Outages
- Winter Storm Landon



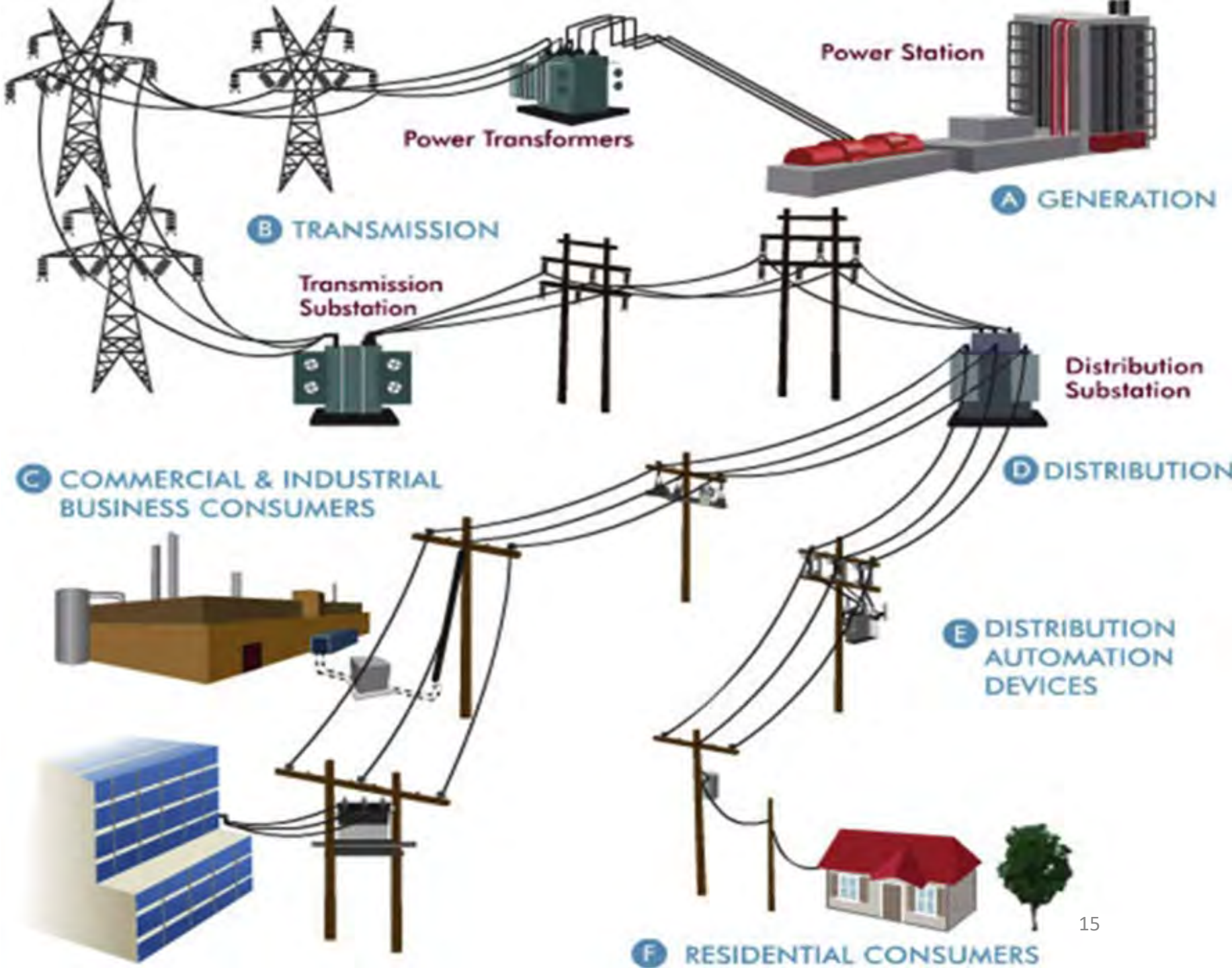
Electric System

Overview of an Electric System

Generation stations

Transmission systems

Distribution systems



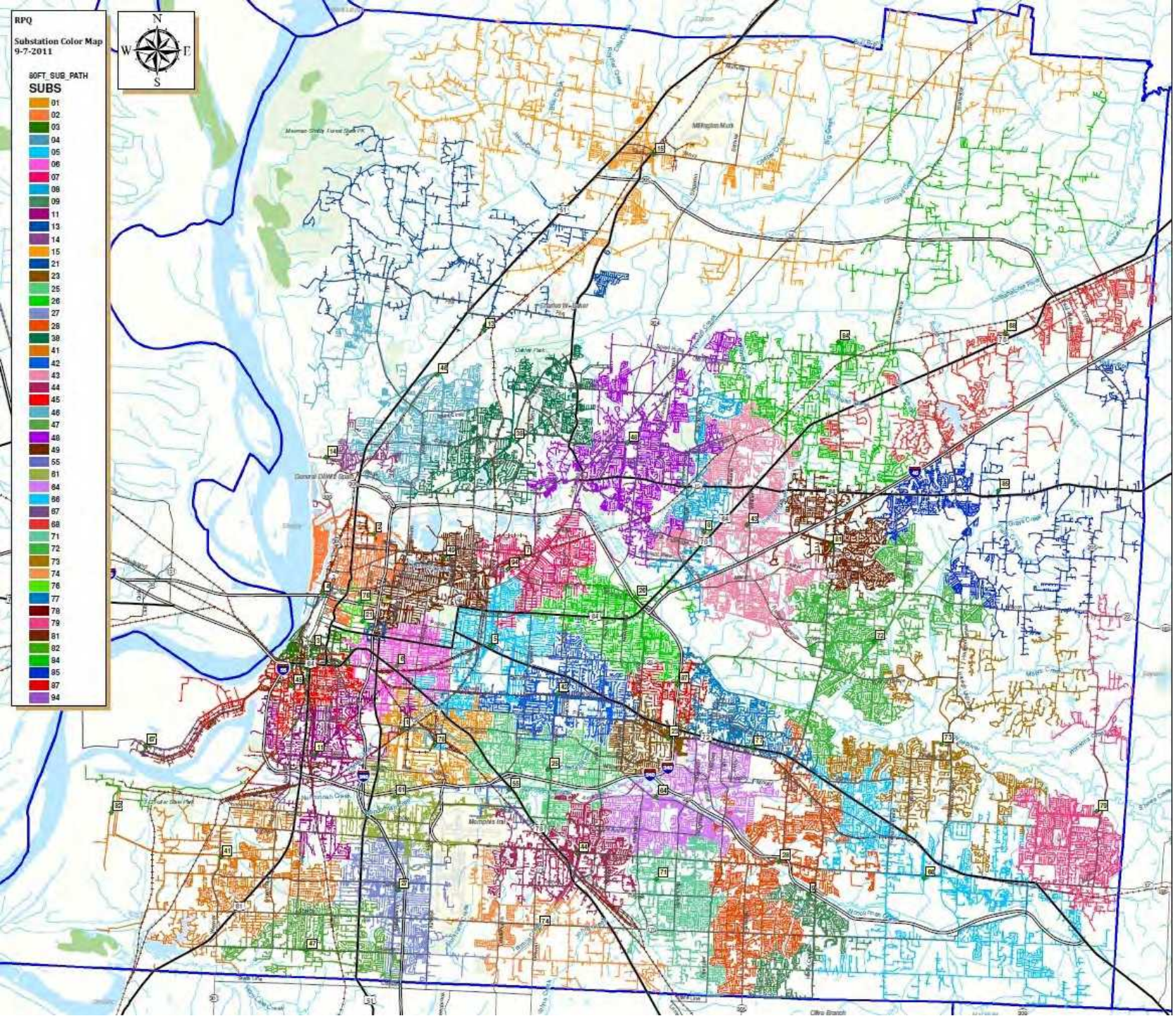
MLGW s Electric System

Quick Facts

- Purchase 100% of generation from TVA
- 644 Transmission circuit miles
- 60 Distribution substations
- 7,220 Distribution circuit miles
  - 4,410 Overhead
  - 2,810 Underground
- 440,000 Electric Customers (10th largest electric public power system in the U.S.)

MLGW is a 5-time APPA Reliable Public Power (RP3) Award winner

Reliable Public Power Provider



MLGW's Substations and the territories they serve

Major Distribution System Components

- Poles
- Circuits (wires)
- Fused taps/laterals (wires)
- Transformers (look like tin cans on a pole or green boxes on the ground)
- Services or service drops (wires)
- Meters
- Protective devices
  - Switches
  - Circuit breakers
  - Reclosers
  - Fuses
  - Relays
  - Lighting arresters

This is an aerial photo of circuit 49301. Although the back layer is difficult to read the blue line shows the backbone circuit. It follows a path from substation #49 on University south to the Overton Bayou and then east on Hubert and then Brown; south on Tupelo past the MLGW North Center. The yellow lines are fused taps serving customers on Vandale, Winnona, Dexter, Shasta and other north Memphis customers. The line also proceeds south to serve customers on Liberty, Lyndale, Los Angeles and other streets. Fused taps are the next part of the delivery system.

Fused Laterals / Taps

Expulsion fuse

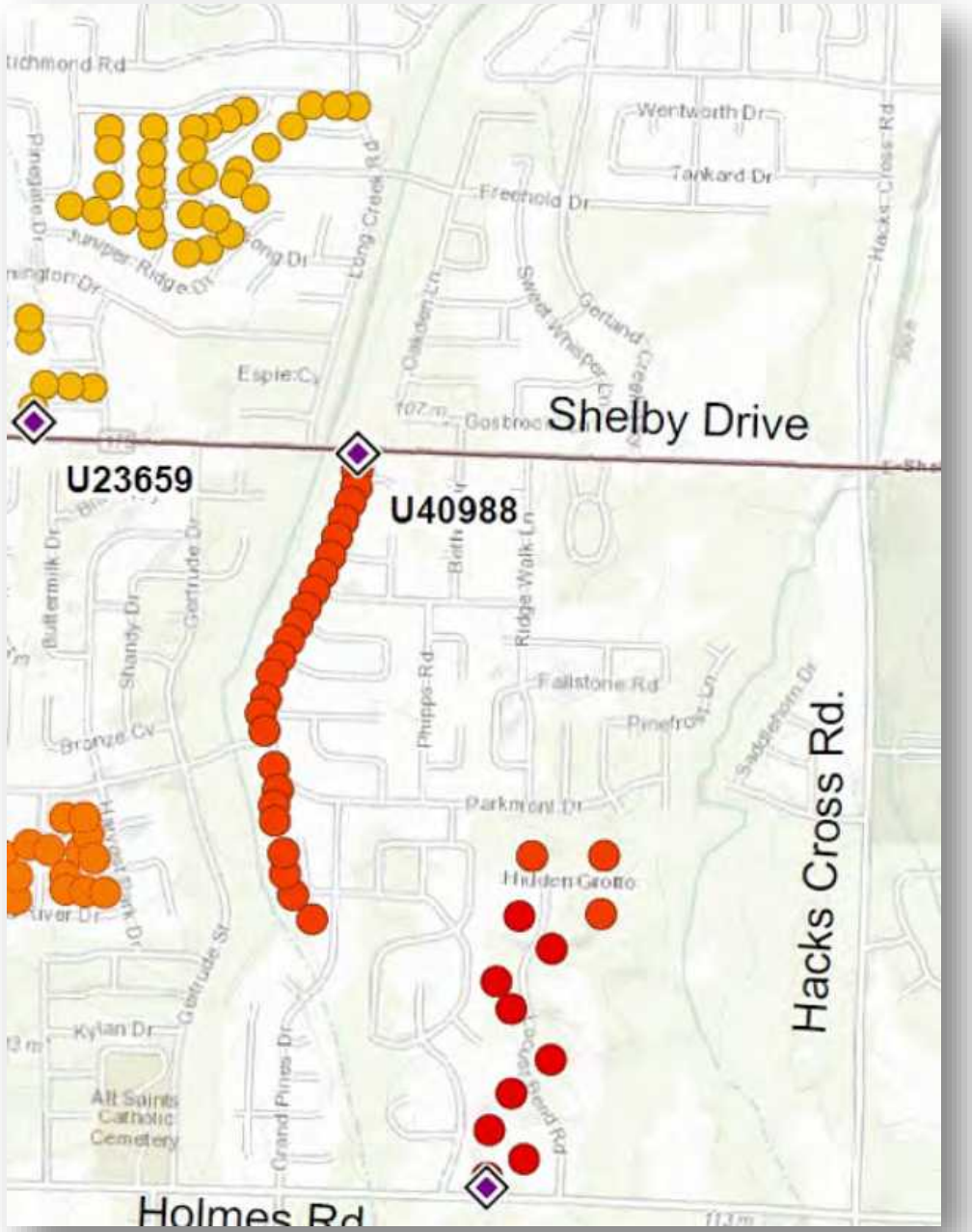
- **Blows when a fault occurs on the line**
- **Shields customers on main circuit from outage**
- **Fuse can be replaced but often faults result from damage to the line that must be repaired.**

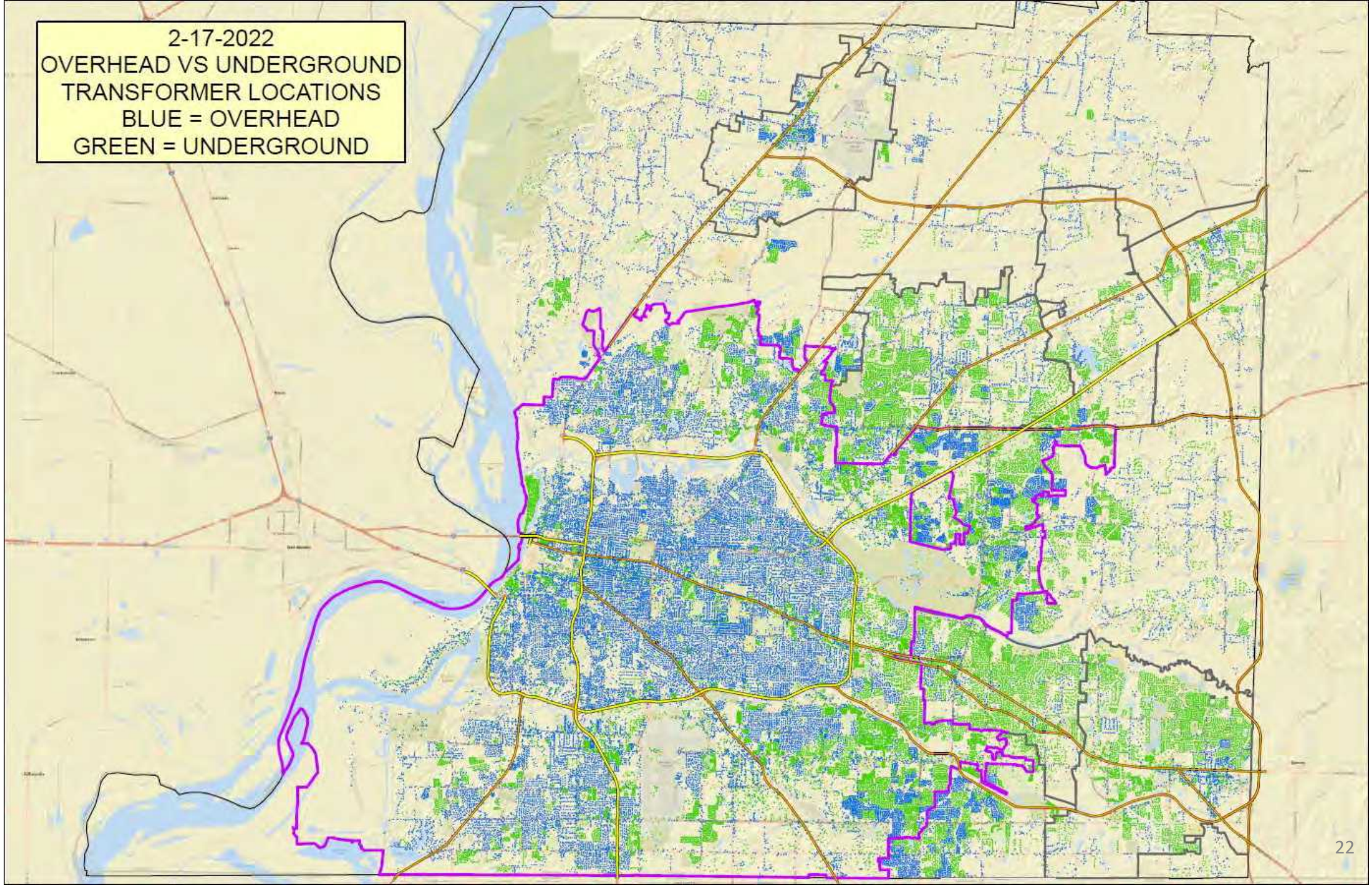
Fused Laterals / Taps

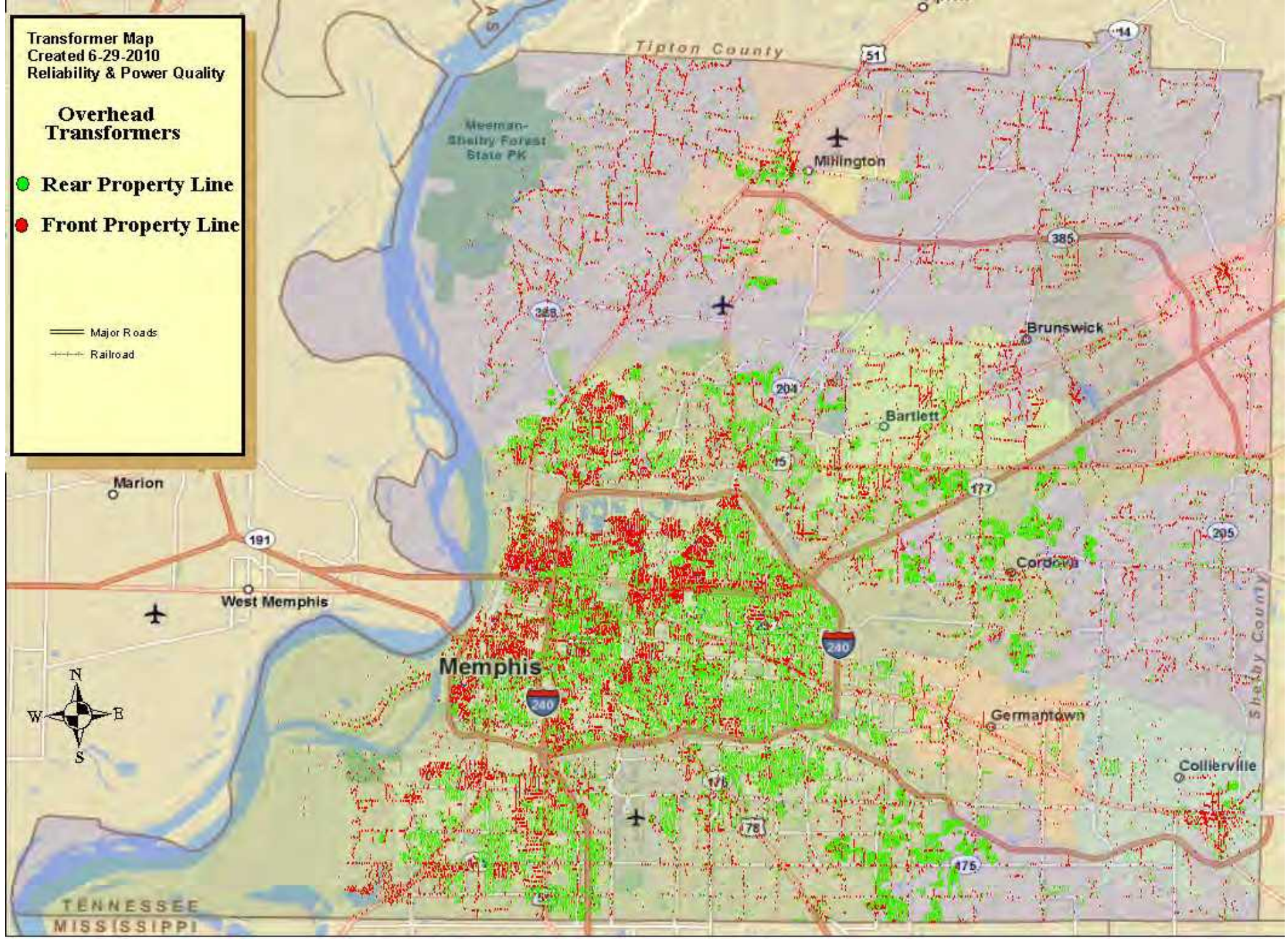
Taps can be overhead or underground lines

Overhead lines may be on the street or at rear property line.

Overhead lines are vulnerable to weather-related interruptions that require long repair times.




2-17-2022
OVERHEAD VS UNDERGROUND
TRANSFORMER LOCATIONS
BLUE = OVERHEAD
GREEN = UNDERGROUND


Transformer Map
Created 6-29-2010
Reliability & Power Quality
Overhead Transformers
Rear Property Line
Front Property Line
Major Roads
Railroad
Tipton County
Millington
Meeman-Shelby Forest State PK
Brunswick
Bartlett
Marion
West Memphis
Memphis
Germantown
Collierville
Shelby County
TENNESSEE
MISSISSIPPI
N
W
E
S

How customers are typically connected to the electrical system in a newer residential subdivision

Customer is associated with a premise (location) and meter.

Meter is connected to secondary service and the service is connected to a transformer (pad-mounted or pole-mounted)

- 1 customer per service.
- ~1 to 5 customers per transformer.

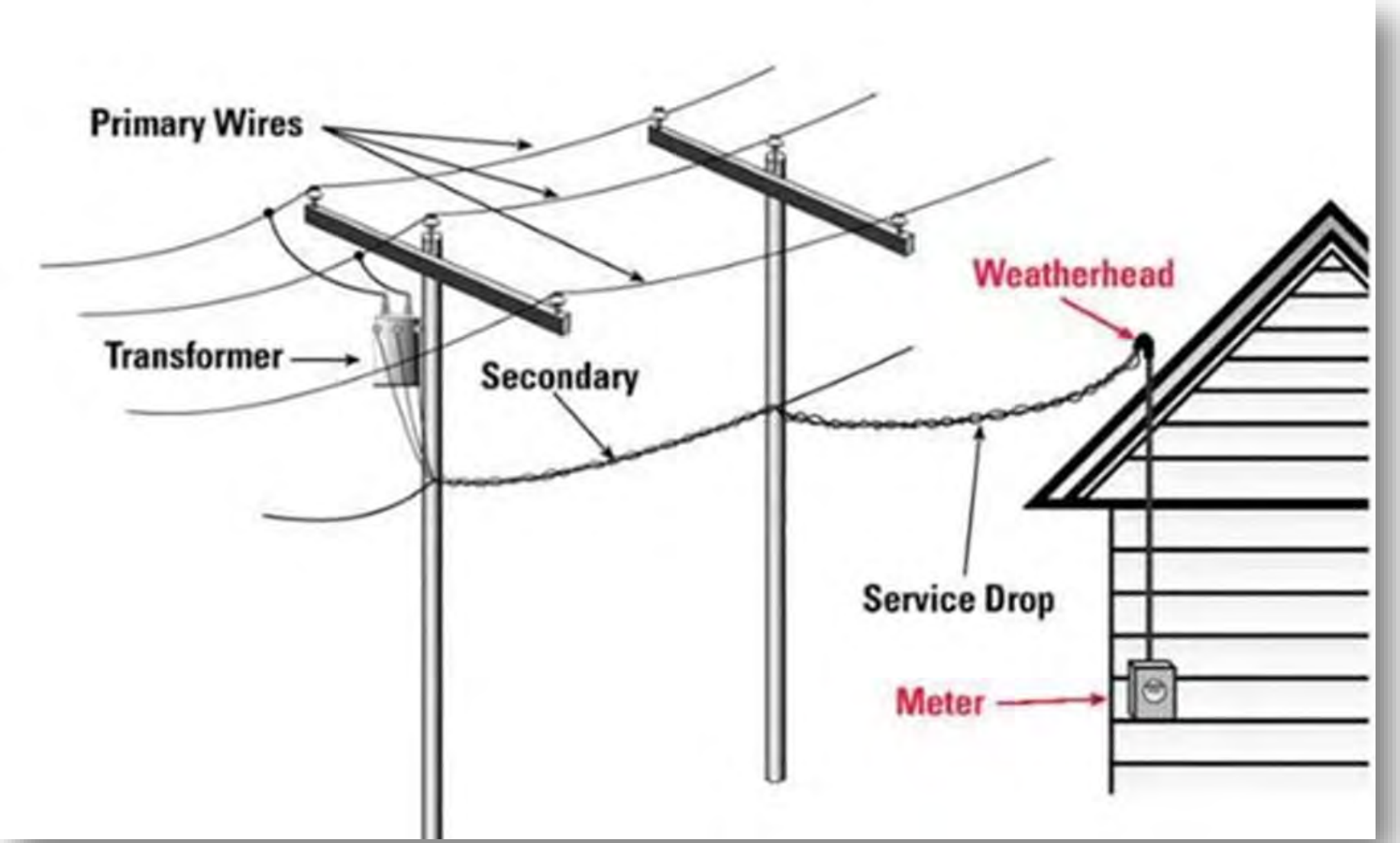
Transformers are connected to a single-phase fused Primary Circuit Lateral feed into a subdivision or down a street.

- ~50+ customers associated at this level.

The single-phase Primary Circuit is part of a three-phase Primary Backbone Circuit that you see typically on major streets or roads (see image).

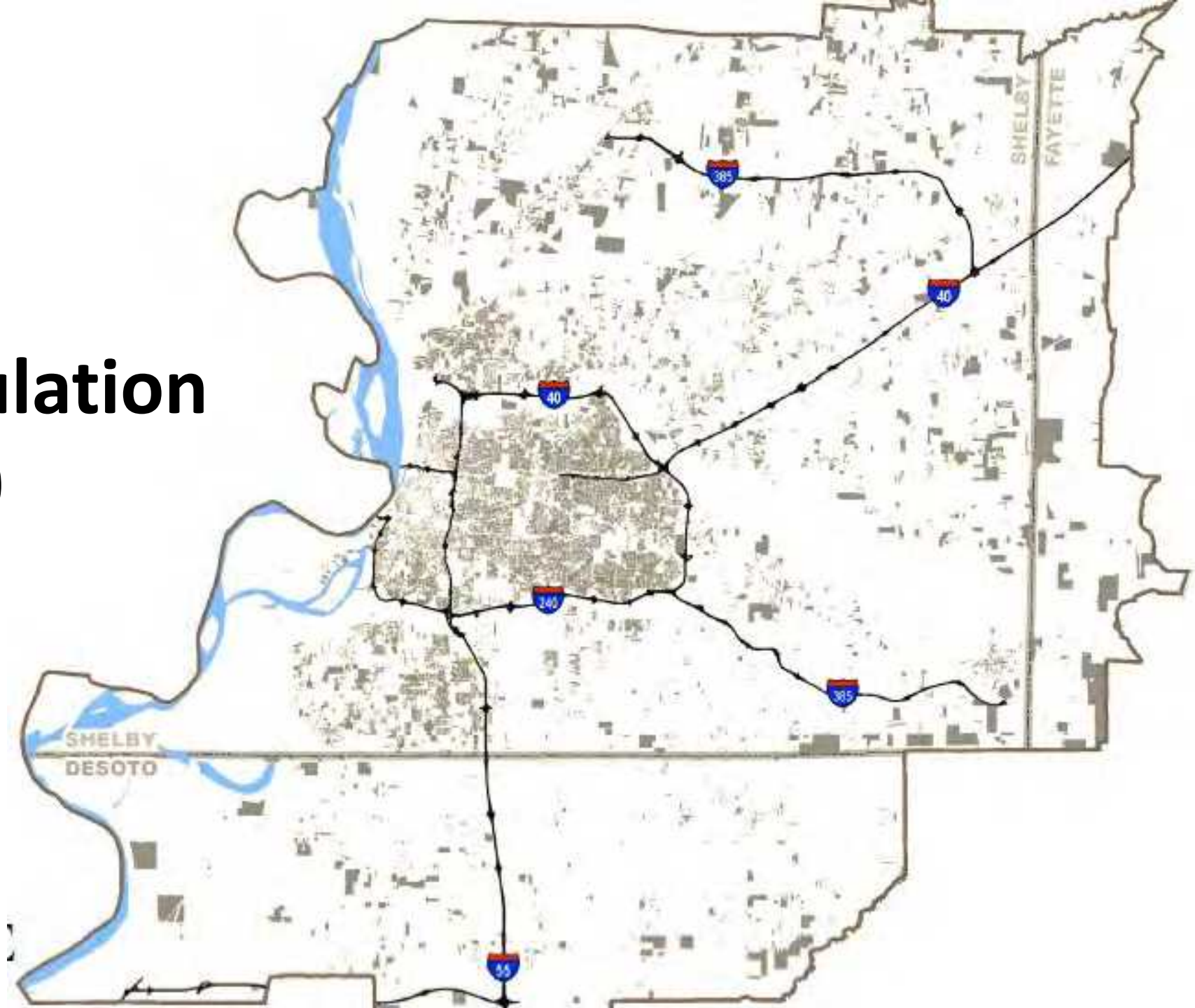
- ~1000+ customers associated at this level.

How customers are typically connected to the electrical system in an overhead service

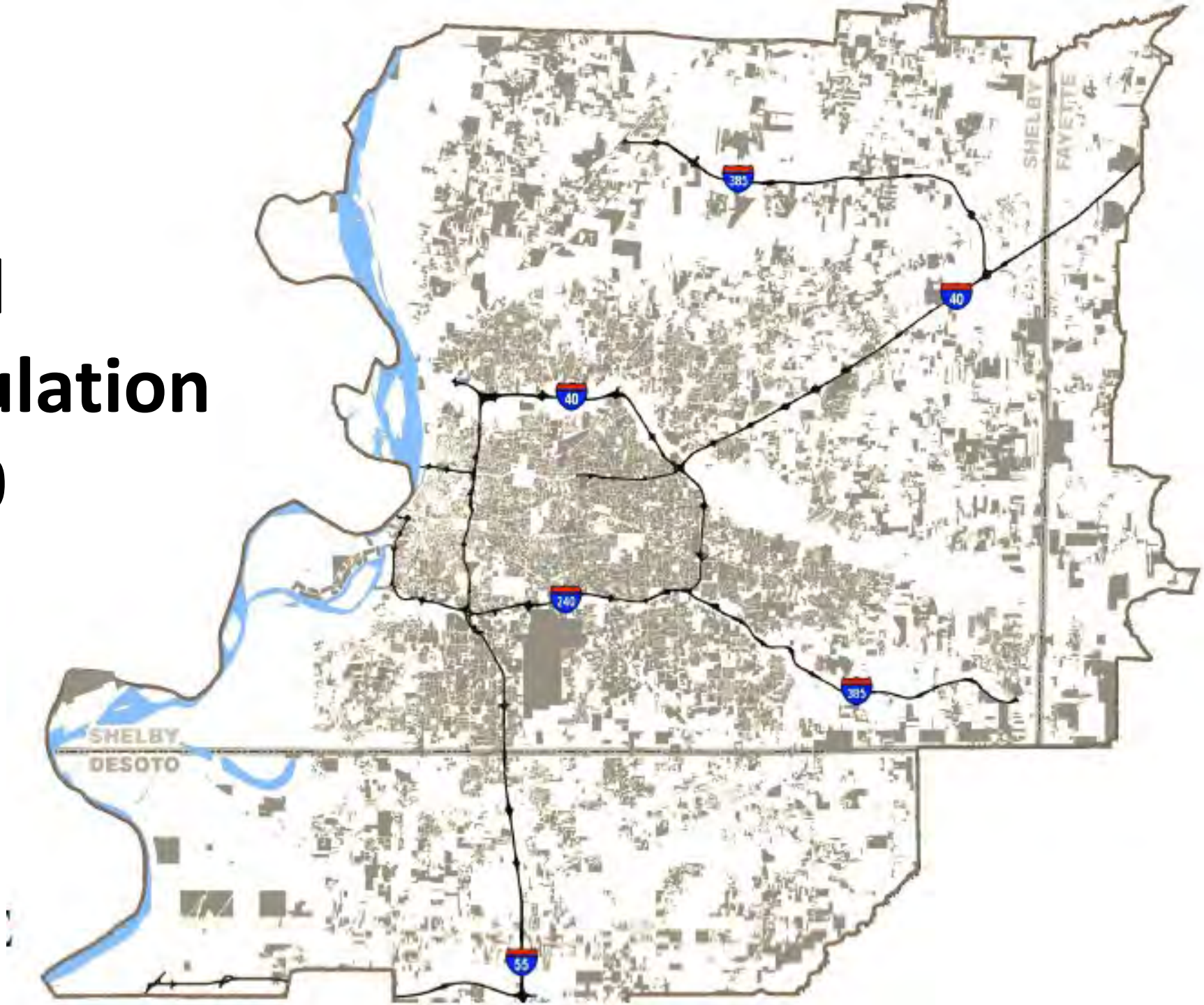


Evolution of MLGW s System

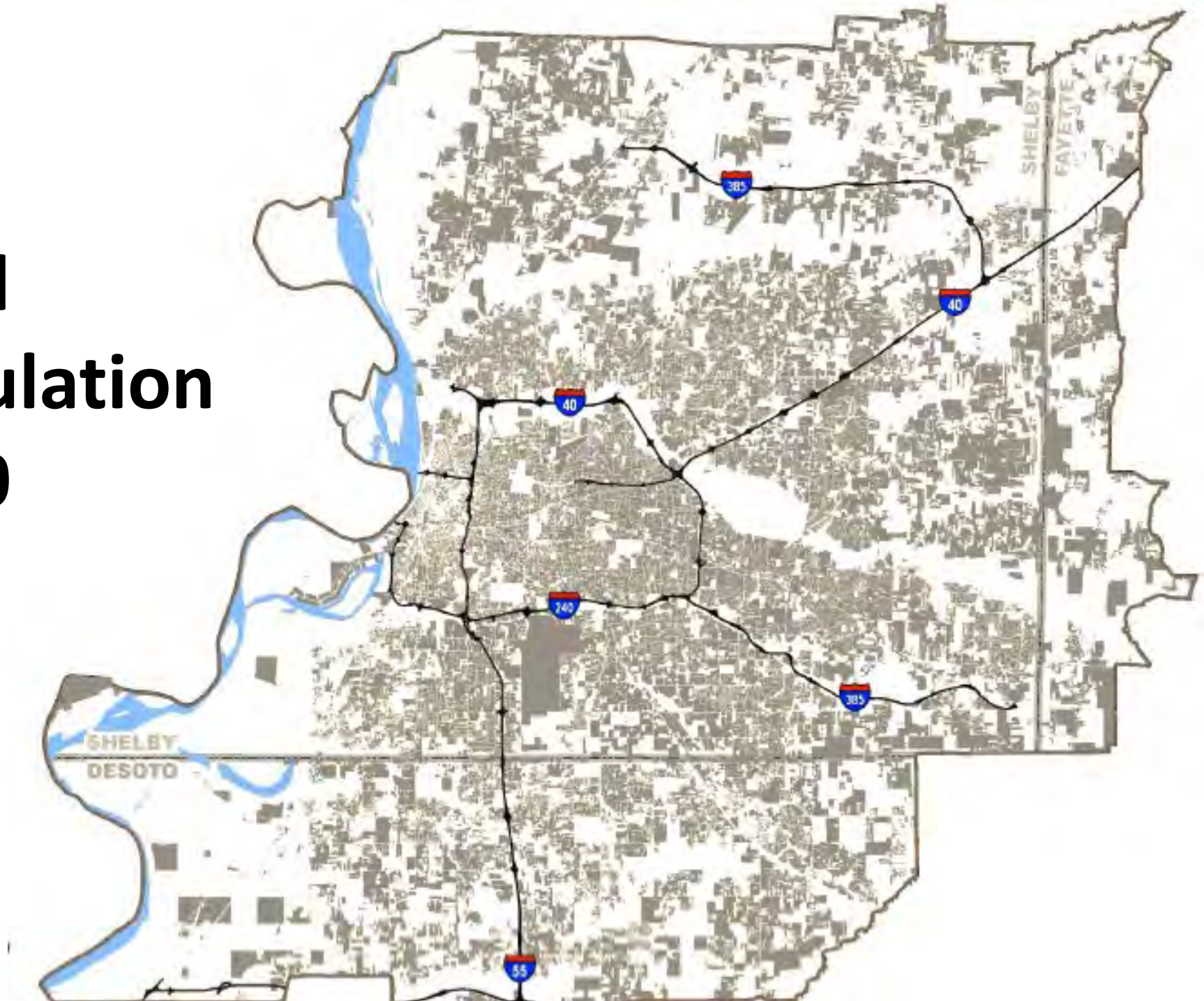
Total Population 1960



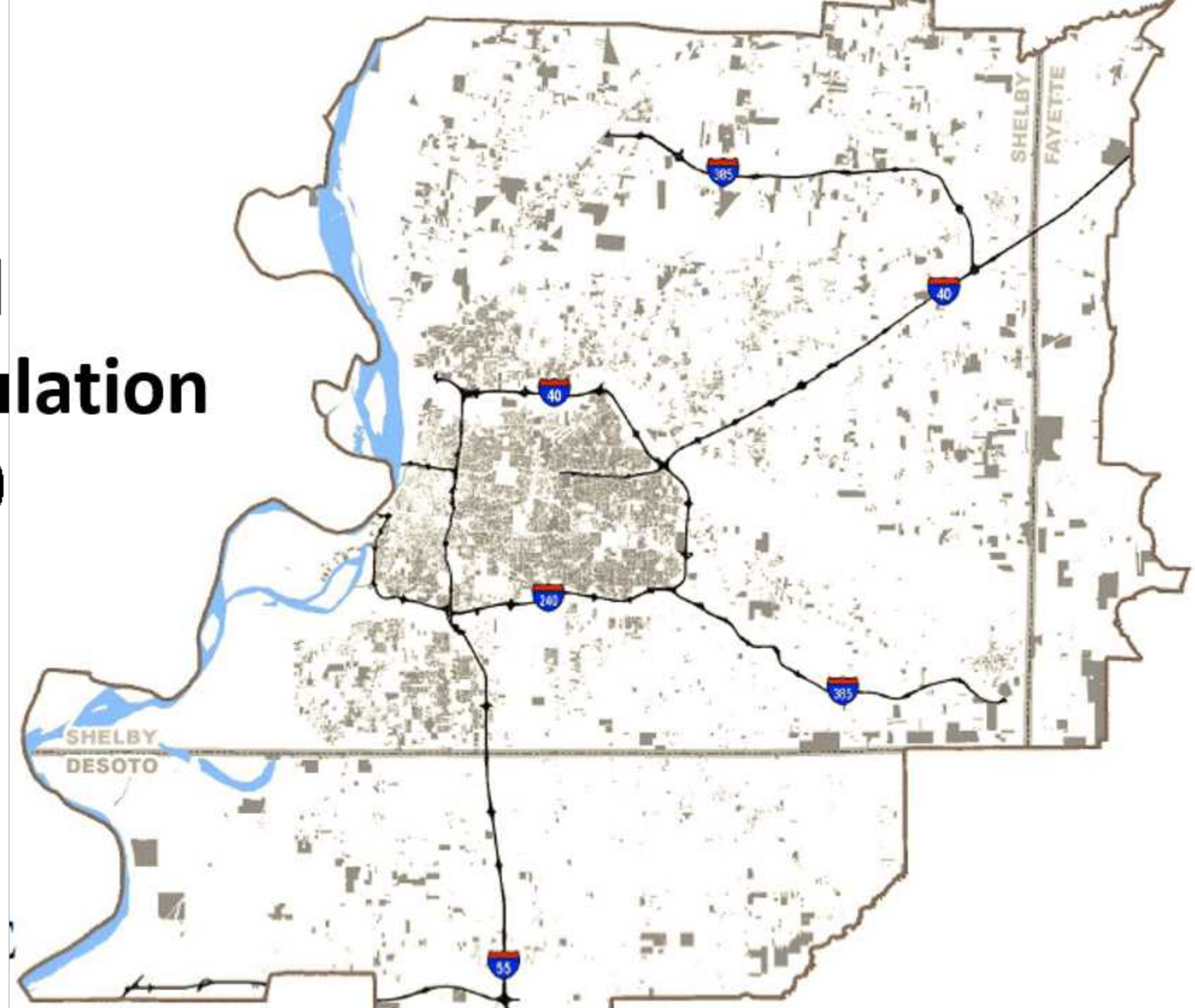
Total Population 1990



Total Population 2010



Total Population 1960



Electric Distribution Standards History

Distribution and Residential Services were primarily overhead till the 1950s/1960s across the industry.

Figure 2 from Electric World magazine in 1961 illustrates that utilities were beginning to adopt new undergrounding practices or standards.

Progress in residential underground electrical distribution in the past five years has been considerable. Largely because of vigorous promotion of buried cable systems by a few utility companies, 78 per cent of the major utilities in the United States and 73 per cent in Canada now have adopted residential underground distribution programs. A 1961 survey of electrical utility companies conducted by Electrical World[3] magazine included data from 78 utilities in 42 states, serving over 60 per cent of U. S. meters, and 11 utilities in five Canadian provinces, serving about 40 per cent of Canada's meters. The figures summarize these data.

Figure 1 shows the per cent of electric utilities now offering some type of underground residential wiring. In all but two geographic regions, 70 per cent or more of the reporting utilities offer such service, the exceptions being New England with a 45 per cent average for six states, and the East South Central region with a 50 per cent average for four states.

Figure 2 shows the per cent of electric utilities which have adopted new residential underground wiring installation practices within the last five years, and the per cent which expect to be using new practices within the next five years.

Figure 1

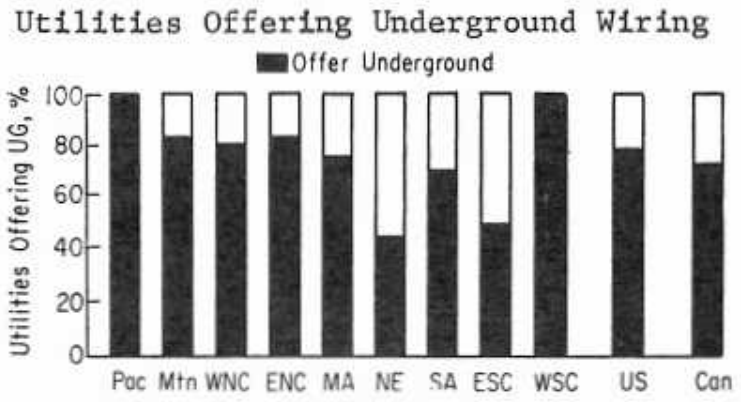
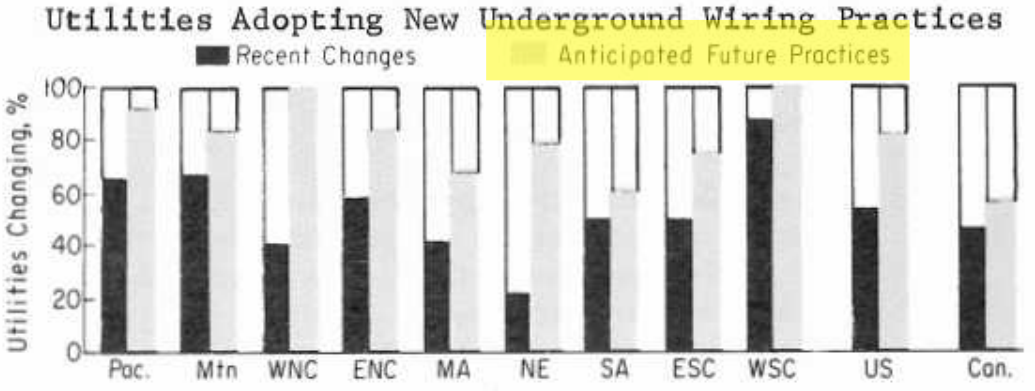
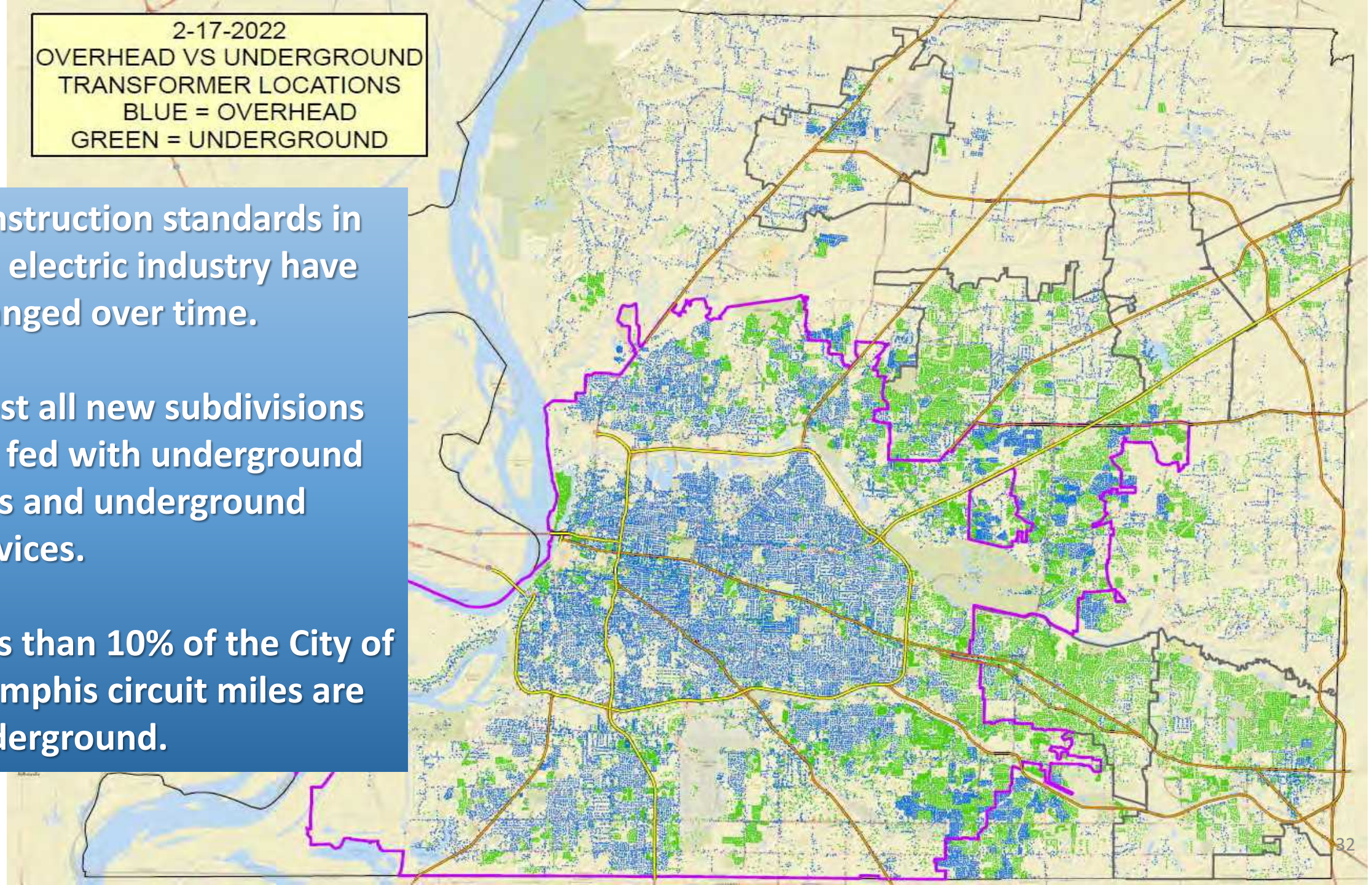


Figure 2



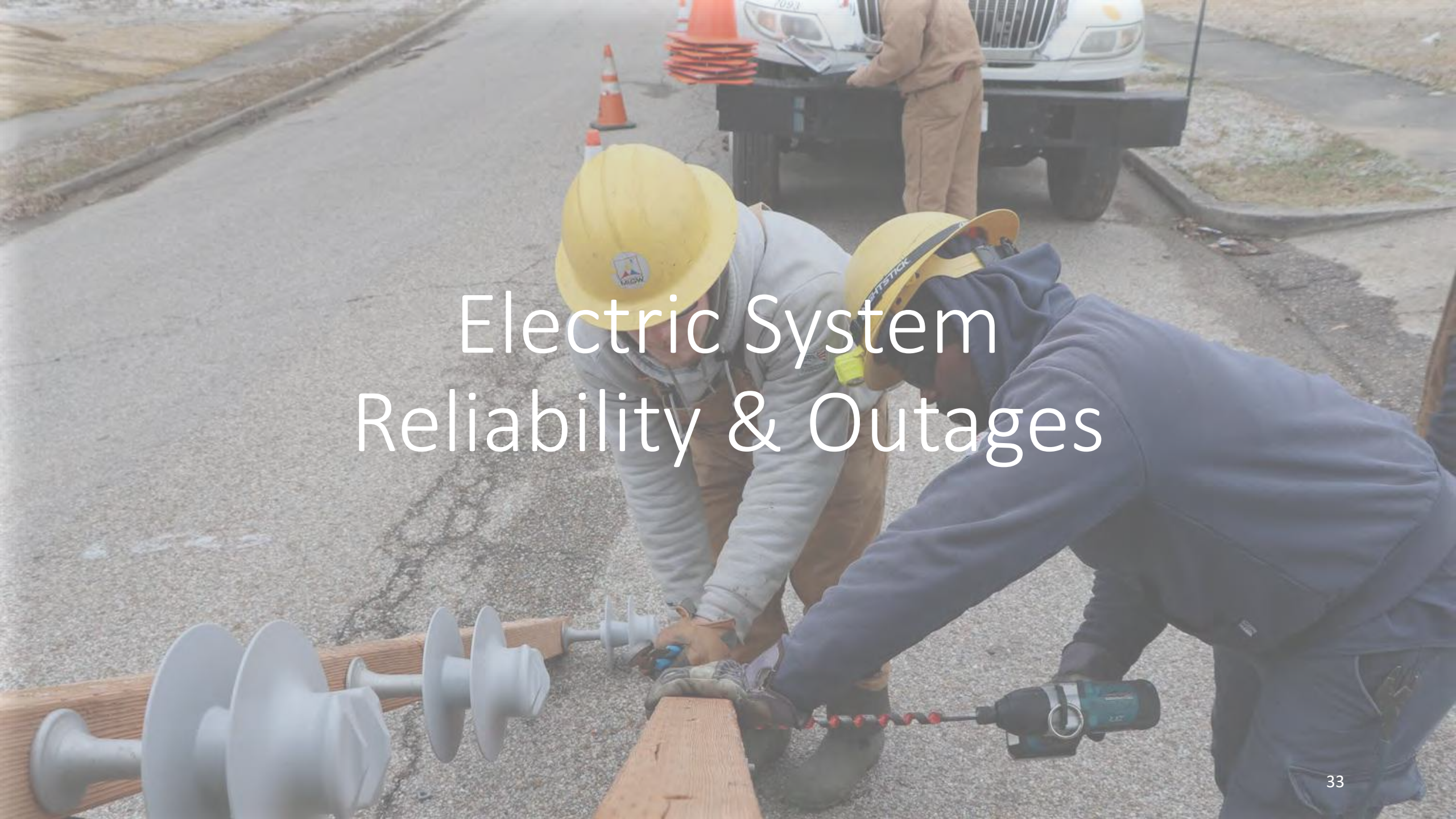
From Electrical World, February 6, 1961, © copyright 1961, McGraw-Hill Publishing Co., Inc. All rights reserved. Note: Pac, Mtn, WNC, etc., refer to regions.



Construction standards in the electric industry have changed over time.

Most all new subdivisions are fed with underground taps and underground services.

Less than 10% of the City of Memphis circuit miles are underground.



Electric System Reliability & Outages

Primary Causes of Outages

Storms/Weather (can be large, regional events)

Trees (primarily wind and storm related)

Animals

Vehicles striking poles and/or devices

Equipment/Infrastructure failures due to aging

Emergency requests for safety reasons (i.e., Fire, Police, etc.)

Routine/Planned maintenance

Other

CARES Outage From Beginning to End

(Computer Aided Restoration of Electric System)

CARES interfaces with a high call volume system 544-6500.

Outage calls come in and are associated to their transformers.

Transformers are tied to lines that tie to electric fuse taps, that tie to all other upline devices on the circuit.

An outage engine infers what device is faulted and places a unique outage number on the device.

CARES dispatches a Troubleshooter to figure out the damage.

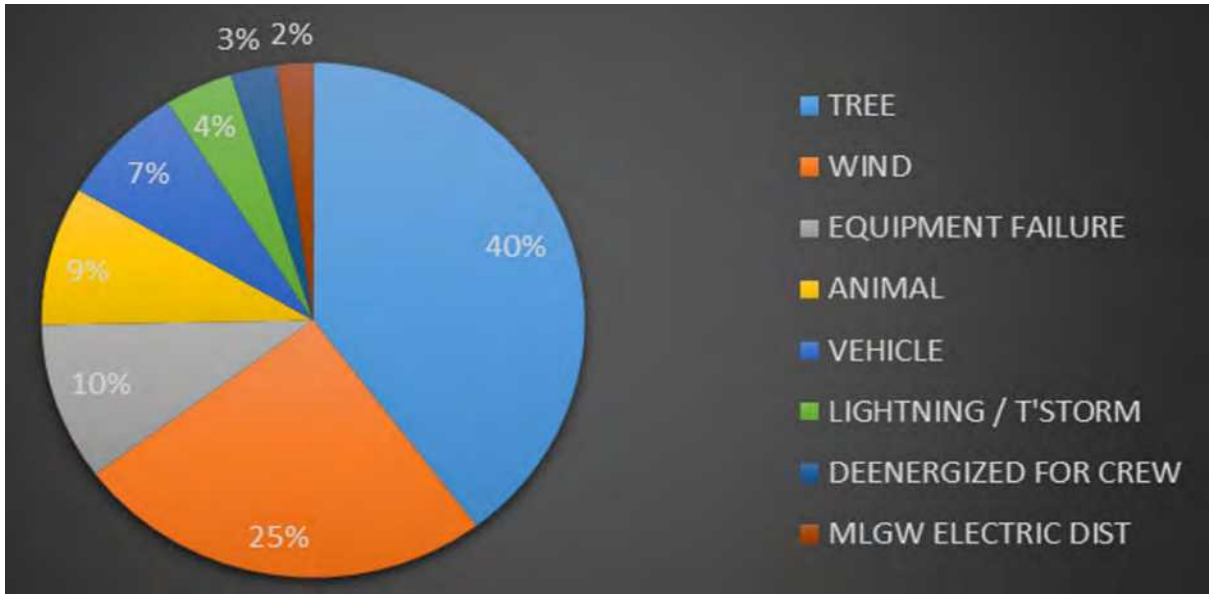
If there is damage, it gets referred to a Crew. Otherwise , the Troubleshooter re-fuses the device.

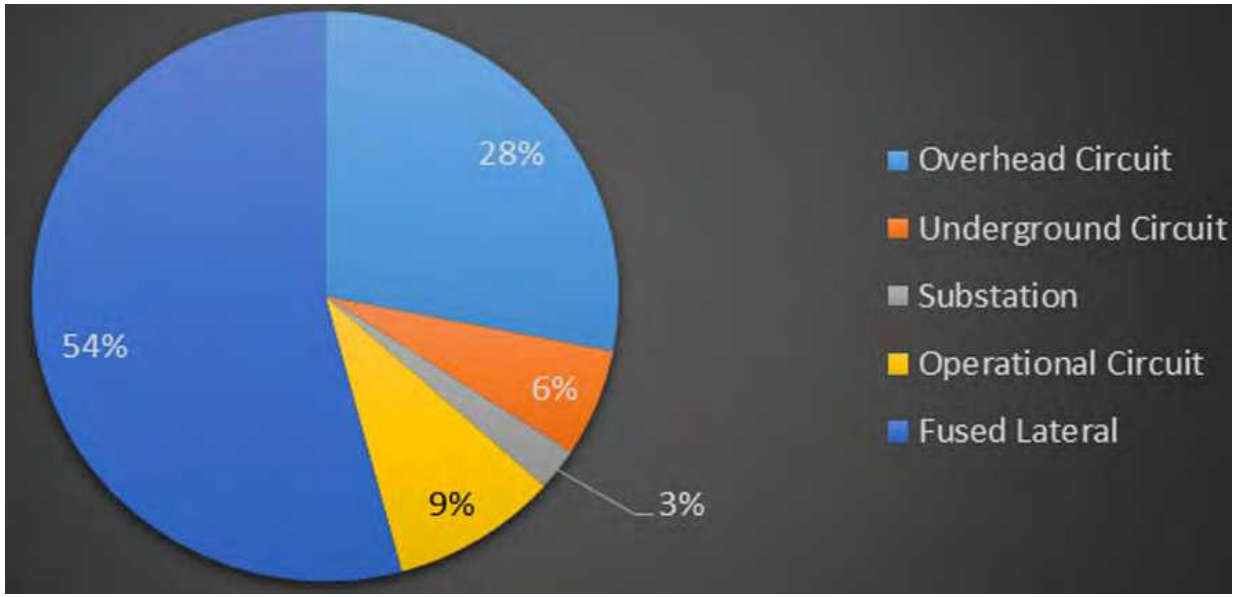
CARES creates a work order to track the Crew work. The Troubleshooters utilize MLGW s Mobile Dispatch system.

Single customer outages are sent to Customer Service personnel who are also on MLGW s Mobile Dispatch system.

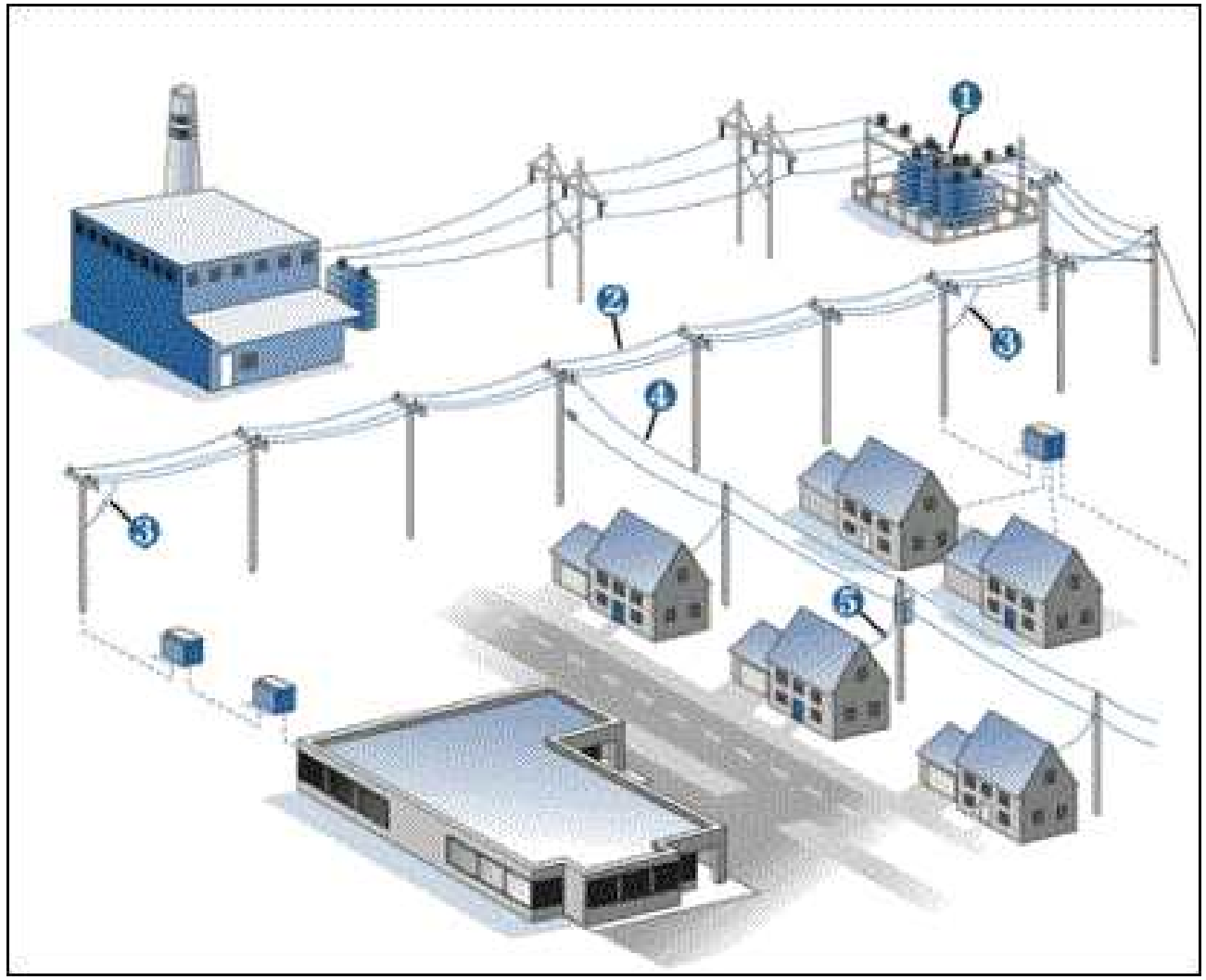
Crews report to CARES when repairs are done and the outage is completed in CARES.

Outages by Root Cause and System Location





Detailed Distribution System Example



There are often six to ten Main Circuits out of each Electric Substation with several elements like 3, 4 and 5. **Emergency and public safety facilities are always the first priority.**

1. Electric Substation
2. Main Circuit (Backbone)
3. Fused Tap to UG
4. Fused Tap to OH
5. Individual Customer Service

(1) Assuming no Substation repairs are necessary

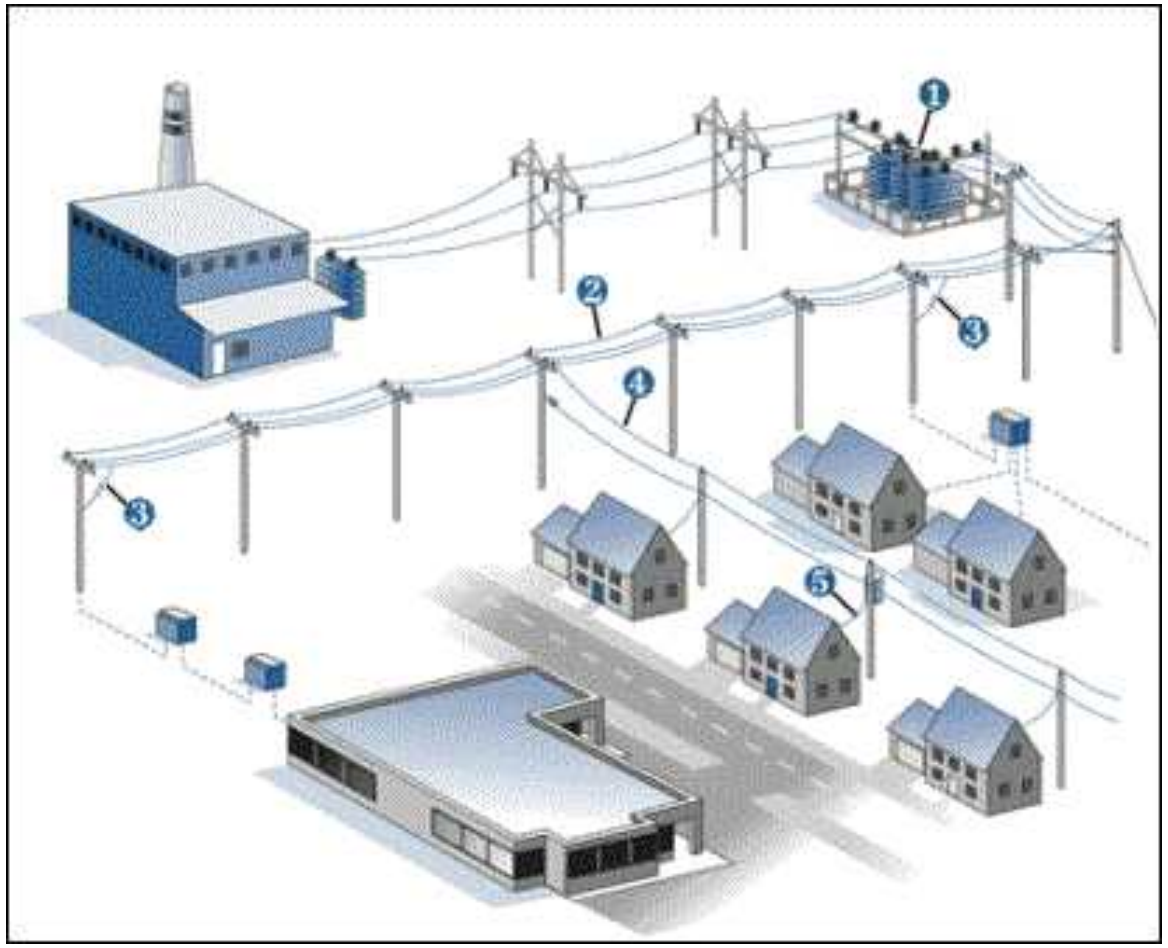
(2) Restoration begins with Main Circuits (**100s to 1000s of customers**) [This potentially restores the largest portion of customers. However, if there is damage to a downstream device such as a fuse or individual customer service drop (3, 4 or 5); the outage will not be resolved]

(3 and 4) Next, restoration efforts are focused on fuse outages (**dozens of customers**) that were not resolved by fixing the Main Circuit (2)

(5) Restoration is finalized resolving **smaller outages** affecting as little a **single person**

Credits:
https://www2.ameren.com/common/DistributionSystem.aspx

Clarification of Some Observations



My Power Was Restored First!! You may share a circuit with a facility critical to public safety

My neighbor has Power and I don t You may have damage to your single customer service or not be on the same electrical path as your neighbor altogether

A worker just came and left There are several tiers of restoration workers (Damage Assessment, Tree-Trimming, Troublemen, Crews etc). The worker likely observed or performed his/her portion of the work and needed another group to complete.

I don t see anyone working in my area A crew or other type of restoration worker can be repairing a problem miles away that resolves your issue. Many circuits span several miles

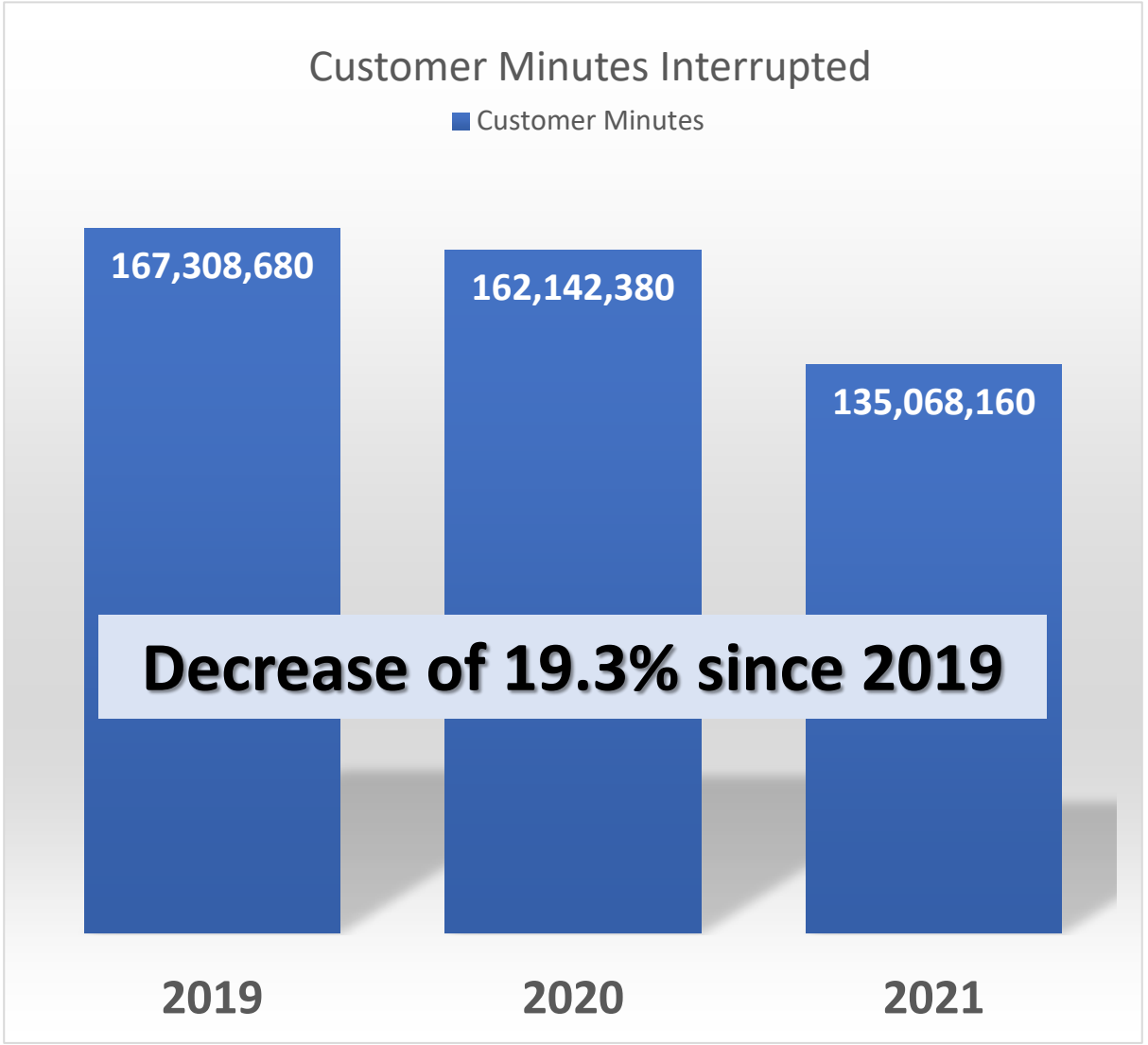
During an event like we just experienced where there was extensive damage to fused taps (over 2000) and single customer services (over 3000), restoration may appear slower. However, if the circuits are not energized first, connecting the downstream elements will not energize your household. It also presents other complications with efficiency and safety.

Credits:
https://www2.ameren.com/common/DistributionSystem.aspx

Reliability: Five-Year Improvement Plan

Areas of Focus

- Replacement of Defective UG Cable
- Wood Pole Management
- Tree Trimming
- Aging Substation Equipment
- Automation of Distribution System
- Hardening of OH Electric System



Questions

Winter Storm Landon Action Update

MLGW Committee Debriefing

February 15, 2022

Winter Storm Landon stretched from Texas to Maine dropping snow and ice over 2,220 miles

In the Memphis area we received up to 0.5 of ice accumulation

Dates: 2/3 through 2/14
Peak Outages: 186,000
Total Customers Affected: 233,640
Total Restoration Hours: 272

The storm garnered national attention

WSJ Wall Street Journal

Tens of Thousands Still in Dark in Tennessee After Winter Storm

Outages are concentrated in the Memphis area, as the eastern U.S. recovers from snow and ice.

2 days ago

The New York Times

Thousands Remain Without Power in Tennessee After Winter Storm

In Memphis, ice began accumulating on Friday from freezing rain, which led to crashes on roads, downed trees and power failures. Officials in...

1 day ago

The Weather Channel

Winter Storm Landon: Two Critical After 16-Car Pileup i… Memphis; Power Outages Top 200,000 | The Weather ...

Winter Storm Landon knocked out power to more than 200000 homes and businesses. - Articles from The Weather Channel | weather.com.

5 days ago

The Washington Post

Major snow, ice storm plastering mid-South, Midwest

In Memphis, ahead of updates from Weather Service that areas are under ice storm warnings, the office of emergency management said to "take time...

6 days ago

Historical Context

MLGW Major Storm History

- *Winter Storm Landon was the 4th largest event in terms of peak customers interrupted in MLGW history only behind Hurricane Elvis in 2003, the Ice Storm of 1994 and the Tom Lee storm of 2017.*
- *The Total Customers Impacted was 233,640 and at the peak, outages were 186,000. After the peak occurred, customers continued to experience outages due to falling limbs and trees, thus the impacted number continued to grow in the early days of the storm.*

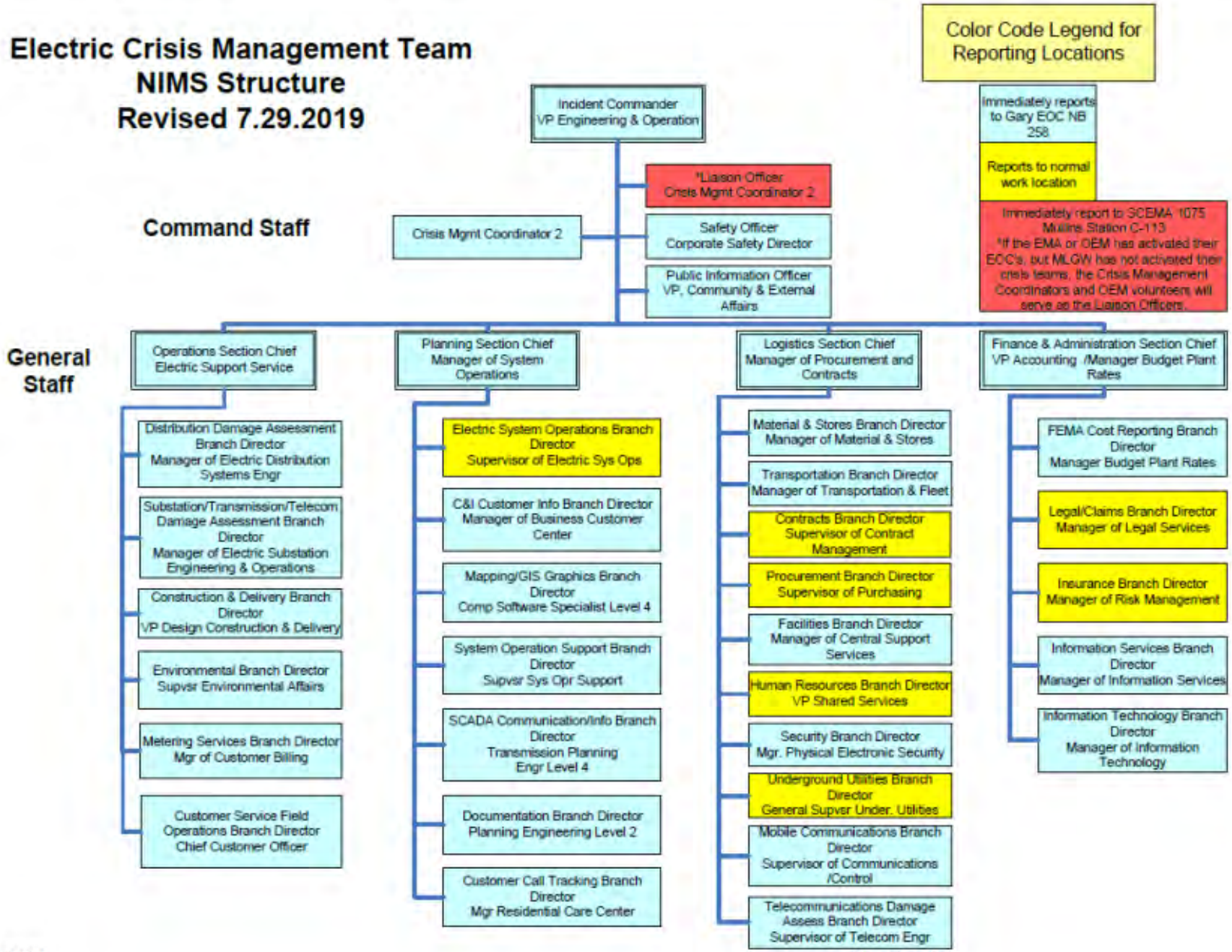
Major Storm Dates	Name	Peak Customers Interrupted	Duration Hours
July 22, 2003	Hurricane Elvis	339,000	379
February 11, 1994	1994 Ice Storm	281,000	333
May 27, 2017	Hurricane Tom Lee	188,000	263
February 3, 2022	***Winter Storm Landon***	***186,000***	***272***
June 12, 2009	Little Elvis	150,000	168
August 29, 2005	Hurricane Katrina	100,000	114
August 22, 2003	Hurricane Echo	74,000	48
April 4, 2011	MLK	70,000	98
April 19, 2011	April Repeat	65,000	67
July 4, 2004	M-80	60,000	36
March 2, 2014	Winter Mixer	51,000	112
February 5, 2008	Super Tuesday	46,000	108
April 26, 2011	April Threepeat	35,000	76
September 25, 2005	Hurricane Rita	35,000	38
May 1, 2010	May Day	32,000	50

Preparation Efforts

Storm Preparation Activities

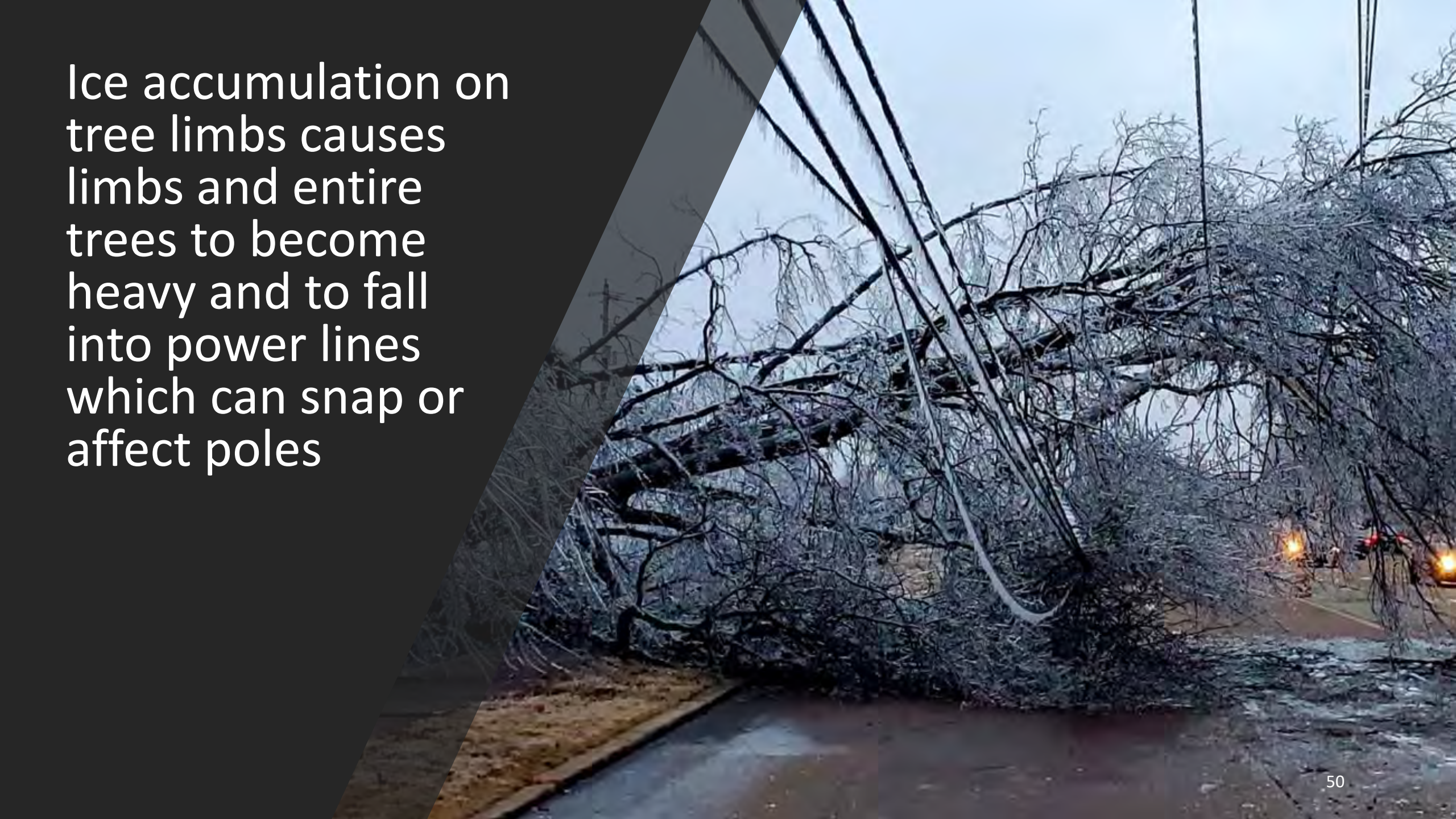
- Emergency Response Plan
- Put crews and personnel on Standby
- Assess and replenish fuel supplies for trucks and equipment
- Assess and replenish critical materials needed
- Formulate Storm Kits for the contract crews to utilize during the event
- Pre-event Crisis Team communications
- Ready to activate the Crisis Team

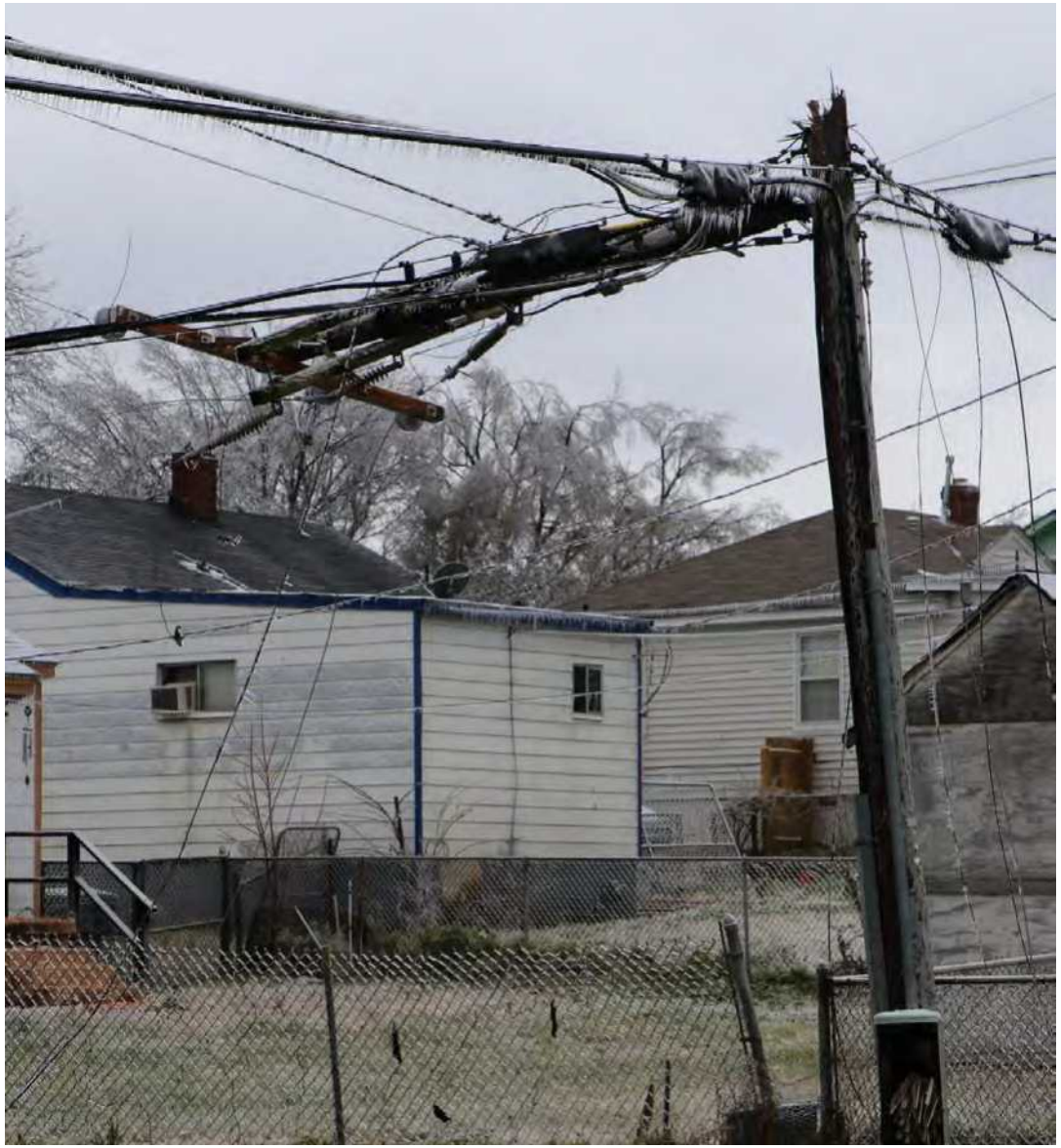
Electric Crisis Management Team NIMS Structure Revised 7.29.2019

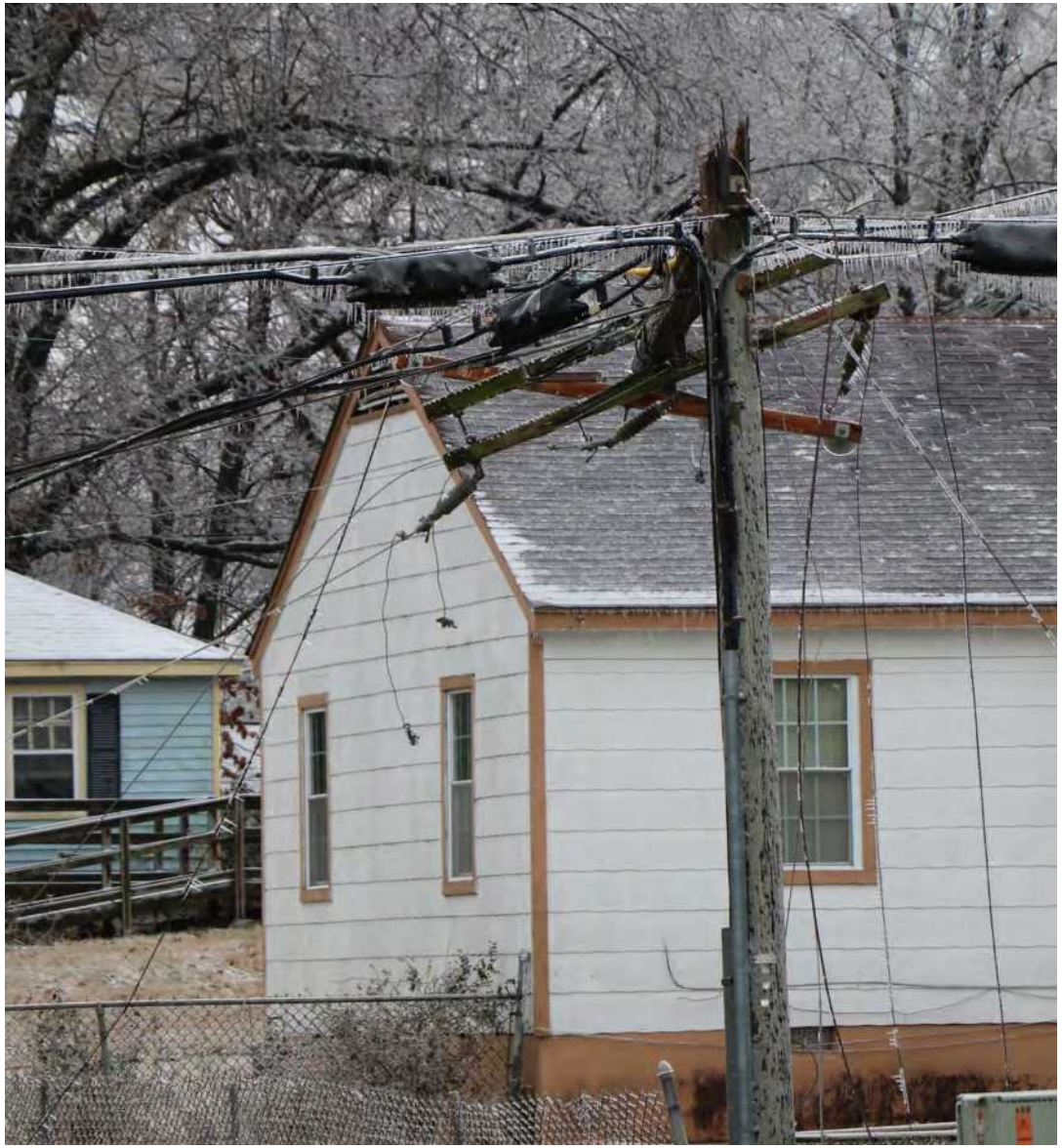


Storm Damage and Outages

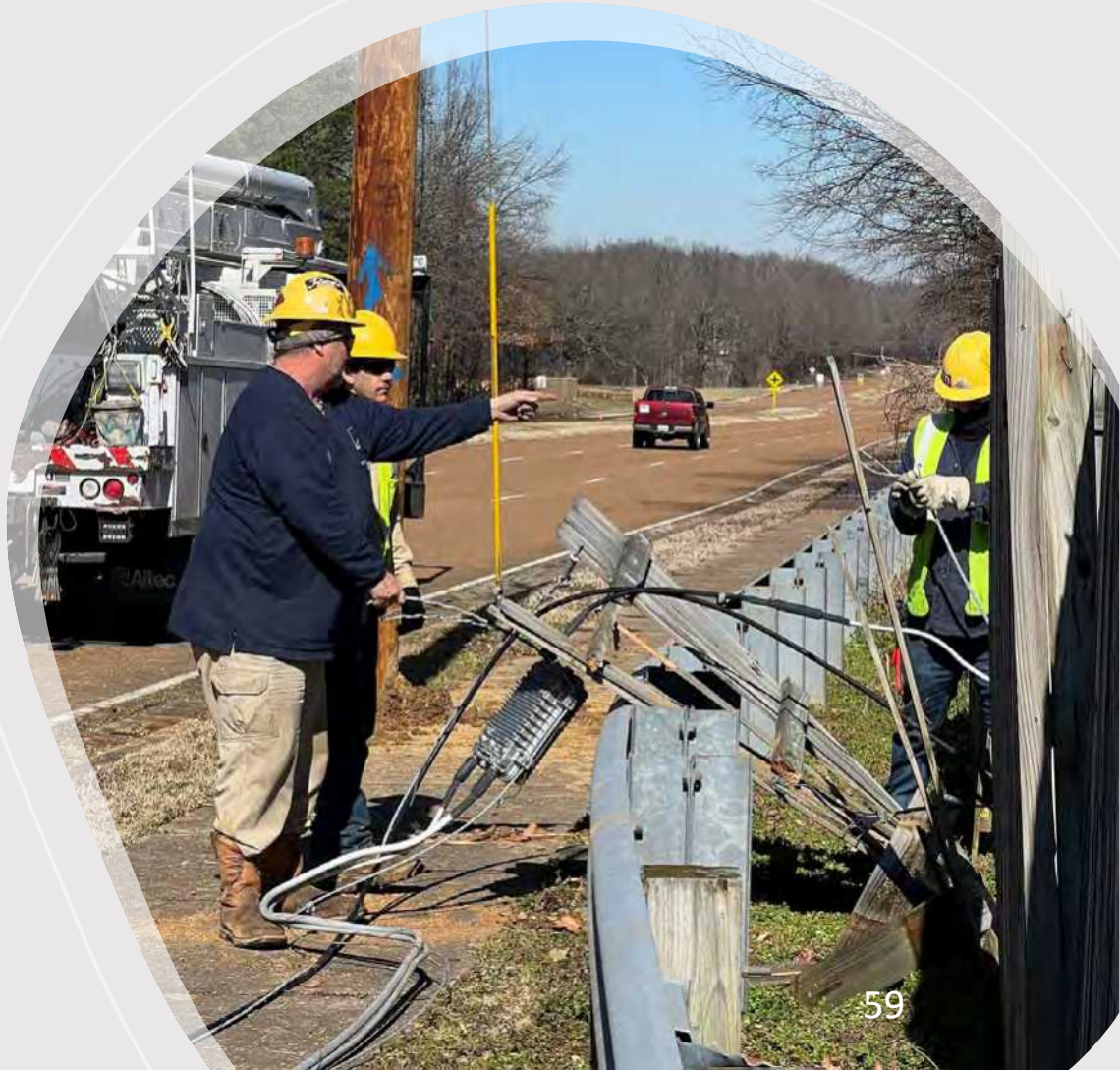
Ice accumulation on tree limbs causes limbs and entire trees to become heavy and to fall into power lines which can snap or affect poles








Altec
3228
GS 5785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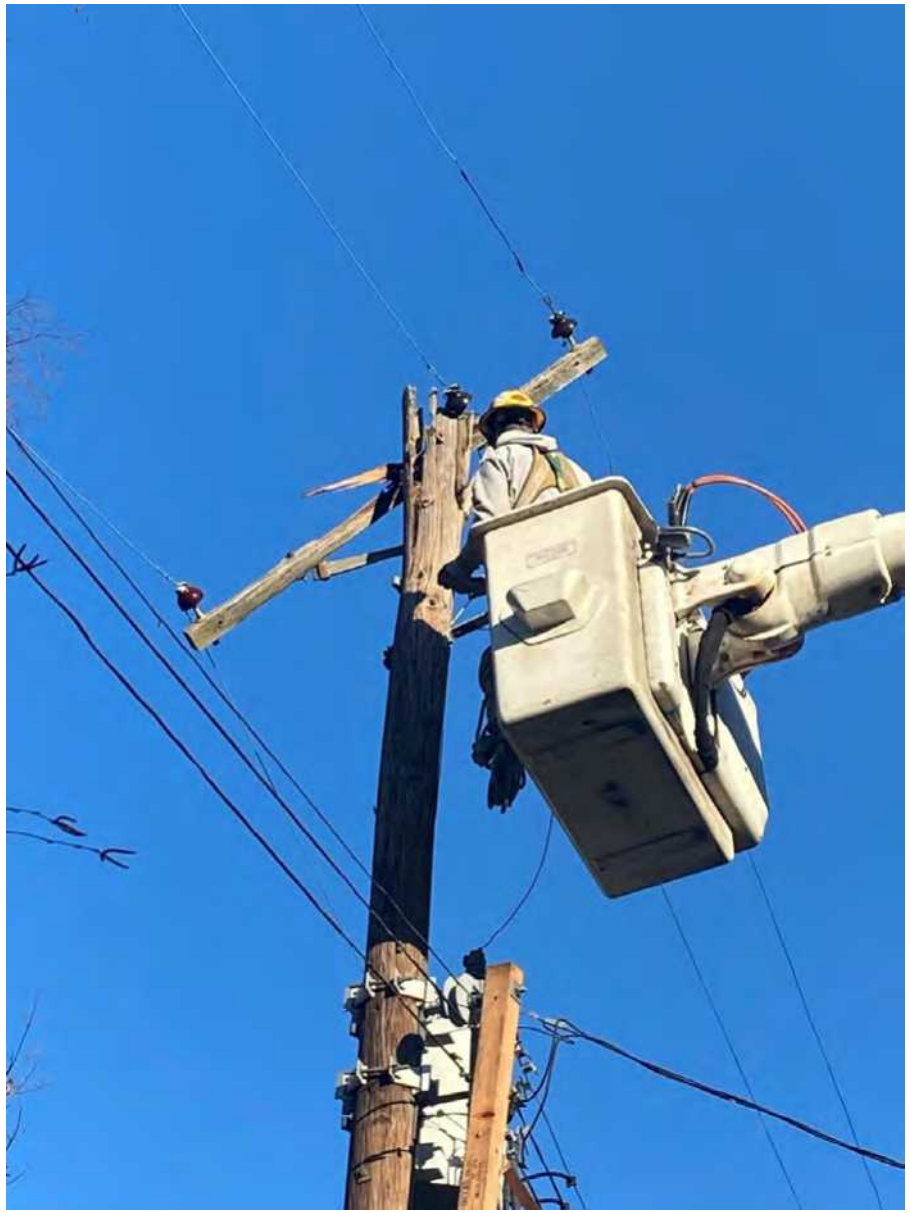



KOMATSU

Restoration Prioritization Process

Specific Strategies Employed

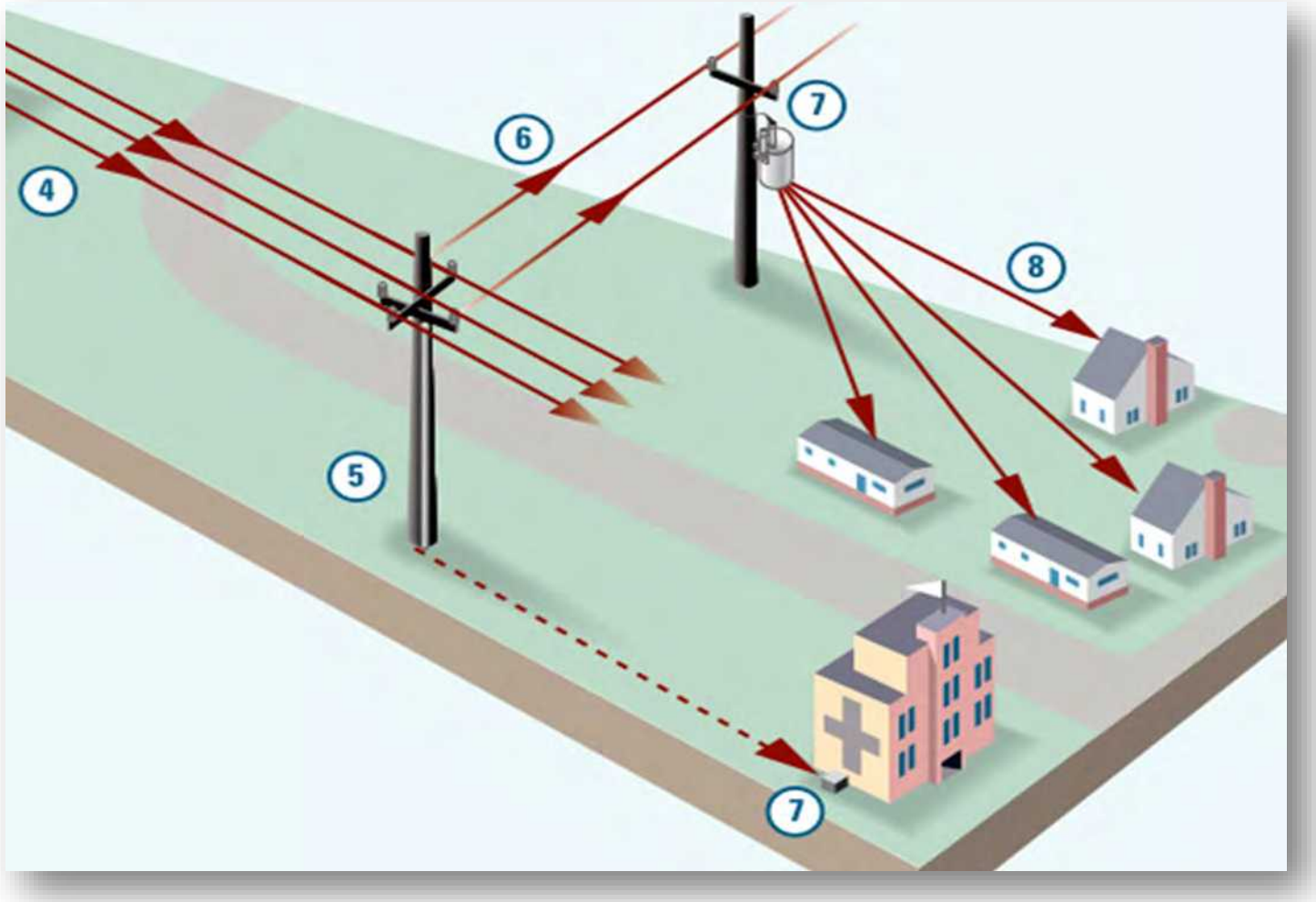
Critical public health and safety facilities (EMA, police, fire, hospitals, water pumping stations*)

Biggest Return

- Work primary circuit outages (#4 on image to right) out from the substations.
- Pros: gets most customers back on if there are no further outages downstream in the system (typically impacts thousands of customers)
- Cons: Leaves potential downstream outages (#6,#7,#8) behind the primary outage.

Saturation of Areas

- Employed after biggest return revealed there were many downstream outages behind the primary circuit outages.
- Examples of these are many fuse tap outages (#6) for tap circuits from the primary circuits, transformer outages (#7) and service outages (#8).



** This impacted the water system by reductions in water pressure and limited water availability. MLGW requested the TVA Combined Cycle Plant to limit water usage late Thursday night due to limited well capacity at Davis Pumping Station. In addition, MLGW had numerous water pumping stations with power loss and/or were restricted to one circuit as opposed to the normal two incoming power feeds*

Restoration Timeline

Level Set Factors to Consider

Safety is paramount We deploy resources with this in mind.

Vast majority of contract crews couldn t be released to MLGW until the storm affects were no longer present in their areas.

We had significant issues with Outage Text Alerts Due to damaged infrastructure used to help communicate information The system had just been rolled out and works well in typical circumstances.

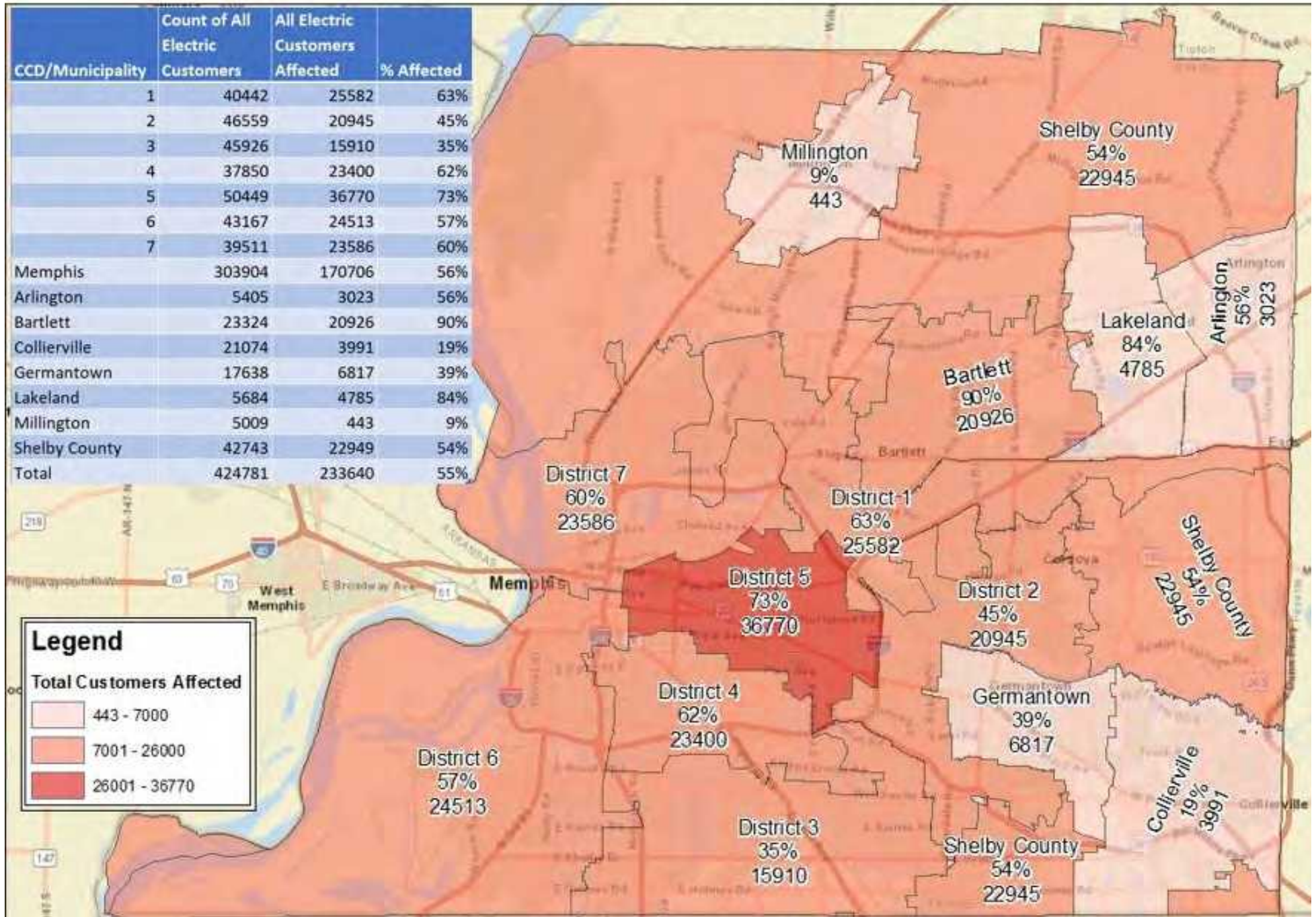
Crews are assigned to the sources of problems on our system, which may not always be visible to customers. Our network spans across both easily seen and not easily seen locations.

Crews may assess damage and leave without repairing due to the need to optimize our restoration efforts by turning in the damage so that it can be repaired consistent with our prioritization process.

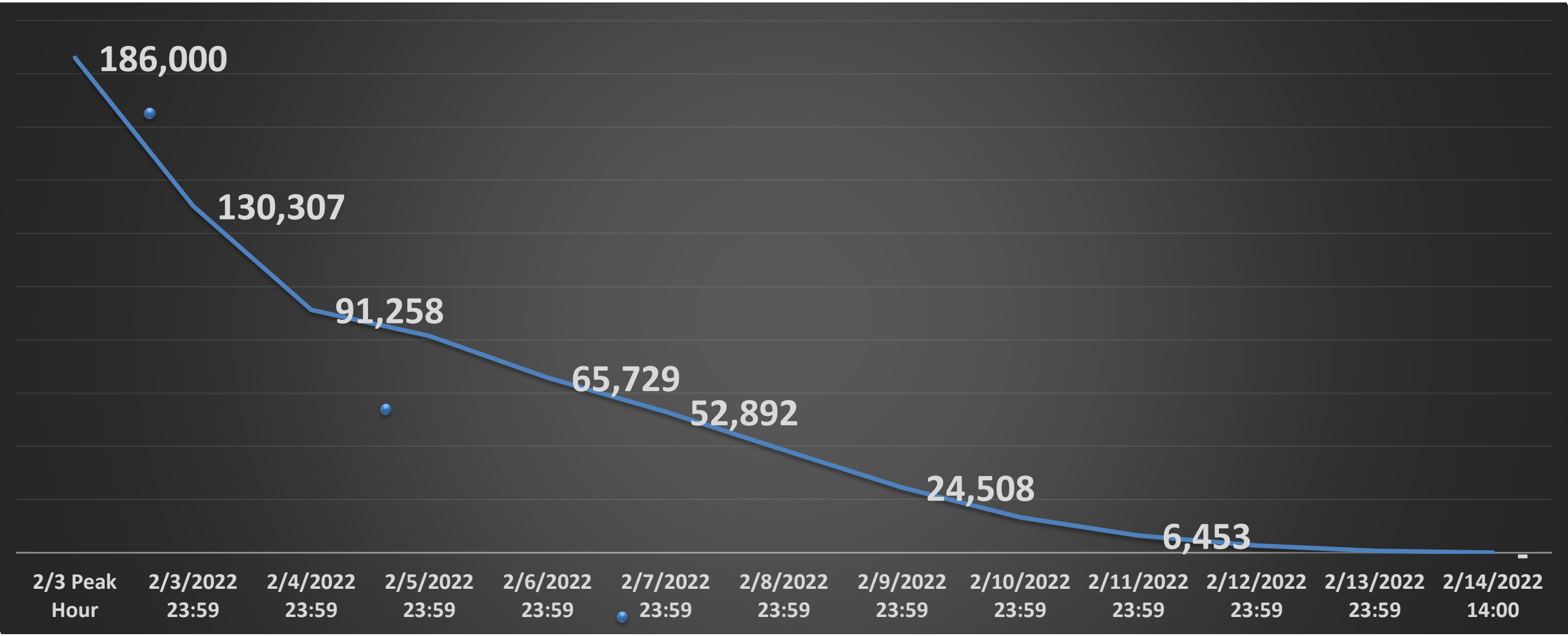
We remind the public to stay away from any downed lines To treat any downed lines as energized.

Customers Affected in 2022 Ice Storm by CCD and Municipality

CCD/Municipality	Count of All Electric Customers	All Electric Customers Affected	% Affected
1	40442	25582	63%
2	46559	20945	45%
3	45926	15910	35%
4	37850	23400	62%
5	50449	36770	73%
6	43167	24513	57%
7	39511	23586	60%
Memphis	303904	170706	56%
Arlington	5405	3023	56%
Bartlett	23324	20926	90%
Collierville	21074	3991	19%
Germantown	17638	6817	39%
Lakeland	5684	4785	84%
Millington	5009	443	9%
Shelby County	42743	22949	54%
Total	424781	233640	55%



Snapshot of Customer Outages at the End of the Day



**** Excludes counts for which power supply cannot be taken at home or commercial facility.***

Resources Deployed

Resource Availability Boots on the Ground

40 MLGW Troubleshooters (first responders, damage assessment)

26 MLGW Overhead, Shift, Network Crews, ~136 people

78 Contracted Tree Trimming Crews, ~273 people (grew over time)

90 Contracted Line Crews (from various states), ~450 people (grew over time)

25 Electric Substation/Meter Operations Crews, ~125 people (primarily assigned to services)

Retirees and Engineers assisting, ~100

Total field personnel of over 1,100.

Communications Efforts and Community Outreach

Social Media and Web Metrics

Updated web and social media banners
Livestreamed press conferences
Expanded social media response hours
Ice Storm Update Dashboard added to mlgw.com

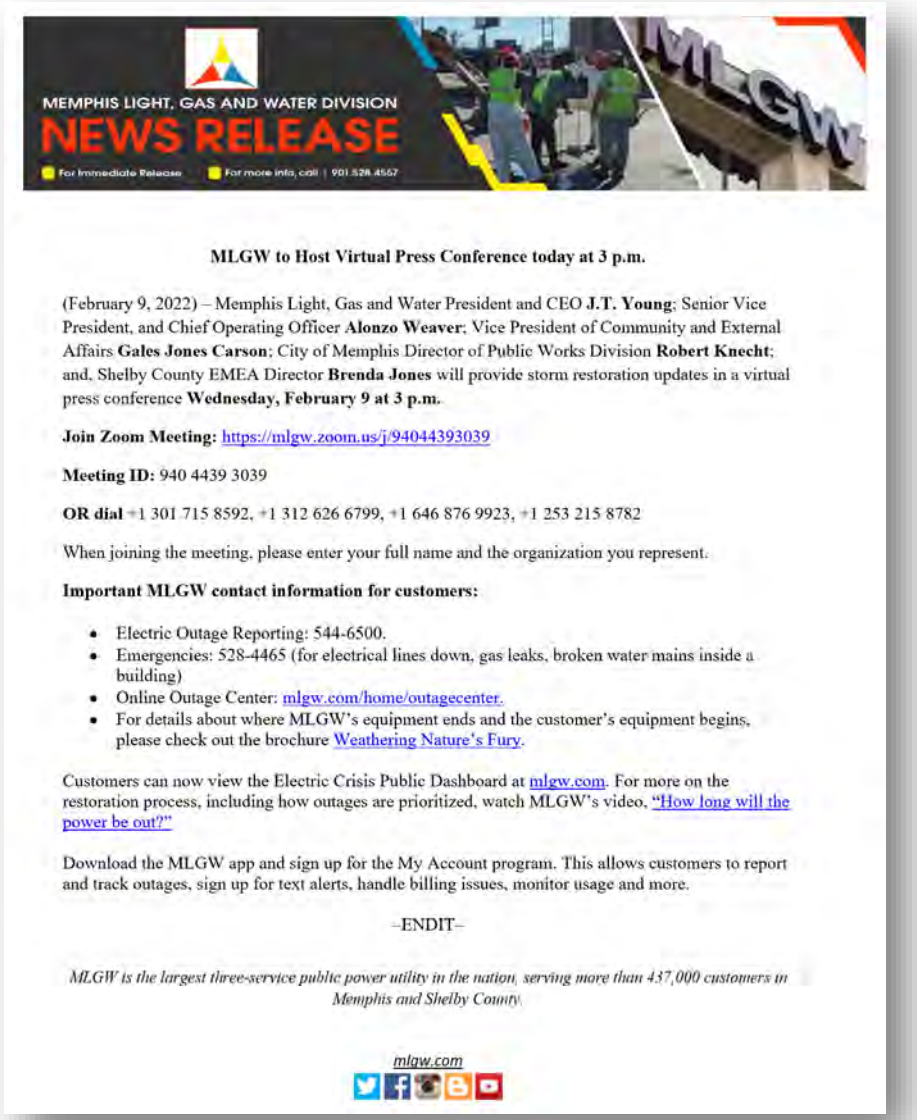
Social Media Metrics

- **74,213** overall impressions
- **3,248** new followers
- **18,700** received messages
- **15%** increase in audience growth

Web Traffic on mlgw.com

- **1,057,292** page visits
- **590,570** Outage Map views
- **94,945** Outage Center page views
- **19,617** Report outage page views
- **34,000** My Account page visits
- **16,602** MLGW Outage Dashboard

Data as of 2/10/22



MEMPHIS LIGHT, GAS AND WATER DIVISION

NEWS RELEASE

For Immediate Release | For more info, call | 901.528.4552

MLGW to Host Virtual Press Conference today at 3 p.m.

(February 9, 2022) – Memphis Light, Gas and Water President and CEO **J.T. Young**; Senior Vice President, and Chief Operating Officer **Alonzo Weaver**; Vice President of Community and External Affairs **Gales Jones Carson**; City of Memphis Director of Public Works Division **Robert Knecht**; and, Shelby County EMEA Director **Brenda Jones** will provide storm restoration updates in a virtual press conference **Wednesday, February 9 at 3 p.m.**

Join Zoom Meeting: https://mlgw.zoom.us/j/94044393039

Meeting ID: 940 4439 3039

OR dial +1 301 715 8592, +1 312 626 6799, +1 646 876 9923, +1 253 215 8782

When joining the meeting, please enter your full name and the organization you represent.

Important MLGW contact information for customers:

- Electric Outage Reporting: 544-6500.
- Emergencies: 528-4465 (for electrical lines down, gas leaks, broken water mains inside a building)
- Online Outage Center: mlgw.com/home/outagecenter.
- For details about where MLGW's equipment ends and the customer's equipment begins, please check out the brochure Weathering Nature's Fury.

Customers can now view the Electric Crisis Public Dashboard at mlgw.com. For more on the restoration process, including how outages are prioritized, watch MLGW's video, "How long will the power be out?"

Download the MLGW app and sign up for the My Account program. This allows customers to report and track outages, sign up for text alerts, handle billing issues, monitor usage and more.

–ENDIT–

MLGW is the largest three-service public power utility in the nation, serving more than 437,000 customers in Memphis and Shelby County.

mlgw.com

Media Relations

CNN
Wallstreet Journal
Weather Channel
AccuWeather
Associated press
Daily Memphian
FOX 13
Local 24
WREG News 3
WMC 5
The Commercial Appeal
KWAM Radio
The New York Times
WKNO
Tennessee Lookout
The Wall Street Journal
Newsweek
CW30

News Release

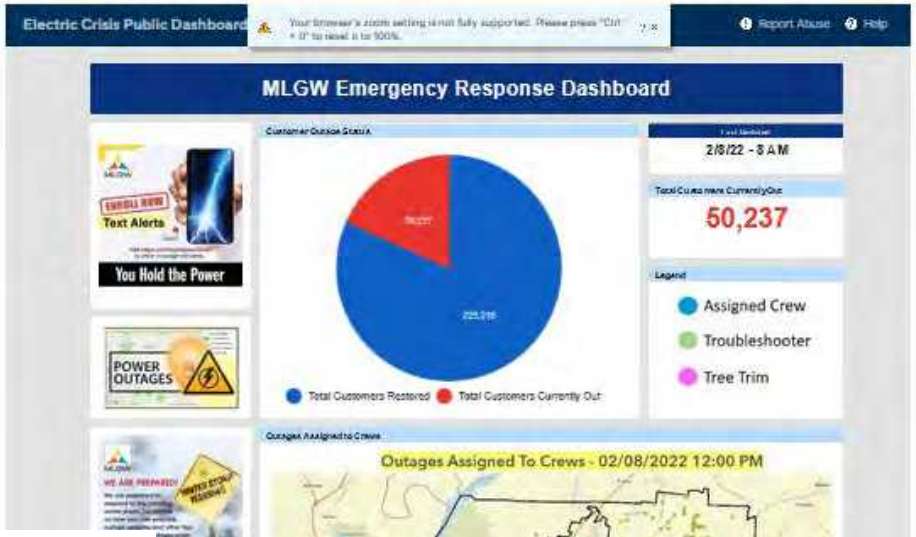
21 news releases sent

Media Requests

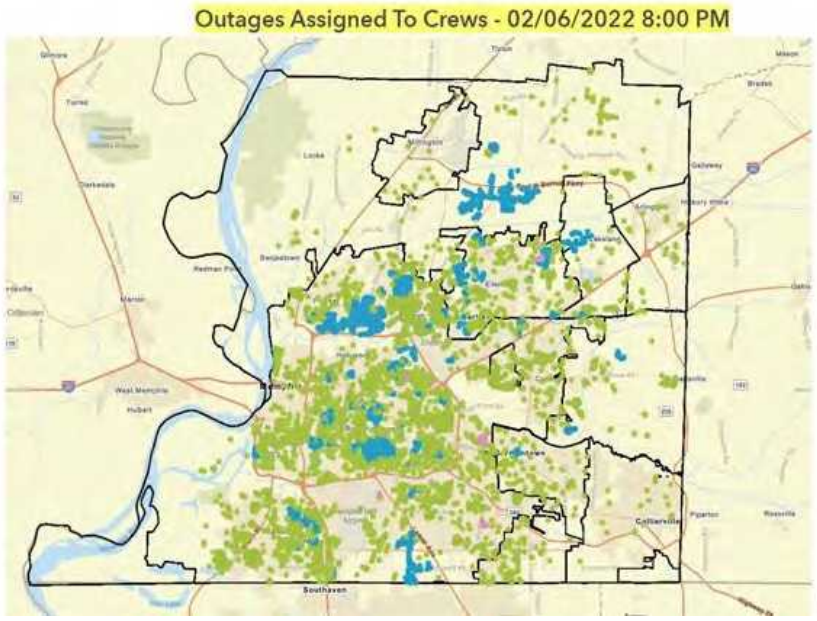
81 media inquiries

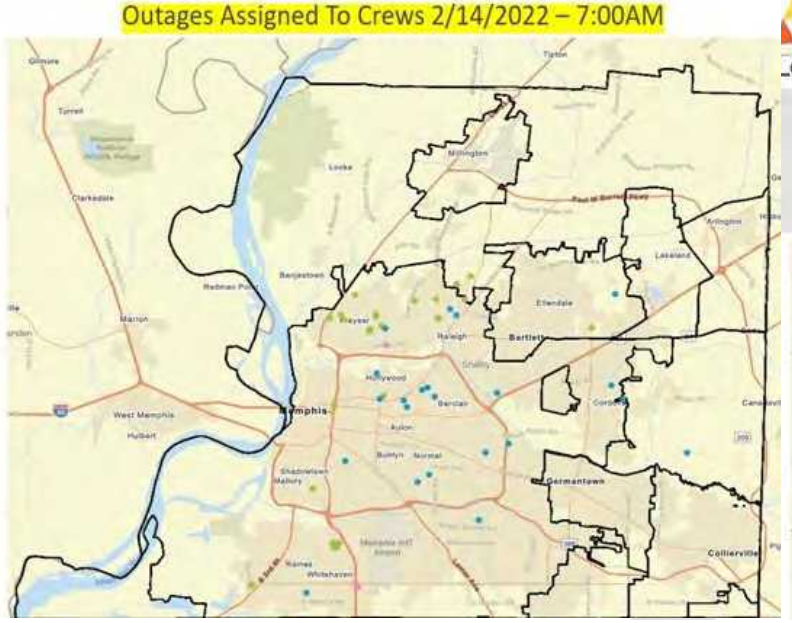
Data as of 2/10/22

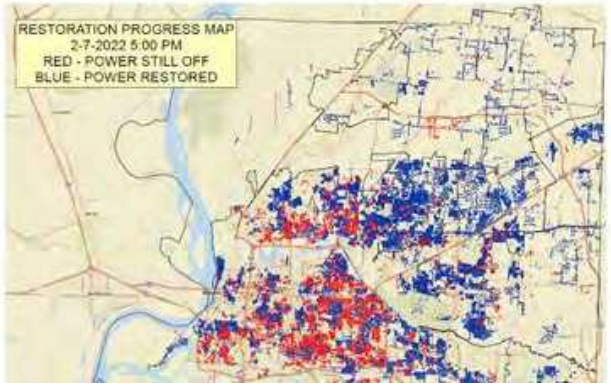
Created new dashboards and crew restoration maps



Outage of Crews Assigned Progress







Community Outreach

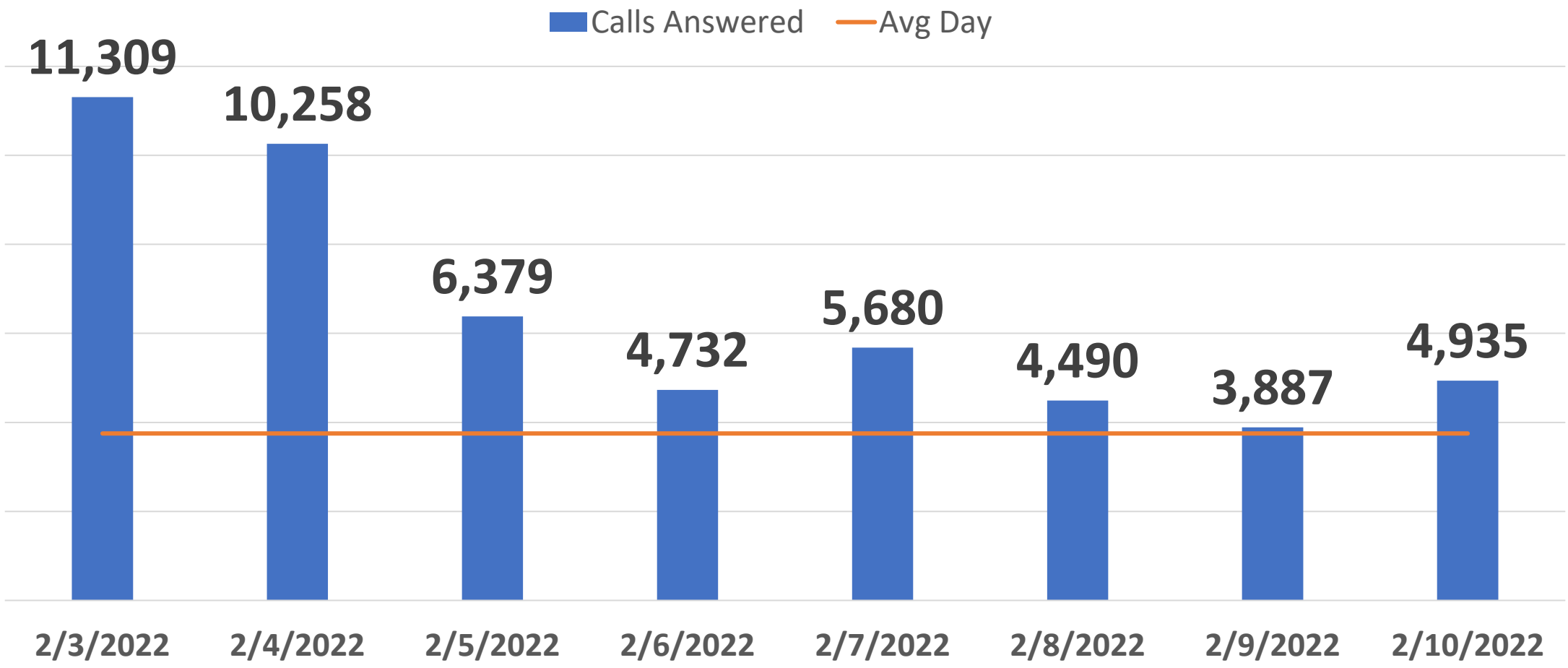
Community Outreach

Communicated with social service agencies regarding community issues and resources related to ice storm and restoration including senior meal replacement.

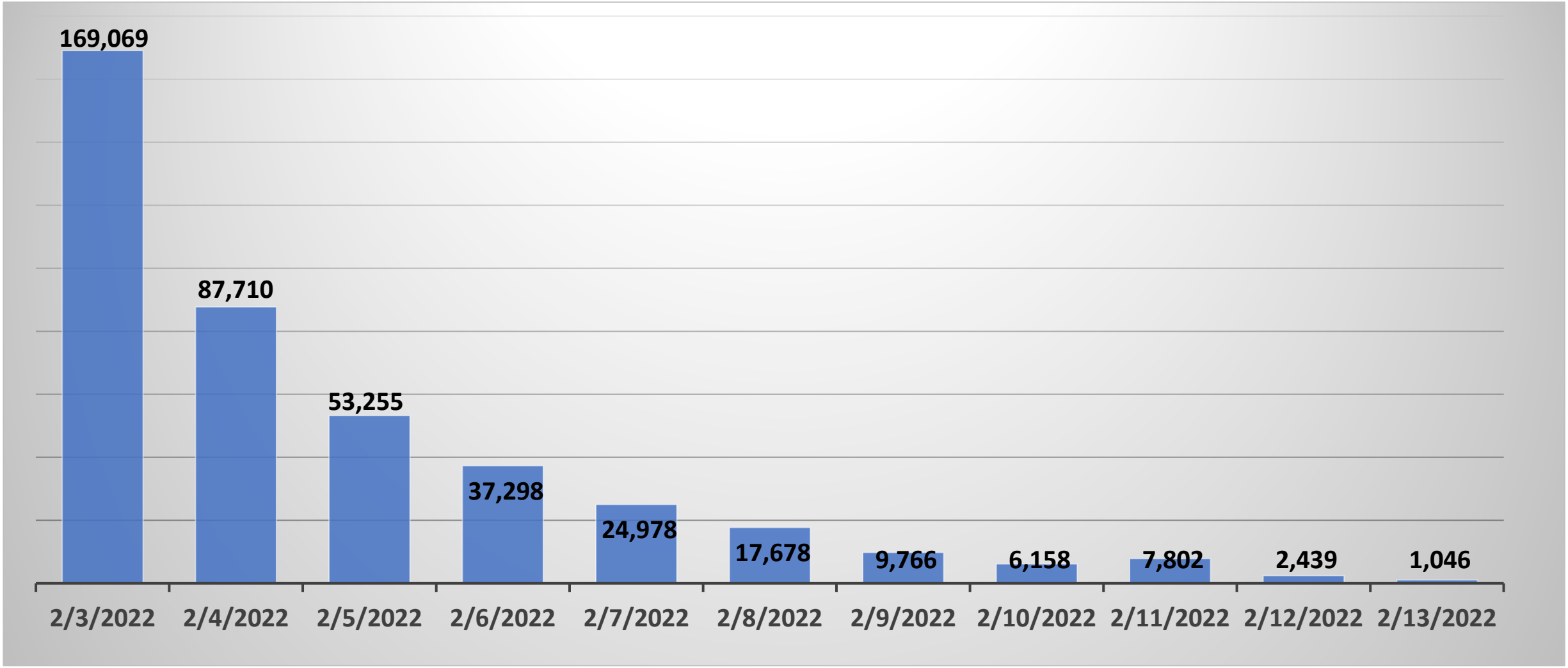
Partnered with Mid-South Food Bank to host Mobile Food Pantry on February 8 and February 11. Tennessee Highway Patrol volunteers assisted on February 8.

Communicated with the Department of Human Services regarding replacement of SNAP benefits. Current DHS clients who experienced an outage of 12 hours or more will be eligible for replacement after total restoration is complete.

Customer Care Center Phone Calls Answered



Outage Hotline Calls by Day (544-6500)



Cost Projections

Cost Projections

- Submitted initial preliminary cost estimate of $14 million to TEMA/FEMA for a disaster declaration request from the Governor to the President.
- Presidential declaration was made on 3/11/22.
- With the declaration MLGW will be eligible for a 75% reimbursement of the eligible costs.
- For historical context, the 1994 Ice Storm (14 days) and 2003 Hurricane Elvis (16 days) were approximately $14.5 million and $31 million in total event cost respectively.

FEMA

President Joseph R. Biden, Jr. Approves Tennessee Disaster Declaration

MARCH 11, 2022 • STATEMENTS AND RELEASES

Today, President Joseph R. Biden, Jr. declared that a major disaster exists in the State of Tennessee and ordered Federal assistance to supplement state and local recovery efforts in the areas affected by a severe winter storm from February 3 to February 4, 2022.

Federal funding is available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm in the counties of Crockett, Fayette, Haywood, Lauderdale, Shelby, Tipton, and Weakley.

Federal funding is also available on a cost-sharing basis for hazard mitigation measures statewide.

Early Lessons Learned

Early Lessons Learned

- Provide more timely information to our Customer Care team so that they can be better prepared to answer customer questions about restoration efforts.
- Disable our text alert/outage status information because our infrastructure damage was too severe to allow it to function as intended...The system works very well under normal conditions...make appropriate fixes to this system asap.
- Reevaluate our damage assessment strategy to ensure that it is optimized in all areas to allow for safe, efficient, timely, flexible/expandable infrastructure damage tracking.
- Explore the pre-arrangement of staging locations for outside crew trucks and similar pre-arrangement for crew transportation to and from lodging locations to their vehicles and other logistics to optimize outside crew efficiency.
- Have a prioritized list (prior to the storm s arrival) of traffic signals at key intersections and coordinate early on with affected municipalities in our restoration process.

Early Lessons Learned (cont.)

- Ahead of the storm, give customers a better estimate (erring on the side of a worst-case scenario) of how long they could be without power.
- Reevaluate our Crisis Management Team structure and associated processes for needed tweaks to ensure proper prioritization of actions needed during restoration.
- Work through our partnerships within the American Public Power Association (APPA) and similar utility industry affiliations to glean best practices in ice storm restorations.

Accountability

Annually, we will review with our Board and the Council our storm restoration plan with any updates incorporated and we should include the updated plans in bill inserts and via online access.

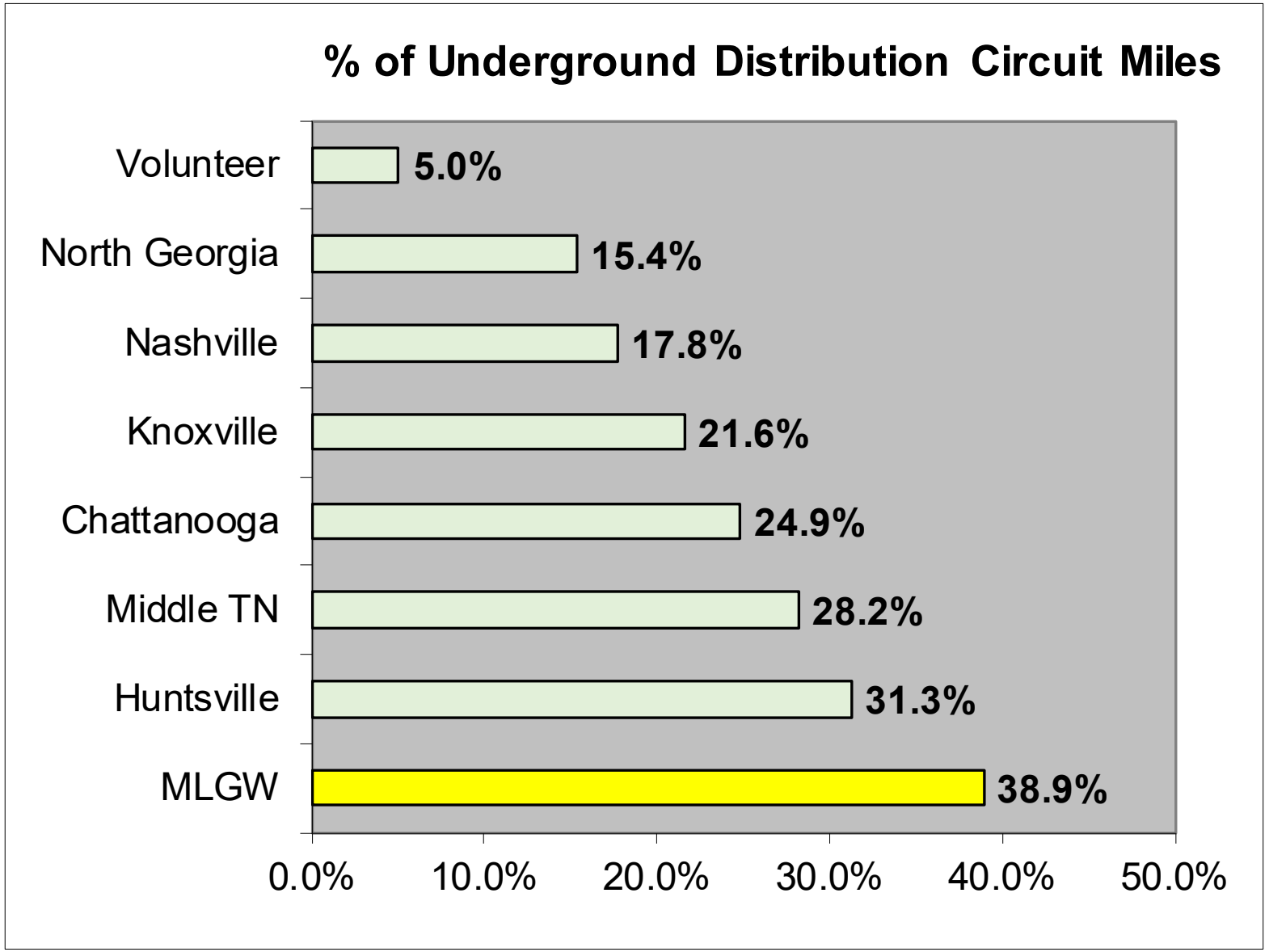
Community engagement opportunities acknowledging our commitment to meeting customer expectations.

Once we activate our Crisis Team in advance of a storm, we will notify our Board, City Council, Mayors and other elected officials throughout Shelby County regarding our plans and they will be updated at least daily regarding the status of our restoration efforts.

Overhead vs Underground

Overhead vs Underground

MLGW currently has almost 40% of its distribution system underground and that is the highest percentage among the Big 8 distributors in the Tennessee Valley.



Overhead vs Underground (cont.)

An estimated cost is $1.3 million per mile (may be on the lower end)

Cost of various options

- $6+ billion to covert 100% of MLGW s remaining overhead distribution miles.
- $2+ billion to convert the primary backbone circuits, about 38% of overhead distribution miles.
- $1+ billion to convert 100% of the rear property line circuits and rear property line services (about 28% of overhead distribution miles and includes cost estimate for service lines).

Summary

Winter Storm Landon was the 4th largest event in MLGW history and the restoration timeline was similar to the Tom Lee event.

Storms and outages will always be a part of our business.

We realize that customers don t really want to have to think about their electrical service.

Will improve restoration and communication processes based on our lessons learned.

Will evaluate strategic underground conversions of parts of the distribution system.

Thanks to all the MLGW personnel and contractors who are the heroes.

Questions

MLGW

SERVING YOU IS WHAT WE DO

Continuation of 5-Year Service Improvement Plan

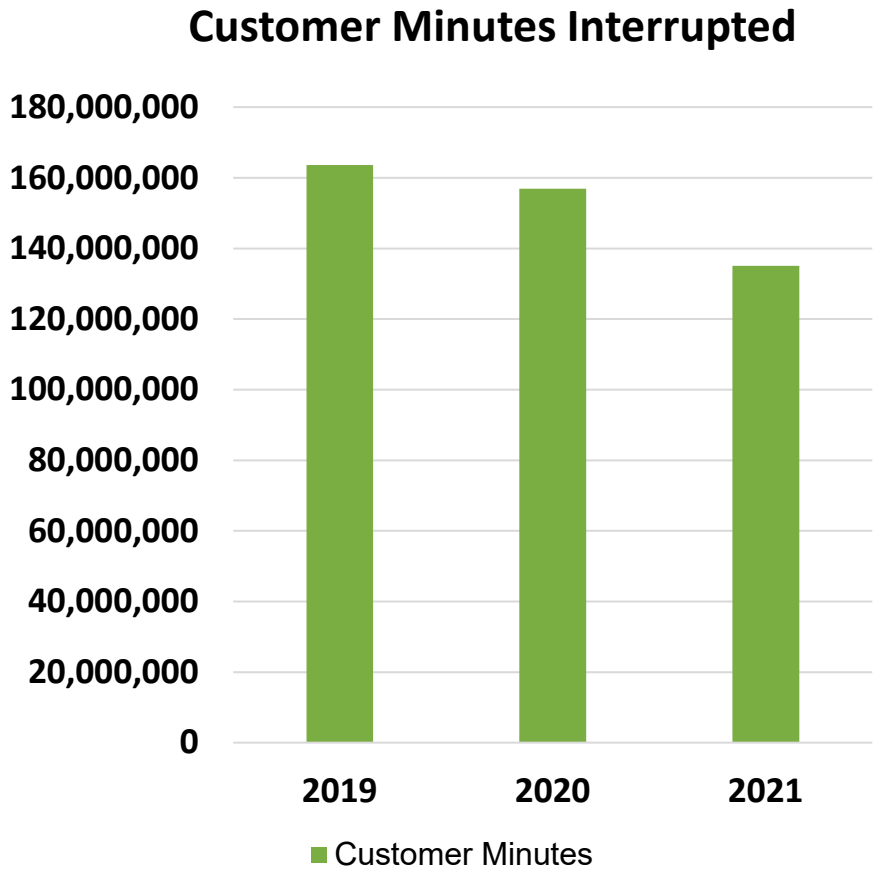
(Originally planned for 2020 2025)

90

Reliability: Five-Year Improvement Plan

Areas of Focus

- Replacement of Defective UG Cable
- Wood Pole Management
- Tree Trimming
- Aging Substation Equipment
- Automation of Distribution System
- Hardening of OH Electric System



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Planned Electric Infrastructure Investment

Asset Affiliation	Description	Consequence	5 Year Spending Target	Spending through Dec-21	% Spend to Date	Remaining Expenditure
Asset life	Substation equipment needs to be maintained and components need to be replaced periodically to extend asset life.	Depending on the equipment that fails, a long duration outage could occur.	$54.7 Million	$23.5 Million	43%	$31.2 Million
Vegetation management	Vegetation-caused outages.	Vegetation is the leading cause of MLGW outages. Need to reduce trim cycle.	$98.5 Million	$14.3 Million	14.5%	$84.2 Million
Underground cable	1960-1980 vintage UG cable failures.	Cable segment failures lead to long duration outages.	$54 Million	$6.2 Million	11.5%	$47.8 Million
Grid modernization	Technology needs to be upgraded	Delays in implementing can create an inability to implement upgrades in an optimal manner.	$130 Million	$11.1 Million*	8.5%	$118.9 Million
Wood poles	Wood poles have been inspected and rated. Not all identified poles have been replaced.	To the extent that those identified have not been replaced, additional pole failures are likely to occur.	$15 Million	$6.1 Million	40.7%	$8.9 Million

(Excerpts from HDR Engineering Study s Risk Register)

****Cust. Mins. Interrupted (CMI) -~25% below 2019 levels***

Reliability: Contracts Executed

Contract #12163/Davis H. Elliot Electric C & M/Overhead

Contract Value: $55.3 million

Contract Term: 4/12/2021 -4/11/2026

Replacement of Defective Wood Poles

Automation of Distribution System

Hardening of OH Electric System

Contract #12198/Standard Electric Co. Electric C & M/Underground

Contract Value: $69.7 million

Contract Term: 9/2/2021 - 9/1/2026

Replacement of Defective UG Cable

MLGW
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Reliability: Contracts Executed

Contract #12077/Asplundh Tree Expert Line Clearance

Contract Value: $97.4 million

Contract Term: 10/7/2019 - 10/6/2024

Electric Distribution Line Clearance

Contract #12151/ABC Professional Tree Services Line Clearance

Contract Value: $30.0 million

Contract Term: 1/3/2021 - 1/2/2026

Electric Distribution Line Clearance

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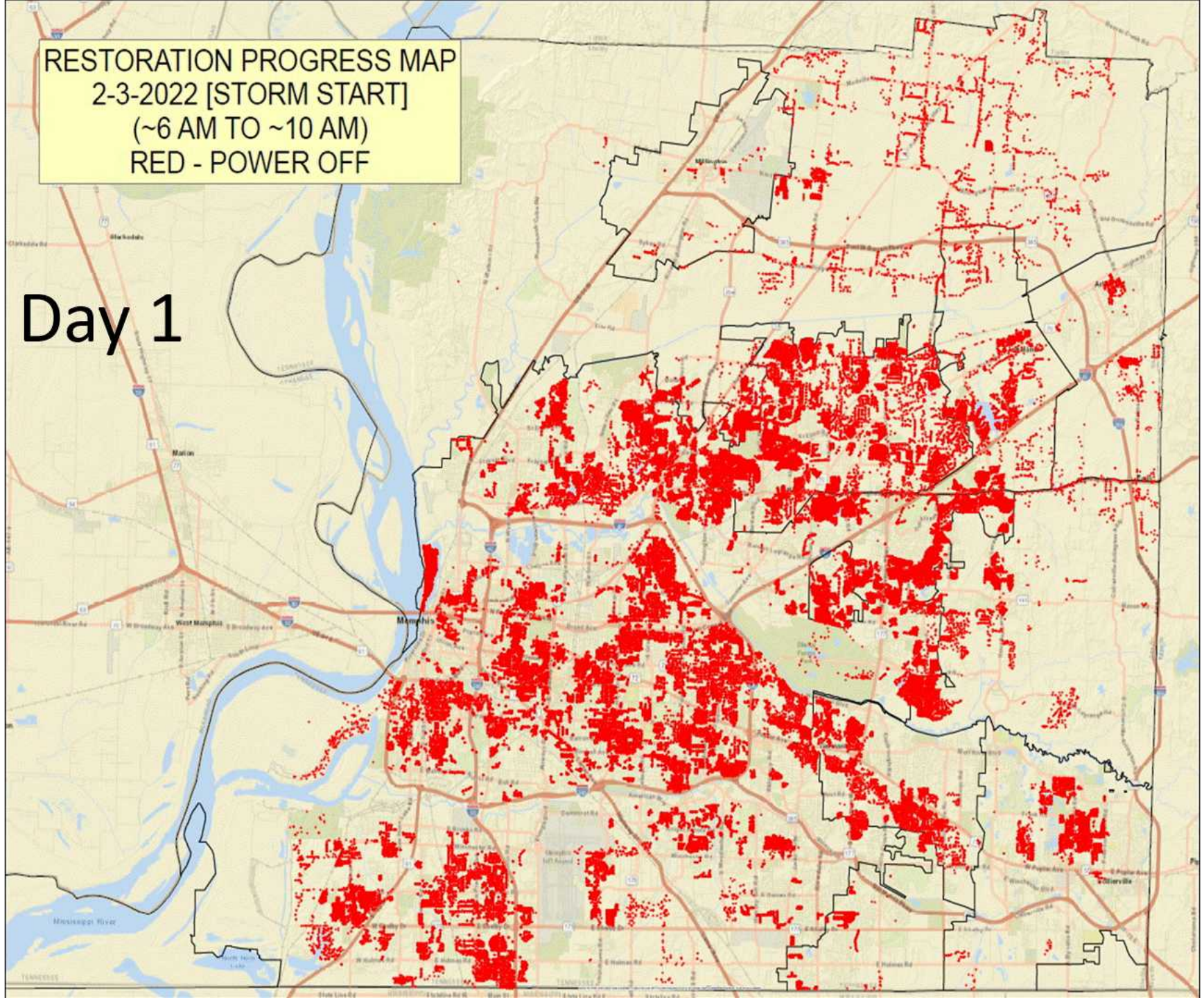
RESTORATION PROGRESS MAP
2-3-2022 [STORM START]
(~6 AM TO ~10 AM)
RED - POWER OFF
Day 1

Next OIAT meeting topics (Scheduled for 3/31)

MLGW
SERVING YOU IS WHAT WE DO

- Review information from previous meeting of 3/17.
- Complete the overview of electric distribution, outages & restoration process (if necessary).
- Review details of MLGW s 5-Year Service Improvement Plan
- Provide a team brainstorming session to hear your thoughts regarding outage issues and ideas for potential improvements.