System Resiliency and Data Analytics

Austin Energy

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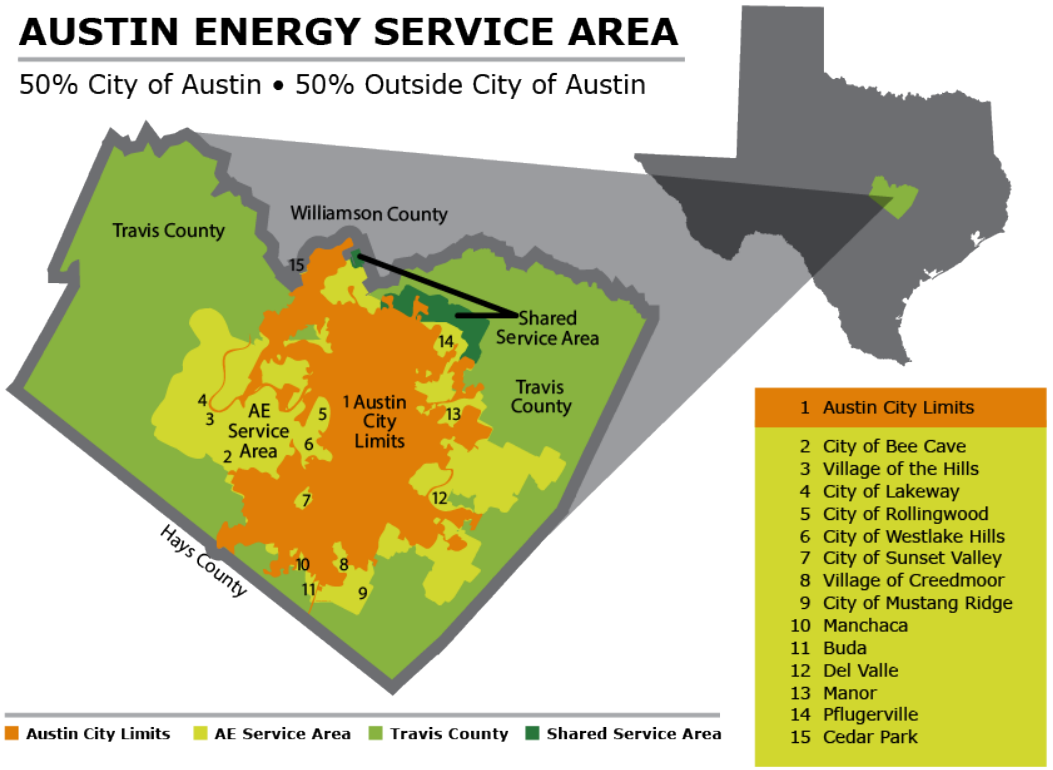
About Austin Energy

- 2nd largest municipally owned utility in Texas
- Reports to the City Manager, who executes the policy and direction of the City Council
- 437 square miles of service area covering City of Austin and beyond
  - 624m of Transmission lines
  - 11688m of Distribution lines
- Vertically-integrated in a deregulated, whole-sale, energy only market
- Annual Revenue $1.4 B



System peak load:
2812 MW (summer)
2377 MW (winter)

496,000+ customers
515,000+ meters
1700+ Employees

Austin Energy Grid Data Challenges

Predictive Analytics

Identifying faults before they happen on the distribution systems

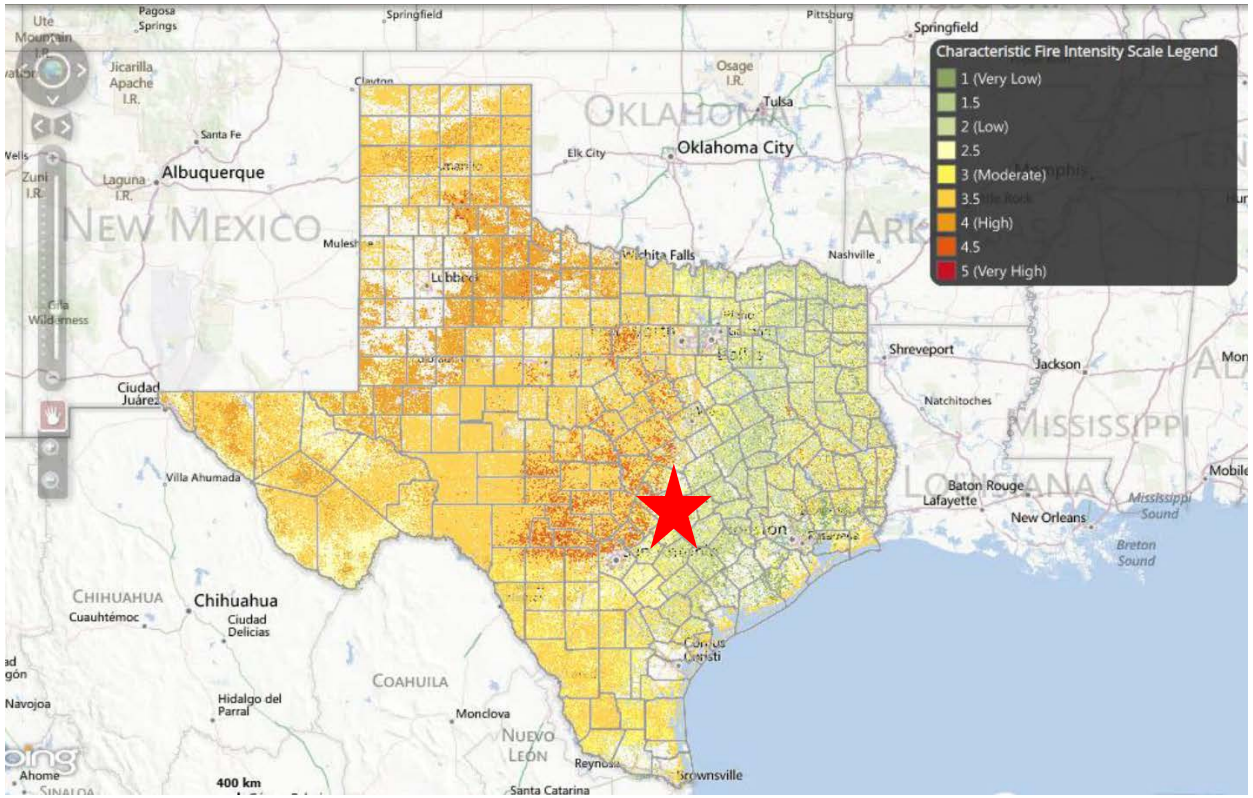
Cyber Security

Balancing the considerable push for “open data” against the pull of securing your networks

Interoperability

Open Standards in emerging technology areas (Distributed Energy Resources) become critical in asset lifecycle - EX: Energy Storage Systems

Example – Wildfire Risk Mitigation

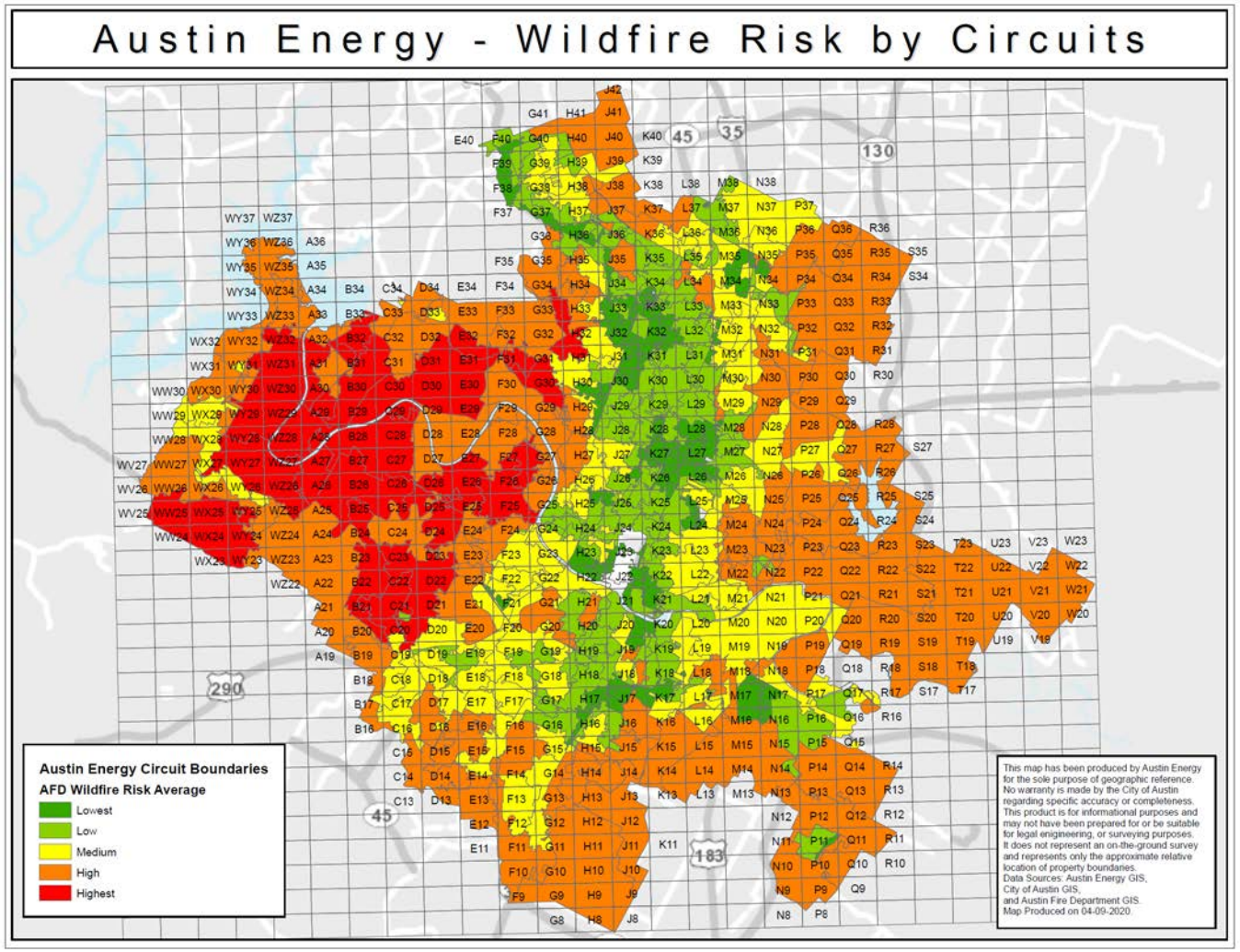


- Austin is in one of the hot spots for Wildfire Risk in the state of Texas

- 2011 Bastrop Fires
  - SE of Austin/Travis County
  - Hottest June-August on record
  - Severe Drought Conditions
  - Lowest single year rainfall since 1895
  - Ignition Source - Suspected Downed Power lines
  - ~5800 acres burned

**Map provided by Texas A&M*

Wild Fire Risk Mitigation

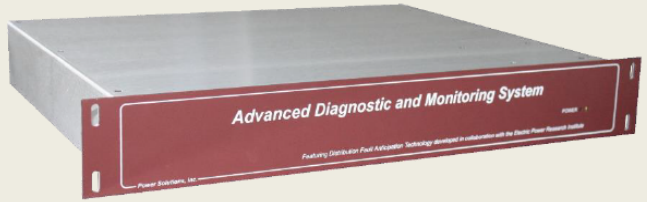


- Strategic Goal –Grid Resilience
  - Distribution System Maintenance
    - Target – WPF and WFRM
- Multiple GIS Data Sources
  - Austin Energy
  - City of Austin
  - Austin Fire Department
- Reliability Analytics
  - ADMS Data
  - AMI Data
  - DFA Data

Distribution Fault Anticipation (DFA)

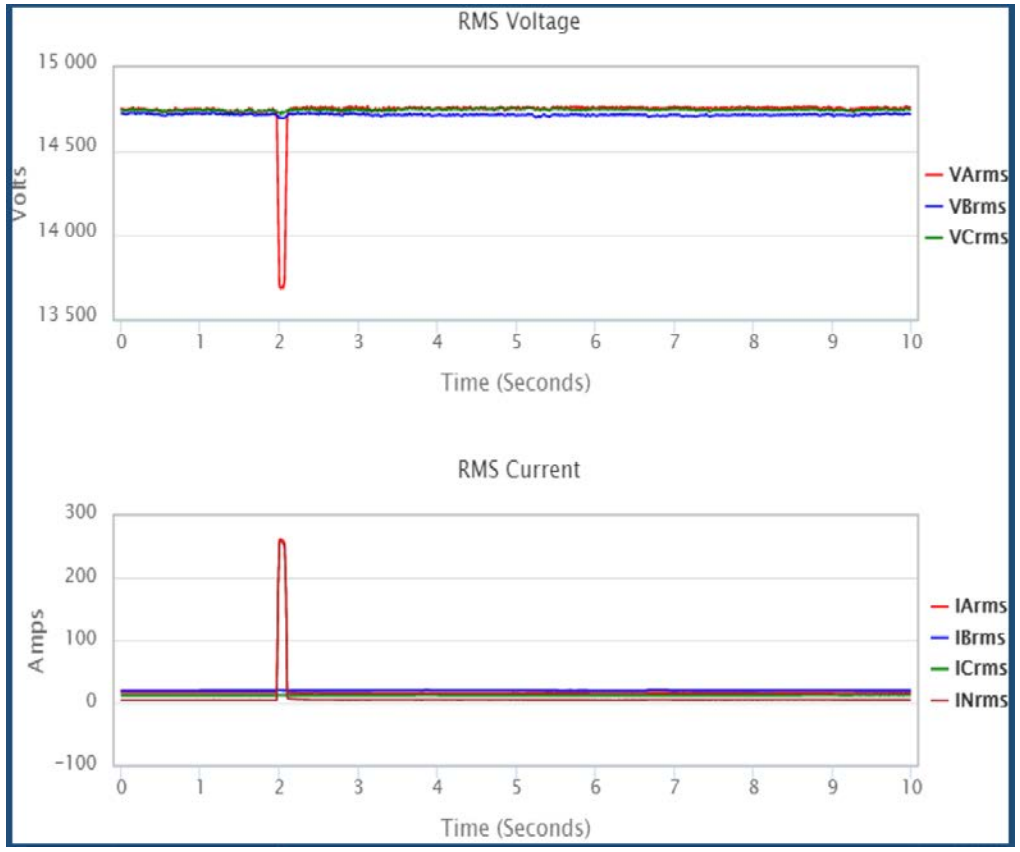
Hardware Description

- Standard 19” rack-mount substation equipment
- One device per feeder
- Uses conventional CTs and PTs
- No distributed electronics or communication required
- Communicates with master station via Internet



- Pilot Program
  - Developed by Texas A&M
  - Austin Energy 1 of 7 utilities participating when project started
  - AE signed on in 2016
  - 6/277 Feeders
  - Anticipated Benefit - Predictive Fault Analysis

Distribution Fault Anticipation (DFA)



- Voltage/Current Waveforms
  - Sequence of Events
  - Estimated Fault Current
  - Estimated Fault Duration
- Fault Location
- Downed conductors
- Conductor slap/clash
- Equipment arcing or explosions
- Trees/Vegetation

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Thank you!

Contact me:

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