



***Electric Power Board
Chattanooga***



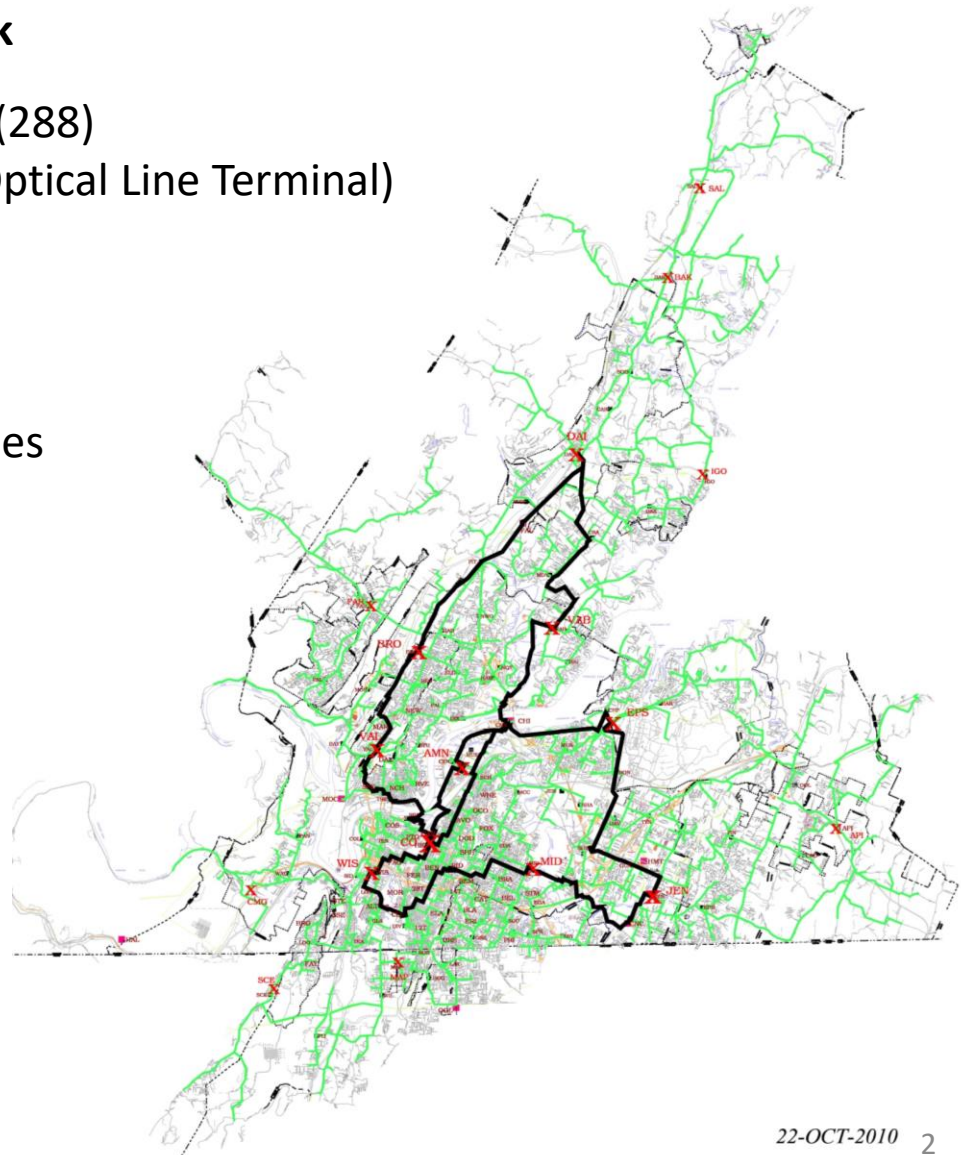
NR ITS Connect Chattanooga Annual Meeting

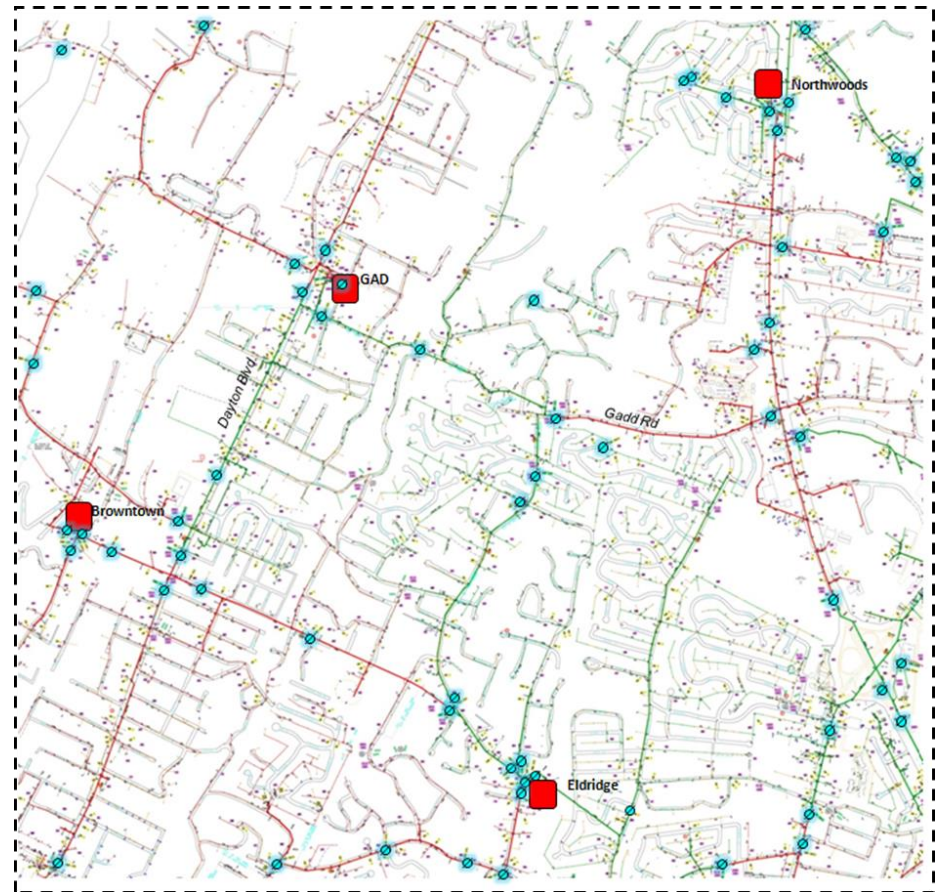
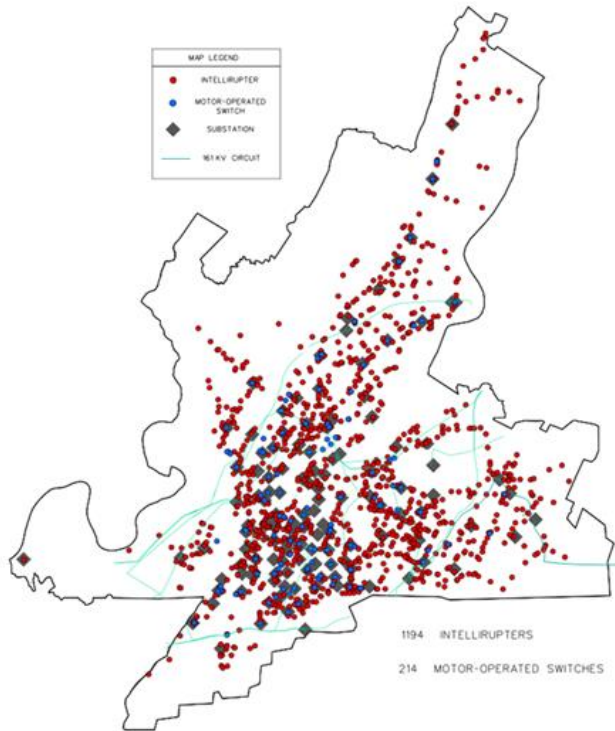


***10/2016
Lilian Bruce
Strategic Research, EPB***

A GPON-Gigabit Passive Optic Network

- Two fully redundant 10 gig rings (288)
 - 10 gig East and West /OLT(Optical Line Terminal)
 - 1.6 Tbps of capacity
- Central Office-GPON Electronics
- 11 Super Nodes & 6 Remote Nodes
 - 82 OLTs today
- 91 miles of Transport fiber
- 802 miles of Feeder fiber
- 3,365 miles of Distribution fiber
- 4,300+ miles of Drop fiber

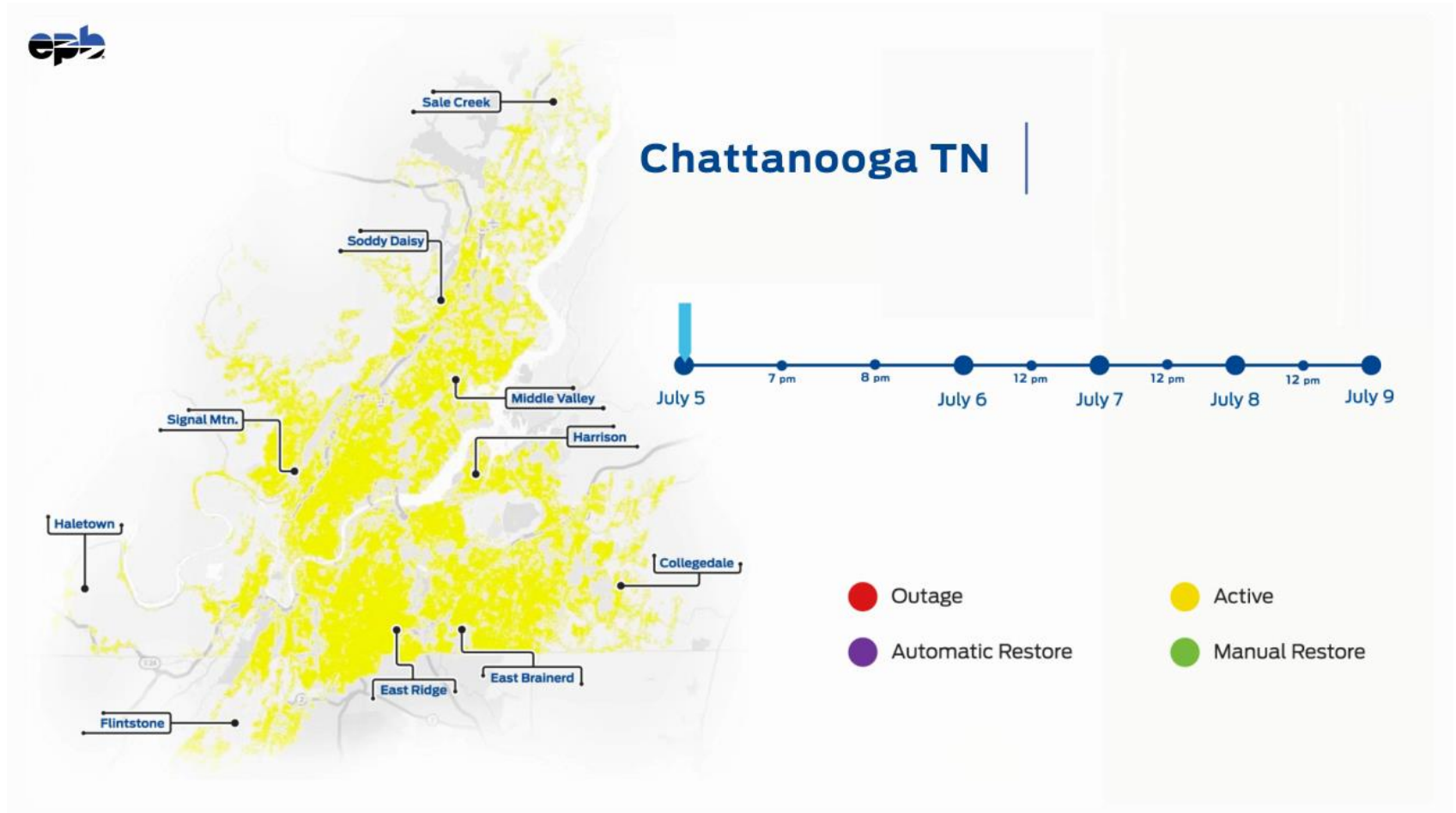




- ~1,200 Installed Intellirupters, 12 kV
- 214 Motor Operated Switches, 46kV
- All communication over EPB Fiber
- Utilizes peer to peer communication for distributed automation
- AMI at all 174,000 premise
- Voltage Line Regulators

EPB Outage Replays – July 2012

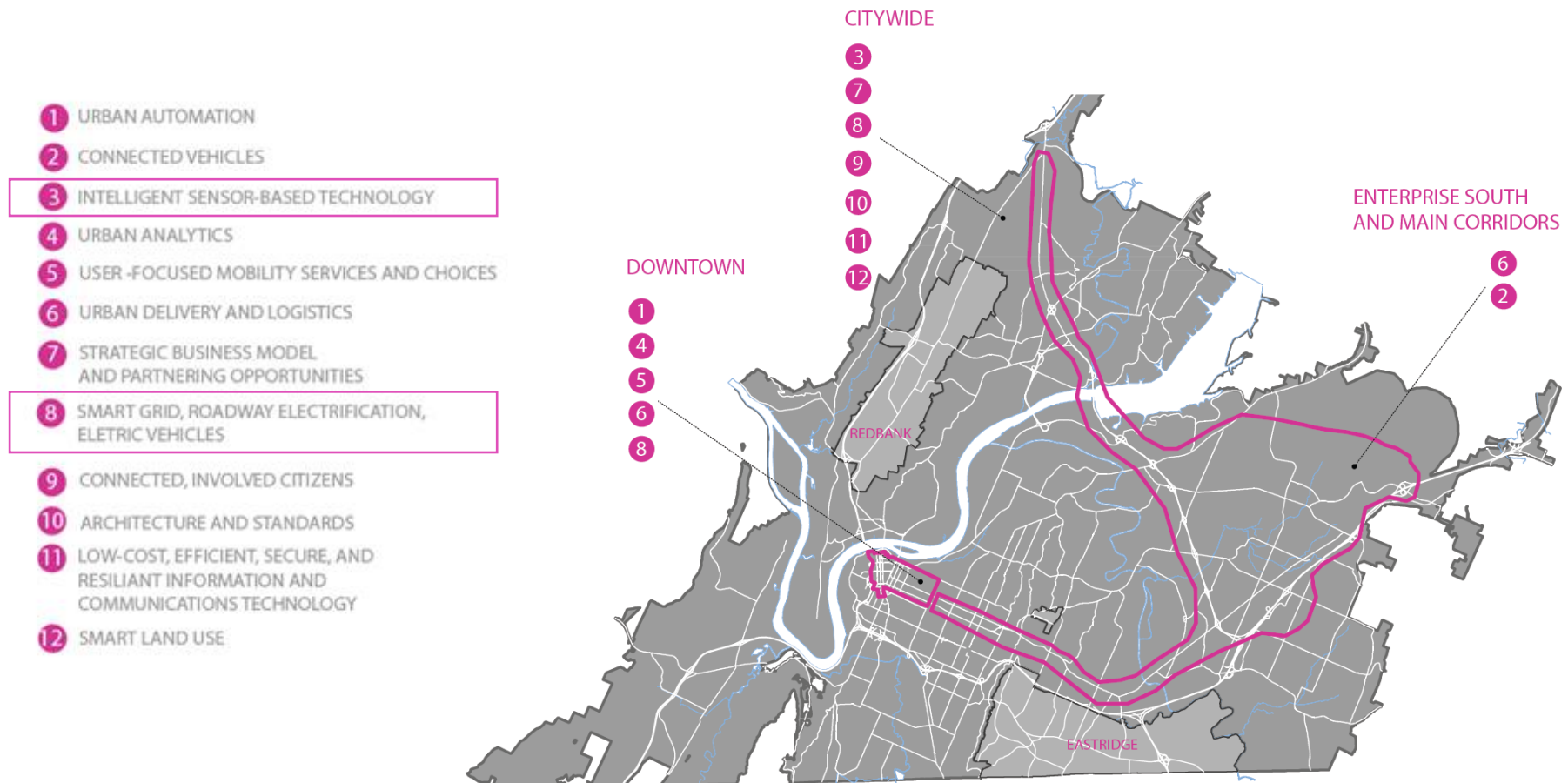
Fiber Enabled



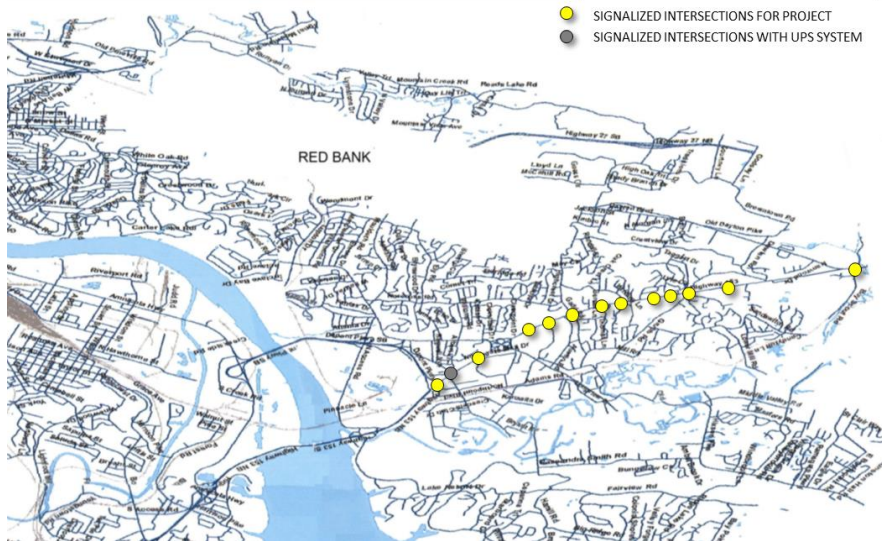
USDOT-Chattanooga's Beyond Traffic Vision

The Vision adaptive, efficient

- Safer Streets • Stronger Neighborhoods • Smarter Students, Stronger Families • High Performing Government • Growing Economy



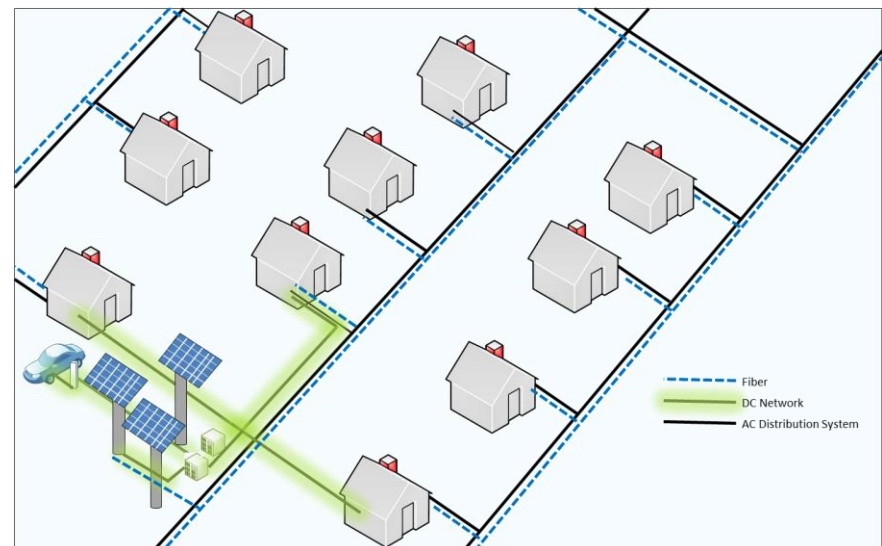
Opportunities-Community / Customer



Extend DER capabilities to Support other Community networks

- Traffic
- Water
- Waste

Last Mile Alternative Resilience - Pure DC



COMMUNITY BENEFIT:

- Less than ½ emissions of comparable gasoline cars
- EV's become cleaner as more energy is produced with wind and solar
- Tax base support for communities



CUSTOMER BENEFIT:

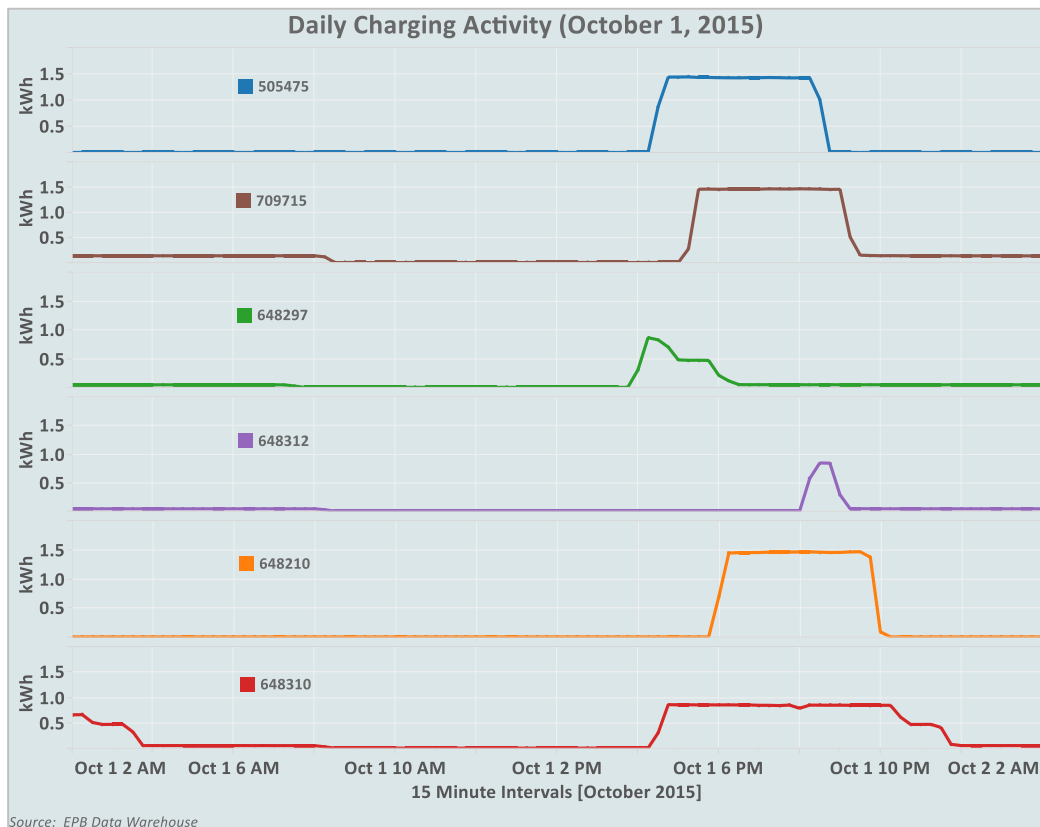
- Saves ~36% over 5 years
- 3-4x better fuel economy
- Never have to “fill up”
- HOV lane access

UTILITY BENEFIT:

- Balances the grid
- Lowers grid costs for all ratepayers

Fleet:

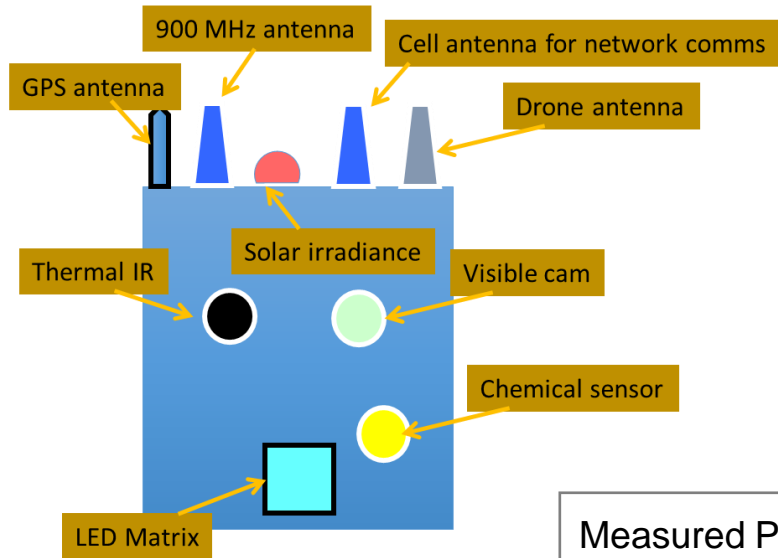
- 3 Plug-in hybrid electric bucket trucks
- 3 Vans
- Total of 9 EV chargers: 6 O.C. & 3 public



Key Points:

- Charging begins consistently after 5PM
- Charging is coincident with potential system peak

EPB's Intelligent, Sensor-Based Infrastructure *Technologies*



Stationary

Legend

Both

Stationary Only

Mobile Only

Measured Parameters

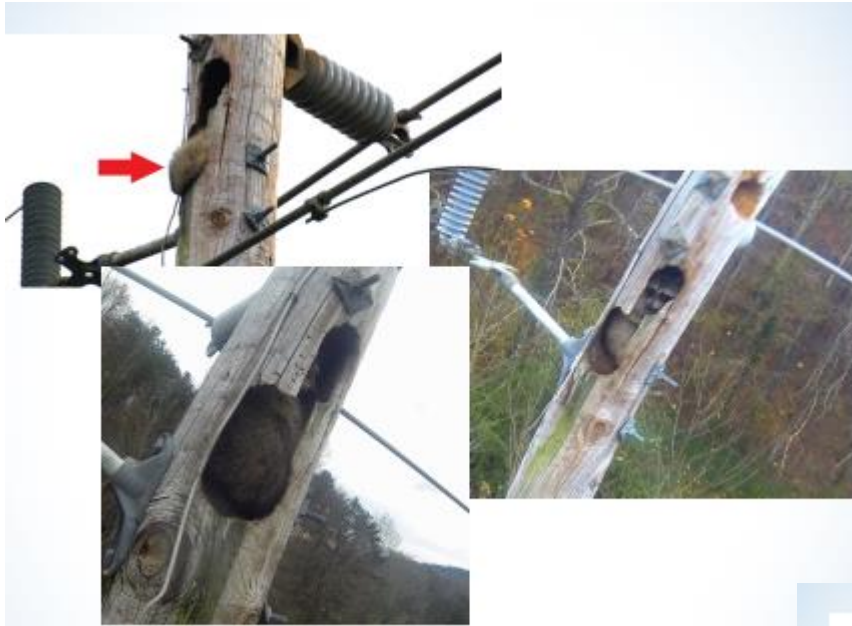
- Thermal IR
- Visible camera
- Chemical (CO, CO₂, H₂, CH₄)
- Cell phone detection
- Temperature
- Humidity
- Barometric pressure
- GPS
- Solar irradiance
- Drone detection
- Magnetic field
- Coronal Arc Detector
- Accelerometer



Mobile

EPB's Intelligent, Sensor-Based Infrastructure

Purpose



Preparing for the Future

- *Last mile communication infrastructure, 5G Small Cells*
- *Strategic Partnerships*
 - *USIGNITE, ORNL, UTK CURENT, EPRI, TVA, City of Chattanooga, TEC*
- *DER Integrations*
 - *Storage & Solar*
- *New Electric Loads – Vehicles, Intelligent Lighting*
- *Microgrid Demonstration*
- *IoT-Sensor deployments*
 - *Utility Based; Stationary & Mobile*
 - *Grid Enabled customer appliances*
- *CYBER*