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manage energy better

Advanced Grid Analytics Using AMI Data

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- Reliability

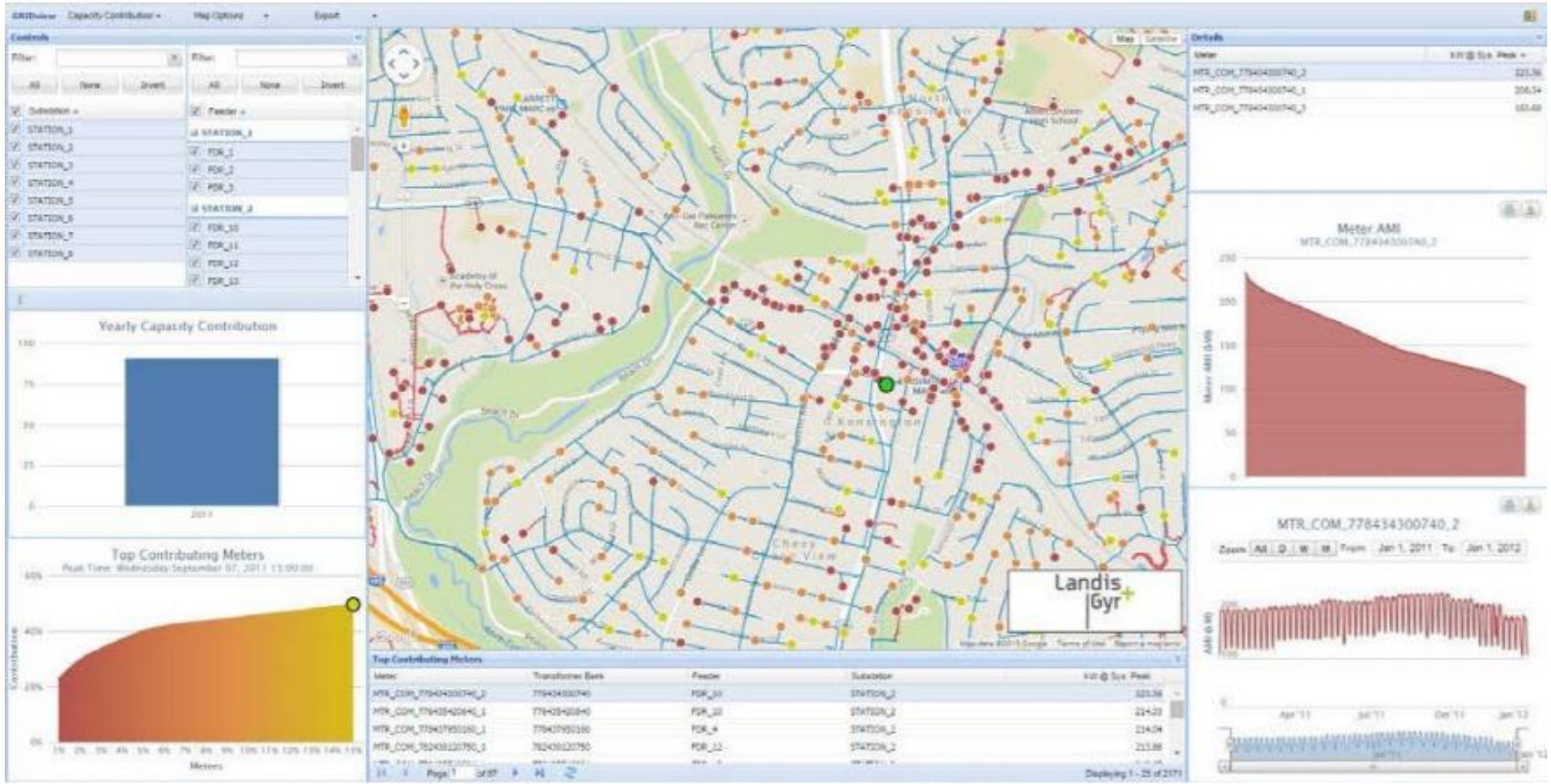
AMI Benefits

- Complements SCADA (top to bottom) with load points (bottom to top)
- Loading based on actual measurements instead of estimates
- Load profiles unique to customer instead of grouping by customer class
- High frequency measurements
- Data availability via AMI head end system

Asset Loading Analytics – Capacity Contribution

- Identification of coincident peak load contributors from individual customers to customer classes supports customer segmentation
- Identification of heavily loaded areas instead of aggregate at head of the feeder supports capacity deferral studies for assets downstream from the substation power transformer

Asset Loading Analytics – Capacity Contribution



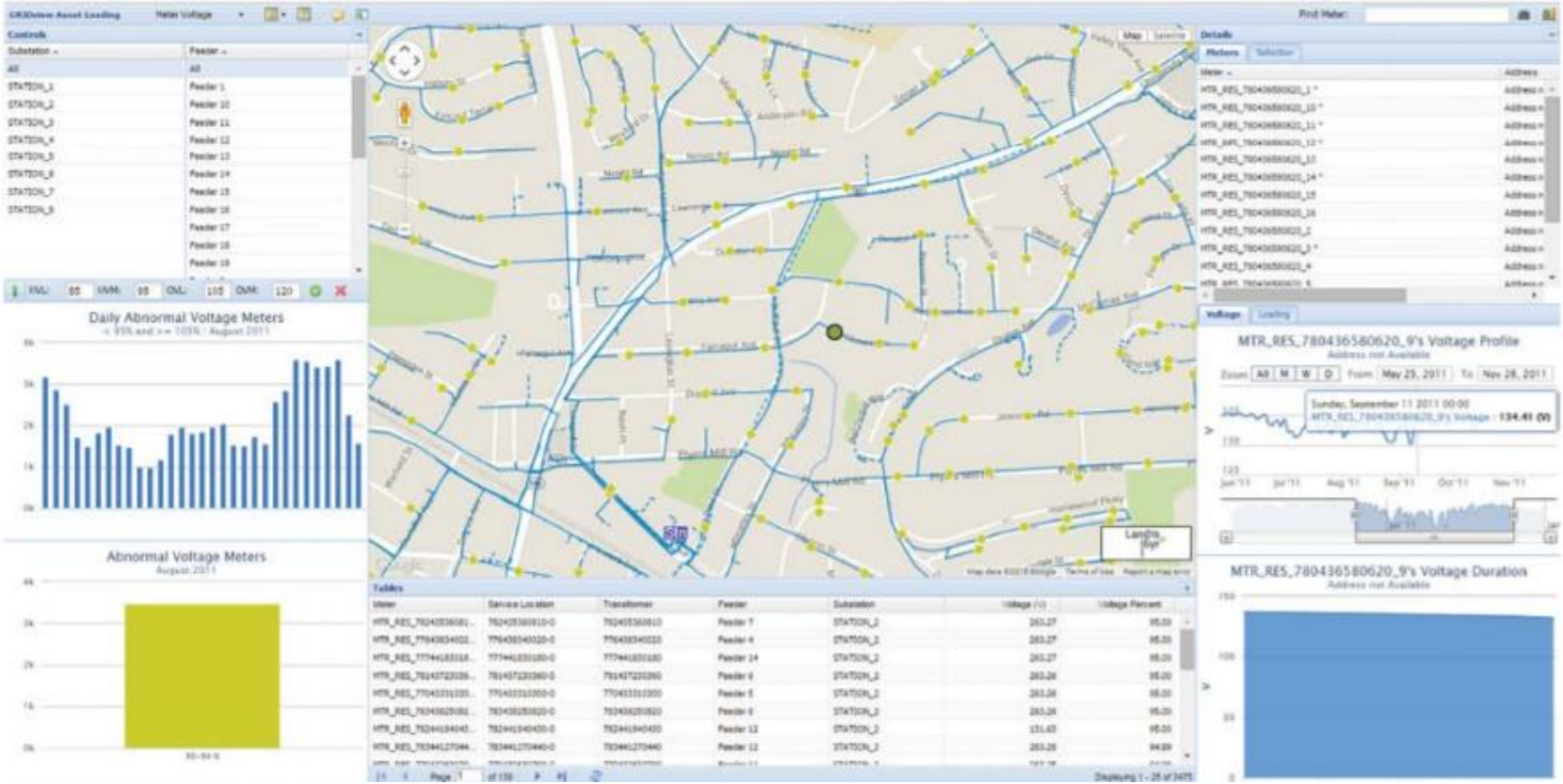
Asset Loading Analytics – Asset Management

- Accurate account of technical loss including secondary network supports re-conductoring projects
- Detection of overloading based on field measurements supports transformer loss of life analyses for individual transformer
- Analyses based using actual customer load data supports identification of root cause of erratic loading fluctuation

Asset Loading Analytics – Voltage Vizualization

- Monitoring of voltage at customer premises across system supports mitigation of voltage exceptions
- Analysis of historical voltage readings across system allows for regulators and capacitors controls settings for maximum impact from Conservation Voltage Reduction programs

Asset Loading Analytics – Voltage Visualization



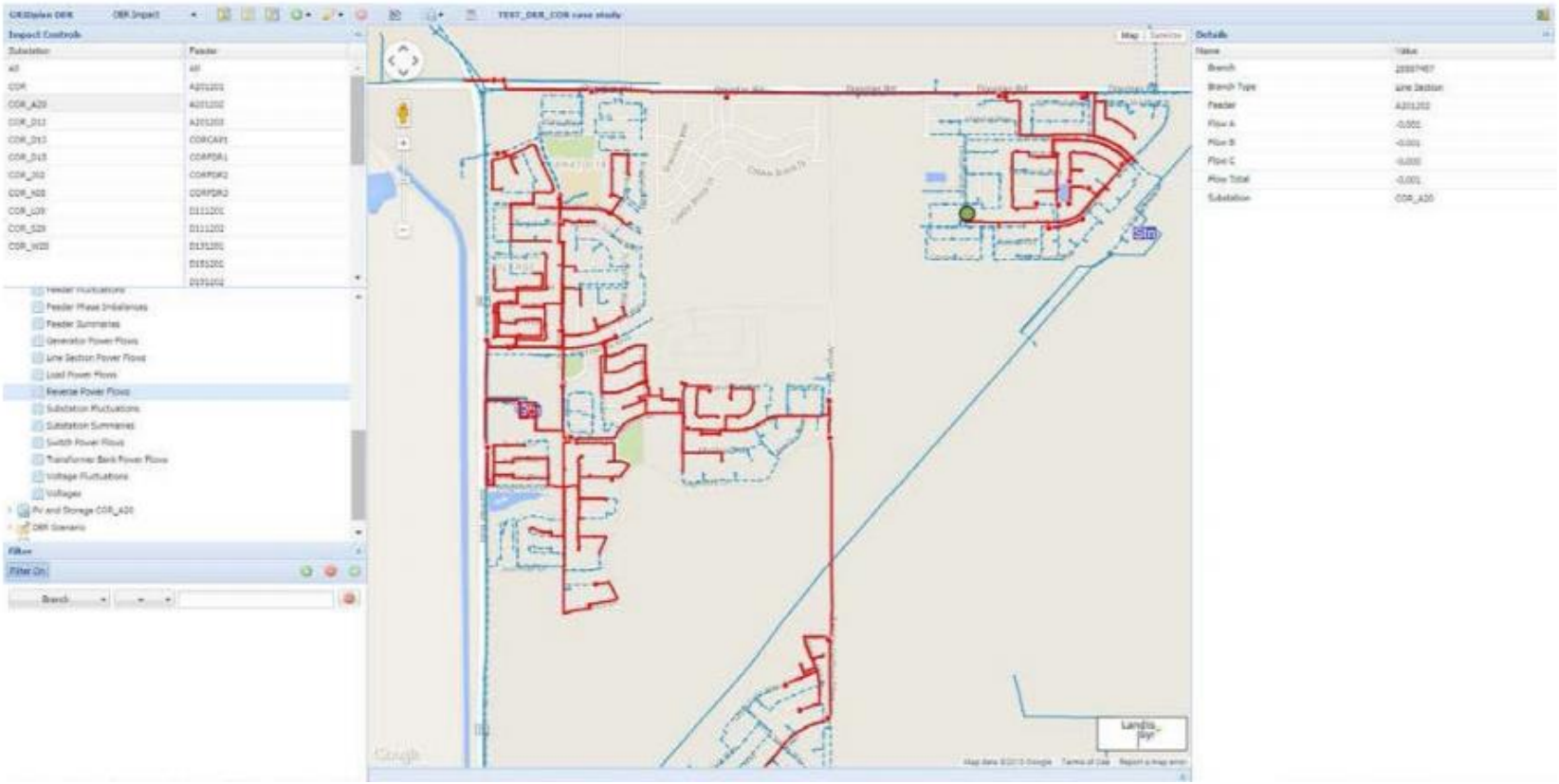
DER Integration Analytics – Demand Response

- Historical loading data from before and after a Demand Response program is implemented supports the quantification of its technical impact for individual customers up to customer classes

DER Integration Analytics – Distributed Generation

- Net metering enables the modelling of customer loads decoupled from their local generation, which supports planning analysis based on different load and Distributed Generation growth
- More accurate loading distribution supports the identification of areas most susceptible to voltage and power flow fluctuations from intermittent renewable energy and more likely to benefit from energy storage deployment

DER Integration Analytics – Distributed Generation



Reliability Analytics – Outage Impact

- Historical load measurements support the estimation of unserved energy for specific customers due to an outage event

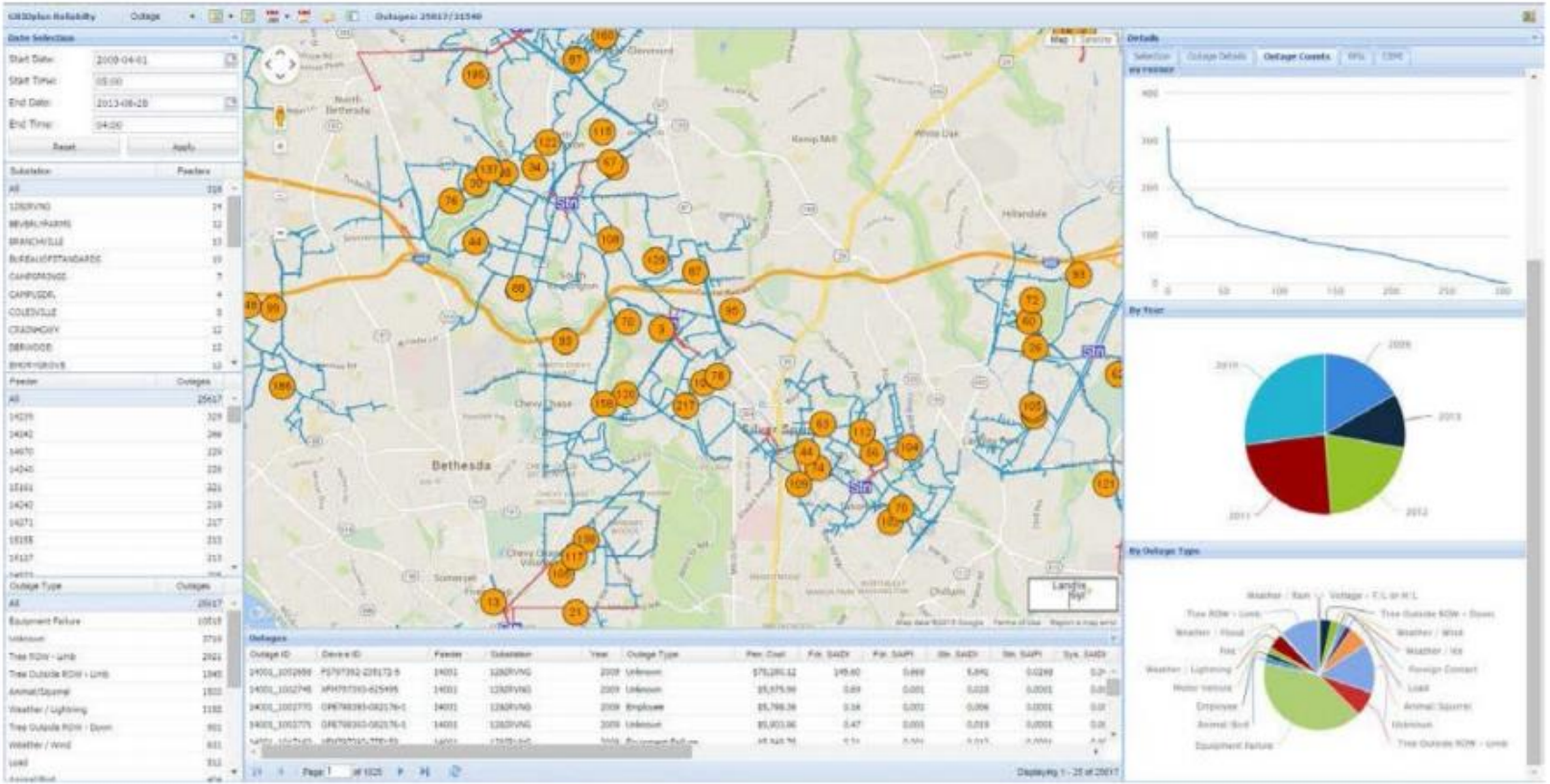
Reliability Analytics – Outage Prediction

- “Last Gasp” signals from a group of meters support the identification of tripped protective device(s) and outage area
- Better outage location prediction translates in more efficient crew dispatch
- Better outage cause prediction improves the guess as to the expertise, devices, and tools required for restoration

Reliability Analytics – System Reconfiguration

- Load transfer analyses based on historical load profiles enhances confidence in feeder capacity adequacy
- Reliability impact of system reconfiguration can be estimated from changing the circuit sectionalization causing customers and historical outage events to be transferred

Reliability Analytics – Historical Outage



Questions?