

SOUTHWIRE'S DIGITAL GRID RESILIENCY SOLUTIONS

SOUTHWIRE'S DIGITAL SOLUTION SERVICES' RAPID GRID RESILIENCY ASSESSMENT:

- Identifies areas for system reliability improvements by leveraging existing outage and GIS data.
- Finds circuit reliability issues at the device level and prioritizes equipment replacement and/or maintenance actions.
- Provides prescriptive recommendations with cost justification and expected reliability improvements.
- Assets are ranked by an Overall Equipment Ranking based on the Asset's Health and Network Criticality.
- Detects data integrity and connectivity discrepancies with system correction recommendations.
- Through AI and ML techniques, confirms and refines equipment failures, causes, root causes, and remedies.

The Assessment is performed over 30 Days which includes a **Findings and Recommendations** presentation. The utility is also provided with a 30-day Subscription to our **Grid Resiliency** Solution with access to the following solutions:



GRID MODERNIZATION

- Recommends equipment upgrades or replacements based on cost savings, number of failures, and reliability improvements.
- As actions are taken, results are measured.
- Users configure how they measure replacement criteria such number of failures, minutes of interruption, and causes.
- Assets include wire, protection devices, and transformers.
- Generates a Work Plan based on user priorities, resources, and available dollars.



NETWORK RELIABILITY

- Provides IEEE 1366 reporting with advanced circuit analysis.
- Performance indices measured from the circuit to the device level.
- Generates Remedies with Expected Results based on action taken.
- Analysis provided by organization, time, failure, and cause.
- SAIDI, SAIFI, and CMI calculations are embedded throughout modules.
- Extensive queries and analysis is fully supported.



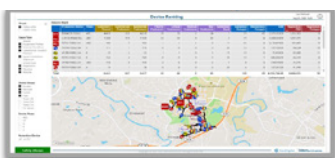
ASSET PERFORMANCE ANALYSIS

- Asset health and ranking is established by asset risk & criticality.
- Measures the health of your network on an ongoing basis.
- System supports O&M and CAPEX budgeting with expected improvements based on actions planned.
- Generates a Work Plan for execution by WMS.
- Loaded Labor, Material, equipment costs are supported for improved Cost accuracy.



DATA INTEGRITY & CONNECTIVITY MODEL

- Ensures data quality & completeness for accurate decision making.
- Identifies where data issues need to be corrected at the source level.
- Connectivity Model spatially constructs protection zones, and customers affected for accurate impact.
- The Model is also used for Phase Balancing, Segmentation recommendations and other analysis.



VEGETATION OPTIMIZATION

- Identifies Asset at Risk from external factors such as vegetation and weather.
- Places a Probability of Failure based on multiple criteria.
- Establishes a priority based on probability and impact.
- Generates a Work Plan to be executed.
- Supports ongoing analysis as improvements are executed.

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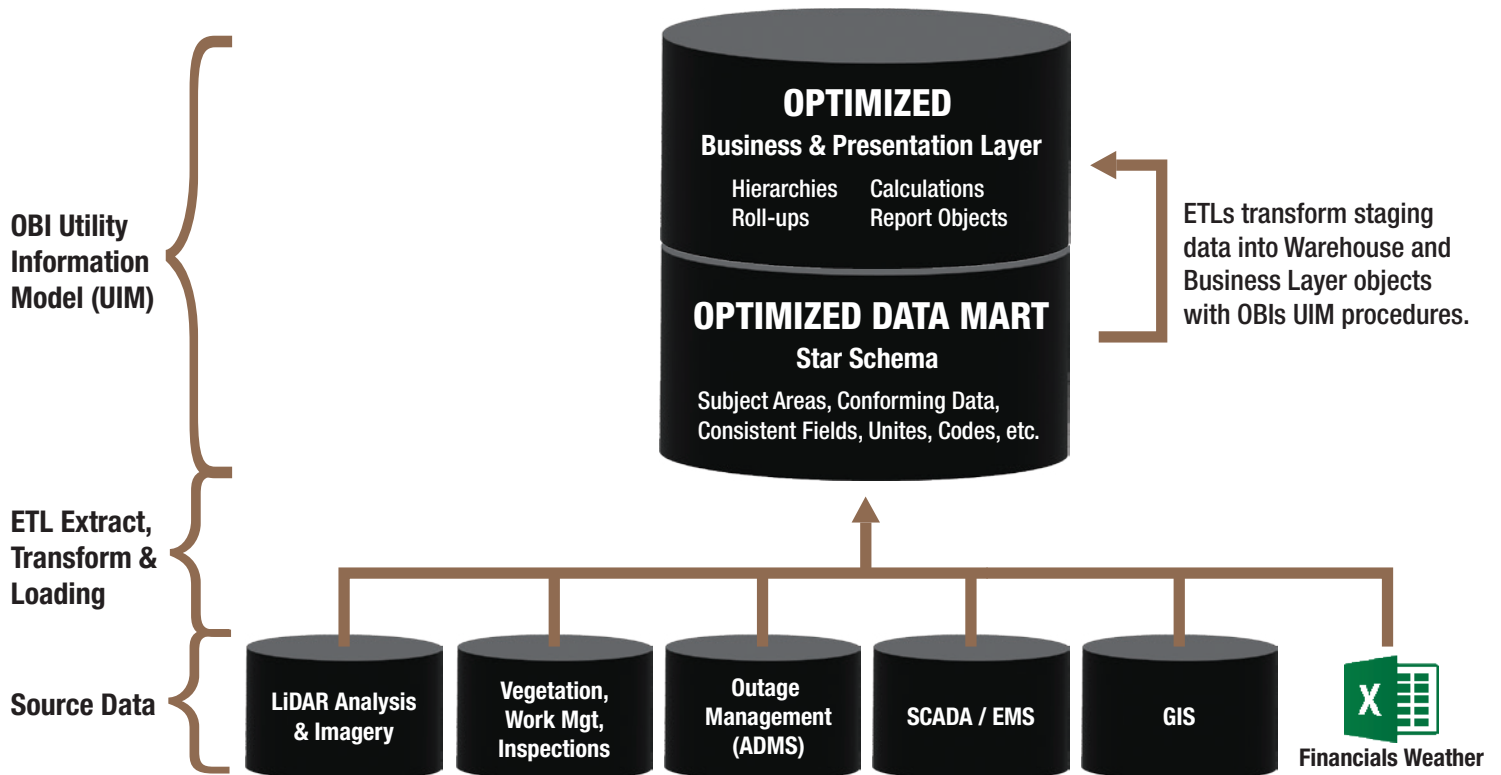
UNLOCKING THE POWER OF YOUR DATA

Our Digital Grid Resiliency Solutions consist of a suite of dashboard applications that utilize our underlying Utility Information Model for the consolidation and conforming of disparate data, AI/ML for predictive analysis, and advanced analytical processing for actionable intelligence.

Our applications provide valuable insight to enable utilities to make strategic operational decisions for Transmission & Distribution O&M and Capital Investments. These tools have been used in determining protection device with location and cable replacement strategies, segmentation, and proactive maintenance prioritization. Recommendations are based on predicted Benefits with a Return on Investment (ROI).

DATA SOURCES ASSESSED INCLUDE:

- GIS
- Outage Mgt/ADMS
- WMS (Veg, Inspect)
- LiDAR/Imagery
- SCADA/EMS
- Financials
- Weather





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DATA REQUIREMENTS

GIS Shapefiles, ESRI, or other GIS database export.	OMS Database dump, CSV, xlsx, or other file format.
<p>NETWORK DEVICES Breakers, Reclosers, Switches, Fuses, Transformers, Open Points, Open Elbows, etc.</p> <p>REQUIRED NETWORK DEVICE ATTRIBUTES</p> <ul style="list-style-type: none"> • Device Name or Id (that would support linking to OMS data) • Device Type • Phase (ABC, AB, A, etc.) • Normal Status (Open/Closed, by Phase if appropriate) • Circuit Name or Id • Geometry 	<p>SUSTAINED OUTAGES (MULTIPLE YEARS)</p> <p>REQUIRED OUTAGE INFORMATION</p> <ul style="list-style-type: none"> • Outage Number/ID • Begin Time / Restore Time • Number of Customers Affected • Interrupting Device – Name, as well as unique id that links to GIS • Cause (as well as sub-causes if available) • Comments (Operator, Crew, etc.)
<p>OPTIONAL NETWORK DEVICE ATTRIBUTES</p> <ul style="list-style-type: none"> • Voltage • Control Type (Reclosers) • Rating where applicable • Configuration where applicable (i.e., Delta, Wye, etc.) 	<p>OPTIONAL OUTAGE INFORMATION SUSTAINED OR MOMENTARY</p> <ul style="list-style-type: none"> • Region, Substation, Circuit • Fault Equipment • Weather • Partial Restoration Steps <ul style="list-style-type: none"> • Deenergize Time/Customer Count • Reenergize Time/Customer Count
<p>CONDUCTORS</p> <p>REQUIRED CONDUCTOR ATTRIBUTES</p> <ul style="list-style-type: none"> • Overhead or Underground • Phase (ABC, AB, A, etc.) • Circuit Name or ID • Geometry <p>OPTIONAL CONDUCTOR ATTRIBUTES</p> <ul style="list-style-type: none"> • Voltage • Primary Wire Type (per phase if available/applicable) • Neutral Wire Type 	<p>OPTIONAL CUSTOMERS SERVED</p> <ul style="list-style-type: none"> • Customer Count per Transformer • Customer Type (Residential, Commercial, etc.) • Customer Priority (Critical, Medical, Key, etc.) • Customer Business Name – (Non-Residential) <p>This is used to create facility type groupings/priorities (i.e., schools, police & fire, communications, medical, grocery, etc.) SIC or NAICS code</p>
<p>NOTE: If GIS data is not available, we can work with the OMS data to derive an equipment hierarchy based on interrupting device and affected customers.</p>	<p>OPTIONAL OUTAGE CALL INFORMATION</p> <ul style="list-style-type: none"> • Call Time • Outage Number/ID • Call Codes or Flags • Call Comments <p>OPTIONAL CALL INFORMATION</p> <ul style="list-style-type: none"> • Call Source (i.e., AMR, IVR, Web, etc.)