

Grid Resilience Insights

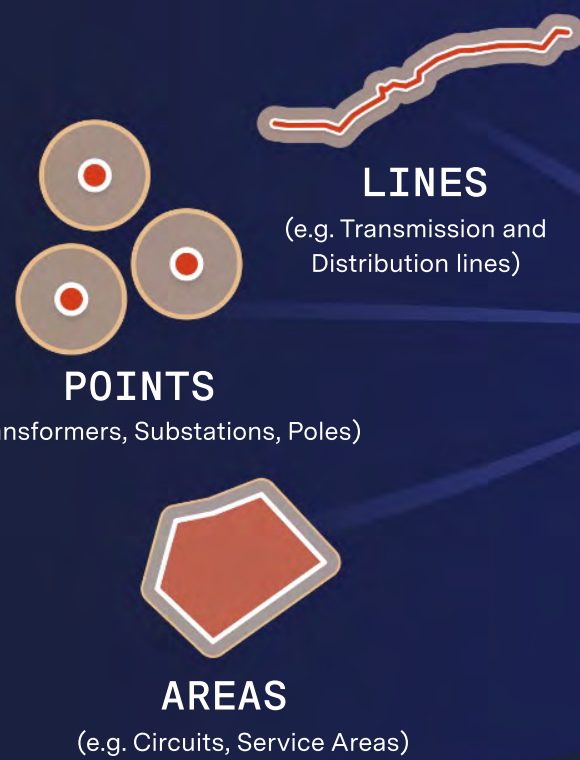
Critical climate, community, and urban insights for energy grid assets in any U.S. location

Energy utilities sit at the center of compounding climate, community, and market challenges. Extreme weather, accelerating heat waves, drought and fire, floods and hurricanes threaten grid assets and the communities they serve. Transportation electrification and energy transition mandates place pressure on an aging grid. Vulnerable communities and a host of new requirements to deploy capital to historically underserved areas add complexity to an already daunting multi-threaded challenge. Grid modernization planning, hardening plans, and regular capital improvement planning is more complex than ever before.

UrbanFootprint's Grid Resilience Insights (GRI) solution brings essential climate and community insights to grid planning, investment prioritization, and compliance activities. GRI is a complete package of the metrics needed to understand current and future climate and hazard risk and community vulnerability in and around utility assets, and across any service area or jurisdiction. GRI metrics sit alongside utility asset metrics (e.g. age, capacity) to inform more robust risk and reliability assessment, capital improvement plans, social equity analytics, and asset investment prioritization.

ANALYZE ANY SERVICE AREA

Service territories and energy grid assets are geo-located and processed through UrbanFootprint's nationwide data core, a normalized and up-to-date view of land use and site conditions across 160 million U.S. land parcels.



Built Environment

Understand the land uses, buildings, and infrastructure served by grid assets.

- Residential land use and building types
- Commercial land use and building types
- Building age, home heating fuel type
- Land and building \$ value
- EV chargers, transport dynamics

Community

Understand the community and people served by grid assets, including their vulnerability to service interruption.

- Socio-Demographic Characteristics
- Population, Household, and Employment
- Homeowner/Renter Stats, Vehicle Ownership
- Poverty and Public Assistance
- Equity Priority Areas
- Community Vulnerability Measures

Hazards

Identify hazard risks to grid infrastructure and the community

- Flood
- Sea Rise
- Extreme temperature
- Extreme Precipitation
- Storm Surge
- Wildfire
- Winds
- Earthquake

Grid Asset Metrics (from infrastructure operator/client)

- Asset Type
- Age
- Condition
- Capacity

CONNECT TO RESILIENCE INSIGHTS

Each area and grid asset is connected to the urban, socio-demographic, and climate risk data needed to evaluate current and future hazard risk, community vulnerability, and a host of other service area population, employment, and built environment metrics anywhere in the U.S.

PRIORITIZE ACROSS THE FULL ASSET PORTFOLIO

Evaluate and compare risk, exposure, and vulnerability for all grid assets.

- Top Electric Substations
- Electric Substations
- Transmission Lines
- Circuits



SUBSTATION NUMBER	RANK	AGE	CAPACITY	HAZARD RISK	COMMUNITY VULNERABILITY
101	1	1965	140%	High	High
302A	2	1982	135%	High	Medium
45B	3	1975	110%	Medium	High
208	4	1990	120%	Medium	High
556	5	2004	125%	Medium	High

EVALUATE GRID AND COMMUNITY RESILIENCE

Hazard risk for any asset or service area can be evaluated alongside community vulnerability metrics and grid asset characteristics (e.g. age, capacity).

Substation 45B

Voltage: 33-92kV
Year Built: 1986
Percent Overload: 10%

BUILT ENVIRONMENT AND COMMUNITY

- Number of Households: 1,200
- Residential Parcel Area: 30,000 sqft
- Population Served: 2,380
- Percent Poverty: 34%
- Percent 65+ years old: 32%
- Office & Manufacturing Jobs: 1398
- Assessed Property Value: \$94.1B

CLIMATE

- 100+ degree days per year: 50
- Probability of 75+ mph winds: 95%
- 1% annual chance of flood: Yes

DIVE DEEP INTO ANY LOCATION

Dig deeper on specific grid assets or communities in any U.S. service territory.

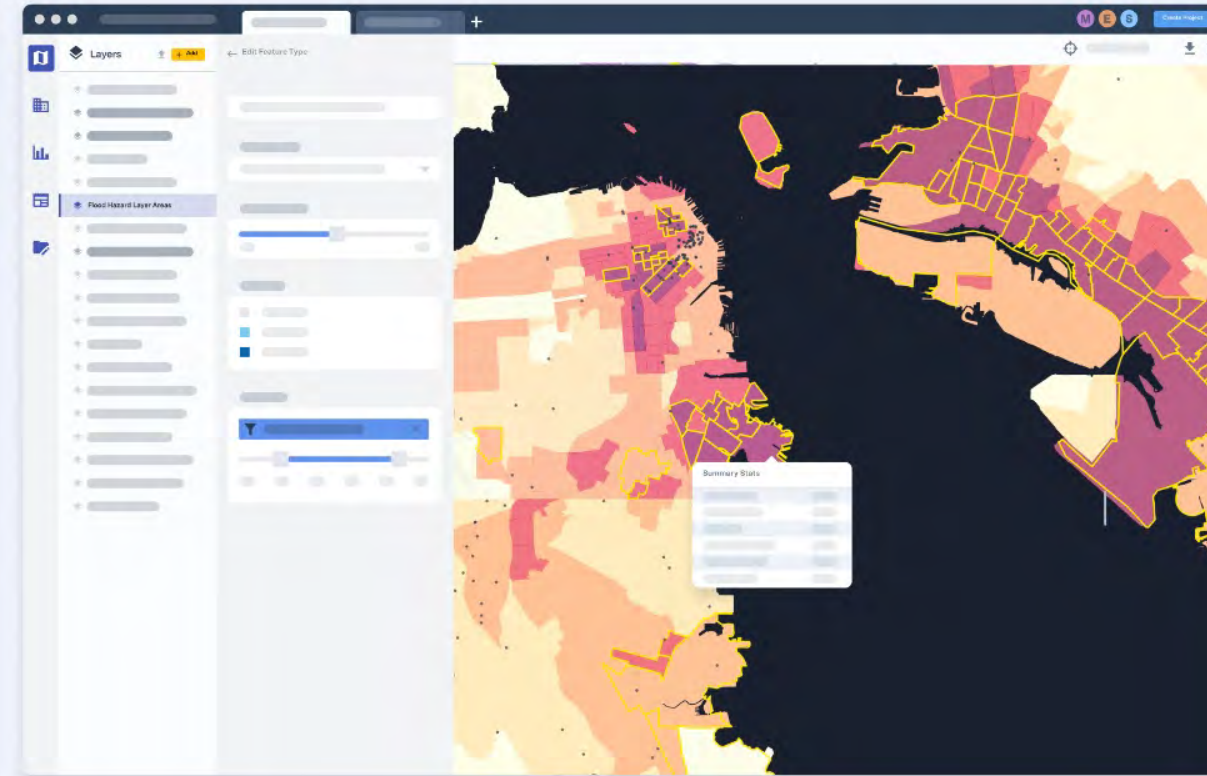
Grid Resilience Insights with the UrbanFootprint Platform

The UrbanFootprint platform includes the data to map and analyze any service territory or location in the U.S. for the climate, hazard, community, and social equity data needed to support utility grid and capital improvement planning. The Platform connects grid assets (e.g. substations, transformers, circuits, and lines) to a purpose-built Grid Resilience Insights (GRI) package that pre-assembles the metrics needed to understand current and future hazard risk and community vulnerability in and around utility infrastructure, and across a service area or jurisdiction.

1

National Exploration

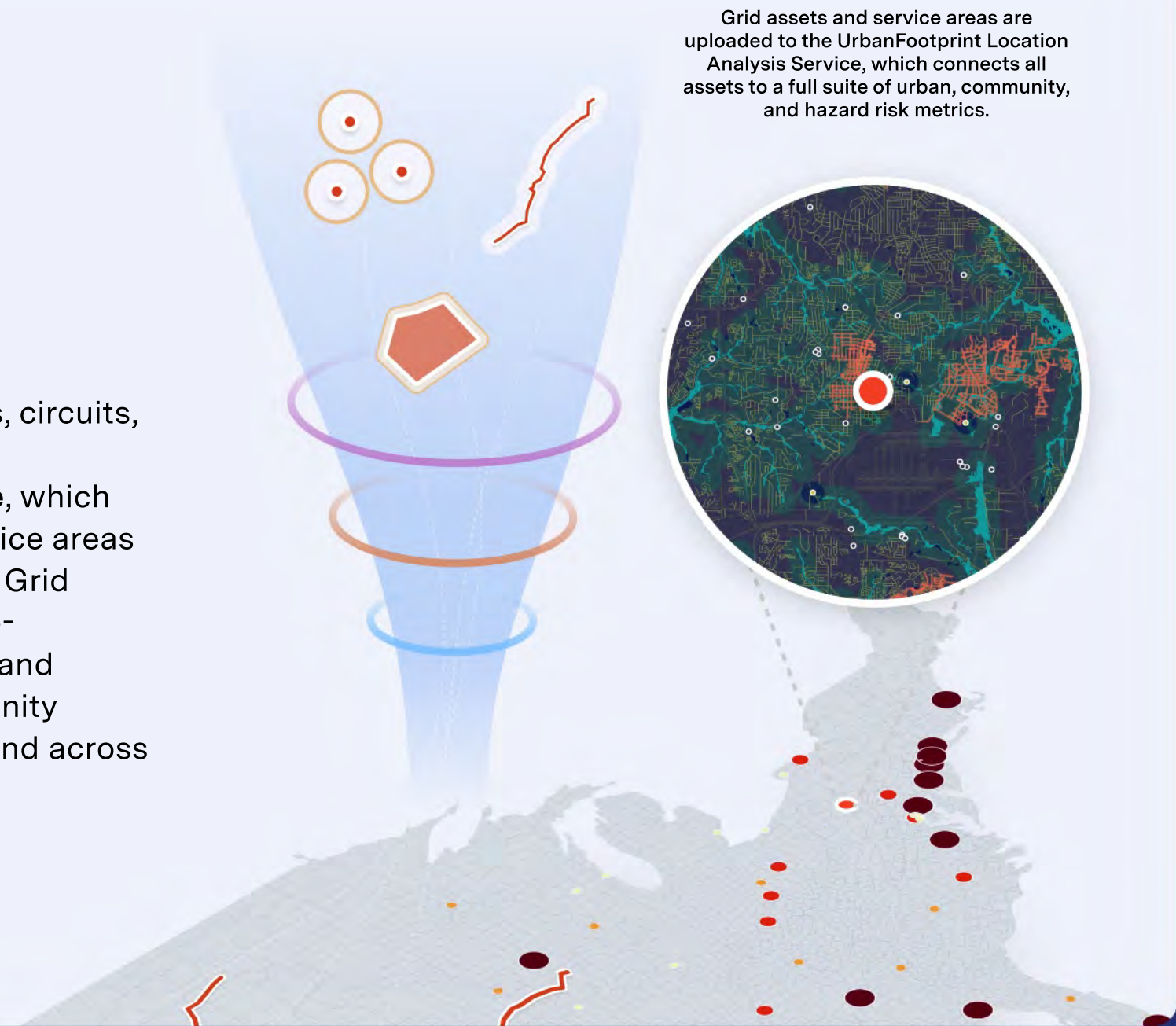
The UrbanFootprint Analyst application comes pre-loaded with all the data needed to explore any service territory or location in the U.S. for the climate, hazard, community, and social equity data needed to support utility grid and capital improvement planning. Analyst can be used for pre-sales activities, proposals, and a wide range of marketing activities.



2

Connect Grid Assets to Critical Resilience Metrics

Grid assets (e.g. substations, transformers, circuits, and lines) are securely uploaded via the UrbanFootprint **Location Analysis Service**, which geo-locates points, linear assets, and service areas and connects all assets to a purpose-built Grid Resilience Insights (GRI) package that pre-assembles the metrics needed to understand current and future hazard risk and community vulnerability in and around utility assets, and across a service area or jurisdiction.

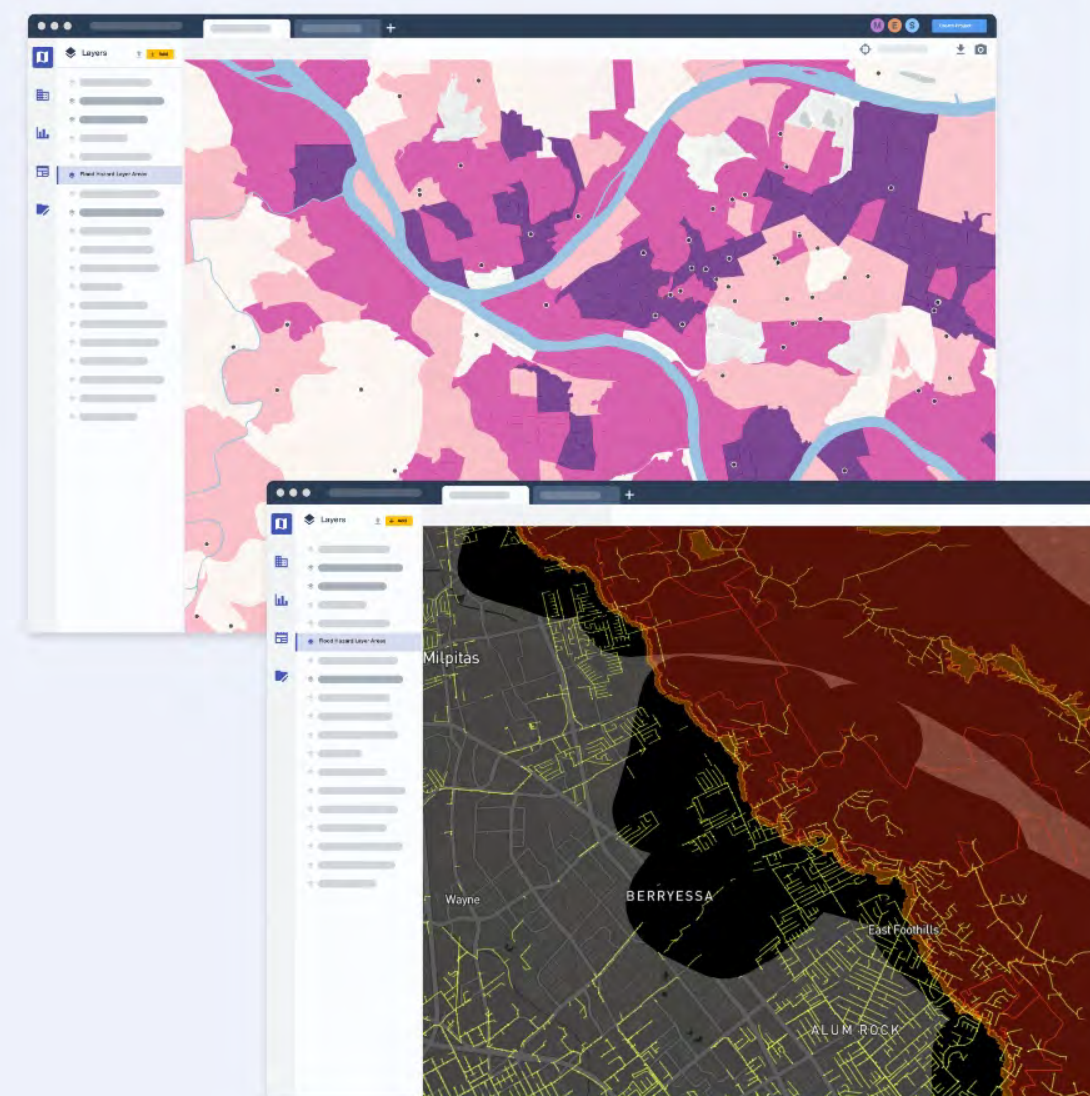


3

Map, Analyze, Export Resilience Analytics

Grid Resilience Insights for the assets and service territory are loaded into the UrbanFootprint Analyst web application for mapping, analysis, and export to other tools and software.

GRI metrics sit alongside utility asset metrics (e.g. age, capacity) to inform more robust risk and reliability assessment, capital improvement plans, social equity analytics, and investment prioritization.



4

Grid Asset Ranking and Investment Prioritization

Utility assets can be scored and ranked according to risk and vulnerability factors. Consulting teams can utilize UrbanFootprint scoring schemes and/or use the packaged GRI data to develop their own prioritization schemes or scores.

