

811-BASE: The Future of Field Operations



The unacceptable cost of a single severed line



**Billions in Annual
Infrastructure Damage**

Over \$50 Billion/Year



**Severe Safety Risks
to Workers and Public**

Injuries, Fatalities,
Evacuations



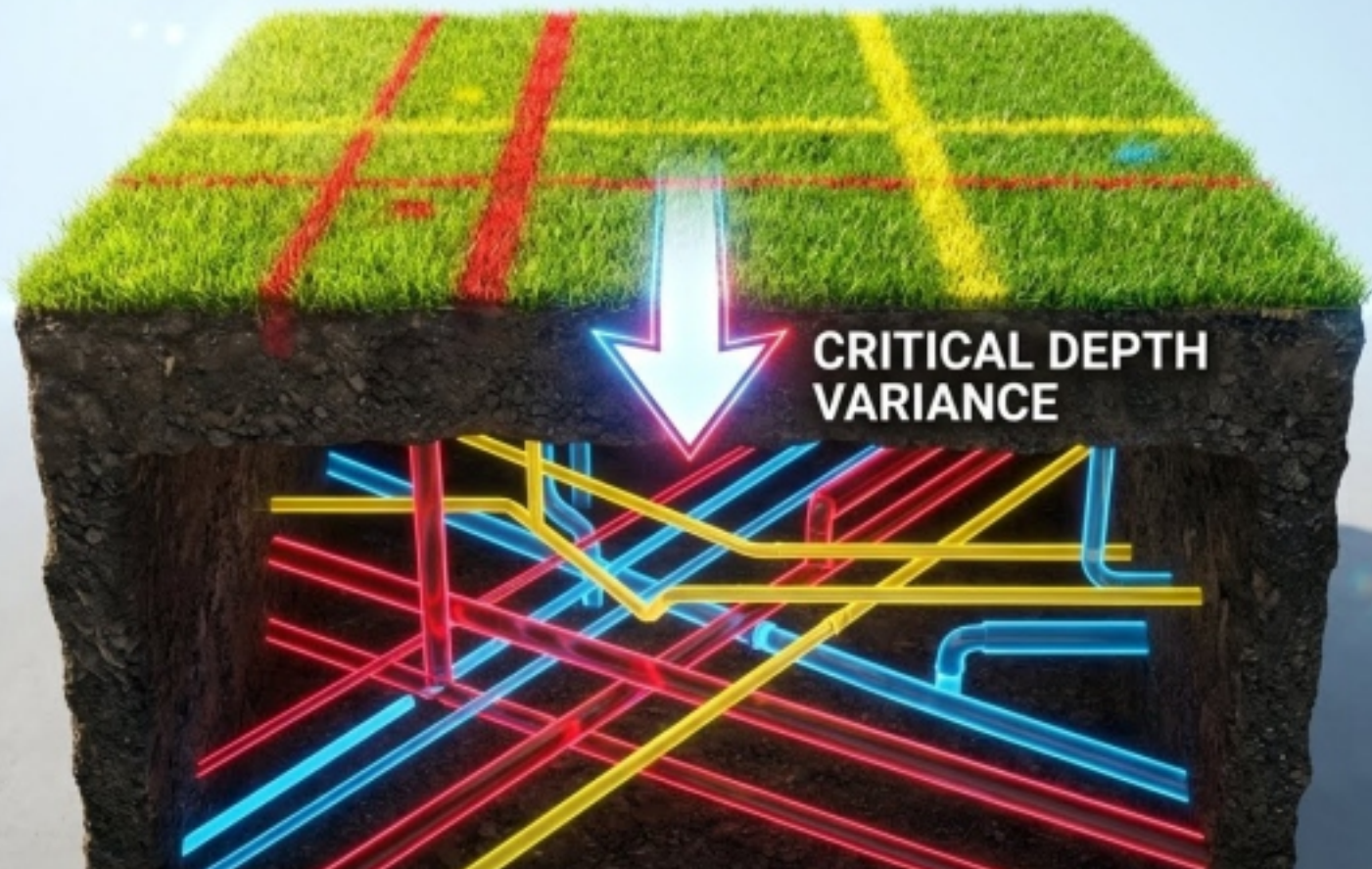
**Regulatory Fines
and Project Delays**

Hefty Penalties,
Missed Deadlines

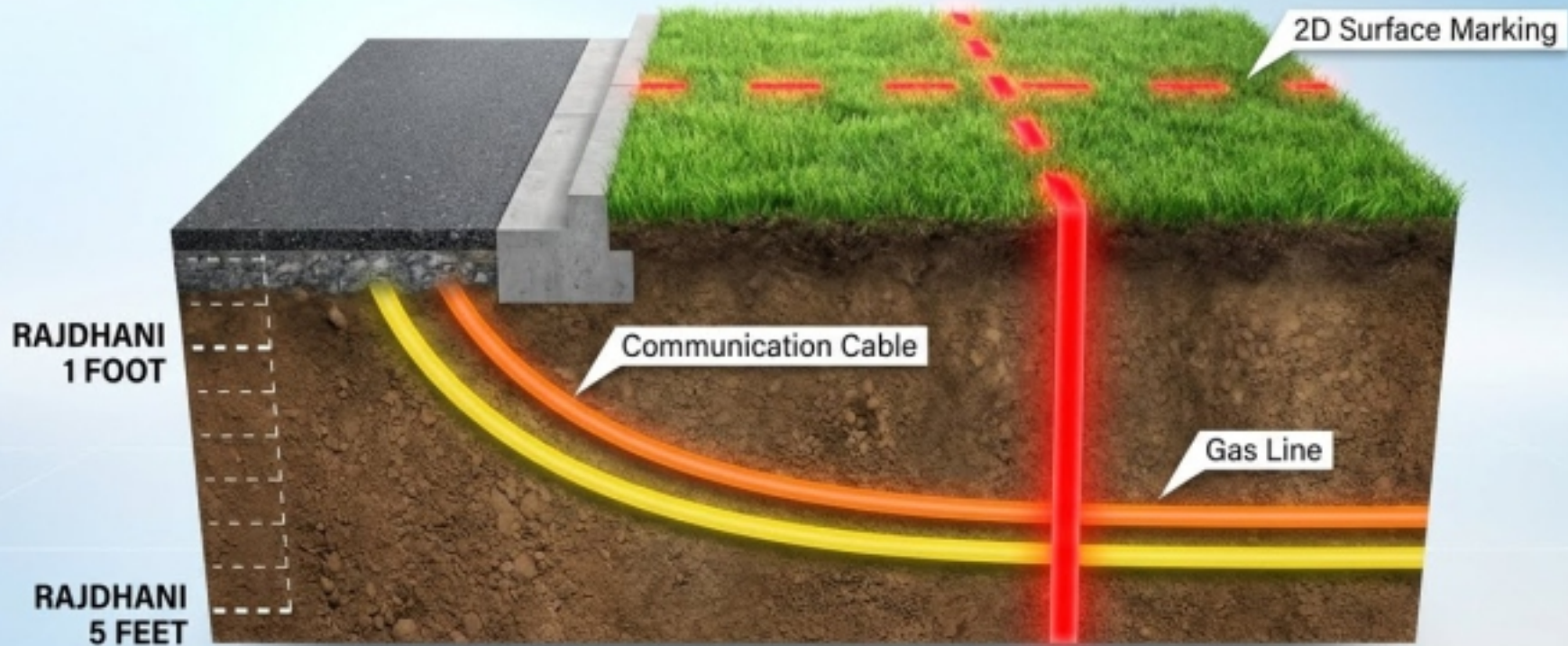


Protecting Infrastructure. Saving Lives. 811 Before You Dig.

Surface indicators cannot capture critical depth variance



The mechanics of lateral drift and depth blindness



Analog tools are failing to protect permanent infrastructure



We rely on degrading paint and easily displaced plastic flags to protect highly volatile, multi-million-dollar subterranean networks.



True excavation safety requires precise Z-Accuracy

Traditional 'Locate & Mark'
surface paint is insufficient.

LiDAR-captured depth data
(Z-Accuracy) is the crucial
missing dimension,
providing contractors
contractors with exact
depth projections via AR
devices before digging
commences.

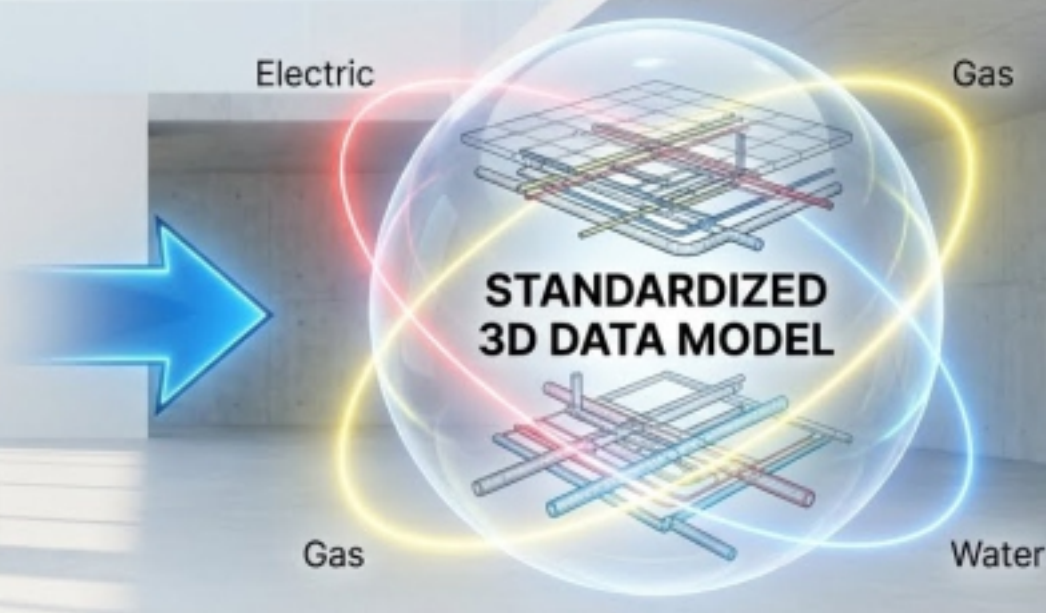
Z=3.5ft



Eradicating data fragmentation through unified 3D standards



Inconsistent, siloed 2D paper records and disparate digital formats create massive inefficiencies.



A mandate for utility owners to migrate existing locates into a standardized, open-source 3D format (GeoJSON, GeoTIFF). This unified data is accessible via a single API, enabling seamless AR integration.



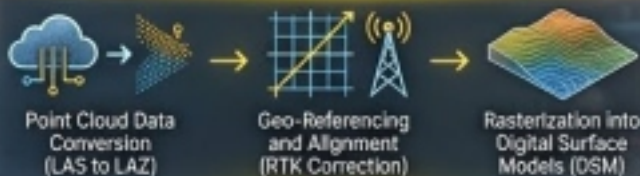
The 811-BASE continuous operational loop

Field Operations: 811 Call and Marking

Phase 1: Data Capture



Phase 2: Cloud Processing and Integration



Phase 3: County-Level Digital Database Utilization



Automated
Environmental
Overlay Update
Loop



Phase 1: Establishing ground truth during physical installation



The most accurate map is created when the trench is open. This is standard practice for utility maintenance and upgrades, providing the perfect window for systemic, high-fidelity mapping before the earth is closed.



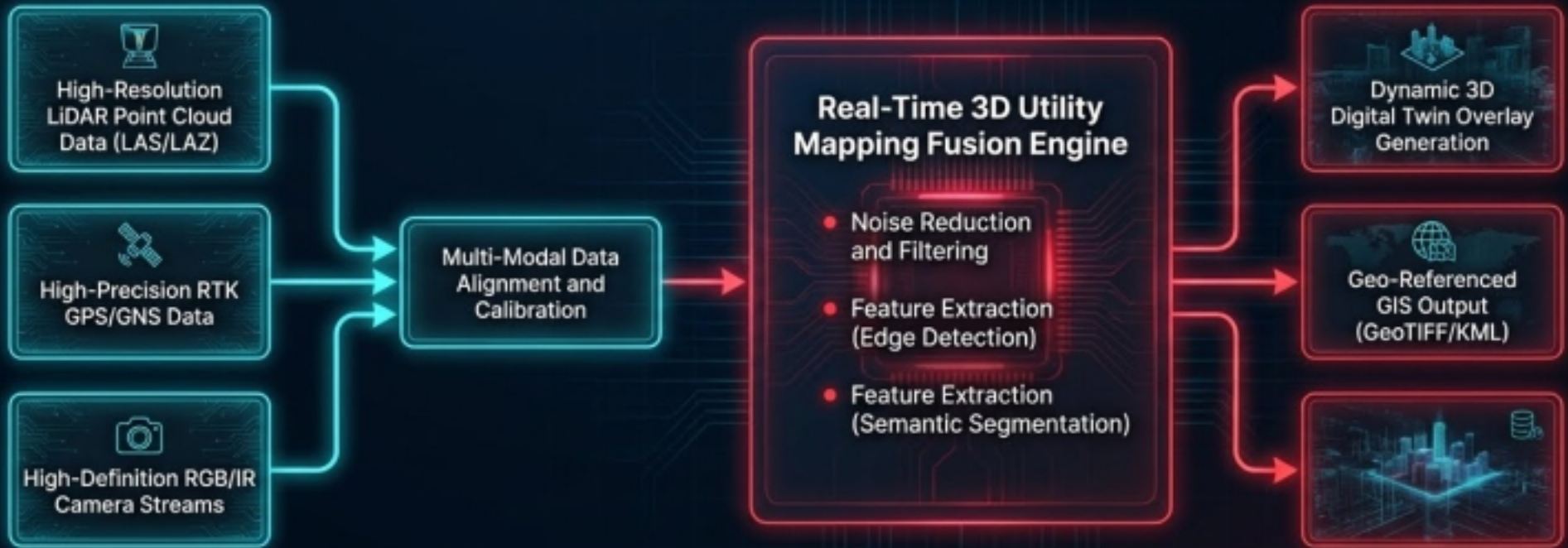
Capturing high-fidelity point clouds at the source



- **LiDAR Scanning:** Generating industry-standard point cloud data containing 3D coordinates (X, Y, Z), intensity, color, and classification.
- **Format Efficiency:** Raw LAS files are compressed into LAZ formats to ensure significant file size reduction for large datasets without losing accuracy.
- **Metadata Integration:** High-accuracy GPS logging ensures every millimeter of scanned pipe is permanently locked to a global coordinate system.



Phase 2: The Real-Time 3D Utility Mapping Fusion Engine



Raw point clouds and RTK GPS are fused in the cloud, filtered for noise, and converted into highly optimized Digital Surface Models (DSMs) ready for instant field access.



A secure, regulated commercial cloud repository



Phase 3: Bringing the 3D map back to the dirt

The loop closes. Contractors pull standardized, county-level 3D overlays from the regulated database directly into their mobile devices, visualizing the invisible world before a single bucket drops.



Establishing absolute strike prevention zones



Operators are no longer guessing based on faded surface paint. They have an exact, mathematically locked safety boundary projected directly onto their operational environment, ensuring zero-strike digging.



AI-driven real-time excavator activity logging

Video data (RGB)



Point cloud (LAZ)



Two-stream CNN for feature extraction

Classification based on extracted features

Advanced machine vision continuously logs approach distances and digging behaviors against the 3D digital twin to ensure absolute regulatory compliance and instantly flag dangerous proximity.



Approach



Digging



Dumping



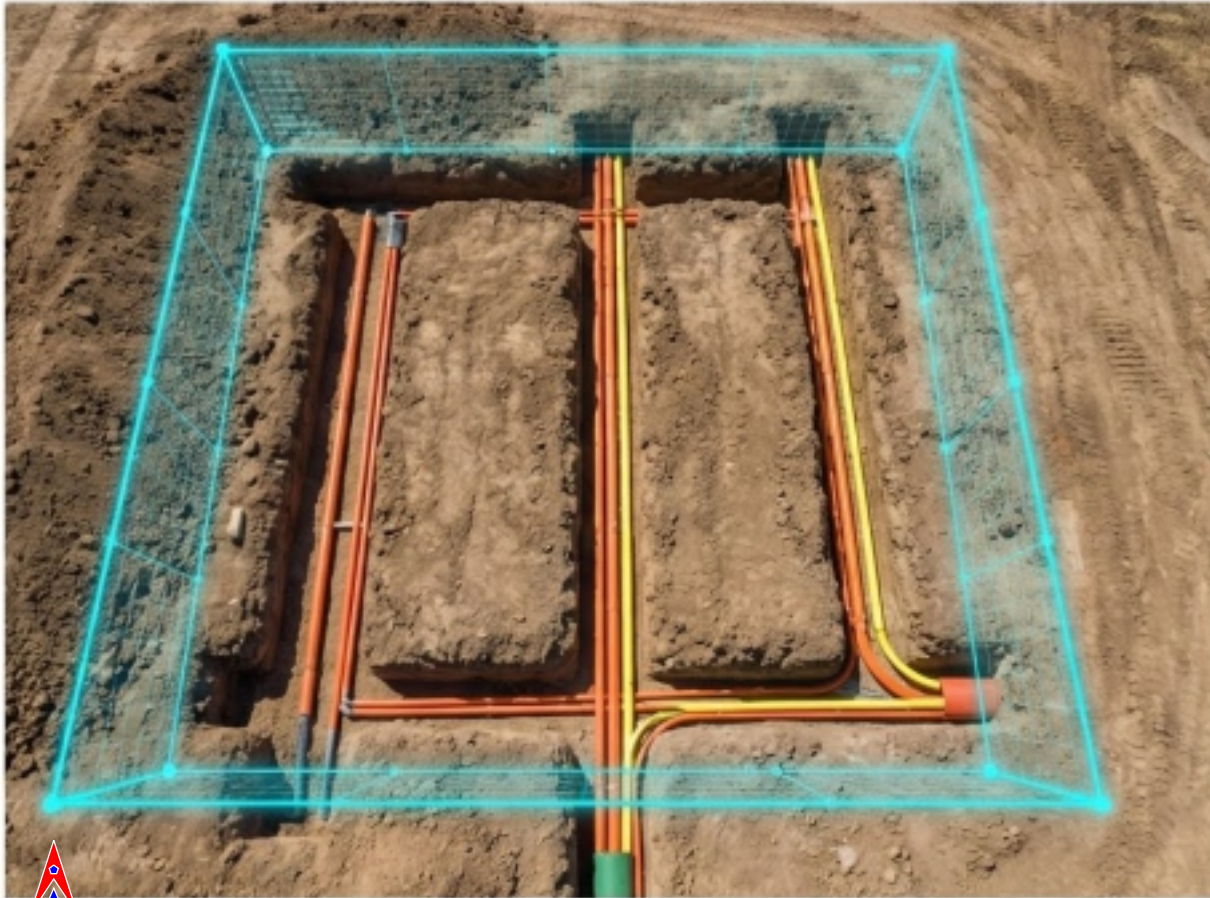
Idle



Leveling



Closing the loop through municipal permitting

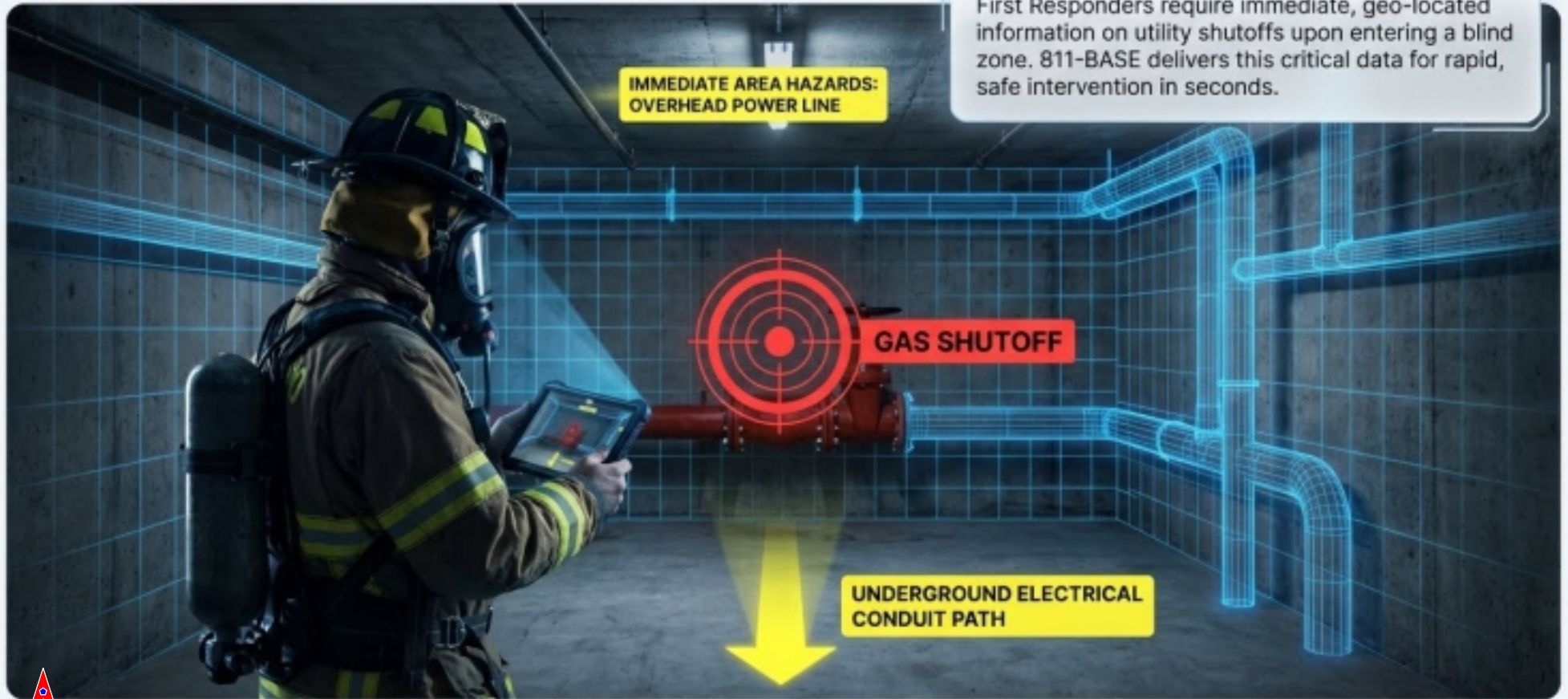


All municipal construction permits must include a final closing step: the mandatory submission of **high-accuracy, geo-referenced 3D data** (point clouds and GIS overlays) all new installations to the regulated database.

This ensures continuous, reliable updates to the global map.



Immediate structural hazard context for First Responders



First Responders require immediate, geo-located information on utility shutoffs upon entering a blind zone. 811-BASE delivers this critical data for rapid, safe intervention in seconds.



A unified spatial understanding: Ground to Airspace



With increasing air activity, Government drones equipped with LiDAR continually add overlays. 811-BASE creates a total 3D hazard map—critical for municipal safety regulation and future air traffic control.



Protecting Infrastructure. Saving Lives.

811 Before You Dig. In 3D.

