Chicago Underground Project Objectives and Approach April 2017

About UI Labs - City Digital

INNOVATION AT THE PHYSICAL-DIGITAL CONVERGENCE IN SMART CITIES

City Digital is a **collaborative partnership** among leading corporations, research institutions, and the public sector that:

- Establishes and prioritizes critical areas of need
- Develops innovative solutions
- Deploys solutions leveraging Chicago as a pilot test-bed
- Facilitates scale-up and global implementation



WATER & SANITATION



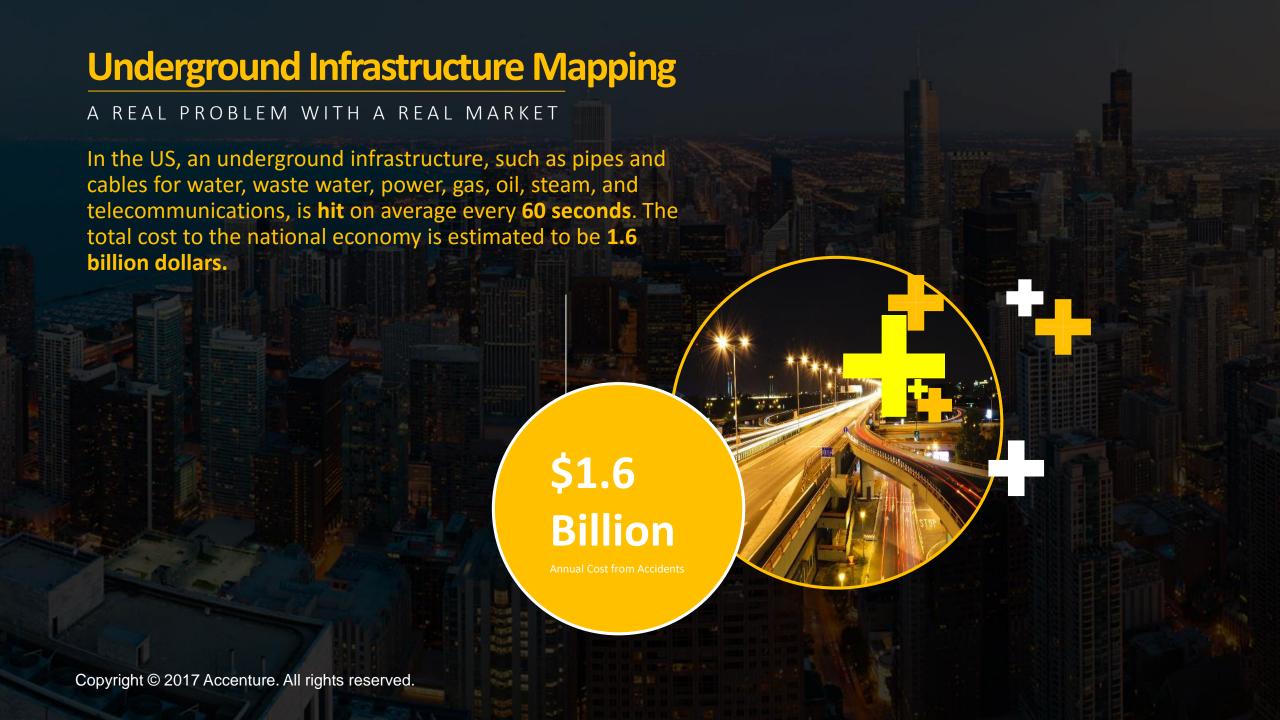
ENERGY MANAGEMENT



PHYSICAL INFRASTRUCTURE



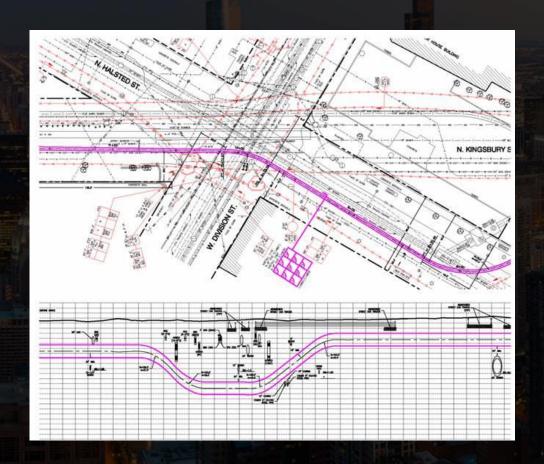
TRANSPORTATION



The Challenge

The problem is due to:

- Existing records are typically 15-30% off mark
- Existing records are incomplete (in Chicago, 90% don't have depth dimension)
- Maps are not updated after relocation of assets
- Underground assets are not mapped and digitally managed in a single database



Return on Investment

Of Accurately Mapping the Underground Infrastructure

PennDOT 2007 21X

Milan Expo 2015 16X

U.S. DOT 1999 4.6X

Toronto 2010 4.3X

Toronto 2004 3.4X

The rate of return for underground mapping projects ranges from 3.4X to 21X

Chicago Pilot Overview

Objective: The Pilot project will deliver a self-building, self-maintaining, engineering grade, common, secure data platform of 2D/3D utility data scalable to support a city the size of Chicago.

The Pilot team will demonstrate to stakeholders (cities, utilities, construction firms) how the tool could potentially be used in real-world applications.

Solution Partners:









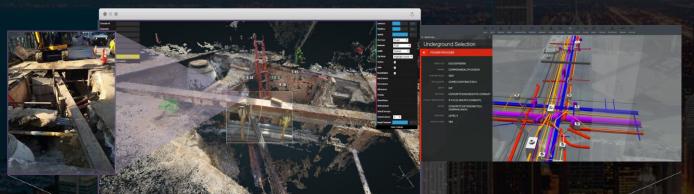








Chicago Pilot Overview



User Interface

- view the infrastructure in the geographic area in 3D format
- upload/download data from/to CAD format



GIS Data Platform

- Standardized GIS data
- Cloud-based
- Secure

Chicago – Proof of Concept



<u>Video Link</u>

Process & Governance

Mapping and scanning technologies are underpinned by new processes and data governance



Value Proposition – Value Tree

Current issue of	causes	resulting in the following pain points
Inaccurate and incomplete existing underground asset data	Inability for multiple stakeholders to efficiently coordinate to make decisions Utility conflicts or conflicts with geological structures Accidental damage to underground and above ground infrastructure	 *High amount of time spent on information retrieval *Project approval delays *Design costs (due to delays) *Design costs (due to additional survey/ testing/ platting services) *Liability concerns for approving projects *High effort of coordination among parties working on the same data set *Higher construction bids *Construction cost (due to delays) *Construction costs (due to non-labor related services) *Adverse economic impact *Increase in change orders *Increased time required for conflict resolution based on disparate plan formats *Risk to public and worker safety *Higher insurance costs *Higher raw material costs *Bad publicity and city image
Lack of <u>security</u> around sharing and coordinating data	Potential IP issues, confidentiality, data security issues	Security/information sharing concerns delay projects Higher cost due to liability for data security breach Negative impact to company whose assets information are wrongly shared

Value Proposition

Beyond financial benefits



Citizen
Satisfaction



Safety Costs



Construction Delays



Information Retrieval



Design Costs



Negative Economic Impact



Information Security



Construction Costs



DataSharing