Chicago Underground Project
Objectives and Approach

April 2017
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**
Underground Infrastructure Mapping

A REAL PROBLEM WITH A REAL MARKET

In the US, an underground infrastructure, such as pipes and cables for water, waste water, power, gas, oil, steam, and telecommunications, is hit on average every 60 seconds. The total cost to the national economy is estimated to be 1.6 billion dollars.

$1.6 Billion
Annual Cost from Accidents
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**

<table>
<thead>
<tr>
<th>Location</th>
<th>Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>PennDOT 2007</td>
<td>21X</td>
</tr>
<tr>
<td>Milan Expo 2015</td>
<td>16X</td>
</tr>
<tr>
<td>U.S. DOT 1999</td>
<td>4.6X</td>
</tr>
<tr>
<td>Toronto 2010</td>
<td>4.3X</td>
</tr>
<tr>
<td>Toronto 2004</td>
<td>3.4X</td>
</tr>
</tbody>
</table>

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:**

![Solution Partners Logos](image-url)
Chicago Pilot Overview

GIS Data Platform
- Standardized GIS data
- Cloud-based
- Secure

User Interface
- view the infrastructure in the geographic area in 3D format
- upload/download data from/to CAD format
Mapping and scanning technologies are underpinned by new processes and data governance.
<table>
<thead>
<tr>
<th>Inaccurate and incomplete existing underground asset data</th>
<th>Utility conflicts or conflicts with geological structures</th>
<th>Accidental damage to underground and above ground infrastructure</th>
<th>Potential IP issues, confidentiality, data security issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current issue of... causes... resulting in the following pain points...</td>
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</tr>
<tr>
<td>• High amount of time spent on information retrieval</td>
<td>• Construction cost (due to delays)</td>
<td>• Risk to public and worker safety</td>
<td>• Security/information sharing concerns delay projects</td>
</tr>
<tr>
<td>• Project approval delays</td>
<td>• Construction costs (due to non-labor related services)</td>
<td>• Higher insurance costs</td>
<td>• Higher cost due to liability for data security breach</td>
</tr>
<tr>
<td>• Design costs (due to delays)</td>
<td>• Adverse economic impact</td>
<td>• Higher raw material costs</td>
<td>• Negative impact to company whose assets information are wrongly shared</td>
</tr>
<tr>
<td>• Design costs (due to additional survey/testing/platting services)</td>
<td>• Increase in change orders</td>
<td>• Bad publicity and city image</td>
<td></td>
</tr>
</tbody>
</table>