Leveraging Technology for High Performance Infrastructure: City Tech’s Smart Green Infrastructure Monitoring Solution

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City Tech accelerates technology-enabled solutions to make cities happier, healthier, and more productive

1. We tackle public problems and business opportunities that are too big for any single sector or organization to solve alone.

2. We create cross-sector teams that develop scalable, market-ready urban solutions; our proven approach and methodology help City Tech solutions succeed where other collaborations fall short.

3. We focus on industries that shape urban life – current City Tech initiatives include Advanced Mobility, Healthy Cities, and Connected Construction.

4. City Tech was born and raised in Chicago, and every city is a potential partner.
CITY TECH ENGAGES CROSS-SECTOR INDUSTRY & CAPABILITY PARTNERS

Consortium Members are Evolving Across Previous Industry and Capability Boundaries, Opening New Business Opportunity

- Cloud, ERP, systems integration
- Mayors, CIOs / CDOs, IT, innovation, operational departments & agencies
- Communication networks, narrow / wide / broadband, 5G
- Access, inclusion, equity, social services, resident representation
- Devices, sensors, data aggregation, analysis, visualization, & apps
- Service providers, OEMs, asset management, parking solutions
- Capital financing, VC / PE, risk modeling & insurance
- Equipment, architecture, engineering, materials
- Electricity, gas, water, waste
- Care providers, insurance, nutrition, epidemiology
- Health & Wellness
- Design & Construction
- Telecommunications & Connectivity
- Platforms
- Financial Services
- Utilities
- Civic Institutions
- Mobility & Transportation
- Local Government
- Hardware / Software / Analytics
- HardWARE & Software / Analytics
- Telecommunications & Connectivity
CORPORATE MEMBERS, PARTNERS, & COLLABORATORS
City Tech’s Ecosystem Combines Broad Capabilities and Deep Expertise To Implement Groundbreaking Urban Solutions
CITY TECH PROGRAMS & OFFERINGS
Reinventing Cities Through Technology-Enabled Solutions and Resident Engagement to Make Cities Happier, Healthier, & More Productive

1. City Solutions
- End-to-end opportunity identification, solution development / testing, and go-to-market support to address pressing urban challenges

2. Resident Engagement
- Direct resident design input and feedback on public-facing technology, including City Tech projects, local government initiatives, websites, apps, and other products and services.

3. Thought Leadership
- Conferences, workshops, training, and ideation with public, private, and civic leaders to drive innovative, inclusive, and impactful technology solutions
A PROVEN APPROACH TO RESULTS-FOCUSED, HIGH-IMPACT COLLABORATION

Our Solutions Methodology Delivers Innovative, Market-Focused Results

1. OPPORTUNITY DISCOVERY
2. SOLUTION DEFINITION
3. SOLUTION IMPLEMENTATION
4. SOLUTION SCALING

ACCELERATED RESULTS & BUSINESS IMPACT:

Technology Integration | Market Validation | Strategic Partner Development | Policy & Landscape Assessment | Public Recognition & Civic Engagement

ADVANCED MOBILITY | HEALTHY CITIES | CONNECTED CONSTRUCTION | AND MORE

And More
SMART GREEN INFRASTRUCTURE MONITORING
From source to reclamation, water management is shifting towards a watershed approach, integrating natural systems with the built environment through the convergence of physical and digital.
SMART GREEN INFRASTRUCTURE MONITORING
Preventing Urban Flooding Through Technology-Enabled Solutions

CHALLENGE

Cities are making major investments in green infrastructure (GI) yet have limited ability to:

» Consistently monitor the performance of the investment
» Optimize investments in GI to maximize benefits
» Compare GI investments against traditional grey infrastructure solutions
SMART GREEN INFRASTRUCTURE MONITORING SOLUTION
Preventing Urban Flooding Through Technology-Enabled Solutions

SOLUTION

A low cost IoT-based sensing package, allowing GI performance data from multiple sites to be aggregated for individual and collective performance management.
SMART GREEN INFRASTRUCTURE MONITORING SOLUTION
Preventing Urban Flooding Through Technology-Enabled Solutions

- House the data
- Provide the testbed and share data
- Provide subject matter expertise
- Deploy sensor technology
- Deploy telecom and dashboards
- Review data for commercial application
PILOT

Create and deploy sensors, communications, and cloud analytics supporting GI performance data collection at four urban GI sites in both public and private locations.

» Start: June 2015

SENSOR DEPLOYMENTS
Piloting Across Multiple Green Infrastructure Types

Installations across 4 green infrastructure types:
1. Permeable Pavement (Langley Avenue)
2. Bioswale (UI LABS – Goose Island)
3. Infiltration Planter (Argyle Street)
4. Tree grate filters (Cottage Grove Avenue)
EXAMPLE SENSOR INSTALLATION LOCATION: PERMEABLE PAVEMENT
Argyle Street Between Broadway and Sheridan

Commercial
- permeable pavers
- infiltration planters

Argyle St
EXAMPLE SENSOR INSTALLATION LOCATION: PERMEABLE PAVEMENT
Argyle Street Between Broadway and Sheridan

- Transmission Node (includes Opti solar wireless gateway; tipping bucket rain gauge, temperature, humidity, wind speed, wind direction)

- Decagon GS3 (Water Content, Temperature, Conductivity) at sub-grade at 18-inches; Decagon 10HS (Water Content) at 10-cm
RESULTS
SCALABLE TOOLS TO EVALUATE GI PERFORMANCE

» Improves future engineering of green infrastructure through sensing data from functioning systems
» Platform connects to over 20,000 data streams to blend external data sets with live local data
» Allows for multiple sites to be monitored from one central location and can be shared with stakeholders and public
Smart Green Infrastructure Monitoring

Sensors - Historical

Environment & Sustainable Development

This dataset is historical-only. Results from a 2017-2018 project of City-installed sensors measuring water runoff from streets and sidewalks. These data can be used to measure the impact of sustainable green infrastructure on flooding. These sensors also captured weather data.

More

Updated
May 2, 2018

Data Provided by
City of Chicago

Featured Content Using this Data

Smart Green Infrastructure Monitoring

External Content

Further information on the SGIM project.
SMART GREEN INFRASTRUCTURE MONITORING
Preventing Urban Flooding Through Technology-Enabled Solutions

OUTCOMES

✓ A novel, sensing technology to meet the challenges of data collection from decentralized stormwater infrastructure across a city.
✓ New data sources and frequency to enable existing GI maintenance as well as performance feedback to inform future designs.
✓ The ability to collect GI performance data from multiple sites and enable systemwide GI and traditional stormwater infrastructure planning.
✓ New, real-time stormwater storage capacity data to enable future real-time or performance-based management systems and contracts.
✓ Demonstrated pathways to active/dynamically controlled infrastructure at the edge of cloud
KEY QUESTIONS FOR DISCUSSION

▪ Where is your community on the progression from watershed performance baselining to performance-based management and control?

▪ How can data and tools for GI performance either change the role of existing stormwater management stakeholders or empower new participants to remove barriers?

▪ How can we best support collaborations between unlikely partners to remove barriers to green infrastructure adoption, operational management, and long-term performance?
THANK YOU

CITY TECH COLLABORATIVE

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