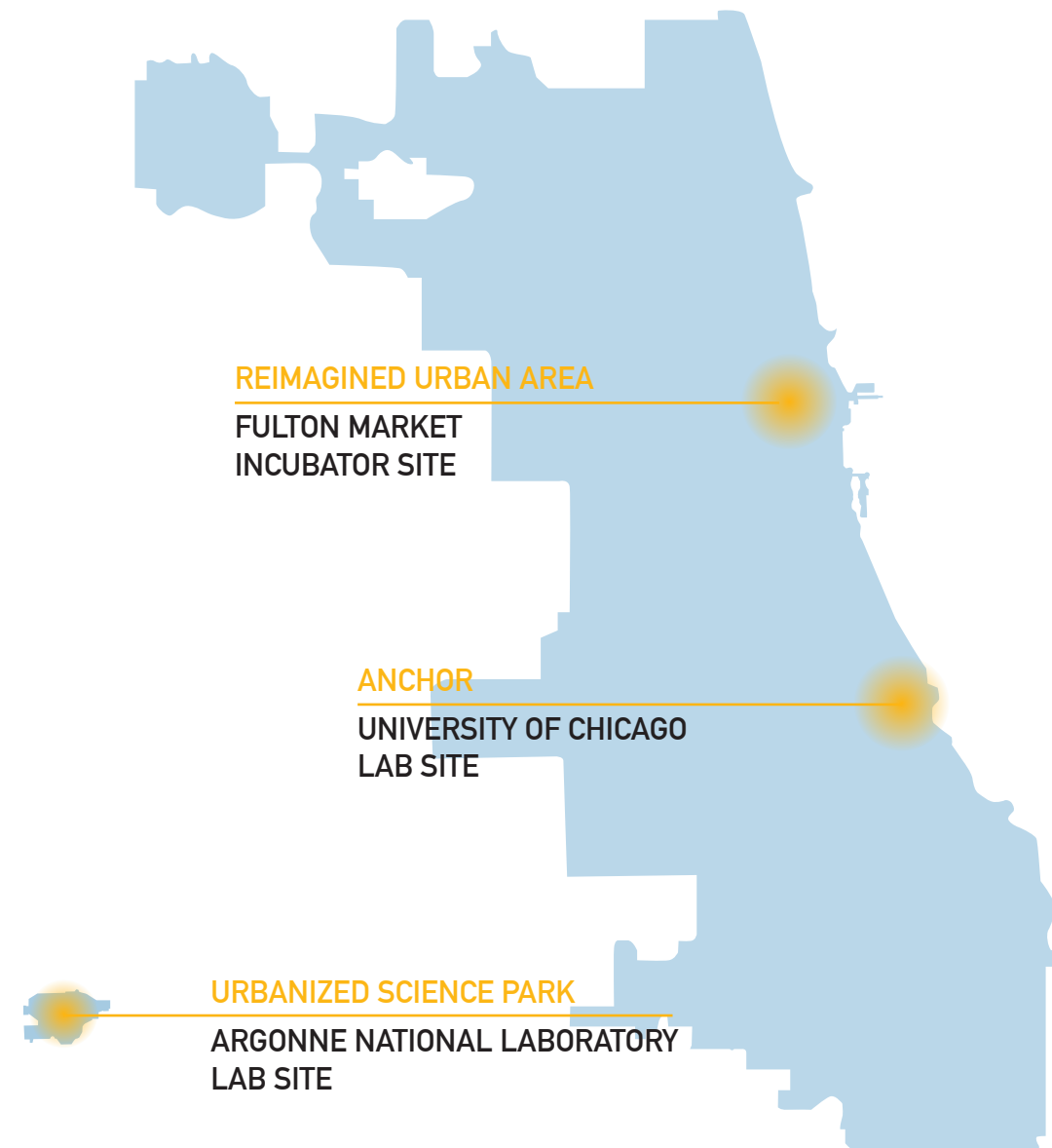# Innovation Model for the Water-Energy Nexus in Chicago
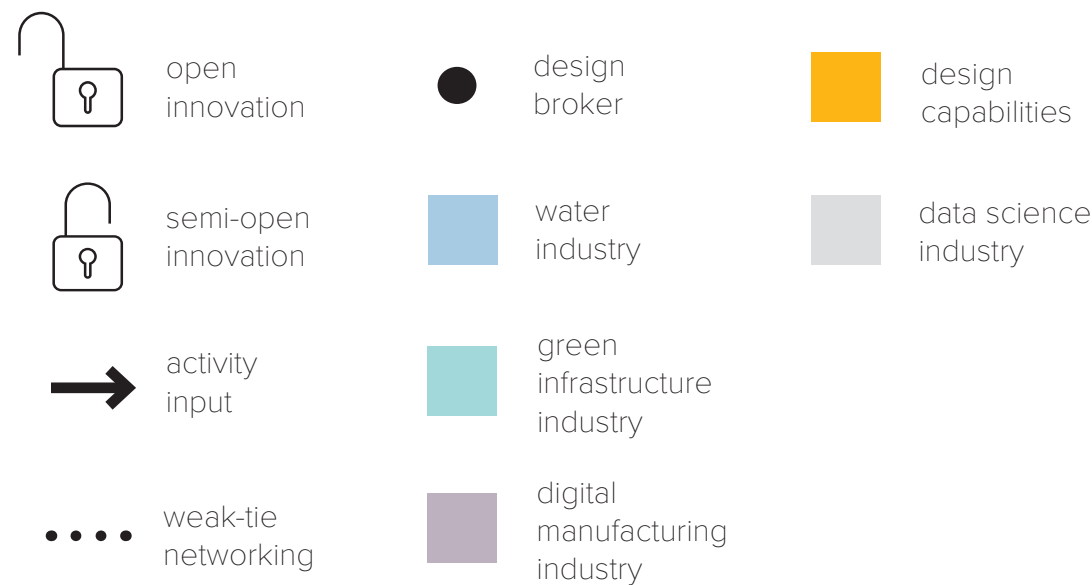
Chicago is making a play to become a leading global innovation hub for water infrastructure. Chicago has a $14 billion water industry, the 4th largest in the nation, and there are already several platforms and consortiums looking to connect the 250+ water companies headquarted in Chicago with the dozens of research universities, research institutions and civic organizations that have the capabilities to collectively generate and scale solutions and new technology.

Energy and water systems are tightly intertwined and thermoelectric power plants use the majority of freshwater in Illinois. **There is a huge opportunity to utilize connected devices and design to improve the efficiency and sustainability of these systems.** The innovation model presented proposes an open system, built on top of existing activities and leveraging distributed knowledge, to move new solutions through public and private innovation pipelines.
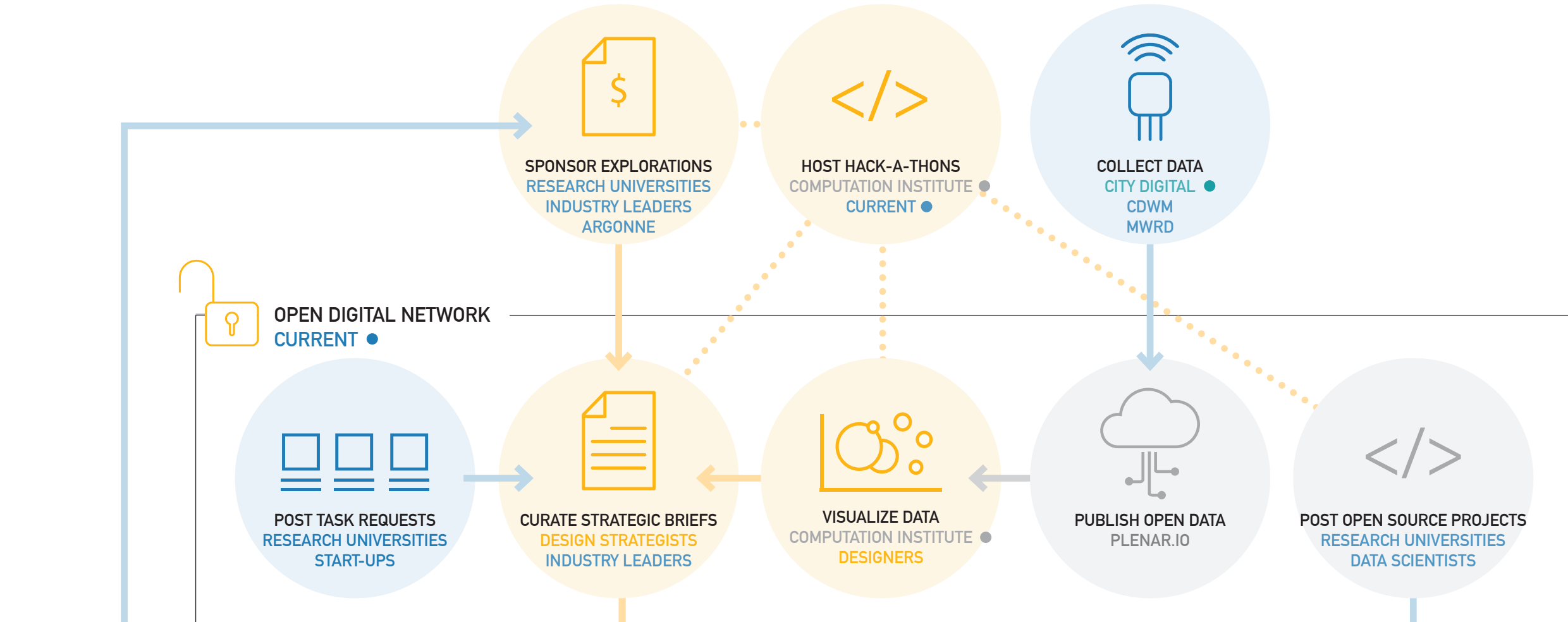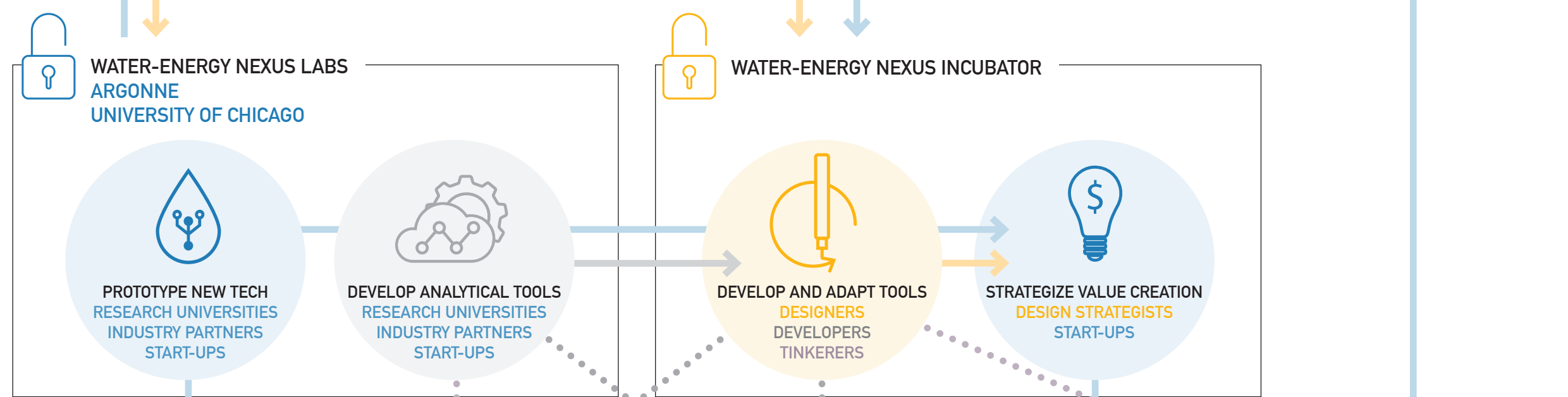
INNOVATION DISTRICTS

REIMAGINED URBAN AREA
FULTON MARKET INCUBATOR SITE

ANCHOR
UNIVERSITY OF CHICAGO LAB SITE

URBANIZED SCIENCE PARK
ARGONNE NATIONAL LABORATORY LAB SITE

KEY

- open innovation
- semi-open innovation
- activity input
- weak-tie networking
- design broker
- water industry
- green infrastructure industry
- digital manufacturing industry
- design capabilities
- data science industry

SCOPE AND SOCIALIZE

SPONSOR EXPLORATIONS
RESEARCH UNIVERSITIES
INDUSTRY LEADERS
ARGONNE

HOST HACK-A-THONS
COMPUTATION INSTITUTE
CURRENT ●

COLLECT DATA
CITY DIGITAL ●
CDWM
MWRD

OPEN DIGITAL NETWORK
CURRENT ●

POST TASK REQUESTS
RESEARCH UNIVERSITIES
START-UPS

CURATE STRATEGIC BRIEFS
DESIGN STRATEGISTS
INDUSTRY LEADERS

VISUALIZE DATA
COMPUTATION INSTITUTE
DESIGNERS

PUBLISH OPEN DATA
PLENAR.IO

POST OPEN SOURCE PROJECTS
RESEARCH UNIVERSITIES
DATA SCIENTISTS

DESIGN

WATER-ENERGY NEXUS LABS
ARGONNE
UNIVERSITY OF CHICAGO

WATER-ENERGY NEXUS INCUBATOR

PROTOTYPE NEW TECH
RESEARCH UNIVERSITIES
INDUSTRY PARTNERS
START-UPS

DEVELOP ANALYTICAL TOOLS
RESEARCH UNIVERSITIES
INDUSTRY PARTNERS
START-UPS

DEVELOP AND ADAPT TOOLS
DESIGNERS
DEVELOPERS
TINKERERS

STRATEGIZE VALUE CREATION
DESIGN STRATEGISTS
START-UPS

DEVELOP ANALYTICAL TOOLS
DMDII ●

DEVELOP ANALYTICAL TOOLS
START-UPS

DEVELOP OPEN HARDWARE
DESIGNERS
DEVELOPERS
TINKERERS

PILOT AND SCALE

DEMONSTRATE TECH
CURRENT ●
CITY DIGITAL ●

LICENSE TECH
RESEARCH UNIVERSITIES
INDUSTRY LEADERS

PILOT BUSINESS MODELS
CURRENT ●

PROTOTYPE SOLUTIONS
COMMUNITY STAKEHOLDERS
DESIGNERS

CONCEPTS

The Network Information Economy is a new stage in the information economy wherein the reduced cost of computing technology is enabling a much greater role for nonmarket information production by individuals through cooperative and coordinated action. (Benkler 2006)

Internet of People is a reframing of the concept Internet of Things to highlight the fact that the value of IoT comes from the network of relationships between people that make internet-enabled connectivity productive for the advancement of human society. (Nold and Vankranenburg)

Diversity of Productive Knowledge is the concept that certain pockets of society have been able to operate at a much higher level of intelligence because they distribute bits and pieces of it among its members and have established structures to effectively recombine it. (Haussman, Hidalgo et al., 2007)

Design as a Knowledge Broker is a design strategy that promotes knowledge flow from the outside to inside organizations. The knowledge diffused outside is internalized as a strategic resource for developing incremental innovation on products meaning and functions, based on the social and cultural trends generated by users. (Bertola and Teixeira, 2003)

Motivation in Social Production refers to the extrinsic and intrinsic incentives for participating in nonmarket contributions to the information economy. (Benkler 2006)

Boutique Business Models are the localization and support of open source software, where the software itself is free, while people pay for local support and adaptation for their needs. (Nold and Vankranenburg)

Innovation Districts are geographic ares where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators, contributing to a robust open innovation economy. (Katz and Wagner, 2014)

Re-imagined Urban Area is a model for innovation districts where industrial or warehouse districts are undergoing a physical and economic transformation. (Katz and Wagner, 2014)

Urbanized Science Park is a model for innovation districts where traditionally isolated, sprawling ares of innovation are urbanizing through increased density and an infusion of new activities. (Katz and Wagner, 2014)

Weak Ties refer to relationships in innovation-enabling networks between people or firms working within different contexts or economic clusters where there is infrequent contact. (Katz and Wagner, 2014)

Hackathons are events that bring together software programmers and designers for multi-day, voluntary software production sprints. (Irani, 2015)

Open Source Hardware are physical technological artifacts wherein information about the design and construction are easily shareable, allowing for much freer replication. It is closely tied to the Maker Movement (Anderson, 2012)

SOURCES

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