

March 26, 2019

Realizing the Value of Data Civic Lab

Waterfront Toronto

Agenda



Items:

1. Welcome and Opening Remarks
2. Introduction & Agenda Review
3. Urban Digital Ecosystem
4. Intellectual Property in the Canadian Context
5. Smart City Data as an Important Public Resource
6. The World of Open Data
7. Best Practices from Around the World
8. Break
9. Discussion
10. Expert Reflections
11. Closing Remarks
12. Adjournment

Presenters:

- Charles Finley (*DSAP*)
Nicole Swerhun (*Facilitator*)
Kristina Verner (*WT*)
George Takach (*McCarthy Tétrault*)
Kurtis McBride (*Miovision*)
Bryan Smith (*ThinkData Works Inc*)
Michael Geist (*University of Ottawa*)
- All
Panel
Kristina Verner (*WT*)

Opening Remarks

Charles Finley

Waterfront Toronto's Digital Strategy Advisory Panel

Introductions & Agenda Review

Nicole Swerhun, Facilitator, Swerhun Inc.

How Value Could Flow in the Urban Digital Ecosystem

**Kristina Verner, Vice President, Innovation, Sustainability & Prosperity
Waterfront Toronto**

Procurement Steps in the RFP

- RFP objectives grounded in helping Canadian firms overcome barriers to going to scale by providing a meaningful testbed for new technologies and approaches (not intended to be solely digital)
- Intent is to grow the local ecosystems

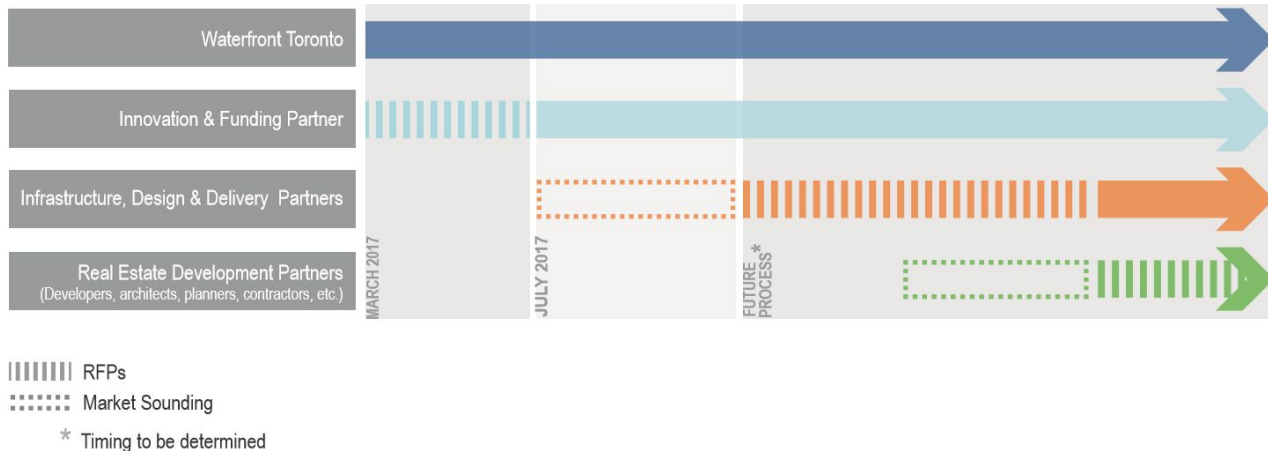
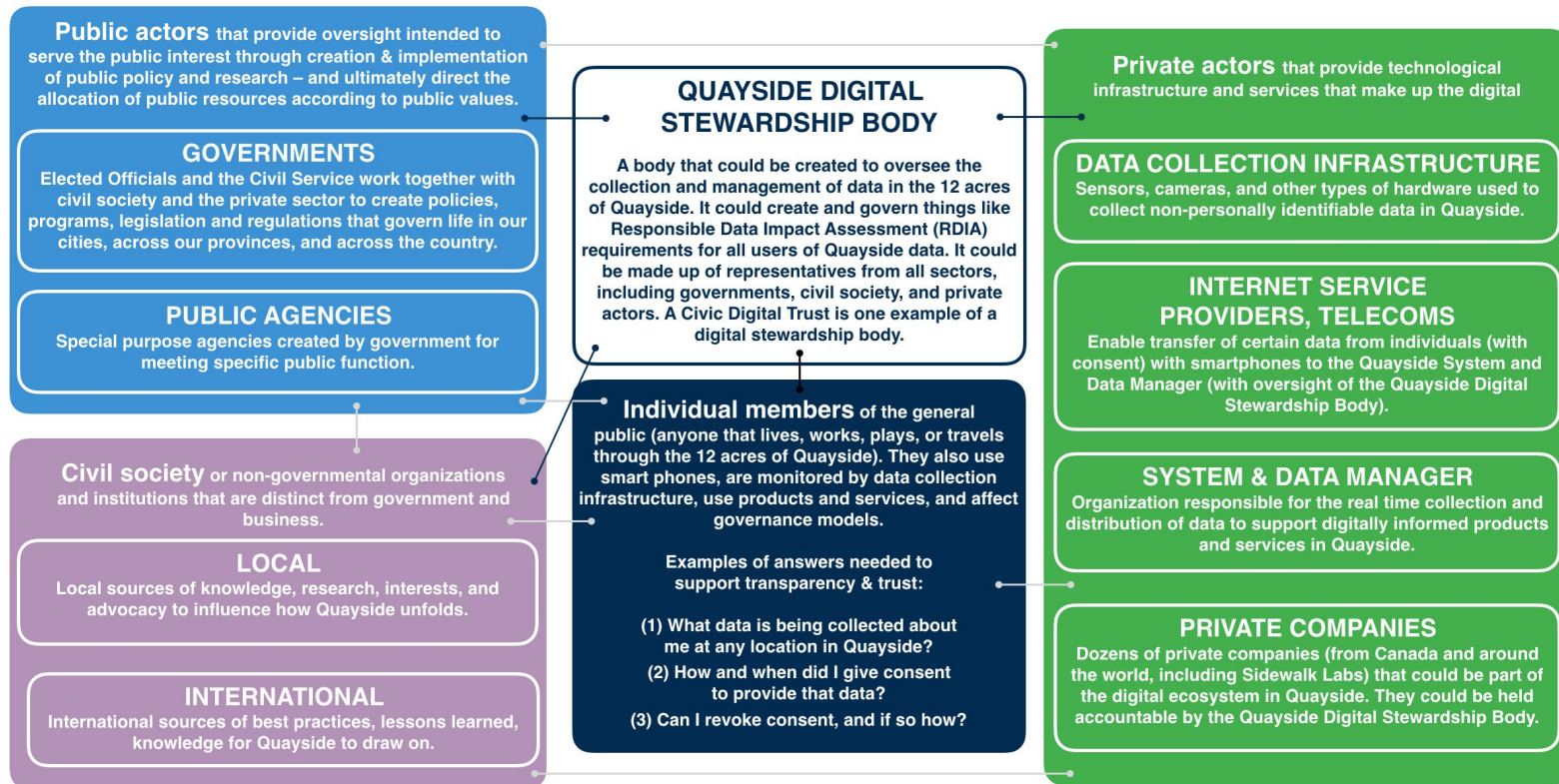


Figure 3. Phases of RFPs

Digital Ecosystem Overview



Legend

Public actors

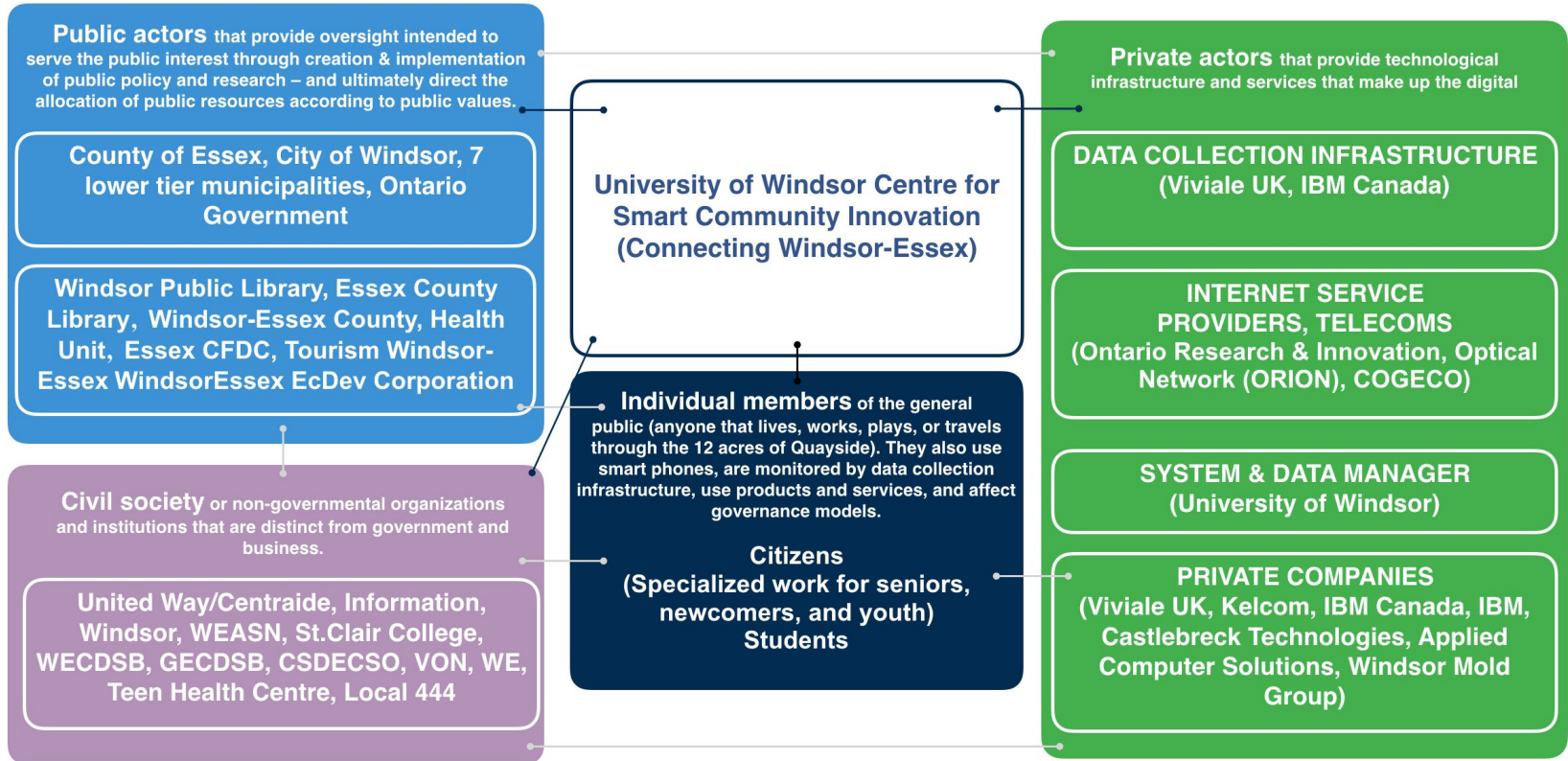
Civil society

General Public

Private actors

Digital Ecosystem - Example 1

Lived Experience: Example - Windsor-Essex



Legend

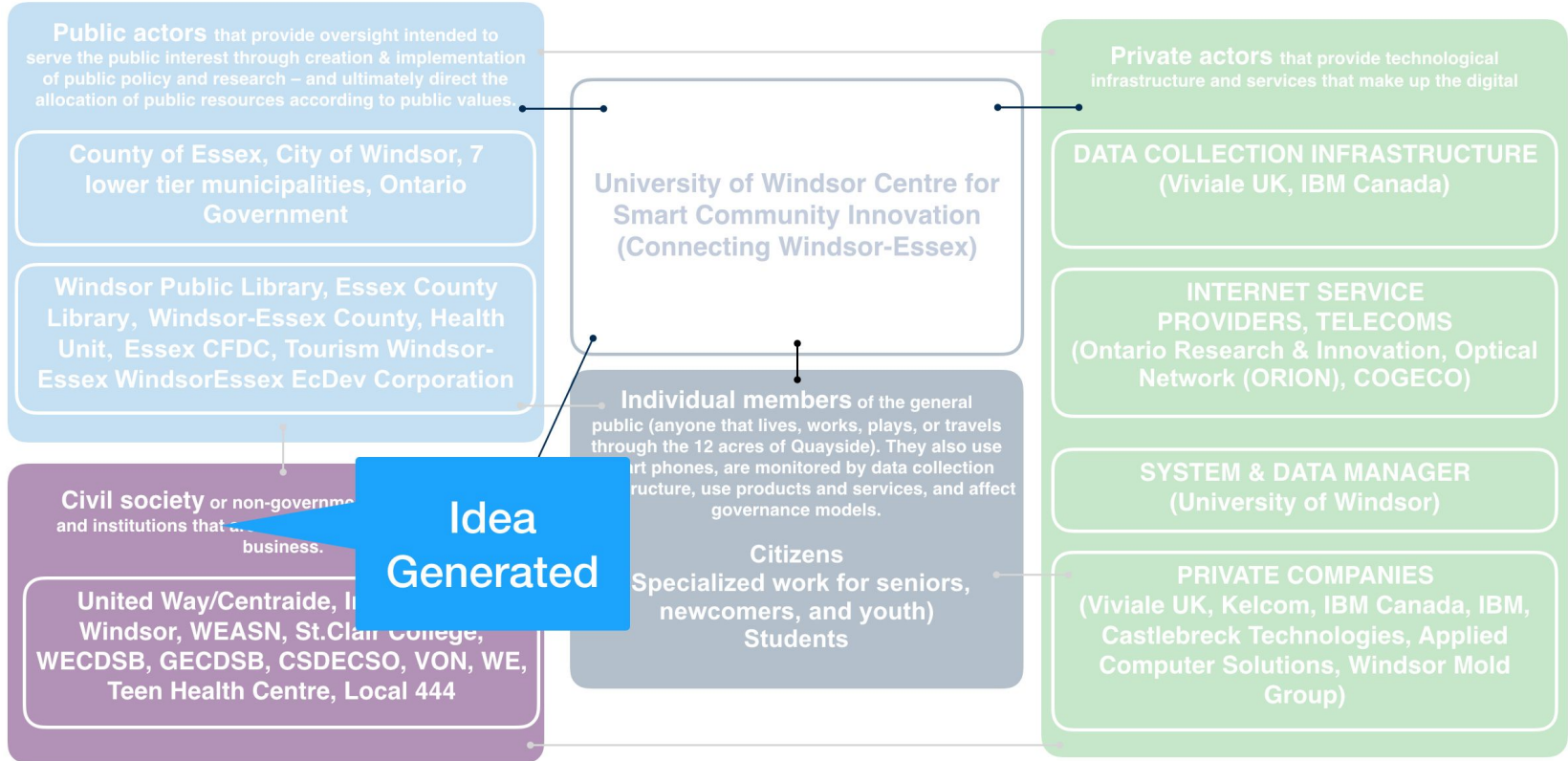
Public actors

Civil society

General Public

Private actors

Lived Experience: Example – Healthcare Application



Legend

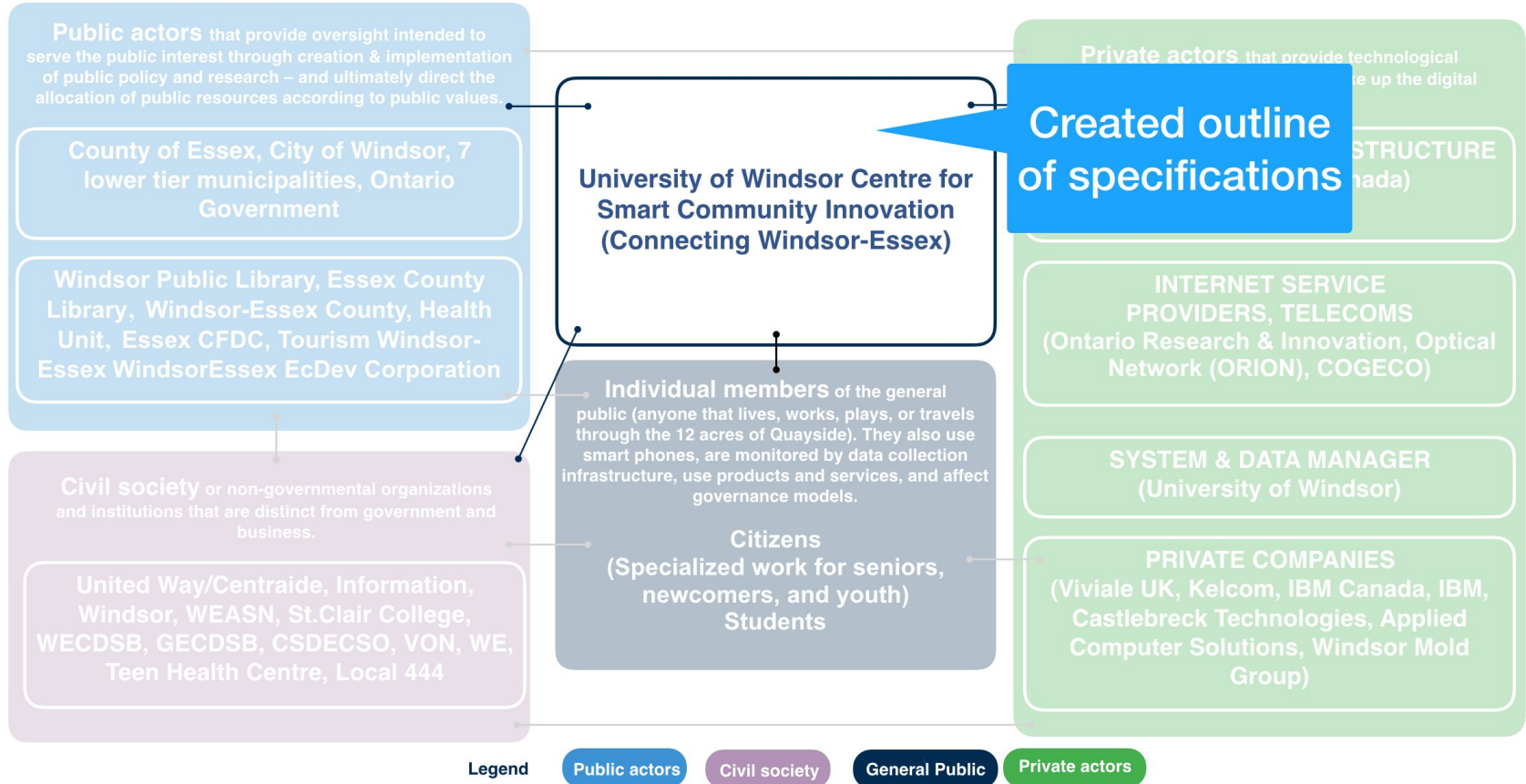
Public actors

Civil society

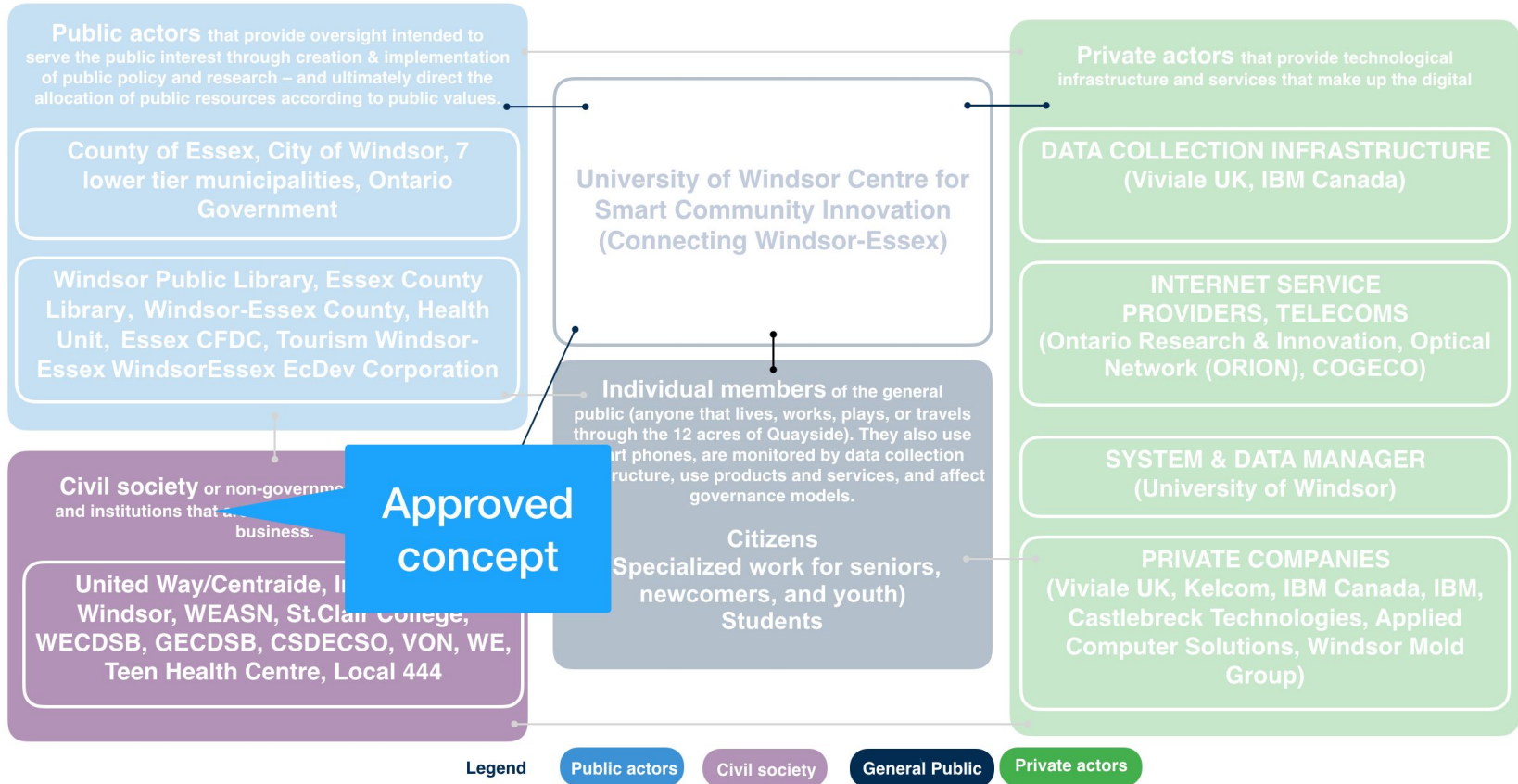
General Public

Private actors

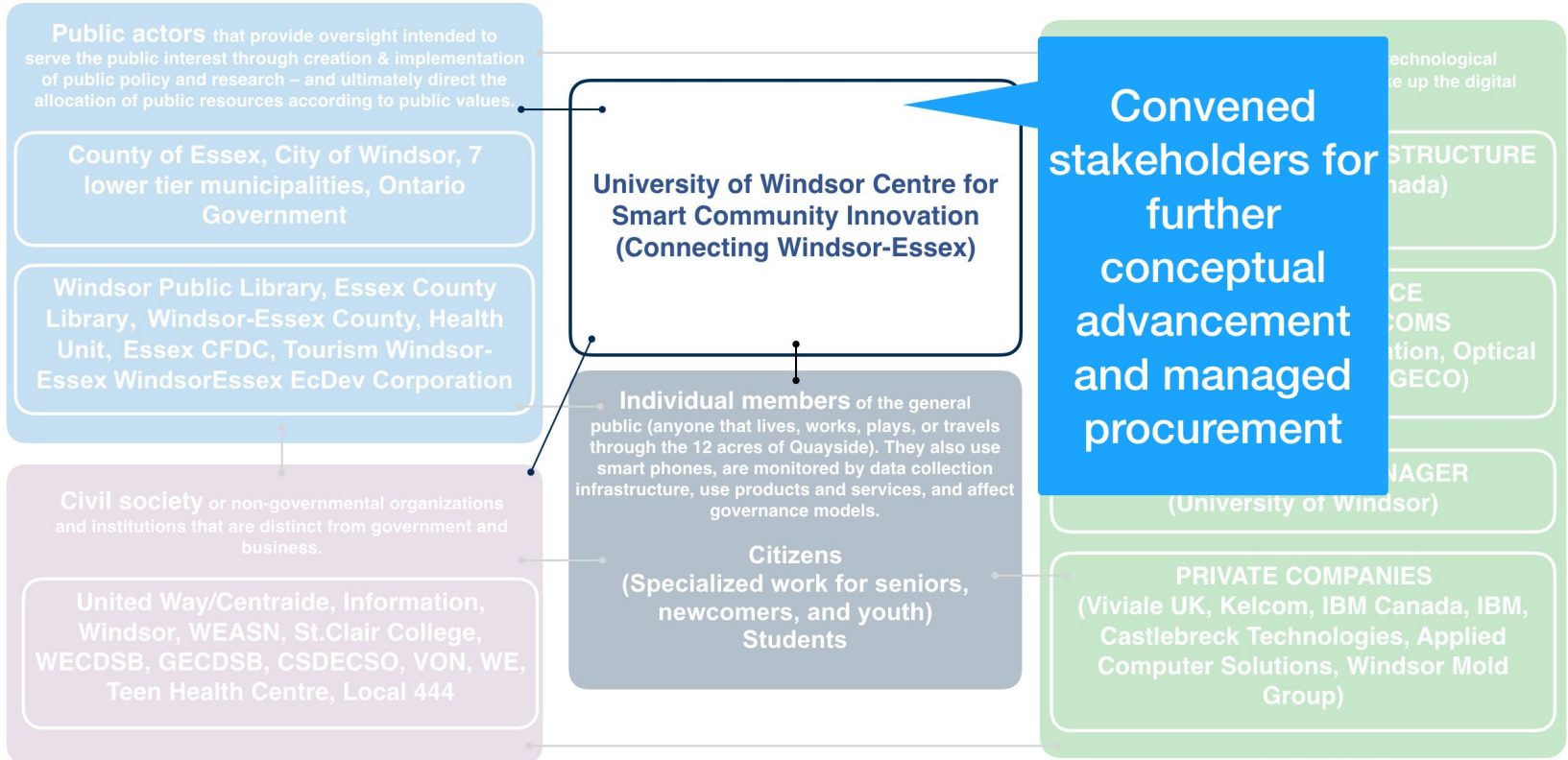
Lived Experience: Example – Healthcare Application



Lived Experience: Example – Healthcare Application



Lived Experience: Example – Healthcare Application



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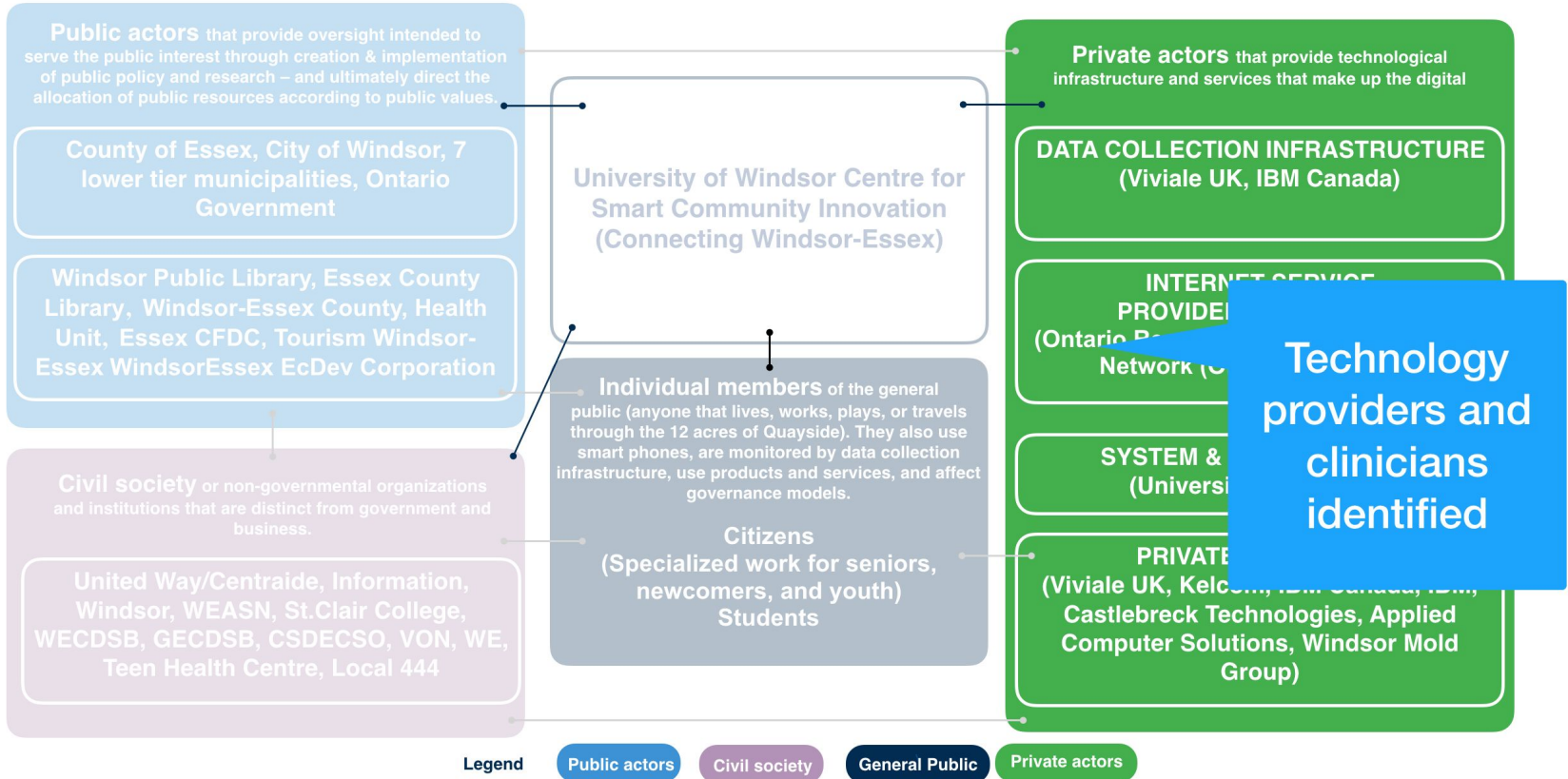
Public actors

Civil society

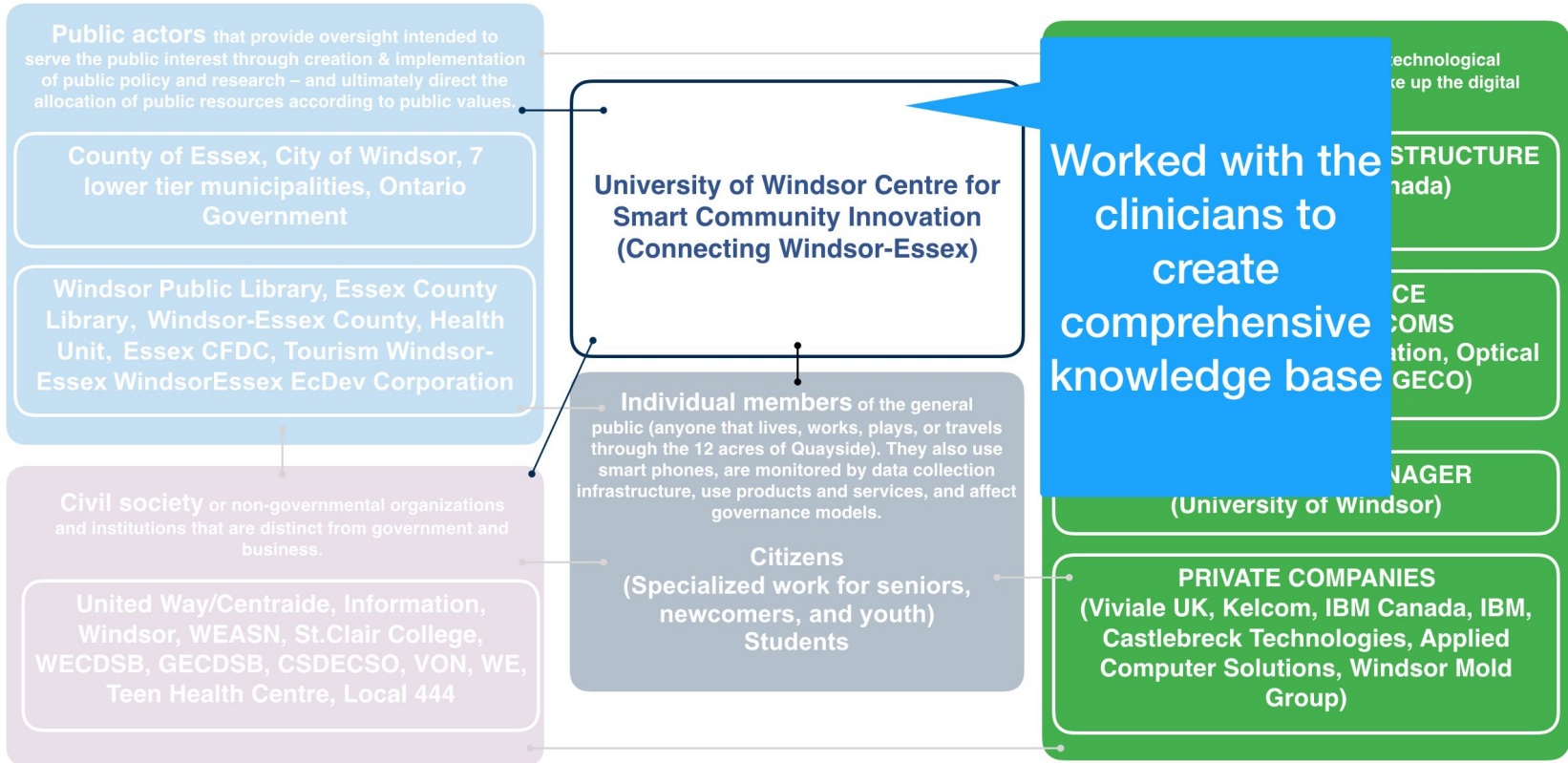
General Public

Private actors

Lived Experience: Example – Healthcare Application



Lived Experience: Example – Healthcare Application



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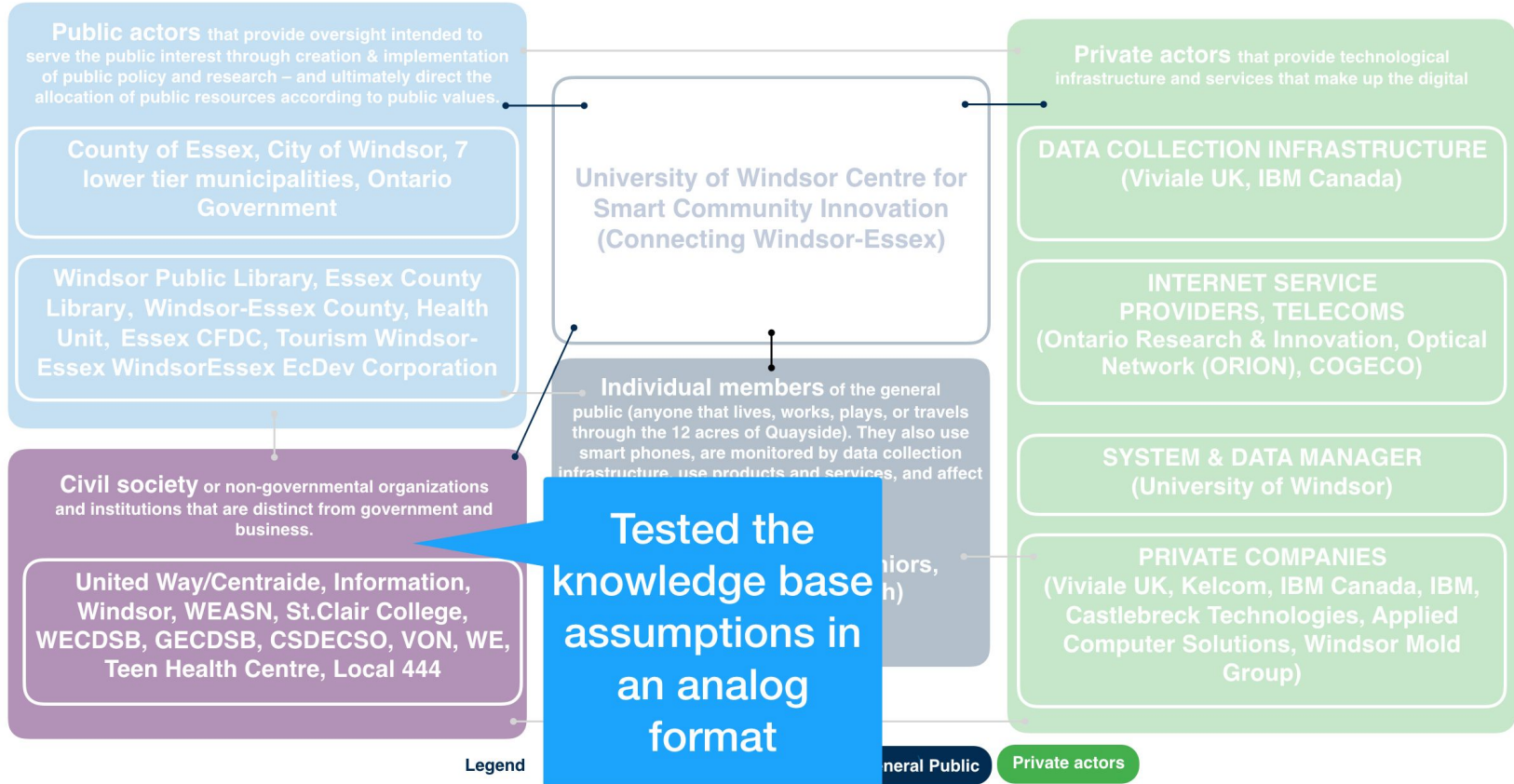
Public actors

Civil society

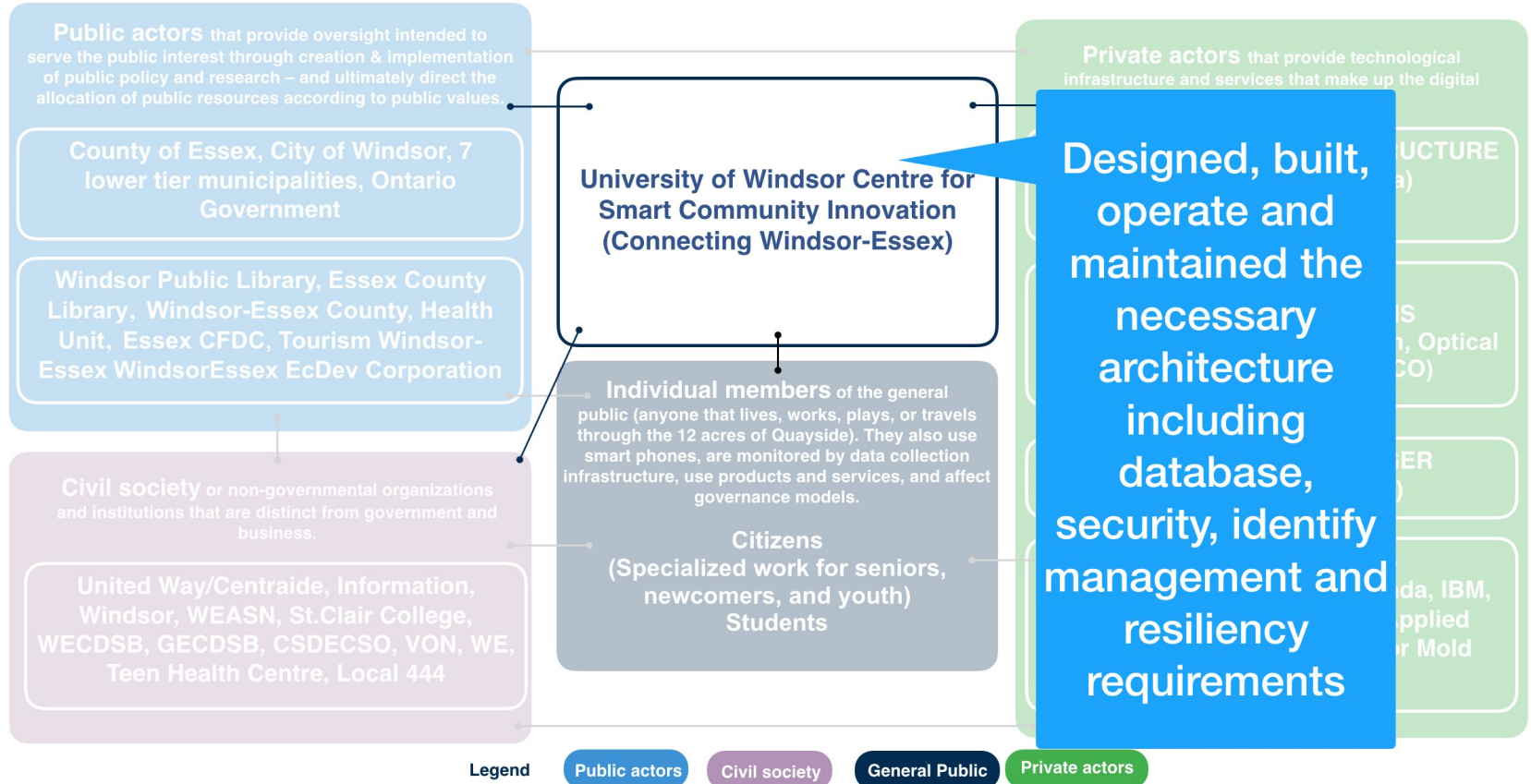
General Public

Private actors

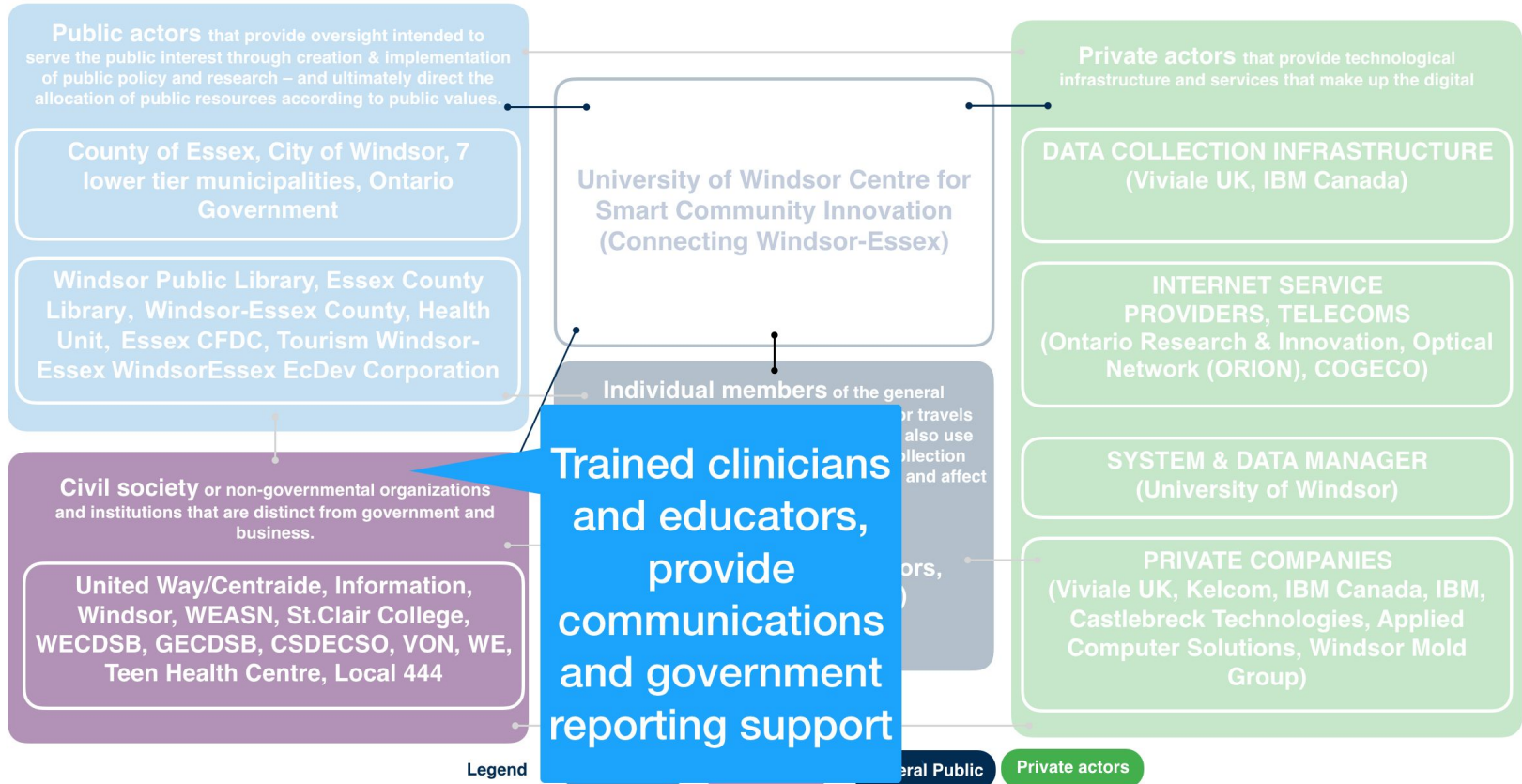
Lived Experience: Example – Healthcare Application



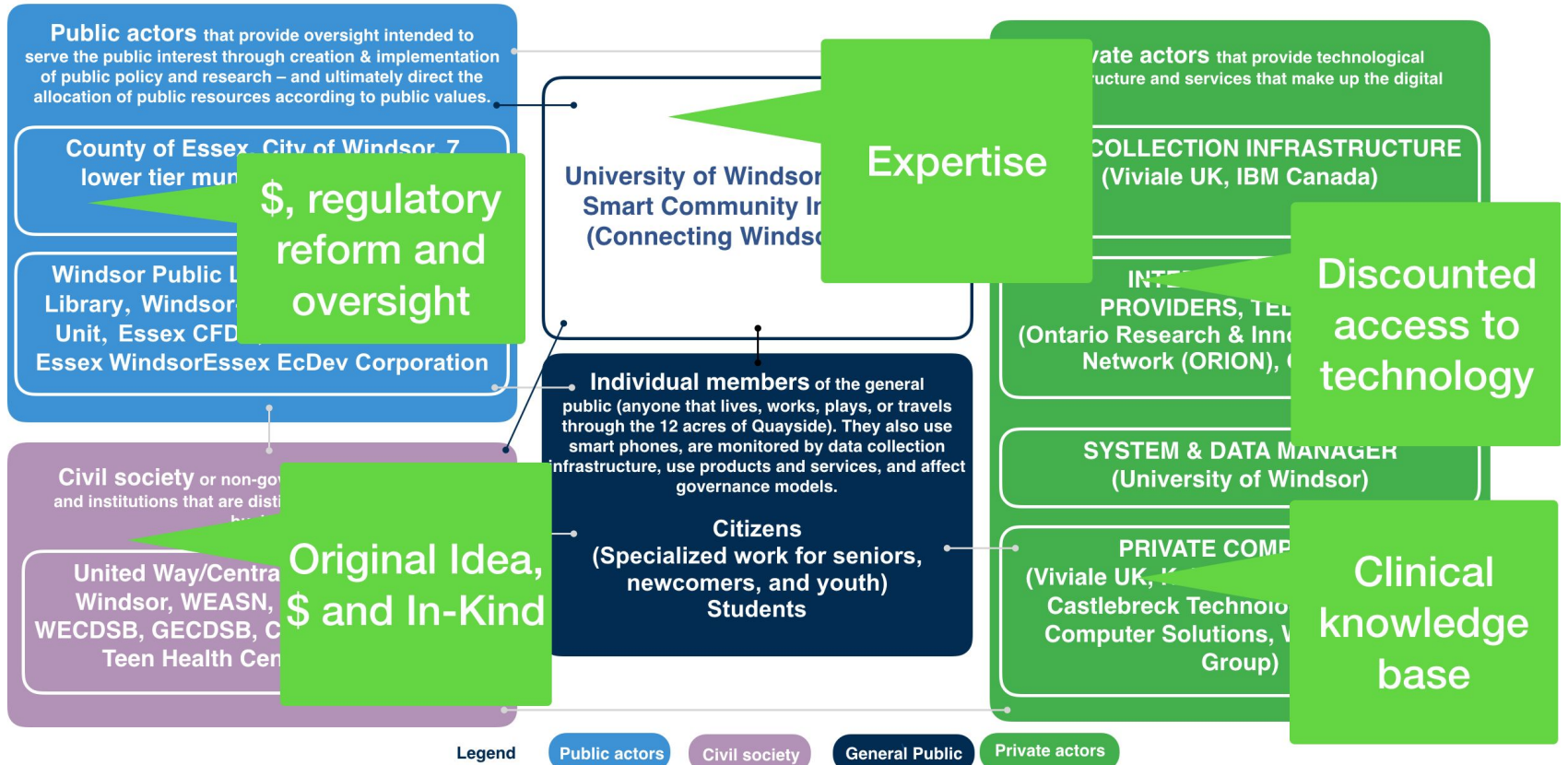
Lived Experience: Example – Community Portal



Lived Experience: Example – Healthcare Application



Lived Experience: Example – Healthcare Application



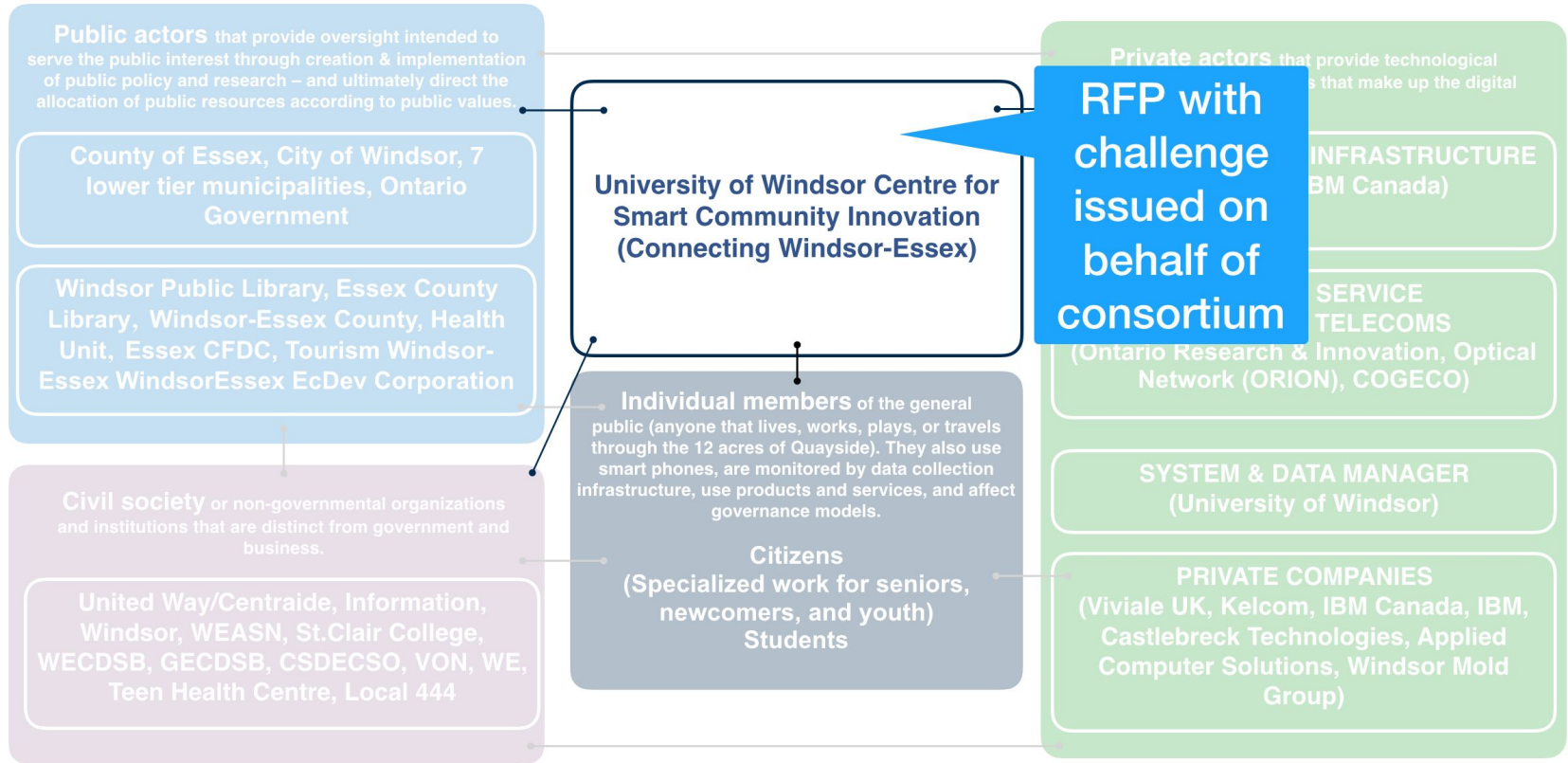
Lived Experience: Example – Healthcare Application



Source	Contribution	Retained IP	Ownership
Civil Society	Idea, Limited Funding and Clinical Implementation	Conceptual Idea	40%
Government	Grant Funding	None	0%
University of Windsor	Convening, technology expertise (including design of specifications, DBOM technology stack and applications) Reduced participation fees	Architecture design and core code elements	25%
Private Actor - Technology	Discounted access to products	Their own	0%
Private Actor - Clinician	Funding and Subject matter expertise to design and test the knowledge base as well as provide validation of solution	Knowledge base and rules that guided the inference engine	35%

Digital Ecosystem - Example 2

Lived Experience: Example – IDMS Pilot



Legend

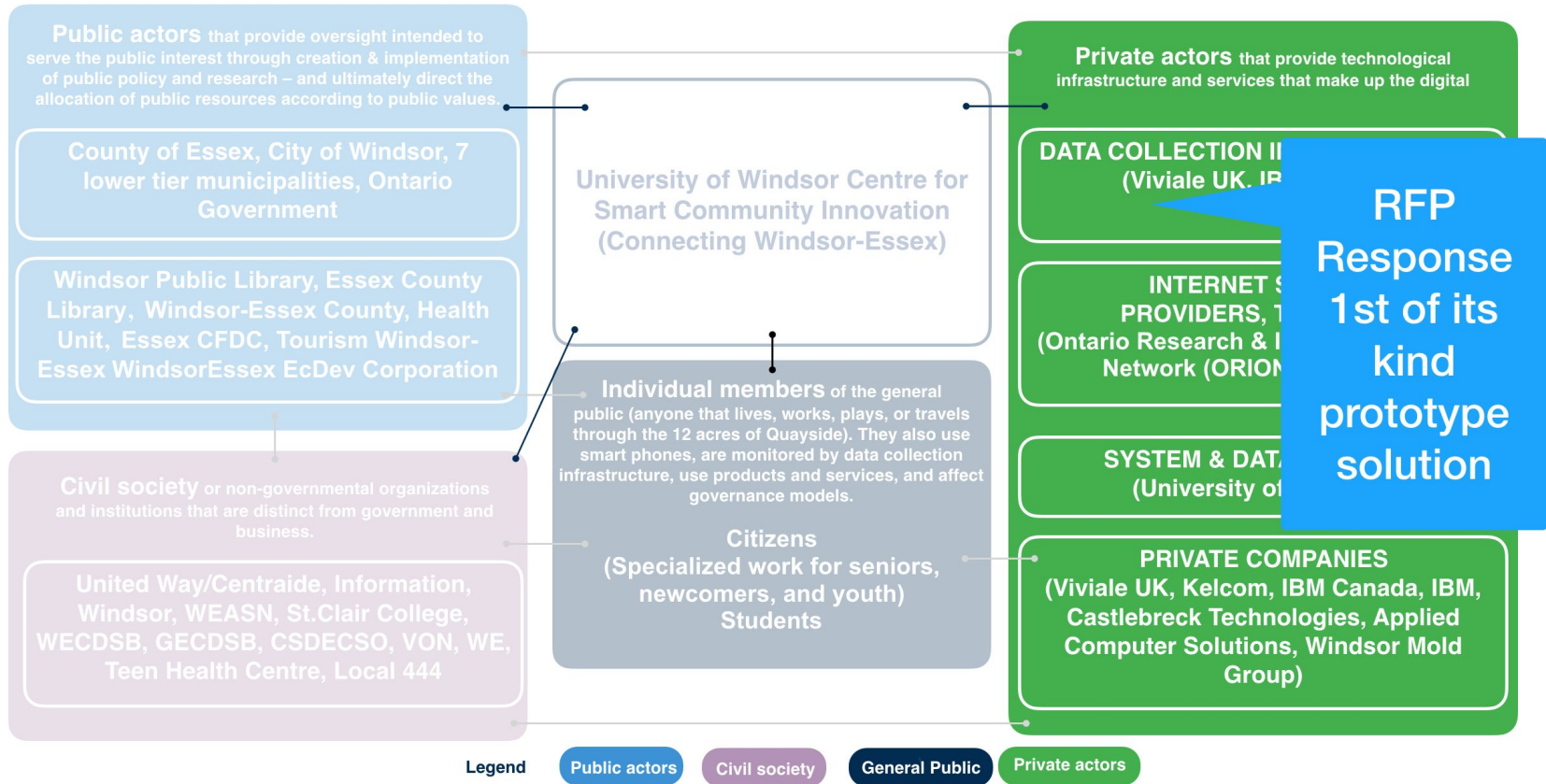
Public actors

Civil society

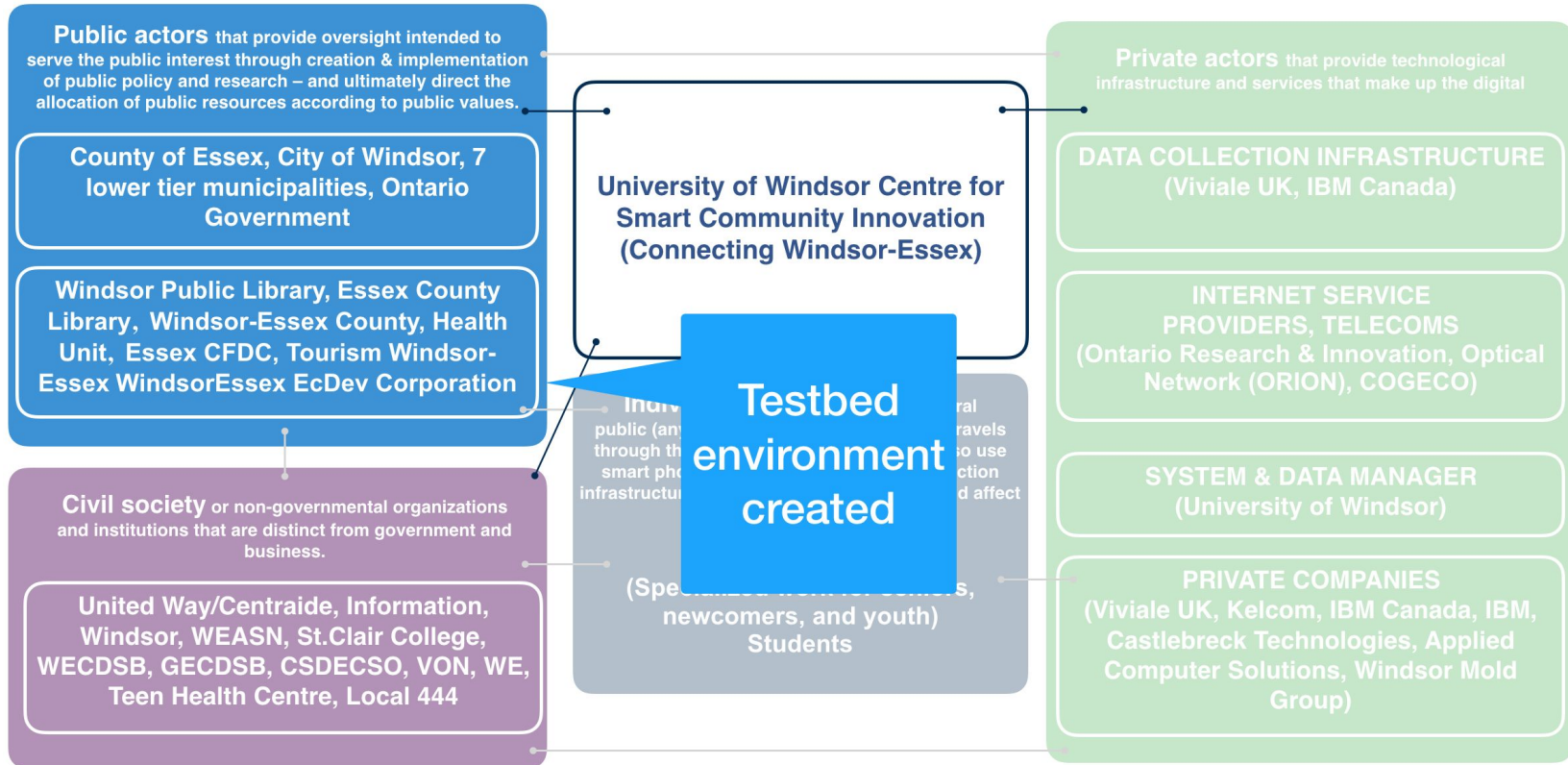
General Public

Private actors

Lived Experience: Example – IDMS Pilot

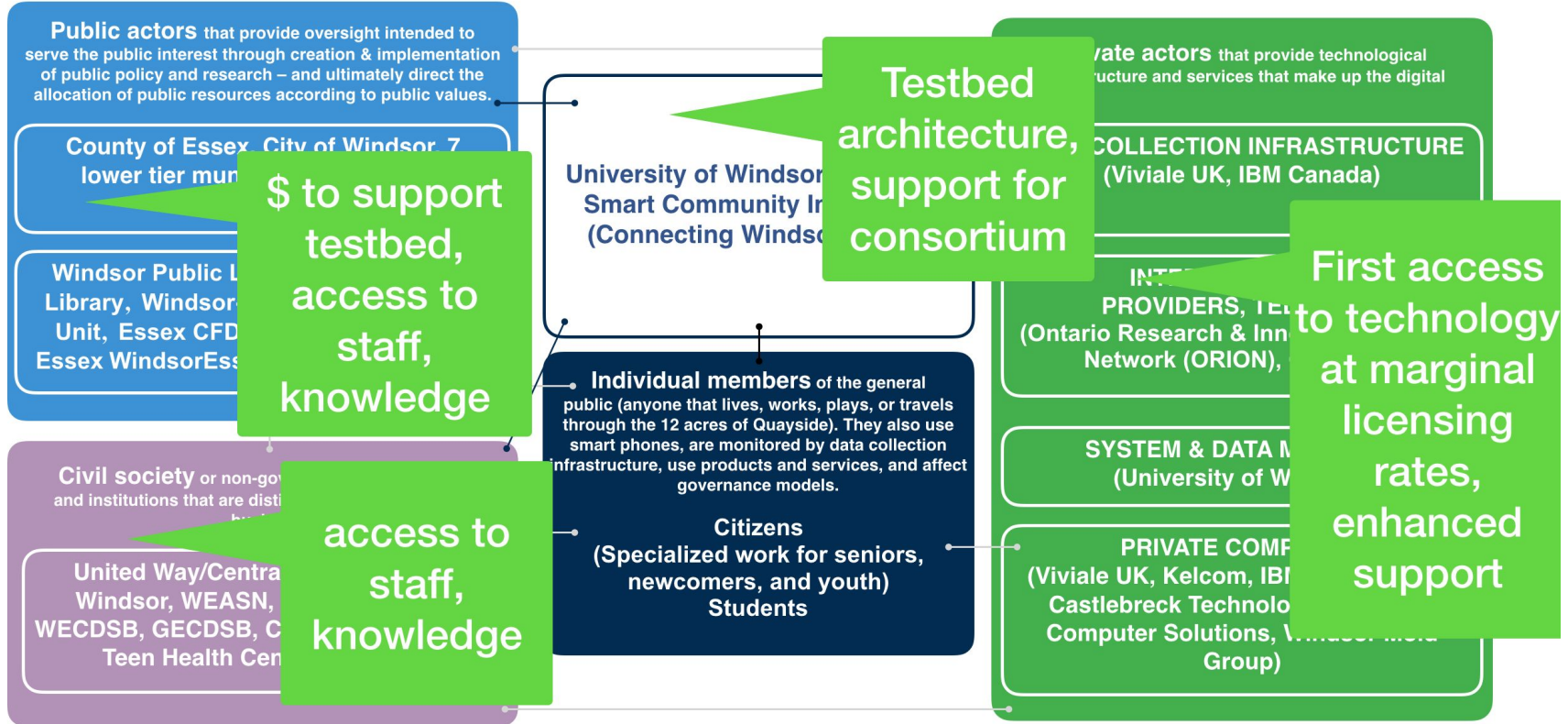


Lived Experience: Example - IDMS Pilot



- Legend
- Public actors
 - Civil society
 - General Public
 - Private actors

Lived Experience: Example - IDMS Pilot



Legend

- Public actors
- Civil society
- General Public
- Private actors

Lived Experience: Example – IDMS Pilot



Source	Contribution	Retained IP	Ownership	Other Benefits
Civil Society	Participation in the testbed through access to staff and existing knowledge	None	0%	Access to robust technology and enhanced support at no cost.
Government	Challenge statements, limited funding for testbed, participation in the testbed through access to staff and existing knowledge	None	0%	Access to robust technology and enhanced support at no cost.
University of Windsor	DBOM technology stack and interface to local applications, coordination of local efforts	Architecture design and core code elements	0%	Access to robust technology and enhanced support at low cost (5 year savings of ~\$750K) Access to de-identified data for research at no cost.
Private Actor - Technology Companies	First access to technology at marginal licensing rates, enhanced support	All	100%	Results of testbed enhanced product. First customer access.

Some questions to keep in mind today...



- What key elements do we need put in place to ensure that we keep our goals and objectives top-of-mind with regard to providing opportunities for the Canadian ecosystem?
- What architecture decisions/elements are necessary to ensure that the technology does not unintentionally put these objectives at risk?
- Are there frameworks/approaches from other jurisdictions/examples that we should consider (both positive/negative)?



a waterfront for everyone



Setting the Stage – Intellectual Property in the Canadian Context

George Takach, Senior Partner, Technology Law, McCarthy Tétrault

QUAYSIDE CIVIC LAB #3: DERIVING VALUE FROM DATA

SETTING THE STAGE - INTELLECTUAL PROPERTY CONSIDERATIONS IN A CANADIAN CONTEXT

Presentation by George S. Takach, Partner,
McCarthy Tétrault

OVERVIEW OF PRESENTATION

- The types of intellectual property (“IP”)
- IP at Quayside
- Data as IP
- Revenue considerations
- NOTE: this presentation focuses on IP strategy, which ultimately must be integrated with strategies for data governance, privacy, procurement and the overall commercial deal for Quayside

CONTEXT FOR PRESENTATION

- This is a brief, 10 minute overview presentation
- The Quayside IP issues are complex (as are the data governance, privacy, procurement and related issues)
- This is simply the start of a conversation
- MIDP not yet submitted by SWL
- See Schedule G of Plan Development Agreement for additional considerations on IP at Quayside
- Happy to engage in dialogue with public sector, private sector and civil society participants on these and related issues; will be very vigorous, structured engagement on these issues once MIDP is submitted

TYPES OF PROPERTY

- Real property (land, buildings, infrastructure)
- Personal property (equipment, raw materials, finished manufactured products)
- Intellectual property (the product of people's brains)

INTELLECTUAL PROPERTIES

- Ideas (concepts, business models)
- Inventions (applied ideas that implement a product, service, feature, function)
- Software (code, also possibly structure, architecture)
- Works of authorship (writings, videos, images, creative content)
- Data (especially databases)

DATA AS IP

- Data derives its value from its context
- One data point vs. a database
- Real time data vs. historic data
- Public data vs. private data

LEGAL PROTECTION FOR IP

- Patents
- Copyrights
- Trade Secrets
- Contract
- Technical measures
- Trade marks
- Domain names

QUAYSIDE AND IP

- Pre-existing IP
- Co-created IP
- Site specific IP
- See Schedule G of the PDA for further elaboration

QUAYSIDE AS IP TEST BED

- Quayside as an IP alpha site (for prototypes)
- Quayside as an IP beta site (for pre-commercial release)
- Quayside as a first/early adopter
- Quayside as an product/service interoperability environment
- Patent non-assertion model
- Objective is an open, easily accessible and diverse operations ecosystem, with meaningful Canadian participation

WATERFRONT TORONTO AND IP-RELATED COMPENSATION

- Revenue share from co-created IP
- Testbed fees
- Data-related revenue share
- IP compensation model applies to all suppliers
- Consistent with WT's mandate, amounts paid to WT are applied against Quayside public policy objectives, such as: housing affordability; sustainability; urban technology innovation, and funding of the Data Steward/System Manager organization

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Smart City Data as an Important Public Resource

Kurtis McBride, CEO and Co-Founder



Kurtis McBride

CEO, Co-Founder

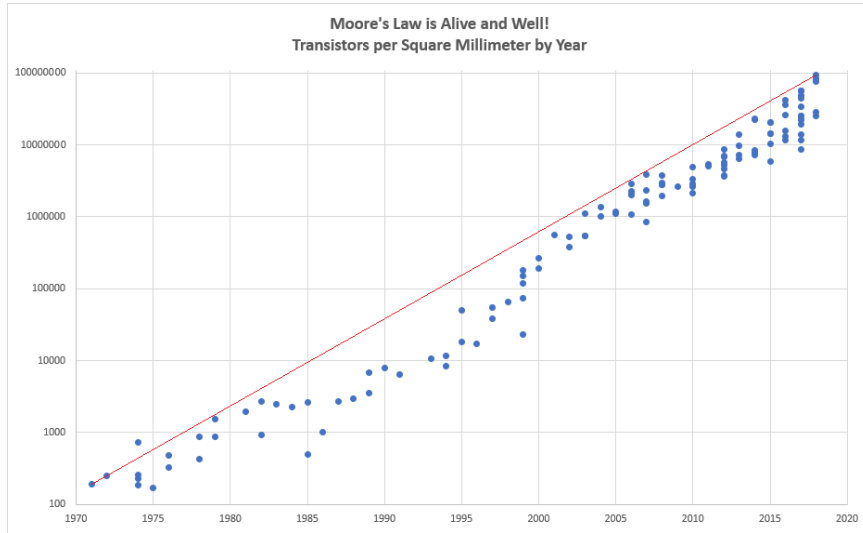
Miovision Technologies Inc.

@kurtismcbride

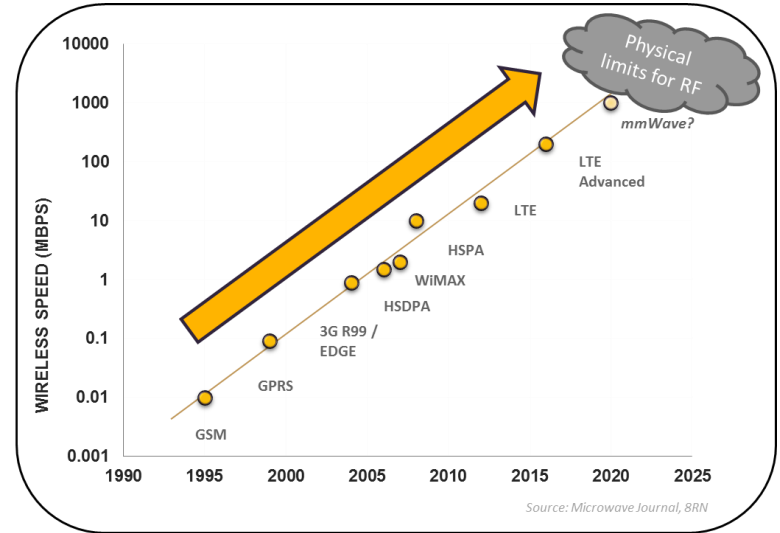
Exponential Price Performance of Processors and Networks

This is not slowing down...

Price Performance of Sensors



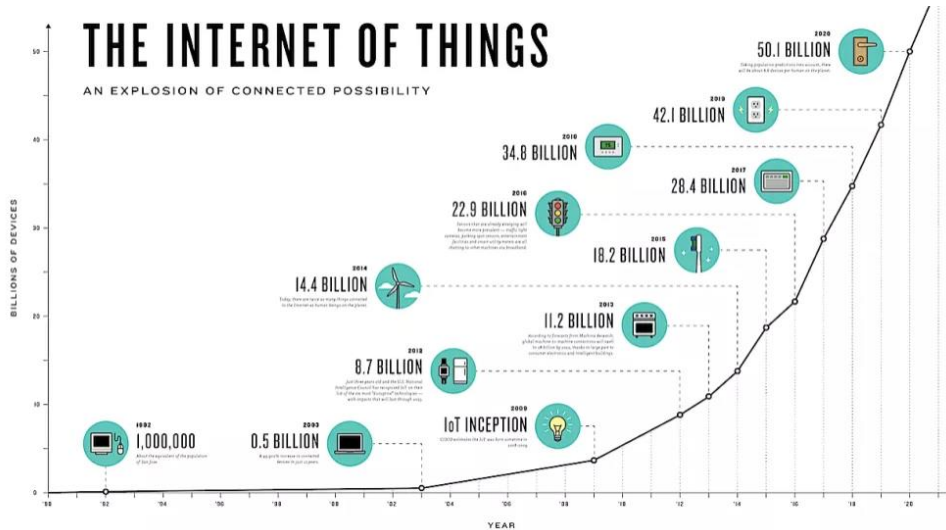
Price Performance of Networks



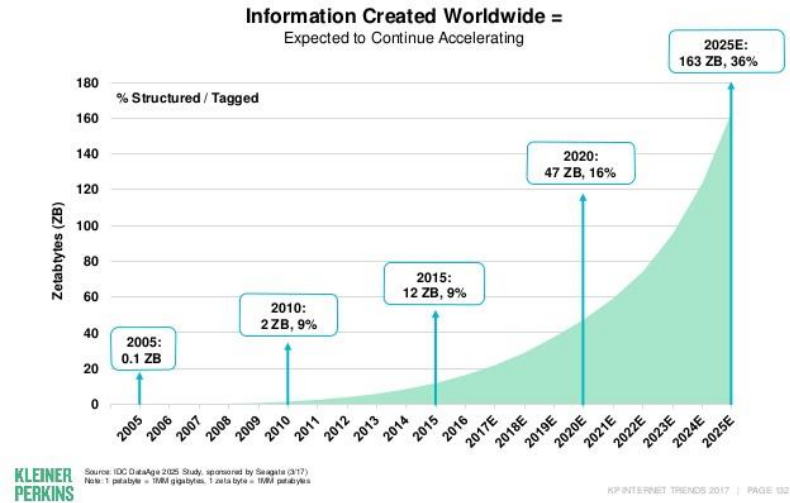
Exponential Growth of Sensor Networks & Structured Data

This is accelerating...

Explosion of Connected Sensors



Explosion of Structured Data

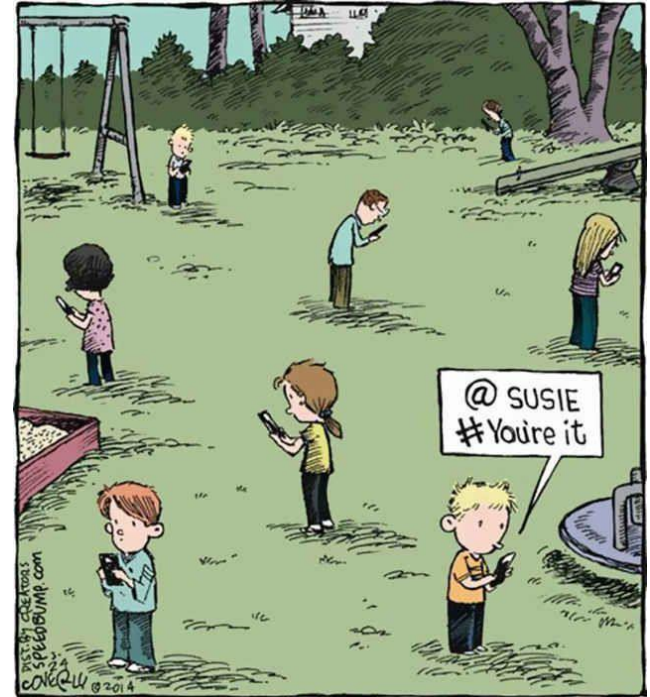


1 ZetaByte = 1 Billion Hours of Netflix!

Exponential Evolution of Public Policy

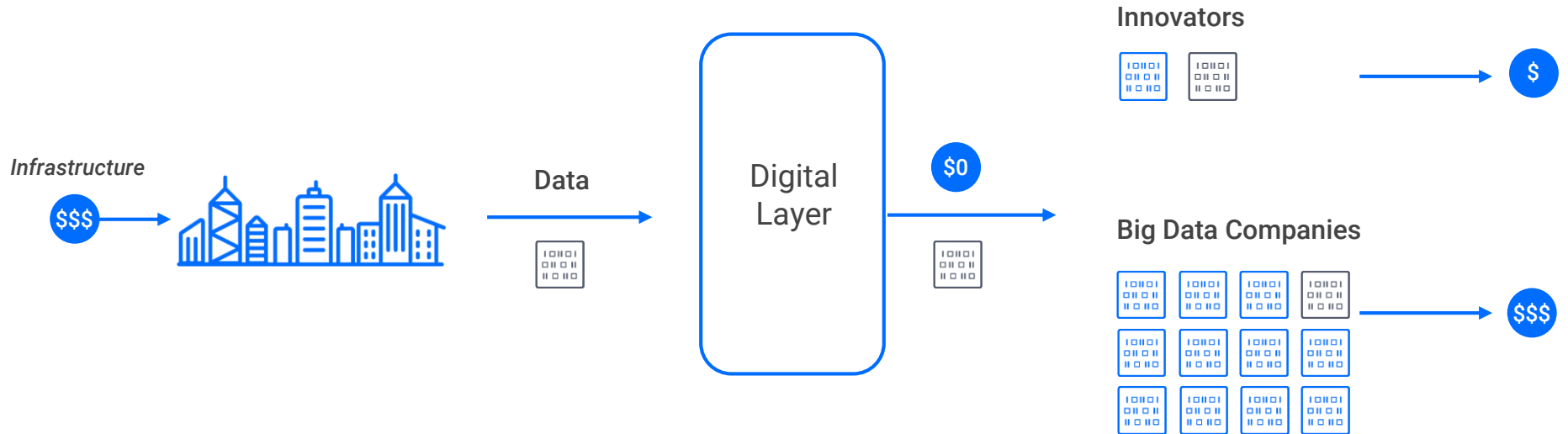
This is not keeping up...

- **Democracy vs. Technology**
 - Policy: 4 year cycles
 - Architecture: 20+ year cycles
- **Privacy vs. Public Benefit**
 - Whatever you measure improves, we have never been able to measure.
- **Open Data vs. Value of Data**
 - Information asymmetry create value from data paid for by taxpayers



Open Data - Freedom Isn't Free

Free money from taxpayers to private companies - thanks!



Tax dollars fund the building and maintenance of infrastructure. This infrastructure can generate valuable data.

Data is normalized and free access to it is granted through a Open Data Policies.

Private Companies access this data. Companies with the most data can combine this data with existing large dataset and realizes the most benefit from data generated from city infrastructure.

Architecture Concept for the Internet of Cities

Let's get this right, so we don't get it wrong.

Data Exchange Layer

- Open Source Protocols
- Data Standards Based
- Federated Governance
- Integrated Digital Identity
- Appropriate Use Licenses
- Built-in Economic Incentive

Application Domain Layer

- Enterprise Software
- Data Accessible via Open APIs
- Relationships via SLAs
- Customer / User Driven

Network Communications Layer

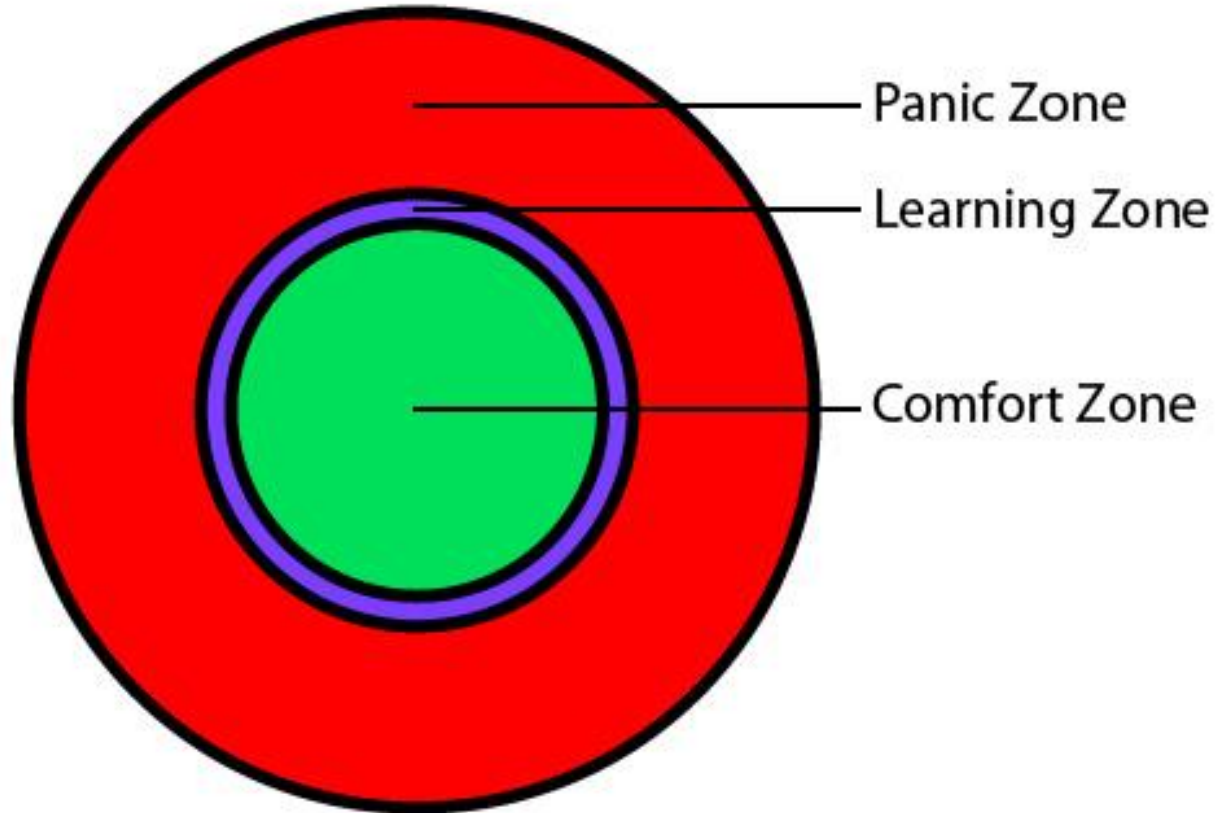
- Public Wireless Networks (4G/5G)
- Private Wireless Networks (Wifi)
- Private Wired Networks (Ethernet, Fibre)

Sensor Layer

- Legal/Regulatory Compliant Measurement of Mobility, Energy, Public Safety, Quality of Life and Environmental Based Factors

It's Time to Improve the Public Discourse

Highly scientific chart follows...



Open City Network

Insert shameless plug...



Andy Best

Executive Director, Open City Network

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The World of Open Data

Bryan Smith, ThinkData Works Inc.

Data Management at Scale

Deploying a mechanism to distribute data safely

Civic Lab #3: March 26, 2019

ThinkData Works at a Glance

From our roots in the Open Data community to developing a data management platform, ThinkData is an end-to-end bridge between data providers and data users

Public Data

+3000 Government Open Data Portals streaming into the platform, where all data sets are refreshed daily to monitor updates, changes to the data structure.

Data Providers

Extensive data partnerships with SME-to-Enterprise companies, enabling their secure data distribution through the Data Marketplace.

Secure Environment

- Source-agnostic infrastructure manages the flow of all data
- Data is monitored as it flows into the environment, granting instant insight into the quality and change of the data over time
- Data transformation engine that enables on-the-fly restructuring and aggregation of data sets
- Granular permission controls and access requirements

Integration

Access and export via a common API, integrate with analytics and BI tools.

CORE FOCUS

In order to realize and maximize the value of data, citizens, governments, and businesses have to find ways to leverage more data, more effectively.

Key Problem Areas

- "Data Ops" is virtually nonexistent
- 80% of a data scientist's time is spent sourcing, connecting to, and cleansing data
- The value of External Data is ignored
- AI and ML deployment relies on a huge corpus of clean, well-structured data
- Insight-driven businesses are being held back by the janitorial process of using new data sources

What Does the Civic Data Trust Actually Look Like?

What is a good mechanism for the use of our public data? The policies decided upon by the Civic Data Trust will be implemented through technological infrastructure that supports and manages the secure distribution of the data maintained by the Trust.

Data from many sources will flow into an independent organization that enables stakeholders to access and distribute the data for agreed-upon uses.

Mandates such as **Open by Default** will be implemented through the use of this mechanism, providing a **central data commons** where data generated by the Trust can be made available to the public.

Data collection and use will be made transparent through this mechanism, providing a single-pane insight into what data is being used, and how.

REQUIREMENTS

The Trust will set the rules around data use, make it open and accessible to people while offering privacy protection and ensure that Sidewalk Labs does not receive any special status or rights when it comes to data access.

The Data Commons will

- Bring together legal frameworks and democratic policy under the umbrella of a technological mechanism
- Manage and provide universal access to the Trust's non-personal open data
- Provide granular control of the Trust's proprietary, third-party data
- Enable data distribution, use, and reuse among stakeholders of the Trust

Namara: A Homegrown Data Commons

Toronto's platform to manage Toronto's Data

Managing access to urban data is possible through ThinkData Works' Namara Platform

01

Independent

Toronto-based ThinkData Works built Namara, an open data management platform, to standardize government data and provide a single-pane insight into the data being released at every level of government.

Partnered with the Vector Institute, Communitech, MaRS, and Canada's Treasury Board Secretariat, ThinkData Works is positioned at the heart of the Canadian Tech ecosystem.

02

Public-Facing

Government Data from +3000 open data portals is publicly available on Namara.

Partner Data from local businesses and international corporations is provided through the platform and made available according to the usage requirements set out by the organization that provides it.

Civic Data collected by the Data Trust can be shared through the Namara platform, enabling collaboration while maintaining control.

03

Open by Design

Namara is publicly accessible and allows unlimited access to open data. Users can share, integrate, and collaborate on data projects directly from the platform.

For sensitive public data, Namara provides row and column level permissions, providing security and stewardship where it is needed most.

04

Optimized

A Data Commons must be able to standardize and translate data from a variety of formats into well-structured, human- and machine-readable data sets. Namara is trained on +250,000 public data sets to recognize, standardize and reformat data automatically.

Namara is **GDPR compliant**, and provides an infrastructure that will let the Civic Data Trust collectively manage and facilitate the stewardship of sensitive public data.

05

Integration-Ready

Data that is **Open by Default** will be made publicly available through the Namara Marketplace, where organization and individuals can connect to it through the commons, API, or query service.

Namara integrates with many analytics and BI solutions, letting members of the Civic Data Trust not only plug into the Open Data created and maintained by the Trust, but analyze, visualize, and help it reach a wider audience.

06

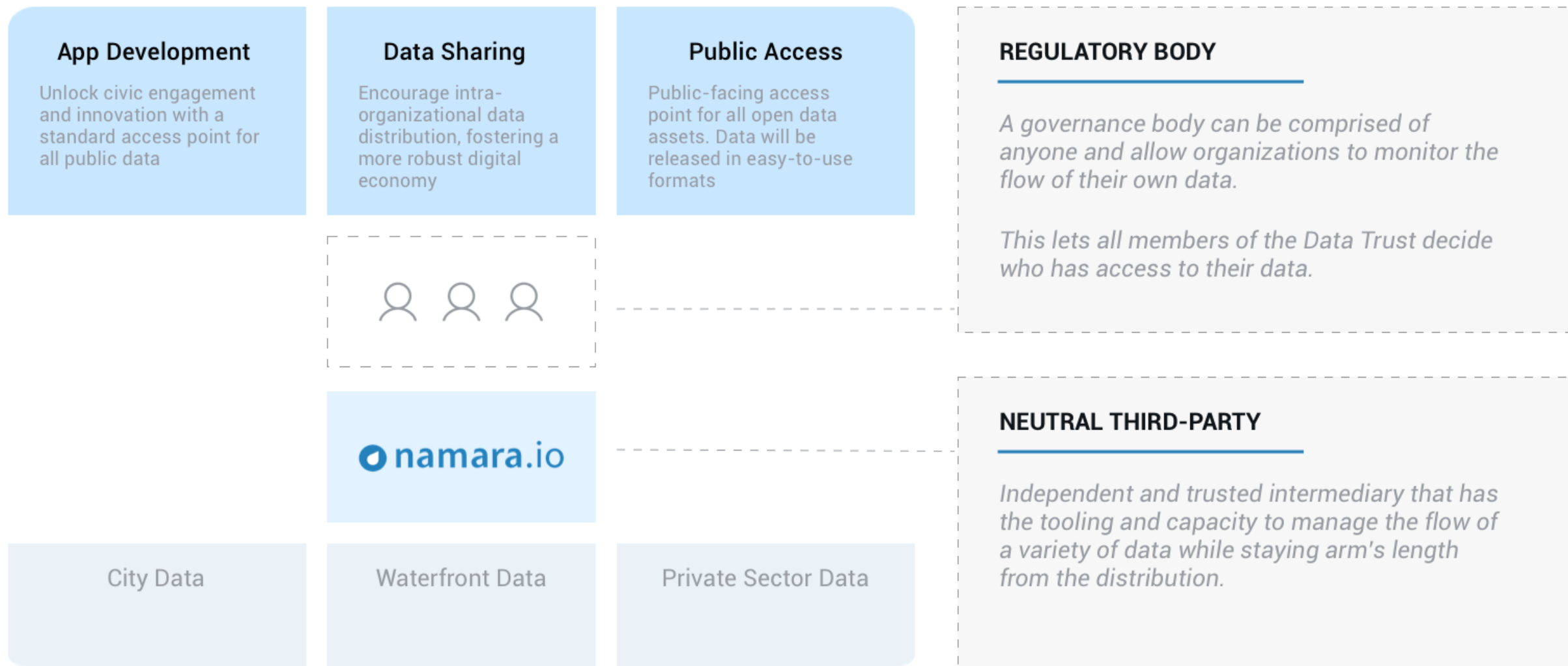
Monitored

Namara runs real-time analysis on data that is flowing through the platform, so changes in quality and quantity are tracked and reported.

Namara's **Dataspec** service scans data sources for changes, revisions, and anomalies, providing critical insight into both publicly available and potentially sensitive data.

A Secure Distribution Mechanism

Ensuring open data remains open, IP is protected, and no one receives special status or rights when it comes to data access



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Best Practices from Around the World

Michael Geist, Canada Research Chair in Internet and E-Commerce Law,
University of Ottawa & Chair, Waterfront Toronto's Digital Strategy
Advisory Panel

Realizing the Value of Data

Professor Michael Geist

Canada Research Chair in Internet and E-commerce Law

University of Ottawa, Faculty of Law

Centre for Law, Technology and Society

Chair, Waterfront Toronto DSAP

Limited examples
IP – Data connection
Measuring value

How to measure value?

India: city development

Japan: private company growth/standards

Brazil: low cost housing

UAE: environment

Many cities: innovation/quality of life

Canadian business

Economic growth

Public benefit

Developing global standards

Community branding

Transit Data

- Passengers
- Community
- Environment
- Local and Global Businesses
- Transit services
- Service providers

Transit Data

- Portland – develop standards with Google that become widely used
- San Francisco – battle over real-time data
- Stakeholders
 - Passengers
 - App developers
 - City taxpayers
 - Device manufacturers
 - Local and global businesses

Transit Data

- Revenue Generation – sell access to high end data
- Revenue Savings – “outsource” new development to the community
- Interoperability – terms that mandate openness
- Real time data – limit ability to challenge app developers
- Patents – use data as a shield against patent claims

How do you extract value?

~~How do you extract value?~~

What do you value?

@mgeist

Break



WATERFRONToronto

Discussion

Discussion on the Value of Data



- What are the key questions that the presentations generated for you?
- What additional information would be helpful to assessing any proposal related to realizing the value of data in Quayside?
- Do you have any other feedback or advice for Waterfront Toronto to consider?

Expert Reflections

Closing Remarks

**Kristina Verner, Vice President, Innovation, Sustainability & Prosperity
Waterfront Toronto**

Thank you.

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