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Open Smart Cities in Canada: Webinar 2

Presented by: Jean-Noe Landry (Open North) & Dr Tracey P. Lauriault (Carleton University) & Rachel Bloom (Open North)

Content Contributors: David Fewer CIPPIC, Mark Fox U. of Toronto, Stephen Letts (RA Carleton U.)

Project Name: Open Smart Cities in Canada

Date: December 14, 2017 at 1 PM

Project Funder: Natural Resources Canada GeoConnections

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Welcome

Introductory remarks

- Jean-Noe Landry, Executive Director, Open North

Webinar 2 includes:

1. Summary of Webinar 1: E-Scan and Assessment of Smart Cities in Canada (listen at: http://bit.ly/2yp7H8k)
2. Situating smart cities amongst current digital practices
3. Towards guiding principles for Open Smart Cities
4. Examples of international best practices from international cities
5. Observations & Next Steps

Webinar Presenters:

6. Rachel Bloom, Open North
7. Dr Tracey P. Lauriault, School of Journalism and Communication, Carleton University

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Open North

- Founded in 2011, OpenNorth is Canada's leading not-for-profit organization specialized in open data and civic technology.
- **Focus:** inclusive, innovative, and dynamic open data ecosystems
- **Expertise:**
  - open smart and resilient cities
  - data standards and life cycle management
  - open data policy, licenses, and governance
  - data user needs identification and stakeholder engagement
  - strategy and planning
- **Approach:** global/local, multi-stakeholder, inter-jurisdictional, capacity building, maturity modeling, applied research
- **Networks:** Open Data Charter, Open Government Partnership, International Open Data Conference, Global Initiative on Fiscal Transparency, Open Contracting Partnership, Canadian Multi-stakeholder Forum

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Open Smart Cities in Canada Project

Funded by: GeoConnections

Lead by: Open North

Project core team:

- Rachel Bloom & Jean-Noe Landry, Open North
- Dr Tracey P. Lauriault, Carleton University
- David Fewer, Canadian Internet Policy and Public Interest Clinic (CIPPIC)
- Dr Mark Fox, University of Toronto
- Research Assistants Carleton University
  - Carly Livingstone
  - Stephen Letts

Project collaborators:

- Expert Smart City representatives from the Cities of:
  1. Edmonton
  2. Guelph
  3. Montréal
  4. Ottawa
- Collaborators include experts from the provinces of:
  1. Ontario
  2. British Columbia

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1. Summary Webinar 1

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Webinar 1

E-Scan & Assessment of Smart Cities in Canada

- E-scan identified
  - smart city makers
  - smart city components
- Assessment of smart city strategies:
  - Cities of Edmonton, Guelph, Montreal, and Ottawa
    - governance structures
    - practices relate to open data
    - geospatial data
    - Procurement
- Conclusion

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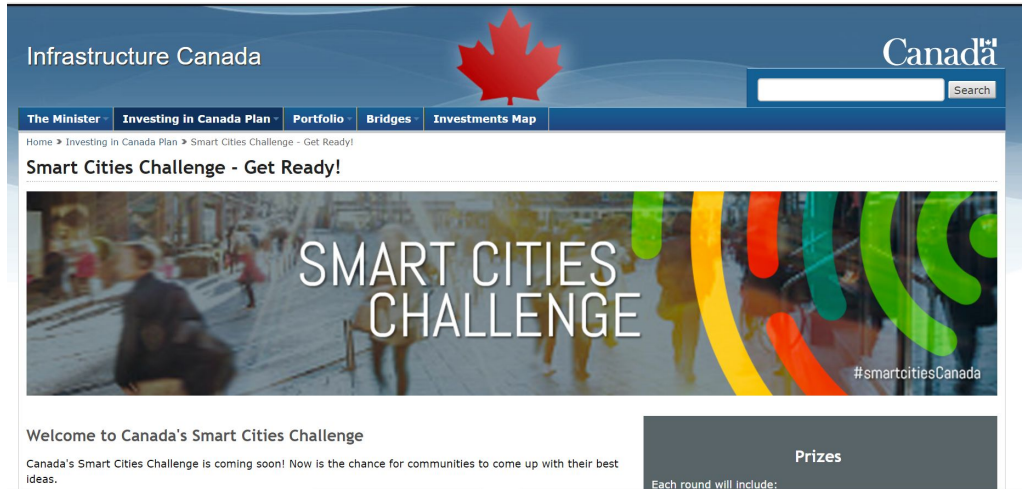
Smart City Challenge



- Launched November 2017
- Municipalities, regional governments, & Indigenous communities
- Community not-for-profit, private sector company, or expert
- $300 million Smart Cities Challenge in 2017 Budget

What is a smart cities approach?

A smart cities approach aims to achieve meaningful outcomes for residents by leveraging the fundamental benefits that data and connected technology have to offer:

- **Openness**
  When communities make their data truly accessible, usable and barrier-free, their decision-making processes become transparent, empowering citizens and strengthening the relationship between residents and public organizations.

Image 1: Timeline of Smart Cities Challenge Process

2. Situating Open Smart Cities

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Data & Technology

are considered as more than the unique arrangement of objective and politically neutral facts & things

&

they do not exist independently of ideas, techniques, technologies, systems, people and contexts regardless of them being presented in that way.

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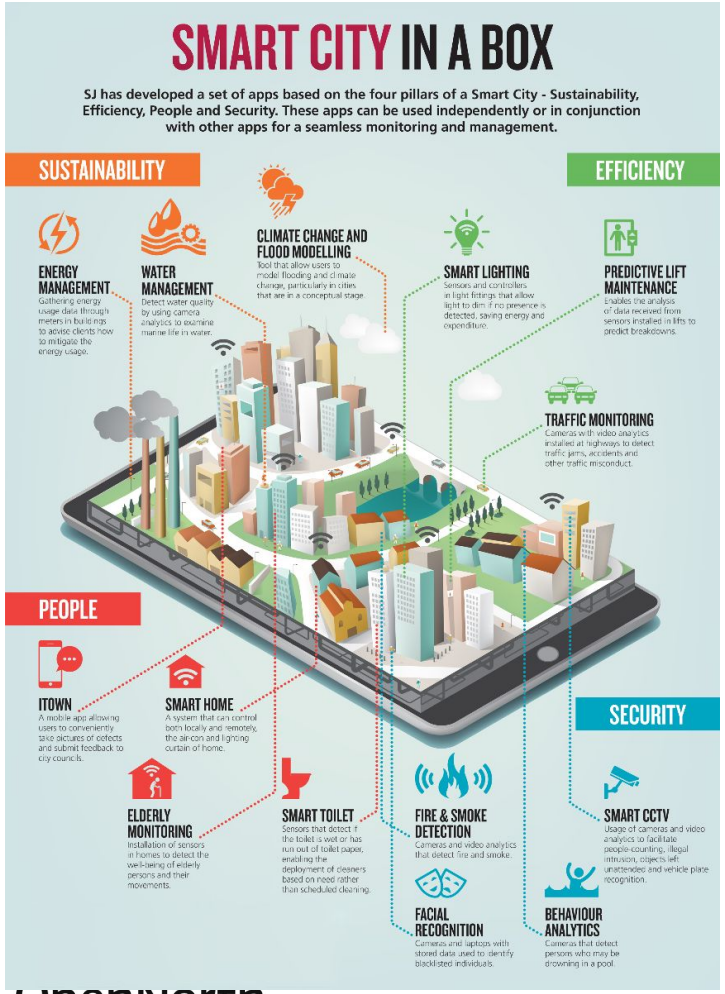
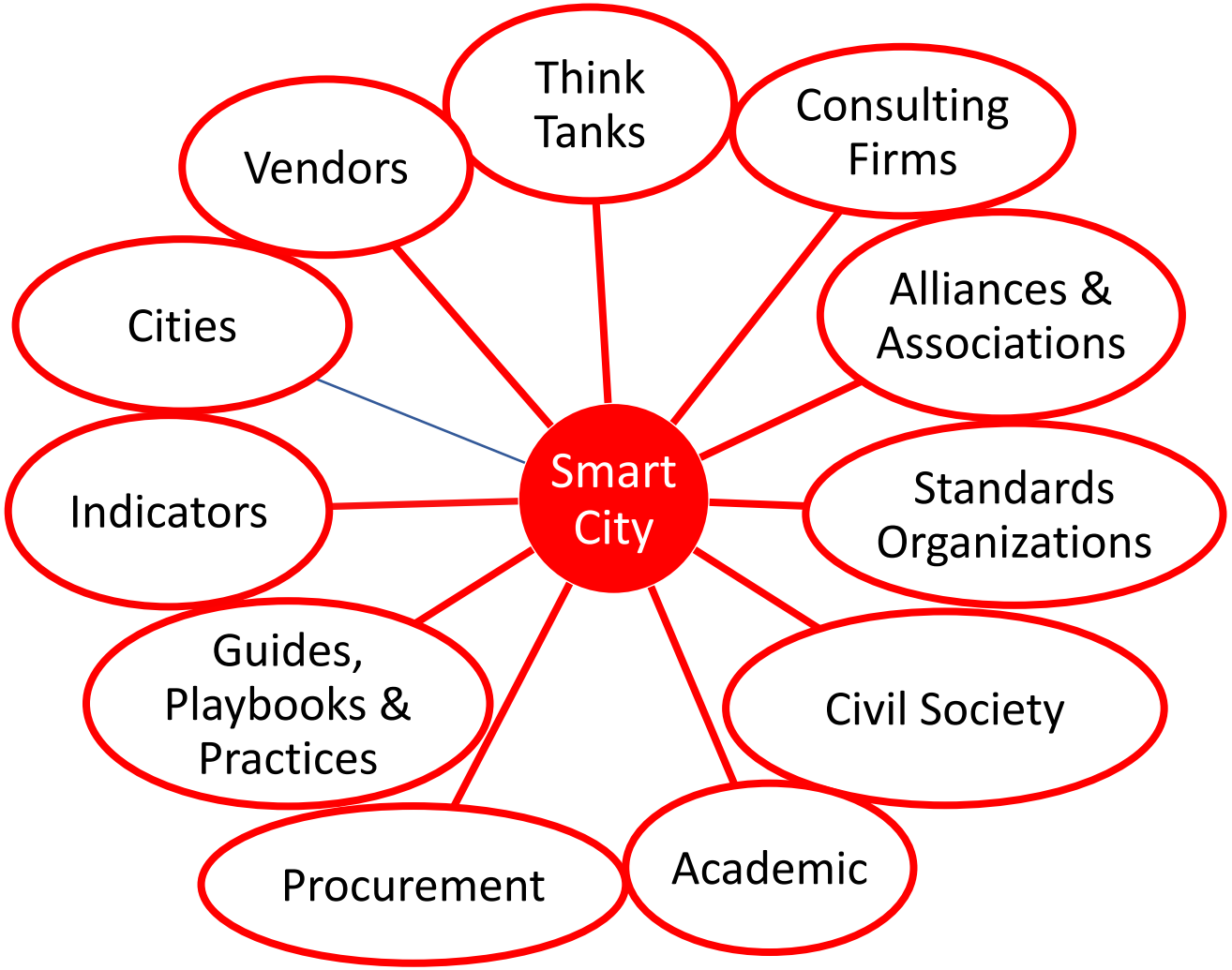
Smart City





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Smart City Components

- Smart Infrastructure
- Smart Buildings
- Smart Mobility
- Smart Technology
- Smart Energy
- Smart Citizens
- Smart Governance
- Smart Education
- Smart Economy

Smart City Like Concepts:

- Safe City
- Healthy City
- Accessible City
- Resilient City
- Sharing city
- Smart city in the public interest
- Open Smart City

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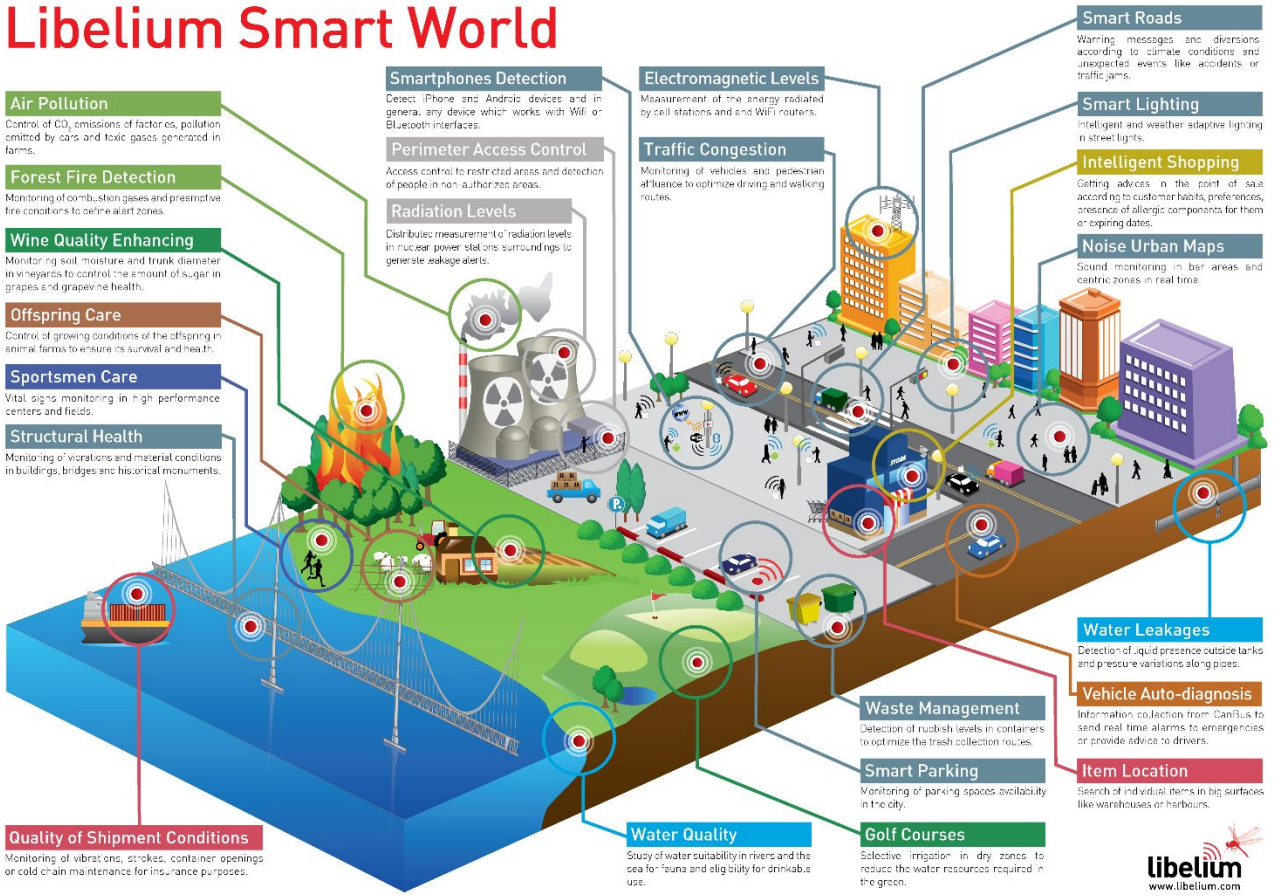
Smart City Data



- Sensor, Algorithm & AI derived
- Big
- Real-time
- System wide & component focused
- Centrally stored and cloud-based
- In platforms with device lock-ins
- Proprietary
- Tied to operations
- Applied to operational decision making and maybe planning

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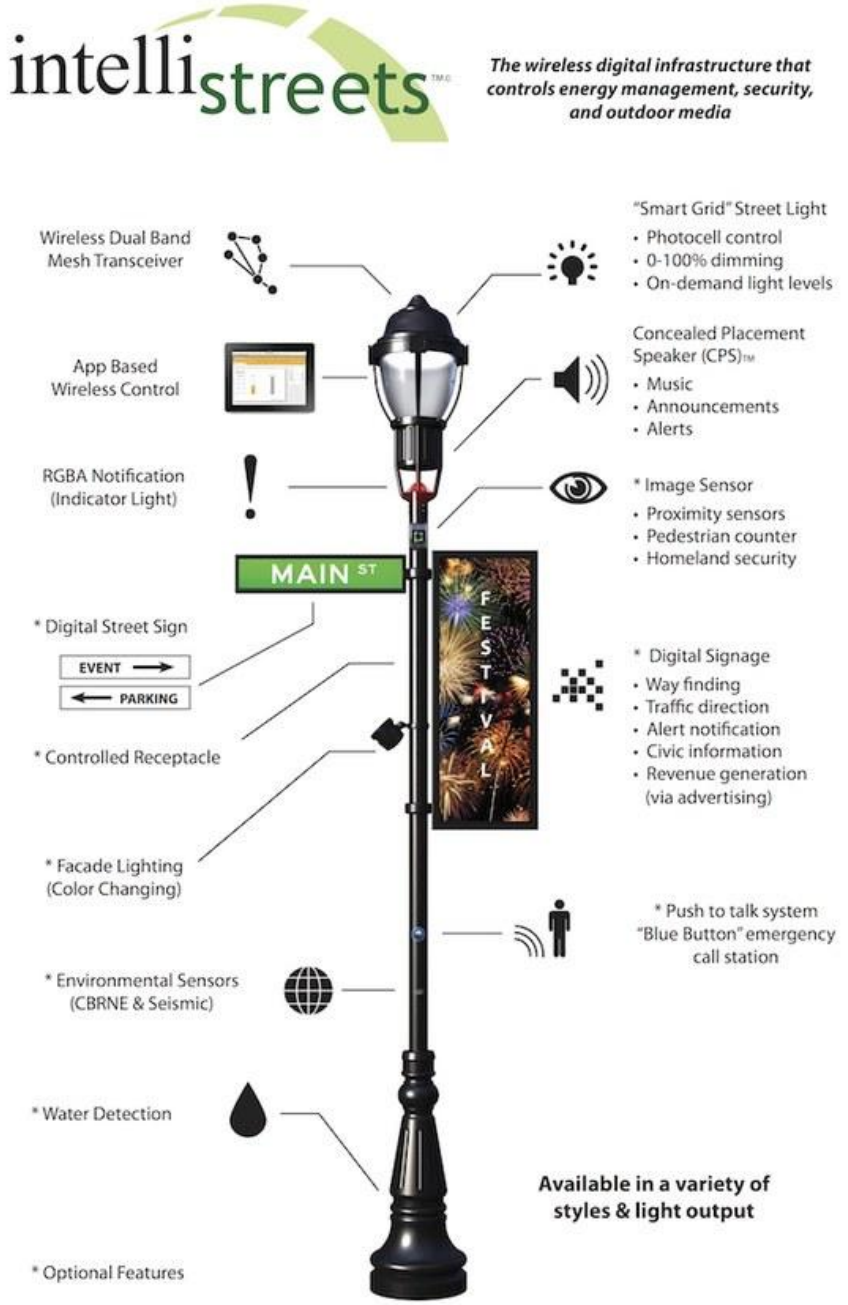
Internet of Things

- Security & privacy vulnerabilities (hacking)
- E-waste – cost, short shelf life
- Mission creep - potential
- Surveillance / dataveillance potential
- Ownership / procurement
- Repair – DRM
- Device lock in
- Archiving - the lack thereof
- Reuse – unintended purposes
- Sustainability & maintenance & management
- Interoperability – the lack therefor
- Standards – emerging



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Current Digital Practices

- Smart city strategies are being created as stand alone institutions
- It is suggested that open smart cities should be aligned and integrated with a number of other open & digital practices
- We will discuss smart cities in the context of the following practices
  - Digital Strategies
  - Open Government
  - Open Data
  - Open Science
  - Open Platforms
  - IoT/Smart Cities/Precision Agriculture

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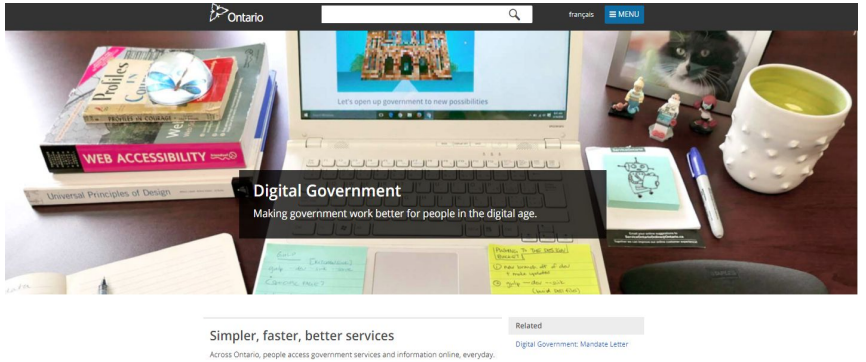
Digital Strategies

- Delivering faster, better and ‘consistently good’ *(ON)*
  - government services online to citizens (E-Government)
  - web bases government enterprise services for public servants/administrators
- Providing greater and easier access to government information and resources on the multiple devices and platforms *(Fed.)*
- Enterprise-wide alignment and cost-effective use of information resources, and to promote and sustain a culture of innovation *(NB)*



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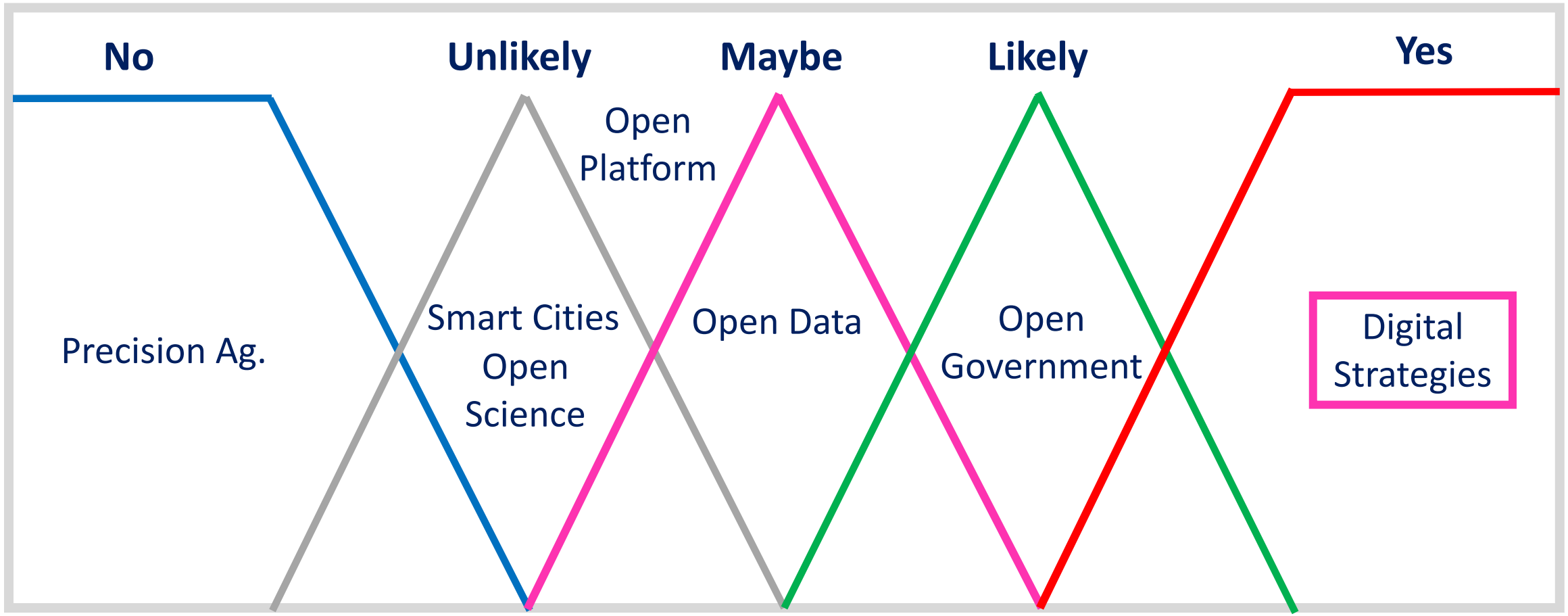
Digital Strategies



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Open Government

- “is about making government more accessible to everyone. This means giving greater access to government data and information to the …**public** and the **businesses community**”
- “is about creating a more open and transparent government for the **people** of…”
- “foster a global culture of open government that empowers and delivers for **citizens**, and advances the ideals of open and participatory 21st century government.
  - Values
    - Access
    - Openness
    - Transparency
    - Participation

- Canada is the Co-Chair of the OGP for 2018-2019
- Province of Ontario Joined OGP in 2016

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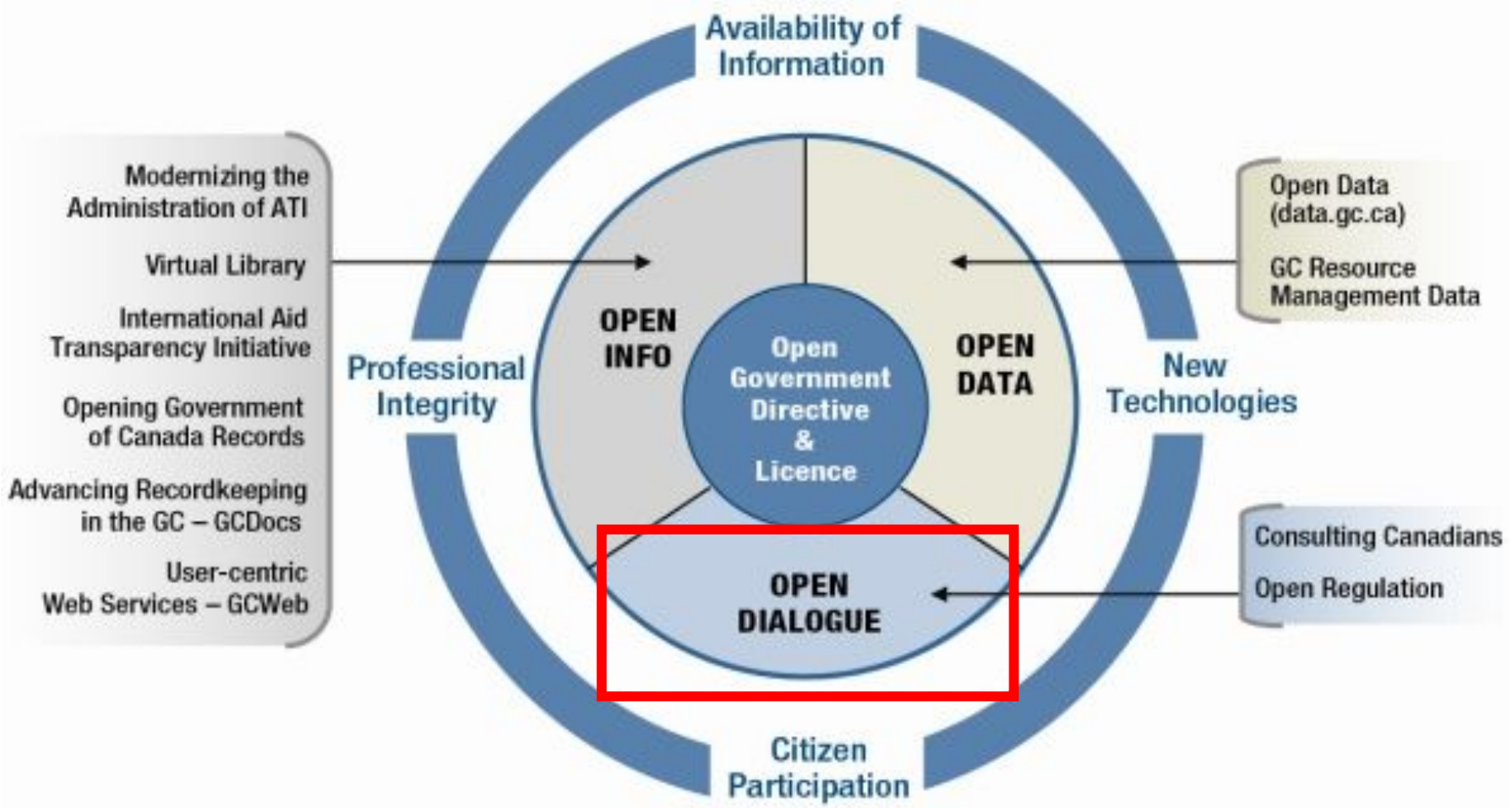
Canada's Open Government Action Plan Commitments



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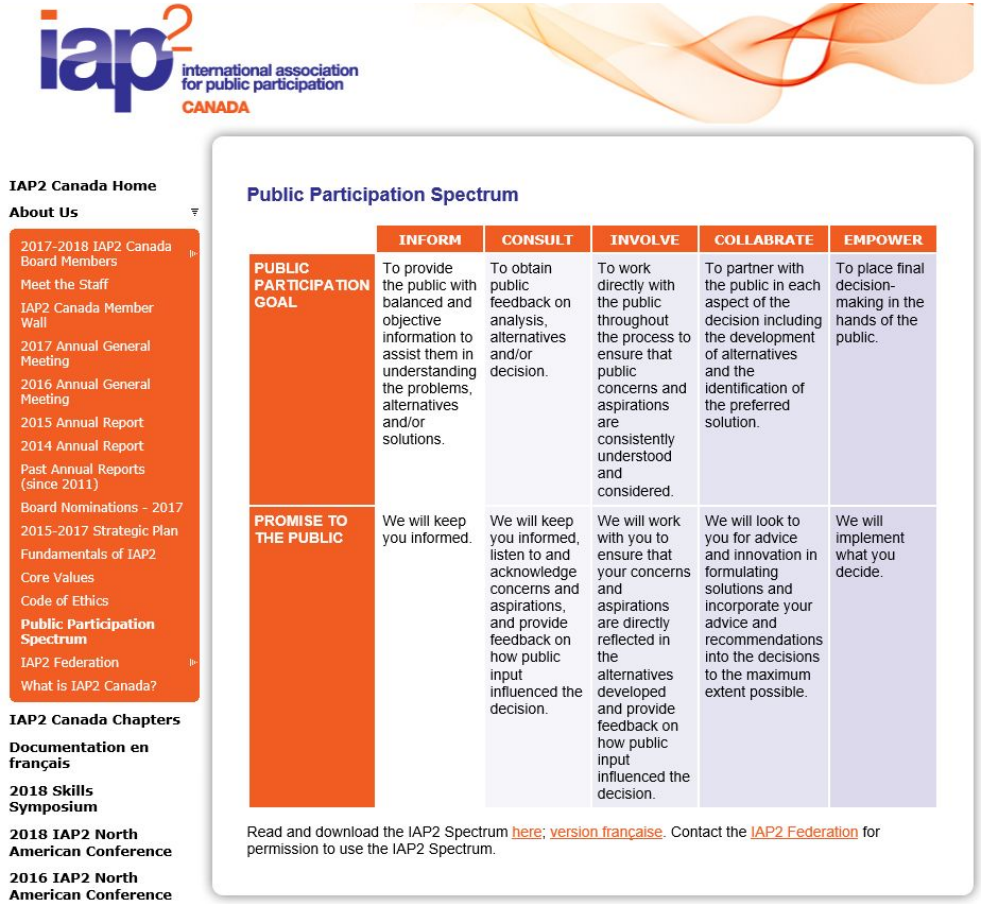
OGP Participation and Co-Creation



iap2 international association for public participation CANADA

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- 2017-2018 IAP2 Canada Board Members
- Meet the Staff
- IAP2 Canada Member Wall
- 2017 Annual General Meeting
- 2016 Annual General Meeting
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- Board Nominations - 2017
- 2015-2017 Strategic Plan
- Fundamentals of IAP2
- Core Values
- Code of Ethics
- **Public Participation Spectrum**
- IAP2 Federation
- What is IAP2 Canada?

IAP2 Canada Chapters
Documentation en français
2018 Skills Symposium
2018 IAP2 North American Conference
2016 IAP2 North American Conference

Public Participation Spectrum

	INFORM	CONSULT	INVOLVE	COLLABRATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Read and download the IAP2 Spectrum here; version française. Contact the IAP2 Federation for permission to use the IAP2 Spectrum.

Public participation Principles

1. those who are affected by a decision have a right to be involved in the decision-making process.
2. public's contribution will influence the decision.
3. recognizing and communicating the needs and interests of all participants, including decision makers.
4. involvement of those potentially affected by or interested in a decision.
5. seeks input from participants in designing how they participate.
6. provides participants with the information they need to participate in a meaningful way.
7. communicates to participants how their input affected the decision.

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Canadian Civil Society Open Government Recommendations

1. Lead by Example
2. Active and proactive participation by politicians and civil servants at all levels
3. Clarify the Message
4. Go Beyond Compliance
5. Translate open government to other policy areas
6. Reinforce the relationship with Canadian civil society organizations

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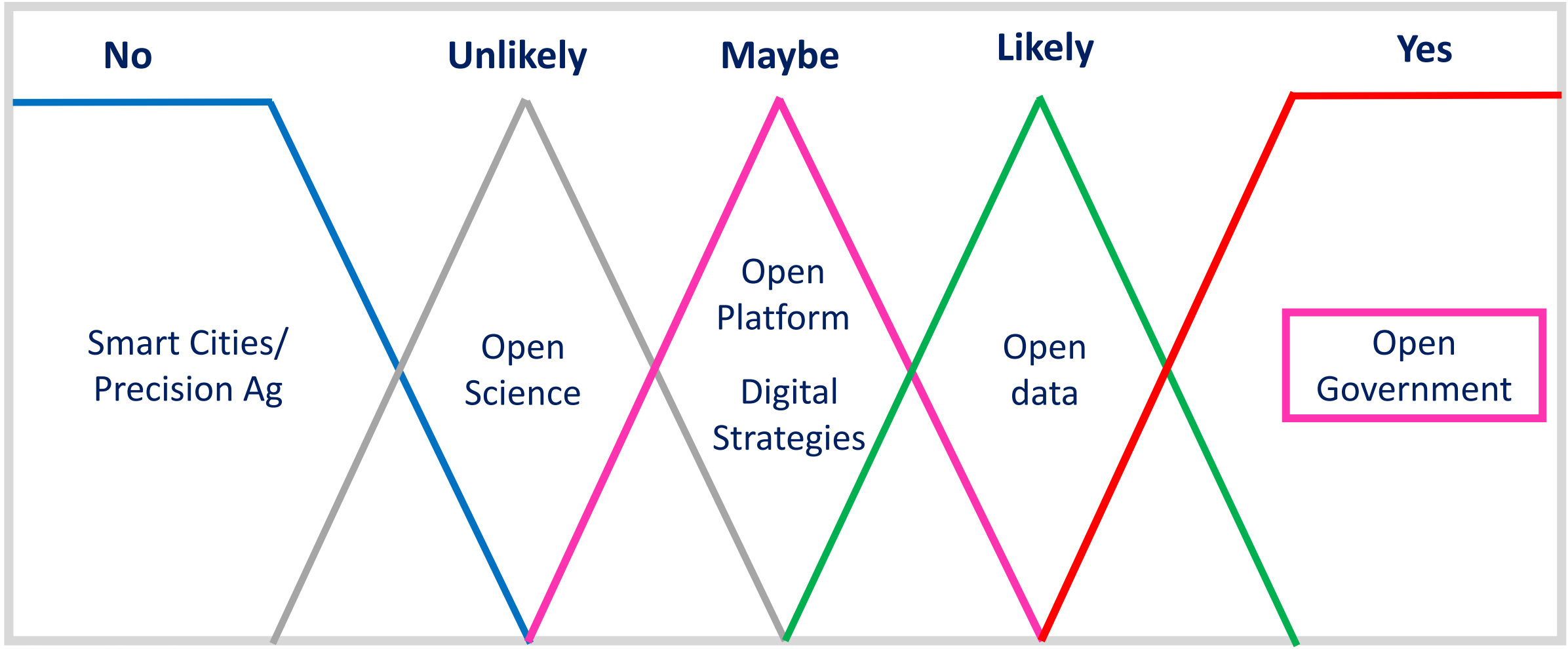
Open Government



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Open Data

Open Definition Summary:

Knowledge is open if anyone is free to access, use, modify, and share it — subject, at most, to measures that preserve provenance and openness.

This essential meaning:

matches that of “open” with respect to software as in the Open Source Definition and is synonymous with “free” or “libre” as in the Free Software Definition and Definition of Free Cultural Works.

OPEN KNOWLEDGE INTERNATIONAL

1.1 Open License or Status

1.2 Access

1.3 Machine Readability

1.4 Open Format

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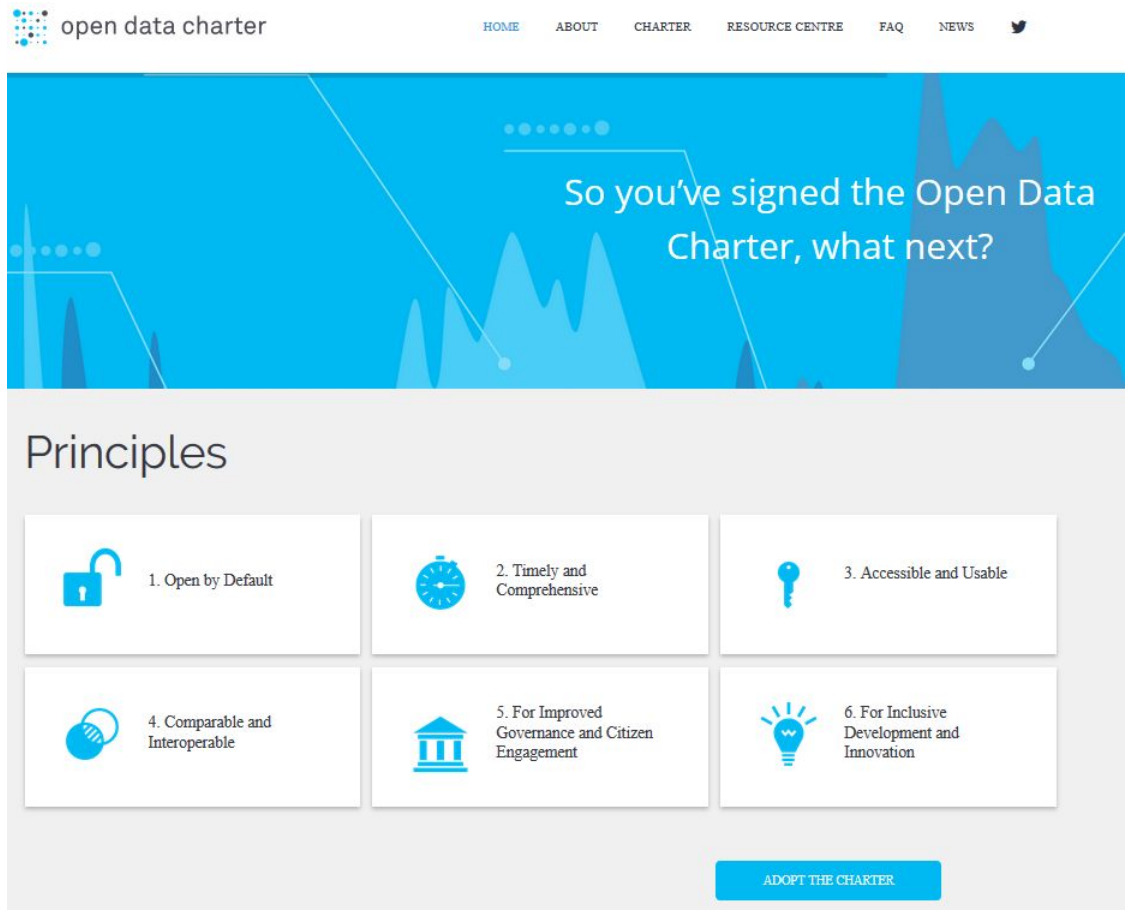
International Open Data Charter



"digital data that [are] made available with the technical and legal characteristics necessary for [them] to be freely used, reused, and redistributed by anyone, anytime, anywhere"

- Open North is one of the international stewards of the Open Data Charter
  - OpenNorth forthcoming study on Charter
- TBSC is on the Advisory Board
- Endorsed in Canada by IDRC
- Adopted by:
  - City of Edmonton
  - Government of Ontario

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Open Data Standards

- Domain-specific:
  - Transit (e.g., GTFS), Service Requests (e.g., Open311),
  - Procurement Information (e.g., Open Contracting),
  - International Aid (e.g., AITI), and others…
  - Linked Open Data (e.g., RDF, DCAT, SPARQL)
  - Open Corporates

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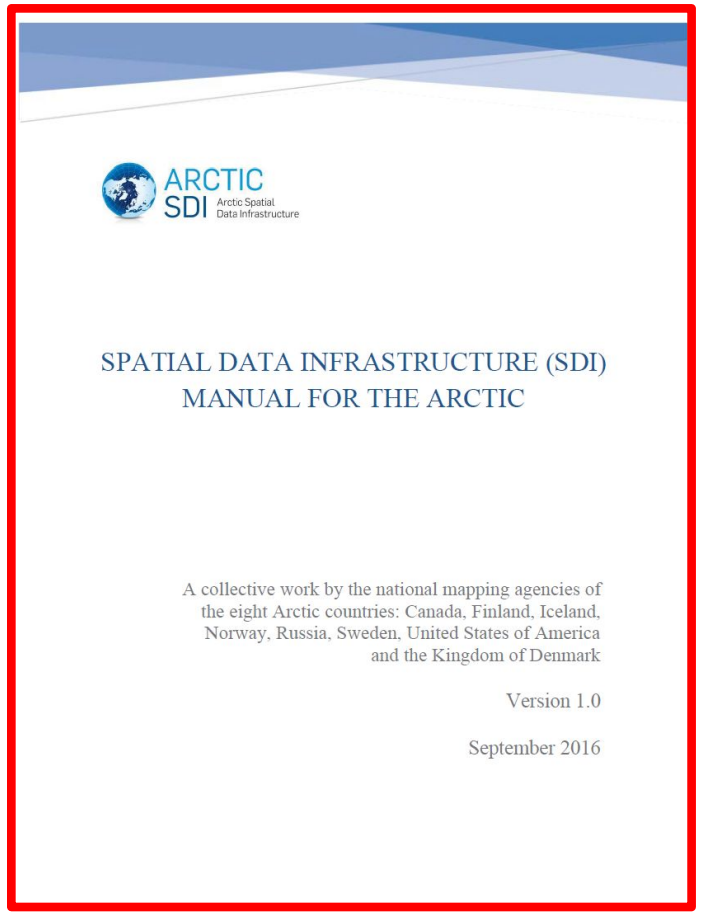
Open Standards



An **open standard** is one that

1. is created in an open, international, participatory industry process;
2. is freely distributed and openly accessible;
3. does not discriminate against persons or groups; and
4. ensures that the specification and license are technology neutral (its use must not be predicated on any proprietary technology or style of interface).

Open Specification

- A document written by a consortium, vendor or user that specifies a technological area with a well-defined scope, primarily for use by developers as a guide to implementation. A specification is not necessarily a formal standard.

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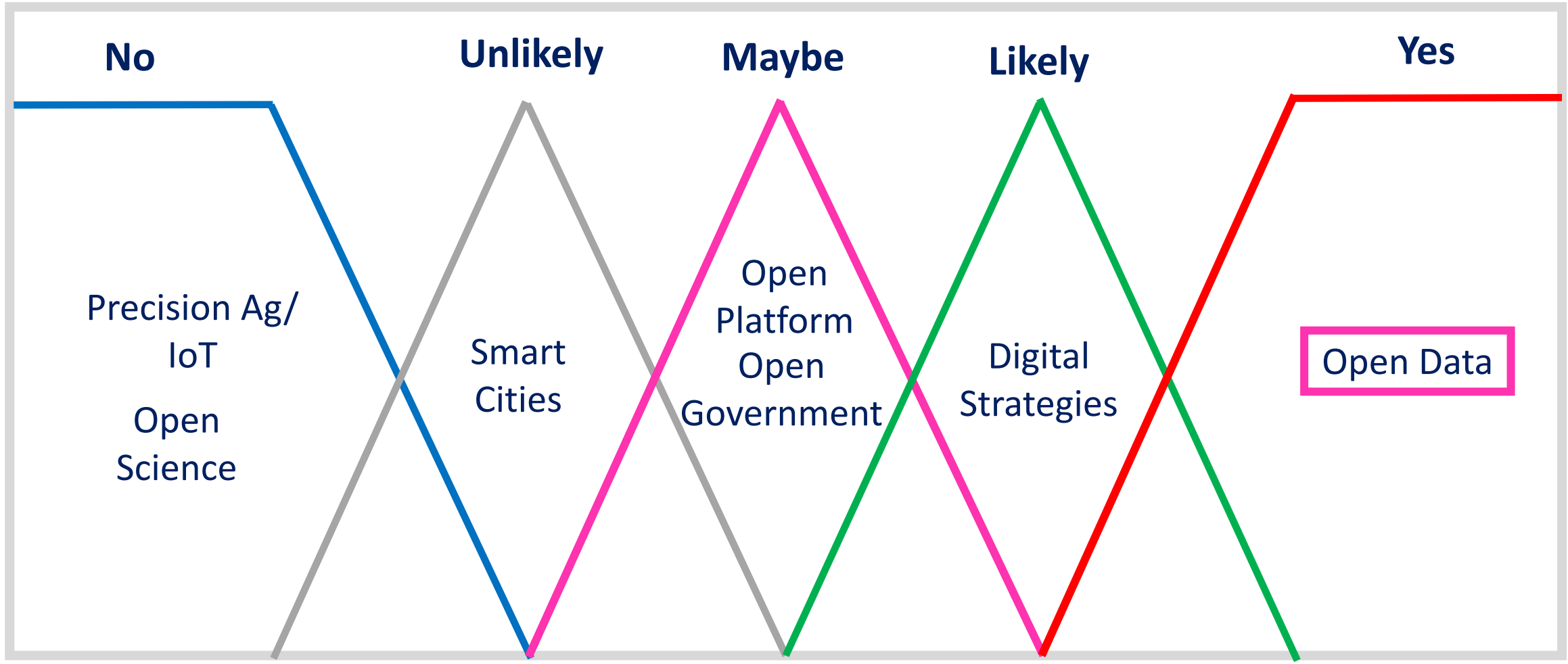

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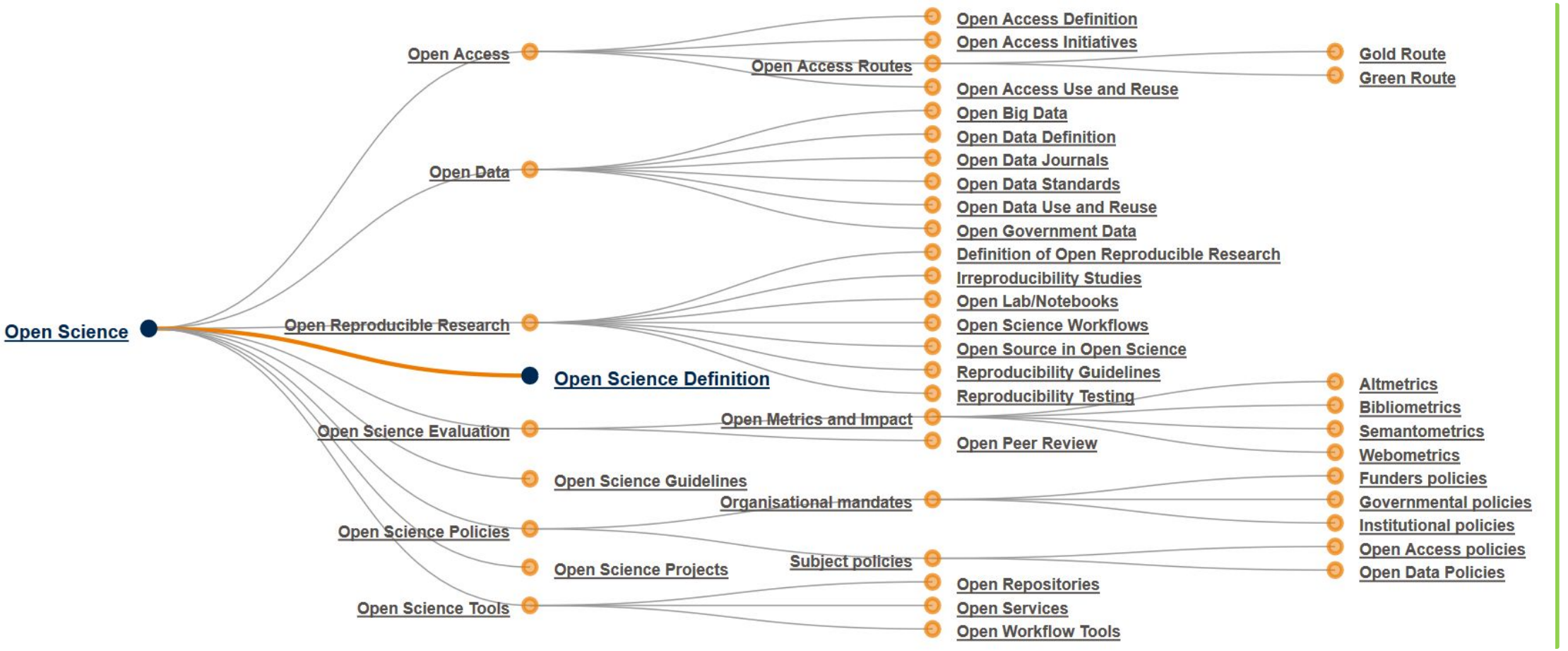

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https://www.fosteropenscience.eu

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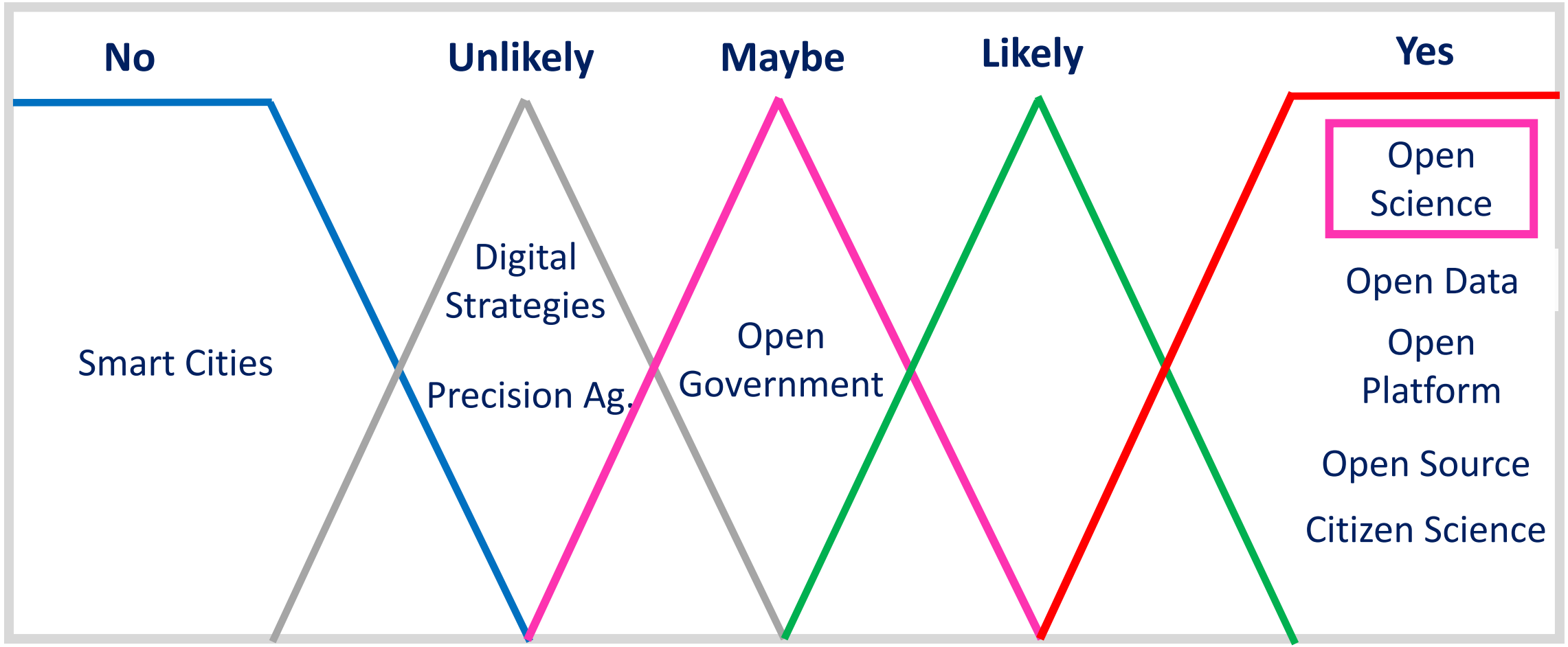
Open Science



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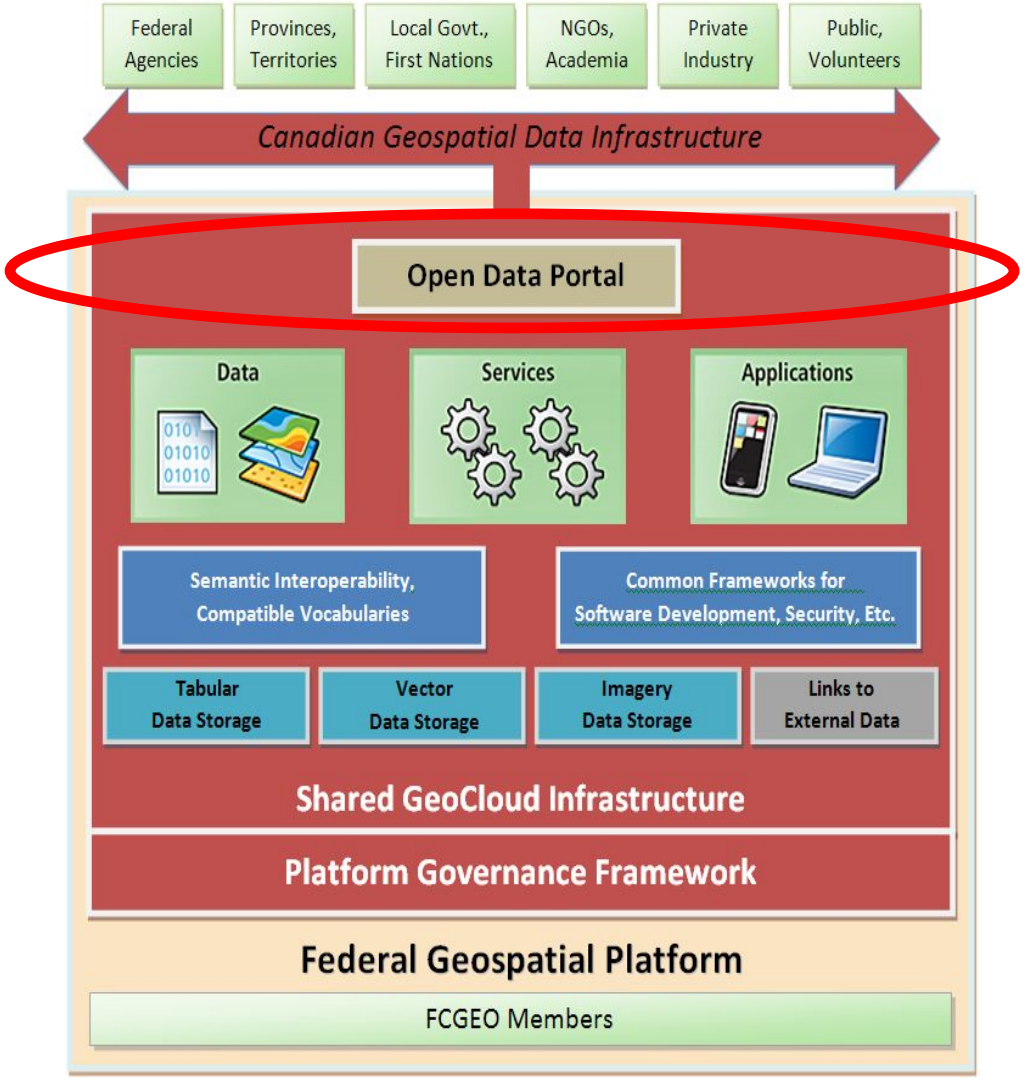
Open Platforms

Federal Geographic Data Platform

- Comprehensive collection & sharing of **authoritative data**
- **Search, discovery, access, & visualization tools** built once & reused many times, **search once and find everything**
- **Common web-based environment** enabling data integration, analysis, & visualization to support informed decision-making
- **Shared governance & management** of geospatial assets and capabilities, through **operational standards & policies**



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Canadian Geospatial Data Infrastructure Principles

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1. **Open:**

enables better decision making, the CGDI is based on open, barrier-free data sharing and standards that allow users to exchange data.

2. **Accessible:**

allows users to access data and services seamlessly, despite any complexities of the underlying technology.

3. **Evolving:**

the network of organizations participating in the CGDI will continue to address new requirements and business applications for information and service delivery to their respective users.

4. **Timely:**

the CGDI is based on technologies and services that support timely or real-time access to information.

5. **Sustainable:**

is sustained by the contributions of the participating organizations and broad user community and through the infrastructure's relevance to these groups.

6. **Self-organizing**

the CGDI enables various organizations to contribute geospatial information, services and applications, and guide the infrastructure's development.

7. **User and community driven**

emphasizes the nurturing of and service to a broad user community. These users, including Canadians in general, will drive the CGDI's development based on user requirements.

8. **Closest to source**

maximizes efficiency and quality by encouraging organizations closest to source to provide data and services. Thereby eliminating duplication and overlap.

9. **Trustworthy**

is continually enhanced to protect sensitive and proprietary data. The CGDI offers this protection through policies and mechanisms that enable data to be assessed for quality and trusted by users.

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Source: : *2012, Canadian Geospatial Data Infrastructure Vision, Mission and Roadmap - The Way Forward DOI:10.4095/292417*

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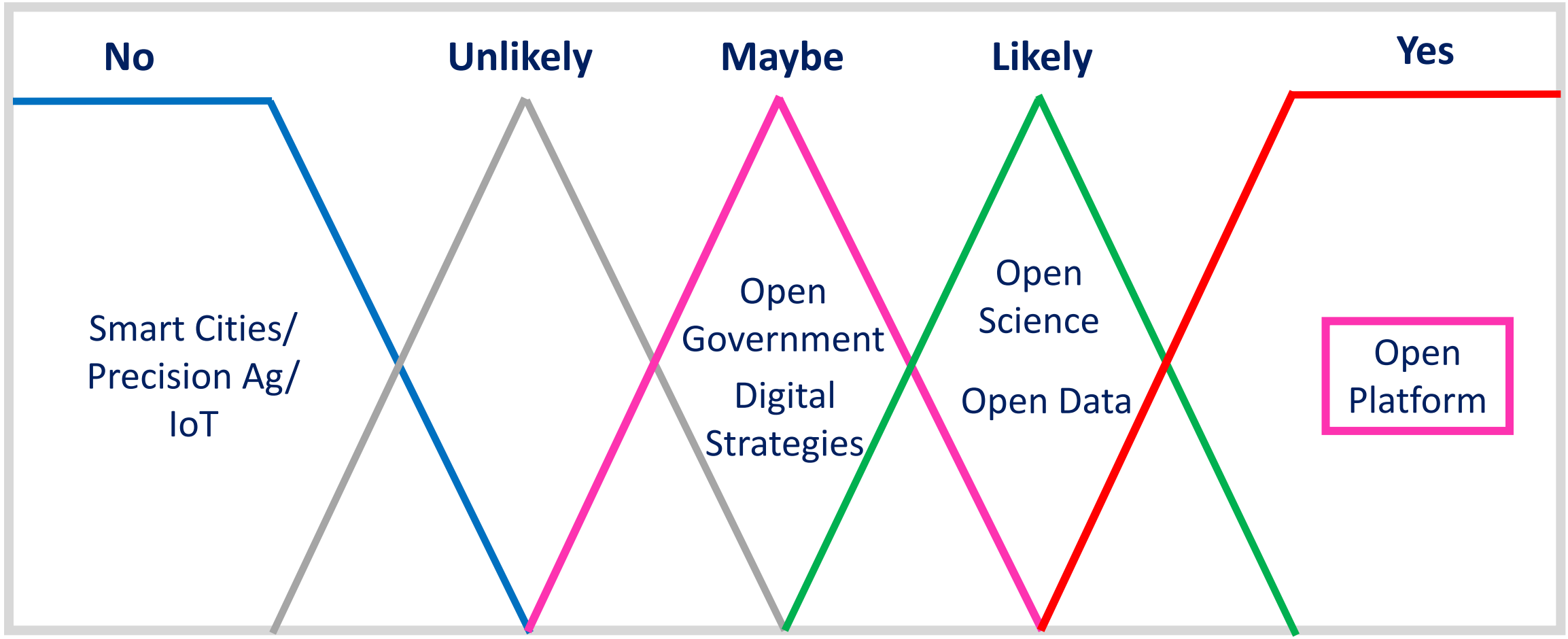
Open Platforms



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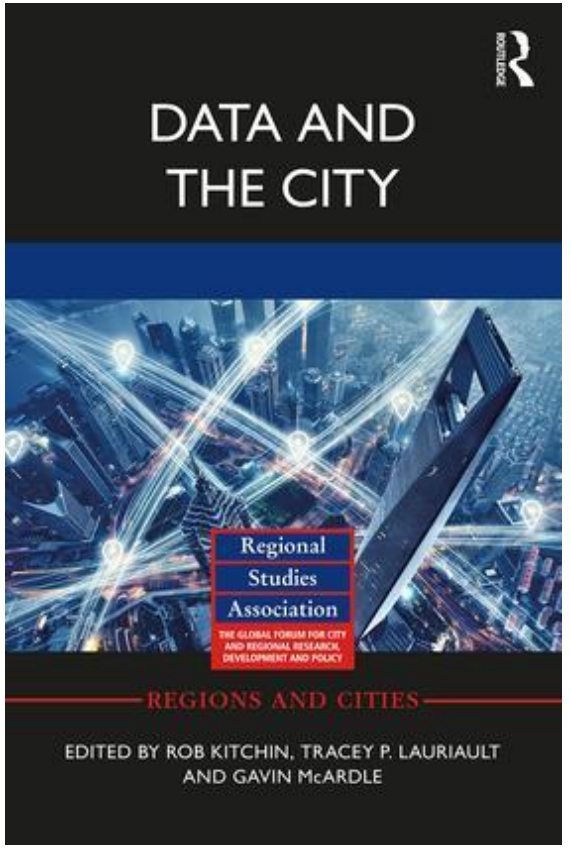
Data-Driven, Networked Urbanism

Cities that are "*instrumented and networked, their systems interlinked and integrated, and vast troves of big urban data are being generated and used to manage and control urban life in real-time" (Kitchin, 2018)*

- Smart cities
- Digital city
- Intelligent cities
- Sustainable cities
- Responsive cities
- Sentient cities
- Sharing cities
- Cities as a platform
- Innovative cities
- programmable cities
- Connected cities, and
- Hackable cities



Kitchin, Rob, (2015) Data-Driven, Networked Urbanism, http://dx.doi.org/10.2139/ssrn.2641802

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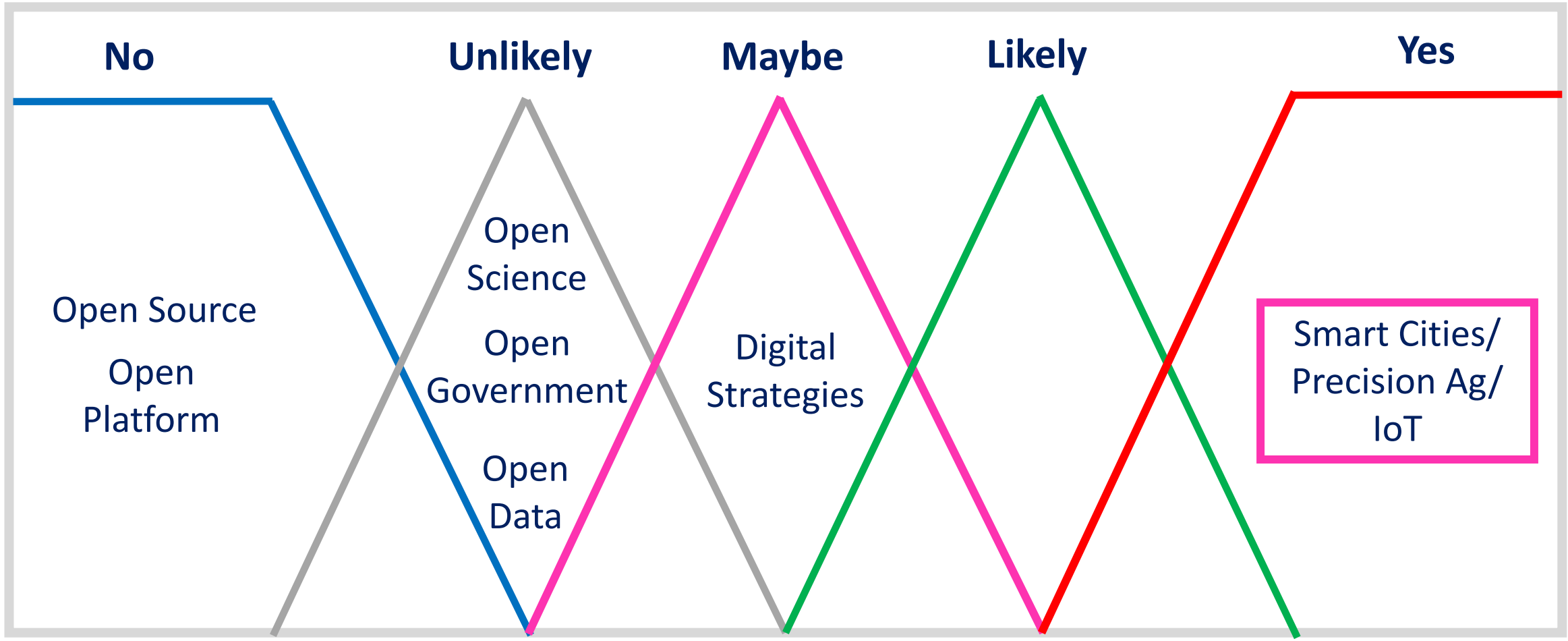
Smart Cities / Precision Ag. /IoT



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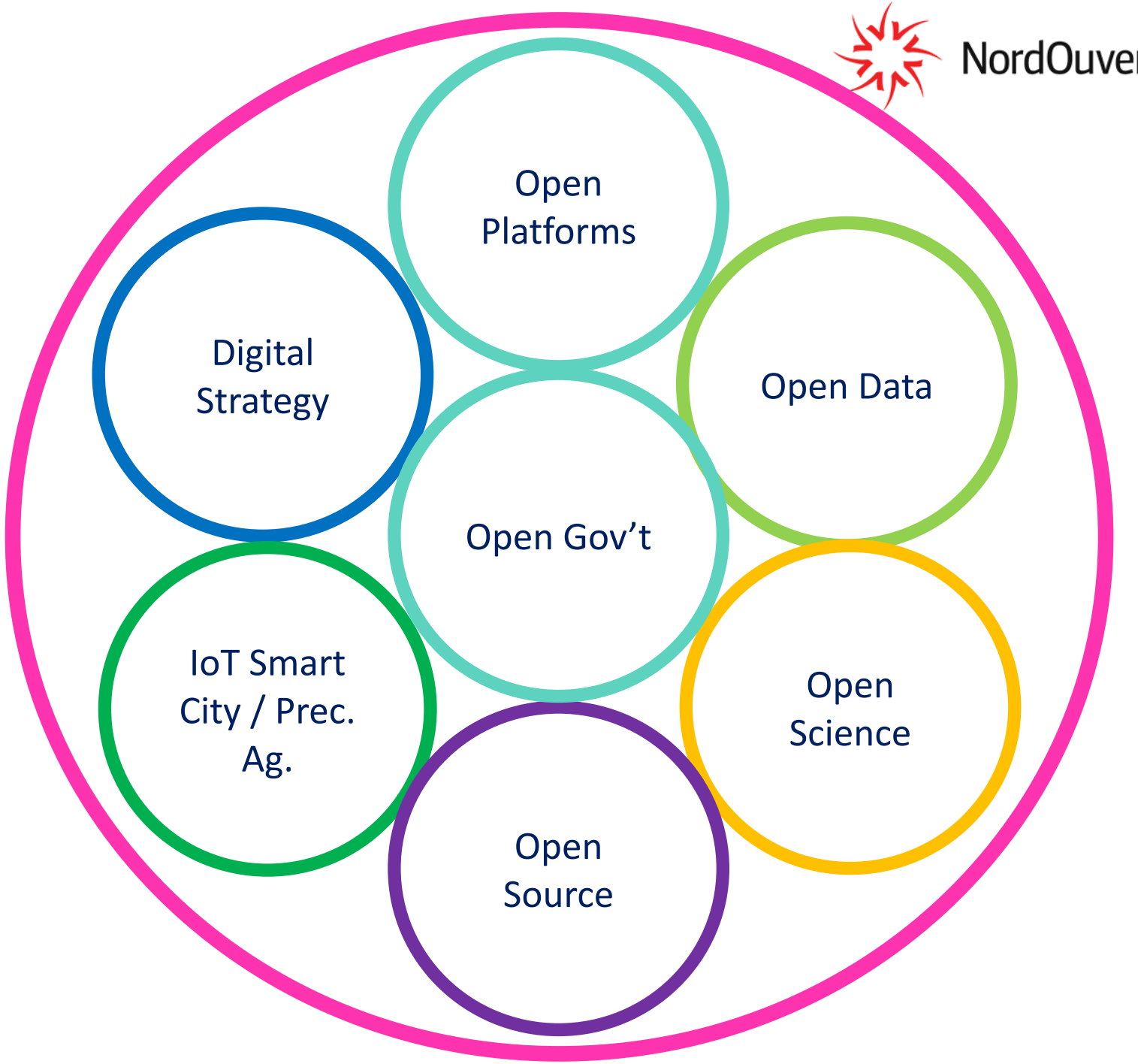
Mapping openness onto the smart city requires the Integration of digital practices

All levels of government



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3. Guiding Principles for Open Smart Cities

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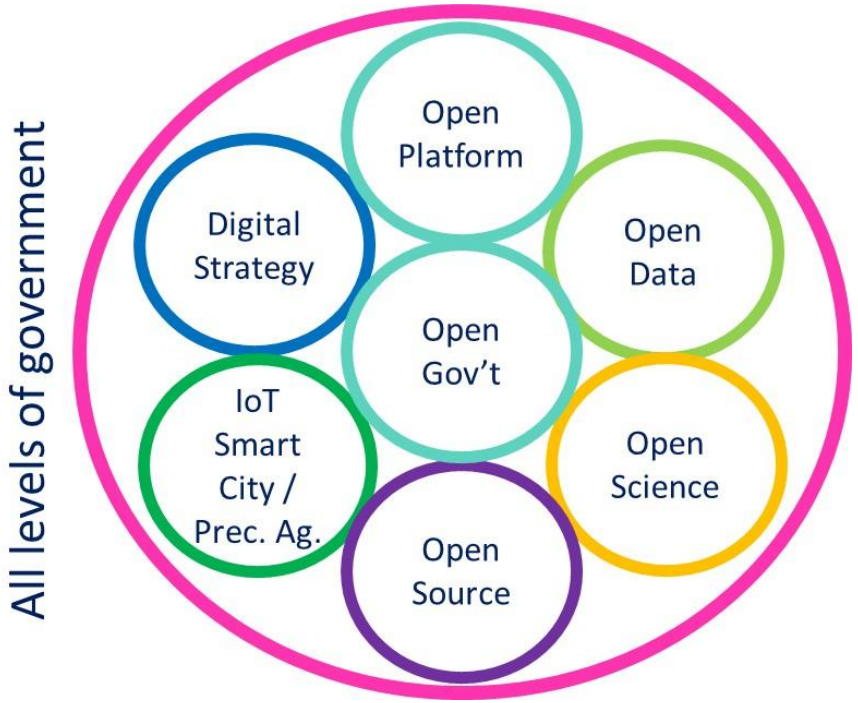
Open Smart Cities

Mapping openness onto the smart city requires the Integration digital practices



Openness is also the public interest, rights & ethics.

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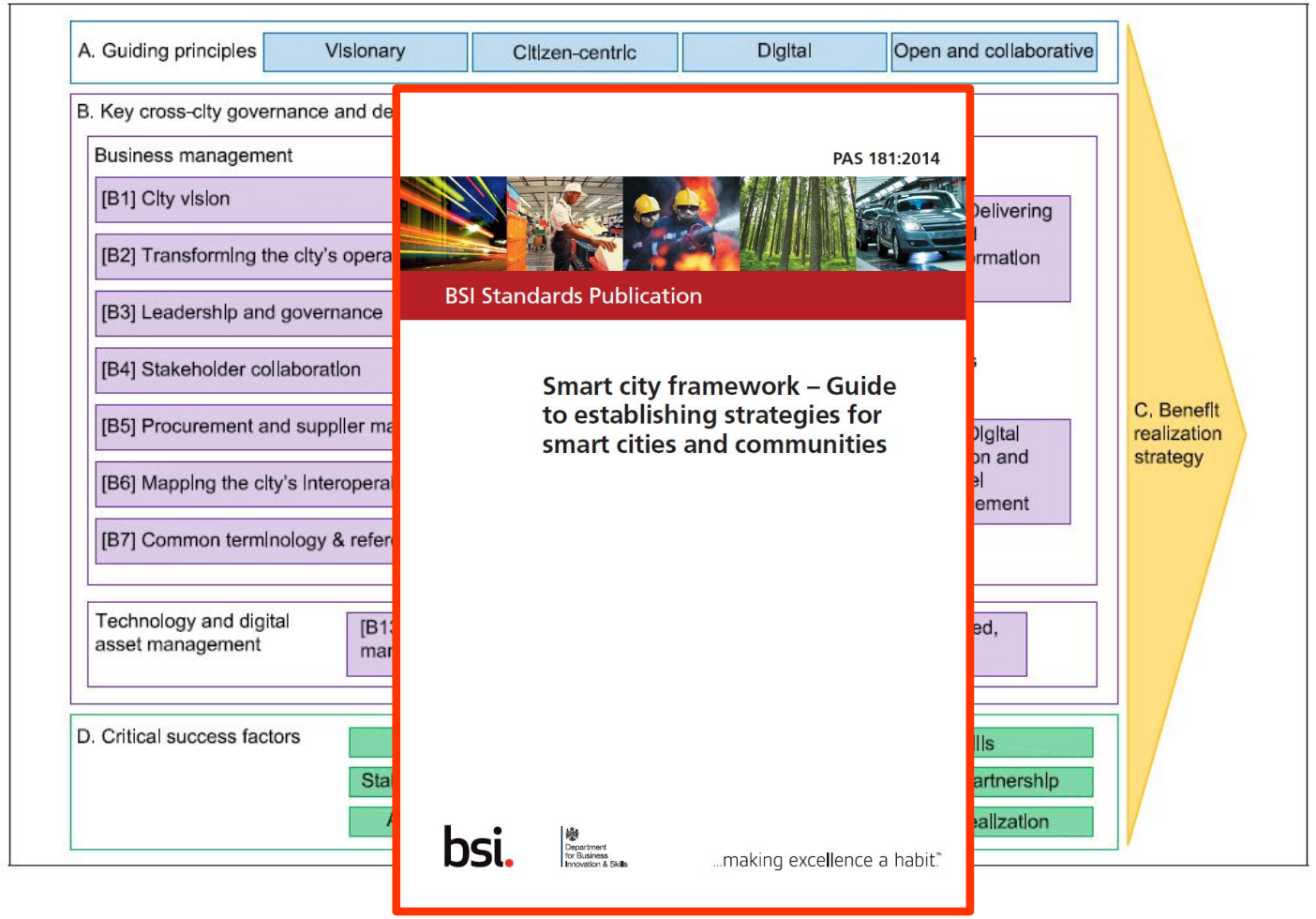
PAS 181:2014 Smart City Framework

- Operations approach
- Agreeing a set of principles
  - for the management of data that data owners commit to working towards
  - open data standards & the Five Star Rating
- Civic engagement
- Ethics and rights?

Figure 1 High-level structure of the SCF



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A Smart City in the Public Interest

Objectives of this report are to provide public servants with ethics guidelines to follow in the development of their smart city plans whereby:

1. Smart cities should favour above all the public interest and public good
2. Reduce possible negative consequences as it pertains to dignity, privacy and democratic life
3. Ensure that there is equitable distribution of the benefits of the smart city and avoid and minimize the possible discriminatory outcomes of the smart city
4. Ensure that the benefits always outweigh the costs

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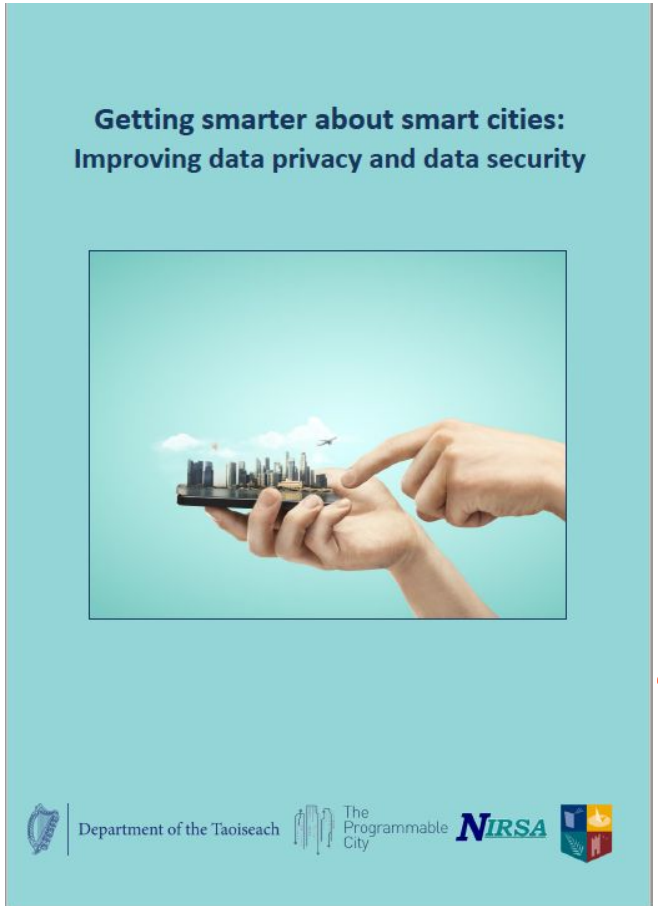
Data Privacy & Security in the Smart City



Multi-pronged ecosystems approach that uses a suite of solutions across the life-cycle (procurement to decommissioning) that are not prejudicial to people's privacy, actively work to minimize privacy harms, curtail data breaches, and tackle cybersecurity issues.

1. **Market driven**
2. **Technical**
   - privacy enhancement technologies
3. **Policy, regulatory and legally focused**
   - revised fair information practice principles,
   - privacy by design,
   - security by design,
   - education and training,
4. **Governance and management orientated**
   - vision and strategy – smart city advisory board and smart city strategy; oversight of delivery and compliance –
   - smart city governance, ethics and security oversight committee;
   - day-to-day delivery – core privacy/security team, smart city privacy/security assessments, and computer emergency response team.

EU - GDPR
General Data Protection Regulation

- Data Subjects
- Breach Notification
- Data Sovereignty
- Data Portability
- Right to Access
- Right to Explanation – Algorithms

Not included:

- Right to Repair
- Environment

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Smart Cities – IoT waste & environment

Reducing waste & recycling, energy efficiency, toxic batteries, electricity consumption, short shelf life, fair Labour practices, mining of semi-precious metals, ability and right to repair.

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4. Applications of Open Smart City Practices

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Assessment of 4 Cities in Canada

- Last webinar we presented our assessment of smart city strategies and practices at the Cities of Edmonton, Guelph, Montreal, and Ottawa
- We identified some gaps and considerations for the future related to strategic principles, situated linkages, guidelines for IoT, privacy and security considerations, interoperability standards for opening data, and civic engagement

Four Canadian Smart Cities

- Smart cities are a work in progress
- Smart cities are defined, governed and operationalized differently in each city
- Smart cities are being integrated into urban plans & strategies
- Cities have economic incentives for smart city initiatives
- Standards are considered important, and there is awareness, but have not yet been officially adopted
- Only Guelph has a security & physical location security subcommittee
- Privacy is considered for data but not at the sensor or meter level
- Spatial Data & GIS/Geomatics are important, Guelph and Edmonton have specific strategies but generally distant from smart city & open data initiatives
- Data analytics units are emerging in Edmonton & Montreal
- Data ownership & licencing is sometimes negotiated at procurement
- Utility partnerships in Guelph, Edmonton, & Ottawa
- Montreal has meaningful public engagement at the moment with an multi-sector advisory committee
- Civic technology groups are not obvious actors
- Open is conflated with smart cities
- Open data & open government are assumed to be smart city
- Most have environmental initiatives

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Chicago (USA)

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Chicago - Smart City

Leadership:

- Mayor, CTO, and CDO; DoIT and units for advanced analytics, content management and process modernization, Information Security Office (ISO), and Data Science Team
- *Chicago Technology Plan (2013)* and *Progress Update (2015)*

Foundational Strategies:

- establish next generation infrastructure and ensure participation of all Chicago residents and businesses in the digital economy

Growth Strategies:

- leverage data and new technology to make government more efficient effective, and open; work with civic technology innovators; and attract and retain science, tech, engineering and math professionals

Open data drives Plan:

- transparency, accountability, analytics, and economic development

Chicago embraces a ‘City-as-a-Platform’ model for enabling products and services to be built out of publicly owned resources

Close Collaboration w/ Civil Society on Digital Literacy

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Close collaboration with the **Smart Chicago Collaborative**, a local civic organization that focuses on digital inclusion and technology for public good

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Activities	Description
The City that Networks	Report on Smart Chicago Collaborative's initiative for inclusion. Specifically the Mayor's Advisory Council on Closing the Digital Divide was challenged to make recommendations to help ensure universal digital access and to improve community, educational, economic and other outcomes.
Digital Skills Initiative	Technology training across departments and delegate agencies that have received federal funding
Connect Chicago	Network of 250 places in the city where internet and computer access, digital skills training, and online learning resources are available free of charge
Smart Health Centers	Training health information specialists in low-income clinics to assist patient in connecting to their own medical records and find reliable information about their own medical conditions
Civic User Testing Group (CUTGroup)	A project started by the Smart Chicago Collaborative. The project consists of paying residents to test civic website and apps to improve their user experience design. Daniel X. O'Neil and the Smart Chicago Collaborative published a book, entitled The CUTGroup, that covers in detail how to conduct user experience testing, community engagement, and digital skills in one civic tech system. The book is openly available online and licensed under a version of the Creative Commons Attirbution-ShareAlike license.
Open City/ Chi Hacknight	Volunteers and meet ups to build civic applications with open data

IoT: Transparent Engagement Methods & Policies about Privacy and Security

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Array of Things Civic Engagement Report

A Summary of Public Feedback & the Civic Engagement Process

August 2016

Prepared by the Smart Chicago Collaborative for the residents of Chicago, the City of Chicago, and the operators of theArray of Things: Urban Center for Computation and Data, a research initiative of the Computation Institute at the University of Chicago and Argonne National Laboratory.

Array of Things Privacy Policy

5. Purpose and Scope

The Array of Things is designed to collect and share data about Chicago's urban environment to support research that seeks will provide insight into city challenges. This includes, but is not limited to, information about temperature, humidity, barometric pressure, vibration, air quality, cloud cover, and pedestrian and vehicle counts and patterns. Pedestrian and vehicle movement data will come from computer software analyzing images.

The purpose of this policy is to disclose the privacy principles and practices for the Array of Things program. It is complemented by the Array of Things Governance Policy and Process document, which defines how decisions about the program will be made. The privacy policy sets forth how the operators of the Array of Things program will collect and manage data, some of which may include personal information or Personally Identifiable Information (PII). The operators of the Array of Things are defined as the University of Chicago and Argonne National Laboratory.

6. Guiding Principle

We value privacy, transparency, and openness.

7. Personally Identifiable Information

Personally Identifiable Information or PII[1] is any information about an individual, including "(1) any information that can be used to distinguish or trace an individual's identify, such as name, social security number, date and place of birth, mother's maiden name, or biometric records; and (2) any other information that is linked or linkable to an individual, such as medical, educational, financial, and employment information." As noted in NIST 800-122, this includes the following:

- Names
- Personal identification numbers
- Email or street address information
- Personal characteristics, including photographic images of face or other identifying characteristic), fingerprints, handwriting, or other biometric data (e.g., retina scan, voice signature, facial geometry)
- Information about an individual that is linked or linkable to one of the above (e.g., date of birth, place of birth, race, religion, weight, activities, geographical indicators, employment information, medical information, education information, financial information)

1 "PII" has been defined in accordance with the National Institute of Standards and Technology's Special Publication 800-122 *Guide to Protecting the Confidentiality of Personally Identifiable Information (PII). Updates to the NIST guidelines will be reviewed as part of the regular review of this policy.*

Array of Things Governance Policy and Process

1. Purpose and Scope

This document provides a framework within which the University of Chicago and Argonne National Labs (program operators) and the City of Chicago will implement and manage the Array of Things (AoT) in Chicago by 1) defining the initial scope of the program, 2) establishing the roles and responsibilities of program partners; and, 3) describing the process by which decisions about the program will be made.

This document is complimented by the AoT Privacy Policy, which sets forth requirements regarding Personally Identifiable Information (PII).

1.1. Guiding Principle

We value privacy, transparency, and openness.

1.2. Program Overview

The AoT program operators aim to build an urban-scale research instrument comprising a network of at least 500 Internet-connected "nodes," each supporting multiple environmental and air quality sensors. As a first of its kind public sensor utility, AoT will produce an open and freely available source of urban sensor measurements to support research, development, education, prototyping, and demonstration. The program operators have designed AoT to enable the instrument to evolve at a pace commensurate with consumer electronics, maintaining state-of-the-art capabilities over many years.

The initial prototype, funded by Argonne National Laboratory, involved 12 nodes equipped with a collection of environmental sensors (e.g., temperature, light, sound, humidity, air quality). Each node was mounted on private facilities at the University of Chicago, Argonne National Laboratory, and DePaul University for testing purposes, with installation occurring between July 2014 and June 2015.

Beginning in summer 2016 a second set of prototypes will be mounted in Chicago on street signal light poles and external building walls. The network will be expanded to roughly 500 nodes from 2016 to 2018. The program operators will develop functionality to enable research, application development, education, prototyping, or demonstration projects. The location of each of the 500 nodes will be determined via the process identified later in this document (§4.3). The program will be evaluated nine months after the second set of prototype nodes are mounted in the City and every 12 months from that time on. The evaluation criteria and the results of each review will be made available to the public.

Sensor readings will be processed and sent to a database managed by the program operators. A period of evaluation and calibration will be required for each sensor; this

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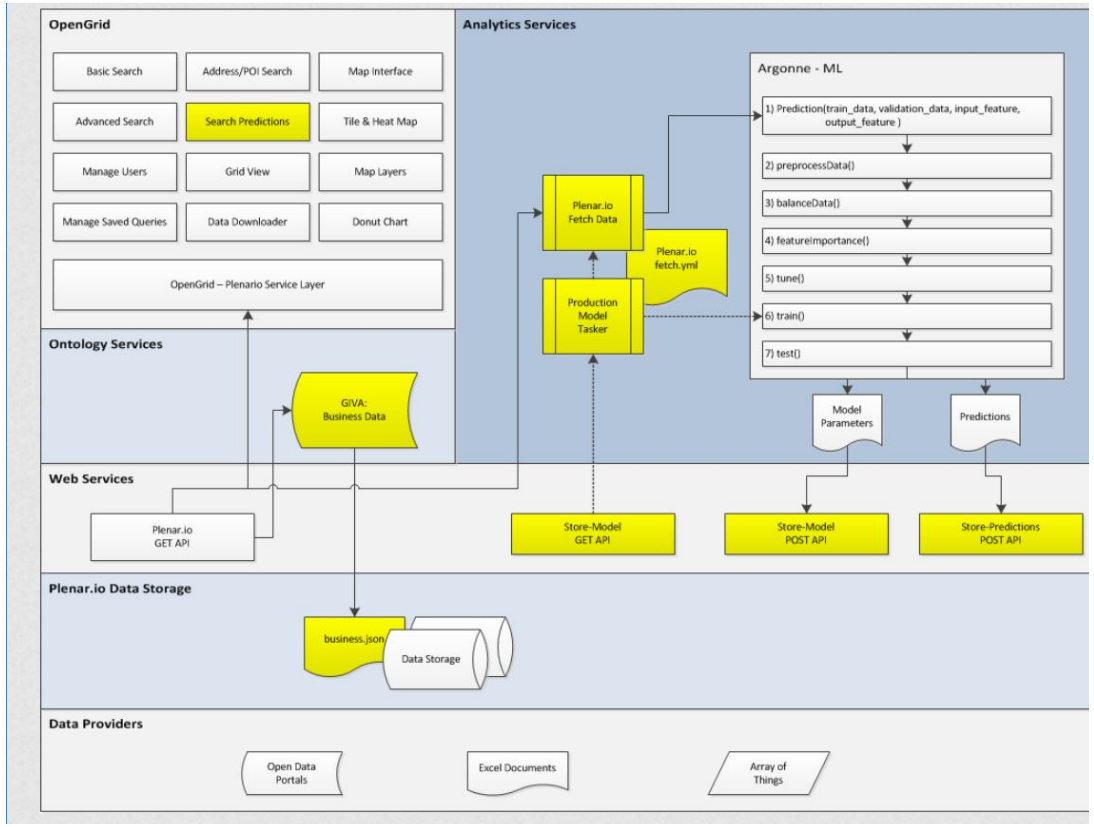
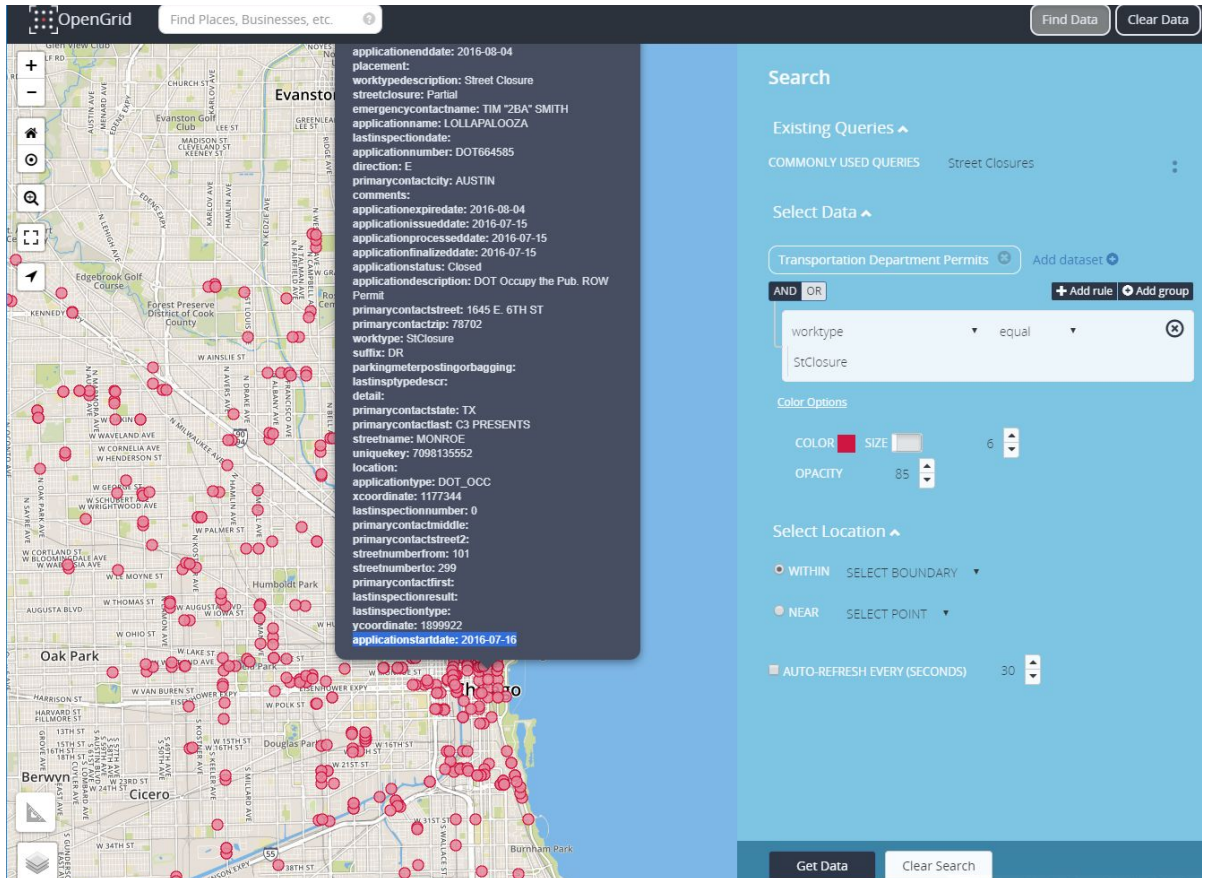
Open Source, Geospatial and Open Data

Smart Data Platform



OpenGrid



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Dublin (Republic of Ireland)

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Dublin - Smart City

- Lead by the four Dublin Local Authorities
- Smart Dublin (2016) program
- As Smart City is real time, connected, and data driven
- Vision: A leading **open, connected,** and **engaged** smart city region to live in, work in, and visit
- Initiative is driven by urban challenges of Smart Mobility, Environment, Smart Government, Smart People, Smart Economy, Smart Living

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Context

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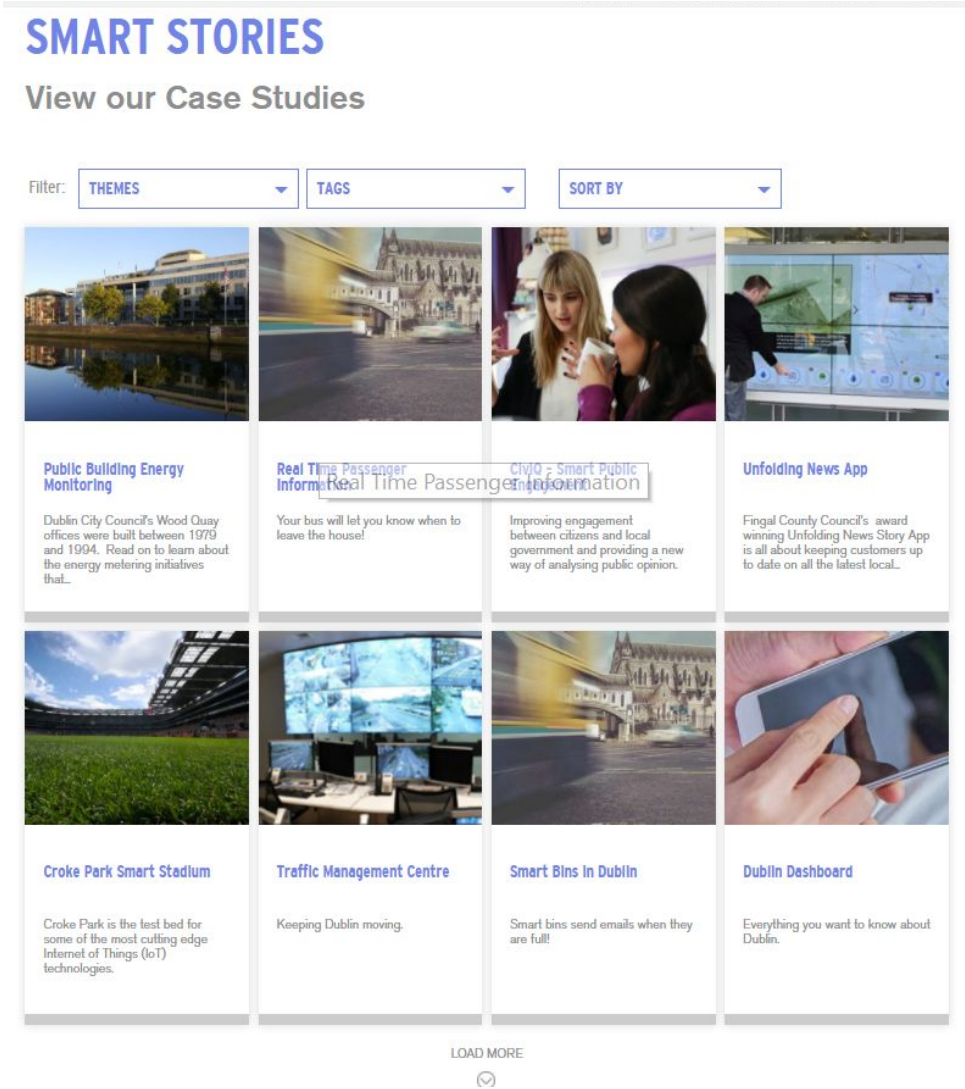
Tracking Initiatives



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Open, Real-Time, Geospatial Data

DublinDashboard

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Helsinki (Finland)

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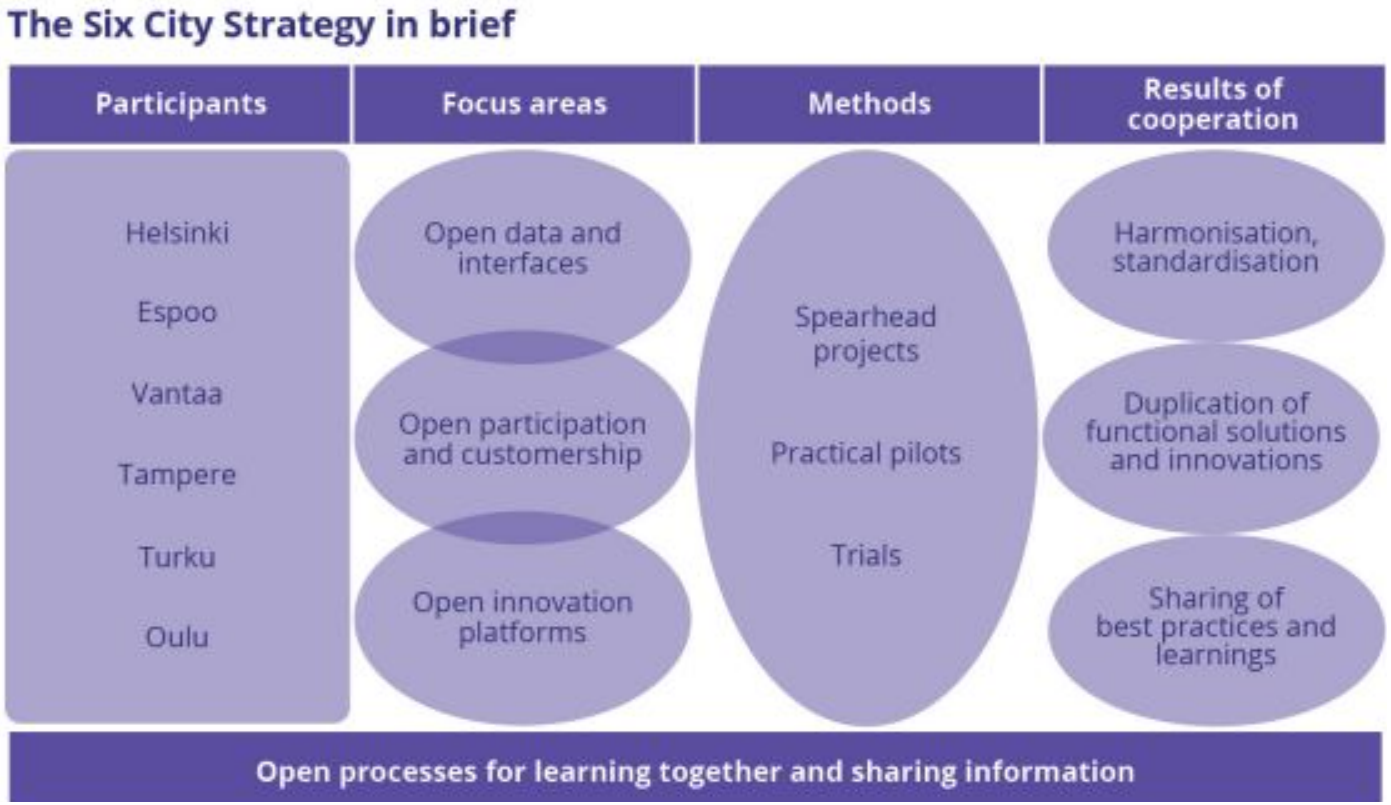
Helsinki - Smart City

- Forum Virium Helsinki, centralized office for smart city projects
- *6Aika Strategy* (2014); *Smart Helsinki Region*
- 6Aika Strategy:
  - Focus areas: open innovation platforms, open data and interfaces, open participation and customership



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3D Model – Open, Geospatial, Smart

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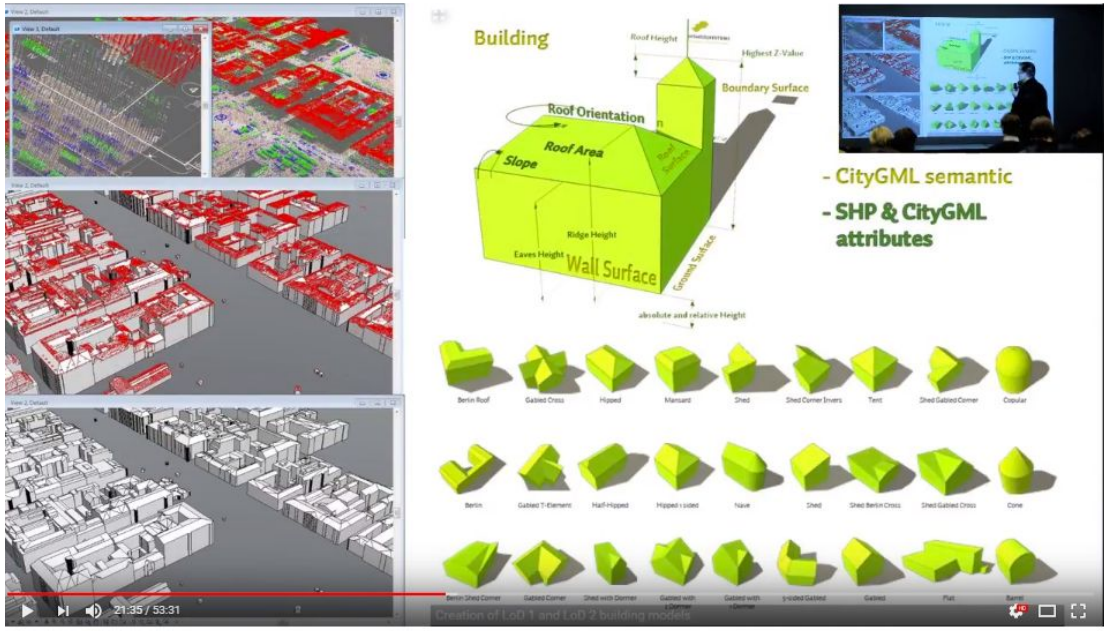

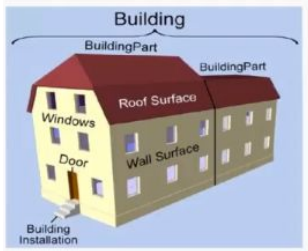

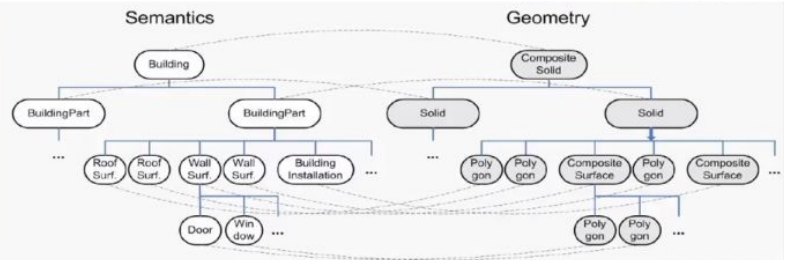

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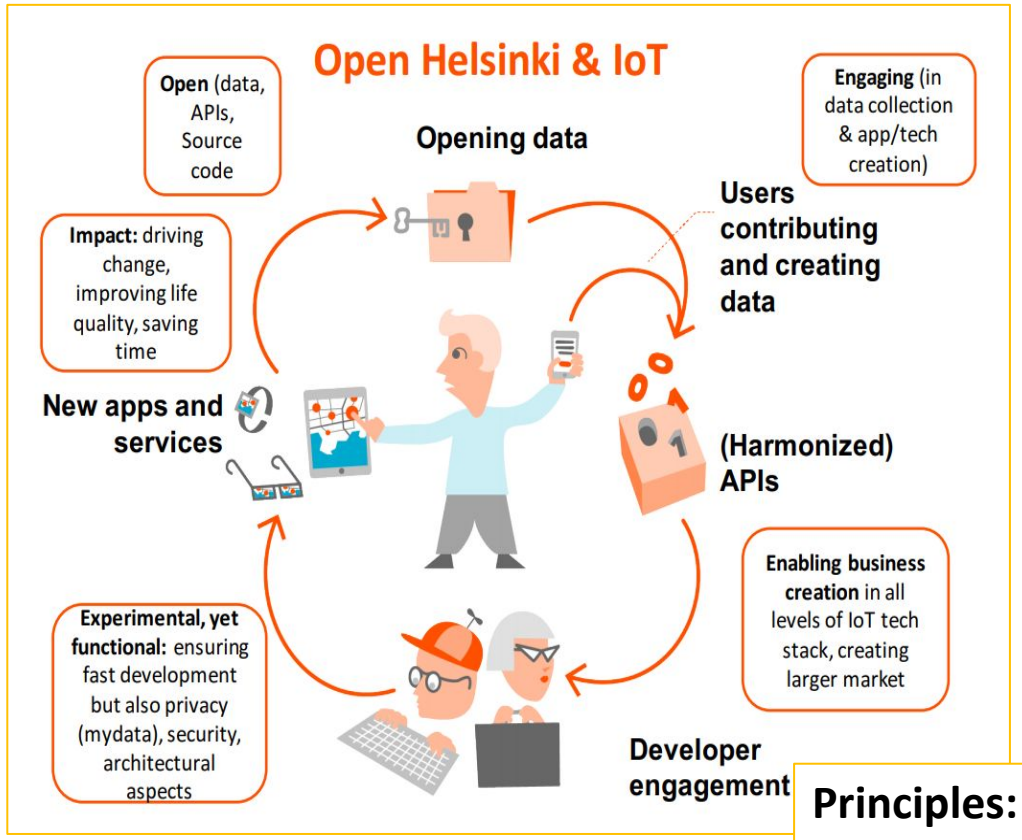
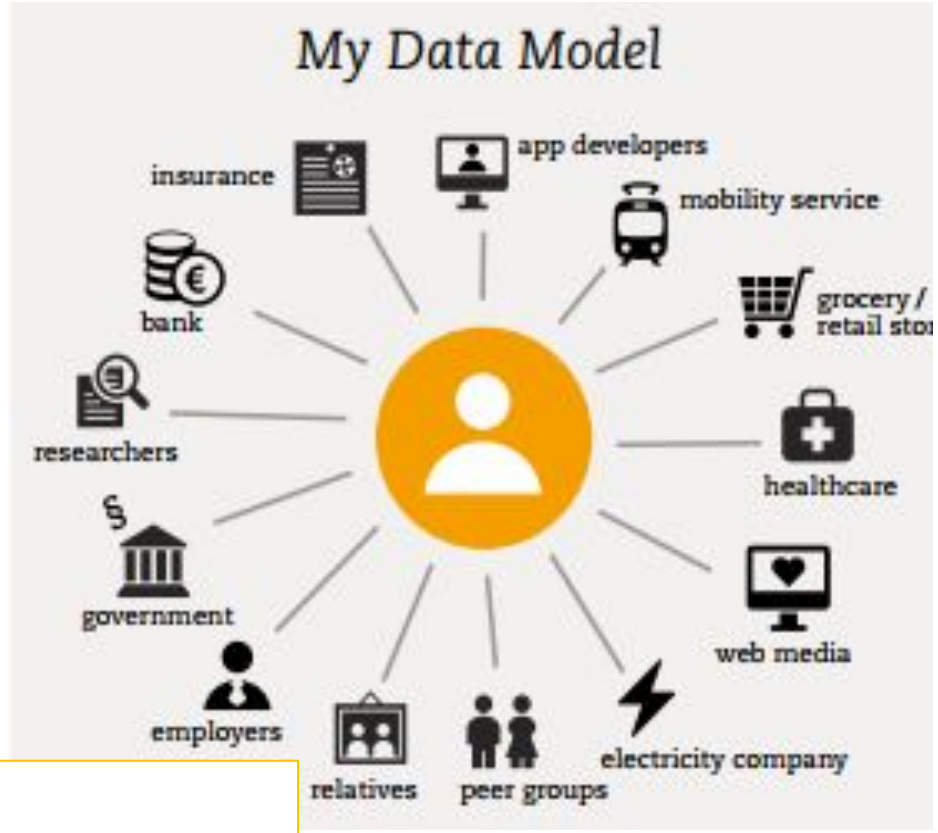
IoT: Openness and Principles





Principles:

1. Human centric control and privacy
2. Usable data
3. Open business environment

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Applications of MyData Model

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E-Estonia and Data Exchange Layer

building blocks of e-estonia

e-identity

Did you know that more digital signatures have been used in Estonia than in the rest of the European Union altogether?

- ID card
- Mobile-ID
- e-Residency
- Smart-ID

LEARN MORE

interoperability services

Did you know that X-Road saves over 800 years of working time for Estonia every year?

- X-Road
- e-Land Register
- Population Registry
- Sharemind

LEARN MORE

security and safety

Did you know that scalable blockchain technology called KSI is invented by Estonian cryptographers?

- KSI Blockchain
- e-Law
- e-Court
- e-Police

LEARN MORE

healthcare

Did you know that Estonia uses blockchain technology to ensure healthcare data security?

- e-Health Records
- e-Prescription

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e-governance

Did you know that 99% of public services are available to citizens as e-services?

- i-Voting
- State e-Services Portal
- e-Cabinet

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mobility services

Did you know that self-driven vehicles have been allowed to drive on public roads in Estonia since 2017?

- Intelligent Transportation Systems
- Mobile Parking
- Border Queue Management

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business and finance

Did you know that you can establish a company in Estonia just in 18 minutes?

- e-Tax
- e-Banking
- e-Business Register
- Industry 4.0

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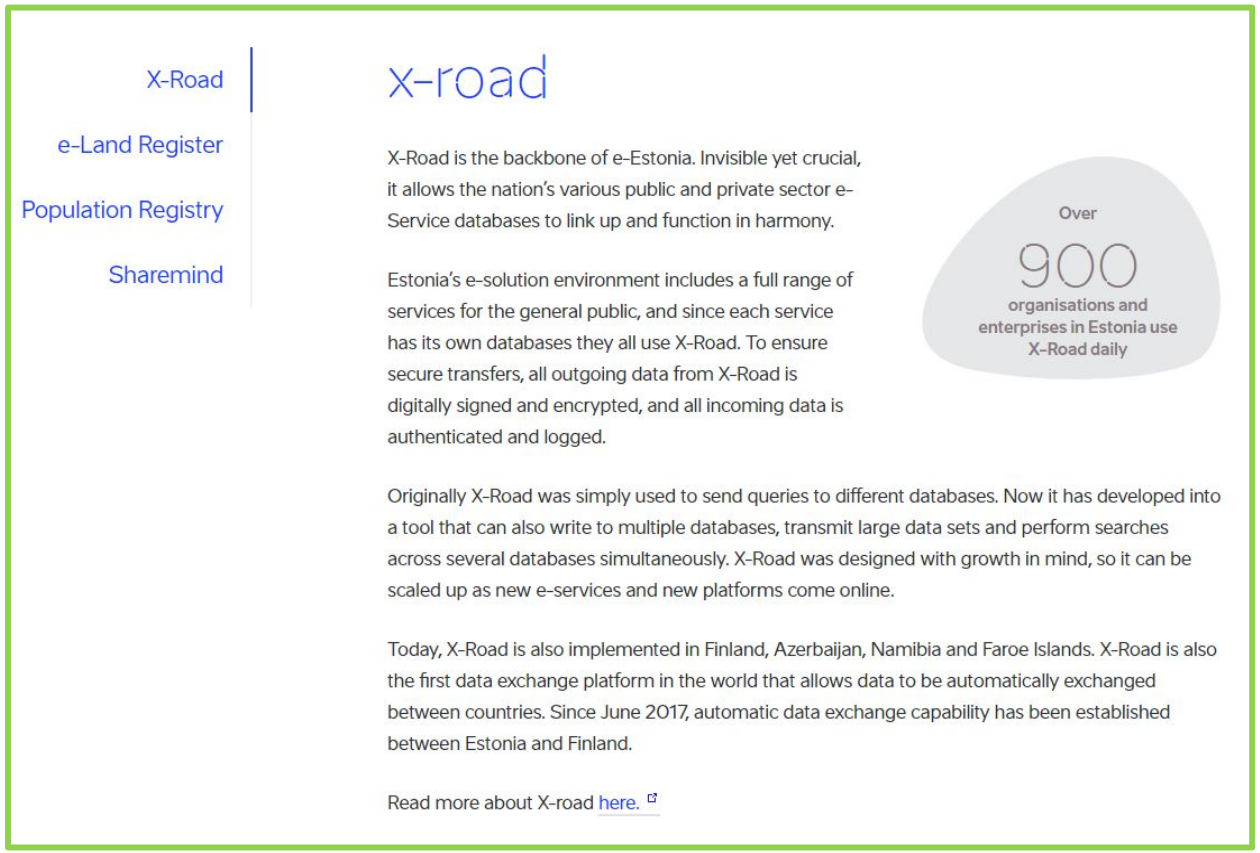
education

Did you know that twice as many students pursue IT careers in Estonia than the average in other OECD countries?

- e-School
- DreamApply
- Estonian Education Information System
- Eliis

LEARN MORE



X-Road

e-Land Register

Population Registry

Sharemind

x-road

X-Road is the backbone of e-Estonia. Invisible yet crucial, it allows the nation's various public and private sector e-Service databases to link up and function in harmony.

Estonia's e-solution environment includes a full range of services for the general public, and since each service has its own databases they all use X-Road. To ensure secure transfers, all outgoing data from X-Road is digitally signed and encrypted, and all incoming data is authenticated and logged.

Over 900 organisations and enterprises in Estonia use X-Road daily

Originally X-Road was simply used to send queries to different databases. Now it has developed into a tool that can also write to multiple databases, transmit large data sets and perform searches across several databases simultaneously. X-Road was designed with growth in mind, so it can be scaled up as new e-services and new platforms come online.

Today, X-Road is also implemented in Finland, Azerbaijan, Namibia and Faroe Islands. X-Road is also the first data exchange platform in the world that allows data to be automatically exchanged between countries. Since June 2017, automatic data exchange capability has been established between Estonia and Finland.

Read more about X-road here.

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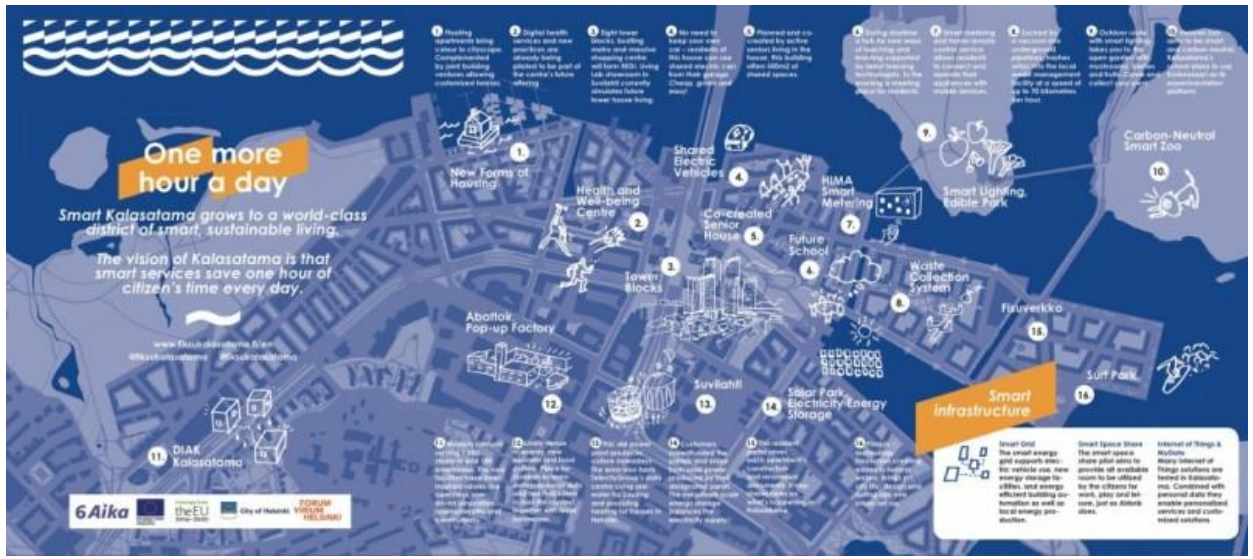
Innovative and User-Driven Procurement

Helsinki Open Innovation Platform

		MISSING	STARTED–INCOMPLETE	COMPLETE–ADVANCED
OPENNESS	**CUSTOMERS** Has the customer group been recognised and clearly defined? Who can be a customer of the platform?	The customer group has not been defined.	The customer group has been recognised, but definition is still incomplete.	The customer group has been clearly defined.
	DEVELOPERS Has the developer group been recognised and engaged in the platform's activities?	The platform has no external developers.	The platform has some developers.	The platform has adequate number of developers and their number is rising.
	CUSTOMER INTERFACE Is there a planned route for customers to the platform, which is recognised by the customers?	The customer interface is not recognisable.	There is an existing interface, but it is not firmly established.	There is a clear and recognisable route to the platform.
	ENGAGEMENT OF DEVELOPERS WITH THE PLATFORM Is there a clearly planned and visible route to the platform?	There is no clear access or route to the platform, and participation in the platform's activities is occasional.	There is a somewhat recognisable route to the platform, but the activities are not firmly established. There is no clear person whom to ask about platform's activities.	There is a recognisable and firmly established route to the platform. Participation is planned and the application project, etc., is clearly planned.
INNOVATIVENESS	**VALUE CREATION FOR THE PLATFORM'S CUSTOMER** Does the platform offer its customers added value?	The platform does not offer added value.	The platform occasionally produces added value.	The platform produces added value with established practices.
	AGREEMENT AND IPR PRACTICES Does the platform have agreements and defined IPR practices?	No thought has been given to contractual matters.	Thought has been given to contractual matters, but the agreements are not at a level required for the activities.	Agreements documents have been drawn up and their use is established practice.
	THE PLATFORM'S TECHNOLOGY ENVIRONMENT Does the platform enable the development of a special technology (such as studios, laboratory environments or living labs)?	No special technological capabilities.	One or a few environments.	The test environment is widely available (national and international).
PLATFORM ORIENTATION	**CO-CREATION PROCESS** Is the co-creation process modelled, measurable and scalable?	The platform has no defined process but brings people together.	The development of a platform-based process is in the planning stages.	The co-creation process is scalable and clearly defined.
	REVENUE GENERATION MODEL What is the platform's revenue generation model?	The activities are not viable without project-based funding, another organisation or the organisation's basic funding.	Maintained by a few key organisations (such as the city/university) and partial own revenue generation.	The platform has sufficient own revenue generation and it covers the platform's activities.
	INTERNAL DEVELOPMENT OF THE PLATFORM How does the platform develop its activities?	The platform has no clear endeavours or direction to develop its operating model.	The platform is developed using random methods.	The platform is developed systematically.
	THE PLATFORM AS A PART OF THE PLATFORM NETWORK How is the platform connected to other platforms?	Functions separately from other platforms.	The platform is sporadically connected into the wider platform network.	The platform is systematically connected to other platforms.
	PLATFORM COMMUNITY Does the community support the platform's activities?	The platform has no clearly recognisable community.	The platform has a recognisable social group/community.	The platform community supports development activities and provides support without money transactions.
	NETWORK EFFECT Do the platform's users create value for each other by using the platform? Do the existing users attract new users to the platform?	The users do not create value for each other.	The users create some value for each other.	The users create value for each other, and the value creation depends on other users.

Smart Kalasatama District



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New York City (USA)

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New York City - Smart City

- **Leadership:**
  - Mayor's Office of Technology and Innovation (MOTI), Department of Information Technology & Telecommunications (DoITT), Mayor's Office of Data Analytics (MODA) (operates as a Center of Excellence)
- ***Guided by:***
  - *Roadmap for the Digital City* (2011); *Building a Smart and Equitable City* (2015); *NYC Digital Playbook* (2016)
- ***Building a Smart and Equitable City:***
  - integrated with One New York urban plan and equity is an "explicit guiding principle"
- ***Digital Playbook:***
  - Principles of equity, inclusivity, accessibility to government information and services; improving public services, user friendliness, and civic engagement and outreach; transparent, secure, and trustworthy data practices; and sharing and collaborating data and platforms to improve City service to residents
  - 12 strategies in the *NYC Digital Playbook* to uphold these principles

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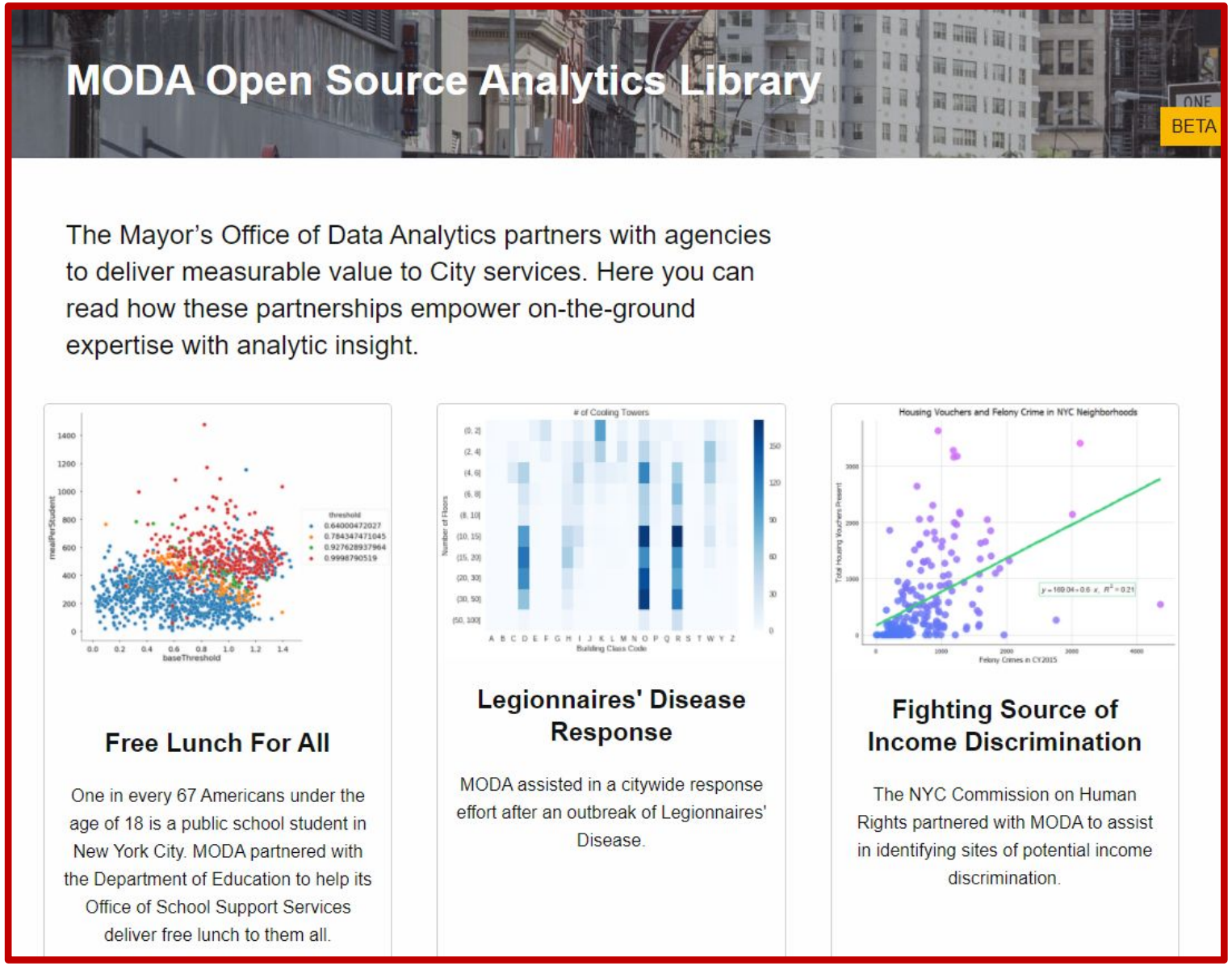
MODA Open Source Analytics Project Library

- Showcases 3 projects (plans to expand number of projects)
- Makes transparent the source code behind the analytics and the algorithms that MODA is developing for city services
- Information is deliberately provided in plain language about the technology landscape and the policy goals that were made as part of that engagement



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Open & Geospatial Data Legislation and Standards

- Local Law 11 of 2012 (Open Data Law)
- Local Law 108 of 2015 (Geospatial standards)
- Local Law 107 of 2015 (Data Dictionaries), Local Law 106 of 2015 (Retention and Archiving), Local Law 109 of 2015 (Public Requests), Local Law 110 of 2015 (Timely updates); Local Law 7 of 2016 (FOIL responses including data); and Local Law 8 of 2016 (Examination and Verifications)
- Proposed bill INT 1696-2017 (Open algorithms)

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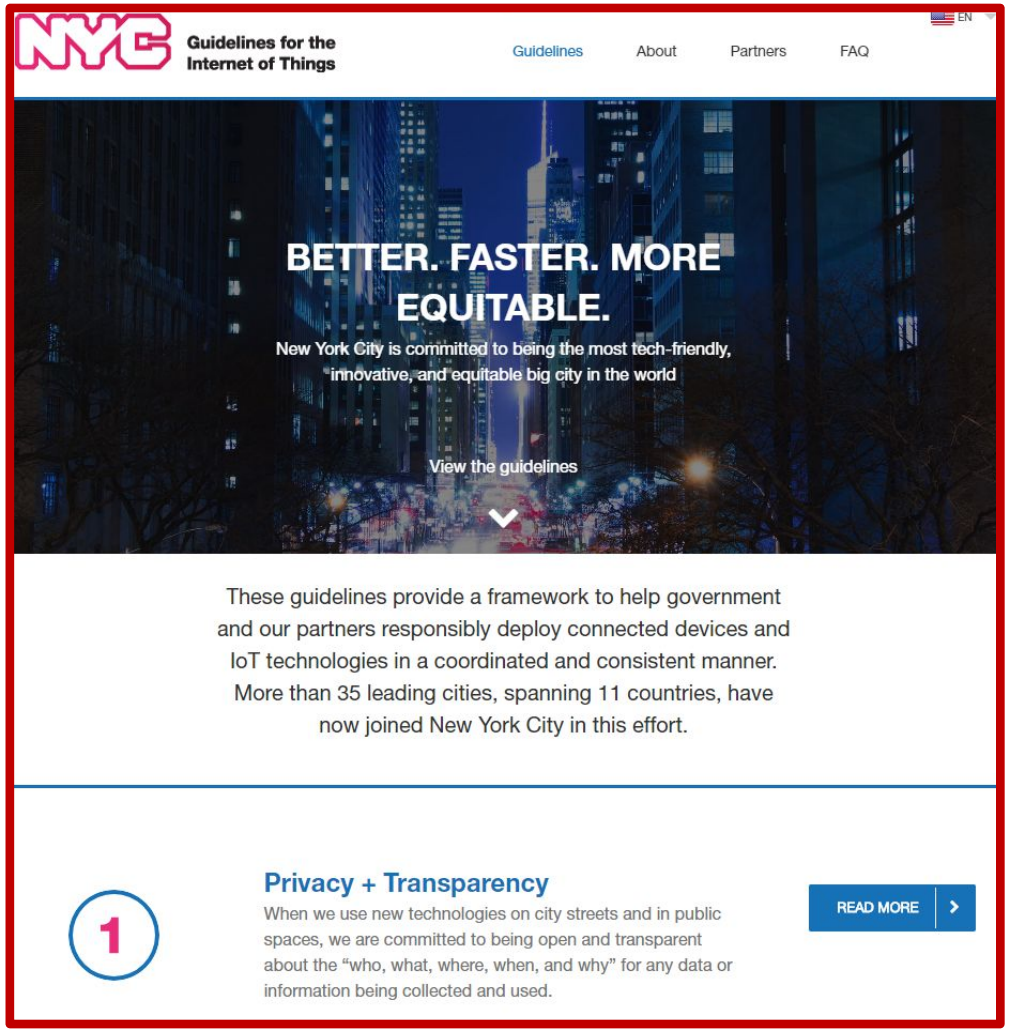
IoT Guidelines

- Privacy + Transparency
- Data Management
- Infrastructure
- Security
- Operations and Sustainability



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Summary of Open Smart Cities Practices

- Ethical and principles-based guidelines, recommendations, and models for IoT and smart cities:
  - Security
  - Privacy
  - Access to personal data
  - Data management
- Open and geospatial data can be mandated
- Visualizations
- Meaningful engagement
- Partnerships
- Open data are central to strategies
- Open:
  - Source
  - Algorithms
  - Platforms
  - APIs
  - Procurement
  - Innovation
  - Standards
  - IoT

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Gaps and Challenges

- Translating ethics and principles into practice
- Compliance is difficult to monitor
- Auditing is not carried out
- Openness & transparency are secondary to open innovation
- Sustaining meaningful engagement
- Little discussion of human rights and environment

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5. Conclusion

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Preliminary recommendations

Integrate digital and open practices onto smart cities:

- Open government
- Open data
- Open science
- Open IoT
- Open standards & specification
- Open platforms

Open smart cities include:

- Rights (GDPR & right to repair)
- Are in the public interest
- Ethics (Quebec, NyC, Helsinki, Chicago)
- Environmental considerations
- Critical and meaningful public engagement & dialogue not just consultation
- Ecosystems approach (ASDI and Dublin Report)

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Next Steps

1. Open Smart Cities Definition
2. Guidelines and principles for open smart cities

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Q&A

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Thank you

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