Smart Planning For Smart Cities

9:15 - 10:15 AM
Friday, Sept 20, 2020

LSNetwork

CANADIAN URBAN INSTITUTE

www.lsnetwork.org

WELCOME

GENEVA STARR

Project Manager,
LSNetwork / Canadian Urban Institute

CANADIAN URBAN INSTITUTE

Non-profit applied research organization dedicated to achieving healthy urban development.

INTRODUCTION: LSNETWORK

LSNetwork

We support the adoption of smart & efficient technologies to help reduce community GHG emissions and improve overall quality of life in Canada.

www.lsnetwork.org

Funded by Natural Resources Canada
Financé par Ressources naturelles Canada
Canada

AGENDA

9:15 Introduction

9:20 The Intelligent Community Movement: "Navigating Through Uncertainty"
John Jung, ICF Canada

9:45 Smart City Master Planning Guide
Geneva Starr, CUI

10:05 Group Discussion

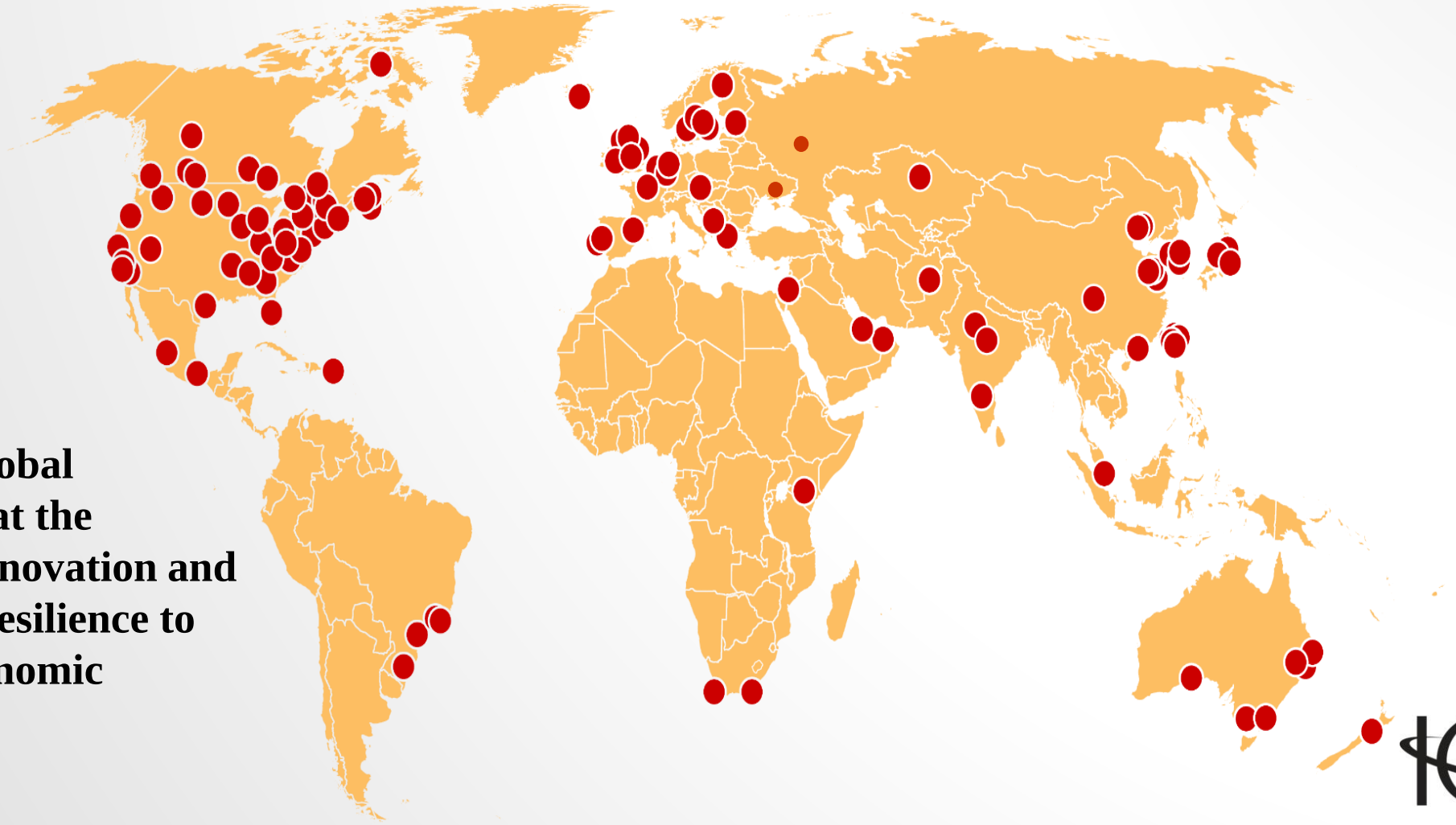
THE INTELLIGENT COMMUNITY MOVEMENT: "NAVIGATING THROUGH UNCERTAINTY"

John G. Jung, Chairman and Co-Founder
Intelligent Community Forum
jjung@intelligentcommunity.org
www.intelligentcommunity.org
www.icf-canada.com

Municipal Finance Officers' Association of Ontario Annual Conference
Deerhurst Resort, Huntsville, Ontario
September 20, 2019

ICF Intelligent Communities

1999 - 2019



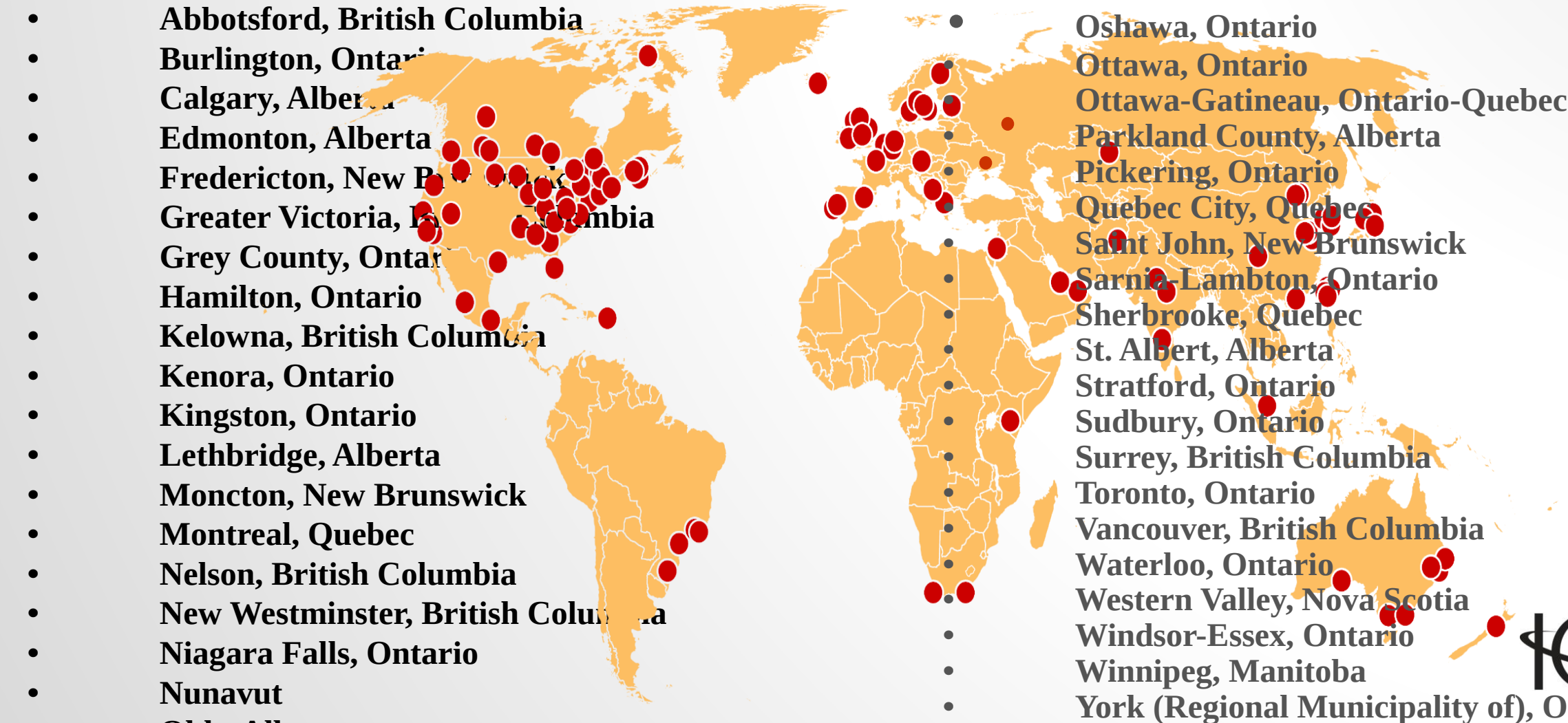
Nearly 200 Global examples are at the forefront of innovation and have greater resilience to withstand economic downturns.

ICF Intelligent Communities

1999 - 2019

Canada

- Abbotsford, British Columbia
- Burlington, Ontari
- Calgary, Alber
- Edmonton, Alberta
- Fredericton, New B
- Greater Victoria, B mbia
- Grey County, Ontar
- Hamilton, Ontario
- Kelowna, British Columbia
- Kenora, Ontario
- Kingston, Ontario
- Lethbridge, Alberta
- Moncton, New Brunswick
- Montreal, Quebec
- Nelson, British Columbia
- New Westminster, British Colu a
- Niagara Falls, Ontario
- Nunavut
- Olds, Alberta



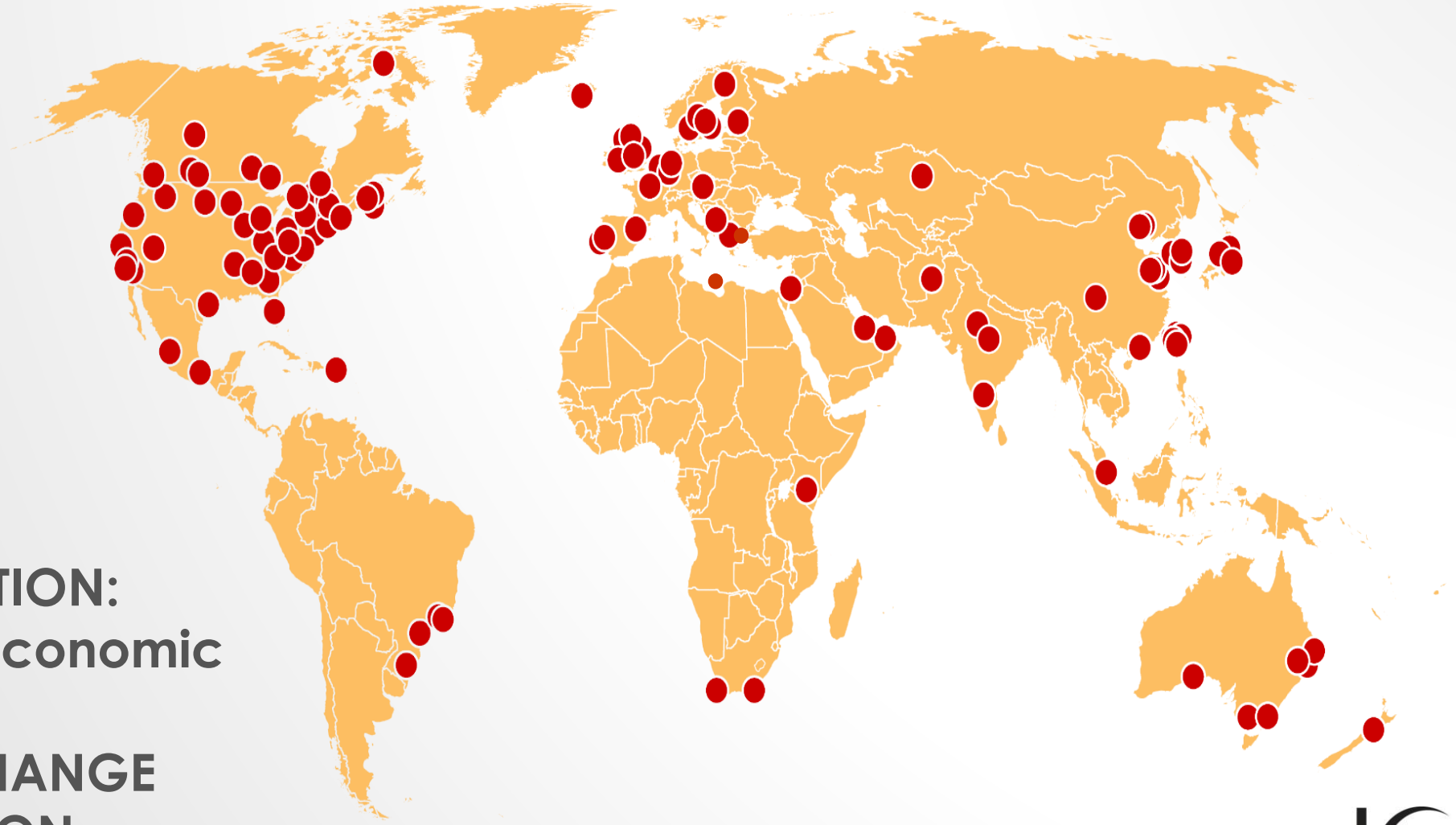
- Oshawa, Ontario
- Ottawa, Ontario
- Ottawa-Gatineau, Ontario-Quebec
- Parkland County, Alberta
- Pickering, Ontario
- Quebec City, Quebec
- Saint John, New Brunswick
- Sarnia-Lambton, Ontario
- Sherbrooke, Quebec
- St. Albert, Alberta
- Stratford, Ontario
- Sudbury, Ontario
- Surrey, British Columbia
- Toronto, Ontario
- Vancouver, British Columbia
- Waterloo, Ontario
- Western Valley, Nova Scotia
- Windsor-Essex, Ontario
- Winnipeg, Manitoba
- York (Regional Municipality of), Ontario

ICF Intelligent Communities

Top 7 Intelligent Communities 2019

- Abbotsford, Canada
- Chicago, USA
- Hudson, Ohio, USA
- Sarnia Lambton, Canada
- Sunshine Coast, Australia
- Taoyuan, Taiwan
- Westerville, Ohio, USA

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS



COMMON CHALLENGES:

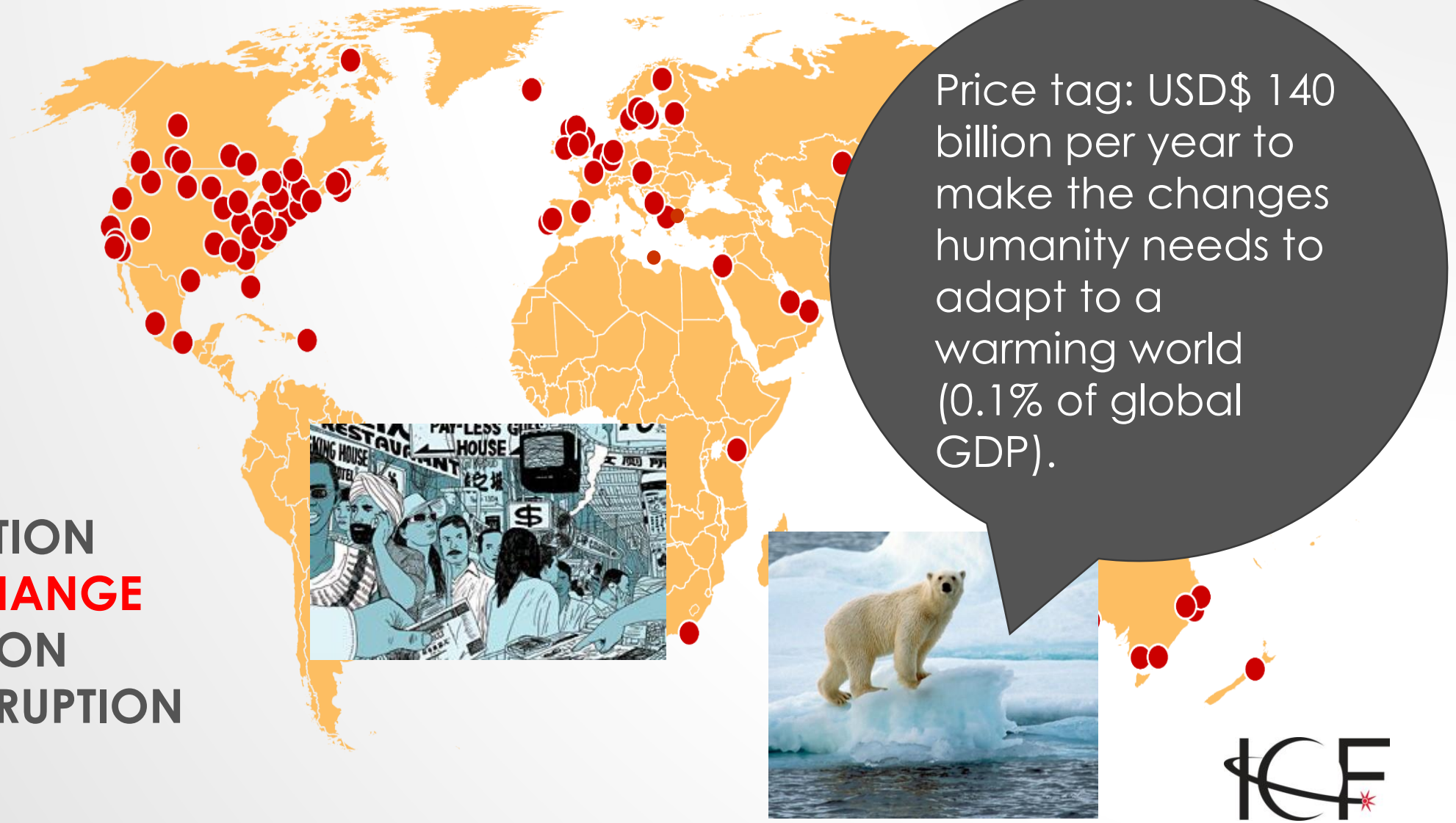
1. GLOBALIZATION: Political and Economic Disruptions
2. CLIMATE CHANGE
3. URBANIZATION
4. DIGITAL DISRUPTION

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS

COMMON CHALLENGES:

1. **GLOBALIZATION**
2. CLIMATE CHANGE
3. URBANIZATION
4. DIGITAL DISRUPTION

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS



Price tag: USD$ 140 billion per year to make the changes humanity needs to adapt to a warming world (0.1% of global GDP).

COMMON CHALLENGES:

1. GLOBALIZATION
2. **CLIMATE CHANGE**
3. URBANIZATION
4. DIGITAL DISRUPTION

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS

UN's New Climate Economy Report: USD$26 Trillion Economic Opportunity

COMMON CHALLENGES:

1. GLOBALIZATION
2. **CLIMATE CHANGE**
3. URBANIZATION
4. DIGITAL DISRUPTION

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS

COMMON CHALLENGES:

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2. CLIMATE CHANGE
3. **URBANIZATION**
4. DIGITAL DISRUPTION

INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS

COMMON CHALLENGES:

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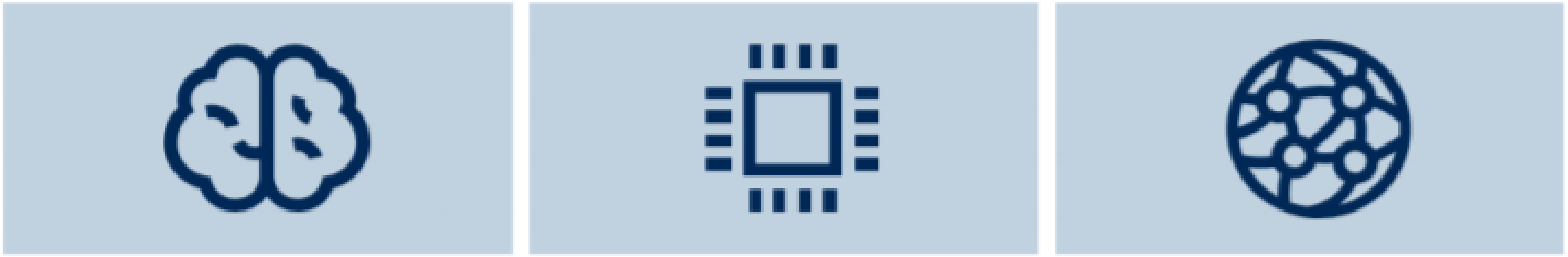
INTELLIGENT COMMUNITIES SHARE THEIR SOLUTIONS

COMMON CHALLENGES:

1. GLOBALIZATION
2. CLIMATE CHANGE
3. URBANIZATION
4. **DIGITAL DISRUPTION**

Top 10 Strategic Technology Trends for 2019



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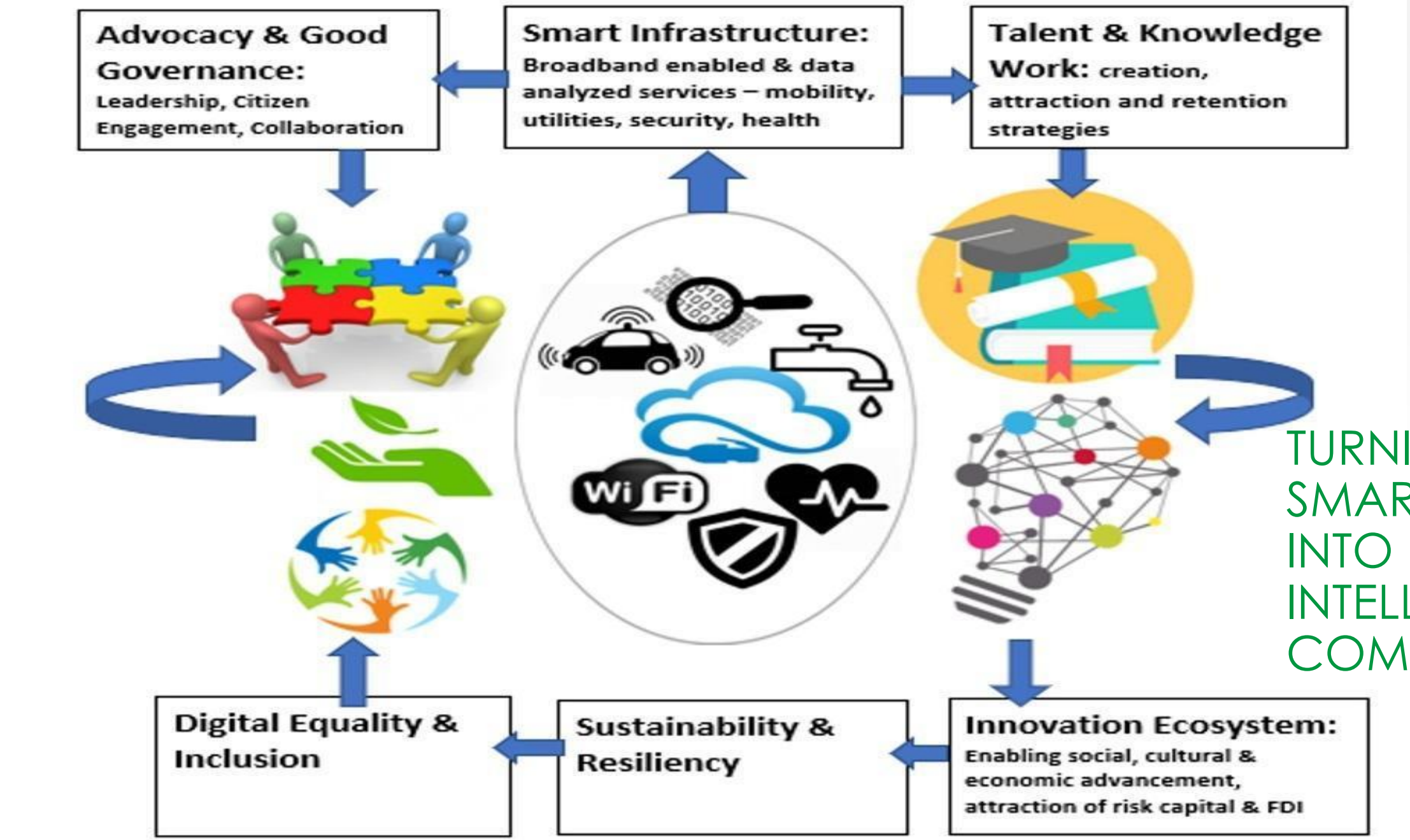


TURNING SMART CITIES INTO INTELLIGENT COMMUNITIES

Source: ICF Canada

a.k.a. SMART –CITY Infrastructure

Broadband

Broadband is the new essential utility, as vital to economic growth as clean water and good roads. Intelligent Communities express a strong vision of their broadband future, encourage deployment and adoption, and deploy their own networks where necessary.

When local governments among the Class of 2018 build **broadband networks**, what form do they take?

18% Build networks only for the use of government facilities.

28% Build "dark" networks in which they own the infrastructure but lease it to service providers to provide service.

32% Build open-access networks, in which they deliver a basic "transport layer" of service that makes it fast and inexpensive for services providers to bring up new service.

22% Build their own competitive local exchange carriers (CLEC) to provide data, voice and sometimes video services in competition with the private sector.

What kinds of **open access networks** do the Class of 2018 operate?

57% Operate fiber-optic networks.

27% Operate wireless networks.

16% Operate traditional copper-based networks.

Land-Use Policy

Telecom Carriers

Property Owners

Government Network

Integrators

Public Infrastructure

Integrators

Telecom Carriers

Open Access Network

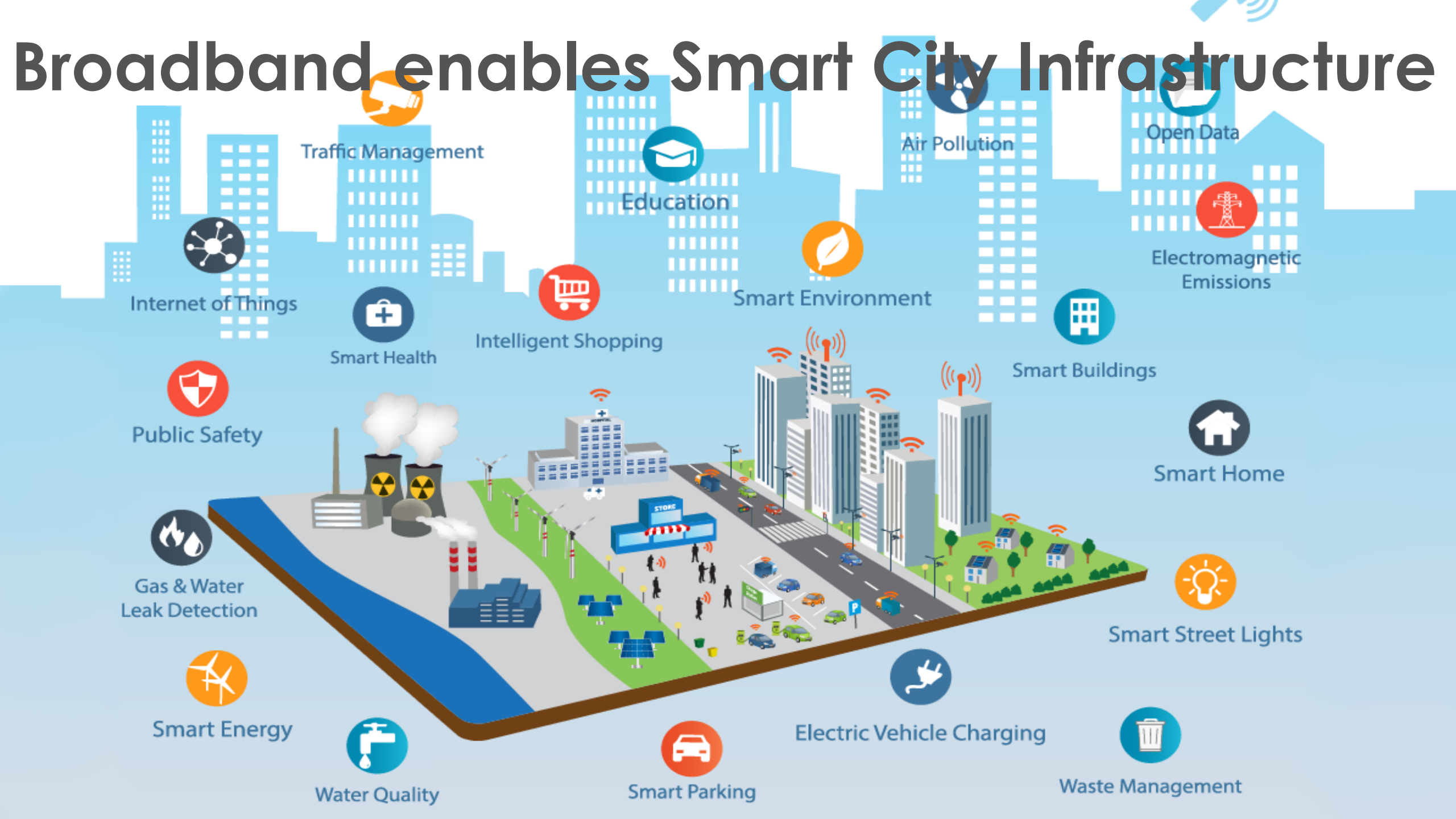
Integrators

Telecom Carriers

Direct Competition

Broadband Deployment

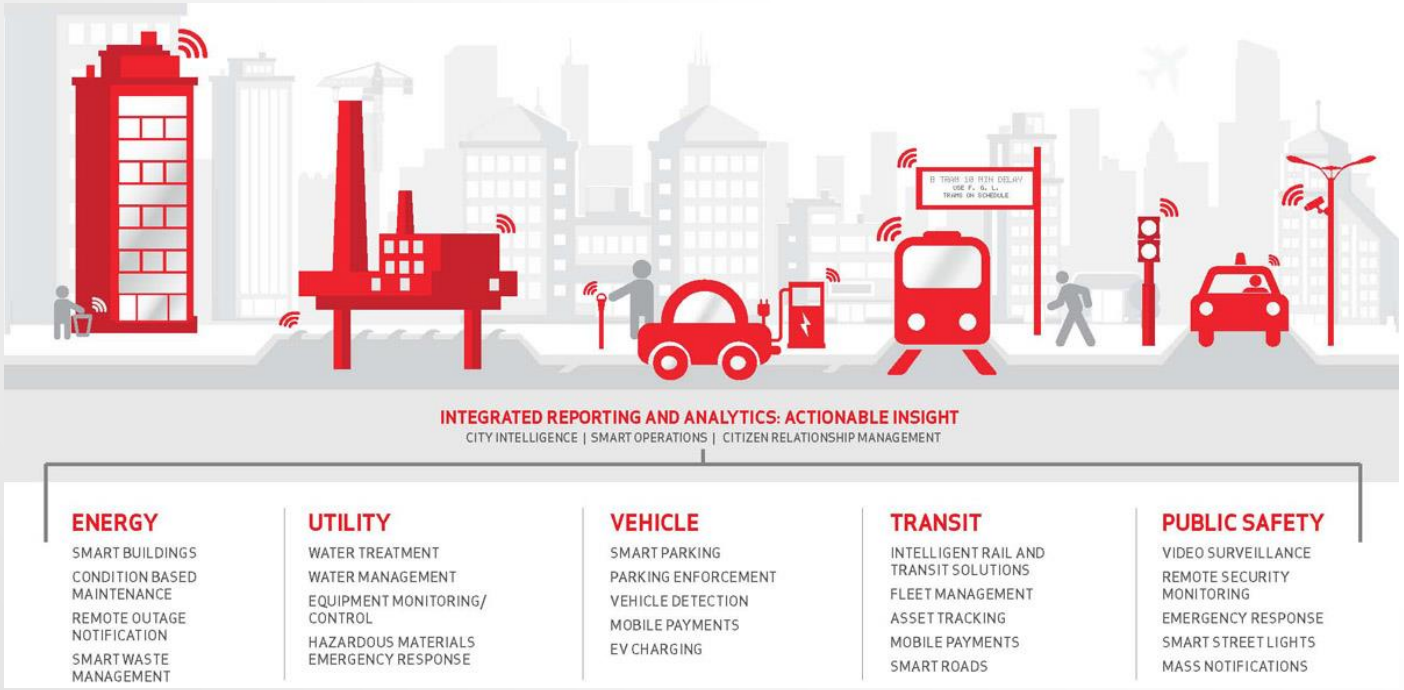
Broadband enables Smart City Infrastructure



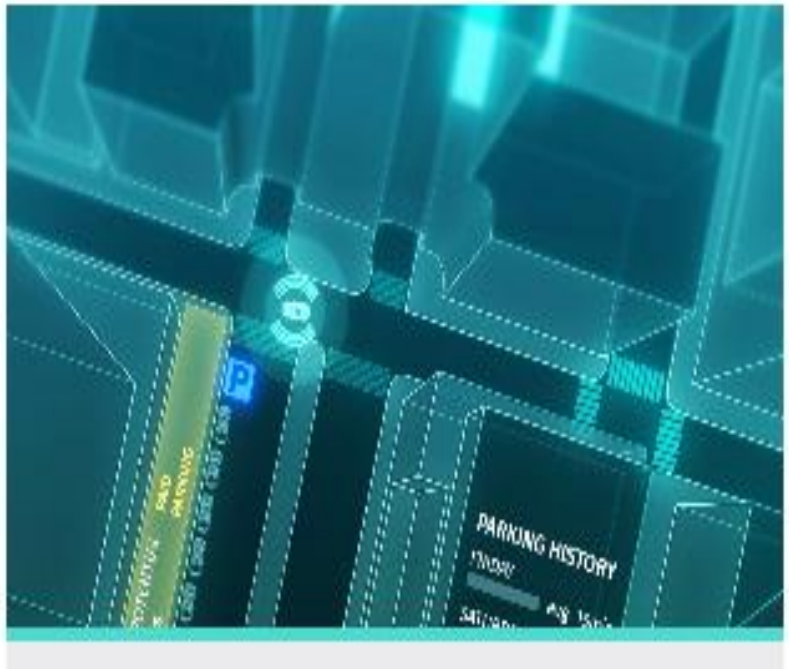
SMART INFRASTRUCTURE & DATA - KEY TO SMART COMMUNITIES

SMART CITIES

Focus on Infrastructure - Big Data / Predictive analytics for evidenced based decision making regarding urban assets, resources and sustainability.

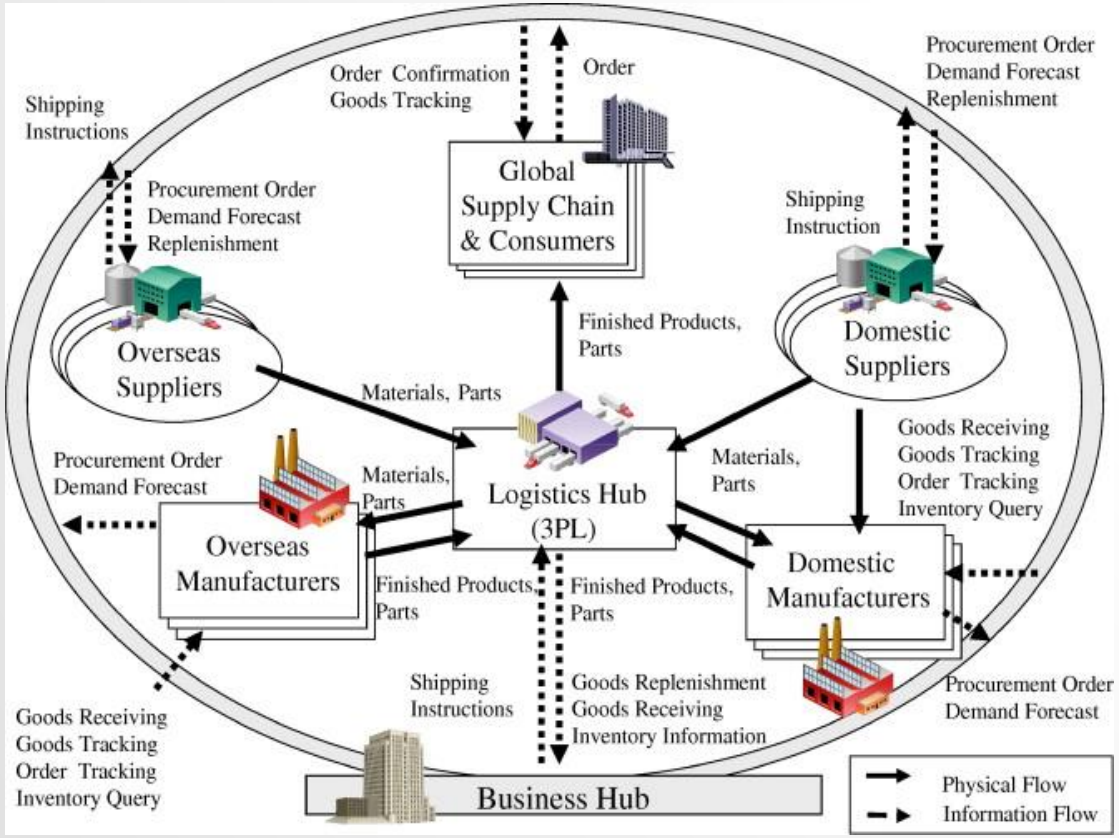


Thirty years ago, we set out to make paper maps in cars obsolete. Now we are taking the driving experience from hands-on to hands-off. Tomorrow, maps will morph into something else entirely -- when everything physical will become digital. ***We are no longer a map company, but a data company; one that is preparing for a world of increasingly autonomous machines.***




Vehicles: 6
Speeding: 0%
Moving: 0
People: 0
Photo
traffic: 19 inside: 2
MAC
traffic: 7 inside: 0
Disney
traffic: 27 inside: 8
Forever21
traffic: 10 inside: 0
car
car
van/truck
cab
cab
van/


the new state of logistics


Order Confirmation
Goods Tracking
Order
Procurement Order
Demand Forecast
Replenishment
Shipping
Instructions
Procurement Order
Demand Forecast
Replenishment
Global
Supply Chain
& Consumers
Shipping
Instruction
Finished Products,
Parts
Overseas
Suppliers
Domestic
Suppliers
Materials, Parts
Goods Receiving
Goods Tracking
Order Tracking
Inventory Query
Procurement Order
Demand Forecast
Materials,
Parts
Logistics Hub
(3PL)
Materials,
Parts
Overseas
Manufacturers
Domestic
Manufacturers
Finished Products,
Parts
Finished Products,
Parts
Shipping
Instructions
Goods Replenishment
Goods Receiving
Inventory Information
Procurement Order
Demand Forecast
Goods Receiving
Goods Tracking
Order Tracking
Inventory Query
Business Hub
Physical Flow
Information Flow


FedEx
FedEx
FedEx

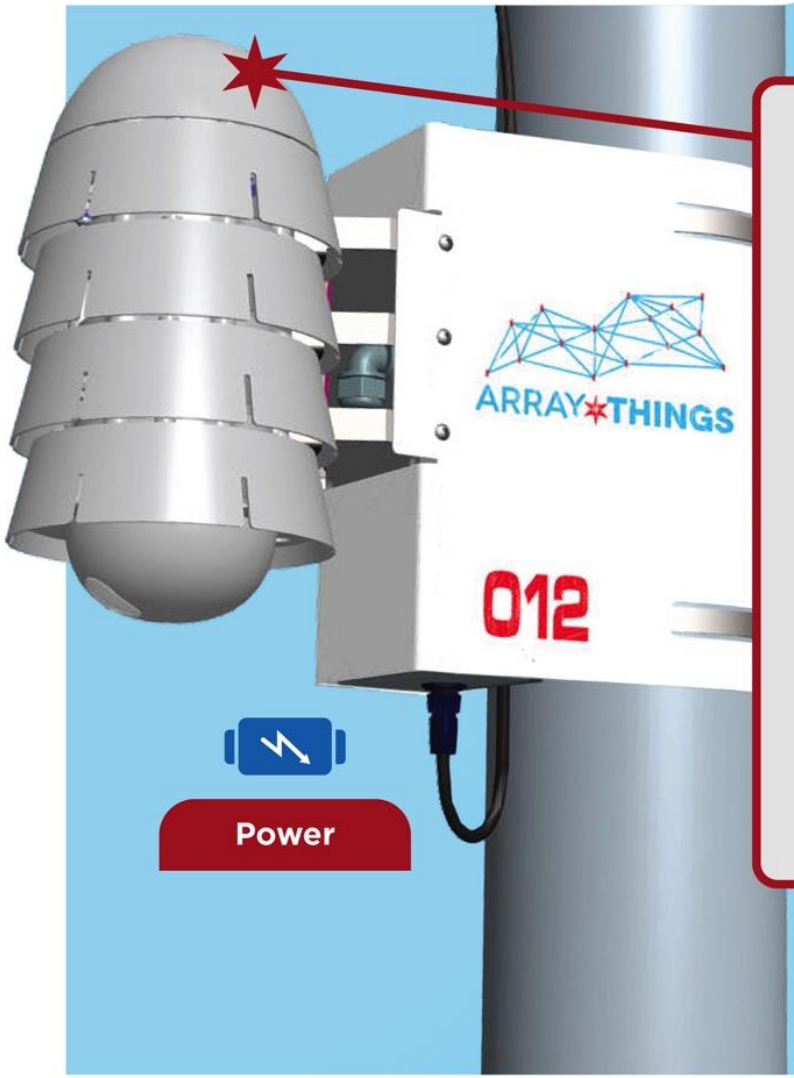
Enabling Technology / ITS

Intelligent Mobility Standards
Enforcement, road safety & security
Fleet Management,
PayAsYouDrive Insurance
Sensor based Parking
Road Pricing

Public Transport
Travel information
Traffic management
Autonomous Vehicles
Pedestrian areas Public Realm and Walkability
Bicycle pathways

Smart Cities – IoT and AI - World of Sensors, Beacons and Monitors Measuring Everything

ARCHITECTURE



Power

Node Components

Environmental Sensors

Air temperature, Humidity, Barometric Pressure, Vibration, Sound Intensity, Magnetometer

Air Quality Sensors

Nitrogen Dioxide, Ozone, Carbon Monoxide, Hydrogen Sulfide, Sulfer Dioxide

Light & Infrared Sensors

Light intensity, infrared (CLOUD COVER; SURFACE TEMPERATURE), camera, vehicle and pedestrian traffic. Images processed in-situ and discarded.

Linux Node Controllers

CPU CPU

Image Processing Computer & System Health Manager and Control/Communications Computer

Node Power Manager

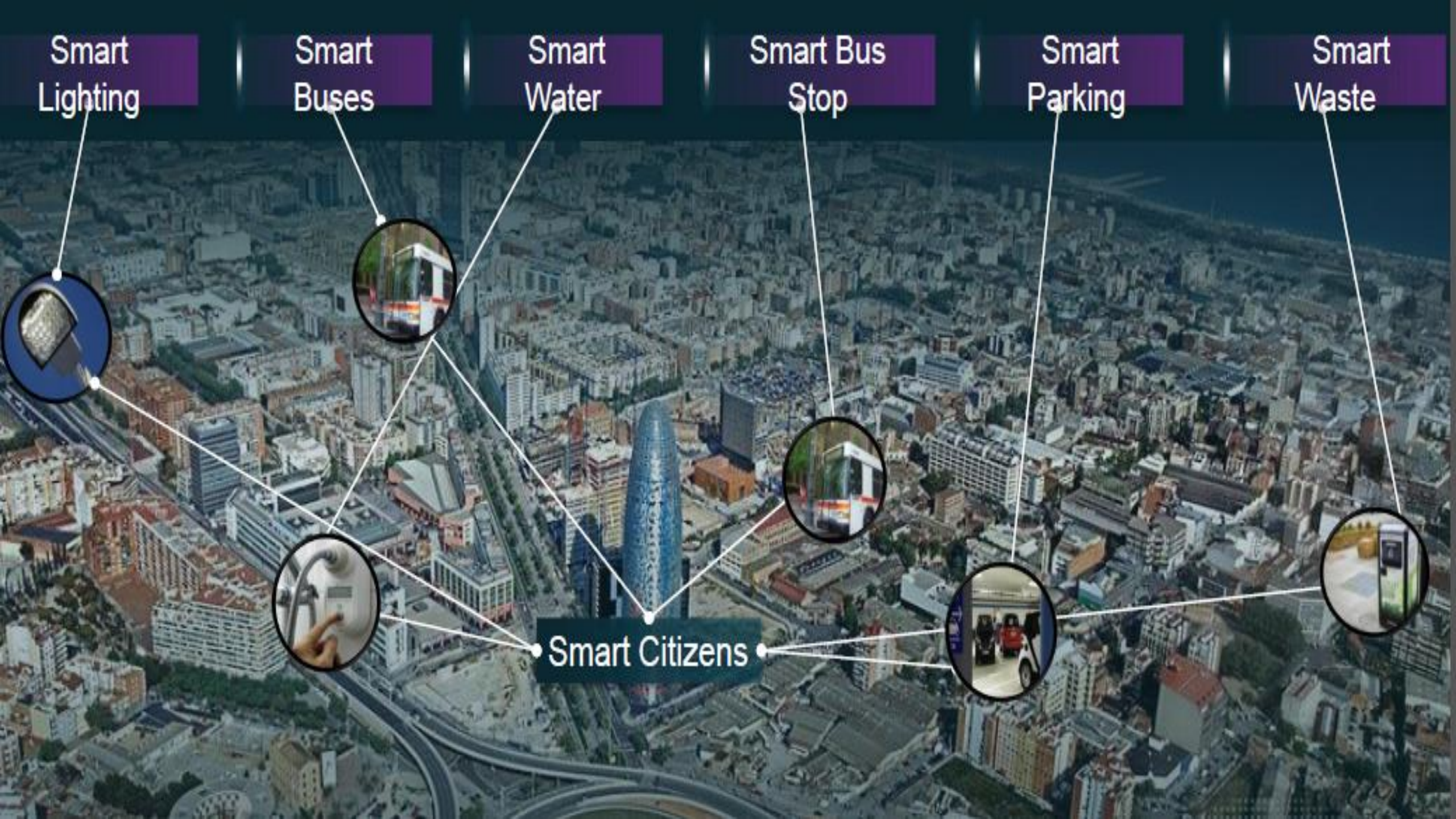
Node health monitoring and resilience functions

Argonne NATIONAL LABORATORY

Argonne Server

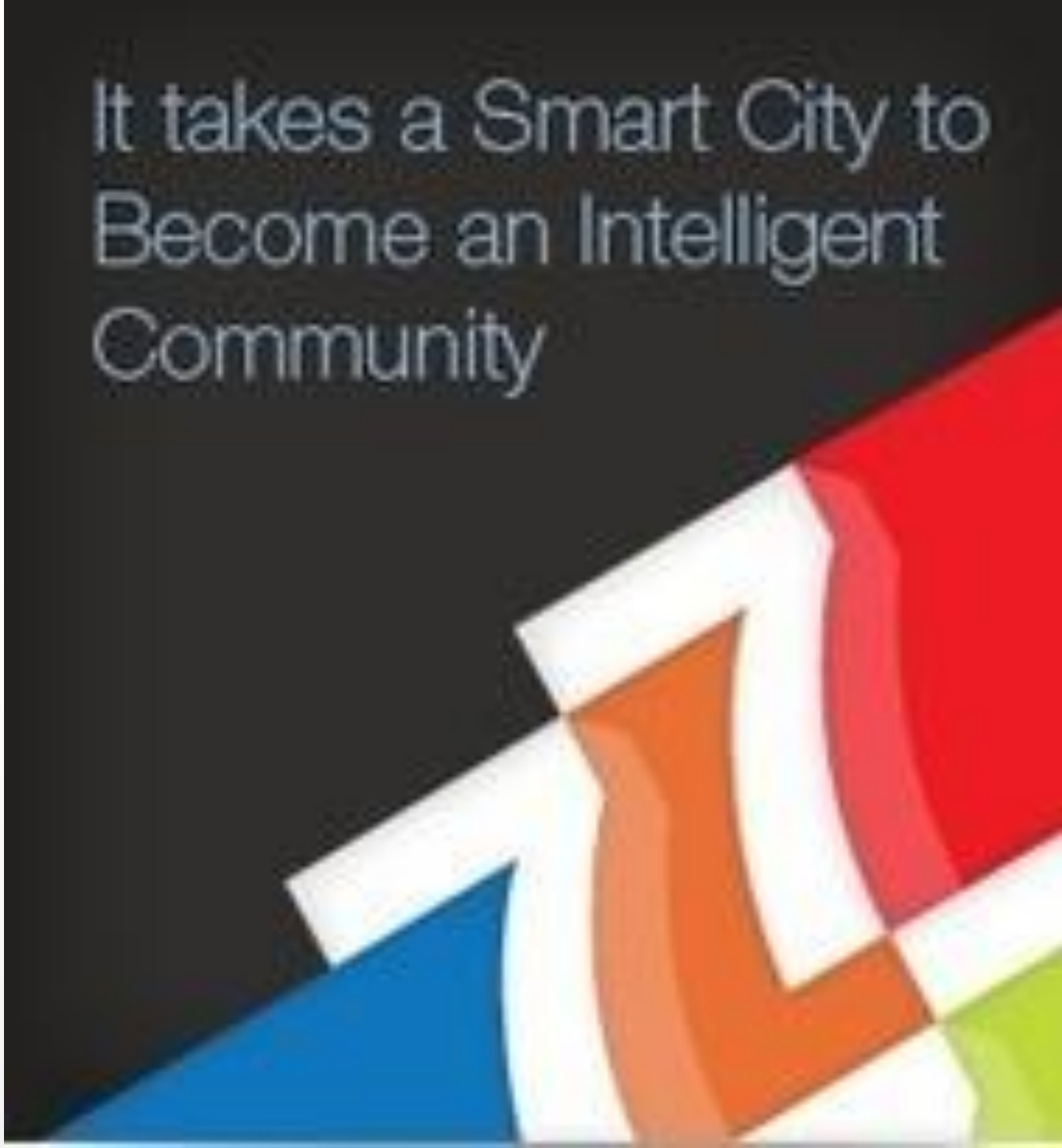
Plenario, Open Data Portals, Dashboards, and Apps

URBAN CENTER FOR COMPUTATION AND DATA


Smart Lighting
Smart Buses
Smart Water
Smart Bus Stop
Smart Parking
Smart Waste
Smart Citizens

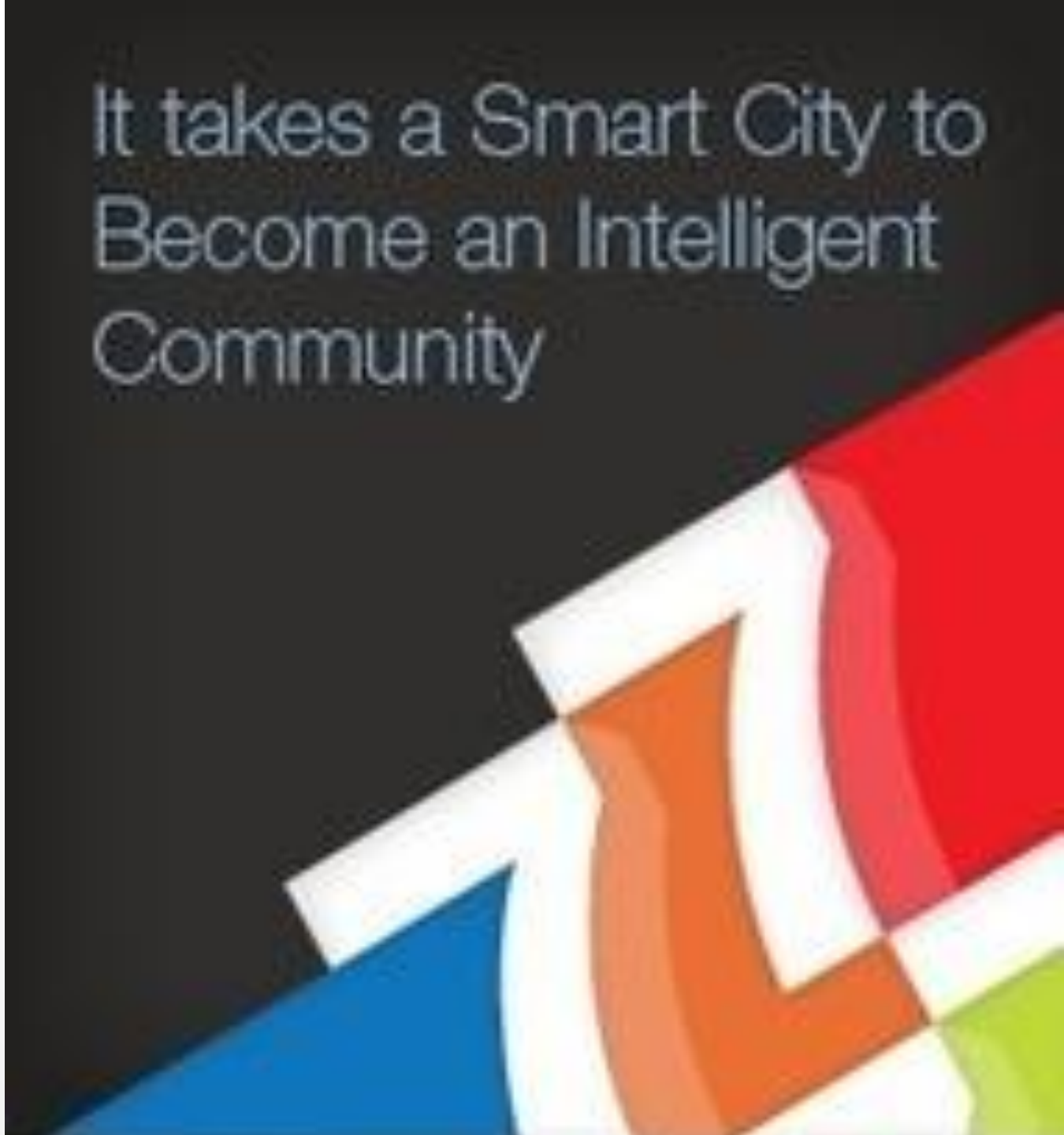
SMART VS INTELLIGENT

- Smart City Technologies make cities work better.
- Smart Cities leverage technologies to improve services
- Smart Cities use of Data to make informed decisions



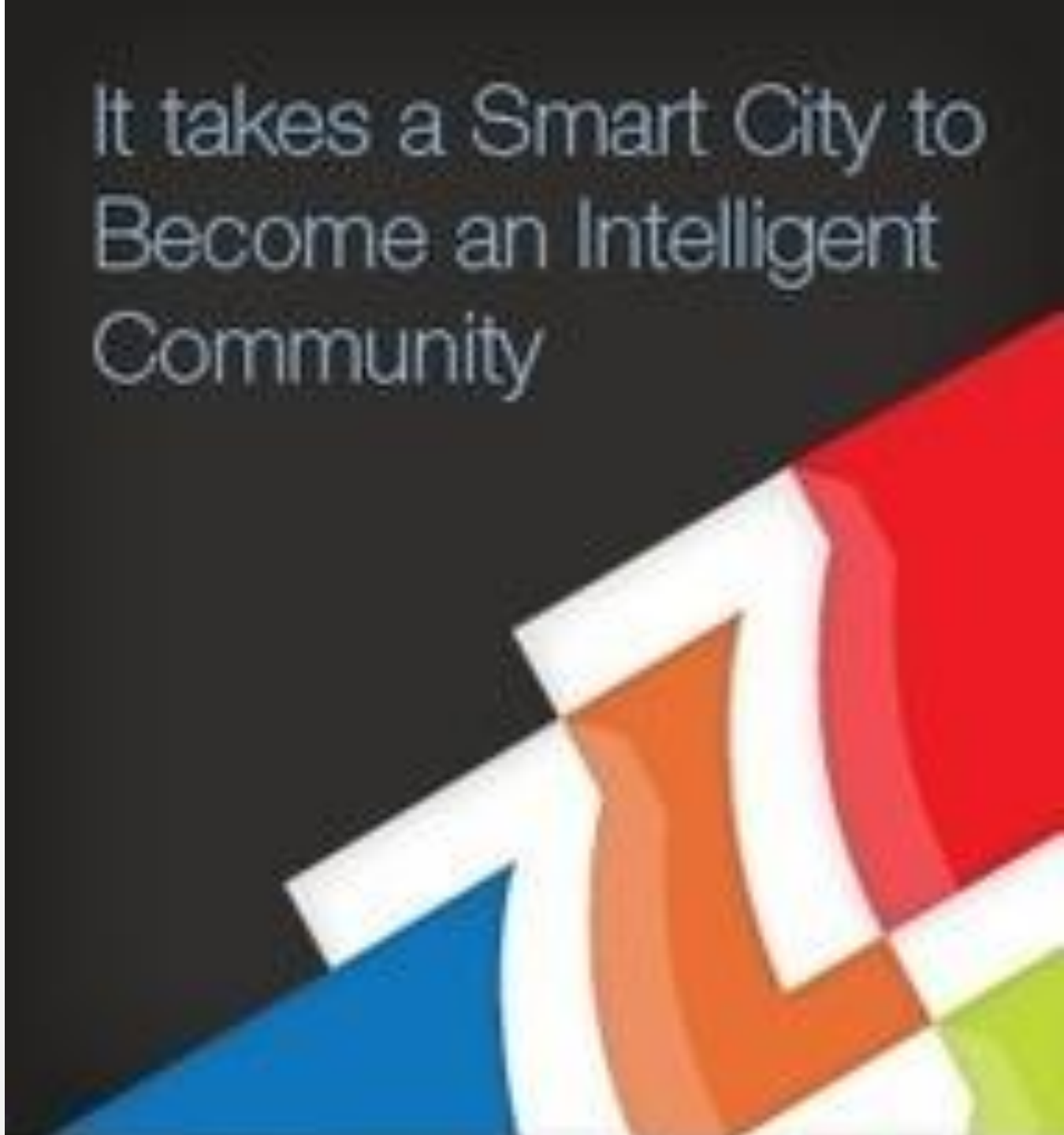
SMART VS INTELLIGENT

- Like Smart Cities, Intelligent Communities leverage technology to improve services and use data to inform decisions,



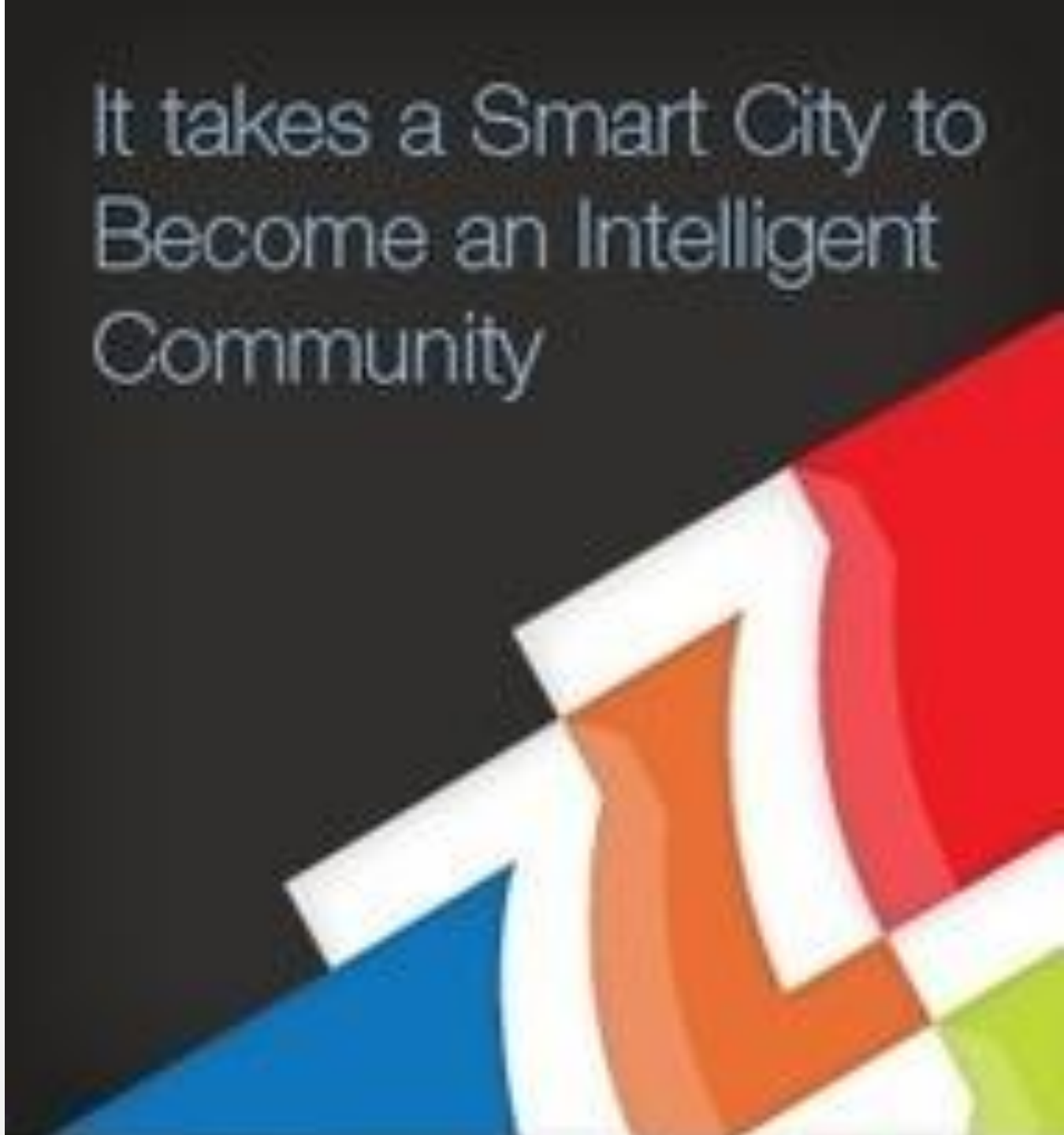
SMART VS INTELLIGENT

- Like Smart Cities, Intelligent Communities leverage technology to improve services and use data to inform decisions,
- But- Intelligent Communities do not focus on technology;
- its not the driver of solutions;
- rather people in the community drive solutions through innovation and creativity.



SMART VS INTELLIGENT

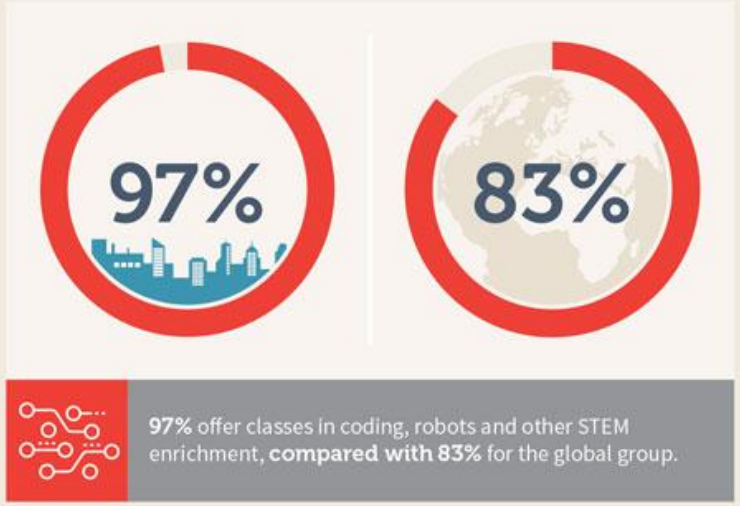
- Like Smart Cities, Intelligent Communities leverage technology to improve services and use data to inform decisions,
- But- Intelligent Communities do not focus on technology; its not the driver of solutions; rather people in the community drive solutions through innovation and creativity.
- **Intelligent Communities engage in open, citizen-centric and holistic strategies that create better cities where citizens and employers thrive and prosper in the broadband economy.**



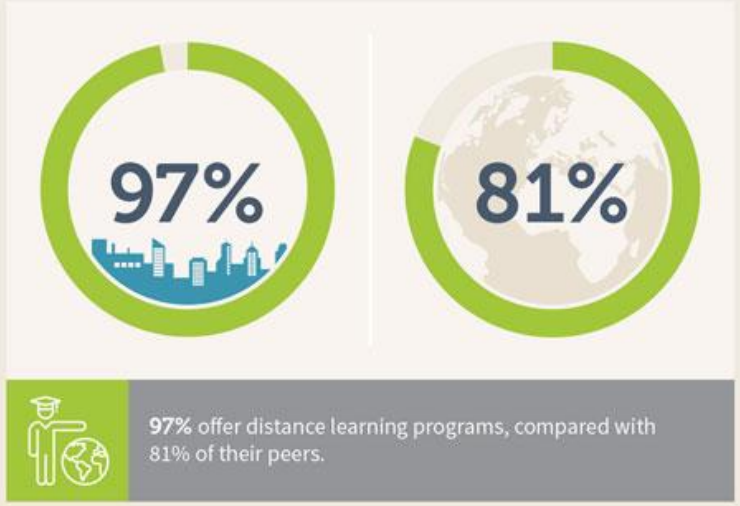
Talent is our No.1 operating priority and our most important asset.

Creating the Knowledge Workforce

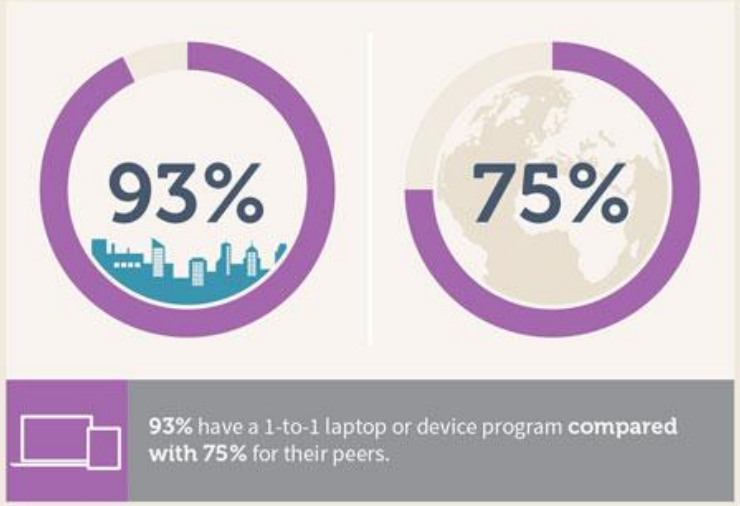
A knowledge workforce is a labor force that creates economic value through its knowledge, skills and ability to use information effectively. Success in the broadband economy requires the ability to create a workforce qualified to perform knowledge work from the factory floor to the research lab, and from the construction site to the call center or corporate headquarters.



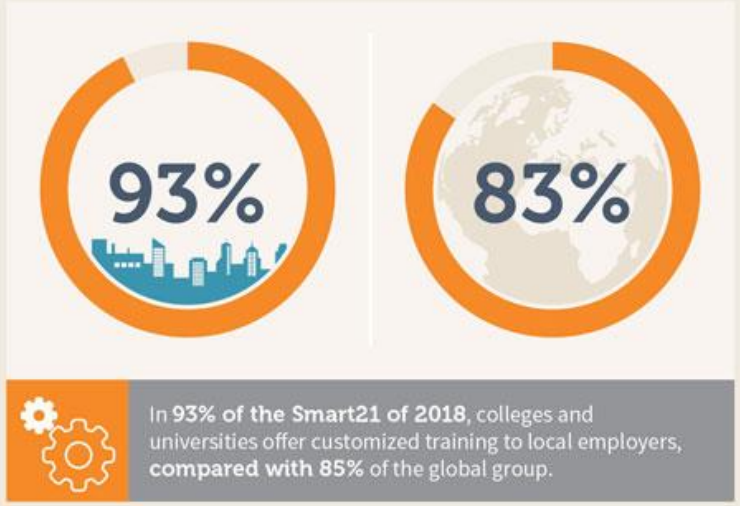
97% offer classes in coding, robots and other STEM enrichment, **compared with 83%** for the global group.



97% offer distance learning programs, compared with 81% of their peers.



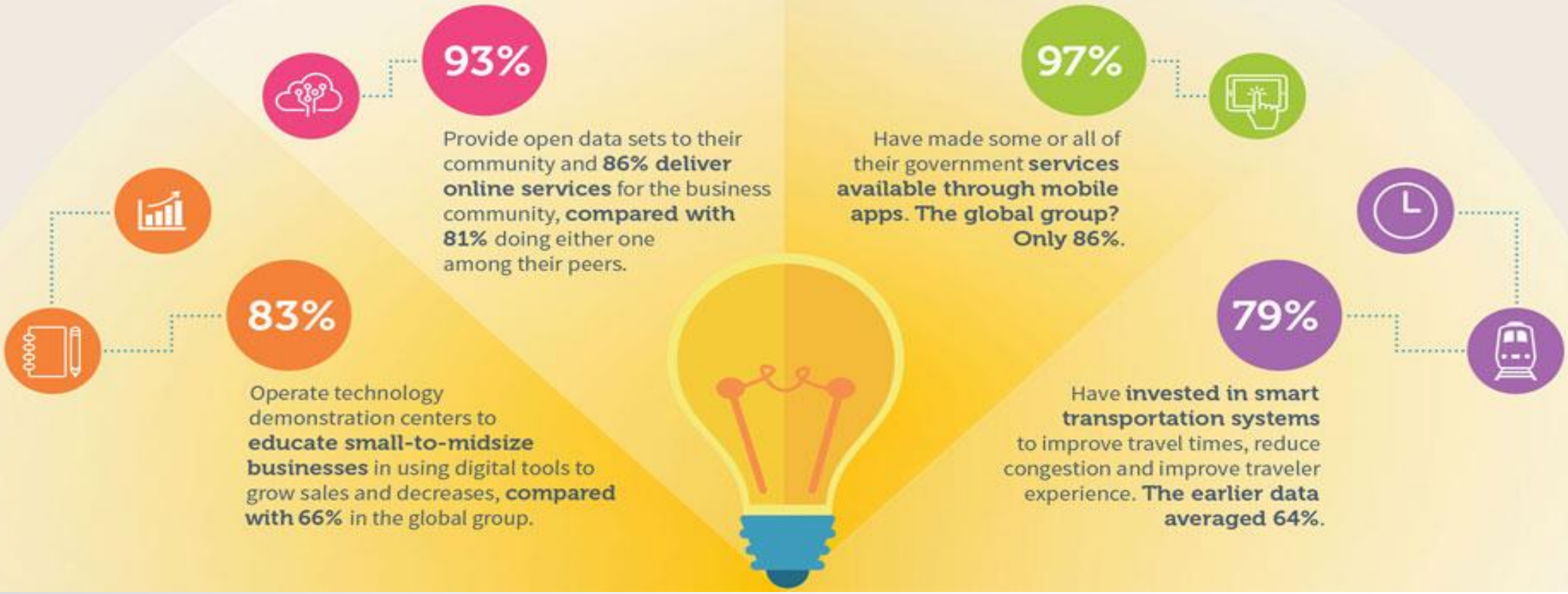
93% have a 1-to-1 laptop or device program **compared with 75%** for their peers.



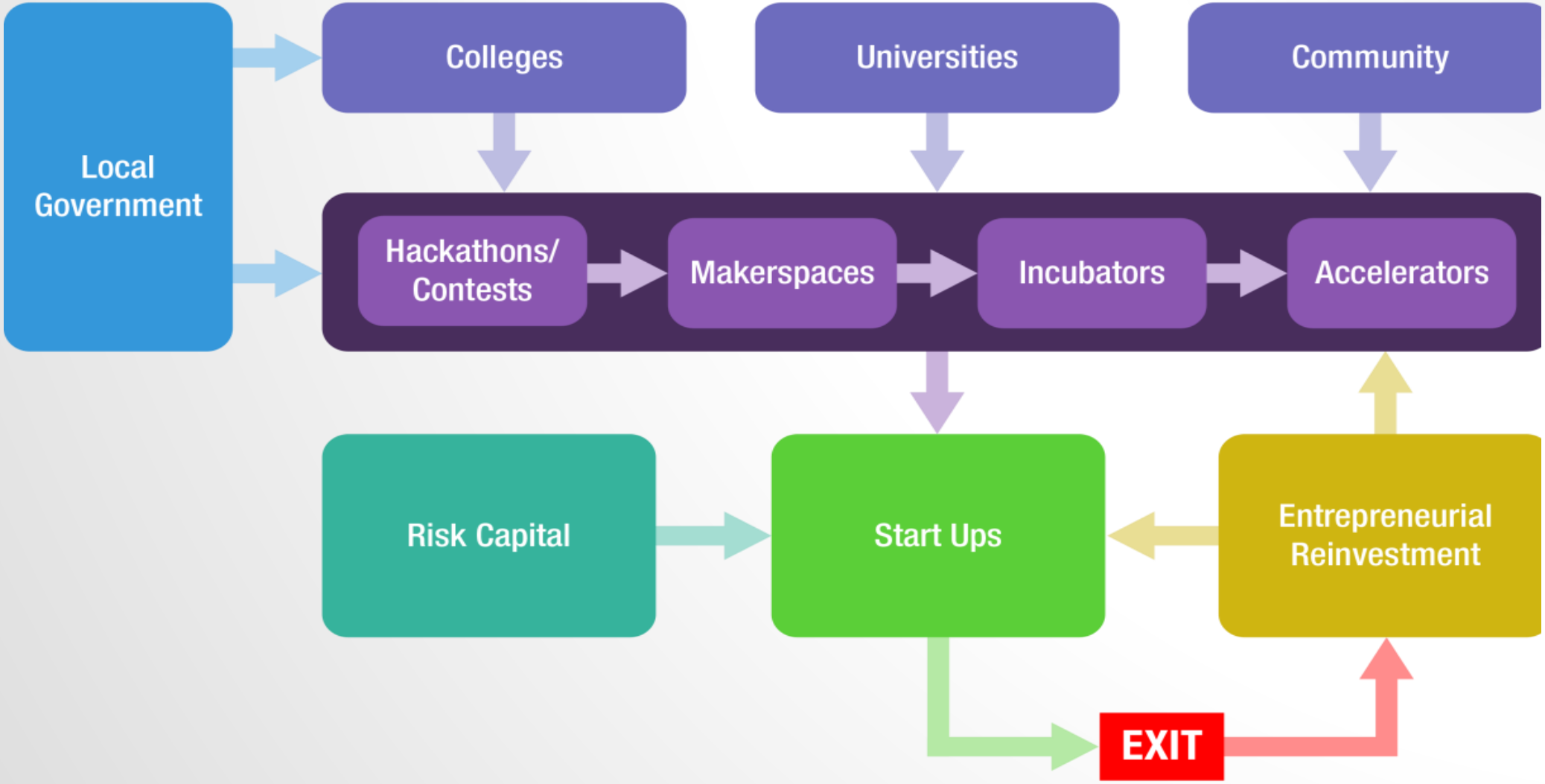
In **93% of the Smart21 of 2018**, colleges and universities offer customized training to local employers, **compared with 85%** of the global group.

Innovation

Innovation is the lifeblood of the modern economy. Intelligent Communities pursue innovation through a relationship among business, government and such institutions as universities and hospitals. This Innovation Triangle helps keep the economic benefits of innovation local, and creates a culture that engages the entire community in positive change. Investments in innovative technology by government also improve service to citizens while reducing operating costs, providing valuable support to a dynamic innovation ecosystem.



INNOVATION ECOSYSTEM



Digital Equality and Inclusion

As broadband deploys through a community, there is serious risk that it will worsen the exclusion of people who already play a peripheral role in the economy and society, whether due to poverty, lack of skills, prejudice or geography. **Intelligent Communities promote digital equality by creating policies and funding programs that provide everyone with access to digital technology and broadband**, offer digital skills training and motivate people to acquire those skills.

83% of the Class of 2018 offer free unscheduled tech support to residents in need of help, **compared with 70%** of the global group.

79% of the Class of 2018 have programs that work to create community champions among excluded groups, as models for others to follow, **compared with 54%** of the global average.

62% provide direct subsidies or discount programs for home access to broadband, **compared with 49%** from the global average.

Sustainability

Communities that use fewer resources to create products and provide services are more efficient and productive, which is key to continued improvements in standard of living. **Many if not most sustainability measures improve local quality of life, from cleaner air and water to improved public transportation and greater "livability."** Communities that make sustainability a shared goal typically engage organizations, community groups and neighborhoods in sustainability programs and activities. These contribute to civic pride, local identity and mutual understanding.

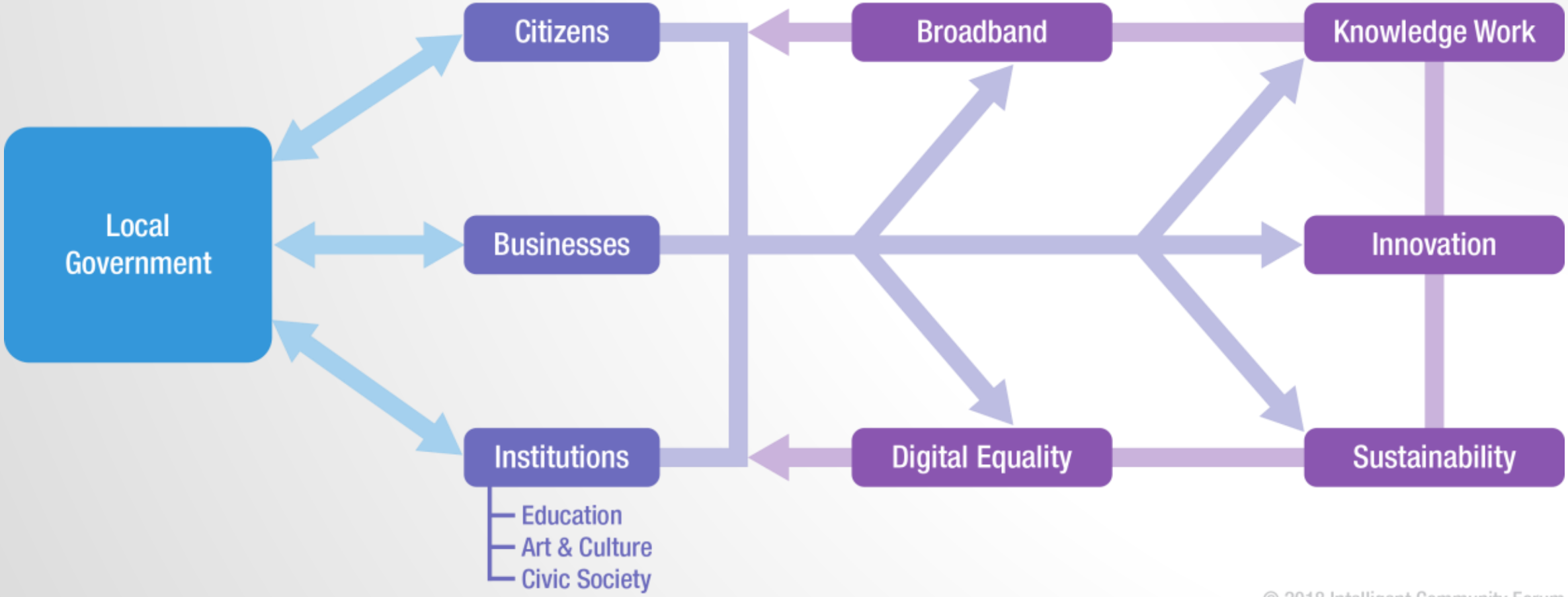
For the global average, only 36% of communities track the important measure of trips taken without an automobile. Rural communities are much less likely to track this measure because of how car-dependent their citizens are. But encouragingly, 55% of the Class of 2018 reported measuring this.

Advocacy

A community's citizens can be a barrier to progress, when they resist change, or can become its most powerful advocates for a better future. Advocacy is the slow and difficult process of building a common understanding of the challenges facing the community and a shared vision for overcoming them. **Intelligent Communities devote time and resources to educating and engaging their citizens, businesses and institutions as true partners in understanding challenges, identifying solutions and planning a better future.** Intelligent Communities are also good marketers to the outside world of their digital age advantages for economic development purposes.

The percentage of the **Smart21 that have developed a formal Intelligent Community growth strategy rose to 93% among the Class of 2018** from 87% for their global peers.

ADVOCATING FOR CHANGE



STRATFORD – A CASE STUDY OF AN INTELLIGENT COMMUNITY

BROADBAND/ Smart City Infrastructure

- Via leadership of Mayor - executed IT Digital strategy with great intensity.

- City-owned utility built out over 100-km open access fiber network with a Wi-Fi overlay

- Signed sales agreements with commercial carriers to deliver triple-play & mobile services.

- Network enabled Festival to significantly expand its online marketing

- Key role in the city's tourism strategy

- City has used the network to slash its own telecom costs and power a smart meter program.

- Created ubiquitous WiFi, key to attracting living lab opportunities re. IoT, VR, AV, AI, and other related initiatives- beta testing focus, especially re Autonomous Vehicles

STRATFORD – A CASE STUDY OF AN INTELLIGENT COMMUNITY

KNOWLEDGE WORKFORCE: Digital Media Campus

- Stratford established satellite campus of the University of Waterloo leveraging Shakespeare Festival and its digital content and media needs

- Province of Ontario $10 million
- OpenText $10 million
- Federal government $10.7 million under the Canadian Digital Media Network (CDMN)
- In 2013 $1.75 million in federal funding used to strengthen the Stratford Accelerator Centre over the next five years.

STRATFORD – A CASE STUDY OF AN INTELLIGENT COMMUNITY

Innovation Ecosystem

- **Having established an institution to produce digital media professionals, Stratford went on to create a home for innovators**

- outgrowth of the Waterloo Accelerator Center
- in-house mentors and entrepreneur-in-residence
- advise on finance, marketing, product development, manufacturing and other fields, as well as helping companies set milestones and execute against them.
- accelerator offers a 3-month program called Pathfinder, designed for developing ideas

- **With each addition to Stratford's ecosystem, the city's attractiveness to innovators has increased.**

STRATFORD – A CASE STUDY OF AN INTELLIGENT COMMUNITY

Economic Development / Branding

- test bed for technology projects: "city large enough to give new technologies a meaningful test but easy to operate in due to its small size".

- Brand names Toshiba, Cisco, BlackBerry, Inter-Op and Clemson University run pilots
- North American auto industry decline pushed unemployment in Stratford to 7.9% as the city lost 1,600 mostly low-skilled jobs in manufacturing.

  - But the city also gained hundreds of new jobs requiring ICT skills and has recently seen the revival of automotive related opportunities / Autonomous vehicles, etc.
  - For an economy in transition, these trends are a serious validation that STRATFORD is on the right track.

OLDS, ALBERTA – THE GIGABIT TOWN **SMART21 2018**

TURNING SMART CITIES INTO INTELLIGENT COMMUNITIES

Sidewalk Toronto; GOOGLE; Waterfront Toronto; City of Toronto; George Brown University; & Citizens

Privacy Issues wrapped in Urban Design

EXAMPLE

The Columbus DOT win gained momentum through being recognized by ICF as the Intelligent Community of the Year in 2015 because of its foundational work on broadband infrastructure, focus on neighborhoods, and a strong public-private partnership eco system."
Moez Chaabouni, Columbus Deputy CIO

Columbus (ICF 2015)

- $40 Million USD – DOT Smart City Transportation Challenge
- $140 Million USD overall initial matching
- Today over ½ Billion $ invested

Goals of the Smart Cities Challenge

- Realize outcomes for residents via measurable progress
- Empower communities to innovate
- Forge new partnerships and networks
- Spread the benefit to all Canadians - scalable and replicable across Canada.

Town of Bridgewater, NS $5M

Nunavut Communities $10M

City of Guelph and Wellington County, Ontario $10M

City of Montréal, Quebec $50M

Key areas of focus include

- smart technologies,
- data ownership,
- data management,
- privacy and security.


SMART CITIES
CHALLENGE
canada.ca/
transportandinfrastructure
Canada


SMART CITIES CHALLENGE
Community
Support Program
Canada


FUTURE CITIES CANADA
COMMUNITY
Solutions Network
COMMUNITY ROUNDTABLE
City of Kelowna
10 AM - 2 PM | October 25, 2019
Kelowna Downtown Library
Kelowna, BC
EVERGREEN
Infrastructure Canada
Canada


$10 MILLION PRIZE WINNER
CITY OF GUELPH AND
WELLINGTON COUNTY
SMART CITIES CHALLENGE

$10M FINALISTS
NUNAVUT COMMUNITIES

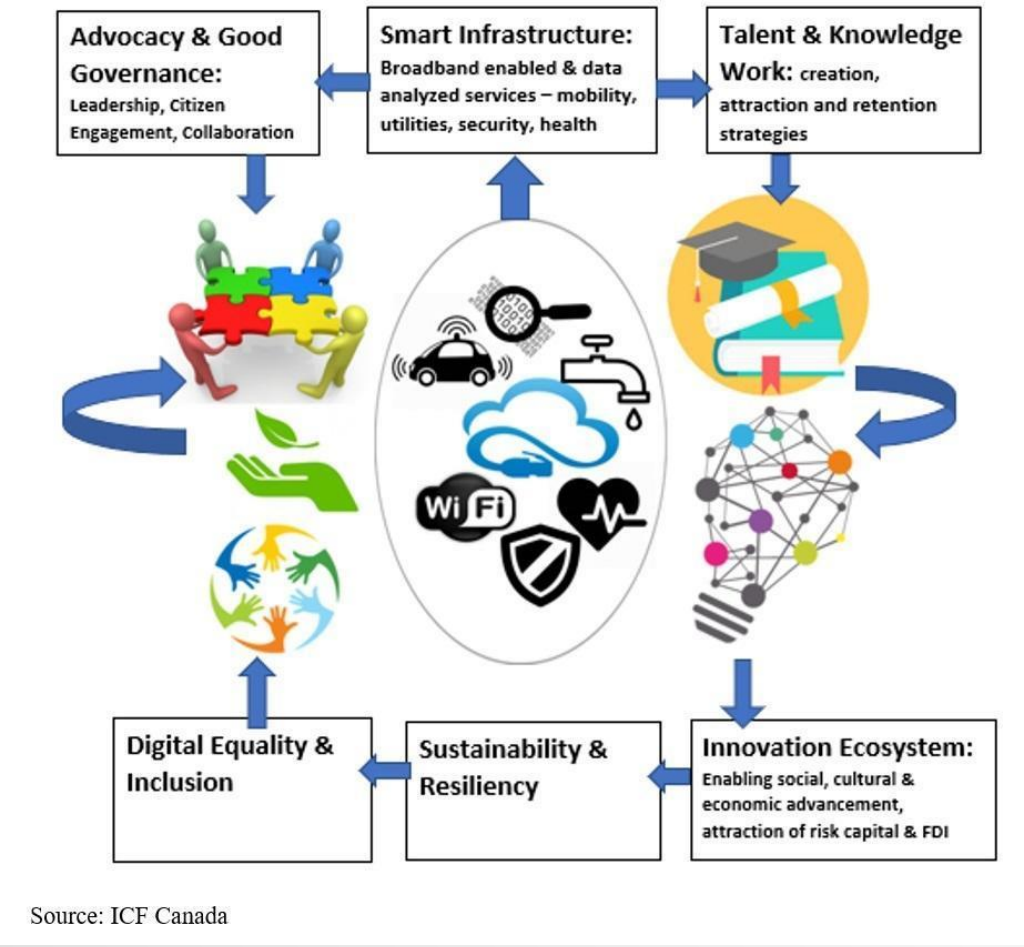

FUTURE CITIES
CANADA


$5 MILLION PRIZE WINNER
TOWN OF BRIDGEWATER
GAGNANT DU PRIX DE 5 M$
VILLE DE BRIDGEWATER
SMART CITIES CHALLENGE
DÉFI DES VILLES INTELLIGENTES
Canada


$50M FINALISTS
MONTRÉAL


FUTURE CITIES CANADA
COMMUNITY
Solutions Network
A Program of Future Cities Canada
ATLANTIC IDEA CAMP
In partnership with:
CANADIAN URBAN INSTITUTE
City of Mount Pearl
EVERGREEN
OpenNorth
With funding provided by:
Infrastructure Canada
Canada

TAKE-AWAY IN AN AGE OF UNCERTAINTY



Source: ICF Canada

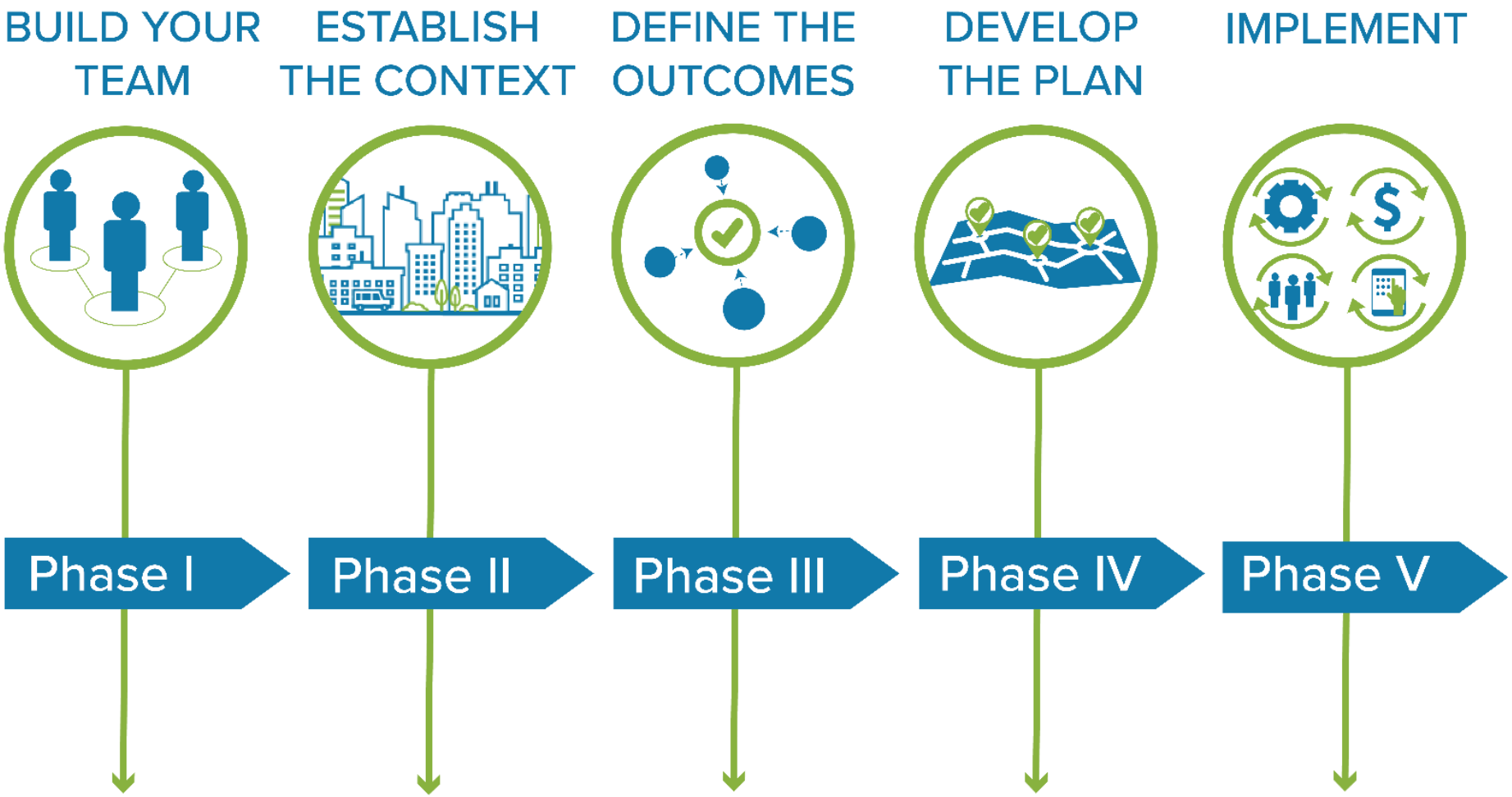
Holistic strategies that advocate open and citizen-centric approaches that are ethical, transparent and accountable such as advocated by organizations such as the Intelligent Community Forum (Canada), Canadian Urban Institute and Evergreen/Open North create better, more sustainable cities where citizens and employers thrive and prosper in the broadband-enabled and data-driven economy today.

Thank you!

John G. Jung
Chairman and Co-Founder
Intelligent Community Forum (ICF) &
President, ICFF &
ICF Canada Executive Director
www.intelligentcommunity.org
www.icf-Canada.com

jjung@intelligentcommunity.org


LSNetwork
SMART
PLANNING OUR
SMART CITIES
A BEST PRACTICES GUIDE FOR BUILDING OUR FUTURE CITIES
Prepared by the Canadian Urban Institute, June 2018
CANADIAN URBAN INSTITUTE


BUILD YOUR TEAM
ESTABLISH THE CONTEXT
DEFINE THE OUTCOMES
DEVELOP THE PLAN
IMPLEMENT
Phase I
Phase II
Phase III
Phase IV
Phase V

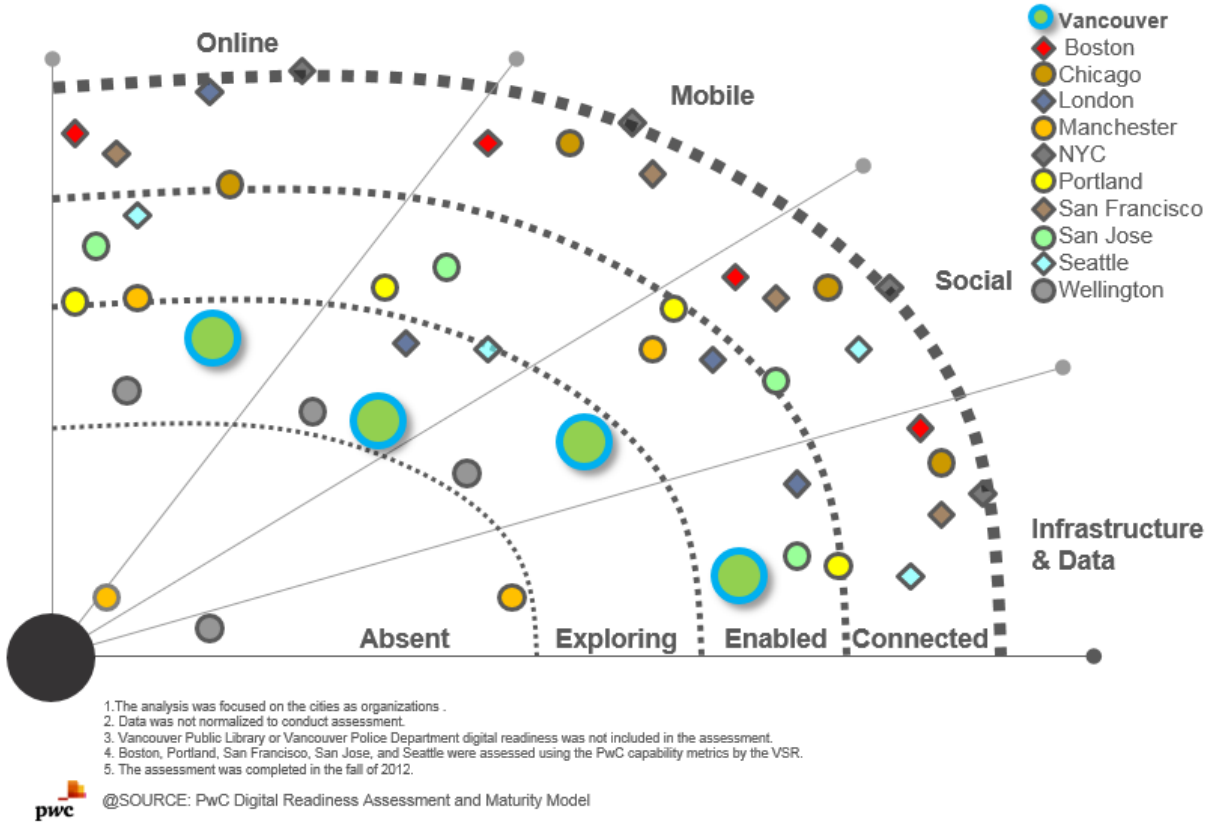

ECONOMIC OPPORTUNITY
Thriving local economy fostering innovation & competivieness
MOBILITY
Move freely throughout the community
EMPOWERMENT & INCLUSION
All residents have the opportunity to participate in the community
DATA & CONNECTED TECH
High speed broadband
Open data
Digital inclusion & data security
HEALTHY LIVING & RECREATION
Opportunities that encourage & support healthy & active life
SAFETY & SECURITY
Safe & secure environment for all residents
ENVIRONMENTAL QUALITY
Achieving a healthy & sustainable environment

BUILD YOUR TEAM

- List of potential collaborators & stakeholders
- Mayor & council support & engagement
- Smart City Master Plan Team and Champion
- Knowledge sharing groups
- Global partners

ESTABLISH THE CONTEXT

- Current state & digital maturity level
- Community engagement plan
- List of major community needs
- List of existing strategic priorities
- Defined SCMP objectives for the
- List of available data and gaps



http://vancouver.ca/files/cov/City_of_Vancouver_Digital_Strategy.pdf

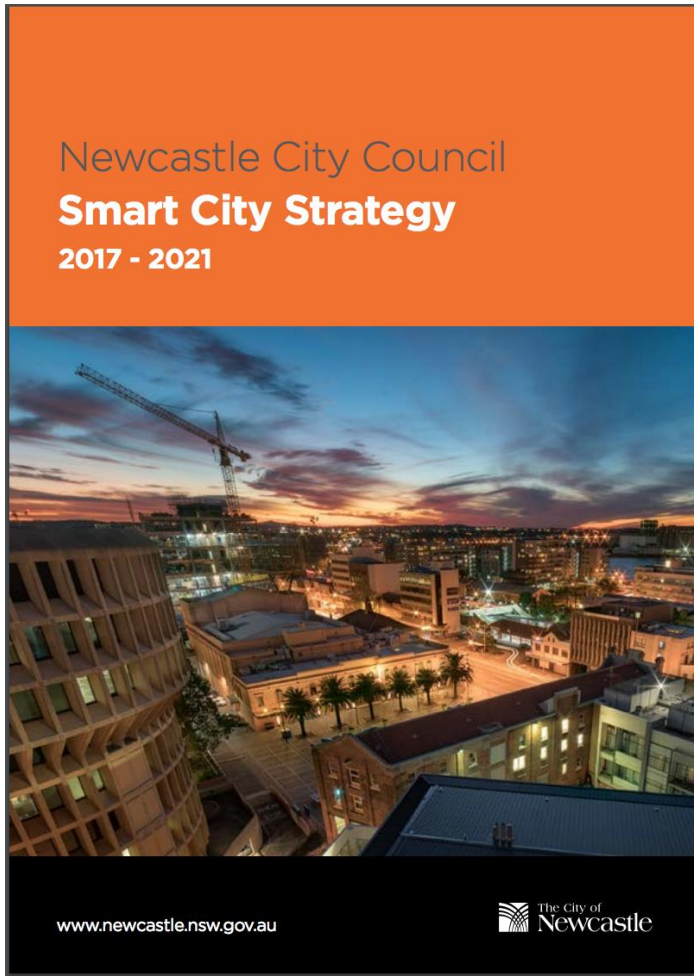
DEFINE THE OUTCOMES

- List of desired outcomes of the Smart City Master Plan
- List of available technology solutions to help achieve the outcomes

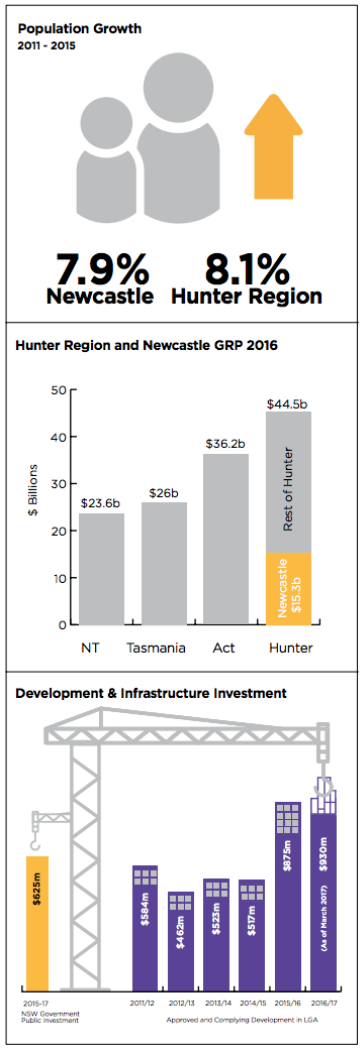
https://www.edmonton.ca/city_government/documents/PDF/Smart_City_Strategy.pdf

DEVELOP THE PLAN

- The local context
- Vision and mission statements
- Roadmap to desired outcomes
- Evaluation framework with KPIs and baselines
- Approach to overcome challenges of smart city planning



https://www.newcastle.nsw.gov.au/getmedia/392db4be-d418-48d8-a593-7a17a4b482bb/2752_Smart-City-Strategy-FINAL-WEB.aspx



DEVELOP THE PLAN

St. Albert's action plan:

Strategy & Action	Policy Link	Estimated Timing	Estimated Cost	Funding Source
F.1 Civic Sensor Array & Connected Assets				
F.1.1 Civic Sensor / IOT Array	N	Short (+)	$$$A	Project Charter(s)
F.1.3 Vehicle and Asset Tracking	N	2016 (+)	-	Existing Resources
E.2 Emergency Response & Safety Technologies				
E.2.3 Crime Analytics & Surveillance	Y	Med (+)	$$	Bus Case / Proj Charter
E.2.4 RCMP Pilot Community	N	Short (+)	-	Staff Time & External

- Estimated Cost: New financial investment required by the municipality to support the proposed action.
  - $ = < $50k; $$ = $50k – $100k; $$$ = $100k - $1M; $$$$ = > $1M.
  - A = potential for partnerships and/or grants which could significantly reduce municipal capital or operating cost over time.
  - B = potential for revenue generation which could significantly reduce municipal capital or operating cost over time.

https://stalbert.ca/dev/smart/masterplan/

IMPLEMENT

- Implementation by strategy
- Funding and financing
- Solution procurement
- Monitoring and communication
- Embedded smart

Photo credit: Nao Okawa on Flickr

Smart Planning for Smart Cities

LSNetwork

CANADIAN URBAN INSTITUTE

Geneva Starr
Canadian Urban Institute
gstarr@canurb.org
416-365-0816 x 257

www.lsnetwork.org
@LSNetworkCA

Thank You!

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www.lsnetwork.org

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