

Alaska Smart Communities Forum

Perspectives from San Jose

November 2019

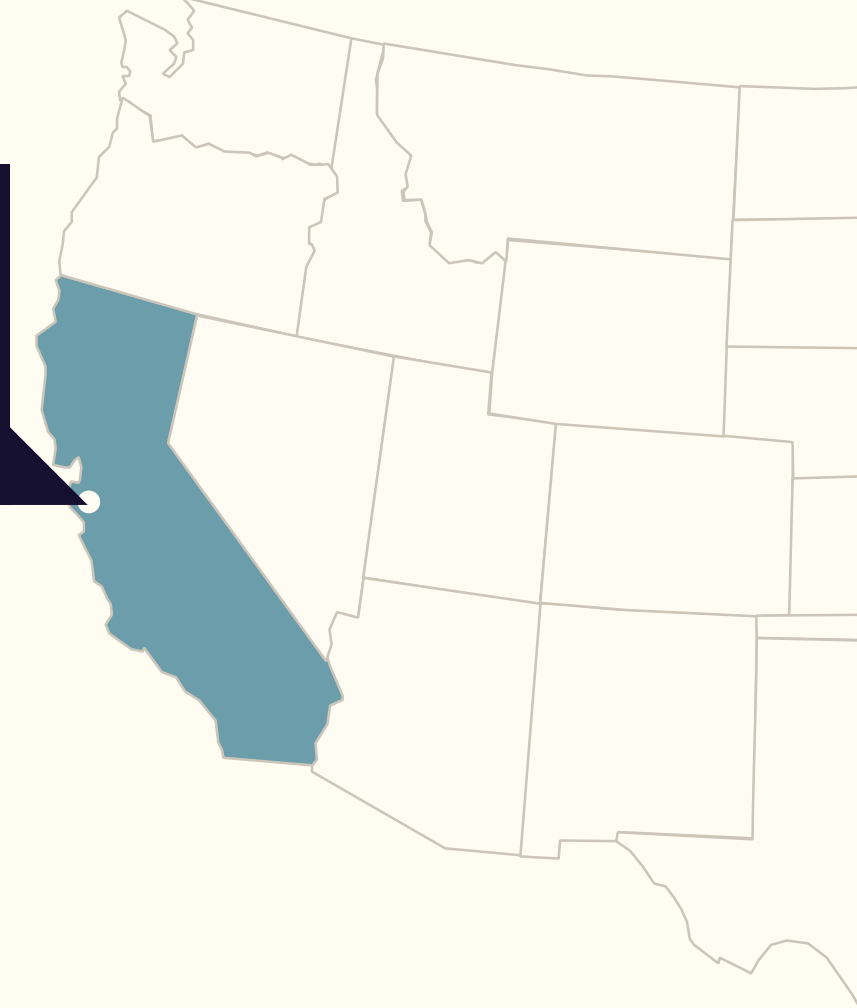
Rob Lloyd, Chief Information Officer



San Jose, California

1 million residents

10th largest city in the US



A diverse valley of opportunity...

1/3 Asian, Latino, White

10% Vietnamese

57% speak other language at home

39% born outside the United States

41% have a bachelor's degree or higher

\$1,066,800 median home price

28% households make less than \$50k

100s Tech HQs Cisco, Adobe, eBay, PayPal, sgi, zoom, TiVo, Polycom, Xactely, pinger



1,000,000 residents

A staggering range of local government services...

11.5 million airport passengers per year
9.2 million library items checked out
565,000 police emergency calls per year
69,000 streetlights
38,000 building permits
3,500 acres of parkland
3,000 fires per year
2,400 miles of streets
178 zoo animals



6,200 employees



San José Smart City Vision

Just as the world looks to Silicon Valley to provide the most creative, impactful technologies to disrupt industries and transform lifestyles, so too can San José become a global leader for civic innovation. Becoming a “smart city” means that game-changing technologies and data-driven decision-making will drive continuous improvement in how City Hall serves our community, and to promote concrete benefits in safety, sustainability, economic opportunity, and quality of life for our constituents.

- Mayor Sam Liccardo

2016

Imperative to Innovate

Strategy:
None

TRADITIONAL GOVERNMENT

Customer Experience

Paper and In-Person
Often Frustrating

INEFFICIENT

Process

Often Not Documented
Sometimes Nonexistent
Frequently Inconsistent

OUTDATED

Technology

Decade of Disinvestment
Archaic Legacy Systems
Security Risk
Closed Systems

EXHAUSTED

People

Demotivated by Cuts and Struggle

As innovative as
the community
we serve

2020 Innovation in Action

Strategy: Roadmap

DELIGHTFUL

Customer Experience

Easy
Responsive
Digital
Mobile

AGILE

Process

Champion the Customer
Learn from Data
Iterate to Improve

ENABLING

Technology

Modern Platform
Data Architecture/Open APIs
Secure Resilient Systems

ENGAGED

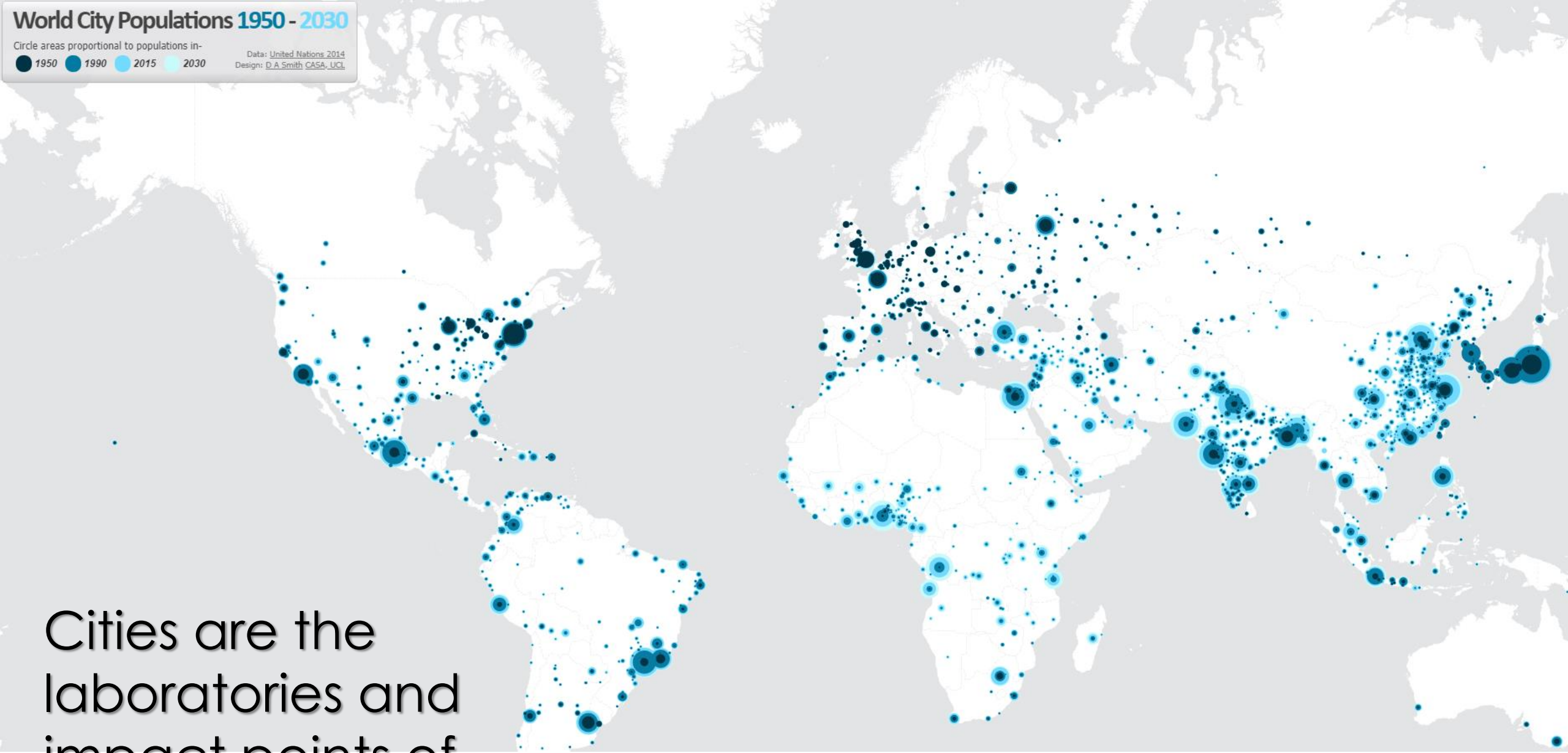
People

Empowered to Take Action
Digitally Fluent
Network of Partners

World City Populations 1950 - 2030

Circle areas proportional to populations in-

Data: [United Nations 2014](#)
Design: [D.A. Smith](#) [CASA](#), [UCL](#)



Cities are the
laboratories and
impact points of
technology

Smart monitors and controls across all aspects of city life are set to transform the urban landscape

- Transport
- Environment
- Buildings
- Infrastructure
- Utilities
- Life

01 GREEN BUILDINGS
Rooftop gardens or vegetation on the side of buildings to help insulation, absorb CO₂ and produce oxygen

02 BUILDING MANAGEMENT
Automation and optimisation of services such as heating, energy usage, lighting and ventilation

03 PERIMETER ACCESS CONTROL
Controlling access and monitoring of restricted areas with CCTV, intruder detection and alarms

04 ROOFTOP WIND TURBINES
Wind turbines built on top of high-rise buildings or integrated into the building design itself

05 AIR POLLUTION CONTROL
Controlling CO₂ emissions of factories and monitoring car pollution

06 BUILDING-INTEGRATED PHOTOVOLTAICS
Solar panels integrated into the building fabric to replace conventional materials

07 SMART GRID
Energy consumption monitoring and management

08 CHEMICAL LEAKAGE DETECTION
Detecting leakages and waste of factories in rivers

09 REAL-TIME UPDATES
Instant traffic updates sent to smartphones to help route-planning and avoid congestion

23 FIRE SAFETY
Fire detection and intelligent extinguishing tailored to each room

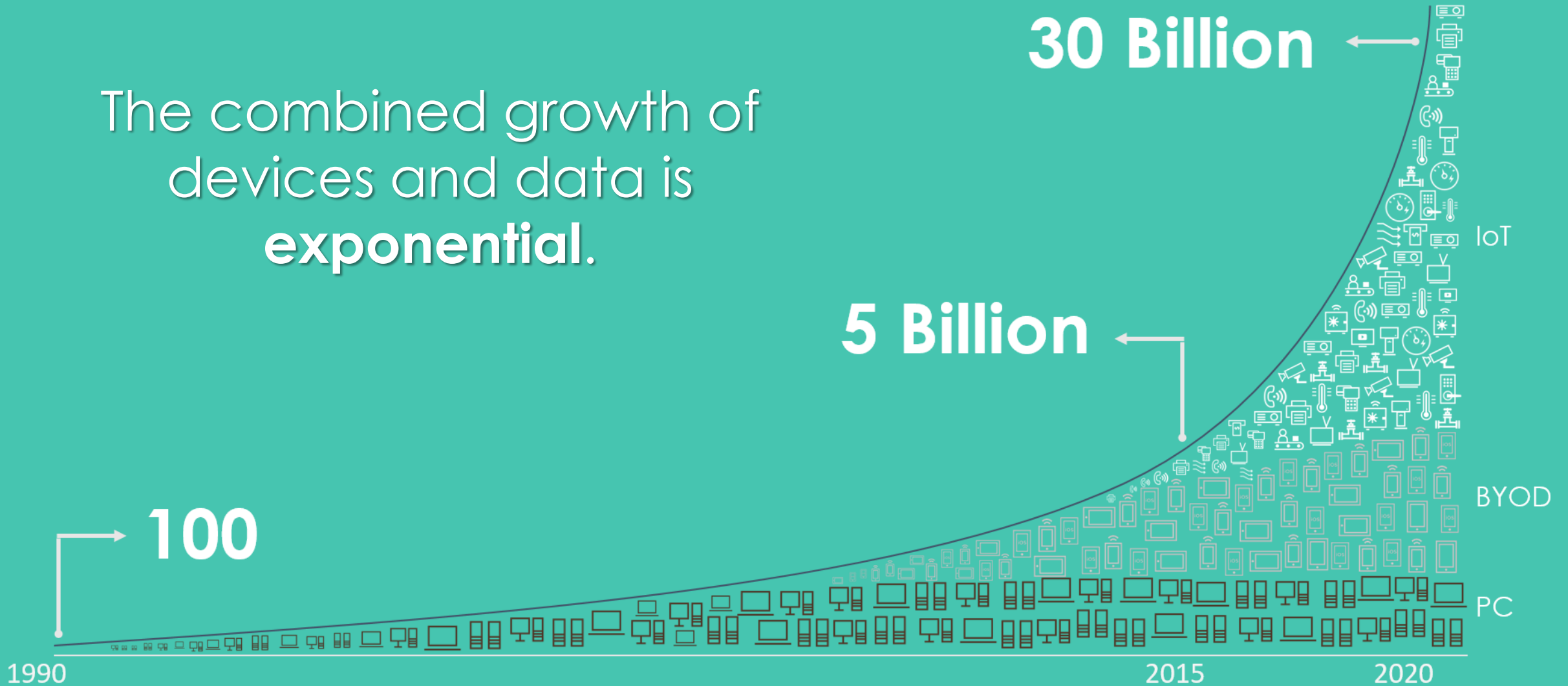
22 STRUCTURAL HEALTH
Monitoring vibrations/material conditions in buildings and infrastructure

21 ELECTRIC TRANSPORT
Electric vehicles and public transport, with charging stations across the city



The World is in More Connected

The combined growth of devices and data is **exponential.**

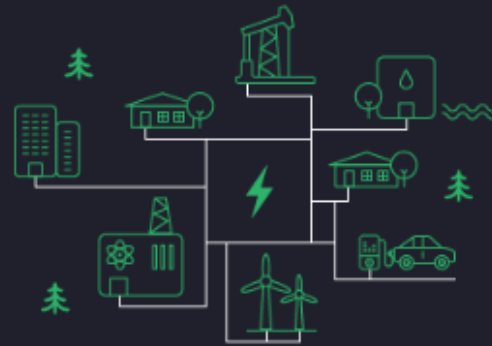


Cross-Domain + Intelligent Possibilities

Advent of low-cost sensors/processors + ubiquitous high-speed communications networks + yottabyte-class data storage and processing make new approaches possible.



SMART FARMING



SMART ENERGY



SMART MANUFACTURING



SMART CITIES

But Communities are More Isolated



Equity versus Economic, Physical and Digital Isolation

- +/- 15 Years of Life
- Health & Illness
- +/- \$1M Lifetime Income
- Heightened Tribalism

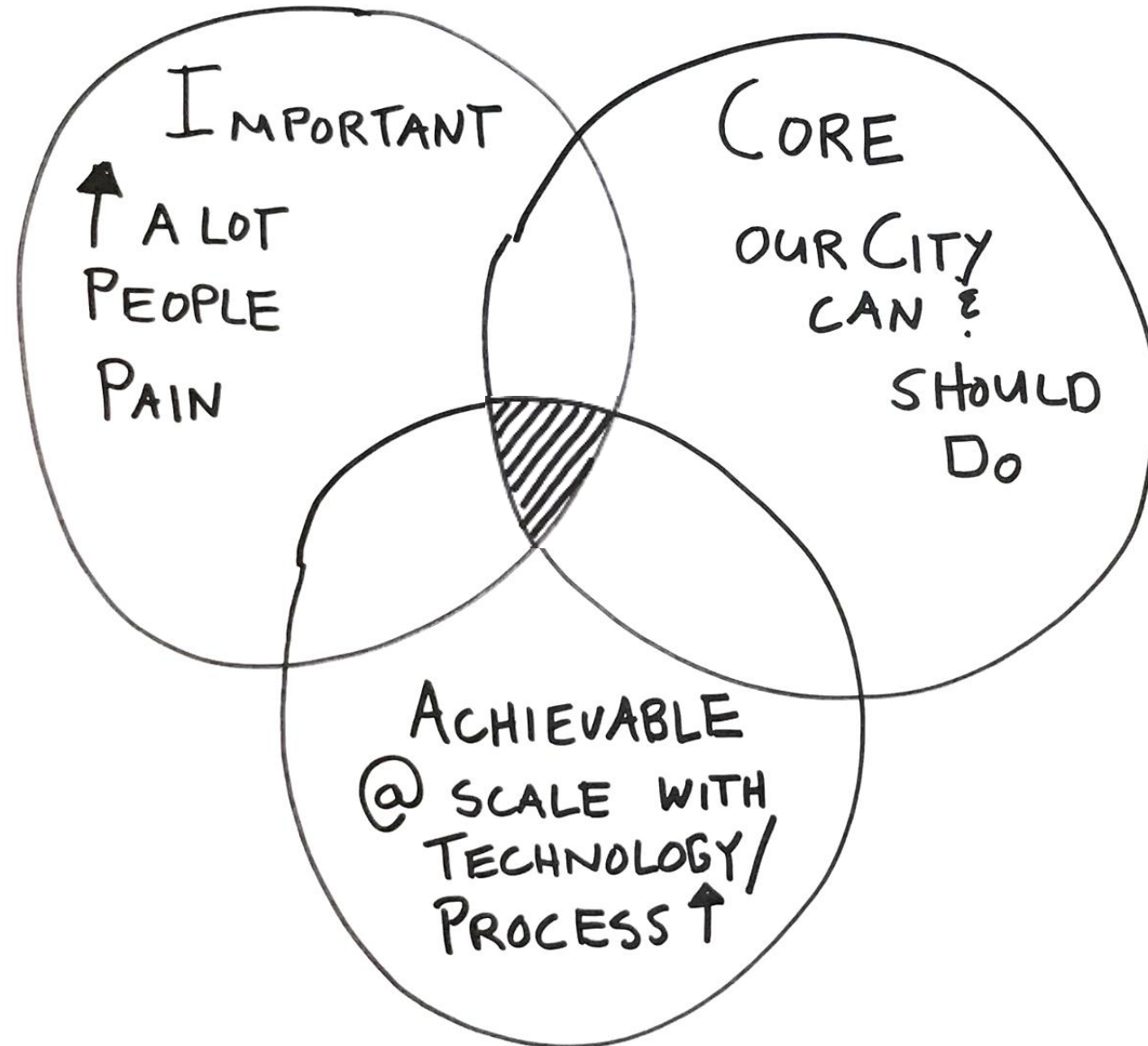
**WHAT are the things
we focus on?**

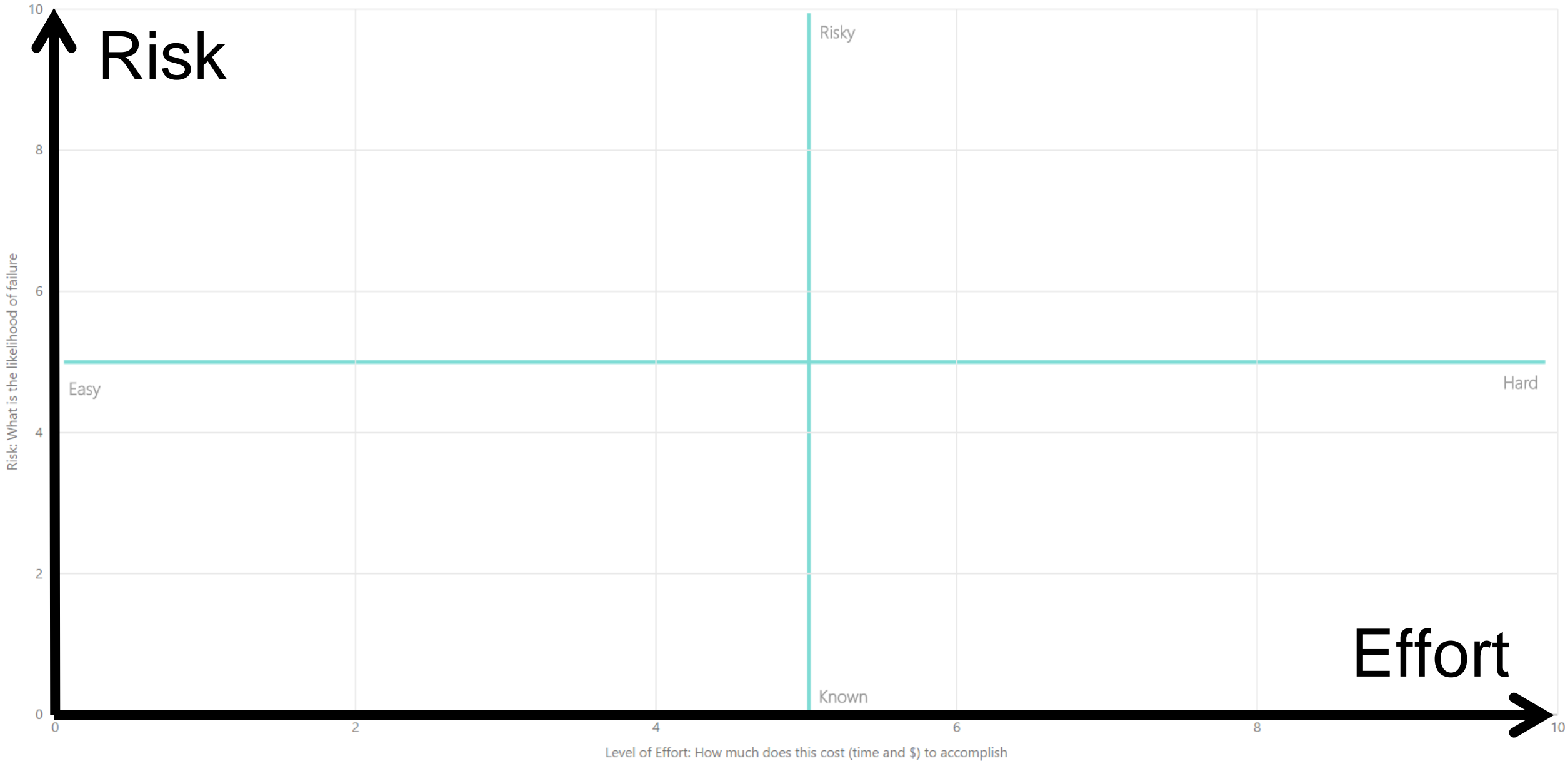
CHAMPION
THE
CUSTOMER

LEARN
THROUGH
DATA

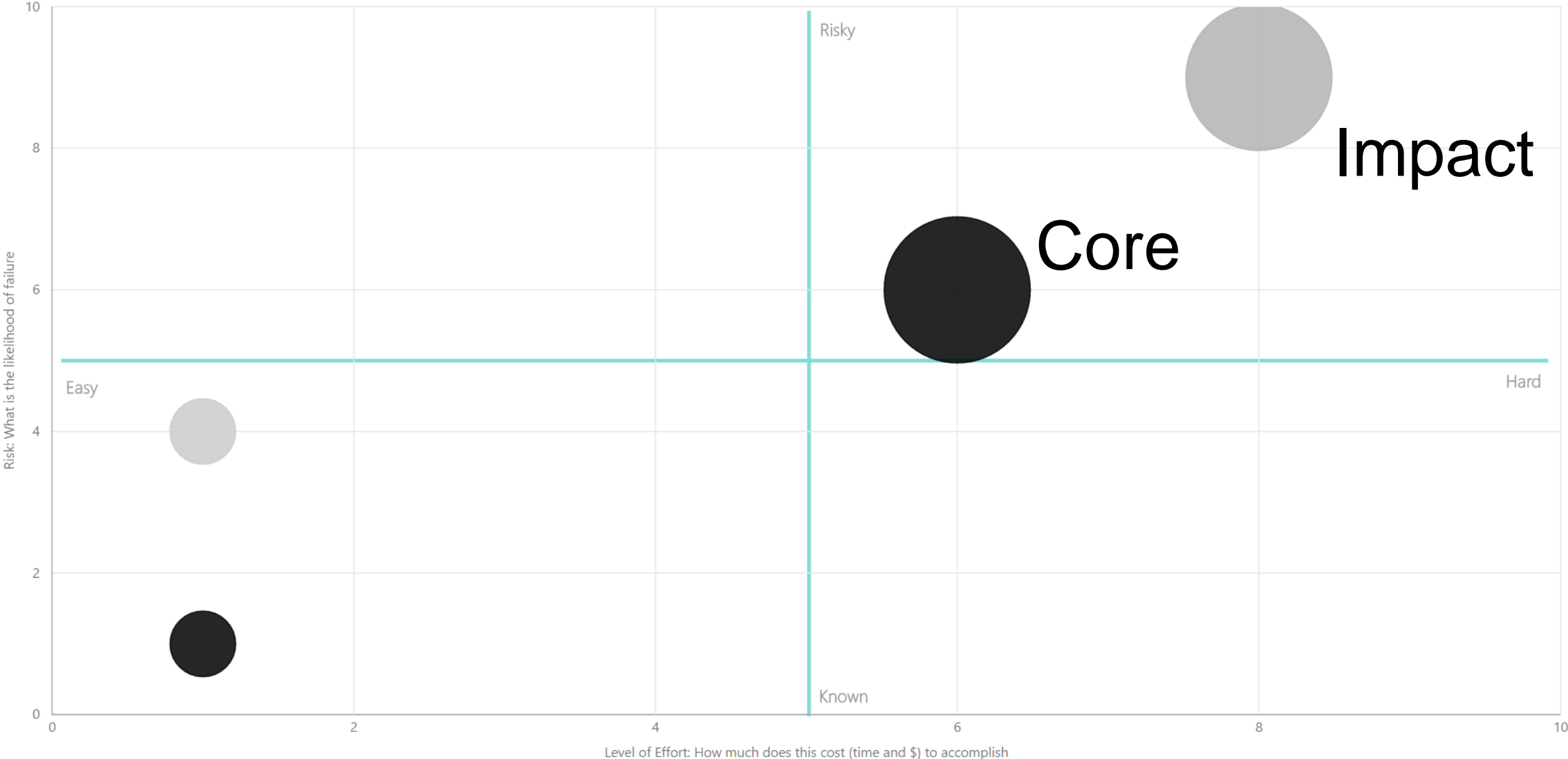
ITERATE
TO
IMPROVE

What we work on





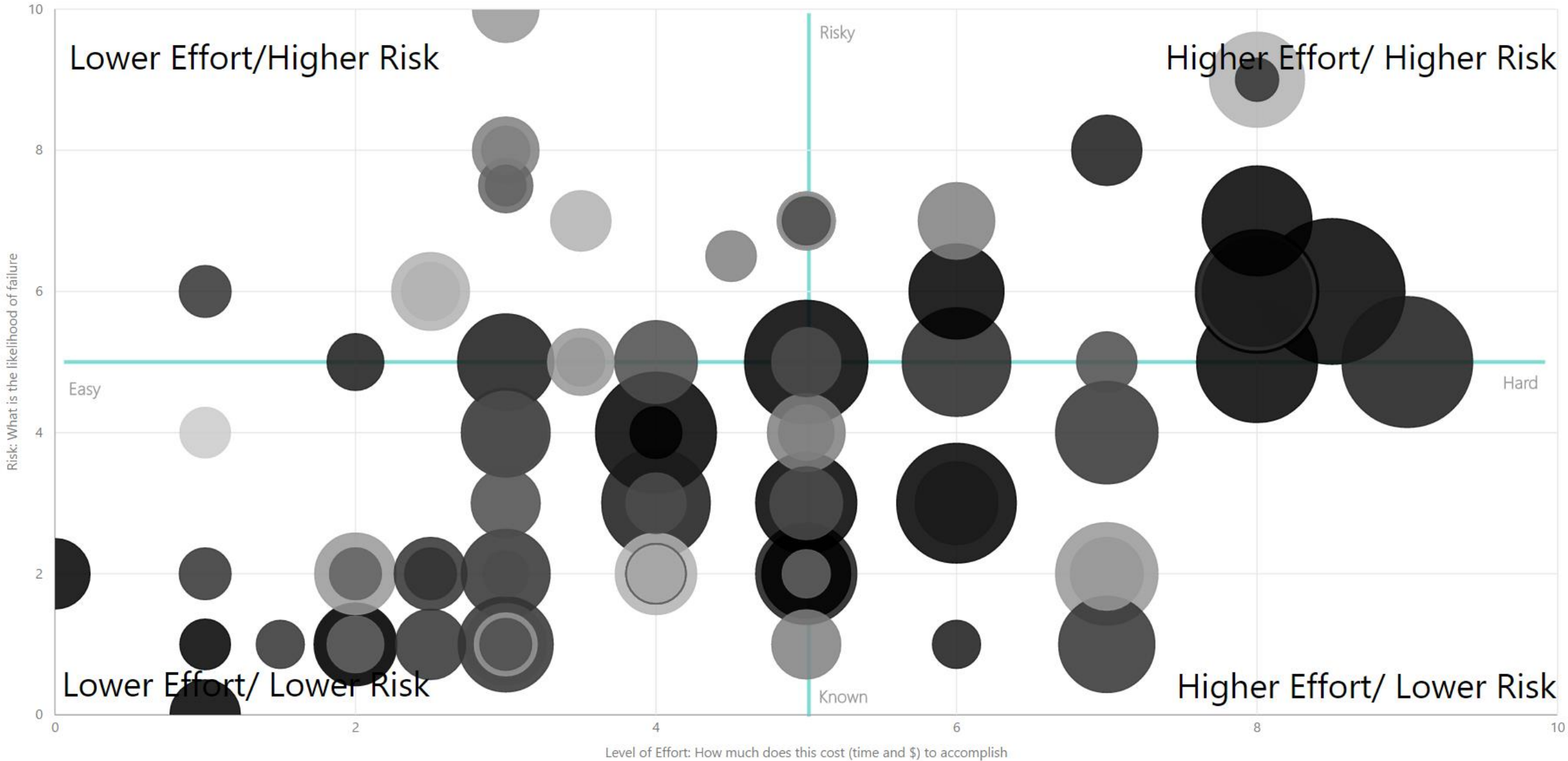
● Larger size = Greater impact to San Jose citizens
● Darker color = Greater connection to Core Mission of City



Innovation Projects

Projects by Level of Impact, Effort, Risk, and Connection to Core

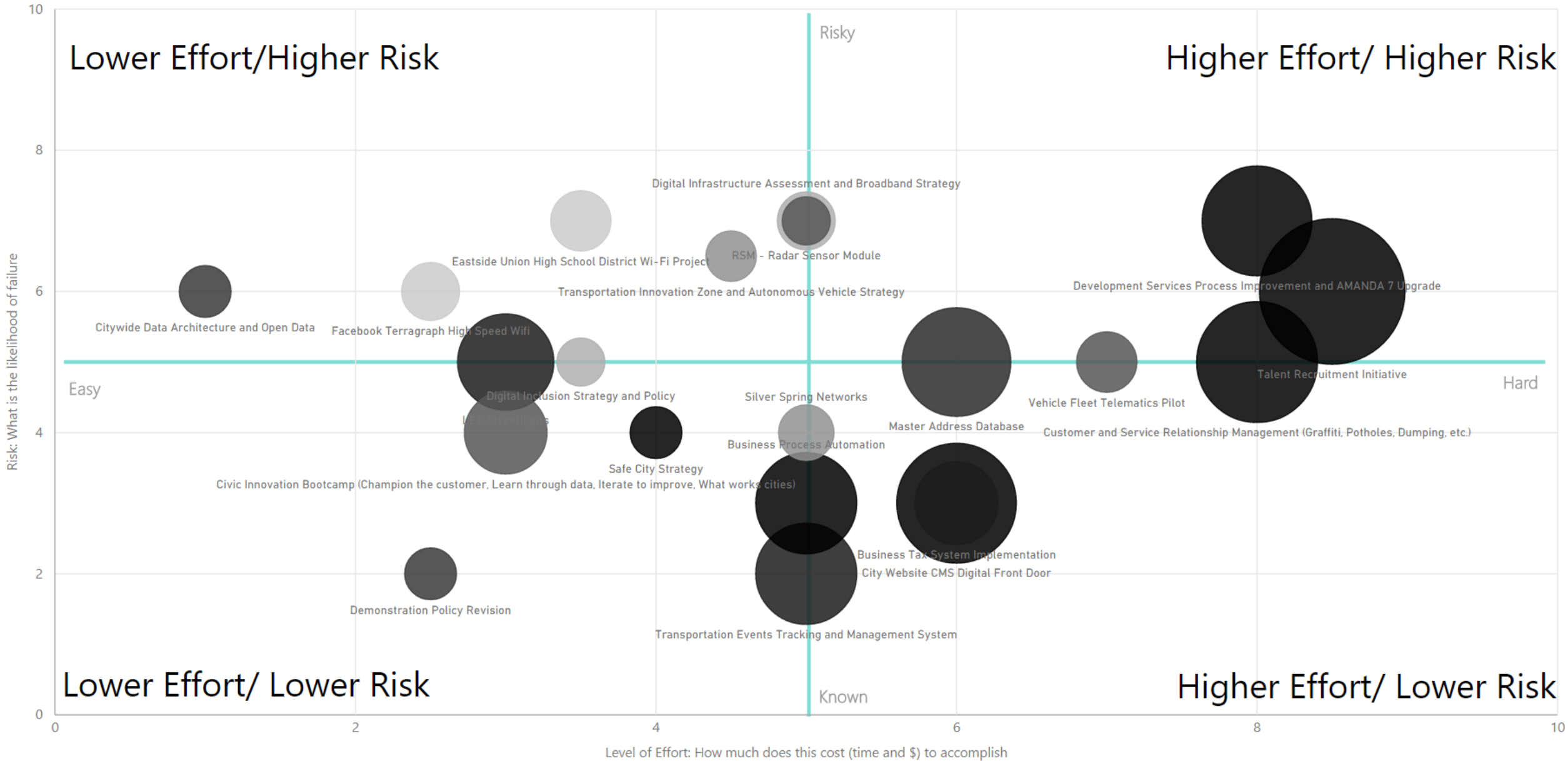
● Larger size = Greater impact to San Jose citizens
● Darker color = Greater connection to Core Mission of City



Innovation Projects

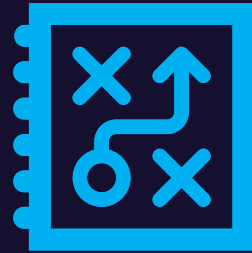
Projects by Level of Impact, Effort, Risk, and Connection to Core

Larger size = Greater impact to San Jose citizens
 Darker color = Greater connection to Core Mission of City





Smart Cities
Roadmap



IT Strategic
Plan



Small
Wonders

PRIORITIZED SMART CITY ROADMAP 2.0

OCTOBER 2019

User-Friendly Government	Integrated Permitting/ Development Transformation	Privacy Strategy	City Website	My San Jose	Digital Services Strategy	Data Strategy	Start Up in Residence (STIR) program	Spatial Data Integration (SDI)	
Smart Mobility	Autonomous Vehicle – First and Last Mile	Transportation Events Tracking (E-tracker)	Verizon Traffic Data Services Pilot	Access and Mobility Plan	Micro-mobility sidewalk and data pilots				
Smart Infrastructure	Small Cell Permitting Deployment and Process Improvements	LED Smart Controllers	IoT Reference Architecture	Irrigation Sensor Connectivity - CalSense	Facebook Terragraph Wi-Fi	AT&T Community Wi-Fi at Community Centers/Parks			
Safe City	Safe City Strategy	FirstNet Evaluation and Migration	Silicon Valley Regional Communication System	Text to 911 (sub project to Next Gen 911)	Fire Station Alerting System	Fire Department Business Intelligence	EOC Damage Assessment GIS tools and capabilities	Verizon Intersection Safety Analytics	Smart Digital Infrastructure Nodes – AT&T pilot
IT Roadmap	Cybersecurity Work Plan	IT Infrastructure Modernization	City Open Data Environment	Business Tax System	Products Management-Projects Execution	Business Tax Amnesty Solution	Advanced Cybersecurity Products and Service RFP	IT Staff Skill-Up and Engagement	
Equity	Digital Inclusion Program Fund	Community Wi-Fi Strategy	Rent Registry (Apartment Rent Ordinance)	Access Eastside	Joint/School Issued Library Cards	DAHLIA Affordable Housing Portal	AT&T Tech for Good Pilot	Verizon STEM	
Climate Smart	EV Strategy	Greenhouse Climate Smart Engagement	Gas Emissions Report and Dashboard	Climate Smart Dashboard	Residential Housing Natural Gas Elimination Roadmap				



LEGEND – PROJECT STATUS

- ON TRACK
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE
- AT RISK, CORRECTIVE ACTIONS NEEDED
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE



PRIORITIZED SMART CITY ROADMAP 2.0

OCTOBER 2019

User-Friendly Government	Integrated Permitting/ Development Transformation	Privacy Strategy	City Website	My San Jose	Digital Services Strategy	Data Strategy	Start Up in Residence (STIR) program	Spatial Data Integration (SDI)	
Smart Mobility	Autonomous Vehicle – First and Last Mile	Transportation Events Tracking (E-tracker)	Verizon Traffic Data Services Pilot	Access and Mobility Plan	Micro-mobility sidewalk and data pilots				
Smart Infrastructure	Small Cell Permitting Deployment and Process Improvements	LED Smart Controllers	IoT Reference Architecture	Irrigation Sensor Connectivity - CalSense	Facebook Terragraph Wi-Fi	AT&T Community Wi-Fi at Community Centers/Parks			
Safe City	Safe City Strategy	FirstNet Evaluation and Migration	Silicon Valley Regional Communication System	Text to 911 (sub project to Next Gen 911)	Fire Station Alerting System	Fire Department Business Intelligence	EOC Damage Assessment GIS tools and capabilities	Verizon Intersection Safety Analytics	Smart Digital Infrastructure Nodes – AT&T pilot
IT Roadmap	Cybersecurity Work Plan	IT Infrastructure Modernization	City Open Data Environment	Business Tax System	Products Management-Projects Execution	Business Tax Amnesty Solution	Advanced Cybersecurity Products and Service RFP	IT Staff Skill-Up and Engagement	
Equity	Digital Inclusion Program Fund	Community Wi-Fi Strategy	Rent Registry (Apartment Rent Ordinance)	Access Eastside	Joint/School Issued Library Cards	DAHLIA Affordable Housing Portal	AT&T Tech for Good Pilot	Verizon STEM	
Climate Smart	EV Strategy	Greenhouse Climate Smart Engagement	Gas Emissions Report and Dashboard	Climate Smart Dashboard	Residential Housing Natural Gas Elimination Roadmap				



LEGEND – PROJECT STATUS

- ON TRACK
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE
- AT RISK, CORRECTIVE ACTIONS NEEDED
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE



SMALL WONDERS – OCTOBER 2019

Theme	2018 Operational Efficiency	2019 Operational Efficiency	2019 Community Benefit/Unleash Your Geek
User-Friendly Government			Multilingual and Accessible Social Media/Texting Tools Emergency Management
			Translation Tools to Improve Communication with Non English Speaking Residents
Smart Mobility			UAV/UAS Solution for Disaster Monitoring and Search and Rescue Response
Smart Infrastructure			
Safe City	STIR Disaster Response Platform		
Equity	STIR Affordable Housing Compliance System		Mobile Application/Mobile-Friendly Website Application that Helps Homeless Individuals Locate other Social Services
		Use Technology to Scan Websites that Discriminate Section 8 or Voucher Tenants and Create Reporting Tool	
		Automation of Affordable Homeownership Pricing and Household Qualification Process	
Climate Smart			Change Behavior to Encourage Sorting of Cleaned Recyclables

LEGEND – PROJECT STATUS



ON TRACK



ISSUES WITH SCHEDULE,
BUDGET OR SCOPE



AT RISK, CORRECTIVE
ACTIONS NEEDED



INITIATING SMALL
WONDERS CHALLENGE

IT Portfolio Map– 2017-2019

(Update: 9/2019)

	Active					Done				
Innovation Roadmap	Business Tax (Hold)	Integ Permit System	Open Data Environment	Business Tax Amnesty			New City Data Portal	IT Strategic Plan	My San Jose 1.X	Access East Side 1
	Facebook Terragraph	My San Jose 2.x	IoT Architecture			Youth Viol. Data Story	CEVP Data Story	Transport Data Story	IT Advisory Board	Open Data Architecture
Team	Availability 99.1% ↗ 99.6%					ERP Staffing	Proj Success 5% ↑ 79%	Engagement 8%ile ↑ 29%ile	Vacancy 36% ↑ 13%	Cust Sat 74% ↑ 86%
Secure / Reliable	Privacy, Data, and Use	Priority Anti-Malware	Power Vuln Planning			Security Scanning	Cybersec.y Team	Secondary Data Center	PCI Compliance	Cyber Intel Alliance
	Cybersecurity RFP	Security Training		Measure T & New EOC	➔	Mobile Mgmt	City Hall Wireless	Incident Response	Cloud Apps Architecture	Secure Card Processing
Modernize & Execute	Bus Process Automation	Infrastructure Modernization	Arcadia	FirstNet Impl & Mgmt		eSig Policy & Ordin	Prod-Project Management	HR Mgmt Upgrade	Talent Mgmt System	Payroll Upgrade
	C3PO Positions	Productivity & Collaboration				Virtual PCs	Budget System	Treasury System	Revenue Mgmt System	Work Comp Sys/Vendor
New	Electronic Time Clocks	City Website		Access East Side 2		Mobile Collabor.	Microsoft Licensing	Utility Billing System	3-1-1/CRM System	Business Tax Registration
	911 to 311 Transition	Records Retention	Financials Prep	Modernization Fund			Data Eng Grant	Smart Irrigation	IT Disaster Recov Drill	Financials Upgrade
Audits	Technology Deployments	Mobile Devices	General Controls				CAPUC Energy Audit	External Financials	Cybersecurity Policy	Call Handling Audit

**The importance of
connectivity...**

PRIORITIZED SMART CITY ROADMAP 2.0

OCTOBER 2019

User-Friendly Government	Integrated Permitting/ Development Transformation	Privacy Strategy	City Website	My San Jose	Digital Services Strategy	Data Strategy	Start Up in Residence (STIR) program	Spatial Data Integration (SDI)	
Smart Mobility	Autonomous Vehicle – First and Last Mile	Transportation Events Tracking (E-tracker)	Verizon Traffic Data Services Pilot	Access and Mobility Plan	Micro-mobility sidewalk and data pilots				
Smart Infrastructure	Small Cell Permitting Deployment and Process Improvements	LED Smart Controllers	IoT Reference Architecture	Irrigation Sensor Connectivity - CalSense	Facebook Terragraph Wi-Fi	AT&T Community Wi-Fi at Community Centers/Parks			
Safe City	Safe City Strategy	FirstNet Evaluation and Migration	Silicon Valley Regional Communication System	Text to 911 (sub project to Next Gen 911)	Fire Station Alerting System	Fire Department Business Intelligence	EOC Damage Assessment GIS tools and capabilities	Verizon Intersection Safety Analytics	Smart Digital Infrastructure Nodes – AT&T pilot
IT Roadmap	Cybersecurity Work Plan	IT Infrastructure Modernization	City Open Data Environment	Business Tax System	Products Management-Projects Execution	Business Tax Amnesty Solution	Advanced Cybersecurity Products and Service RFP	IT Staff Skill-Up and Engagement	
Equity	Digital Inclusion Program Fund	Community Wi-Fi Strategy	Rent Registry Apartment Rent Ordinance)	Access Eastside	Joint/School Issued Library Cards	DAHLIA Affordable Housing Portal	AT&T Tech for Good Pilot	Verizon STEM	
Climate Smart	EV Strategy	Greenhouse Climate Smart Engagement	Gas Emissions Report and Dashboard	Climate Smart Dashboard	Residential Housing Natural Gas Elimination Roadmap				

LEGEND – PROJECT STATUS

- ON TRACK
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE
- AT RISK, CORRECTIVE ACTIONS NEEDED
- ISSUES WITH SCHEDULE, BUDGET OR SCOPE

HIGHEST

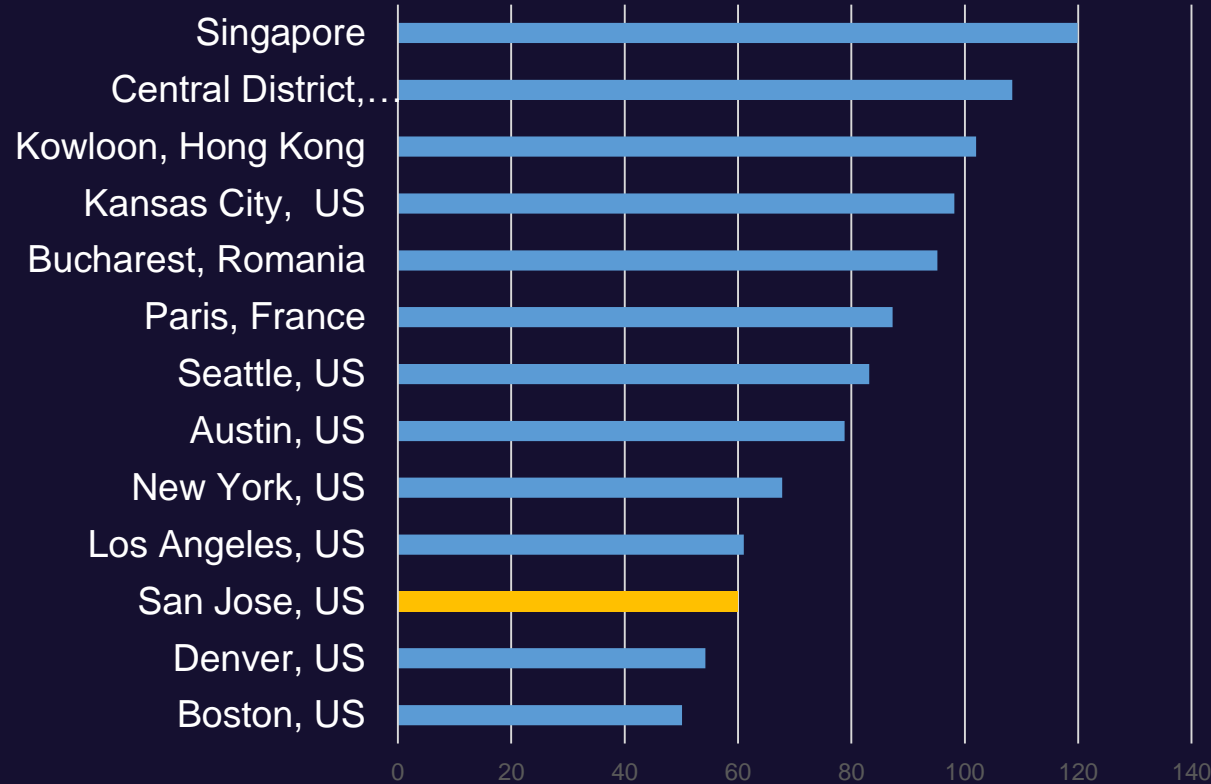


RELATIVE PRIORITY OF PROJECTS FROM HIGH TO LOW

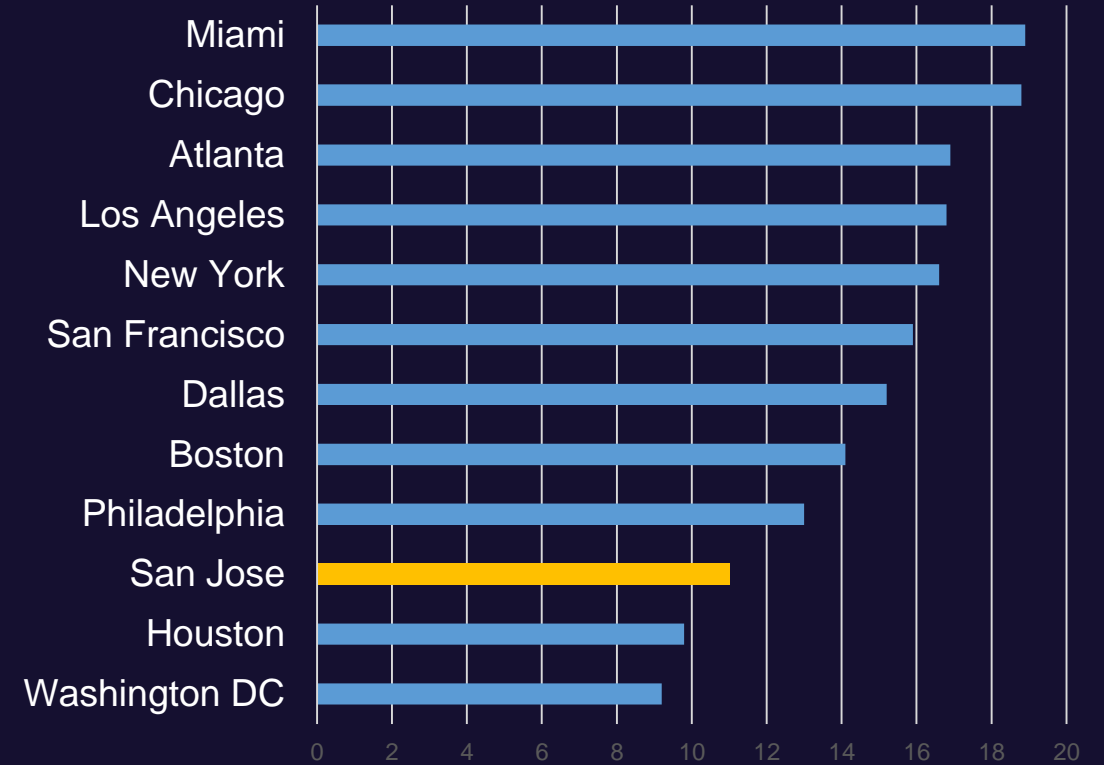
LOWEST

Broadband Current State

Average residential wireline download speeds (mbps)



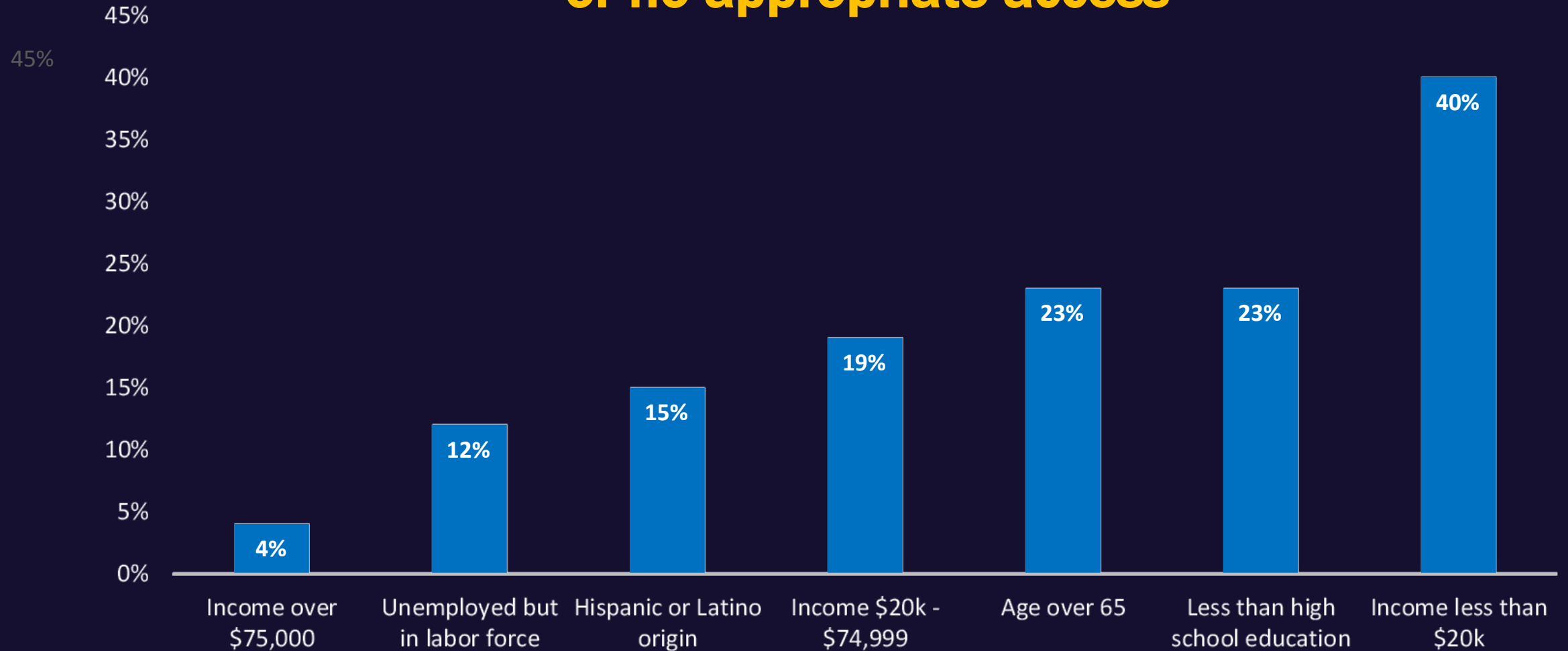
Average mobile download speeds (mbps)



San Jose's broadband significantly lags our peers

Digital Exclusion Current State

95,000 individuals have no home broadband or no appropriate access



Broadband Strategy

Broadband Priorities:

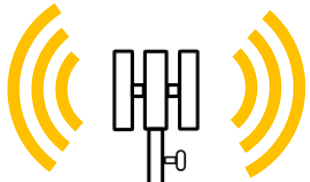
1. Economic Development
2. Digital Inclusion
3. Smart Cities and IoT

	Government-led	Hybrid model	Market-led
Summary	<p>Cities building full fiber networks is expensive, complex, and risky</p> <p>Too Risky</p>	<p>Cities that welcome private investment with appropriate guidance are most successful</p> <p>Just Right</p>	<p>Cities with laissez faire broadband stagnate as cable-telecom duopolies</p> <p>Too Ineffective</p>
Key Takeaways	<ul style="list-style-type: none"> Seattle, Palo Alto and others have determined that city-led full fiber build-outs are not practical after detailed study 	<ul style="list-style-type: none"> Enter into value exchange agreements leveraging City Assets to incent investment, fund speed and predictability, and close the digital divide Centralize broadband governance Adopt balanced broadband friendly policies 	<ul style="list-style-type: none"> Broadband speed and price cluster to the bottom of the peer set No substantial competition in any market-led city

Unanimous Council Approval

Broadband Agreements

- **June 2018** – Agreements with AT&T, Verizon, and Mobilitie
 - 4100 small cells
 - 1000 miles of fiber
 - \$500 million in private sector infrastructure improvements
 - \$4 million investment for process improvements and smart city solutions
 - \$6 million to fund permitting staff and additional improvements to achieve desired speed and predictability
 - \$0 cost impact to general fund
- **February 2019** – Agreement to implement \$24 Million Digital Inclusion Fund



Emerging landscape for voice and DATA

Effective in Dense Urban, Urban, and Suburban

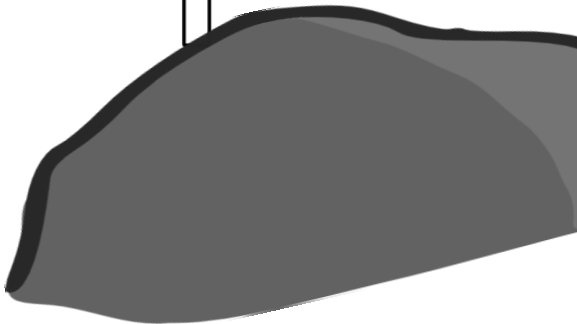
Cell towers: carry all mobile voice & some data

Broadband Strategy



Broadband Priorities:

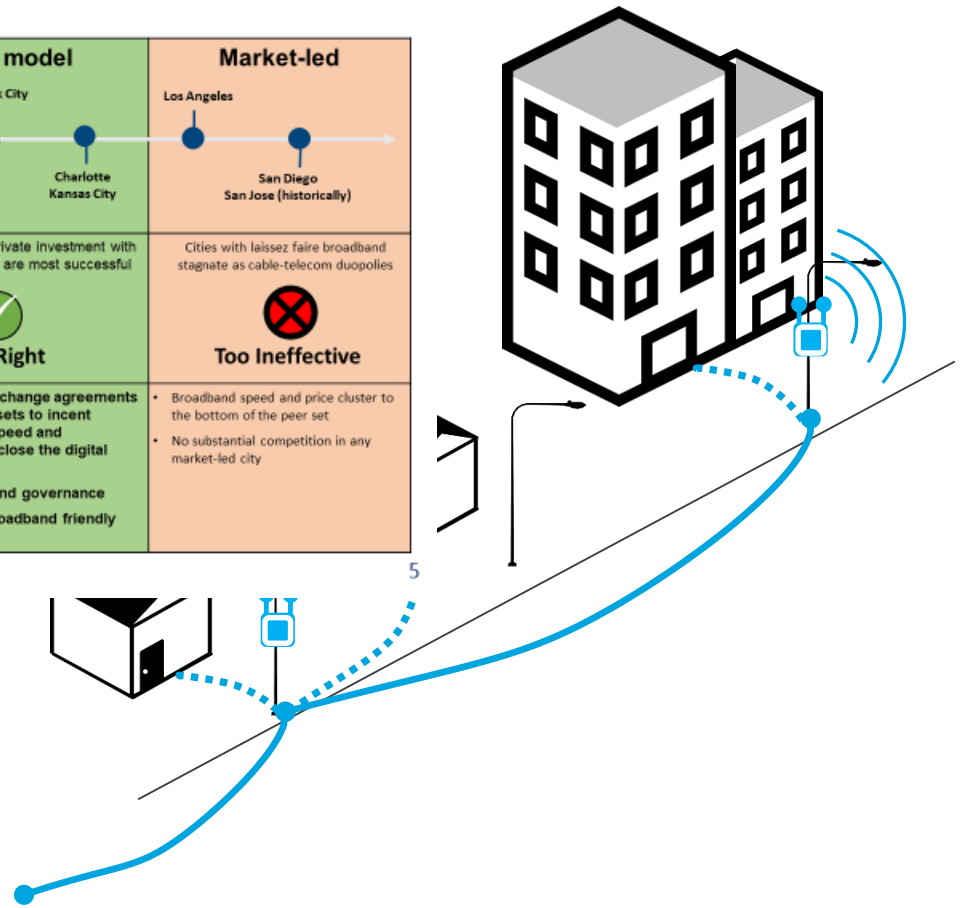
1. Economic Development
2. Digital Inclusion
3. Smart Cities and IoT



Gigabit speed up to 50x faster

Unanimous Council Approval

	Government-led	Hybrid model	Market-led
	Chattanooga San Francisco (shelved plans)	New York City Seattle Charlotte Kansas City	Los Angeles San Diego San Jose (historically)
Summary	Cities building full fiber networks is expensive, complex, and risky Too Risky	Cities that welcome private investment with appropriate guidance are most successful Just Right	Cities with laissez faire broadband stagnate as cable-telecom duopolies Too Ineffective
Key Takeaways	<ul style="list-style-type: none"> Seattle, Palo Alto and others have determined that city-led full fiber build-outs are not practical after detailed study 	<ul style="list-style-type: none"> Enter into value exchange agreements leveraging City Assets to incent investment, fund speed and predictability, and close the digital divide Centralize broadband governance Adopt balanced broadband friendly policies 	<ul style="list-style-type: none"> Broadband speed and price cluster to the bottom of the peer set No substantial competition in any market-led city



Early considerations on street light pole

STREETLIGHT

Light / Safety

Properties

Height
Power
Light Sensor
Lumens
Density

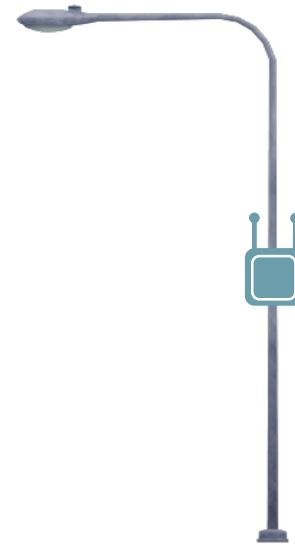


SMALL CELLS

Broadband Digital Infrastructure

Properties

Height
Power
Light Sensor
Lumens
Density
Data Backhaul
(Fiber, COAX, Radio mesh)

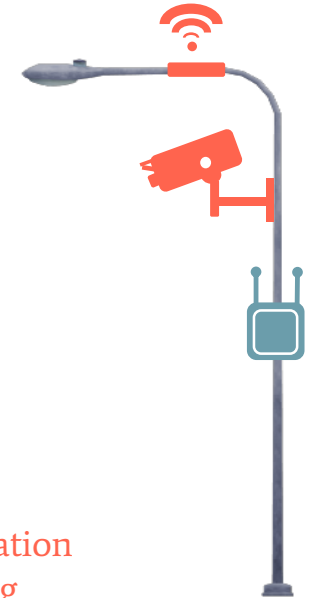


INTERNET OF THINGS

Smart Cities

Properties

Height
Power
Light Sensor
Lumens
Density
Data Backhaul
Sensors
Cameras
2-way Communication
Banner Advertising



Mature

Proceed w/ LED Light Replacement Only

Emerging

Re-examine in Broadband Strategy

Extremely Immature

Seek to Understand with Knight IoT Grant

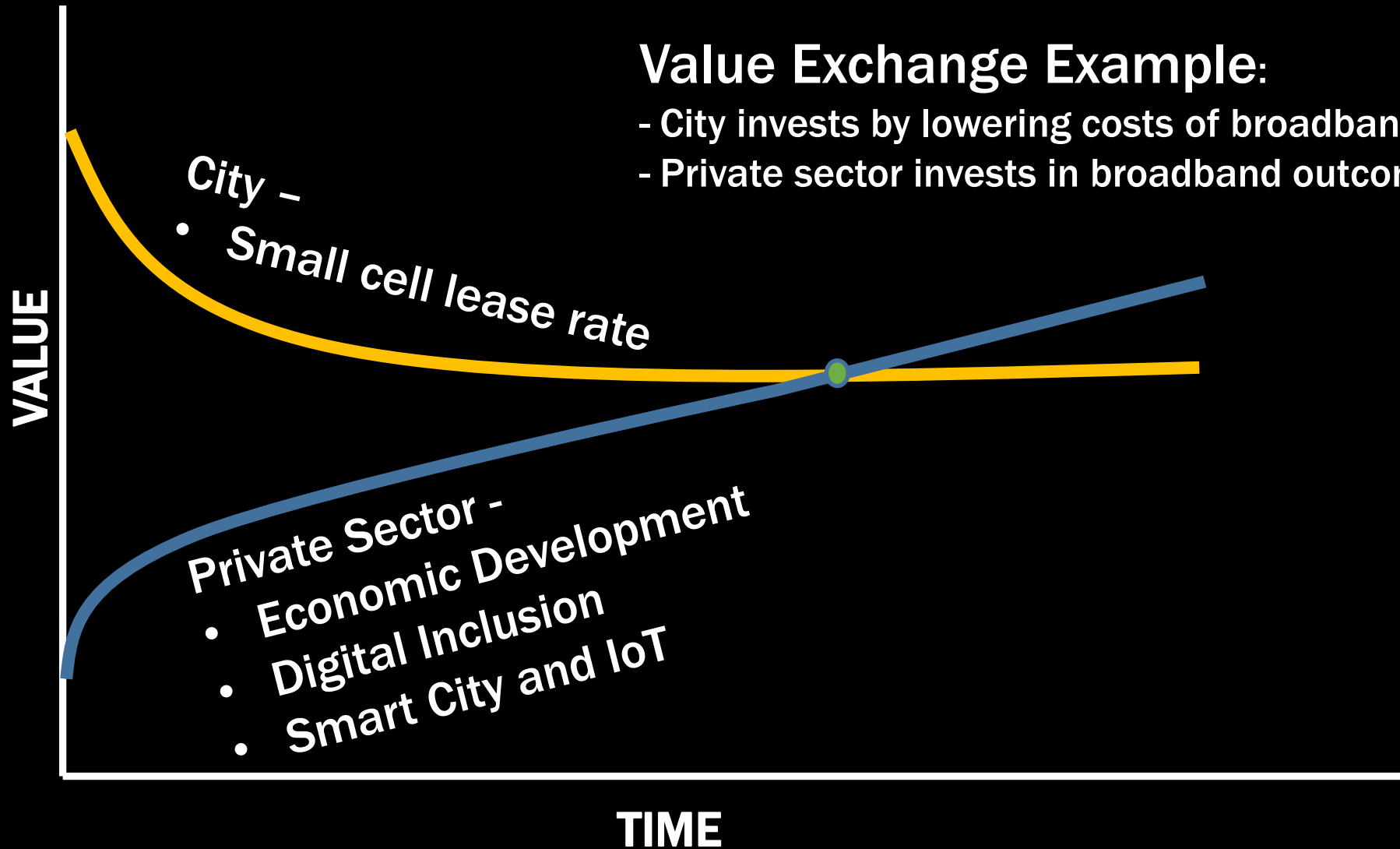
Strategy and Recommendations

Hybrid Approach – 80% results for 20% effort

	Government-led	Hybrid model <u>(Recommended)</u>	Market-led
	<p>Chattanooga</p> <p>Sam Francisco</p> <p>Seattle</p> <p>New York City</p> <p>Charlotte Kansas City</p> <p>Los Angeles</p> <p>San Diego San Jose</p>		
Summary	<p>Cities building full fiber networks is expensive, complex, and risky</p> <p></p> <p>Too Risky</p>	<p>Cities that welcome private investment with appropriate guidance are most successful</p> <p></p> <p>Just Right</p>	<p>Cities with laissez faire broadband stagnate as cable-telecom duopolies</p> <p></p> <p>Too Ineffective</p>
Key Takeaways	<ul style="list-style-type: none"> • Seattle, Palo Alto and others have determined that city-led full fiber build-outs are not practical, after detailed assessments • Chattanooga's unique buildout included control by the utility and federal funds 	<ul style="list-style-type: none"> • Seattle leveraged streamlined policies to drive competition and massive fiber buildout • NYC used franchise agreements to drive fiber build-out 	<ul style="list-style-type: none"> • Broadband speed and price cluster to the bottom of the peer set • No substantial competition in any market-led city
Potential costs	Very high. City-owned fiber-to-the-premise would cost \$800M+.	Moderate. Working with carriers could cost \$50-250M based on build types.	Very low or none. City relies on private sector investment.
Results	Peers show 90%+ fiber build-out.	Peers show 55-70% fiber build-out.	Peers show 0-5% fiber build-out.

Strategy and Recommendations

Leverage valuable city assets



Roles of Connectivity



Inclusion



Economic



City Services

City Wi-Fi Projects Evolved Based on Separate Use Cases

The Wi-Fi projects differ in footprint. Goals range from field trial to visitor coverage to inclusion

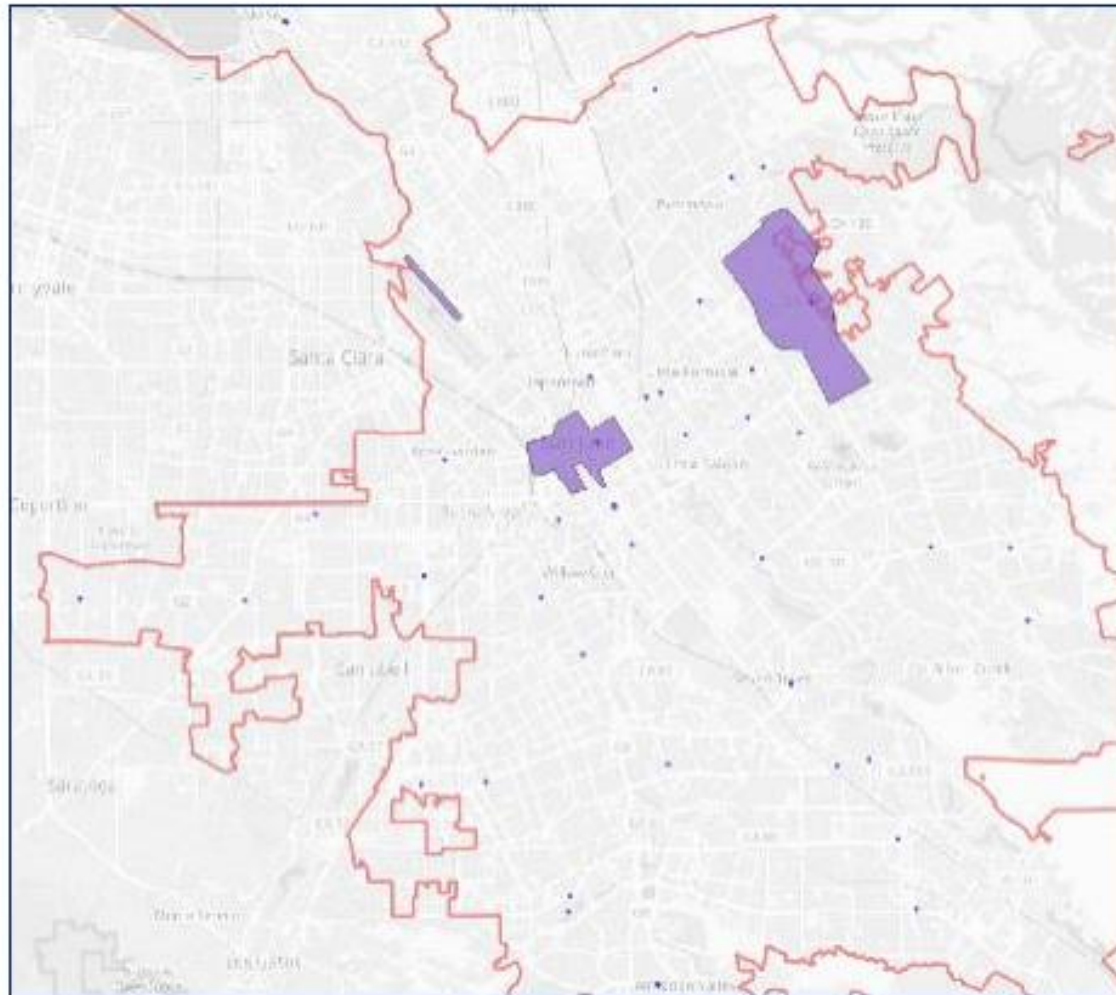
Deployment Zones



Year	2016	2013	2018	2018 (Upgraded to 1 Gbps)
Users	Terragraph backhaul field trial in downtown with APs open to Facebook and City employees	City hall: 7,552, Airport: 373.5K, Convention center: 22,830, Community centers: 15,810	Target: 23,000-25,000 students across 3 school districts (deployed only in 1 so far)	In 2016-17, a total of 408,000 users connected via the branch library Wi-Fi
Network	Backhaul network trial in downtown corridor with Wi-Fi APs set up for evaluation	Total APs: City hall: 86, Airport: 69, Convention center: 316, Community centers: 92, DT: 30	198 Ruckus Wi-Fi APs deployed in a wireless mesh topology with fiber and microwave backhaul	100 Wi-Fi APs across the branches; APs provide 100 Mbps connectivity
Governance	SI, FB	SI, City IT, CIO, City Mgr., ITAB	SI, City IT, CIO, City Mgr., ITAB	Library IT (autonomous)
Capex	TBD steady-state capex and opex	No capital budget, paid ad hoc; Airport maintains its own capital budget for Wi-Fi	\$2.7M via the Tech Bond Measure I for the first 2 attendance areas; \$1.7M to be identified for 3 rd area	State funding for CENIC provides infrastructure capital
Opex		Total spend: \$120K/year with \$53K budgeted in FY18-19	School bond: \$75,000 earmarked per attendance area per year	Library funds O&M through property tax fund + other city funds

City of San José Wi-Fi Coverage Evolved Based on Use Cases

Downtown area, Library, Community Center, and Access East Side (ESUHSD) Wi-Fi cover a relatively small footprint in San José, but encompass key use-case corridors



- ESUHSD has the largest coverage area as part of covering the attendance area
- Wickedly Fast Wi-Fi provides coverage at Airport, Community Centers, Convention Center, City Hall, and downtown outdoor visitor areas
- The Wi-Fi APs connected to the Terragraph backhaul field trial are located in the downtown area
- The Convention Center has the largest indoor coverage

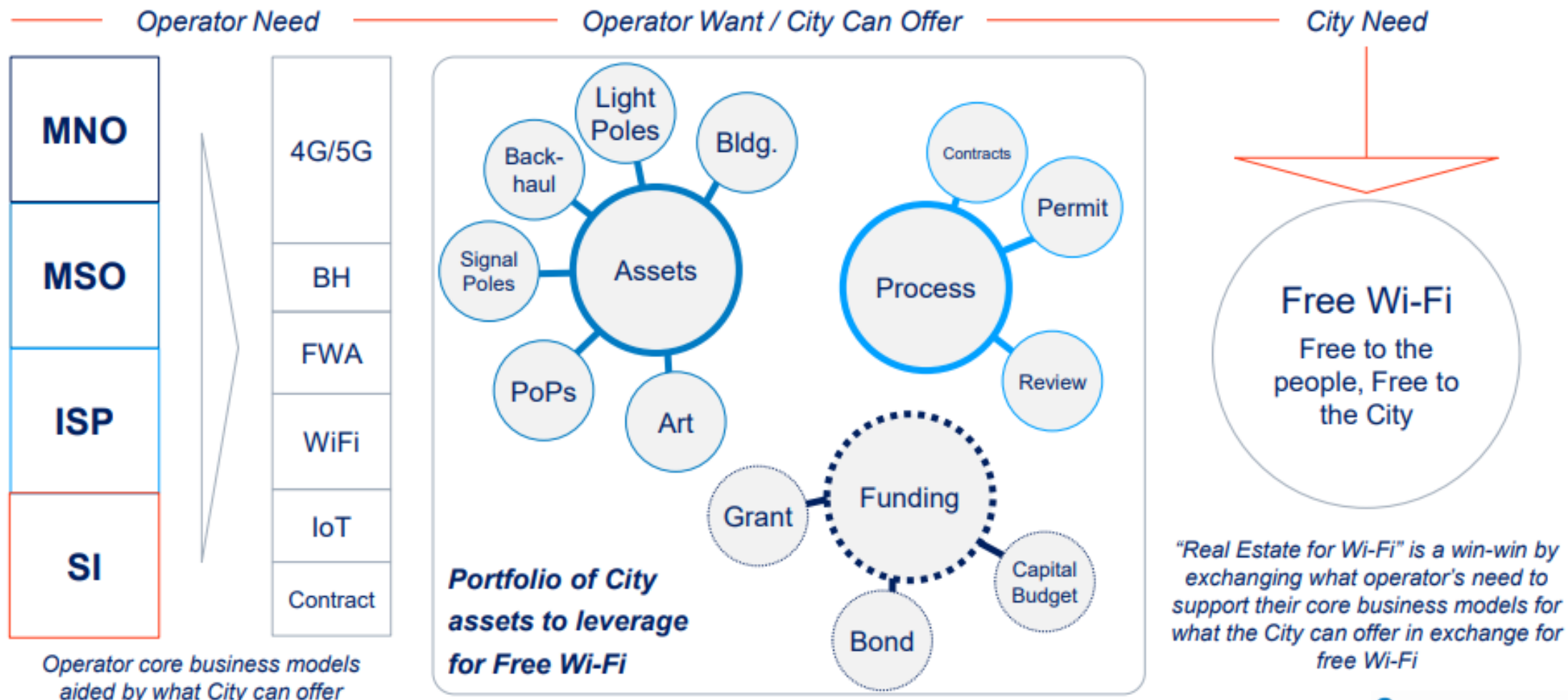


Source: inCode analysis

© Copyright 2018 inCode

Bridge Gap from City and Operator Needs with Value Exchange

City of San José wants free Wi-Fi. Operators positioned to provide free Wi-Fi for the City in exchange for what the City can provide in support of needs for their core business models



City of San José

10
Gbps

10
Gbps



City
Uses



Partner-
ships



Schools



Airport



Police



Fire



Special
Events



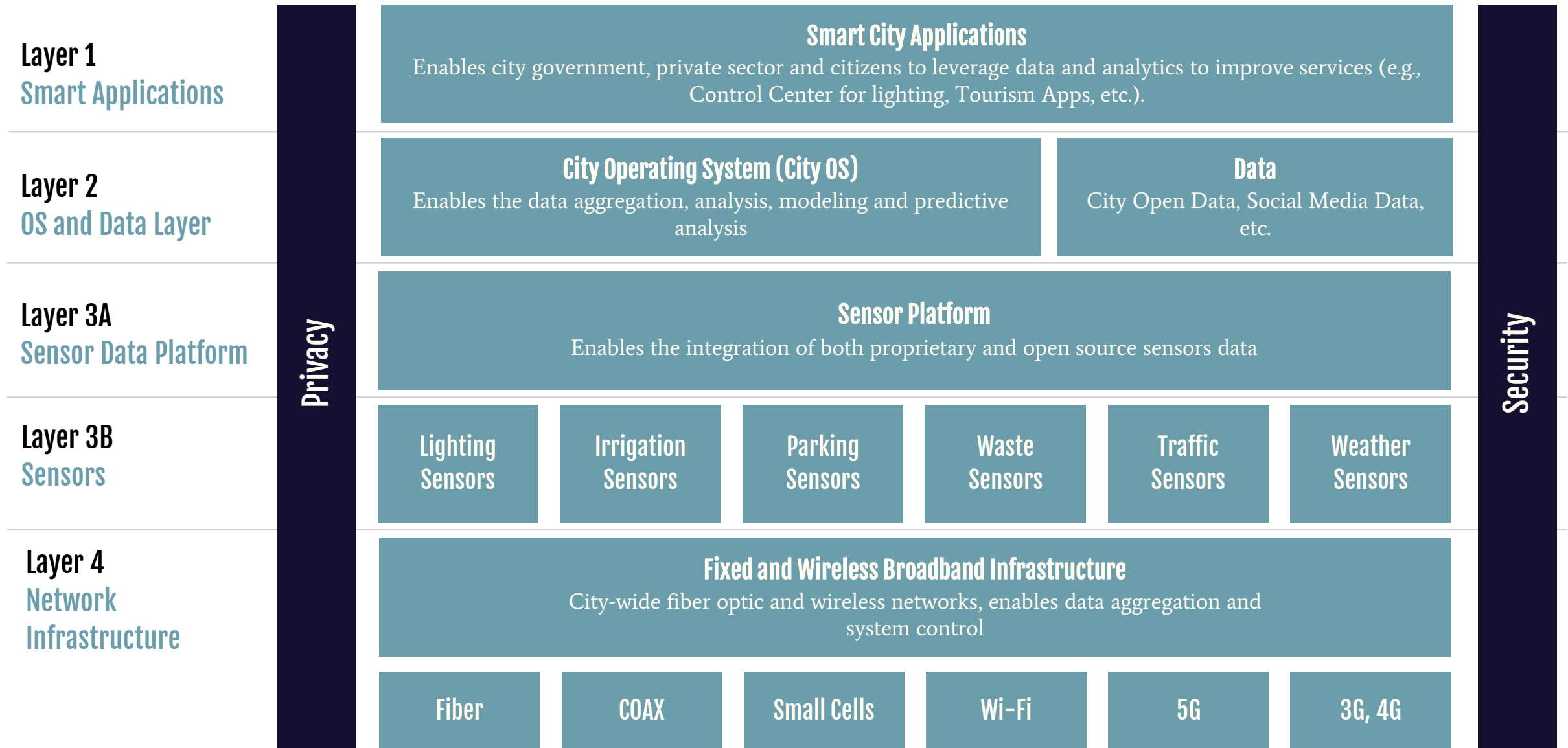
Transp-
ortation



Conven-
tions

**We still have problems
to solve...**

IoT Smart City Reference Architecture



Privacy and Ethical Use of Data



Non-Profit

Victor Sin, Chair of the Santa Clara Valley Chapter, ACLU of Northern California

Roxana Marachi, Education Chair, San Jose Silicon Valley NAACP



Technology Industry

Heather Patterson, Senior Research Scientist, Intel Labs

Michelle Finneran Denedy, Chief Privacy Officer, Cisco



Academia

Bob Lim, Vice President, Information Technology and CIO San Jose State University

Irina Raicu, Director, Internet Ethics Markkula Center for Applied Ethics, Santa Clara University



Law Enforcement

James Randol, Retired SJPD Captain, Former Law Enforcement Representative

Government

Mike Shapiro, Chief Privacy Officer Santa Clara County

Privacy and Ethical Use of Data

Approval of Final Privacy Principles

The following Privacy Principles are intended to apply to the City's consideration of policy development as it relates to how the City collects, distributes, or otherwise manages data.

WE VALUE PRIVACY

We affirm that privacy is an inherent human right. San Jose commits to fully evaluating risks to your privacy before collecting, using, or sharing your information.

WE COLLECT ONLY WHAT WE NEED

We collect only what is required to provide and improve City services and comply with the law. We seek community input about what information is used and collected.

WE ARE OPEN AND TRANSPARENT

We are transparent about what information we collect, why we collect it, and how it is used. We commit to being open about our actions, policies, and procedures related to your data. We make our policy documents publicly available and easy to understand.

WE GIVE YOU CONTROL OVER YOUR DATA

We will provide you with the information to make an informed decision about sharing your data. We have clear processes that ensure data accuracy and provide you visibility into what data the City has collected from you.

WE SHARE ONLY WHAT WE NEED

We anonymize your information before we share it outside the City, except in very limited circumstances. Business partners and contracted vendors who receive or collect personal information from us or for us to deliver City services must agree to our privacy requirements.

WE DESIGN FOR PRIVACY AND SECURITY

We integrate privacy and security into every aspect of our designs, systems, and processes. We commit to updating our technology and processes to effectively protect your information while under our care. We follow strict protocols in the event your information is compromised.⁹

Privacy and Ethical Use of Data

Applied Uses and Standards

```
graph TD; A[Applied Uses and Standards] --> B[Footfall Analytics]; A --> C[Illegal Dumping Monitoring]; A --> D[Audio Sensors]; A --> E[Crime Surveillance]; A --> F[Personal Services]; A --> G[Data Monetization];
```

Footfall Analytics

Illegal Dumping
Monitoring

Audio Sensors

Crime Surveillance

Personal Services

Data Monetization

The development of each use case is:

- Intended to utilize real world technologies with defined outcomes;
- Provide learnings to be applied to City-wide privacy policy;
- Test the City's privacy governance model; and
- Align with the Privacy Principles;