
Smart City Startups: Market Landscape
Embracing technology + entrepreneurship to build the cities of tomorrow
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Smart City Startups: Market Landscape

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Preface

"Technology entrepreneurship and venture capital are critical components in the transformation from a traditional city to a 'smart city.'"

Society has crossed a pivotal threshold. Over 50% of the world's population now lives in urban areas for the first time in history. Although cities are a main driver of economic growth—attracting citizens with access to jobs, education, entertainment, culture, and other amenities—rapid urbanization comes with many challenges. Growing populations are straining infrastructure, unemployment puts pressure on government resources, and crime in urban areas continues to demand solutions. To meet these demands, cities are beginning to incorporate disruptive technologies to solve metropolitan challenges. These 'smart cities' exist on the intersection of digital technology, disruptive innovation and urban environments.

While disruptive technologies, data, and talent have been recognized as critical components of a smart city by municipalities and consultants helping governments develop smart city strategies, engagement with entrepreneurs and the venture capital community is nascent. This is an untapped opportunity. Not only are startups a primary driver of job creation necessary for economic growth, venture backed companies have been the main force behind technology innovation over the past several decades. Thus, technology entrepreneurship and venture capital are critical components in the transformation from a traditional city to a 'smart city.'

This report explores the Smart City Market and how municipalities, public-private partnerships, corporate incumbents, startups and investors are working together to build the smart cities of tomorrow. This paper also focuses on the landscape from the perspective of how early stage technology entrepreneurs and venture capitalists can help drive advancements and adoption of smart city technologies in regions while creating jobs and generating wealth in their communities.

1. World's Population Increasingly Urban with More Than Half Living in Urban Areas, United Nations, July 10, 2014.
2. Smart Cities: How rapid advances in technology are reshaping our economy and society, Deloitte Gov Lab, November 2015.

Contents

Smart Cities

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Smart City Overview

Definition, Outlook, Barriers to Growth, Market Size

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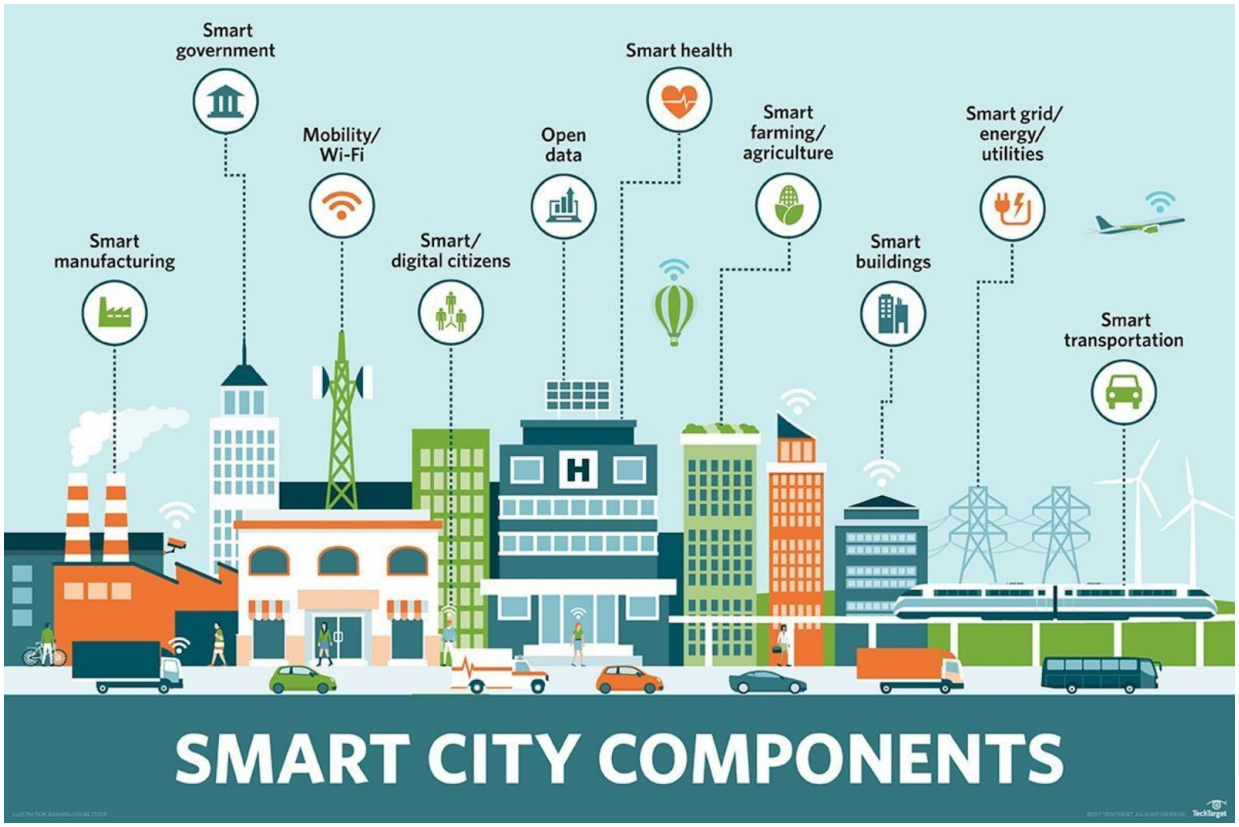
What is a Smart City?

Human and social capital + traditional infrastructure + disruptive technologies = Economic growth, high quality of life, and wise management of natural resources



A smart city might be defined differently, depending on who you ask, but there are a few core features that make up a smart city. According to Deloitte, a city is smart when investments in (i) human and social capital, (ii) traditional infrastructure, and (iii) disruptive technologies fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance. Many tend to define smart cities by looking at the type of technology that the city has implemented, but every city has different demographics, infrastructure, and economic drivers. However, it's important to note that a city can be considered a smart city even if it doesn't have a specific volume or quality of cutting-edge technology depicted in this infographic.

1. Smart Cities: How rapid advances in technology are reshaping our economy and society, Deloitte Gov Lab, November 2015.
2. https://internetofthingsagenda.techtarget.com/definition/smart-city

Cities Will Continue to Grow

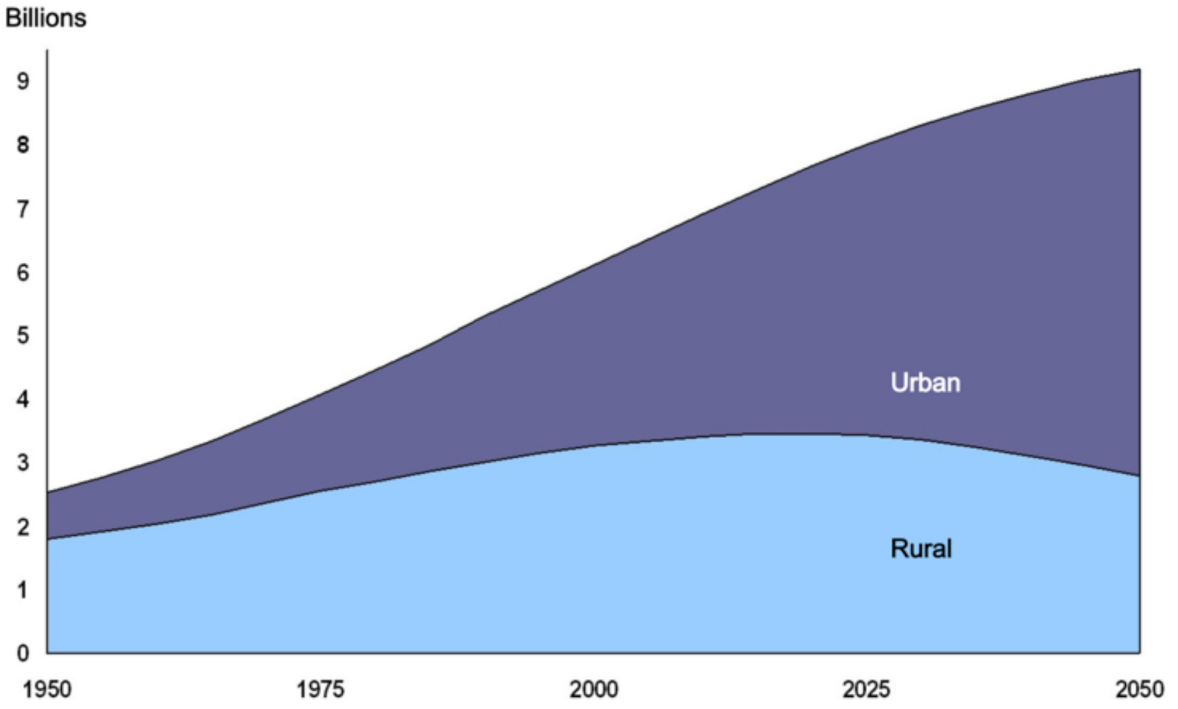
3.9B people called a city home in 2014, representing an 8X INCREASE over 1950's urban population.

By 2045, 6B OR 70% of the world's population will live in urban areas.

MASSIVE INVESTMENTS in infrastructure and new technologies are necessary.

Cities, companies, and financiers are RESPONDING TO THE CALL with market-based solutions.

Future World Population Growth Will Be in Places Defined by Countries as "Urban" While Rural Places Decline



United Nations Population Division, *World Urbanization Prospects, The 2007 Revision.*

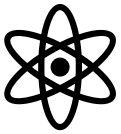
PRB | INFORM. EMPOWER. ADVANCE.

1. The World's Cities in 2016, United Nations, 2016.
2. World's Population Increasingly Urban with More Than Half Living in Urban Areas, United Nations, July 10, 2014.

Vision 2030: Trillions in Investment Needed for Mass Urbanization

Transportation

Traffic congestion will cost an estimated $300B by 2030 in Britain, France, Germany, and the US (up from $200B in 2013).



Energy

Demand will rise by 25%—thanks primarily to urbanization in developing countries.

Food & Water

Food production must increase by 70%, requiring more water while 2 in 3 countries face shortages.

Housing

4.6M new apartments must be built in the US.

$60T Infrastructure Investments Needed Between 2013 and 2030

1. (according to the World Economic Forum)

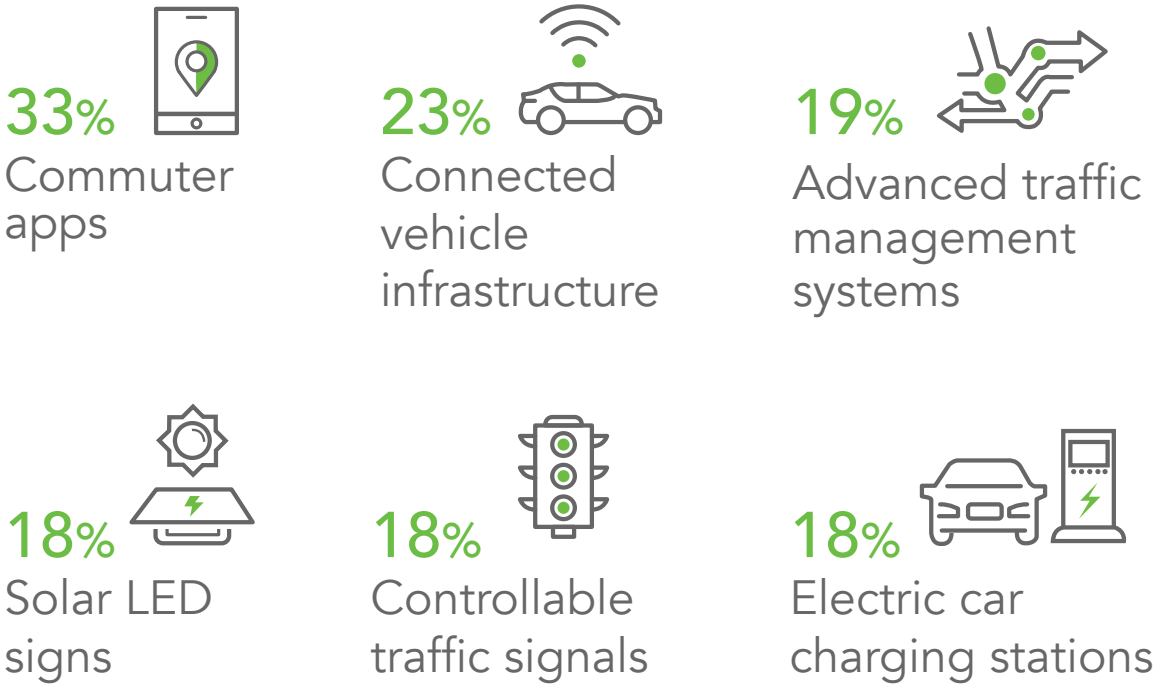
1. Fostering Investment in Infrastructure, Organization for Economic Co-operation and Development, January 2015.
2. The Cost of Traffic Jams, The Economist, November 2014.
3. Water and Sustainability, United Nations, 2014.
4. 2017 Outlook for Energy: A View to 2040
5. National Multifamily Housing Council (NMHC)

U.S. Govtech Spend is a Large Market Opportunity

Government agencies spend $250B on infrastructure projects per year in the U.S.. As public officials seek to improve efficiency and deliver solutions for their constituents, public sector CIOs are investing in technology solutions to drive results.

Although the ROI of govtech spending is difficult to measure, it is estimated that on average, a $1 increase in state CIO budgets is associated with a reduction of as much as $3.49 in state overall expenditures.

Top Smart Infrastructure Technologies
(anticipated state and local procurements through 2022.)

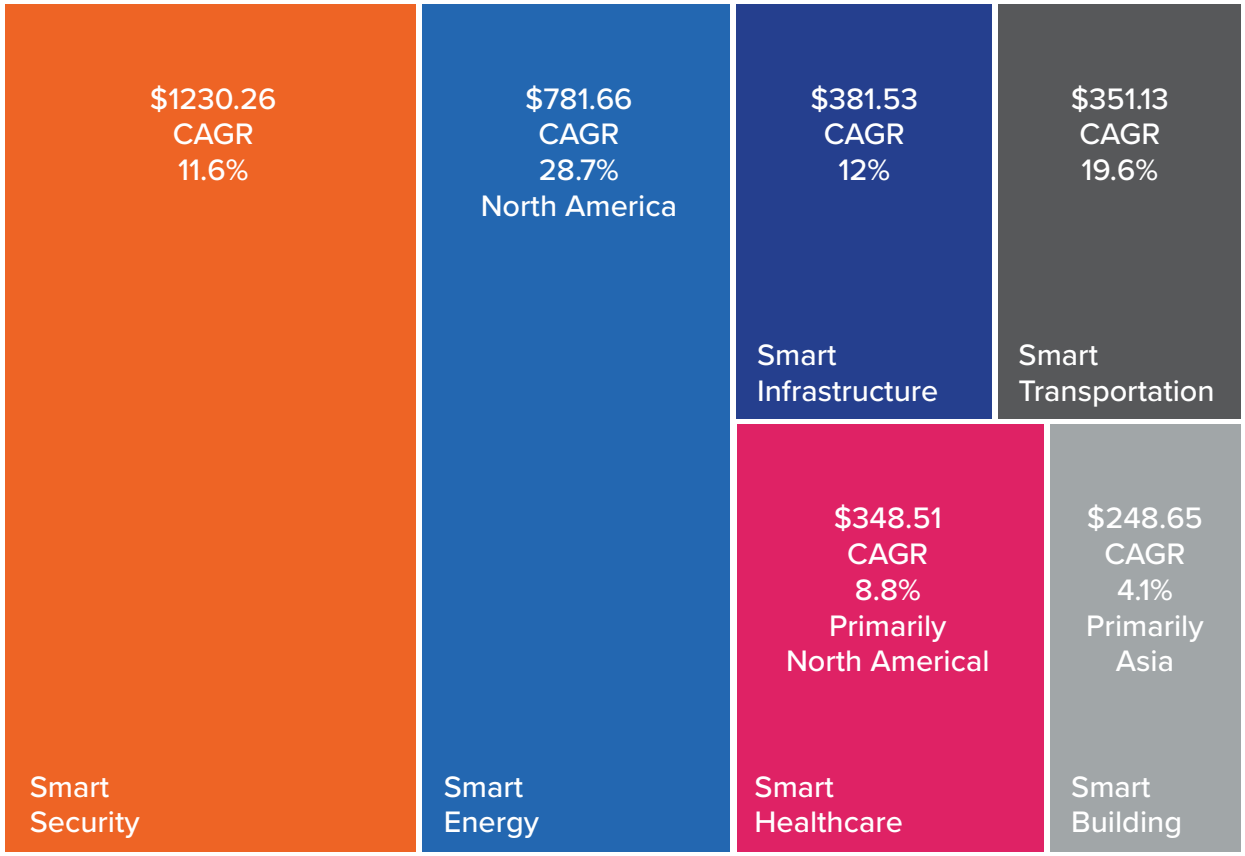


Source: Center for Digital Government

1. State & Local Government is an Industry of Industries, e.Republic, Accessed: November 30, 2017.
2. DO CIO IT Budgets Explain Bigger or Smaller Governments? Theory and Evidence from U.S. State Governments. Min-Seok Pang, Ali Tafti, and M.S. Krishnan. Management Science. 2015.
3. Public Infrastructure Spending for State and Local Governments. Governing: The States and Localities. Accessed February 2, 2018.

- Munitech market size is forecasted to grow from approximately $430B in 2017 to approximately $332T by 2025 (23% CAGR).
- The main driver is the adoption of smart tech by individual city governments.
- Collectively, the inventions spurred by this spending will change how we see, feel, and inhabit cities.
- Venture-backed startups, in particular, are well-poised to change how we live and work in these urban spaces.

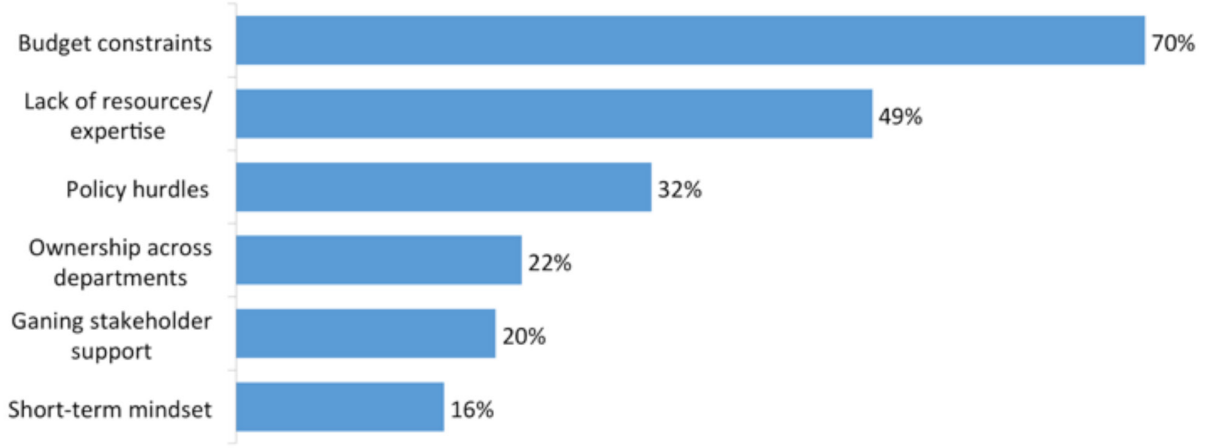
Smart City Market by Category, by 2025 in Billion (USD)



1. Smart Cities Market by Focus Areas, MarketsandMarkets Research Private Ltd., July 2017.; Graph data Frost & Suliivan

Budgets & Know-How: Hurdles to Overcome

- Constraints include governmental austerity measures, lack of resources, and insufficient experts to lead new tech initiatives.
- In the past 5 years, cities have started to hire CIOs (Chief Innovation Officers) to oversee the implementation of new tech.
- Yet cities still lack enough front-line employees to envision, implement, and maintain new technologies in neighborhoods.
- Collectively, these amount to growing pains for the munitech market—challenges which, when overcome, will speed adoption.



1. The Smart Cities Report, BI Intelligence, October 2016.
2. Do CIO IT Budgets Explain Bigger or Smaller Governments? Theory and Evidence from U.S. State Governments. Management Science. Accessed February 2, 2018.

Public-Private Partnerships: A Way Forward

State agencies can **make existing and future infrastructure projects smart** or create tax breaks to fund projects that simultaneously improve transportation, energy, and more.

Case in Point:

- Maryland's Property Assessed *Clean Energy Financing* leading to Low-cost financing for cleantech projects

Federal legislation can **finance smart cities** via several US departments targeted at specific policy or tech goals.

Cases in Point:

- Department of Transportation *Smart City Challenge*
- Department of Housing and Urban Development *Community Development Block Grant Program & Section 108 Loan Guarantee Program*

Municipal governments **hire leadership** responsible for leading smart-city projects or issue infrastructure bonds for financing.

Cases in Point:

- Pittsburgh, Atlanta, San Francisco and Columbus *Chief Innovation Officers*
- Atlanta's *Smart City Initiative* ($250M bond)
- Columbus' *SMRT program*

Municipal governments **hire leadership** responsible for leading smart-city projects or issue infrastructure bonds for financing.

Companies can implement best practices, especially those of design, or execute large-scale implementation projects.

Cases in Point:

- IBM *Smarter Cities*
- Siemens *Intelligent Solutions*
- Atkins *Future Proofing Cities*

1. Funding and Financing Smart Cities, Deloitte, 2017.

Startups, VCs, & Private Investors Also Play Big Roles

Startups can **develop and pilot** innovative smart city solutions.

Case in Point:

- American Electric Power Innovation team partners with startups such as JadeTrack, Exacter Inc., and Gridcure.
- Cisco's Smart Cities engages with the startup community to develop use cases for its platform.
- Comcast's MachineQ Smart Cities develops use cases for its LoWaRan network.

Private investors and early-stage investors such as NCT Ventures and Urban US are starting to invest in startups bringing smart city solutions to market and forging long-term relationships with key governmental stakeholders.

Case in Point:

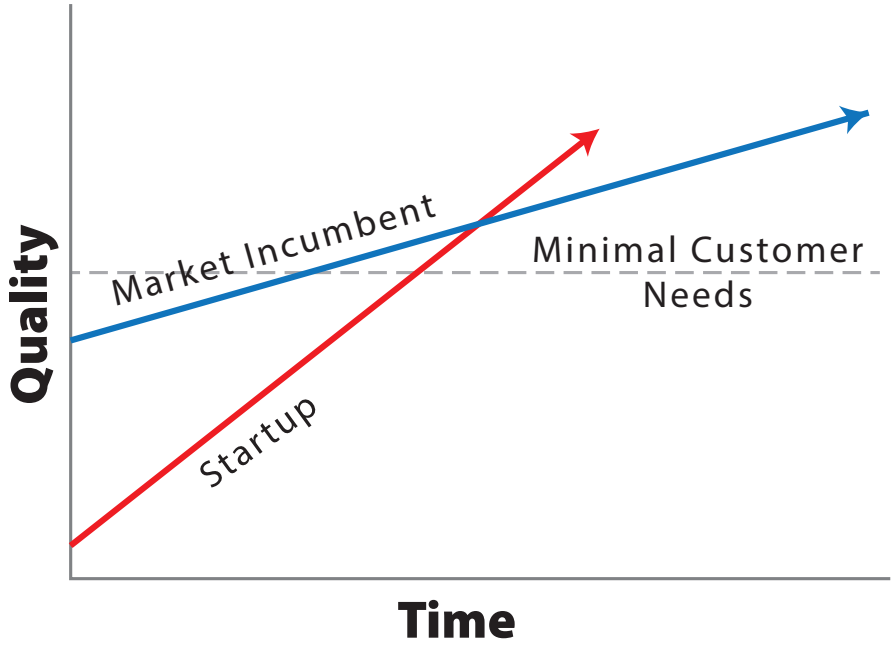
- Singularity University, NCT Ventures, and American Electric Power collaborate on a Smart Cities Accelerator.
- UrbanX accelerator program funds smart city startups.

1. Funding and Financing Smart Cities, Deloitte, 2017.

What's the Opportunity?

Startups are best positioned to bring disruptive technologies and business models to the market, delivering better, cheaper solutions to cities.

- While local municipalities can develop smart city strategies or make large investments in infrastructure, they often hire recognized consultants and companies.
- This decision shortchanges the startup community which is sometimes better suited for cities' needs.
- The "Innovator's Dilemma" states that incumbent firms cannot easily bring disruptive technologies to market.
- Therefore cities will find cheaper, more efficient solutions to their problems from startups because they have room to thrive from technological disruptions.



Startups disrupt the status quo when their products suit market conditions, quickly taking market share from stagnant incumbents.

Startups Also Create Jobs and Develop the Economy

- Small businesses serve as an **engine that drives net new job creation** in the US.
- Venture-backed companies **disproportionately** impact wealth creation and innovation.
- To sustain economic development and attract jobs that will raise standards of living, regions will **need to partner with entrepreneurs** who create jobs.
- Governments can **divert a larger fraction** of their smart city budgets to invest in startups that attract capital, create jobs, and generate wealth in their communities.

What does Success Look Like? Metrics that Matter

- For cities hoping to measure or understand the beneficial effect of technology on their cities, a few metrics can be helpful guides and potentially serve as an alternate return on investment.
- ISO, the International Organization for Standardization, has identified 14 categories to track performance of smart city initiatives for three key perspectives: residents, community managers, and environmental impact (ISO/TS 37151:2015).
- These metrics are not the end-all-be-all, but they are a useful springboard for a wider conversation around priorities and tradeoffs. The goal is to help policymakers evaluate and decide the most effective uses of capital.

Residents

- Service availability
- Accessibility
- Affordability
- Safety & security
- Quality

Community Managers

- Op. efficiency
- Econ. efficiency
- Info availability
- Resilience
- Maintainability

Environmental Impact

- Effective use of resources
- Climate change mitigation
- Reduced pollution
- Conservation

1. The Economic Impact of Venture Capital: Evidence from Public Companies, Will Gornall and Ilya A. Strebulaev, Stanford Graduate School of Business, 2015.
2. The Importance of Young Firms for Economic Growth, Jason Wiens and Chris Jackson, Kauffman Foundation, 2015.
3. International Organization for Standardization. How to measure the performance of smart cities. Accessed February 12, 2018.

Public/Private Partnerships

Ohio Case Study

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Investors Put $470M to Work in Ohio's Startup Scene

$47M
Invested in 19 manufacturing, robotics & automation companies

$25M
Invested in 18 other companies

$144M
Invested in 54 life science companies

$244M
Invested in 119 IT sector companies

170
Investors and fund managers made investments in Ohio companies

26%
Increase in capital invested over previous year

117
Out-of-state investors made investments in Ohio companies

Source: Venture Report, Venture Ohio, 2017

The State of Ohio has Prioritized its Startup Ecosystem

The Ohio Third Frontier (OTF) is a technology-based economic development initiative that accelerates the creation and growth of investable and scalable technology and tech-enabled companies throughout Ohio. The program was launched in 2002, and a rigorous, objective assessment showed significant economic impact, including a 10:1 return on investment for the state, 18.5% annual growth in early-stage venture capital investment, and 4% growth in high-tech employment from 2004 to 2008. Initially a 10-year program, the OTF was extended and continues to be a driver of economic development in the region.

Seed Fund of Funds

- Pre-seed
- Since 2006
- $247M total invested: $113M OTF/$134M match
- 3,288 new jobs
- $1.77B product/sales revenue
- $1.75B follow-on equity
- $1.65B exits

Commercial Acceleration Loan Fund

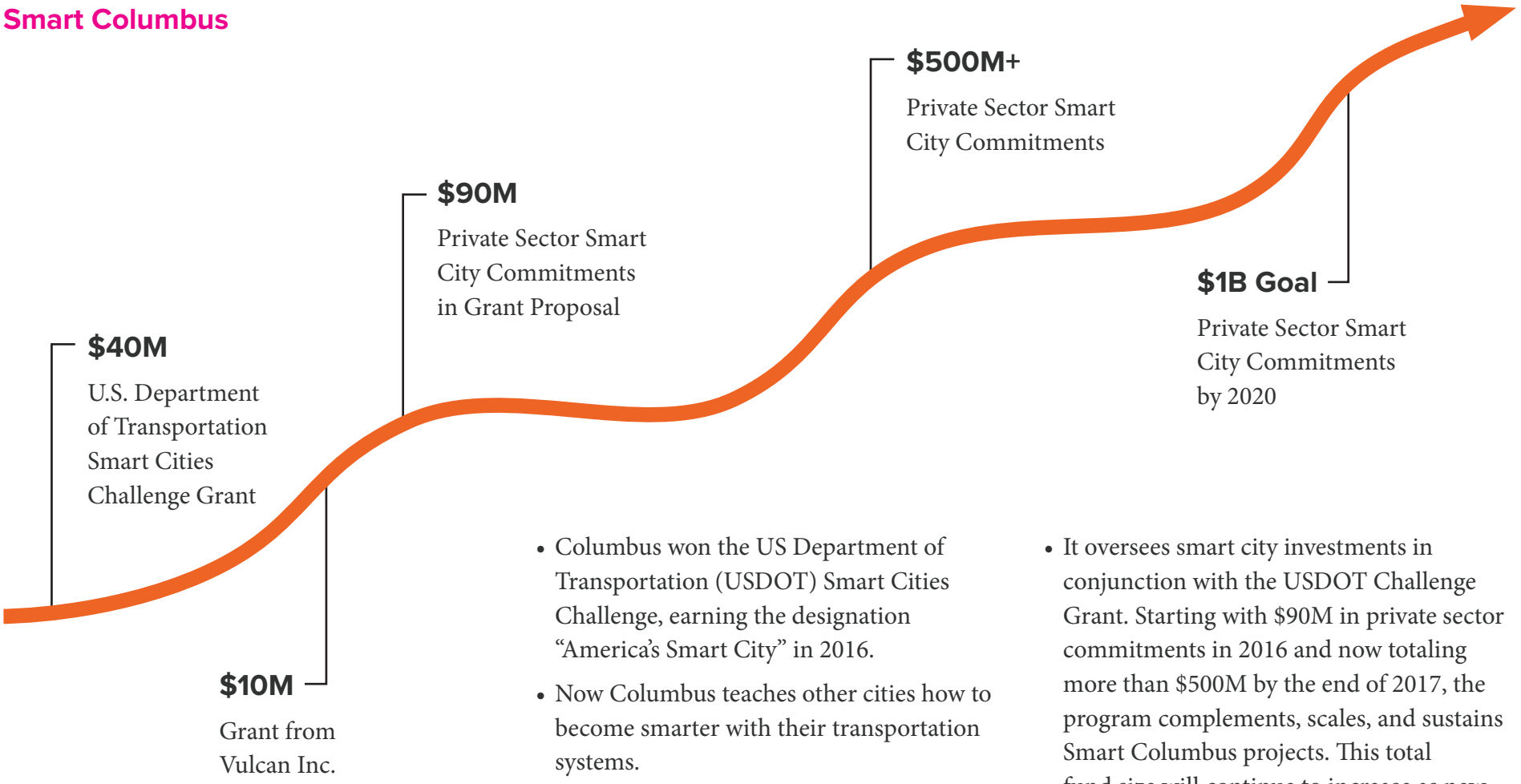
- 24 transactions closed ($28.7M)
- 247 total jobs created
- $157.6M total leverage
- ($25.5M non-dilutive, $23.6M product sales, $105M follow-on equity) 54% follow-on from outside Ohio
- 4 FDA approvals (10 pending or under R&D)
- 48 new patents (over 150 applications pending)

Technology Validation & Start-up Fund Program

- 170 total jobs created
- 148 projects reporting
- $58.4M total leverage
- ($4.5M product sales, $14.9M Federal grants, $9.7M other, $29.3M follow-on equity)

1. Ohio Third Frontier Commission Meeting, Ohio Development Services Agency, September 14, 2017.
2. Assessing the Economic Impact of Ohio's Third Frontier Program, SRI International.

Smart Columbus



- Columbus won the US Department of Transportation (USDOT) Smart Cities Challenge, earning the designation "America's Smart City" in 2016.
- Now Columbus teaches other cities how to become smarter with their transportation systems.
- The Columbus Partnership, a private sector consortium, administers the Acceleration Fund, a key factor in winning the grant.
- What is the Acceleration Fund?

- It oversees smart city investments in conjunction with the USDOT Challenge Grant. Starting with $90M in private sector commitments in 2016 and now totaling more than $500M by the end of 2017, the program complements, scales, and sustains Smart Columbus projects. This total fund size will continue to increase as new partnerships are formed to reach the goal of $1B by 2020.

Source: Smart Columbus. The City of Columbus. Accessed February 12, 2018

Smart City Accelerator Launched with 10 Startups

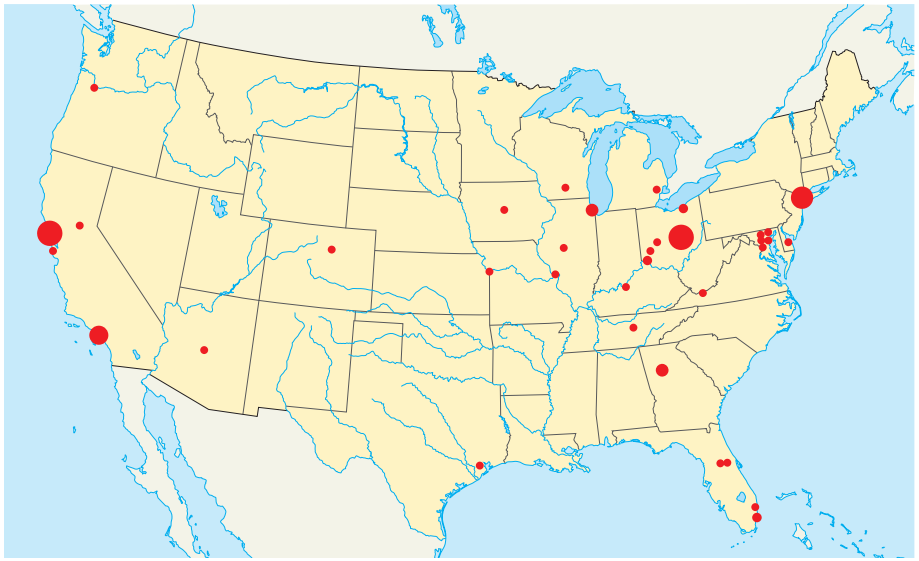
381 Applications

155 International Cities

50 U.S. Cities

52 Countries

The Smart City Accelerator was launched in September 2017 with 10 startups and 2 corporate teams participating in the 10-week program in Columbus, Ohio. The accelerator was sponsored by American Electric Power, Singularity University, and NCT Ventures. Each of the selected businesses was eligible for up to $100,000 in funding from NCT Ventures. The program attracted 381 applications from around the world that were assessed by NCT, AEP, and 40 expert mentors from the Singularity University network. During the program, Smart Columbus, AEP, the City of Columbus, and several enterprises from the region engaged with the startups to explore project opportunities. Several companies have successfully raised additional funding and are in the process of developing pilots in the region that are expected to be announced in early 2018.



10 Smart City Accelerator Companies

+ 2 corporate innovation teams from AEP

Corporate/Startup Partnerships

Case Studies

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Solutions in Partnership with

Summary

- Energy and utility costs are the largest expenses for a building.
- By working with Jadetrack, an energy and sustainability management platform, building owners can save 12% with ENERGY STAR® benchmarking.
- The cloud-based software program combines automated utility bill management, facility benchmarking, and real-time monitoring to create cost-saving insights and long-term sustainability.

OBJECTIVE

"Improve energy efficiency among commercial and industrial buildings, saving time and money through cloud-based software"

Case Study: AEP Ohio & Jadetrack

Details of the Campaign: AEP Ohio & Jadetrack

Problem

- Until recently, energy management for commercial and industrial buildings has been time-consuming and error-prone due to manual data entry.
- Monitoring complex energy efficiency and sustainability data requires more sophisticated tools than spreadsheets.
- Since energy and utility costs produce a third of a typical building's operating budget and accounts for nearly a fifth of total greenhouse gas emissions in the US, reducing costs decreases both the cost of utilities and our collective carbon footprint.

Solution

- Jadetrack, an energy and sustainability management platform, partnered with AEP Ohio to send data directly into ENERGY STAR®.
- This product enables C&I customers to enroll their facilities online, allowing them to easily compare energy efficiency across all buildings.

Outcome

- The benefits of adopting a sustainability and energy efficiency platform are significant. Buildings that take advantage of ENERGY STAR® benchmarking are able to bring all of their data together, which controls costs and creates efficiencies, producing long-term value.
- Facility benchmarking has many benefits: higher occupancy, increased asset value, reduced exposure to volatile fuel costs, and diminished ongoing costs. ENERGY STAR®-powered buildings over four years saved on average 2% versus similar buildings.
- Additionally, Jadetrack helps the environment by reducing waste. With utility bill management, each monthly bill is automated and PDF copies are digitally stored all in one place, eliminating the hassle of paperwork.

To learn more, visit jadetrack.com atnd aepohio.com.

Solutions in Partnership with

Summary

- While responding to an emergency, first responders are involved in nearly 60,000 emergency vehicle collisions annually in the US.
- HAAS Alert is a mobile vehicle-to vehicle platform that delivers preemptive notifications to motorists when first responders are nearby.
- Real-time information generated is broadcast to drivers via car stereo or headphones so they can safely get out of the way.

OBJECTIVE

"Enable in-dash notifications to drivers alerting them when emergency services are on scene"

Case Study: Smart Mobility & Logistics

Details of the Campaign: Smart Mobility & Logistics

Problem

- First responders are dispatched by 9-1-1 over 190 million times per year in the US. Police officers and firefighters have a higher death rate driving to a scene of an incident than at the scene itself.
- Although short-range vehicle sensors such as DSRC were developed in 1999 for vehicles to talk directly with others and thus save thousands of lives, the technology never arrived.
- However, smartphones, mobile networks, and other technologies can fill the void.

Solution

- HAAS Alert keeps the road safe via responder-to-vehicle communication. In-dash alerts connected to a car's navigation system send a message to motorists. JRL and Ford are exploring driver safety and awareness with HAAS.
- The company has also launched a feature to track driver behavior following the alerts. Further, HAAS Alert is working with Waze, a real-time traffic app, to offer HAAS Alert to increase safety on the road.

Outcome

- As a result of real-time in-dash HAAS Alerts, motorists are able to make proactive decisions, enabling them to avoid collisions, reduce congestion, and ultimately save lives.

To learn more, visit haasalert.com.

Solutions in Partnership with

Summary

- Many individuals don't have WiFi, leaving them disconnected from work, travel, and other information.
- By instituting Bluetooth beacon technology, individuals are able to access WiFi almost anywhere, allowing app users to increase their communication for businesses ranging from cities to local museums.
- In addition to sending out messages, beacons can help share incentives for frequent visitors and increase foot traffic by giving customers discounts and boosting partnerships among businesses.

OBJECTIVE

"Utilize Bluetooth beacon technology to enhance the communication and experience across all industries"

Case Study: Cisco & inTouch

Details of the Campaign: inTouch & Cisco

Problem

- The United Nations World Cities Report (2016) notes that cities will house 60% of the global population by 2030.
- This influx requires cities to adapt by incorporating more technology to accommodate its citizens.
- The population of Cleveland has skyrocketed thanks in part to entrepreneurship.
- During the Republican National Convention in 2016, the city wanted to make sure attendees could access information.

Solution

- Cisco Meraki and Cisco Kinetic teamed up with startup inTouch, a software development company that connects the physical and digital worlds.
- Using the Bluetooth-powered inTouch app, users can share messages with others. Cisco Meraki's WiFi access points distribute information via proximity sensors and push notifications.

Outcome

- inTouch improved the RNC's communication and even helped Columbus become a smarter city. "Destination Cleveland" will use the Bluetooth beacons from inTouch to improve sightseeing and shopping in Cleveland and other parts of Northeast Ohio through customized notifications for users.
- The Bluetooth beacons can collect location-based user analytics anytime when in range. By analyzing these data trends, retailers can improve shopping recommendations and cities can identify and re-route traffic patterns.

To learn more, visit intouchapplication.com.

Solutions in Partnership with

Altovista
TECHNOLOGY

Summary

- Police misconduct has sparked a large public uproar against police officers.
- Of cities surveyed between 2014 and 2016, they reported over $1B in settlements and $130M in legal fees.
- Altovista created a public safety solution dedicated to providing police departments advanced identification of at-risk officers via a behavior compliance program.

OBJECTIVE

"Reduce police transgression through behavior compliance software to better community relations across law enforcement nationwide"

Case Study: Altovista & Detroit P.D.

Details of the Campaign: Altovista and Detroit P.D.

Problem

- Police officers in the U.S. now face higher scrutiny for their behavior. Over the past few years, more officers have been charged with police brutality or homicide. In some communities, people simply do not trust officers.
- Undoubtedly, more excessive force from officers and heightened media coverage contribute to more lawsuits and settlements. Although police misconduct is not new, technology can help a community regain this lost trust in officers by identifying those who are at-risk before an incident occurs.

Solution

- Altovista is a cloud-based public safety product for police departments. Supervisors can identify officers at-risk for procedural violations and put them through training programs.
- The Management Awareness Platform (MAP) stores all reports electronically. KPIs are generated via a machine learning algorithm that identifies at-risk officers through various signals.

Outcome

- In 2009, AltoVista teamed up with the Detroit Police Department to digitize its entire system. For 18 months, Altovista monitored Detroit P.D.'s systems and provided supervisors with lists of officers potentially at-risk. Further, the software allowed Altovista to help the officers manage training and corrective programs.
- As a result, the Detroit P.D. saw lawsuits drop from 105 to 40 (-60%). Payouts, meanwhile, decreased from $10M to $4.9 million per year. Excessive force, shootings, and fatal shootings all declined while community relations increased.
- Overall, Altovistas's compliance technology saves the city money simply by monitoring and ultimately protecting more than 2,300 officers.

To learn more, visit intouchapplication.com.

Appendix

Smart Cities Landscape:
Startup, Investor, and Corporate Highlights

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Startups

Company Profiles

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Smart Mobility Startup Profiles

CrowdAI

Combines machine learning, computer vision, and human intelligence for autonomous vehicles. CrowdAI also annotates images for autonomous drone and satellite image companies.

Founded: 2016

Headquarters: Mountain View, CA

Website: crowdai.io

Total Equity Funding: $2.12M

Most Recent Funding: Seed

Investors: SV Angel, Y Combinator, Jerry Yang, AME Cloud Ventures, Susa Ventures, BoxGroup, and Metamorphic

ChargePoint, Inc.

Runs the world's largest open electric vehicle (EV) charging network with over 28,000 stations. It also developed a mobile app to help customers find nearby charging locations.

Founded: 2007

Headquarters: Cambell, CA

Website: chargepoint.com

Total Equity Funding: $229.2M

Most Recent Funding: Series G

Investors: Kleiner Perkins Caufield & Byers, Toyota Tsusho, Siemens AG, Daimler, BMW i Ventures, Rho Ventures, etc.

Smart Mobility Startup Profiles

WayRay

Creates advanced hardware and software to develop holographic AR technologies for cars. This product creates a dynamic overlay in the car that reacts to the environment. WayRay provides route-related information and emergency notifications to drivers. In the future, it hopes to create a virtual world around the car.

Founded: 2012

Headquarters: Vaud, Switzerland

Website: wayray.com

Total Equity Funding: $28M

Most Recent Funding: Series B

Investors: Alibaba Group, Sistema JSFC, Honda

Arbe Robotics

Arbe's patented imaging SAR is the first radar to provide automotives with a high-res 4D image. This tech can turn any vehicle semi-autonomous; however, the first step is to prevent drone collisions. Down the line, Arbe intends to make drones fully autonomous.

Founded: 2015

Headquarters: Tel Aviv, Israel

Website: arberobotics.com

Total Equity Funding: $11.5M

Most Recent Funding: Series A

Investors: Canaan Partners, Our Crowd, iAngels, Taya Ventures, O.G. Tech Ventures,

Smart Energy & Infrastructure Startup Profiles

AutoGrid

Organizes and analyzes energy data to generate real-time predictions.

Founded: 2011

Headquarters: Redwood City, CA

Website: auto-grid.com

Total Equity Funding: $41.75M

Most Recent Funding: Series C

Investors: Stanford University, Voyager Capital, Foundation Capital, Energy Impact Partners, Foundation Capital, etc.

Blue Pillar

Single platform for all energy-focused IoT devices. Blue Pillar surfaces real-time data to strengthen critical infrastructure and accelerate business. Blue Pillar's Aurora® is both automated and highly secure from end-to-end.

Founded: 2006

Headquarters: Indianapolis, IN

Website: bluepillar.com

Total Equity Funding: $35.73M

Most Recent Funding: Funding Round

Investors: Arsenal, Allos Ventures, EnerTech Capital, Elevate Ventures

Smart Energy & Infrastructure Startup Profiles

Energyworx

A SaaS-based platform for energy data management and intelligence cloud service that disrupts the global energy and utilities market.

Founded: 2012

Headquarters: Houten, Utrecht, The Netherlands

Website: energyworx.com

Total Equity Funding: $2.6M

Most Recent Funding: Series A

Investors: HENQ Invest, SET Ventures

GridCure

Solves the smart-grid analytics issue by bringing big data to the power utility space.

Founded: 2014

Headquarters: Toronto, Ontario

Website: aveautomedia.co

Total Equity Funding: $95k

Most Recent Funding: Seed

Investors: 500 Startups, NEXT Canada, Hedgewood, Launch Capital

Smart Government & Public Safety Startup Profiles

OpenGov

Leader in government performance management, with easy-to-use cloud software for better budgeting, improved operational intelligence, and comprehensive open data. OpenGov gives local governments the right tools and relevant data for more informed decision-making and greater transparency for the public.

Founded: 2012

Headquarters: Redwood City, CA

Website: opengov.com

Total Equity Funding: $77M

Most Recent Funding: Series C

Investors: Andreessen Horowitz, Thrive Capital, FF Angel, Telstra Ventures, Sway Ventures

Enigma

Sells operational data management and intelligence, and supports the open data community by open-sourcing its vast library of data.

Founded: 2011

Headquarters: New York, NY

Website: enigma.com

Total Equity Funding: $34.6M

Most Recent Funding: Series B

Investors: New Enterprise Associates, Two Sigma Ventures, American Express Ventures, The New York Times, Comcast Ventures

Smart Government & Public Safety Startup Profiles

Nexla

Monitors, adapts, and securely moves data between companies so you can focus on the real work—machine learning, AI, and analytics.

Founded: 2016

Headquarters: Millbrae, CA

Website: nexla.com

Total Equity Funding: $3.5M

Most Recent Funding: Seed

Investors: Blumberg Capital, Correlation Ventures, Storm Ventures, Engineering Capital

OnSeen

OnSeen is a command and control platform for mobile teams that helps organizations coordinate their people, places, and things. They focus on the insurance, government, and transportation/logistics markets.

Founded: 2016

Headquarters: Columbus, OH

Website: onseen.com

Total Equity Funding: Undisclosed

Most Recent Funding: Undisclosed

Investors: NCT Ventures

Investors

Venture Capital and Accelerators

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Loudspring

Loudspring is a clean-tech venture capital firm that invests exclusively in startups that solve environmental problems. Their portfolio companies have already saved 150,000 tons of CO_2 emissions and 9.6 million cubic meters of water. Some of the problems their portfolio companies are looking to solve include: electricity generation, recycling food, and water filtration.

Founded: 2005

Headquarters: Helsinki, Finland

Website: loudspring.earth/people

Investment Activity: Undisclosed amount in 13 investments

Contact: Alexander 'Bigge' Lidgren (Partner, CEO)

EcoMachines Ventures

An early stage and later stage investment venture capital firm with a pan-European focus in investments. EcoMachines invests in energy, transport, circular economy, smart city and industrial high-tech sectors, primarily B2B hardware/software startups.

Founded: 2013

Headquarters: London, England

Website: ecomachinesventures.com

Investment Activity: Undisclosed amount in 7 investments

Contact: Dr. Ilian Iliev (Managing Director)

Urban.Us (VC)

Urban Us is the leading early-stage investor for startups re-imagining cities. The firm believes that over the next two decades, startups will play a central role making city life better as we redesign cities for 80% lower greenhouse gas emissions.

Founded: 2012

Headquarters: Miami, FL

Website: urban.us

Investment Activity: $11.35M in 36 investments

Contact: Shaun Abrahamson (Managing Partner)

UrbanX Accelerator

Early stage accelerator focused on smart city technologies and infrastructure technologies. UrbanX has a 20-week program that runs twice a year. The program can invest up to $100,000 in up to 10 companies that complete the accelerator. The accelerator is a partnership between Urban US and BMW's MINI group.

Founded: 2016

Headquarters: Brooklyn, NY

Website: urban-x.com

Investment Activity: Undisclosed amount in 23 investments

Contact: Micah Kotch (Managing Director)

Plug and Play (Accelerator)

Runs 12 industry-specific accelerator programs, including smart city and fintech, that acts as a platform for major corporations and high-quality startups to connect and collaborate.

Founded: 2006

Headquarters: Sunnyvale, CA

Website: plugandplaytechcenter.com

Investment Activity: 542 investments in 457 companies

Contact: Saeed Amidi (Founding General Partner)

Motus Ventures (VC)

Seed venture capital fund and business accelerator focusing on innovation in the transportation industry.

Founded: 2012 (first investment in 2014)

Headquarters: Redwood City, CA

Website: motusventures.com

Investment Activity: Undisclosed amount in 12 investments

Contact: Robert Seidl (Managing Partner)

Capital Intelligence

Capital Intelligent Mtl is comprised of venture capital investors, corporations, and financial institutions. Helps arrange vital financial backing for innovative companies offering solutions for present and future urban challenges. Over $100M in funding is available both for startups and established businesses wishing to grow their operations.

Founded: 2016

Headquarters: Montreal, Canada

Website: cimtl.com/en/

Investment Activity: N/A

Contact: Michel Brouillette (Director)

AIM Smart City

AIM Smart City Accelerator is India's first dedicated smart city accelerator. AIM exclusively works with startups that are trying to make a difference by improving living spaces and conditions of people. It has some of the best mentors and experts who understand smart cities and can provide valuable insight for organizations to grow.

Founded: 2015

Headquarters: New Delhi, India

Website: aimsmartcity.com

Investment Activity: 80 companies graduated

Contact: Ankit Gupta (Board Patron)

Corporate Teams

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MachineQ (Comcast)

MachineQ is the B2B IoT service within Comcast. It is a LoRaWAN-based network and service platform. Last year, Comcast announced that it was going to offer the platform in 12 new cities in the United States to meet growing demand. This carrier grade low-power network built on LoRa technology enables Comcast to provide a cheap way to connect sensors and devices to power. Currently focused on enterprise and government applications, MachineQ offers services from connectivity as a service to full stack device and application solutions.

During the 2017 holiday season, MachineQ worked with the City of Philadelphia to install a smart lighting solution. Using the platform, the city could monitor power outages and energy consumption and even control the energy usage. MachineQ is able to communicate with sensors installed on the lights using the LoRaWAN network. City officials could then set dimming schedules and remotely turn lights on and off using small amounts of power to communicate.

1. https://corporate.comcast.com/stories/comcasts-machineq-deploys-smart-city-solution-in-philly-holiday-hotspots
2. http://machineq.com/
3. http://www.lightreading.com/smart-cities/comcast-opens-up-on-smart-cities-and-machineq/d/d-id/733818

Cisco

Cisco will continue to be a prominent player in the smart city market, both in the United States as well as around the globe. Cisco has smart city solutions in everything from smart street lighting to urban mobility and city financing. Cisco has also been active on the M&A front in the smart city space. In 2016, Cisco acquired Jasper Technologies for $1.4B. Jasper Technologies is a cloud-based software platform for the Internet of Things. The acquisition highlights Cisco's determination to be a dominant player in the IoT network management and monetization space.

In addition to making outside acquisitions, Cisco developed robust internal innovation capabilities to spin out company-owned IP. Its Technology Innovation Fund allocates $10M in capital annually toward both nearsighted product development and more long-term technology projects. To date, it has funded over 40 projects.

Cisco has completed multiple Smart City Projects all around the world. In China, Cisco built a manufacturing cloud that is being used by the manufacturers of the Guangdong Province to determine how such solutions could drive innovation, create revenue streams, and lower costs. Additionally, Cisco partnered with the City of Manchester to transform into a smart city. Central Manchester NHS Foundation Trust will use IoT devices so that patients can monitor their physical activity and track their medication timetable.

Funding is often a large hurdle and barrier to cities wanting to implement smart city projects. Cisco is tackling this problem with the launch of their City Infrastructure Financing Acceleration Program, a $1B fund to help cities finance smart city projects.

1. https://www.networkworld.com/article/3122478/lan-wan/cisco-diversifies-its-internal-innovation-practices.html
2. https://techcrunch.com/2016/02/03/cisco-buys-jasper-technologies-for-1-4-billion/
3. https://www.cisco.com/c/en/us/solutions/industries/smart-connected-communities.html
4. https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=1895705
5. https://www.cisco.com/c/m/en_uk/never-better/core-networking.html

Amazon

As cities deploy more sensors, they will generate massive amounts of data, in turn requiring cloud storage and analytics. Amazon Web Services (AWS) offers these capabilities and much more to cities. Among the product offerings for cities are database storage, analytics, and management tools. All of these products are offered through the AWS cloud by which users can access the data and services.

AWS also has powered smart city applications by developers. Startups are a significant portion of the AWS customer base. Many of these startups would not have had the opportunity to qualify as an AWS partner without proving the value of their solution first, itself made possible via venture financing. Their smart city solutions partners offer services from mobility to public safety to public health.

Amazon is also working with many cities to help move the needle forward on their smart city projects. Recently, AWS announced its Shanghai-Amazon AWS United Innovation Center in partnership with the city. This center will help to showcase new technologies through creating exhibits that people can experience and interact with.

1. https://aws.amazon.com/smart-cities/
2. https://www.shine.cn/news/metro/1801118905/

Verizon

Verizon has been one of the preeminent smart city developers. Verizon works with cities, enterprises, and startups to bring smart city solutions to new metro areas. Most notably, Verizon has been extremely active on the M&A front. In 2016, Verizon acquired the intelligent lighting and public security company, Sensity. It offers smart street lighting and video processing to improve public safety. This is also a direct add-on to Verizon's ThingSpace platform, its web-based open development platform for IoT development.

Verizon also acquired Fleetmatics in 2016 for $2.4B. Fleetmatics became a part of the telematics and IoT division of Verizon. Also in 2016, Verizon purchased LQD WiFi in a play to strengthen it's IoT business further. LQD WiFi builds kiosks that provide WiFi connectivity, news, and emergency alerts and also collects crowd and weather data.

In 2016, Verizon announced a partnership with Boston to install new fiber cable to upgrade the city's fiber infrastructure through its One Fiber program. With this new grid in place, Boston will be able to take advantage of 5G network capabilities. Verizon proved it could integrate more of their smart city solutions such as lighting and intelligent video applications. In 2017, Verizon announced plans to expand One Fiber to other cities.

frogdesign.com

1. http://www.verizonenterprise.com/products/internet-of-things/smart-cities/
2. https://techcrunch.com/2016/11/14/verizon-buys-lqd-wifi-to-expand-its-iot-strategy-into-smart-cities/
3. https://techcrunch.com/2016/08/01/verizon-buys-fleetmatics-for-2-4b-in-cash-to-step-up-in-telematics/
4. https://techcrunch.com/2016/09/12/verizon-acquires-sensity-systems-to-add-led-light-control-to-its-iot-platform/
5. http://www.lightreading.com/smart-cities/verizon-takes-one-fiber-to-more-cities/d/d-id/733901
6. http://www.lightreading.com/gigabit/gigabit-cities/verizons-boston-smart-cities-pilot-begins/d/d-id/728893

City Initiatives

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Madrid

Key Problems: Tackling traffic congestion, pollution, and public services via a unique bottom-up approach with data. Avoiding the pitfalls of a single-city grid system locks public services into a central network for decades.

Open Data: Offers real-time open-source bus data to identify high-traffic streets so that apps such as Waze and Google Maps redirect drivers accordingly to avoid congestion.

MAX: Both thyssenkrupp Elevator and Microsoft are creating predictive analysis maintenance for machines. This technology reduces downtime for repairs and improves accessibility for the public.

MiNT: Also known as Intelligent Madrid, the technology platform aims to improve the quality of services, increase communication with citizens, and better coordinate resources. Citizens will communicate via social media platforms with their local municipal office should a problem arise. So if a tree struck by lightning fell, a user could take a photo and send it to the municipal government. The platform runs on the IBM Intelligent Operations and IBM Maximo technologies.

Barcelona

Smart Hardware: Barcelona has launched a series of lamppost computer systems that can measure noise, traffic, pollution, and crowds. In addition, the city has funded a line of digital chips for garbage dumpsters and sensors for parking spots. Moreover, Barcelona has installed over 600 WiFi hotspots across the city. The city has also installed 19,500 smart meters to monitor and optimize energy consumption in certain areas of the city.

Fiber Optic Cable: Lay 500 kilometers of fiber optic cable within the city. Serving as the backbone for IoT systems throughout Barcelona.

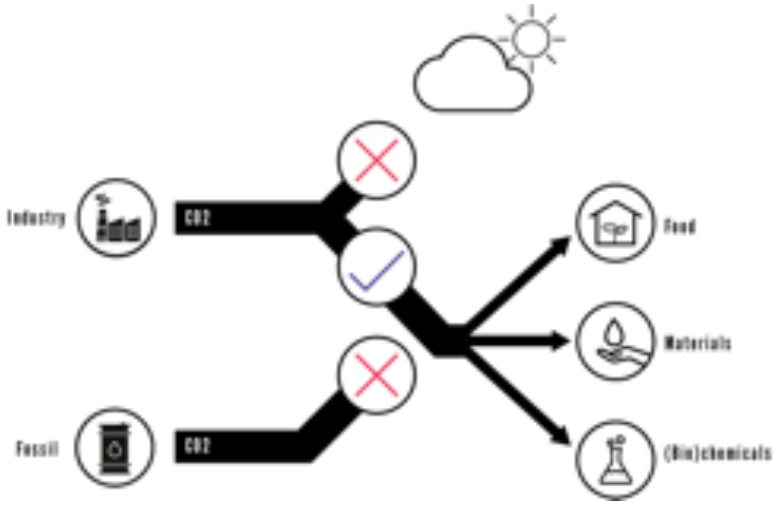
Smart City Expo World Congress: More than 16,000 professional visitors attended the event, including 600 exhibitors, senior representatives from more than 650 cities, and over 400 thought leaders.

Urban Mobility Plan: Developed in 2014, this plan was intended to reduce pollution and vehicle congestion in the city. One unique aspect is the "Super Block"—essentially 9 pedestrian-favored streets with low speed limits and circular paths. Super Blocks aims to revitalize public spaces, promote walking and biking, and increase green spaces in the metro area.

1. https://www.vox.com/2016/8/4/12342806/barcelona-superblocks
2. https://www.smartcitiesdive.com/ex/sustainablecitiescollective/madrid-spain-launches-ibm-smarter-cities-project/316481/

Amsterdam

Circular Economy: The Netherlands is a pioneer in the field of reusing products, recycling materials, and rethinking manufacturing processes. The term "circular economy" encompasses a wide variety of industries, businesses, processes, and projects. Amsterdam has numerous circular economy projects including a cradle-to-cradle business park, future-proofing a port, and utilizing Light-as-a-Service. Additionally, in the circular economy program, Amsterdam has the CO_2 Smart Grid project as well. The CO_2 project aims to massively reduce the amount of CO_2 put into the atmosphere by trapping CO_2 and reusing it in the production of other goods.



Toronto

Toronto Smart City Challenge: Toronto is preparing to submit a proposal to the Government of Canada for the Smart Cities Challenge. Toronto has solicited ideas from members of the public, an unusual step compared to competitors. Toronto plans to include in its plan an open data exchange, online water information platform, and smart traffic signals.

Sidewalk Toronto: In this joint effort between the City of Toronto and Sidewalk Labs (NYC), the goal is to create a new mixed-use community on Toronto's Eastern Waterfront. The new community will use tech to make a people-centered community that promotes sustainability, affordability, mobility, and economic opportunity. Google will begin by relocating its Candian HQ to the metro zone, bringing approximately 300 employees. The region will feature new designs, such as a thermal grid that reuses energy in circulation, flexible real estate that can be converted for multiple uses, and restriction of non-emergency vehicles. The region will become a beacon for smart cities around the world.

1. https://amsterdamsmartcity.com/projects/co2-smart-grid
2. https://sidewalktoronto.ca/
3. https://sidewalktoronto.ca/wp-content/uploads/2017/10/Sidewalk-Labs-Vision-Sections-of-RFP-Submission.pdf
4. https://www.toronto.ca/community-people/get-involved/smart-cities-challenge/

Tel Aviv

Citizen Engagement: Tel Aviv created public WiFi networks in most high traffic areas, including beaches. The city also created the Digi-Tel app, which connects citizens ages 13 and older to city, providing them with alerts about neighborhood roadwork, showing them the nearest bike-sharing station, or offering discounts to cultural events, etc. Residents can notify the city of anything from activities and events to city obstacles or hazards. The iView app makes spatial information available to the public in a large number of spheres: engineering, transportation, community, tourism, education, art, and more.

Smart Infrastructure: A new traffic control center uses data collected from vehicle volume sensors, traffic cameras, and third-party systems such as Waze to automatically or manually set traffic policies for traffic lights or to intervene with traffic in other ways.

Smart Ecosystem: The city is creating a culture of innovation. Tel Aviv has 1,450 startups which is the highest concentration of startups, per capita in the world. There are an additional 84 accelerators and incubators within the city. This momentum was created by developing numerous symbiotic relationships throughout the city and decentralizing Smart Initiatives.

Dubai

Dubai Blockchain: Dubai is aiming to be the first government entirely powered by blockchain technology. Its leaders believe that the implementation of blockchain technology will create 5.5B dirham in annual savings by eliminating document processing. The blockchain project also hopes to make government more efficient by creating a paperless digital layer for all city transactions. Additionally, by creating a paperless government, Dubai estimates that up to 114 million tons of CO_2 emissions will be eliminated from trip reductions and a redistribution of up to 25.1 million hours of economic productivity in saved processing time.

Happiness Meter: Dubai has created a tool meant to measure the happiness of citizens and people visiting the city in real-time. The data collected from the Happiness Meter can also be used to create a map of happiness across the city at any point that can be accessed by both the private and public sector. This is meant to be a tool that drives progress forward toward the goal to "Make Dubai the happiest city on earth."

Smart Dubai Platform: Dubai has funded a platform that will bring an array of innovations to its citizens. The platform will yield a personalized dashboard and analytics tools for individuals, a secure digital payment gateway, a single-sign-on digital ID, geolocation data, and access to shared city data.

1. http://www.smartdubai.ae/sdp.php

San Diego

Smart Lighting: Partnering with GE to upgrade and connect streetlights to reduce energy costs by 60%. These street lamps will also help optimize parking and traffic, enhance public safety, and track air quality. The city has installed 3,000 LED streetlights with adaptive controls downtown—one of the first deployments of this technology in the US.

2030 District: This is an urban area in which the private sector and local building industry leaders commit to sustainability and economic growth. The goal is to provide a 50% reduction in energy, water, and transportation emissions in participating buildings by 2030.

Smart Cities San Diego Hackathon (June 2017): Powered by the Predix platform, entrants had unlimited access to CityIQ's real-world datasets, Intelligent Cities APIs, engineering support, and developer resources.

Solar to EV: In this partnership between the City of San Diego and the San Diego Zoo, the city installed a solar photovoltaic canopy that charges electric vehicles (EV) in the zoo's parking lot. Installed in 2012, the canopy automatically redeploys energy back into the grid if underutilized.

San Francisco

Superpublic: This is an innovation lab and collaborative space where federal, state, and city government representatives partner with academics and private companies to tackle policy and regulatory issues.

WiFi Hotspots: These hubs provide residents with a large number of free WiFi hotspots. A 3-mile stretch of Market Street, a main artery in the city, has free WiFi.

Green/Sustainable Initiatives: The city has long been a leader in recycling, requiring residents to separate their garbage into three categories: recycling, compost, and landfill waste. The city of San Francisco intends to eliminate waste by 2020.

SFpark: The city recently installed sensors on over 8,200 on-street spaces to collect parking availability in real-time. This pilot has proven to be successful and contributes to the city's goal of reducing greenhouse gas emissions. The SFpark program resulted in a 30% reduction of greenhouse gas emissions and miles traveled by vehicles in neighborhoods where the program was implemented.

SF Energy Map: This is an initiative that aims to make San Francisco carbon-free by 2030.

1. http://app.dumpark.com/sunlight/sf/
2. https://apiumhuB.com/tech-blog-barcelona/smart-city-projects-leaders-barcelona/
3. http://sfpark.org/wp-content/uploads/2014/06/SFpark_Pilot_Project_Evaluation.pdf
4. https://www.sdge.com/video/solar-ev-project-san-diego-zoo

Boston

Smart Streets: Working with Verizon to test data-gathering technology at the intersection of Massachusetts Avenue and Beacon Street. It collects data to help residents better understand the hazards on the city's roads using video cameras, LED light sensors under the road, and a web-based platform for data analysis.

Wicked Free WiFi: Boston's outdoor wireless network that displays shopping and dining destinations. The city intends to expand the network over the next several years, eventually connecting Boston's 20 neighborhoods and creating an estimated 130 access points.

Self Driving Cars: In 2017, the Massachusetts-based startup nuTonomy, Inc., began testing its fleet of self-driving cars in a section of Boston. As nuTonomy hits predetermined milestones, the company can expand the area in which its cars can drive. This project could lead to Boston becoming one of the leaders in autonomous vehicle adoption and policy.

Union Point: This newly-announced 1,500 acres of land will be developed into a mini high-tech sustainable city. The new city, built from scratch, will feature all of the new technologies like solar power, smart grids, and Internet of Things applications. The city will also be connected to Boston by a rail station.

New York City

Citizen Engagement/Data Analytics: The New York Fire Department started using data mining and predictive analytics to determine which of New York City's 1 million buildings are at the highest risk for fires. Now it examines more than 7,500 factors across 17 city-agency data streams and uses artificial intelligence to track trends citywide.

Smart Cities NYC 2017: This hackathon has 4 themes: growth, sustainability, resilience, and equity. Participants submit app ideas that touch on and improve one of these themes.

LinkNYC: This initiative focuses on providing connectivity for all of the citizens in the city. Services these kiosks offer include free WiFi, city services and maps, free phone calls, and phone charging. The Link NYC program is self-funded via advertising.

Child Care Connect: This initiative is meant to provide meaningful and quantitative KPIs for the parents of NYC. They provide information on quality, peer reviews, inspections, and permits of child care center in NYC.

flashfunders.com

1. https://www.builtinboston.com/2017/01/12/public-projects-making-boston-smart-city
2. https://www.huffingtonpost.com/entry/sustainable-smart-city-union-point_us_59dfd221e4b0a52aca16a5b4
3. https://www1.nyc.gov/site/forward/innovations/projects.page
4. https://www.link.nyc/
5. https://a816-healthpsi.nyc.gov/ChildCare/ChildCareList.do

Chicago

Array of Things: This is a network of interactive, modular sensor boxes that will be installed around Chicago to collect real-time data on the city's environment, infrastructure, and activity for research and public use. The city hopes it will foster development of innovative mobile applications that let residents track their exposure to certain urban health hazards, and lets the city track vehicle and pedestrian traffic.

CIVIQ Smartscapes: This is an interactive waypoint that will include digital applications such as wayfinding for tourists, interactive information about transportation services, safety alerts and free WiFi. This service is also available in New York City.

Smart Street Lighting: This smart street lighting project is similar to those of many other cities who aim to upgrade their lighting infrastructure with modern day technologies. Chicago will upgrade more than 270,000 street, alley, and park lights. Once upgrades are complete, the city will be able to have much quicker response times to outages in the lighting network.

Chicago Health Atlas: This project democratizes access to population health data. By combining data from multiple sources, like the State of Illinois, the City of Chicago, and multiple hospitals, citizens can spot trends and react accordingly. Some of the information on the platform includes hospital admissions, uninsurance rates, cause of death, and birth rates.

Columbus

Smart City Challenge: The City of Columbus was the winner of the US DOT Smart City Challenge and recipient of the $50M grant from the DOT. The private sector in the greater Columbus area has also pledged over $500M to smart city related projects, and the City of Columbus has a goal to reach $1B in commitments by 2020.

Integrated Data Exchange: Known as the "brain" of the city connected transportation system, it will share near real-time data on traffic throughout the city. The data will be used to help with planning in a mobility environment and position the city to be ready for autonomous vehicles when they come. Data will be collected from roadside units that should be installed in 2018 by the city.

Integrated Data Exchange: The city will also be completing a pilot in a suburb, adding LED lights in the community to measure the impact on safety. Additionally, the city will provide free WiFi connectivity to determine its effect on access to healthcare and food.

Connected Electric Autonomous Vehicles: Six of these vehicles will have established routes that will take citizens in a popular shopping center to first and last mile stops. The aim of this project will be to see whether transportation becomes easier and more efficient. This will also likely lead to the adoption of more autonomous vehicles in the future.

1. https://www.columbus.gov/smartcolumbus/projects/
2. http://chicagoinfrastructure.org/initiatives/smartlighting/
3. http://www.smartchicagocollaborative.org/work/health/chicago-health-atlas/

Seoul

Open Data: All non-PII data is freely and openly shared on one of the municipality's digital platforms. As of October 2016, 8.8 million government reports and documents were available, including 4,529 datasets available on the portal, which has been accessed 950 million times.

Online Engagement: The government created a local voting platform, M-Voting, to allow citizens to vote on day-to-day matters. In 2015, 3,800+ voting agendas had been posted by 3,500+ citizens and 250+ by the government. 610,000 citizens had participated in voting, resulting in 150+ cases in which M-Voting results have contributed to the formation and implementation of policies.

Big Data: The city has incorporated big data to optimize public services. To ensure bus routes were chosen to maximize impact, the Seoul government analysed 3 billion late-night phone calls and identified areas of activity based on phone call volume and passengers boarding bus stops in the high call volume regions to refine new bus routes. As a result, the city launched 9 new "Owl Night" Bus routes, earning the project a public service award in 2013.

Hong Kong

Autonomous Vehicles: Hong Kong is planning to facilitate trials of autonomous vehicles in the West Kowloon Cultural District. The city will aim to reduce traffic congestion and CO_2 emissions, and seeks to make the roads safer. Hong Kong also intends to introduce trials for autonomous vehicles in other cities as appropriate.

Smart Airport: By introducing facial biometrics at the check-in, boarding pass, and boarding checkpoints, travelers will experience a much more seamless travel agenda. There will also be designated spots for driverless vehicles at the airport to pick up passengers and luggage and transport them.

Support for Healthcare: There has been a lot of emphasis put into providing more technology applications to support the elderly. Hong Kong has made it a goal to set up a big data analytics platform by 2020. Additionally, by 2022 Hong Kong will have an electronic health record sharing system in place. These initiatives will allow patients to view their own medical information, thus giving them more ownership and driving more patient engagement.

Smart Government: Hong Kong would like to "open up more public and private sector data in digital forms to facilitate research and innovation via the government's one-stop Public Sector Information Portal."

1. http://www.clc.gov.sg/documents/books/research-workshop/2017/smart-city-smart-residents.pdf
2. https://www.washingtonpost.com/news/the-switch/wp/2016/09/15/the-real-issue-with-new-yorks-free-internet-kiosks-isnt-porn/?utm_term=.ed9fc09c4472
3. https://www.smartcity.gov.hk/blueprint/HongKongSmartCityBlueprint_e-flipbook_EN/mobile/index.html#p=26

São Paulo

Public Security: The city of Sao Paulo plans to roll out 10,000 surveillance cameras throughout the city. All of the cameras will be linked to Detecta, a system built by Microsoft. The city has also implemented the use of five drones to further monitor high crime areas, working in tandem with the cameras. The mayor has decided to work with Dahua and DJI Phantom, both Chinese manufacturers. Both of these projects aim to decrease the crime rate and make life in the city better for all people.

Digitization: The city's gazette has gone digital, reducing costs by $3M annually. The process to register a company in the city has been brought down from 128 to 5 days via digitization. The government expects that the time-to-open will be cut to 2 days by May 2018. Lastly, the mayor has pledged to replace blackboards with tablets by the end of 2018. The city has been working closely with Cisco to make the city smarter.

Mexico City

Plan Verde: The city is backed by the United Nations and World Bank to allocate 8% of the city's budget to green initiatives. It is on track to halve overall carbon emission levels by 2020. As part of the project, the city is also turning its highway pillars into vertical gardens. In addition, Plan Verde will filter harmful gases and produce clean oxygen for hundreds of thousands of citizens. This both reduces pollution and makes the city look better.

Traffic Management: Mexico City has installed 20,000 sensors and cameras around the city. These sensors can be used for traffic management and incident detection. With this technology, city officials can monitor traffic levels and re-route cars accordingly during peak hours or limit the number of vehicles on the roads.

Traffic Management: The city has implemented a bike sharing program, which itself has already reduced carbon emissions by 200+ tons in the first three years. Over 120,000 individuals have already tried the bike share program.

1. http://safesmart.city/en/sao-paulo-smart-city/
2. http://www.zdnet.com/article/sao-paulo-mayor-outlines-smart-city-plan/
3. http://www.mexiconewsnetwork.com/adventure/via-verde-cdmx-clean-air-initiative/
4. http://en.mxcity.mx/2016/12/2016-smart-cities-list/

Melbourne

Open Innovation Challenge: The City of Melbourne is running an open innovation competition in which it will seek out submissions from citizens to make the city more accessible by the people with disabilities. The government also wants to inform citizens with disabilities that they can participate in a range of city activities. The top five solutions will be presented in May 2018.

Open Data: Melbourne is making many different data sources open to the private and public sectors to accelerate the creation of new ideas and technologies. The city has open-sourced all data related to parking maps and geospatial, pedestrian volume, and more on its website.

Free WiFi: WiFi is now free in many parts of the city. People can use 250MB per device each day without logging in and will not see any advertisements. This solution helps people to better navigate the city, view transportation options, and stay on top of local news.

Recycling: The city installed 60 new cigarette butt bins in four different regions. They have collected over 1 million discarded cigarettes. The city also installed smart sensors in 50 street litter bins that will send a message to the trash collection company when the bin is almost full, increasing efficiency.

London

London City Airport: The London airport is one of the first in the world using IoT to make the customer experience much more enjoyable and operations more efficient. Using IoT sensors, the airport captures the number of passengers to identify pain points in their experience. The airport is also using small tracking devices to track airport equipment to help staff decrease delays in takeoffs and reduce the downtime for planes.

Datastore: London is enabling an open data-sharing portal in which individuals and companies can access all different types of data relating to the city. It has data in a plethora of categories, from jobs and economy, transport, and citizen health. By making different types of data open to the public, the City of London hopes that new innovative solutions will be developed that can improve the quality of life and decrease the pollution in the city.

Future Streets Incubator: This fund, organized by the Transport for London division of the city, was used to fund projects to transform streets and public spaces. The fund closed in early 2017, so no new projects will be funded. Some of the projects that were funded included a traffic-free space that generated energy from the sun and the sidewalk and a central platform where citizens could order everyday items to be delivered via bike or electric vehicle.

1. https://www.ellenmacarthurfoundation.org/case-studies
2. https://amsterdamsmartcity.com/projects
3. http://www.melbourne.vic.gov.au/about-melbourne/melbourne-profile/smart-city/Pages/innovation-competition-city-accessibility.aspx
4. http://www.melbourne.vic.gov.au/residents/waste-recycling/Pages/working-smarter-reduce-litter.aspx
5. https://data.melbourne.vic.gov.au/?_ga=2.210920851.724979828.1516985088-1264162963.1516985088
6. http://www.melbourne.vic.gov.au/about-melbourne/melbourne-profile/smart-city/Pages/free-wi-fi.aspx

Resources

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Resources

Research

Deloitte Smart City Report 2015

National League of Cities Report 2016

IBM Smart City Report

Cisco Smart City Report

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