



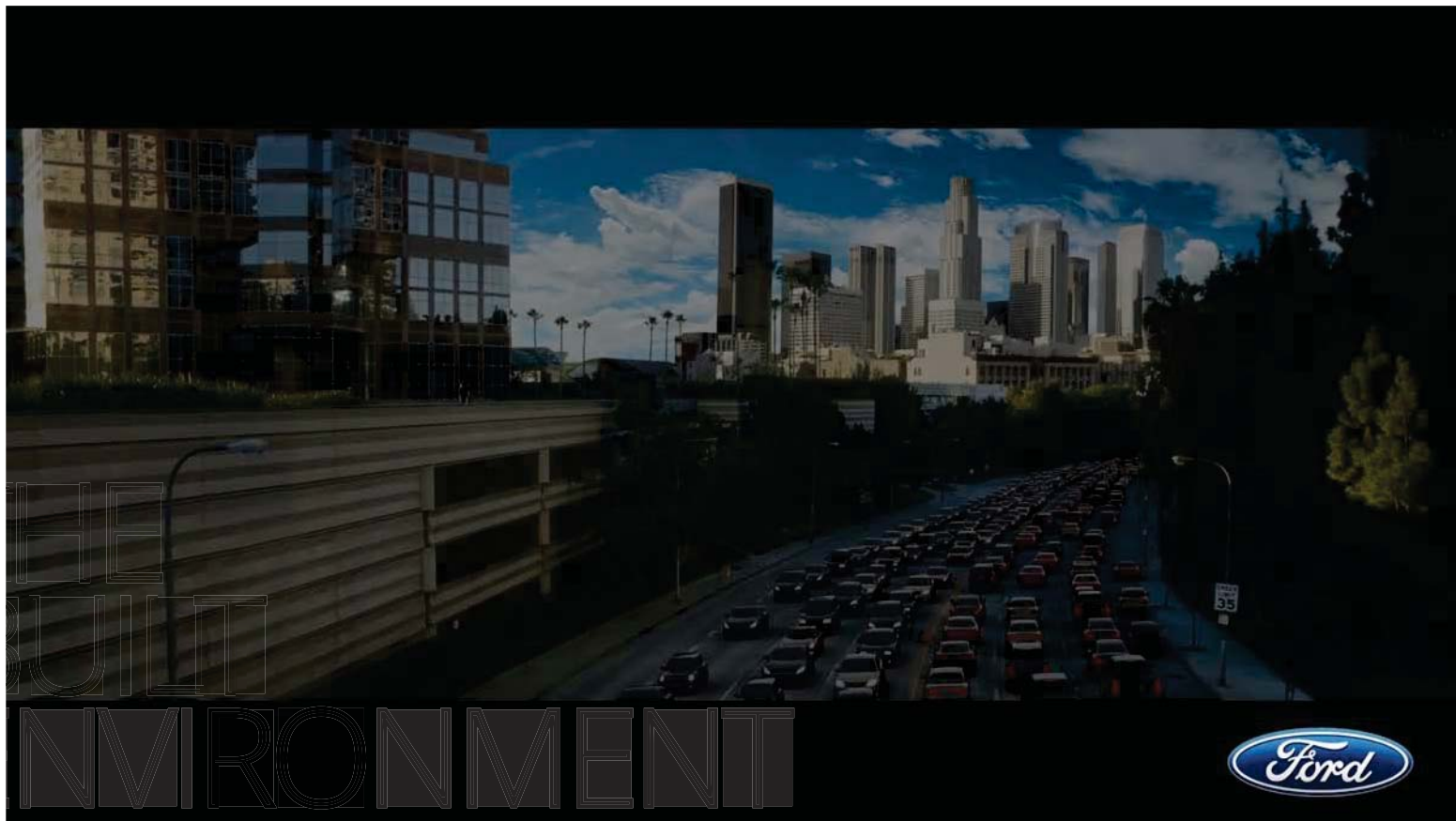
# THE FUTURE OF THE BUILT ENVIRONMENT

Designing, Building and Improving Our World



# CITY OF TOMORROW

CC Canadian  
Construction  
Innovations



For the first time in our planet's history, half of the world's population lives in cities.

As we chart this new reality, we envision a City of Tomorrow that could be a holistic, organic, inter-connected system powered by a transportation operating system and shaped by total multi-modal mobility.

# UNIQUE EXPERIENCE IN THE BUILT ENVIRONMENT



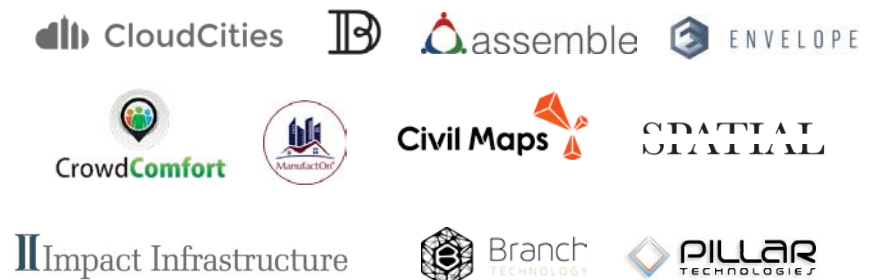
## Design & Engineering Tech Exits



## Built Environment Investments



## Built Environment Opportunities







"The human-made space in which people live, work, and recreate on a daily basis.

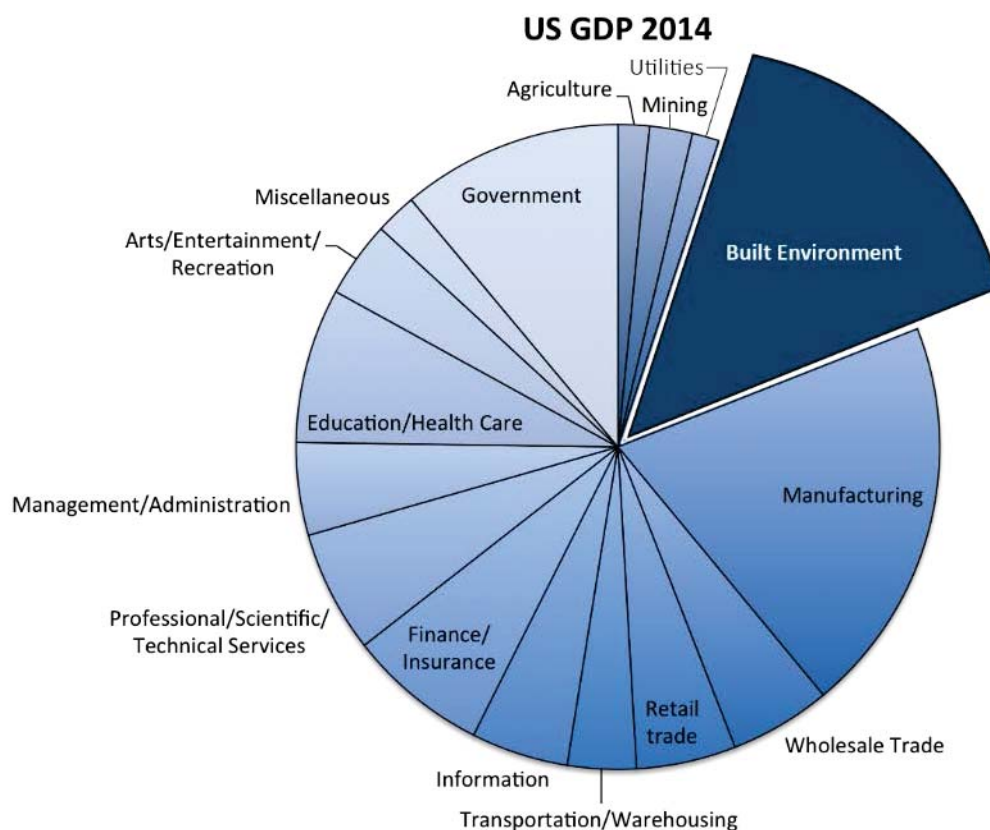
The built environment encompasses places and spaces created or modified by people including buildings, parks, and transportation systems."



WIKIPEDIA  
The Free Encyclopedia

# THE BUILT ENVIRONMENT

# BUILT ENVIRONMENT ECONOMY



## \$4.3 Trillion

The Built Environment represented 14% of the economic output of the United States in 2014 (\$4.3 Trillion USD) and a similar percentage of the world's economic activity.

(Source: Bureau of Economic Analysis)





**Increasing demand will require that design, construction and operation of the Built Environment becomes dramatically more efficient. Technology is the catalyst to drive this quest for efficiency throughout the entire design-build-operate sequence.**

People living in cities  
by 2030

5 billion

\$54 trillion USD

Investment required in global  
infrastructure by 2030

The percentage of global  
urban population by 2030

70%



# THE BUILT ENVIRONMENT IS THE PLATFORM FOR OUR MODERN EXISTENCE



Boston. 1987 vs 2014



Dubai. 1990s vs 2016





# WE NEED A BETTER BUILT ENVIRONMENT



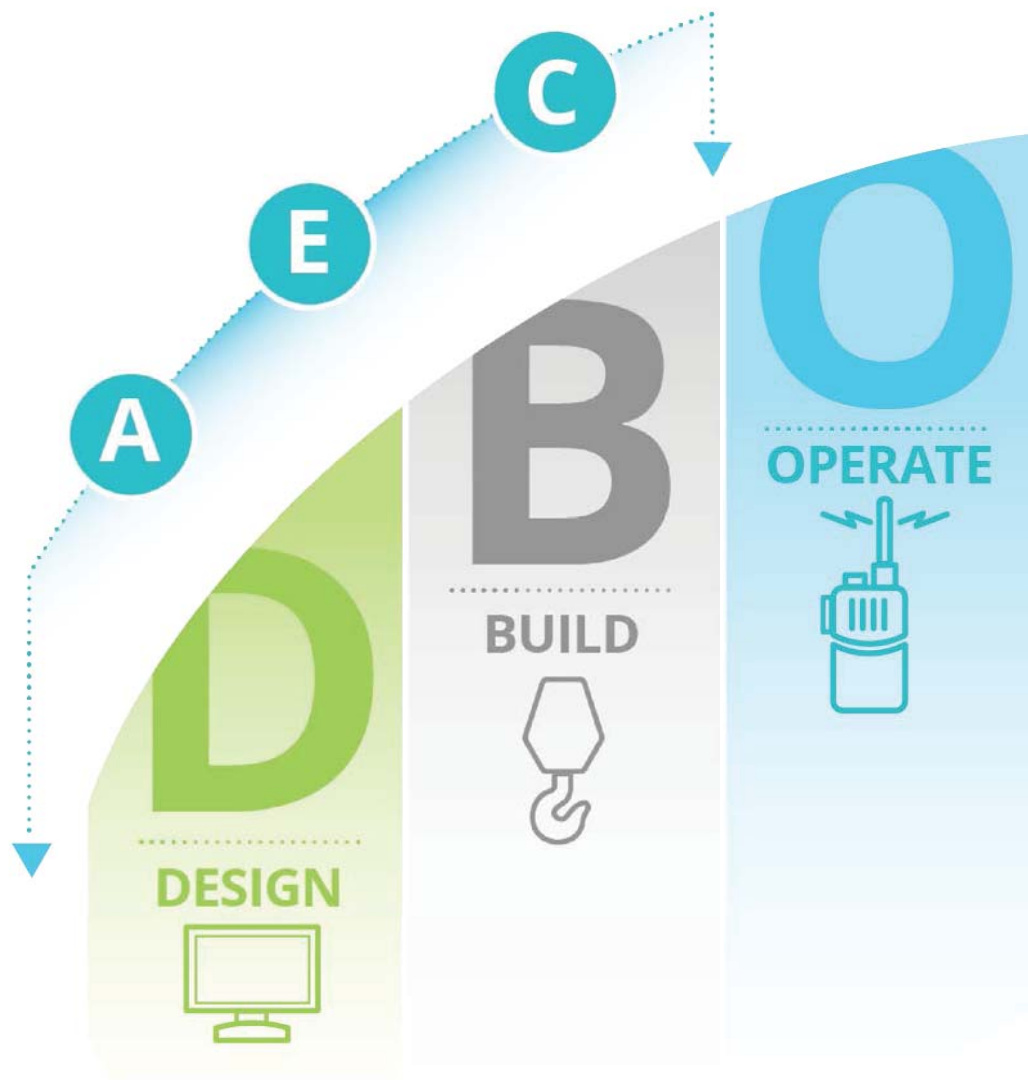
The Current Infrastructure & Processes  
Won't Scale To Meet Future Demands

**DIGITAL TRANSFORMATION IS THE ANSWER**





# AEC PROFESSIONALS WORK IN SILOS



While AEC Professionals work as teams on a project, silos have prevented a truly integrated design and building process.

## Architecture



## Engineering



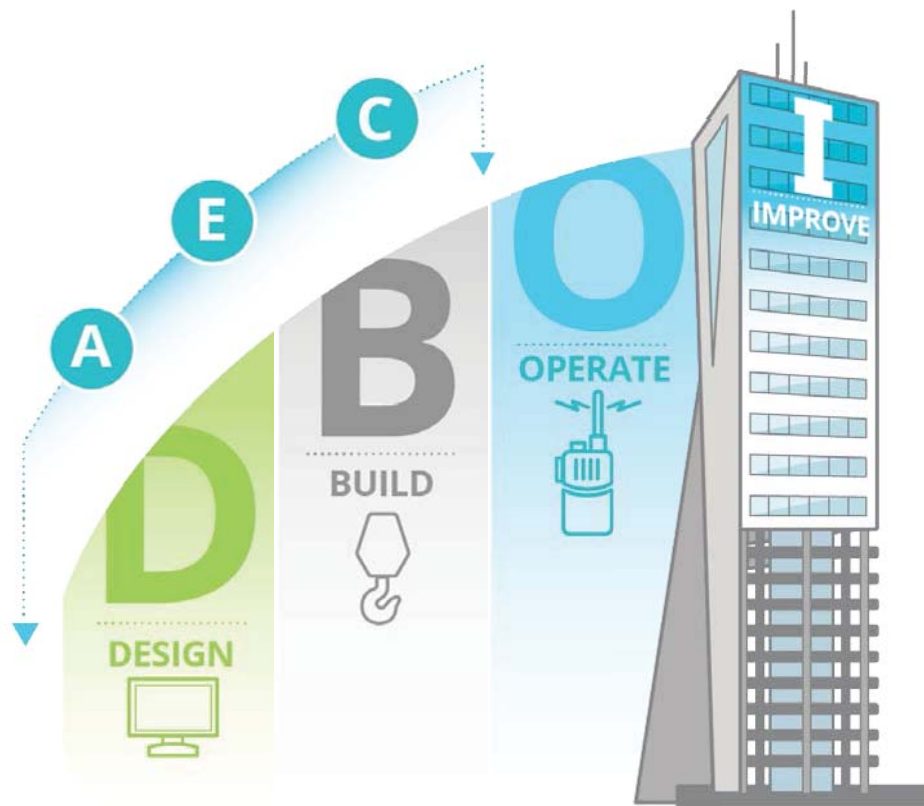
## Operations + Maintenance



## Construction



# COLLABORATION IS IMPROVING



Technology and  
New Business  
Arrangements  
are improving  
Collaboration

# BUILT ENVIRONMENT PACE OF INNOVATION IS INCREASING



## GreenBiz

### 10 companies moving up in smart buildings

Heather Clancy  
Monday, December 19, 2016 - 2:13am



"And for the next three years at least, IoT will be more pervasive in smart commercial buildings than anywhere else, suggested consulting firm Deloitte."

## wework

### At WeWork, Humans Supply Data For Its "Giant Computers"

The coworking startup is using heat maps and beacons to make its real estate operating system even more efficient.



"Buildings are literally becoming giant computers," says Joshua Emig, head of product research."

## lyft

### Lyft co-founder lays out vision for driverless vehicles, says car ownership will end by 2025

BY TAYLOR SOPER on September 18, 2016 at 8:40 am



"...the shift to autonomous cars will expand dramatically over the next ten years, transforming transportation into the ultimate subscription service."



# DATA CENTERS = MISSION CRITICAL FACILITIES



# GAME CHANGERS



**Cloud Computing** has improved the **efficiency** and **productivity** of organizations working within the built environment.



The **mobile phone** has shifted computing access from fixed, restricted access to computing services to **ubiquitous** access.



**Low cost chips** and **sensors** have enabled inexpensive **IoT** and **data capture** for the “**digitization**” of the physical world.



# INDUSTRY TRANSFORMATION IS UNDERWAY



Urbanization



Sustainability  
in Design



City  
Resiliency



Community  
Engagement



Industrialization  
of Construction



Building  
Performance



Lean  
Construction



Prefabrication



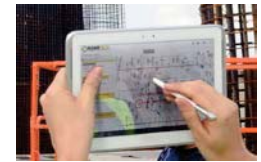
Robotics, AI &  
Machine Learning



Computational  
Design



Autonomous  
Vehicles



Mobile & Cloud  
Computing



3D  
Printing



Innovative  
Materials



AR  
& VR



Internet of Things  
& Big Data



Drones  
& UAVs



BIM &  
3D Design

# Inside Singapore's bid to achieve smart city status



By Shawn Lim - 12 October 2017 00:55am

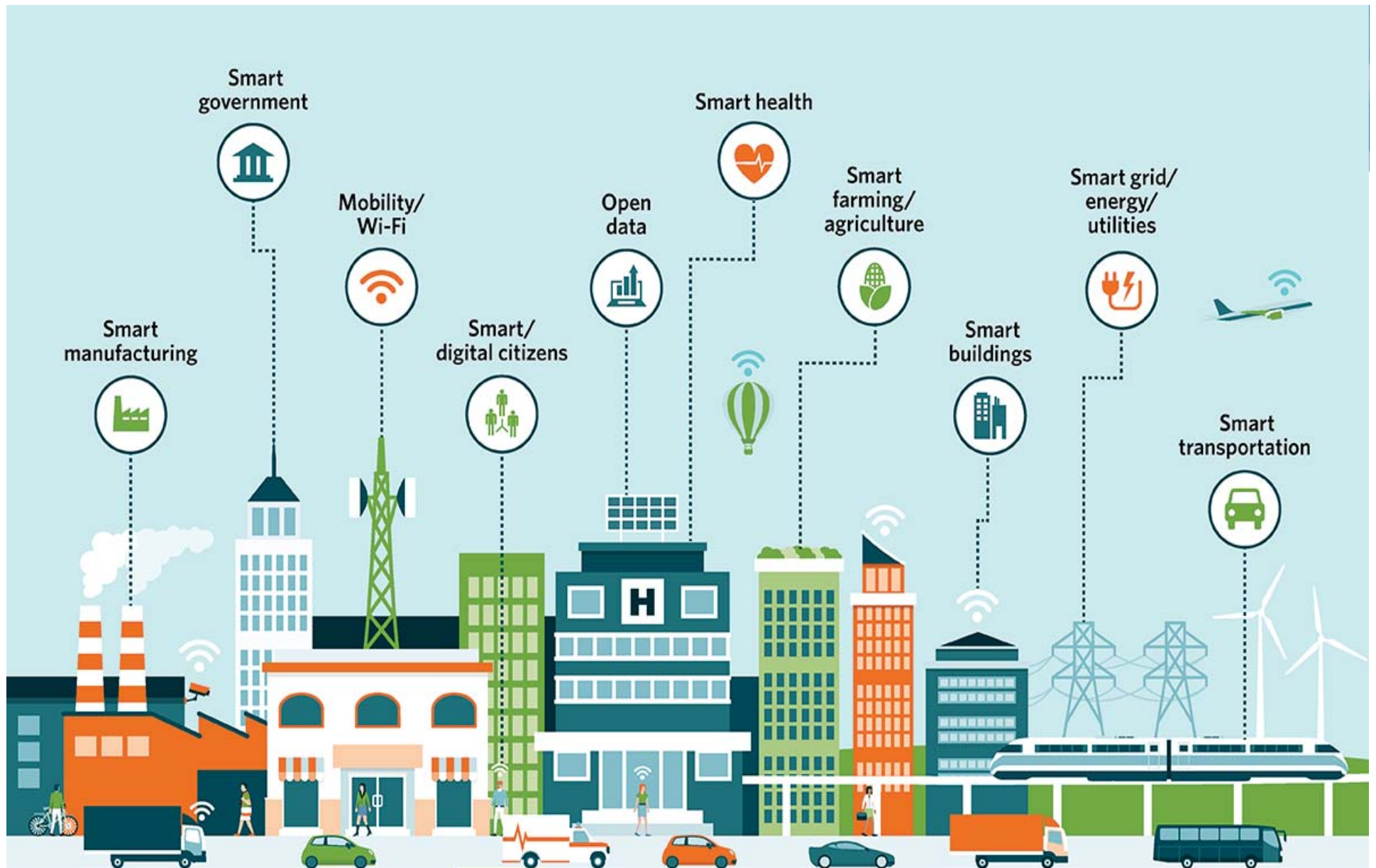
167

Shares

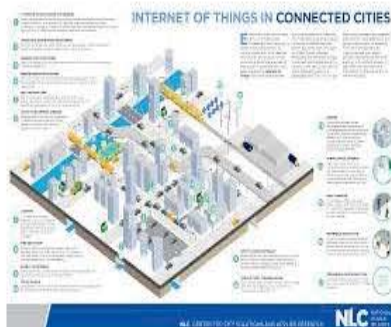


Singapore has made becoming the world's first smart city-state one of its key objectives in the next few years. Photo by Wisar.





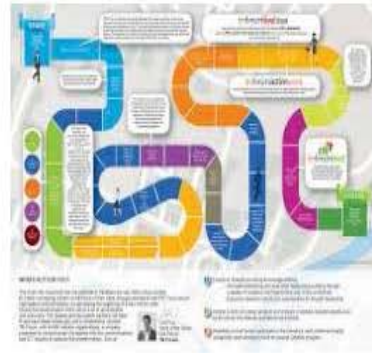
# SMART CITY COMPONENTS



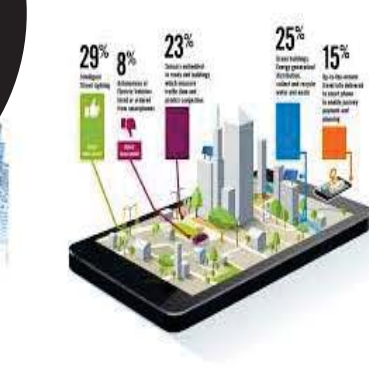
SmartCity





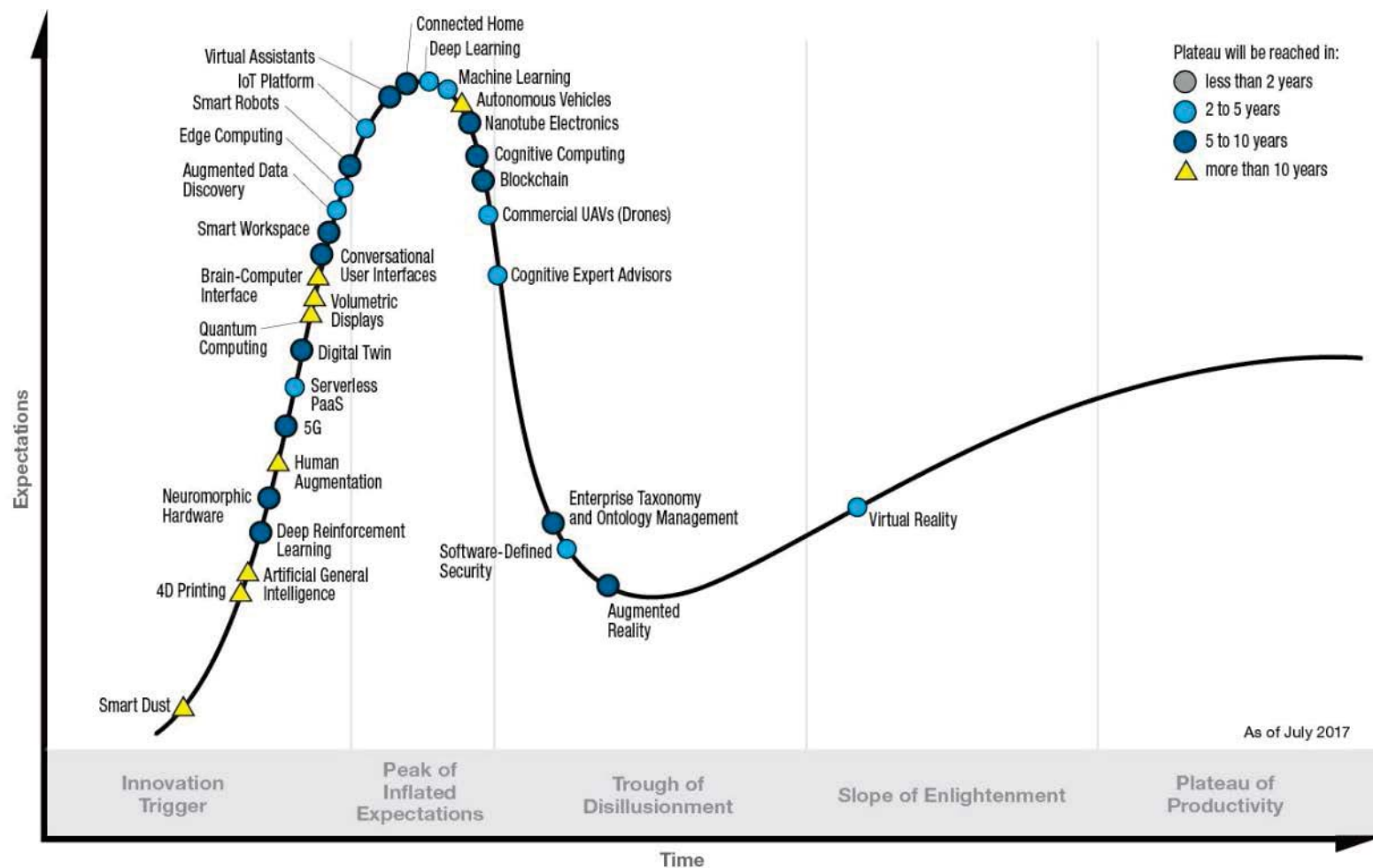


HYPE  
CYCLE  
?



# HYPE CYCLE

## Gartner **Hype Cycle** for Emerging Technologies, 2017





# BUILTR.IO – SOURCE OF INNOVATION



Today's BUILTR Daily | Subscribe

ARCHITECTURE ENGINEERING CONSTRUCTION TECH EVENTS INSIGHTS

**TRENDS**

- OCTOBER 27, 2017**  
MIT students find a way to make stronger...
- OCTOBER 27, 2017**  
Occipital Acquires Paracosm Plans Collaborative 3D Mapping Projects
- OCTOBER 27, 2017**  
New Industry Transformation Map launched to create new...
- OCTOBER 27, 2017**  
How virtual reality can defuse conflicts over building...

**Current Filters:**

- #INFRASTRUCTURE**  
Elon Musk shares first photo of Boring Company's underground LA tunnel  
OCTOBER 26, 2017 @everge
- #AI**  
The Impact of Artificial Intelligence on the Built Environment  
OCTOBER 26, 2017 @jamesocarsley
- #DESIGN**  
Why Every Organization Needs an Augmented Reality Strategy  
OCTOBER 26, 2017 @HartfordB2
- #CONSTRUCTION**  
Bricsys introduces SketchUp-like Shape for AEC conceptual design  
OCTOBER 26, 2017 @AECmagazine
- #DESIGN**  
Striking apartment complex is made of 48 raw shipping containers  
OCTOBER 26, 2017 @mhalabatt
- #CONSTRUCTION**  
Construction Safety Technologies - Videos  
OCTOBER 26, 2017 @smit
- #MATERIALS**  
MIT students find a way to make stronger concrete with plastic bottles  
OCTOBER 27, 2017 @mhalabatt
- #MAPPING**  
Occipital Acquires Paracosm Plans Collaborative 3D Mapping Projects  
OCTOBER 27, 2017 @accorcity
- #CONSTRUCTION**  
New Industry Transformation Map launched to create new, better jobs in construction sector  
OCTOBER 27, 2017 @hassanmawana
- #CONSTRUCTION**  
How virtual reality can defuse conflicts over building projects  
OCTOBER 27, 2017 @phyrng.com

THE BUILTR DAILY

Today's Daily is sponsored by Assemble

**BUILTRTAKE**

Join CHMA Educator of the Year Kevin Miller  
Thursday, November 2nd @ 1PM CT

**FREE WEBINAR**  
REGISTER NOW

**The Impact of Artificial Intelligence on the Built Environment**

Chris Hall  
AEC  
Senior Director  
Executive Director  
Executive Director

**BUILTRTAKE**

As part of our special report for 2017, Chris Hall joins a panel of experts to discuss the impact of AI on the built environment and its role in the future of the built world.

**Holsters WEMO Operator System by TRINIS**

WEMO Operator System by TRINIS

**BUILTRTAKE**

The new BUILTRTAKE Operator System is the first of its kind in the world of virtual reality. It is designed to be used by the built world to create a virtual reality environment. The system is designed to be used by the built world to create a virtual reality environment. The system is designed to be used by the built world to create a virtual reality environment.

October 22 - 28, 2017

**SMART CITIES WEEKLY**

Today's Smart Cities Weekly is sponsored by Assemble

New York's new chief technology officer (CTO) will transform Governor Cuomo's goal of the Smart City Initiative into a reality for the state and other advanced connectivity technologies.

**NYC effort will be New York's next positive for smart city innovation**

@StateScout

New York's Chief Technology Officer Miguel Camacho is promoting NYC's program to apply advanced smart city technologies and the IT industry into city services and infrastructure. NYC's program to transform the state into a smart city is a collaborative process in which smart city startups can work with the community to develop products using public spaces and city infrastructure.

**Assemble Insight Now**  
Available on iPhones and iPads  
LEARN MORE

**Smart Cities - what does it mean for the Property world?**

@Kinology

Smart cities and the platforms described don't appear to show many parallels with the property market. It's likely that local authorities or developers will use such data to enhance planning policy or street development. These are, however, other aspects of Smart Cities which could potentially have more obvious implications for the property world. Smart Buildings are a clear example of this. Smart Buildings include state-of-the-art systems designed to improve energy efficiency and performance. Smart buildings are designed to be able to manage energy and water use when business need to be done are obvious examples of smart technology in action.

**Smart City Projects Set Out to Build a Global Network**

@StateScout

While smart city success rests on the optimal blend of people, process and technology working in concert to solve multifaceted problems, about 40 percent of government officials also perceive that a wide gap also exists in necessary technology expertise as a primary area of concern affecting the expansion of smart city initiatives, according to the report.

**New Toronto Smart City Project Has To Be Open To**

## LA, NYC and Chicago top the smart list

News 06 Sep 2017

Cities were evaluated across a range of metrics including deployment of LED lights, smart meters, renewable energy and smart parking



New York has the highest deployment of LED streetlights in the US

Los Angeles, New York and Chicago are the smartest cities in the United States, according to ABI Research's new report on smart cities in North America.



The Himalayan Times > Opinion > Smart cities: New generation

## Smart cities: New generation

Published: October 11, 2017 2:50 am On: [Opinion](#)



Share 3



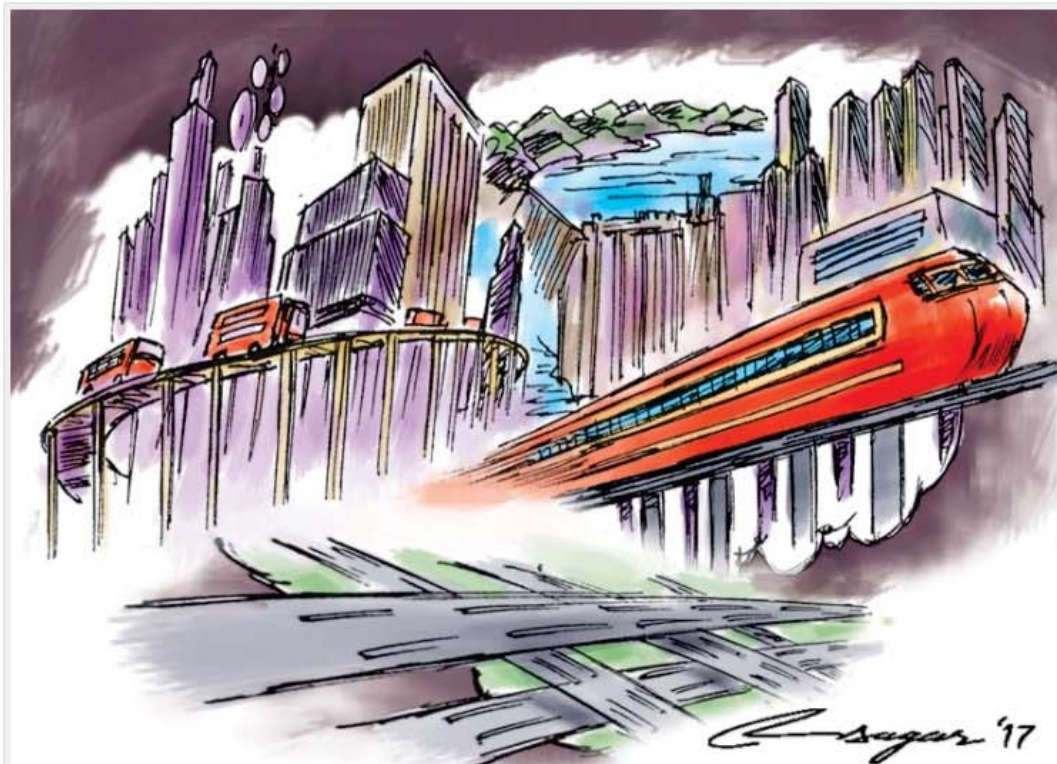
Tweet



Save

**PRADIP KHATIWADA**

A smart city has a vibrant culture that attracts people to visit that place and has a quality of life and facilities for people. Feeling safe and reduction of pollution, organized traffic system, disabled friendly pedestrian pathways and well-managed cycle lanes are in place





Got a tip? [Let us know.](#)

Follow Us



[News](#) ▾ [Video](#) ▾ [Events](#) ▾ [Crunchbase](#)

Message Us



## Nvidia picks up Alibaba and Huawei as partners for smart city platform

Posted Sep 25, 2017 by [Darrell Etherington](#) (@etherington)



[Next Story](#)



Nvidia's Metropolis AI smart cities platform sounds like a story arc for DC's superman comics, but it's actually a GPU-based intelligent monitoring tool that can enable things like easing traffic congestion, allocating city services and even finding lost individuals. To that end, Metropolis has picked up two new partners in Alibaba and Huawei, and Nvidia's also announcing that it's including its DeepStream software development kit in the generally available version of Metropolis.





By Alex Gao

OCT 16, 2017

## Blockchain and Smart Cities: On the Way to the Second Capital of China

11586 Total views 498 Total shares



On Oct. 14, Peng Yijie, a powerful Chinese businessman, visited Chen Gang, the Communist Party Secretary of Xiong'an New Area and Vice Governor of Hebei Province.

### Hottest Bitcoin News Daily

For updates and exclusive offers,  
enter your e-mail below.

SUBSCRIBE



# BLOCKV

A Platform for Smart  
Virtual Objects on the Blockchain

JOIN NOW!

**BLOCK SHOW** ASIA 2017  
POWERED BY THE COINTELEGRAPH

PROMO CODE

POWER25



### About GenslerOnCities

What makes cities tick? GenslerOnCities explores the planning, design, and the potential futures of urban landscapes.

### Search GenslerOn



### Cities Topics

[#OurCityOakland \(1\)](#)

[#SXSW \(1\)](#)

[2016 olympics \(1\)](#)

[22016 olympics \(1\)](#)

[3D Modelling \(1\)](#)

[826 Valencia \(1\)](#)

[Academic Incubator \(9\)](#)

[Academic Incubators \(11\)](#)

[Accelerator \(6\)](#)

[AI \(1\)](#)

[airport \(1\)](#)

[Airport Design \(31\)](#)

[altasea \(1\)](#)

[Main](#) | [Revitalizing Downtown San José: Design's Evolution And Impact »](#)

## City: 2050

By Joe Pobiner







The  
Urban  
Developer



Click to join  
our **Mailing List**

## Our Products

Advertising  
Content  
Events

## Event Series

Insight CityShapers CurioCity

Find out more about our series and how to get involved

# Australia's Largest Urban Renewal Area Targets Sustainability Initiatives

📅 25th October 2017 | Category: Architecture, Commercial, Construction, Features, Government, Industrial, New Developments, Residential, Retail, Sustainability, Top Stories, Town Planning, VIC | Staff Writer



TUD

Connect your  
with busi

# NYCx effort will be New York's next pipeline for smart city innovation

Mayor Bill de Blasio has pulled back the curtain on NYCx, a civic tech initiative that will test smart city solutions through startup collaboration.



By [Jason Shueh](#)

OCTOBER 20, 2017 5:22 PM

BIO



*New York's new civic tech program NYCx will transform Governors Island, just off the coast of Manhattan, into a testbed for 5G and other advanced connectivity technologies. (SimpleThrill / Flickr)*

New York's Chief Technology Officer Miguel Gamiño is promoting NYCx, a program to apply advances from entrepreneurs and the IT industry into

mimecast cyberscoop | statescoop



## RELATED ARTICLES

### STATE & LOCAL NEWS

With tech leading the charge, report ranks top states and cities for startup growth

### STATE & LOCAL NEWS

San Francisco gets blueprint for a municipal gigabit network

### SMART CITIES

Toronto to design smart city district with the help from Google's Sidewalk Labs





HOME → MANAGEMENT

## MANAGEMENT

OCT  
16  
2017

# Seattle Lays Out the 6 Benefits of Smart City Development

The city's director of digital engagement breaks down the ways government can boost public services and resident opportunity with connected tech deployments.



by [Juliet Van Wagenen](#)

Juliet is the senior web editor for *StateTech* and *HealthTech* magazines. In her six years as a journalist she has covered everything from aerospace to indie music reviews — but she is unfailingly partial to covering technology.

## ADVERTISEMENT

POWER YOUR  
TEAM CAN  
DEPEND ON

ORCHESTRATION  
BY CDW.G.

LEARN MORE ▶

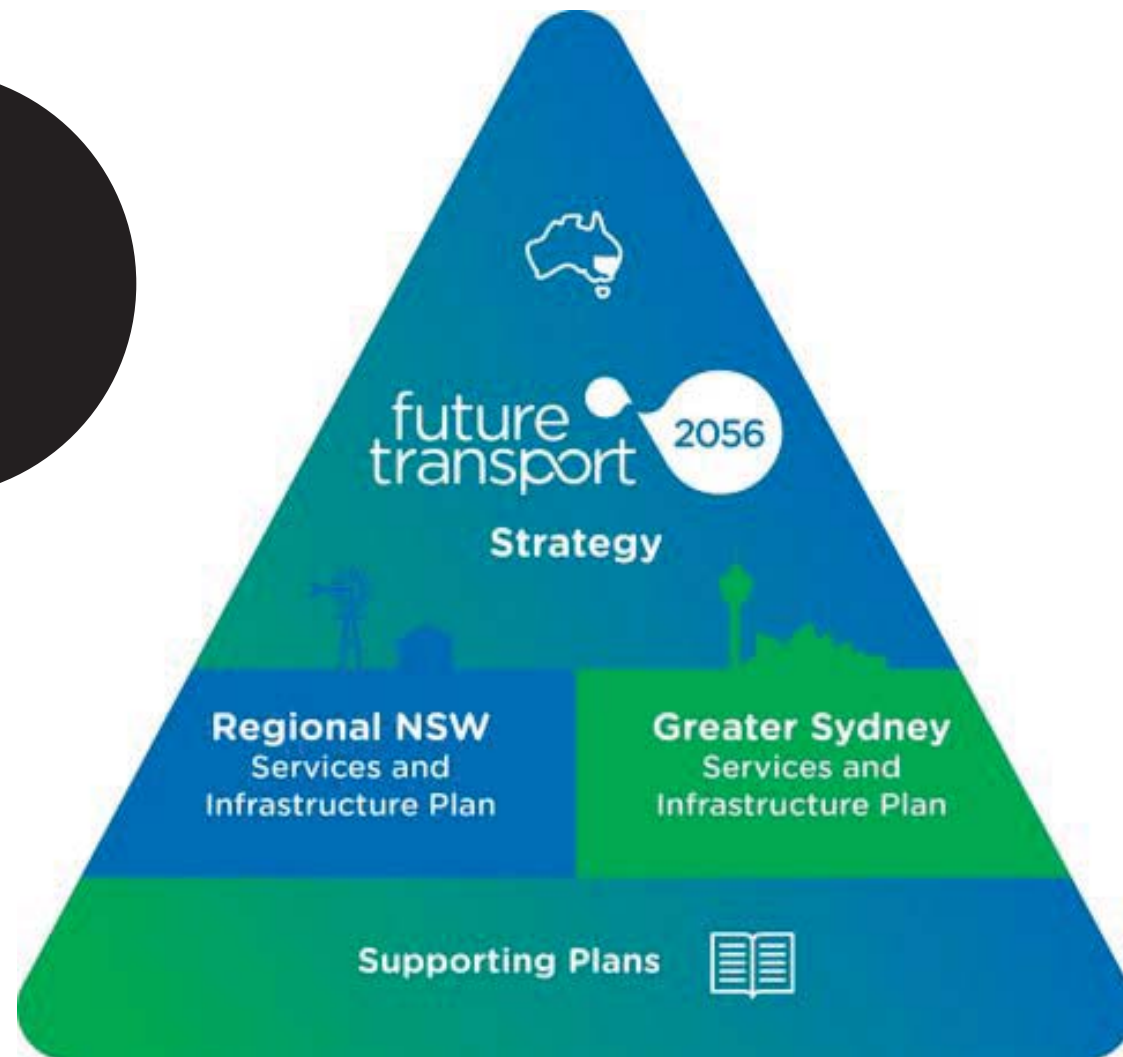
COMMVAULT

CDW.G. PEOPLE  
WHO  
GET IT

## Latest Articles

Las Vegas Taps Smart City

TOD



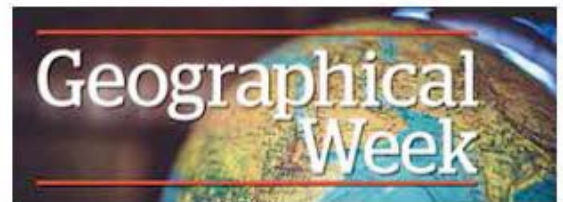
React now





## Smart cities are key to fight against climate change

Written by Nathan Pierce Published in Opinions



Get the best of *Geographical* delivered straight to your inbox every Friday.

Name:

Email:

**Sign Up**

### LATEST OPINIONS



**Smart cities are key to fight against climate change**

October 23, 2017



**Polar Politics: changing Arctic climate**

October 16, 2017



HOW CITIES, BUSINESSES, AND CITIZENS  
CAN SAVE THE PLANET

# CLIMATE OF HOPE

Michael Bloomberg  
Carl Pope



Future Society

# Google's Parent Company Is Building a High-Tech Neighborhood in Toronto

Sidewalk Toronto

## IN BRIEF

Google parent company Alphabet's Sidewalk Labs is partnering with Toronto to build a high-tech neighborhood of the future. The urban innovation project known as Sidewalk Toronto will cost an estimated \$1 billion, and Sidewalk Labs has already committed \$50 million to its first phase.

## SHARE



## WRITTEN BY



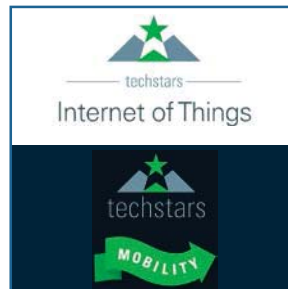
# SEEDING THE FUTURE



Have launched active relationships and are supporting venture developments at **Stanford University** and the **Massachusetts Institute of Technology**.



## ACCELERATOR PARTNERSHIPS IN THE BUILT ENVIRONMENT





# GROWING MARKETS

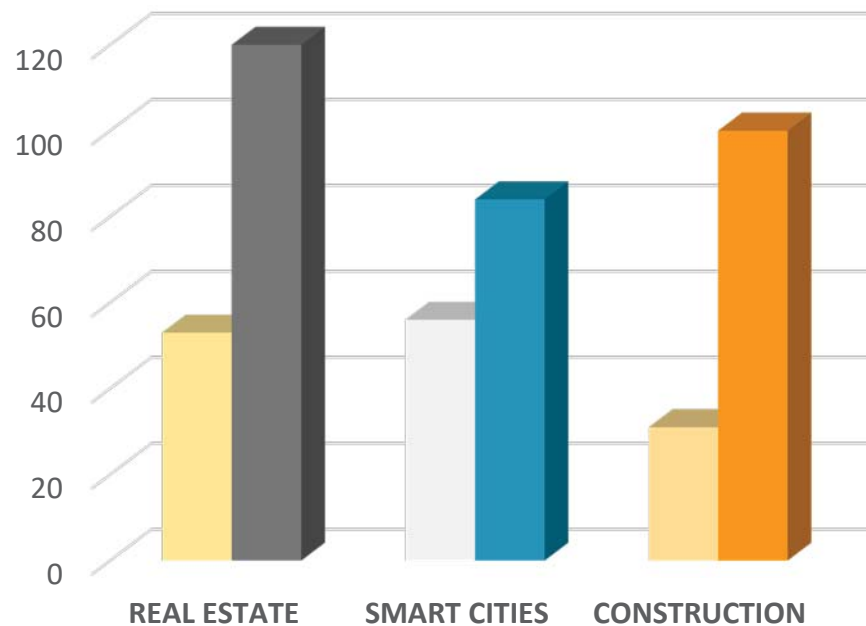
## CONSTRUCTION



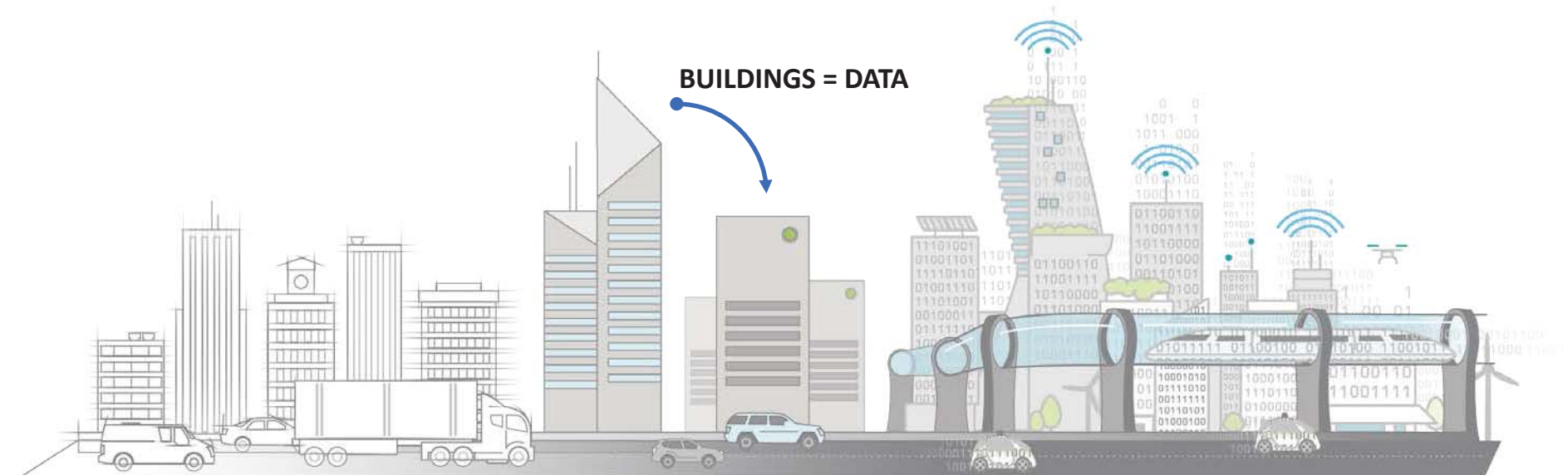
REAL ESTATE

SMART CITIES

## FUNDED STARTUP COMPANIES 2015 VS 2016



# FROM CAD TO BIM TO DATA



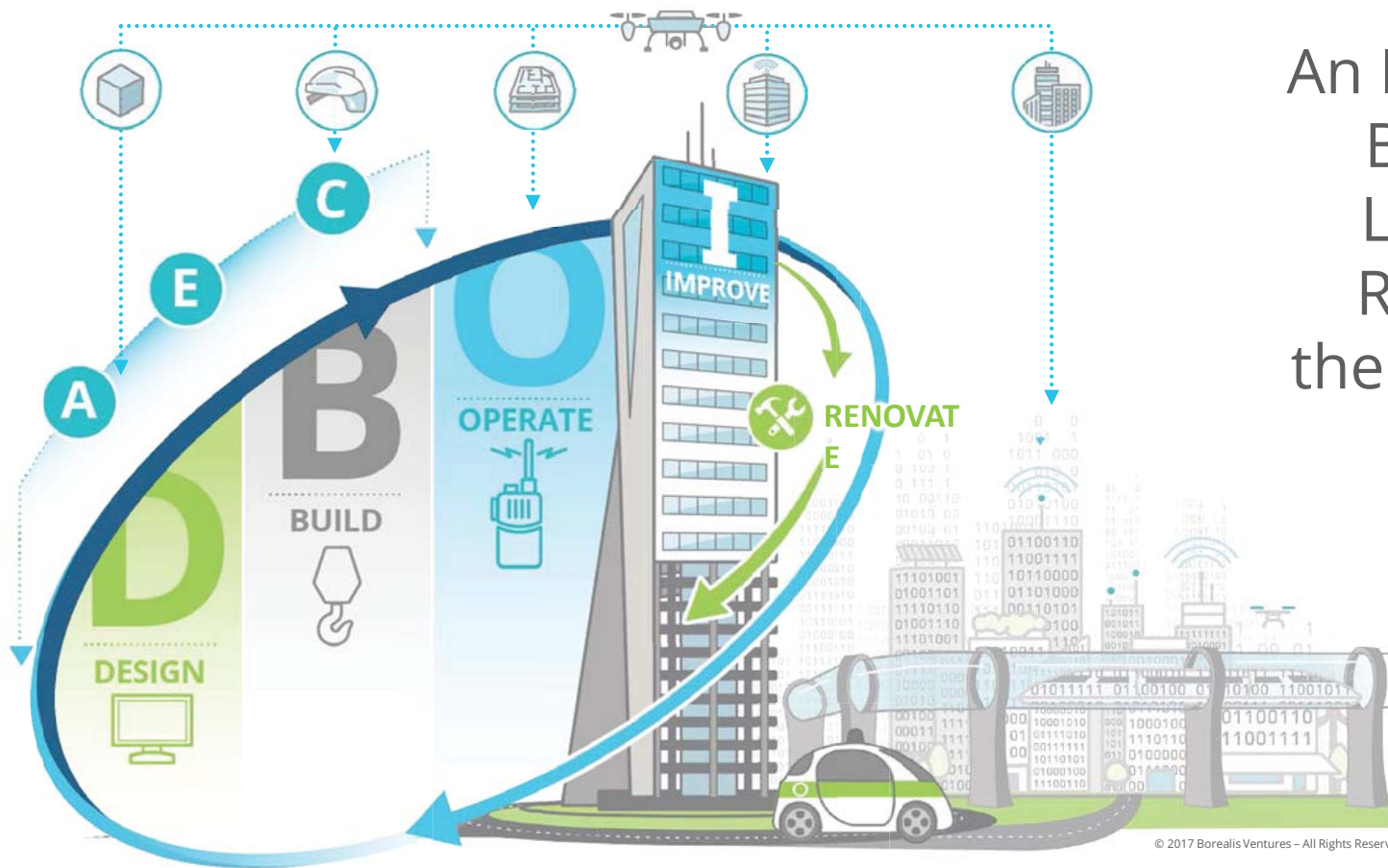
1980's  
CAD Drawings

2000's  
BIM Models

2020's  
Connected Data



# INTEGRATED BUILDING LIFECYCLE



An Integrated  
Building  
Lifecycle  
Requires  
the Free Flow  
of Data

# THE PATH TO “TRULY SMART CITIES”

- Innovation for Real Life
- Data Informed
- Local and Equitable
- Supported by Community
- Real Results, Early



CONTACT: [jdevitte@borealisventures.com](mailto:jdevitte@borealisventures.com)



# FREE THE DATA FOR A TRULY CONNECTED WORLD

