



# NEW TECHNOLOGIES & THEIR REAL ESTATE IMPACTS

2018 Dutch Treat Breakfast Meeting

February 12, 2018

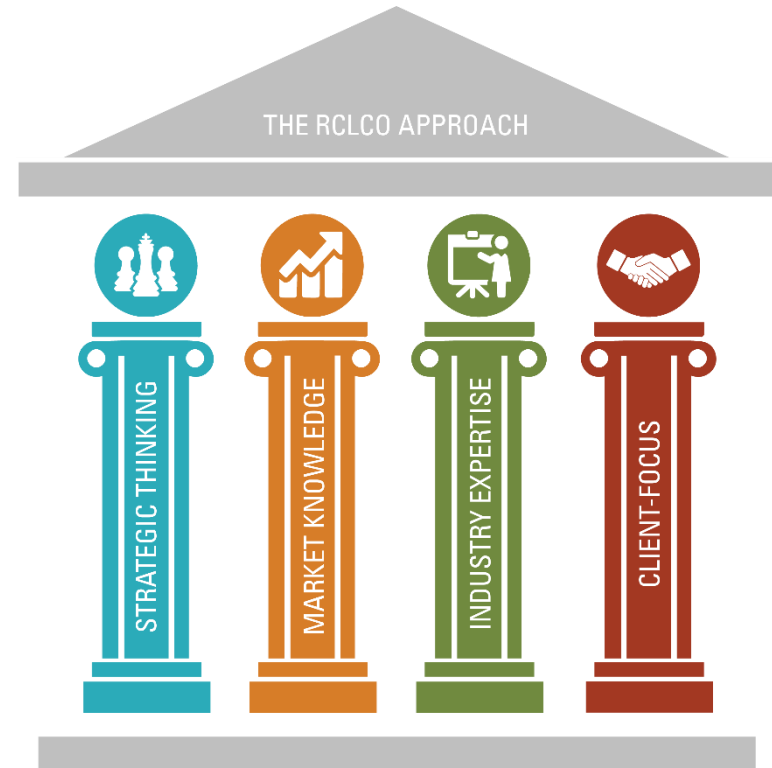
***Taylor Mammen, Managing Director***

**RCLCO**  
REAL ESTATE ADVISORS

# ABOUT RCLCO

Since 1967, RCLCO has been the “first call” for real estate developers, investors, the public sector, and non-real estate companies and organizations seeking strategic and tactical advice regarding property investment, planning, and development. RCLCO leverages quantitative analytics and a strategic planning framework to provide end-to-end business planning and implementation solutions at an entity, portfolio, or project level.

With the insights and experience gained over 50 years and thousands of projects – touching over \$5B of real estate activity each year – RCLCO brings success to all product types across the United States and around the world.



# 10 TECHNOLOGIES TO MONITOR

## IMPACTS ON HOW WE USE REAL ESTATE

- » Technology-Enabled Flexibility
- » Autonomous Vehicles
- » Virtual & Augmented Reality
- » Automated Manual Labor
- » Automated Thinking

## IMPACTS ON HOW WE UNDERWRITE AND/OR FINANCE REAL ESTATE

- » Big Data & Machine Learning
- » Blockchain

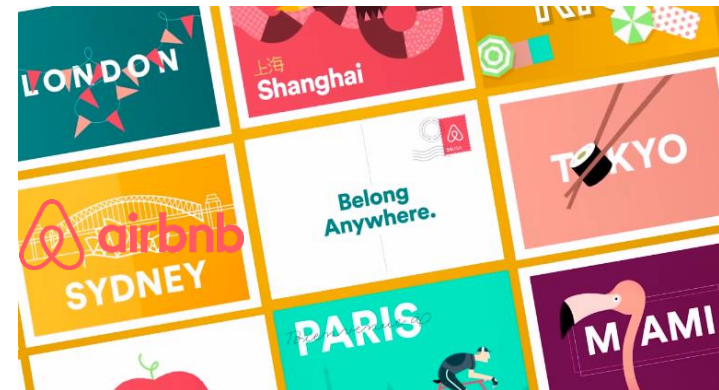
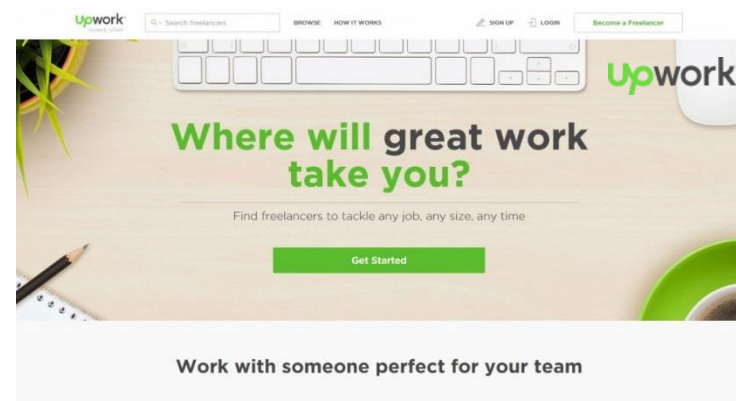
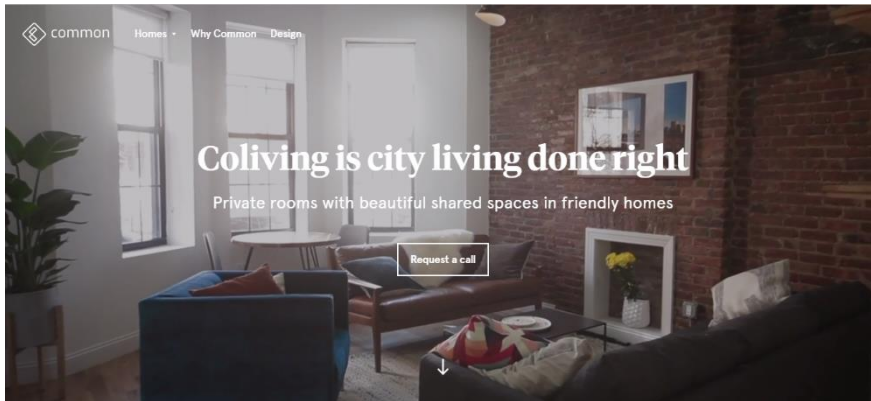
## IMPACTS ON HOW WE CONSTRUCT REAL ESTATE

- » Construction Innovations
- » Internet-of-Everything
- » Smart Cities



# HOW WE USE REAL ESTATE

# TECHNOLOGY-ENABLED FLEXIBILITY



# TECHNOLOGY-ENABLED FLEXIBILITY

## THE INNOVATION:

- » Efficiency, effectiveness, and scalability create “new” products that offer greater transparency and flexibility

## REAL ESTATE IMPACTS:

- » More supply than previously contemplated
- » More flexible use of real estate: shorter (or no) leases

## IMPLICATIONS TODAY:

- » Users re-thinking space needs and how they lease space
- » New institutional products
- » New demand segments

# AUTONOMOUS VEHICLES



# AUTONOMOUS VEHICLES

## THE INNOVATION:

- » Automated driving leads to a transportation revolution
- » Lower “costs” of commuting, shifts how people spend their time, changes land use needs

## REAL ESTATE IMPACTS:

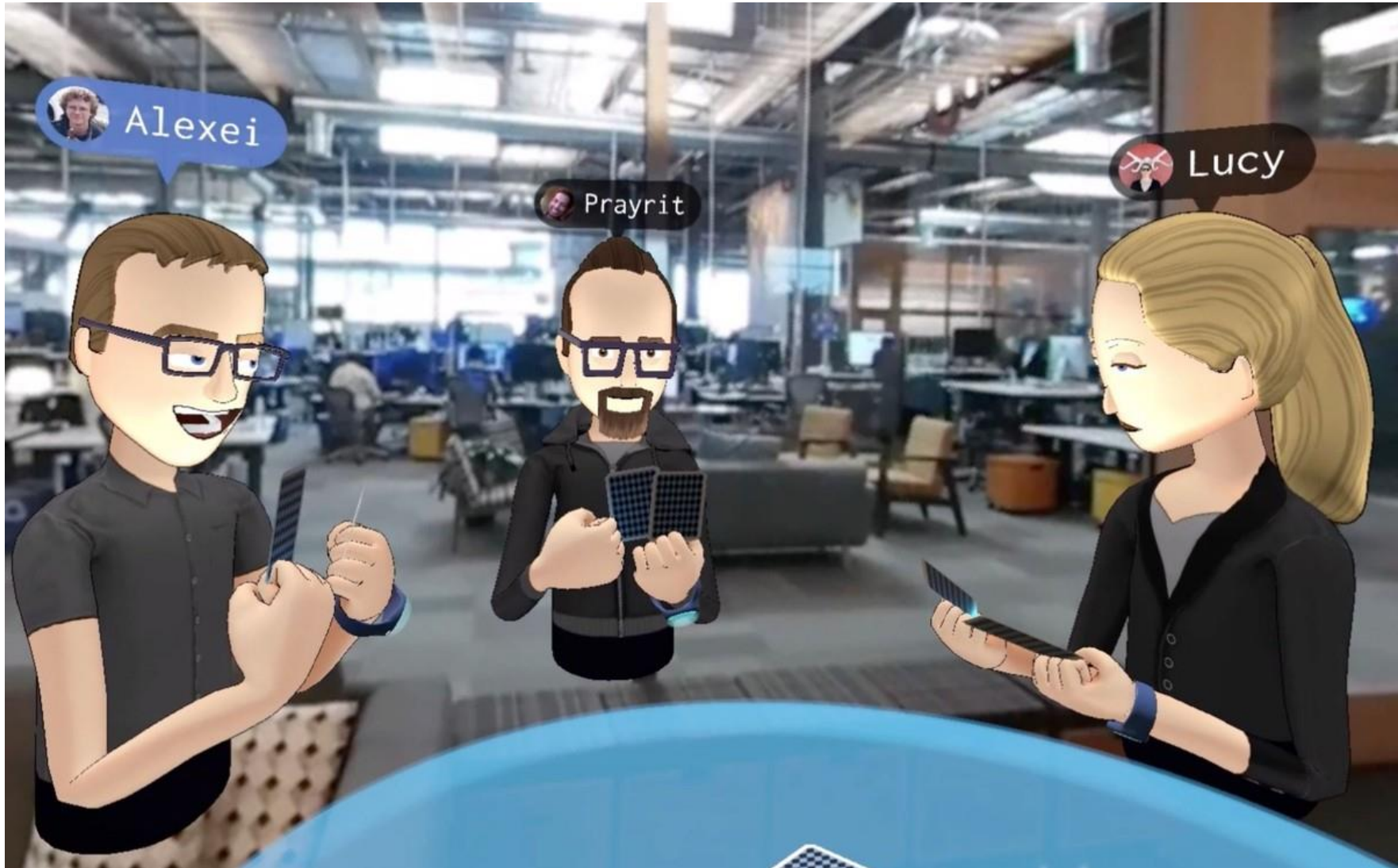
- » Changing location characteristics
- » Changing parking and other design requirements
- » Changing urban and suburban land values

## IMPLICATIONS TODAY:

- » Rideshare platforms offering clues
- » Re-thinking garage designs and amounts of parking
- » Investors evaluating neighborhood impacts



# VIRTUAL & AUGMENTED REALITY



# VIRTUAL & AUGMENTED REALITY

## THE INNOVATION:

- » Location becomes less relevant for communication, collaboration, transactions, etc.

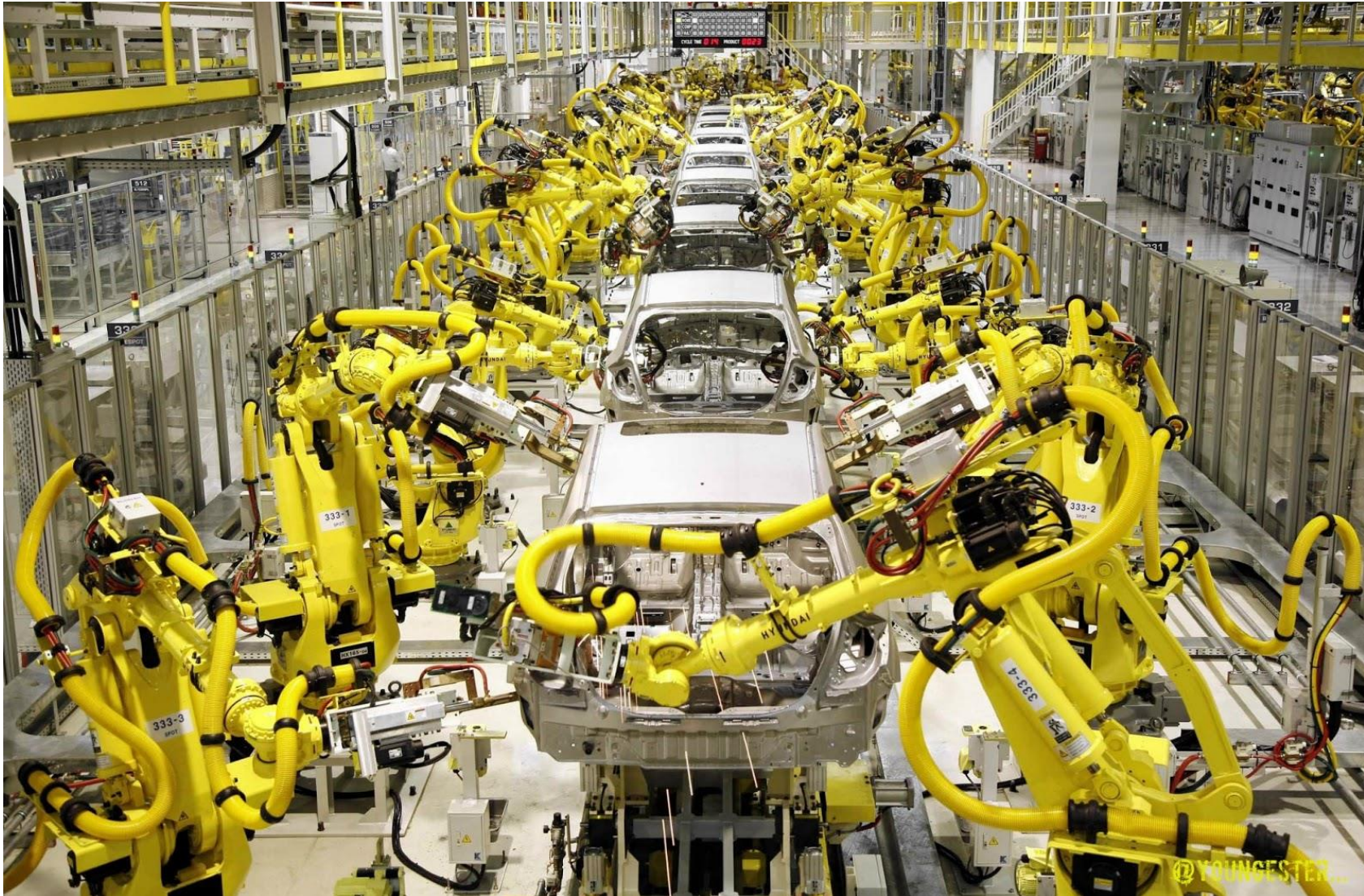
## REAL ESTATE IMPACTS:

- » How do you take into account *virtual* space/employee in an office?
- » Retail experiences become more virtual
- » Data centers!

## IMPLICATIONS TODAY:

- » Part of a broader threat to traditional office space and retail
- » Also impacts how we underwrite real estate

# AUTOMATED MANUAL LABOR



# AUTOMATED MANUAL LABOR

## THE INNOVATION:

- » Machines/robots take the place of humans in doing physical labor

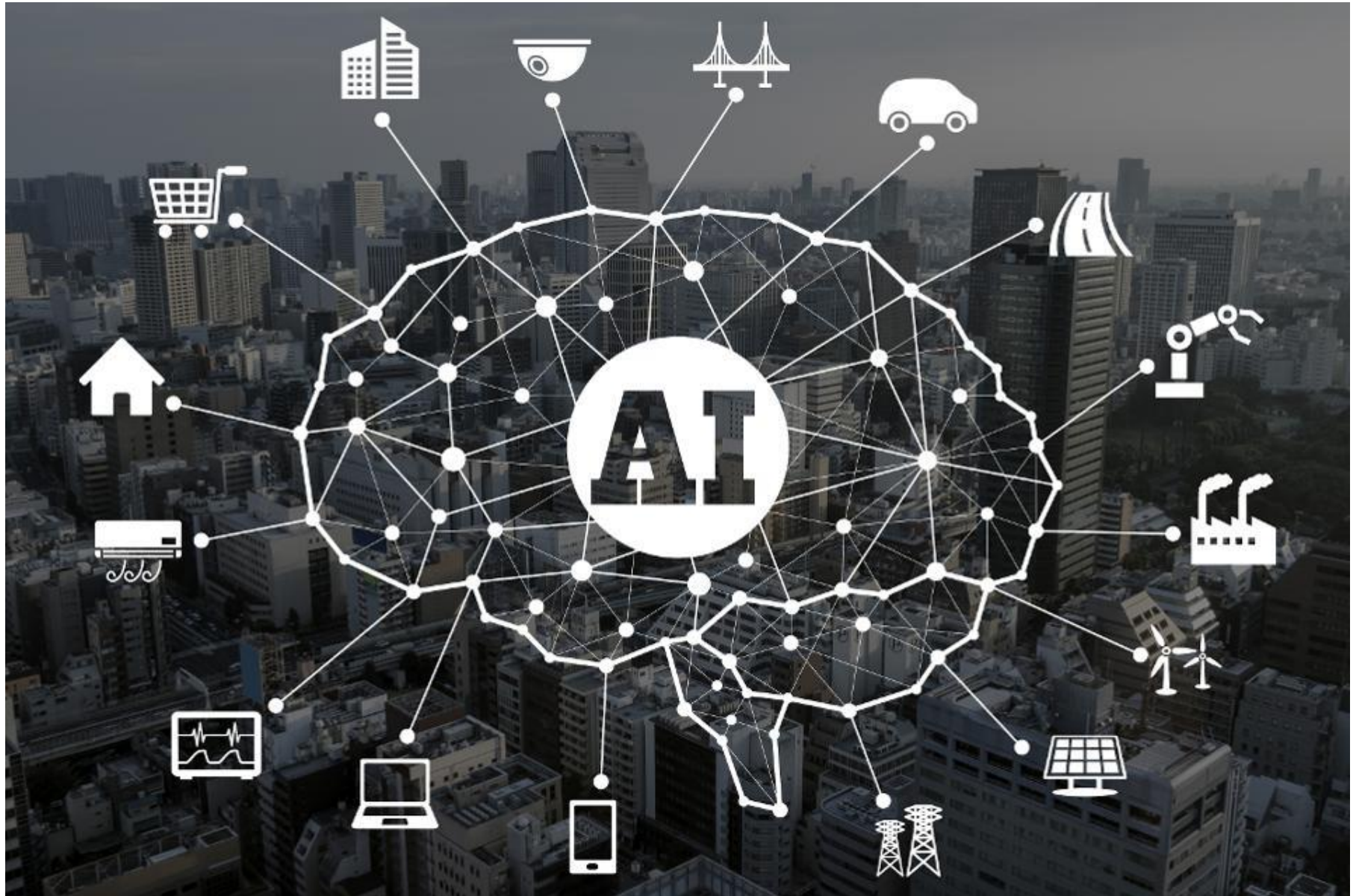
## REAL ESTATE IMPACTS:

- » Re-designing real estate to accommodate robots (Kiva systems for Amazon, self check-out lanes in stores, self check-in for hotels, robot lawn maintenance and vacuums)
- » Location considerations change when human labor is less important

## IMPLICATIONS TODAY:

- » Warehouses are now built for robots (likely to increasingly impact location decisions)
- » Ongoing societal, economic, and political implications

# AUTOMATED THINKING



# AUTOMATED THINKING

## THE INNOVATION:

- » Computers replace jobs that require some level of thought (at increasing levels of complexity)

## REAL ESTATE IMPACTS:

- » Current tenants are either “winners” or “losers” thanks to AI
- » Significant data consumption leads to need for data centers

## IMPLICATIONS TODAY:

- » Shifts in performance by region, metro, or submarket are in part driven by automation
- » Buildings that house “creative industries” or their employees are outperforming

An aerial photograph of a city skyline, likely New York City, featuring numerous skyscrapers and buildings. A large, semi-transparent white 'X' is overlaid on the left side of the image. The text is positioned on the right side, overlaid on the cityscape.

**HOW WE UNDERWRITE  
AND/OR FINANCE  
REAL ESTATE**

# BIG DATA & MACHINE LEARNING



VTS



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# BIG DATA & MACHINE LEARNING

## THE INNOVATION:

- » Novel sources of data and/or unprecedented processing power allows analysts to draw predictive conclusions

## REAL ESTATE IMPACT:

- » Better business intelligence (risks, customers, etc.) drive better decisions
- » More efficient real estate markets?
- » Competitive advantages to those with unique data and insights

## IMPLICATIONS TODAY:

- » Lots of money flowing into real estate tech
- » New tools available for underwriting, risk management, customer relations and engagement, etc.

# BLOCKCHAIN

## BLOCKCHAIN FOR EVERY INDUSTRY

Exploring blockchain use cases beyond Bitcoin and financial services

Blockchain technology has the potential to upend the way every industry manages its information and data, not only financial services. This infographic details the opportunities in every vertical to effectively store transaction, customer, and supplier data in a transparent, immutable ledger online.



### LEGAL

"Smart contracts" stored on the blockchain track contract parties, terms, transfer of ownership, and delivery of goods or services without the need for legal intervention.



### SUPPLY CHAIN

By utilizing a distributed ledger, companies within a supply chain gain transparency into shipment tracking, deliveries, and progress among other suppliers where no inherent trust exists.



### GOVERNMENT

Blockchain offers promise as a technology to store personal identity information, criminal backgrounds, and "e-citizenship," authorized by biometrics.



### ENERGY

Decentralized energy transfer and distribution are possible via micro-transactions of data sent to blockchain, validated, and re-dispersed to the grid while securing payment to the submitter.

# BLOCKCHAIN (DISTRIBUTED LEDGER TECHNOLOGY)

## THE INNOVATION:

- » Decentralization of ledger information across many (all?) internet-connected devices, leading to faster transactions with lower costs and greater security

## REAL ESTATE IMPACT:

- » Potential disruptor to financial and title institutions and could meaningfully change real estate transaction processes
- » Further impacts to businesses that occupy office space

## IMPLICATIONS TODAY:

- » Financial institutions exploring use of blockchains in limited ways

An aerial view of a city skyline, likely Los Angeles, featuring numerous skyscrapers and buildings. A large, semi-transparent white 'X' is overlaid on the left side of the image. The text 'HOW WE CONSTRUCT REAL ESTATE' is prominently displayed in white, bold, uppercase letters on the right side of the image. One of the buildings in the center has the text 'ONE WILSHIRE' visible on its facade.

# HOW WE CONSTRUCT REAL ESTATE

# CONSTRUCTION INNOVATIONS



# CONSTRUCTION INNOVATIONS

## THE INNOVATION:

- » Dramatically reducing the time and/or cost of construction through automating more of the process, from manufacturing components offsite to “3-D printing” buildings

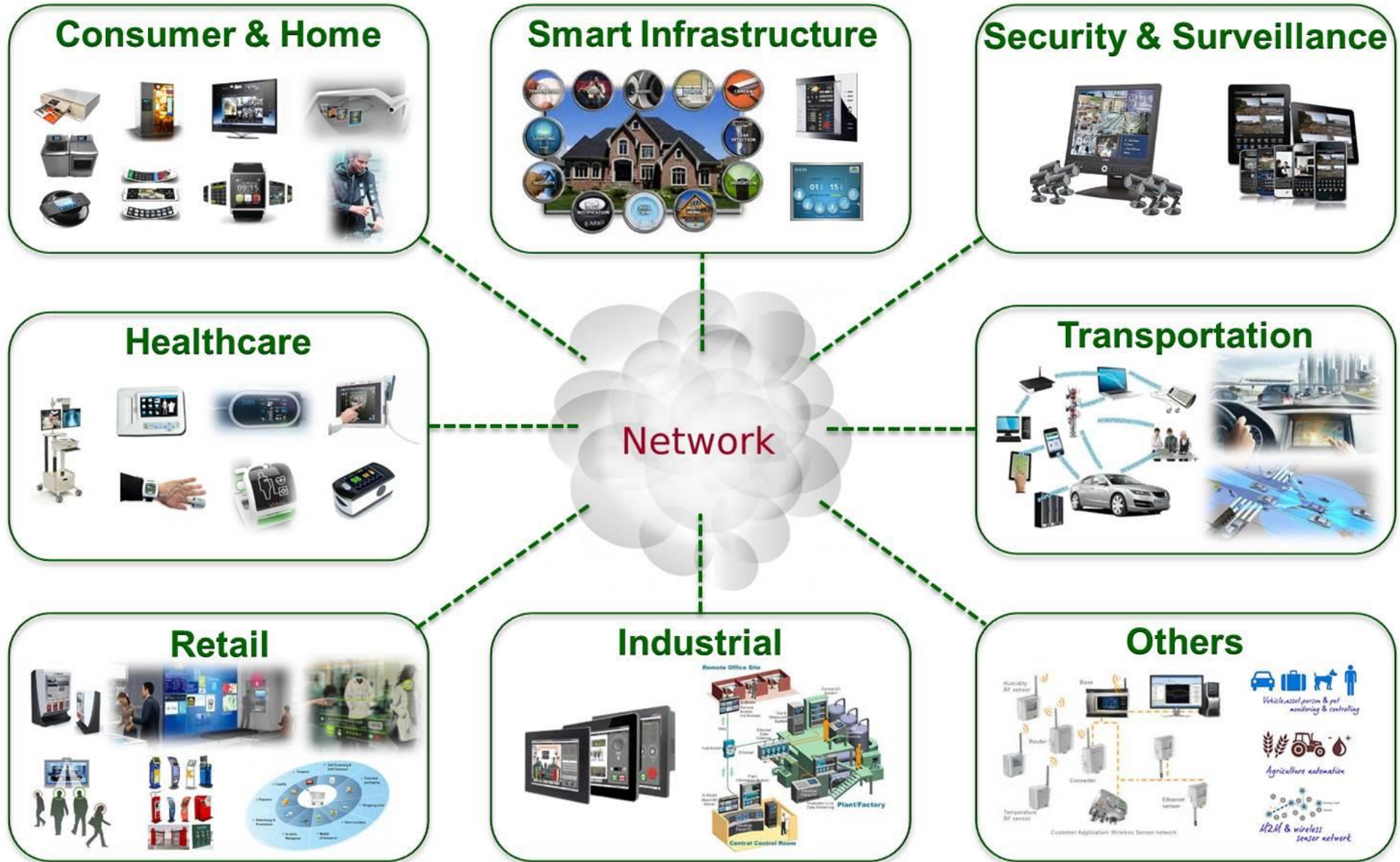
## REAL ESTATE IMPACT:

- » Construct buildings with significantly less labor
- » Lower construction costs and/or risk
- » Replacement costs and land residual values meaningfully change

## IMPLICATIONS TODAY:

- » Factory-built real estate being introduced to the U.S. (important given labor shortages and increasingly stringent environmental requirements)
- » Even more automation is on its way

# INTERNET-OF-EVERYTHING



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# INTERNET-OF-EVERYTHING

## THE INNOVATION:

- » Connecting previously inanimate or analog objects to the internet in order to drive better performance

## REAL ESTATE IMPACT:

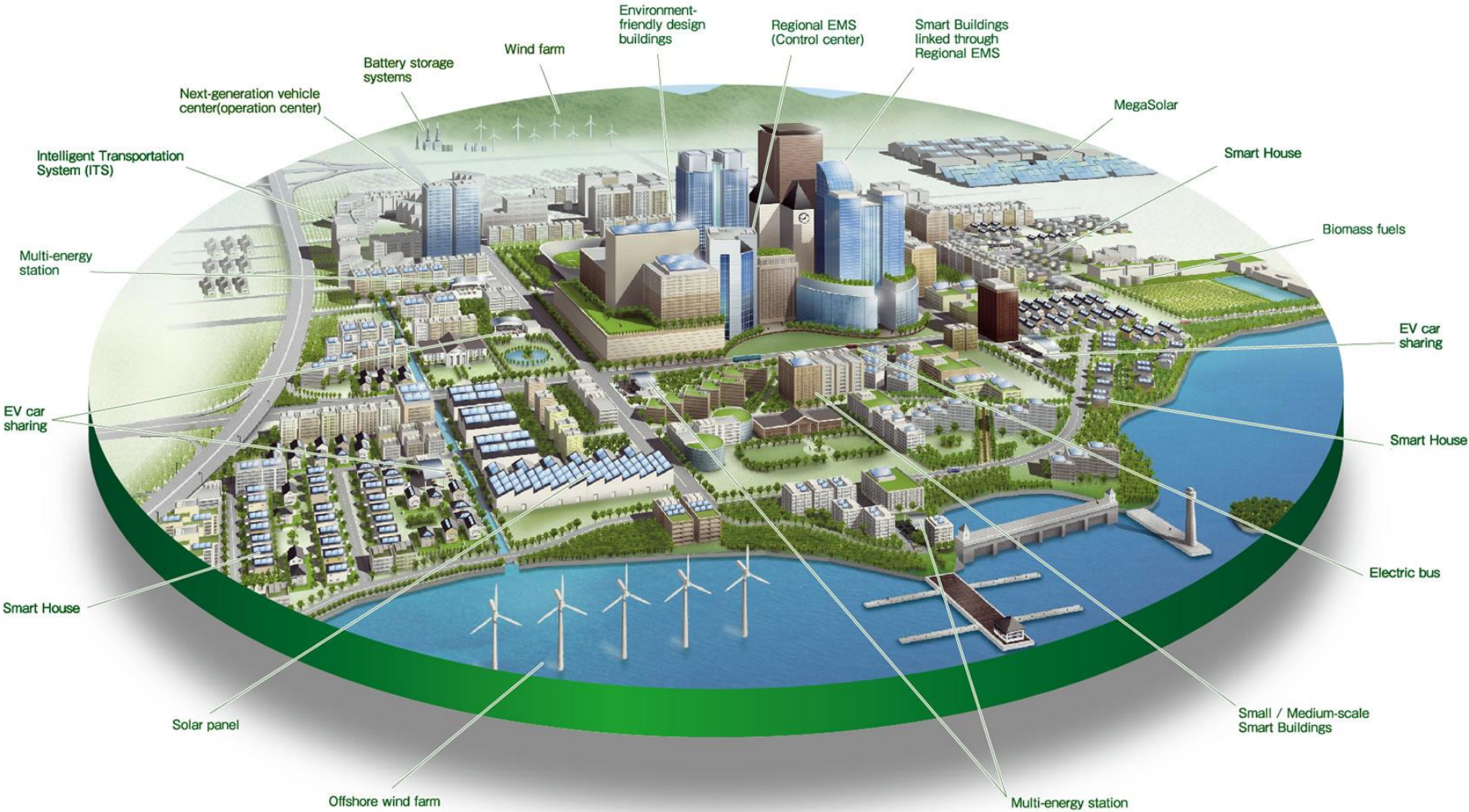
- » “Smart” home technology becoming a reality
- » Dramatically improved building efficiency
- » Increased possibility of structural obsolescence

## IMPLICATIONS TODAY:

- » Need for flexibility in design and infrastructure!



# SMART CITIES



# SMART CITIES

## THE INNOVATION:

- » The logical conclusion of the internet-of-things at a metropolitan scale; significant interconnectedness to make cities safer, more efficient, productive, and pleasant

## REAL ESTATE IMPACT:

- » Requires reconfiguration of most cities' current buildings and infrastructure
- » Winners and losers by location (are you in the network or not?)

## IMPLICATIONS TODAY:

- » Technology companies and governments are launching experiments
- » All previously discussed technology contributes to this outcome



# IMPACTS

# TIMING & DEGREES OF IMPACT

*Timing*

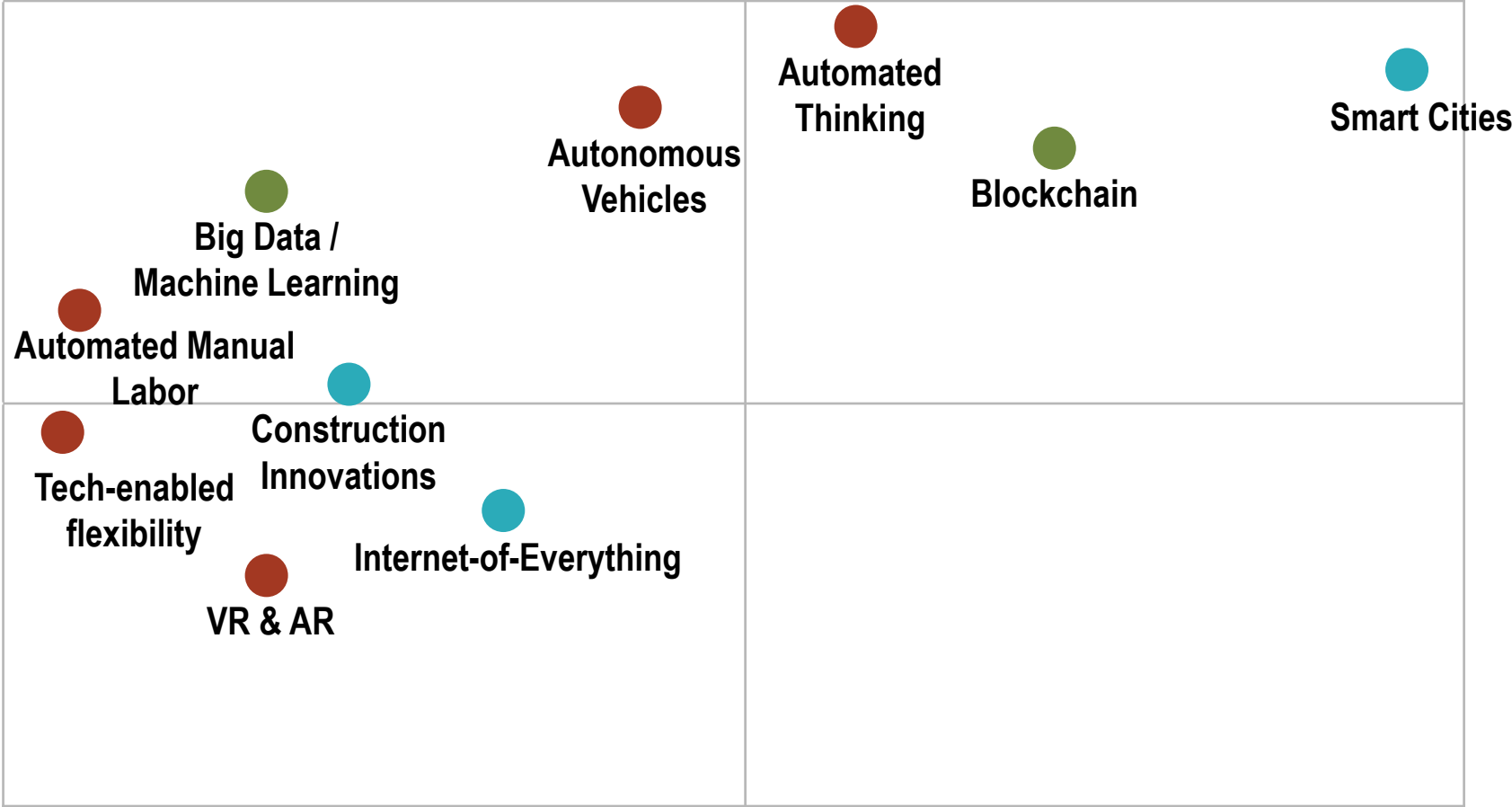
*Near-term*

*Long-term*

*Degree of Impact on Real Estate*

*Radical*

*Incremental*





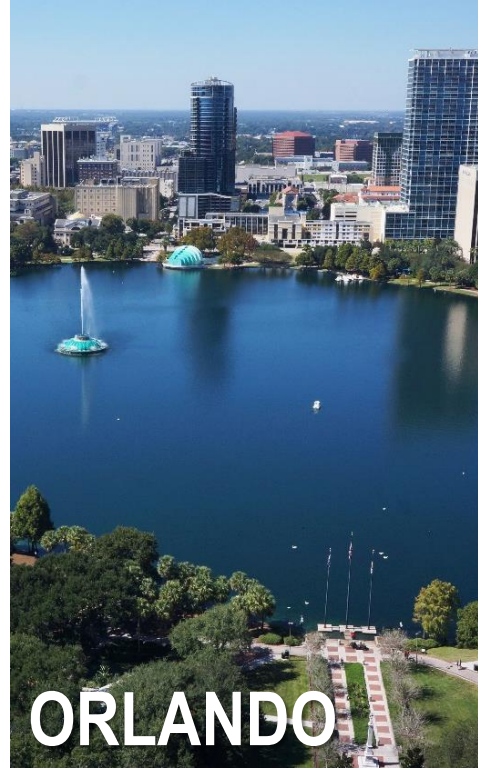
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