



for the Built Environment



WARD AND SMITH, P.A.  
ATTORNEYS AT LAW

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Construction Conference  
February 21, 2019

# FMI Overview

FMI provides consulting, investment banking and private equity services for clients serving the Built Environment. We leverage unrivaled industry access and 65 years of client service to achieve transformational outcomes for our clients.

**6**

U.S. Offices  
Canada (new)

**66**

Years in  
Business

**200**

Professionals

**600+**

Annual Client  
Engagements

**25+**

Annual M&A  
Transactions

## FMI Consulting

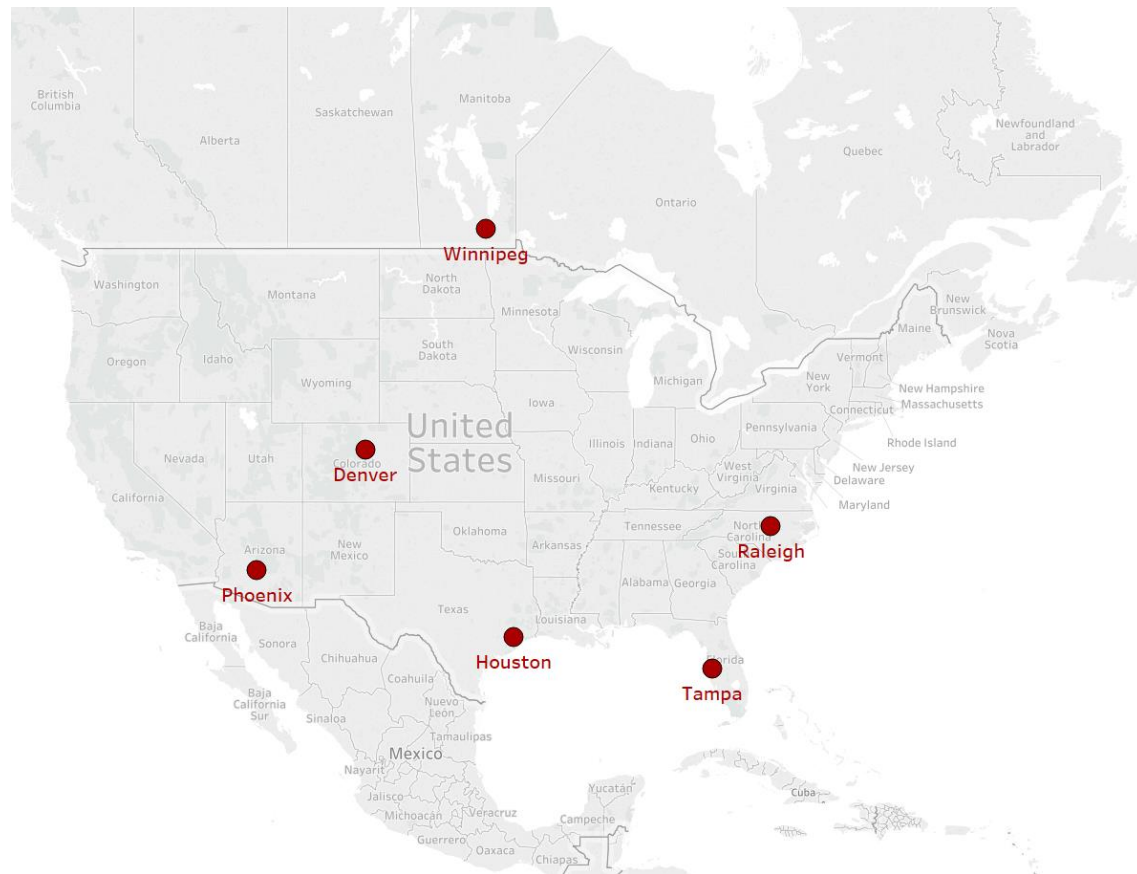
- Strategy
- Leadership & Organizational Development
- Performance
- Technology & Innovation
- Signature Programs
- CEO Peer Groups
- Insurance Captive

## FMI Capital Advisors

- M&A Representation
- ESOP
- Valuation
- Financial Advisory

## FMI Investment Partners

- Private Equity (new)



We serve clients in all 50 states and Canadian provinces, as well as, Europe, Asia and South America

# Themes from Last Year's Conference (Fall 2017)

## National Construction Spending

- Residential spending outlook remained robust
- Non-residential spending growth expected to moderate to +1 to 2%
- Non-building structures to decline by as much as -5%

## North Carolina Outlook

- Raleigh, Durham, Charlotte, Greenville, Asheville, Winston-Salem and Wilmington outperforming state Non-Residential average

## The Trump Agenda

- Trump 'bump' slow to materialize – no progress on Infrastructure, Taxes or Healthcare

## Industry Themes

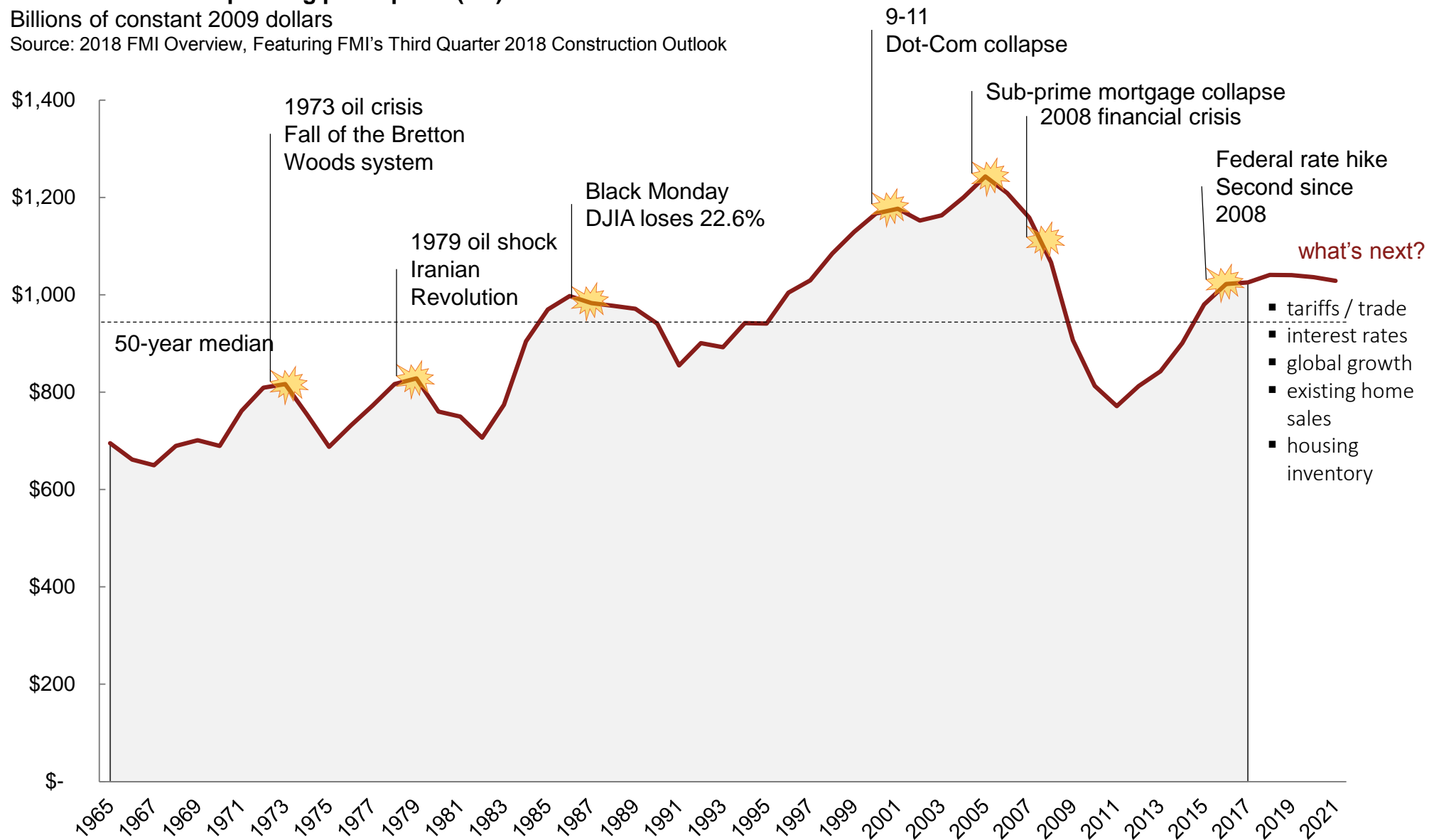
- Technology and innovation beginning to impact the industry
- Baby-boomers are behind the curve on addressing succession
- Generational ownership transfers within family members declining
- Robust M&A activity across all sectors of the industry

# Where are we in the current cycle?

## Total construction spending put in place (US)

Billions of constant 2009 dollars

Source: 2018 FMI Overview, Featuring FMI's Third Quarter 2018 Construction Outlook



# Too Much Uncertainty for Too Long Leads to Inaction .... Which Leads to ...?

Iran



Interest Rates



Democrats take the House



China – trade, debt, tariffs



USMCA – will it be ratified?



North Korea



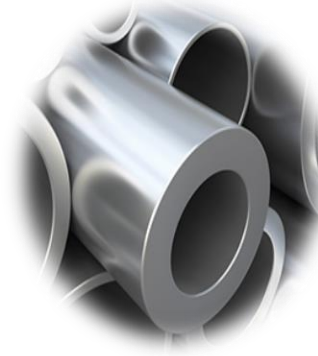
Venezuela



Trans Pacific Partnership – U.S. out forever?



















Tariffs – how many for how long?



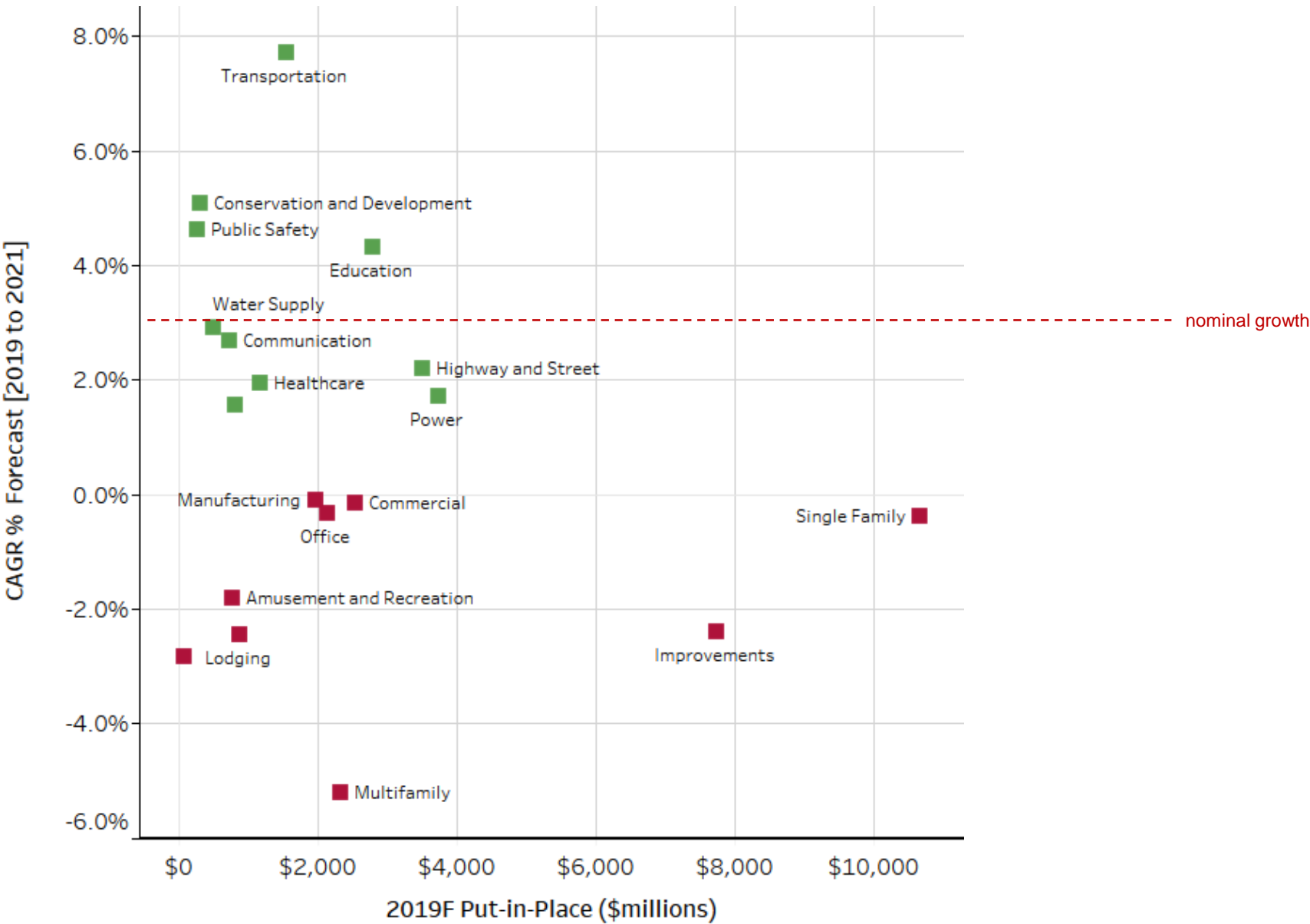
# Predicting the next US recession

## Predictive indicators

Source(s): FMI analysis of multiple sources

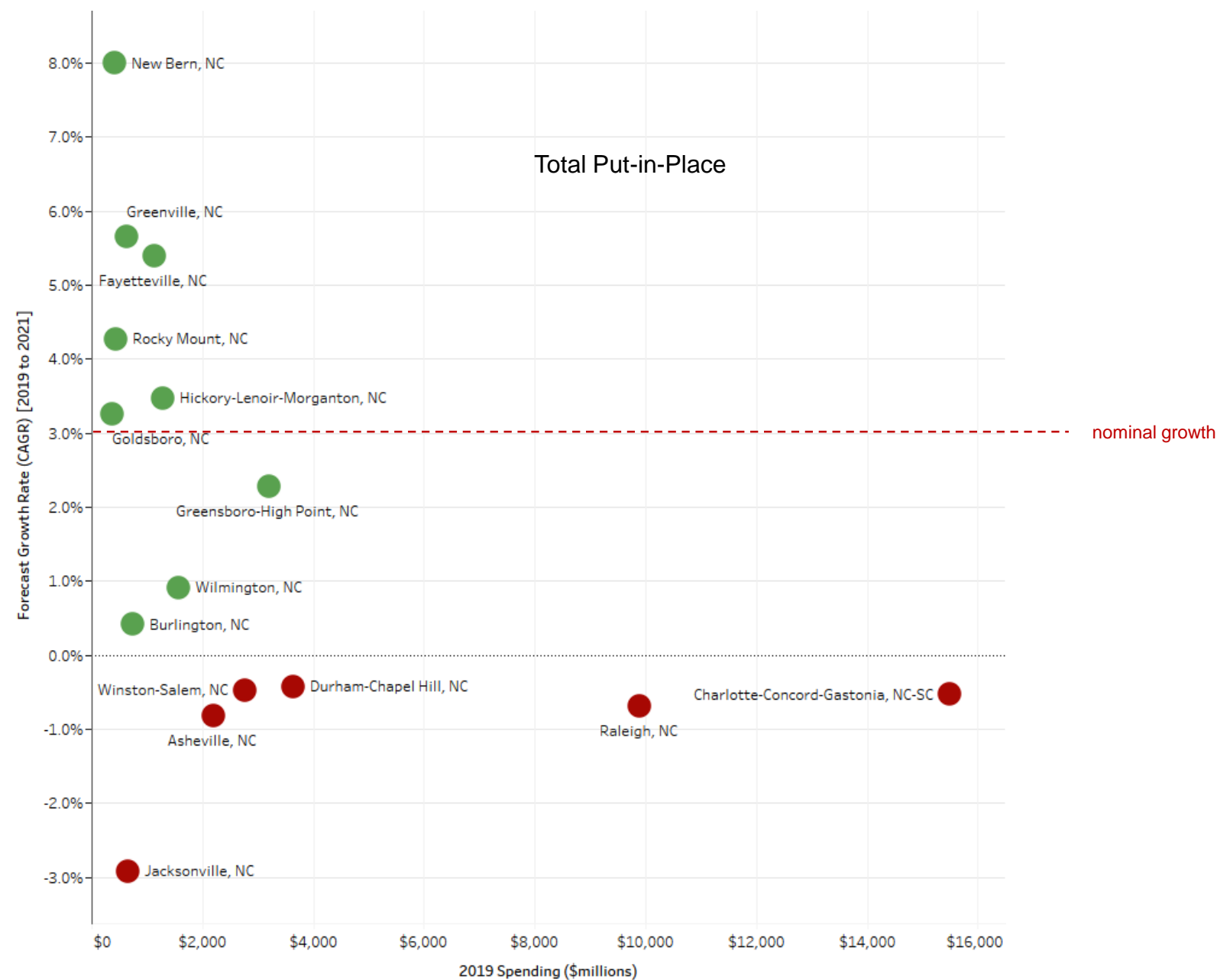
Indicators / Metrics	Recessions Considered	Correct Predictions	False Positives	Prediction Strength*	Flag/ Warning Timing	Risk Assessment/ Trending
Yield Curve Inversion	5	5	-	High (100%)	~2-3 year	MODERATE 
New Home Sales	6	5	1	High (67%)	~1-4 year	LOW/MODERATE 
Unemployment Rate	6	4	-	High (67%)	~1 year	LOW 
US Trade Balance (BOP % change)	6	6	2	High (67%)	~1 year	MODERATE 
Money Supply	7	5	1	High (57%)	~1-3 year	MODERATE 
Lumber Sales	2	2	1	High (50%)	~1-2 year	MODERATE 
MBS Held by Banks	2	2	1	High (50%)	~1-2 year	MODERATE 
Rental Vacancy Rates	9	4	-	(44%)	~1-4 year	LOW 
Residential CPIP	6	3	1	(33%)	~1-3 year	LOW 
Stock Market Performance	3	2	1	(33%)	<1 year	LOW 
Copper Price (Doctor Copper)	7	4	2	(29%)	~2-5 year	MODERATE 
Consumer Confidence (OECD)	8	5	4	Low (13%)	~1 year	MODERATE 
Heavy Duty Truck Sales	7	4	4	Low (0%)	~1-2 year	LOW 
Manufactured Goods, New orders	2	1	1	Low (0%)	~1 year	LOW 
US Trade Balance (values)	6	1	1	Low (0%)	~1 year	MODERATE 
Unemployment Claims	7	4	5	Low (-14%)	~1 year	LOW 

# North Carolina Forecast Growth Rate (2019 to 2021)



Source: FMI MSA Forecast as of Q4 2018

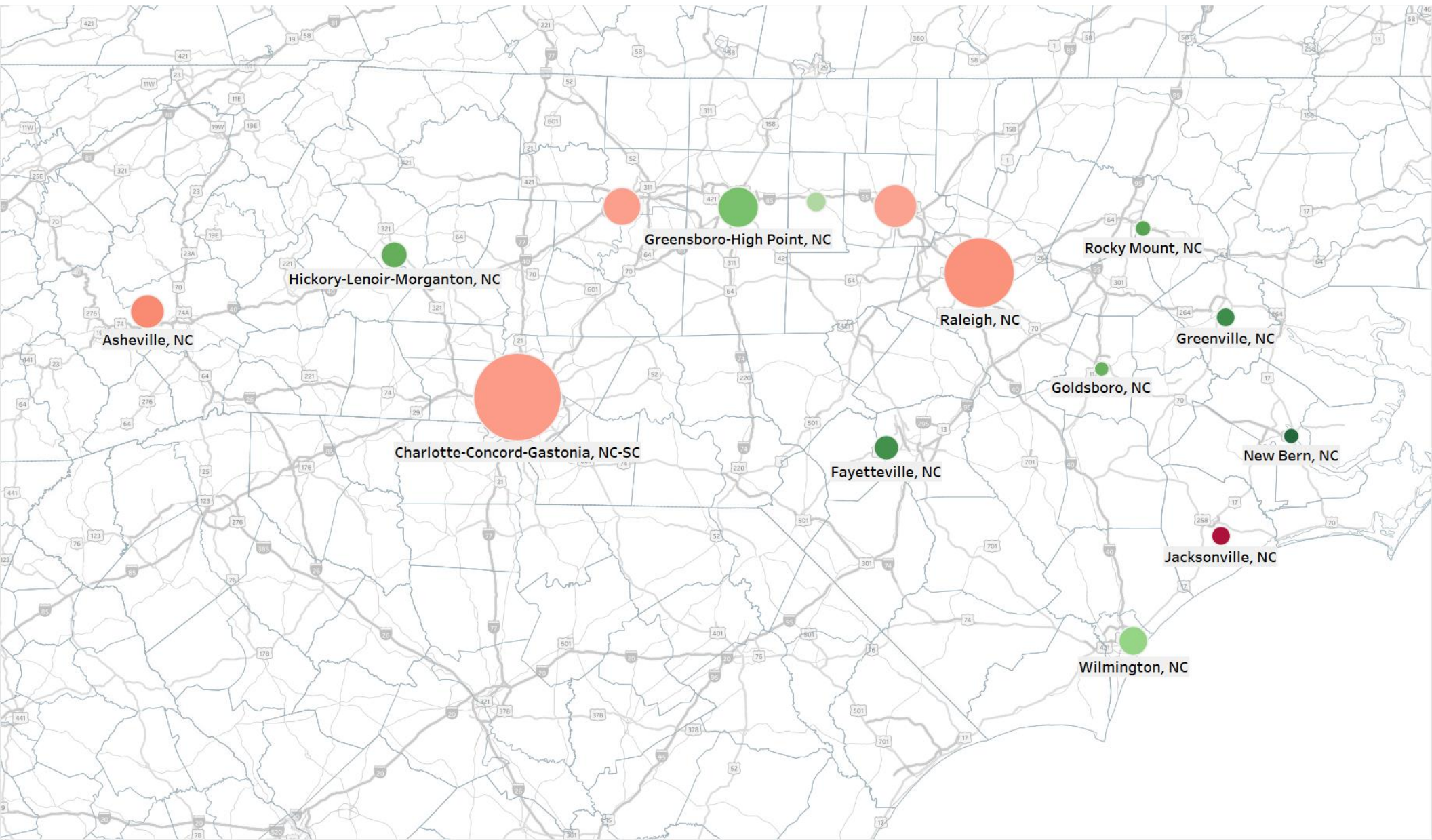
# North Carolina MSA Forecast Growth Rate (2019 to 2021)



Source: FMI MSA Forecast as of Q4 2018



# North Carolina MSA Forecast Growth Rate (2019 to 2021)



# Top and Bottom Three by MSA (Forecast 2019 to 2021)

## Asheville

- + Transportation, Public Safety, Education
- Multifamily, Improvements, Religious

## Burlington

- + Transportation, Public Safety, Education
- Multifamily, Religious, Lodging

## Charlotte

- + Transportation, Conservation and Development, Public Safety
- Multifamily, Improvements, Religious

## Durham

- + Transportation, Public Safety, Education
- Multifamily, Improvements, Single Family

## Fayetteville

- + Conservation and Development, Water Supply, Highway and Street
- Religious, Lodging, Amusement and Recreation

## Goldsboro

- + Conservation and Development, Water Supply, Highway and Street
- Religious, Lodging, Amusement and Recreation

## Greensboro

- + Conservation and Development, Transportation, Water Supply
- Religious, Lodging, Amusement and Recreation

## Greenville

- + Conservation and Development, Transportation, Highway and Street
- Religious, Lodging, Amusement and Recreation

# Top and Bottom Three by MSA (Forecast 2019 to 2021)

## Hickory-Lenoir

- + Conservation and Development, Water Supply, Highway and Street
- Religious, Lodging, Amusement

## Jacksonville

- + Transportation, Public Safety, Education
- Multifamily, Improvements, Sewer and Waste

## New Bern

- + Conservation and Development, Water Supply, Highway and Street
- Religious, Lodging, Amusement

## Raleigh

- + Transportation, Public Safety, Education
- Multifamily, Improvements, Religious

## Rocky Mount

- + Conservation and Development, Water Supply, Highway and Street
- Religious, Lodging, Amusement

## Wilmington

- + Transportation, Public Safety, Education
- Religious, Lodging, Sewer and Waste

## Winston-Salem

- + Transportation, Public Safety, Education
- Multifamily, Improvements, Religious

# Industrialization and Digitization of the Construction Industry

## In the marketplace



Shifting customer profile



Increasing building and infrastructure complexity

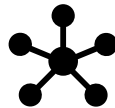


Nontraditional stakeholders and methods of competition

## And among management practices



Profiting from data analytics and real-time insights



Enhancing solutions by expanding across the value chain



Augmenting labor development to accelerate productivity

# A Dozen Enabling Technologies Driving Innovation and Transformation



Smart Mobile  
Devices



IoT / Wireless  
Sensors



Smart  
Wearables



Augmented  
Reality



Robotics



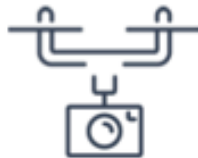
Artificial  
Intelligence



Cloud  
Computing



Remote  
Connectivity



Scanning/Reality  
Capture



Virtual  
Reality



Worker  
Augmentation



Additive/Subtractive  
Manufacturing

*Entrepreneurs and innovators from both inside and outside the industry are leveraging combinations of these enabling technologies to create new business models and transform existing processes*

# New competitors WILL NOT adhere to your legacy practices

## *Artificial Intelligence*

Replicating or replacing knowledge-work tasks

## *Internet of Things*

Process optimization via a network of sensors and other devices for data collection, monitoring, etc.

## *Advanced Robotics*

Human augmentation and/or task automation that enhances precision and speed of delivery



## *Iterative Manufacturing*

Increased customization, creation of unique products, and reduction of waste

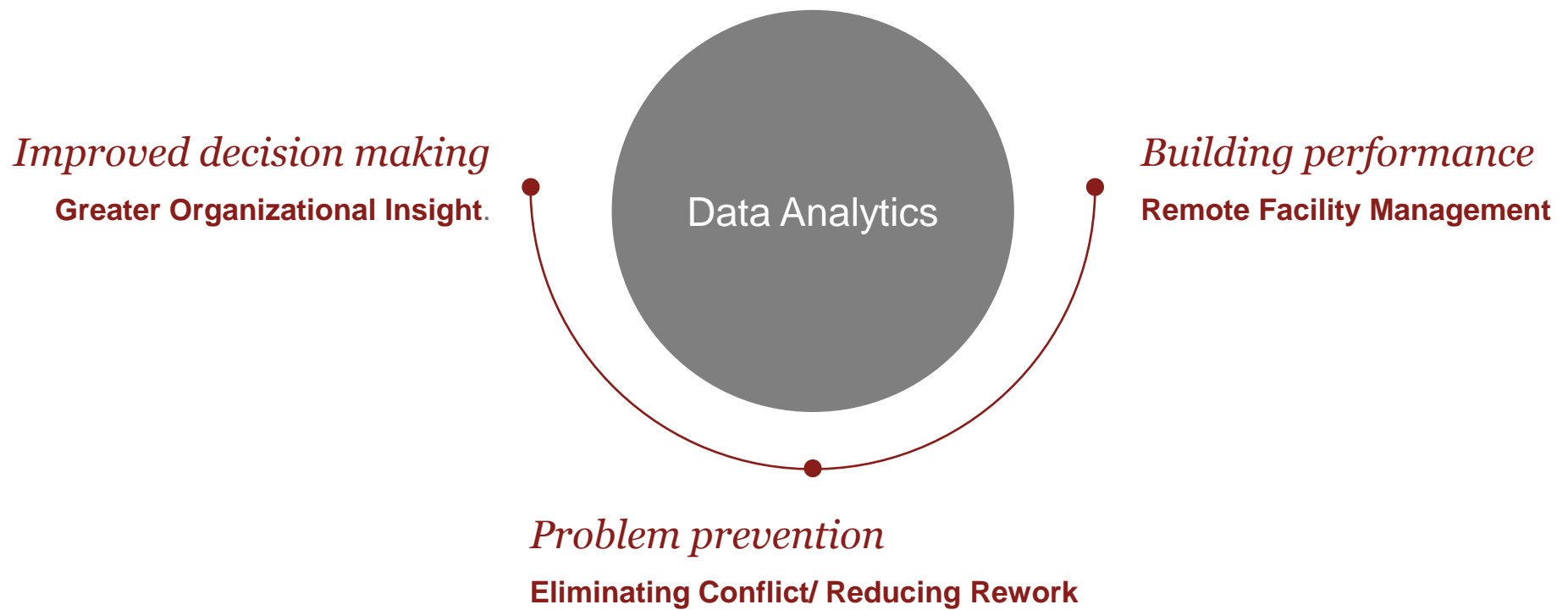
## *Autonomous Vehicles*

Machine-to-machine communication and elimination of human operation

## *Modularization/ Prefabrication*

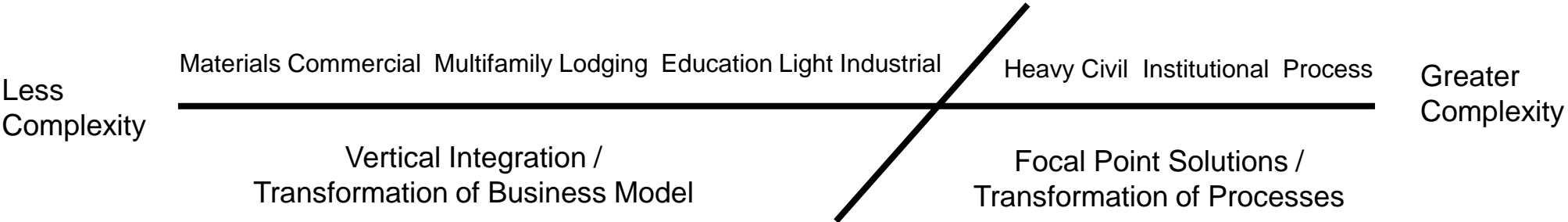
Off-site fabrication and kitting services

## Profiting from data and real-time analytics



# Different Impact Across the Infrastructure Spectrum

Disruption will look different the Built Environment and progress at different paces







UpCodes has proprietary AI called **Reinforcement Learning** to notify you when your building plans are going to result in code noncompliance. You upload your plans to their app, and the system flags problem areas that need to be revised before you start building. It is geographic-specific.



Doxel uses a system of autonomous rovers and drones that take images and use lasers coupled with building plans to assess the state of a building in progress. Their system then uses a technique called **Deep Learning** to deliver this information in a real-time dashboard that gives you percent complete reports. This system also takes schedule and budget into account and lets you know when items are overdue and influencing the critical path, and also visually assesses the dollar amount of materials that have already been installed and compares that with your budget.



Grit takes schedules and creates a 4D workplan that allows you to see a virtual model of the building as it's built from the ground up, and then uses **Artificial Intelligence** (machine learning) to recalculate the critical path if certain schedule elements are not done in their original order. It then makes recommendations for which other scheduled activities can be completed during the delay.



TestFit.IO has developed a regenerative design platform that allows a user to input building programmatic requirements such as total square feet, number of apartments and rooms with various size requirements, number of floors, number of elevators, number of parking spaces, etc. After configuring basic building requirements and the footprint, TestFit runs a series of algorithms that will produce the ideal design/layout. By point, click and drag the design can then be manipulated/stretched and the design parameters will automatically adjust as the building is being stretched. It allows for early conceptual to schematic design of a building to allow for more precise planning and budgeting. The TestFit design is intended to serve as the basis for a design team to use as they proceed to DD and CD level drawings. TestFit also applies 3D prototyping and shadow/lighting elements to assess shape, site location and more.

<https://youtu.be/mKkTJZ05bxl>



Trussmatic is a Finnish company that has brought together robotics, proprietary software and process engineering. Trussmatic is a fully automated manufacturing solution for the fabrication of trusses, wall and floor panels. Trussmatic is currently in use for wood frame components but can also be used for metal components with a quick switch of the heads on the robot. With Trussmatic, manufacturers can automate the full Truss production line. General contractors can now vertically integrate truss and wall panel fabrication into their services. The system is turnkey with the associated robotics, production tables, conveyors, banding/bundling and supporting technology all included in the Trussmatic offering.

<https://www.youtube.com/watch?v=sQh2s2e0C7k>

# Summary Thoughts

- We are at or near the top of the cycle....
- Has your good performance been a result of your innovation and operational improvement or merely a byproduct of a strong market?
- Contractors don't go broke due to lack of work....
- How are you leveraging lessons learned from the Great Recession and coaching your next generation?
- Someone is definitely working to disrupt your sector and your role in the industry
- You need to be thinking differently about your strategy, business model, people and processes
- It's great to be in North Carolina!

# Thank You

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As president and chief executive officer of FMI Corporation, Chris oversees the management of all FMI businesses and services and leads the firm's strategic growth efforts. Previously, Chris served as president and senior managing director of FMI Capital Advisors, the firm's investment banking subsidiary, where he also led the firm's utility infrastructure practice.

He works with owners, boards and management teams on strategic issues involving industry trends, management, ownership transfer, and mergers and acquisitions. He is a contributing author to numerous industry publications and media outlets and is an energetic and entertaining speaker on the current and future impact of economic, technology and competitive trends on the industry.

Prior to joining FMI, Chris served as global financial services leader for an industrial company with operations throughout North and South America and Europe, and he began his career in public accounting with KPMG.

Chris has a Bachelor of Science in business with a major in accounting from Virginia Tech. He is a licensed certified public accountant (inactive) in the state of North Carolina and holds FINRA securities licenses 24, 79 and 63.