

Idencia

Smart Infrastructure Market Report 2017



Infrastructure Asset Networking Solutions

Table of Contents

What is Smart Infrastructure?	Page 1
Idencia's Vision for Smart Infrastructure	Page 2
Part 1: Manufacture and Construction	Page 3
Part 2: Asset Management	Page 14
Part 3: Idencia's Role in Smart Infrastructure	Page 19
Part 4: Smart Infrastructure Opportunity	Page 25
Conclusion	Page 29
Participate in Smart Infrastructure	Page 30

What is Smart Infrastructure?

“Infrastructure that conveys information about its manufacture, construction, depreciation and use to its stakeholders.”

Idencia's Vision for Smart Infrastructure



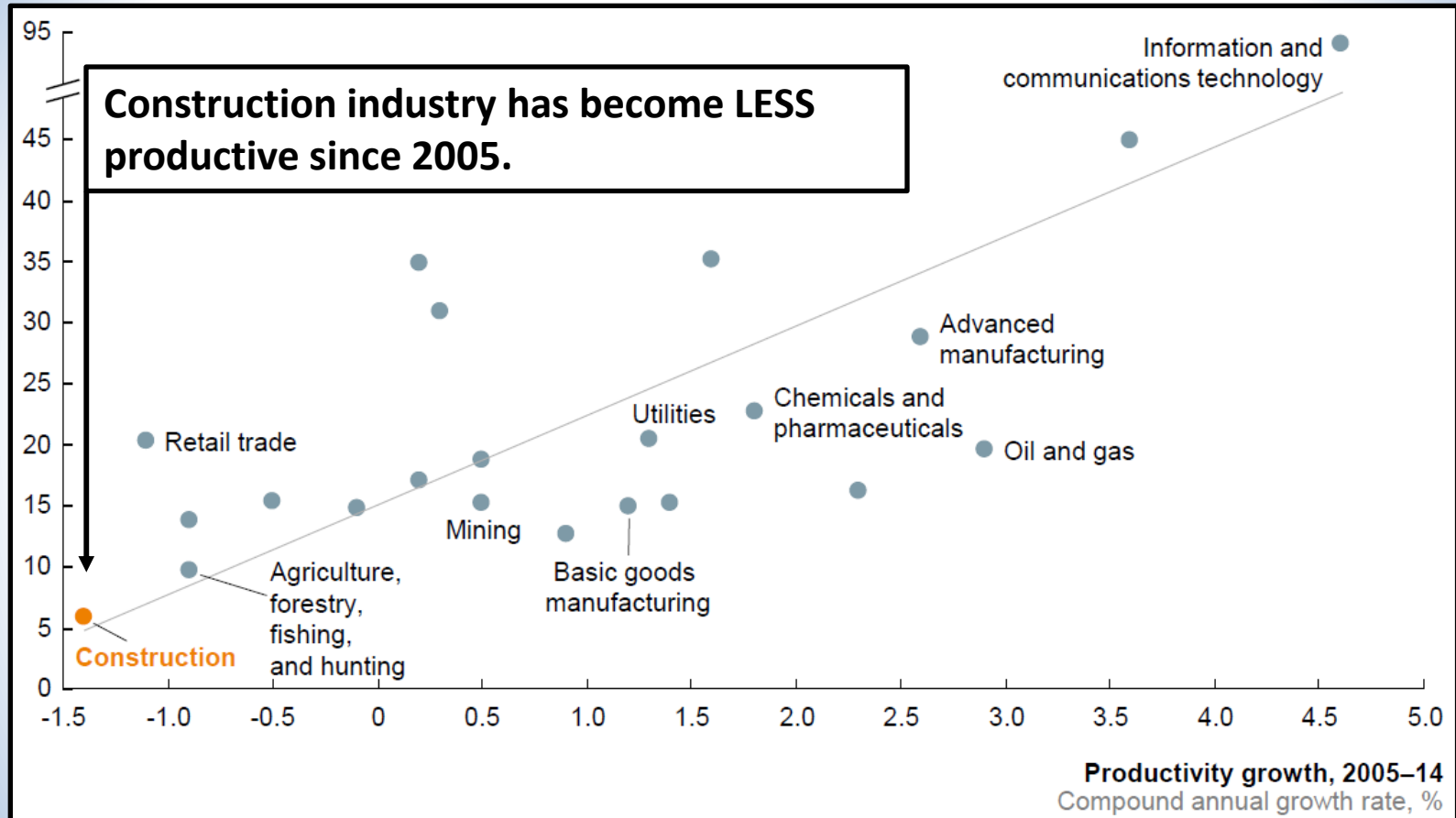
“Smart infrastructure will redefine the utility of physical infrastructure and eliminate billions of dollars from the cost of manufacture, construction and maintenance.”

Part 1

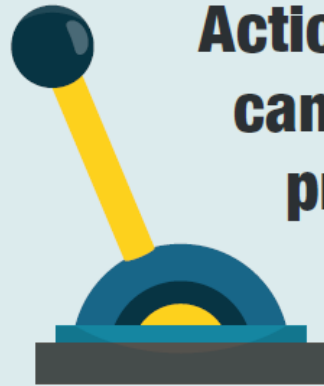
Manufacture & Construction



Problem



Need

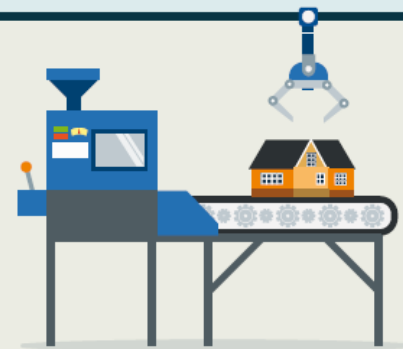


**Action in seven areas
can boost sector
productivity by
50–60%**

- Reshape regulation
- Rewire contracts
- Rethink design
- Improve procurement and supply chain
- Improve onsite execution
- Infuse technology and innovation
- Reskill workers

5–10X productivity boost

possible for some parts of the industry by moving to a manufacturing-style production system

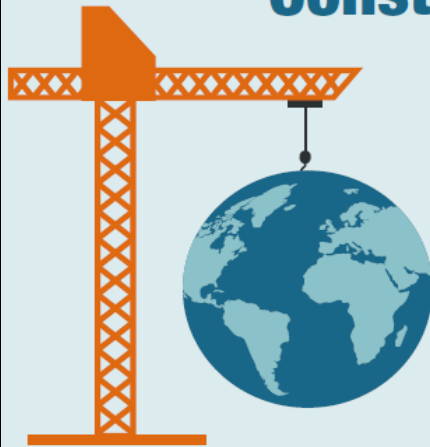


Opportunity

The **productivity opportunity** in construction



Construction matters for the world economy ... but has a long record of poor productivity



Construction-related spending accounts for

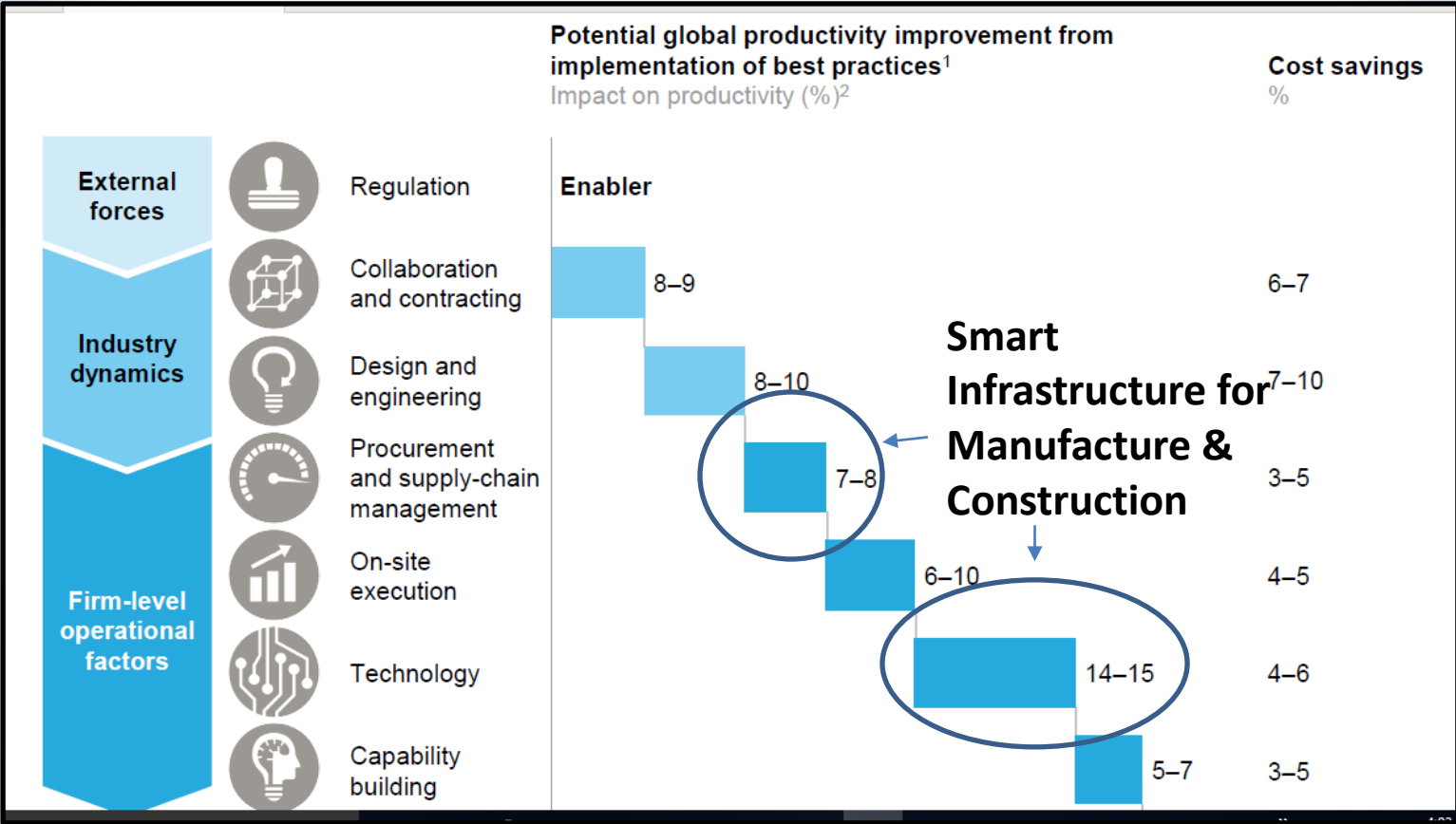
13% of the world's GDP

...but the sector's annual productivity growth has only increased

1% over the past 20 years

\$1.6 trillion of additional value added could be created through higher productivity, meeting half the world's infrastructure need

Solutions



Source: [Reinventing Construction: A Route to Higher Productivity](#); McKinsey Global Institute; Feb 2017.

Solutions

Smart Infrastructure

IMPROVE PROCUREMENT AND SUPPLY-CHAIN MANAGEMENT	
	<ul style="list-style-type: none">• Use standard procurement tools and levers seen in other sectors• Invest in a central procurement organization• Leverage clean sheeting to improve supplier and subcontractor management
IMPROVE ON-SITE EXECUTION IN FOUR KEY WAYS	
	<ul style="list-style-type: none">• Introduce rigorous integrated planning• Implement collaborative performance management• Mobilize projects effectively• Collaborate to reduce waste and variability
INFUSE DIGITAL TECHNOLOGY, NEW MATERIALS, AND ADVANCED AUTOMATION	
	<ul style="list-style-type: none">• Invest in a chief digital/tech/innovation office and team• Make 3D BIM universal• Introduce drones and unmanned aerial vehicles for scanning, monitoring, and mapping• Use digital collaboration and mobility tools on portable devices

- Web-hosted product information platform using RFID
- Web-hosted supply chain integration
- As-Built information – BIM integration

Source: [*Reinventing Construction: A Route to Higher Productivity*](#); McKinsey Global Institute; Feb 2017.

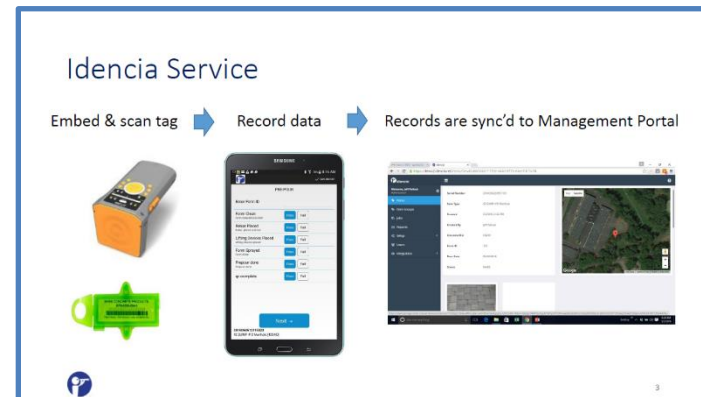
Procurement & Supply Chain

“Too often, there is no tracking of inventory and no system that organizes where materials should go, which have been used, and how soon they are likely to be out of stock...”

Source: [Reinventing Construction: A Route to Higher Productivity](#); McKinsey Global Institute; Feb 2017.

Smart Infrastructure

- Web-hosted product information platform using RFID



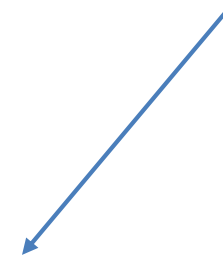
On-Site Execution

“Managing a supply chain well and thereby reducing costs, reducing inventory rotation days, and performing to schedule requires an integrated approach.”

Source: [Reinventing Construction: A Route to Higher Productivity](#); McKinsey Global Institute; Feb 2017.

Smart Infrastructure

- Web-hosted supply chain integration.



PROCORE[®]

 **ManufactOn**

Digital Technology

“Nearly two thirds [of BIM users] believe that they are seeing a positive ROI from their use of BIM, with about half of those reporting an ROI of 25% or more.”

Source: [*The Business Value of BIM for Infrastructure 2017*](#); Dodge Data & Analytics; 2017

Smart Infrastructure

- As-Built information – BIM integration



Part 2

Asset Management



Problem

1. US infrastructure requires **\$4.6 Trillion** of investment by 2025
2. Operating budgets for state departments of transportation are **shrinking**.



Source: [2017 Infrastructure Report Card](#);
American Society of Civil Engineers; March 2017

Need

Improved productivity in management of required infrastructure investments.



Source: [*Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future*](#); American Society of Civil Engineers; March 2017

Opportunity

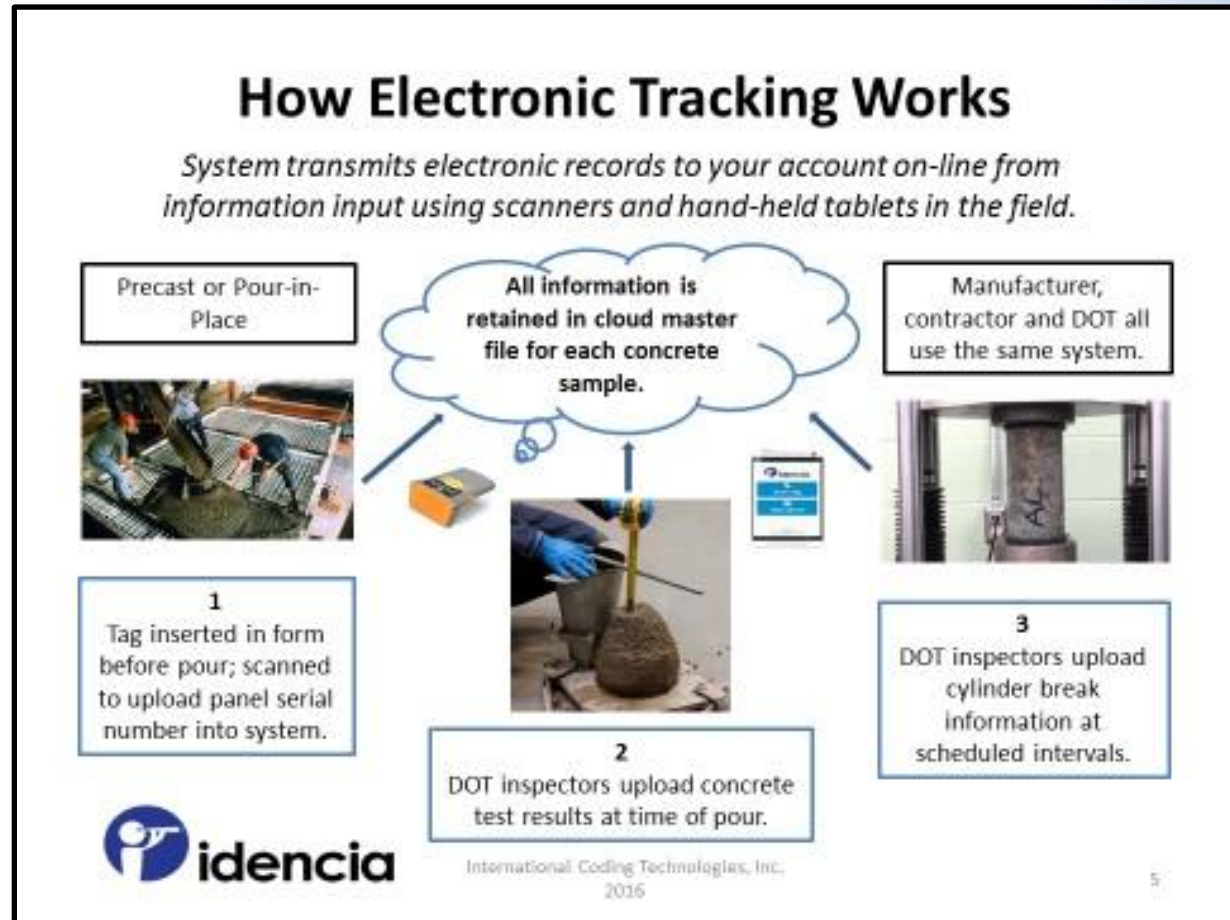
Provide DOTs with a solution for managing more assets with fewer resources.

The screenshot shows the RFID Journal website. The main header features the 'INTERNET OF THINGS JOURNAL' logo and the tagline 'Or is it a set of standards and technologies that will transform your business'. Below the header is a navigation bar with categories like Home, Internet of Things, Aerospace, Apparel, Energy, Defense, Health Care, Logistics, Manufacturing, and Retail. The main content area displays an article titled 'North Carolina Transportation Dept. Tracks Precast Concrete and Samples' by Claire Swedberg. The article text describes the use of UHF RFID tags and a cloud-based server for tracking construction materials. To the right of the article is a 'Best-in-Class' advertisement for ParkerVision's PVOA201 - Op Amp, highlighting its RF linearity and power efficiency. Below the article are social media sharing options (PDF, Email, Print, Definitions, Save Article) and a 'PREMIUM CONTENT' section featuring a case study on Italy's waste management problem.

“...the [DOT] expects to achieve **\$1.2 million in savings** within the first year, based on a reduction in labor, vehicle and fuel costs...” Source: [North Carolina Transportation Dept. Tracks Precast Concrete and Samples](#); RFID Journal; Oct 24, 2014.

Solution

Replace manual data entry with the Idencia electronic information platform.



Part 3

Idencia's Role In Smart Infrastructure

The screenshot displays the Idencia web application interface. The browser address bar shows the URL: <https://prodemo.idencia.net/Reports/View?path=%2Fqcdemo%2FCasting%20QC%20Report&name=Casting%20QC%20Report>. The application header shows the user is logged in as Jeff. The left sidebar contains navigation options: Items, Item Groups, Jobs, Reports, Setup, Users, and Integration. The main content area displays a 'Casting QC Report' for a pour on 4/14/2016 at 12:00:00 AM, using Concrete Mix 1. The report includes a table of casting data and concrete test results.

Casting QC Report									
Cast Date	4/14/2016	Concrete Mix	Mix 1						
Cast Date	4/14/2016	Concrete Mix	Mix 1						
Cast Date	4/14/2016	Concrete Mix	Mix 1						
Serial Number	Product #	Design Length	Cast Length	Design Width	Cast Width	Design Depth	Cast Depth	Design Bar Size	Design Bar Spacing
2016041413503914	13DBH	36		24		16			
E2002029271902550850BBF5	13DBH	36	24.5	24	11.5	16	8		
E2002029271902430890BB19	13DBH	36	24.5	24	11.5	16	8		
E2002029271902700860BBBA	13DBH	36	24.5	24	11.5	16	8		

Concrete Test Results			Cylinder Breaks						
Air Content	9	7 Day Break Results				28 Day Break Results			
Slump	9	Cylinder ID	Break Date	Break Stress	Average	Cylinder ID	Break Date	Break Stress	Average
Concrete Temperature	78								
Ambient Temperature	65								
Stripping Stress	3125								

Idencia Currently

Idencia Solution: Web-hosted Product Records

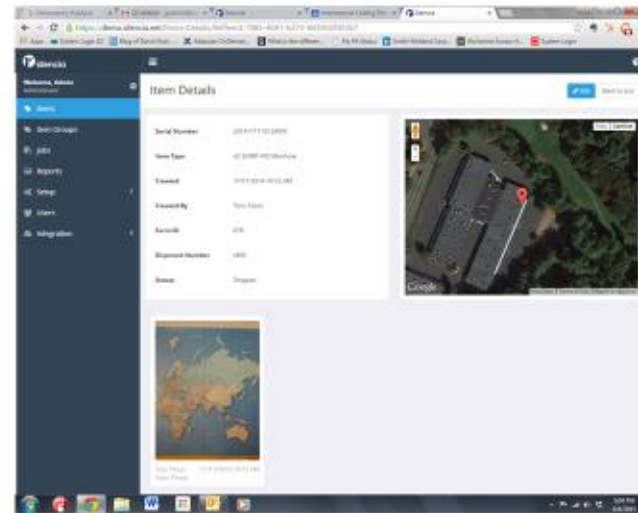
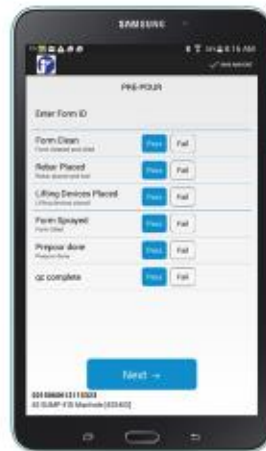
Embed & scan tag



Record data



Records are sync'd to web hosted account



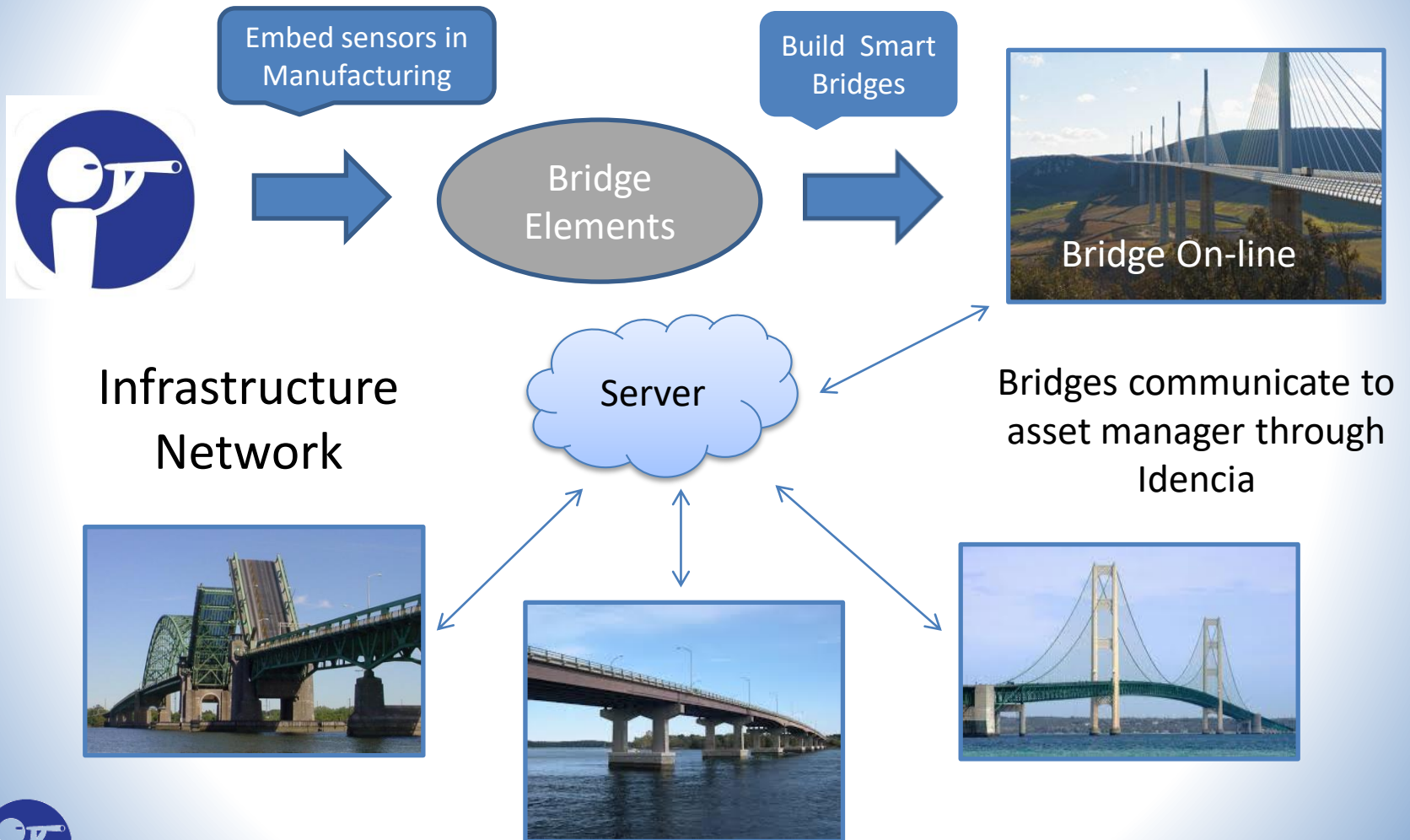
Consumer technology; easy to use.



4

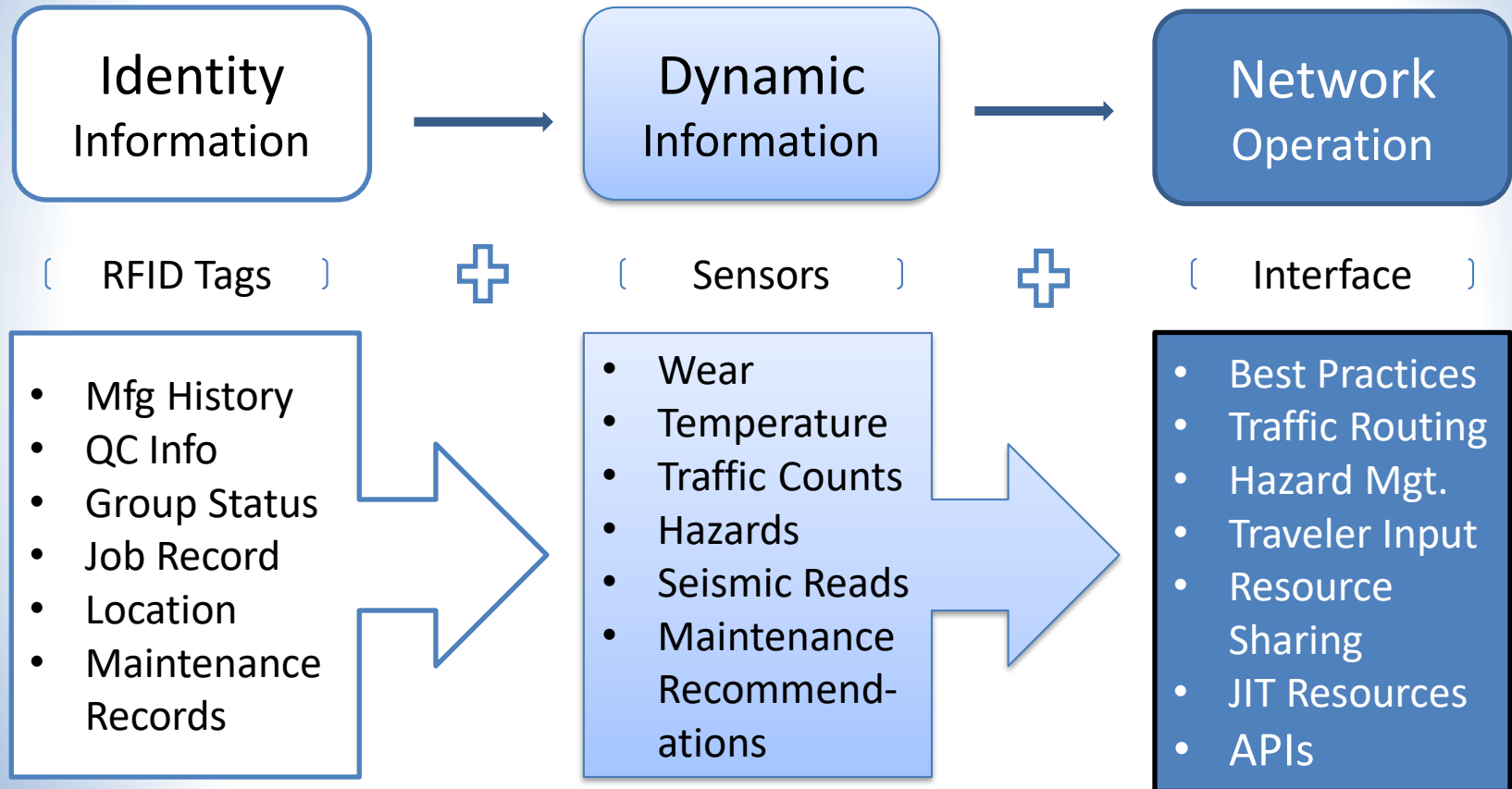


Idencia Next Bring Infrastructure On-line



Idencia Future Evolve into Interactive Network

(Idencia Currently)



Idencia Smart Infrastructure

Infrastructure Becomes a Network Platform



Each bridge, tunnel, sewer pipe, etc. becomes a node on the network.



Manufacturers embed identifiers and sensors to create network frame.



True potential of the platform is realized by the services provided on it by developers.



Idencia Smart Infrastructure

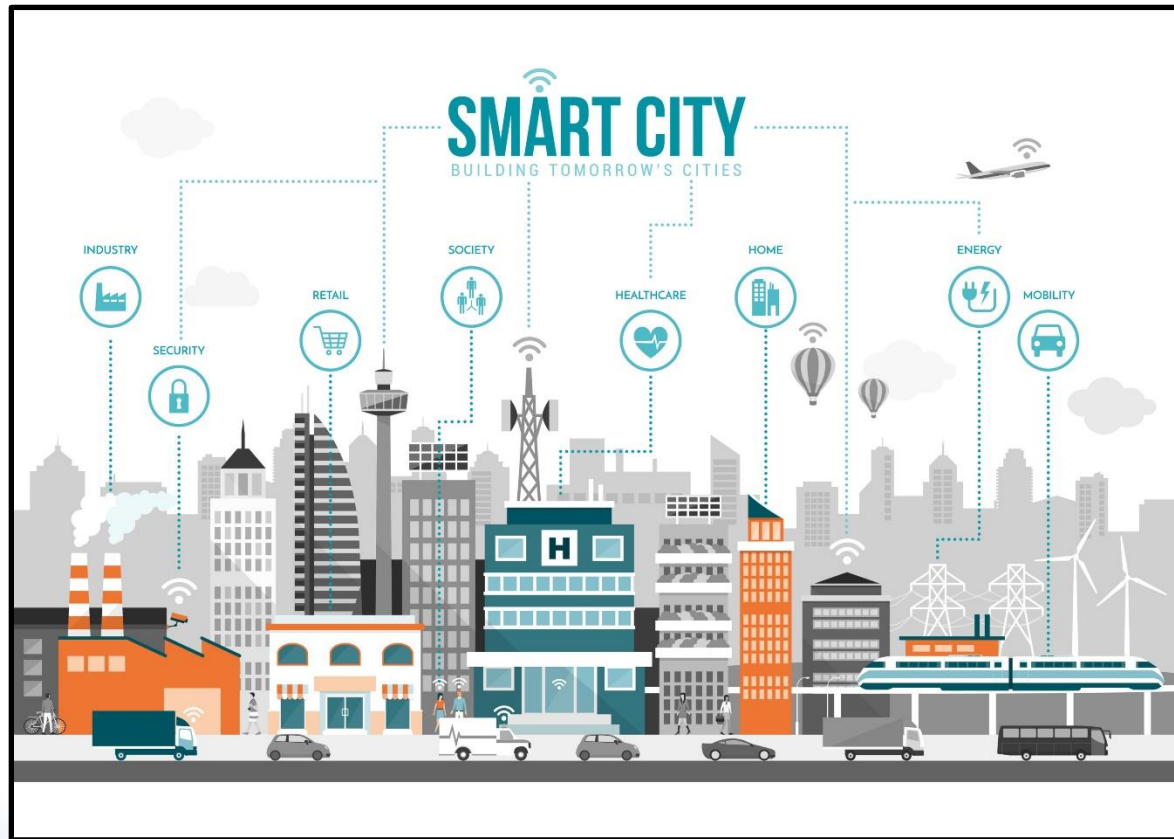
Produces Efficiencies For Asset Managers



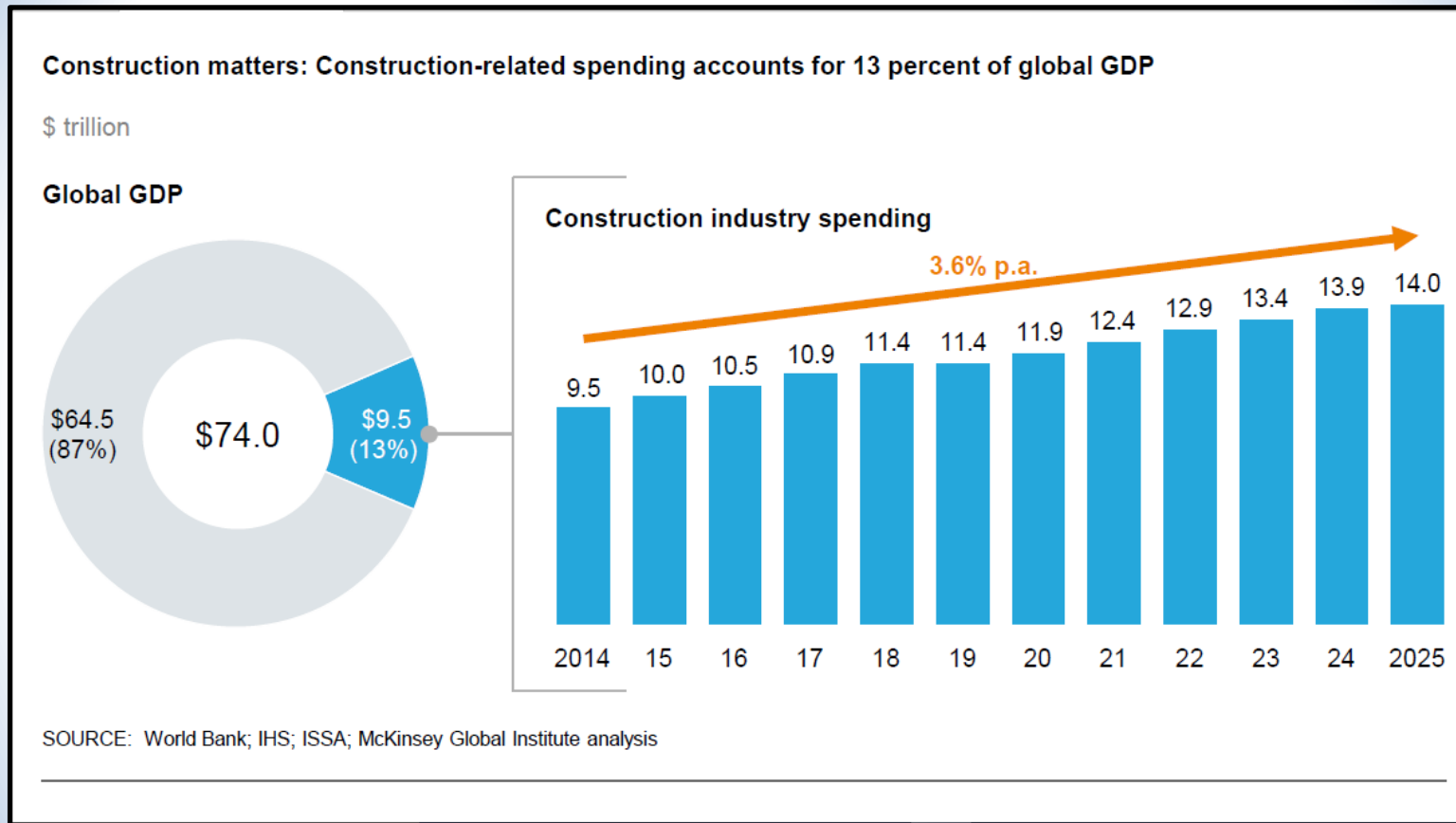
- Eliminates cost of paper records
- Enables asset search efficiencies
- Enhances safety with advanced warnings from sensor reports
- Enables networked communication for better public service

Part 4

Smart Infrastructure Opportunity

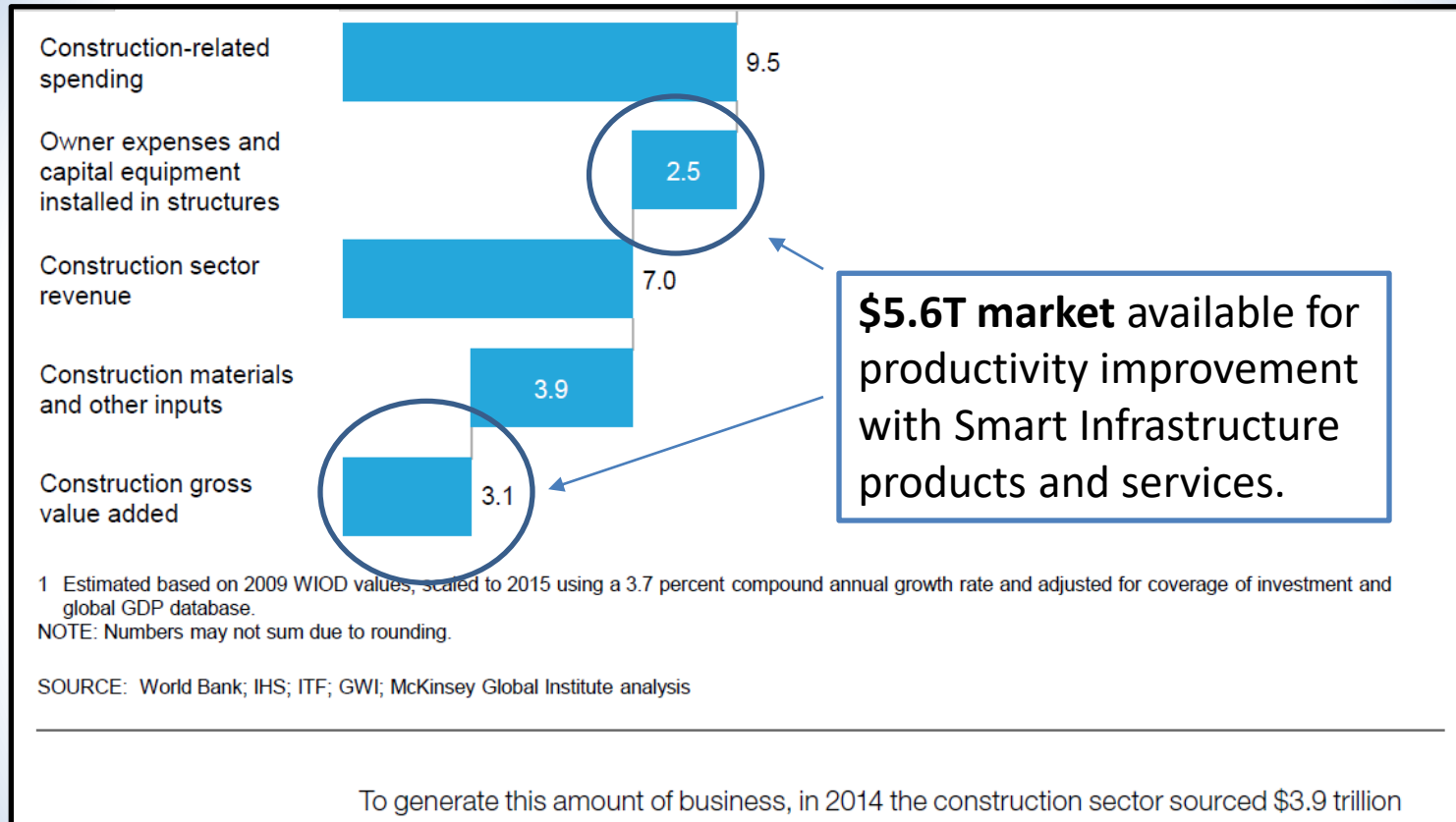


Market \$9.5T (2014) growing at 3.6% per annum



Source: [Reinventing Construction: A Route to Higher Productivity](#); McKinsey Global Institute; Feb 2017.

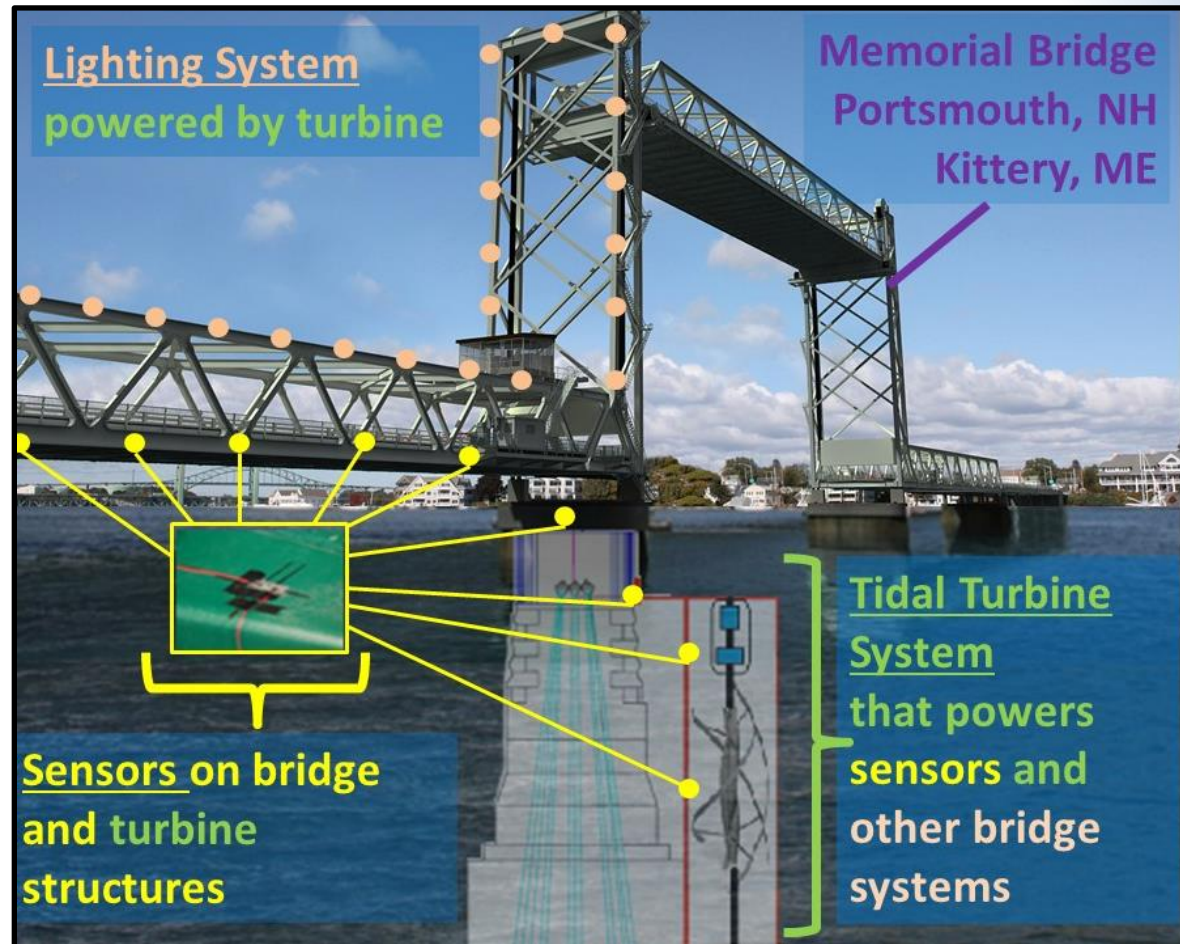
Market \$5.6T market needs more productivity



Source: [Reinventing Construction: A Route to Higher Productivity](#); McKinsey Global Institute; Feb 2017.

A Peak Into The Future

'Living Bridge'
created by
University
of NH
researchers
and NH
DOT.



Click Image for Video

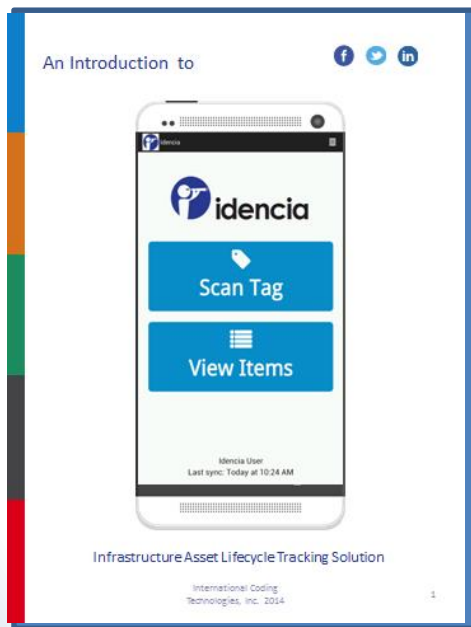
Conclusion

“Smart Infrastructure is essential to fulfilling the construction & maintenance needs facing the US and the world over the next 10 years.”

1. \$4.6T **infrastructure required** in US by 2025
2. Construction: **\$9.5T of global GDP**
3. Construction **least productive** industry
4. Productivity gains **require technology**
 - a) Supply chain integration
 - b) Universal technology adoption
5. State DOTs need to do **more with less**
6. \$5.6T **global productivity opportunity**

Would you like to see how your business can participate in Smart Infrastructure?

Download
Idencia Primer



Yes, I would like to:

Schedule an
Idencia
Consultation

Please click on either to learn how