Infrastructure Management: Current Practices & Future Trends

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January 10, 2017
Infrastructure Management:
Current Practices and Future Trends

• RICS Research report written in May 2017 by The Building People

• Audience:
  – Senior government officials & executives
  – Private sector service provider professionals
  – Stakeholders including investors

• Scope: all disciplines across the infrastructure life cycle
Expert Roundtables across North America

New York City

Washington DC

Toronto
Goals of the Report

**PRIORITIES**
Identify and establish clear priorities across the industry in terms of governmental and social needs.

**INSIGHTS**
Provide insight and guidance on how to address challenges throughout the lifecycle of infrastructure Projects.

**SYNERGY**
Establish synergies between infrastructure operations professionals by raising awareness for professional standards and best practice.

**INNOVATION**
Recognize innovation and best practice across core areas of infrastructure asset management, at both the federal and local level.
The Report

21st Century Infrastructure Challenges
Explores the current state of infrastructure across five core sectors and identify the challenges, priorities, and roadblocks that need to be addressed.

Infrastructure Management
Focuses on issues that need to be addressed in finance, asset management, organizational management, and quality control.

Technology, Data, & Automation
Explores how trends in these areas impact the industry and what executive managers must do today to ensure they are ready for the future.

Workforce
Discusses how to address the skills gaps, attract talent, and adopt strategies to develop the next generation of infrastructure professionals.

Advancing Best Practice
Concludes with practical steps on how RICS can work with industry leaders to advance high priority best practices and cross sector policy issues that require the attention of executives and policy makers.
## 21st Century Infrastructure Challenges

<table>
<thead>
<tr>
<th>P3 stakeholder structures</th>
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<tbody>
<tr>
<td>Innovative financial approaches</td>
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<tr>
<td>How much investment is enough?</td>
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<td>ASCE’s suggested $4.5 trillion?</td>
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<td>Trump’s suggested $1 Trillion?</td>
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<td>Long-term Lifecycle Strategies</td>
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<td>Managing risk</td>
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<td>Ribbon cutting syndrome</td>
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<td>Do crowdfunding strategies work?</td>
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- **Is there enough talent to fill the need?**
- **Innovative financial approaches**
- **How much investment is enough?**
- **ASCE’s suggested $4.5 trillion?**
- **Trump’s suggested $1 Trillion?**
US Infrastructure Challenges

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>2017</th>
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<tbody>
<tr>
<td>Aviation</td>
<td>D</td>
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<tr>
<td>Bridges</td>
<td>C+</td>
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<tr>
<td>Dams</td>
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<td>Drinking Water</td>
<td>D</td>
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<td>Energy</td>
<td>D+</td>
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<td>Hazardous Waste</td>
<td>D+</td>
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<tr>
<td>Inland Waterways</td>
<td>D</td>
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<tr>
<td>Levees</td>
<td>D</td>
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<tr>
<td>Ports</td>
<td>C+</td>
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<tr>
<td>Public Parks &amp; Recreation</td>
<td>D+</td>
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<tr>
<td>Rail</td>
<td>B</td>
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<tr>
<td>Roads</td>
<td>D</td>
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<tr>
<td>Schools</td>
<td>D+</td>
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<tr>
<td>Solid Waste</td>
<td>C+</td>
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<tr>
<td>Transit</td>
<td>D-</td>
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<tr>
<td>Wastewater</td>
<td>D+</td>
</tr>
<tr>
<td>GPA</td>
<td>D+</td>
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<tr>
<td>Cost to Improve**</td>
<td>$4.59T</td>
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Average Age of Infrastructure in the U.S. in Years (2015)

- Transportation: 20 years
- Utilities: 24 years
- Social: 25 years
- Highways and Streets: 28 years

Real Infrastructure Spending by Federal vs. State & Local Governments (1956-2014)

Figure 6: ASCE 2017 Infrastructure Report Card
Infrastructure Management 2.0

How to attract private investment in public infrastructure?

Creating value through partnerships
Regional P3 structure for infrastructure management
What constitutes a quality asset management strategy?

“Don’t rely on the policy to drive business decisions, make good business decisions to drive policy.”

Driving value from infrastructure
Successful business cases
Resiliency
Strategic asset planning

Influence
Relationships
Infrastructure Asset Management

Public Spending on Infrastructure

Expenditures

Influence

Level of influence

Design
Planning
Construction
O&M

Cumulative Cost

Time (Years)

1
25

0%
50%
100%
"Across the spectrum there is a lack of cradle to grave mindset. Managers still do not understand how to transform data into knowledge to help them make long term decisions."

"I love data! It is our life blood in quality assurance. The models are what matter; how do we capture old data and make it relevant to a particular job?"
Technology Adoption Principles

Technology Adoption Curve

EVERETT ROGERS - DIFFUSION OF INNOVATIONS 1962

2.5% INNOVATORS
13.5% EARLY ADOPTERS
34% EARLY MAJORITY ADOPTERS
34% LATE MAJORITY ADOPTERS
16% LAGGARDS

Figure 13: Rogers Adoption Curve

Evaluate  Comms  Train  Apply  Monitor
Key Factors for Consideration

• Resistance from the client
• ‘Big data’ and professionals ability to use
• Pre-fabrication and its limitations
• Automation – the need for integration
• Robotics in use across the life cycle
• Cultural change across all fronts
“Experience can be shared, but it can’t be taught.”

“I did not realize surveying was such a male dominated field. After noticing I was the rare female, it became a strength because people remembered me and I used that to my advantage.”
Advancing best practice

1.0 21st Century Infrastructure Challenges
2.0 Infrastructure Management
3.0 Technology, data, & automation
4.0 Workforce

Evidence Based Research
Technology Adoption
Education
Skills Gaps and Vulnerabilities
Have a Strategy to Address Resistance
Quick Strategies for Workforce Wins
Outreach and Selling the Industry

Campaign for Operational Excellence
Regional P3 Structures
Implement a Lifecycle Strategy
Innovative Thinking for P3
Financial Approaches Must Change
Have All Project Phases at the Table Early

Outreach and Selling the Industry
Who is RICS?

RICS is the world's leading professional body for qualifications and standards in land, real estate, infrastructure and construction, promoting and enforcing excellence, worldwide.
RICS supports business by helping to setting **standards** for the built environment sector, and training, qualifying and regulating professionals to **deliver** those standards in markets across the world.