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RESEARCH

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Capturing Existing Conditions with Terrestrial Laser Scanning

*A Report on Opportunities, Challenges and
Best Practices for Owners, Operators,
Engineering/Construction Contractors and
Surveyors of Built Assets and Civil Infrastructure*

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Background

Cost-effective and timely capture of existing conditions has long been an intractable problem for owners, operators, engineers, constructors and surveyors of built assets and civil infrastructure. Developing accurate as-built/as-maintained documentation is in the critical path of all revamp projects, and maintenance, repair, retrofit, revamp and decommissioning need up-to-date documentation of existing physical conditions of the asset or structure. Yet this information is almost never available when needed. The most widely used manual techniques for collecting it remain slow, expensive and error-prone. As a result, engineering and construction work suffers from estimating errors, inaccurate bids, design and fabrication mistakes, expensive field rework, delays, penalties, lost capacity, and squandered profit and opportunity. While estimates vary by industry, many believe that from 2% to 5% project cost savings can be achieved with better capture of existing-conditions information and intelligent use of this information to inform design and construction work processes.

One obstacle is that CAD tools for modeling assets and infrastructure have been geared primarily toward new construction, even though work on existing assets makes up the majority of global engineering and construction spending. Primarily used in the design phase of a project, most CAD models are typically not kept up to date with field changes. And where technologies were developed specifically for capturing existing conditions, these were sometimes oversold, leading to disappointment and diminished appetites for unproven technology.

Today, however, new technologies for capturing existing conditions have begun winning attention from growing numbers of industry best-practice leaders. Based on advances in 3D laser scanning and digital processing of the resulting point-cloud models, the new solutions are being used to deliver material advances in speed, cost, accuracy and efficiency over older tools and methods.

Capturing Existing Conditions with Terrestrial Laser Scanning: A Report on Opportunities, Challenges and Best Practices for Owners, Operators, Engineering/Construction Contractors and Surveyors of Built Assets and Civil Infrastructure analyzes the potential benefits to practitioners of upgrading their capability to capture existing conditions of built assets and civil infrastructure. The report gauges how, and to what extent, new-generation tools and methods are helping practitioners achieve the business objectives of higher-confidence, more accurate bids; faster, better, cheaper, lower-risk execution of work; better quality control of outsourced design and engineering; better quality

control of fabrication; visualization to help win public approval of projects; and better documentation of existing and interim conditions to minimize litigation risks.

Already these new approaches have seen stellar successes, together with some disappointing failures. The report features case studies that pinpoint critical success factors as well as pitfalls that trapped the unwary, and identify best practices that leaders in a range of industries are using to get maximum value and return from the new tools and methods. Key to success, the report reveals, is how practitioners integrate the new approaches into existing design workflows, and how work processes are being changed to take full advantage of all that the new technologies make possible.

Project managers, asset managers and engineering managers will also find the report's concise, informed assessments of leading software developers, hardware manufacturers and service companies a valuable resource in qualifying, selecting and working with solutions and providers.

What You'll Learn

This report will:

- Guide you in understanding and analyzing the business case for investing in new technologies and methods for capturing existing conditions of built assets and civil infrastructure
- Give you an overview of today's high-impact technologies – how they work, what they can do now, and how their capabilities can be expected to advance in the future
- Help you sidestep common pitfalls and manage risks by learning from the mistakes and false starts that befell early adopters
- Reveal what changes in work processes are needed to take full advantage of the new tools, and how these changes can be accomplished
- Identify best practices for qualifying, selecting and working with solutions and providers
- Brief you on trends and directions in adoption of the new tools and methods by owner, operator, engineering/construction contractor and surveyor best-practice leaders

Who This Report is For

This report is for project managers, project engineers, chief engineers, asset managers, engineering managers, business development managers, and others at owners, operators, engineering/construction firms, surveyors, and government organizations and contractors involved in design, construction, operations, maintenance, revamp, retrofit or decommissioning of built assets or civil infrastructure.

Industries that will profit from this report include:

- Process
 - Oil and gas
 - Pharmaceuticals and life sciences
 - Consumer products, food and beverage
- Power generation
- Civil infrastructure
 - DOT and other public sector agencies
 - Highways, bridges, tunnels
- Discrete manufacturing facilities – automotive, aerospace, industrial equipment

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Have service providers visit the site before bidding, if possible

Work with the service provider to plan scanning operations in advance

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CSA, Inc.

Design Power, Inc.

InnovMetric Software, Inc.

iQvolution AG

I-SiTE Pty Ltd

Leica Geosystems Cyra/HDS Division

MENSI S.A./Trimble Navigation Limited

Optech Incorporated

RIEGL Laser Measurement Systems GmbH

TORNADO Technologies, Inc.

Visi Image, Inc.

Zoller+Fröhlich GmbH

Design system providers

Autodesk, Inc.

AVEVA Group plc

Bentley Systems, Incorporated

Dassault Systèmes S.A.

Intergraph Process, Power & Offshore

Scanning service providers

ANNUAL SUBSCRIPTION

Capturing Existing Condition with Terrestrial Laser Scanning: A Report on Opportunities, Challenges and Best Practices for Owners, Operators, Engineering/Construction Contractors and Surveyors of Built Assets and Civil Infrastructure is provided as an annual subscription.

Subscription options:

- A one-year subscription to the report is available for \$995.
- A special discount rate of \$495 is available to employees of surveying or engineering firms.
- A one-year subscription to the report plus one day of in-person consultation with Spar Point's analyst team is also available. Please call Tom Greaves at 978.774.1102 for pricing and availability.

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Spar Point is an independent research firm founded by Tom Greaves and Bruce Jenkins to focus on best practices for creating, modifying and managing engineered assets and products. We provide a suite of products and services – publications, industry conferences, and custom consulting – designed to help practitioners maximize the business impact of technology. We serve project leaders, program managers and discipline heads in the aerospace, automotive, civil infrastructure, consumer products, energy, industrial equipment, power and process industries, and the hardware, software and service providers that support them.

Our methodology is grounded in researching and documenting practitioner cases – successes and failures – to identify industry best practices for creating business value through technology deployment and application.

Spar Point's charter is to help practitioners:

- Benchmark the business impact of their organizations' digital technology practices against other industry leaders.
- Understand and analyze the business case for investing in emerging as well as established technologies.
- Justify and validate technology investments for engineering, project and program managers as well as corporate management.
- Ground decisions in rigorous quantitative analysis of technology ROI, practitioner benefits and savings, market size and growth, solution-provider market share and other hard data.
- Evaluate, qualify and select solutions and providers based on technology leadership, R&D commitment, financial strength, management depth, soundness of vision, and ability to execute

ORDER FORM

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