

Advance Your Infrastructure Workflows

by Turning Reality Data into Real-world Insights
for Your Digital Twins with iTwin® Capture



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Discover How to Better Advance Your Infrastructure Workflows

Drone pilots, surveyors, data acquisition specialists, and mappers need to capture reality data and generate reality model to support the decision-making process during the design and engineering, construction, and operations workflows.

However, they are struggling to quickly capture existing conditions and work with large amounts of datasets, large data file sizes, and different formats from different systems. They are also facing challenges to extract value from data and easily share massive amounts of mapping data.

In this e-book, discover how to improve your reality data workflows by leveraging an all-in-one reality capture solution—from capture to delivery.



Planning

Assess and understand existing conditions.



Design

Accelerate design and manage constructability risk.



Construction

Monitor sites for change and to verify design.



Operations

Document existing conditions and manage assets in real time.

The Daily Tasks of Reality Capture Experts

As reality capture experts, we understand you, and we know that you're dealing with these tasks on a daily basis:

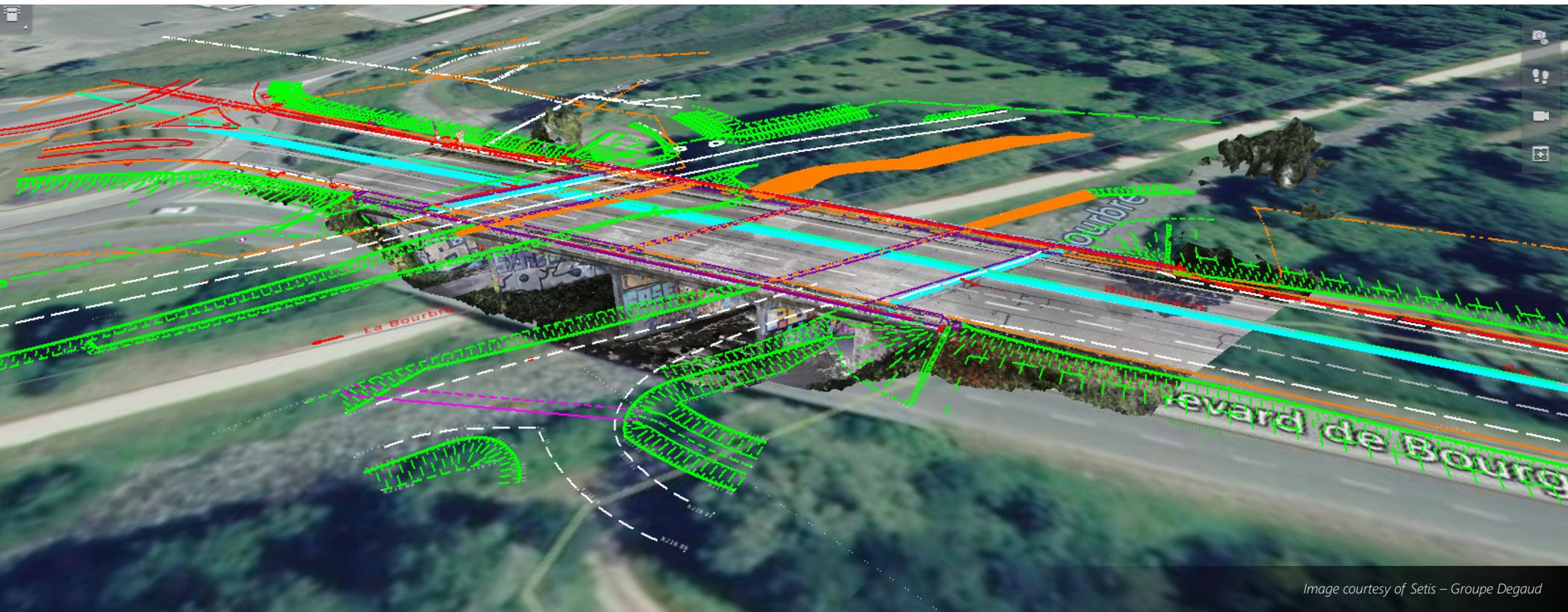
- ◆ Capturing existing conditions of any size using any capturing system
- ◆ Managing terabytes of reality data captured over time
- ◆ Dealing with the multiplicity of captured reality data
- ◆ Updating assets at the speed of data collection
- ◆ Extracting insights from reality data
- ◆ Validating work through quality assurance before delivery
- ◆ Sharing and bringing this reality data to stakeholders



Make Your Real World Easier with iTwin Capture

iTwin Capture enables you to go above and beyond the creation of a digital replica of real-world conditions. With iTwin Capture, you can continuously update your digital twin with valuable information extracted from reality data—such as photos, point clouds, and reality meshes—by leveraging automated analysis technology.

iTwin Capture democratizes reality capture and enables any infrastructure practitioner to access reality capture capabilities to capture, manage, analyze, and share reality data, adding real-world insights to digital twins. This connected reality data environment serves as a single source of truth to advance infrastructure workflows.



An All-in-one Reality Capture Solution to Advance Your Infrastructure Workflows

Capture, create, and enhance reality data

iTwin Capture enables you to create and enhance engineering-ready reality data—such as reality meshes, classified point clouds, anonymized images, and orthophotos of any size and resolution—using any digital camera, scanner, or mobile mapping device.

- ◆ Leverage on-premise or cloud processing capabilities to scale your production and fit your business needs.
- ◆ Continuously update your digital twin with global and localized updates using an augmented reality capture mobile application.

Manage, catalog, and share reality data

iTwin Capture enables you to federate all your reality data into a connected reality data environment. Use an unlimited amount of reality data of any size and type, such as ground or aerial-captured point clouds or photos.

- ◆ Organize, catalog, and index your reality data to enable effective search and accelerate your workflow.
- ◆ Easily and securely make data accessible to any authorized stakeholders on any devices.



Validate, extract insights, and deliver

With iTwin Capture, easily make data actionable so any stakeholders can get the right information at the right time to make more informed and timely decisions.

- ◆ Visually assess the quality of your reality data that is optimized for streaming and web publishing, as well as control alignment and dimensions with dedicated capabilities before handing it over to the engineering and operations teams.
- ◆ Leverage automatic feature extraction and machine learning to turn reality data into field truth insights for data-driven decisions.
- ◆ Get the most of your reality data to serve as a key component of your digital twins using the iTwin Platform or any third-party software.



Generate Real-world ROI with iTwin Capture

iTwin Capture enables you to cover the full lifecycle of reality data, from capture to delivery. Using a single data environment, users can capture, manage, analyze, and share reality data of any type or size, coming from any capturing system to add real-world insights and reality data to digital twins.

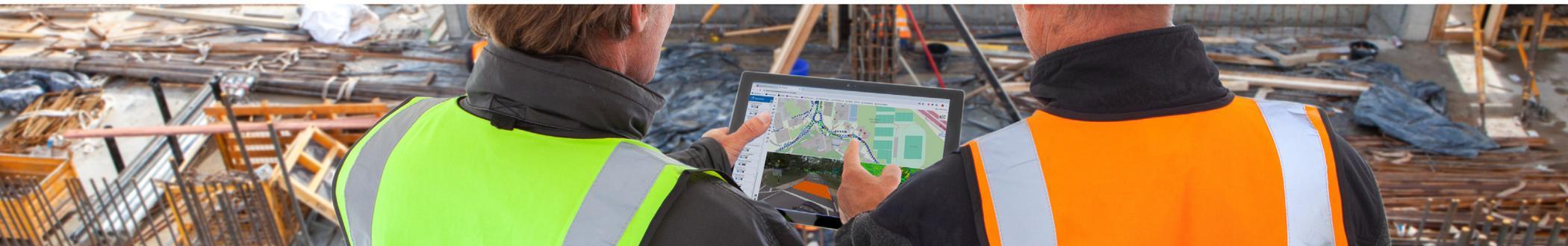
Teams that work in this environment are able to:

Aid in decision-making

- ◆ Open access to data and being able to share with stakeholders improves communication and decision-making processes.
- ◆ Leveraging a digital context to support design and engineering, construction, and operations workflows helps you make better decisions.
- ◆ Teams can mitigate risk, improve decisions, and optimize outcomes through access and visibility to data.

Increase productivity and reduce risks

- ◆ Being able to share data with stakeholders increases productivity and project quality.
- ◆ It is possible to speed up reality data workflows using an interoperable solution.
- ◆ Teams can easily access the most up-to-date reality data.



Generate Real-world ROI with iTwin Capture

iTwin Capture Modeler is a comprehensive, cost-effective reality data and modeling solution that allows you to generate a 3D single source of truth.



Save Money and Time
Add real-world insights to your digital twins to make informed decisions and avoid costly mistakes and rework.



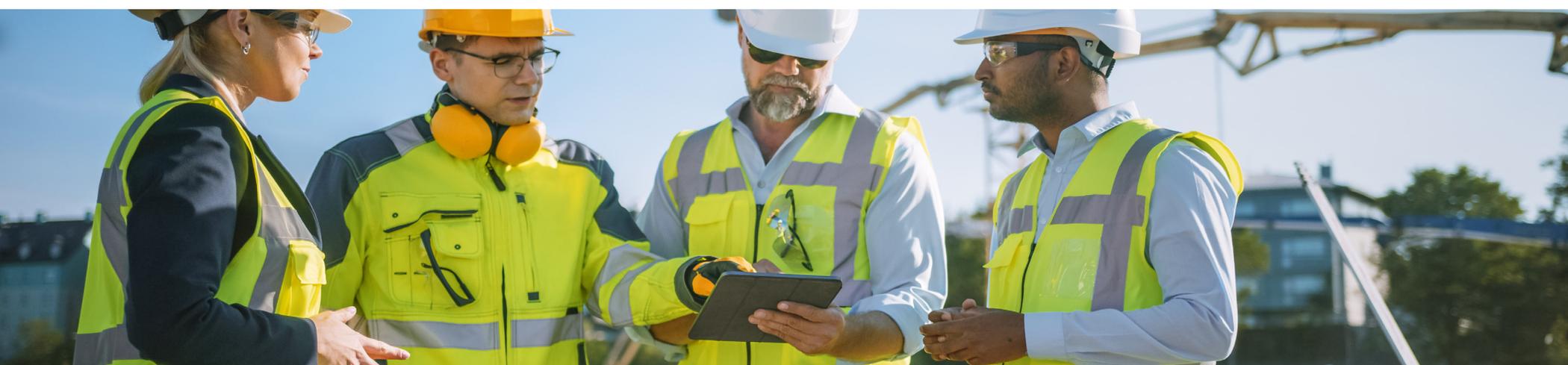
Improve Reality Data Quality
Get a precise reality mesh by reaching reaching millimeter accuracy.



Deliver On-time
Speed up your production time.



Optimize Performance and Speed Up Workflows
Streamline reality modeling workflows from capture to delivery by quickly extracting insights using artificial intelligence and machine learning.



Use Cases

Thousands of Users Trust iTwin Capture.





Use Case

iTwin Capture for Transportation

N4 Montrose Interchange

SMEC South Africa | Mbombela, Mpumalanga, South Africa

The Montrose Interchange project was initiated to replace an existing at-grade T-junction on the N4 highway, improving traffic mobility, safety, and the Mbombela province's economy and tourism. Positioned between two rivers amid steep valleys between mountains, the project presented difficult terrain for implementing the new high-standard, free-flow interchange on a short timeline with no available survey data. Bidding for the contract, SMEC realized that their traditional, manual 2D strategies would not suffice to meet the project challenges and requirements to use much of the existing infrastructure.

SMEC selected iTwin Capture to develop a reality mesh of the existing terrain and infrastructure and LumenRT™ to present their conceptual design, winning the design contract and delivering a workable design in record time. OpenRoads™ Designer facilitated integration with the bridge team's modeling software while corridor modeling applications enabled accurate earthworks and material quantities calculations, reducing the carbon footprint of the project. Working in a collaborative digital environment saved approximately 2,500 hours in design time and an estimated ZAR 2.5 million in design costs. **Project Playbook:** iTwin Capture, LumenRT, MicroStation®, OpenFlows™, OpenRoads, Pointools™

[Watch Video](#)



Use Case

iTwin Capture for Cultural Heritage

The Digital Twin for Structural Monitoring of St. Peter's Basilica

Italferr S.p.A. | *Vatican City*

To help preserve some of the world's most important architectural and religious heritage, Italferr was hired to develop a digital twin of St. Peter's Basilica. The project required an extensive survey campaign, resulting in a large amount of data needing to be managed and processed into a reality mesh, and shared among multiple disciplines and stakeholders for continued monitoring. To address these challenges on a six-month timeline, Italferr needed integrated and open 3D modeling and digital twin technology.

Italferr relied on ProjectWise®, iTwin Capture, and MicroStation to manage three terabytes of multisourced data and generate a digital twin model shared among 30 people. Working in a collaborative digital environment saved 50 hours in modeling time, delivering the model 20 days ahead of schedule. Using iTwin, a structural monitoring system will be developed, facilitating data collection, and connected to the digital twin to monitor the basilica's health. **Project Playbook:** iTwin, iTwin Capture, LumenRT, MicroStation, OpenBuildings®, OpenCities®, ProjectWise

[Read Case Study](#)[Watch Video](#)



Use Case

iTwin Capture for Dams

New Bullards Bar Dam

Yuba Water Agency | *Camptonville, California, United States*

Constructed in 1970, New Bullards Bar Dam was part of the Yuba River Development project to reduce flood risk, generate clean hydropower, and ensure reliable water supply for Yuba County. Yuba Water Agency initiated a modernization of the dam monitoring system, replacing a hazardous legacy system and manual inspections. The new system optimizes dam operations, preventing potential loss of life and billions of dollars of damage in Northern Sacramento Valley. Faced with steep terrain and site challenges, Yuba Water needed to remotely survey and monitor the dam.

They selected iTwin Capture Modeler to generate a 3D reality mesh from thousands of drone-captured images and uploaded the mesh to the iTwin Platform, creating a digital twin. The digital twin remotely captures sensor data from monitoring devices and performs real-time digital crack detection, enabling visualization into the structural integrity of the dam. Compared to the conventional monitoring system, the automated digital station provides 1,000 times more data monitoring points and has improved data accuracy by 50% and risk assessment by 100%.

Project Playbook: iTwin, iTwin Capture, iTwin IoT

[Watch Video](#)



Use Case

iTwin Capture for Bridges

Digital Twins and Artificial Intelligence For Historic Robert Street Bridge Rehabilitation

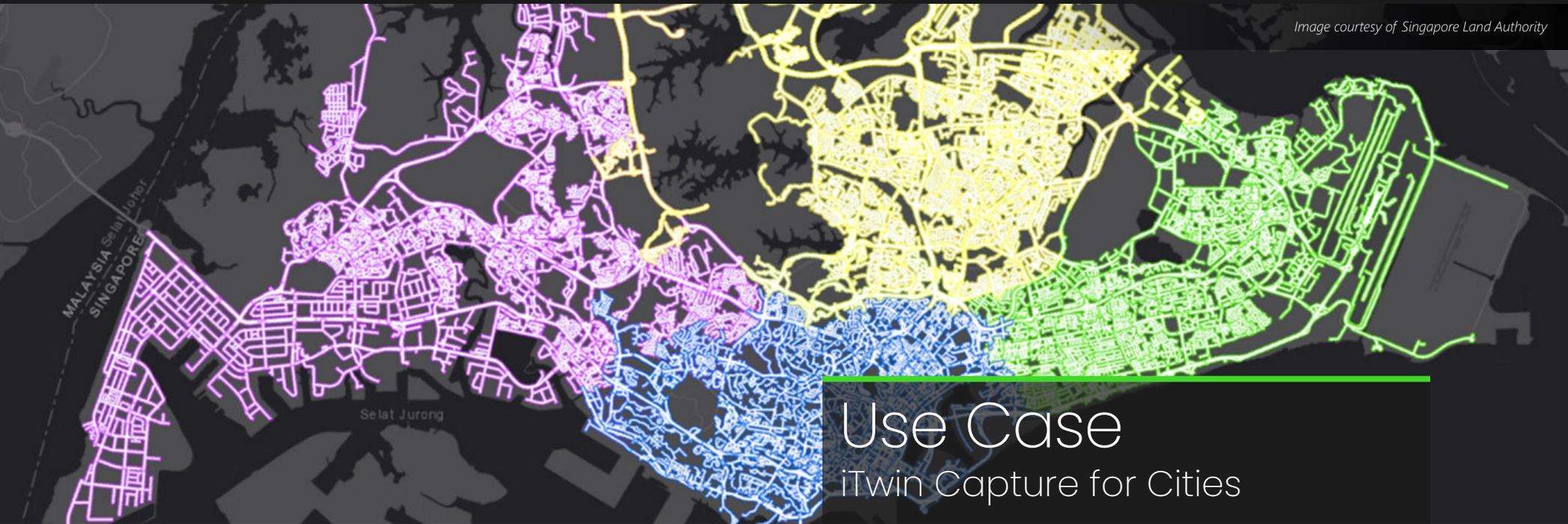
Collins Engineers, Inc. | St. Paul, Minnesota, United States

Nationally registered as a historic structure, Robert Street Bridge is a reinforced concrete arch bridge that crosses the Mississippi River. To address significant structural deterioration, MNDOT initiated a bridge rehabilitation project and retained Collins Engineers to perform a detailed bridge inspection. The project required accurate collection of detailed inspection information that traditional methods and previous software could not accommodate. Collins wanted to supplement conventional workflows with artificial intelligence and digital twins.

They selected iTwin Capture and iTwin Experience to generate a 3D digital twin of the bridge, helping automatically find, quantify, and communicate concrete cracks and deterioration. The ability to pre-inspect the bridge with the digital twin allowed engineers to validate defects prior to starting fieldwork. The solution saved 30% in inspection hours and offers an advanced method for future management. By making the digital twin available for insight into the bridge's structural condition, Collins expects to save approximately 20% in rehabilitative construction costs.

Project Playbook: AssetWise®, iTwin, iTwin Capture, iTwin Experience, MicroStation, ProjectWise

[Watch Video](#)



Use Case

iTwin Capture for Cities

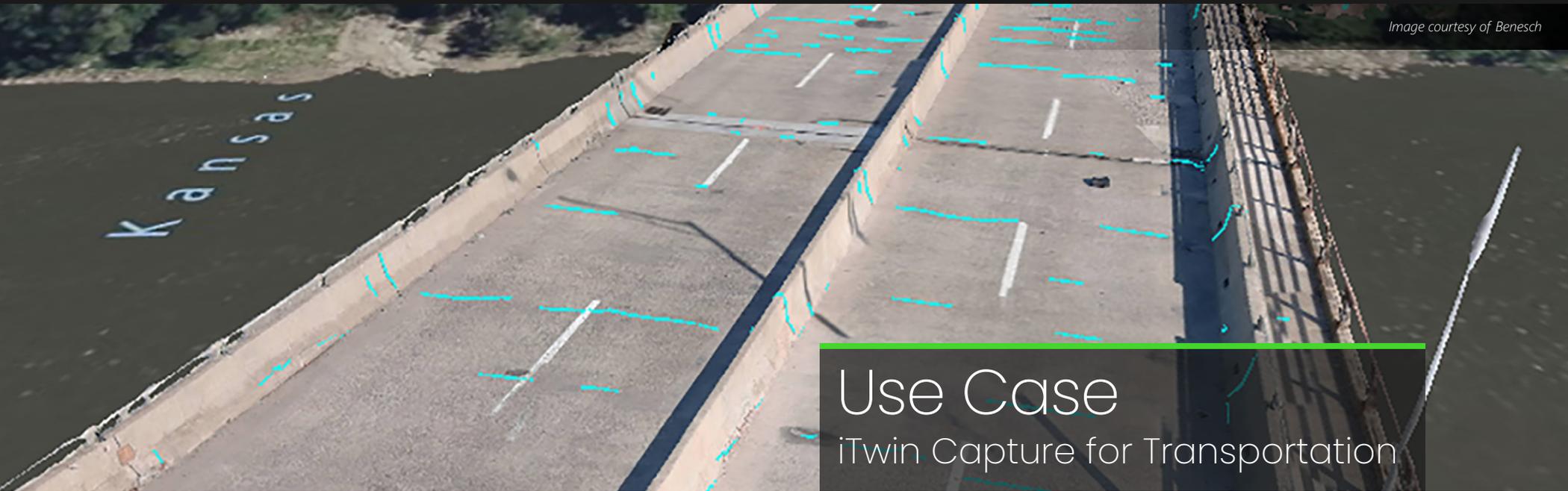
SG Digital Twin Empowered by Mobile Mapping

Singapore Land Authority | *Singapore*

Singapore Land Authority (SLA) initiated a national 3D mapping of Singapore via aerial and street mobile imaging. The objective was “capture once, use by many” to create a smart, resilient, and sustainable nation. The project presented challenges when integrating aerial and mobile-captured data, compounded by difficulties refining 600 billion point clouds and sharing 25 terabytes of mobile mapping data with government agencies and stakeholders. SLA needed a comprehensive, web-based application to manage the massive amount of data and develop a digital twin.

SLA selected iTwin Capture to manage and integrate the large volume of point clouds and images, then generated a digital twin, enabling data sharing with multiple users via cloud-based resources. Compared to traditional mapping methods, rapid mobile mapping using Bentley’s application saved SGD 26 million and one year in capture and processing time. The digital solution increases data availability by 50%, enables accurate data extraction, and delivers a sustainable, collaborative digital twin that can be used for multiple planning purposes. **Project Playbook:** iTwin Capture

[Read Case Study](#)



Use Case

iTwin Capture for Transportation

AI/ML-Driven Pavement Crack Detection

Benesch | *United States*

Most public agency assets include pavement and, therefore, require crack detection survey and maintenance. Given that traditional pavement assessment practices and technology are time-consuming and inaccurate, Benesch explored integrating artificial intelligence (AI) and machine learning (ML) into their field data collection workflows, targeting crack detection in pavement. However, they faced challenges closing the gap between digitally identifying cracks and classifying the cracks based on condition assessment. Therefore, they sought to develop their pavement crack detection technology solution.

They selected Bentley's iTwin Capture Modeler, AssetWise, and iTwin to pilot their digital innovation at three active project sites in the United States, creating digital twins of the sites. Bentley technology harnessed the power of AI and ML, streamlining the crack detection process and feeding the data into the digital twin for analysis. The solution automates digitization of the crack linework data and saves 75% in field time, and is expected to save USD 144,000 in 100 airport inspections without impacting traffic and/or airport operations. **Project Playbook:** AssetWise, iTwin, iTwin Capture, MicroStation

[Read Case Study](#)

Partnership for Success

Your success goes beyond software. It is also dependent on doing business the way that best serves your organization. That is why we have a variety of subscription and license options, as well as 24/7/365 support to ensure your software is up and running quickly and continuously.

[Learn More About iTwin Capture](#)

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