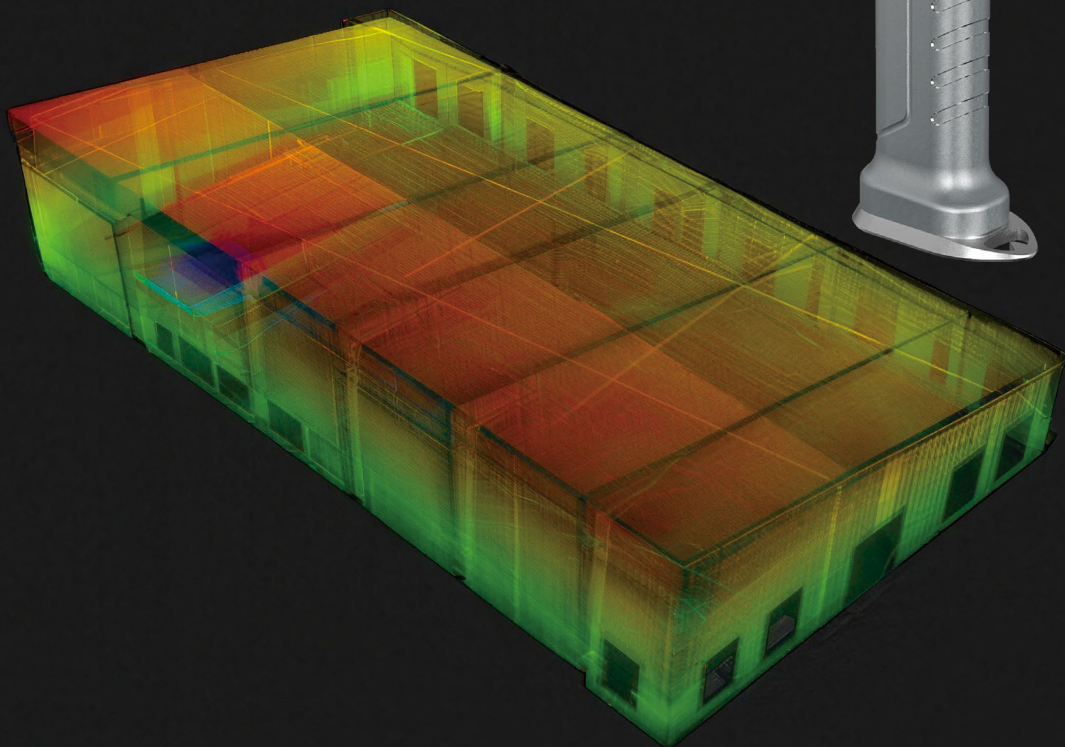




19x Faster

RS7 SLAM Completes 900 m²
Renovation Data Capture
in 10 Minutes



Client's Name

Renaissance Design Build Inc and iGage Mapping Corporation

Products and Solutions

Captured with RS7 SLAM Scanner and processed in CoProcess Software



► Achievements / Highlights



Fast field capture :

Complete a **900 m²** indoor survey in **10 Minutes**



High Precision and Stability:

≤1 cm Measurement Accuracy



Intelligent Processing:

Automated Optimization and CAD Outputs
from CoProcess



Minimizes Rework Risk

with Full Scene Capture



Single Operator Workflow:

Lower Labor Costs & Safer Operations

1. Project Overview

According to market research reports, the U.S. building renovation and retrofit market is projected to grow at a CAGR of 5.2% from 2026 to 2031, outpacing new construction, which represented 68.1% of the market in 2025. Demand continues to rise for the renovation and adaptive reuse of office, hospitality, education, healthcare, and sports and cultural facilities.

In 2026, both the residential and commercial sectors are expected to support market growth, driven by aging building stock, long-term occupancy trends, government policy, and the transition to lower-carbon buildings. However, the industry still faces several challenges, including labor shortages, high interest rates, and rising costs.

Renaissance Design Build, Inc., an Indiana-based company, was commissioned to renovate a 900-square-meter former swimming pool facility and convert it into a multifunctional indoor sports classroom. Accurate floor plans and area calculations were essential for supporting the renovation design and estimating materials.



► Project Requirements



A current, accurate indoor floor plan to initiate renovation design.



Quantified paved area and volume calculations to support initial material procurement and cost estimation.



Verifiable, reusable spatial data that can reduce rework and support subsequent construction and maintenance.

► Main Challenges



Team-based workflow



Sketching mistakes



Manual CAD transfer



Error-driven rework

2. How the RS7 Handheld SLAM Works



High-Precision LiDAR

Up to 1.15 million pts/s
360° × 189° ultra-wide FOV



HD Imaging System

Dual 12 MP HD cameras for sharper images in low-light conditions



High-precision IMU

IMU bias instability better than 0.5°/h



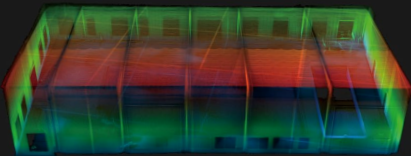
Expansion Interfaces

Expandable design with an open hardware interface and SDK



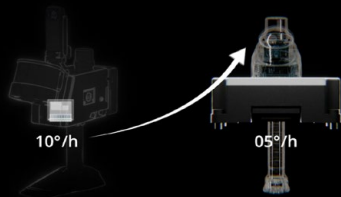
Figure 2 - CHCNAV RS7 overview

The RS7 is CHC Navigation's high-performance handheld LiDAR SLAM scanner for building and indoor applications, offering four key features:



High-Rate LiDAR

The RS7 features a new-generation LiDAR scanner with a point rate of up to 1.15 million points per second, capturing fine objects and surface textures with high precision.



IMU bias stability 0.5°/h

High-precision IMU

By fusing high-precision INS and SLAM, and featuring an IMU with bias instability better than 0.5°/h, it ensures stable motion tracking in feature-poor environments.



HD Imaging System

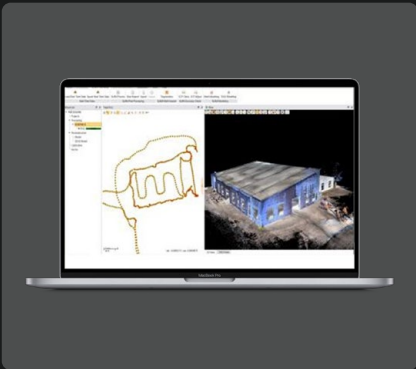
With an ultra-wide field of view of 360° × 189°, it captures ceilings and corners without manual angle adjustments, obtaining complete and accurate scans.



Step1

Route Planning & Data Acquisition

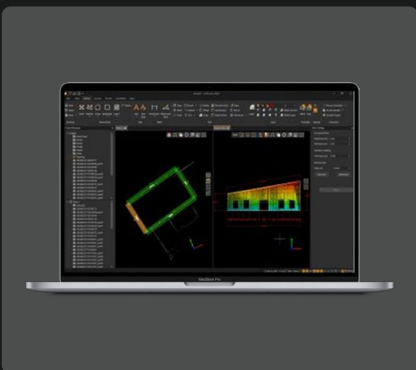
After connecting the device to SmartGo, users can quickly complete initialization and begin scanning. The visual interface shows real-time scanning progress, while the intuitive workflow supports efficient outdoor data collection.



Step2

Data Optimization

CoPre provides a one-stop workflow for quick setup and one-click optimization of point cloud thickness, with integrated noise filtering.



Step3

Data Vectorization: CoProcess

CoProcess supports multiple data formats, including point clouds, mesh models, and DOMs. It provides intelligent point cloud capture, vector line drawing, fast measurement, and annotation, with export to .dwg and .dxf formats.

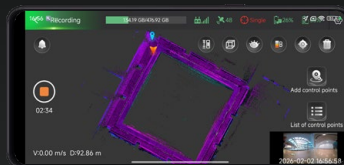
Surveying System



CHCNAV RS7



Data Collection Software



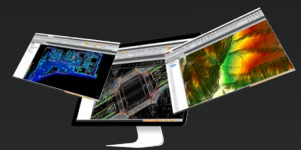
SmartGo



Data Processing Software



CoCloud



CoProcess

Figure 3 - Smartgo+CoPre+CoProcess simple workflow

3. Tape + Laser + Hand Sketch vs. RS7 SLAM

In this 900-square-meter renovation survey, the RS7 workflow was compared with traditional methods. A three-person team using tape measures, laser rangefinders, hand sketches, and manual CAD entry spent 1.5 hours measuring only the total facade length and window openings. By contrast, a single operator using RS7 and SmartGo captured the full scene in just 10 minutes, with real-time point cloud preview. The data was then exported directly and processed in CoProcess to start drawing immediately, showing a clear efficiency advantage from field capture to indoor design.

► Traditional Tools (Tape + Laser + Hand Sketch)



Complex Workflow	multiple operators are needed for field measurement, hand sketching, and manual CAD input.
Prone to errors	sketching mistakes, missed measurements, and repeat visits are common. Manual transcription adds time and increases error risk in complex interiors.
Time-consuming workflow	about 190 minutes of fieldwork, no structured point cloud output, and drafting that can take a full day.
Low Accuracy	typically 5–10 cm in real-world indoor renovation conditions.

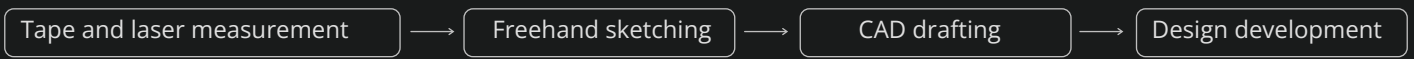




Figure 6 - Traditional workflow

Aspect	 Traditional Tools	 RS7 Handheld SLAM
Personnel & Workflow	Multi-person workflow; tape and laser measurement, freehand sketching, manual CAD input; prone to omissions	Single operator; rapid walkthrough; real-time preview and export
Fieldwork Time (this project scale)	Approx. 190 min	Approx. 10 min
Data Handling	No structured point cloud data; manual transcription required later	Immediate use of real-time point clouds; parallel data optimization
Accuracy	Approx. 5 to 10 cm	≤1 cm (absolute accuracy ≤3 cm)
Rework Risk	Higher risk of missed or incorrect measurements and repeat visits	Low (full-scenario capture; stable IMU; easy verification)
Deliverables	2D drawings after manual drafting (about 1 day)	Optimized point clouds and 2D/3D drawings (about 2 hours drafting)
Best-Fit Use	Small/simple spaces; one-off measurements	Medium to large interior renovation projects requiring speed, reliability, and reusable data

Comprehensive Comparison (1-Year TCO Perspective)

Cost & Benefit Dimension	Traditional Survey Method	Handheld Scanner Solution	Quantitative Conclusion
Labor Cost per Project	\$10,500	\$1,050	↓ 90%
Annual Project Volume	24 projects	24 projects	-
Annual Labor Cost	\$252,000	\$25,200	Annual Savings \$226,800
Equipment Investment	N/A (leased separately)	\$12,000 (one-time)	Payback in 1.27 projects
1-Year TCO Total	\$252,000	\$37,200*	Total Cost Reduction 85%

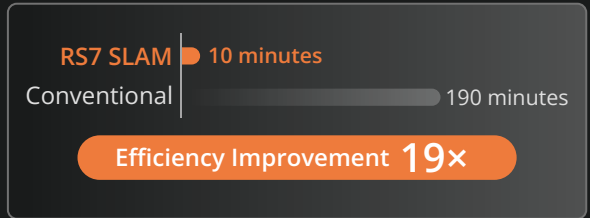
** Note 1. U.S. Surveyor Average Daily Wage: The \$350 per day assumption is based on industry benchmarks for field survey technicians and surveyors. BLS and [Salary.com](https://www.salary.com) data from March 2026 indicate hourly wages of \$25 to \$45 for survey technicians and \$45 to \$65 for experienced field surveyors. On an 8-hour workday basis, this corresponds to \$200 to \$520 per day. The \$350 per day figure used in this analysis represents a conservative average for a qualified mid- to senior-level field surveyor.

**Note 2- Calculation Formulas:*

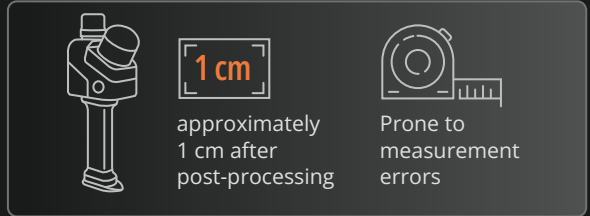
- Traditional Method Labor Cost = 10 days x 3 crew members x \$350/day = \$10,500 per project
- Scanner Method Labor Cost = 3 days x 1 crew member x \$350/day = \$1,050 per project
- Annual Savings = (\$10,500 - \$1,050) x 24 projects = \$226,800
- Payback Period = \$12,000 equipment cost / \$9,450 savings per project ≈ 1.27 projects
- 1-Year TCO (Scanner) = Equipment \$12,000 + Annual Labor \$25,200 = \$37,200

4. Conclusion

① Compared with the traditional tape-measure method, the **RS7 handheld SLAM scanner** completed field data collection for this project in just **10 minutes**, delivering a **19× efficiency** gain over the conventional 190-minute workflow.



② The point cloud and imagery captured by RS7 feature stable accuracy, with a relative accuracy of approximately **1 cm** after post-processing. Compared with traditional methods, it reduces human-induced measurement errors and ensures high-precision project deliverables.



③ The data acquired by RS7 can serve as the base map for subsequent **construction as-built documentation and facility operation**, providing **long-term sustainable value** to the client.





5. Customer Feedback



Renaissance Design Build Inc



"Using traditional methods, surveying seven floors would have required three people, five days, and three rounds of rework. Your solution has truly addressed our biggest challenges. It is fast and, more importantly, reliable, thanks to the  iGage and  CHCNAV teams." #iGage #CHCNAV team

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