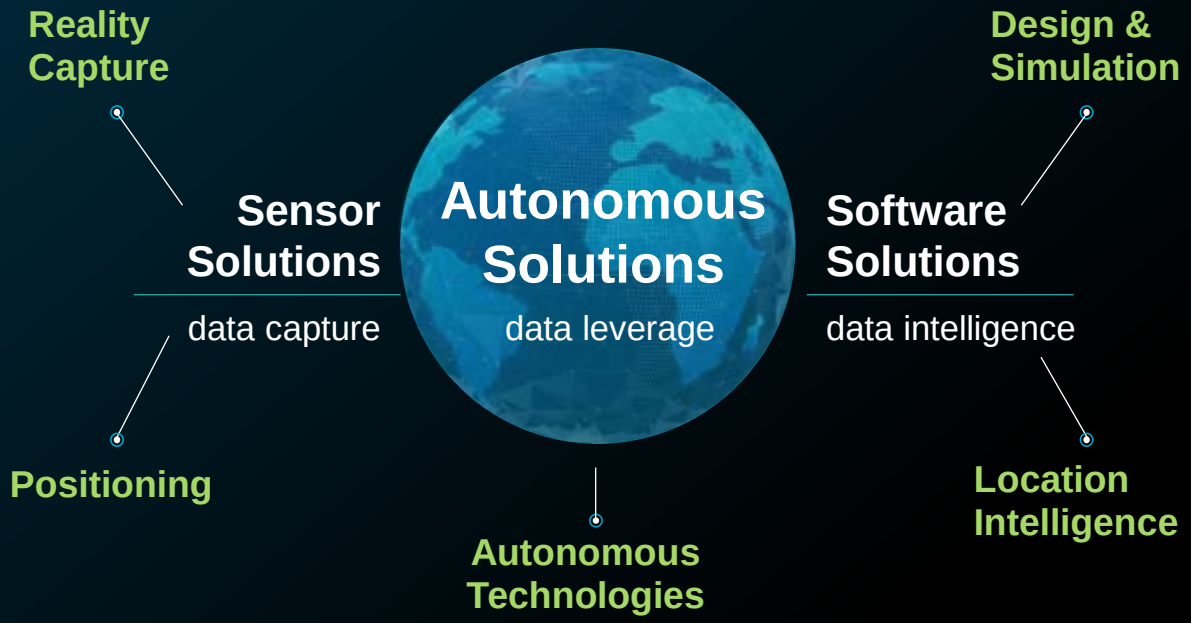
HEXAGON
empowering an autonomous future

Autonomy in buildings & infrastructure

Burkhard Böckem | CTO

Thomas Harring | President, Geosystems division

The importance of autonomy



Solving challenges in the world's most complex ecosystems

With solution offerings that drive sustainable value creation

Core Capabilities

- **Sensor Solutions**
  Reality Capture | Positioning
- **Autonomous Solutions**
  Autonomous Technologies
- **Software Solutions**
  Design and Simulation | Location Intelligence

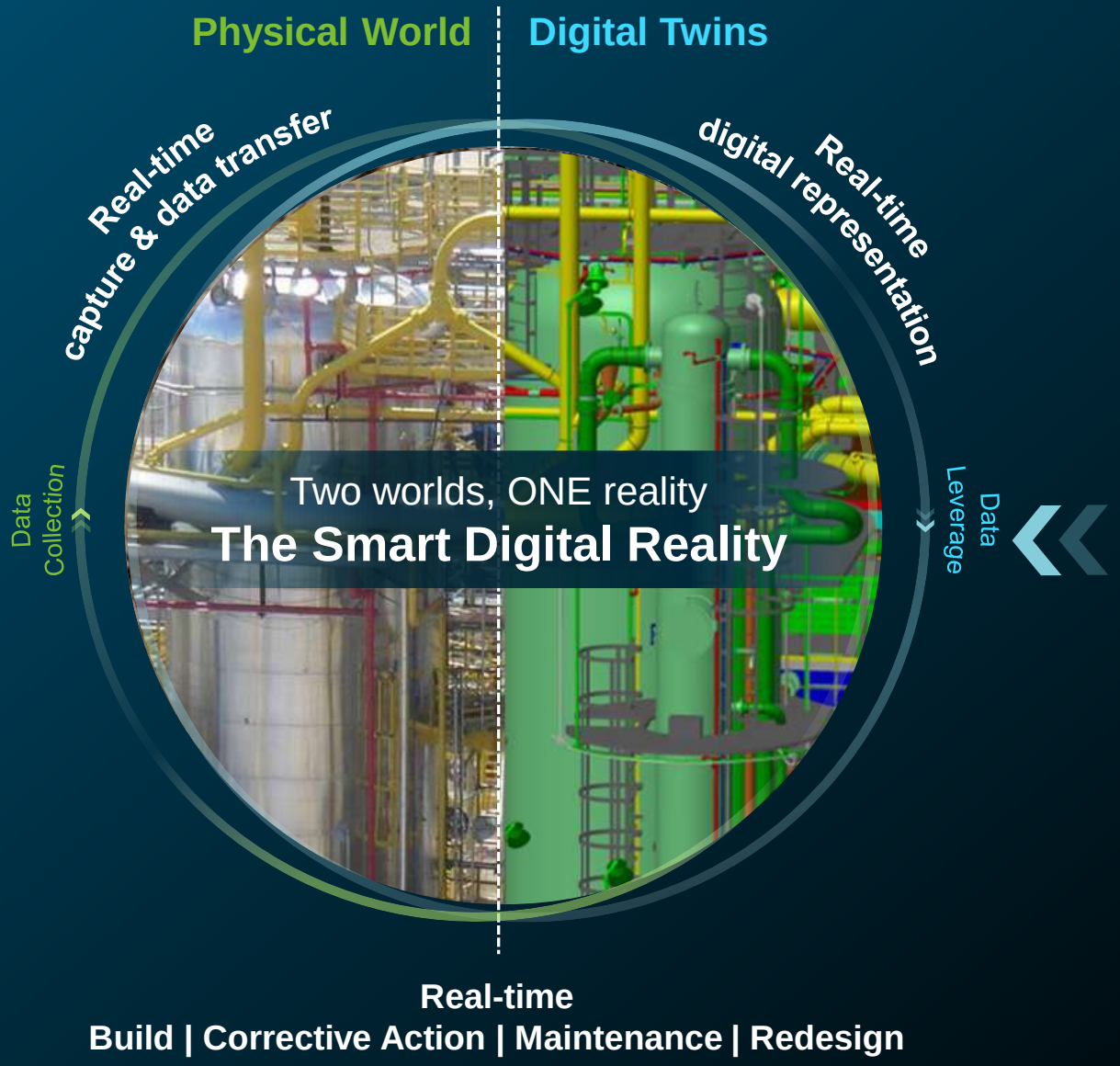
HxDR Platform

- Hexagon Digital Reality (HxDR)

Xalt Platform

- Artificial intelligence
- Edge computing
- Mobile / Web / AR / VR
- Enterprise integration

Solving challenges in the world's most complex ecosystems



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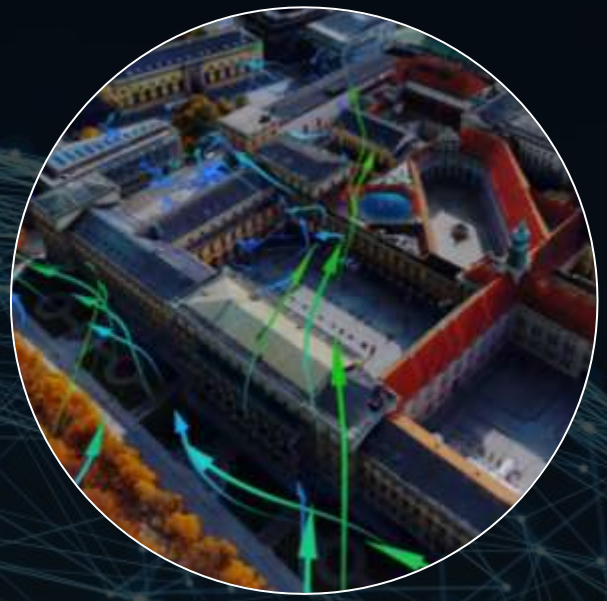
The Smart Digital Reality



What do we mean by autonomy in reality capture?

Robots & Platforms

Sensors

AI-based Software

GrandSLAM technology as in the Leica BLK2GO

GrandSLAM – Perception, Navigation and Reality Capture

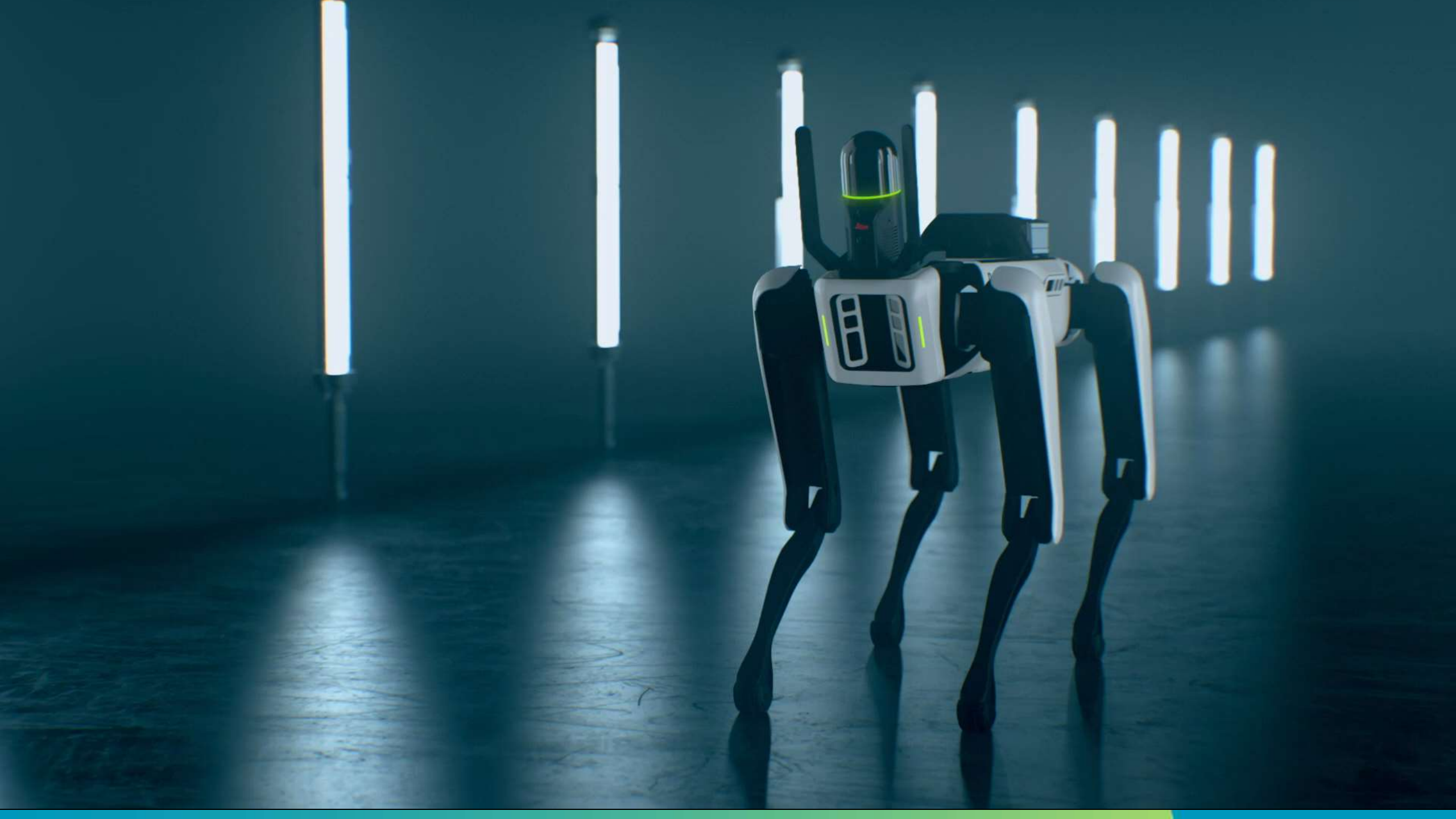
As enabling core technology for autonomous systems

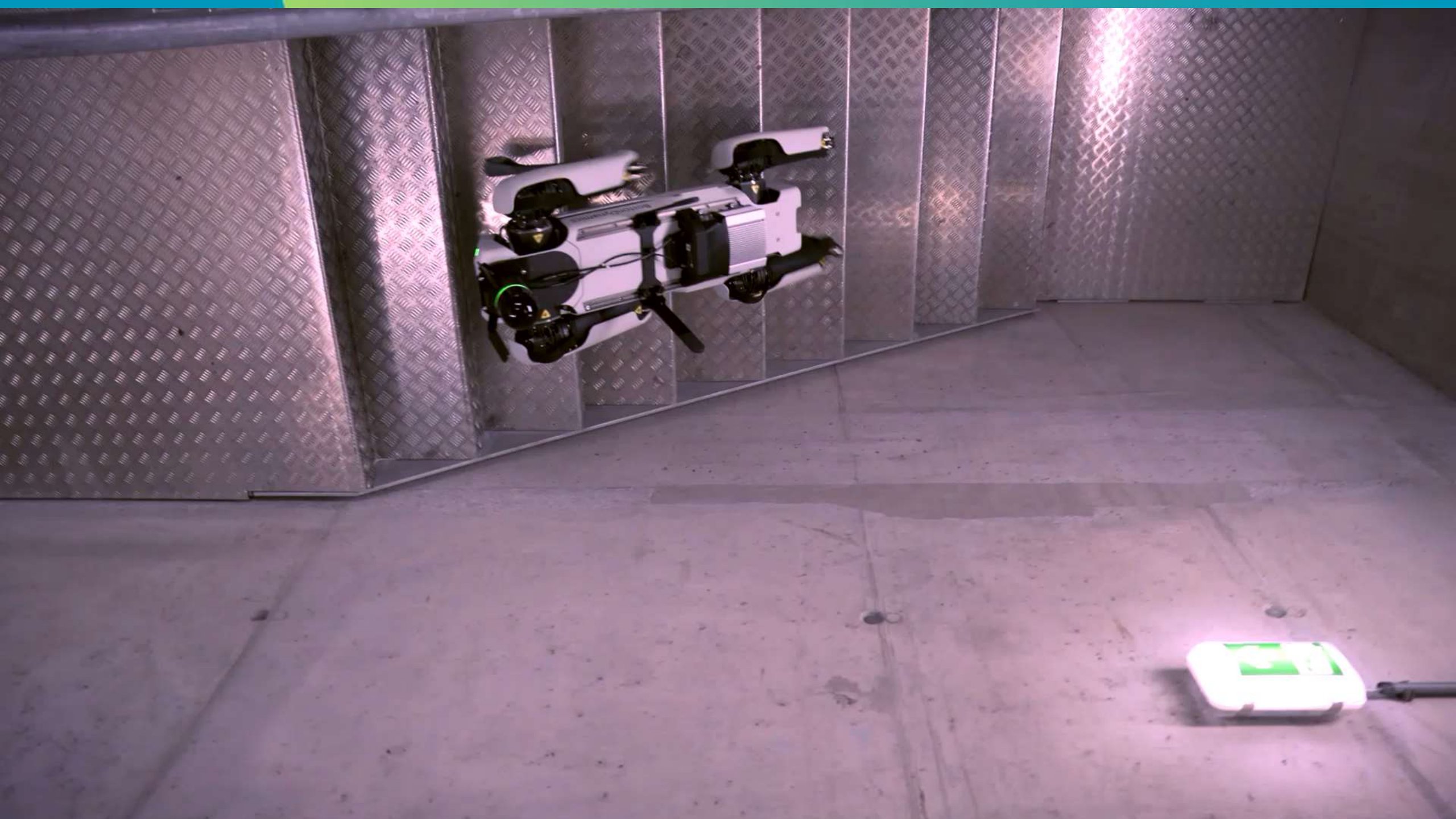
DUAL AXIS LIDAR

IMAGING

GRANDSLAM

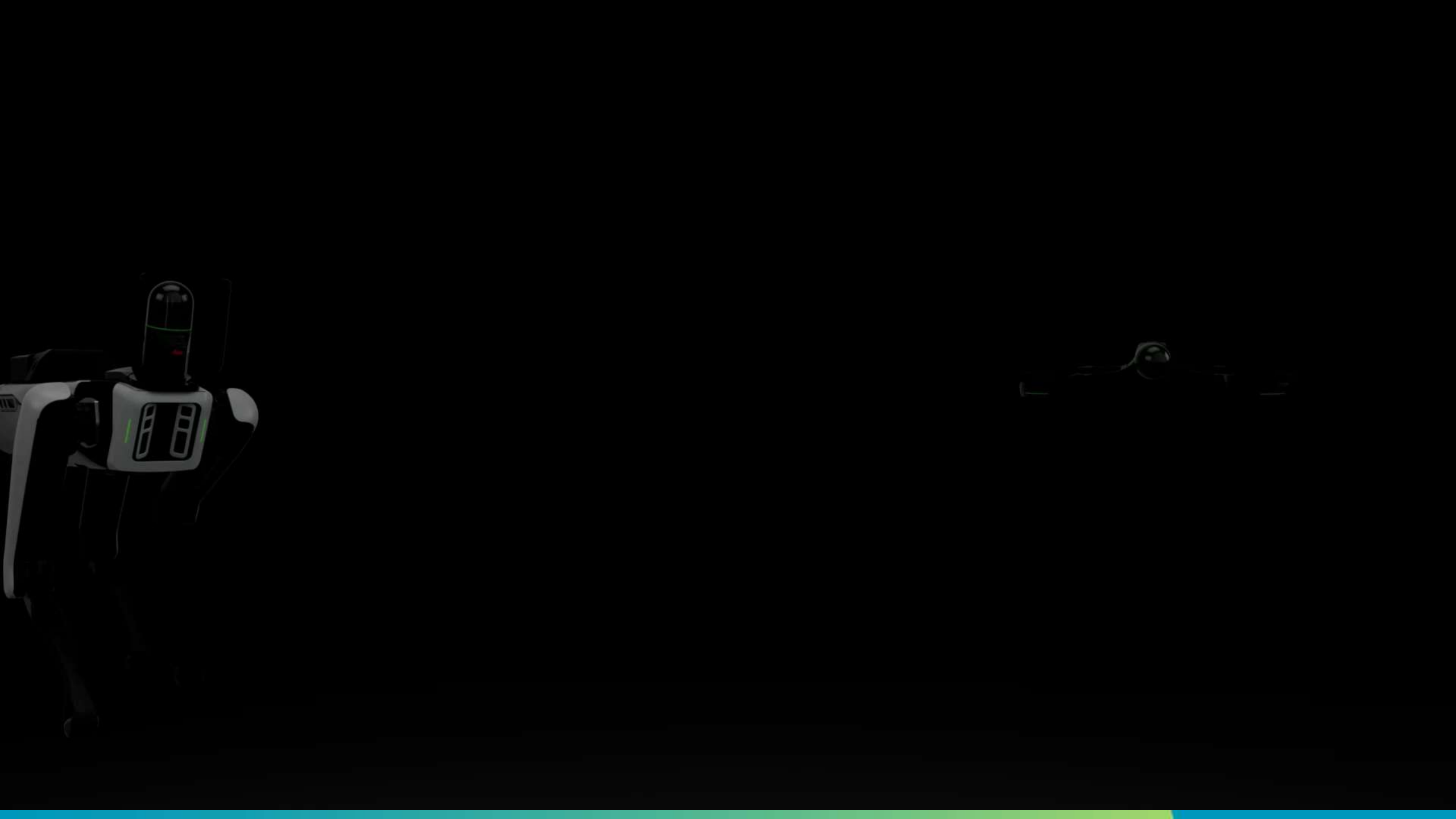
Trajectory (green)
LiDAR point-cloud (colored)





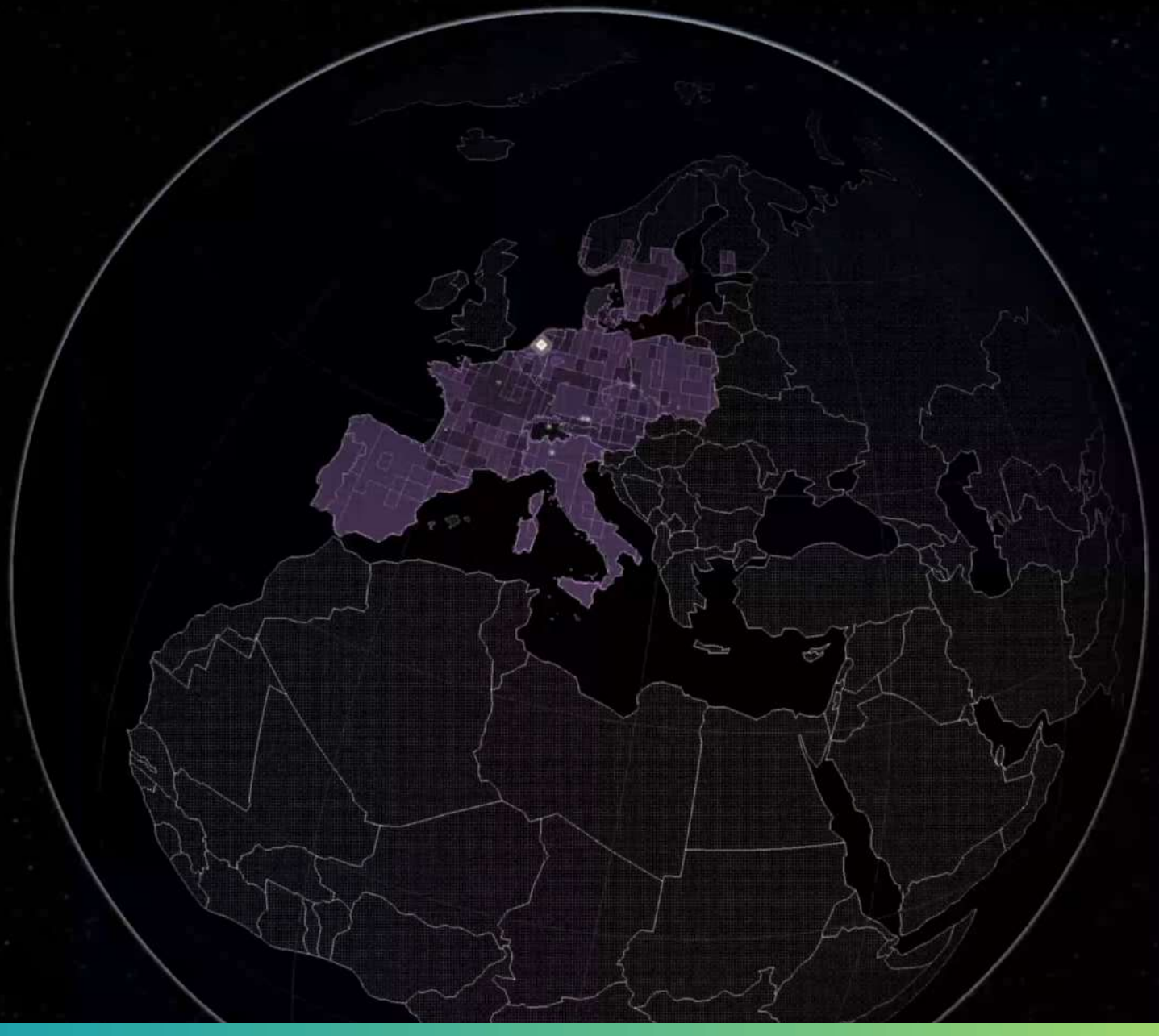
Leica

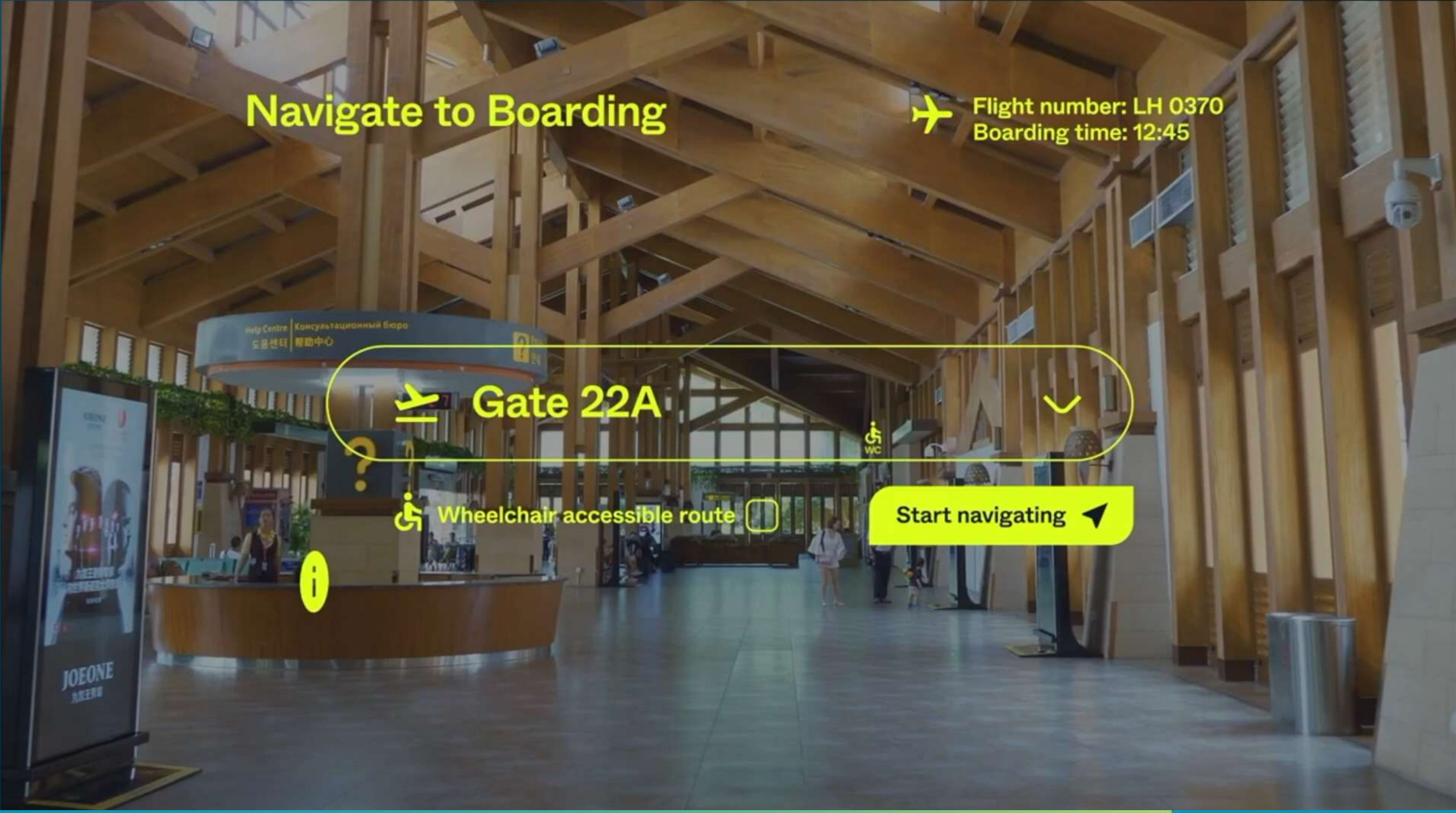
5 min
Please mark the corners of the area you want to scan.
Surface planning mode is active.



HxDR
DIGITAL REALITY

- Point-cloud
- Mesh (automated)
- Panoramic and spherical imagery
- Progress Reporting (Planned)
- Deviation Analysis (Planned)




Navigate to Boarding
Flight number: LH 0370
Boarding time: 12:45
Gate 22A
Wheelchair accessible route
Start navigating
Help Centre
Консультационный бюро
도움센터
帮助中心
JOEONE

Pairing technology with domain expertise in buildings & infrastructure

> **The future is already here – it's just not evenly distributed"**
>
> - William Gibson

Powering innovation for a sustainable future

> 50% cost overrun for large public projects

> 50% non-value add activities in construction

> 40% of world's carbon emissions

Digital transformation is gaining momentum as innovation gets faster

Productivity, health & safety (robotics)

Collaboration and remote work

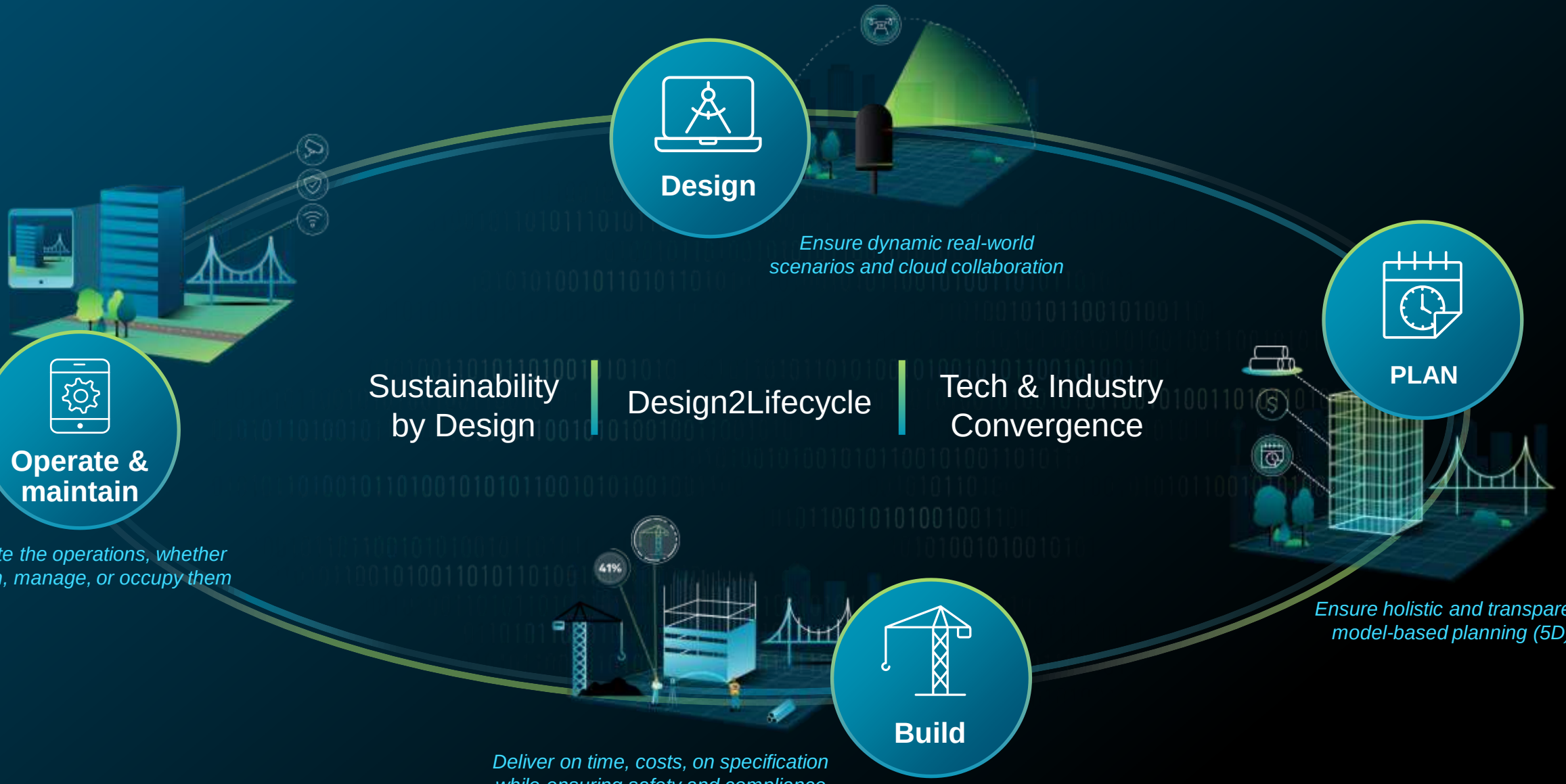
Insight-based (AI) decision support

Site Safety with AI-insights

AI-detected safety issue on site

Management dashboards to benchmark site safety across multi-construction sites

Putting data to work throughout the asset lifecycle with Smart Digital Realities



Connecting design and planning with the real world

Beyond static geospatial data to Content as a Service streaming

Real-world environment
Access to real-world data / existing conditions

Design and Planning environment
Cloud collaboration and workflow automation

Connecting planning to construction with safety in mind

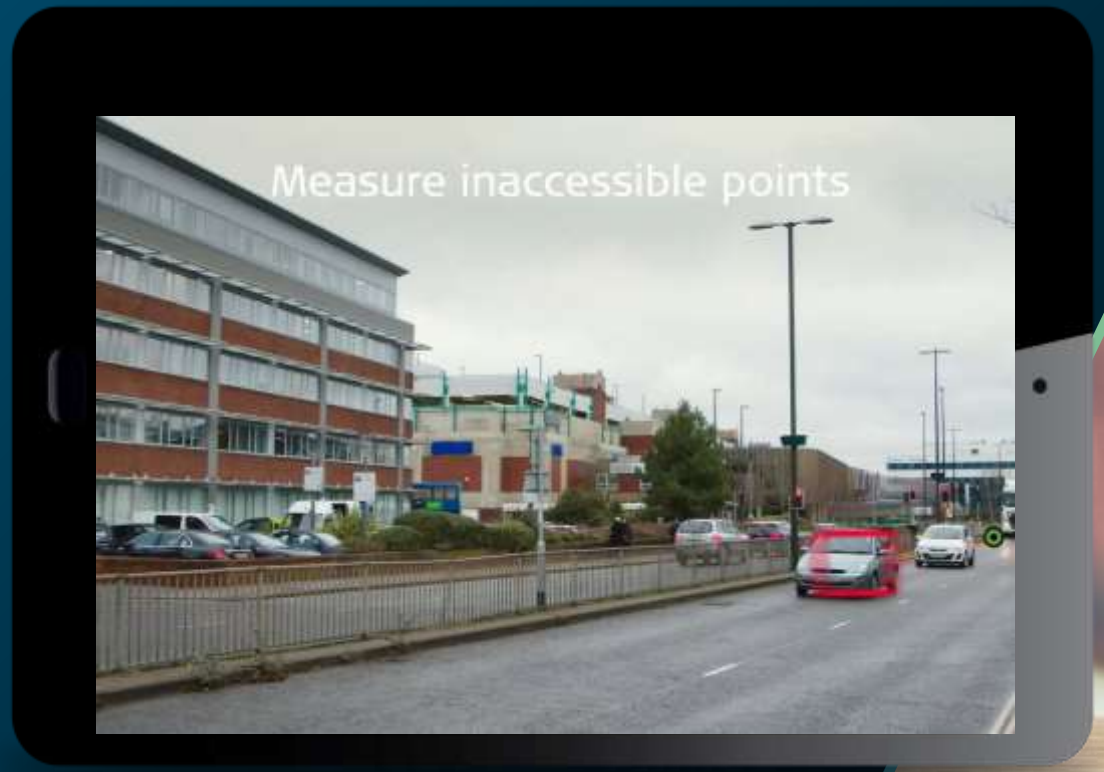
Beyond 3D machine control – automating site work *and* safety

Site productivity
The future of excavating

Site safety
A productive and safer construction site

Infinitively connecting field and office

A constant feedback loop between the real and digital worlds

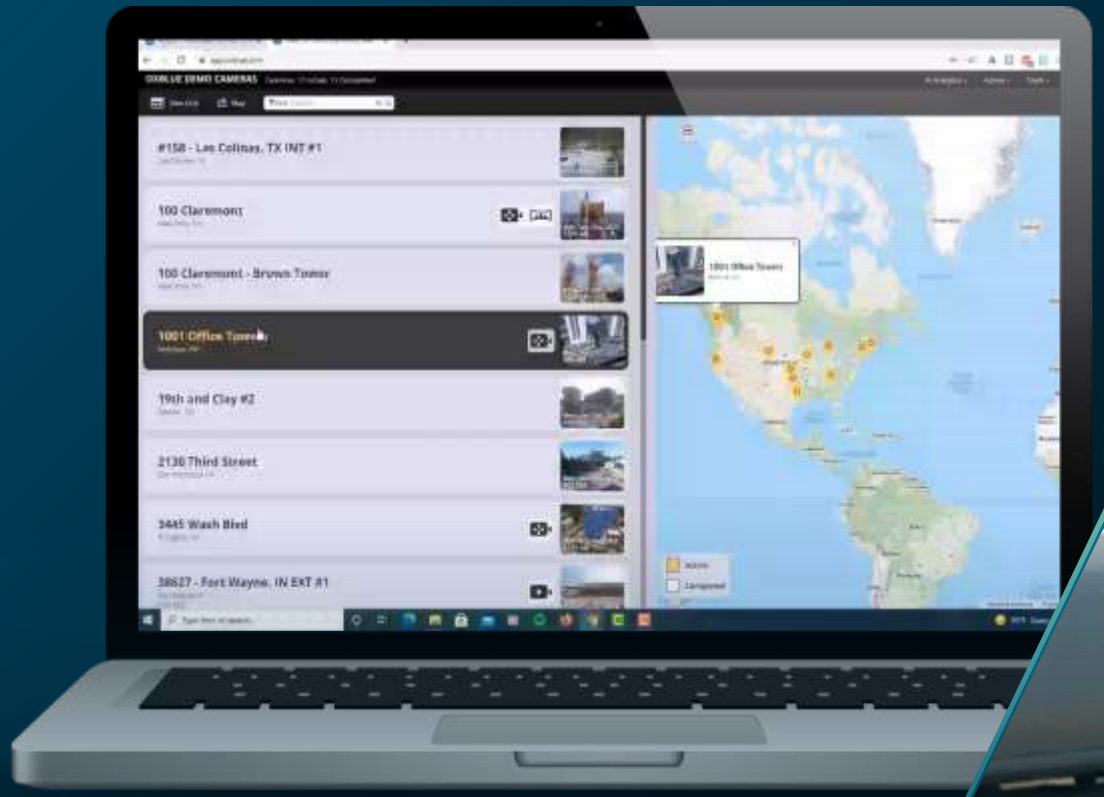


Reality capture – made easy
Ability to measure what you see

Field/Office SW – always on
Keeping digital realities of sites up to date

Enabling jobsite intelligence with AI-powered insights

An all-in-one ‘Sensor & SW as a Service’ – connecting field and office

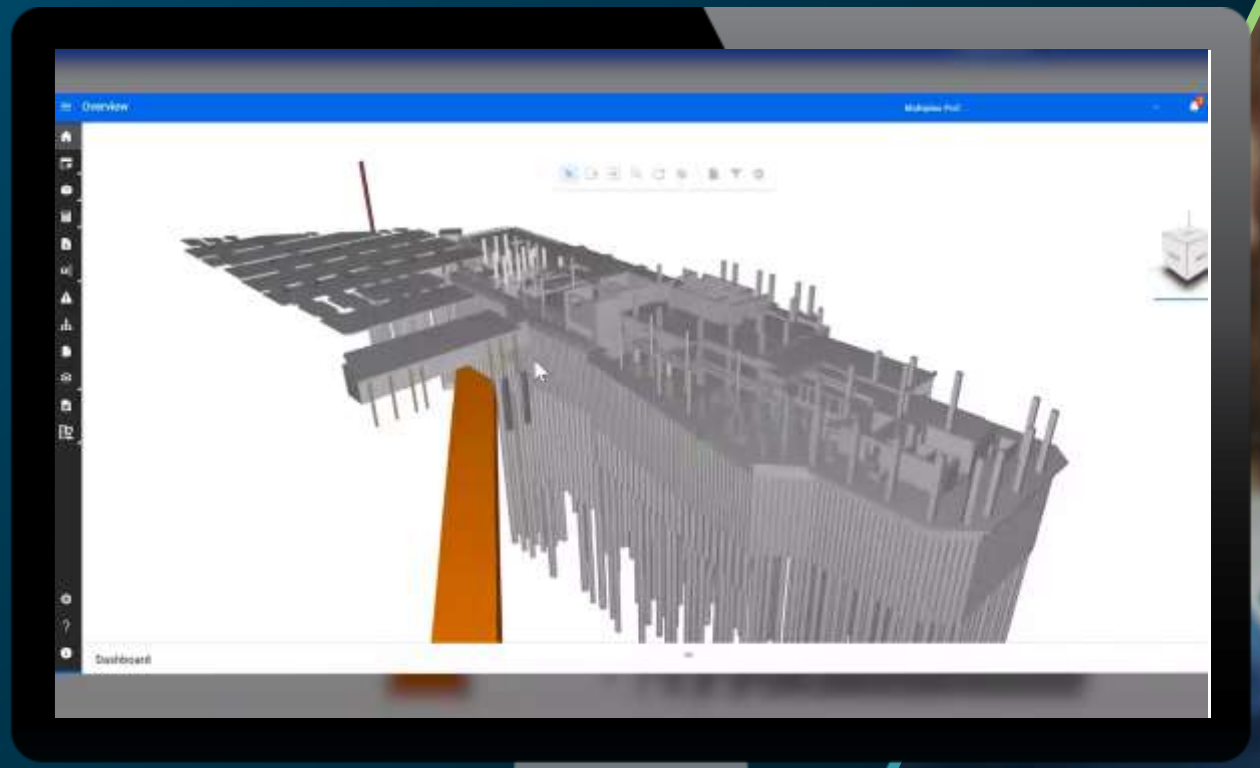


Multi-project productivity / safety insights

Job site monitoring
Project equipment tracking and more

Ensuring construction as planned

Real-time verification and issue management

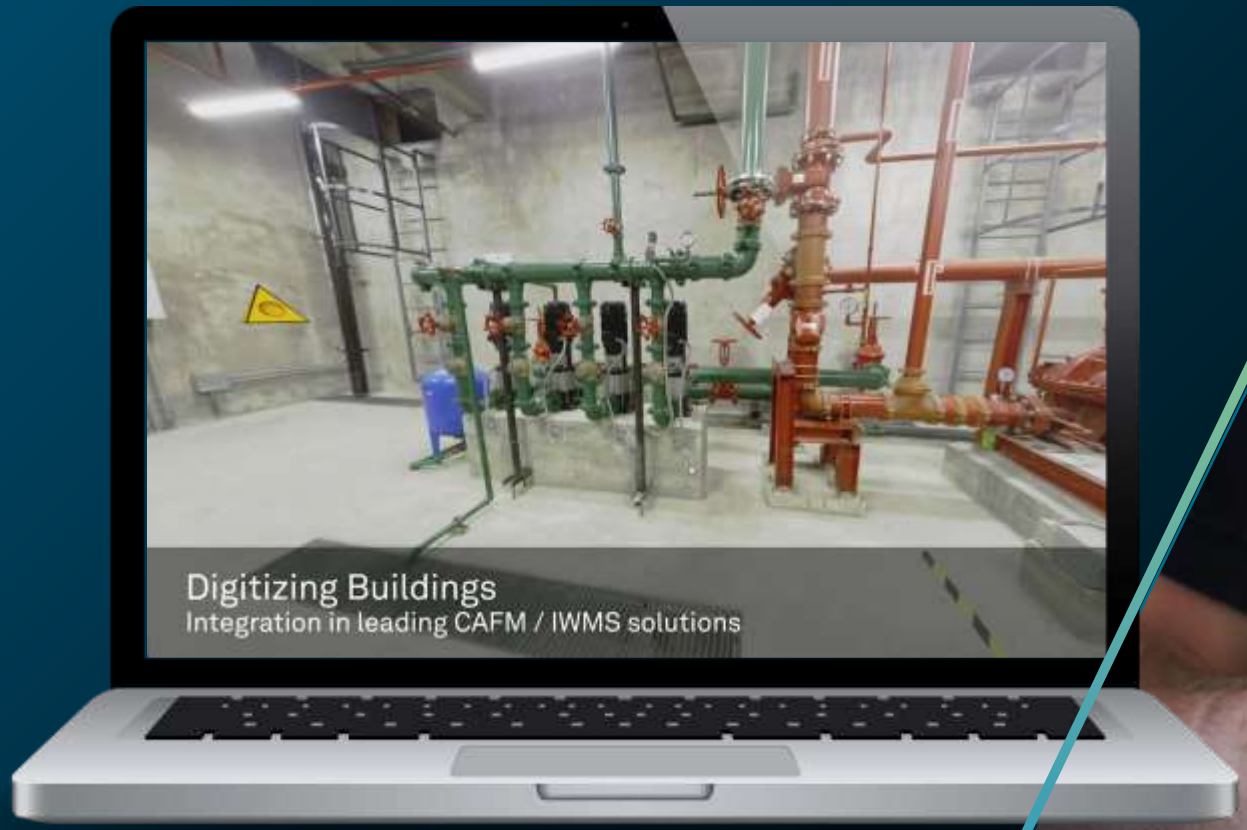


Jobsite monitoring and security
Progress documentation and issue management

Up-to-date Digital Reality
True 5D construction management

Facilitating operations

Prolonging the life of assets and ensuring indoor navigation



Handover
Digital realities of “what is”

Predictive Maintenance
Location-based asset tracking

Taking reality capture to the next level – autonomously!

Autonomous agility and speed for any reality capture workflow

Leica BLK2FLY
to capture Rail infrastructure

Leica BLK ARC
to capture Train station

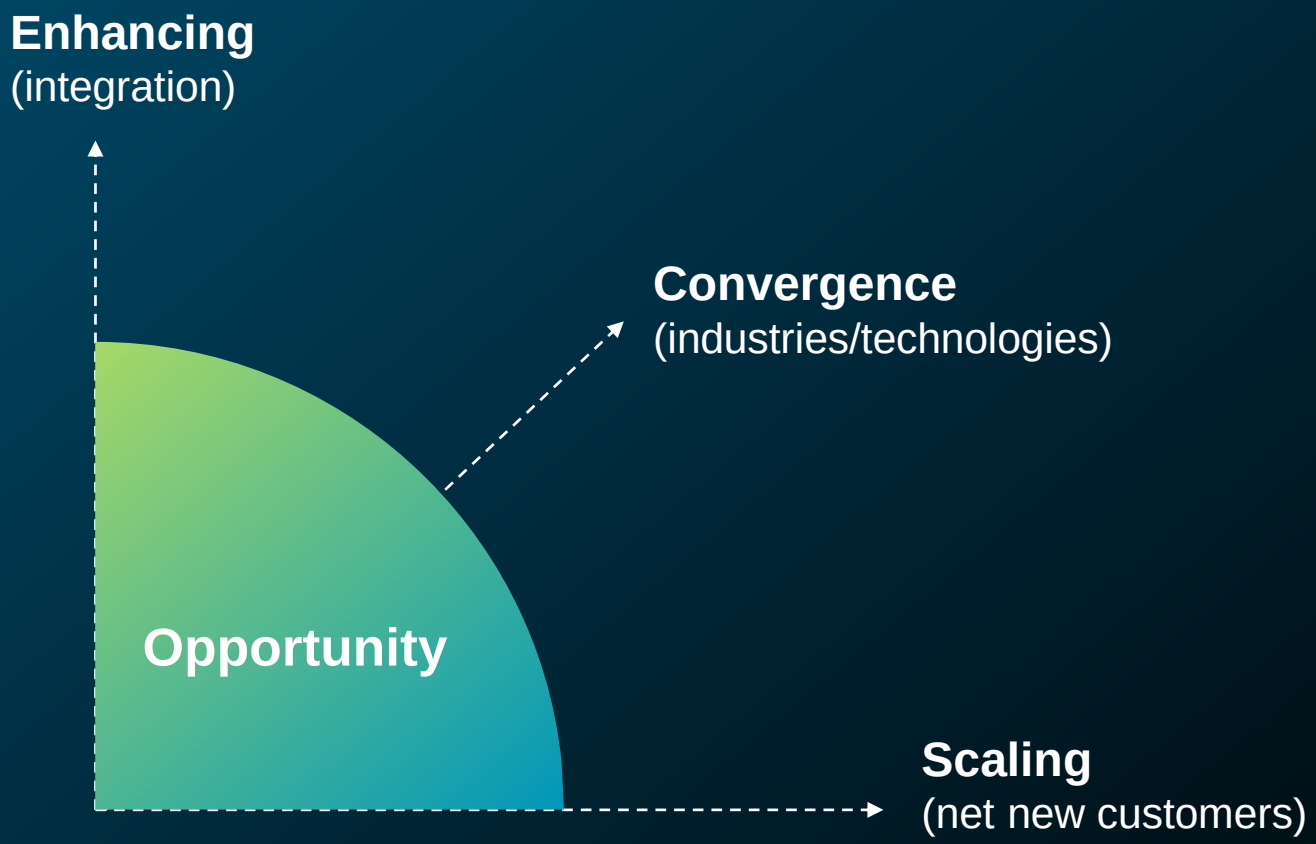
Smart Digital Realities are the key to unlocking true value

Precise insights and immersive experiences

3D Models in Context
BIM integration

Smart Digital Reality
Visualisation and sharing

Endless opportunities in and beyond Buildings and Infrastructure



Portfolio transformation

Innovating for a sustainable future

Create opportunity