HEXAGON
empowering an autonomous future

Leica Geosystems

“Reimagine Reality”

ERPUG Athens - 2023

ERPUG

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empowering an autonomous future

Global leader in **digital reality solutions**

that are empowering an autonomous, sustainable future by putting data to work

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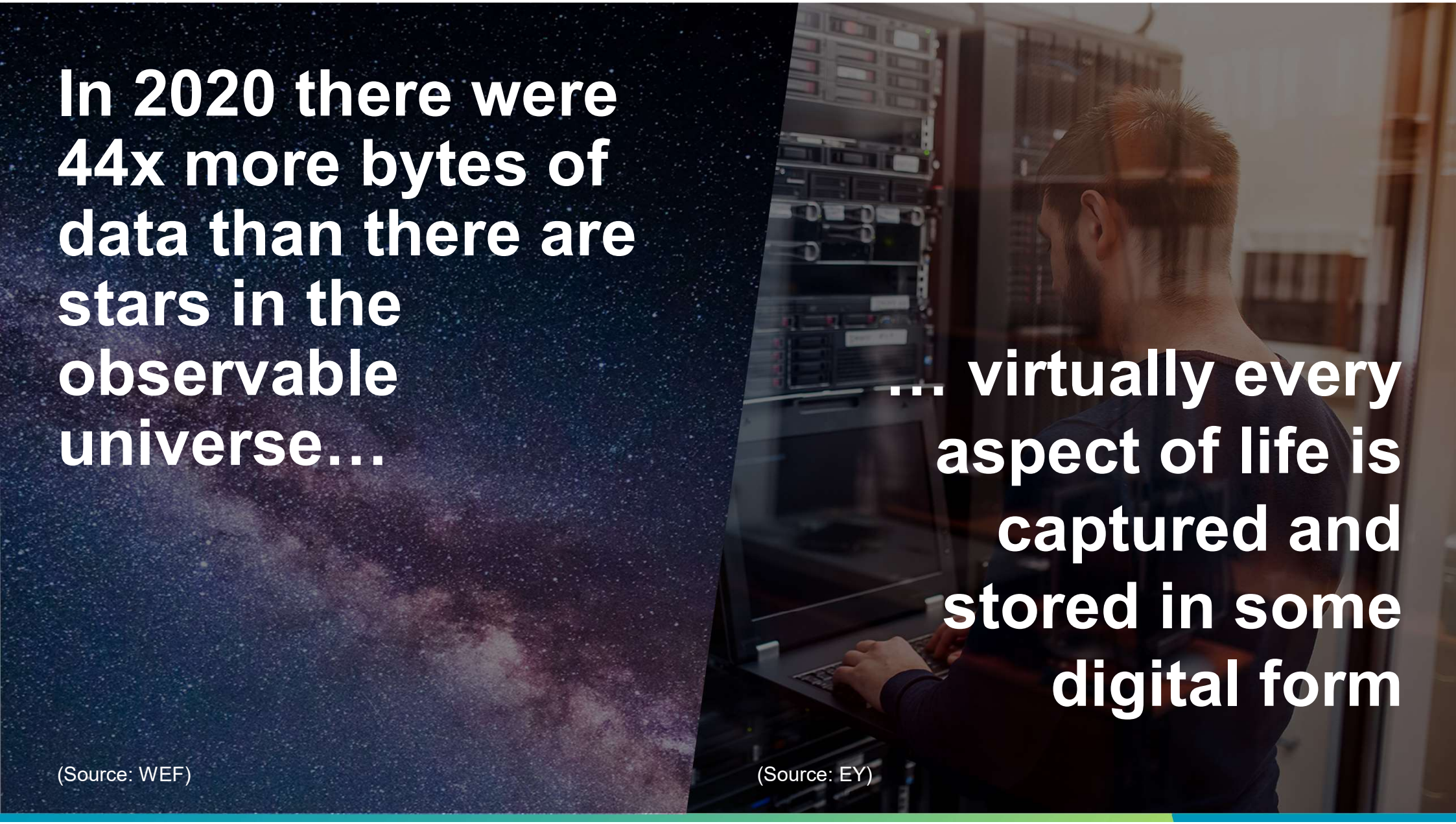
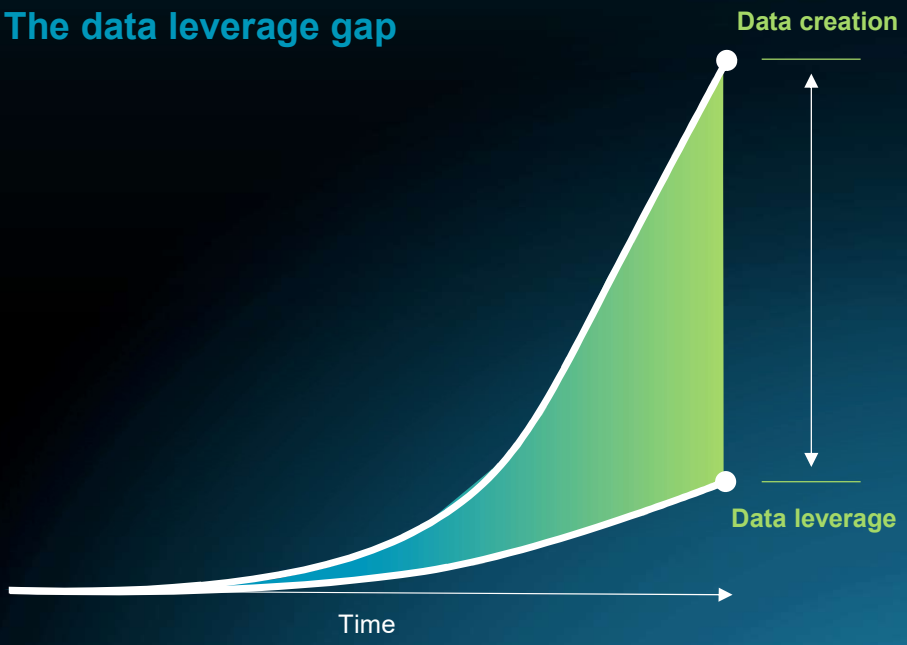

In 2020 there were 44x more bytes of data than there are stars in the observable universe…
(Source: WEF)
… virtually every aspect of life is captured and stored in some digital form
(Source: EY)

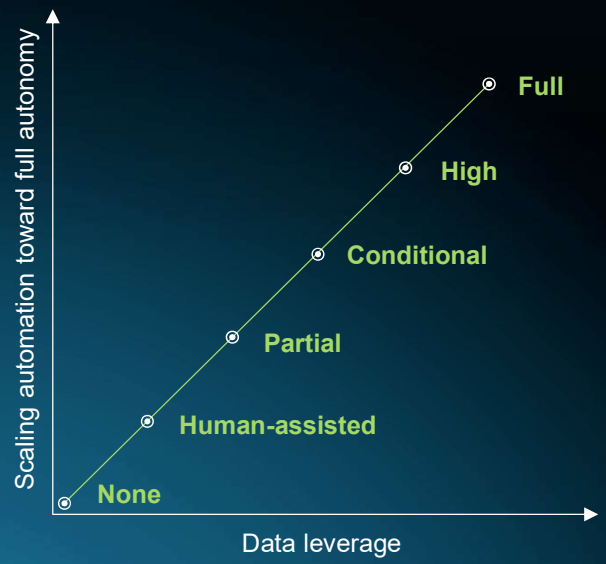
Is data holding you back or setting you free?

Autonomous leverage of data frees us from the constraints that impede sustainable growth

The data leverage gap



Autonomous leverage of data



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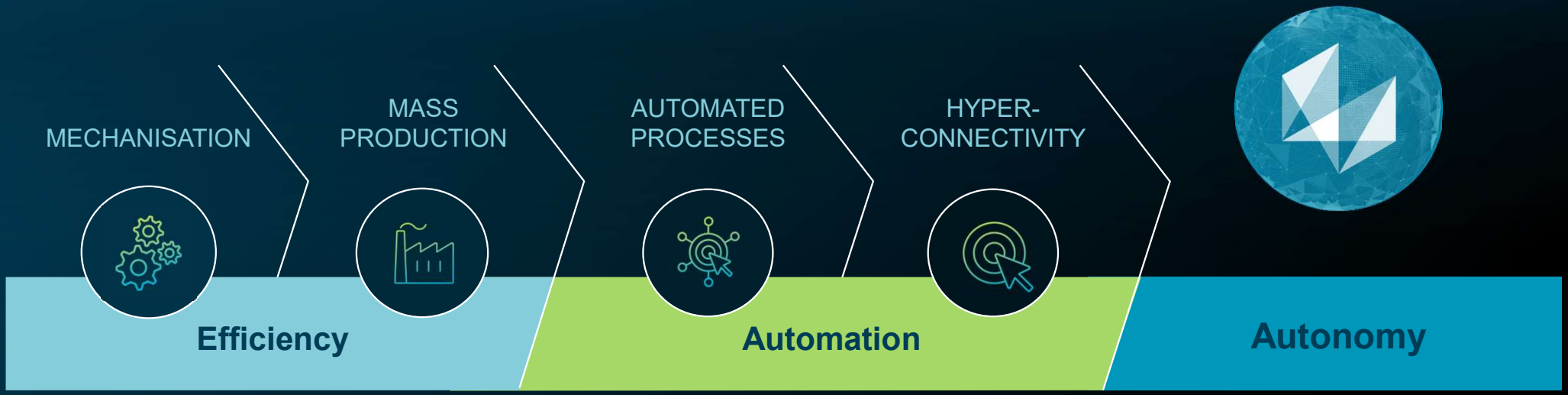
Leading a revolution

From automation to autonomy

Autonomy is the ultimate form of putting data to work



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The digital reality feedback loop

Hexagon's core technology competencies enable a digital reality feedback loop – creating freedom of insight so you can be proactive, preventative and event-predictive

Reality Capture

Digital capture of the physical world

Design & Simulation

Design and replication of real-world scenarios

Autonomous Technologies

Automation of any task, workflow, machine or decision – enabling action without human intervention

Positioning

Location, tracking, navigation and/or control of anything, anywhere

Location Intelligence

Active, geo-referenced intelligence of real-world situations

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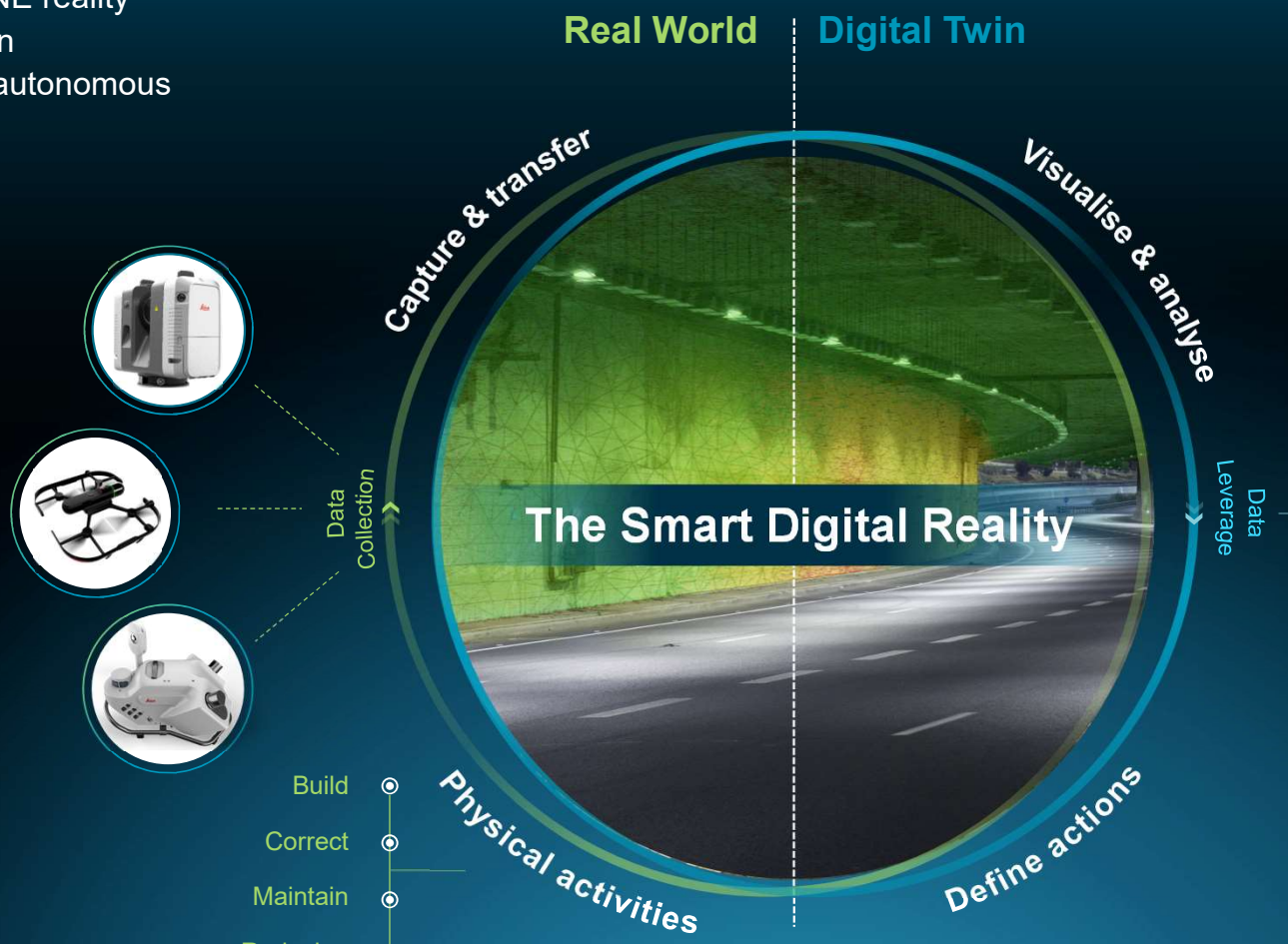
The Smart Digital Reality

Two worlds, ONE reality
Workflow-driven
Real time and autonomous



Intelligence engine

- Reality capture data sets
- 3D models
- Connection to persistent data sets
- Enrichment with real-time data sets
- Two-way integration & interaction
- Autonomous decision-making & actions

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With reality capture we digitise the world, creating VALUABLE digital twins of cities, roads, power grids, construction sites to enable this transformation
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Our Product Portfolio

Terrestrial Laser Scanning

SCANSTATION P30 / P40 | SCANSTATION P50 | CYCLONE FIELD 360 | RTC360 | RTC360 LT

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Our Product Portfolio

BLK & BLK Autonomy

BLK3D | BLK360 | BLK2GO | BLK2GO PULSE | BLK2FLY | BLK ARC

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Our Product Portfolio

Mobile Mapping Systems

PEGASUS TRK500 / 700 NEO

PEGASUS TRK500 / 700 EVO

PEGASUS TRK100

PEGASUS FIELD & CYCLONE PEGASUS OFFICE

PEGASUS:BACKPACK

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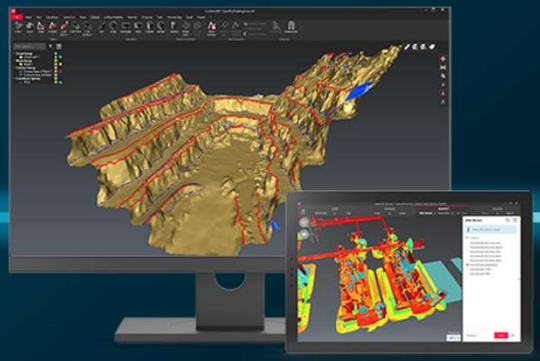
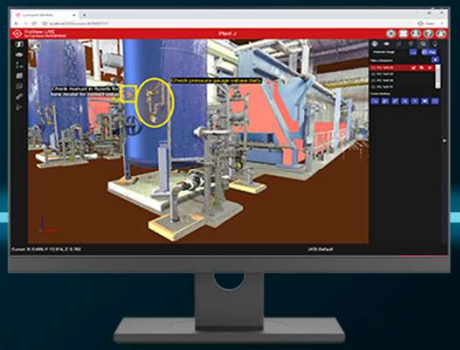
Our Product Portfolio

Software

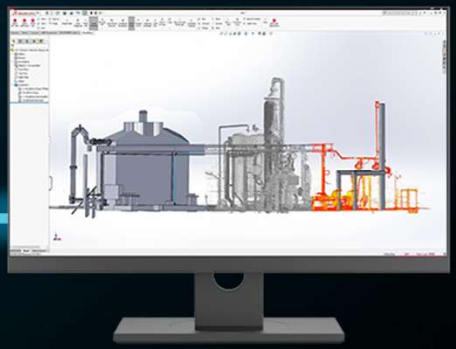
CYCLONE REGISTER 360 PLUS



CYCLONE 3DR



TRUVIEW



CLOUDWORX

Reality Cloud Studio, powered by HxDR

CYCLONE FIELD 360

BLK LIVE APPS

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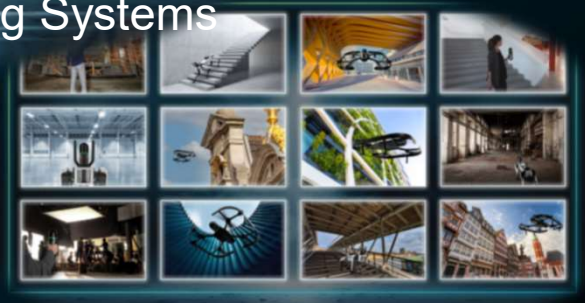
Leica Geosystems Reality Capture Portfolio

Mobile Mapping Systems



BLK & BLK Autonomy

Terrestrial Laser Scanning

SCALE

ACCURACY

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Customer Use Case

Virtual road and management and maintenance

Veris - Australia

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Who We Are

Veris Australia is a leading provider of spatial data services.

National operating platform with over 530 personnel and 18 office locations across Australia.

Subject matter experts in spatial data to deliver end-to-end solutions for our clients.

Investment in leading-edge technologies that support the rapid capture, analysis and sharing of data.

ASX-listed company with financial capacity to deliver large scale projects

Maximising the Value of Spatial Data

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"Using road infrastructure as a case study in extracting value from spatial data. This can be applied to a vast array of assets and infrastructure."

- Maintaining road infrastructure is essential
- There has been very little innovation in road condition assessments
- Yet clients are capturing vast amounts of spatial data and only using a fraction of its potential
- Just imagine being able to have access to a virtual environment with a powerful insights.
- Taking it one step further. What if this data was collected over time and you were able to predict asset degradation.
- It is now possible using the power of spatial data

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The Problem With Traditional Methods

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The problem with traditional methods for assessing damage to road surfaces

1. It's a very manual task
2. It's field-based and involves stopping on the road
3. It's labour intensive and time consuming
4. There is no assessment of change over time
5. There has been little innovation in this space
6. Involves significant safety issues working near live traffic
7. Is not linked to a single database

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The Problem With Imagery Only Methods

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The problem with imagery only methods for assessing damage to road surfaces

1. Doesn't contain spatial geometry for measurements
2. Relatively inaccurate in terms of location and extent
3. Limited spatial information and context
4. Single use only. Can't be used for other applications
5. Typically only looking at pavement and not at the roadside to understand surrounding context
6. Difficult to provide as a map within a GIS environment
7. Most defects are more accurately mapped with a laser scanner such as for potholes, rutting and depressions

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Driving Smarter Road Decisions Through Spatial Data

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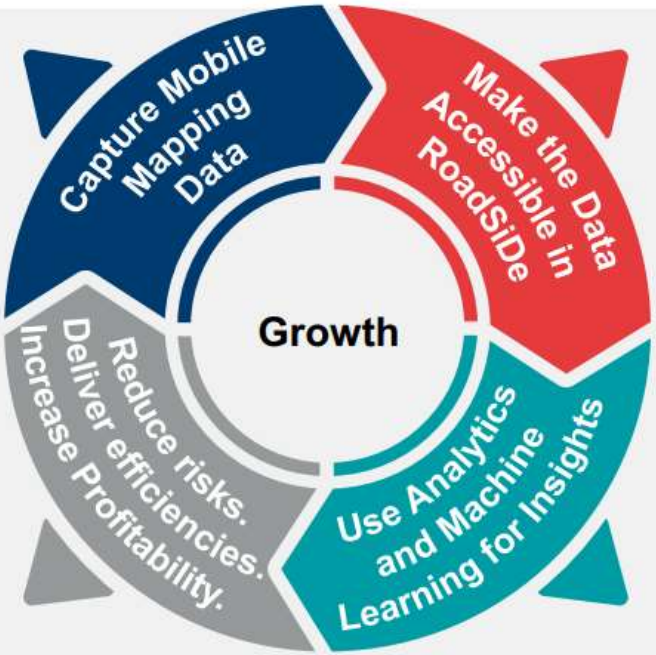
Partnering with Hexagon for the capture and delivery of data has enabled us to deliver on our strategy. Leica Geosystems Mobile Mapping combined with Hexagon M.App Enterprise provides a high-quality, configurable solution to meet our client's needs.

Leica MLS

- High-Quality fit-for purpose data
- Efficient, rapid capture processing

Use Cases

- Enable our clients to find valuable insights
- Build and strengthen key client relationships
- Increase the value so clients demand more data



M.App + Luciad Fusion

- Securely store the data for the client
- Make the data easily accessible

Scripts and Automation

- Make it simple for our clients to interact and visualise the data
- Provide analytics and value-added services on demand

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Our solution

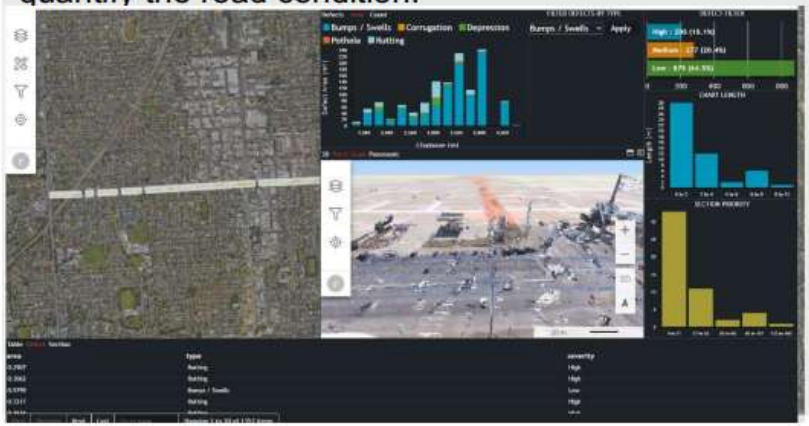
Rapidly identify and assess road defects using our bespoke spatial data solution.

3D Data Capture

Data capture of the road corridor is performed rapidly using Lecia Pegasus mobile laser scanning (MLS) and 3D ground penetrating radar (GPR).

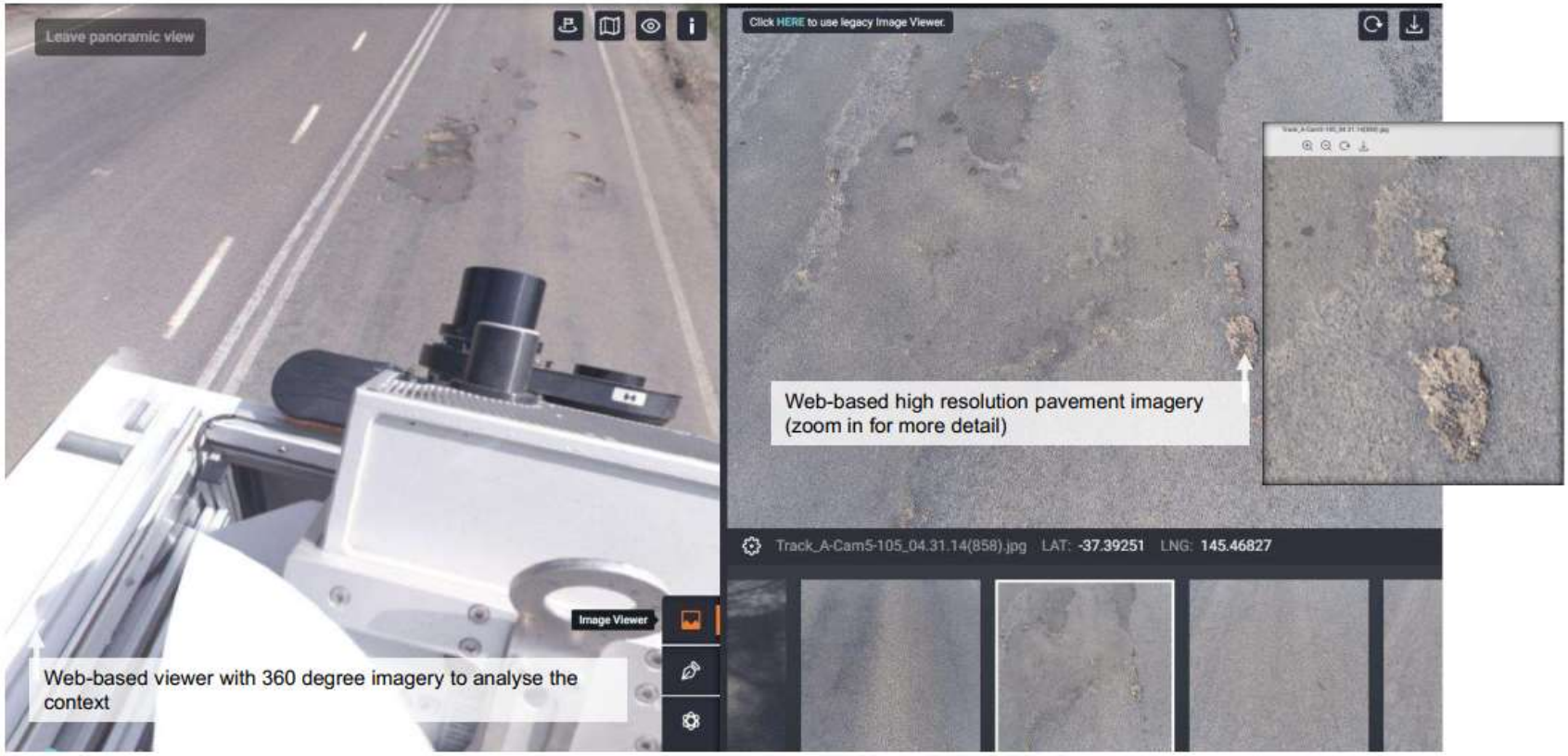
RoadSiDe Analytics & Machine Learning

The data and insights are delivered using Hexagon M.App Enterprise and Luciad Fusion; integrating 3D visualisations and 2D dashboards with machine learning and spatial analytics to identify, assess and quantify the road condition.



We are the only provider to offer a full 3D road condition and corridor platform

Interactive 360 Imagery and Detailed Imagery

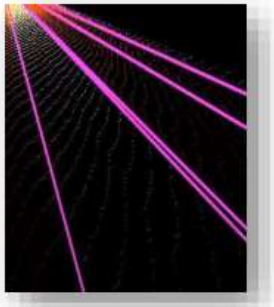


Surface Defects Workflow

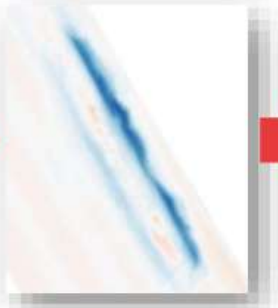
Raw point cloud

First pass automated defect identification and classification (polygons)

Surface point cloud (3D points)

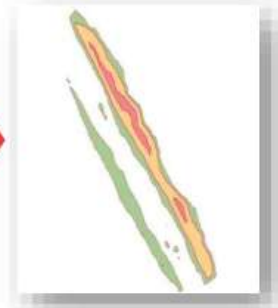


Ideal road surface (3D planes)



Surface Difference Model (2D grid)

Defect contours (lines)



Improved surface defect definition (polygons)

Machine Learning Crack Detection

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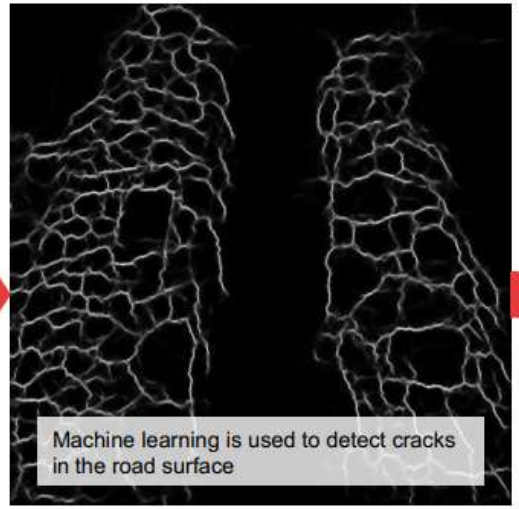
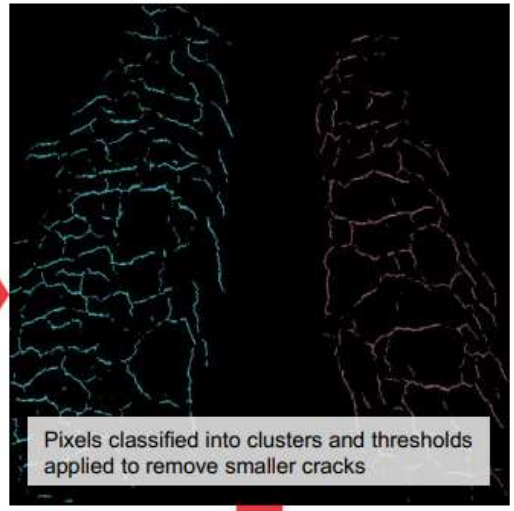
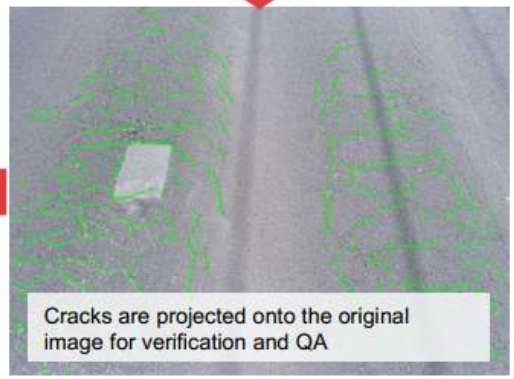
Oblique 12MP/20MP imagery captured from MLS vehicle 2.5m above the road surface. Displays cracks >2mm.



Machine learning is used to detect cracks in the road surface



Pixels classified into clusters and thresholds applied to remove smaller cracks



Cracks are projected onto the original image for verification and QA

Cracks are projected into world coordinates for the RoadSiDe dashboard.

MLS is used to efficiently capture road cracking

Machine learning is used for road crack detection.

- 12MP/20MP cameras capture crack details.
- Cracks are mapped into the RoadSiDe dashboard
- Attributes on cracking width and length are captured within the geodatabase.

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Case study for Maintenance Contractors

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Hume Hwy and Melba Hwy

- Over 200km of mobile laser scanning data capture
- Workflow automation, machine learning and spatial analytics for defect and hazard detection
- Vegetation encroachment and clash detection for maintenance
- Web configuration and deployment using our RoadSiDe platform

Diagnosis	Triage	Heal
Mobile laser scanning	RoadSiDe Dashboard	RoadSiDe 3D Viewer
Defect detection	Prioritise the areas	Maintenance & Repair

Data Capture & Extraction

RoadSiDe

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OUR SOLUTION
3D DATA CAPTURE OF ROAD CONDITION IS PERFORMED RAPIDLY OVER LARGER DISTANCES
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VERIS.COM.AU
hidrive

What's Next?

Road safety and roadside asset mapping

Integration of bridges and subsurface

Expanding technology to rail and airports

Adapting defect detection to building facades

Accelerating Impact with Our Hexagon Partnership

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Recognised Hexagon as the partner of choice for our innovation platforms for delivering spatial solutions to clients.

- Early collaborative meetings to assess joint market opportunities
- Training on M.App Enterprise and Luciad Fusion
- Onboarding and installation of the software
- Consultancy and support to deliver our RoadSiDe solution
- Jointly assessing market opportunities

Lessons learned in the Past Year

- Be engaged and proactive
- Ensure that benefits go both ways
- Be responsive and take the opportunities as they come
- Plan a future together

"We are the only Australian company to deliver an end-to-end Hexagon solution."

Collaboration & Joint Opportunities → Training & Trial Licensing → Onboarding & Software Installation → Consultancy & Development → Market Assessment

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Purpose is good.
Shared purpose is better.
We see customers more as co-creators of the smart solutions we deliver. Putting data to work to boost efficiency, productivity, and quality outcomes is one that we share with you.
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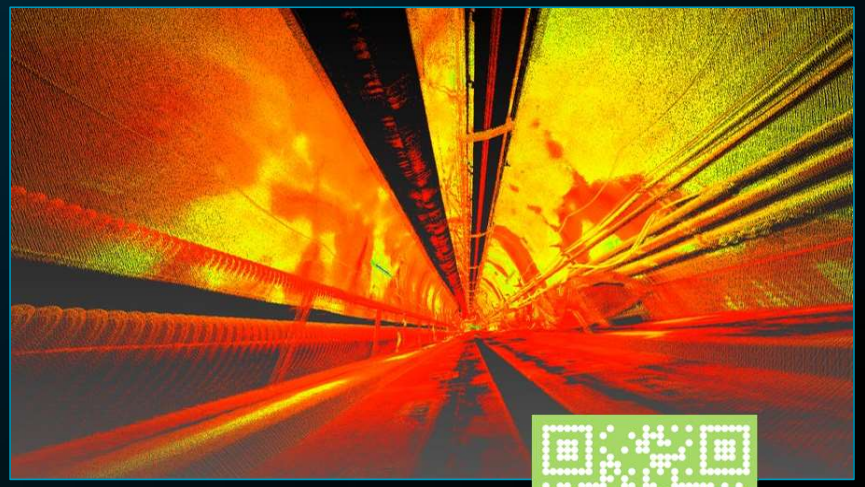
Our Thought Leadership Content

How reality capture technology can grow your business!

Investing in mobile mapping: why, what, how, when? Hexagon explains everything you need to know.

READ THE BLOG

Tunnelling: how reality capture technology provides a guiding light for the surveying industry.



READ THE BLOG

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Let’s Connect!

- Surveying Engineer CNAM ESGT, France
- 26 years working in surveying and geospatial industry
- 12 years at Leica Geosystems
- 7 years working on **Mobile Mapping** Business Development around the globe

Let's Connect!

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The best way to predict the future is to create it
Abraham Lincoln

Thank you

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