



Supporting Partner



**5 - 8 DECEMBER 2022**  
DUBAI WORLD TRADE CENTRE

# Asset Information Nirvana

**Thomas (Tom) Deacon**

Leveraging data to enhance geotechnical design  
5<sup>th</sup> December 2022

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## Digital Twins can enable substantial benefits

Research suggests up to 50% increase in whole life, whole system asset value



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## Connecting data delivers value

Maintaining a 'single view' of asset, and using visualization and analytics to support decision making; asset planning, delivery and operation are improved



- ▶ Connected Digital Twins, fed by
- ▶ Digital Thread; to support and optimise
- ▶ Simulations, scenario modelling, planning tools
- ▶ Requirements, design, scheduling, cost modelling
- ▶ Operational, engineering and control systems
- ▶ Maintenance planning and execution
- ▶ Renewals, re-use, recycling, decommissioning

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## Integrated Network Models...

Are the framework for attaching the Digital Thread to enable visualisation



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## Sensors fuel the Digital Thread

Inspections and automated monitoring / surveys provide near real time data



- ▶ Market maturing for resilient, connected sensors & platforms
- ▶ Offers near real time monitoring
- ▶ In construction and operation
- ▶ Includes LiDAR, drone photogrammetry, IoT sensors etc.
- ▶ But...
- ▶ Needs clear Asset Information Specifications; and
- ▶ Mindset, behaviours, skills and governance; to drive
- ▶ Consistency and quality of data



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## Value released through insight and decisions

All stages of asset lifecycle benefit from analysis to support best action



- ▶ Planning: 50% reduced planning time, 20% increase in value from asset investment, 300% less risk (Roads)
- ▶ Design: 30% reduction in load on bored piles (Commercial Real Estate)
- ▶ Construction: 30% reduction in claims, 25% reduction in rework, 30% reduction in contingency (Rail / O&G)
- ▶ Construction: 18x faster startwork analysis, 228 days critical delay avoided (Rail)
- ▶ Operation: 20% reduction in congestion (Roads)



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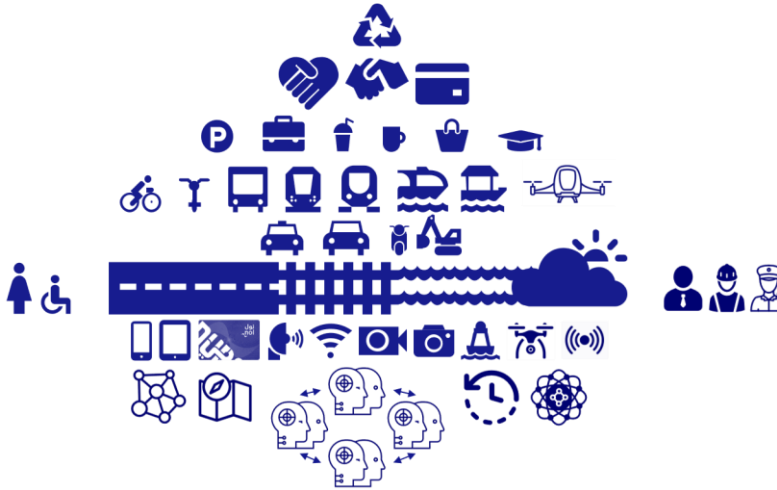
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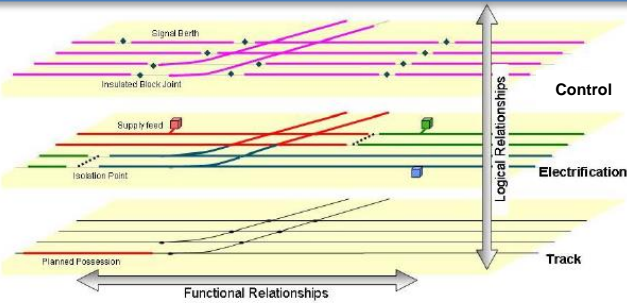
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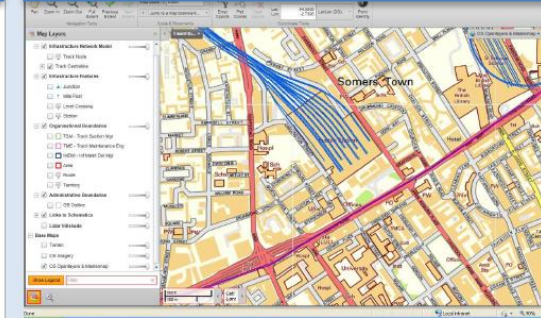
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Are the framework for attaching the Digital Thread to enable visualisation

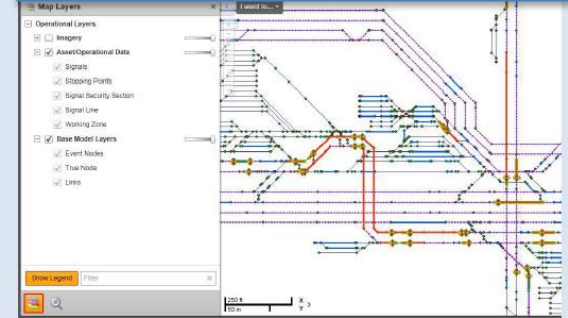
## Multiple Connected Networks



## Geospatial View



## Schematic View



AR / VR View



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**Notes**

- 1) Under Bridge (including intersection bridges, viaducts, intersection viaducts); Over Bridge (Excluding Pipe and Footbridges); Footbridge (Non-station only)
- 2) Define 'Bridge' as a section that is off-ground, extending from the point it leaves the ground to when it makes contact again (+10m?) including the ramps/stairs at each end
- 3) Supports can be above or below bridge (suspension).

Asset	Mastered as	Extent
Bridge deck area	Polygon	Along bridge deck area extent from when it leaves ground level to when it makes contact again.

Attrib. #	Ref. #	Attribute name	Type	Tolerance (precision)	Applicable standards	Requirement reason	Author	Notes
RINM09-00001-1	1	Bridge deck area	3D Polygon	+/- 0.5m	RT/CE/S/080, NR/BS/L/331	Maintenance, volume	Engineer	
RINM09-00002-1	2	Bridge parapet OHLE distance	Numeric	+/-0.05m	RT/CE/S/080, NR/BS/L/331	Comply with standards & parapet height is a RINF requirement.	Engineer	From top of parapet to closest OLE equipment.
RINM09-00003-1	3	Bridge parapet	3D Poly-line	+/-0.1m	RT/CE/S/080, NR/BS/L/331	Comply with standards	Engineer	Optional, along top of parapet if one is present.
RINM09-00004-1	4	Bridge end support	3D Poly-line	+/-0.1m	RT/CE/S/080, NR/BS/L/331	Maintenance, volume	Engineer	Optional, along top of parapet if one is present.
RINM09-00005-1	5	Bridge wing wall extent	3D Polygon	+/-0.1m	RT/CE/S/080, NR/BS/L/331	Maintenance, volume	Engineer	
RINM09-00006-1	6	Bridge intermediate support area	Polygon	+/-0.1m	RT/CE/S/080, NR/BS/L/331	Maintenance, volume	Engineer	
RINM09-00007-1	7	Bridge track offset from parapet	Numeric	+/-0.05m	RT/CE/S/080, NR/BS/L/331	Safety, Clearance	Engineer	
RINM09-00008-1	8	Bridge track offset from supports	Numeric	+/-0.05m	RT/CE/S/080, NR/BS/L/331	Safety, Clearance	Engineer	
RINM09-00009-1	9	Bridge min. clearance between railroad and soffit at mid span	Numeric	+/-0.5m	RT/CE/S/080, NR/BS/L/331	Safety, Clearance, Low headroom	Engineer	
RINM09-00010-1	10	Bridge staircase/ramp/landing extent	3D Polygon	+/-0.5m	RT/CE/S/080, NR/BS/L/331	Maintenance, volume	Engineer	Optional. Not shown in above picture.

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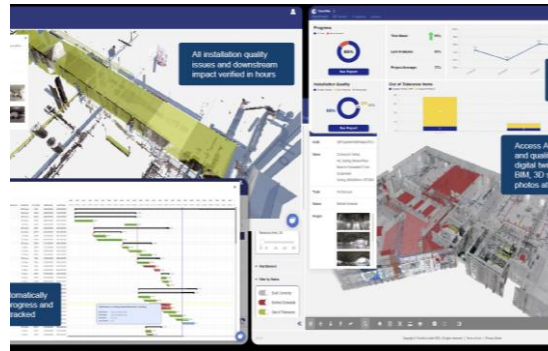


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