NK INTEGRA™

ENGINEERING A SMARTER FUTURE

SMART

OPERATIONS MANAGEMENT ECOSYSTEM

ROAD | RAIL | CITIES

UGL

A MEMBER OF THE CIMIC GROUP

CIMIC

INTEGRA™ is built using UGL's 25+ years system integration experience combined with the expertise of a proven International Digital Transformation Partner.

INTEGRA™ provides comprehensive control of tunnel, motorway, rail, smart cities, and utility management systems.

INTEGRA™ provides unmatched security, stability, speed, scalability, and resilience.

HIGH-SPEED

RELIABLE

SECURE

UX FRIENDLY

MODULAR

SCALABLE

SERVICE ORIENTED ARCHITECTURE

MULTI-PROTOCOL

INTEGRA™ Smart Operations Ecosystem

INTEGRA™ is UGL's advanced suite of integrated Operations Management Control Systems (OMCS) software applications across multiple market verticals.

N INTEGRA ITS

Integrated managed motorway digital platform for highways, road tunnel traffic and plant infrastructure.

N INTEGRA Rail

Integrated digital platform delivering an intelligent solution for central operations control, M&E plant monitoring, train management and signalling control (powered by SigView).

N INTEGRA BMS

Sophisticated automation system that controls and monitors building HVAC, MVAC, Security, and other M&E systems.

N INTEGRA Utilities

Digital platform for utilities & smart city applications that provides data sharing across community infrastructures, surveillance management, building management, and connected devices.

▶ Minimum platform availability is 99.995%

▶ Minimum network availability is 99.999%

▶ Response times less than 1 second

N INTEGRA™
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Modular Design with Fully Integrated Control, Configuration & Monitoring

INTEGRA™ incorporates management and control modules to suit all motorway, ITS, tunnel, rail, building, cities or utility applications. Modules are fully integrated into an overarching management and control user interface.

INTEGRA™ is built on a Service Oriented Architecture (SOA) framework to enable connectivity with other business information systems.

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INTEGRA™ Smart Operations Ecosystem

INTEGRA™ provides a state-of-the-art configuration, monitoring and decision support ecosystem to support mission critical smart city infrastructure and transport operations.

INTEGRA™ provides control room operators with fast system response times, uptime performance, stability, security and long-term locally-based technical support.

KEY CAPABILITIES

Typical Systems (Major Projects)
- \> 50,000 field IO points
- \> 500,000 SCADA IO points
- 1 second field response times

System Features
- Minimum ICT and PLC hardware architecture availability 99.995%
- Minimum network architecture availability 99.999%
- System designed using strict RAMS/ FMECA methodologies
- Fully scalable for multi-tenancy or multiple systems
- System design complies to AS61508 and EN50128
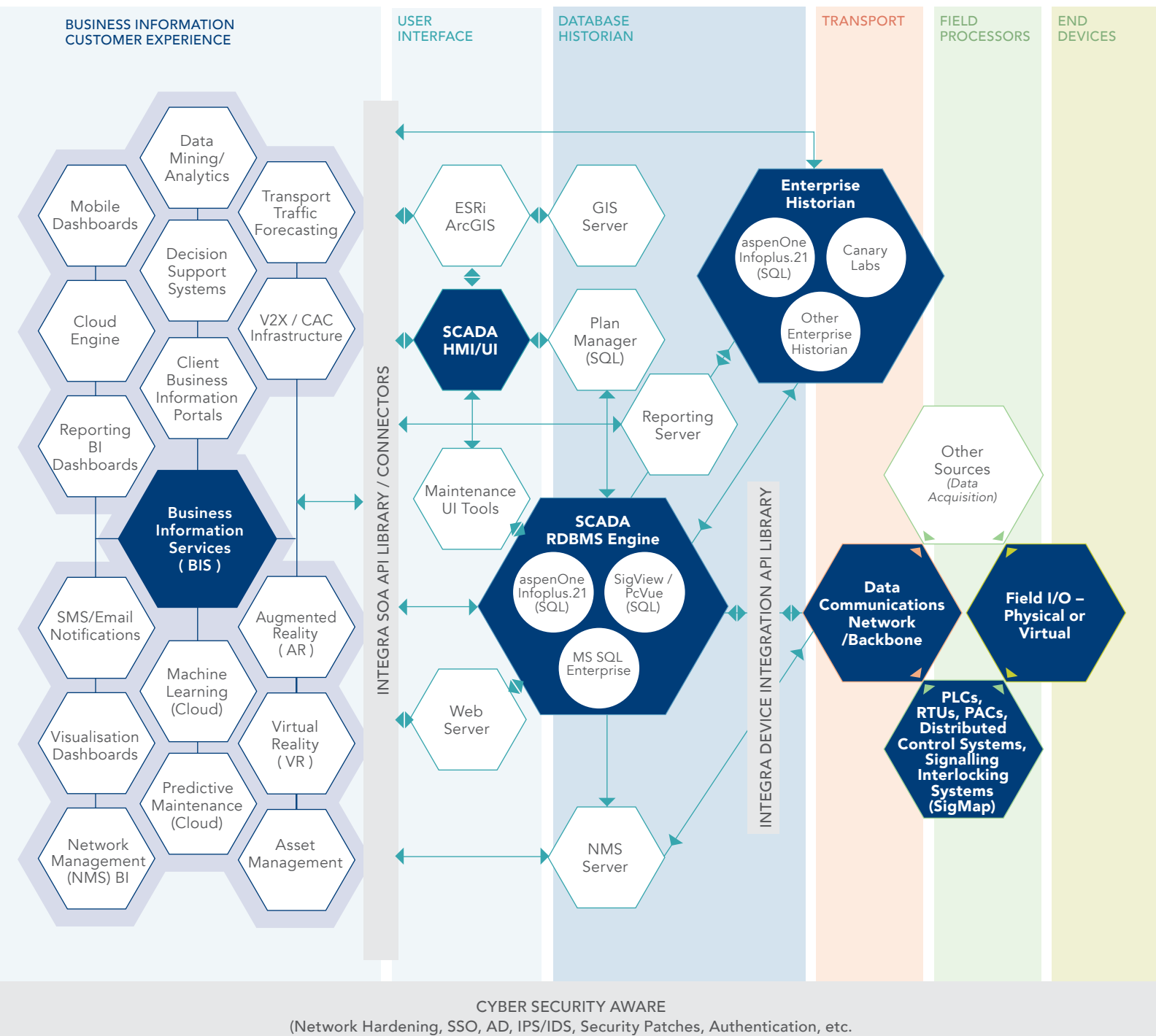- Built to Safety Assurance SIL 2 standards

Hardware Platforms
- Fault tolerant and highly available IT/ICT service platforms
- Resilient network and PLC architecture
- Scalable and expandable to handle multiple system modules

Clem 7 Tunnel, Brisbane

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INTEGRA™ Ecosystem Stack

INTEGRA's secure ecosystem architecture effortlessly manages over 500,000 SCADA IO points, providing fast, granular monitoring and control.

BUSINESS INFORMATION CUSTOMER EXPERIENCE

USER INTERFACE

DATABASE HISTORIAN

TRANSPORT

FIELD PROCESSORS

END DEVICES

Data Mining/ Analytics

Mobile Dashboards

Transport Traffic Forecasting

Decision Support Systems

Cloud Engine

V2X / CAC Infrastructure

Client Business Information Portals

Reporting BI Dashboards

Business Information Services (BIS)

SMS/Email Notifications

Augmented Reality (AR)

Machine Learning (Cloud)

Visualisation Dashboards

Virtual Reality (VR)

Predictive Maintenance (Cloud)

Network Management (NMS) BI

Asset Management

INTEGRA SOA API LIBRARY / CONNECTORS

ESRi ArcGIS

GIS Server

SCADA HMI/UI

Plan Manager (SQL)

Reporting Server

Maintenance UI Tools

SCADA RDBMS Engine

aspenOne Infoplus.21 (SQL)

SigView / PcVue (SQL)

MS SQL Enterprise

Web Server

NMS Server

INTEGRA DEVICE INTEGRATION API LIBRARY

Enterprise Historian

aspenOne Infoplus.21 (SQL)

Canary Labs

Other Enterprise Historian

Other Sources *(Data Acquisition)*

Data Communications Network /Backbone

Field I/O – Physical or Virtual

PLCs, RTUs, PACs, Distributed Control Systems, Signalling Interlocking Systems (SigMap)

CYBER SECURITY AWARE
(Network Hardening, SSO, AD, IPS/IDS, Security Patches, Authentication, etc.

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Key Features

▶ **UNIFIED VIEW UX**

Manages and monitors data from multiple sub-systems like TMCS (traffic, electronic signage etc.), PMCS (lighting, ventilation, etc.) from a single screen i.e. single pane of glass view.

▶ **REAL TIME RESPONSE / GRANULAR MONITORING**

Architecture achieves < 1s (or sub-second) response times to field changes where the end device / protocol supports the framework.

▶ **OPEN BIS ECOSYSTEM CONNECTIVITY**

BIS interfaces use standard APIs to develop plug ins to the management infrastructure.

▶ **CUTTING EDGE HOSTING PLATFORMS**

Provides the best-in-the-market hosting platforms, catered to handle the required availability and downtime targets of mission critical systems.
(Cloud based solutions are an advanced feature.)

▶ **FUTURE-FOCUSSED DIGITAL / TECHNOLOGY PARTNERSHIP**

Platform is designed in conjunction with a proven International Digital Partner specialising in future-focussed IT digital transformations and product development, with over 700+ IT engineers.

▶ **IOT AND SMART CITIES ENABLED PLATFORM**

System design enables an IoT dashboard view incorporating AI.

▶ **MOBILE PLATFORM**

System design enables support for mobile solutions.

▶ **END TO END ECOSYSTEM STACK**

Enabled with partnerships with proven technology vendors to provide a fully integrated system with evolving technologies for continued growth and success.

▶ **SERVICE ORIENTED OPEN ARCHITECTURE**

Built on a SOA framework that provides seamless connectivity to various BIS systems (hosted on premise or in the cloud) like Asset Management, Transport Predictions, AI/ML Predictive Maintenance, IOT Platform etc.

About aspenOne Infoplus.21

UGL has selected aspenOne Infoplus.21 as INTEGRA's enterprise historian and RDBMS because of its raw performance metrics, sophisticated big data analytics toolkit, fast sampling rate and robust security profile.

Produced by Aspen Technologies, it is internationally regarded as amongst the top three enterprsie historians for mission critical applications.

About Sigview (PcVue)

UGL has selected SigView (powered by PcVue) as INTEGRA's SCADA RDBMS for Train Control Applications because of its proven use in train control applications in the APAC region, support for a range of data acquisition formats, and its performance metrics.

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Smart Traffic Management, Plant Management & Managed Motorway ITS Applications

Intuitive Traffic Management Control System (TMCS) and Plant Management Control System (PMCS) provide Smart control, monitoring and configuration of all mission critical tunnel / motorway ITS equipment.

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N INTEGRA ITS
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KEY FEATURES

Integrated GIS mapping

Advanced incident / motorway management engine

Electronic VMS, VSLS, LUMS sign management

Intelligent traffic counting & AID detection

Rule-based dynamic speed limiting and interlocking

Advanced traffic plans management engine

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WestLink M7 Tollway, Sydney

Queue
management

Compliant to C2C / S2S
framework

Incident logging lifecycle
management (IL2C)

Business
intelligence system

BI

Ventilation, drainage, HVAC,
MVAC, lighting management

BMS, security, CCTV,
communications, HV, LV
electrical management

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Smart Central Control System (CCS), Train Management System (TMS) and Plant Management System (PMCS) for Rail Applications

Smart Central Control System ensures seamless rail operations, including real-time control mechanisms and data for various diverse systems by providing a digital layer of intelligence enabling improved performance, increased capacity and managed disruption.

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NK INTEGRA BMS
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KEY FEATURES

- Electrical / power management
- Building management
- Route management
- Traction control
- Security & access control
- Electronic train graphs
- Intelligent power control
- Passenger information
- Timetable integration
- Ventilation, drainage, HVAC, MVAC, lighting management
- Advanced planning models
- Fleet management

Smart Cities Management System (SCMS) for Connected Cities

Smart Cities Platform is a digital platform that provides a data sharing layer to connect community infrastructures. With INTEGRA™, cities can flourish with economic efficiencies, improved public infrastructure and cost reductions.

NK INTEGRA Utilities
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NK INTEGRA BMS
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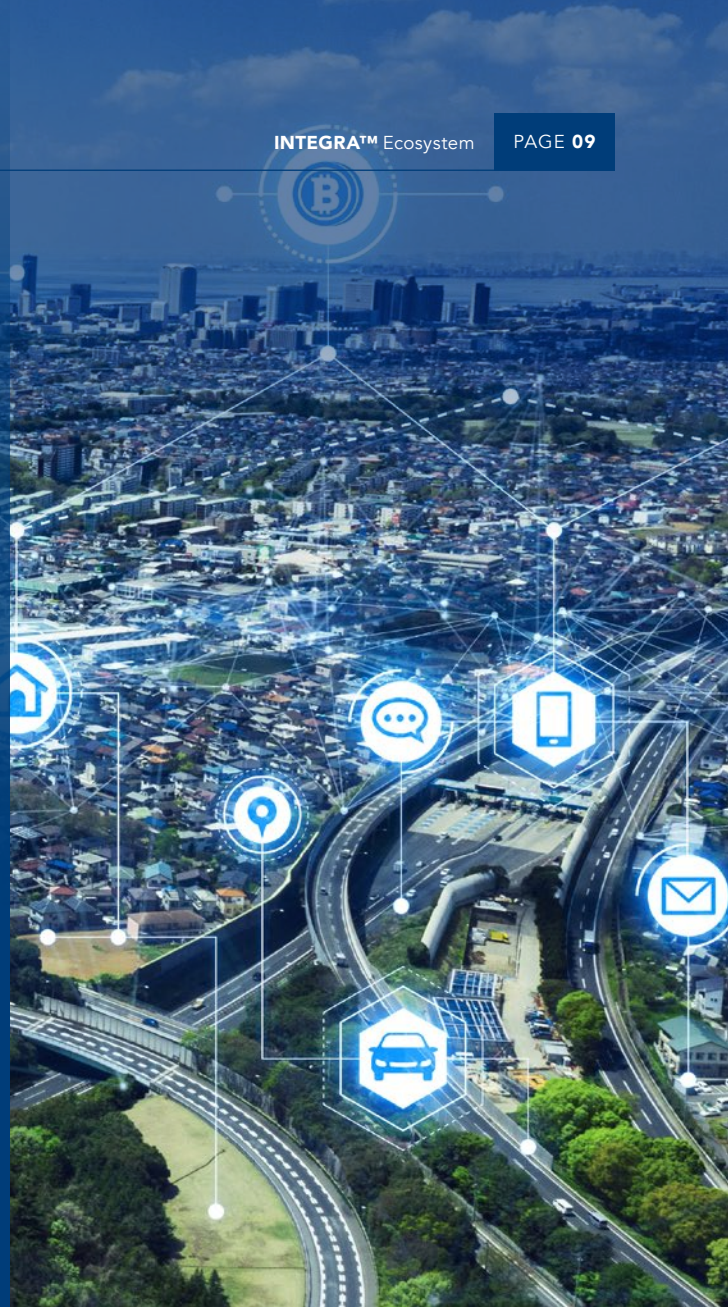
KEY FEATURES

|		
Smart City IoT platform	Ventilation, drainage, HVAC, MVAC, electrical management	Public Wi-Fi, networks
Infrastructure and mobility management	Building management	Data communications
Environmental Management	Security & access control	Parking infrastructure
Intelligent Lighting Control	Utilities management	Cross domain information

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FOCUS on Operational Intelligence, User Experience, Open APIs, BIS Connectivity, and Future-Focussed Architecture

INTEGRA's modern, intuitive graphical UX interface and robust design simplifies control room management and provides fast, granular monitoring, configuration, control, alarm management and analytics.
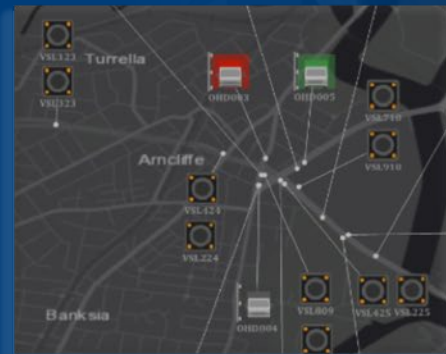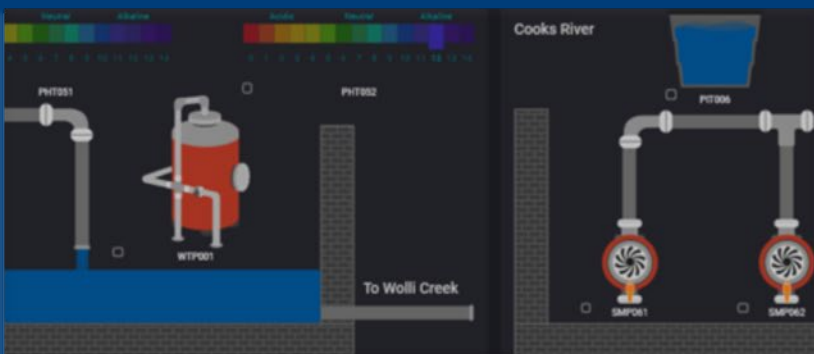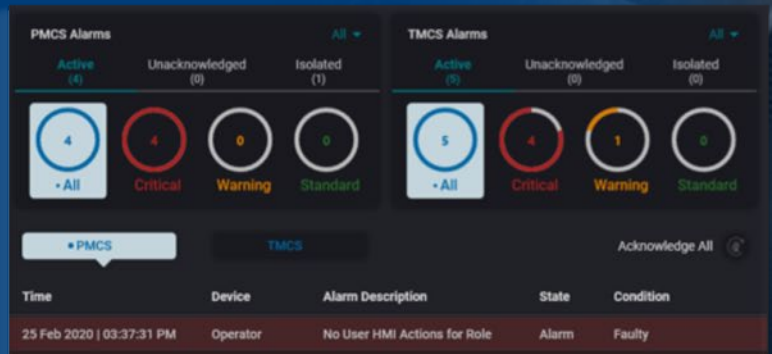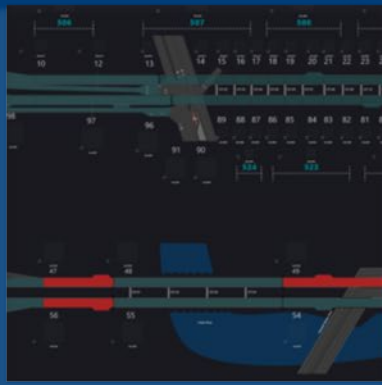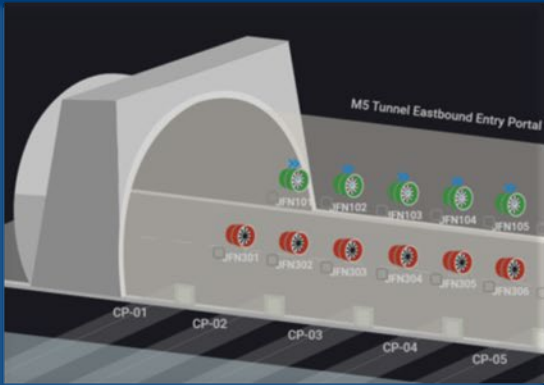
Recent/Current INTEGRA™ projects

M5E TUNNEL AND MANAGED MOTORWAY OMCS

As part of the RMS M5 East tunnel upgrade for Stage 2 WestConnex, UGL has upgraded the OMCS and installed M2M interface with RMS TMC, updating UGL's initial tunnel, motorway and ITS control system installed by UGL during tunnel construction

UGL role: Tunnel and motorway INTEGRA™ OMCS

CROSS RIVER RAIL BRISBANE

Commencing in 2019 the $5B project includes a 10.2 km rail line from Dutton Park to Bowen Hills in Brisbane, including a 5.9 km tunnel under the Brisbane River, four underground stations and two station upgrades.

UGL role: Tunnel and station M&E D&C with INTEGRA™ RAIL and BMS and 24 years' maintenance
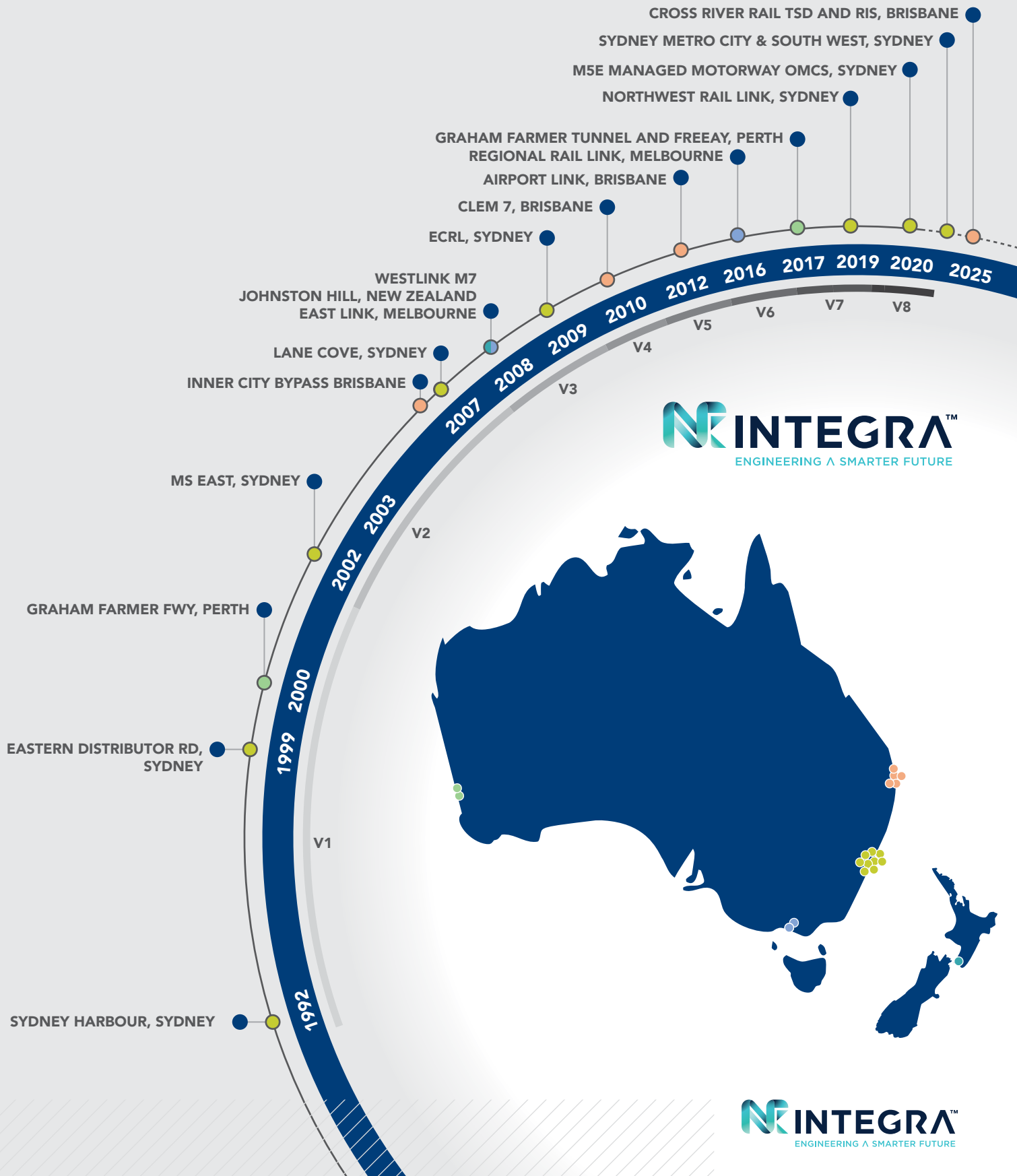

SYDNEY METRO NORTHWEST

Sydney Metro North West is Sydney's largest rail project ever. It includes 15.5 km of twin rail tunnels, 4 km of viaduct and eight new stations.

UGL role: Tunnel and station M&E construction, O&M, and installation of INTEGRA's Power Control System (PCS) and Tunnel Ventilation Control System (TVCS).

	PROJECT	LOCATION	COMPLETION	OMCS/CCS/BMS
1	Sydney Metro South West Rail	Sydney	Current	✓
2	Cross River Rail TSD	Brisbane	Current	✓
3	Cross River Rail RIS	Brisbane	Current	BMS ✓
4	Sydney Metro Northwest Rail	Sydney	2019	✓
5	M5E Tunnel and Managed Motorway	Sydney	2019/2020	✓
6	Graham Farmer Tunnel and Freeway	Perth	2017/2018	✓
7	North Connex	Sydney	N/A	PMCS ✓
8	Regional Rail Link	Melbourne	2016	✓
9	Airport Link	Brisbane	2012	✓
10	Clem Jones Tunnel	Brisbane	2010	✓
11	Epping Chatswood Rail Link	Sydney	2009	✓
12	Johnston Hill Tunnel NZ	Auckland	2009	PMCS ✓
13	Westlink Motorway M7	Sydney	2008	✓
14	EastLink	Melbourne	2008	✓
15	Lane Cove Tunnel	Sydney	2007	✓
16	Inner City Bypass	Brisbane	2003	✓
17	M5 East	Sydney	2002	✓
18	Graham Farmer Freeway	Perth	2000	✓
19	Eastern Distributer	Sydney	1999	✓
20	Sydney Harbour Tunnel	Sydney	1992	✓

CROSS RIVER RAIL TSD AND RIS, BRISBANE

SYDNEY METRO CITY & SOUTH WEST, SYDNEY

M5E MANAGED MOTORWAY OMCS, SYDNEY

NORTHWEST RAIL LINK, SYDNEY

GRAHAM FARMER TUNNEL AND FREEAY, PERTH
REGIONAL RAIL LINK, MELBOURNE

AIRPORT LINK, BRISBANE

CLEM 7, BRISBANE

ECRL, SYDNEY

WESTLINK M7
JOHNSTON HILL, NEW ZEALAND
EAST LINK, MELBOURNE

LANE COVE, SYDNEY

INNER CITY BYPASS BRISBANE

MS EAST, SYDNEY

GRAHAM FARMER FWY, PERTH

EASTERN DISTRIBUTOR RD,
SYDNEY

SYDNEY HARBOUR, SYDNEY

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V1

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UGL Smart Transportation Solutions

Market leader in end-to-end technology solutions

This state-of-the art, user-friendly and innovative UGL system is designed to streamline control and operations management – so that you can work with confidence.

Whatever your needs are for a project, INTEGRA™ has got you covered.

More Information:
Selvin Kottaram
Head of Engineering
ITS and Technology

Level 8, 40 Miller Street, North Sydney, New South Wales, 2060, Australia
T (+61) 2 8925 8925

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