

**Project Controls Expo UK - 13<sup>th</sup> November 2019**  
Emirates Arsenal Stadium, London

# The application of project controls to change the way we work

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**Ammar M Hajiya**

Project Controls Director, Arcadis



# About me



**Project and Programme Controls Director**  
**Head of Project and Programme Controls Rail – Infrastructure**

Industries	Oil & Gas	Power	Rail	Aviation	Highways
Disciplines	Project Controls	Project Mgt	Six Sigma Lean	Performance Mgt	
Delivery	EPC	PM/CM	Corporate		
Career	Bechtel	Arcadis			
Experience	20 years				



**Arcadis**

**Improving Quality of Life**



# Arcadis in perspective

Number of projects

35,000+

Employees worldwide

27,354

Countries where Arcadis  
has completed projects

70+



Number of employees

Continental Europe	6,149
North America	5,589
United Kingdom	4,792
Asia	4,133
CallisonRTKL	1,753
Middle East	1,666
Latin America	1,413
Australia Pacific	1,244

Countries with offices

40+





## Our Passion

Improve quality of life and be recognised as the best.

## Our Goals

- Create sustainable solutions
- Deliver exceptional outcomes
- Realise people's potential
- Enjoy the journey



# Our Values

**PEOPLE FIRST:** We care for each other and create a safe and respectful working environment where our people can grow, perform, and succeed.

**INTEGRITY:** We always work to the highest professional and ethical standards and establish trust by being open, honest and responsible.

**CLIENT SUCCESS:** We are passionate about our clients' success and bring insights, agility, and innovation to co-create value.

**COLLABORATION:** We value the power of diversity and our global capabilities and deliver excellence by working as One Arcadis.

**SUSTAINABILITY:** We base our actions for clients and communities on environmental responsibility and social and economic advancement.



# Case Studies – Arcadis Infrastructure Major Programmes : Aviation, Rail and Highways



# AT ARCADIS

We believe a best-in-class programme and project controls strategy considers the following components:



## CLIENT NEED

We recognize the key trends and challenges that we see across the industry, including: **Market Change** : the environment has never been more time and cost conscious; **Digitization** : technologies present both opportunity, disruption and complexity for all our clients; **Capacity & Skills** : attraction and retention of talent and skills is key. **Perception & Benefits** : projects that have been set up for success will have highly effective project controls functions that consider three core elements; people, process and systems; **Customer Expectations** and **Project Insights & Data** : forward looking, integrated advice and insightful reports are the key to delivering successful outcomes.

## OUR APPROACH

**Schedule, Cost & Interface Management** : creating actionable plans to align time and cost delivery, reporting and forward-looking analysis with objectives & priorities.

**Risk & Opportunity Management** : enabling increased certainty and predictability in successfully achieving project, programme and business objectives.

**Change Control & Scope Management** : embedding a comprehensive service, delivering a robust change culture, with pace, transparency and assurance.

**Benchmarking & Knowledge Transfer** : embedding new capabilities and ways of working in client organizations while transferring skills and knowledge.

**Performance, Insight & Reporting** : providing access to centralized digitization of a single source of truth reducing inefficiencies using Lean and BIM and enabling forward-looking insight

## OUTCOMES

**Integrated** reporting, enabling efficient use of leadership time to focus on priorities. **Robust and timely** management information to underpin decisions on investments, performance and interventions. A **control framework** and operating model which gives assurance, clear accountability and instills **confidence** for stakeholders and investors. Lower **risk delivery** through proportionate, integrated portfolio, programme and project controls. Clear understanding of the relationship between **outcomes**, **asset** management and **investment** lifecycles. Programme and project controls **capability** set up for success and responsive to changes across the asset lifecycle

## WHY ARCADIS?

Unlocking value at every step we work with clients to implement their project controls strategy; we set the processes and procedures and create a controlled environment and standardise reporting – one version of the truth.

We enable and empower the project office responsible for the business and technical management of programme delivery. Our approach is client-focused, sector-agnostic, and configurable to the specific needs of each assignment. By investing in engagement and relationships, we drive lasting benefit.

## RECENT EXAMPLES



Network Rail | Digital Railway Programme, and Trans Pennine Route Upgrade



Highways England | Lower Thames Crossing, and East of England



Aviation | London City Airport and Manchester Airport Transformation Programme

**Ammar Hajiya** | Project Director  
Capability Lead, Project and  
Programme Controls

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# Our Project Controls Service Model

**CLIENT OUTCOME:** Actionable plans to align delivery with business objectives & priorities

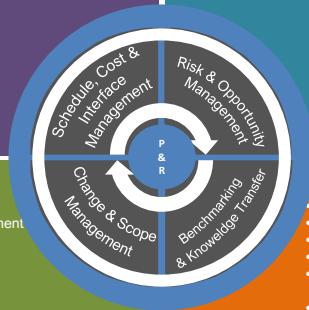
**Achieved via:**

- Tender & bid management
- Integrated programme / project planning
- Scope management and control account creation
- Schedule and cost planning and baselines
- Schedule and cost budgeting quality assurance
- Cost management tool sets
- Interface management and coordination
- Time and cost progress validation and assurance
- Cost and time claims management

**CLIENT OUTCOME:** Increased certainty and predictability in successfully achieving objectives

**Achieved via:**

- Risk strategy and appetite setting
- Audits, due diligence & risk maturity modelling
- Embedding risk culture and good practice
- Strategic risk and value workshops
- ERM Systems, tools and registers
- Risk performance reporting & process assurance
- Quantitative cost & schedule risk analyses & contingency setting



**Achieved via:**

- Change control strategies and process
- Scope, schedule, cost and risk baseline management
- Identification & engagement of stakeholders
- Change impact and outcome communication
- Scope measurement & analytics
- Lessons learnt & Stakeholder management
- Business case & change champions
- Communication & continuous improvement plan

**Achieved via:**

- PMO / individual capability & maturity measurement
- Body of knowledge of best tested & proven practices
- Capability expectations for individuals and teams
- Competence assessment and benchmarking toolset
- Client owned competency certification and career development framework
- Capability management reporting and analysis tools, knowledge & competence trend analytics and insight

**CLIENT OUTCOME:** A robust change culture, with pace, transparency and assurance

**CLIENT OUTCOME:** New capabilities and ways of working with increased efficiencies and use of skills

**PERFORMANCE & REPORTING - CLIENT OUTCOME:** digitization of a single source of truth reducing inefficiencies and enabling forward-looking insight



# Aviation: Manchester Airport Transformation Programme (MAN-TP)

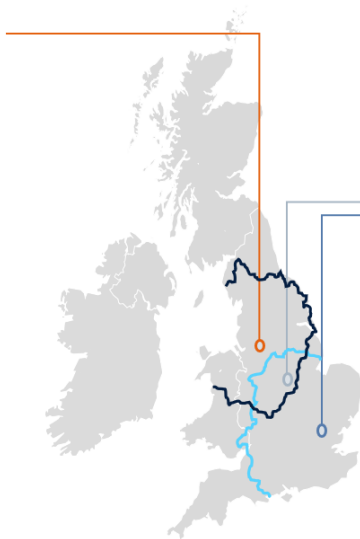


# MANCHESTER AIRPORTS GROUP (MAG)

## Manchester Airport - MAN

- 28.3m passengers in 2018
- **UK's 3rd largest airport**
- 70+ airlines & 200+ destinations
- 2 runways with potential **62% spare capacity**
- 21m people within a 2 hour drive

Catchment area within 2 hours' drive of:



## East Midlands Airport - EMA

- 4.9m passengers in 2018
- **UK's largest freight airport after Heathrow** – 31,834 tonnes p.a. (2018)
- Located next to key road interchanges – four hours from virtually all UK commerce

## London Stansted Airport – STN


- 28m passengers in 2018
- **UK's 4th largest airport**
- 150+ destinations
- 1 runway with **50% spare capacity**
- 25m people within two hours drive
- Acquired February 2013

## MAG Property

- MAG has a property portfolio of >£600m
- c.500 properties and 1,000 tenants







**60 new shops and restaurants**

**112 aircraft stands**

**10,000 new car parking spaces**

**24 new security lanes**

**127 new check-in desks**

**12 new baggage belts**

**200+ procurement packages**

**15,000 building services assets**

**35,000 programme activities**

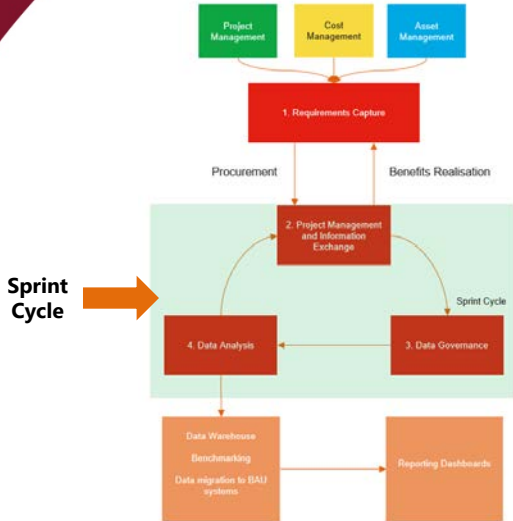
**5,000 contract communications**

**3,000 risk register entries**

**1,500,000 fire system data points**

**Manchester Airport Transformation Programme (MAN-TP)**

# INFORMATION MANAGEMENT AT ARCADIS



Arcadis Way for Program Management Overview

TEMPLATES

TRAINING RESOURCES

PROCESSES

CASE STUDIES

Arcadis Way for Program Management Overview

Shortcuts to SOP Capability areas

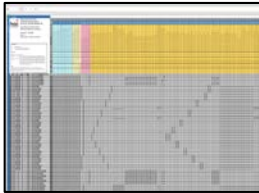
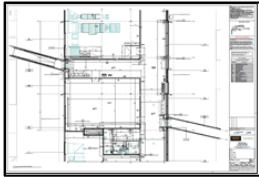
- Baseline Development and Change Control
- Cost and Commercial Management
- Information and Systems Management
- Procurement Management and Tendering
- Risk Management
- Sustainability
- Benefits and Business Change
- Design Management
- Investment Assessment
- Procurement and Supply Chain Management
- Program Management
- Program Management
- Value Management
- Programs Union and Delivery
- Governance
- Leadership and Organization
- Program Status
- Risks and Issues Management
- Capital Investment Planning
- Health, Safety and Environment Management
- Operational-readiness Reduction and Integration
- Quality Assurance and Control
- Stakeholder Engagement



# THE SOLUTION: DATA VISUALISATION

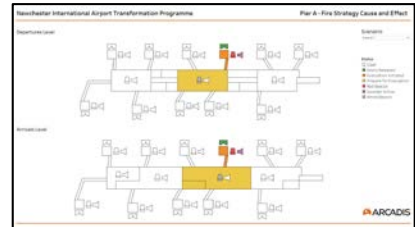
Input

Layouts / Datasets

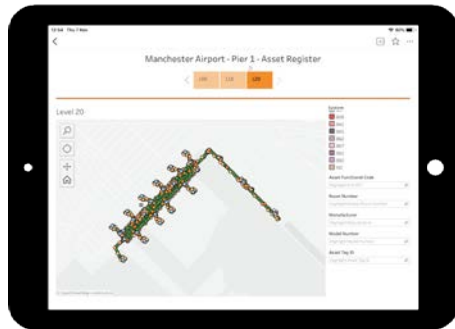
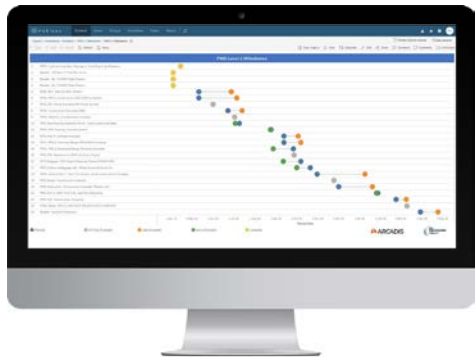


Output

Bespoke Visualisations



# BETTER ACCESS TO INFORMATION



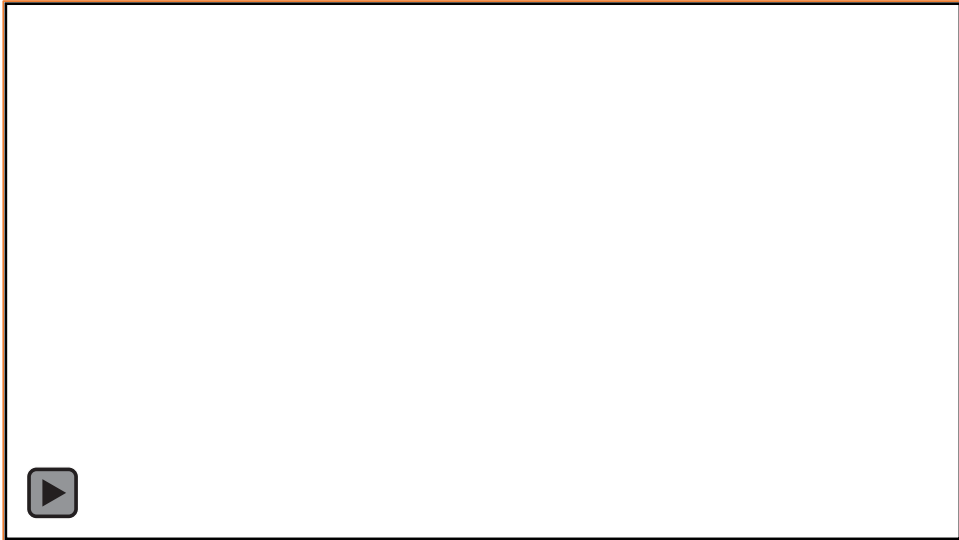
# OPERATIONAL READINESS



# SCHEDULE MANAGEMENT

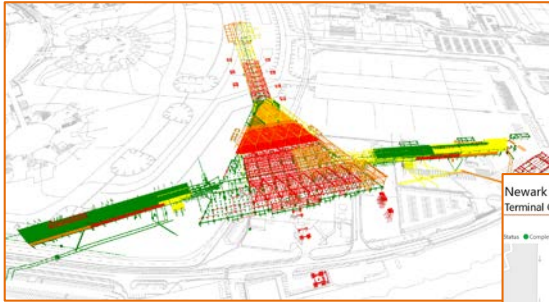


# SCENARIO PLANNING





# AN ADAPTABLE APPROACH



THE PORT AUTHORITY OF NY & NJ

**ARCADIS** Project Controls

### Newark Liberty International Airport Terminal One Redevelopment

Asset Location and Status (WIP)

Status: ● Completed ● Not Started

Completed and Not Yet Started by 121, Uniformat 2010 - L4 Code

Activity ID	Activity Name	Finish
PS14-35007	Masonry Partitions / KM Frames - Lev...	12/31/2019
PS14-35009	Overhead Plumbing Rough-in - Level...	12/31/2019
PS14-35727	Masonry Partitions / KM Frames - Lev...	12/31/2019
PS14-37160	Overhead Plumbing Rough-in - Level...	12/31/2019
PS14-36638	Column Enclosures - Level 2 Sector 28	12/30/2019
PS14-37736	Overhead Fire Protection Rough-in - L...	12/30/2019
PS14-36020	Overhead Plumbing Rough-in - Level...	12/27/2019
PS14-36547	Ceilings - Level 2 Sector 28	12/27/2019
PS14-36595	Overhead Plumbing Rough-in - Level...	12/27/2019
PS14-081-1902	Install Storage racks - Sector 12	12/27/2019
PS14-081-3328	Install Fire Alarm Devices - Level 1 Sec...	12/27/2019

Asset Installed (Finish Date)

8/5/2016 12/31/2019

REFRESH DATE: May 2019      VERSION: 1.0



# BENEFITS AND VALUE PROPOSITION



**Better  
Insights**



**Quicker  
Review**



**Client  
Experience**



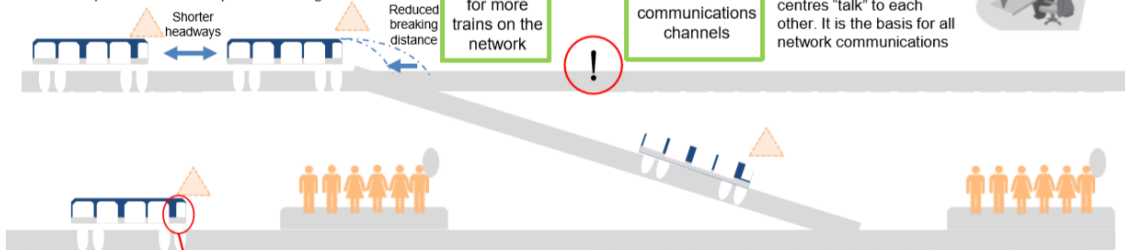
**Scalable  
Solution**

# Rail: Digital Railway Programme (DRP)



# Understand the Digital Railway

**ETCS** allows trains to get closer together through reducing the distance between trains whilst ensuring a safe breaking distance is maintained. It also allows train to run at optimal speeds dependent on the required breaking distance



Increases the capacity for more trains on the network

Provides safe and reliable communications channels

**Telecoms and Data** are how the trains and control centres "talk" to each other. It is the basis for all network communications

Automates and advises on activity for optimal speeds

**C-DAS and ATO** provides decision support information as well as optimise time allocation e.g. time taken to open and close doors



Optimises the flow of trains on the network

**Traffic Management** optimises the flow of trains on the network ensuring the most efficient timetabling and routing is used. This means if a problem occurs in one area the impact is managed in others



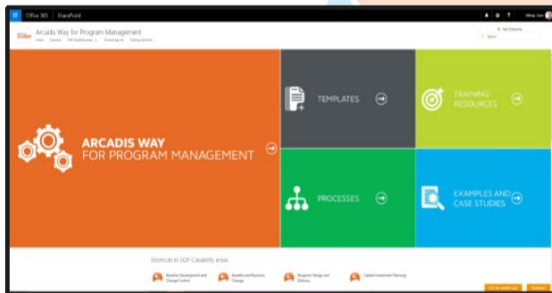
# Culture change

*"As our Delivery Partner, Arcadis is helping me to drive the can-do behaviors that we need, alongside the relentless need for continuous improvement"*

Michael Bridgeland – DRP Head of PMO



# Standard Operating Procedures (SOPs)



**The Arcadis Way** is standard processes and procedures used globally to provide the best ways to work together in a seamless end-to-end process, supporting us to consistently be our best.

**Standard Operating Procedures**



*The Arcadis Way of Program Management*



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# Leading Innovation

## DRP Hub

Digital Railway



## New Hub, New Look, New Features



- Collaboration** - dedicated team pages, enhanced sharing of information
- Core Information** - vision, benefits, values, components and capability
- Key Features** - quick links to vital programme information
- Video** - briefings, stand-up, interactive lessons learned
- Key Resources** - document templates, jargon buster, induction pack
- Search** - intelligent tool delivering efficient results

<https://gdr.hub.networkrail.co.uk/sites/drp/Pages/hub-home.aspx>



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# Leading Innovation

Digital Railway

## DRP APP



# DRP CP6 Launched !



**CP6 DRP Programme Execution Plan (PEP), Control Period 6 Programme Baseline and Programme Controls process execution plans established !**



# A balance of process, people and systems

## PROCESS & GOVERNANCE



## PEOPLE



## SYSTEMS



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# Benefits and Value Proposition



**Scalable  
Solutions**



**More  
Efficient  
Reporting**



**Developed  
Behaviours**



**Better  
Insight**



**Greater  
Programme  
Control**



**Developed  
leadership  
capabilities**

# Highways: Lower Thames Crossing (LTC)

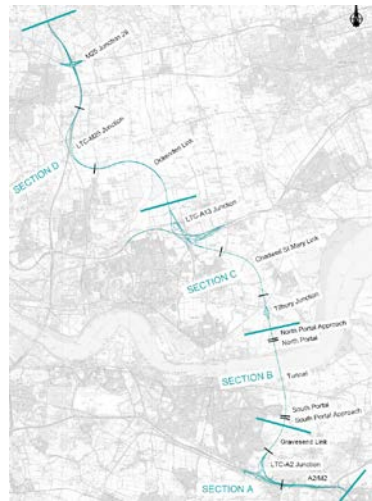


# Highways England – Lower Thames Crossing Technical Partner

The Lower Thames Crossing Project represents a once in a generation opportunity to connect communities and businesses in Thurrock, Essex, Kent and beyond. It will unlock journeys for our customers across the whole region east of London. It is also the largest single road investment in the UK for decades.

The Technical Partner together with Highways England needs to deliver a successful statutory consultation, DCO Application & Approval, Detailed Design, Procurement & Management of Contractor (s) to build, and handover for opening in 2027.

We work in partnership with our clients to deliver exceptional and sustainable outcomes through the application of deep market sector insights and collaborative Design, Consultancy, Engineering and Project Controls services.



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# In order to meet the client needs, our solutions have been digitized



## Cloud Database



- The creation of a central cloud database for all project information.
- Creates a single version of the truth
- A complete view of programme performance, with better insight and faster decision making
- Highlighting key project focus areas.
- Created with Azure



## Streamlined Visualisation of key data



- Improved reporting through Power BI
- Customised dashboards
- Accessible by all on the project
- Easily communicated
- 15% reduction in cost exposure
- 60% reduction in overdue risk reviews



## Custom User Interfaces



- Custom apps have been created for everything from budget and forecasting to health and wellbeing
- Interfaces customised for each team
- Links seamlessly with database to update key information in realtime



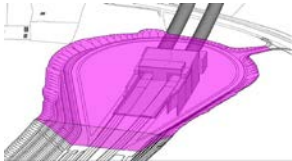
**Project Controls**  
EXPO  
London, UK

# BIM for advanced Design & Cost Estimating

## Client Need

With commercial pressures routinely plaguing large infrastructure projects, there is a clear need for Highways England to have a robust cost estimate to ensure that the commercial delivery can be tracked against the budget.

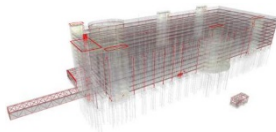
Recognising the need and opportunity for improvement, Highways England appointed Arcadis to key leadership and delivery roles in the Information Systems work package



## Arcadis' solution

Arcadis developed an Information Management solution that delivers controlled sharing of information and data for digital assurance processes (BIM). This will also enable digital costing.

In addition there has been an information security plan compliant with Highways England

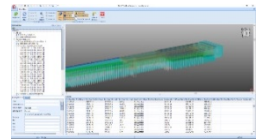


## The results

As agreed in the BEP (BIM Execution Plan) as part of the Information Management solution, the design engineer added Uniclass coding (UK standard classification system) to each object in the model.

This allowed our cost estimate teams to use BIM software to rapidly quantify and price the modelled elements based on this classification.

Placing additional specification data in the model such as quantity of reinforcement and blinding has further increased the efficiency of the pricing exercise.





# The effects of implementing digital solutions have been felt across the entire project

## Accuracy

The data is a crucial decision-making tool for project leadership as they can have a complete and accurate overview of project performance

## Capability

Knowledge and use of digital solutions has increased across the project

## Communication & Collaboration

With a single version of the truth, the people across the project can have meaningful conversations

## Increased Decision Making

The project leadership can now make well-informed decisions to improve performance and mitigate emerging issues



# So what has changed ?

**MAN – TP :** We have figured out how to make sense of the vast amount of data available to affect real-time decision making by focusing on data visualization techniques

**DRP :** BY taking the time to re-build the basic building blocks for Programme Controls on DRP, we have established a solid foundation for Controls and Governance that has set the right tone for CP6 delivery. It sounds simple, but how often in a business do we get the chance to do a full system reset?

**LTC :** The data is a crucial decision-making tool for project leadership as they can have a complete and accurate overview of project performance. With a single version of the truth, the people across the project can have meaningful conversations ..no more this not my data- accountability



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London, UK

An aerial night view of a city street with a railway line. The scene is illuminated by streetlights and building lights, creating a vibrant urban atmosphere. The railway tracks run diagonally across the center of the image. Buildings of various heights and styles line the streets, some with lit-up windows and facades. The overall color palette is dominated by blues, purples, and yellows from the artificial lighting.

Thank you

