

AGS Data Format

Enabling BIM Modelling of the Sub-surface

Dr Roger Chandler

4 Questions

- What is BIM and why is it important?
- Why are our delivery expectations changing?
- Is AGS data format helping BIM?
- What could we improve?

AGS Experience

- 1996 - Implemented AGS for an offshore CPT project in the Philippines
- 1997 - Joined UK AGS Data Format Committee
- 1998 - Founded Keynetix
- 2000 - Co-authored AGS-M
- 2012 - Autodesk Geotechnical Industry Partner (worldwide)

Q1: What is BIM and Why is it Important?

Building Information Modelling

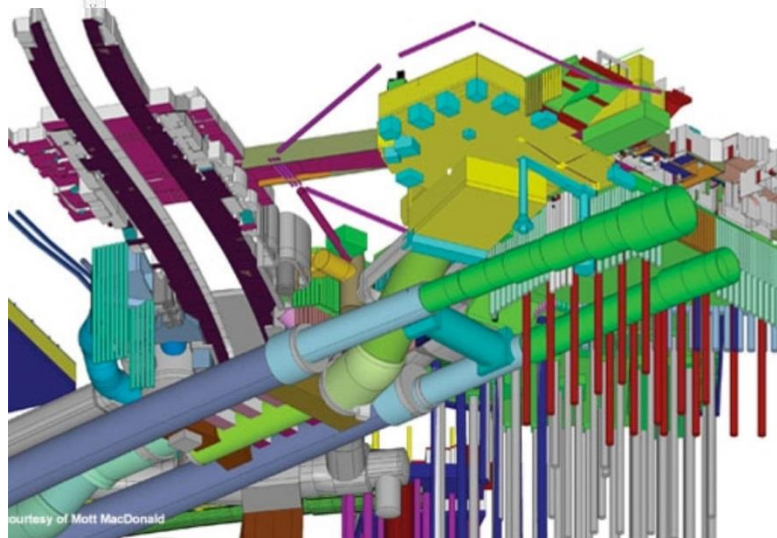
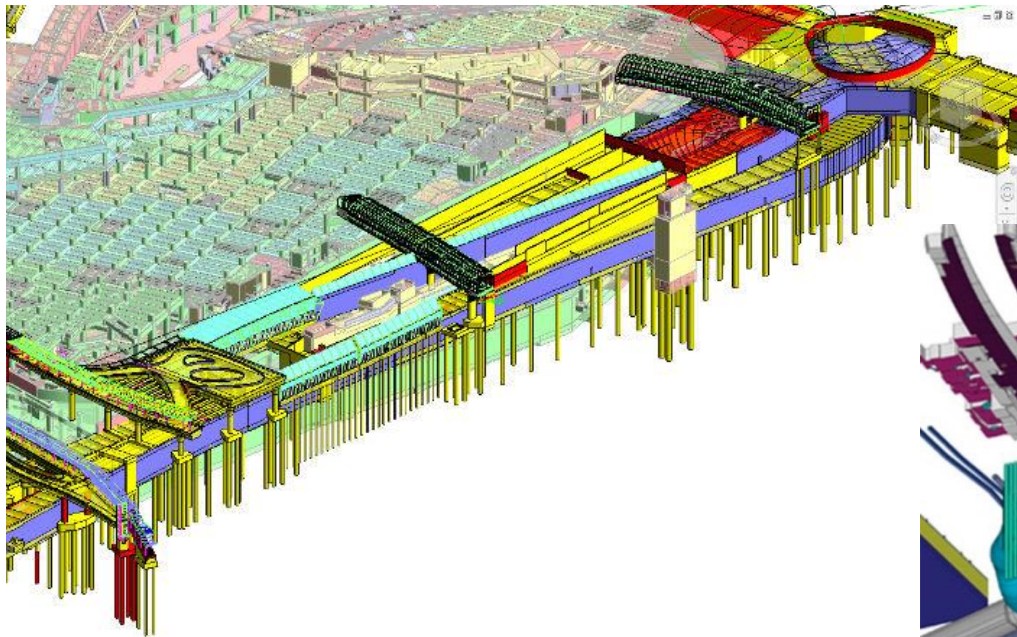


The Noun



The Verb

Where is the Geology?



2015 Excellence in Infrastructure



Geotechnical Data
Software Transformed

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ARUP

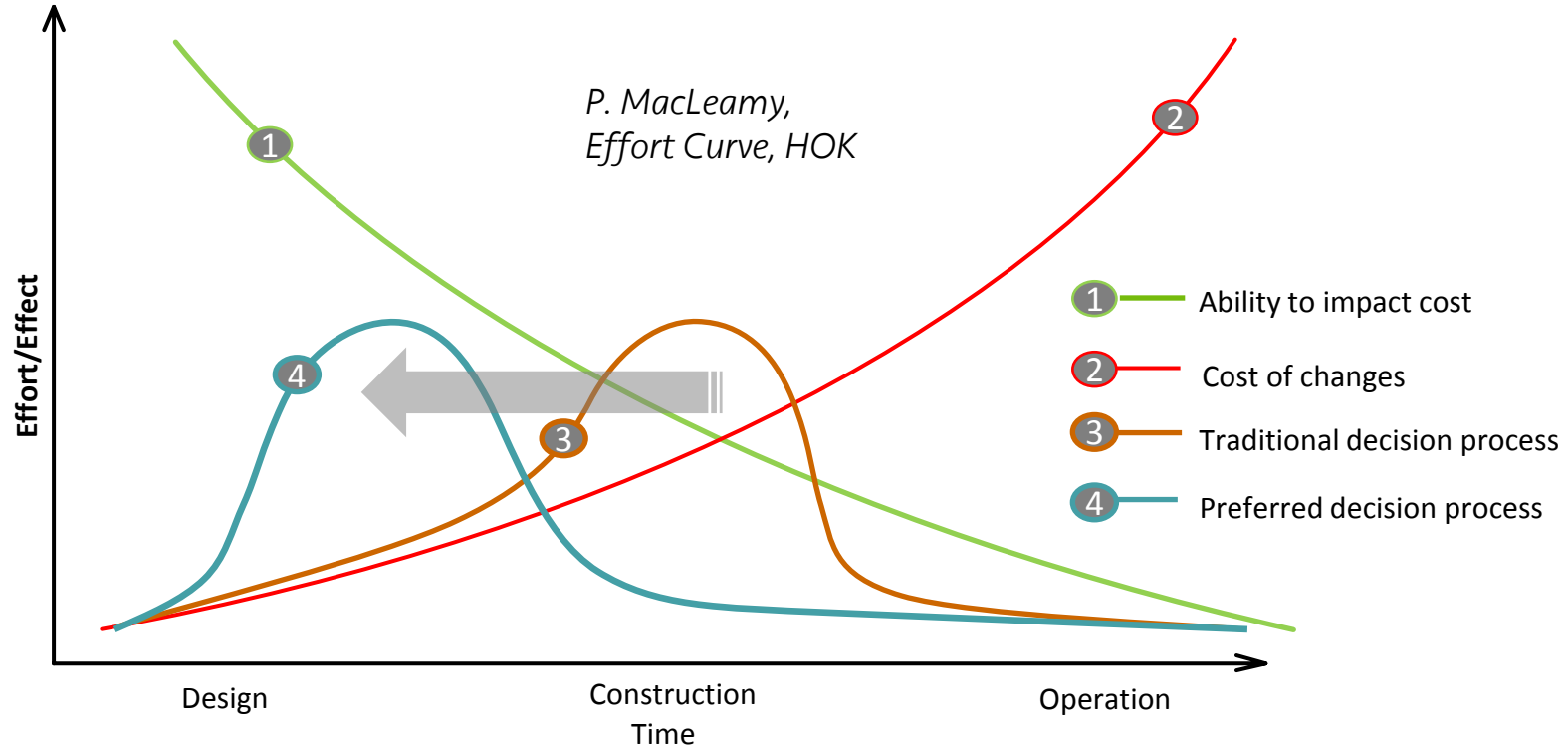


2015 Excellence in Infrastructure Winner

A BIM Definition

Is an intelligent 3D model base
process that provides insight for
creating and managing building and
infrastructure projects faster, more
economically, and with a less
environmental impact

Earlier Knowledge Reduces Risk

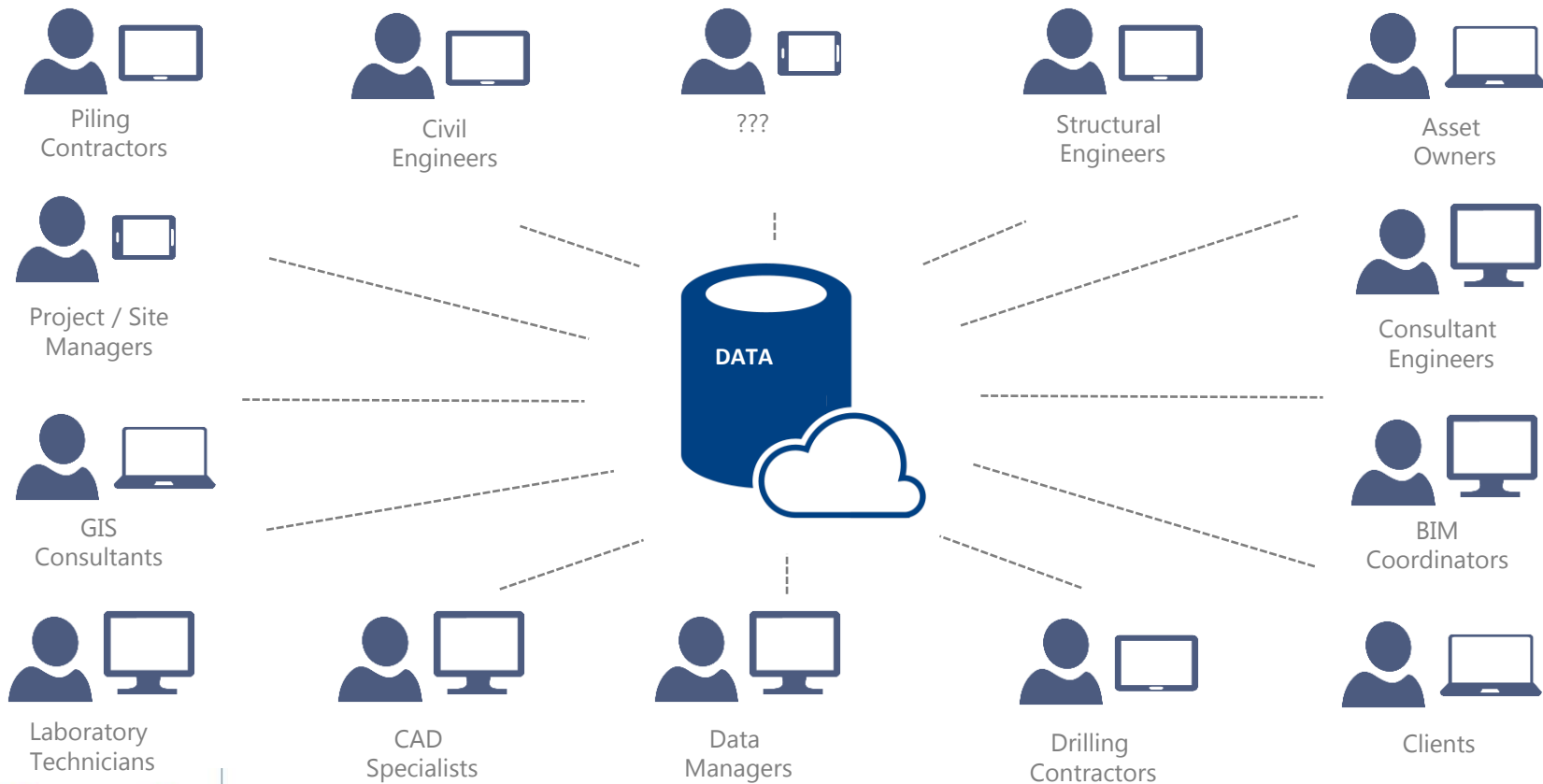


Early Site Investigation

“Early investigation allows the identification of any ground-related risks associated with a development so that they can be effectively managed and associated costs controlled”

AGS Guidelines for
Good Practice in Site Investigation

Improve collaboration throughout the wider supply chain



Key Components for BIM Process

- Data and Information
- Collaboration
- 3 Dimensions



“We’ve been doing BIM for years” ?

We've Been Doing BIM **Badly** for Years...

- Clients

"The clients never value the site investigation process"

- Consultants

"The AGS data was delivered 3 weeks after the paper report"

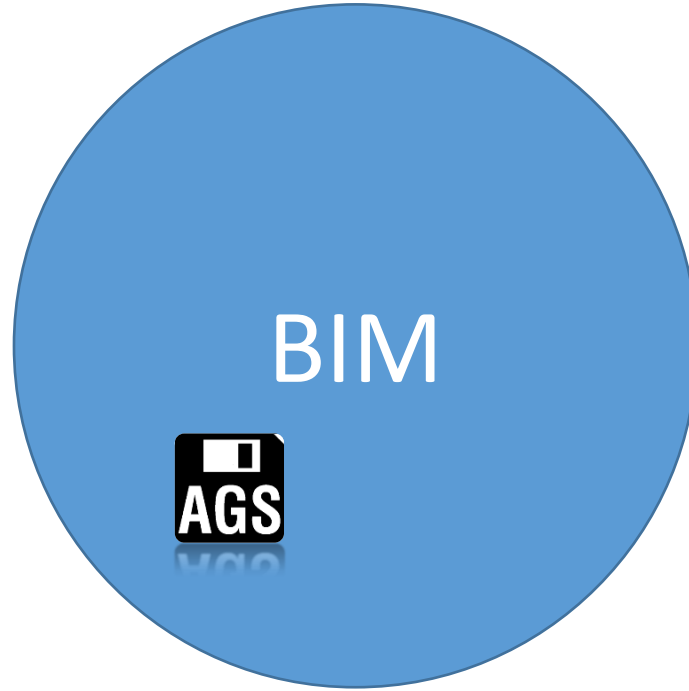
- Piling Contractors

"We never get the AGS data"

- Governments

"People rarely request AGS data"

AGS is a vital part of BIM



Q2 - Why are our delivery expectations changing?

Extinct?



Thriving?



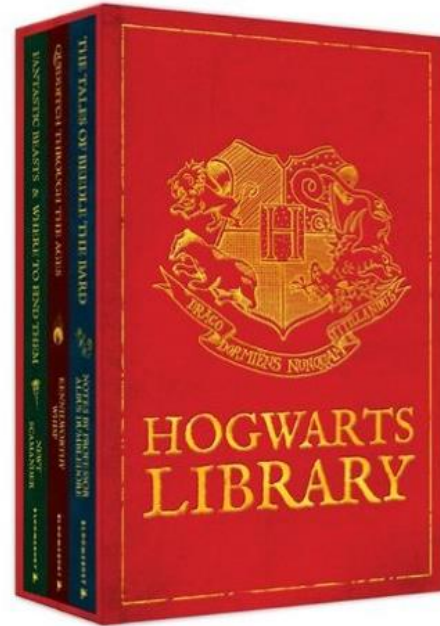
Extinct?



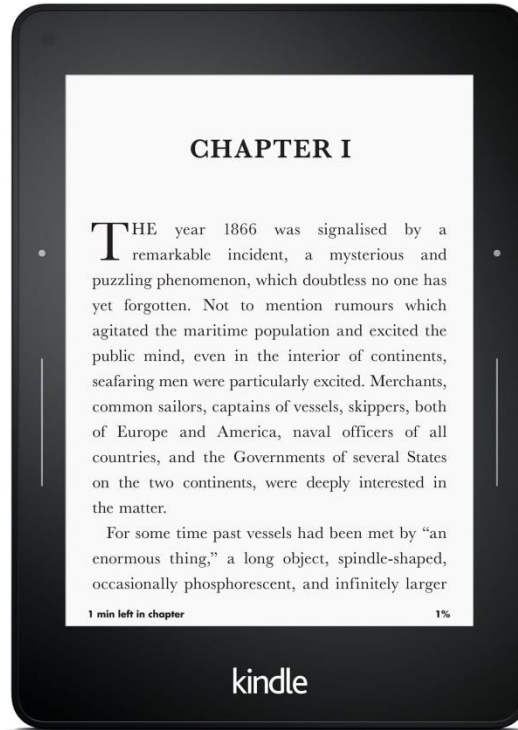
Thriving



Extinct or Endangered?



Thriving



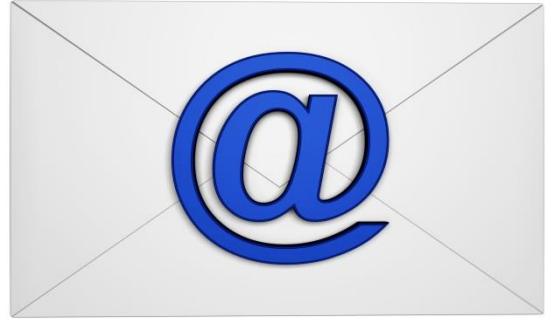
Extinct or Endangered?



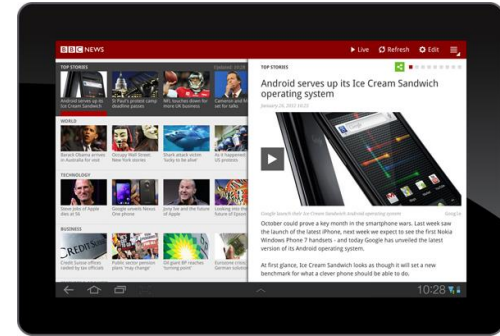
Thriving



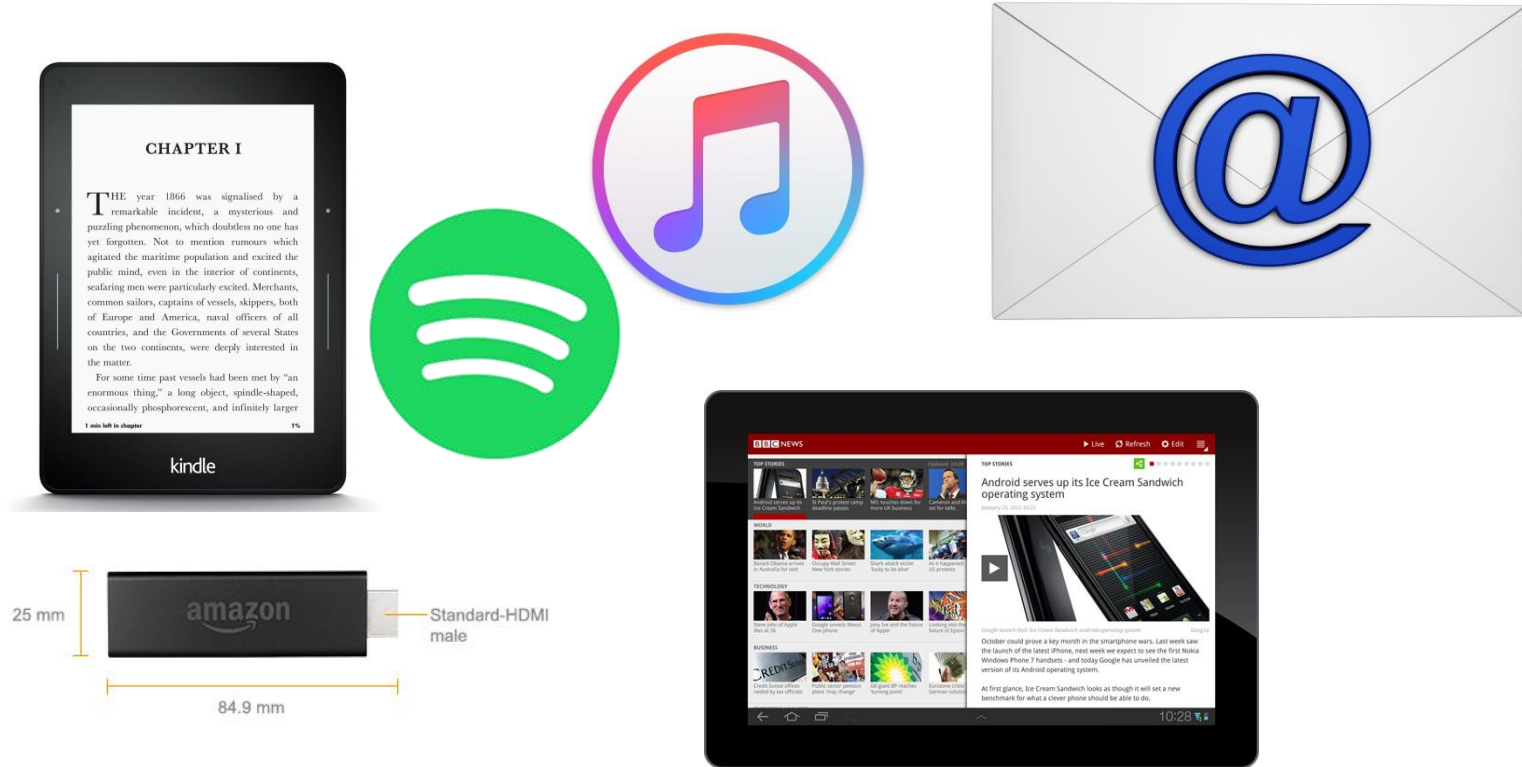
Slow Communication



Yesterday's News



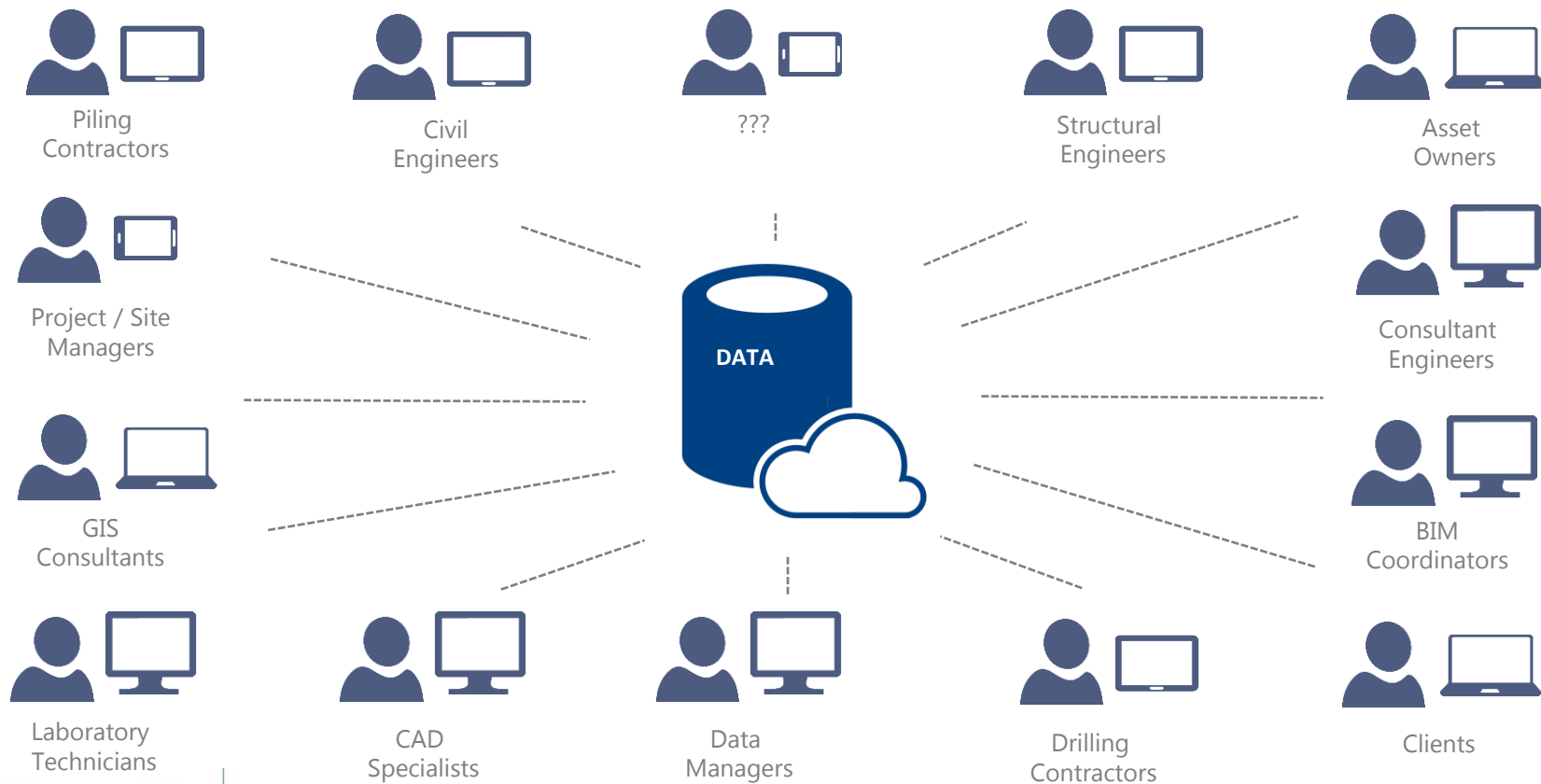
What Do These Have in Common?



Speed of Delivery* & Self Service

* without reduction in quality

Self Service and Speed of Delivery



Q3: Is AGS data format helping BIM?

1. Build upon and refine previous knowledge

- Why start from Scratch?





Previous Projects



ELEVATION GENERALE

VIADUC

NOUVEAU PONT HASSAN II

CULEE CREUSE

PONT
BASE NAUTIQUE

Station
Bouregreg

RAMPE TRAMWAY



Nouveau port fluvial

Station Pont
Moulay Hassan

Base nautique
et Restaurants

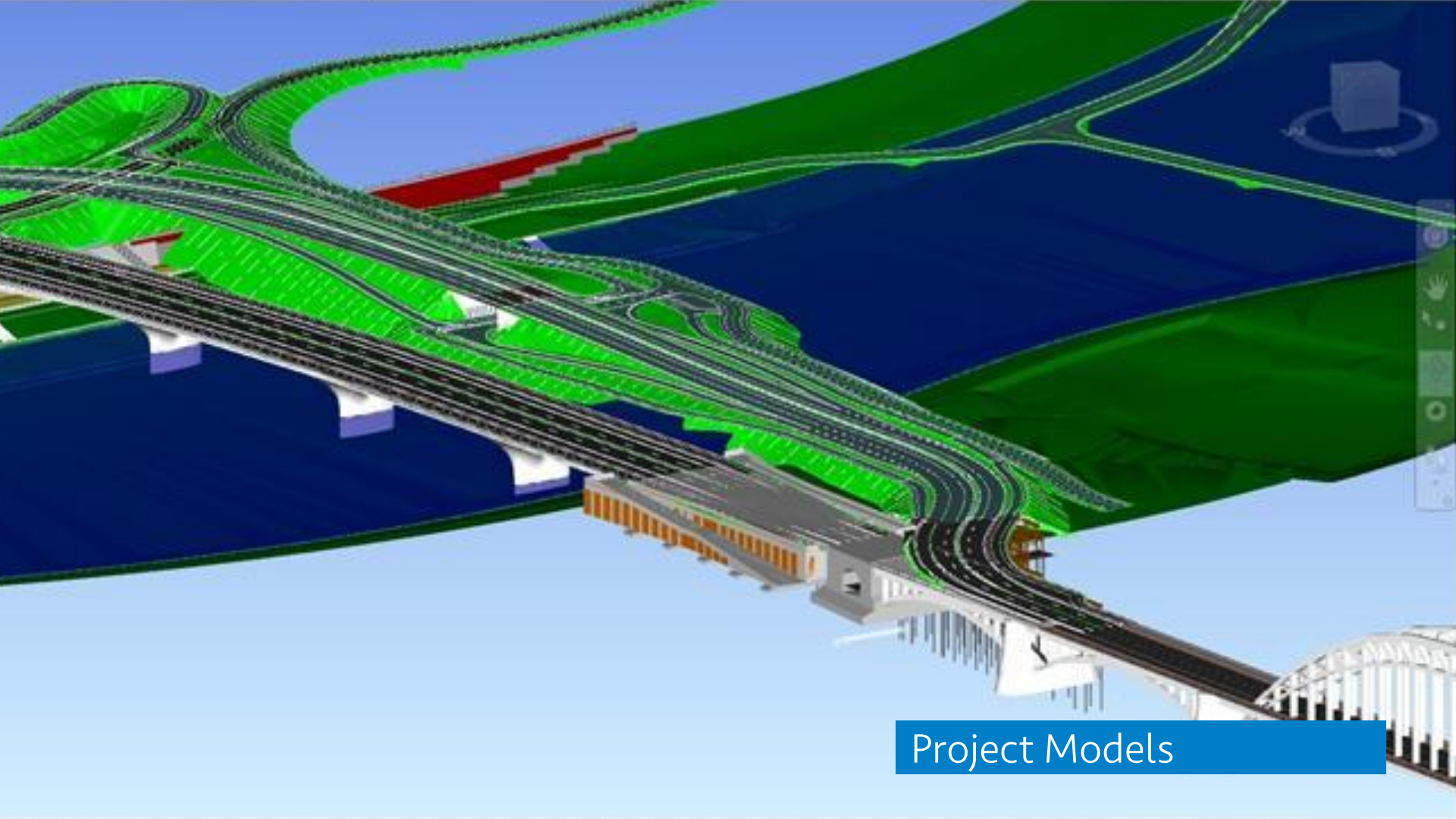
Tour Hassan

ROUTE DE LA
FALAISE

Makhlouf

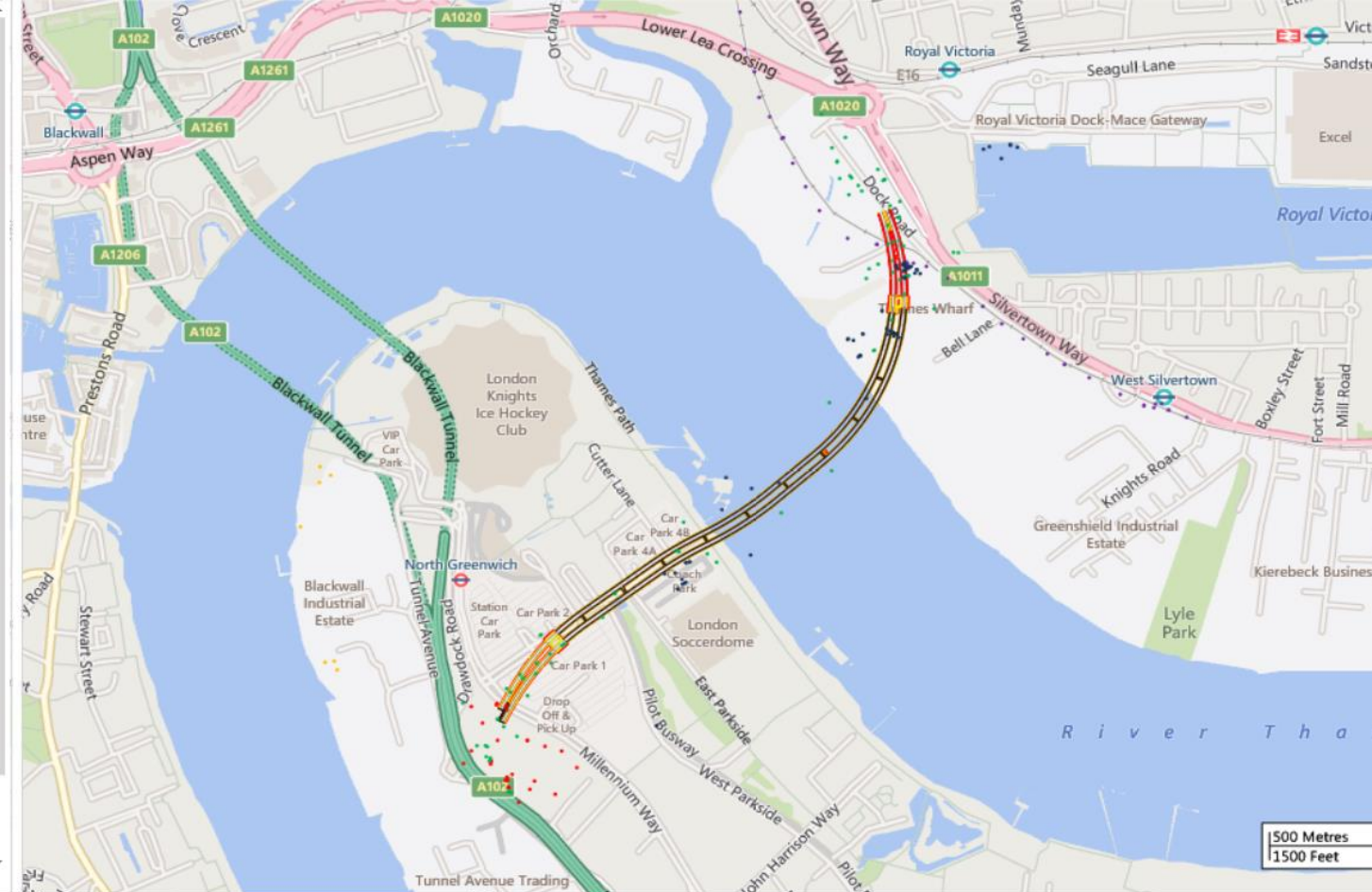
- LEGENDE
- Voies véhicules
 - Voies 2 roues
 - Voies piétons
 - Voies tramway

Site plans and drawings

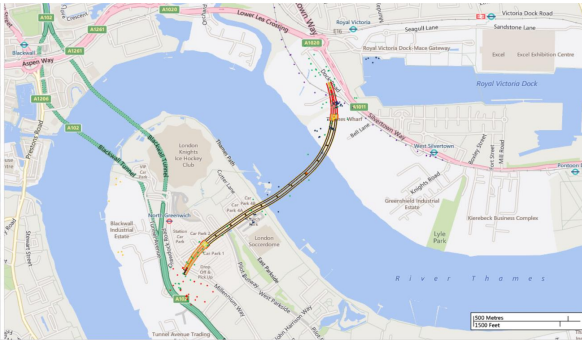


Project Models

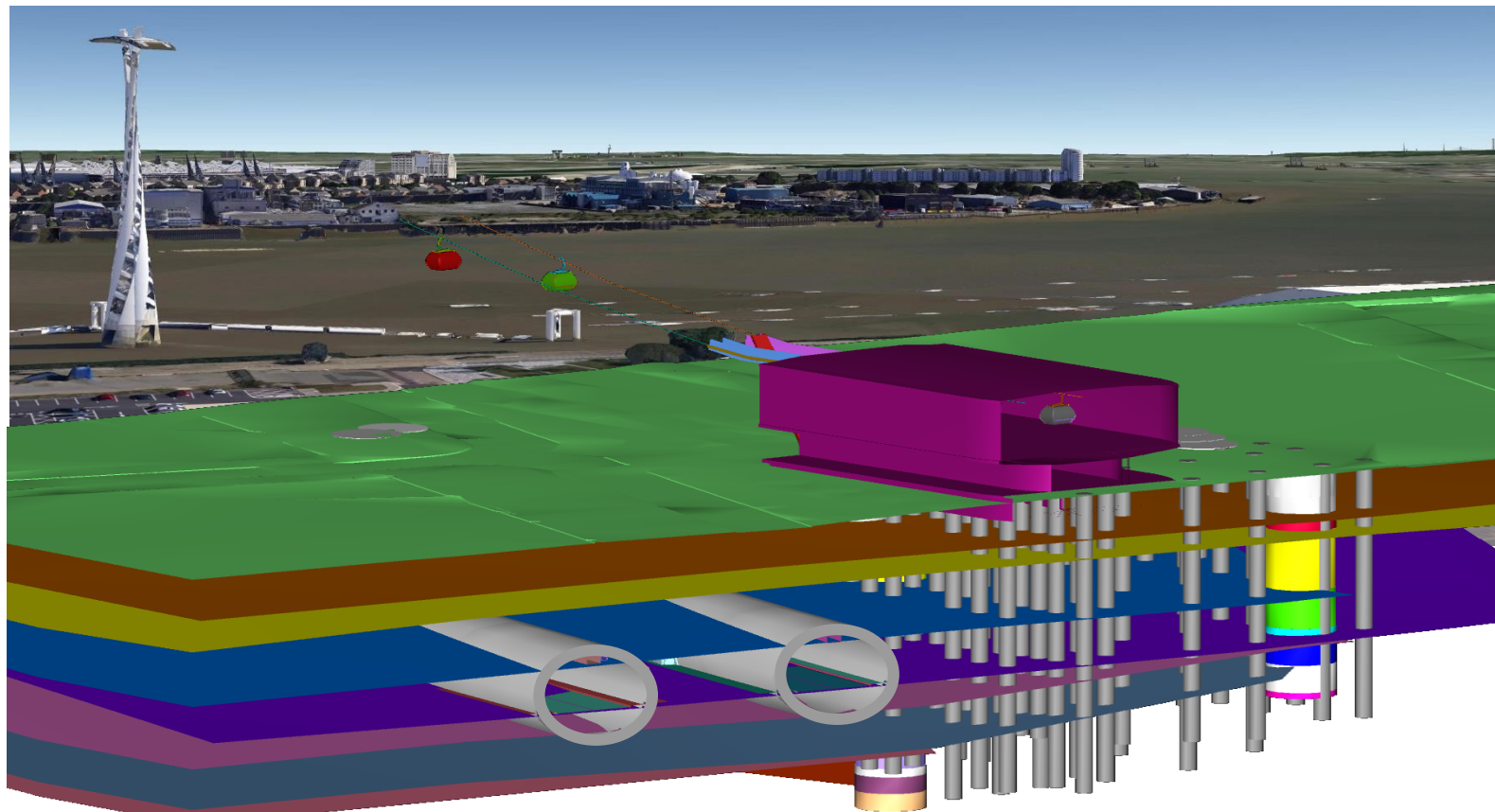
- Information Layers
 - Locations
 - Saved Searches
 - Location Groups
 - Groups
 - Cable Car
 - Cable Car
 - NewGI
 - NewGI
 - 2003 Gas Holder
 - 2003 Gas Holder
 - Peninsula River Walls
 - Peninsula River Walls
 - DLR LCY Extn
 - DLR LCY Extn
 - Bounds
 - Project
 - Imported Datasets
 - STWTN-ATK-GEN-XXXX-M2-Z-0014 - Tu
 - STWTN-ATK-GEN-XXXX-M2-Z-0016 - Nc
 - STWTN-ATK-GEN-XXXX-M2-Z-0017 - So
 - 20141014-RevisedGILocations



Silvertown Tunnel – Previous Investigations



- Docklands Light Railway
- Millennium dome
- Cable Car (same alignment as tunnel)
- Only needed 3 over water holes. (each one costing around £20,000)
- Estimated saving around £100,000

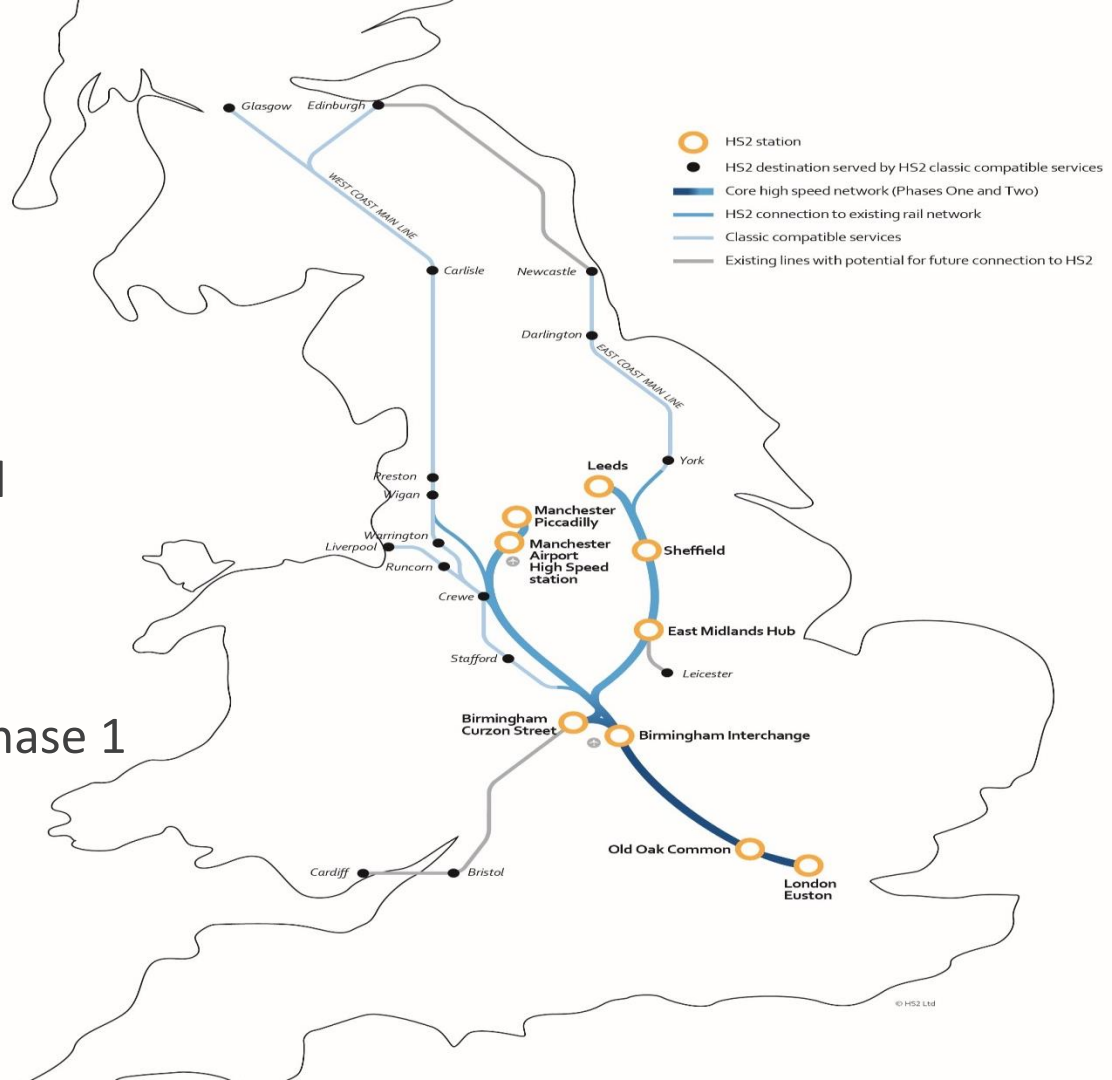


Silvertown Tunnel:
By kind permission of Transport for London

hs₂ *engine for growth*

Introduction...

- Two Phases
- Approximately 550 kilometres
- 400km/hour design speed
- 18 trains per hour
- Circa 20,000 seat/hour
- 60m gross tonnes/annum
- 700+ Design Elements - Phase 1



Ground Investigation Programme

£67m

PHASE 1 GI
VALUE

58

GIDM TEAM

9

FRAMEWORK
CONTRACTS

90+

WORK PACKAGES

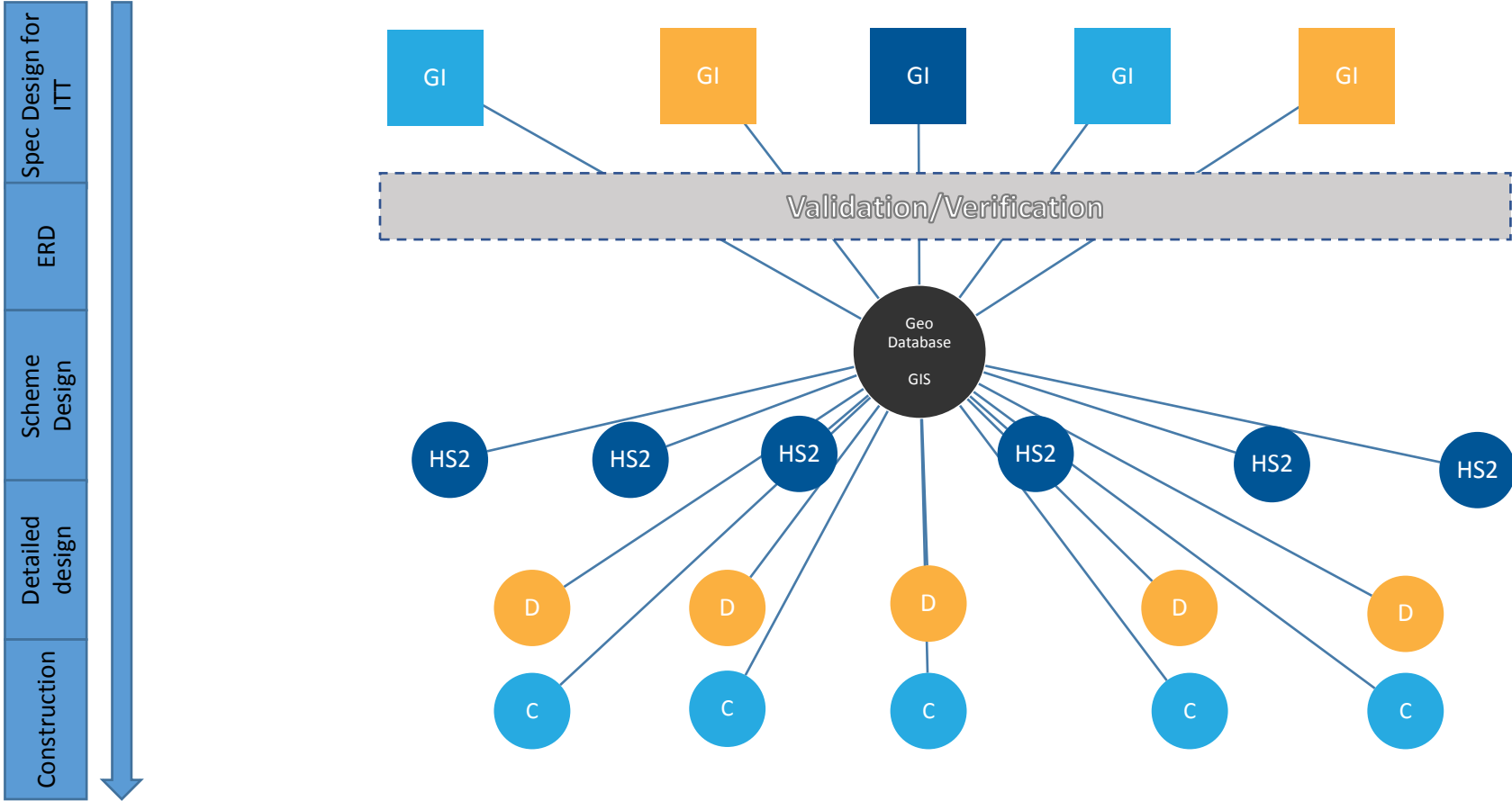
9000+

FIELDWORK
LOCATIONS

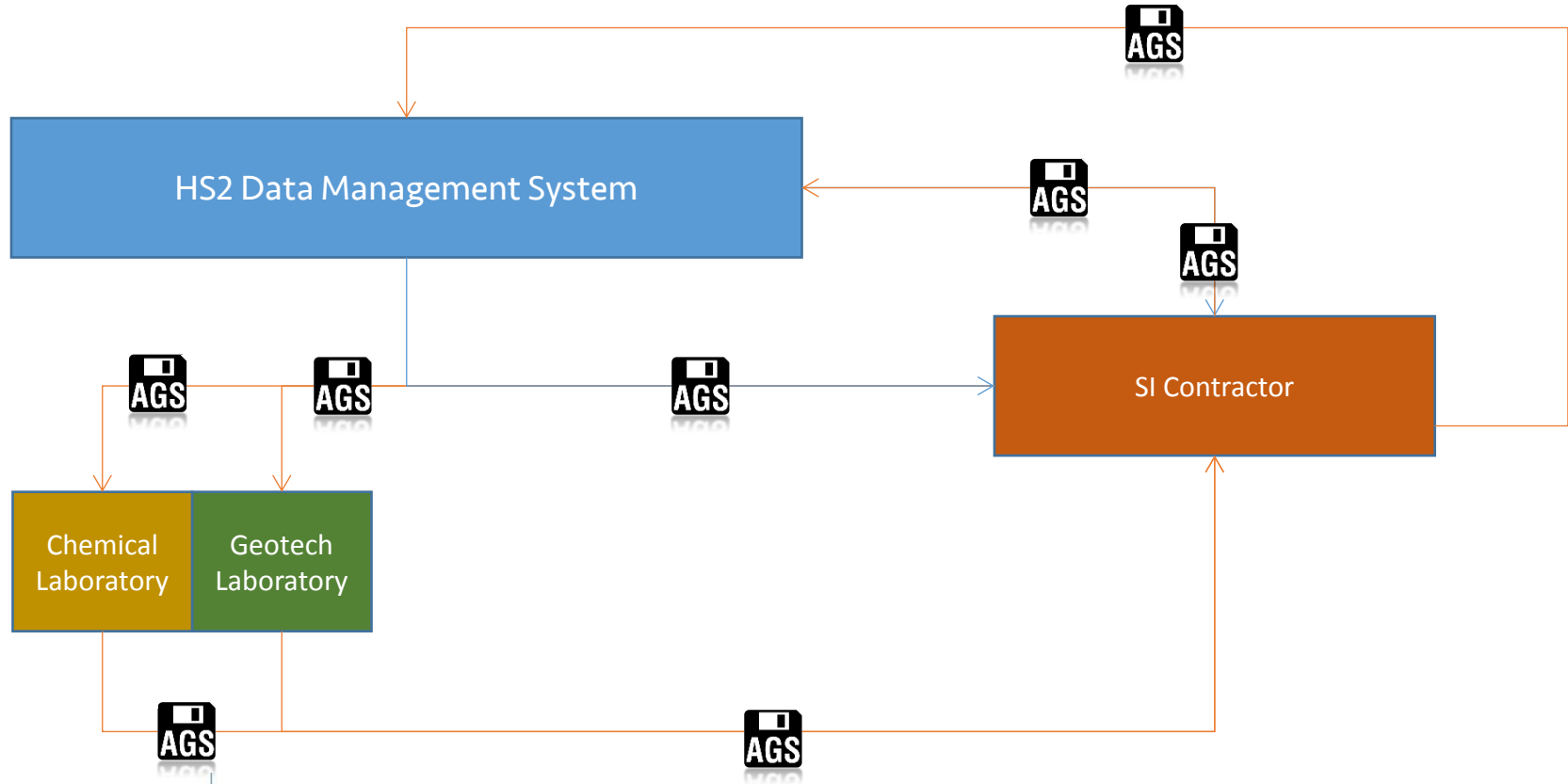
2015 - 17

(APRIL)
WORKS STARTED

AGS use in HS2



AGS Data Flow



Q4: What Could we Improve?

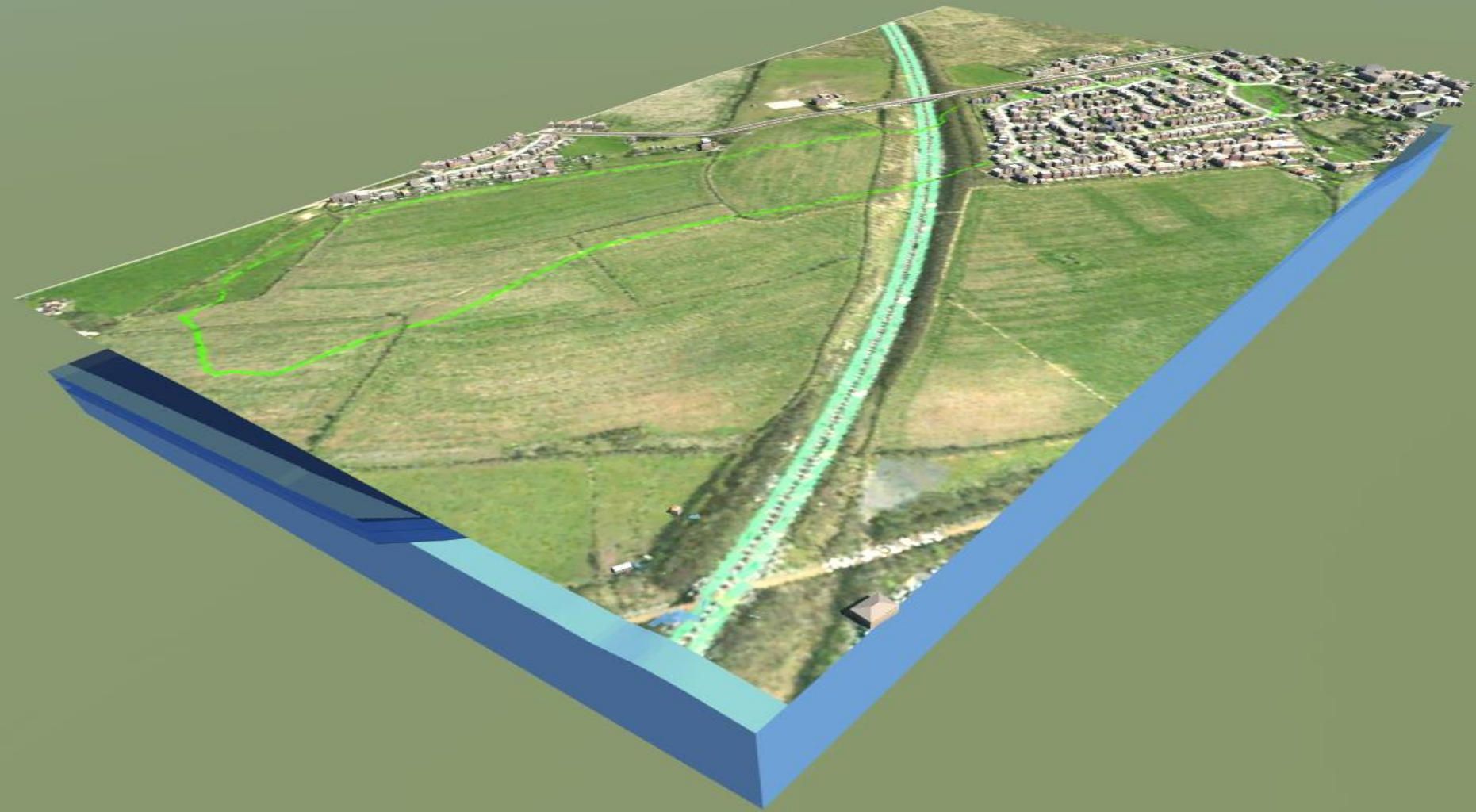
Using AGS and BIM to Help Your Client Understand Their Problem

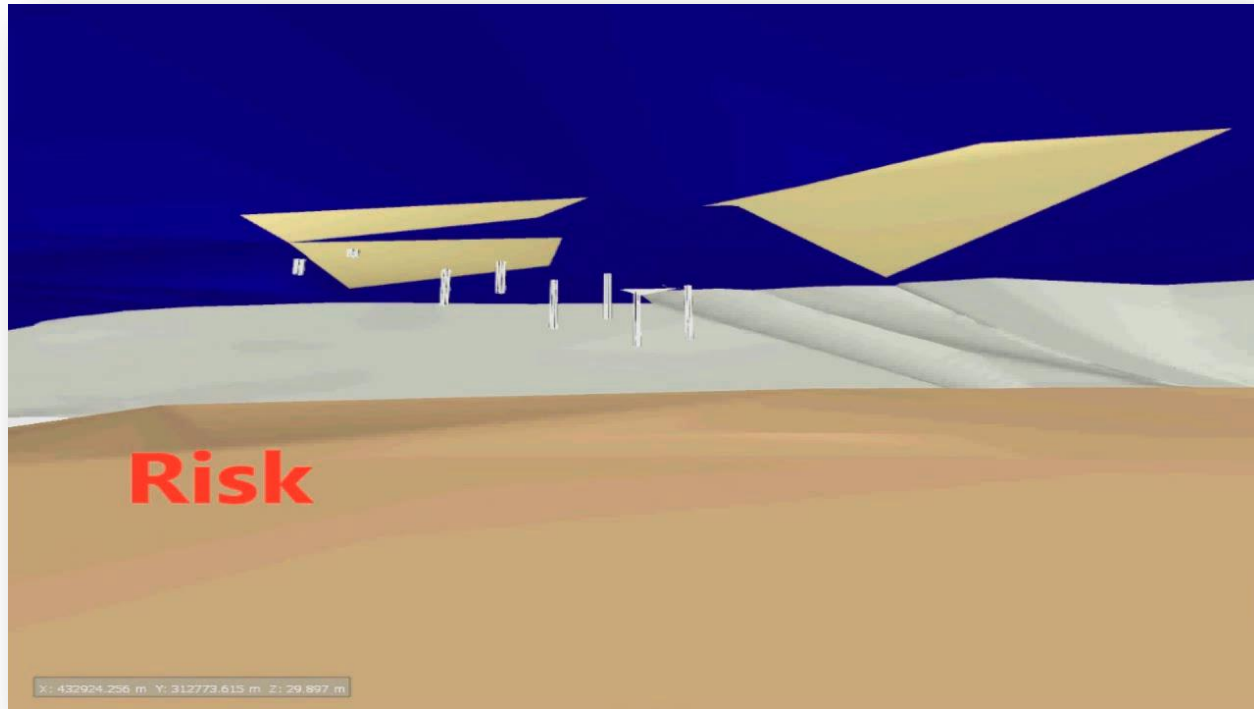
Help Your Client Think in 3D



Geotechnical Data
Software Transformed

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Rapid access to newly captured SI data

Rapid access to newly captured SI data

The golden rules

1. Enter data only once
2. Get someone else to do it

Log as close to source as possible and use electronic transfer





[illegible]

M1 – Smart Motorway



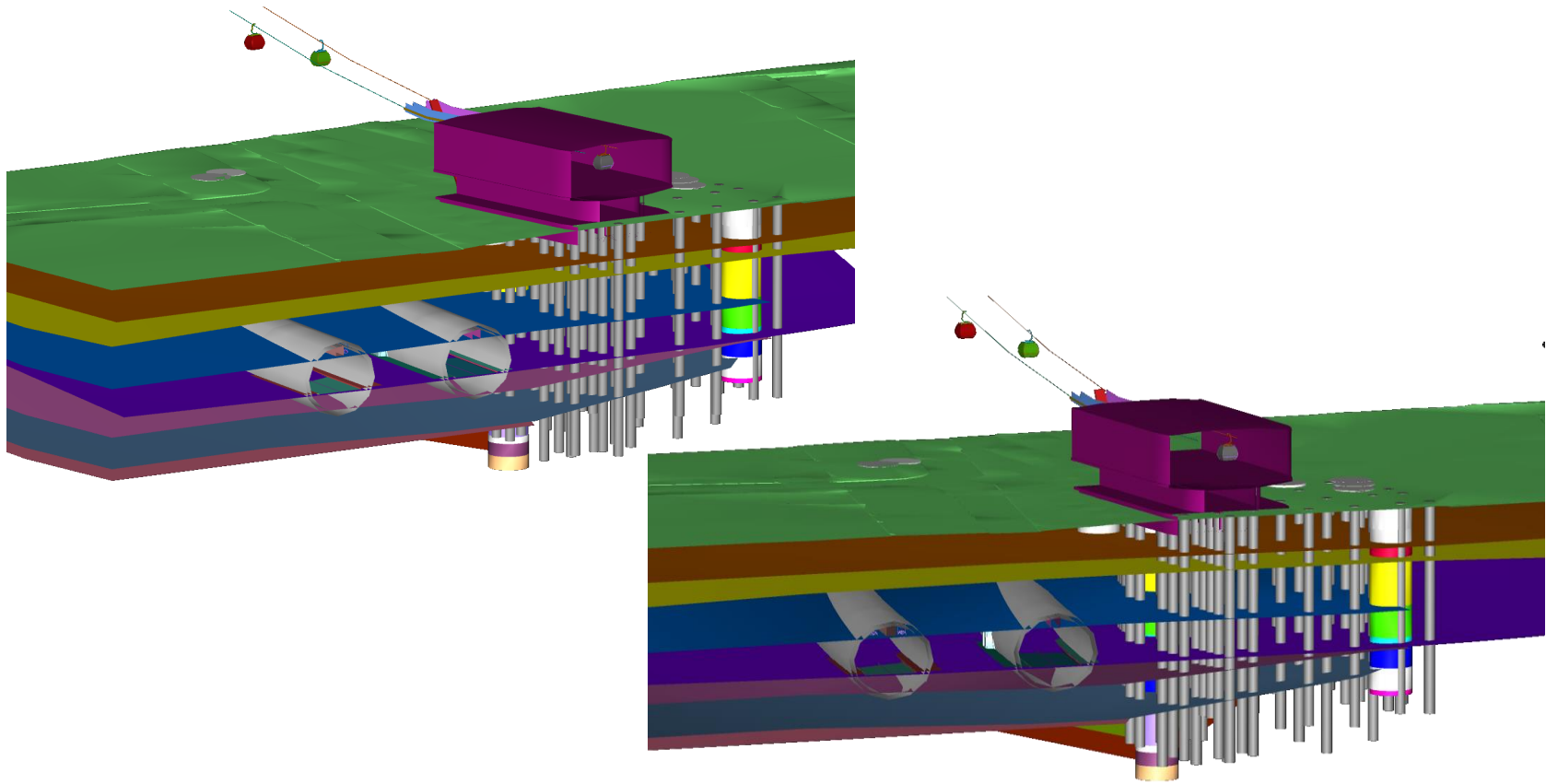
M1 J19 – J16 – Smart Motoroway

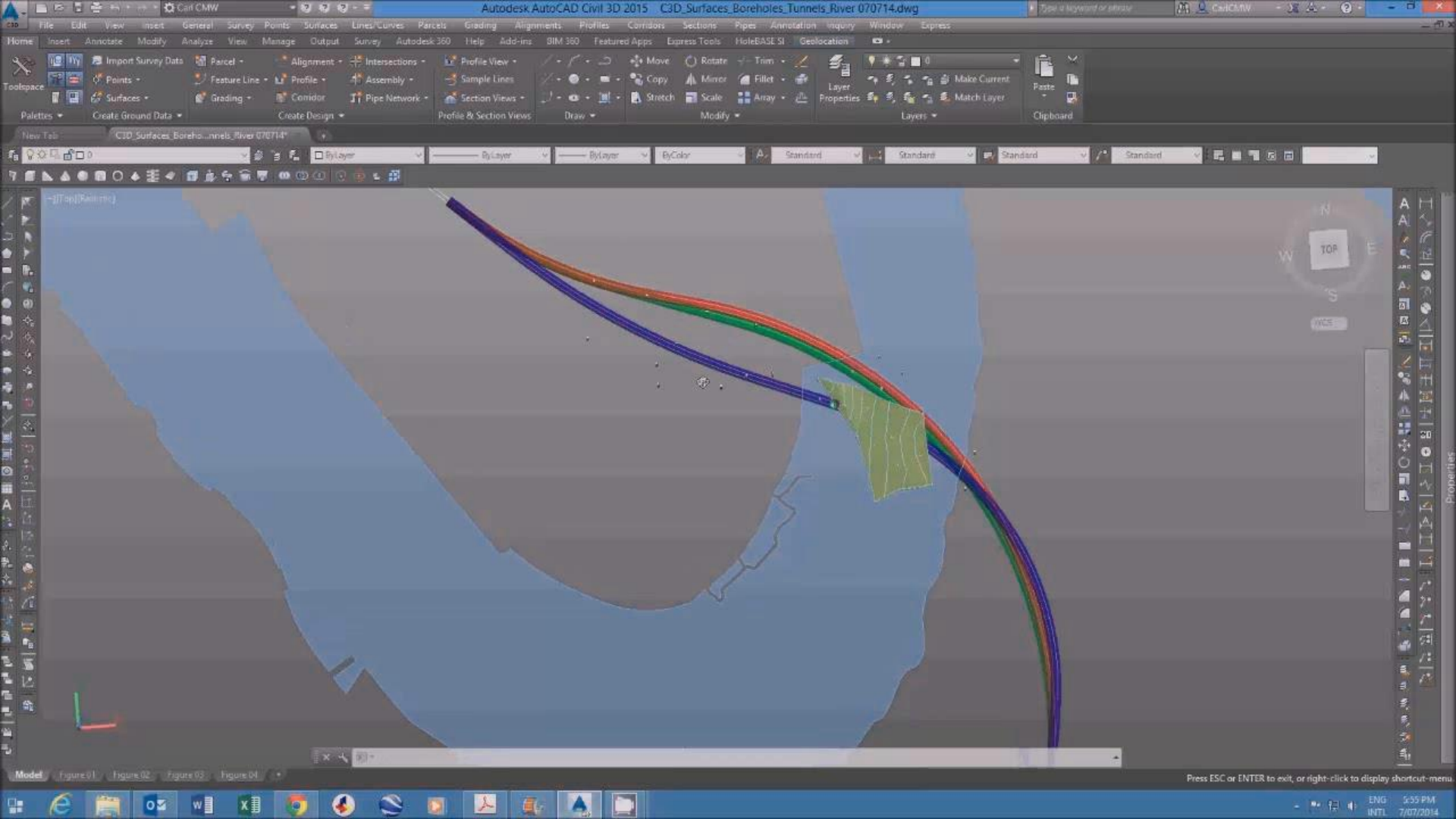
ATKINS

- 125 boreholes
- 31 “sites”
- SI design modified as work progressed

**Better understand and visualise
data in context**





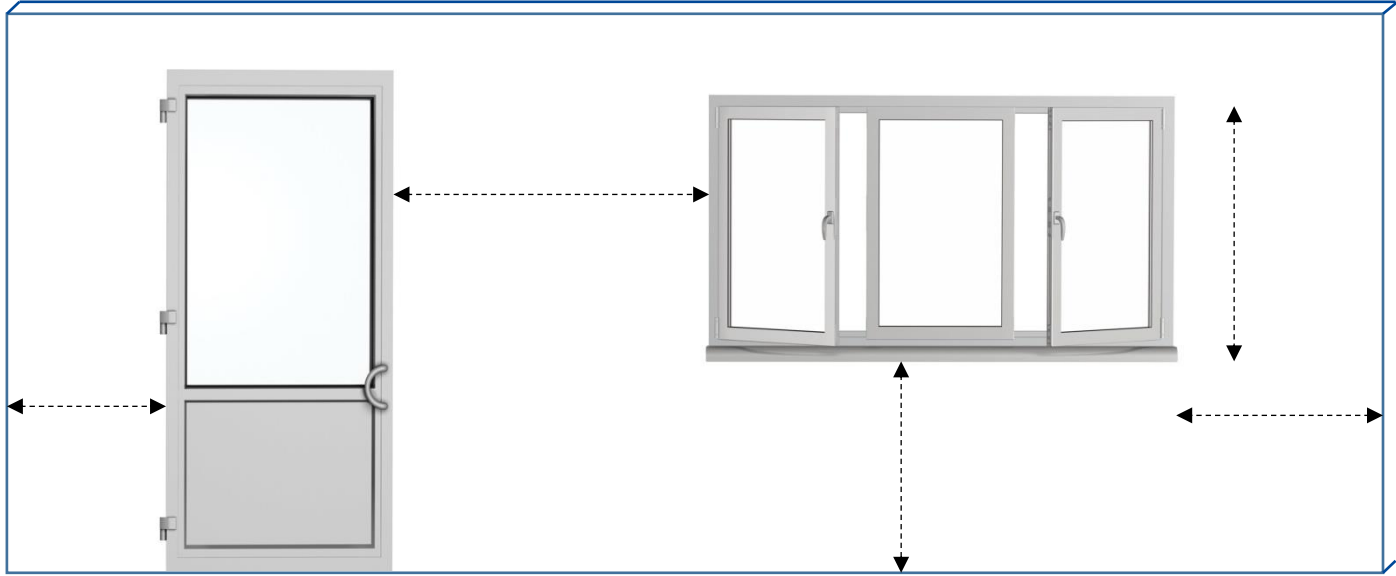


Better understand and visualise data in context

- Rapidly view down hole data
- In context with the proposed site plan
- Better understand where potential problems may occur

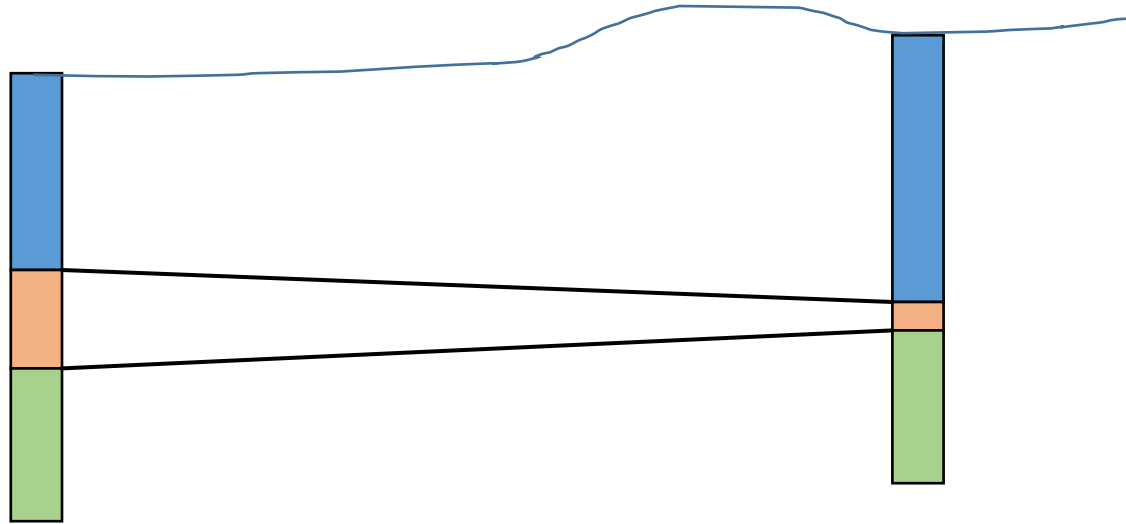
Communicate Uncertainty

BIM Relationships



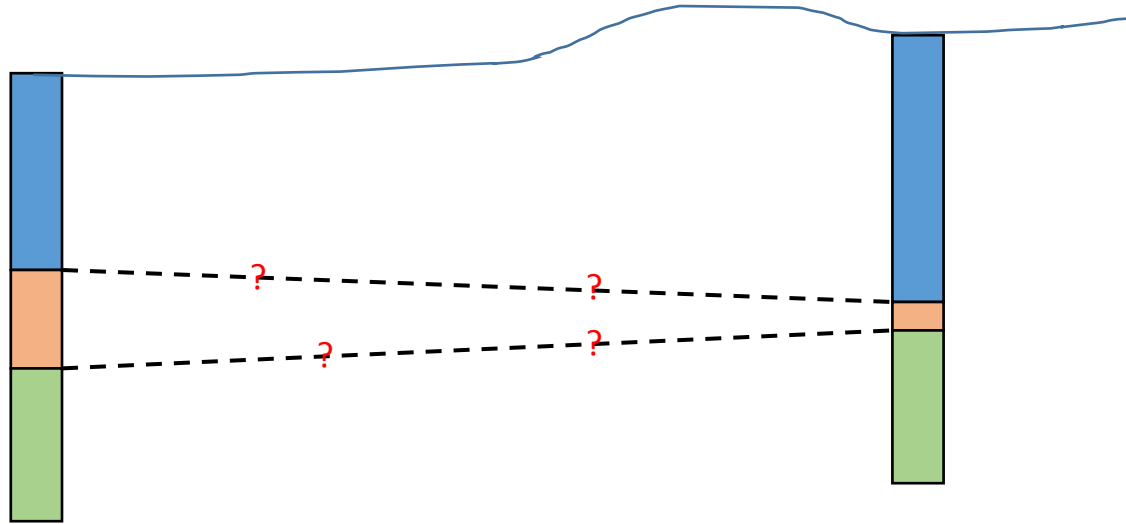
3 BIM Objects (1 x Window, 1 x door, 1 x Wall)

BIM Relationships



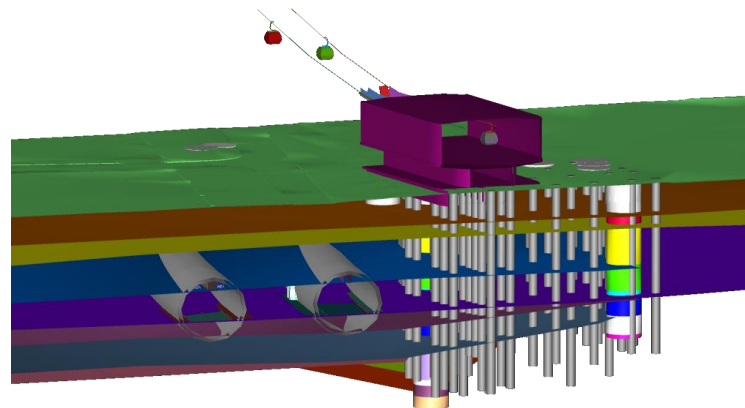
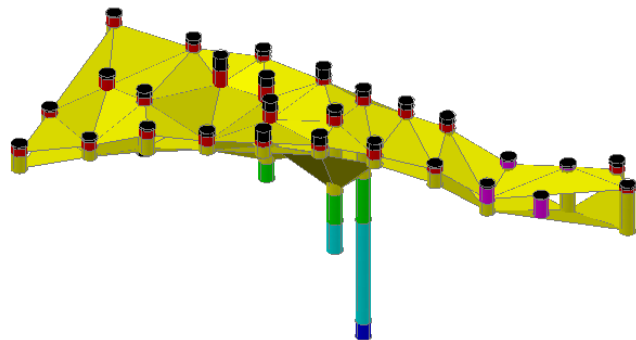
8 BIM Objects? (2 x Boreholes, 6 x Layer Locations)
1 x Surface DTM

BIM Relationships



1 BIM Object (1 x section) ???

This Is Not Real

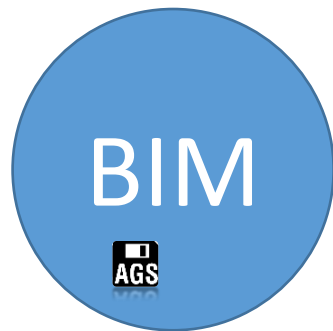


A BIM Definition

Is an intelligent 3D model base
process that provides insight for
creating and managing building and
infrastructure projects faster, more
economically, and with a less
environmental impact

The Role of AGS data in BIM

Providing timely AGS data for a BIM project is vital but only represents a small part of additional benefits of BIM



Thank You

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- Thank you to the following organisations for providing case studies information for this presentation

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