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Heathrow Airport: The A-Z of Airport Views

Stephen Neal - Autodesk
Nigel Stroud - Heathrow Airport Limited

GS7083 This class looks at the solutions, products, and workflows which enable critical business decisions to be made using real-time information, including the following:

- Airfield Maps - providing a standard view of the airfield;
- Community Relations - mapping noise compensation schemes and vortex strikes
- Engineering and Services - providing up-to-date, accurate information on the services of a mini-city
- Operational Views - providing awareness of the operational status of the airfield
- Space Map Views - providing the terminal floor plans mapped against the space lease data
- Service Clearance - enabling contractors to undertake works within a highly controlled environment
- Winter Resilience - enabling critical decision making tools within times of severe operational impact due to adverse weather

The class will provide an overview of the interfaces that make the aggregation of this data possible

Learning Objectives

At the end of this class, you will be able to:

- Discover the solutions, products and workflows at a large airport for infrastructure and asset management information
- Learn about the Various Views of Heathrow and how they address key business needs
- Learn about the multiple Integrations within AIMS / Oracle
- Demonstrate the possibilities of Flexible Layouts

About the Speakers

Steve is a Technical Consultant for the Autodesk Global Services, BIM Construct, Operate & Manage Line of Business in EMEA. He has over 14 years of project experience, successfully implementing and supporting Autodesk solutions to various customers including airports, transport planning, water utilities, and electrical utilities. This is Steve's second visit to Autodesk University

Nigel has worked for 25 years in the construction industry, Implementing Modelling workflows and evangelising in efficient workflows and reuse of geometry asset information. As a practitioner he has adopted a 'keep it real' approach. Privileged to have worked for the duration of Heathrow's Terminal 5 project setting up and on-going management of the Common Data Environment. He is currently part of a companywide Asset Management Programme leading Heathrow's Asset Information strategy

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Stephen Neal
Technical Consultant - Autodesk
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Heathrow Today

Welcome to Heathrow – A complex city

- **70** million passengers each year – **185,000** every day
- **476,000** flights per year – **86** airlines, **183** destinations
- **2** runways – operating at 99% capacity
- **76,000** people work at Heathrow
- **100,000** additional local jobs are created by Heathrow
- **323** companies work at Heathrow
- **2000** retail outlets

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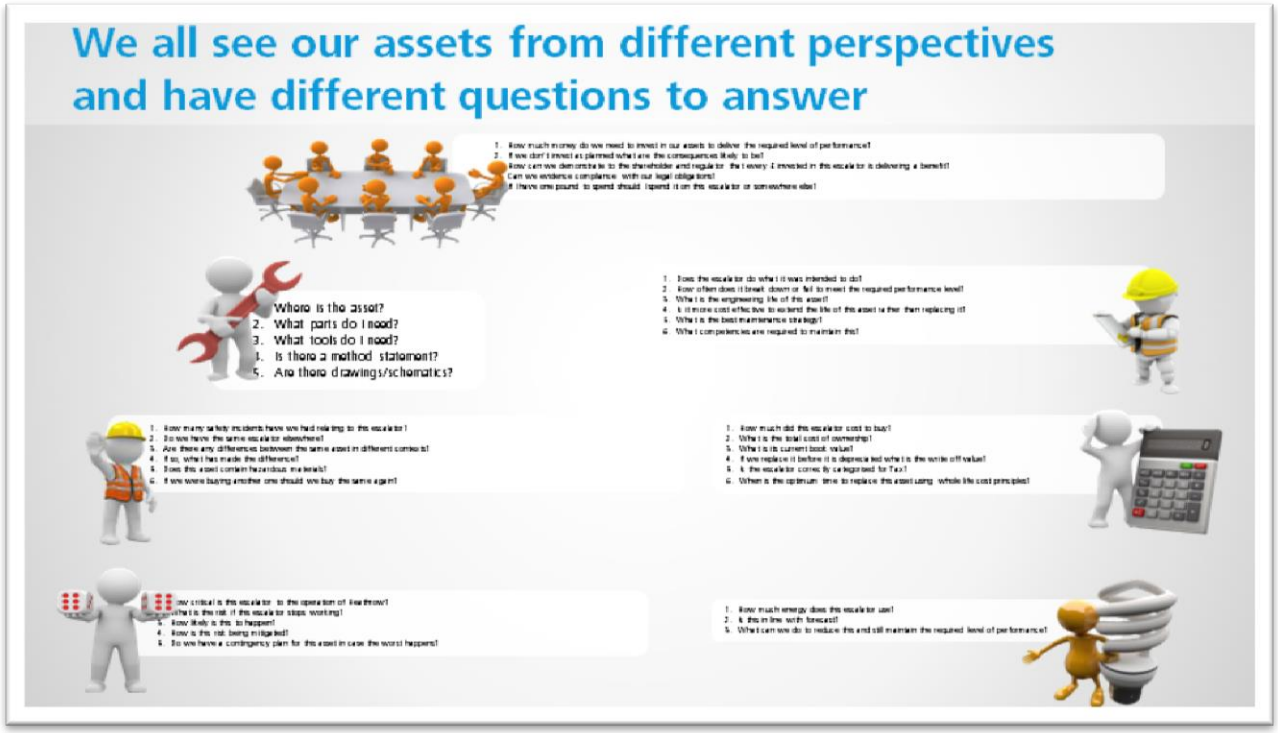
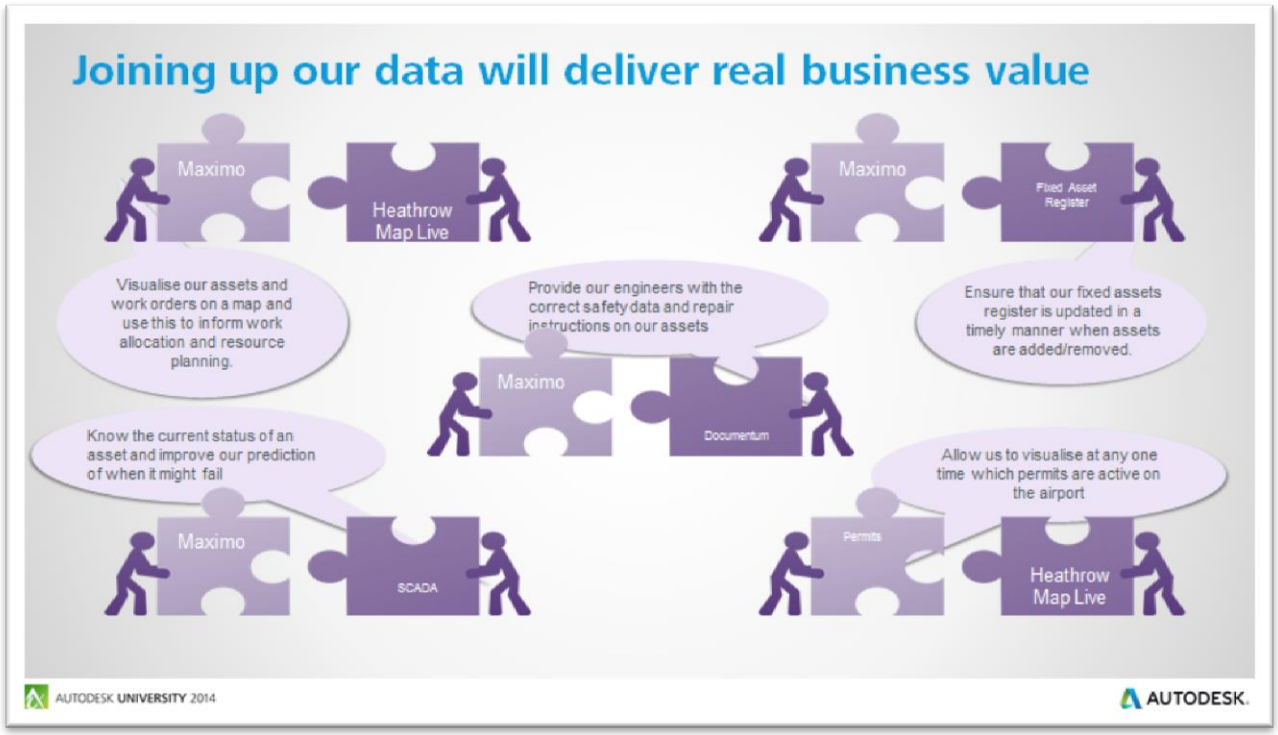

We all see our assets from different perspectives and have different questions to answer
Where is the asset?
What parts do I need?
What tools do I need?
Is there a method statement?
Are there drawings/schematics?


Joining up our data will deliver real business value
Maximo
Heathrow Map Live
Visualise our assets and work orders on a map and use this to inform work allocation and resource planning.
Maximo
Fixed Asset Register
Ensure that our fixed assets register is updated in a timely manner when assets are added/removed.
Provide our engineers with the correct safety data and repair instructions on our assets
Maximo
Documentum
Know the current status of an asset and improve our prediction of when it might fail
Maximo
SCADA
Allow us to visualise at any one time which permits are active on the airport
Permits
Heathrow Map Live
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Our destination - Informed decisions supported by joined up data which is of a known quality

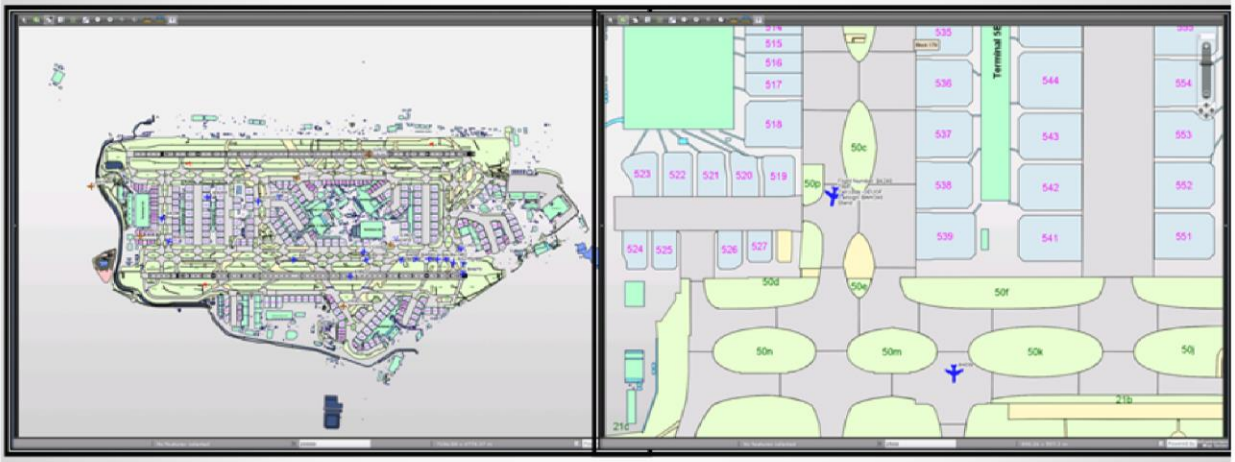
The Views – ACDM

Airport Collaborative Decision Making

- Joint initiative between the airlines, handlers, NATS and Heathrow Airport Limited.
- Facilitate the sharing of operational processes and data to allow better informed decisions to be made.

Implementation at other major European Airports have shown improvements in stand and gate management, resource management, slot adherence leading to reduced costs for all parties and improved accuracy of passenger information

The Views – ACDM



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The Views - Airfield Map

- Simplified view of the airfield showing the primary Taxi Way, Link ways and Navigational Aids
- Used internally by operations and externally by the Airlines and other third parties.

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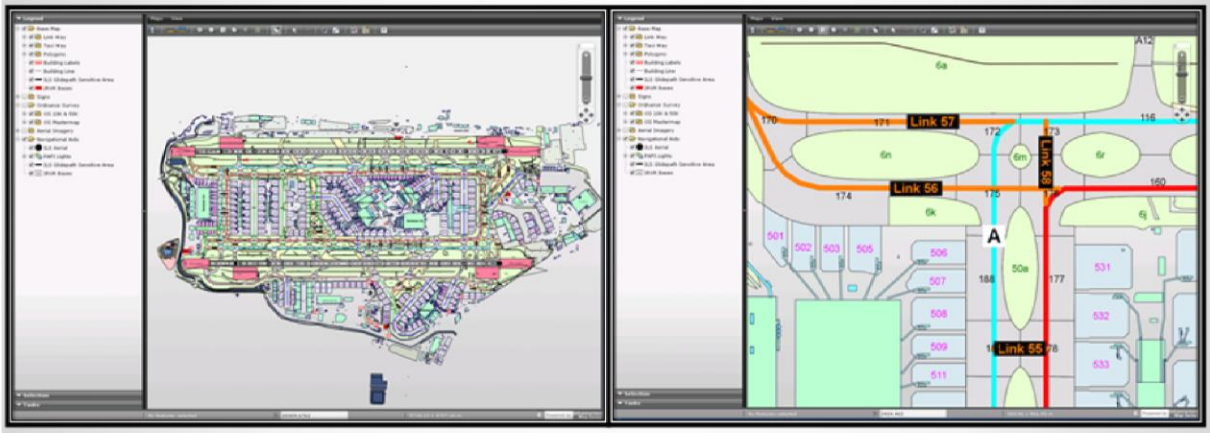
The Views - Airfield Map



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The Views – Community Relations

Strategic Intent

To limit aircraft noise impacts and gain the trust of our stakeholders that we are using best practicable means to achieve this goal, and to continue this approach into the future, within the framework established by government.

- Mitigating noise and land use. Effective noise insulation schemes and influencing planning to minimize the number of noise-sensitive properties around the airport.
- Working with local communities.
- Reflecting the community's concerns in our noise strategies and communications.

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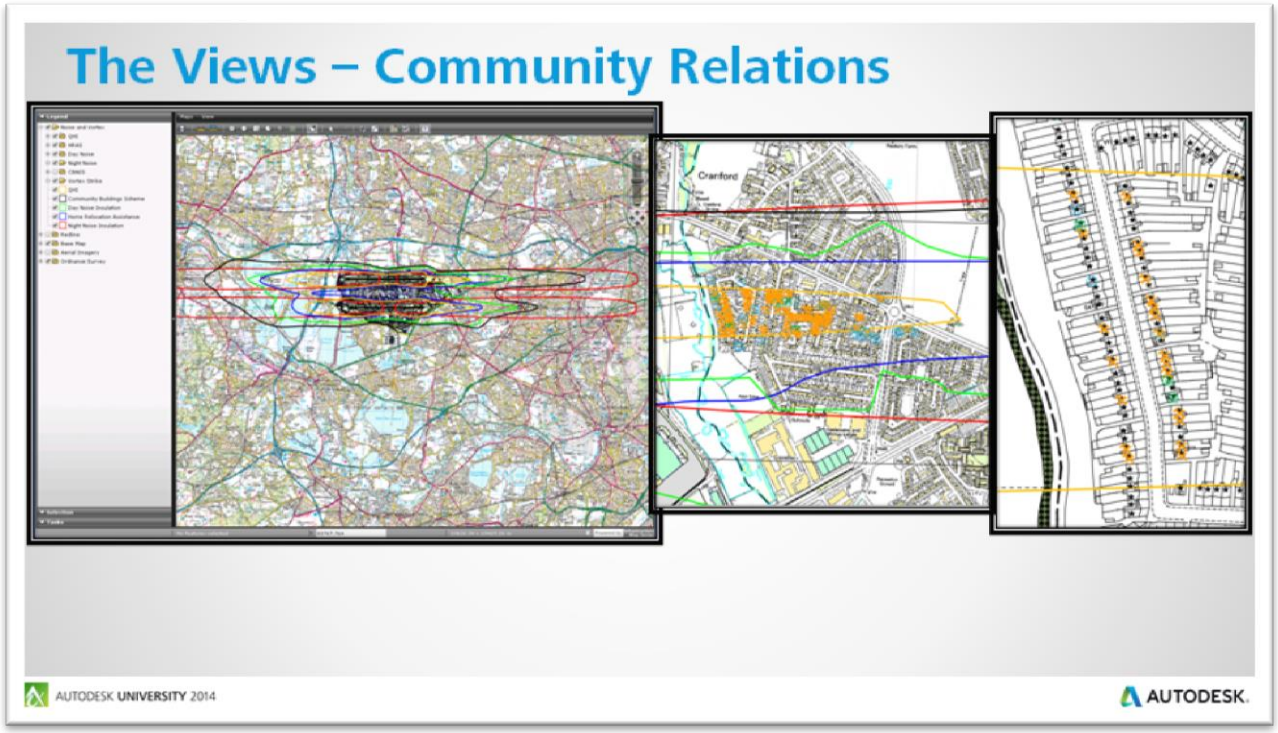
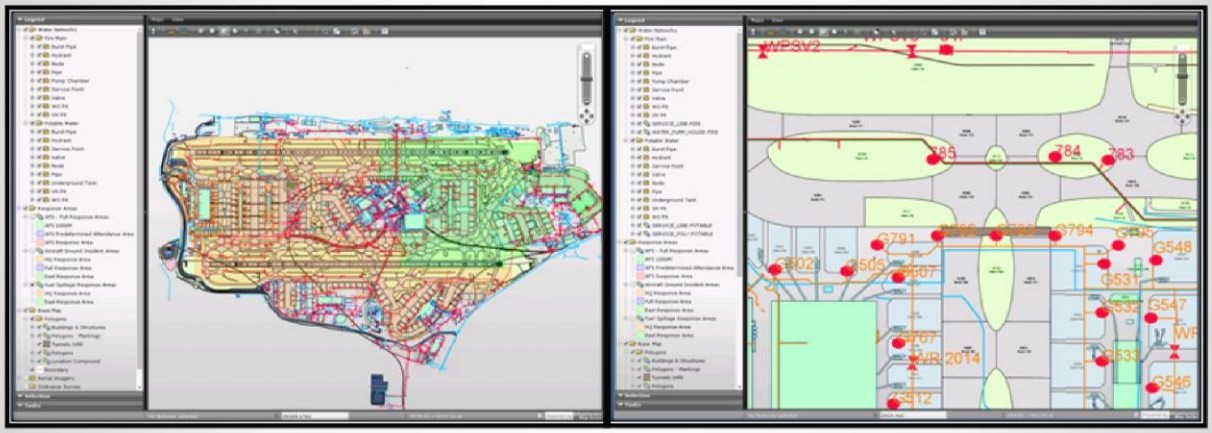


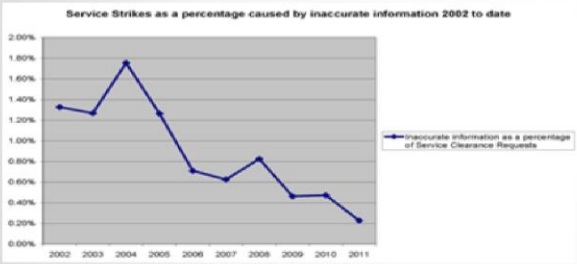
Community Relations shows the Boundaries for the Noise Compensation Schemes. Heathrow uses Salesforce to manage residents claiming against the various community relations schemes. There is an interface which enables visualising the status of claims per scheme with AIMS.

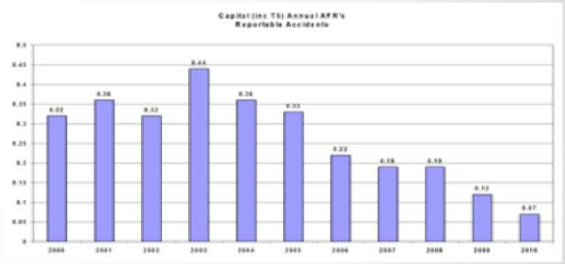
The Views – Fire Services



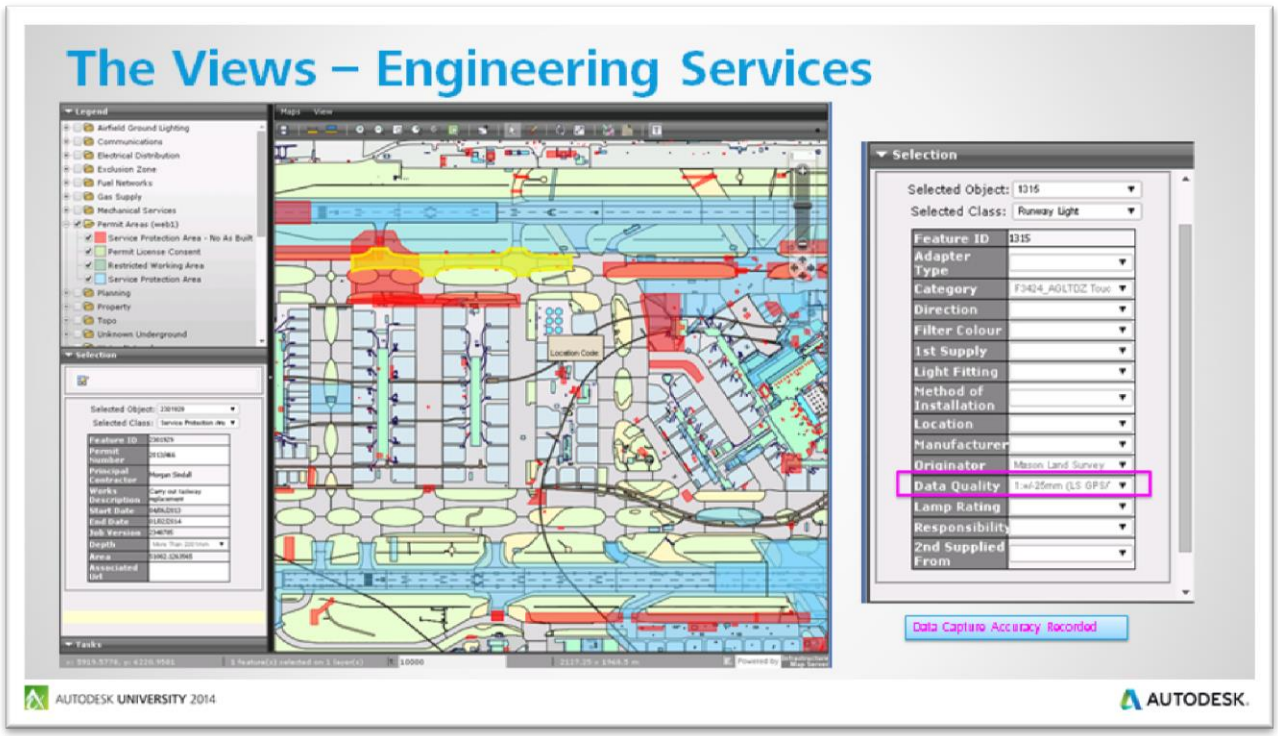
The Views – Engineering Services

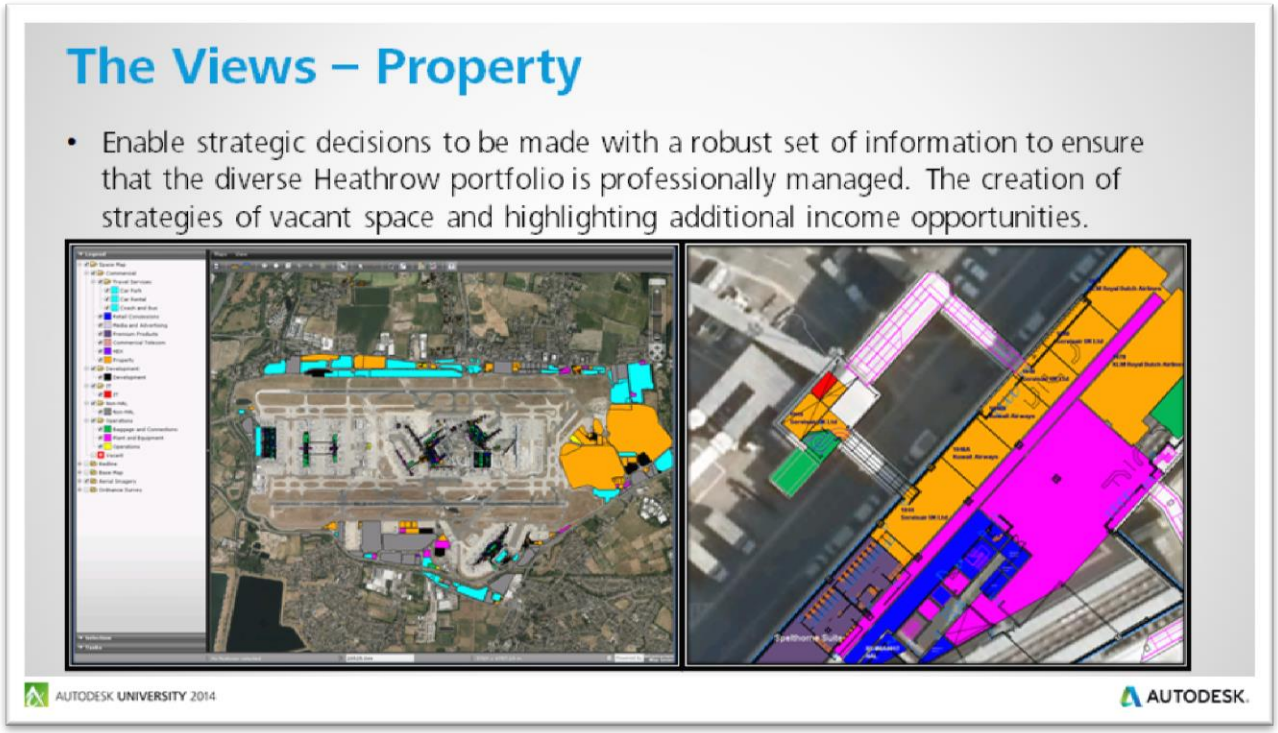
- Providing a single source of Engineering information about our Airfield services and infrastructure
- Provide accurate information for constructions teams delivering new assets





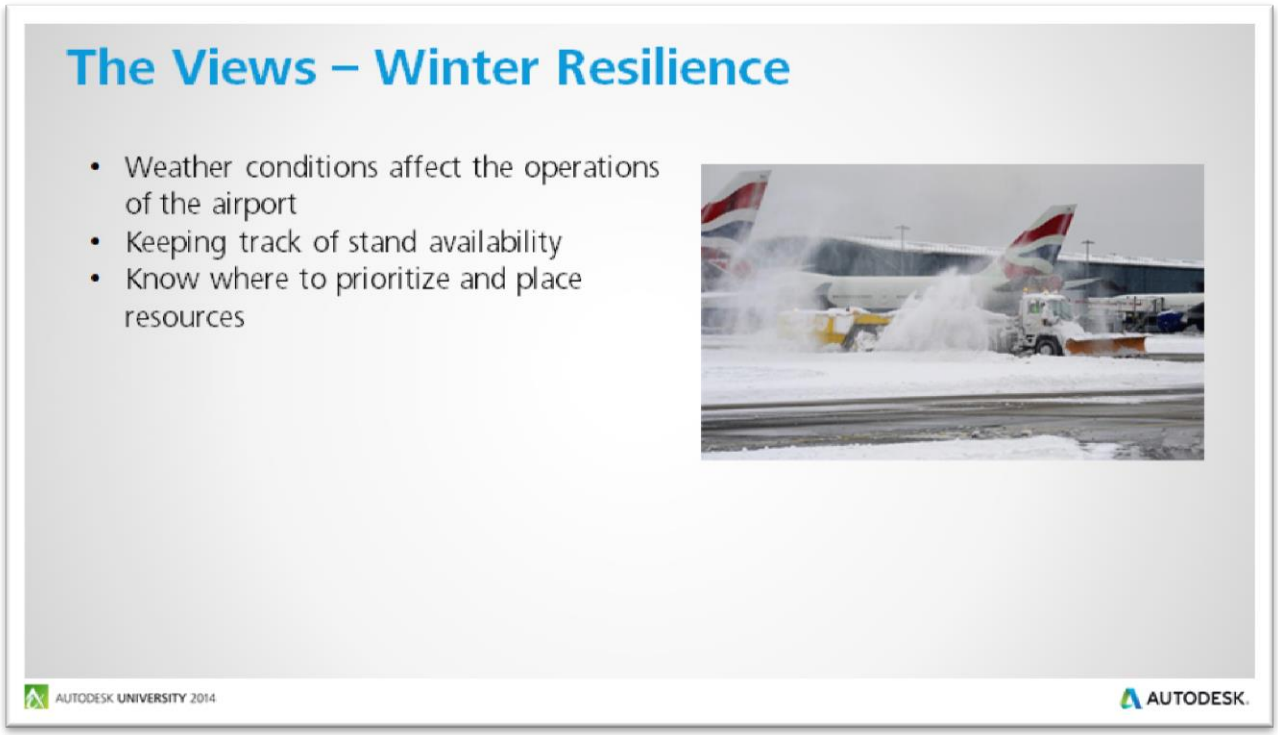
Engineering precision mapping capability - Showing the underground services within a specific area as well as the Level information. Quality Codes provides guidance as to the accuracy of the information which is critical in such a highly sensitive area to undertake construction/works.



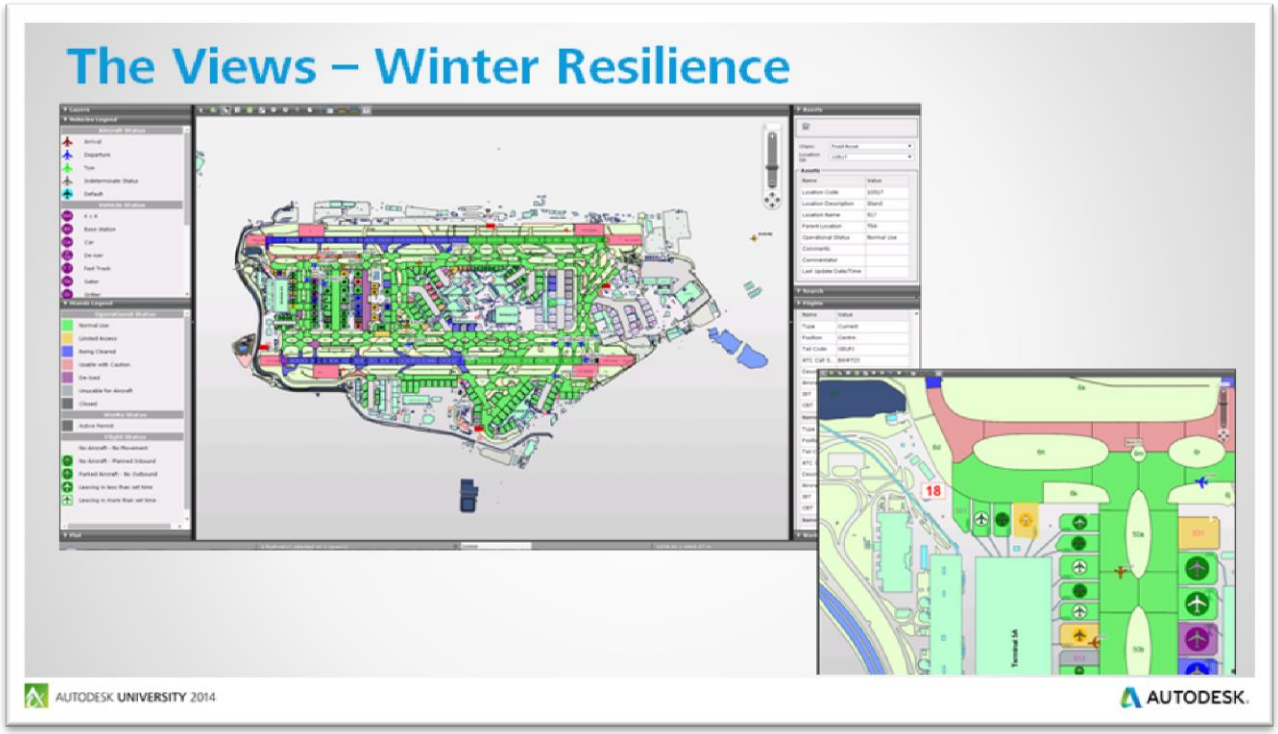


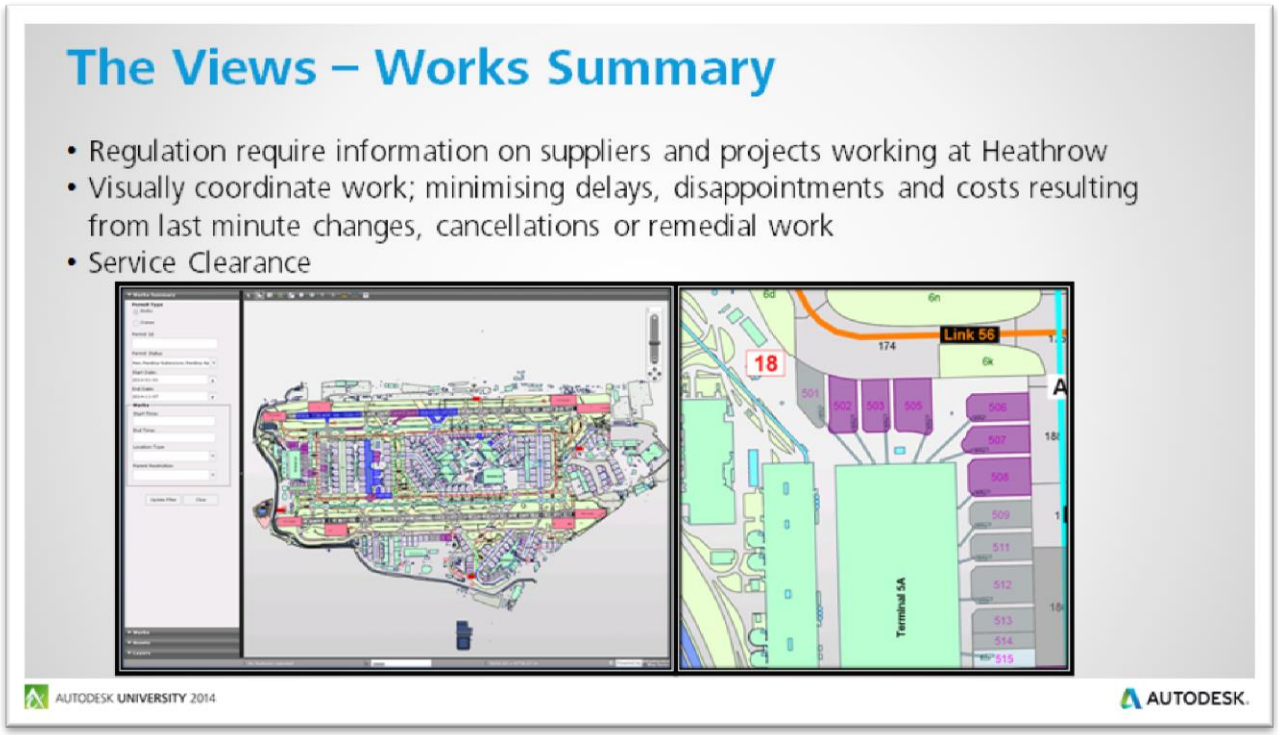
Property information – thematically mapped by USE. Terminal Building Model sliced to show individual floor against thematic for Property spaces.

Horizontal and Conical Surfaces, Approach and Take-off Contours and Radar information, ILS sensitive Areas.



Operational Information during Severe Weather. Aggregating information from a variety of systems across Heathrow to enable critical decisions to be made using real time information.





The Solution & Interfaces

Heathrow Map Live Metrics

- 1000+ x Heathrow Map Live Users
  - AUTODESK INFRASTRUCTURE MAP SERVER
  - Access to Live Geometry and Attribute Data
  - Asset Location
  - Internal Building Models
  - Dynamic Data: Aircraft, Ground Vehicles, PEGA
- 10 x AUTODESK AUTOCAD MAP 3D
  - Enterprise Industry Models
  - CAD Integration / Data Maintenance
  - Service Clearance Plotted Output
  - Reporting Data

HML DATA SPECIFICATION

- Number of Service Assets within this Area: 250,000+
- Number of Base Map Features within this Area: 250,000+
- Number of Topographic Features within this Area: 750,000+
- Data Stored in Airport Grid (Heathrow Defined Coordinate System)

Data set	Type	Estimated size in Generation
Services and BAA Topographic base map	Oracle table space	5Gb (Includes data files and indexes)
Ordnance survey base map	Oracle table space	1.5Gb (Includes data files and indexes)
Air quality SHP files	File SAN storage	0.5 Gb
Enviro SHP files	File SAN storage	1 Gb
Project DWG files	File SAN storage	1 Gb
Ordnance Survey Raster files	File SAN storage	3.5Gb
Aerial Photography	File SAN storage	2Gb
Total		14.5

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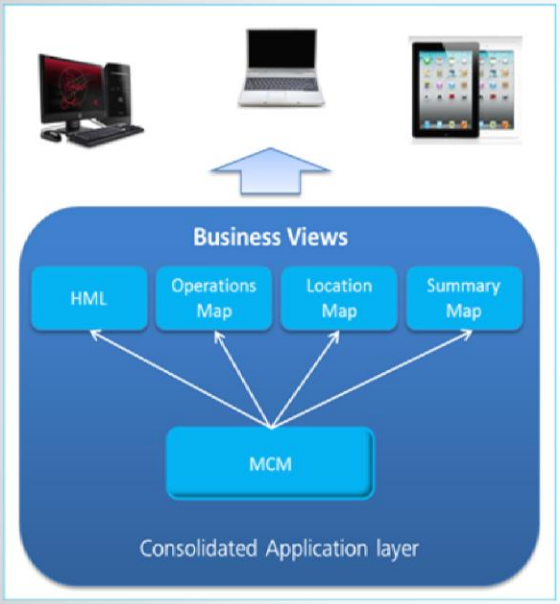

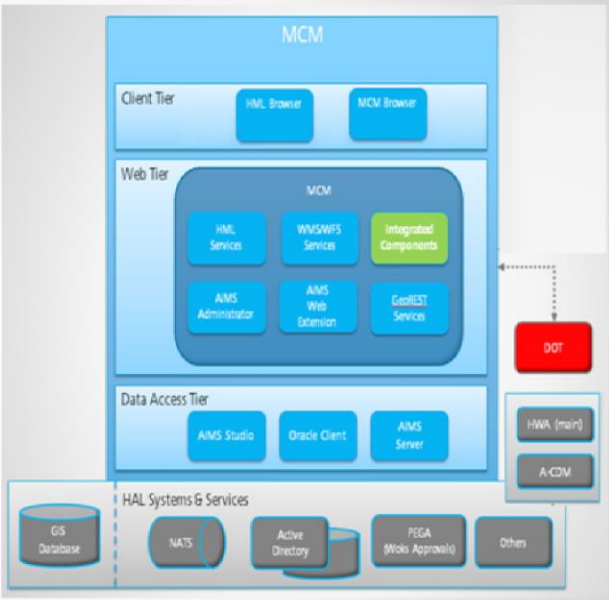

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The diagram summarizes the high level architecture: the solution is deployed across three layers (client, web tier and data access tier).

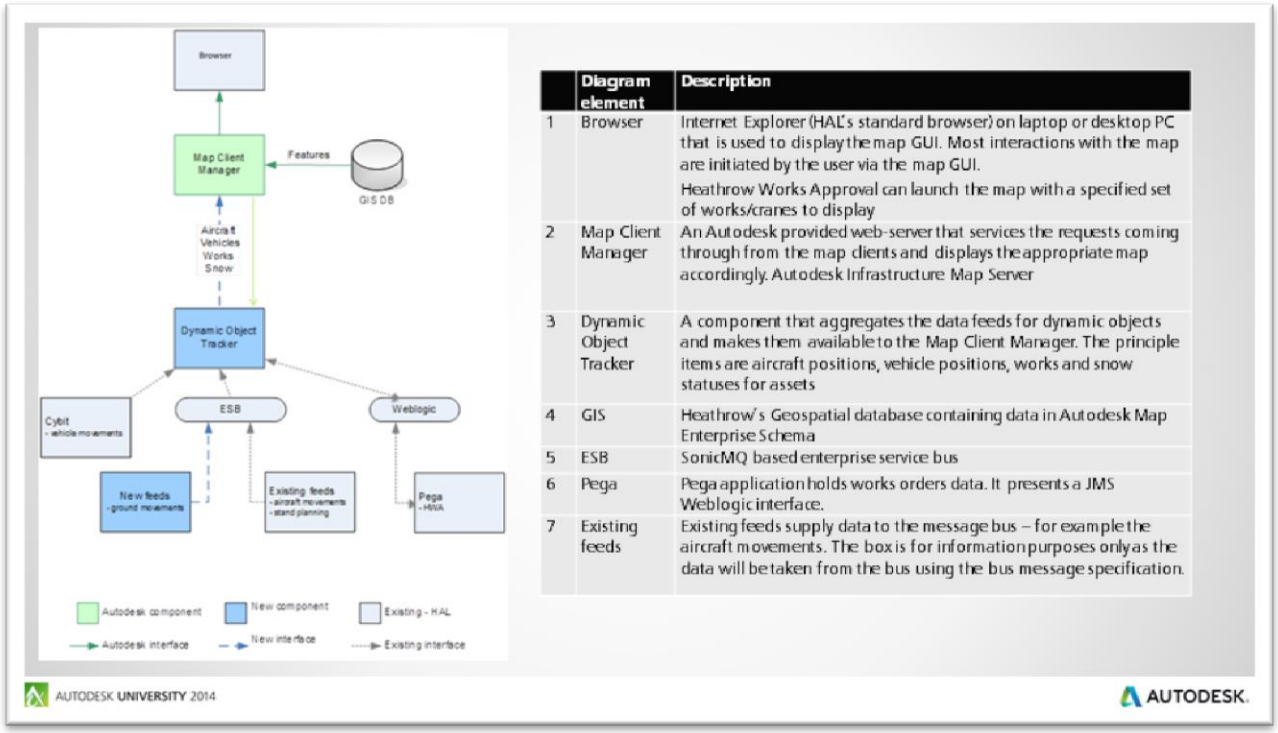
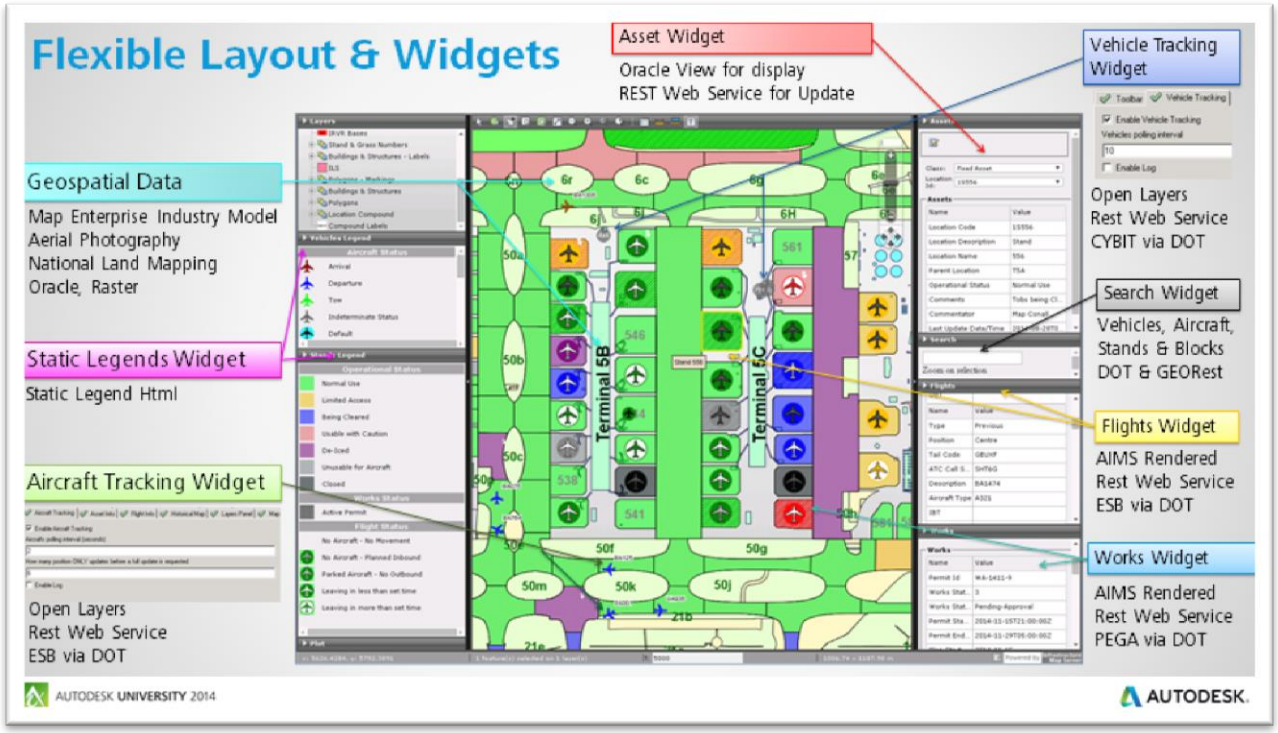
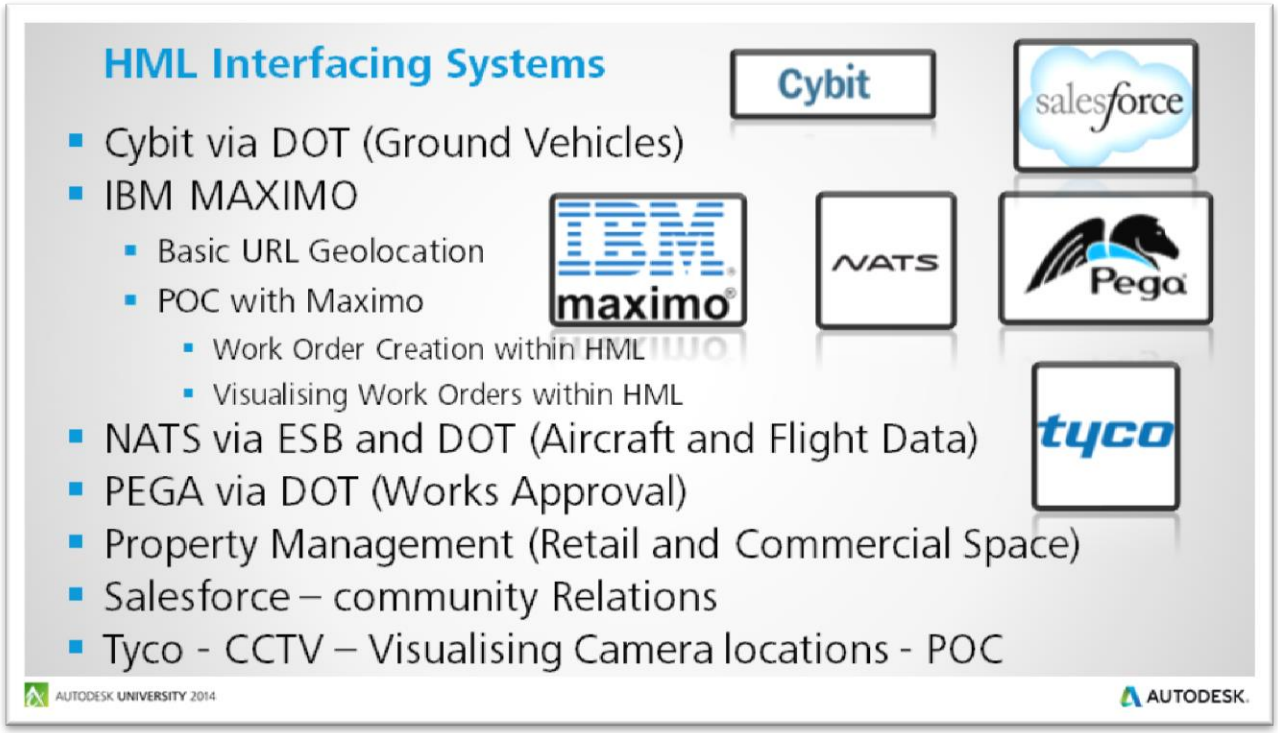


	Diagram element	Description
1	Browser	Internet Explorer (HAL's standard browser) on laptop or desktop PC that is used to display the map GUI. Most interactions with the map are initiated by the user via the map GUI. Heathrow Works Approval can launch the map with a specified set of works/cranes to display
2	Map Client Manager	An Autodesk provided web-server that services the requests coming through from the map clients and displays the appropriate map accordingly. Autodesk Infrastructure Map Server
3	Dynamic Object Tracker	A component that aggregates the data feeds for dynamic objects and makes them available to the Map Client Manager. The principle items are aircraft positions, vehicle positions, works and snow statuses for assets
4	GIS	Heathrow's Geospatial database containing data in Autodesk Map Enterprise Schema
5	ESB	SonicMQ based enterprise service bus
6	Pega	Pega application holds works orders data. It presents a JMS Weblogic interface.
7	Existing feeds	Existing feeds supply data to the message bus – for example the aircraft movements. The box is for information purposes only as the data will be taken from the bus using the bus message specification.




HML Interfacing Systems
Cybit via DOT (Ground Vehicles)
IBM MAXIMO
Basic URL Geolocation
POC with Maximo
Work Order Creation within HML
Visualising Work Orders within HML
NATS via ESB and DOT (Aircraft and Flight Data)
PEGA via DOT (Works Approval)
Property Management (Retail and Commercial Space)
Salesforce – community Relations
Tyco - CCTV – Visualising Camera locations - POC
Cybit
salesforce
IBM maximo
NATS
Pega
tyco
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