Services | Asset Digitisation

Asset Digitisation involves retrospectively capturing graphical and non-graphical information about a brownfield asset to improve record information, support future capital projects, and pave the way for digital asset management.

Asset Digitisation services provided

Developing 3D models from 2D records

The process of developing an existing asset 3D model using existing 2D record drawings as the base input to the modelling process. If existing drawings are static files such as pdf, TIFF, JPEG, or paper drawings, this information will be interpreted and translated into a 3D model environment. If the existing drawings are electronic formats such as .dwg files this information will act as an underlay in the 3D model environment and will be 'traced' over.

Existing 2D record information is often not maintained or kept up to date, meaning that there will often be a requirement to refine the existing asset 3D model over time by undertaking survey work, or updating the model-based information as part of capital projects.

Developing 3D models from Point Clouds

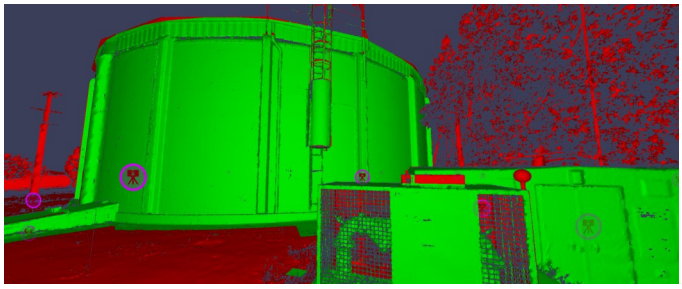
The process of developing an existing asset 3D model using survey-grade point cloud data as the base input to the modelling process.

Example of 3D model developed from point clouds

Model Verification

As part of our modelling process, we undertake periodic model quality assurance reviews with the timing and regularity of these being determined on a project-by-project basis. These reviews confirm that the models being developed are aligned to the client brief and end user requirements. Our approach includes:

- general checks for geometry and alignment
- detailed quality assurance checks for element accuracy, including the use of issue tracking and management software
- model QA/QC checks alignment and consistency of naming conventions and metadata requirements. Including the extraction, manipulation, and importation of data using automation tools and processes



Example of model verification

Information Reliability and Classification

It is important that elements within the existing asset 3D model are clearly identified in terms of their reliability and the source of the information is recorded against the element.

During this process we identify the types of source information such as point cloud data, existing as built drawings, site surveys, etc. as well as assigning a reliability rating based on the standards defined in the IPWEA International Infrastructure Management Manual.

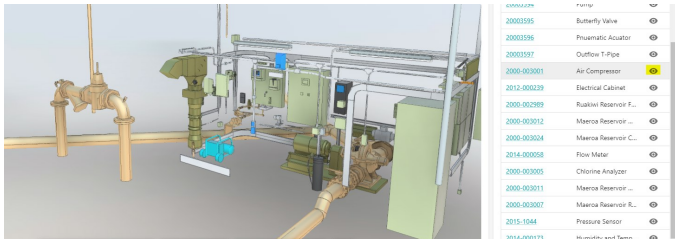
This information is recorded as metadata against model elements, providing a level of confidence and certainty relating to its future use such as capital project planning and asset and facilities management planning.

Asset Data capture and handover

Upon completion of the existing asset 3D model we can visit site to identify assets and tag the assets in the 3D models, populate elements within the 3D model with asset data and reconcile asset data from the clients asset database with the 3D model(s).

Digital Twin Integration

Upon completion of an asset digitisation project, we will work with the client asset management team to integrate the handover information with operational data that is typically stored in multiple locations, with the as built digital model of the physical asset. A variety of information can be integrated, including static information such as documents, drawings, photographs, maintenance records and asset data. It can also include live information such as data feeds from building and infrastructure-based sensors, this is the beginning of the journey to leveraging the Internet of Things (IoT) and a true Digital Twin.



Example of Digital Twin integration

Renders and Visualisations of Existing Assets

Using the 3D models developed of assets, we can produce renders and visualisations (i.e. flyovers), to assist with stakeholder engagement, H&S briefings etc.

Example render of existing reservoir

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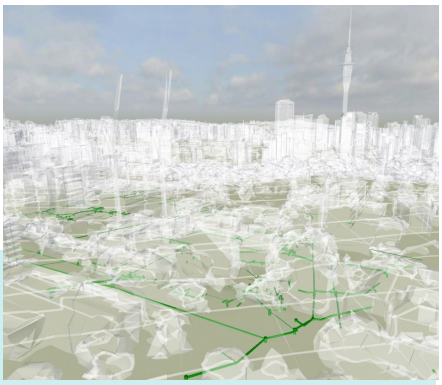
Project Examples | Asset Digitisation - Underground Services

University of Auckland City Campus - Stormwater Modelling



Client I University of Auckland

Project Duration I 2023 - 2024

Project Role I Modelling Standard Development • 3D model development • Site Investigations and Survey

Project Description

The University of Auckland is seeking to better understand its existing underground infrastructure including the location of sub-surface utilities and key asset related information such as capacity and size. The purpose of this project is to support the understanding of the current capacity of the infrastructure to inform future upgrade requirements. To achieve this the University is proposing to survey the existing underground infrastructure and develop a 3-dimensional model, tagged with key asset information which can be updated and maintained over time as the campus develops.

The Auckland City Campus Stormwater Modelling project is being delivered in three stages, with Stages one and two complete. The scope of these stages is as follows:

Stage 1:

- Development of an Existing Underground Infrastructure Modelling Standard
- Collation of existing underground services reference information - UoA and Auckland Council GIS data, as-built models and drawings
- Site walkover to confirm surface level assets are as per reference information,
- Initial 3D Stormwater model developed from reference information and known asset data captured (i.e. diameter of pipes, utility type)

Stage 2:

- Non-intrusive site survey undertaken to confirm locations, depths, diameters and utility status
- 3D models updated with the survey information to improve the accuracy of the models
- Asset data added where known

Stage 3 will include intrusive site survey being undertaken (potholing, GRP) to improve the accuracy of the asset and dimensional data of buried services. The models will be updated with this once the survey is completed.

Approach

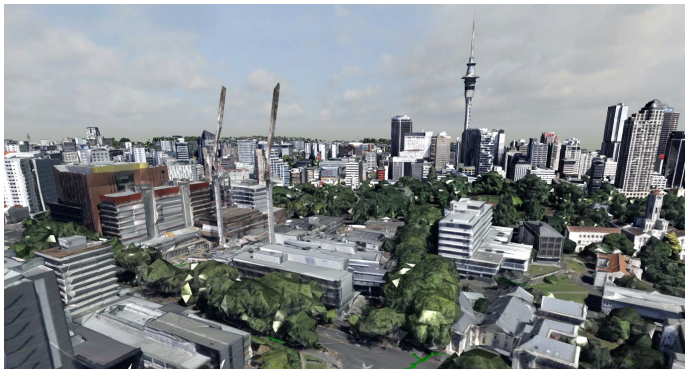
Our approach was to begin with establishing the Existing Underground Infrastructure Modelling Standard which outlines the methodology, technical requirements and asset information required to be captured and delivered at each Stage of the process. This included engagement with UoA Stakeholders to confirm how the data captured would feed into other systems, such as Maximo, and meet any UoA existing requirements.

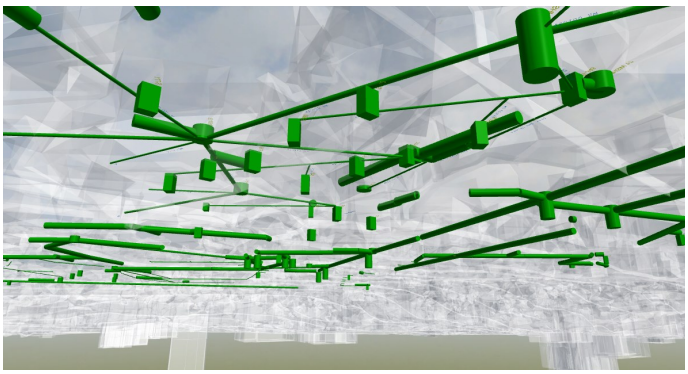
Reference information of the stormwater network in Sectors 100 and 300 was collated and used by the survey team to confirm if surface level assets such manholes were in the correct location in accordance with the as-built information. An initial 3D stormwater model was developed using the as-built information and findings from the survey walkover, with elements modelled with correct geometry (where known) and in the correct location spatially.

Quality levels (in accordance with *AS 5488 Classification of Subsurface Utility Information*) were assigned to each model element to verify the level of confidence in the data.

Benefits Realised

- Improved understanding of existing stormwater asset locations which can be used for capital works planning, Identifying potential conflicts with utilities within planned work zones and providing basic data which can be included in UoAs asset registers and asset management system
- Base model developed to be used in Stage 2 for additional model development and data collations
- Project identified opportunities to streamline the modelling of other utilities using the same standard and process
- Staged approach to data capture and 3D model development, with incremental increases in reliability based on the needs of either asset management, new buildings projects, or network capacity upgrade projects. This is a cost effective, needs based approach which allows UoA to target the areas they require information about as opposed to having to do all the works at once.





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