Report on Asset Data Confidence

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Client: Invercargill City Council

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1.0 Introduction

This report summarise the data confidence findings from meetings AECOM held with staff at Invercargill City Council on 6 – 8 March 2017.

2.0 Purpose

The purpose of the report is to present the findings of a high level assessment of asset related data confidence for the four asset groups involved in this Asset Management Plan project which are:

- Buildings
- Parks and Cemeteries
- Roading
- Three waters including:
  - Water Supply
  - Wastewater
  - Stormwater

The findings have been obtained by having meetings/discussions with staff involved in the management and use of asset data for the above asset classes and also receiving an overview of the software/systems being used to manage the asset data.

The structure of the assessment is such that using the matrix shown in Table 1 below, it would be easy to delve down to a lower level of detail which would involve looking more closely at the actual data e.g. the assessment of Condition information for the wastewater asset class could be broken down into pipes, manholes, pump stations and treatment plants etc. Similarly Attribute details could be broken down into material, size and installation date etc. and applied to individual asset types such as pipes and manholes etc. There is also the potential to break down Three Waters into water supply, wastewater and stormwater.

3.0 Assessment Structure

The data areas that have been chosen for assessment are those that are considered to be the foundation for enabling good practice asset management. The areas are:

- Completeness of records
- Attribute details
- Asset hierarchies
- GIS representation (spatial locations)
- Condition information
- Maintenance history

A digital perspective was taken on the above areas but it is acknowledged that non-digital information does exist although some has been scanned and can be accessed via the electronic document management system.

The data confidence assessment structure used is as follows and is the same as recommended in the IIMM 2015:

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A	Highly reliable	Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%.
B	Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%.
C	Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%.
D	Very uncertain	Data based on unconfirmed verbal reports and/or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%
E	Unknown	None or very little data held.

4.0 Data Confidence Assessment

Table 1 below summarises our assessment of data confidence.

Table 1 Data quality assessment

Assessment Element	Buildings	Parks & Cemeteries	Roading	Three Waters
Completeness of records	B	B	A	A
Attribute details	A	B	A	A
Asset hierarchies	C	B	A	B
GIS representation	N/A	D	B	A
Condition information	B	C	A	C
Maintenance history	B	B	A	B
Overall assessment	**B**	**B**	**A**	**B**

The following subsections provide commentary on the above assessments.

4.1 Buildings

Buildings are in the slightly enviable position in that they were early adopters of IPS which came about because they were using the forerunner of IPS commonly known as Hansen 7. Buildings have used Hansen 7 and IPS out of the box with no customisation. While this hasn't provided the flexibility that may eventually be achievable such as control of workflows etc., it has provided structure and discipline to the management of asset data and maintenance activities.

A number of tasks within IPS are currently being performed manually. Complaints about buildings get logged into the Council's corporate CRM Pathways and these complaints get emailed to Buildings staff. With the new/revised implementation of IPS, complaints entered into Pathways will be pushed automatically into IPS and from there work orders can easily be created. Similarly work orders currently created in IPS are emailed to contractors. The hope is that contractors will either be able to

access IPS to obtain their work orders or receive them on handheld devices using the IPS app that is available.

One aspect of asset data management which is ongoing for Buildings is deciding on what asset hierarchy best suits their needs. The dilemma with buildings is that most of the asset components are visible and it is easy to capture a lot of detail which then needs to be maintained. Compounding the dilemma is the emergence of new metadata standards which are currently being developed by LINZ. The NAMS Property Manual leans towards modelling buildings down to a low level of detail and this philosophy is supported in the buildings asset management software SPM which the NAMS Property Manual promotes. If time and resources was not an issue then the detailed modelling approach would be practical but most councils don't have this luxury so it is about trying to achieve the right level of detail that is manageable and will not adversely impact on any asset management decision making. Getting the asset hierarchy right is important when it comes to other aspects of asset management such as condition inspections and maintenance management. Currently Opus is doing condition inspections down to a detailed component level and the current problem is that there are place holders in IPS for only some of this condition information.

Building assets are not represented in the GIS and to an extent there is no great need. With ArcGIS being integrated with IPS, the use of ArcGIS will offer an alternative easy to use entry to assets held in IPS. Only building outlines (footprints) need to be recorded in the GIS which would then allow navigation to the top level of a building's asset hierarchy in IPS and the potential to drill down to further detail.

4.2 Parks & Cemeteries

Parks currently utilise a customised SQL database for managing parks and cemeteries asset information combined with contract (work) management. Individual trees are being recorded in a separate database and another separate system is being used to manage the nursery inventory. Parks also record additional data in the Yardstick benchmarking system. Parks have a robust process in place for creating new assets – one person creates the assets and a different person must approve the data entry before the asset is committed to the database.

The plan is for Parks to move from their current databases and systems to the Infor Public Sector (IPS) system. Buildings have already been using IPS for some time and Three Waters is currently in the process of moving to IPS. The advantage of Parks using IPS is that hopefully all data will reside in one single system with the probable exception of data held in Yardstick although it is questionable why some data only resides in Yardstick which is not a Council owned system.

One of the main observations with Parks is that some assets are recorded as individual items and other assets are aggregated e.g. a single asset record may represent multiple bins. This in itself may not be an issue but of consideration should be whether or not all the assets are of the same type and same age etc.

It is acknowledged that underground services within parks including water, wastewater and stormwater are not well recorded in the SQL database and appear to be non-existent in the GIS. While there is good knowledge amongst Parks staff and their contractors about these assets, it does represent a risk to Council that there is not more digital locational visibility of these assets and that they cannot be accurately quantified.

Condition information while being recorded, is being done so in reports which are scanned and stored in the electronic document management system. To allow improved and more efficient decision making, it will be necessary to associate condition information directly with assets. The move to IPS will allow this and will allow Parks staff to initiate and manage condition inspection activity.

The SQL database is being used to manage maintenance of assets and there is no reason why this cannot be continued with IPS and the use of its work order system.

4.3 Roading

Roading is fortunate in that it was an early adopter of RAMM and has been using the system for over 25 years. RAMM is the industry standard tool for roading asset management in New Zealand and

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offers a very structured approach that has been developed and refined over many years by RAMM Software Limited.

Associated with the use of RAMM is ongoing asset/data audit activity by both council staff and external contractors. Valuations are being carried out in RAMM which offers a range of checks throughout the valuation workflow and highlights when there are data problems that need resolving before the workflow can continue. Council are also utilising dTIMS although this work is being done by an external consultant. By doing dTIMS analysis, the data preparation required also further imposes a requirement for data validation.

Maintenance which is carried out by external contractors is managed through RAMM using RAMM Contractor. Contractors are also using Pocket RAMM which allows them to update and maintain data in RAMM.

Council is making use of RAMM GIS to visualise roading assets and this is the one area where there is room for further improvement. Footpaths in RAMM GIS are typically drawn using offsets from road centrelines using start and end points and widths. This means that footpaths appear as a series of rectangles that don't interconnect at road junctions and don't follow the exact routes or widths. The underlying attribute data such as length is recorded accurately (except possibly for cul-de-sacs) so valuations etc. are not impacted. It is just visually disconcerting for users to look at the footpaths in RAMM GIS especially when overlaid on aerial photography, to see that the RAMM representations differ from how the footpaths were actually constructed. Fortunately RAMM GIS has built-in tools for dealing with this issue and it is something that council is resolving slowly as time and resources permit.

4.4 Three Waters

Three Waters (water supply, wastewater and stormwater) utilises a customised SQL database which combines the management of asset information with contract (work) management. The SQL database is also integrated with ArcGIS which is where most of the network data originated from anyway. Council have the luxury of being able to refer back to the original paper network records which were the source information when establishing the GIS.

A project is currently underway to migrate all of the Three Waters data including extensive work history, from the customised SQL database to IPS. The IPS implementation has been going for about 12 months. Council have taken responsibility for cleansing and importing data into IPS which is improving the overall quality of the data. Associated with this project, manhole surveys have been undertaken to validate and capture additional information. IPS will offer the advantage of being able to be integrated with Council's CRM Pathways. This will mean that complaints entered into Pathways will be able to be pushed automatically into the service request module of IPS. Council have purchased additional functionality including Asset Accounting (valuations) and Advanced Asset Management (predictive modelling) and are planning to make use of both these areas of functionality. The Asset Accounting module is not a full accounting module in that it does not maintain a unit rates lookup table. Instead full replacement costs will need to be recorded against assets in order to calculate depreciation.

Council are maintaining a watching brief on the emerging metadata standards for Three Waters which are being developed by LINZ. While there may be some attempt at alignment with the implementation of IPS, the standards are only in draft form and until they are finalised the implications will not be fully known.

Asset hierarchies typically are not a problem or challenge when it comes to modelling underground network assets. IPS is well suited to managing underground network assets and will not present any problems. When it comes to modelling treatment plant and pump stations there is a reasonable amount of flexibility on offer. A preview of some treatment plants in IPS indicates these have been modelled appropriately. A preview of some pump stations indicates there may be room for improvement i.e. model pump stations to a greater level of detail but the benefits of doing this would need to be assessed.

Not a lot of condition information has been recorded for underground network assets – derivation of condition is mainly based on remaining life. Not a lot of CCTV is being undertaken - CCTV is being used to confirm planned renewals and investigate problems but there is no planned CCTV inspection

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programme in place. One problem being experienced is that the CCTV work which is done by contractors is not that reliable in terms of the observations being made and the resulting scoring. If the reliability and accuracy of the CCTV scoring can be improved, IPS does offer very good functionality for managing CCTV inspections and scoring. Some sampling of AC water mains has been undertaken. Above ground assets are being inspected but scoring is not being recorded directly against assets.