Chapter 13: North West Melbourne Data Integration Project

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Introduction
Over the past ten years Melbourne has consistently ranked as one of the most liveable cities in the World (Moore 2012). However the Victorian Government and researchers from the University of Melbourne have recognised that liveability in the North West Melbourne is under threat. The population in the area is growing rapidly and is forecast to increase by over five hundred thousand people in the next 10 years (1,662,500 to 2,183,700) (DPCD, 2012). Recognising the significant challenges that this population growth will have on the liveability the North West Melbourne Regional Management Forum (NWM – RMF) has identified the need to work collaboratively across government, academia to develop an integrated spatial data platform to support research in the region.

The value of this project will be shown through the development of the integrated data platform along with four demonstrator projects that cover the most pressing issues facing the region: walkability, employment clustering, housing affordability and health services. Improving these problems is of critical importance to these communities. However it is recognised that they are not single issues that can be readily solved in an isolated study. There are many interacting systems with complex interplays, which require an integrated approach to plan solutions to the problem.
Background
The project has a strong Victorian Government connection provided through the North West Melbourne RMF; the NWM-RMF was established in 2007 as a resource to strengthen advocacy platforms. The RMF has a mandate to share data with the intention to guide policy decisions and collaborate in integrated planning activities across the North West Melbourne. Members of the RMF include government secretaries from across the Victorian Government and Chief Executive Officers from each of the fourteen local governments across the area. Figure 1. provides an illustration of the North West Melbourne, which includes 14 local government areas.

![Figure 1: North and West Metropolitan Region of Melbourne](image)

This initiative builds on several of the key strategic directions identified by the NWM – RMF, which is working collectively across government and academia. This project recognises that by using web enabled technology for connecting computers, data exchange and integration can take place enabling multi-disciplinary research teams to provide an evidence-based approach to decision making. The project is being supported by the Australian Urban Research Infrastructure Network (AURIN) and the Australian National Data Service (ANDS) both of which are funded by the Australian Governments Super Science scheme to provide the infrastructure to facilitate access to a distributed network of datasets.
Figure 2. provides a level project design illustrating the relationship between data custodians, the AURIN portal and RDA. Developing a system that is able to connect data custodians and provide both data and metadata into AURIN, as well as Metadata records to Research Data Australia (RDA), is central to the project. Four demonstrator projects have been developed to demonstrate the value of the integrated data hub. The outputs and outcomes will be specific to each demonstrator; however, generally they are operating towards a similar goal of supporting liveability in the region. All demonstrators will identify a wide range of datasets for the North West Melbourne Corridor, which will be made available through a ‘data hub’.

Figure 2. Structure of the data integration project.

This data will also aim to test the metropolitan planning policies in operation across the region, the following section highlight the policies in the region.

The data hub will provide access to a number of datasets to researchers via the AURIN portal. Each demonstrator will provide static outputs of their work, or provide additional functionality via the writing of code to facilitate dynamic query of supplied datasets using specifications as supplied by AURIN. The data hub (including data integration and interrogation capability) will be used to highlight the potential in unlocking and
integrating data to focus on an evidence-based approach for researchers and authorised users.

Software and data validation and integration tools will be developed to synthesise the various datasets to demonstrate value to all project stakeholders (the concern of ANDS). The project includes four demonstrators, each focussing on key policy questions relating to the urban environment issues identified by the NWMR-RMF. Specifically this project will demonstrate how a data hub together with innovations in software for data analysis can be used to support policy and decision making across a number of liveability lenses, being the: built environment and health, housing affordability, economic productivity, and transport and sustainability.

The following summary provides an overview of the aims and objectives of the demonstrator projects:

**Demonstrator 1: Walkability Demonstrator Outcomes**
Walking is one of the most beneficial forms of exercise. Planners are increasingly in need of spatial tools to map walking paths and improve coverage through the street network. This project aims to provide an online agent based pedestrian catchment modeller delivered via web-based mapping tool. The tool will include a scenario testing functionality to enable planners to change the street network and upload more detailed data such as footpaths. Two study areas have been chosen for this project one in inner Melbourne and one in the Shire of Melton.

**Demonstrator 2: Employment Demonstrator Outcomes**
Production of gravity and cluster-method based web-mapping tool. This tool will use gravity and clustering methodologies to understand the formation of overall sector-specific job clusters. Data will be drawn from the ABS journey to work and Department of Transport (Victoria). It will provide an evidence-based data source to better understand clusters, commuter and firm response to clustering policies, and ultimately clustering dynamics (commute changes and job growth). Outcomes from this project will be made available to stakeholders in State government and available via the AURIN portal.

**Demonstrator 3: Housing Affordability Demonstrator Outcomes**
Production of a dynamic web-mapping application aimed at generating a Residential Development Potential Index (RDPI) for the North West Melbourne Region. Tools developed for further reporting on this RDPI will
include reporting and analysis outcomes. Analysis tools include: econometric, land as a function of housing affordability, urban intensification, housing development, change of use, spatial analysis and analysis of development approvals.

**Demonstrator 4: Health Demonstrator Outcomes**

Production of a dynamic ecological web-mapping tool to combine diabetes and disadvantage indicators to provide ‘heat map’ concentrations of combined need. The tool will compare the outputs from first tool to the distribution of diabetes and primary health care services. These tools will be made available via the AURIN portal and the metadata made available via the RDA. The tool aims to identify areas of particular vulnerability and combine these outputs with social and physical infrastructure data based on CASE-D Study data. Reporting and academic outputs will conclude the program, which aims to highlight the importance of data integration in interrogating any apparent associations between data sets. These results will be presented to Medicare Locals, scientific conferences and other key stakeholder groups. All outputs will be made available via the AURIN portal.

**Conclusion**

This project aims to bring together datasets into a common platform for enhancing research and policy outcomes, as well as collaborating with state government and data custodians. The framework development has been endorsed by the Victorian Government and represents an exemplar in terms of broad participation with five departmental secretaries (CEOs) giving written support to the project.

The demonstrator projects have been selected based on prior consultation with state government agencies to identify policy areas which need attention. The 12 month time span of the project is a timeframe in which the projects can input directly into the policy objectives.

Technically the infrastructure to be developed will be based on an open source platform, which enables access to the distributed datasets maintained by Victorian Government departments and linked with broader national data and research through the national priorities of AURIN and ANDS.
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