



# Enabling Engaged Organisations and Communities *to Assist Asset Decision-Making*

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SUPPORTING LOCAL DEMOCRACY AND INFRASTRUCTURE MANAGEMENT IN NEW ZEALAND



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# 01 Introduction

WSP conducted a research pilot to develop a method to help decision-makers to deliver smart, community-focused, affordable asset management. It was found that communities want to influence current and future levels of service, costs and utilisation of infrastructure assets such as drinking water, waste and stormwater and public amenities such as parks; and decision-makers such as local authorities, developers and local trusts want to improve democratic processes while working within limited budgets.

Data and information are crucial foundations for taking a smarter approach to asset management. Geospatially-referenced data is imperative because it provides decision-makers with spatially-relevant information upon which to make and evaluate decisions about infrastructure investments in the community. Getting value out of data requires fit for purpose digital information infrastructure that can successfully integrate multiple sources of data to provide the right information at the right time.

Vivienne Ivory, Technical Principal – Social Science Resilience and Public Health at WSP New Zealand, says a key outcome of the research was to ensure that the goal of managing assets was to improve the quality of life for the all of the communities that they serve.

Smart cities use sophisticated digital tools to collect data and use insights to manage assets, resources and services efficiently. To date, the *smart* agenda has primarily focused on large urban centres where the data possibilities, information needs, and built environments, are large and complex. Yet the need for good quality information to manage and govern assets efficiently and effectively is as great in smaller towns and cities.

Lack of economies of scale for collating and managing

data, and difficulties attracting the interest of technology providers with services that are fit for purpose, are real barriers for smaller centres.

Smaller budgets mean that affordable ways of being smarter are now needed. WSP's research investigated how information digital data about assets and communities can be integrated, used, accessed and shared with communities through digital means to engage citizens in decisions about assets.

"What emerged from the pilot was that telling stories about infrastructure and environments through digital methods resources can pragmatically engage the community in meaningful decisions with the council about the ongoing management of those assets," says Ivory.

Out of this research, WSP developed the Participatory and Affordable Information Infrastructure (PADII) toolkit. This toolkit is an adapted design sprint process that can help decision-makers to:

- Build smarter provincial cities. For example, a local authority or developer wanting to develop affordable, useful digital information infrastructure giving better value from existing and future data about assets and communities through digital information infrastructure.
- Enable a community-centric approach to levels of service through better information sharing. For example, a local authority with a difficult infrastructure problem (such as water infrastructure renewal) may want to identify the right digital methods resources and systems to have an ongoing conversation rather than a one-off consultation with its community.

## KEYWORDS

*Asset Management, Infrastructure, Democracy, Local Government, Affordability, Digital Information Infrastructure*

## 02 Research

WSP invited small regional local authorities to participate in a research pilot to develop a method to help decision-makers to deliver smart, community-focused, affordable asset management.

Participating organisations were identified as grappling with asset management challenges, a drive to engage more fully with their communities over asset decisions, and a desire to use data and technology more effectively but with limited resources (funding, technology and expertise).

Three questions were posed:

1. How can we tell if our infrastructure is giving us what we need?
2. What information, processes or tools do we need to tell us whether it is giving us what we need?
3. What can we make that is meaningful, accessible, useful and affordable to help people make decisions?

The research adapted a design sprint process to work efficiently with councils. During workshops, the data needs, availability, and gaps were mapped into a matrix, revealing challenges to using knowledge, closing data gaps, and making decisions.

Having affordable means to integrate a wide range of information sources, including geospatial data was recognised as critical to facilitating a community-centric approach to asset management over the whole lifecycle of infrastructure.

Several other insights were gained through the pilot – particularly on the use of digital methods such as data integration to reduce siloes within councils, and between a council and their community. They could also reduce inter-regional silos by enabling multi-council cooperation where data themes cross regional boundaries, such as water quality and traffic volumes.

From a council perspective, more effective use of data through affordable, integrating digital resources can increase the ‘smartness’ of managing assets through enhanced capacity to analyse, diagnose, and communicate about assets, without large investment.

Ultimately the research showed that if councils are to move from the rhetoric of people-focused consultation, they need the digital tools to collate, connect, and communicate between asset managers and the communities they serve.

This was part of the investigation Urban Narrative research project, which seeks to re-position towns and cities as *listening communities*.

The Urban Narrative vision is of a town or city where local knowledge, ideas and aspirations are gathered through ongoing conversations about urban environments. Through ‘listening’ tools, citizens can participate with institutions such as councils in conversations about the design and governance of infrastructure and the wider built environment.

To achieve this, data about communities and the urban environments they inhabit needs to be generated, captured, and managed so that stories can be told about the people, places, and infrastructure that matters to them.

The Urban Narrative project has been undertaken within the Building Better Homes, Towns & Cities (BBHTC) National Science Challenge funded by the Ministry of Business, Innovation, & Employment (MBIE). The project is a collaboration between the University of Waikato and WSP Research.

The WSP Research component focuses on using an adapted design sprint process to help councils improve their digital information infrastructure when limited by budget. Participatory and affordable digital information infrastructure can enable provincial local authorities to have conversations with their communities about the built environment through the better use of multiple sources of information about urban environments.

### PUBLICATION

WSP presented its findings in a paper, *Enhancing Liveability Through Community-Centric Approaches to Asset Management and Affordable Digital Tools*, at the World Engineers Convention in Australia in November 2019. The paper is authored Vivienne Ivory, Kai O'Donnell and Phil McFarlane.

To read the paper in full or for more information, please contact Vivienne at [Vivienne.Ivory@wsp.com](mailto:Vivienne.Ivory@wsp.com).

# 03 Webinars

## Smart Asset Management

Data is crucial to making good decisions about managing public infrastructure. However, while cities with large populations and complex built environments yield high volumes of digital information, smaller centres can struggle.

WSP is available to run webinars on how local authorities, asset managers, developers and local trusts in smaller centres can harness the power of data to engage communities to participate in decisions over the whole life of assets.

A webinar can give an overview of the **PADII method** (developed from this research and articulated in section four of this paper) and provide interested parties with an opportunity to explore how better information and communication about infrastructure and communities can enhance decision-making in their organisation(s).

For more information, please contact Vivienne Ivory at [Vivienne.Ivory@wsp.com](mailto:Vivienne.Ivory@wsp.com).

## PRESENTER PROFILE

**Vivienne Ivory** is Technical Principal – Social Science Resilience and Public Health at WSP New Zealand. She is a social scientist specialising in place, mobility and infrastructure. She comes from a Public Health research background, with an established track record evaluating the role of the environment in community and societal wellbeing, resilience and liveability. A feature of her work is developing methods for using spatial data to measure characteristics of the environment and outcomes such as wellbeing so that impacts can be robustly evaluated and assessed. Her research takes a systems approach to liveable and resilient environments, helping us think about accessibility to health-related community resources for the wellbeing of people and the wider community, and how dwelling and neighbourhood and transport infrastructure can create healthy living environments. She has completed a Masters in Policy and a PhD in Public Health. She brings expertise across range of quantitative and qualitative data collection and analysis methods, population-level thinking about health and wellbeing, and theoretical concepts of place, health, and resilience.



# 04 The PADII Method

## 4.1 Overview

The Participatory and Affordable Information Infrastructure (PADII) toolkit helps decision-makers to harness the power of data in affordable ways to allow communities to participate in decisions over the whole life of assets.

PADII is particularly useful to organisations who:

- are grappling with asset management, planning, and services challenges
- want to engage more fully with communities about asset decisions
- want to use data and technology more effectively, but with limited resources (funding, technology, expertise).

PADII has six steps (Figure 1) which includes three workshops, plus a primary engagement meeting (The method was adapted to three workshops to meet the needs of council partners, and the size and scope of workshops can be adapted to meet participants' needs). It takes decision-makers through an adapted design sprint process to first identify existing information sources and gaps about the community, commerce, and environment, then sketch what integrated rich information about assets and communities could look like.

Then it uses a demonstrator to identify organisational barriers and opportunities for investing in improved data management systems. This aims to gain agreement on best how to optimise technical and organisational resources.

The final output is a lessons and recommendations report setting out the agreed approach as well as the *value story* for using digital resources to support community-centric approaches to levels of service.

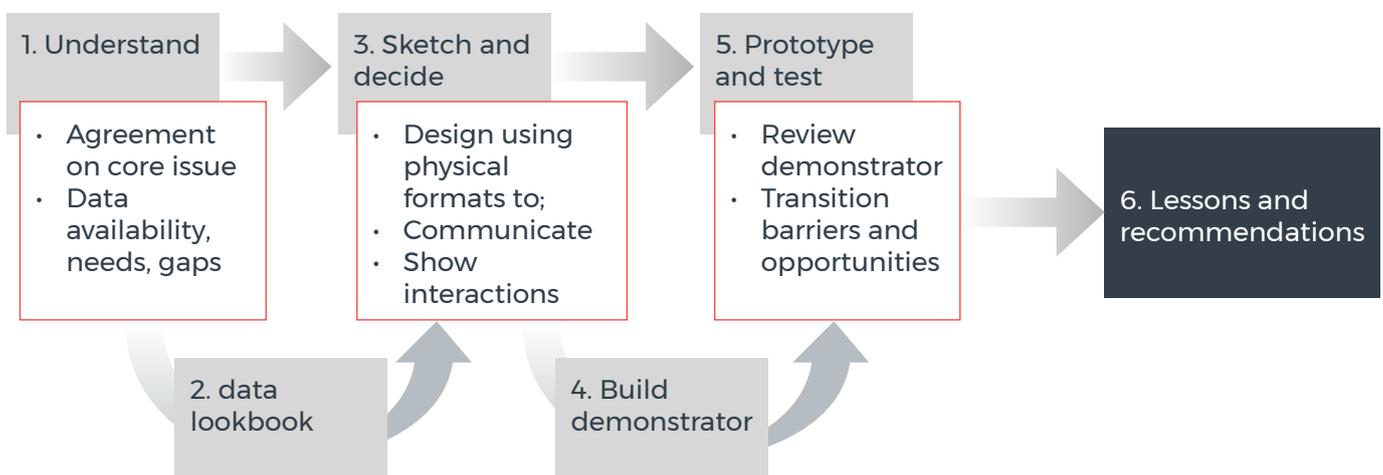


Figure 1: Participatory and Affordable Digital Information Infrastructure steps

## 4.2 A step by step guide to using PADII

### 4.2.1 Preparation: The primary engagement meeting

As groundwork, hold a primary engagement meeting to identify challenges in accessing information for setting infrastructure levels of service and community engagement for decision-making over the life-cycle of assets.

**Output: A list of questions and uncertainties to address during the workshop process.**

### 4.2.2 Step One: Design Sprint Workshop 1 – Understand and explore

Step One is the first of three design sprint workshops to identify and understand information challenges and assets.

#### ABOUT DESIGN SPRINTS

The design sprint process is a series of interactive rapid-fire workshops to:

- encourage the exploration of underlying issues and opportunities (rather than the detail of solutions)
- allow for free-flow conversation.

Here are our recommendations for running design sprints, but keep in mind they can be scaled up or down to meet the needs of the decision-making organisation.

- Invite a mix of perspectives and disciplines involved in infrastructure, planning and service decision-making, as well as people involved in communications and engagement. Community representatives may also attend.
- During workshops, ideally two researchers attend and take turns to lead and facilitate exercises, and record observations.
- After workshops, have researchers review and extract content and key themes from participant-generated and researcher-generated material.

#### PROCESS

- Prepare materials: attendance list (name, role, organisation, email, phone), base maps of area, slide deck.
- Welcome people and provide a design sprint overview, workshop goals and processes. Present the list of questions generated during the primary engagement meeting, and clarify and agree these questions.
- Ask: *'What infrastructure-related decision should we focus on now?'* Prompts for discussion: accessibility, usefulness, and affordability of data and knowledge to convey meaning and community values and needs.
- Once this has been agreed the workshop can split into sub-groups reflecting different interests (e.g. community, council, and commerce).
- Brainstorm these four questions within each group, then ask each group to report back. Use maps as prompts for information gaps and opportunities.
  - *'What knowledge, information, and data do we need to make this decision?'*
  - *'What knowledge, information, and data do we already have?'*
  - *'What are the gaps between what we need and what we have? (What we don't have)'*
  - *'What are the challenges to: using the knowledge; closing the gaps; making decisions?'*
- Summarise lists and address any parked issues, and wrap up the workshop.

**Output: A summary of information gaps, opportunities, needs, and challenges.**

### 4.2.3 Step Two: Create an information lookbook

The next step is to create an information lookbook to identify existing and potential data/information about the community, commerce and council sourced from existing council and researcher knowledge. The lookbook pulls together visual outputs from a wide range of information sources into a single portfolio that illustrate the possibilities of data sources and uses. As well as existing outputs, it can call on examples from other jurisdictions that could be useful to consider, or data that is available but not currently used – e.g. mapping economic trends.

**Output: An information lookbook illustrating the range of data sources, presentation, processes and issues identified by Workshop 1 participants.**

### 4.2.3.1 Step Three: Design Sprint Workshop 2 - Sketch and decide

In Design Sprint Workshop 2, participants sketch a set of possible approaches to address information challenges and agree key features and functions.

#### PROCESS

- Before the workshop, prepare and distribute a summary of Workshop 1.
- Demonstrate the range of data sources and types available and visualisation options using the information lookbook. Prompt discussion on what data could be better used and how it could convey information effectively.
- Design a mock-up of a digital means (such as a web platform integrating multiple data sources) that:
  - links ‘people’ data with existing data on ‘things’ (such as physical infrastructure, the natural environment, buildings etc)
  - can both gather and share ‘people’ data such as infrastructure use, attachment of people to place and assets, perceptions, and aspirations.

To achieve this, give participants two physical ‘formats’ for their mock-up tools: a book simulating web pages and a map. Using the two formats, ask participants to address two design challenges as a case study to focus attention.

- Reflect on the features of the design mock-ups to identify common points and key differences.

**Output: A summary of key features and functions required of digital information infrastructure.**

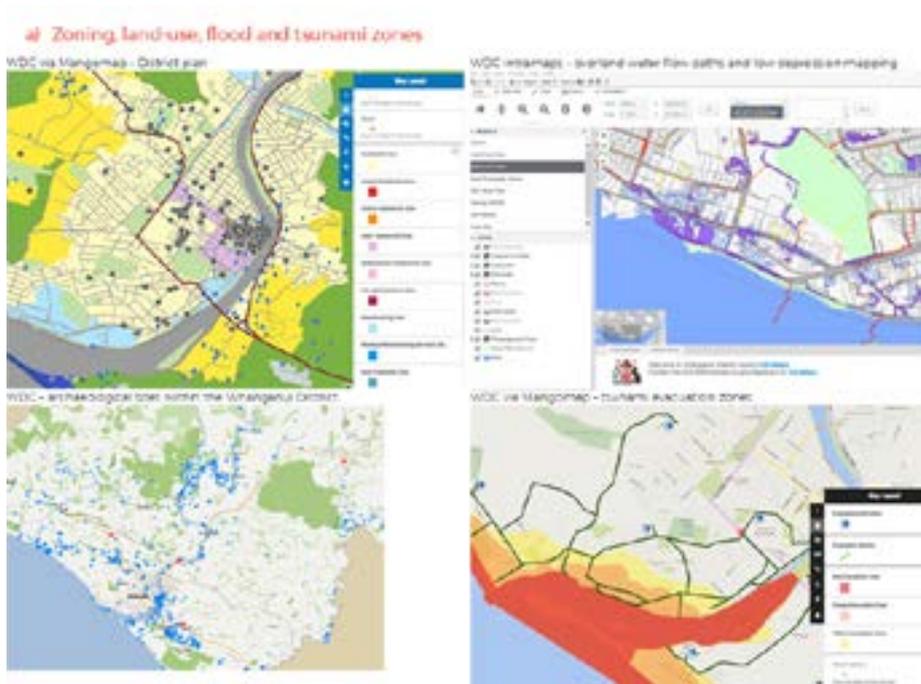


Figure 2: A sample page from an information lookbook

#### 4.2.3.2 Step Four: Build a demonstrator

The purpose of building a demonstrator is to show the key features and functions identified in Design Sprint Workshop 2. For example, this could be a mock-up of single, cohesive portal interface demonstrating features and functions that are capable of intuitively delivering council and community information needs.

One software tool that can be used for this purpose is Maptionnaire, an interactive geospatial survey tool which allows users to build functionality, branches and questions from modular 'building blocks'. Maptionnaire can build reasonable likenesses of a range of functions identified through the workshop process.

Depending on capabilities and time available, a demonstrator could anything be a series of mocked-up images showing how potential key functions could be added to existing platforms, to a fully functioning website showing how information can be accessed and used by different parties. The intention is to demonstrate possibilities that address the previously identified information needs as well as to stimulate discussion on next steps.

(See Figure 3)

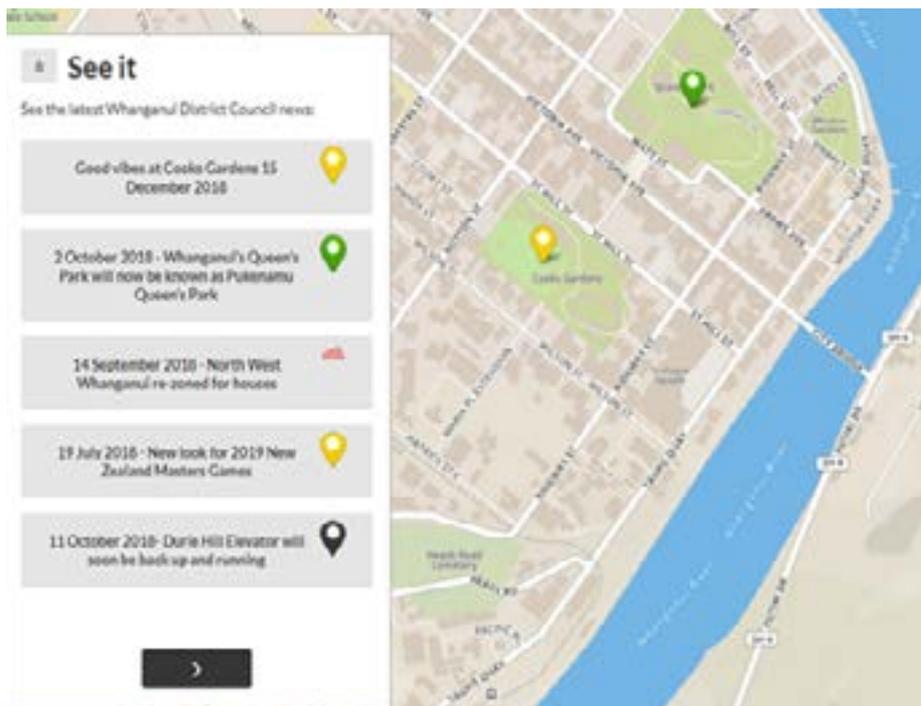


Figure 3: Example of a demonstrator using Maptionnaire

#### 4.2.3.3 Step Five: Design Sprint Workshop 3 - Prototype and test

The purpose of Workshop 3 is to identify the current capacities that could be used to develop digital information infrastructure with the desired functionality, and to identify needs to be met. It is also important to identify changes that need to be made at an organisational level and technical capacity to deliver the digital tool.

##### PROCESS

- 'Test' the demonstrator by exploring its functions with participants through use of examples, scenarios and images.
- Discuss the technical and organisational limitations and possibilities of each feature, and the difference these could make to decision-making around assets, planning and services.
- Discuss technical and organisational requirements to support story-telling and surveying functions necessary to guide users through complex or data-rich asset decisions, both existing and what would be needed.
- Identify the changes needed to implement functions (and associated barriers) in terms of desirability and difficulty using a matrix.
- Agree on prioritisation of changes in terms of low-hanging fruit, biggest impact and potential staging.

**Output: Summary of prioritised actions.**

#### 4.2.3.4 Step Six: Lessons and recommendations report

The last step is to summarise lessons and recommendations into a short report which includes outcomes and outputs from design sprint workshops, and a *value story*.

##### EXAMPLES OF DESIGN SPRINT WORKSHOP OUTCOMES

- Challenges and emerging opportunities, e.g. where critical gaps or silos in knowledge and information-sharing inhibit a community-centric approach to asset management. This could include silos within decision-making organisations and between council and communities.
- Possible approaches and preferred functions and features
- Requirements for a participatory and affordable digital information infrastructure including how this will feed into a community-centric approach to asset management, and priorities for change.

##### EXAMPLES OF A VALUE STORY

The value story outlines in a simple way how digital tools will support community-centric approaches to levels of service. This may include:

- how investments will benefit decision-making organisations and communities
- where opportunities lie to improve technical and community knowledge through enhanced expertise, new and integrated data sources and collation
- where investment is needed in digital information infrastructure to support community-centric approaches to asset management and decision-making about the wider environment.



## 05 Conclusion

Digital data plays a valuable role in informing discussions, addressing challenges and generating agreement between communities and decision-makers over the management of assets. Yet smaller centres face financial barriers in accessing smart data systems and software.

Affordable approaches are needed to help decision-makers in smaller centres to generate rich information about communities and assets through data integration, to involve communities in infrastructure management in an efficient and effective way.

### ***How can we help?***

If you think the PADII method might be helpful to your organisation, please get in touch with us. We can set up an initial discussion about what might be most useful and effective, and, if appropriate, how the PADII method could be applied in your situation.



## 06 Acknowledgements

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