Mobile Libraries and Digital Inclusion in Non-urban Aotearoa New Zealand

BY

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ABSTRACT:

PROBLEM: The purpose of this study is to investigate the contribution mobile libraries are making to digital inclusion in non-urban areas of Aotearoa New Zealand, the challenges mobile librarians face in providing digital inclusion services, and how mobile libraries collaborate with other organisations to support digital inclusion. Research concerning mobile libraries and their role in supporting digital inclusion is limited, and this study aims to begin closing this gap in the literature.

METHODOLOGY: This research project was qualitative and conducted using semi-structured interviews of six staff members from five mobile libraries. Research data was coded and analysed to identify key themes and insight on the topic.

RESULTS: By providing a range of digital inclusion services, participating mobile librarians contribute positively to digital inclusion in non-urban areas of Aotearoa New Zealand. Participants reported a range of challenges in providing these digital inclusion services, as well as a number of opportunities to collaborate in their delivery. Many mobile librarians were transitioning towards a more contemporary model of service provision and identified a number of themes associated with this change.

IMPLICATIONS: Findings from this project suggest many avenues for future research, and may be useful to mobile librarians and their potential collaborators, researchers looking to investigate in this area, and those seeking a greater and more nuanced understanding of digital inclusion in Aotearoa New Zealand.

KEYWORDS: Mobile libraries; digital inclusion; non-urban libraries; rural libraries.

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1.0 Introduction

Digital technologies have become critical for participation in modern social, professional, and civic life (Jaeger et al., 2012). As the government in Aotearoa New Zealand moves towards a digital public service (Department of Internal Affairs (DIA), 2020) and consumers increasingly "communicate and transact online" (Park et al., 2019, p.139) it is vital that all people are digitally included. This means they should be able to access "affordable and accessible digital devices and services at a time and place convenient to them, as well as the motivation, skills and trust to use the internet and pursue and realise meaningful social and economic outcomes" (Digital Inclusion Research Group, 2017, p.5).

Those living in non-urban areas are recognised as one group at risk of not being digitally included (Gann, 2019; Kos-Łabędowicz, 2017; Park, 2017), and recent analysis of data in Aotearoa New Zealand shows that larger country towns have the lowest proportion of people with access to the internet (Grimes & White, 2019, p.24). In general, access to digital infrastructure in Aotearoa New Zealand is high (Rural Broadband Usage Survey Project Team (RBUS), 2018; Grimes & White, 2019; Digital Inclusion Research Group, 2017; 20/20 Trust, 2017) even in non-urban areas, although during the first year of the Covid-19 pandemic, the need for broadband access in non-urban areas of Aotearoa New Zealand was again highlighted as people were required to conduct their work, education, life, and leisure activities from home (RNZ, 2020).

Access to the internet, however, does not ensure digital inclusion, and even when levels of access to broadband infrastructure are high, further tiers of digital exclusion may be apparent in which the barriers of affordability, capability, motivation and trust prevent people benefiting from the digital technologies available to them (Park & Humphry, 2018; Van Dijk, 2012; Helsper & Reisdorf, 2016; RBUS, 2018).

1.1 Problem Statement

Described as a "new type of social inequality" (Park & Humphry, 2018, p.936), digital exclusion has a strong relationship with social exclusion (Park & Humphry, 2018; Alam & Imran, 2015; Martin et.al., 2016; Helsper, 2012; Lloyd et.al., 2010), and the correlation of social exclusion, economic disadvantage and digital disengagement has been shown to have increased over time

(Helsper & Reisdorf, 2016). One study in Aotearoa New Zealand indicated that those without internet access have lower subjective wellbeing than others, and are also less likely to be civically engaged through activities such as voting or signing a petition (Grimes & White, 2019, p.7, 35). Those who were unable to access the internet have reported experiencing isolation, powerlessness, and limited opportunity (Elliot, 2018) as a consequence of their digital exclusion.

Public libraries are an important community asset in aiding digital inclusion, and often provide internet access and technology training (Real et al., 2014; Gann, 2019;). They have also become central sites for "national policy focused on digital equity and universal service" (Strover et.al., 2020, p.247) and in the Aotearoa New Zealand context this can be seen in initiatives such as the Aotearoa People's Network Kaharoa (APNK)[1], Skinny Jump[2], and Stepping UP[3], which are discussed in more detail in section 2.2. As interactions with government become increasingly digital, public libraries are also picking up the slack as a public contact point with government agencies (Lankes, 2012, p.17). In Aotearoa New Zealand, many people with limited internet access cite their local library as a place they can access the internet for free (Elliot, 2018), and it has been reported that some government departments will refer clients who do not have internet access to the public library where they can connect with digital government services (Local Government of New Zealand & Public Libraries of New Zealand, 2012, p.14).

As well as access to the internet and digital devices, public libraries contribute to digital inclusion in many other ways. These services include information and digital literacy training, 'makerspaces', assistance with online tasks, coding programs (Wyatt et al., 2015), technology classes, e-resources (Mehra et al., 2020, p.3) and digital content in accessible formats (Beyene, 2018). In this research project, these contributions to digital inclusion are referred to as 'digital inclusion services' or DIS.

Many of the DIS provided by public libraries are delivered at static library buildings. While these may serve the majority of library users, Aotearoa New Zealand, by OECD standards, is sparsely populated (Statistics New Zealand, 2005), with a large and scattered non-urban population that

[1] https://natlib.govt.nz/librarians/apnk
[2] https://www.skinny.co.nz/jump/home.html
[3] https://steppingup.nz/

may not be able to access static delivery points. Mobile libraries have the ability to serve non-urban communities in the absence of a static public library, and have been shown to play a role in combating exclusion (Haggis & Goulding, 2003), aiding equity of access to online services (Knight & Makin, 2006), providing a sense of community (Davidson, 2006, p.45) and a focal point for social interaction (Dyson, 1990, p.27).

Given the large non-urban population in Aotearoa New Zealand, mobile libraries have the potential to act as important contributors to digital inclusion, but it is not clear how they do so. Several studies have focused on static library services to non-urban communities, and their role in supporting digital inclusion. There is, however, limited recent research concerning mobile libraries in general, and even less investigating the ways in which they contribute to digital inclusion.

This study aims to begin closing this gap in the literature by exploring the role mobile libraries play in digital inclusion for non-urban communities. It may be of value to mobile and outreach librarians, potential collaborators with mobile libraries, researchers looking to investigate in this area, and those seeking a greater and more nuanced understanding of digital inclusion in Aotearoa New Zealand.

1.2 Objective and Research Questions

The objective of this study is to investigate the contribution mobile libraries are making to digital inclusion in non-urban areas of Aotearoa New Zealand, the challenges mobile librarians face in providing DIS, and how mobile libraries collaborate with other organisations to support digital inclusion. To achieve this, the project will address the following research questions:

RQ1: What digital inclusion services do mobile libraries provide to non-urban areas of Aotearoa New Zealand?

RQ2: What challenges do mobile librarians face in providing digital inclusion services?

RQ3: How do mobile libraries collaborate with other organisations to increase digital inclusion in non-urban communities in Aotearoa New Zealand?

1.3 Definitions

Mobile libraries

In this study, a mobile library is defined as "a vehicle designed, equipped and operated to extend and facilitate access to public library services to those people who do not have reasonably convenient access to a static public library" (NSW Public Libraries, 2015, p.5). In Aotearoa New Zealand, mobile libraries were traditionally modified diesel-powered buses (Hawke & Jenks, 2005), although this study found that some services are transitioning to smaller vehicles that do not require a heavy transport license to drive.

Digital Inclusion

The terms digital divide, digital literacy, and digital inclusion have lacked clarity or consistent use (Jaeger et.al., 2012). In this study the term digital inclusion is used, and refers to an end state in which everyone has equitable opportunities to participate in society using digital technologies (Digital Inclusion Research Group, 2017).

Non-urban Areas

There is no agreed definition of rural, or non-urban areas, and areas have traditionally been defined according to population size. Although Statistics New Zealand (2004) has developed a more nuanced classification, in this research project, non-urban simply indicates that an area is not a main urban centre. This is guided by a population-based classification used by Grimes and White (2019, p.24) which originated from the New Zealand Election Study. The categories of larger country towns (10,000 – 25,000 population), country towns, and rural areas (under 10,000 population), are combined, and referred to as 'non-urban areas'.

2.0 Literature Review

This literature review is organised by three themes: (a) digital inclusion and how this relates to non-urban communities; (b) public libraries and their contribution to digital inclusion; and (c) studies of mobile libraries.

2.1 Digital inclusion and non-urban communities

Digital inclusion is widely regarded as a requirement for full participation in modern social, professional, and civic life (Jaeger et al., 2012). Some also state that it is not merely a beneficial

privilege, but a human right (Petri, 2017). Given this vital nature, there is a vast body of literature on this topic. This literature review begins with a brief overview of digital inclusion and associated terms, followed by a review of literature related to digital inclusion amongst non-urban communities and in the Aotearoa New Zealand context.

Early studies in this area focused on internet adoption and the binary framework of internet 'haves' or 'have-nots', naming the gap between the two the 'digital divide' (Jaeger et al., 2012). This understanding, however, was seen as too narrow, and a call was made for a more complex approach (Bertot, 2003; Warschauer, 2003; Van Dijk, 2005).

Discussion of the digital divide subsequently shifted to one of varying levels, and focus moved from first-level issues of internet access to second-level issues of skills and use (Hargittai, 2002). This departed from the notion that access to internet technology automatically provided a user with all the benefits of that technology (Scheerder et al., 2017). Later, a third level of digital divide was proposed. This focused on tangible outcomes of internet use and acknowledged that access and skills do not necessarily result in beneficial outcomes for users (Wei et al., 2011; Stern et al., 2009). Recent studies have indicated that even when internet access is universal, first-level divides persist in the form of access to devices, device opportunities, and related maintenance expenses (Van Deursen & Van Dijk, 2019).

Building on the concept of the digital divide, *digital literacy* acknowledges that the opportunities created by digital technologies cannot be realised through access alone (IFLA, 2017). According to the IFLA, a digitally literate person can efficiently, effectively and ethically use digital technology to meet their information needs (2017, p.2), and digital literacy is regarded as a vital precondition to digital inclusion (Gann, 2019, p.148), which can be viewed as an end state in which everyone has equitable opportunities to participate in society using digital technologies, and as the policy and outreach activities which mitigate the problems of the digital divide and digital literacy (Real et al., 2014) to achieve this.

Described as a "new type of social inequality" (Park & Humphry, 2018, p.936), digital exclusion has a strong relationship with social exclusion (Park & Humphry, 2018; Alam & Imran, 2015; Martin et.al., 2016; Helsper, 2012; Lloyd et.al., 2010), and the correlation of social exclusion,

economic disadvantage and digital disengagement has been shown to have increased (Helsper & Reisdorf, 2016). While Klecun (2008) discussed the potential of digital exclusion to compound existing social disadvantage, others have noted that lack of access to and appropriate use of digital technologies may be factors in social exclusion, but are not primary causes (Foley, 2004; Clayton & Macdonald, 2013).

Those living in non-urban communities are identified as one group at particular risk of digital exclusion (Gann, 2019; Real et al., 2014; Freeman & Park, 2015). Factors that cause this vary with specific geographic contexts, but include socio-economic circumstances of communities, aging populations, poor broadband connectivity, and the commercial feasibility of infrastructure development (Gann, 2019; Freeman & Park, 2015).

In Aotearoa New Zealand recent analysis of existing data has shown that residents of larger country towns experience the lowest levels of internet access (87.44%), along with country towns (88.59%) and rural areas (90.39%), compared to major cities (92.73%) (Grimes & White, 2019, p.24). These figures show that internet access is high, even in non-urban areas (RBUS, 2018; Grimes & White, 2019; Digital Inclusion Research Group, 2017; 20/20 Trust, 2017) and programs such as the Rural Broadband Initiative (RBI) aim to increase access to 99.8% of the population by 2023 through enhanced access to non-urban households and businesses, off-shore islands and marae (Crown Infrastructure Partners, 2018).

Despite high connectivity rates, those living in non-urban areas of Aotearoa New Zealand may still not be digitally included (Sylvester et al., 2017; Digital Inclusion Research Group, 2017), and the Rural Broadband Usage Survey (RBUS) has identified that even when the RBI achieved over 90% access to rural areas, problems in achieving potential gains seemed to be the effective *use* of broadband internet (RBUS, 2018) rather than access alone.

In 2019, the government in Aotearoa New Zealand released their Digital Inclusion Blueprint. This document outlines the role of central government in achieving digital inclusion, while also identifying existing initiatives and gaps. Drawing heavily on the Pulse of our Nation report (Digital Inclusion Research Group, 2017), the Blueprint identifies four factors of motivation, access, skills, and trust, which are required for digital inclusion. The Blueprint also acknowledges that residents

of rural or non-urban communities are amongst those at most risk of not being digitally included (DIA, 2019a).

This study was undertaken during the first year of the Covid-19 pandemic, and as people conducted work, education, life, and leisure activities from home during national lockdowns, issues of internet connectivity in Aotearoa New Zealand were quickly highlighted. In April 2020, the government recognised that some isolated households still required reliable broadband access (Faafoi & Jones, 2020, para.6) and funding was allocated to upgrade existing non-urban mobile towers and wireless infrastructure (Faafoi & Jones, 2020, para.3). In October, as Aotearoa New Zealand neared a general election, the Labour government pledged to set aside a $60 million fund to improve internet access in non-urban areas if they were re-elected (RNZ, 2020).

Finally, the Digital Inclusion Research Agenda stated that one way of achieving the government's priorities for digital inclusion research is to undertake qualitative studies with groups less likely to be digitally included (DIA, 2019b). By investigating digital inclusion in non-urban areas of Aotearoa New Zealand, this project hope to help, in a small way, to provide insight in this area.

2.2 The role of public libraries

Public libraries play an important role in the dissemination of information, and have extended this by offering access to the Internet, technological tools, and digital literacy training (IFLA, 2017). As one of the few institutions offering many services free of charge, public libraries are also an ideal location for the promotion of digital inclusion (Noh, 2019; Gann, 2019), and contribute through a range of services, including public access to the internet, digital devices, and digital content; digital literacy and technology training; (Noh, 2019; Bertot et al., 2015; Mehra et al., 2020) and information in accessible formats (Beyene, 2018). Some also provide 'non-traditional' digital inclusion services (DIS), including coding workshops, makerspaces, media labs and access to recording equipment (Wyatt et al., 2015).

During the Covid-19 pandemic, libraries have played an important role by providing reliable information to patrons (Wang & Lund, 2020, p.283); combating mis- and dis-information (Naeem & Bhatti, 2020); and, in some countries, providing Wi-Fi hotspots (Ayre, 2020). Researchers have also stressed the importance of providing virtual services, digital resources (Chakraborty et al.,

2020; Grassel, 2020), and digital inclusion initiatives (Gann, 2020a) while patrons were unable to physically access the library.

Despite these offerings, research continues to reveal areas in which digital exclusion persists. Preliminary findings of a survey of library managers in Aotearoa New Zealand indicate that more work is required to meet the digital needs of 'specialist groups', including patrons who are blind, low vision, deaf, hearing impaired, or who have physical impairments and complex needs (Hartnett, 2020).

In non-urban areas with poor quality, unaffordable or unavailable internet connectivity, and a lack of access to professionals who can assist with digital literacy tasks, DIS offered by public libraries are particularly important (Strover et al., 2020; Thiele, 2016). The provision of free public access to the Internet, computers, and printing facilities (Bishop et al., 2016), as well as computer and technology training (Hancks, 2012) by non-urban libraries has been shown to support the economic development of their surrounding communities. Recent research investigating the use of technology by non-urban libraries to promote community engagement has shown evidence that this may also help to overcome marginalization and bridge digital divides (Mehra et al, 2020).

Despite this critical role that non-urban public libraries can play in digital inclusion, they are relatively understudied, and have been found to experience difficulty offering DIS due to persistent problems with low staffing levels, a reliance on limited local funding, limited open hours, small and aging spaces (Real et al., 2014; Real & Rose, 2017), and poor telecommunications infrastructure (Thiele, 2016; Bishop et al., 2016; Mehra et al., 2020). Researchers in this field have also noted that, as a greater emphasis is placed on the provision of digital services, non-urban libraries will struggle further to keep up due to the difficulties outlined above (Real & Rose, 2017).

In Aotearoa New Zealand, the government has recognised inequalities in digital inclusion, and one of the measures implemented to mitigate this is the use of public libraries as technology hubs (Sylvester et al., 2017). This is evident in three programmes: the Aotearoa People's Network Kaharoa (APNK), Stepping UP, and Skinny Jump (formerly Spark Jump).

Funded by the National Library of New Zealand (National Library) in partnership with local councils, APNK provides "free and facilitated access to the internet and computer technology" in public libraries to help enable all New Zealanders become connected online (National Library, n.d., para. 1). APNK provision includes access to free high-speed and WI-FI internet connections, access to hardware including computers, printers and scanners, and the systems and support required to manage and maintain these.

Stepping UP is run by the Digital Inclusion Alliance Aotearoa (DIAA) in collaboration with public libraries and community centres. The program provides free, community-based training to build digital skills and knowledge through 38 training modules delivered at 93 locations which are predominantly libraries (DIAA, n.d.). The 2017-2018 Stepping UP annual report identified the need to continue expanding the Stepping UP program, especially to those who were rurally isolated (20/20 Trust, 2018).

Closely associated with Stepping UP, Skinny Jump is managed by the DIAA and many of the same partner organisations with support from the Spark Foundation. With no contracts or credit checks, Skinny Jump provides heavily subsidised, flexible prepaid broadband and a free modem to those families recognised as being at most risk of digital exclusion by the government's Digital Inclusion Blueprint (Skinny Jump, n.d.). As Skinny Jump partners, local libraries help to determine which families are eligible for the service, as well as providing support to set up and maintain Skinny Jump.

These DIS and human intermediaries have been shown to provide a critical role in brokering the interaction between people and information in order to create digitally included local communities (Mervyn, et al., 2014). While there has been much discussion about public libraries and how they aid digital inclusion, this research project focuses specifically on *mobile* libraries and their contribution to the digital inclusion of non-urban communities.

2.3 Mobile libraries

Mobile libraries play a vital role in bringing library services to those without access to a static public library (Hawke & Jenks, 2005; Stringer, 2010), and have traditionally focused on dispersed or non-urban communities (Stringer, 2010). Mobile access is shown to be particularly important

for those groups who may have difficulty travelling to bricks and mortar libraries, including older people (Vincent, 2014), those who are blind or low vision (Kavanagh & Sköld, 2005) and children (Akanwa, 2013, Bamkin et al., 2013; Lewins & Paterson, 1990), for whom libraries play an important part in literacy development (Akanwa, 2013).

Scholarly and peer-reviewed studies of mobile libraries are limited, and due to this scarcity, much of the literature reviewed here is now over 15-20 years old. A large amount of literature surveys and summarises the range and types of mobile library services available in specific geographic areas. These include North America (Yarrow & McAllister, 2018), Zimbabwe (Doust, 1999), Greece (Bikos, 2014), Finland (Haavisto,1994), India (Khanna, 1994), the extreme north (Maksimova & Nebogatikova, 1993), and Africa (Ward, 1996). A smaller number focus on tracing the history of mobile library services, such as Han's (2010) in-depth study of public library services in post-colonial Singapore.

Remaining literature regarding mobile libraries tends to focus on practical and operational aspects of the service. This includes studies of the cost-effectiveness of a variety of library provision methods to rural communities (Haggis & Goulding, 2003), the barriers and potential solutions to the delivery of mobile library services to a rural county in Wales (Dyson, 1990) and the degree to which alternative methods of library provision are being utilised in rural areas of England (Benstead et al., 2004). Similarly, studies of mobile library services in Aotearoa New Zealand investigate the criteria upon which selection decisions are made (Davidson, 2006), and planning approaches used by public libraries for mobile library services (Quinn, 2008). Hawke and Jenks' paper (2005) outlines the history of mobile libraries in Aotearoa New Zealand, and discusses their detailed survey which was used to develop standards in this country, although this is now 15 years old. Results of their survey revealed the number of mobile libraries operating in Aotearoa New Zealand, as well as a rich description of their physical nature, funding, staffing, and usage. At the time, only one mobile library in Aotearoa New Zealand reported offering access to digital technology in the form of printing, photocopying, scanning and faxing services (Hawke & Jenks, 2005).

A very small handful of literature also takes a broad view, examining the role that mobile libraries played in constructing ideas of community in twentieth-century America (Attig, 2014), the use of mobile libraries as 'tactical urbanism' (Lydon & Garcia, 2015), or a lens through which to consider the politics of institutional mobility (Lingel, 2018).

The contribution of mobile libraries to digital inclusion is not often the sole focus of literature. The issue of digital inclusion instead appears in articles which discuss the upgrade of mobile library fleets (Clancy, 2003), and the adoption of new technology by mobile libraries (Monley & Pestell, 1996). Mobile makerspaces and fabrication labs have also been discussed as a way of taking new, creative technologies to patrons who cannot access static maker locations (Moorefield-Lang, 2015; de Boer, 2015). In Australia, Knight and Makin (2006) explored the transformation of mobile libraries from basic bookmobiles to 'branches on wheels' which offer a full range of public library services including access to the internet and new technologies. Professional guidelines for mobile library provision also touch on the requirement for mobile libraries to act as 'mini-branches', providing public access computers, copying facilities, access to online reference works and the provision to download (Stringer, 2010). IFLA mobile library guidelines refer to the 'cybermobile' – a specialist mobile library containing internet access, computers, and provision to scan, photocopy, and access digital material in various formats (Stringer, 2010).

2.4 Summary

When viewed together, existing literature provides a clear picture of the barriers to digital inclusion faced by non-urban communities, and the potential of public libraries to foster digital inclusion. A small amount of insight is given into the provision of mobile library services generally, but very little literature addresses the interaction of mobile libraries, DIS, and non-urban communities.

This research project therefore focuses on how mobile libraries contribute to digital inclusion in non-urban areas of Aotearoa New Zealand, the challenges faced by mobile librarians in providing DIS, and how mobile libraries collaborate with other organisations to support digital inclusion.

3.0 Methodology

To answer the research questions of this project, a basic qualitative study was undertaken, with a focus on mobile librarians themselves. A qualitative research design alongside deductive and inductive reasoning allows for a rich and thick description of a phenomenon to be developed. Investigations of a qualitative nature are also "required to genuinely assess value and impact of all public services, rather than just levels of provision of service performance" (Eve & Brophy, 2000, p.3). Given the lack of research in the area of this study, an explorative approach was needed to gain insight into issues surrounding the topic (Leedy & Ormrod, 2015).

An ongoing literature review helped to identify gaps and formulate the research problem, questions, and design, as well as situating findings from the study in the context of previous work. Keywords, subject headings, citation searching, and snowballing was used to retrieve peer-reviewed, scholarly articles from library, information, and humanities databases. Keywords were also used to search the internet for related reports and policy.

3.1 Population Sample

A small and purposeful sample of mobile librarians was chosen for this study. The goal in selecting this unique sample was to gain insight from those closest to the provision of service, who interact with both the patrons of mobile library services, and the branch libraries that provide them.

A directory of libraries in Aotearoa New Zealand (National Library, n.d.a., n.p.) was used to identify possible participants. The website of each public library was viewed by the researcher and 12 libraries appearing to operate a mobile library were identified and emailed directly. Three libraries, according to their mobile librarian, operated only within main urban centres and therefore did not fit the project scope. Ultimately, recruitment emails yielded six staff members from five libraries willing to participate. This sample is small, but nonetheless represents approximately 55% of public libraries that offer mobile library services to non-urban areas in Aotearoa New Zealand.

Participants were emailed an information about the project as well as individual and organisational consent forms. Signed consent forms were returned electronically to the

researcher, and an interview date was organised. Copies of these can be seen in Appendices 1-4. A multi-site and multi-person approach allowed the researcher to speak to mobile participants from a range of locations, aiming to capture "the diversity in experiences [of people] living in various geographical and cultural settings" (Leedy & Ormrod, 2017, p.280).

3.2 Ethics

Victoria University research projects involving human subjects require approval from the Human Ethics Committee, and this was gained before data collection began. Ethical issues of interview-based research most often centre around informed consent and confidentiality, which were both addressed in this study.

Participation was strictly voluntary, and participants were informed of the nature of the study and granted written permission of their involvement through informed consent forms. Consent forms were stored separately from research data so that participants could not be linked to their contributions. Consent forms provided participants with the option of receiving a copy of their interview transcript so member checking could occur, and to receive a copy of the final report, although none chose to receive their interview transcript.

To ensure confidentiality, data that could identify a participant was de-identified by removal or through use of pseudonyms. Data was securely stored in a password-controlled device and will be destroyed once no longer required.

3.3 Data Collection and Analysis

The primary instrument for data collection and analysis in this study was the researcher (Merriam, 2009, p.15), and data was collected through semi-structured, person-to-person interviews. Covid-19 travel restrictions meant that interviews were conducted by telephone, or online via video-conferencing software, Zoom. Interviews were chosen as they are shown to yield high response rates (Leedy & Ormrod, 2015, p.160) and to collect rich and complex data from which findings can be drawn. As mobile librarians serving non-urban communities in Aotearoa New Zealand are limited, high response rates were particularly important.

Because not much is known about the area of this study, the exploratory and flexible nature of the semi-structured interview format was vital. Participating were enabled to articulate what is important to them in their own terms, while still enabling the researcher to guide the interview, and respond to new ideas on the topic (Merriam, 2009, p.90).

Interviews were recorded then transcribed verbatim, and inductive and deductive analysis was applied to one interview before first- and second-cycles of coding took place. Coding, the process of examining a unit of data and labelling it with a summarizing word or phrase, makes the data "readily accessible for analysis" (Linneberg & Korsgaard, 2019, p.259). First-cycle coding produced an initial list of codes, which was used to analyse remaining transcripts. Using axial coding a final list of codes and subcodes was developed, with definitions and examples to guide further analyses. These final lists can be seen in Appendix 6. Second-cycle coding was then undertaken, with all transcripts analysed sentence by sentence using the final code list.

3.4 Assumptions and Limitations

Two primary assumptions are made in this study: that those living in non-urban communities are at risk of digital exclusion; and that the delivery of services through mobile libraries contributes to digital inclusion amongst non-urban communities. Existing literature suggests that these assumptions are sound, but this research project aims to shed light on the topic.

Due to time constraints, the study sample is limited to mobile librarians serving non-urban communities in Aotearoa New Zealand. This non-probabilistic and purposive sample was also chosen so that participants had expertise and experience in the project area. Sample limitations also determined the small sample size.

Limitations in data analysis revolved around member checking and the use of a single researcher to code data. Interviewees could opt to receive a copy of their transcript to check it was correct. As none chose to do so, member checking did not occur. Due to time and resource constraints, data analysis was undertaken only by the principal researcher, which increases the risk that this person's expectations and biases will influence the codes assigned (Leedy & Ormrod, 2015, p.313). Future research in this area would benefit from both member checking, and multiple independent raters during coding and data analysis.

Delimitations were made when reviewing literature. Traditionally used to describe a non-static library, the term *mobile library* has expanded to also refer to the use of mobile technologies in libraries. This resulted in a large number of false positives when literature searching. Only papers related to mobile libraries as previously defined in this study are included.

4.0 Findings

Deductive analysis revealed a number of themes which are discussed below and organised around the project's research questions. Many comments corresponded with the Digital Inclusion Blueprint themes of access, skills, motivation, and trust, and this framework is reflected in how these findings are reported. Further inductive analysis revealed a number of additional themes related to changing models of service provision. Although this study is qualitative, the frequency with which each theme is discussed can be seen in Appendix 7 to further assist in building a rich picture of the data.

4.1 What digital inclusion services do mobile libraries provide to non-urban areas of Aotearoa New Zealand?

Access

Participating mobile librarians offered a wide range of digital inclusion services (DIS) to non-urban communities. The majority of these related to the theme of access. Participants primarily discussed internet access, with four out of five mobile libraries offering free Wi-Fi, and two providing Skinny broadband. Where Wi-Fi was not offered, the participant stated that this was trialed, but not continued due to low use:

> *"…we really didn't have a lot of uptake with the Wi-Fi, […] honestly, everyone seemed to have things on their phone."*

Three additional participants also commented that although they provided free Wi-Fi, patron use remained low. This is further discussed under RQ2.

Access to digital devices was also offered by all participants, including iPads, Chromebooks, laptops and a stationary computer, as well as printing, photocopying and scanning equipment. Three mobile libraries provided access to new technologies such as virtual reality headsets,

robots and robotic kit, light pads, and 3D printers. One participant was considering providing digital conferencing equipment so that children in remote areas could participate in book or coding clubs at branch libraries.

Another interviewee emphasised the importance of providing access to non-urban schools that may be ill-equipped in terms of digital technologies and skilled staff:

> *"…a school that might have 25 students, be incredibly rural, the service we offer is disproportionately important to them in terms of digital technologies. […] If we can take our coding laptops or our robots, […] they don't have that stuff".*

Additionally, one participant indicated that the access they provided gave patrons the opportunity to try digital technology before purchasing it themselves. This participant recounted giving advice to a grandmother who frequently brought her mokopuna[4] to a robotics group:

> *"…the following week she would come in and say, could you write down exactly what it is? […] So I'm […] looking it up, ok, look I'm going to email you, this is the product description, this is where you get it from, oh they've got one in stock in [town] at [shop]."*

Skills

Many interviewee comments also related to the provision of digital skills which helped patrons use the internet and digital technology. Participants reported that these services may be part of planned programming, or ad-hoc.

Librarians offered skill-based programming on three mobile libraries, and a fourth planned to do so. Activities in this area were usually library-focused, with programming to teach patrons how to log into their library accounts, download e-books and audio books, and access online material. Interviewees also discussed programming related to new technologies, including coding and robotic programming, 3D printing, and digital literacy.

Three participants noted that skill-based assistance was often ad-hoc, and centred around the use of digital technology for library-related purposes. This included assisting patrons to access e-books and e-magazines, and use library websites and software. One participant cited an ad-hoc

[4] Te Reo Māori: grandchildren or descendants.

query from a patron who lived in an isolated area, had difficulty accessing a physical library, and had recently gained access to the internet through Skinny Jump broadband:

> *"I demonstrated on my computer how to access e-magazines as she'd been having some trouble previously […]. She went away knowing that she could actually get the magazines she wanted via the internet and vowed to give it a go...."*

Ad-hoc assistance with digital tasks that were not library-related included requests for help with internet banking, listing items on internet auction websites, use of personal digital devices, and using digital technology to make community funding applications and apply for jobs.

One interviewee noted that the type of assistance required by patrons differed along with varying internet access. This participant reported that patrons from areas with poor internet service required assistance with basic tasks like using the library app, whereas those from areas with higher internet connectivity may seek to perform more complex tasks or utilise new technology.

Motivation and Trust

Significantly fewer comments related to DIS associated with themes of motivation and trust. Those services that motivate patrons to understand how digital technology can help them meaningfully, and build trust with patrons to use digital technology safely.

The majority of comments related to ***motivation*** came from one participant who made a strong effort to encourage patrons to use digital services when they were introduced:

> *"It took them a while to get used to it, that they could access the internet and all of that. So that was quite a lot of me gently pushing that side of the new service because they were so used to the older one."*

Two additional interviewees also touched on issues of motivation when discussing potential programming focused on intentional non-users of digital technology, and the need for mobile librarians to promote the use of digital collections.

Trust was mentioned by two participants when discussing assistance with personal digital devices. One participant used the example of helping a patron to update her iPad:

> *"…she could have done it by herself […] but I think sometimes people just want someone with them, […] sometimes that's all it is, we're just sitting here […], and they're actually doing all the work but it's like a security blanket while they do it."*

Another interviewee discussed the trust that patrons held in public libraries generally, and the use of this to promote the ability of librarians to help with digital technology:

> *"…people really trust libraries and the people who work at them, with helping them with their digital stuff, and it's something we actively advertise as well, […] do you need help with your iPad, come talk to your local librarian."*

4.2 What challenges do mobile librarians face in providing digital inclusion services?

All participants identified a range of challenges in providing DIS. These are discussed below under the sub-themes of patron use, staffing, physical, scheduling, Covid-19, financial, and measurability. Some interviewees also commented on benefits to the library service and these are also reported.

The largest number of comments regarding challenges in the provision of DIS were associated with ***patron use***. One participant had discontinued free Wi-Fi access due to low patron use, and of the remaining four mobile libraries, staff from three commented that patron use remained low:

> *"It's not used at all. You know you advertise that we've got it, we're paying for it, and I think the staff use it more than any customer ever."*

One interviewee stated that they had also ceased offering access to printing and photocopying equipment due to low use, and the same participant mentioned that this was a contributing factor when deciding whether to introduce other digital technology.

Patron interest and skill level in the use of digital technology was also discussed. One participant reported having many elderly patrons who were not interested in e-books, and varying levels of skill proved difficult when implementing programming aimed at this cohort:

> *"…we'll […] take some iPads and try to do a little bit of digital instruction, but it's been, it's very unsuccessful. The skill level of the participants and what they really want is just so varied."*

When discussing mobile library use generally, one participant also noted the effect of changes in the non-urban community they serve. This librarian reported decreasing use of their mobile library in non-urban areas, and identified contributing factors which included: a smaller population due to increasing farm sizes, increased connectivity rates in the area, and younger, more mobile residents.

Challenges of ***staffing*** were associated primarily with differing staff attitudes to digital technologies, and with practical staffing issues. Interviewees from two mobile libraries discussed challenges related to staff attitudes, interest, and familiarity with digital technology, with one stating that:

> *"…everyone in the team has [a] slightly different level of comfort with it, and I think some of us promote it far more than others. Others probably wouldn't think about it."*

Practical staffing issues were primarily related to the number of staff who worked on the mobile library at any one time. One participant discussed the nature of being a 'solo-operator' and the difficulty this caused when patrons required assistance with digital technology:

> *"…you can't sit down and talk to someone for five or ten minutes or teach them how to get an email. […] the fact that we're sole operating, we can do those quick and dirty little queries, but we can't do anything more in-depth."*

Issues of scheduling the mobile library service, and the relationship this had to staff attitudes were also mentioned and these are discussed below under the subtheme of 'logistics'.

All participants discussed ***physical*** challenges. Comments in this area most often referred to the mobile library vehicle itself and were sometimes intertwined with issues of staffing. Four interviewees noted that larger mobile library vehicles required a heavy transport license, and that this was, or had been, a limiting factor when seeking staff. These participants identified this

as a factor when replacing older mobile library vehicles, and often a smaller vehicle that didn't require a heavy transport license was chosen:

> *"We used to have a bigger bus but then it died […], and my managers were keen to get one that was easier to drive. Because we always had trouble getting people to drive, […] if I was away, or someone was away, it's really hard to get someone to drive the big bus at short notice. So it was part of our reason to go for something you can just drive on a car license."*

The shift to a smaller vehicle often involved new physical challenges, and three participants mentioned that a smaller mobile library could be a limiting factor when offering access to digital technologies or skill-based programming:

> *"…see our van [is] pretty small already, and […] there's not really a lot of space on it for a desk or a computer for someone to sit down and do their stuff."*

One Interviewee reported that a reliance on batteries to run digital equipment could also be challenging and was a factor when deciding whether to continue providing access to a computer, printer and photocopier on a new mobile library.

Challenges of ***scheduling*** were identified a number of times, with one participant indicating that low uptake of free Wi-Fi may be related to a schedule made up of short stops. This interviewee continued by discussing the implementation new schedules in which longer stops allowed patrons more time to access digital services. Similarly, four interviewees acknowledged that in order to provide DIS, longer periods of time spent in the community were required.

One participant discussed the challenges of scheduling in great detail and in relation to changing models of service provision, which are discussed below in greater depth. Issues of scheduling also appeared to have a relationship to staff attitudes, with this participant describing the effect of staff attitudes when implementing new models of scheduling:

> *"…some of it is around breaking the models of thinking, both our communities and our staff have around, it's like just a constant battle to not go back to scheduling standard, regular stops."*

All interviewees identified challenges related to ***Covid-19***. One participant had only recently begun to provide DIS. Their second 'pop-up' library was due to take place when a national lockdown began and was unable to proceed. This interviewee also mentioned that lockdowns had prevented coding workshops and a regular robotics group from taking place.

One interviewee noted that older patrons who did not have access to the internet, or the skills to access digital materials, were especially excluded throughout Covid-19 lockdowns. This participant observed an increasing interest in e-books from older patrons, and related this to the potential benefit of higher digital engagement:

> *"…they had no books for like three months, […] it was just ripped out from under them, and that's why it would be good if they did have more ability."*

Additionally, one participant was involved in an outreach survey conducted during a Covid-19 lockdown and reported expressions of vulnerability felt by residents of non-urban communities. Respondents to the survey expressed a desire for internet training and assistance with tasks such as internet banking. Despite these challenges, two participants also noted that nationwide lockdowns had provided a valuable opportunity to invest time in the planning and strategy of mobile library services.

A small number of comments from three participants related to challenges of a ***financial*** nature. One interviewee was waiting on funding so that a new mobile library could be purchased, and until then was delivering mobile library and DIS from a domestic vehicle. Another discussed low patron use of the mobile library generally in relation to the cost of a replacement vehicle. Low uptake of DIS also contributed to challenges in accessing funding, as one participant discussed:

> *"We got Wi-Fi on the buses two and a half years ago and that was quite a big struggle to get the acceptance of funding for it really, […] because it's not used much."*

Challenges related to the ***measurability*** of DIS were mentioned by only one participant. This interviewee planned to implement more DIS but expressed concern that the success of these could not be captured by traditional, circulation-based measures.

A few participants also reported ***benefits*** to their library service in providing DIS. On one mobile library where patron use of Wi-Fi was very low, the mobile librarian noted that this access was still beneficial to staff when familiarising patrons with the library's digital interfaces. Where free internet access was provided through APNK, the participant reported benefits of cost and security to the library:

> *"…so the fact we can add that into our annual subscription and they do the back end and stuff, rather than us having to set up a kind of independent. […] It's also safe, you know […] it's running through the DIA National Library security systems..."*

One interviewee commented that, as their smaller mobile library carried fewer print books, the importance of supporting patrons to access digital resources grew. This support then facilitated a rise in e-book readership. Greater patron familiarity and use of digital library resources may also free up staff time, and assist mobile librarians who wished to implement less-regular, and more responsive scheduling:

> *"Having the digital library is a really key part of our strategy around lending. If we can encourage our customers to use the digital library, which is open 24/7, then we might not need to go every four weeks."*

4.3 How do mobile libraries collaborate with other organisations to increase digital inclusion in non-urban communities in Aotearoa New Zealand?

When prompted to speak about collaboration, the majority of comments related to Skinny Jump mobile and broadband services, or services related to APNK. Three mobile libraries distributed Skinny Jump, while another used Skinny Jump for internet access on the mobile library. A fourth participant had promoted Skinny Jump in the past.

One interviewee intended to use APNK Chromebooks when delivering DIS to non-urban communities, and only one mobile library collaborated with APNK to offer free Wi-Fi access:

> *"…and the really interesting part of what we've done with the [mobile library] is it actually has APNK, has a mobile version of APNK."*

Additional statements regarding collaboration stemmed primarily from one participant. This mobile librarian was investigating a number of opportunities to collaborate with organisations to promote both traditional and digital literacy. As the librarian stated:

> *"I'm down to work with anyone!"*

This interviewee planned to collaborate with the Department of Conservation to run coding workshops for children during conservation week, but this was unable to proceed due to Covid-19 lockdowns. They were also investigating the implementation of Digital Inclusion Alliance Aotearoa's (DIAA) Better Digital Futures for Seniors programme. When this mobile librarian was approached by a local resource centre regarding computer classes, they had connected the community group with DIAA, and planned to work with both organisations to implement these.

4.4 Changing Models of Service Provision

Findings related to this theme are discussed here under the subthemes of: traditional or contemporary models; the 'whole library experience'; digital exclusion in non-urban communities; community consultation, and digital inclusion strategy.

Five interviewees made comments related to a ***traditional model*** of mobile library service provision centred around larger vehicles that prioritised access to print material, and made multiple short stops:

> *"…there was a bus, […] it had set stops, […] it would drive to so-and-so a place and sit there for half an hour whether anyone came or didn't come, […] it had shelving and didn't do any programming, didn't have any Wi-Fi, didn't have computers, didn't have any of those things. It was kind of like the traditional model."*

Conversely, comments from participants indicated that a ***contemporary model*** of service provision was associated with smaller mobile library vehicle which incorporated DIS. Comments related to this theme described a mobile library service that went to the community rather than expecting patrons to come to it, and scheduling that included longer and more flexible stops.

Four interviewees discussed taking their mobile library services to community events, including weekend markets, halls, pools, and sporting events, as one participant explained:

> *"We need to go to where the people already are rather than us going to a hall and saying, come to the hall! How is the hall any different from going to the [nearest] library? […] So whether that's going to rugby on a Saturday morning, or is it going to the wool sheds, or is it going to the stockyards, or is it going to touch night, or the farmers market…"*

In order to incorporate this, three participants mentioned the need for flexible scheduling and longer stops.

The incorporation of DIS was discussed by four interviewees in relation to those offered at branch libraries. These participants aimed to provide a mobile library service that offered everything a branch library could, and is described here as '***the whole library experience***'. One interviewee explained this intention:

> *"…anything you can get at a regular library you can get on the [mobile library]. That's why we have printing, […] scanning, […] the 3D printer, […] programming. It's not about like, oh here's the mobile library, it's a watered down miniaturised version of a lending service. We aspire for it to have everything that a regular library could have."*

All interviewees cited examples of ***digital exclusion in the non-urban communities*** they serve and five expressed the need for ***community consultation*** when developing services that respond to this. Participants indicated that consultation took place through formal and informal community surveys, and by speaking to community representatives. One interviewee commented that:

> *"…there's no point of taking what you think they're going to want, because they're less likely to use it."*

When asked whether their model of service provision was informed by ***digital inclusion strategy***, participants from three mobile libraries indicated that they had clear strategy in place for their service which was linked to both organisational and national digital inclusion strategy. One of these participants indicated that new digital technologies content in the New Zealand school curriculum had also informed their desire to implement digital literacy programs. While remaining participants did not identify alignment with digital inclusion strategy, both noted that

activities on their mobile libraries were informed by the strategy of their associated branch library.

5.0 Discussion

While findings related to each theme were reported separately above, it is clear that many have a complex relationship. In light of this, findings of the study are discussed here together, in relation to existing literature on which the project was based. Suggestions for further research are also made throughout.

Many digital inclusion services (DIS) offered by mobile libraries in non-urban areas of Aotearoa New Zealand appear to target first-level divides of access. While internet connectivity remained an issue in some of the areas served by participants, many non-urban areas in Aotearoa New Zealand are relatively well-connected (RBUS Project Team, 2018; Grimes & White, 2019; Digital Inclusion Research Group, 2017; 20/20 Trust, 2017). Continued focus on access despite this seems to support research which shows that even when the internet is widely available, first-level digital divides may persist in the form of access to devices, or expenses related to the maintenance of hardware, software, and subscriptions (Van Deursen & Van Dijk, 2019).

However, many interviewees reported that although they offered access to the internet and digital technologies, patron use remained low. It is unclear whether this was because patrons were already digitally included, or due to a lack of motivation and trust. This finding calls into question one of the primary assumptions made in this study, that those living in non-urban communities were at risk of digital exclusion, and is an area that requires further investigation.

Participants also offered DIS related to second-level, skill-based digital divides, and most interviewees reported a desire or need among their patrons for assistance in this area. These findings are in keeping with the notion that access to technology does not automatically provide the user with all the associated benefits (Scheerder et al., 2017), and that the problem in fulfilling gains offered by the RBI in Aotearoa New Zealand are now associated with effective use of the internet, rather than access alone (RBUS, 2018).

Third-level divides associated with motivation and trust were mentioned much less, and DIS targeted in these areas appeared to be minimal. One interviewee, however, seemed to be very aware of the issue of motivation, and their comments indicated a conscious effort to increase their patrons' motivation to utilise DIS provided.

The Digital Inclusion Blueprint describes trust as a person's level of trust in the internet and online services, and their ability to use the internet and "avoid scams, harmful communication and misleading information" (DIA, 2019a, p.10). In this research project, statements regarding trust were limited, and this theme was predominantly discussed in terms of the trust patrons had in libraries and their staff. Although the theme of trust is not discussed here in the same context as that understood in digital inclusion strategy, comments regarding trust indicated that, in general, patrons trusted mobile librarians. One interviewee noted that this trusted position could also be problematic, as patrons may request assistance with tasks such as internet banking:

> *"It's tricky right, for librarians, because we're like, oh we can't transfer money for you, you have to do that for yourself. But there is a huge cry for support…"*

Human intermediaries fulfil a critical role in brokering the interaction between people and information to create digitally included communities (Mervyn et al., 2014), and it is worth noting that participants who discussed the role of motivation and trust when delivering DIS, also reported issues of low patron use less frequently. Although only anecdotal, it may be of benefit to collect more information about the relationship between these factors.

By offering DIS, participating mobile libraries respond to digital exclusion in their non-urban communities, and research has suggested that where there is low connectivity and a lack of skilled professionals, DIS offered by public libraries are particularly important (Strover et al., 2020; Thiele, 2016). This is especially evident in participant comments regarding the vital nature of DIS offered to remote schools who face issues of low connectivity and a lack of staff with digital skills. Suggestions that access to the Internet and digital technology (Bishop et al., 2016) through non-urban libraries supports the economic development of surrounding communities also ring true alongside participants' reports of the use of DIS for community funding and job applications.

While literature related to the challenges faced by mobile libraries when delivering DIS is limited, *static* non-urban libraries have been found to experience persistent problems with low staffing levels, a reliance on limited local funding (Real et al., 2014) and poor telecommunications infrastructure (Thiele, 2016; Bishop et al., 2016; Mehra et al., 2020). Real and Rose also identified that small, aging buildings; limited staff funding; and a lack of mechanisms for collaboration may make it difficult for non-urban libraries to keep up with changes in the field by offering digital services (2017). Some challenges reported in this study align with those identified. Interviewees discussed low staffing levels in the form of difficulties finding drivers for mobile libraries, especially when a heavy transport license was required, and challenges associated with small and aging buildings may also have similarities with those of aging, or smaller mobile library vehicles. Overall however, it appears that due to their intrinsically mobile nature, many of the challenges faced by mobile libraries are unique. These findings highlight a gap in existing literature and an opportunity for further research.

Participants in this study sought collaborative opportunities to varying degrees when implementing DIS, and the benefits of this collaboration were especially evident where mobile libraries capitalised on existing relationships between public libraries and organisations such as APNK and Skinny Jump. Mehra et al. (2020, p. 9) have stated that when implementing technology use in non-urban libraries, a strategic approach to collaboration with external stakeholders was an important way for libraries to create greater impact with their available resources. Closures of public libraries worldwide due to Covid-19 restrictions have also highlighted the need for digital inclusion and the fact that public libraries cannot fulfill this alone. Research in this area suggests that community consultation and collaboration with local, national, and international organisations will be vital in achieving parity of access to digital technology and opportunities (Ayre, 2020) and this call is supported by a number of participant comments in these areas.

Most participating mobile librarians were moving, or had moved, towards a contemporary model of service provision which was characterised by the provision of DIS, use of smaller vehicles, flexible scheduling, community consultation, and attendance at existing community events. Previous studies have explored the transformation of mobile libraries to ‘branches on wheels’ (Knight & Makin, 2006), while professional guidelines recommend that mobile libraries act as a

'mini-branch', offering access to a range of digital technology and resources (Stringer, 2010), and this desire to provide the 'whole library experience' was expressed by participants in this study. This contemporary model of service provision is, in many ways, vastly different from that described by Hawke and Jenks in 2005, when only one mobile library offered access to digital technology, and perhaps it is time for a replication of their survey in order to learn more about our current situation.

Real and Rose (2017) identified that remote non-urban libraries had different needs and challenges to those that were closer to main urban centres, but were often treated as one homogeneous group when their service offerings were studied. In response to this, the researchers separated non-urban libraries into three, more nuanced categories (2017, p.41). Many participant comments in this study noted that the needs of each community were unique:

> *"What I do out in [community A] is completely different to what I do in [community B] because there are different needs for those communities."*

In response to this, participants stressed the importance of community consultation to ascertain differing needs, and it is encouraging to note that five out of six participating mobile librarians reported engaging in community consultation to some degree when planning the delivery of DIS. Due to the small number of possible participants in this study to begin with, non-urban communities of different natures were indeed grouped together into one. In future, case-studies, or studies that focus on a specific type of non-urban community would also be helpful to differentiate needs and possible models of provision.

Some participants were very aware of, and informed by, national and organisational strategy regarding digital inclusion, whereas others were unfamiliar with these, although it did appear that the activities of all participants' mobile libraries were informed by the strategy of their associated branch library. Findings in this area were minimal, so conclusions cannot be drawn, but, as strategy and policy related to digital inclusion is seen to be key component in bridging non-urban digital divides (Strover, 2014), mobile librarians may benefit from greater familiarity with these. Despite this, through the provision of programmed and ad-hoc DIS related to access,

skills, motivation, and trust, mobile libraries appear to be contributing to national government strategy for digital inclusion in Aotearoa New Zealand.

6.0 Conclusion

This study aimed to begin closing a gap in available literature by investigating how mobile libraries contribute to digital inclusion in non-urban communities of Aotearoa New Zealand. Analysis of interview data revealed findings which indicate that mobile libraries contribute positively to digital inclusion in a wide variety of ways, and have the potential to fulfill an important role in promoting digital inclusion in the non-urban communities they service.

In relation to the research questions, mobile libraries provide digital inclusion services (DIS) that enhance the provision of access to the internet and digital technology in non-urban areas of Aotearoa New Zealand, as well as DIS that increase the skills, motivation, and trust of patrons in this area. Participants reported a range of challenges in providing these DIS, and these were primarily associated with levels of patron use, staffing, physical limitations, scheduling, and those related to the Covid-19 pandemic. Some interviewees also collaborated with external organisations to provide DIS in their non-urban communities, and many discussed the transition towards a more contemporary model of service provision, along with the related elements of a 'whole' library experience, responding to digital exclusion, community consultation, and digital inclusion strategy.

The topic of digital inclusion is multi-faceted and complex, and this research project identified, and touched lightly on a large number of important issues. As there is minimal research related to mobile libraries in these areas, many of these issues could benefit from in-depth investigation in their own right. This study was exploratory, and due to time constraints and participant responses, the number of participants was limited to only six staff from five libraries. This small sample size does not allow for generalised conclusions to be drawn on the topic, and research drawing on a representative sample of mobile librarians servicing non-urban areas of Aotearoa New Zealand would enable a more complete picture to be built.

Additionally, by focusing only on the perspective of mobile librarians, this study does not capture the experiences of mobile library patrons, or intentional non-users of mobile library services. Future research which investigates DIS from a patron perspective may be of value. Despite these limitations, the qualitative data captured in this research project begins to build a rich picture of how mobile libraries contribute to digital inclusion in non-urban areas of Aotearoa New Zealand.

When writing about non-urban libraries and digital inclusion, Brian Real made a call for academics in this field to conduct research that enabled non-urban librarians to share information with their peers, and that could be used positively by librarians, their funders, and their allies (Real, 2017, p.3). In a small way, this study hopes to provide some insight in this area which may be useful to mobile librarians, especially as they seek to update their existing models of service provision; potential collaborators with mobile librarians; researchers looking to investigate further in this field; and those seeking a greater, and more nuanced understanding of digital inclusion in Aotearoa New Zealand.

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Appendices

Appendix 1: Participant Information Sheet

Mobile libraries and digital inclusion in Aotearoa New Zealand

INFORMATION SHEET FOR PARTICIPANTS

You are invited to take part in this research. Please read this information before deciding whether or not to take part. If you decide to participate, thank you. If you decide not to participate, thank you for considering this request.

Who am I?

My name is Rachel Bell and I am a Masters student in the Master of Information Studies at Victoria University of Wellington. I am currently undertaking a research project supervised by Professor Anne Goulding.

What is the aim of the project?

This research project aims to investigate the contribution mobile libraries are making to digital inclusion in non-urban areas of Aotearoa New Zealand.

Your participation will support this research by detailing what digital inclusion services your mobile library offers, how patrons interact with these services, and how your mobile library collaborates with other organisations to support digital inclusion.

This research has been approved by the Victoria University of Wellington Human Ethics Committee (#0000028732).

How can you help?

You have been invited to participate because you are a mobile librarian providing services to non-urban areas of Aotearoa New Zealand. If you agree to take part I will interview you in person or online. I will ask you questions about digital inclusion services in your mobile library. The interview will take up to one hour. I will make an audio recording of the interview with your permission and write it up later. You can choose to not answer any question or stop the interview at any time, without giving a reason. You can withdraw from the study by contacting me at any time up until 14th September 2020. If you withdraw, the information you provided will be destroyed or returned to you.

What will happen to the information you give?

This research is confidential. This means that the researchers named below will be aware of your identity but the research data will be combined and your identity will not be revealed in any reports,

presentations, or public documentation. However, you should be aware that in small projects your identity might be obvious to others in your community.

Only my supervisors and I will read the notes or transcript of the interview. The interview transcripts, summaries and any recordings will be kept securely and destroyed, at the latest, on 30th October 2022.

What will the project produce?

The information from my research will be used in my Masters research project report.

If you accept this invitation, what are your rights as a research participant?

You do not have to accept this invitation if you don't want to. If you do decide to participate, you have the right to:

- choose not to answer any question;
- ask for the recorder to be turned off at any time during the interview;
- withdraw from the study up until 14th September 2020;
- ask any questions about the study at any time;
- receive a copy of your interview transcript;
- be able to read any reports of this research by emailing the researcher to request a copy.

If you have any questions or problems, who can you contact?

If you have any questions, either now or in the future, please feel free to contact either:

Student:
Name: Rachel Bell
University email address: [redacted]

Supervisor:
Name: Anne Goulding
Role: Professor of Library and Information Management
School: School of Information Management
Phone: 04 463 5887
anne.goulding@vuw.ac.nz

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research you may contact the Victoria University of Wellington HEC Convenor: Associate Professor Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

Appendix 2: Participant Consent Form

Mobile libraries and digital inclusion in Aotearoa New Zealand

CONSENT TO INTERVIEW

This consent form will be held for two years.

Researcher: Rachel Bell, School of Information Management, Victoria University of Wellington.

- I have read the Information Sheet and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.
- I agree to take part in an audio recorded interview.

I understand that:

- I may withdraw from this study at any point up to 14th September 2020, and any information that I have provided will be returned to me or destroyed.
- I understand that I will be sent a copy of my interview transcript for member checking.
- The identifiable information I have provided will be destroyed on 30th October 2022 at the latest.
- Any information I provide will be kept confidential to the researcher and the supervisor.
- I understand that the findings may be used for a Masters report and academic publications and/or presented to conferences.
- I understand that the recordings will be kept confidential to the researcher and the supervisor.
- My name will not be used in reports and utmost care will be taken not to disclose any information that would identify me.
- I would like to receive a copy of the final report and have added my email address below. Yes ☐ No ☐

Signature of participant: _____

Name of participant: _____

Date: _____

Contact details: _____

Appendix 3: Organisational Information Sheet

Mobile libraries and digital inclusion in Aotearoa New Zealand

INFORMATION SHEET FOR ORGANISATIONS

Thank you for your interest in this project. Please read this information before deciding whether or not your organisation will take part. If you decide to participate, thank you. If you decide not to take part, thank you for considering my request.

Who am I?

My name is Rachel Bell and I am a Masters student in the Master of Information Studies at Victoria University of Wellington. I am currently undertaking a research project supervised by Professor Anne Goulding.

What is the aim of the project?

This research project aims to investigate the contribution mobile libraries are making to digital inclusion in non-urban areas of Aotearoa New Zealand.

Your organisation's participation will support this research by detailing what digital inclusion services your mobile library offers, how patrons interact with these services, and how your mobile library collaborates with other organisations to support digital inclusion.

This research has been approved by the Victoria University of Wellington Human Ethics Committee (#28732).

How can you help?

If you agree to take part, I will interview mobile librarians employed by your library. I will ask them questions about digital inclusion services in your mobile library. The interviews will take up to one hour. Employees may take part outside of work time, or complete interviews during work time, with your permission. The interviews will take place in person at your library or a nearby location convenient to your mobile librarian, or online via Zoom. Each individual participant will be asked to provide consent before their involvement in the research. I will make an audio recording of the interview with the permission of the participants and write it up later. The interviews will be confidential, meaning that the research team will know who participated, but the identities and regions of the participants will be protected.

What will happen to the information you give?

Participation in this research is confidential. This means that the researchers named below will be aware of the identity of your organisation but your organisation will not be revealed in any reports, presentations, or public documentation. However, you should be aware that in small projects your identity might be obvious to others in your community.

Only my supervisors and I will read the notes or transcript of the interview. The interview transcripts, summaries and any recordings will be kept securely and destroyed, at the latest, on 30th October 2022.

What will the project produce?

The information from my research will be used in my Masters research project report.

If you accept this invitation, what are the rights of your organisation?

You do not have to accept this invitation if you don't want to. If you do decide that your organisation will participate, you have the right to:

- ask any questions about the study at any time;
- withdraw your organisation's participation from the study before 14th September 2020, however, individual participants retain the right to decide if their data will be withdrawn;
- be able to read a report of this research.

If you have any questions or problems, who can you contact?

If you have any questions, either now or in the future, please feel free to contact either:

Student:
Name: Rachel Bell
University email address:
[redacted]

Supervisor:
Name: Anne Goulding
Role: Professor of Library and Information Management
School: School of Information Management
Phone: 04 463 5887
anne.goulding@vuw.ac.nz

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research you may contact the Victoria University of Wellington HEC Convenor: Associate Professor Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

Appendix 4: Organisational Consent Form

Mobile libraries and digital inclusion in Aotearoa New Zealand

CONSENT TO PARTICIPATE (ORGANISATION)

This consent form will be held for two years.
Researcher: Rachel Bell, School of Information Management, Victoria University of Wellington.

- I have read the Information Sheet and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.
- I agree that my organisation will take part.

I understand that:

- I may withdraw this organisation from this study at any point before 14th September 2020, and the information provided by members of the organisation will be returned to them or destroyed.
- Any information the participants provide will be included in a final report but the transcripts and recordings will be kept confidential to the researcher and the supervisor.
- The identities of the participants will not remain confidential to the researchers.
- I understand that the results will be used for a Masters report and academic publications and/or presented to conferences.
- The name of my organisation will not be used in reports and utmost care will be taken not to disclose any information that would identify the organisation.
- I would like to receive a copy of the final report and have added my email address below. Yes ☐ No ☐

Signature of participant: _____

Name of participant: _____

Date:_____

Contact details: _____ _____

Appendix 5: Semi-Structured Interview Guide

Research topic	Open-ended questions
Warm up	1. To start, could you tell me a little bit about how you ended up being a mobile librarian and what your role entails? 2. Could you tell me about your mobile service? E.g. the vehicle, how many librarians are involved, the routes, the communities you serve. 3. Are there particular skills that you require for this role? Are there any challenges that you experience around this? E.g. practical skills or isolation.
Digital inclusion services provided	4. Could you tell me about the digital inclusion services that your mobile library provides to the non-urban communities you serve? (and by digital inclusion services I mean…) 5. Do these have any strategic alignment with either council or library goals for digital inclusion? 6. What are the challenges?
Patron interaction (I'd really like to understand more about how patrons interact with these…)	7. Are there some digital inclusion services patrons use a lot, or not very much? 8. Do patrons express a desire for other types of digital inclusion service? 9. Do patrons ask questions about digital technology? 10. Do patrons require assistance with digital technology? If so, how often? 11. What types of tasks do you assist patrons with? 12. Do they bring their own devices to the mobile, and do you provide assistance with these? 13. Do patrons express any positive or negative impacts these digital inclusion services have for them? 14. Do you notice a difference between services used in your urban and non-urban routes? (Where this is applicable)
Collaboration	15. Does your mobile library collaborate with any other organisations to provide digital inclusion services to non-urban communities? 16. Which organisations do you collaborate with? 17. What are the benefits and/or challenges that you face in this/these collaboration/s?
Follow up	18. Was there anything else you'd like to add? 19. Was there anything I missed that you think I should have asked? Any questions or comments? 20. Question re: other mobile librarians/contacts

Appendix 6: Final Code List

FINAL CODE LIST		
#	**Descriptive Label**	**Code**
1-0	Digital Inclusion Services (DIS) provided	DIS
1-1	Access	DIS-A
1-2	Skills	DIS-S
1-3	Motivation	DIS-M
1-4	Trust	DIS-T
2-0	Challenges in providing DIS	CH
2-1	Scheduling	CH-SCH
2-2	Financial	CH-FIN
2-3	Physical	CH-PHY
2-4	Staffing	CH-STF
2-5	Measurability	CH-MEA
2-6	Patron use	CH-PAT
2-7	Covid-19	CH-COV
2-8	Benefits to the library of providing DIS	BEN
3-0	Collaboration	COLAB
4-0	Changing Models of Service Provision	MOD
4-1	Traditional model	MOD-TRD
4-2	Contemporary model	MOD-CNT
4-3	The Whole Library Experience	MOD-WLE
4-4	Digital Inclusion Strategy	MOD-STR
4-5	Digital Exclusion in the Community	MOD-EXC
4-6	Community Consultation	MOD-CON

Appendix 7: Definitions and Frequency of Themes

DEFINITIONS and FREQUENCY OF THEMES		
CODE	**FREQ.**	**DEFINITION: EXAMPLE**
DIS-A	75	Relates to the provision of access to digital devices, services, software and content: *"So we've got the Chromebooks and there's a stationary computer in there as well that they can use."*
DIS-S	55	Relates to the provision of digital skills: how to use the internet and digital technology: *"A lot of people are asking how to do things on their phones too."*
DIS-M	14	Relates to the motivation of patrons to understand how digital technology can help them meaningfully: *"It took a while to get them used to, that they could access the internet and all of that. So that was quite a lot of me gently pushing that side of the new service…"*
DIS-T	16	Relates to the building of trust in patrons to use digital services safely: *"Sometimes that's all it is, we're just sitting here like, yep ok just push settings, just push it, and they're actually doing all the work but it's like a security blanket, while they do it."*
CH-SCH	24	Relates to challenges of scheduling and route-planning: *"Because a lot of our stops are 30 minutes in time, so it's not a lot of time and we do lots and lots of stops."*
CH-FIN	9	Relates to challenges of financial or budgetary nature: *"We've got WIFI on the buses two and a half years ago and that was quite a big struggle to get the acceptance of the funding for it really."*
CH-PHY	30	Relates to challenges of a physical nature: *"…and it also sucked our batteries up, you know we run off these deep-cycle batteries, and it just kept killing the batteries, you know using the photocopier and stuff."*
CH-STF	32	Relates to challenges of staffing or staff attitudes to DIS: *"So the fact that we're sole-operating, we can do those quick and dirty little […] queries but we can't do anything more in-depth."*
CH-MEA	5	Relates to challenges in measuring the success of DIS: *"The success of the mobile library is always often based on issuing books, and we're trying to get away from that to a more…"*
CH-PAT	38	Relates to challenges of patron uptake and use of DIS: *"Maybe like, there were only like 20 or 30 customers in the whole district, for a $500,000 bus, it didn't really sort of stack up."*
CH-COV	21	Relates to challenges associated with Covid-19: *"So that's kind of, was going well until Level 2 and now we've had to pause it which sucks."*

BEN	9	Relates to benefits to the library in providing DIS: *"But I've noticed that our online, our e-books and that have gone up in those areas. People using them because now they know how to use them. […] I've shown them how."*
COLAB	44	Relates to collaboration with external organisations to provide DIS: *"I've been in touch with DIAA about Skinny modems, so yeah […], I will do Skinny modems on the road."*
MOD-TRD	26	Relates to comments about a 'traditional' model of mobile libraries: *"You know it had shelving and didn't do any programing, didn't have WIFI, didn't have computers, didn't have any of those things. It was kind of like the traditional model."*
MOD-CNT	51	Relates to comments about a contemporary model which is responsive, agile, and 'goes to the people': *"whether that's going to rugby on a Saturday morning or is it going to, you know, the wool sheds or is it going to the stock yards or is it going to touch night, or farmer's market, or, etc. etc."*
MOD-WLE	14	Relates to comments about the mobile library providing the 'whole library experience': *"Anything we can do in the libraries, we can do on there [the mobile library]."*
MOD-STR	18	Relates to strategy underpinning digital inclusion services on mobile libraries: *"But yeah we haven't got […] a strategic direction or plan."*
MOD-EXC	31	Relates to issues of digital exclusion that the mobile libraries are responding to: *"Because in a lot of our rural communities the quality of the [internet] connection is a challenge."*
MOD-CON	22	Relates to comments about community consultation in the provision of mobile library services: *"There was a lot of consultation done when it was started but we probably do need to do a second pass."*

Additional Information

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Course name: INFO580

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