Design of a Regional Town and Rural Hinterland (RTRH) MaaS Blueprint

Final report on the overall project outcomes

iMOVE Project 3-020

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Prepared by the ITLS RTRH MaaS project team: John D Nelson, Corinne Mulley, David A Hensher, Chinh Ho, Haoning Xi, and Camila Balbontin

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Executive Summary

This is the Final Report of the iMOVE Design of a Regional Town and Rural Hinterland (RTRH) MaaS Blueprint project. The vision of the Blueprint is to improve access to services, both local and more distant, within the context of encouraging fairness and equity, and contributing to overall sustainability. The evidence base for the Blueprint is established through literature review and primary data collection across New South Wales (NSW). The Blueprint takes a multi-service approach, including modes not yet present in the rural and regional landscape and non-mobility services. Importantly, the Blueprint recognises that the car will play more of a role in Rural and Regional MaaS than in its urban counterparts. A key focus of the Blueprint is to set out the critical role of governance and the central role of Transport for NSW in enabling and supporting the development of stakeholder roles, including community support and the trust of private partners.

The report begins with an introduction to MaaS, outlining its key components and benefits. The evidence base underpinning the development of the Blueprint is then presented and comprises an international review of experience with rural and regional MaaS and a summary of the primary data collection. The full Blueprint is then presented followed by an Action Plan for the NSW Government to take forward when implementing the Blueprint.

The primary data collection and analysis is based on three strands of work. First, seventeen in-depth interviews conducted with supply-side providers and organisers in the three locations selected for detailed study (Dubbo, Nowra, and Coffs Harbour). These interviews yielded valuable insights into the perspectives and experiences of stakeholders who could be involved in MaaS provision in these areas. Secondly, community discussion groups with 45 participants, which included a "pencil & paper" survey, conducted in the same three locations. This approach engaged directly with end users and captured their mobility barriers, feedback and suggestions, contributing to a deeper understanding of their mobility needs and expectations. Finally, a NSW-wide online survey targeting residents of the 16 regional cities was conducted to provide a broader perspective, allowing for the identification of preferences and needs related to mobility and non-mobility services in regional and rural areas.

Based on the analysis of this primary data, the report concludes by summarizing key findings and action outcomes. This evidence base has informed the development of the Blueprint which highlights the critical role of the NSW Government in creating an enabling environment for MaaS implementation. This includes policy and regulatory support, funding and investment, and fostering innovation in transport provision. An example of a better and more sustained use of existing modes and new modes is the Car Community Club (the triple C – 'CCC'), proposed as an outcome of this research, in a Rural and Regional MaaS product.

Overall, this final report presents valuable insights derived from a comprehensive analysis of primary data. Findings have highlighted the transformative potential of MaaS in rural and regional areas, including:

- The potential for improved accessibility,
- The potential for enhanced user experience; and
- The importance of tailored solutions.

The report presents a robust Blueprint designed to guide implementation of MaaS in a rural and regional context. The Blueprint includes an implementation roadmap. The Blueprint highlights in particular:

- The critical role of governance and the importance of including a wide range of stakeholders in a governance framework,

- The need to recognise the potential of innovative solutions, including solutions which are car based, in the MaaS offering; and
- The need to communicate and market MaaS particularly as the less visible modes may be unfamiliar to residents.

Introduction

Although we are accumulating a great deal of knowledge and experience in progressively introducing elements of Mobility as a Service (MaaS) into a metropolitan setting, there is a relative void in the context of Rural and Regional MaaS, with the generally accepted position that the metropolitan context is quite different. MaaS in rural and regional areas is unlikely to be built on a strong regular route-based public transport offer, and therefore car-based solutions are likely to be important in the mix with potentially more flexible forms of public transport services with a different client customer base. In a rural setting, reducing social exclusion and improving well-being are the key policy objectives that can be enhanced through a MaaS framework. The purpose of this report is to present the outcomes of a Project to design a Blueprint for future MaaS initiatives in a rural and regional setting, drawing on new data specifically collected with all relevant stakeholders.

What do we mean by MaaS?

MaaS has been widely used in recent years and often without due attention to its definition. A concise definition of MaaS is:

> *A type of service that, through a joint digital channel, enables users to plan, book and pay for multiple types of mobility service.*

A longer and more detailed definition (Hensher et al., 2021) is:

"MaaS is a framework for delivering a portfolio of multi-modal mobility services that places the user at the centre of the offer. MaaS frameworks are ideally designed to achieve sustainable policy goals and objectives. MaaS is an integrated transport service brokered by an integrator through a digital platform. A digital platform provides information, booking, ticketing, payment (as PAYG and/or subscription plans), and feedback that improves the travel experience. The MaaS framework can operate at any spatial scale (i.e., urban or regional or global) and cover any combination of multi-modal and non-transport-related multi-service offerings, including the private car and parking, whether subsidised or not by the public sector. ***MaaS is not simply a digital version of a travel planner, nor a flexible transport service (such as Mobility on Demand), nor a single shared transport offering (such as car sharing).*** *'Emerging MaaS' best describes MaaS offered on a niche foundation. This relates to situations where MaaS is offered on a limited spatial scale, to a limited segment of society or focused on limited modes of transport. The MaaS framework becomes mainstream when the usage by travellers dominates a spatial scale and the framework encompasses a majority of the modes of transport."* (Hensher et al., 2021; emphasis added).

MaaS has until now been primarily considered in an urban context where typically there is a core local public transport offering and a wide variety of shared transport providers. MaaS in a rural and regional setting is much less likely to have conventional public transport as its core and thus, more attention needs to be given to the role of the car as a potential shared collective and to consider how trip needs are likely to encompass travelling outside the rural and regional setting to locations where specialised services are provided.

In a rural and regional context, the inclusion of non-mobility services is one way that Rural and Regional MaaS may find personal mobility can be provided sustainably. Importantly, Rural and Regional MaaS must include connectivity of the rural hinterland beyond regional towns.

Vision for the Blueprint

The vision of this Blueprint is to improve access to services, both local and more distant, within the context of encouraging fairness and equity, and contributing to overall sustainability.

The Blueprint takes a multi-service approach, including modes not yet present in the rural and regional landscape and non-mobility services. Importantly, the Blueprint recognises that the car will play more of a role in Rural and Regional MaaS than in its urban counterparts.

The vision of the Blueprint includes the innovative delivery of mobility solutions, including combining mobility solutions with non-mobility elements (see Hensher et al., 2023), where these could provide a better overall solution.

A key focus of the Blueprint is to set out the critical role of governance and the central role of Transport for NSW in enabling and supporting the development of stakeholder roles, including community support and the trust of private partners.

Structure of the report

This report is structured as follows. First, we present the evidence base (including key findings from literature review, data collection, location selection, qualitative and quantitative analysis) underpinning the research. Next, we present the Blueprint, followed by an Action Plan and discussion of the critical role of the NSW Government in creating the environment for implementing the Blueprint. Finally, our conclusion with a series of Action outcomes.

The evidence base

Introduction

The Blueprint has been developed from an extensive evidence base of existing experience and new data collection. This section describes the work conducted and the findings. This comprised a desktop review of recent international experience with Rural and Regional MaaS (Mulley et al., 2023, **Annex 1**) and an extensive programme of primary and secondary data collection. Three regional towns in NSW were selected for study, with the choice of locations based on Public Transport Accessibility Levels (PTALs), economic links, justice and fairness and disadvantage (based on Socio-Economic Indexes for Areas data) resulting in the selection of Nowra, Dubbo and Coffs Harbour (**Annex 2.A**). The data collection comprised three principal strands comprising design (**Annex 2**) and analysis (**Annex 3**) to:

- identify, via **interviews**, the barriers and business opportunities of different **stakeholders** in the three locations;
- explore current transport needs and experiences among regional and rural **residents** (via **community discussion groups**) in the three locations; and
- to establish through an **online survey** the transport modes that users have used recently when travelling locally and further afield, and to elicit switching behaviour potential under varying mobility subscription plans in the **16 cities**.

Literature review – Key findings

The review (reported in full in elsewhere and subsequently published as Mulley et al. 2023) provides an up-to-date perspective on what are the key elements of MaaS in the context of regional towns and rural hinterlands, including barriers identified to date, through examination of recent "on the ground experience" with MaaS and MaaS-like schemes, primarily in a rural context but also including reference to urban areas. In a regional and rural context, key exemplars are primarily identified from Finland, the Netherlands, Sweden, the UK, the USA and Japan. The review considers the implications for the prospects for realising MaaS in a regional and rural setting.

The review (see **Annex 1**) is organised as follows. It begins with a discussion of the rural transport context, noting that definitions of "rural/remote" vary. Rural environments are generally characterised by a fragmented transport base and the challenges of providing rural transport services have been extensively documented. Notwithstanding this, there is a wide array of rural shared mobility services that have been proposed and tested in a variety of contexts. The main body of the review provides an up-to-date perspective on what are the key elements of Rural and Regional MaaS. This is done by assembling and analysing the existing evidence base. A table of MaaS schemes is presented, their status and levels of integration as at January 2022 (see Table A1 in Annex 1) and then follows a discussion in more detail of a number of country-specific examples, including from Finland, Sweden, Netherlands, USA, Scotland and Japan.

A number of general observations on rural MaaS schemes are drawn from the review of literature and evidence:

- It is apparent that much of what is currently promoted as MaaS could be best described as a journey planner or a scheme with MaaS-like (or MaaS-lite) qualities rather than MaaS *per se*. The majority of schemes identified fall within the Level 1 or 2 classification of Sochor et al. (2018). This means that although marketed as MaaS, they do not go beyond offering integrated information, booking or payment. We take this to reflect the relative infancy of MaaS in a rural context, but following the definition proposed by Hensher et al. (2021), we

should be referring to these schemes as MaaS-like (or even as exhibiting components or qualities of MaaS), rather than MaaS.

- There is some evidence that existing schemes in the West have been "downgraded" while those in Japan appear more widespread (World Economic Forum, 2021). While the *Kätevä Seinäjoki* MaaS pilot (2016-17) was one of the first MaaS schemes in Finland to introduce mobility bundles, the App continues but only as a regional journey planner and a mobile ticketing application.

- There is a distinctiveness to rural MaaS and we caution against direct comparison with urban areas. While MaaS *per se* faces an uncertain future, much of the current concern is directed towards experience in the urban context.

- MaaS in a rural context is dominated by a preponderance of short-lived pilots, even in Finland (Eckhardt et al, 2018 & 2020) and Sweden (Hult et al, 2021), which can be described as the trailblazer locations. There is also an important contrast between locations which have attempted to create a "MaaS experience" from the outset (e.g., *Go-Hi* or *NaviGoGo*) and those schemes which are attempting to put in place the elements of a MaaS scheme and then build from there (e.g., the Tompkins County initiative and *Vamos* in California are implementing the building blocks of a wider initiative to plan and implement a rural and regional MaaS system). Similarly, even though the recent ALPIO Eastern Uusimaa pilot did not include real MaaS-like integration, this development is seen as an enabler for future MaaS.

- Some schemes are very small in terms of actual users (e.g., Finland and Sweden). A small potential user base will always be a threat. Whilst not yet implemented, a key part of the aims of the Netherlands pilots is to ensure a minimum of 50,000 users of the app as 'without this kind of scale, there will be only a limited effect and little opportunity to make a positive business case.' (Ministry of Infrastructure and Water Management, 2019).

- While population density is widely accepted as being crucial to a workable MaaS scheme this appears to be less important in a rural context as shown by experience from Finland and the Netherlands. Nevertheless, degrees of rurality provide barriers to the achievement of sustainable mobility outcomes.

- Not every trial / scheme is the same in terms of their targeted users/trial participants. Lessons learnt and transferable policy is therefore more limited than the number of schemes in existence might suggest. Also, information on historical schemes often disappears, which makes learning from past schemes more difficult, especially if there has been no formal evaluation.

- There are examples of niche schemes such as the tourist focussed *Ylläs Around* (Artic MaaS) in northern Finland and *FjällMaaS* in Sweden and the cross-border pilot (not yet implemented) in Limburg, Netherlands. *NaviGoGo* was specifically targetted at young people. The Japanese national level approach to MaaS distinguishes between tourism-driven and tourism-promoting MaaS and also incorporates a variety of revenue raising activities such as encouraging the participation of sponsors such as local businesses.

- Trust and partnership are crucial building blocks. Evidence of partnership working is key as in the Tompkins County initiative which is a good example of moving from a concept with a vision to the on the ground implementation. The Limburg pilot in the Netherlands, while yet to be

implemented, is unusual in that it is intended to be developed in conjunction with foreign partners from Germany and Belgium. However, working with key stakeholders, whether they be businesses or activity-based centres, is an important part of partnership working. The recent ALPIO Tampere pilot is a good example of how mainstream transport services and social and health service transport can be integrated as part of a MaaS offering.

- Car-based modes are becoming more prevalent (e.g., inclusion of carsharing in the *KomILand* pilot in Sweden and ridesharing as part of the four other current or recent Swedish pilots, and the proposal to incorporate e-car sharing in the Sao Joaquin scheme in California). This is important since public transport is unlikely to be the backbone of Rural and Regional MaaS. Finding better ways of utilising the car by sharing in one form or another, while moving forward to achievable sustainable outcomes is a key challenge and opportunity.

- App integration is more common, even with the smallest schemes (for example the recent experience in Sweden) – meaning that the technology issues are largely resolved and that the future focus should be on the development of organisational and business models where very little work has been done, apart from in Finland.

- There is almost no mention of school transport in the rural transport offer, although there is scope for widening non-school use of school transport.

- As is the case with urban-focussed MaaS, there is limited technical evaluation (an exception being the Finnish pilots and the current Swedish MaaS trials). Proper evaluation of pilots is key to identify which aspects, if any, are transferable to new locations. It is worth noting that in the Netherlands' pilots, the intention is that these should be self-sufficient within two to three years, even those two which are more rurally or regionally based.

- There is absence of expressly rural (as distinct from regional which incorporates rural) journey planners.

- Prospects for scalability appear limited in current Rural and Regional MaaS activities since this will depend on how well MaaS segments the market through the number of mobility bundles offered (if bundles are offered) although it should be noted that the Netherlands' pilots are intended to have a high number of App users to achieve scalability.

- The unique Finland country level approach to the development of MaaS has not yet led to rural implementation at scale (in contrast to Japan), perhaps partly due to the emphasis on urban MaaS in Helsinki and Turku. There remains a pressing need to identify potential business models to support MaaS in rural environments. It has been suggested that the Public-Private Partnership (PPP) MaaS business model could be especially suitable in rural or sparsely populated areas, where overall transport volumes are low, but travel distances are relatively long. This could include logistics and non-transport-related multi-service offerings. There is limited experience from Finland (*Kätevä Seinäjoki*) and Sweden (*FjällMaaS*) which suggests that it will be beneficial to include freight and small goods movement within a Rural and Regional MaaS model.

- The regional archetypes of MaaS in Japan (tourism-driven; tourism-promoting; community-sustaining; community-harnessing) proposed by World Economic Forum (2021) represents a significant finding from a collection of MaaS developments as they inform not only the model that MaaS should follow depending on the characteristics of the regions where MaaS is to be

introduced, but also the challenges and key success factors that the Blueprint developed as part of this research should consider.

- The role of policy-related stakeholders in developing an appropriate policy context for Rural and Regional MaaS to be established and thrive should not be understated since there is often considerable lack of capacity. Actors involved in rural MaaS pilots face similar organisational challenges as found in urban MaaS developments. Collaboration and combination are essential if effective use is to be made of the available transport resource.

- Finally, it is important to bear in mind that a solution which has proven successful in one context should not be assumed to be replicable in another (different) context with the same level of performance.

In summary, the review of the literature provides an up-to-date perspective on what are the key elements of MaaS in the rural and regional context, including barriers identified to date, through examination of recent "on the ground experience" with MaaS and MaaS-like schemes, primarily in a rural context but also including reference to urban areas. In a regional and rural context, key exemplars are primarily identified from Finland, the Netherlands, Sweden, the UK, the USA, and Japan.

Approach to primary and secondary data collection

The literature review provided a baseline to explore what might work well in regional and rural New South Wales (NSW) in the next stages of the research. There was a clear implication that MaaS in a rural and regional context needs to take account of the potential contribution of improved mobility to reduce social exclusion. This was an important factor in establishing the role of all potential stakeholders and in the location selection for primary data collection.

Identifying the stakeholders

The advancement of the mobility agenda in remote and rural areas requires a good understanding of the stakeholders involved and their roles, and how these may differ in different settings. Eckhardt et al. (2018) formulated what they termed measures of rural mobility which they considered necessary to maintain the vitality of rural areas, identifying the interoperability and integration of stakeholders and transport modes as one of the key measures. Mounce et al. (2020) in their study of good practice in rural mobility across the EU, identified the willingness of stakeholders to exchange information and to make compromises, if necessary, as being one the requirements to achieve the necessary integration between rural shared mobility services.

Figure 1 shows for NSW, Australia, the stakeholders who should (ideally) be involved in the provision of rural and regional transport services. Five stakeholder categories are identified:

- Transport policy makers
- Transport users
- Transport operators and co-ordinating organisations (who require a supply of transport)
- Transport finance
- Transport capacity building

This list needs to be extended and refined in the context of MaaS where co-operation between additional stakeholders might be envisaged.

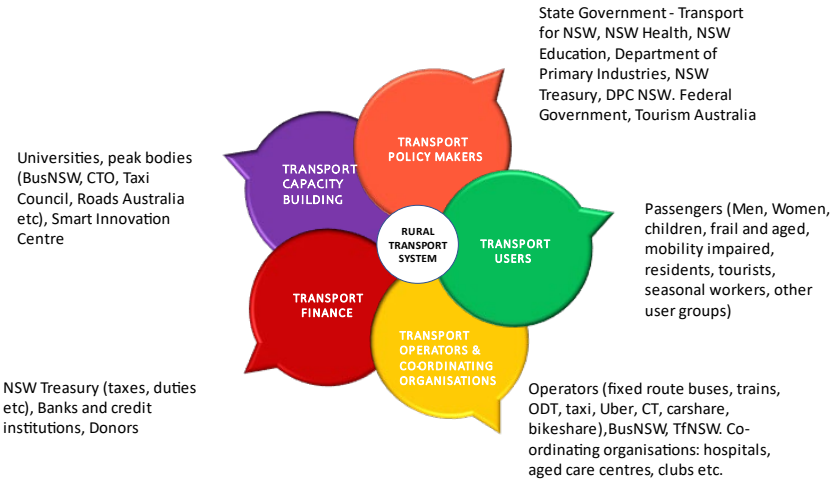


Figure 1: Major stakeholders in rural transport

In the development and delivery of the MaaS ecosystem, Mulley & Nelson (2020) emphasise the importance of identifying the correct stakeholders, given that value is captured through their actions, and benefits are obtained through their participation in the ecosystem. Arias-Molinares & García-Palomares (2020) propose a detailed list of stakeholders and include customers (noting that different customer segments need to be defined), transport authorities, transport operators, data providers, technology and platform providers, ICT infrastructure providers, insurance companies, regulatory organisations, universities and research institutions, unions and other media, and marketing and advertising firms). Hensher et al. (2020) identify a further stakeholder in the form of the "MaaS Champion" who can provide vision and strong leadership.

Mulley & Nelson (2020) identify the following stakeholders in a MaaS ecosystem:

- Operator
- Public Authority
- Regulator, usually by State/National Government
- Aggregator/Integrator/Broker
- Platform provider
- Customer
- Other service providers (as possible conjoint activity)
- The MaaS Champion

Ultimately, however it should be borne in mind that for each stakeholder, roles need to be defined and allocated and that the functions to be performed may be context specific and vary between geographical locations.

Polydoropoulou et al. (2020) offer a further contribution to the discussion around stakeholder definition by also considering their relative importance within the MaaS ecosystem (Figure 2), although they did not consider non-mobility / multi-service aspects. In their study, stakeholders were asked to define the key actors in a MaaS partnership and rank the importance of their contribution on a scale of 1 to 5 (where 1 means "not important actor" and 5 "extremely important actor"). From that study, undertaken in a European metropolitan context where MaaS had not yet been introduced, stakeholders tend to regard the mobility service providers as the most important actors in MaaS and especially the public transport operators. By contrast, a collection of 69 studies of rural MaaS in Japan identified small businesses and local event organisers as critical actors for the success of MaaS in rural

and regional settings (World Economic Forum, 2021). Extending MaaS stakeholders to include non-mobility service providers such as small businesses and event organisers is in essence moving MaaS from a multi-modal to a multi-services framework.

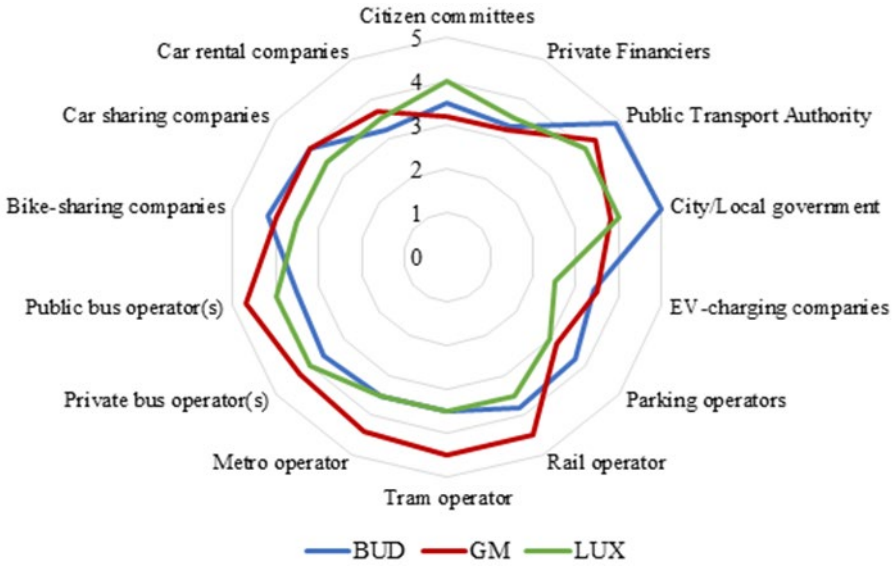


Figure 2: Stakeholders in a MaaS ecosystem (Polydoropoulou, et al., 2020)

Findings from the literature review emphasised that the role of policy-related stakeholders in developing an appropriate policy context for rural and regional MaaS to be established and thrive should not be understated since there is often considerable lack of capacity. Collaboration and combination are essential if effective use is to be made of the available transport resource. Additionally, trust and partnership are essential in building a MaaS solution. This finding is echoed in the work of Kandanaarachchi et al. (2021) who suggest that coalescence of the spectrum of stakeholders (mobility and non-mobility providers) implies the need for joint decision making to generate an effective MaaS solution which addresses the diverse stakeholder interests. This in turn suggests the importance of trust and collaboration among the stakeholders in a MaaS ecosystem and the need to understand the factors that contribute to building trust and collaboration, including an understanding of risk.

To summarise, in the context of rural and regional NSW, Figure 3 identifies the range of stakeholders who can play a part in developing a MaaS framework and who should be consulted in the process of the development.

Figure 3: Stakeholders who can play a part in developing a MaaS framework

Choice of regional towns

For a rural and regional setting, the most obvious mobility support services include demand-responsive transport, Community Transport, taxis, buses, and connections to long-haul transport (coach, rail, and air), and carpooling. Additional services might include parcel deliveries, library services, and food and medicine distribution. In reviewing rural mobility, it has historically been suggested that solutions such as car-pooling and on-demand buses receives high priority because of their flexibility; and where practical, active transport ranks as high priority due to need for safe biking and walking infrastructure. Personal electric vehicles also should receive high priority, due to dispersed housing and destinations, but both electric and conventional public transport have medium priority. Carshare, ride-sourcing (such as Uber and Ola), bikeshare and taxis, are ranked low, mostly due to lack of accessibility, feasibility, and the need for subsidy (e.g., taxis).

This project, which has a focus on regional towns and their rural hinterlands, highlights the desire to facilitate access to other key locations such as regional centres and State capitals (see Figure 4), Rural and Regional MaaS should be seen as spatially diverse in order to recognise and deliver, as appropriate, mobility services beyond the boundary of a regional town. Indeed, one of the arguments for MaaS includes delivering services that are borderless. By way of definition, *hinterland* is a region, either rural or urban or both, that is closely linked *economically* with a nearby town or city[1]. This focus

[1] Definition of Hinterland from britannica.com/science

on MaaS for regional towns and their rural hinterlands is expected to be found suitable for implementation in both Inner and Outer Regional Australia (Figure 4).

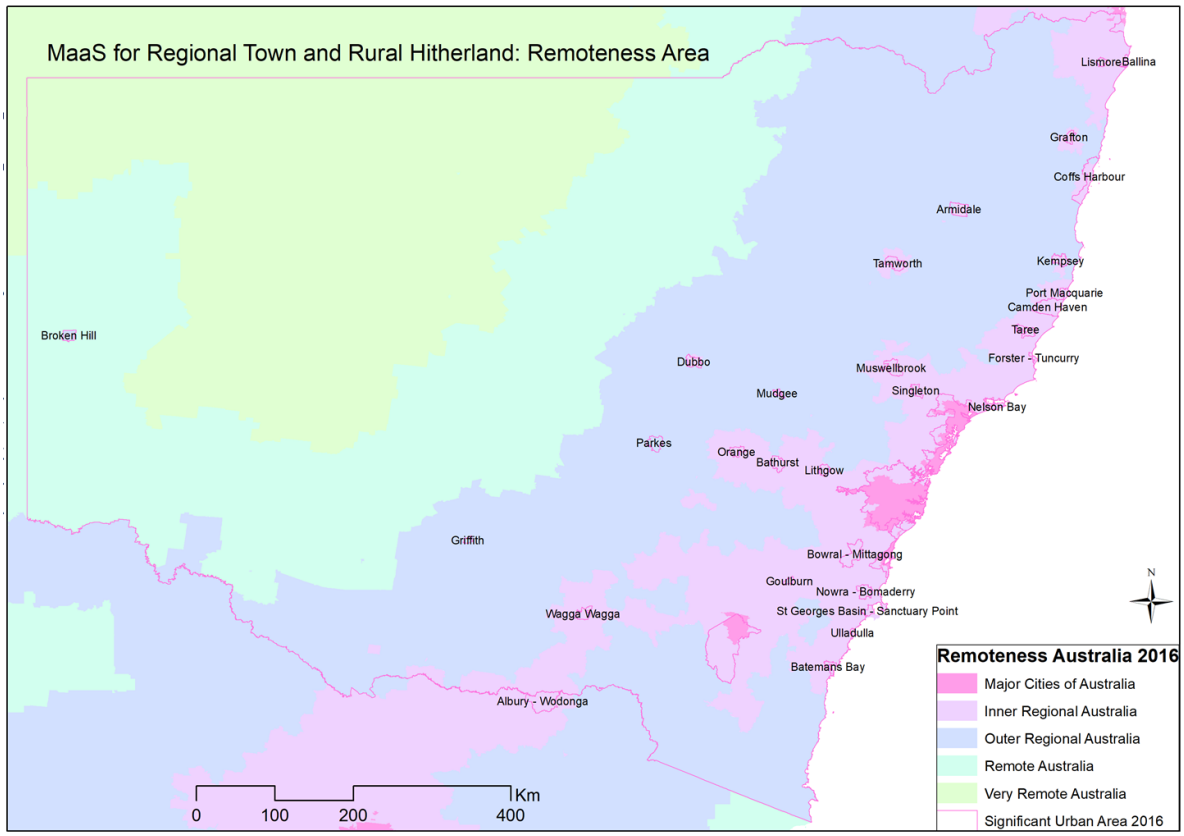


Figure 4: Classification of Remoteness in NSW

For most rural environments, funding transport services remains the biggest barrier to implementation and long-term sustainability. The cost of provision far exceeds the revenue generated, but the benefits are potentially huge. Integrating statutory health and education transport demands into the design of the flexible transport services can bring in extra funding for the service from these public-sector budgets, as has been demonstrated in Finland. Such an approach could potentially form part of a Rural and Regional MaaS framework where the objective is to make best use of the available transport resource. Another way of putting this is that, in a regional town setting (including the rural hinterland), reducing social exclusion and improving well-being come to the forefront as very important objectives that can be enhanced through a MaaS framework. Stanley et al. (2021) state that '[u]nderstanding the value of improving wellbeing highlights the opportunities to assist those at most risk of mobility-related social exclusion by taking more integrated approaches to transport planning and policy making.' This has a very good strategic fit with the role that Rural and Regional MaaS can play provided its success is measured by the behavioural benefits induced by integrated mobility services.

Location selection criteria

Location selection followed several steps beginning with the location of the residential population or communities. Figure 5 shows the resident population in NSW derived from 2016 census data, the darker the colour, the greater the population. This can be used to give a crude indication of the

number of people who might benefit from the introduction of MaaS. On this basis alone, potential locations with their hinterlands for the introduction of MaaS would include:

- Orange
- Bathurst
- Nowra
- Coffs Harbour
- Lismore

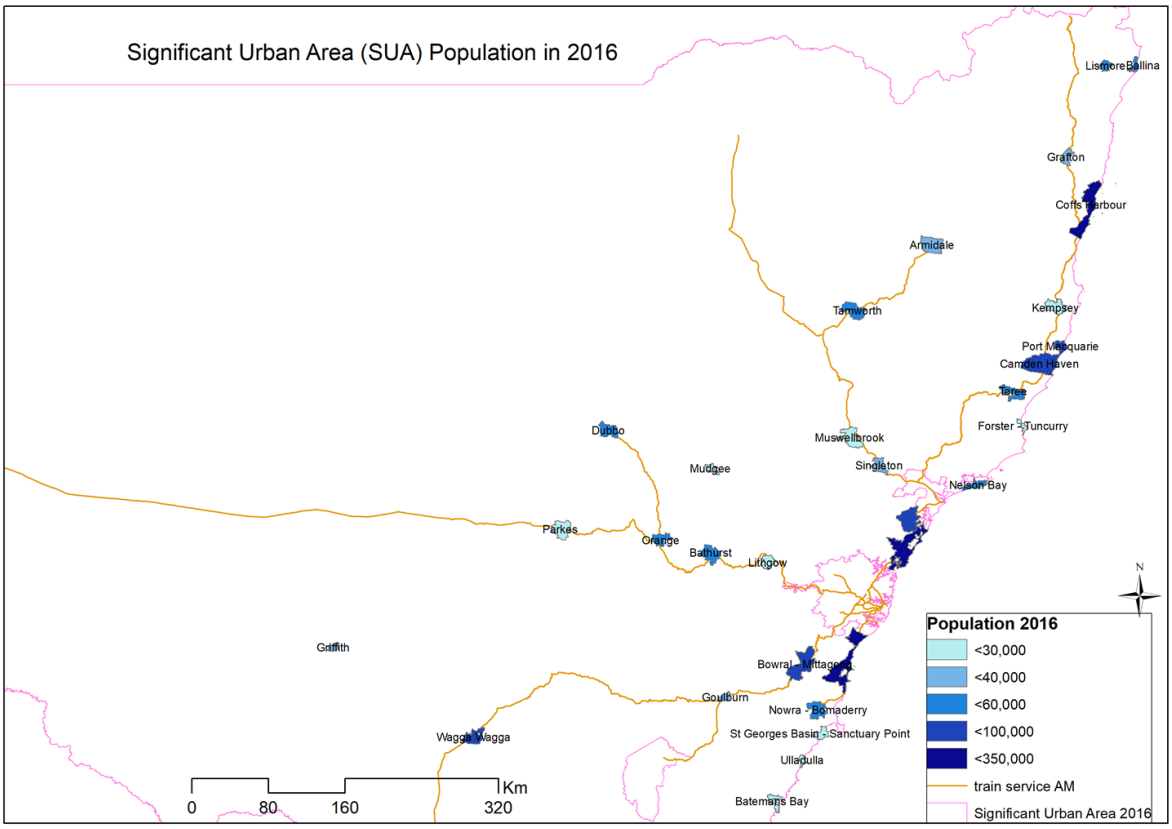


Figure 5: Target Residents

Following the approach of the World Economic Forum (2021), we can also consider potential locations based on target visitors (Figure 6). In this case, the map looks completely different and there is considerably less influence in the outer area beyond the coast.

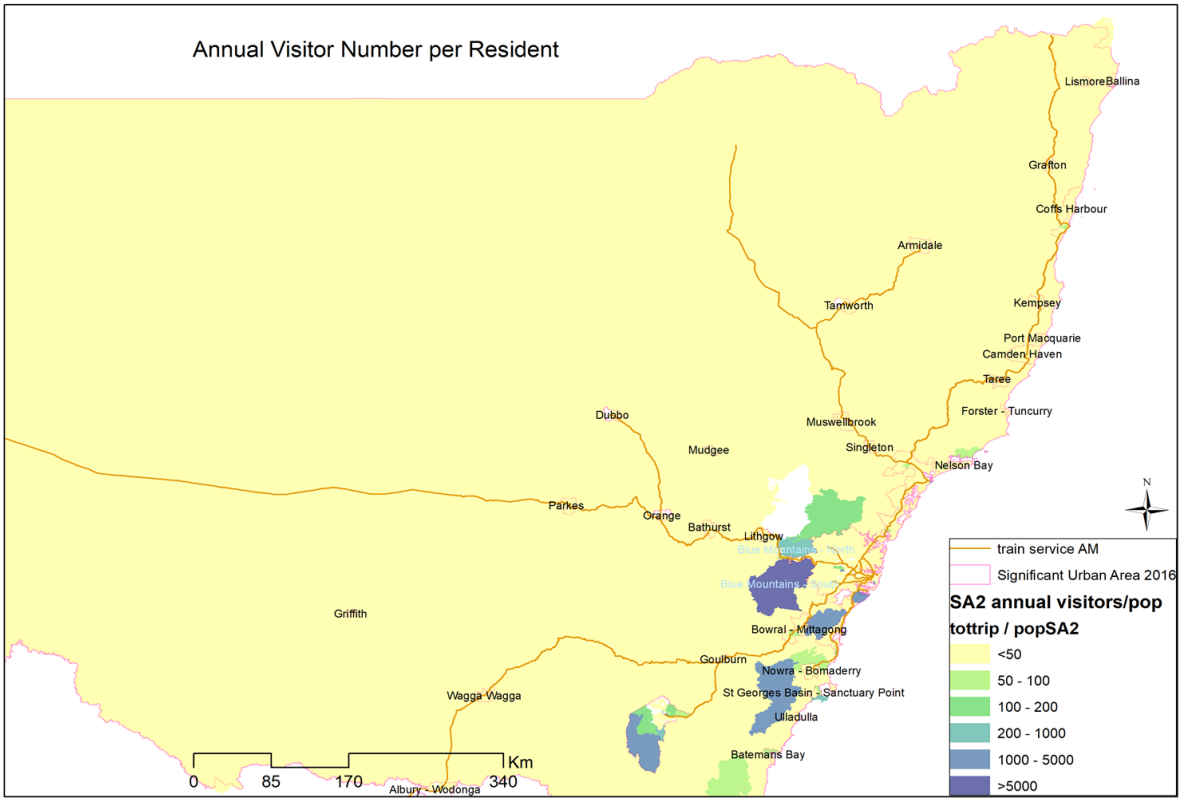


Figure 6: Target Visitors

Based on an approach which targets visitors / tourists, potential locations would include:

- Blue Mountains
- Nowra
- Nelson Bay
- Coffs Harbour
- Batemans Bay

However, it is important to recognise that the archetype approach cannot be directly translated to Rural and Regional MaaS, as a wider approach is necessary to take account of the objectives of the local context in NSW which includes the need to address transport disadvantage, of which social inclusion is one example. Additional criteria such as public transport provision, equity considerations and economic links, have been used to identify some ranking of regional towns in NSW to identify where improved mobility can really make a difference to reducing transport disadvantage, social exclusion and improving well-being as well as aligning MaaS with other schemes such as those to support the First Nations population.

Whilst the level of public transport provision in a rural and regional context means that it is not possible to build MaaS solutions around a backbone of public transport, it is nevertheless useful to include a location which has a reasonable degree of public transport provision and accessibility. This can be done by considering the e*xisting Public Transport* provision across regional NSW based on the Public Transport Accessibility Index (PTAI). The outcome is shown in Figure 7 where the greener the colour the better the public transport provision. On this basis, Nowra is the only location with

moderate public transport according to the PTAI, which suggests merit as a candidate location. Orange and Coffs Harbour do have some public transport provision, but more convenient services are needed.

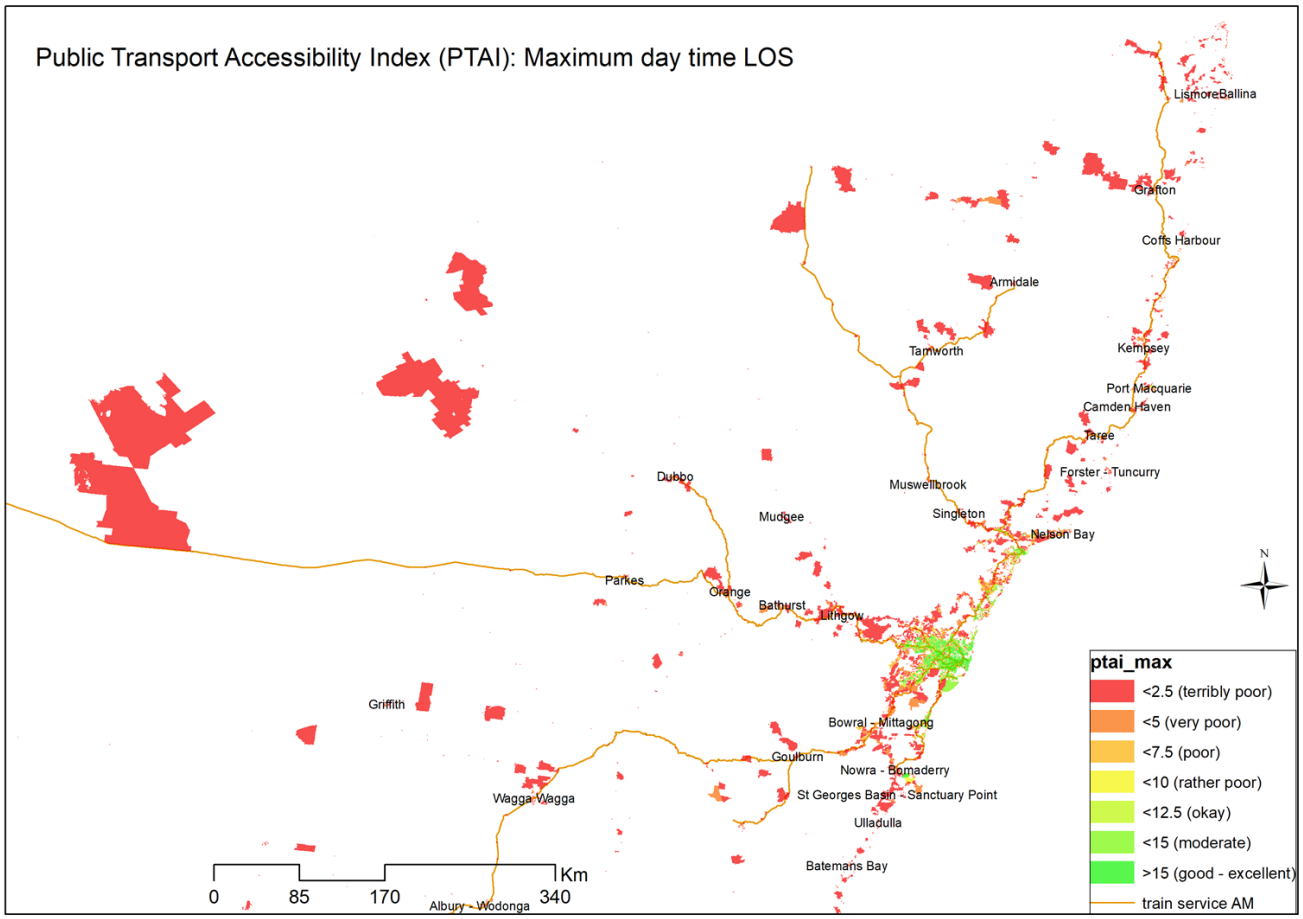


Figure 7: Existing Public Transport

Figure 8 shows the outcome of considering *equity* issues in terms of the SEIFA (Socio-Economic Indexes for Areas) data at the SA2 level. Areas with a lower Index of Relative Socio-Economic Disadvantage (IRSD) contain a higher proportion of more disadvantaged persons. In Figure 8 the darker colour equates to a greater number of local residents who would be classified as socially and economically disadvantaged. The role of geography is important here as well since the nature of the hinterland and the proximity to nearby towns determine the *economic* prospects of residents. Figure 9 suggests that Orange, Bathurst, Nowra, Coffs Harbour all have a decent percentage of non-urban commuting trips.

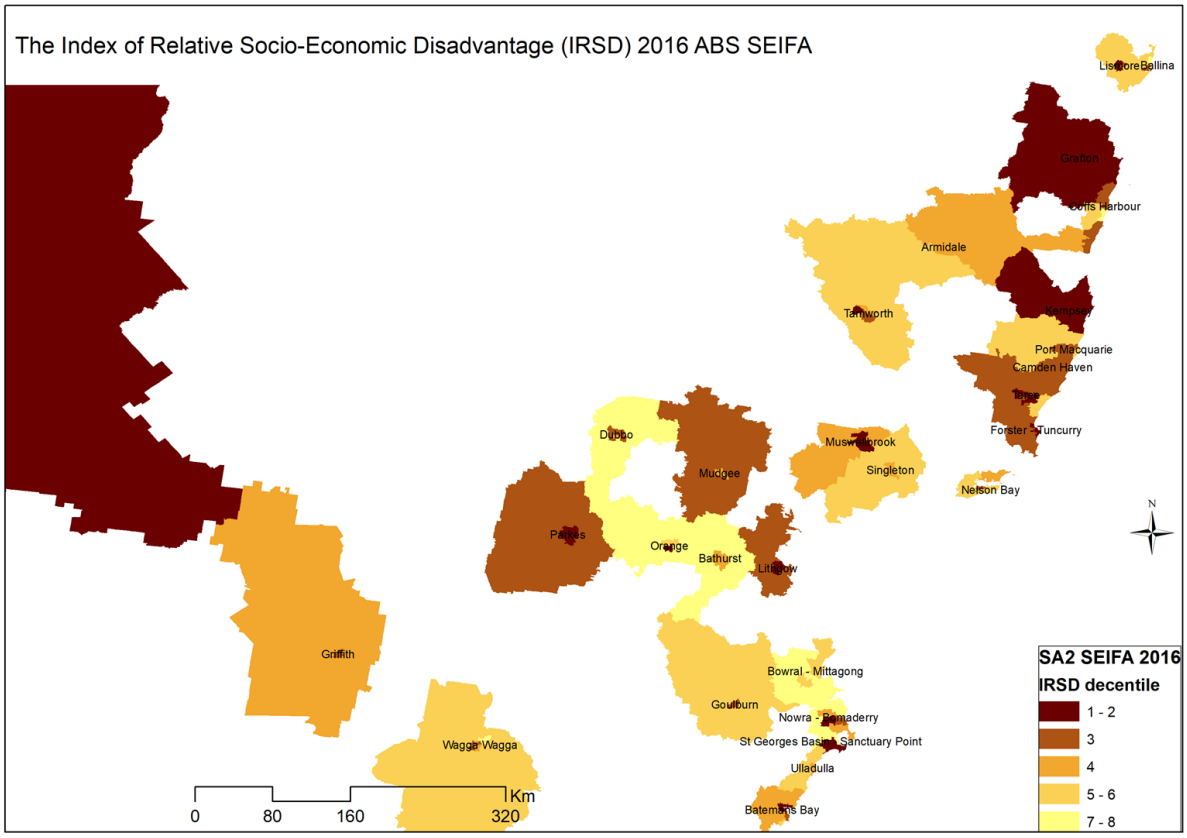


Figure 8: Equity considerations

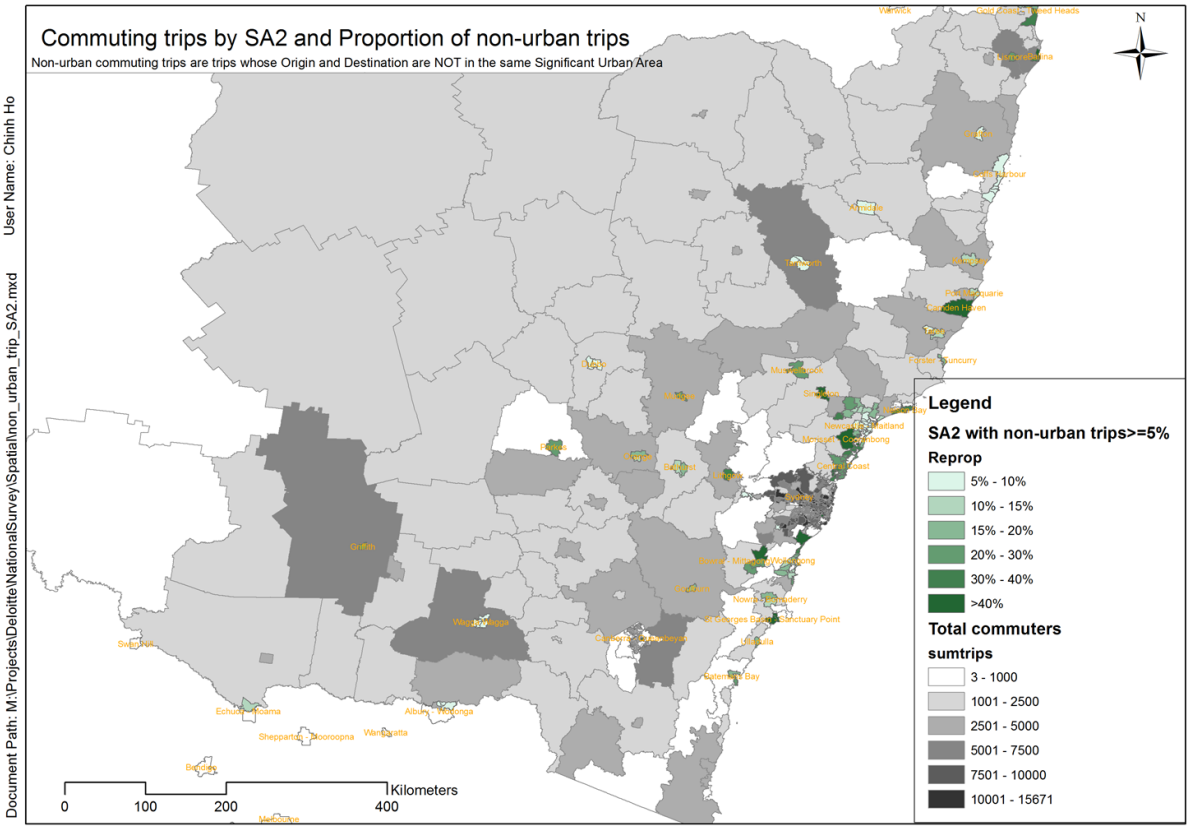


Figure 9: Economic link of hinterland area to nearby town or city via commuting trips

Following discussion with SMEs from Transport for NSW, three locations were selected as the focus for detailed study in the next stages of the project, namely Dubbo, Coffs Harbour and Nowra.

Profiling the three locations

With this project's focus on regional towns and their rural hinterlands (see Figure 10), MaaS should be seen as spatially diverse to recognise and deliver, as appropriate, mobility services beyond the boundary of a regional town. A summary of the key characteristics of each of the three towns prepared to build up a detailed profile of the potential transport resource and the mobility patterns of the population in each of the locations is included as **Annex 2.A**.

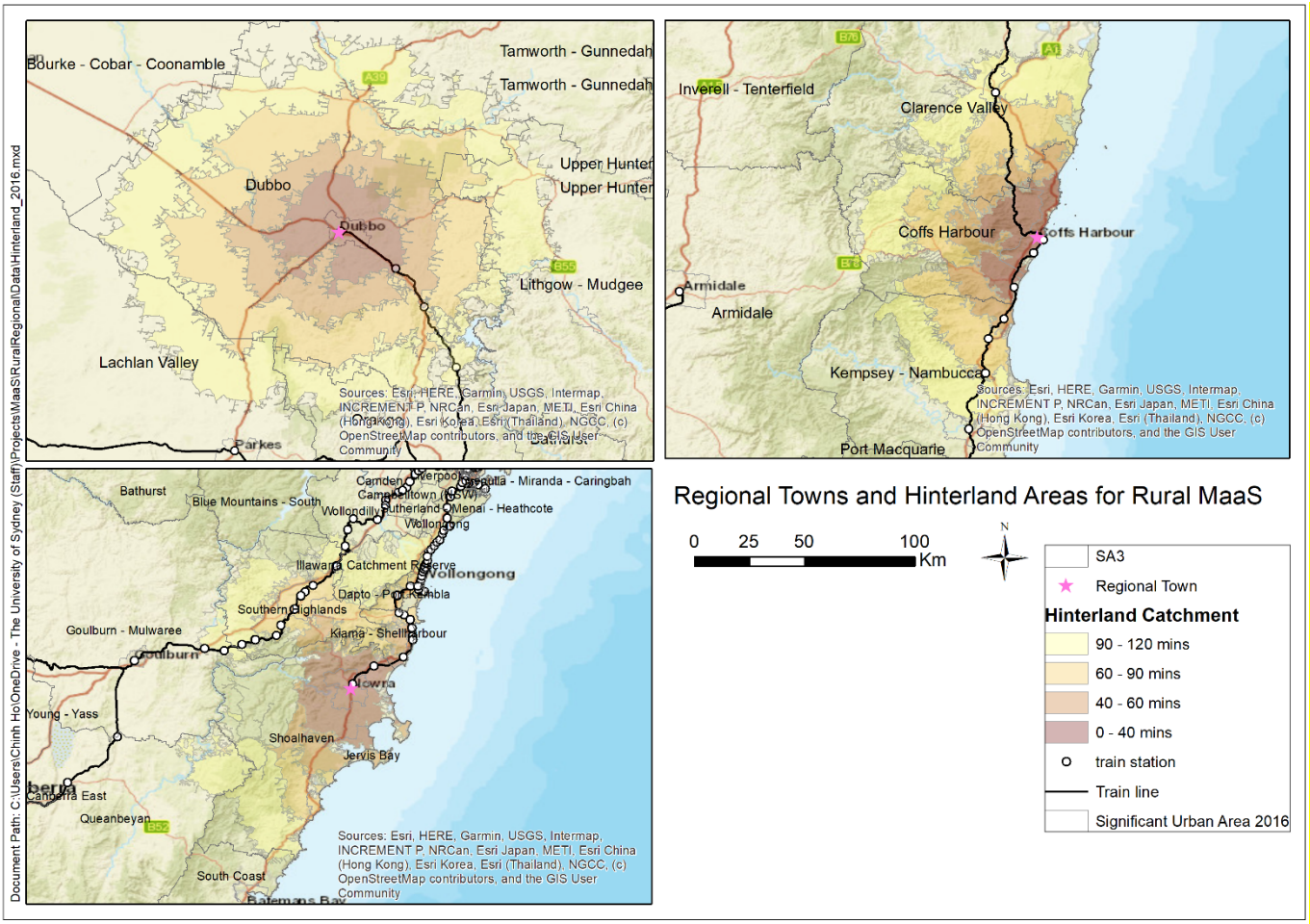


Figure 10: The three regional towns and their hinterlands

Using data from SEIFA (the social-economic indexes for areas), described in ABS (2016) Table 1 shows that the score of Dubbo Region is always the highest and the score of Nowra is the lowest across four indexes. On average, Coffs Harbour and Nowra are more disadvantaged than Dubbo. Relevant information includes selected personal characteristics such as education and qualification, employment and income, distance to work, mode of travel to work, selected dwelling characteristics, indigenous household indicator, the number of motor vehicles, and dwelling internet connection, etc. This is useful to help identify where a reduction in transport disadvantage may reduce social exclusion and support increased wellbeing. Additionally, comparisons between rural / regional locations and the metropolitan area are important for drawing out the distinctiveness of transport opportunities and travel behaviour and to provide insights into what MaaS needs to address. For example, around 80%

of people drive to work in each of the three locations, explained in large part by the lack of other alternatives, which underscores the role for car-based modes in a future MaaS offering.

It is possible to derive an indication of, for example, variations in household income, places where elderly populations are located (which may of interest to Community Transport), where numbers of household vehicles are lower and which areas score better or worse on the SEIFA indexes. For example, with the IRSD RSD (Index of Relative Socio-Economic Disadvantage) the west of Dubbo and central Coffs Harbour are areas which contain a higher proportion of more disadvantaged persons.

Table 1: Summary of the four SEIFA indexes for the three locations

2016 Statistical Area Level 2 (SA2) Name	IRSD		IRSAD		IER		IEO		Usual Resident Population
	Score	Decile	Score	Decile	Score	Decile	Score	Decile	
Coffs Harbour - North	941	3	931	3	942	2	945	4	17,462
Coffs Harbour - South	944	3	936	3	927	2	960	4	10,295
North Nowra - Bomaderry	979	4	962	4	991	5	972	5	15,759
Nowra	907	2	897	1	938	2	912	2	20,039
Dubbo - East	961	3	944	3	979	4	934	3	10,378
Dubbo - South	985	4	965	4	976	4	970	5	16,942
Dubbo - West	958	3	944	3	977	4	942	3	8,768
Dubbo Region	1043	7	1020	6	1083	9	997	6	5,625

Notes: IRSD - Index of Relative Socio-Economic Disadvantage; IRSAD - Index of Relative Socio-Economic Advantage and Disadvantage; IER - Index of Economic Resources; IEO - Index of Education and Occupation (see ABS, 2016 for definitions)

Modes that currently exist in the three case study areas are shown in Figure 11. Different cities have different mixes of modes and different levels of service within each mode. The characteristics of transport services in each location are summarised below.

Dubbo is considered an ideal precinct for MaaS, particularly for the remote communities to the north and west of the city – e.g., connecting Trangie, Nyngan, Warren, Mendooran, Coolah, etc. It is also a location with a significant First Nations population. Selection of this location allowed investigation of interesting nuances around isolation and distance while keeping a focus on addressing transport and social disadvantage. There are known unmet mobility needs (confirmed by the user surveys) and MaaS can address these constraints for both residents and visitors. For example, the ABS 2016 Census data shows that the distance to work for most of the most population (66.2%) in Dubbo region is 10-30 km, and over 70% of households own one or two motor vehicles to solve the first and last mile problems. Moreover, over 80% people living in Dubbo travel to work by driving or as a passenger in a private car. Only 3.2% of people travel to work by active transport and the corresponding figure for bus is 0.5% which is less surprising given the poor PTAI score. It is anticipated that MaaS can attract more private vehicle users by providing them with cost-effective mobility services. Moreover, the non-mobility services provided by MaaS, such as delivery services and online medical services and library services could prove attractive for those who work from home or do not go to work (15%). Due to the low public transport accessibility in Dubbo, most people do not find the bus services attractive.

Coffs Harbour is interesting as a potential location for MaaS because there are already a variety of different types of transport including on-demand (which has been successful), local buses, Community Transport, long distance trains, air, and road. It is also an attractive tourist destination. Coffs Harbour

hosted a 3-year driverless bus trial (BusBot) which ended in November 2021. The ABS 2016 Census data shows that the distance to work for much of the population (64.2%) in Coffs Harbour is 2.5-10 km, and over 80% of household owns one or two motor vehicles to solve the first and last mile problems. Moreover, 70% of people living in Coffs Harbour travel to work by driving their private cars. An average of 6.8% of people travel to work as passengers and 6.9% of people travel to work by active transport. MaaS has the potential to attract current private vehicle users by offering access to the variety of transport services available.

Nowra is considered a good location for MaaS since it has a reasonable degree of public transport provision and accessibility (although feedback from public transport users is mixed). It is suggested that the focus in Nowra should be connecting the rural villages and towns around the St Georges Basin like Vincentia, Huskisson, etc., as well as Sussex Inlet, with feeder services into Nowra. An additional attraction is that Nowra can be seen as a hub to connect to the ACT, thus allowing the study of inter-regional MaaS. The ABS 2016 Census data shows that there are 0.3% of people living in Nowra but working in ACT, and the distance to work of most of the population (58.7%) is 2.5-10km, followed by 0-2.5 km (16.4%) and 10-30 km (15.0%), respectively, while over 80% of households own one or two motor vehicles to solve the first and last mile problems. Moreover, 70% people living in Nowra travel to work by driving their private cars. An average of 6.3% people travel to work as car passengers and 4.5% people travel to work by taking active transport. The non-mobility services provided by MaaS, such as delivery services and online medical services and library services could attract those who work from home or don't go to work (15.7%). Moreover, the medium PTAI and the predominance of shorter distance journey to work trips is also promising.

Figure 11: Modal offerings in the case study areas

Data Collection and Analysis

The analysis of primary data to inform the development of a Rural and Regional MaaS Blueprint comprises outcomes from the three strands of work:

- Qualitative analysis of in-depth interviews with supply-side providers / organisers at the three locations selected (Dubbo, Nowra, Coffs Harbour).
- Qualitative analysis of community discussion groups, including a "pencil & paper" survey at the three locations.
- Quantitative analysis of the NSW-wide online survey of residents of the 16 regional cities.

The in-depth interviews identify the specific features of the mobility framework that are relevant to MaaS from the service provider perspective. One-to-one in-depth interviews with 17 key stakeholders were conducted to gain insights about the services and products they provide and their fit within the MaaS Blueprint, and how they could be leveraged through greater integration. Building on the insights gained from the in-depth interviews, community discussions groups were conducted with end users in the three locations with a view to gaining an understanding of users' everyday travel needs and their likely interest in integrated mobility plans. The NSW-wide online survey targeted respondents living in the 16 regional cities in NSW (based on the 16 Regional Cities Services Improvement Program to improve bus services). The survey included questions on respondents' long-distance trips and short-distance trips (local travel) to better understand the potential services or travel modes that attract users most, together with stated preference (SP) choice games including both transport and other services designed for the respondents' reported local travel. Detail on the design and administration of the in-depth interviews with key stakeholders and surveys with end use passengers (community discussion groups and online survey) are found in **Annex 2**.

The primary data collection process comprised two phases of collecting different data types with various samples, locations, and key outputs (see Table 2). Detailed findings from the analysis are given in **Annex 3**.

Table 2: Overview of primary data collection and aims

Phase	Data type	Sample	Location	Key output
1	In-depth interviews with stakeholders	• Transport providers • Non-transport providers	• Nowra • Dubbo • Coffs- Harbour • Sydney	Highlight complex rural mobility issues • identify the mobility framework • capture perception of customer needs
2a	Group discussions with end users	• Drivers • Non-drivers	• Nowra • Dubbo • Coffs- Harbour	• Confirm barriers of stakeholders • Further insight into nature of issues of transport disadvantage and vulnerability • Implications for Rural and Regional MaaS
2b	Online Survey with end users	• Drivers • Non-drivers	• 16 Regional Cities	• Explore new initiatives offering travellers more travel options for both short and long-distance trips • Elicit travellers' preference on different subscription plans with a set of travel options at discounted prices as well as other services

In-depth Interviews

The major aims and objectives of the in-depth interviews are summarised in Figure 12. The interviews with service providers and organisers of transport were designed to gain insights into the services and products they provide and their potential fit within the Blueprint for Rural and Regional MaaS, and

how they could be leveraged through greater integration. Interviews sought to establish the barriers the transport service providers face in meeting users' needs, key success factors of MaaS, and business opportunities that MaaS may bring. Detailed findings are reported in Xi et al., 2023).

Each interview included three major sections: Introduction, Stakeholder Experience, and Conclusion. Interviewees were asked to talk about their customer base, the services and products they provide, and their customers' mobility requirements (such as how their customers/clients currently move around their surroundings). The interview also explored the role of technology in enhancing mobility service provision (e.g., booking, payment, information searching, journey planning) and the potential for a MaaS-like subscription system. The challenges of implementing Rural and Regional MaaS (such as institutional and regulatory barriers) were explored, and interviewees were asked for their views about where key responsibilities should lie in the setting up of Rural and Regional MaaS. The interview outline is given in Table 3. Survey materials received University of Syndey Human Research Ethics Committee ethics approval and interviews were conducted by an external market research company group (CaPPRe Pty Ltd).

Table 3: Interview outline (50-60 min)

Contents	Time
Introduction	5 min
Warm up	5 min
Getting to know your customers / clients	10 min
Mobility requirements of your customers / clients	10 min
The role of technology in enhancing mobility service provision	15 min
Implementing rural and regional MaaS	10 min
Conclusion	5 min

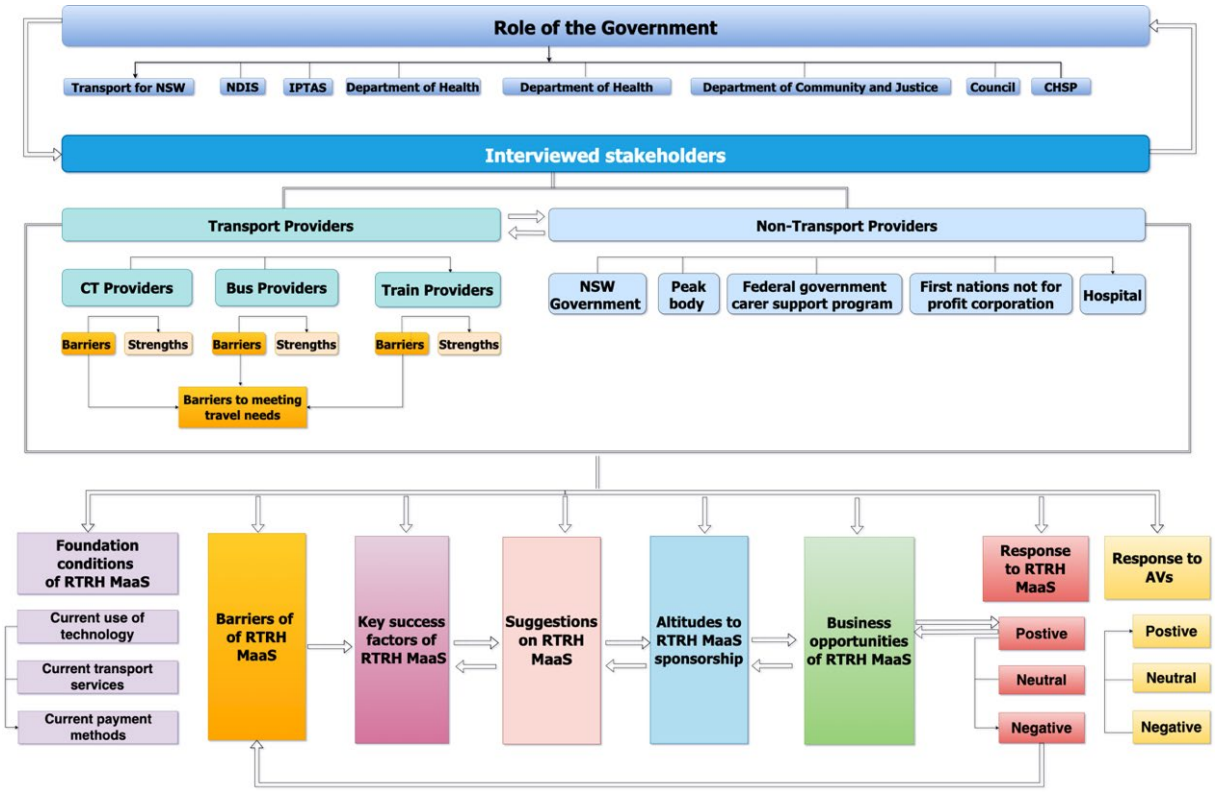


Figure 12: The aims and objectives of the in-depth interviews with key stakeholders

A total of 17 stakeholders were interviewed (see Table 4) including both non-transport providers such as government, peak bodies, health and Aboriginal organisations and transport providers from the bus, train and Community Transport sector and included a variety of levels of seniority. All interviewees were drawn from the management level in their organisations including Managers (8), Senior Officers (3), CEOs (3), Peer Support Partner (1), and Senior Directors (2).

Table 4: List of interviewees

Participant	Work City	Organisation Type
I01	Sydney	Non-Transport provider (NSW Government)
I02	Sydney	Non-Transport provider (peak body)
I03	Nowra	Transport provider (CT)
I04	Dubbo	Non-Transport provider (Federal Government carer support program)
I05	Dubbo	Non-Transport provider (Hospital)
I06	Nowra	Non-Transport provider (NSW Government)
I07	Dubbo	Transport provider (CT)
I08	Dubbo	Transport provider (Bus)
I09	Dubbo	Transport provider (Bus)
I10	Nowra	Transport provider (Train)
I11	Dubbo	Non-Transport provider (NSW Government)
I12	Coffs Harbour	Transport provider (Bus)
I13	Coffs Harbour	Non-Transport provider (NSW Government)
I14	Sydney	Transport provider (Bus)
I15	Coffs Harbour	Transport provider (CT)
I16	Coffs Harbour	Non-Transport provider (First Nations not for profit corporation)
I17	Sydney	Transport provider (CT)

The initial results of the qualitative analysis showed that many people experience real challenges in meeting their mobility requirements due to the high level of transport disadvantage and other vulnerabilities, and there is a gap between existing transport systems and the people who are most dependent on them. Distance makes a car a necessity, while other transport modes offer unsatisfactory alternatives.

A key initial finding was the varying perception amongst providers of their clients' needs (see Figure 13).

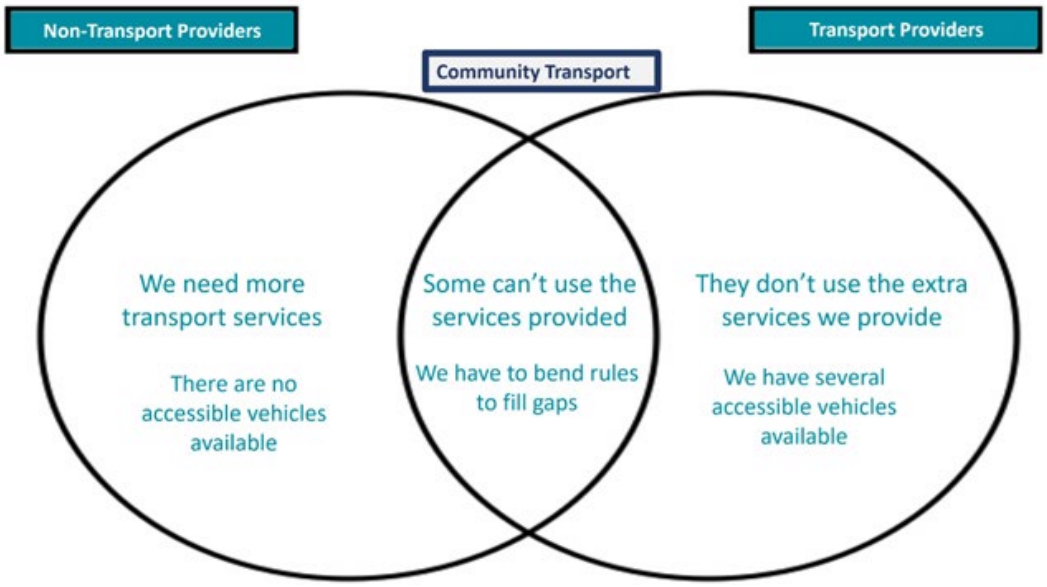


Figure 13: Varying perceptions of clients' needs

Subsequently, more detailed analysis was completed using NVIVO software. Interview transcripts were coded following a thematic analysis approach to identify thematic categories grounded on the stakeholders' views and experiences of rural mobility. Thematic analysis can use a mix of inductive and deductive reasoning methods with well-defined and systematic coding procedures. Initial coding was undertaken to assign conceptual labels to pertinent extracts, and these labels were refined as coding proceeded and new insights emerged. Secondly, the codes that emerged were categorised under overarching themes. The 'constant comparison' method was used, whereby instances to which similar codes assigned to themes were compared, so as to develop understanding of the core properties of each concept and refine the labels attached to these concepts. Finally, the codes under each theme were reviewed to define and name each of the identified themes.

Figure 14 provides a summary of themes based on the analysis of the in-depth interview transcripts.

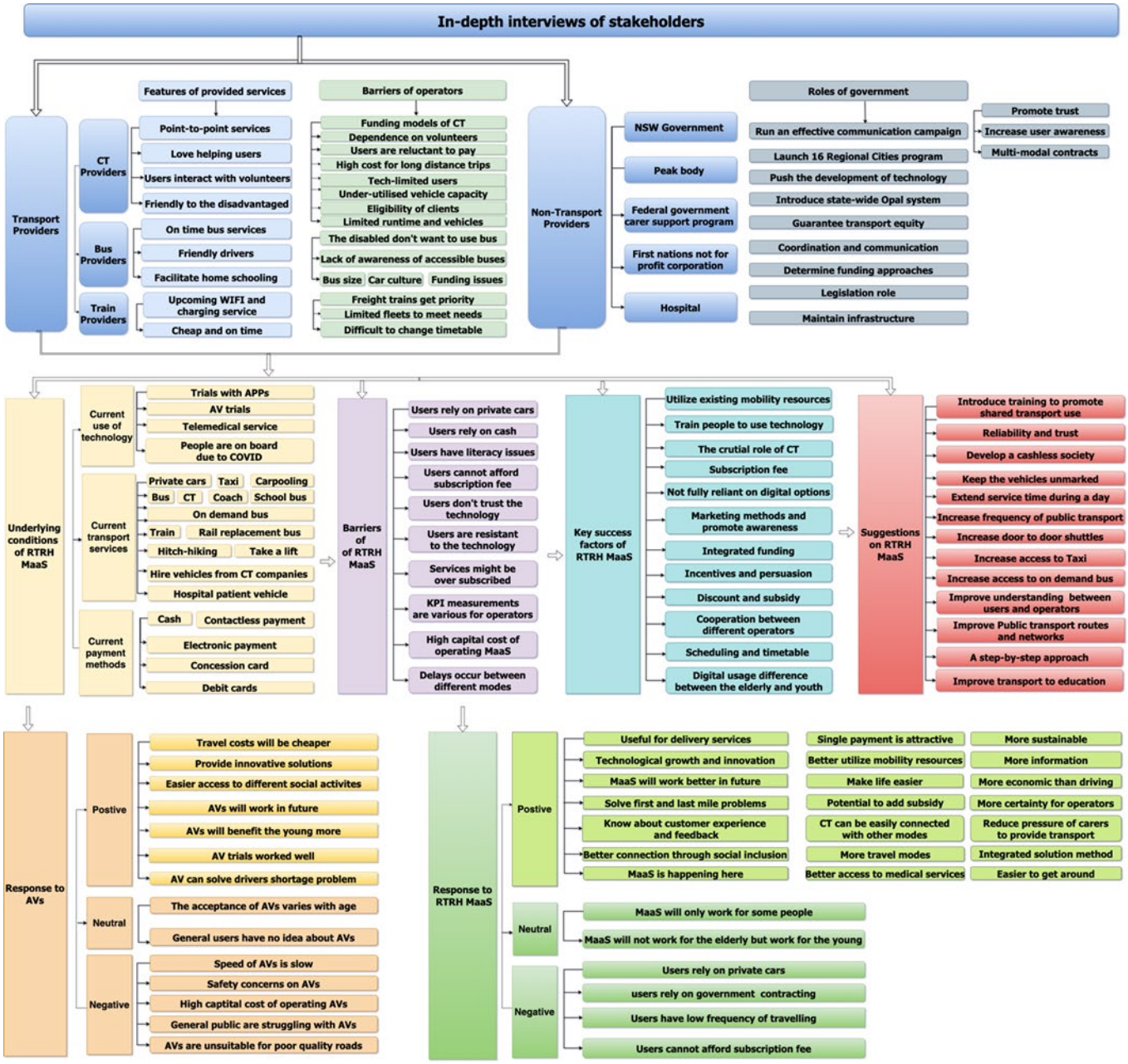


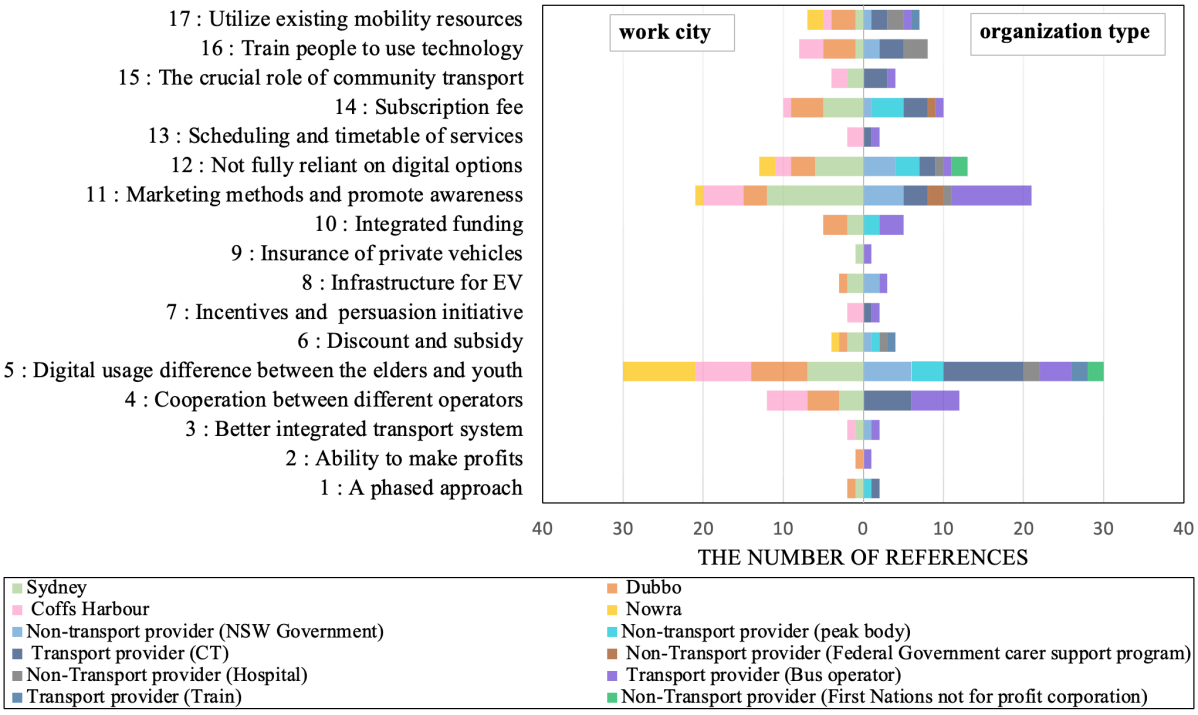
Figure 14: Summary of results obtained from in-depth interviews

The analysis of the in-depth interview transcripts identified 13 core themes that may be considered as critical determinants underpinning the acceptance and success of Rural and Regional MaaS, which are explored in the detailed report of findings (**Annex 3**). These are:

1. Underlying conditions for implementing MaaS,
2. Barriers to meeting mobility needs of the general public,
3. Barriers to meeting mobility needs of disabled persons,
4. Barriers for transport service providers,
5. Barriers to transport in the Aboriginal community,
6. Barriers to implementing MaaS,
7. Responses to MaaS,
8. Impact of disaster and COVID-19 on transport services,
9. Factors influencing the ability to meet needs,

10. Considerations for MaaS sponsorship,
11. Business opportunities of MaaS,
12. Key success factors (KSF) of MaaS, and
13. Expected role of government.

Key success factors (KSF) are the critical factors that are necessary for stakeholders to achieve their objectives or goals. The KSF of Rural and Regional MaaS for stakeholders as reported by interviewees of this stakeholder group are summarised in Figure 15 which shows that 17 factors were identified. The number of references made to a particular factor is given in brackets and indicates the significance of a factor or sub-theme. For example: 'Digital usage difference between the old and the young' (30 references), 'Marketing methods and awareness promotion' (21 references), and 'Not fully reliant on digital options' (12 references) are the most frequently mentioned.



Note: The number of references made is given in brackets and indicates the significance of a success factor.

Figure 15: Key success factors of Rural and Regional MaaS

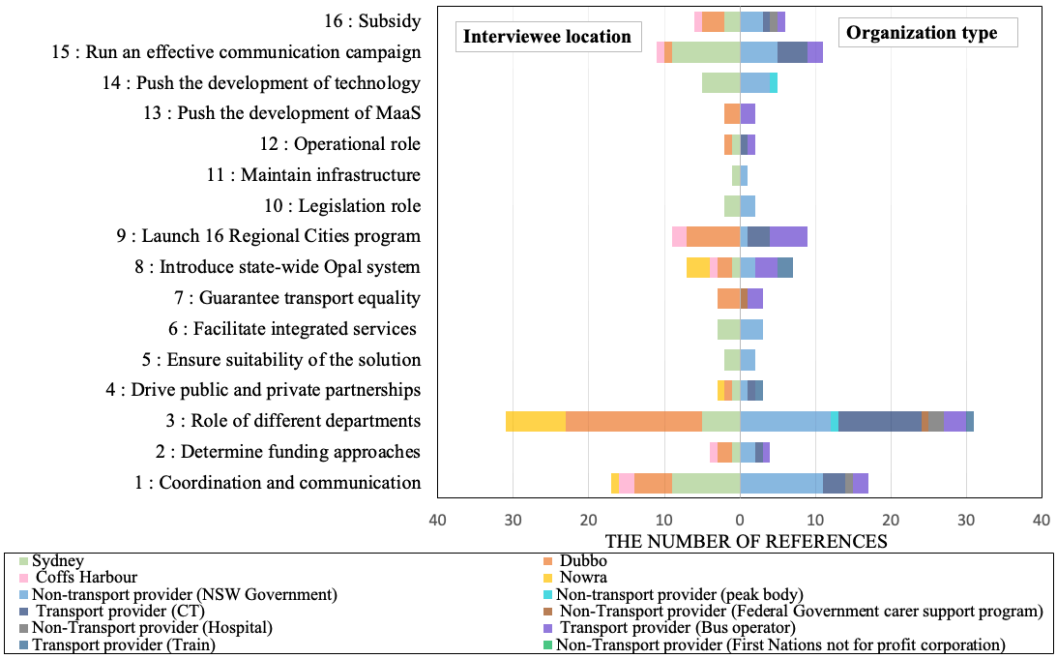
Since technology is increasingly recognised as a significant way that mobility services can influence transport use and lifestyle the difference in outlook between the between the young and the old should be considered while designing the MaaS Blueprint. A non-transport provider interviewee working in NSW Government felt that younger generations are easier to get on board with a MaaS App. A CT operator interviewee felt that while young people are used to using Apps, but it will not work for some of the demographic at all.

A non-transport provider interviewee working in a peak body mentioned that carers in regional and rural areas are resistant to technology. The young and middle-aged groups are good at using the technology, but older people are less confident since they may not have an internet connection, or they don't have a smartphone. They observed that even though many older people have a smart mobile device, they have never used it since they are scared of using it. Although some programmes have been launched to facilitate more services moving online in the local community and to improve older people's digital literacy, many people wish that paper-based elements are maintained.

A non-transport provider working in NSW Government mentioned that people usually ring the CT or Train link to book services, or directly show up to book bus services with the driver, rather than book services online. A bus operator mentioned that: *"old habits die hard, since they have been used to picking up the phone talking to one of our depot staff to get the answer."*

Although most stakeholders have a concern over non-tech savvy users, there are some stakeholders who are optimistic and suggest that technology will work better for the elderly in the future. A non-Transport provider working in NSW Government suggested that people are getting more confident digitally especially after COVID.

The role of the government as reported by interviewees is summarised in Figure 16 with 16 identified sub-themes. The most frequently mentioned are: 'Role of different departments' (31), 'Coordination and communication' (18 references), 'Run an effective communication campaign' (11 references), 'Launch 16 Regional Cities Program' (9 references), and 'Introducing state-wide Opal System' (8).



Note: The number of references made indicates the significance of a sub-code.

Figure 16: Expected role of government

The expected roles of the government sector in MaaS as indicated by interviewees are summarised in in Table 5.

Table 5: Expected roles of the government sectors in Rural and Regional MaaS

Department	Expected roles
TfNSW	Connect and communicate with different organisations and stakeholders together to develop strategies.
NDIA	Support a better life for Australians with a significant and permanent disability and their families and carers by better administering the access to the scheme and simplifying the approval procedure for the payment of individualised support packages.
IPTAS	Serve as significant funding source for users who need to travel more than 100km one way or 200km within a week for appointments to the same medical practitioner or health service.

CHSP	Provide transport support for older people who stay at home and closely work with transport service providers to maintain their life independence.
DOH	Provide health related funding to community transport providers
DOE	Provide education related transport funding and start a curriculum about life skills and using public transport to promote awareness on public transport from a young age
DCJ	Oversee disability policy and link how that all fits in in terms of disability type services.
Councils	Councils can oversee a better utilization of assets, resources, and funding across different sectors.

The transport agency has a strong position and influence within the government, committees, and regional NSW. By participating in these structures and having strong relationships with service providers, the agency is well positioned to interact with other stakeholders and bring new solutions to the market. The power and resources of a state government agency, combined with effective engagement and partnerships, can help ensure that the transport agency is able to deliver solutions that meet the needs and expectations of the general public.

Local governments and councils are significant stakeholders in the transport sector, as they are often responsible for the maintenance and operation of the local road network, as well as other infrastructure such as paths, buildings, and public spaces. Collaborating with local governments and councils is essential in ensuring that transport solutions are aligned with local needs and priorities and can help to drive positive outcomes for the public.

The government is expected to run an effective communication campaign between users to set up their trust, improve their awareness and learn about community needs.

It is suggested that a top-down approach from the government may not always be the most effective solution, especially in the context of aged care reforms and transport for vulnerable individuals. A more effective approach might be to involve the community in the co-design and decision-making processes, considering their needs and preferences. This can be done through community consultations, surveys, or focus groups, where stakeholders can voice their opinions and suggest solutions.

While the government does play a crucial role in setting policies and regulations, it is important to note that their involvement alone may not be enough to ensure the success of MaaS. The adoption of MaaS requires the collaboration of multiple stakeholders, including private companies, transport providers, and the public, with the government playing a facilitative role in bringing everyone together.

Community Discussion Groups and End-user Surveys

The *community discussions groups* sought to explore current transport needs and experiences among regional and rural dwellers in terms of how they access their surroundings, what constraints they face, and how to address barriers; and to ascertain the nature and extent to which travel can be eased, and behaviour changed by better integration of different forms of transport and the availability and use of supporting technology.

Community discussions groups with representatives of end users were conducted in Dubbo, Coffs Harbour and Nowra during which each participant was asked to finish a “paper & pencil” survey which explored issues of everyday travel and potential for bundling of different services. These were completed in August 2022 by CaPPRe who conducted six discussion groups after the pilot test of the survey (each group was recruited by a professional agency using a screening questionnaire). There were 45 participants across Coffs Harbour, Dubbo, and Nowra, and each group comprised up to nine participants for a 2-hour duration. Participant consent was sought at the start of each discussion group.

The *online survey* sought to elicit switching behaviour potential under varying mobility subscription plans associated with different mobility services and non-mobility services in regional towns and to generalise the findings from the three locations (Nowra, Coffs Harbour and Dubbo) to a wider regional NSW context. The online survey was designed to:

- establish the transport modes that users have used recently when travelling locally and further afield,
- collect users' feedback on some new transport initiatives designed to give users better value for money in their travel,
- elicit users' preference in different mobility plans with both mobility services and non-mobility services in the rural and regional context, and
- improve users' access to different places that users want to go or need to go using services they like or need to use.

A summary of the methods adopted and approach to analysis is given in Table 6.

Table 6: Summary of qualitative and quantitative study in analysing end-user survey

	Qualitative study	**Quantitative study**
Type of data	Group discussions of 6 groups with 45 participants in the selected 3 locations	Online survey of over 900 respondents of NSW state-wide
How data is collected	Observations, interviews, and textual analysis	Measuring and counting things
How data is analysed	Text analysis; grouping data into meaningful themes or categories	Statistical analysis
Level of analysis	In-depth, local phenomena; more subjective	Large-scale, generalisable
Type of findings	Informative, understanding of the why or how about stakeholders' barriers and altitudes towards MaaS	Elicit the probability of choosing different mobility plans and quantify the preference for different mobility services

Outcomes from the end user community discussion groups

Demographic information of the 45 participants across six groups in the selected locations (Dubbo, Coffs Harbour, and Nowra) and characteristics of participants are summarised in Table 7.

Table 7: Demographics of 45 participants across 6 community discussion groups in the selected locations

Gender	**35 x Female; 10 x Male**
Age	**2** x 20-34 years; **16** x 35-54 years; **24** x 55-74 years; **3** x 75-83 years
Socio-Economic Status (SES)	**13** x In paid work (FT, PT, S/E, casual. N.B. Low-income) **9** x Unemployed; **8** x Retired; **1** x Student **14** x Did not answer (likely a mix of volunteers + unemployed)
Cultural Association	**26** x Australian born, not as First Nations **12** x Australian born, as First Nations **4** x Born overseas **3** x Not answered
Location	**12 x** < 5kms from town centre **24 x** 5-10kms from town centre **9 x** 11-30km from town centre
Drivers/Non-drivers	**26 x** Drivers (**15** x provide lifts to non-household contacts >**1** x pw**, 11** x Also use PT) **19** x Non-drivers**: (14** x Private car passengers + PT Users**, 4** x PT only**, 1** x Walking only**, 1** x e-bike rider)
Concession Cards	**22** x Multiple**; 10** x Single; **13** x None **Type: 21** x Seniors card/travel voucher, **19** x Centrelink (**18** x Health care card), **13** x RED Ticket, **5** x TTSS, **2** x NSW Companion card, **5** x Mobility Parking Permit
Disabilities	**24** x None / undisclosed **21** x Single / multiple (**9** x Physical, **7** x Mental, **4** x Sensory, **1** x Unspecified)

The barriers for people to get around which emerged from the discussion groups are summarised in Figure 17.

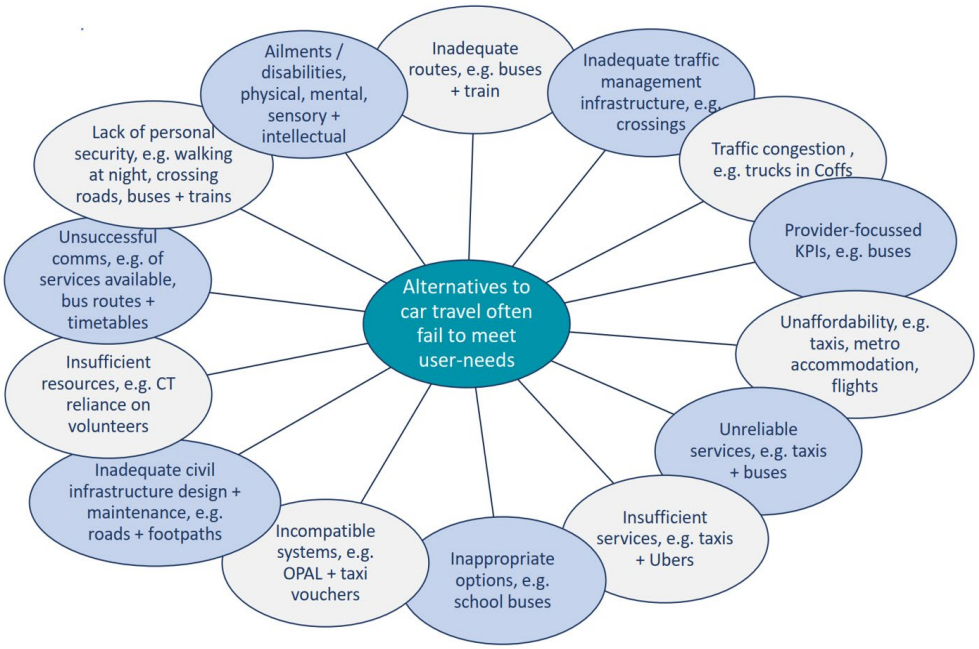


Figure 17: Barriers for people to get around

Three layers of users' unmet needs have been identified (see Figure 18). The outer layer summarises the functional needs of users, such as more extensive and direct routes, better-maintained roads, easier-to-access buses, more footpaths in better condition, less volunteer-dependent workforce, more suitable accommodation close to hospitals, more frequent services, more user-friendly timetabling. The middle layer summarises users' social needs, such as more affordable, greater

reliability, inclusivity, greater flexibility, greater awareness, less time wasted, and easier accessibility. The inner layer summarises the emotional needs of users, such as getting out independently and safely in a way that makes them feel capable.

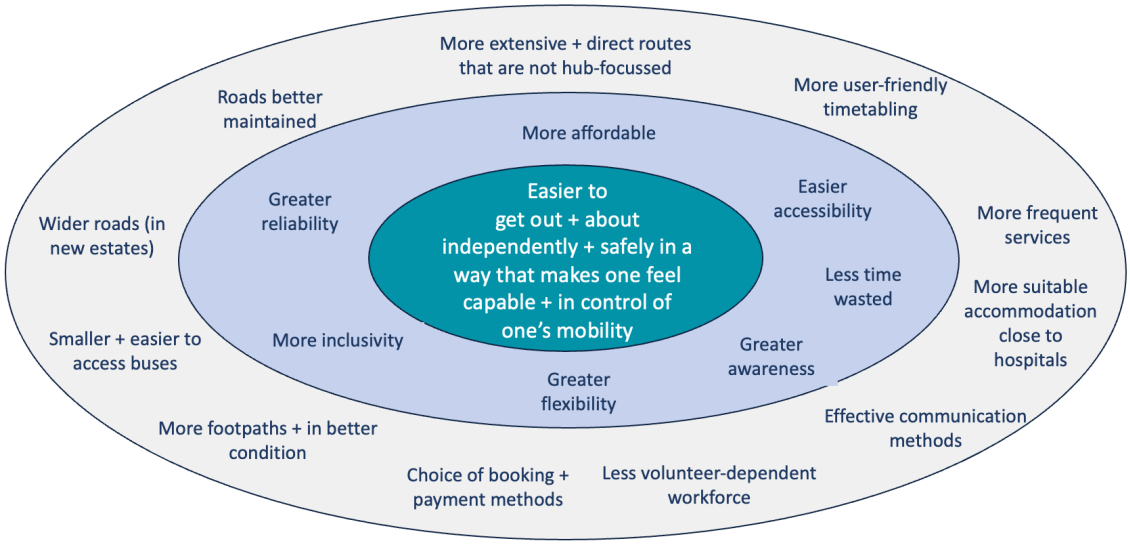


Figure 18: Three layers of unmet needs

As an indication of the impact of transport disadvantage on vulnerable groups, Figure 19 highlights the three layers of impact that transport disadvantage can have which was documented during the discussions. These include: (i) *Emotional impact* which refers to the impact that transport disadvantage can have on a person's emotions and well-being.; (ii) *Social impact* which is the impact on a person's social life and relationships; and (iii) *Functional impact* which is the impact on a person's ability to carry out daily activities and access essential services.

Our findings suggest that it is important to consider these three layers of impact when addressing transport disadvantage and developing solutions to improve access to transport for vulnerable groups. This will help to ensure that solutions are comprehensive and address not just the practical challenges, but also the emotional and social impacts of transport disadvantage.

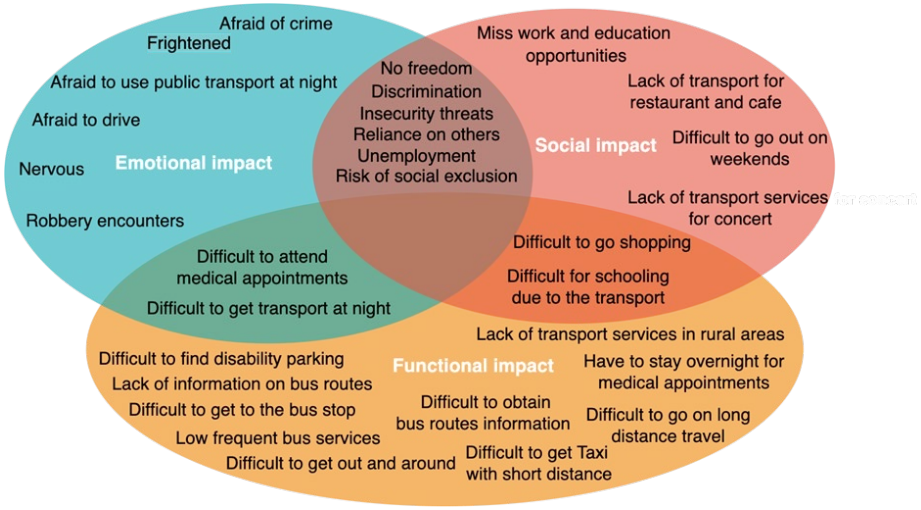


Figure 19: Impact of transport disadvantage on vulnerable groups

Figure 20 shows current transport modes mentioned by users which include micro-mobility and active modes in addition to the traditional shared transport modes as well as the private car. Users employ a variety of online and offline methods to obtain information, book and pay for transport services. The use of Apps was consistently mentioned as a feature of the future mobility landscape.

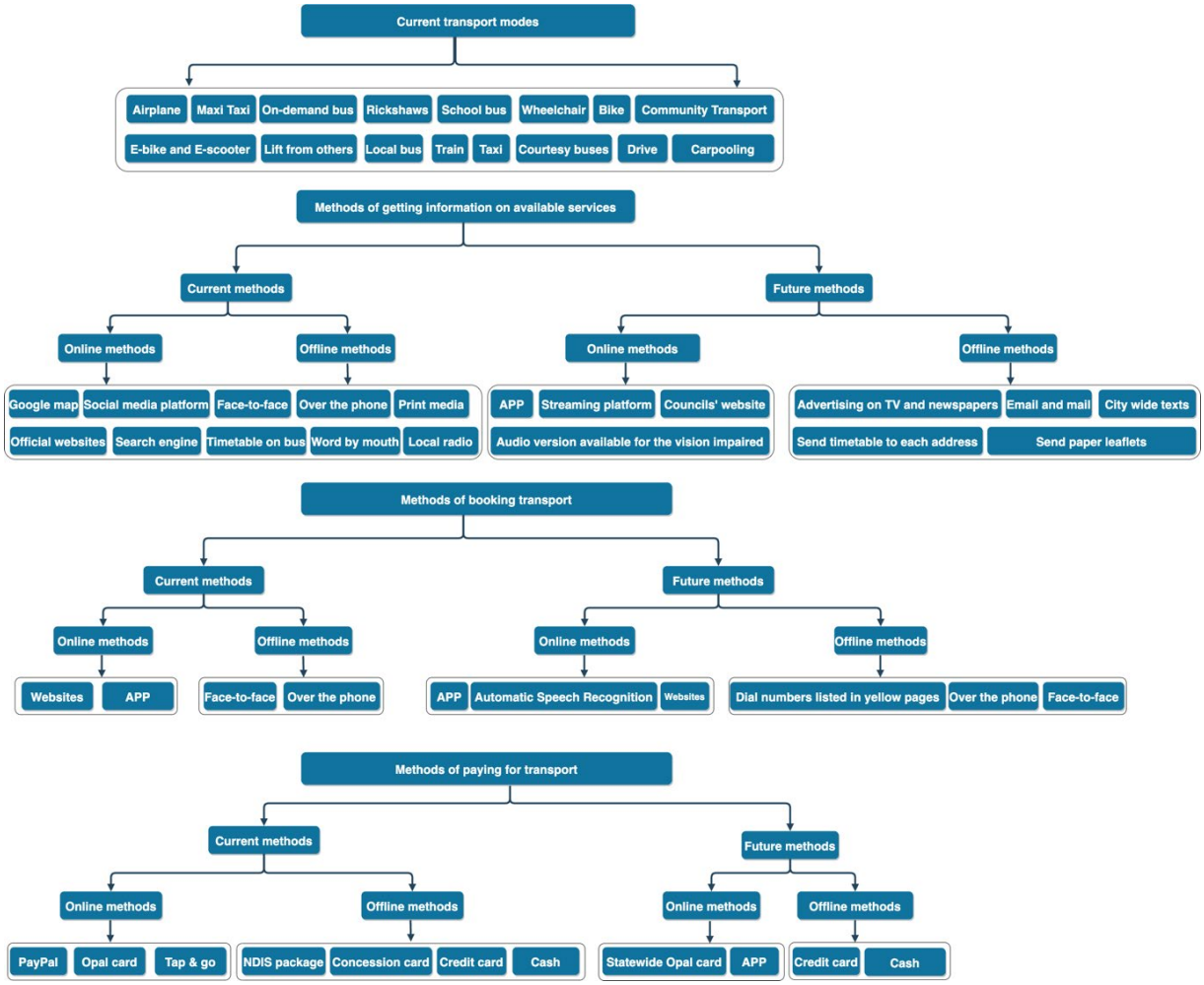


Figure 20: Current transport modes, methods of knowing about, booking, and paying for mobility services

The expected "gold standard" in transport, as described by end users during an exercise completed as part of the group discussions, can be summarised into four categories: better infrastructure; integration; safety, comfort and convenience; and availability, affordability and flexibility, as shown in Figure 21.

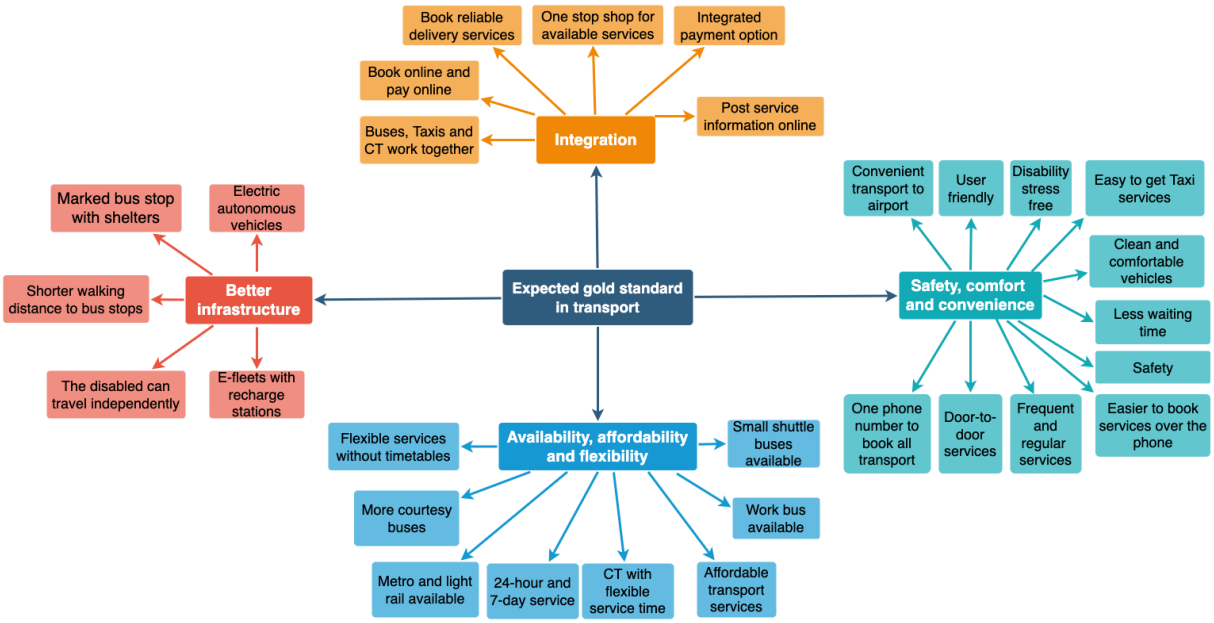


Figure 21: Expected "gold standard" in transport

The "pencil & paper" survey completed by participants of the group discussions made a first attempt to explore the attractions of different integrated services to users if these services were available in their areas. Respondents were asked about which services (see Table 8) would be attractive to them.

The results indicate that users are interested in bookable taxi services and value the ability to walk to a conventional bus service. A bookable car share service with known persons appears quite attractive for users. Participants showed great interest in using an App to order shopping and then have it delivered to home, suggesting that there would be scope for delivery services to bundled within MaaS.

The qualitative analysis of the community discussion groups and survey provided valuable insights into the pain points faced by NSW regional and rural residents. The results identified barriers to meeting the mobility needs of vulnerable groups and the current transport conditions, as well as users' positive and negative responses to MaaS offering in regional NSW. The findings (Table 8) have also provided preliminary knowledge on the types of mobility services that are attractive to users. It has been shown that in the three locations studied, the focus is often on providing transport services to connect communities with larger regional or urban centres, rather than providing intra-regional transport services.

Table 8: Services that people would be interested in using if they were available in their areas

Services that respondents are currently use or would be interested in using if they were available in the three locations	Nowra	Dubbo	Coffs Harbour
Public transport			
Walk to bus stop, take regular bus, and walk to your destination; full or concession fare (depending on entitlements)	71%	67%	69%
Book an on-demand bus, walk to pick up point, travel on the on-demand bus, walk from bus to your destination	53%	53%	85%
Book on-demand bus, take on-demand bus to train station, take train and walk to destination	59%	40%	62%
Walk to train station, take a train, and then walk to your destination; full or concession fare	35%	27%	54%
Bookable Car share in advance (at least 5 hours' notice):			
If just for you: pay the same as you do for a bus, picks you up from home and drops you at your destination. Guarantees return trip at booked time	76%	60%	69%
Sharing with other people you know: Each pays the same as they would for a bus. Picks you up at your chosen location (e.g. home, agreed meeting point) and drops you off at your chosen location (e.g. home, agreed meeting point).	76%	60%	77%
Sharing with other people you don't know: Each pays the same as they would for a bus, picks you up at your chosen location, drops you at your destination and guarantees return trip at booked time	47%	47%	46%
For just you: take you to train station, pick you up from station, and drop you at destination	76%	40%	54%
Sharing with other people you know pick everyone up, take them to train station, pick them up at station, and drop everyone off at their destinations	59%	47%	54%
Sharing with other people you do not know take everyone to train station, pick everyone up at station, and drop everyone off at their destinations	35%	27%	38%
Bookable Taxi:			
Book taxi anytime on concession entitlement or subsidy	82%	87%	77%
Bookable Go-get or Car- next door:			
Book and use Go-get or Car- next door	53%	27%	38%
e-scooter/bicycle			
Use personal e-scooter or e-bike all the way from "anywhere to anywhere".	29%	20%	38%
Use shared e-scooter or e-bike all the way from a pick-up point to destination	24%	7%	31%
Use e-scooter or e-bike to bus stop and take on bus	18%	7%	23%
Use e-scooter or e-bike to bus stop and take on train	24%	7%	8%
Walk:			
Walk the entire trip	29%	40%	62%
Non-mobility services:			
The ability to be able to use an App to order your shopping, take away food and other needed items such as a medicine, grocery, wine etc., and have it delivered to your home	71%	67%	54%

Insights obtained from the qualitative study were used to design an online survey targeting residents living in the regional 16 Cities in NSW[2]. The study areas were widened to cover the 16 Cities so that a larger sample size could be achieved for the purpose of generalising the findings from the qualitative phase. Widening the study areas was also important for obtaining quantitative evidence on local and long-distance travel demand of regional NSW residents; both are crucial for the design of MaaS. The insights gathered from the group discussions and paper and pencil survey have shed light on the mobility challenges faced by vulnerable groups. By understanding the barriers that they face in meeting their mobility needs, the current transport conditions, and their responses to MaaS through an App and subscription, the state-wide online survey was designed to better understand the users' expectations of a future transport system.

[2] https://www.transport.nsw.gov.au/projects/programs/16-regional-cities-services-improvement-program

Outcomes from the online survey

The survey was piloted in early November 2022, followed by a full launch on the 21st November after a one-week pause to check the data quality. Residents living in the 16 NSW Regional Cities and their hinterland areas were recruited via the Pureprofile online panel. The online survey was closed on the 13th December 2022 with a total sample size of 916 respondents, spread nicely across the 16 Cities (see Table 9).

Table 9: Distribution of the online survey sample by residential location

Regional cities	#Respondents
Tamworth	60
Armidale	20
Port Macquarie	68
Coffs Harbour	56
Grafton	49
Lismore	49
Nowra - Bomaderry	55
Canberra - Queanbeyan	101
Albury - Wodonga	74
Wagga Wagga	72
Griffith	47
Bathurst	49
Orange	62
Dubbo	54
Parkes	10
Tweed Heads	91
Total	**916**

The survey included eight sections, with the first two aiming to collect spatial and socio-demographic information of the respondent (such as age, gender, residential postcode) and their use of various transport means and payment methods. Section 3 of the survey focuses on long-distance travel, defined as trips that are outside their local area as shown on a map for each respondent. Section 4 focuses on local travel, including questions on travel purpose, number of trips taken by mode and purpose in the last 7 days and average cost per trip. This aims to understand existing user choices of mobility services for the purpose of designing a MaaS offering within an experimental setting of Stated Preference (SP) choices that follows in section 5. Section 6 seeks feedback on subscription plans while section 7 contains a set of attitudinal questions on transport services. The survey ends with optional questions on income group, employment status, cultural background, and booking methods when using on-demand transport such as taxi, rideshare, and on-demand bus.

Table 10 shows the split of respondents by occupation and some key socio-economic characteristics including age, gender, and income. Females were over-represented (76.4%), and the sample average age was 42. The most common occupations were Professional followed by Clerical and Administrative Worker, and other occupation.

Table 10: Online survey sample profile

Characteristic	Average (standard deviation)
Occupations	
Clerical and Administrative Worker	20.4%
Community and Personal Service Worker	9.1%
Labourer	3.3%
Machinery Operators and Driver	2.4%
Manager	9.7%
Professional	23.9%
Sales Worker	10.2%
Technicians and Trades Worker	4.4%
Other occupation	16.8%
Other socio-economic characteristics	
Female	76.4%
Age (years)	42.41 (16.72)
Personal annual income (AUD$000)	60.17 (41.53)
Have a smartphone	100.0%

Figure 22 shows the age distribution of the sample. Respondents in the 25-34 age group account for the largest proportion and this percentage reduces gradually with age.

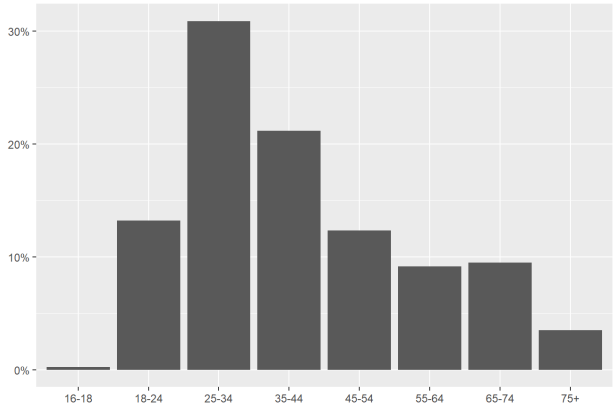


Figure 22: Sample distribution of age: Online survey Dec 2022

Figure 23 summarises the frequency of long-distance trips over the last 3 months for NSW regional and rural residents from all 16 cities by journey purpose. On average, a resident living in the 16 cities made about 16 long distance trips to visit their relative and friends (VRF) over 3 months. The equivalent statistics for holiday, social/recreational, medical, and work are 9, 5, 3.5 and 3.2 respectively. Regional residents appear to make much fewer long trips for other purposes (education/training, employer's business, or others) with the average long-distance trip rate over 3 months being less than 2 for each purpose. An implication is that if MaaS were to improve long distance travel via, for example, providing better connection to inter-regional transport hubs, it should focus on people travelling for social (including leisure, VRF, and holiday) and medical purposes.

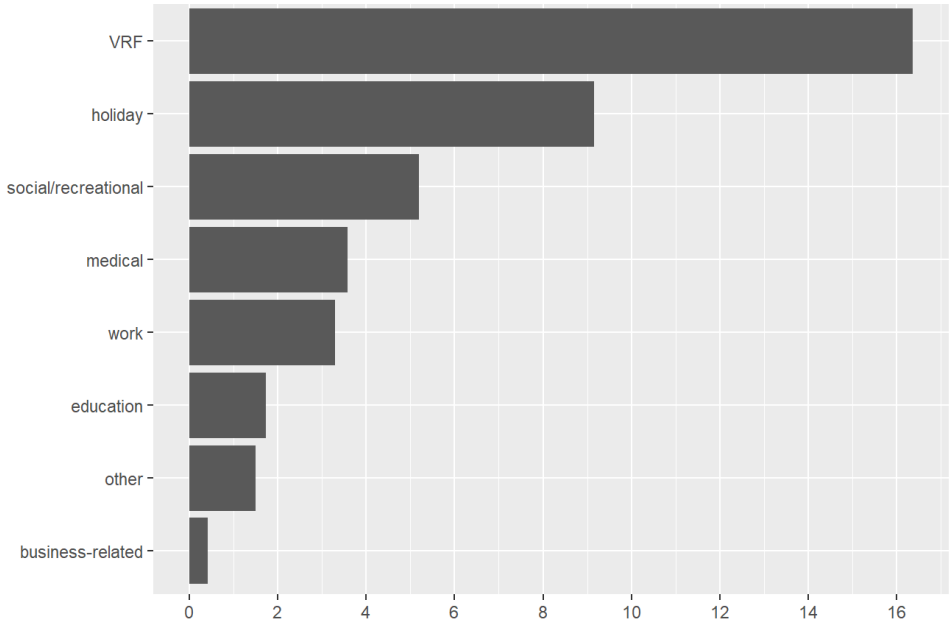


Figure 23: Average long-distance trips over the last 3 months by NSW regional and rural residents

Figure 24 shows the average number of long-distance trips by mode and purpose over 3 months taken by regional and rural NSW residents. Unsurprisingly, regional NSW residents rely heavily on the private car when they make long distance trips; however, regional NSW also uses other means of transport, particularly for social/recreational and medical purposes. Community Transport (CT) appears to play a bigger role for social/recreational travel while plane is more popular for medical purposes.

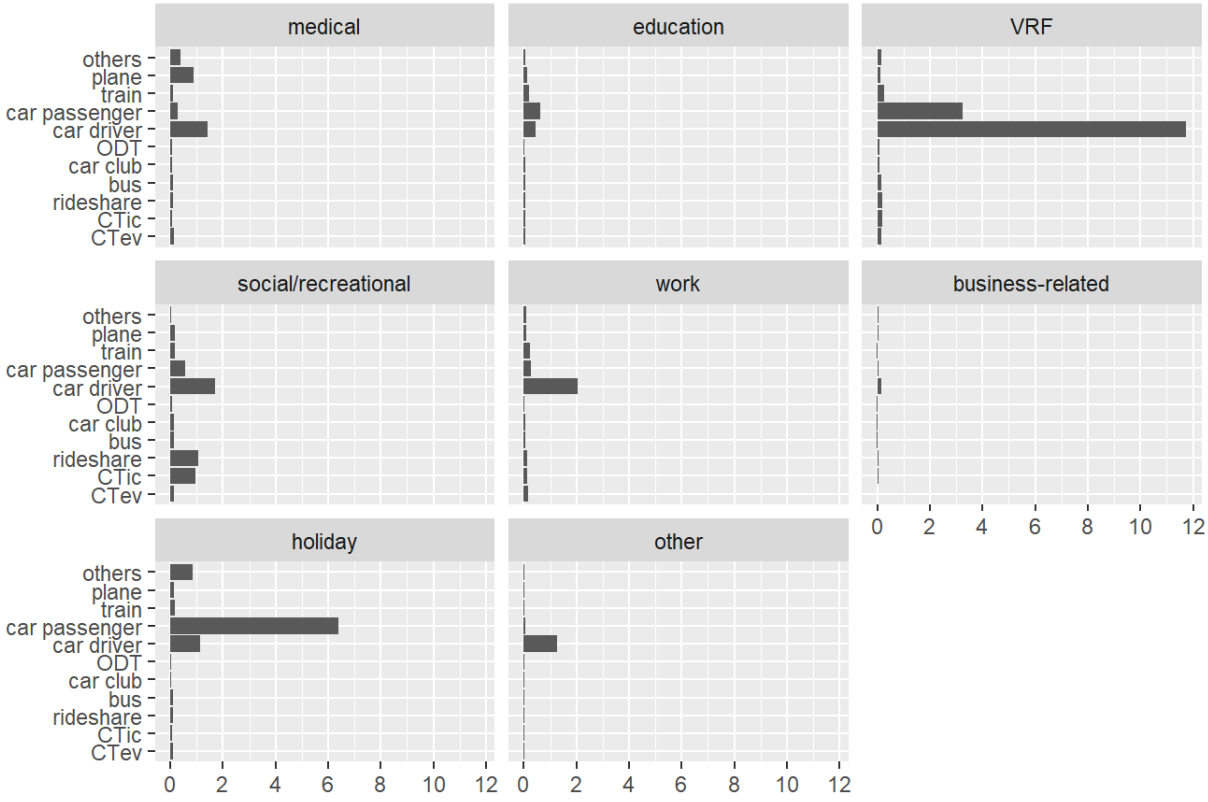


Figure 24: The average number of long-distance trips by mode and purpose over 3 months taken by regional and rural NSW residents

Looking at average weekly local trips by mode (Figure 25), most of the local trips are by the private car, mainly as a driver but also as a passenger. An average regional resident makes about 20 one-way car trips per week while the number of trips made by other means of transport is much fewer, totalling around 4 trips per week. This suggests that Rural and Regional MaaS offerings should somehow include the private car.

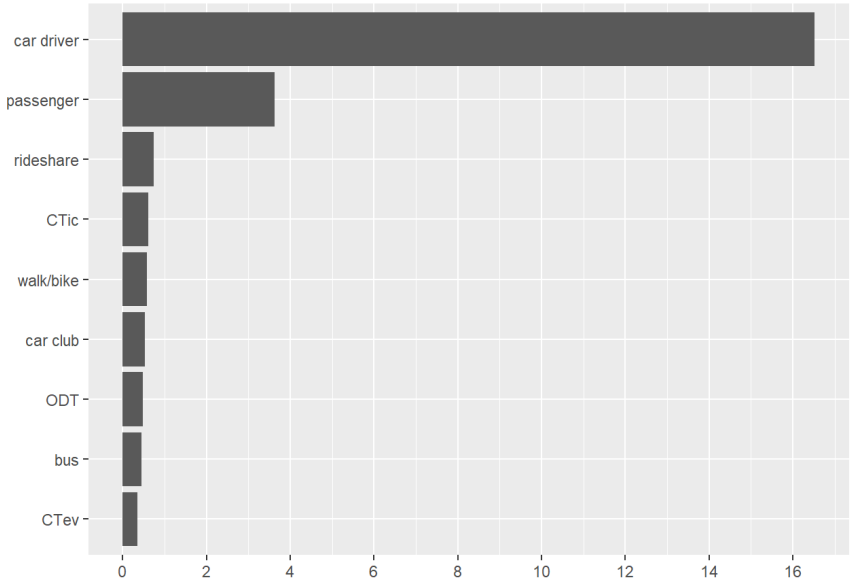


Figure 25: Average weekly local trips by mode by regional and rural NSW residents

Figure 26 shows that local trips to/from work are made mainly by car, but other travel purposes use a higher share of active and public transport modes. Community Transport, either using an internal combustion engine vehicle (CTic) or electric vehicle (CTev), and rideshare, appear to be popular for medical and visiting relatives and friends (VRF) trips within the area covered by MaaS, relative to other means of public transport. Bus and ODT together account for about 7% to 10% of local trips, reflecting the role of local bus in regional towns.

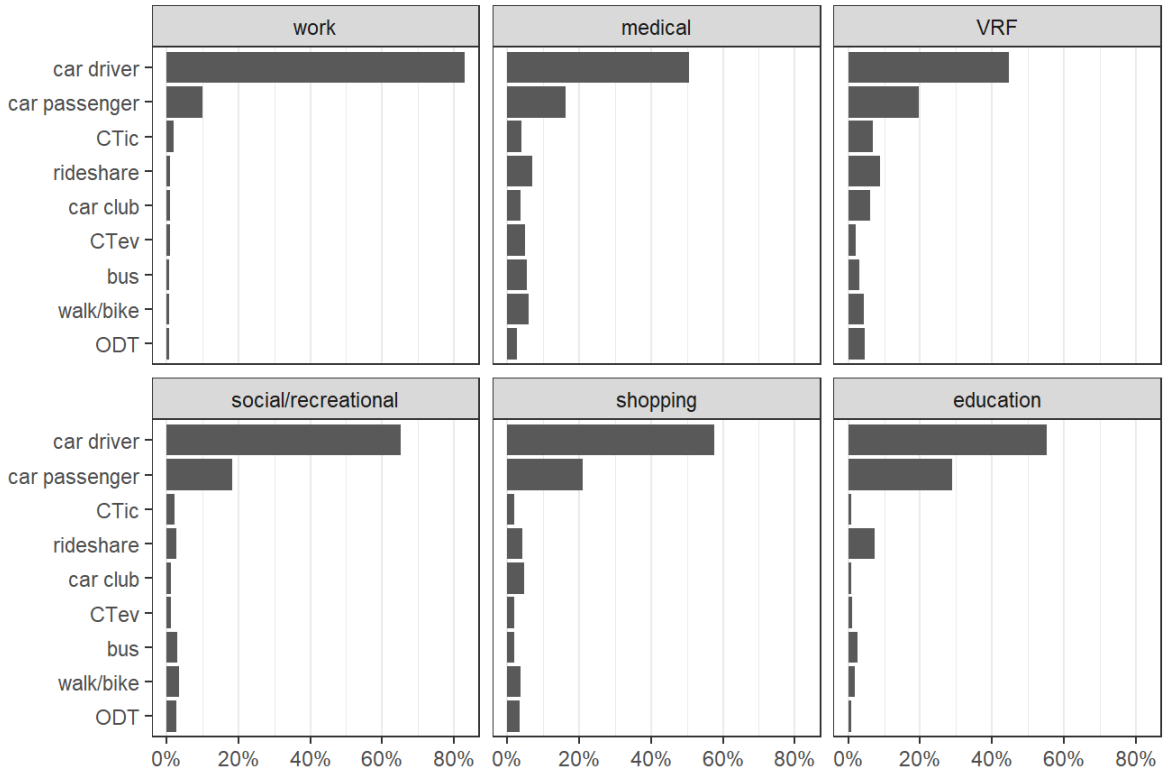


Figure 26: Mode share of local trips by purpose in NSW regional towns and rural hinterlands

The Stated Preference Experiment

A key feature of the online survey for 16 cities is a stated choice experiment designed to elicit preferences for various MaaS packages. Respondents were shown various alternatives, described by a combination of levels of attributes associated with each mode and non-modal service offers, asked to review them, and decide which one is their most preferred that they would choose if offered in a real market in the future. If none of the offers are appealing, they can simply choose to stay with what they currently do.

The modelling explores the appetite of respondents in the survey to bundling of different modes, in different packages and at different bundle prices. Overall, it suggests offering bundle discounts can be an effective way to encourage individuals to choose certain services but that it is important to note that different respondents exhibit different preferences in terms of the level of discount offered. Transport service providers and policymakers should take this into account when designing MaaS bundle offers. Full analysis is presented in **Annex 4**.

The MaaS Blueprint for Regional Towns and Rural Hinterlands

Introduction

This Blueprint is the principal output of the iMOVE project and presents a vision for how transport services in rural and regional areas in the NSW context could be better organised to meet the needs of residents and visitors. The Blueprint features a mobility framework for Rural and Regional MaaS which is multi-modal (including all modes available, including the private car) and multi-service (e.g., non-mobility services such as parcel deliveries, library services, food and medicine distribution, media streaming). The Blueprint also provides a focus on decarbonising transport and combatting social exclusion. A distinctive feature of this Blueprint is the recognition of the relative importance of the car (private or shared) as a mode in the rural and regional context and the critical importance of stakeholder involvement in governance. The full Blueprint is included as **Annex 5**.

The first section of the Blueprint sets out the vision to improve access to services, both local and more distant, within the context of equity, justice and fairness, with a focus on disadvantage and contributing to overall sustainability. An important part of this vision is to take a multi-service approach, including modes not yet present in the rural and regional landscape and non-mobility services and to recognise that the car will play more of a role in Rural and Regional MaaS than in its urban counterparts. Within the vision is the inclusion of the innovative delivery of mobility solutions, including combining mobility solutions with non-mobility elements, where these provide a better overall solution.

The identification of vision and focus is followed by a description of relevant NSW State policies. The main body of the Blueprint presents key areas relevant to the design and implementation of MaaS in rural and regional areas, illustrated by example and case studies. These key areas, introduced on a section-by-section basis, are:

- The critical role of governance
- How is Rural MaaS different to Urban MaaS?
- Lessons from international practice
- The spatial coverage of Rural and Regional MaaS
- The modal landscape and implications for funding
- Establishing benefits of Rural MaaS
- Implementation Roadmap for Rural and Regional MaaS

The key aspects of the Blueprint are highlighted below.

The critical role of governance

To be successful, Rural and Regional MaaS must have good governance.

In Rural and Regional MaaS, stakeholders may be more far reaching than in other contexts and should include government agencies, transport service providers, health and aged care organisations, community members, First Nations groups, digital platform providers, and business-related sectors. Figure 3 lists some example stakeholders for NSW implementation. These stakeholders can provide policy support, infrastructure, specialised services, cultural perspectives, technology, and economic support necessary for successful implementation.

The key roles might be:

1) Federal, State & Local government who provide policy support, funding, and regulatory frameworks by working with transport service providers and digital infrastructure providers to improve accessibility and affordability.
2) Transport service providers who operate the mobility services, sharing data as required, and work with other stakeholders to identify gaps in existing transport services to fill with innovative MaaS solutions (discussed further below).
3) Health and aged care organisations who help to identify the transport needs of patients and clients, collaborate with government agencies and community members to ensure that the transport services are accessible, safe, and affordable for all.
4) Community members who identify and advocate for the specific transport needs of their communities to ensure that the MaaS solutions are tailored to meet specific requirements.
5) First Nations groups who provide insights into the specific transport needs and ensure that the MaaS solutions are culturally appropriate and sensitive.
6) Digital platform providers who provide the technology and digital infrastructure required for MaaS solutions to operate effectively in rural and regional areas.
7) Business-related sectors who promote the MaaS solutions and attract investment to support their development and expansion, and who may participate in a funding model (including sponsorship).

The governance framework needs to foster trust and partnership between public and private partners. The governance framework must focus on institutional and behavioural/contextual settings, and not just technology. It must nurture the exploration of new opportunities and explore the inclusion of underused assets in the mobility market.

How is Rural MaaS different to Urban MaaS?

The challenges of providing rural transport services include the need to be aware of user needs, to have an appreciation of the set of mobility services that are available and how they might be deployed while recognising the financial constraints which limit service provision. When contemplating a MaaS solution implementation must recognise the 'digital divide' and rural areas, far more than urban areas, may have varying levels of access to digital infrastructure (creating connectivity issues) and technologies. Some citizens may lack knowledge and skills required to use digital systems with, for example, the greater incidence of older persons in the socio-demographics.

Compared to urban areas rural areas are characterised by limited transport options, vast distances, lower population density, different demographics with aging populations, a lack of modal integration, private car dependence, and socio-economic precarity. Understanding the challenges of rural areas is helped by recognising the stakeholders involved, their roles and their perceptions.

MaaS is usually considered an urban concept where there is a core local public transport offering and a wide variety of shared transport providers. MaaS in a rural and regional setting is much less likely to have public transport as its core and thus, more attention needs to be given to the role of the car as a potential shared collective vehicle as a result (the idea of a Car Community Club is discussed below).

In a rural and regional context, reducing transport disadvantage is a priority that can be reduced through a MaaS framework. Including non-mobility services may be one way to sustainably support Rural and Regional MaaS. Importantly, Rural and Regional MaaS must include connectivity of the rural hinterland beyond regional towns.

Longer-distance public transport services that cross the region and that can be accessed by a variety of modes can play a critical role in a Rural and Regional MaaS framework. This means that Rural and Regional MaaS in Australia should be seen as spatially diverse and able to deliver mobility services beyond the boundary of a regional town. Therefore, a Rural and Regional MaaS framework needs to be thought of as including mobility services both within a regional town and in its hinterland.

Lessons from international practice for implementing MaaS in rural areas

There is some recent "on the ground experience" with MaaS and MaaS-like schemes in a rural context such as those in Finland, the Netherlands, Sweden, the USA, and Japan (see earlier literature review section). MaaS schemes, including those in a rural area, have been characterised by short-lived pilots, even in Finland and Sweden which are renowned for their approach to innovation.

Rural MaaS schemes have fallen into two categories – those that attempt to create a "MaaS experience" from the start (e.g., The Netherlands) and those schemes that attempt to put in place the elements of a MaaS scheme and then build from there (e.g., the USA, Japan).

Lessons learnt from international practice include the need for improved digital infrastructure and the need for collaboration between multiple stakeholders. Elements for success include focusing on the specific needs of local communities, recognising and collaborating with all relevant stakeholders, and offering a range of transport options.

The schemes to date show there is no one-size-fits-all approach to Rural MaaS (or indeed MaaS more generally), and schemes must be tailored to context. The practical implementation of Rural MaaS and MaaS-like schemes highlight how barriers must be understood and strategies to overcome these be developed.

The spatial coverage of Rural and Regional MaaS

The choice of how big or small a new Rural and Regional MaaS scheme should be is a first task of the stakeholders. It is important to identify the locations where improved local mobility can really make a difference to reducing transport disadvantage, social exclusion and improving well-being, as well as aligning MaaS with other schemes such as those to support the First Nations population; and to benefit the broader population.

Most important in a rural and regional context is recognising the need to make access to and from the area easier as long-distance transport to access specialised services, typically based in larger hubs, is important. A successful Rural and Regional MaaS will also contribute to meeting climate change and decarbonisation priorities. Whilst every context is different, there are some guiding principles for local services, based on achieving an outcome which builds on public transport provision, equity considerations and economic links. Public transport provision in local areas will normally align with economic and social context as it focuses on key services that users need and want to access and which, in doing so, provide greater well-being for users. The choice of area will normally encompass at least the local labour market and local services, hence the relevance of also focussing on the hinterland (see Figure 10 for the locations chosen for this research).

Equity (and more generally fairness and justice) and well-being considerations mean that priority needs to be given to gap filling with better use of existing resources and/or the development of innovative services. A focus on car-based solutions will be important in location selection for Rural and Regional MaaS as population density is often too low to support the more traditional local public transport and accessing the longer distance networks for specialised services. There will be different needs and preferences for different target groups: a local resident may prioritise cost-effectiveness,

reliability, and convenience when using MaaS, whereas tourists may prioritise flexibility, ease of use, and access to information about local attractions.

The modal landscape and implications for funding

The modal landscape of rural and regional areas can be more limited than seen in urban contexts. Conventional public transport is usually present, along with taxis and Community Transport for specific users. In some contexts, on demand public transport is also present, and ride-share services such as Uber are increasingly being introduced into rural towns.

The Rural and Regional MaaS framework will include those modes that exist already and use understanding of gaps in current provision to encourage and nurture new and innovative mobility options. These options include those transferring from an urban context such as lift-share, and car-share in some rural towns, while the introduction of shared bikes or e-bikes could be fostered to help with first and last mile transport.

The greatest contribution that a rural and regional framework will make is in the identification and implementation of innovative modes. The triple 'C' – the Car Community Club – is likely to be a successful rural and regional introduction specifically aimed at harnessing underutilised car capacity to meet short, and particularly long-distance, journeys.

Mobility as a Feature (MaaF) is an innovation that brings together private non-mobility partners to provide improved mobility options, funded through cross subsidisation.

The Triple 'C' – Car Community Club

This is not car sharing. It is a club, based on a no fee membership for drivers and residents where safety and security of members can be ensured, and safety of vehicles can be logged. This could be operated under charitable status.

The purpose of the club is to match private car trips between drivers and potential passengers. Drivers of cars can list trips, and passengers can request trips to specific destinations, and the Triple 'C' matches these. This is in much the same way as haulage companies match loads.

When a trip has been matched, the passenger makes a voluntary donation to the Triple 'C'. Some part of the donation remains with the Triple 'C' to underpin the safety checking and matching processes and the rest of the donation goes to the driver of the private car. Both the donation and the apportionment can be decided on a case-by-case basis with guidance on what might be deemed a fair allocation (for example, a 50:50 split of $20).

The Triple 'C' need not be restricted to matching drivers with passengers but could co-ordinate with parcel delivery and accommodation services to offer discounted overnight stay where that is necessary.

In the long-term the Triple 'C' should be self-sustaining with donations although some kick-start financial support and government help in developing the app and defining governance will be required.

Mobility as a Feature (MaaF)

A Rural and Regional MaaS framework will offer multi-modal options for users to travel from A to B. In a rural and regional context, this could be enhanced by providing a multi-service rather than simply a multi-modal approach. A multi-service (mobility and non-mobility services - such as parcel deliveries, library services, food and medicine distribution, media streaming) has the advantage of meeting the needs of users over a wider range of services but importantly providing the opportunity

for a degree of cross subsidisation that could enhance the financial sustainability of both the mobility and non-mobility offers.

Mobility as a Feature (MaaF) is this wider activity-focussed product mix, designed to be financially sustainable. The future of MaaF in terms of its business case, and commercial success, is driven by organisations who do not have a direct vested interest in transport supply ownership, but who have an extensive customer base. An example might be an insurance company that can offer reductions in car insurance premia to car owners in return for reductions in car use and travel by more sustainable modes.

Establishing benefits of Rural MaaS

The benefits of Rural and Regional MaaS can be examined by looking at the perspectives of the stakeholders involved. For simplicity, stakeholders can be grouped into categories, such as:

- Transport and non-transport provider perspective
- User perspective
- Government perspective
- Private sector (broadly defined including local business)

From the provider perspective (transport and non-transport) Rural and Regional MaaS offers benefits such as new opportunities to exploit underused assets (for example, many Community Transport vehicles are not used at weekends). Local design and the implementation of integrated services can involve new and beneficial stakeholder partnerships. The existing modal landscape (see previous section) suggests that collectively, different modes can address different need states – as long as mode-specific issues are addressed. Finally, as 'broken' elements of various transport modes are fixed by the implementation of a new mobility framework this can optimise the potential of an integrated system to meet community needs, improve transport disadvantage and lead to greater sustainability in mobility use.

From the user perspective Rural and Regional MaaS offers benefits of greater independent living through better access to medical services (including those at a distance), improved employment prospects and standard of living through better access to education and training opportunities and better mental health through more social inclusion. An improved quality of life for carers is also anticipated through reduced pressure on them to provide transport and/or paying for those they care for to access services.

For the private sector Rural and Regional MaaS offers benefits of potential for new business creation, through more connected transport services and supplemented with non-transport services, where operators can integrate into a larger network. Making it easier for people to access regional towns (from both the hinterland and further afield) is beneficial for the regional economy and stimulates investment by local businesses.

From the Government perspective, Rural and Regional MaaS offers benefits of improving accessibility for the disadvantaged population (with numerous cross-sector benefits envisaged) and the opportunity for improved mobility justice and fairness for all. This underpins a less siloed approach to funding transport services which is a feature of the current mobility framework. Duplication of services can be minimised, thus increasing efficiency as a result of

Government (local and state) understanding the needs of their communities and making informed decisions about funding distribution. New ways of working will include the development of public private partnerships necessary for provision of better integrated transport services.

Implementation Roadmap for Rural and Regional MaaS

A roadmap or plan for implementation is essential. It must consider the unique characteristics of the context. Figure 28 shows an implementation roadmap for Rural and Regional MaaS in NSW. It is described below using the triple 'C' – the Car Community Club (CCC) as a potential new mode as part of the modal landscape (see section on modal landscape). Interest in CCC has already occurred in at least one regional centre. The roadmap is informed by findings from the evidence base of primary and secondary data collected as part of the iMOVE research project discussed earlier in this report.

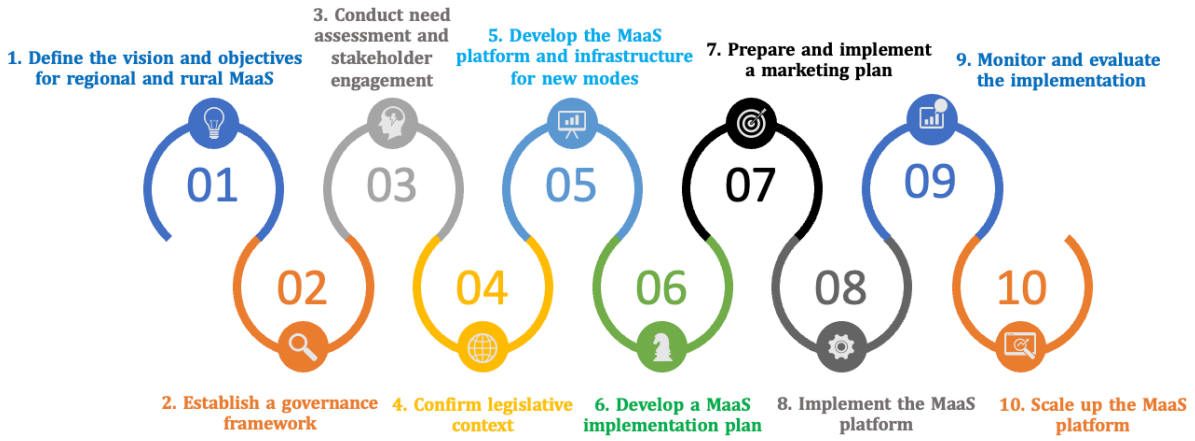


Figure 27: Implementation roadmap for Rural and Regional MaaS in NSW

Step 1: Define the vision and objectives for Regional and Rural MaaS

- Identify the vision including goals (e.g., improving accessibility, social inclusion, and fairness, reducing reliance on private cars).
- Identify the target audience.
- Develop a set of objectives and their associated key performance indicators (KPIs).

Step 2: Establish a governance framework (see section on critical governance)

- Identify the location and service areas.
- Establish the stakeholder group to form the governance framework.
- Engage with government agencies to assess what is possible under existing regulatory frameworks and any potential funding mechanisms. For example, a CCC will need some kick-start financial support and government help but should in the long-term be self-sustaining.

Step 3: Conduct needs assessment and stakeholder engagement

- Undertake a needs assessment to identify the specific transport needs of the target group in the vision.
- Work with transport service providers (and, where appropriate, non-mobility providers) to create an integrated solution, managing existing provision and seeking innovative additional services to fill gaps.

Step 4: Confirm legislative context

- Identify legislative constraints (if any) to the introduction of new services. Seek Transport for NSW guidance if necessary.
- Identify opportunities for using under-utilised assets for new services (for example the greater use of Community Transport fleets)
- Identify existing and new subsidy arrangements.
- Step 5: Develop the MaaS platform and infrastructure for new services
- Develop a MaaS platform integrating multiple modes of transport and non-mobility services.
- Identify a user-friendly app to provide information and payment.
- Build the infrastructure to support the MaaS (CCC) platform and other innovative new modes and services.

Step 6: Develop a MaaS implementation plan

- Determine the scope of the MaaS deployment.
- Design and test the MaaS (CCC) system.
- Establish a data management and analytics system to evaluate objectives against KPIs.

Step 7: Prepare and implement a marketing and communications plan

- Prepare a marketing and communications plan to inform users of the MaaS deployment (users need to know about the new MaaS scheme). The more flexible the services the less visible they are to users. Word of mouth is typically a very effective marketing mechanism.
- Identify a budget for marketing and sources of funding.
- Implement the marketing plan.

Step 8: Implement the MaaS platform

- Implement the MaaS (CCC) plan.
- Collect data and feedback from users and stakeholders to evaluate the effectiveness of the platform.

Step 9: Monitor and evaluate the implementation

- Develop and implement an Evaluation Plan

Step 10: Scale up the MaaS platform

- Adjust where necessary to expand the MaaS platform to an extended area.
- Develop a sustainable business model for scaling up the program and provide the on-going support to ensure the long-term success of Rural and Regional MaaS.

Action Plan beyond the Blueprint

Transport for NSW must have a key role in developing a supportive environment (including the physical transport network) that allows Rural and Regional MaaS to emerge and be sustainable. Government is responsible for building and maintaining transport-related infrastructure to improve connectivity and accessibility. Improvements to the transport network more generally, including adding new roads and bridges can help improve connectivity and accessibility and improve all journeys, including those by public transport.

The Action Plan beyond the Blueprint for Transport for NSW includes:

1. Defining and implementing the governance framework for Rural and Regional MaaS in NSW, building on the evidence and proposals contained within the Blueprint as a solid foundation. This is an absolute priority to allow development, including a relevant pilot.
2. Identifying the organisational changes needed to effectively generate cross-departmental governance (between transport, employment, planning, health, social care, and education) which is an essential part of the governance that will make Rural and Regional MaaS a reality.
3. Establishing the legislative changes that may be necessary to allow the pump priming of new services, including new modes. To recognise new subsidy arrangements may be needed to allow better and more sustained use of existing modes and possible new modes such as the Car Community Club (CCC) in a Rural and Regional MaaS product.
4. Exploration of the scope for bundling in Rural and Regional MaaS as the research underpinning the design of the Blueprint identifies this has promise (see discussion in the evidence base section of this report).

The critical role of the NSW Government in creating the environment for implementing the Blueprint

The Action Plan beyond the Blueprint developed as part of this report and identified in the previous section will enable the Government to implement the vison contained within the Blueprint. Crucially, the Blueprint provides foundations for Transport for NSW to act on with priority to establish the governance framework as this is an absolute priority to allow development to a relevant pilot.

Rural and regional transport is different from their urban counterparts: lower population densities mean that transport services will inevitably be less frequent with limited spatial coverage, and need to be carefully structured to ensure they meet the needs of citizens. In the context of MaaS implementation, user awareness about available MaaS services through marketing and communication explaining the benefits that MaaS provides will be key to generation of patronage. An important role for Government is to educate users about the various transport options available to them through MaaS, and to highlight the benefits of using these services, such as increased flexibility, convenience, and cost savings.

Government involvement is key to facilitating the implementation of Rural and Regional MaaS, especially when market driven solutions are unlikely and subsidy is inevitable. A critical task is to understand if a location is likely to sustain viable MaaS in both the short term and longer term. This is why the Blueprint provides guidance on the need to appreciate the spatial coverage of Rural and Regional MaaS and factors to guide site selection. Practical and implementation issues should be shaped by recognition that improved accessibility will require additional funding and exploration of the opportunities of potential cross-subsidy, as well as including an understanding of new and innovative modes (such as CAV) that can contribute to the modal landscape. It is unlikely that Rural and Regional MaaS will be sustainable in the short-term, or the long-term. Subsidy is likely to be needed: financial stability underpins a stable transport network which is important for user understanding of the network and for user commitment to its use (rather than relying only on ownership of a private car). The best approach to subsidy is likely to be a mixture of user-based subsidy, lowering the farebox revenues, and subsidies targeted at transport providers. Additional subsidy to citizens who might still find travel unaffordable could be managed through the welfare system or targeted subsidies through eligibility to discount cards.

In a rural and regional context, a MaaS platform might best be operated by a community-based body with the government providing the key role of facilitating the integration of different transport service providers. Government agencies also have an essential role in working closely with organisations and stakeholders to understand the different funding streams and requirements, to understand developing policy priorities (such as CAV as being developed in the Future Transport Technology Roadmap) and to develop a strategic approach to securing the appropriate funding. In addition, by leveraging the benefits of technology, governments can help to better integrate different modes of transport so as to pave the way for the implementation of MaaS.

Facilitating integrated transport services through incentivised contracts can help improve the overall efficiency and effectiveness of the transport system by encouraging collaboration between different modes of transport. Key performance indicators (KPIs) should be structured to match user requirements such as reducing travel times, improving reliability, or increasing ridership. Participation by any operator should be subject to appropriate KPIs, even if the service supplied is operated without subsidy. Governments can also incentivise travellers to try MaaS by offering promotions, discounts, or other incentives, as a way to enhance the adoption of these services over time.

Conclusions and action outcomes

The critical role of the NSW Government in creating the environment for implementing the Blueprint has been identified and an Action Plan developed. The report has described the evidence base underpinning the research and summarised the main findings from the analysis of collected primary data. Three strands of work have been included: 1) results of qualitative analysis of in-depth interviews with supply-side providers / organisers at the three locations (Dubbo, Nowra, Coffs Harbour); 2) results of qualitative analysis of community discussions group with a "pencil & paper" survey at the three locations; and 3) results of the quantitative analysis of NSW-wide online survey.

MaaS is conceived as using technology for searching, booking, and paying for end-to-end multimodal transport services. This requires the integration of different modes of transport, including public transport, taxi, and car-sharing services, to provide seamless and convenient mobility options for users. Achieving integration and providing real-time information and pricing through an App could greatly improve the visualization of transport services and make it easier for people to access and compare different mobility options, while also encouraging partnership among different transport service providers through agreements or contracts that outline the data sharing and updating process. This may require government intervention to stimulate supply, where this is a constraint. It also requires transport operators to share data to improve the user experience. Non-mobility services could be included in the offer (as explored in the stated preference survey), for example, deliveries so that if a user orders groceries online, the delivery time could be co-ordinated with available transport services. The convenience of including non-mobility services may be sufficient for their use but users of multiple services could be offered loyalty awards.

The innovative proposal of a new mode as part of the rural modal landscape - the CCC has demonstrated how the car will likely play more of a role in Rural and Regional MaaS than in its urban counterparts – this is a key finding of the Blueprint. This will present opportunities to deliver accessibility benefits beyond improving public transport while allowing the development of a car-based widespread public transport network.

Based on the evidence the Action Plan beyond the Blueprint for Transport for NSW is as follows:

1. Defining and implementing the governance framework for Rural and Regional MaaS in NSW, building on the evidence and proposals contained within the Blueprint as a solid foundation. This is an absolute priority to allow development to a relevant pilot.
2. Identifying the organisational changes needed to effectively generate cross-departmental governance (between transport, employment, planning, health, social care, and education) which is an essential part of the governance that will make Rural and Regional MaaS a reality.
3. Establishing the legislative changes that may be necessary to allow the pump priming of new services, including new modes. New subsidy arrangements may be needed to allow better and more sustained use of existing modes and new modes such as the Car Community Club (the triple C – 'CCC') in a Rural and Regional MaaS product.
4. Exploration of the scope for bundling in Rural and Regional MaaS as the research underpinning the design of the Blueprint identifies this has promise.

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Annexes

Annex 1 – MaaS in a Regional and Rural setting: recent experience

Annex 2 – Design and administration of in-depth interviews with key stakeholders and surveys with end use passengers

Annex 2.A – Summary of the three locations

Annex 2.B – List of 16 Regional Cities and expected sample

Annex 2.C –Discussion Guide – Groups with Community Members

Annex 2.D – Focus Group Accompanying survey Form

Annex 3 – Report Summarising the Main Findings from Analysis of Collected Primary Data Focussing on The Blueprint for RTRH MaaS

Annex 4 – Modelling Analysis of the 16 Cities Online Survey

Annex 5 – The MaaS Blueprint for Regional Towns and Rural Hinterlands