Rethinking the role of the car in a MaaS framework – insights from a rural context

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ABSTRACT: This policy note proposes a focus on ways to make better use of the private car and a corporate commitment model as offering potential to deliver an appealing Mobility as a Service (MaaS) offering in low density settings which are dominant in rural and regional jurisdictions. A set of next steps are presented as part of establishing the economic and social merits of MaaS in a rural and regional setting.

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Introduction

Mobility as Service (MaaS) continues to garner significant interest and yet, transforming the concept to reality still appears to be a long way from a product profile that has the merit of a business case let alone a commercial case (Herrlin, 2021). Nevertheless, the significant interest demands the continuation of exploration of ways in which MaaS may eventually deliver societal outcomes that make it an appealing contribution to delivering improved mobility aligned with sustainability objectives. This policy note is based on literature review and review of actual practice and proposes a focus on ways to make better use of the private car and a corporate commitment model as offering real potential to deliver an appealing MaaS offering in low density settings which are dominant in rural and regional jurisdictions.

MaaS definition

MaaS, a short name for Mobility as a Service, has been widely used in recent years and often without due attention to its definition. Indeed, many definitions exist going back to 2014 of which those by Heikkilä (2014), Hietanen (2014), König et al (2016), Kamargianni and Matyas (2017) and UITP (2019) are illustrative of the variety of definition. Summarising all these to produce a concise definition of MaaS would be: "MaaS is a type of service that, through a digital channel, enables users to plan, book and pay for multiple mobility services seamlessly". MaaS has clearly emerged as a result of the emerging digital revolution that has disrupted the passenger transport sector with new modes emerging, notably those which are summarised by the concept of micromobility.

A more detailed definition of MaaS is given by Hensher et al. (2021) who define MaaS as:
"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 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)."

It is recognised that MaaS faces an uncertain future, partly due to the impacts of the pandemic on public transport patronage (often cited, in an urban context, as the backbone of MaaS), but also because MaaS has been associated with considerable hype (which has not declined despite the pandemic) (Hensher and Mulley 2021, Hensher et al. 2021). Underlying this uncertainty though is a lack of agreed definition as to what MaaS is as well as weak linkages to sustainability goals and an inability to achieve scalability.

MaaS in the literature

Much of what is promoted as MaaS has really only been considered in the literature and in practice in urban contexts where there are multi modal opportunities. Wong et al (2020) for example develop the idea of modal efficiency, but in the context of a modern city. This paper highlights the critical issue of governance, identified by some of the earlier papers on MaaS such as Beheshtian et al (2020) and Pangbourne et al (2020), but again restricted to the urban context. Even papers that concentrate on

the user within a MaaS ecosystem, such as Lyons et al (2019), have an eye for MaaS emerging, if it does, in the urban environment.

Against these early discussions of how MaaS might emerge from the digital revolution are papers that characterise the pathway to a full MaaS offering. For example, Sochor et al. (2018) develop four levels of integration: (1) integrated information, such as is available via a multimodal journey planner; (2) integrated booking and payment using a smart card or a credit card; (3) organisational integration where the user is presented with different modal options in a seamless fashion, irrespective of the ownership and bundling or subscription to a suite and quantity of mobility services for a time-related fee; and (4) integration of societal goals. Mulley et al. (2023) consider this typology to be reflective of the emerging trajectory of MaaS as it describes stages of development the sector will need to experience to achieve the full capability of the MaaS definition.

MaaS however, despite its intuitive appeal and significant discussion in the literature, is struggling to develop a future, with the business case and indeed the commercial case yet to be proven (Hensher et al. 2021). While a growing number of App developers are parading their digital capability as delivering a MaaS capability, in the main we see little more than another trip planning app which may have merit in some markets (especially global tourism where knowledge of local services is limited). To progress, MaaS must attract significant market interest in those markets where there is a dominant amount of habitual mobility behaviour or behaviour change that is typically from one mode to another and which does not need a trip planning App, or need a pay as you go or subscription plan under a multi-modal MaaS offering, even with generous financial incentives. Nothing approaching full MaaS, as described by Sochor et al (2018) is in place in other than a limited area or in the form of a pilot or trial and even Whim which has a longstanding but limited presence in Helsinki has had a mixed experience when they have tried to establish elsewhere (e.g., West Midlands, Antwerp). The example of Breeze from the UK which is promoted as a regional MaaS pilot is another example of an enhanced multi-modal journey planner (whose functionality includes real-time updates and a payment option) which has been branded as MaaS.

MaaS has to date been considered an urban concept (with some exceptions) where there is a core local public transport offering and a wide variety of shared transport providers. MaaS in a rural and regional setting has not been as considered: the Blueprint research of ITLS (Nelson et al. 2023) gives a summary of the experiences in the USA, Japan (World Economic Forum, 2021) and Finland (Eckhardt et al, 2018; Eckhardt et al, 2020) which is elaborated further by Mulley et al. (2023). The extant literature identifies the poor accessibility offered by more limited public transport and we assert that in rural and regional settings, MaaS 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. A focus on the rural environment is therefore an unexplored context where MaaS could deliver societal outcomes that make it an appealing contribution to delivering improved mobility aligned with sustainability objectives.

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. All these factors are elements of developing a MaaS outcome. However, when contemplating a MaaS solution, its 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. Mulley et al. (2023) review the rural context literature.

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. Moreover, in a rural and regional context, reducing transport disadvantage is a priority that could be addressed through a MaaS framework and reaching a sustainable solution may be enhanced by including non-mobility services alongside developing connectivity of the rural hinterland beyond regional towns. Longer-distance public transport services that cross a rural area and that can be accessed by a variety of modes will play a critical role in a rural based MaaS framework that is spatially diverse and able to deliver mobility services beyond the boundary of a regional town. Nelson et al. (2023) have recently completed a detailed assessment of a MaaS Blueprint which 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.

What is certainly the case, after at least ten years of seeing how MaaS might progress as a relevant societal-focussed contributor, is that MaaS cannot progress unless it can change travel behaviour in a behaviourally meaningful way aligned with broad-based societal objectives, which includes reducing private car use in metropolitan contexts, and improving well-being and reducing social exclusion in rural and regional settings (Hensher and Mulley 2021, Hensher et al. 2021). This policy note addresses how exploration of the rural context can help to identify a clear role for a new element that progresses MaaS as a relevant concept for rural, and by extension, to urban and metropolitan areas.
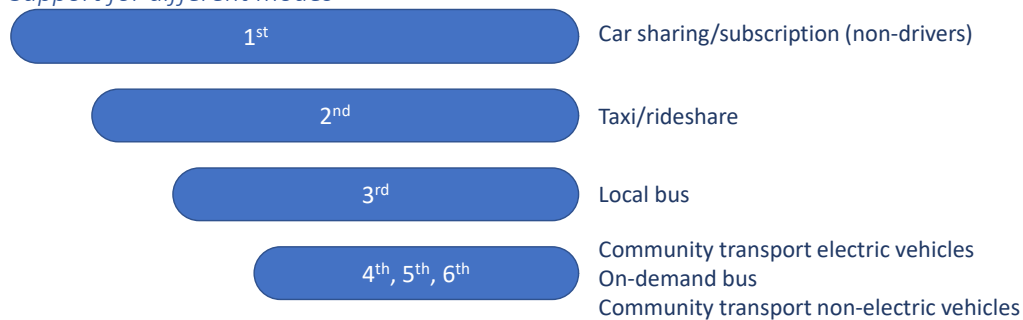
Extending the modal landscape in rural and regional areas

As identified above, rural areas have more limited transport modes than in their urban counterparts. The starting point for a rural MaaS framework must be to include those modes that exist already. However, there is significant evidence (Currie et al., 2005., Hansson et al., 2019, Mounce et al., 2020) that rural residents face gaps in provision which are not met by the current modal landscape. The exploration of a MaaS framework for the rural environment must use understanding of the gaps in current provision, particularly an understanding of those mobility needs which are unmet, to encourage and nurture new and innovative mobility options to extend the modal landscape. There are several potential candidates including those transferring from an urban context such as liftshare, 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. Whilst important to examine these options, antagonists will argue that many of the modes transferring will not achieve the required quantum of users to reach a sustainable outcome.

Within a regional and rural setting, it is unlikely that MaaS, even with MaaF (Mobility as a Feature, which is discussed below), will be commercially viable; however, this does not mean that it has no future since the key performance indicators should, unlike urban settings, focus heavily on improved accessibility as well as improvements in social inclusion. This means that the business case, indeed any social benefit-cost analysis, should focus on identifying multi-service initiatives designed to provide best value for money subsidy solutions. The research undertaken by us and others suggests that a focus on regular public transport service improvements will never satisfy the objective of improved accessibility or reduced social exclusion for a given subsidy outlay; instead, a multi-modal approach with a greater emphasis on the car through a community sharing model such as our proposed Car Community Club (CCC) has great appeal in achieving the required outcomes. Cross-subsidy might occur where a multi-service approach is in place since it offers a real opportunity for non-mobility providers to gain benefits from mobility offerings (Hensher et al 2023).

Through in-depth interviews, focus groups and a generic online survey of a representative sample of residents, the Rural MaaS Blueprint research of ITLS (Nelson et al. 2023) found the support for different modes as given in Figure 1, which is enhanced by the inclusion through a discounted packaging approach of non-mobility services. The findings were reinforced through a stated preference survey and modelling of choices of subscription and pay as you go (PayGo) offerings. Transport service providers and policymakers should take this into account when designing MaaS bundle offers.

Support for different modes

1st	Car sharing/subscription (non-drivers)
2nd	Taxi/rideshare
3rd	Local bus
4th, 5th, 6th	Community transport electric vehicles On-demand bus Community transport non-electric vehicles

Support for different services

Media streaming (63.5% that intends to use it)	1st
Shopping (61.1% that intends to use it)	2nd

Figure 1: Summary of support for modes and non-modal services.

The greatest contribution that a rural framework will make, given the evidence above, is in the identification and implementation of innovative modes. Looking only to extend and transfer modes that exist in urban areas as the only way to extend the modal landscape misses the point that the greatest underused modal asset in rural areas is the private car. This policy note addresses the potential of utilising the spare capacity of the private car of rural residents to provide a 'new' mode in rural areas – the concept is called the triple 'C' or Community Car Club.

The triple 'C' – the Car Community Club – is targeted at harnessing underutilised car capacity to meet short, and particularly long-distance, journeys. Whilst centred on car sharing, it is not a car sharing scheme as seen urban areas. It is distinguished from car sharing, or car owners 'renting' out their cars by the way in which the car together with its driver offer trips. As proposed, the Triple 'C' 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.

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 to include a multi-service component. In this way, adding non-mobility services can enhance the sustainability of the scheme. 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.

However, innovative modes such as the triple 'C', as described above, may not be enough to create a MaaS framework that is long-term sustainable. A rural MaaS framework, as with those proposed for the metropolitan counterparts, will offer multi-modal options for users to travel from A to B. However, the digital revolution, together with changes accelerated by the pandemic, has significantly increased the demand for home delivery. A rural MaaS framework could achieve greater sustainability by providing a multi-service rather than simply a multi-modal approach. A multi-service offering (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.

Extending the idea of a multi-service approach together with a rural area's reliance on the private car suggest that a wider activity focussed product mix may also contribute to a sustainable rural MaaS framework. For example, Hensher and Hietanen (2023) have proposed the concept of Mobility as a Feature (MaaF) whereby an organisation can use their interactions with rural residents to contribute to a more sustainable rural mobility outcome, without actively offering the supply of a mode to extend the modal landscape. An example might be an insurance company[1] that can offer reductions in car insurance premia to car owners in return for reductions in car use and travel by more sustainable modes. 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.

Like many interests looking to find a way forward for Mobility as a Service (MaaS), the evidence base to date requires exploration of other markets in which MaaS must be given greater focus and away from the dominance to date on an individual subscribing to MaaS. The exploration of the rural context offers not only a potentially sustainable new innovative mode in the triple 'C' but also a new way of 'packaging' with Mobility as a Feature. Importantly, these ideas which have their origin in exploring the rural context could also work well in more urban and metropolitan areas as described in the next section.

How might this translate into urban contexts?

It is perhaps unusual to suggest an idea motivated by the exploration of the rural context might also work in a more urban or metropolitan context. But this is the case with the triple 'C'. It may also be the case that the triple 'C' might see a greater uptake in the urban context because of the greater density of users, and of cars. The triple 'C', unlike liftshare, has a stronger safety component through its registration of users and vehicles. It also has a multi-service element as well as operating with a donation rather than a more commercial fee.

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[1] The purpose of MaaF compared to MaaS is to have non-mobility service and product providers participate in a partnership with mobility service providers to enable a range of outcomes including cross-subsidy and growth in user subscription, both designed to deliver a business case that is attractive to all involved, which might be commercially profitable with or without government subsidy through a rewards system.

In particular, the triple 'C' might work well within companies. While some businesses can rightly claim a commitment to greening the environment in which they work, the mobility aspect seems to be struggling to gain momentum to such a degree that it can influence choices and decisions made by employees in their own travel activity. There are a few good practice examples, but in general they are scarce and in part a consequence of the lack of regulations and incentives designed to support initiatives that deliver changes to corporate mobility plans that align with societal goals such as greening mobility (Forde and Tarantola, 2020). The triple 'C' could very easily be adapted to a corporate framework with the 'club' being the company and trips being organised for both private and company use. As mobility becomes more complex and a major lever to reduce CO_2 emissions, businesses need to reconsider their corporate mobility model to better meet their employees' needs (both business-related and personal) and their overall environmental responsibility. This is also a way to get a better understanding of how they are integrated into the public infrastructure network (be it public transport or road networks). Beyond a single company, the triple 'C' could over time grow by a corporate triple 'C' seeing the advantages of joining with another corporate triple 'C' to lead to a bigger triple 'C' with greater opportunities for travel. A growing focus on electric cars can make this model even more attractive from a decarbonisation perspective.

Mobility as a Feature (MaaF) discussed above could also work within a corporate setting, typically within an urban environment. The idea of bundling or packaging of MaaS offers can be appealing to businesses as a corporate initiative that fits well with the social licence and commitment to corporate social responsibility. Moreover, there is a strong case for enterprises to support changes to the mobility activities of their employees towards more sustainable and emission containment in both business travel (including the commute) and private mobility. This is a business to group (BtoG) model[2]. A good example of a positive initiative is the Belgian Mobility Budget legislation, introduced in February 2019, with the aim of not moving away from a company car, but rather opting for a 'greener' and 'cheaper' car – or no car – and using the savings for alternative modes of transport or cash. In the Belgian context, it is in the best interest of companies to implement this Mobility Budget, as electric and hybrid vehicles will be 100% fiscally deductible in 2026. A corporate MaaF plan, especially where the company itself might be interested to be the party offering discounts, such as an insurance company, could offer beneficial car insurance terms in return for a move to more sustainable travel behaviour providing a win- win for both company and employers. This might be called a corporate MaaS plan. The idea is not new, and indeed the Sydney MaaS trial had elements of corporate MaaS in that it was initiated in partnership with a large insurance company (Ho et al. 2021).

Concluding remarks and next steps

It appears that MaaS is in trouble. There are to date, no full MaaS schemes being implemented. As identified in an earlier publication – is MaaS going 'Somewhere or nowhere'? (Hensher et al., 2021). Whim is the largest and closest to full MaaS but with heavy subsidy, but Whim has been shedding staff which is indicative of MaaS being in trouble[3].

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[2] The idea of Corporate (or Company) Mobility Management (CMM) is not new and has been defined by International Transport Forum (2010) as strategies which "seek to promote sustainable commuter, business and customer travel".

[3] Sampo Hietanen sums up the current situation well: "Mobility as a Service (MaaS) has been there as a concept for more than 15 years. For over five years it's been on the lips of just about everyone involved in mobility. In many ways it has been like the emperor's new clothes: something we all should look in awe at – but not really knowing why." And, he comments further: "Still, if you look at the amount of talk, research, national programmes and investment, very little has changed so far. MaaS has not become mainstream, and it has not changed the way people perceive their freedom of mobility". 6 March 2023
https://www.itsinternational.com/feature/sampo-hietanen-maas-we-needed-better-dreams

This policy note offers new contributions, motivated by exploration of the rural context and suggests new innovative modal operation through the triple 'C' and a way of creating enhanced sustainability with MaaF. In both cases the suggestions are not simply new modes but new ways of working that have the potential to be sustainable into the future.

Moreover, the ideas which stemmed from an analysis of the rural context would appear to have even greater potential in urban and metropolitan areas. Extending the ideas into the corporate sector has the appeal of looking to employers to lead by example with hopefully encouragement from government through transparent and committed policy settings that facilitate greater commitments of enterprises, including government agencies.

We have drawn on our research in a large project designed to develop a benchmark plan for regional towns and rural hinterlands (RTRH). We have completed the program of research and a series of papers have been prepared[4]. The next steps we propose involve a formal broad based social benefit-cost analysis accompanied by a commercial assessment. It is anticipated that subsidy will be to recover costs.

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
- Private sector (broadly defined including local business)
- Government perspective

It is also relevant to consider time horizons and sustainability implications. From the provider perspective (transport and non-transport) Rural and Regional MaaS offers benefits such as new opportunities to exploit underused assets (for example, in Australia, 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. In summary, Rural and Regional MaaS offers the possibility of improved freedom, empowerment, capability, and security for rural residents (Figure 2).

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[4] The final Blueprint report and recommendations is available at https://imoveaustralia.com/news-articles/personal-public-mobility/maas-in-rural-and-regional-areas/.
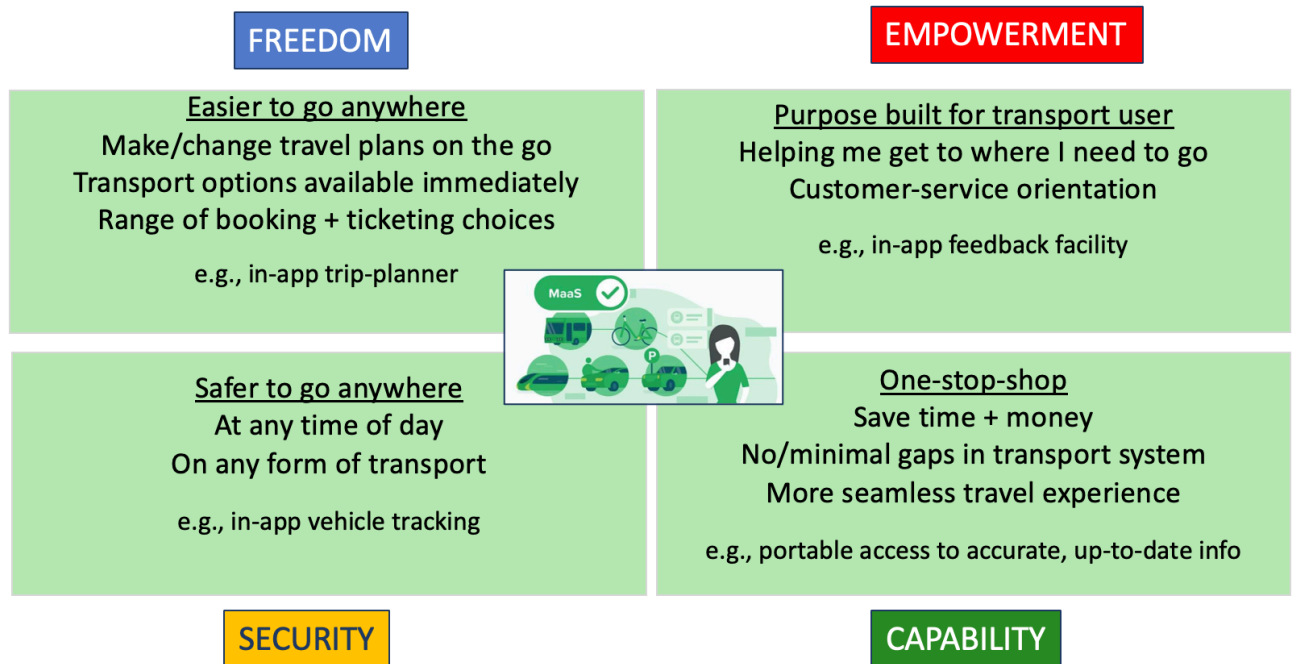
FREEDOM

Easier to go anywhere
Make/change travel plans on the go
Transport options available immediately
Range of booking + ticketing choices

e.g., in-app trip-planner

EMPOWERMENT

Purpose built for transport user
Helping me get to where I need to go
Customer-service orientation

e.g., in-app feedback facility

Safer to go anywhere
At any time of day
On any form of transport

e.g., in-app vehicle tracking

One-stop-shop
Save time + money
No/minimal gaps in transport system
More seamless travel experience

e.g., portable access to accurate, up-to-date info

SECURITY

CAPABILITY

Figure 2: User benefits of Rural and Regional MaaS (source: RTRH MaaS project)

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. For those businesses involved in a multiservice offering, even if cross subsidy is not used to attract customers through reduced prices, their involvement gives access to a wider market.

From a policy perspective, Rural and Regional MaaS offers the Government ways 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 investing in 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. However, whilst the greatest contribution that a rural and regional MaaS framework may make is in the identification and implementation of innovative modes (which includes rethinking the role of the private car) there are likely to be far greater benefits if non-mobility services are included as well. Hence, our proposal to investigate further the concept of MaaF as an innovation that brings together private non-mobility partners and mobility providers, funded through cross-subsidisation, which enhances the financial sustainability of the resulting multi-service offer.

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