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Mobility as a Service (MaaS) Investment Fund Evaluation

Final Report

Contents

Introduction

Background

In its 2018 Programme for Government, the Scottish Government committed to investing £2 million over three years to support the testing of the Mobility as a Service (MaaS) concept in Scotland. The fund was open to public, private and/or third sector organisations looking to undertake a MaaS pilot in Scotland.

The aim of the MaaS Investment Fund (MIF) was to test, in a practical application, the viability of MaaS in Scotland.

Transport Scotland commissioned an evaluation to establish what the evidence from the five MIF pilot projects demonstrates in terms of the overall viability and potential impact of MaaS in Scotland, and to identify the need for further data collection to support decision making on the future of Transport Scotland investment towards MaaS.

The fund was opened for applications in 2019, with a further, final application round in 2021.

MIF applicants were required to outline how their proposed use of MaaS could contribute towards the achievement of Scotland's second National Transport Strategy (NTS2) outcomes under the NTS2 priorities:

- Reduce Inequalities
- Takes Climate Action
- Helps Deliver Inclusive Economic Growth
- Improves our Health and Wellbeing

In addition Round 2, applicants were encouraged to outline how their proposed use of MaaS would complement wider Scottish Government policy, including:

- Low Emission Zones
- Smart Cities
- Covid-19 Recovery
- 20-minute Neighbourhoods

Within the guidelines for applications, applicants were asked to apply MaaS to one or more thematic areas. These were:

- Rural, Islands and Communities: This theme asked for the pilot to address barriers for travel specific to local communities and visitors within rural and island settings. (applicable in Rounds 1 and 2 of the fund)
- Tackling Inequality, Accessibility and Mobility Barriers: This theme asked for the pilot to address barriers for travel specific to those with accessibility or mobility issues, and to challenge inequality. (applicable in Rounds 1 and 2 of the fund)
- Tourism: This theme sought solutions addressing barriers for visitors travelling in and around Scotland. (applicable in Round 1 only)
- Urban Environments: This theme sought to address urban specific challenges, complementing Government initiatives such as Low Emission Zones, smart city schemes, localism or multi-modal smart and integrated ticketing zones. (applicable in Round 2 only)

The breadth of policy objectives available for applicants to respond to reflected the overarching ethos of the MIF to encourage learning from a wide variety of use cases and settings, to test the concept and provide a breadth of learning opportunities. The criteria for the MIF were developed and assessed using a working group made up of a variety of experts with specialisms in MaaS, technology, accessibility and rural issues.

MaaS Investment Fund Pilots

There were two rounds of funding awarded, first in 2019 and second in 2021. The pilots which were awarded funding were as follows:

2019 Allocation:

- GetGo (Dundee City Council): journey planning app with marketing focus around 7 sub-pilot events.
- Go-Hi (Hitrans): multi-modal journey planning across a wide range of modes (including ferries and airplane) with payment functionalities across the Highlands area.
- ENABLE (Tactran): three individual journey planning and booking apps with bespoke branding for different organisations using the same base system, based around Application Programming Interfaces (APIs) with existing mode aggregators.

2021 Allocation:

- GoSEStran (SEStran): app based on the ENABLE platform for journey planning, intended to supplement a new Demand Responsive Transport (DRT) service.
- St Andrews MaaSterplan (University of St Andrews): establishing new modes in St Andrews and integrating these into the existing GoSEStran app.
- Go-Hi (Hitrans): further development of functionality within the Go-Hi app.

Pilot Specific Objectives

In addition to the general themes, there were a number of pilot specific objectives, applied by each project unilaterally, which formed the basis for their self-evaluation. These objectives were either stated in the pilot project's final report or referenced in each individual pilot's monitoring and evaluation plan, and are listed in the following sections. Findings on the use and achievement of these objectives is presented in the 'Pilot Specific Objectives' section of the Impacts chapter and in Appendix D.

GetGo Dundee

- Providing standardised web-based Dundee travel information to improve the uptake of sustainable modes.
- Including shared E-bikes in travel ticketing to improve uptake of sustainable modes.
- Using the bespoke GetGo Dundee app to improve the uptake of sustainable modes.
- Using the National Entitlement Card (NEC) platform to improve uptake of sustainable modes.
- Using integrated ticketing through the ShareMORE app to improve uptake of sustainable modes.
- Including temporary "last mile" services to events to improve uptake of sustainable modes.
- Determining how personalisation of services through the ShareMORE app can improve the uptake of sustainable modes.

Go-Hi

- Improve access to integrated transport services in Highlands & Islands.

- Test feasibility of Mobility as a Service in a rural context.
- Encourage a shift from sole occupancy cars to more sustainable travel options.
- Create healthier lifestyles by improving sustainable travel choices, including active travel.
- Support the delivery of Transport Scotland's National Transport Strategy 2.

Tactran ENABLE

- Promote better travel choices and access to services and opportunities (e.g. healthcare; employment, education and training; leisure) by offering ENABLE users personalised, high-quality, integrated, digital transport information, as well as booking and payment solutions.
- Deliver services that are valued by participating mobility service providers and partner organisations.
- Identify a business model that facilitates: delivery of public policy objectives; good governance; the ability to upscale; and commercial success.

GoSEStran

There are separate sets of objectives which were listed in the monitoring and evaluation plan and the final evaluation report. For the purposes of this evaluation the first stated set of objectives have been examined:

- To investigate whether a MaaS tool of this nature could help address one of the Fund's key themes of transport poverty in a rural context.
- To explore links between MaaS and a linked Digital DRT bus service.

St Andrews MaaSterplan

- To scale an existing MaaS digital platform to meet the needs of visitors, commuters and the residents of St Andrews.
- Explore and facilitate bringing new sustainable modes of transport to the town of St Andrews.
- Incorporate the following (existing and new) transport modes to provide multi-modal and mixed modal routing into the app: demand responsive transport, bikeshare, rideshare, carshare, peer-to-peer car share, walking, public transport and taxis.

- Implement and analyse marketing strategies to engage, acquire and retain users for the MaaS digital platform.
- Monitor and evaluate the project, to indicate successes, failures, challenges, impacts and any unintended consequences.

Methodology

Study Aims

As described in Section 1 of this report, funding for MIF pilot projects was granted based on the submission of a business case which responded to the overall aim of the fund, one or more thematic areas, NTS2 priorities and several other policy drivers. In addition, each pilot project produced their own, separate objectives, which were approved via the submission of detailed monitoring and evaluation plans. Consultation with Transport Scotland emphasised the intent to evidence the contribution MaaS could make to encouraging individuals to choose sustainable and active travel options.

The aim of this study is to establish what the evidence from the five MIF pilot projects demonstrates in terms of the overall viability and potential impact of MaaS in Scotland, test MaaS concepts, and to identify the need for further data collection to support decision making on the future of Transport Scotland investment towards MaaS.

Based on the aim of the fund, and those of the individual pilots, the following three key areas of research were established:

- Viability – What worked for whom and why: Understanding which of the trialled approaches worked best in the Scottish context, in terms of app development and functionality, commercial models, marketing, partnerships, with a view of informing priorities for future investment decisions.
- Impacts – Establishing whether the MIF has achieved its intended outcomes, including facilitating mode shift to sustainable modes, findings against the MIF themes and the challenges of monitoring the performance of the pilots.
- Sustainability and Scalability – Understanding the extent to which MaaS is commercially sustainable and which model would work best if rolled out across Scotland.

These topics were explored through the following research activities:

- A review of evidence from the existing Evaluation Reports for the five MIF funded pilots and identification of knowledge gaps.
- Stakeholder interviews and focus groups to record their views of the benefits and potential for future viability of MaaS and collate learning points regarding delivery approaches.

Further details of the scope for these activities is provided in the following sections.

Review of MaaS Evaluation Reports

The five final Evaluation Reports for each of the MIF pilots were reviewed in order to gain an overview of what the projects delivered, how they were monitored and the evidence towards achievement of their stated objectives, with a view of highlighting evidence gaps and identifying further information requirements from stakeholders. The results of this exercise are summarised in Chapter 3. A list of pilot outputs is provided in Appendix B, evidence of uptake in Appendix C, the performance of each pilot against their own stated objectives as presented in the pilot's own final evaluation reports is detailed in Appendix D and monitoring and evaluation activities are summarised in Appendix E.

Not all of the evaluation reports are publicly available online, but have been supplied to AECOM for the purposes of this study.

Stakeholder Interviews and Focus Groups

The stakeholder engagement encompassed interviews with key personnel from the five MaaS pilots, focus groups with transport operators and a focus group with organisations that benefitted from the MaaS pilots. The review of MaaS Evaluation Reports was used to inform the design of the discussion guide. This is shown in Appendix A.

Five interviews with key personnel responsible for the delivery of the five pilots were conducted in order to establish the scope of the pilot, key benefits delivered and learning points regarding the delivery approaches and service viability relevant to the potential roll out of MaaS across Scotland.

Two focus groups were held with a sample of mode operators involved with at least one of the MaaS pilots and covered their experience of integrating with the service, key benefits from an operator's perspective, feedback on delivery approaches, perceptions on commercial viability and insights relevant to the potential future roll out of MaaS across Scotland.

One interview and one focus group were conducted with key project beneficiaries. These discussions explored topics including key benefits from their perspective of the trial, the promoter's approach to engaging with beneficiaries and insights relevant to the potential future roll out of MaaS across Scotland.

All interviews and focus groups took place between May and June 2024.

Report Structure

This report is structured into the following sections:

- Chapter 3: Viability: discusses finding from the pilots in relation to Viability, including discussions with MaaS leads and other stakeholders.
- Chapter 4: Impacts: discusses finding from the pilots in relation to Impacts, including discussions with MaaS leads and other stakeholders.
- Chapter 5: Scalability and Sustainability: discusses findings from the pilots in relation to the commercial sustainability of MaaS, and implications for rolling out across Scotland, including discussions with MaaS leads and other stakeholders.
- Chapter 6: Summary and Next Steps: A summary of the evaluation finding and recommended next steps for scoping further research.

Viability

This chapter explores the evidence, learning points and knowledge gaps from the MaaS pilots around the implementation of a MaaS solution covering a specific area within Scotland. These are early versions of an app with basic features which typically allow for feedback to be received from early customers to inform future product development. The key themes explored are Technical, Commercial, and Partnerships and Collaboration. In each case the topics are considered in turn through the lens of the evidence presented in the final reports provided for each pilot and findings from the consultation with MaaS leads and the engagement with transport operators and beneficiaries.

Technical

This section will cover the process of developing the MaaS apps and tools for use by users, and the level of functionality offered by the different platforms.

Outputs

The five MIF funded projects delivered five pilot MaaS apps and two websites. Out of the apps developed, three remain live and available for download, with the GetGo Dundee app and HITRANS' Go-Hi no longer available for download. The apps represent bespoke implementations of three base platforms developed through the MIF. These platforms are provided by FleetonDemand (Go-Hi) and Ember Technologies (GetGo Dundee, and Tactran ENABLE (Loch Lomond National Park Journey Planner, My D&A Travel, Go NHS Tayside) were developed as separate platforms, with the GoSEStran app (incorporating the St Andrews MaaSterplan) sharing licences with the Tactran ENABLE platform).

All interfaces/apps contained journey planning functionalities, however only the Mobilleo platform, created by Fleetondemand (Go-Hi) had a full 'plan-book-pay' offer for account holders. Apps which used platforms created by Ember Technologies (Tactran ENABLE, GetGo Dundee, and GoSEStran) made use of existing mode aggregators to take booking and payment for taxi and train journeys but did not support payment for public bus journeys or Demand Responsive Transport (DRT) operators. Specifically the GoSEStran app used a pass out link to a separate app called PINGO for users to book and pay for a DRT trip. Apps provided real time passenger information for public transport where this information was already publicly available.

A brief overview of the functionality and modes hosted on each pilot app is described in Appendix B.

Evidence from Reports

App Development

Four out of the five pilot projects used apps produced by the same developer (Ember Technologies) with initial apps developed separately for GetGo Dundee and Tactran ENABLE, with the Tactran ENABLE platform being extended to the GoSEStran app. The reason for this was primarily time constraints and cost efficiency, however the St Andrews MaaSterplan pilot had a specific aim of scaling an existing MaaS app which allowed them to take advantage of already developed features. This demonstrated the benefits of scaling an existing app to save time and provided a cost-effective solution. As the GoSEStran pilot was placed third in results of the second round of bids, it received less funds than their original proposal, resulting in a revised project plan. Thus the GoSEStran pilot report specifically stated that ensuring cost and time saving was a necessity of the MIF due to the time and budget limitation of the pilot schemes.

The value of co-development of the app was demonstrated by the Making Connections Audit carried out by GoUpStream as part of app development for Tactran ENABLE. The audit tested the journey planning tools with twenty four people with disabilities and early onset dementia. This engagement found that device compatibility, design simplicity and easily understood functionality were vitally important for developing a user-friendly app. The GetGo Dundee pilot report - which did not co-develop – stated that the lack of early workshops and stakeholder engagement was a key limitation of their approach.

App Functionality

A key difficulty highlighted by all the pilots was the integration of booking and payment systems for the modes offered on the platform. This was due to technological limitations, with existing operators either having no capacity to undertake this or having pre-existing and well-established standalone booking and payment systems already in place. Those without capacity would have needed to make a significant investment, whereas those with pre-existing systems did not feel compelled to update or adapt these to accommodate a fully integrated MaaS app on a trial basis.

The Go-Hi, Tactran ENABLE and GoSEStran pilots, which did integrate booking and payment systems for at least some modes, used an API (Application Programming Interface) which allows for the sharing of information between parties. These pilots found that this was not a simple one-step process, and that ongoing updates were required on both sides in order keep the APIs fully integrated. Apps which used the

Ember Technologies platform (Tactran ENABLE, GetGo Dundee, and GoSEStran) made use of existing mode aggregators to take booking and payment for taxi and train journeys, but did not support payment for public bus journeys or DRT (Demand Responsive Transport) operators. The GetGo Dundee app did not achieve the full plan-book-pay functionality and only displayed journey planning information, derived from Traveline Scotland data, with users required to book and pay for the journey outside of the platform. Traveline Scotland is a public-private partnership between transport operators, Transport Scotland and local authorities which provides a 'one stop shop' for all bus, rail, coach, air and ferry times in Scotland via a website and mobile app. It aims to provide clear and up-to-date information on all public transport services within Scotland.

GoSEStran and Tactran ENABLE pilots noted there may be little value integrating bus ticketing to a MaaS app, given the widespread use of National Entitlement Cards and contactless payments. This assertion was supported by user feedback which suggested that planning functionalities are more useful than being able to book or pay for a journey.

The pilot projects all developed apps which could collect data on travel patterns, however where apps did not include booking or payment functions for all modes, this was based on searched journeys. However, the extent to which any of the pilots managed to build in personalisation onto their platform was limited to the user selecting a few preferences once an account was created. This may have fallen below the expectation for the Tactran ENABLE and GetGo Dundee pilots which had specific objectives around personalisation. The GoSEStran and Tactran ENABLE pilots noted the difficulty of encouraging users to create accounts, meaning features such as carbon dashboards, targeted 'nudge' incentives and tailored journey planning were only delivered to users who had created accounts, therefore limiting the scope of these features to influence travel behaviour. GoSEStran speculated reasons for the lack of account creation could be that users were unaware of the additional benefits of registering, or activation emails being sent to junk or spam folders. The Go-Hi evaluation reports notes that they had recently started a partnership with BetterPoints which was still in early stages, and they recommend that MaaS provides greater personalisation through the use of user dashboards or incentives.

Engagement with MaaS Leads

The interviews with leads demonstrated that the pilot projects had provided opportunities for added value beyond the immediate objectives of the programme. Go-Hi suggested that the MIF provided an opportunity to learn lessons through real world application of MaaS, ahead of some others in the sector, UK-wide.

The collaborative nature of the trial group meant efficiencies were found by pilots sharing services and the same base platform. This suggests that the development of MaaS is more efficient at a larger scale, but that individual products can also be tailored. For example, GoSEStran opted to share the existing Tactran ENABLE base platform, for which the developers Ember Technologies and Fuse Mobility provided a shared licence. All three parties involved subsequently benefitted from shared improvements.

Delivery of the full MaaS concept (Planning-Booking-Paying) has been mixed, with an issue experienced by GetGo Dundee, Tactran ENABLE, GoSEStran and St Andrews MaaSterplan being the ability to integrate various ticketing and reservation systems, some of which are still evolving, preventing some MaaS pilots covering all the desired modes. There was also some evidence, including from Tactran ENABLE and GoSEStran, that greater use was made of the pilot apps for journey planning rather than ticketing.

In-app ticketing was a challenge to deliver across operators due to the capacity or willingness of different operators to integrate. There was also some evidence that user demand was low for this feature through Tactran ENABLE user surveys and GoSEStran focus groups. GetGo Dundee said that some operators may have been reluctant to engage with the pilots due to competing priorities and COVID-19 related uncertainties. This was also an issue encountered by MaaS pilots led by RTPs.

Go-Hi found that new mobility solutions such as bike hire were more able and willing to participate than bus, rail, ferry or DRT modes. In many cases their operations were built around the technology side, with St Andrews MaaSterplan describing MaaS as a catalyst for investment in new modes, whereas other modes such as DRT are focused on their own operation and came before the technology was in place. GoSEStran also noted that technical capability of some operators was a key barrier, specifically the lack of app-based payments for some bus operators.

By the end of the pilot 4,750 users had signed up for a Go-Hi account which was in line with target set out prior to the COVID-19 pandemic. However, data generated from the app for the purposes of planning and gaining insights had limited use, with outputs generated by the app not sufficiently detailed. GoSEStran noted that while the usership achieved by the trial limited the sample size, the origin-destination data delivered through the app highlighted opportunities to gain a better understanding of rural demand for travel as part of a wider roll out. The use of dashboard data is further discussed in the ‘Monitoring and Evaluation of Individual Pilots’ section of the Impacts chapter.

Engagement with Operators and Beneficiaries

Operators and beneficiaries observed several barriers to achieving full integration with regard to bookings and payments. Operators noted the importance of an app being laid out in a logical way, and to take users through the planning-booking-payment journey in the order they would expect.

Some beneficiaries felt let down by the app functionality and would have wished for additional features. For example, Loch Lomond and the Trossachs National Park (LLTNP) wished for journey itineraries to be part of the app alongside features which could prevent overcrowding in specific areas. Beneficiaries felt that personalisation should have featured more greatly and a lack of personalisation led to a less useful platform. An example would be for LLTNP, where it was suggested that planned journeys were limited by a generic distance/time limit for walking and it was felt that the app should have got to know the user's preferences first. Those visiting the National Park may have a higher propensity for walking longer distances between connections; an appreciation of this by the app could have given rise to more bespoke and individualised mode selections.

Both the Go-Hi and Tactran ENABLE platform apps had limited functionality for in-app notifications, which reduced the viability of push messaging, thereby potentially limiting some of the potential for behaviour change though 'nudge' type notifications. However, this may not have been so important, as the Dundee and Angus College beneficiary noted that among students, the most requested feature was real time bus information while they did not value rewards/incentives.

Technical capabilities differ for different modes of transport. An example cited by operators was bus and ferries in the Go-Hi region which operate primarily as 'cash on the day' payment method and so were less able to process online payments.

RailEasy who were involved in the Tactran ENABLE pilot reflected that partners underestimated the complexities of integrating with rail services and ticketing due to the user interface requirements which are unique to rail including seat reservations and different ticket types.

Digital inclusiveness was also cited as a reason that the MaaS platform was not able to serve its target market (the hard to reach and socially disadvantaged groups). One DRT operator felt that some of their customers would struggle to use a phone app and, as an operator, they would require a backup option to take bookings to ensure full inclusivity for those without a phone or strong digital literacy.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

Gravitation towards a single base platform generated efficiency benefits.

Three out of the five pilot projects (Tactran ENABLE, GoSEStran and St Andrews MaaSterplan) ended up using the same base platform, in this case ENABLE, to host their MaaS app. This demonstrated the benefits of scaling an existing platform and interface to save time and effort and showed the natural gravitation of the pilot projects to a cost-effective solution. Some pilots also stated that ensuring cost and time savings was a necessity of the MIF due to the time and budget limitation of the pilot schemes.

Co-design with user groups is valuable at the development stage to ensure interfaces are user friendly and accessible to all user groups.

Engagement with disability organisations and other stakeholders found that issues such as device compatibility, design simplicity and easily understood functionality were vitally important in developing a user-friendly app. Pilots which did not co-develop felt that early workshops and stakeholder engagement should have been a part of the process.

Difficulty of integrating existing booking and payment systems with MaaS.

Due to financial and technological limitations with some existing operators having pre-existing and well established standalone booking and payment systems already in place, some operators did not feel compelled to update or adapt these systems to accommodate a fully integrated MaaS app on a trial basis as developing an API takes time and expense for the operators. However, some operators developed a full API interface as a result of the pilot, which would now be available for other MaaS integrations. The MIF has therefore provided catalyst for action around data and integration.

Commercial

This section will discuss commercial aspects of the pilot projects, including the procurement, commercial model and marketing and promotion of the MaaS apps.

Evidence from Reports

The key players in the commercial model for MaaS across all the pilots were the MaaS provider, transport operators, contracted project managers and app developers.

Procurement

GetGo Dundee, Tactran ENABLE, GoSEStran and St Andrew MaaSterplan pilots all found the procurement of a mobile app a steep learning curve with specific considerations including requirements for data protection, security and intellectual property rights and aligning these between all involved parties. Additional information provided by SEStran noted that what was developed allowed the contract with the DRT tech provider to be concluded much more quickly than would have otherwise been the case. However, developing full, reuseable contract documentation initially took extra time and cost.

Commercial Model

The pilots were established as a publicly owned MaaS platform, hosting third party transport providers either through direct agreement with operators, presenting publicly available information, or hosting existing third-party aggregators/booking systems. The Tactran ENABLE interfaces involved different branding based on different public sector organisations who acted as ‘Service Leads’ and promoted the platform through their own channels, and only made financial contributions for specific features, such as carbon counters for the National Park Journey Planner.

The feasibility of a sustainable commercial model for MaaS is a knowledge gap as the pilots either operated a ‘not for profit’ model, or took commission from booking payments which was not significant enough to cover costs. The evaluation reports note a number of key barriers to the establishment of a viable commercial model to MaaS, including the number of competing apps available free of charge for the user. GetGo Dundee and Go-Hi also noted a perception that operators are unlikely to abandon their own established apps in favour of a MaaS platform.

Marketing and Promotion

All pilots invested in marketing the apps, and in some cases the introduction of new transport services, although the level of spending on marketing and the approaches used varied. The GoSEStran pilot included separate marketing streams for the MaaS app and a new DRT service launched as part of the pilot, while the St Andrews MaaSterplan pilot carried out separate marketing for the app and car club.

The MIF programme found evidence that the marketing activities undertaken as part of the pilots were effective, though small in scale. Marketing was more effective where it was well targeted at prospective users and delivered through trusted channels. This included promoting the app at public transport users or those about to change their travel patterns, such as new university students. The high profile of the LLTNP brand made marketing the app towards tourists more successful than other apps.

Several approaches to tailored marketing were trialled. The Go-Hi pilot used hyperlocal marketing, tied to a specific piece of infrastructure and tailored to the local context; in this case a concentrated marketing programme was linking to the opening of Inverness Airport Railway Station. Between the GoSEStran and St Andrews MaaSterplan pilots, the most effective methods were found to include posters at bus stops and direct communications from employers and universities, while the least effective marketing methods were printed adverts in local press, radio adverts and leaflet drops. Trusted channels were noted as important for delivering the marketing, which can include local authorities, universities and employers. GoSEStran and Tactran ENABLE recognised that Regional Transport Partnerships (RTPs) have low brand recognition which demonstrates the importance of developing deep partnerships with partners who can be useful in disseminating information about the platform. Partnering with specific organisations also helped to reach groups which would otherwise not be particularly captive to sustainable travel, as was the case with GetGo Dundee and Dundee United FC. However Tactran ENABLE raised concerns that relying on third parties for promotion risks competing priorities interrupting the marketing programmes for the MaaS app.

Evidence from the GetGo Dundee pilot showed that the offer of free bus travel did not lead to an uptake in users, with only 5% of respondents to their survey (no sample size recorded) stating that price was a major factor in their decision making. Similarly an offer for a £10 voucher for the St Andrews MaaSterplan car club was not redeemed by any users, despite being heavily promoted.

Despite the valuable learning gained from the marketing of MaaS platforms, the marketing methods most effective at generating user downloads of the MaaS app are by their nature quite bespoke and limited to a small audience. Pilots which

conducted non-user surveys found that the large majority of non-users were unaware of the apps, indicating that the reach of a marketing campaign is potentially limited. Pilot projects which conducted market research activities such as co-design workshops felt these helped to build relationships with users and led to changes being made to the app in line with users' needs and wants.

Engagement with MaaS Leads

The ambition of developing a MaaS minimum viable product and testing it within a short timescale highlighted some issues around the lack of capacity for delivering such a product. Interviews with GetGo Dundee, GoSestran and St Andrews MaaSterplan revealed that because the services required were new, there was a lack of experience among procurement colleagues to find a suitable contractual model. This, therefore, required intensive legal investment and understanding of data security, intellectual property and ownership requirements. It is not clear that a universal contractual model has been established that can be rolled out elsewhere, however, it can be said that the MIF programme has induced upskilling within local authority procurement to deal with digital solutions in future. In order to overcome some of the organisational challenges, such as limited capacity, MaaS leads stated that having a dedicated project manager was essential and app trials made use of an expert partner (FOD Mobility, Fuse Mobility or Urban Foresight).

Revenue generation of MaaS was identified as a challenge by Go-Hi and Tactran ENABLE, requiring either booking fees, or advertising. Advertising could make the interface more challenging and less inclusive – undermining the intended benefits of the app. Tactran ENABLE trialled the use of booking fees. However, where applied, they were perceived as a deterrent to use. In any case, it was understood that the small numbers attracted by the trial were far below the 'critical mass' of users required to generate any significant revenue base. As such, it was perceived that, in order to fulfil the social objectives of employing MaaS at a cost which was affordable to the user, MaaS would continue to require public funding at this time. However, it can be noted that other commercially driven products, such as Citymapper or Uber Transit, are now starting to extend into more mobility as a service areas, which may change this marketplace.

Marketing of the app was most effective when tailored toward a specific audience – e.g. Tactran ENABLE through Dundee and Angus College and NHS Tayside. St Andrews MaaSterplan described marketing as a critical component of MaaS, and as important as the interface or modes themselves. Go-Hi felt their marketing approach was too heavily 'front loaded' with intensive activity at app launch, but should have had a longer-term social media presence – "needs to be a constant effort to build over time". They indicated that marketing should form at least 50% of the budget in order to be effective over time.

Engagement with Operators and Beneficiaries

There was limited expectation among operators that being part of a MaaS platform would deliver benefits in terms of additional patronage, though the context of the COVID-19 pandemic in which the pilots were delivered is noted. One operator suggested that MaaS is “a solution looking for a problem”. Since there was a recognition among some operators that MaaS is not a revenue generator at this time, there was also a reluctance to contribute towards a viable commercial model until it became beneficial for the operator to do so. For example, margins for some micromobility operators were noted to be low already without having to share revenue with a MaaS provider. Adding a fee to tickets sold on a MaaS app could also make the platform uncompetitive with what operators could offer directly, although many other platforms do use booking fees Some operators, however, did perceive clear benefits to a well-used, reliable MaaS app. Loganair (the domestic aviation operator) for example felt that MaaS provides a commercial opportunity for them to ‘join the dots’ of an air journey to the customers’ final destination, by providing onward travel options in a central place. Beneficiaries felt it was important for them to keep some control/ownership over the MaaS platform – data is one of the most valuable aspects of what a MaaS app can produce, along with ownership of the customer, and it would be disruptive to operators to not be in direct control of these.

Operators involved in the Go-Hi trial felt that marketing the app should have been considerably greater, and that in their view “all the funding went into app development”. DRT operators in the Go-Hi region noted the difficulty of effectively marketing their services, with poor public perceptions that the service is meant exclusively for older/socially disadvantaged people. Beneficiaries therefore supported a finding from the pilot self-evaluations that branding the app in a trusted and recognisable brand is beneficial and made marketing efforts more effective. It was noted that a public sector developed MaaS app may be one way a DRT and other locally delivered services could reach a wider audience, as these are often not included in commercially available journey planners.

The Digital DRT app supplier (Liftango) provided the back office that was used for the M-connect system in Moray as well as other DRT operations which are marketed under MOOVE Flexi by HITRANS. There was a risk of conflict between the development of the DRT app in Moray and the development of Go-Hi, with the DRT app in Moray successfully marketing and delivering its product in parallel to Go-Hi and both platforms offering similar services. The promotion of the DRT app was part of a multi-faceted approach to improving DRT services in Moray, including improvements to services and widespread marketing, resulting in increased uptake. There is a risk highlighted that users would be confused as to which app to use, if then directed towards Go-Hi.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

Barriers to a commercially viable model.

The pilot projects struggled to find a commercially viable model for MaaS to operate under with all pilots reliant on public funding to ensure the app's continued upkeep. The number of competing apps, including those already available free of charge from transport operators and the private sector was noted as a barrier for establishing a viable commercial model for MaaS. Other factors in sustainability were identified by the pilots as including the costs of upkeep, the lack of potential income and the size of the market. Additional income sources for supporting MaaS could come from transport operators (who's services could reach a wider audience through the app) or beneficiaries (who could pay to access the data generated by the app). The financial sustainability of MaaS is discussed later in the Sustainability and Scalability chapter.

Early engagement with legal requirements.

Across all of the programmes, the pilots have highlighted a lack of experience in procuring the use of a mobile app. Legal consideration included requirements for data protection, security and intellectual property rights and aligning these between all involved parties. Bottoming out these legal considerations ate into the budget for developing and running apps and in some cases limited the 'live time' of the apps.

Marketing is best delivered through trusted channels.

The experience from the pilots was that the most trusted channels for promoting MaaS included educational institutions, workplaces, the national park and local authorities. By contrast Regional Transport Partnerships have low brand recognition and would require much larger and more sustained marketing budgets.

Well targeted marketing has the biggest impact.

All pilots recognised the importance of marketing in the deployment of a MaaS platform and felt this was as important as the app functionality and the modes themselves. The most effective marketing was well targeted to prospective users and potentially linked to a specific piece of infrastructure. By contrast large scale mass marketing such as newspaper and radio advertising was found to be less

effective. However, well targeted marketing struggled to reach a wide enough audience to secure the commercial viability of MaaS.

Partnerships and Collaboration

Evidence from Reports

Transport Operators

A variety of modes were accommodated across the various pilots, including air, bus, rail, ferry , car club, eBike bike hire and hotels. The success in integrating different operators was dependent on the capacity and willingness of those operators to engage.

- Large, established public transport operators were likely to have their own app already up and running and so perceived less value in integrating with a third party.
- Small public transport operators did not have the means, technology or capacity to integrate. Although some benefitted from the support afforded by being part of a MIF pilot, gaining access to digital platforms that otherwise would have been unachievable.
- 'New mobility' providers, focused on innovation such as micromobility and car sharing, were among the most willing (and able) to integrate, perhaps due to greater flexibility of more recently developed back-end systems to integrate and the potential to reach a wider audience.

In the case of Fuse Mobility (who managed the Tactran ENABLE and GoSEStran pilots) it is noted that they preferred to integrate with aggregated data, rather than deal with transport operators directly. In contrast, Go-Hi held monthly partners forums which included transport operators, however their report notes that MaaS must offer 'added value' for operators who are "not yet likely in the short-medium term to abandon their own apps and switch entirely to a MaaS platform instead" with some expressing "reluctance to share their customers" in interviews conducted by Go-Hi as part of their self-evaluation.

The GetGo Dundee pilot report stated that the after-effects of the COVID-19 pandemic may have been a factor in the poor levels of engagement and buy-in from operators with competing priorities at a time of great uncertainty in the industry.

None of the pilots were successful at integrating DRT booking and payment functions into the app or completed integration before the end of the pilot, despite

this being a priority for GoSEStran and Go-Hi. In the case of GoSEStran this was due to compatibility difficulties between the software of Ember Technologies and the local DRT operator's booking systems, known in the industry as the 'data standard problem'. M.Connect and Moove-Flexi operate in the HITRANS area and have separate, stand-alone DRT apps that were procured with support from the Go-Hi budget under the MIF programme. 'M.Connect' in Moray and 'Moove-Flexi' in Highland were being progressed for a phased integration into Go-Hi with phase 1 being a link with platform development for full integration being progressed by Mobilleo and Liftango. For GoSEStran and St Andrews MaaSterplan, taxi operators were integrated through a coverage area overlay with users signposted to a list of operators who could fulfil their journey, but required to book their journey directly with the operator.

For the Go-Hi and St Andrews MaaSterplan pilots, the range of modes offered on the app grew during the course of the pilot, allowing for the testing of functionality and showing proof to prospective operators that the platform worked and could benefit their users. The full range of modes offered is presented in Appendix B.

Other MaaS Projects and Pilots

All of the MaaS projects engaged with a third-party project manager who were expert in the field of MaaS (Urban Foresight, Fuse Mobility and Fleetondemand). These partnerships were largely successful and filled knowledge gaps of the MIF applicants.

Common across all Evaluation Reports was the value in forums and partnerships which have developed between MaaS providers and innovators which are effective at providing support and opportunities for knowledge sharing both within Scotland and internationally. The pilot projects had opportunities for joint working through Transport Scotland and MaaS Scotland facilitated workshops. An Integrated Mobility Partnership (IMP) has been formed between Tactran and SEStran and is seen by members as invaluable for the future delivery and knowledge sharing of MaaS in Scotland.

Local Stakeholders and Beneficiaries

The Tactran ENABLE and GoSEStran pilots involved partners such as health boards, colleges, user groups and local authorities early and developed the solution using a 'bottom up' approach which was found to result in more effective partnerships which could be utilised during marketing activities. For Tactran ENABLE, a monthly meeting was held between all partners to review the previous months usage data and plan for marketing activities. These meetings allowed for cross-fertilisation of ideas and collaborative problem solving. In contrast the St

Andrew MaaSterplan pilot attempted to engage with stakeholders such as local tourism boards and business representatives retrospectively or as a 'one-off' consultation which was less successful at generating buy-in. The Go-Hi pilot reflected that a monthly partners forum which included transport operators would have "supported a collaboration that could deepen the sense of shared endeavour".

Engagement with MaaS Leads

Through the MIF pilots, knowledge sharing relationships have been established. HITRANS mentioned collaboration with Transport for West Midlands (TfWM), Transport for Wales Masterminds group, Transport for Greater Manchester (TfGM), Portsmouth/Southampton Future Transport Zone (FTZs) Breeze and West of England Combined Authority (WECA). Tactran and SEStran formed the Integrated Mobility Partnership in Scotland (IMPs) in order to share learning and help understand what partners require from MaaS products. Wider exchanges were also developed via the annual MaaS Scotland conference and special interest group meetings. The creation of the Scottish Government's MaaS investment Fund allowed Go-Hi to progress ahead of the UK Government's Future Transport Zones (FTZs), many of which are still in the early stage of developing apps, in some respects and has shared lessons across the MaaS sector as a result. GetGo Dundee raised the challenge of maintaining forums and channels of communications in a context with high staff turnover at partner organisations, highlighting the importance of deep organisational relationships, rather than those focused on personnel.

The MaaS pilots used apps which were developed by two developers; Ember Technologies (GetGo Dundee and Tactran ENABLE (3 apps and two websites) as separate platforms, with GoSEStran and St Andrews MaaSterplan using the ENABLE platform) and Fleet on Demand's Mobilleo system (Go-Hi). The 'parent' Apps provided a platform for smaller local schemes to be tailored and promoted, feeding into a larger and more comprehensive offer.

Partnership with Traveline Scotland was considered critical by Go-Hi, GoSEStran and St Andrews MaaSterplan in providing a key source of information for feeding public transport information into the app - The Digital Travel Data Services (DTDS) project, currently being developed by Transport Scotland, in partnership with Traveline Scotland and Trapeze Group (UK) Limited, will enhance this by building on the Traveline Scotland platform and improving real-time journey information availability, providing a single source of truth for public transport and travel information in Scotland.

Tactran ENABLE approached the larger bus companies, but found costs for integration were prohibitive, particularly for a short-term trial, thereby excluding smaller service providers. Across all discussions there was an appreciation that

there is still work to be done to establish a standard way of working between operators and MaaS providers, especially in terms of booking and payment, with Go-Hi suggesting a level of distrust exists with third party booking apps among operators and users.

Engagement with Operators and Beneficiaries

Operators engaged during this study had mixed experiences of integrating with MaaS. Loganair did not integrate their booking and payment functions with the Go-Hi app as they already have their own app (instead Go-Hi relied on a Skyscanner API integration for air services). Developing APIs to integrate would be costly (reported at circa £5-10k) and it is only considered a 'nice to have' at the moment. A DRT operator in the Go-Hi area, who have their own app called M.Connect, was successful in generating user growth without integrating with Go-Hi, but had a contractual arrangement with HITRANS meaning that integration would be required.

A concern was raised by operators around who the lead party in the transaction for a journey is – customers need a single point of contact should something go wrong with their journey and a refund is required. This is a concern which has been raised by the DfT in their MaaS Code of Practice with recommendations for consumer protections including setting out points of contact for users upfront, highlighting when operators are being promoted owing to commercial arrangements and the processing of users data. A DRT operator in the Go-Hi region noted issues such as missed connections become more difficult to solve with a larger platform. Operators suggested that Service Level Agreements could therefore be introduced between the MaaS platform and transport operators.

LLTNP formed a mobility partnership with their three constituent RTPs, four Local Authorities as well as the Forestry and Land Commission with the aim of pooling resources and generating efficiencies in the future roll out of MaaS in the area. This partnership is still in its early stages with partnership managers and officers being recruited but has received enthusiastic support from the Strathclyde Partnership for Transport RTP.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

Effective knowledge sharing networks were established.

As a result of MIF, there are now established forums and partnerships developed between MaaS providers and innovators which is effective at providing support and

opportunities for knowledge sharing both within Scotland and internationally. The pilot projects had opportunities for joint working through Transport Scotland facilitated workshops. The IMP which formed as a result of the pilot programme is seen by members as invaluable for the future delivery of MaaS in Scotland.

Early engagement fosters more effective partnerships.

Partnerships should be made early in the process of implementing MaaS to generate deep organisational buy-in, rather than relying on links to key personnel. Involving partners early and developing the solution in a 'bottom up' approach was found to result in more effective partnerships which could be utilised during marketing activities.

Defining consumer protection standards for MaaS

A key learning point which has emerged is the concerns around consumer protection, operators specifically raised concerns about who the lead party is in a transaction, and how the consumer can provide feedback on their journey, claim for compensation or request refunds.

Impacts

This chapter explores the evidence, learning points and knowledge gaps from the MaaS pilots around the impacts of the MaaS pilots. The key themes explored are Monitoring and Evaluation of Individual Pilots, Evidence of Uptake, Modal Shift, MIF Themes and Pilot Specific Objectives. In each case the topics are considered in turn based on the evidence presented in the final Evaluation Reports provided for each pilot, perspectives from the consultation with MaaS leads, and engagement with transport operators and beneficiaries.

Key metrics relating to the uptake for each pilot are provided in Appendix C including the number of downloads, number of registered users, number of journeys planned and information about user demographics where this data was collected. The total number of downloads varied from 1,500 for GetGo Dundee to over 5,000 for Go-Hi. Tactran ENABLE and GoSEStran did not report the number of app downloads, instead measuring user sessions as evidence of uptake which ranged from circa 1,300 for myD&A College to 11,000 for the LLTNP app. During the engagement sessions, Go-Hi stated that they had an initial target of 5,000 users, with it noted that 3,500 users had registered on the app at the time of writing the self-evaluation report for the pilot in 2023 (4,750 was the final number of registered users with downloads of the app over 10,000). The initial target for GoSEStran was 1,000 users which was achieved a month in advance of the project closure date.. Most other pilot projects did not provide a target or benchmark for the number of users of downloads they hoped to obtain, with only the St Andrews MaaSterplan providing a target number of downloads attributed to different marketing channels. While the number of app downloads/users was reported over different periods after each app launched, there appears to be little correlation between the number of app downloads and the duration of the reporting period.

A potential reason for the high uptake of the LLTNP app, compared to all the others is that it caters primarily for visitors (over 4 million per year), and this is a group who are, by the nature of their relationship to the area, likely to actively seek travel information. Also there is a known lack of parking within the park, which may have contributed. Further assessment would be required to understand that extent to which the app could support the development of the local tourism economy, noting that apps targeted at visitors may have higher potential to influence these less frequent journeys than the more habitual journeys catered for by the other apps piloted.

Evidence of uptake differs for each pilot due to the differences in functionality of each developed platform. Some pilots measured uptake through the number of journeys planned, but others use the number of journeys booked/paid for through the platform where this function was available. Not all apps had user account/registration

functions but could measure user retention by the number of returning user sessions. Statistics measuring repeated use are a better indicator of user retention and hence potential to influence travel behaviour.

Monitoring and Evaluation of Individual Pilots

Evidence from Reports

Each pilot undertook monitoring and evaluation of impacts according to their project specific monitoring and evaluation plan. In general across the pilots the following challenges and limitations limited the scope for robust monitoring and evaluation of the MIF pilots:

- App Functionality Limitations: not all apps include payment functionalities for all modes offered and could only infer measures such as mode shift from planned journeys, rather than paid journeys, with no means of verifying whether a journey actually took place by the looked up mode.
- Low Survey Response Rates: pilots which had aimed to use user surveys including Go-Hi and GoSEStran obtained low response rates which meant that quantitative analysis could not be confidently carried out in the case of GoSEStran. The richest data was gained from the LLTNP, though when cleaned for valid responses and segmented by users and non-users, the sample size was still low.
- Short Evaluation Periods: for GoSEStran the period between app launch and surveys was two and a half months, while other pilots had longer evaluation periods of up to 12 months, they suggest this was limited time to observe uptake in a new digital platform and any positive impacts of this. Tactran ENABLE said they needed to take a “pragmatic approach”, including the use of less robust or representative ‘convenience samples’ for user surveys due to the available budget and evolving nature and extent of the pilot.
- Representative Timepoint: The Go-Hi pilot noted the challenge of obtaining baseline data from which to evaluate the MaaS app against. In addition they state there was not a representative timepoint to assess the pilot, given their app was added to iteratively over time, a finding which was echoed by Tactran ENABLE who noted the “evolving nature and extent of the pilot”. The difficulties presented by delivering the project during the COVID-19 pandemic would have exacerbated this issue.

A variety of methods were used to gather data across the pilots and these each had their strengths and limitations. The full scope of monitoring and evaluation activities for each pilot is included in Appendix E including the response rates to surveys, focus groups held, and other evaluations undertaken as part of the pilot. An overview of the key methods used to gather data is provided below.

Dashboards/System Data

Data Dashboards were available through both Ember Technologies and Fleet on Demand Mobilleo and provided information on user uptake (number of downloads, accounts set up) and how the app was being used, (number/type of journey planned). Where user accounts had been created, further information was available, such as age and access to a car or not. User uptake data was used to monitor the success of marketing campaigns and to provide an indication of return users (most notably on the St Andrew's MaaSterplan project and GetGo Dundee). Dashboard data also provided information on the kind of journeys that were being searched for, providing some insights into the way that people were using the app, the most common finding being that app users were looking for public transport information – specifically bus times, as opposed to booking taxis or other shared mobility.

The extent to which data was analysed in order to inform decision making on transport provision is limited. With over 10,000 journeys planned, the LLTNP app (within Tactran ENABLE) is the most popular of any of the MaaS apps trialled and data available through the dashboard made it possible to analyse where these users were based. This, and evidence from beneficiary discussion, provides some evidence of the ability for app data to provide insights into travel behaviours in order to adjust or tailor transport services. It is also worth noting for Go-Hi, additional data was available directly from operators such as car club and bike hire fleet deployment and utilisation, independent of the MaaS trial.

A key limitation of dashboard data as a metric of success is that it only considers the 'captive audience' of app users and is therefore an unrepresentative sample. The fact that most users were searching for bus times is therefore indicative of the type of audience who may already be engaged in looking for journey information, or who will have seen marketing materials posted at public transport related locations such as bus stops. The effectiveness of MaaS in inducing mode shift is therefore uncertain, based on dashboard data.

Surveys

User and non-user surveys were carried out by Tactran ENABLE, GoSEStran and GoHi.

GetGo Dundee conducted travel behaviour surveys on the day of each of their target events. StAndrews MaaSterplan promoted the wider GoSEStran survey.

Go-Hi conducted an Onboarding Survey, a User Survey and utilised results of the wider Highlands and Islands Travel Survey to gather experiences and attitudes towards the app. Despite a completion incentive, the sample sizes for the Onboarding Survey and User Survey were very low (35 and 54 respectively) impacting the confidence in the results and preventing segmentation. Responses to the Highlands and Islands Travel Survey related to attitudes towards MaaS in general and were non-specific to Go-Hi.

User and non-user surveys allow for greater understanding of the attitudes towards MaaS by different groups, provide a counter-factual in the absence of baseline data, and allow interrogation of the population in terms of attitudes towards MaaS and how likely it would be to change behaviour. Across all pilots which undertook user and non-user surveys, the sample size of non-users was significantly larger than those collected for users. Broadly, these surveys showed that there was a positive attitude towards the MaaS solution as a tool for behaviour change. However, as noted in all of the reports, the sample size and distribution of app users was consistently small and difficult to draw conclusions from.

Qualitative Data

Due to time and budget constraints, GoSEStran were the only one of the pilots to complete a user focus group as part of the post implementation evaluation, rather than as part of app development This found limited evidence (due to only four participants) that users planned their journey in the app, but then purchased tickets through other apps. End-user discussions were held with Tactran ENABLE projects although this was intended to shape the product at the start of the project, rather than gather evidence of effectiveness.

Evaluation Frameworks

All pilot projects developed objectives contained within their initial business cases and monitoring and evaluation frameworks. However in the cases of Tactran ENABLE and GoSEStran, these frameworks were not followed through into the final evaluation reporting. The Investment Fund did not prescribe a consistent or coherent framework through, for example, a theory of change model for which to objectively assess how well each pilot met the aims and themes of Transport Scotland. This led to a shortfall in evidence collected to support the central aims of Transport Scotland. Pilot programmes were therefore permitted freedom to set their own objectives which allowed for exploration of MaaS as a solution for a range of problems for which multiple learning streams have emerged.

Engagement with MaaS Leads

The conversation with St Andrews MaaSterplan elaborated on the challenges with monitoring which included that not all journeys facilitated by an app would be captured/counted in the number of journeys planned, an example would be a daily commuter who might use the app once to plan their journey, but only check real time information once they are familiar with their regular route, or ridesharing whereafter the initial contact between driver and rider, journeys may be planned out with the app.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

Pilots were not evaluated against a common and coherent framework.

Finding a common framework that works has proved very difficult for MaaS across the world. As described in the introduction of this report, funding for MIF pilot projects was granted based on the submission of a business case which responded to the overall aim of the fund, one or more thematic areas, NTS2 priorities and several other policy drivers. In addition, each pilot project produced their own, separate objectives, which were approved via the submission of detailed monitoring and evaluation plans. A unified evaluation framework encompassing all these elements was not created. The development of such a framework in advance of future investment could assist with delivering more robust evidence in relation to Transport Scotland's aims and objectives in the context of further MIF investment.

Difficulty defining the before and after periods of evaluation.

Some pilots reported that monitoring of the app took place over a limited period of time, in some cases only a few months after the app launched, either due to delays encountered earlier in the app development, the fluid nature of the app roll-out, or time constraints of the MIF programme. Some pilots claimed this did not allow enough time for robust timeseries data to be collected and the benefits of their work to be realised.

Monitoring data gathered from the app is constrained by the app functionality and the level of account creations.

The quality of data used to monitor the apps was severely limited by the functionality, for example apps without comprehensive booking/payment functionalities could only infer metrics like mode choice from the last journey a user planned, with no means of verifying whether a journey actually took place by the looked-for mode. However, while the limited user-base achieved by the apps limited such benefits in the context of the pilots, the study highlighted opportunities to deliver insights relevant to policy priorities, including understanding rural accessibility and demand for travel as part of a wider roll-out.

User surveys have low response rates.

All pilots generally found it difficult to obtain meaningful sample sizes from user surveys and may need to seek alternative methods of evaluation.

Modal Shift

Evidence from Reports

Positive evidence of modal shift associated with the use of any of the MaaS pilots is limited and should be interpreted with caution given the small survey sample sizes. However, Tactran ENABLE provides some evidence that the pilot was useful in supporting those making multi-modal journeys. The Dundee and Angus College Surveys conducted as part of this pilot showed platform users surveyed (n=24) were more likely to be making multi-modal journeys than non-users (15% of non-users (53 out of 351) journey to college had three journey parts, compared to 38% of app users (9 out of 24)) and around a third (8 out of 29 app users) stated that the platform had influenced (a great deal or a lot) how they chose to travel to campus.

More than half of Go NHS Tayside platform users surveyed (52 out of 88) stated that the platform would be more likely to make them consider using public transport and active travel modes with around a third stating they would have used the car if they had not had access to the platform. Similarly, over half of survey respondents (39 out of 69) who had used the National Park Journey Planner ‘Strongly agreed’ or ‘Agreed’ that using the National Park Journey Planner had made it more likely that they would use public transport, walk or cycle instead of drive. Both of these questions are self-stated for the respondent, with no further evidence on observed modal shift provided or comparisons with non-users.

There is evidence from the Tactran ENABLE pilot that MaaS apps gave users additional confidence when travelling by public transport. Only 4% of Go NHS Tayside users reported they were not confident they would reach their destination on time (3 of 76 users surveyed), compared to 21% of non-users (70 of 337 non-users

surveyed).A further indication was provided by the responses to the GoSEStran user survey, with around two-thirds of respondents (16 out of 26 app users) saying that they strongly agreed or agreed that the app encouraged them to use public transport, walk or cycle instead of drive. Due to the small sample sizes of app users, the findings of both surveys need to be interpreted with caution and cannot be generalised to app users as a whole.

Engagement with MaaS Leads

MaaS leads were, in general, positive about the potential for mode shift due to MaaS, though conceded that the numbers involved in the pilots were too small to robustly quantify the modal shift potential or wider impacts of MaaS over the course of the pilot. It was also acknowledged that abstraction from car journeys was less likely due to the user profile being generally existing public transport users. Among public transport users, there were further challenges in introducing alternative modes. Go-Hi suggested that the uptake of e-bike hire was dampened in educational settings due to the Young Persons' (Under 22s) Free Bus Travel Scheme.

Engagement with Operators and Beneficiaries

Operators in the Go-Hi region felt that MaaS has little impact on modal shift away from private cars, and any additional trips by shared mobility or micromobility are likely to come from public transport. One of the Go-Hi DRT operators saw no evidence that Go-Hi had directed new users to their service.

Measures which discourage car use (parking charges, access controls) were seen as the only viable ways to reduce car use. One operator stated that 'carrots' such as free/concessionary public transport do not have an impact and it is unrealistic to expect MaaS to achieve modal shift on its own.

Some of the intended added value of MaaS did not see as great an impact as hoped. For example, Dundee and Angus College students did not value incentives and rewards as part of the app because of the free bus travel they already receive.

There was a view that the app may , in some cases, be counterproductive. A key problem with MaaS apps as highlighted by beneficiaries was that it could unintentionally promote the uncompetitive journey times of public and active travel, in comparison to private car or taxi journeys. They noted that the app could adversely lead to car journeys being chosen over more sustainable modes in contrast with their own objectives.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

> **Poor take-up of account creation/registration limited the potential usefulness of features including carbon dashboards, targeted 'nudge' incentives and tailored journey planning.**

Some pilots reported that it was difficult to get users to sign up to create an account or register themselves on the app. This made personalisation more difficult. A reason cited for the lack of account creation was users being unaware/unclear of the additional benefits of registering.

> **MaaS alone does not produce substantial modal shift.**

Experience from the pilots found that MaaS users are, in general, already likely to travel by public transport, and that additional trips by shared mobility or micromobility are likely to come from public transport, as opposed to the private car. There was some evidence however that MaaS can increase the confidence of users completing a journey on time and without delays. MaaS can also have the unintended consequence of highlighting uncompetitive journey times by public or active travel when compared to private or shared car use. Complementary policy measures are required to generate the conditions for MaaS to have an impact on modal shift.

MIF Themes

Applicants were asked to address one of more of the thematic areas set out in the introduction of this report. While these were referred to in their initial business cases, the final evaluation reports focussed on their own evaluation criteria, rather than presenting evidence around each theme., Though some did report relevant pieces of evidence which could be mapped to one or more of the themes, such as the Making Connections audit.

The most well-reported on themes were "Rural, Island and Communities", and "Tackling Inequality, Accessibility and Mobility Barriers". Many of the pilots were delivered in rural areas (GoHi, Tactran ENABLE, GoSEStran), and some pilots reported findings which showed the impact of MaaS on social inclusion and accessibility to services (NHS Tayside, D&A College as part of Tactran ENABLE).

Overall the themes were not used consistently enough to guide the pilot projects implementation or subsequent self-evaluation. In this section, relevant evidence is presented against each theme, where available.

Rural, Islands and Communities

This theme was specifically referred to in MIF applications for:

- GetGo Dundee
- Go-Hi
- GoSEStran
- St Andrews MaaSterplan
- Tactran ENABLE

Evidence from Reports

Go-Hi stated that rural communities were a focus area for their pilot given “shared mobility services can complement public transport systems by improving accessibility in areas with infrequent public transport schedules or limited infrastructure” and that “rural areas with less public transport are being left behind by MaaS developments because of the importance of public transport to MaaS”. St Andrew’s MaaSterplan noted that ridesharing which was a key component of their MaaS project can help solve the lack of public transport in rural areas.

GoSEStran noted that the most successful DRT examples in rural areas have been where funding is available to provide “new branded rolling stock to accompany the change to DRT”. They also note that rural bus operators in particular do not often have the means for pre-booking and payment which restricts what is achievable through MaaS. Despite this, the analysis of origin and destination data for GoSEStran suggests that the app is supporting individuals in rural locations to plan their journeys and is “of value in addressing the transport poverty endemic in rural locations”. St Andrews’s MaaSterplan notes that challenges remain regarding the service models and available funding for rural DRT services.

Engagement with MaaS Leads

Discussion with GoSEStran suggested that origin-destination data generated by the app provided some detailed insights into rural transport demand, however the numbers of people involved were not statistically significant enough to influence matters such as bus route planning. Go-Hi, however, used a different operating

system and felt the dashboard data returned was not sufficiently detailed to provide reliable insights into demand.

Go-Hi felt that MaaS provides an opportunity to create a more equitable transport system in rural areas, perhaps through the use of mobility credits, as existing schemes like free bus passes having a disproportionate benefit in urban areas where there are more extensive bus services.

Engagement with Operators and Beneficiaries

DRT operators linked with the Go-Hi app felt that the automated route optimisation of their service based on bookings led to indirect journeys and excessive journey times for some users depending on how many people the service was carrying and how dispersed stops were. This reflected that “one size does not fit all” when it comes to planning DRT services in urban and rural areas.

Tackling Inequality Accessibility and Mobility Barriers

This theme was specifically referred to in MIF applications for:

- GetGo Dundee
- Go-Hi
- GoSEStran
- St Andrews MaaSterplan
- Tactran ENABLE

Evidence from Reports

Tactran ENABLE reporting states that MaaS should be “seen as a tool for promoting social inclusion by helping people access services such as employment, education and healthcare”. The report states that user surveys provide “pointers” that a MaaS platform has the potential to enable students to access further education opportunities that they might otherwise miss out on, make it less likely that patients will miss or have to cancel medical appointments (49 out of 88 (56%) users agree “Using Go NHS Tayside planner has made is more likely I will not miss my medical appointment”), and enable people without access to a car to undertake more leisure activities.

Comparisons between the user and non-user subsamples for Tactran ENABLE show that app users tend to have less access to vehicles than non-users. Sixteen per cent National Park Journey Planner users reported having 'no access to a car or driving license' compared with 1% of non-users (n=57 users and 250 non-users), and 17% of GoNHSTayside users do not have access to a car compared to 13% of non-users (n=76 users, 337 non-users). App users were also found to be more sensitive to cost (31% of student myD&A travel users indicated they could not afford the alternative modes of travel compared to 17% for non-users) and more likely to have a disability (14% of myD&A travel student users had a disability which affects their travel arrangements compared to 5% of non-users (n=29 users and 361 non-users)). While these findings show the audience reached by the app are more likely to face barriers to transport, it does not provide evidence that the app contributed to the reduction of barriers to transport for these users.

Both Tactran ENABLE and GoSEStran user surveys also suggested that users of the app are less likely to own a car than the general population and are more likely to suffer from a disability or be sensitive to the cost of transport. There was also a suggestion from Go-Hi that a future application of MaaS could use mobility credits to correct for "spatially unequal" policies like free bus travel, which is of little benefit in rural areas where bus service provision is poor. Due to the small sample sizes of app users, the findings of both surveys need to be interpreted with caution and cannot be generalised to app users as a whole.

Inequality could also be tackled through the development process for the apps. The Tactran ENABLE project included a Making Connections audit which was stated to enable "the design of simple and easy to use interfaces" with a focus on people with disabilities and early onset dementia which improved the accessibility of MaaS.

Engagement with MaaS Leads

For the Tactran ENABLE Dundee and Angus College app, there were more searches for the cheapest travel option. This showed what is important to the specific audience of students.

Discussion with St Andrews MaaSterplan supported the finding from Tactran ENABLE that a MaaS app can facilitate access to education and was especially pertinent in St Andrews where accommodation pressures mean many students live outside of the town.

Engagement with Operators and Beneficiaries

Dundee and Angus College supported statements from the Tactran ENABLE self-evaluation report that the app helped to address mobility barriers for travel to college,

and in particular gave pupils not used to travelling by public transport additional confidence.

One DRT operator felt that solely relying on MaaS as the means for customers accessing services could lead to exclusion for a key part of their target market, as some of their customers would struggle to use an app or even own a mobile phone. A MaaS app solution does not therefore replace the need to maintain phone booking.

Tourism

This theme was specifically referred to in MIF applications for:

- GetGo Dundee
- Tactran ENABLE

Evidence from Reports

A key audience for the LLTNP app were tourists and visitors to the park, and the app had the aim of promoting sustainable tourism and allowing visitors to easily explore options for travel to and around the Park that did not involve driving. User sessions were strongly associated with the National Park's peak visitor season and the large majority of users were from outside the National Park including the central belt of Scotland, and various locations in England and Wales. The app was used to complement the closure of a previously problematic car park at Conich Hill with a MaaS tool which acted as a 'carrot' offering journey alternatives.

Go-Hi suggested that tourists have particularly made use of Brompton and Hi-Bike shared bicycles due to the seasonality of the uptake which has reduced their car use at their destination.

Outreach activities with the tourism industry as part of the St Andrews MaaSterplan pilot received little response due to a lack of interest of "engaging with a pilot project developing an app that has little to no immediate impact on their own business goals".

Engagement with MaaS Leads

Tactran ENABLE discussed the work with LLTNP as being an example of the project fulfilling an unmet need in terms of sustainable visitor management.

Engagement with Operators and Beneficiaries

Loganair felt that tourists are a captive audience for MaaS as this group will typically be looking for onward travel in an unfamiliar environment, while lacking the convenience of a private vehicle. The airports they operate out of in the Go-Hi area are often small and lack clear information about onward connections. MaaS was described as “joining the dots” for the customer’s journey.

LLTNP project partners for Tactran ENABLE discussed the use of the app being a potential tool to manage demand and to direct tourists towards different, less well used parts of the park and relieve pressure on tourist ‘hotspots’. Frustration was voiced that the lack of personalisation of the app did not make this possible. The high profile of the LLTNP brand made marketing the app towards tourists more successful than other apps. The National Park are investing in new transport solutions, such as a trial shuttle bus between Aberfoyle and Callander. A positive feedback loop was set up, with the app used to promote new transport options and new transport options used to promote the app.

Urban Environments

This theme was specifically referred to in MIF applications for:

- Go-Hi
- GoSEStran

The theme was too broad to have drawn out any specific learning points. This was a theme in Round 2 reflecting that appetite for a MaaS app within urban environments where there are plenty of other travel options and provision of a number of zonal ticketing schemes, was not forthcoming at the time of the funding.

Evidence from Reports

GetGo Dundee reported that the implementation of MaaS “must be accompanied by broader urban transport policies prioritising safe access to sustainable travel and discouraging reliance on private car”.

Engagement with MaaS Leads

This theme was not raised in engagement with MaaS Leads.

Engagement with Operators and Beneficiaries

This theme was not raised in engagement with Operators and Beneficiaries.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

> **Pointers towards social inclusion benefits through improved access to education, healthcare and leisure opportunities.**

While the available evidence is limited and often anecdotal from a small sample of respondents, it nonetheless points towards the contribution of MaaS towards the achievement of social inclusion policy objectives, including facilitating access to healthcare, education and leisure activities for those without access to a car or more sensitive to the cost of travel, as these groups were found to have higher uptake of the pilot apps. Deployment of MaaS could also provide a platform to support the distribution of mobility credits through the national entitlement scheme. The fact that user surveys found, users were more likely to face barriers, which could be assisted through Maas tools, also represents useful learning in regard to the potential for reducing inequalities.

Pilot Specific Objectives

Evidence from Reports

As set out in the introduction of this report, each pilot had a number of pilot specific objectives which formed the basis of the self-evaluation report for each pilot. The performance of each pilot against their set objectives is set out in Appendix D.

Though the pilot specific objectives were created by each project team, the extent to which these have been used to evaluate the success of each pilot is mixed. The GoSEStran and Tactran ENABLE pilots both developed a strategic overview containing a goal, priority and objectives for their projects as part of a wider logic model which contained performance measures such as outputs, outcomes and impacts. However for both of these pilots, the pilot specific objectives developed at this stage were not returned to, or referred to, in the final report at the conclusion of the trial. Instead Tactran ENABLE used the NTS2 priorities to group their findings while Go-Hi and GetGo Dundee used a series of Performance Indicators broadly linked to their stated objectives.

Engagement with MaaS Leads

GetGo Dundee attributed the failure to meet some of their initial project objectives to the COVID-19 pandemic, as the app launched in September 2020. Their project had been based around public events, some of which were disrupted/rearranged and measures such as car sharing they initially wanted to facilitate, being discouraged at the time.

While not part of the St Andrews MaaSterplan objectives, they cited successful wider impacts such as raising the profile of MaaS within organisations, including St Andrews University and Fife Council, for which MaaS is now included in their transport plans and strategies written since the pilot.

Engagement with Operators and Beneficiaries

Engagement with beneficiaries did not provide evidence regarding whether the pilot objectives were met. Instead, it highlighted that the objectives of beneficiaries often differed from the objectives of the MaaS pilots. For example, during engagement, Dundee and Angus College stated that the app aimed to address parking pressures on campus and the mobility barriers faced by some rural based students. However, these aims were not directly reflected in the Tactran ENABLE pilot objectives.

While East Lothian Council do refer to MaaS in their local transport strategies, they felt that Journey/Mobility Hubs are an area of greater priority, and that the MaaS pilot could have better integrated with this policy area. Another objective for East Lothian Council as part of the GoSEStran project was to improve perceptions and awareness of a DRT service, and address practical difficulties such as keeping printed timetables at bus stops up to date.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

> **Most pilots did not demonstrate achievement of their stated objectives.**

There was inconsistency between the pilot projects in the way that project objectives are reported on. Objectives referred to in initial applications differed from those in the approved monitoring and evaluation plans and these differed again from those reported on in evaluation reports. Future work should ensure the stated objectives are supported by an overarching evaluation framework, including statement on how

outcomes will be measured and followed through into final reports. A constraint mentioned by all pilots was the time limits of the programme, which did not permit evidencing medium to longer term impacts. Engagement with key personnel highlighted that the pilots would have benefitted from more time to test and evaluate the apps, to realise the full benefits.

Sustainability and Scalability

This chapter explores the evidence, learning points and knowledge gaps from the MaaS pilots around the Sustainability and Scalability of MaaS in Scotland. The key themes explored are Financial Sustainability, Resourcing and implications for a National Roll Out. In each case the topics are considered in turn through the lens of the evidence presented in the final reports provided for each pilot, perspectives from the consultation with MaaS leads, and the engagement with transport operators and beneficiaries.

Financial Sustainability

Evidence from Reports

The pilot reports are in agreement that MaaS would require significant subsidy to operate on a continuing basis. Go-Hi stated that, based on a review of international literature, “Some business models rely on government funding for pilot projects, and their ability to achieve sustained economic viability remains unproven”. Tactran ENABLE reported that income streams will not cover the costs of delivering a MaaS project and that a viable commercial model is unlikely to emerge.

The GetGo Dundee pilot quantified the costs required for maintaining the app and keeping it live at £102,900 annually, which did not represent good value and saw the app withdrawn at the conclusion of the pilot project.

Estimates for the cost of further extension of each pilot were generated. However, it is recognised that estimating the monetised benefits of any of the pilot projects (the monetary value of the benefits generated by the pilot) was a challenge and, as such, none of the pilot projects were able to place an estimate of the ‘social return on investment’ that would be associated with a further roll out of MaaS.

Engagement with MaaS Leads

Stakeholder discussions with project leads found that a key concern about the commercial operation of the platform was the reliance on annual public sector grant funding, which does not provide the certainty required to confidently invest in the app. The GoSEStran app for example secured £100,000 of Smarter Choices Smarter Places funding for 2023/4 and 2024/5 to secure development and upkeep of the app but further funding will need to be secured on an annual basis.

Engagement with MaaS Leads indicated that in order to achieve financial sustainability – by either selling advertising or by adding a small booking fee – a 'critical mass' of users would be required and, in order to achieve this critical mass, a large proportion of the budget (more than 50%) would be required to be spent on marketing alone.

Due to low numbers, rural users were said to be unlikely to sustain a subscription-based model required for commercial sustainability, while recruitment of a broad urban user base was said to be challenged by the presence of commercial competitor apps such as Lothian Buses and City Mapper in Edinburgh for example. More widely, industry literature indicates that there is no clear, commercial business model for MaaS products even in the private sector. MaaS leads suggested that a subsidised MaaS app would be most useful at correcting for market failure (DRT services not being advertised on commercial apps for example) by ensuring the transport needs of all members of society are met. A clear example of this is rural settings where smaller bus operators or DRT services are often not shown on commercial apps, where free government subsidised bus travel has little benefit, or where services such as Uber are not commercially viable to operate.

Engagement with Operators and Beneficiaries

The MaaS pilots delivered as part of Tactran ENABLE sought to differentiate from other, market driven products by focusing on personalisation and catering to a specific need. The LLTNP app for example, offered suggested hillwalking routes and car park locations for the walk, enabling users to plan their trip and alleviate pressure on the most popular locations. However, LLTNP noted that the only way a MaaS app could be financially sustaining is if it includes a greater level of personalisation and ticket selling functions, otherwise it is not unique enough to compete with what is available for free elsewhere through either Traveline Scotland or Google Maps. Operators discussed the ongoing annual cost of maintaining and updating app functionality and API integration on both the side of the MaaS provider and the public transport operator. The share of this cost would need to be covered for both parties in order for it to become sustainable.

Dundee and Angus College said they would likely not be able to continue funding the upkeep of the app if this cost is passed onto them (currently this is funded through Tactran) due to wider financial pressures in the higher education sector. Beneficiaries also stressed that, in terms of transport, the focus needs to be on delivering transparent, reliable bus time information, as opposed to the full MaaS offer initially. It was noted that the Bus Open Data (BOD) regulations now oblige bus operators in England to make this information openly available.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

MaaS requires multi-year funding and consideration of the running costs incurred by operators to gain transport operator buy-in.

The lack of financial sustainability and commitment to longer term funding for MaaS may have also been a factor in the lack of buy-in from some operators, who would be reluctant to upgrade their payment systems for a short-term trial with no guarantees of continued support for the platform. One pilot project felt that if ongoing financial support was not given to MaaS, developed apps would have to be discontinued which would erode trust of both transport operators and partner organisations involved with the branding/promotion of the platform.

MaaS requires a critical mass of users to be financially sustainable.

In order for a MaaS app to be commercially sustainable it will require a critical mass of users through delivering a broad user base in both urban and rural areas. To achieve this would require the development of a MaaS platform capable of competing with existing apps developed by transport operators or the private sector, particularly in urban areas.

MaaS can correct for market failure.

Some of the pilots felt that there is the greatest potential for MaaS in rural and poorly served areas, where there is greatest need for services like DRT and community transport which are not advertised on existing commercial apps. However it should be noted this function may be at odds with commercial sustainability and would require significant public subsidy to achieve it. MaaS apps would inevitably be competing against well-established commercial apps such as Google Maps and City Mapper which have similar journey planning functions, albeit for a more limited selection of modes for which they have chosen to include based on existing commercial relationships, or to maximise their number of users/user satisfaction.

Resourcing

Evidence from Reports

All pilot projects recognised that upkeep of a MaaS app would require ongoing resource to ensure it is kept functional, up to date and well promoted.

All pilots outsourced project management and monitoring at some point, and in some cases coordination of marketing activities. For some of the pilots resourcing the roll-out of a MaaS platform proved to be an unanticipated challenge, with the GoSEStran pilot reporting that the application process itself for the MIF was very resource intensive.

The lack of direct support from local authorities was also raised, with St Andrews MaaSterplan suggesting that local authorities should have a dedicated officer who can work to implement MaaS solutions in their area.

The Tactran ENABLE pilot which relied heavily on external 'service leads' as the branding for the platform felt that a possible threat would be competing priorities of these organisations and the lack of an embedded MaaS resource/officer to keep interest up in the app.

Engagement with MaaS Leads

The University of St Andrews MaaSterplan project team encountered a lack of procurement expertise with this project, which they described as "unchartered territory" for them as an organisation. Such points were echoed by the GoSEStran project team. Given the level of legal investment required to draw up the contract, the delivery of a contractual model that can be rolled out elsewhere was considered a key contributor to the value delivered by the pilot. Go-Hi specifically emphasised the importance of having a dedicated project manager as part of the pilot in the discussion.

Engagement with Operators and Beneficiaries

Brompton Bike Hire noted an ongoing resource is required to keep APIs updated to ensure the app can offer the full-service capabilities of the operator. They suggested this would be an annual cost to both the operator and MaaS provider.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

MaaS requires ongoing resources to maintain an online app.

Pilot projects reported that keeping the app online would require ongoing and dedicated resources both in terms of finance and staffing to ensure apps continued to host the correct information about modes, had compatibility with the most commonly used mobile devices, and marketing effort to keep awareness of the apps high among the target audience.

Lack of resources in Local Authorities to deliver MaaS.

None of the pilot apps which are still live were delivered directly by local authorities, with the GetGo Dundee pilot app being withdrawn due to a lack of funding at the city council to continue support. Although some level of engagement with local authorities was attempted by pilots, this largely exposed the fact that local authorities are not well placed to deliver MaaS in term of the financial and staffing resource they could dedicate to the platform.

National Roll Out

Evidence from Reports

The trials opened up considerations regarding which level of the transport hierarchy could most effectively develop, operate and promote a MaaS app. Although the pilots were in five distinct areas, three of the pilots gravitated towards the same back-end platform which could support a hypothesis that an app is best delivered nationally with a single back-end system in order to reduce duplicate effort. However the most successful pilots in terms of user reach were Go-Hi and Tactran ENABLE which were branded and promoted at a hyperlocal level.

The Tactran ENABLE pilot felt that MaaS should continue to be supported and the pilot apps should stay live, as a break in the delivery of MaaS would erode the trust of operators, who may have spent time and resources on updating their systems to integrate with an app, and any partner organisations involved with the branding and promotion of the app.

Other insights included the fact that MaaS is not a ‘silver bullet’ to peoples’ transport needs and problems with GetGo Dundee stating that “it should be viewed as a tool

that complements government initiatives to reduce car usage". Evident across all the pilots is that the success of MaaS is reliant on a set of high-quality transport options being available. For the GoSEStran pilot the key learning was that transport modes should be in place and operating as intended before 'overlaying' the MaaS platform. The Go-Hi report stated that "MaaS is well placed to be one of the pillars of travel behaviour change" but both the GoSEStran and St Andrews MaaSterplan pilots found that the 12-month pilot was not long enough to see substantial behaviour change. This may have been exacerbated by the lack of a unified evaluation framework across all five pilot projects. Further support for MaaS, and its success is largely dependent upon being able to demonstrate benefits in a range of policy areas, something which remains a knowledge gap from the pilot projects.

Engagement with MaaS Leads

ENABLE and Go-Hi felt that for further roll out of MaaS, a single base platform would be the most beneficial and effective method to take forward for the whole of Scotland but noted that having separate apps branded by destinations/partner organisations has helped with uptake. This is a model which St Andrews MaaSterplan felt could be beneficial with local authorities and community based projects that could feed into a national MaaS app in a 'bottom up' approach, with the development of modes (including peer to peer car share/car clubs) occurring at a hyper local level in some cases and forming the building blocks of any MaaS system.

GoSEStran emphasised the importance of ensuring that a national MaaS solution works effectively and serves rural areas, as well as urban areas, and that getting suitable transport modes set up in rural areas may require more time and attention.

Interviewees noted the Finland model of MaaS regulation may be a viable approach for developing MaaS in Scotland on a national scale, where operators are required to sign up to a MaaS platform and provide compatible APIs to enable integration of journey planning and ticketing systems. They noted this approach may encounter acceptability concerns from operators which could be overcome by better demonstrating/evidencing the benefits of MaaS to operators in terms of increased passenger numbers/profits.

Go-Hi discussed the potential to hold the National Entitlement Card on the app, through the ITSO environment, though noted some compatibility issues with Apple devices. They also felt that a future application of MaaS could be business travel planning which was trialled in their pilot by HITRANS with interest expressed by Shetland Islands Council.

Engagement with Operators and Beneficiaries

Operators noted that fragmentation of the MaaS landscape presents an issue for them, as not all MaaS platforms have the same compatibility with standard APIs, meaning operators need budget to generate bespoke APIs for different platforms. Operators involved in the Go-Hi pilot felt that the platform should be given wider geographical coverage which would result in efficiencies in not needing to integrate with multiple platforms covering different geographical areas. There were reflections from operators that the MIF programme possibly awarded funding to too many pilots, leading to a fragmented MaaS landscape in Scotland with three competing platforms developed.

For beneficiaries, Dundee and Angus College felt that the Tactran ENABLE platform they used should be rolled out to other further education institutions in order to provide economies of scale and mutual benefit.

East Lothian Council involved in the GoSEStran pilot felt the best solution would be an integrated journey planner containing all public transport operators and suggested the ongoing Transport Scotland DTDS project or measures similar to the DfT's Bus Open Data regulations as a way that this could be achieved, stating there is currently too much fragmentation in the availability of public transport data. Expanding the role of Traveline Scotland as a MaaS provider would integrate with their existing work in the DTDS project.

Beneficiaries engaged in this evaluation supported the review of the MIF and suggested that, rather than continue to fund a particular solution, that the opportunity exists to gather all the learning from the pilots in order to draw up a service specification for an open tender into a Scotland-wide solution.

Key Learning Points

From the evidence gathered, the following key learning points have been identified.

> **There is value in a 'bottom-up design - top-down delivery' model, with a broad geographic scope delivering critical mass.**

The most successful pilots in terms of user reach were those branded and promoted at a hyperlocal level, and there is value in a 'bottom-up' approach in creating/growing modes such as bike hire and car share which are the 'building blocks' to a successful MaaS app. However it is also clear that people travel outside of one local authority or region for their travel, and a patchwork of different MaaS apps with coverage of specific areas would not be desirable. Therefore a blend of approaches, with

engagement from a range of national and local stakeholders is important to facilitate the successful implementation of MaaS.

Requires high quality transport modes and complementary policies to be successful.

A key learning point has emerged that a MaaS platform is only as good as the transport modes that it hosts. For most of the pilots the key takeaway was that MaaS could only complement the transport modes in place and is not enough of a behavioural change pull factor on its own. MaaS is not a 'silver bullet' to people's transport needs and problems but could be effective as part of a suite of measures. Its success needs to be supported by complementary policies which prioritise safe access to sustainable transport and discourage the use of the private car.

Different approaches for future delivery of MaaS

Different parties involved with the pilot projects made suggestions for the different ways in which MaaS could be rolled out in the future in Scotland. These approaches could include developing one of the pilot apps into a national platform, or as a beneficiary suggested, tendering on the open market, and drawing up a detailed service specification taking on board the learning points gathered from the pilots to address the difficulties encountered with modal integrations and monitoring.

Summary

The MIF programme delivered a total of five MaaS apps, across five pilot projects, operating on three base platforms. In total, MaaS apps funded by the programme were downloaded over 26,000 times. To varying extents, a multitude of transport modes have been integrated, including planes, public buses, club car, DRT, taxi, community transport, cycling, walking, trains and ferries. There was a perceived benefit of developing and building innovation and the delivery of these in Scotland as a pioneer in this field. Some pilot projects achieved the full 'plan-book-pay' ambition of MaaS, to varying degrees with some modes of transport. The funding programme has unlocked a wide array of learning and collaboration opportunities between local authorities, regional transport partnerships, transport operators, public sector organisations and UK-wide network of mobility organisations. This can be considered one of the key benefits of the funding and support provided through the fund. This study has endeavoured to capture some of this learning, though the ongoing value will be in the development of the relationships now established.

The MIF has enabled MaaS to be applied as a potential solution to a wide variety of transport issues facing Scotland today. MaaS has been tested as a solution to the lack of multi-modal public transport journey planning information, the difficulty in accessing rural transport (specifically Demand Responsive Transport) and to enable introduction of new mobility solutions such as car clubs and bike hire. From this experience, the need for consistent and reliable real-time journey planning information has emerged as a prerequisite for MaaS to succeed. It is understood that Transport Scotland is now developing the DTDS project to address this need. In order to ensure the success of this project, it is likely that legislation is required in order to compel public transport operators to provide open data. The MIF work and evaluation will help inform that legislation and this should be considered as a benefit of the work. The model for this may reference the Bus Open Data requirements for services in England or could be based on a more comprehensive model enacted in Finland where service providers are required to provide access to timetable and price data and make ticketing functionality available to third parties for the purposes of MaaS development.

A critical question for the future of MaaS funding is the tension between commercial viability and social good. Commercially viable journey planning and ticketing, which caters for the mass market and dense urban transport networks exist in the form of apps such as Google Maps, Citymapper or popular apps developed by individual transport operators. The MIF pilot projects have identified the need for digital solutions to transport problems faced by marginal social groups such as NHS patients or college students. These 'niche' needs are unlikely to support a commercial model.

Effective and sustained marketing has been highlighted across the programme as a key requirement for a successful and targeted solution to work. The importance of communicating through a trusted and recognised brand has been identified, as well as the need to approach potential users with a solution to a clear transport problem that they face or a service they are actively seeking. This was evidenced by the overwhelmingly popular LLTNP app, which provided a convenient solution for visitors.

The MIF pilot projects also identified a specific, but separate, need for the development of bespoke digital solutions for DRT. Though some MaaS projects aimed to incorporate DRT, there was evidence of the need for reliable and user-friendly DRT services to be in place before the development of a MaaS platform, rather than developing both in tandem. Though MaaS did not present this solution, specific and tailored DRT products, supported by service improvements and strong messaging were seen to be effective.

Future funding for MaaS should be based on the achievement of specific and measurable objectives. Further development of MaaS in Scotland could be taken forward in several ways:

- one or more of the existing platforms could be funded into a second phase in order to build on current successes;
- the learning and understanding of MaaS to date could be used to define the specification for a Scotland-wide MaaS platform; or
- Transport Scotland could adopt a market-based approach, where commercial apps or operator apps are left to emerge.

In any of these scenarios, the need for a supportive legislative environment to enable MaaS is likely, however the extent to which this is implemented is dependent on what is best suited to the needs of users.

Knowledge Gaps

There remain a number of knowledge gaps in the evaluation of the MIF pilot projects and the outcomes of the programme as a whole. These have been prioritised as part of the scoping of the future of MaaS in Scotland in the following categories:

- Key Question: The issues which need to be addressed directly to enable further progress on MaaS in Scotland.
- Further Research: Additional research which may be beneficial to understand the full potential of MaaS in Scotland.

Viability

Key Question:
How to enable full integration from all operators?

A variety of modes were accommodated across the various pilots, including bus, rail, ferry (Go-Hi), car club and bike hire. The success in integrating different operators was dependent on the capacity and willingness of those operators to engage. In Scotland, journey planning information is now provided by Transport Scotland in an open data format. This includes all modes of public transport, plus some active travel information such as bike schemes. The Bus Open Data (BOD) regulations now oblige bus operators in England to provide live information. It was suggested that this requirement could potentially fulfil a specific need identified by this pilot. The MIF project will help in shaping any similar bus open data legislation in Scotland. However this does not address the requirement for operators to provide a route for third parties to retail and book. Different proposals could include ensuring that operators future service contracts include this as an option.

Key Question:
What are the organisational capability and capacity requirements for procuring a MaaS platform?

Areas such as data protection and app procurements were recognised as unfamiliar territory for pilot project leads and took up more resources than anticipated. Whilst the pilot projects overcame these challenges by engaging specialist legal advice, this was costly . It is not clear what lessons were learnt, and whether the capacity for delivering MaaS could be utilised for further development of the concept in Scotland.

Further Research:
The impact of personalisation.

Due to the lack of sign up/account creation, features such as carbon dashboards, targeted nudge incentives and tailored journey planning to users' preferences/requirements could not be fully realised or determined if needed.

Further Research:
Is there a ceiling to the reach and success of a MaaS marketing campaign?

The overall effectiveness of marketing and understanding of MaaS as a concept in reaching a wide audience is potentially limited. Pilots which conducted non-user surveys found that the majority of non-users had not heard of the apps. Further work may be required to understand whether MaaS can be successfully marketed, the concept understood and adopted by a wider audience.

Further Research:

Can MaaS provide a catalyst for the development of new mobility?

Some of the pilots reported that having a workable MaaS platform could act as a catalyst for investment in new modes and allow for better awareness around initiatives such as Mobility Hubs and Park and Ride sites. The pilot projects which involved developing a new mode/service to feature on the app were generally unsuccessful given the time constraints and budget limitation of the MIF, so this remains a knowledge gap for a more widespread implementation of MaaS.

Impacts

Key Question:

What are the collective objectives for MaaS in Scotland in the future?

Pilots chose their objectives based on the MIF guidelines document and were evaluated by the MIF panel before an award was made. As described previously, these were, by necessity, multifaceted and enabled experimentation with the MaaS concept and learning to take place. However the objectives of some operators and beneficiaries sometimes differed to those of the MaaS provider and therefore were not always reflected in the pilot specific objectives. Future pilot(s) would benefit from a unified evaluation framework containing alignment of objectives between Transport Scotland, MaaS leads, operators and beneficiaries reviewed in light of the learning gathered throughout this pilot process, would now help to build a stronger evidence base to measure the ongoing impact of MaaS in Scotland.

Key Question:

Is it possible to quantify the social return on investment of MaaS?

The pilot projects reviewed have produced evidence that the application of MaaS has the potential to address social issues, such as lack of access to transport among

rural populations or addressing the travel needs of marginalised groups. However, the evidence available was not collected in such a way as to allow a clear statement to be made on the value for money of the investment. This would support a more compelling case for future government funding towards MaaS and enable comparisons across spending priorities.

Key Question:
What is the impact of MaaS on modal shift?

Due to the difficulties with monitoring the impacts of a MaaS app, the impact on modal shift is still largely unknown. Most obtained data comes from a small sample of users who tended to plan public transport journey on the app, but it is not known whether these are trips which would have otherwise taken place by car.

Further Research:
Use of the Urban Environments theme.

There was limited evidence reported against the Urban Environments theme, with a key knowledge gap remaining on how MaaS can interact with existing urban transportation policies such as Low Emission Zones, smart city schemes, localism or multi-modal smart and integrated ticketing zones.

Sustainability and Scalability

Key Question:
Is there evidence of a sustainable commercial model?

Establishing a sustainable commercial model for MaaS is a knowledge gap as pilots either operated as ‘not for profit’ or took commission from booking payments which was not significant enough to cover costs. Establishing a viable commercial model for MaaS is difficult given the number of competing apps available free of charge for the user, and the cheapest tickets always being available directly from the operators.

Further Research:
What is the economic cost of not proceeding with MaaS?

The cost of not promoting multi-modal trips for either modal shift or reducing inequalities was a key concern raised in the Tactran ENABLE report. However all of

the pilot projects faced challenges quantifying the economic or social cost of not proceeding with a further roll out of MaaS.

Next Steps

This evaluation has identified value of the MIF programme in terms of knowledge gained, upskilling of the sector and partnerships developed. However, there remains clear knowledge gaps and insufficient evidence to reach conclusions relating to the value for money of MaaS or the mode shift and social return on investment that might be achieved by its wider roll-out.

A scoping phase is now required in order to establish the required outcomes of any further investment into MaaS. The following actions are recommended:

Development of programme objectives and evaluation framework

It is recommended that the findings from these pilots are used to inform a shared set of objectives for future investment in MaaS be established to direct investment and act as the basis of an evaluation framework which can be used to monitor progress over time. These objectives could be reviewed as part of a workshop with MaaS developers, transport operators, users and beneficiaries. This will ensure the buy-in of all groups from the onset by taking account of the views of all parties required to make MaaS successful. The objectives should be based on SMART principles (Specific, Measurable Achievable, Relevant and Time-Bound) and upon a shared vision and definition of MaaS in Scotland.

Define governance structure and delivery framework

The pilot projects were delivered in partnership between Transport Scotland and a mix of local authorities, RTPs, public institutions (NHS, Colleges, National Park) and commercial transport operators. The MaaS working group consisted of transport, MaaS and industry experts and was established in 2018 to agree and assure the delivery of the project deliverables for the MaaS Investment Fund, be decision makers, provide direction, and be global ambassadors for MaaS. The structure within which further investment of MaaS is delivered should be therefore developed in partnership with delivery partners from the existing pilots to ensure future investment builds upon the learning points from investment to date.

Review of legislative requirements

Once the direction of MaaS is established, the requirement for legislation to enable better integration of transport operators with MaaS platforms can be examined. This could reference the provisions of the Transport (Scotland) Act 2019, which enable greater control of bus services by local authorities.

Within this context, there may still be a need for a legislative instrument requiring public transport operators to provide integration of planning, booking and payment functions with MaaS platforms. In-turn, this may also require a reasonable level of grant funding for smaller operators to comply with any new legislation.

Develop specification for MaaS platform

Informed by the previous steps, there may be merit in agreeing a specification for the procurement of a suitable MaaS platform which gathers learning points from the MIF pilots and ensure that the functionality and outputs of any developed MaaS solution meets the expectations of transport operators, users and beneficiaries.

Appendix A – Discussion Guide

Part A: Viability

This section is interested in finding out what worked for whom and why: Understanding which of the trialled approaches worked best in the Scottish context, with a view of informing priorities for future investment decisions. First, we need to understand if what was created represents the Minimum Viable Product (MVP) required to trail a real life MaaS solution. These questions focus on the practicalities of how the solution was developed and what the challenges were to achieving the MVP.

Technically:

1. What key features did your App provide, e.g.:
    - Multi-modal journey planning
    - Real time service/timetable information
    - Account based payments
    - Multi-modal ticketing/cost capping
    - Incentivisation/nudge messaging, etc
2. Did you experience any technical challenges with the App?
3. What data did the App produce and how did you use it?
4. Was there anything that it couldn't do that you had wished it could?

Commercially:

5. How did the commercial model work, what are the key cost elements and revenue sources?
    - Did your project generate any learning points around cost-savings/efficiencies?
6. Was service operator buy-in a problem? Did this vary by mode/operator? Are there any learning points regarding incentivising operators? [prompt: integrated ticketing and revenue distribution]
7. What was your marketing strategy, i.e. how were target audiences reached? Are there any learning points or best practice approaches around maximising uptake/reaching target audiences?

Partnerships and Collaboration:

8. Can you provide a brief description of the relationship between the platform provider, operators and yourself as the promoter (any other parties relevant?)
9. What were the key challenges around setting up and agreeing the roles of each party? How were they overcome?
10. Who owns the app and data in the long term? What are the implications?
11. Would you make any changes to the contractual set up in the future, and if so, why?
12. How do operators interface with the system, e.g. do booking link to their system, or are revenues distributed retrospectively. How well does this work? Would you make any changes?

Part B: Impacts

This section of the discussion aims to understand what the intended outcomes of the trail were from the perspective of the applicant, the extent to which these were achieved and what contribution this made to wider Scottish Government outcomes.

Objectives and scope of the trial [state our understanding of the objectives used for each individual pilot, then]:

1. Ultimately, what did you want to achieve from employing MaaS in the way that you did, i.e. what challenges were you hoping to address?
2. How did the deployment of MaaS fit within/complement your wider programme of travel/behaviour change?
3. To what extent has your solution contributed towards wider RTS and NTS2 priorities?

Monitoring and Evaluation

4. Did you undertake any monitoring or evaluation activity as part of the Pilot?
5. Can you tell us a bit more about what that involved in terms of planning and data collection?
6. What challenges did you face in terms of providing evidence to understand the impact of your MaaS Pilot?

Achievement of project objectives:

7. To what extent were your stated objectives achieved?

    - Can you highlight which areas were most successful, and which less so?
    - Where less so, what were the barriers, could anything have been done differently to improve the outcomes?
    - Where successful, what were the key factors?

Overarching benefits of the trail:

8. What aspects of your MaaS implementation have:

    - Shown most promise to contribute to these benefits in a wider roll-out?
    - Which have been less successful and why?

Part C: Sustainability and Scalability

Does the learning from the pilots translate into clear recommendations for the wider roll out of MaaS in Scotland, is there enough evidence for this, and if so, what's the best solution?

1. Following set up, to what extent was the service self-sustaining? How could this be achieved in future?
2. So, what are the key insights relevant to the potential future roll out of MaaS across Scotland? Discuss barriers and opportunities.

Appendix B – Pilot Outputs

Metric	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
App Developer/Key Partner	Urban Foresight, developed by Ember Technologies	Fleetondemand	Fuse Mobility, developed by Ember Technologies	Fuse Mobility, based on the same platform as Tactran ENABLE.	No specific app, uses GoSEStran app
App Functions	Five main pages covering a map with nearby transport services, journey planning based on Traveline data, and events pages displaying offers and directions.	Mobile and desktop-based apps, base product is Mobilleo software and uses existing API feeds and Flashpass to enable ticketing.	Three separate apps/websites designed for Dundee and Angus College, LLTNP Authority, and NHS Tayside.	Multi-modal journey planning, information on transport hubs, EV charging and Park & Ride sites, account creation, explore trials and points of interest	Addition of new modes in St Andrews including walking routes.
Level of Integration	Journey Planning	Journey Planning, Real-time information, accounts-based booking and payment	Journey Planning, Booking and Payment (for rail and taxi through existing aggregators)	Journey Planning, Real Time Information, Booking and Payment (for rail and taxi through existing aggregators)	Journey Planning, Real Time Information, Booking and Payment (for rail and taxi through existing aggregators)
Modes	Public Bus, Taxi, Car Hire, Bike Hire,	Public Bus, DRT, Taxi, Car Hire, Bike Hire, Cycling,	Public Bus, DRT, Taxi, Community	Public Bus, DRT, Taxi, Community	Public Bus, Taxi, Car Hire, Walking, Train

Metric	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
	Cycling, Walking, Train	Walking, Train, Ferry, Airplane	Transport, Cycling, Walking, Train	Transport, Cycling, Walking, Train	
App Launch	September 2021	June 2021 (new modes added through 2022-24)	August/September 2021	August 2022	September 2023
Marketing Methods	Email at event booking confirmation, social media, local radio, posters at areas of interest.	Hyperlocal campaigns linked to specific transport developments (Inverness Airport Rail Station opening)	Through service leads via appointment letters (NHS), staff bulletins, social media posts, National Park website.	Partnered with East Lothian Council and Queen Margaret University to help promote app. Also printed advertisements, posters at bus stops and leaflet drops.	Various channels including through university matriculation, freshers' fair event, podcast audio advertisements.

Table 1- Pilot Outputs

Appendix C – Evidence of Uptake

Metric	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
Number of Downloads or User Sessions	1,523 downloads (26 months after app launch)	5,000 downloads (24 months after app launch)	D&A College: 1,303 user sessions, LLTNPA: 10,996 user sessions, NHS: 2,342 user sessions (16 months after app launch)	3,400 total new user sessions (14 months after app launch)	1,700 downloads (attributed to St Andrews Marketing over a 5-month period)
Number of Registered Accounts or Returning Users	324 accounts created	3,553 registrations	D&A College: 486 returning users (65 registered accounts), LLTNPA: 3,103 returning users (278 registered accounts), NHS: 278 returning users (account	306 registered accounts	No evidence from final report

Metric	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
			registration not possible)		
Number of Journeys Planned or Booked	1,505	450 bookings made using Go-Hi directly	D&A College: 2,252, LLTNPA: 11,025, NHS: 1,945	3,653	Unknown
User Demographics	A range of user characteristics such as commuters, families and football fans.	Unknown	Though data was gathered across users of three different platforms, all user surveys showed the same trend. Users tend to be younger and more likely to have a disability, and less likely to have access to a car than non-users.	Less likely to have access to a car and more likely to be disabled than general population.	Unknown
User Locations / Origin-Destinations	Unknown	Majority live within Hitrans region	D&A College: 31% of journeys involved a	Most journeys planned from Haddington	Unknown

Metric	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
			trip to/from a college campus. LLTNPA: majority of origins central belt of Scotland. NHS: 49% of journeys planned to Ninewells Hospital (From app data)		

Table 2- Evidence of Uptake

Appendix D – Performance Against Stated Objectives

This appendix presents how each of the MIF pilot projects reported on their progress and performance against their own objectives from their final evaluation reports. However, in many cases the issue or theme picked up in the pilot specific objective is captured elsewhere in reporting – in most cases against the MIF Theme initially stated. The list below, therefore, follows a strict interpretation of whether the pilot specific objective was reported upon in its given format, rather than as general discussion or against a different objective.

GetGo Dundee:

- Providing standardised web-based Dundee travel information to improve the uptake of sustainable modes.
    - Achieved
    - “This feature was integrated into the GetGo App”
- Including shared E-bikes in travel ticketing to improve uptake of sustainable modes.
    - Achieved
    - “This feature was integrated into the GetGo App”
- Using the bespoke GetGo Dundee app to improve the uptake of sustainable modes.
    - Not Achieved
    - “This objective was more challenging to measure as the app doesn’t allow for booking”
- Using the NEC platform to improve uptake of sustainable modes.
    - Not Achieved
    - “The NEC card is a smart card; therefore, its integration into an app is not feasible as a transaction must be done. A user needs to validate its NEC even for free travel making it more suitable in a digital wallet for example.”
- Using integrated ticketing through the ShareMORE app to improve uptake of sustainable modes.
    - Not Achieved

    - "Real-time information as specified was not feasible or at least not in the remit of the software developer in charge of the app development but not completely impossible"
- Including temporary "last mile" services to events to improve uptake of sustainable modes.
    - Not Achieved
    - "This was reviewed as feasible with Software developer – this should be integrated at a later stage"
- Determining how personalisation of services through the ShareMORE app can improve the uptake of sustainable modes.
    - Not Achieved
    - "This would be reviewed as part of a wider deployment of the app but based on engagement, this was on track during pilots – rail and air travel should be integrated at later stage"

Go-Hi:

- Improve access to integrated transport services in Highlands & Islands.
    - "Difficult to measure meaningfully; results from the Motability trial suggest that this is the case for disabled people"
- Test feasibility of Mobility as a Service in a rural context.
    - Not directly reported on
- Encourage a shift from sole occupancy cars to more sustainable travel options.
    - "Demonstrable potential"
- Create healthier lifestyles by improving sustainable travel choices, including active travel.
    - "Insufficient uptake to measure meaningfully"
- Support the delivery of Transport Scotland's National Transport Strategy 2.
    - "Insufficient uptake to measure meaningfully"
    - Focused solely on Carbon Emission reduction: used emission savings from the use of Car Club vehicles instead of private car, found "potential for significant CO2e savings (between 20% and 26%) due to better fleet characteristic and more efficient vehicle utilisation"

Tactran ENABLE:

- Promote better travel choices and access to services and opportunities (e.g. healthcare; employment, education and training; leisure) by offering ENABLE users personalised, high-quality, integrated, digital transport information, as well as booking and payment solutions.
- Though the majority of the report was reporting on the success of promoting travel choices and access to services and opportunities to users and the value of the tool to the services, this was not presented in response to these specific set of objectives. Deliver services that are valued by participating mobility service providers and partner organisations.
    - Not directly reported on
- Identify a business model that facilitates: delivery of public policy objectives; good governance; the ability to upscale; and commercial success.
- Section 4 of the Tactran ENABLE evaluation report discusses the learning points around the business model, using a scenario matrix to illustrate this (high profitability vs high societal benefit) Evidence from Tactran ENABLE states that MaaS is not financially self-sustaining in the geographies that cover most of Scotland, without ongoing public sector support.

GoSEStran:

- To investigate whether a MaaS tool of this nature could help address one of the Fund's key themes of transport poverty in a rural context.
- Not reported upon against this objective, in this format. However, the potential impacts of the pilot on tackling transport poverty in a rural context were described against the theme. This is reported upon in that section in this report: GoSEStran user surveys also suggested that users of the app are less likely to own a car than the general population and are more likely to suffer from a disability or be sensitive to the cost of transport.
- To explore links between MaaS and a linked Digital DRT bus service.
    - "GoSEStran has successfully 'lightly' integrated DRT services across the region"
    - "Limited funding forced technical innovation and the creation of a digital back office for DRT operations in GoSEStran"
    - "Vehicle, as well as tech funding may help to address challenges" such as increasing fuel costs and driver shortages

- "Many DRT operators have hesitation to trial new concepts with the unknown situation they are currently facing, with driver shortages and reduction in funding"

St Andrews MaaSterplan:

- To scale an existing MaaS digital platform to meet the needs of visitors, commuters and the residents of St Andrews
    - "The exercise of building upon an established platform and leveraging the expertise of SEStran and their developer has demonstrated that scaling up existing solutions rather than developing new solutions can save money, time and marketing effort"
- Explore and facilitate bringing new sustainable modes of transport to the town of St Andrews.
    - Not achieved
    - No new sustainable modes were introduced in St Andrews aside from a smart walking feature within the application.
- Incorporate the following (existing and new) transport modes to provide multi-modal and mixed modal routing into the app: demand responsive transport, bikeshare, rideshare, carshare, peer-to-peer car share, walking, public transport and taxis.
    - "Carclub, Rideshare and Peer-to-Peer car share integrated into the app"
    - "Bikeshare and DRT were extensively explored, and efforts were made to bring them into the town"
- Implement and analyse marketing strategies to engage, acquire and retain users for the MaaS digital platform.
    - Extensive commentary is provided on the effectiveness of different marketing methods and channels
- Monitor and evaluate the project, to indicate successes, failures, challenges, impacts and any unintended consequences.
    - "Progress on all indicators and outputs has been submitted to Transport Scotland through monthly meetings and reports"

Appendix E – Monitoring and Evaluation Activities

Activities	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
Dashboard	Number of downloads, returning users and modes of planned journeys.	Number downloads, registrations and bookings. Detailed breakdowns of bookings by duration and distances for car club, bike hire and DRT.	Number of downloads, user sessions, accounts created and journeys planned.	Number of downloads and registered accounts. Planned journeys only captured for registered users.	Number of downloads linked to marketing activity specific URLs.
User Surveys	Surveys at each pilot event, sample sizes not reported.	Onboarding survey (2021) with 35 responses, user experience survey (2023) with 54 responses.	Small numbers of users collected as part of wider sample; D&A College: 36, LLTNPA: 69, NHS: 29	26 responses	None
Non-User Surveys	None	Region wide sample of 202	Full sample of surveys were; D&A College: 569, LLTNPA: 319, NHS: 425	292 responses	None
Focus Groups	None	None	None – dropped due to budget constraints.	1 focus group with 4 attendees	Intended to hold but not undertaken.

Activities	Get Go Dundee	Go-Hi	Tactran ENABLE	GoSEStran	St Andrews MaaSterplan
Other Evaluations	None	Lessons Learnt exercise undertaken by Arcadis mid-project in 2022.	Process review and economic value for money assessment.	Partner interviews with Fuse Mobility and East Lothian Council.	Detailed evaluation of different marketing channels.

Table 3- Monitoring and Evaluation Activities

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