GO-HI
Highlands & Islands
Travel Made Simple

GO-HI Project Evaluation: FINAL REPORT

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Executive Summary

Overview

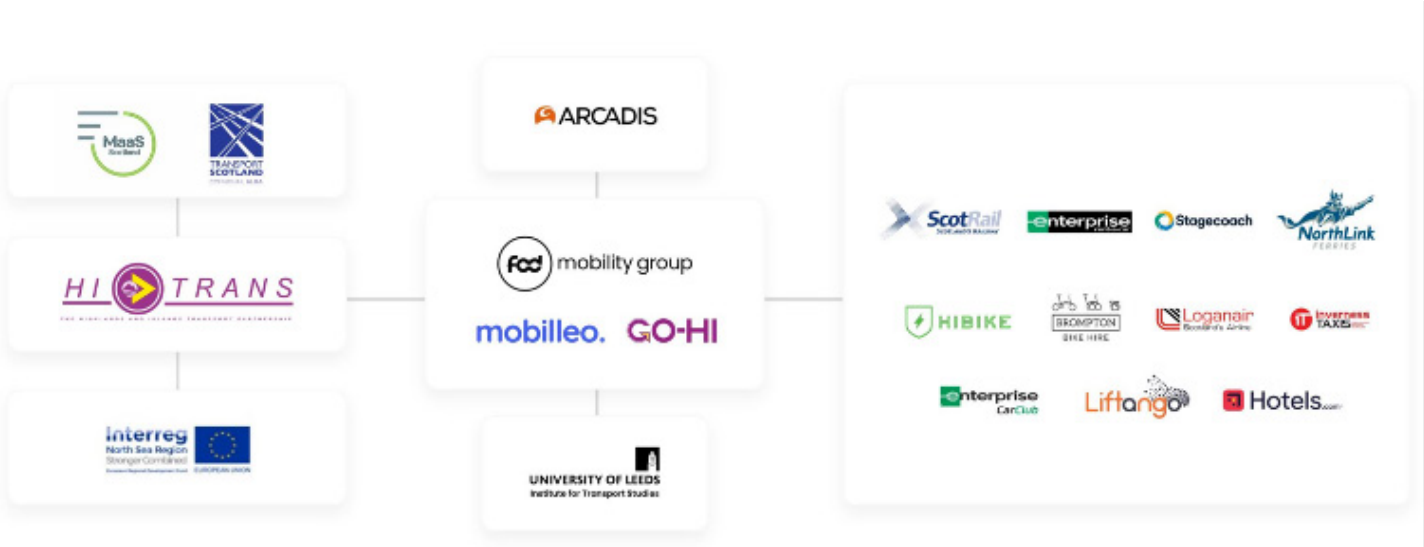
Mobility as a service (MaaS) is a service that, through a joint digital channel, enables users to plan, book, and pay for multiple types of mobility services. GO-HI adheres to the true definition of MaaS, by including journey planning via multiple data sources, operator interfaces to facilitate booking of travel, integrated payment via a dedicated PSP and fulfilment via integrated ticketing where available.

GO-HI is the first regional MaaS platform to launch in the UK. Moreover, it covers a primarily deep rural geography, including islands, with a low population density. These are all geographic factors that are known to be challenging for delivering public transport. There are challenges in supporting an ageing population and in reversing depopulation. The app went live in summer 2021; as this was during the protracted period of pandemic-related disruption to travel patterns, it got off to a slow start. In some ways this was beneficial as it enabled the integrations of new modes to proceed stepwise. GO-HI has been the first in the UK to integrate ferries and bike share for example. There are also many smaller providers of bus services, with less developed technology capacities. GO-HI has also pioneered adding DRT to the MaaS mix in the UK.

In terms of evaluating the project, there is no standardised method for evaluation of MaaS; an existing framework, KOMPIS, proved to be more suited to a small-scale project with a pre-recruited pilot population rather than a large-scale regional on-going deployment. Evaluation has therefore focused more on learning than 'proving', since globally, MaaS remains a niche technological innovation with insufficient time to become adopted by the bulk of populations beyond 'Early Adopters'. Nevertheless, it is a concept that still has a great deal of untapped transformative potential.

Objectives

- Improve access to integrated transport services in the 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, inc. active travel
- Support the delivery of Transport Scotland's National Transport Strategy 2



Project Highlights

Growth:

- Now at 3,500+ registered users
- Gone from 36 bookings to over 200 by mid 2023
- 2 organisations now use MaaS for business travel. Plans underway to explore further B2B rollout in support of a self-sustainable MaaS programme
- Industry prizes – validating quality and innovation

Mode innovation:

- First MaaS platform to integrate ferries (Northlink). Plan to integrate Calmac (reliant on the operator providing an API for ticketing) and Orkney Ferries (once new Ticketing system in place but provider API proven on separate integration).
- First UK MaaS platform to fully integrate Digital DRT (Shotl integration)
- Better DRT booking and routing tech increased use
- Integration of Stagecoach bus ticketing
- Integration of 24/7 eBike and Bike Hire Booking
- Mobility Credit Pilot with Motability
- Clear potential for sharing schemes
- Growth in car club use and in two types of bike-share scheme
- Supported Air – Bus – Rail Integration at new Inverness Airport Station with free bus link initiative.

Evaluation activities have harnessed new secondary data sources to assess spatial prioritization for the PT and shared modes infrastructure that provides the backbone of MaaS.

Research Findings

Baseline survey

A baseline survey in Quarter 2 of 2021 investigated
i) current travel behaviours,
(ii) intentions (taking into account the stage of COVID-19 lockdown release), and
(iii) technology adoption characteristics, along with demographic information.

This established that respondents were functionally car dependent. Whilst most respondents did not perceive their transport costs as excessively expensive in relation to their income, nearly a quarter (across all income groups) did perceive their transport costs as expensive. Bus services were perceived as being unreliable with insufficient frequency to replace car use. Train services were seen as inconvenient if the station was more than 30 minutes drive away, restricting potential for more multi-modal journeys.

In terms of technology adoption in relation to travel, more than 70% of respondents were using mobile apps and websites for planning/booking air travel and for general trip planning. Between 50 and 60% were using it for supporting long-distance travel, driving navigation and public transport. In decreasing order, walking, cycling, vehicle rental, taxi booking and car clubs were all minority uses. Just over 10% reported not using apps/websites for travel purposes.

Mid-project 'lessons learned by partners' survey

The mid project survey of partners to capture learnings recommended the following essential activities:

- having a dedicated project manager
- having a continuing marketing strategy targeting both downloads (new users) and existing user messaging
- more opportunities to bring project partners and transport operators together, to develop shared understanding of the GO-HI app capabilities and project / technological requirements
- adaptive evaluation process and data-sharing
- future transport tenders in the region should include API integration with GO-HI
- areas of poor mobile phone coverage remain an issue. Greater use of roaming SIMs could overcome some of this.

These learnings are clearly transferable to other MaaS projects.

Executive Summary

State of the Art Literature Review

- Few MaaS studies have specifically addressed rural contexts
- Perception is that there remains potential for MaaS
- To enhance rural mobility
- To promote sustainable solutions through integration of different modes/forms of transport (e.g. adding parcels, other deliveries, DRT)
- Conclusions are that both these goals are essential for social inclusion in rural areas.

The GO-HI project has developed some new knowledge about the potential for reduced carbon emissions through the greater use of shared modes. The current state of data does not allow direct assessment of any actual emissions reductions. A MaaS app would need to track all trip making (with and without bookings via the app) to understand that.

In relation to serving rural areas, understanding of the potential for MaaS to reduce private car dependence is even less well developed, being dependent on only a few relatively short-lived projects (Mulley et al 2023). Knowledge generated from the GO-HI project is therefore of global importance. Limited initial user base, even in pioneering regions, is not uncommon.

GO-HI Surveys

We had mixed experiences with surveying users. An initial on-boarding survey in summer 2021 generated poor returns that could not be analysed meaningfully. The GO-HI user survey in 2023 had a low response rate but produced useable data.

Final Regional Survey

The final regional survey in 2023 has also provided useful insight.

Shared Vehicle Data

From the data we have, we can see that car club vehicles are capable of serving needs for long distance trips, which could encourage people to go car-less and use MaaS instead, since they would still be able to access a car when needed.

From the data we have from Hi-Bike, we can infer that shared bikes can provide good accessibility over a variety of distances for users. From the seasonality of the uptake, we suggest that tourists are able to reduce car use at their destination by using shared bikes.

GO-HI key data

Around 70% of downloads have been converted to registrations (3553), and around 450 bookings have been made using GO-HI directly. The concierge service has been utilised for around 4% of those bookings.

Trends in car dependence in GO-HI Region

Using MOT data (vehicles older than 3 years) shows overall there is a small upward trend in 3 yr + vehicles in the postcodes examined (AB, HS, IV, KW, PH). This trend is driven mainly by AB and IV, but also PH. Line is flat for HS and KW.

However, across all postcode areas, total annual mileage of MOT'd vehicles has gone down (KW mileage spiked in 2020, but by 2021 was back on the downward trend). Without data about younger vehicles, no firm conclusion about car dependence can be drawn from this, except that it might be inferred that carbon emissions from older vehicles are going down due to the decreases in overall mileage.

Conclusions

Go-Hi delivered a lot of technical functionality on a relatively small budget. This sometimes hampered the ability to develop quickly even where opportunities were clear. From this experience we conclude that MaaS projects that require integrations of modes would benefit from the ability to progress more quickly.

There were three main areas within the region identified as needing focused attention at the outset of the project. We learned that Inverness is a core area for building the normalisation of MaaS within the region. Skye's issues with tourist

congestion need more ideation around how MaaS can develop new services and diversionary recommendations. Learnings from attending MaaS related workshops and seminars for example, service expansion could be considered to reach camper van/caravanners to provide advance stance bookings and/or divert to less congested alternatives for example. We noted that Orkney has relatively few transport options for inclusion into MaaS, and we used innovative data to identify where public or demand responsive transport might be enhanced to provide a better backbone for MaaS in Orkney.

Our initial outcome KPIs were ambitious. However, we are able to demonstrate untapped potential for MaaS to increase its impact if it can be sustained through the Early Adoption phase.

GO-HI has national reach for the core long-distance transport services, which is a significant selling factor for visitors to the region and for those within the region who need to make journeys elsewhere – they don't need to go outside the app. GO-HI has a lot more potential to support vehicle sharing to reduce car dependence and increase active travel by both visitors and residents.

GO-HI has been recognised in the industry as highly innovative, winning several awards.

Recommendations

Technical:

Future tenders for travel options in the region (including national contracts) should include API integration with GO-HI.

Poor phone coverage in some areas remains an issue. Roaming SIMs are needed to overcome this (for operational interfaces).

Marketing:

A core activity for MaaS in order to raise awareness and drive adoption. Hyperlocal marketing linked to key transport-related developments or events that generate travel (such as festivals) is effective.
Geographic coverage:

Early adopters of MaaS are more mobile than the majority of the population – as core users they need to be able to use a MaaS platform for journeys outside the core region, preferably nationally.

Research:

Spatial analysis using travel time data and a database of Ordnance Survey (OS) Points of Interest could be used to visualise accessibility to different destination types, to answer the question "Where is car dependence deepest?" as a means of identifying strategic priorities for strengthening transport options that feed through to the MaaS value proposition.

Operator value proposition:

Integrated ticketing still challenging for some bus operators; national engagement with bus operators around MaaS should be encouraged.
User value proposition:
Greater personalisation through user dashboards that summarise trip making behaviours, providing metrics like cost, calories, distances, mode split, CO2 emissions.

Behaviour:

User dashboards can help nudge behaviour, especially if supported by more personalised messaging and incentives. GO-HI has started this in partnership with BetterPoints Ltd but it is in its infancy although a positive start has been made with 274 people participating in the programme.

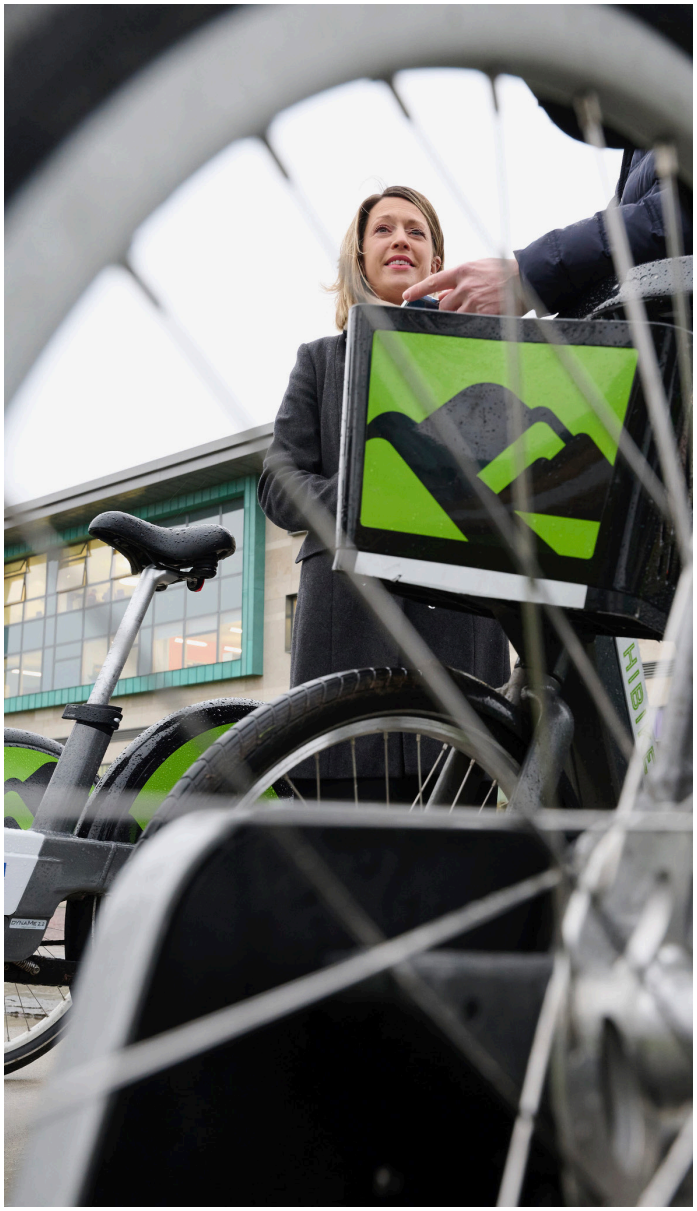
Data:

App look and feel is not enough: Source data for journey planning needs to improve. Provision of accurate open data should be a priority for Scotland. This is being addressed by GO-HI/ HITRANS with Traveline (DTDS). This will have the added benefit of delivering fares data for more bus services to push tap on tap off payment.

With a better user value proposition, mode tracking becomes more acceptable. Unlocking this data source is one key policy and commercial benefit of MaaS that is not yet fully harnessed.

Service offering:

Much of the current literature is looking at how the user value proposition and the viability of MaaS can be enhanced by extending the services included to those which are adjacent to trip making.



Introduction

Approach

The evaluation of HITRANS tranches 1 and 2 evolved dynamically over the period as the partnership developed more learnings about the realities of launching a complex and innovative transport app during a pandemic.

At the outset we identified the following research questions related to intended outcomes of the MaaS Investment Fund (Table 1)

Table 1 Themes, research questions and intended outcomes for GO-HI

Areas/themes to be covered	Research questions	Intended outcome(s)	Key Parameters to Measure	Means of measurement
Impact on travel behaviour	Do GO-HI users reduce their overall car use? Do GO-HI users increase their use of active modes (including PT)?	Overall car use should be reduced as a result of using GO-HI **(O1)** Overall active travel (including PT) should increase as a result of using GO-HI **(O2)**	Mode usage prior to using GO-HI Mode usage during GO-HI: both using and not using GO-HI	Can be measured using system data, baseline travel diary, pilot period travel diaries and comparison to background survey.
Supporting digital innovation	Do users find Go-Hi of relevance and easy to use? Do service providers engage with Go-Hi and find the data useful?	Users should find Go-Hi a compelling proposition that is easy to use **(O3)** User retention should be more than 10% over an 8 week period.[2] **(O4)**	Usability and User Experience (UX). Usage, user retention and user stickiness.	Evaluation survey, questions on usability and UX. System data on use, retention and stickiness.
Impact on viability of transport services	Do service providers consider that the viability of their service is improved by participating in Go-Hi?	Service providers should find providing access to their service through Go-Hi a compelling proposition that is cost-effective and increases custom. **(O5)**	Service provider self-assessment of Go-Hi's impact on their business, including any effect of subscription packages/price discounting. Increased sales for service providers.	Interviews/survey of service providers.
Impact on mobility and accessibility	Do Go-Hi users have improved mobility/ access as a result of using the app?	Go-Hi users should report that they have improved mobility and access as a result of using the app. **(O6)** Tourist users report improved travel experiences. **(O7)** Users disadvantaged by remoteness, disability or deprivation report improved access to key activities. **(O8)**	Objective measures of use over time. Subjective measures/ feedback from user surveys. Origin/Destination analysis (e.g. trips which end at hospitals or further/ higher education)	User experience measures Interviews/surveys of DRT survey providers O/D analysis of system data Individual trends in mode use through the app compared to outside the app

Areas/themes to be covered	Research questions	Intended outcome(s)	Key Parameters to Measure	Means of measurement
Impact on carbon emissions	What impact on overall carbon emissions can we infer from the system data and user evaluation?	Business travel managed through Go-Hi is lower carbon than previously. **(O9)** There is less reliance on private car and more walking, cycling and public transport use by Go-Hi users than the average population. **(O10)** Go-Hi users show a shift towards lower carbon modes between Onboarding and end of pilot. **(O11)**	For business users we need benchmarking information from businesses using Go-Hi For all users, we need up to date information on travel behaviours, ideally at LA level or HITRANS level (Scottish averages as fall back position) to estimate carbon emissions impacts.	Interviews/surveys with business user organisations CO2e calculation of user travel inside and outside the app (utilising DEFRA standards)
Impact on health	Do Go-Hi users increase their use of active travel modes during the pilot?	Frequent travellers using Go-Hi increase their active travel, in part through greater use of public transport. **(O12)** Tourist users use Go-Hi to access shared bicycles and public transport, even if they arrived at their holiday destination by car. **(O13)** Users report that they would have used a car if they had not used Go-Hi. **(O14)**	Comparing travel diary baseline, during and after. Mode use of regular users inside and outside the app. Use of active travel by tourists (cycling, requesting walking routes, public transport use). Business travel users undertake multimodal journeys with walking/cycling segments instead of unimodal car journeys.	System data on active mode user trends Travel diary self-report (all user types)

GO-HI Evaluation Challenges

A key challenge for evaluation of GO-HI was to establish some sort of regionally realistic baseline. Even though the launch was delayed due to the pandemic, transport patterns were (and remain) different to prior to the pandemic, and there were constraints in reaching a statistically random sample of the region's population. Whilst we carried out a baseline survey, with 256 responses, these factors undermine the reliability of our baseline survey, though it provides a reasonable guide to trip-making in the region at the time of the survey. The baseline survey results were reported in 2021.

A second challenge arose when it became apparent that the plan to utilize the standardized KOMPIS evaluation framework to enable comparison with other MaaS pilot was problematic in that it was not designed to be applied to a constantly evolving user base. Subsequently, we learned that our experience of KOMPIS was not unique.

The evolution of GO-HI itself, as it integrated new transport providers during the life of the project also posed a challenge for evaluation, since the user and operator benefits of a MaaS platform are related to the number of services that are available in the system, and there is no 'representative' timepoint at which to assess that.

We have therefore relied on a synthesis of a variety of data sources: utilisation statistics supplied by operators and the platform provider, operator interviews and two additional surveys, one of GO-HI users and one general survey of travel behaviours, technology adoption and MaaS interest within the region. Consequently, we have a mix of quantitative and qualitative information from which to derive some robust findings. We are able to make contributions in understanding MaaS's continued potential to have a positive impact on personal car use (currently accounting for 40% of transport emissions) and the problems associated with that car use (congestion and health impacts) in line with Scottish Government targets.

Overview of baseline information

The purpose of the background survey carried out in quarter 2 of 2021 was to provide baseline data on
(i) current travel behaviours of HITRANS area residents,
(ii) future mode/travel intentions (we assumed that context was a continuing phased pandemic lockdown release), and
(iii) technology adoption characteristics, with a particular focus on mobile technologies and transport-related applications.

This background dataset was useful to understand existing travel habits, for assessing any unmet mobility needs or wants and understanding the propensity of residents in the region to take up a product like GO-HI. We carried out exploratory analyses to identify current travel pattern and mobility needs across different demographic groups with the help of this dataset.

To develop the questionnaire, we referred to previous and on-going exercises/guidelines available including work carried out by Lucas et al. (2019) about inequalities and access across the UK, London Mobility Survey about travel behaviour and new mobility services designed by MaaSLab (see Kamargianni 2019; Kamargianni, et al. 2018), as well as the Users questionnaire developed by KOMPIS (Karlsson et al 2019). Multiple online MaaS user surveys carried out by HERE (2020) have also been reviewed to understand individuals' current transportation and transportation app usage patterns.

Introduction

Sample information

The 256 respondents were recruited via emails through our personal networks, to community councils, posting on LinkedIn and Facebook place-based pages. The sample comprised 55% women and 41% men (the remainder withheld the information).

This sample cannot be treated as representative, but we have good reason to believe that the transport data is realistic. Forty-three per cent of respondents reported that they never take multi-modal trips, 30% are seldom multi-modal, 18% are sometimes multimodal. Only 7% said they were often multimodal.[1]

68% of respondents considered that they were reporting on a typical week in terms of trip making. 16% felt they had taken more trips and 13% felt that they had taken fewer trips.

Figure 1 and Figure 2 shows the geographic breakdown of the background survey respondents.

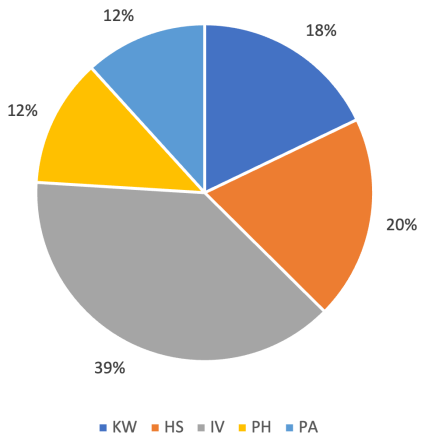


Figure 1 % of Background Survey Respondents in each Postcode

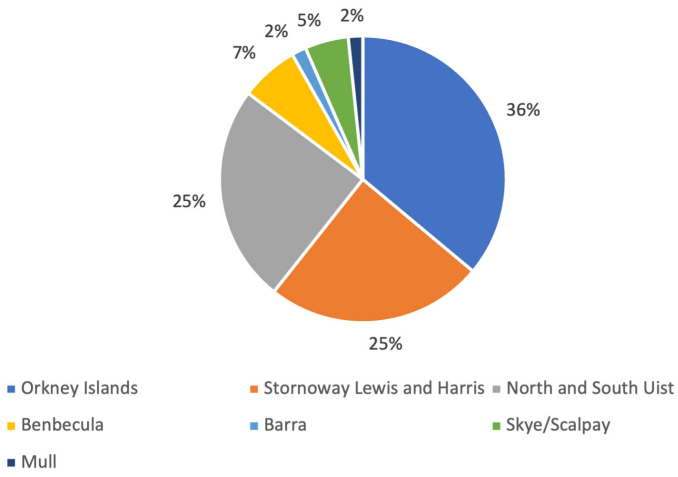


Figure 2 Percentage Split Respondents from Islands (n=61)

Key findings

Figure 3 below shows that the background survey participants are functionally car dependent for all trip purposes. Most people in the background survey had a driver's licence and access to a private car, and at the time of the survey were not finding it excessively expensive in relation to their income (most were low to middle income). Across all income groups, slightly less than a quarter were finding car costs excessively expensive. Being able to transport things was very important as a driver of private car use.

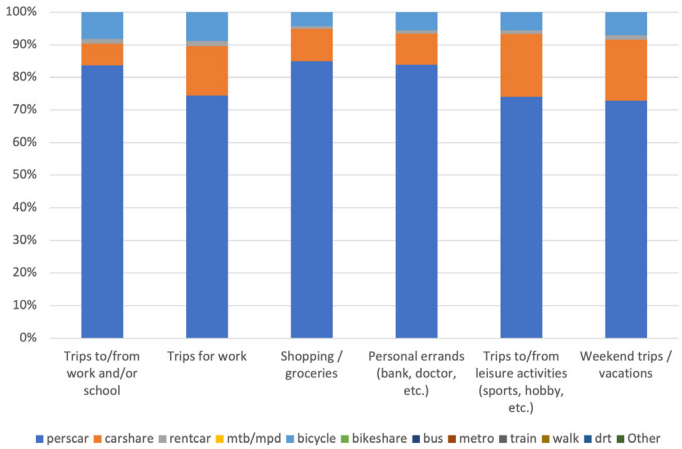


Figure 3 Background survey percentage mode split by trip purpose

[1]Percentages do not sum to 100 due to missing data.

Interpreting other data from the survey suggests that infrequent bus services (or too wide a service interval, suggesting hourly is not enough) prevent more people taking the bus, there is a strong preference for reliable services, and that the train is less used where there is a need to drive more than 30 minutes to a station – interchange becomes more inconvenient.

Table 2 Satisfaction with current transport by postcode area

	Variables	Postcode										
		Missing data	AB	DD	EH	HS	IV	KW	KY	PA	PH	Total
Satisfaction	Very dissatisfied	1	0	0	0	14	10	1	0	7	2	35
	Rather dissatisfied	5	0	0	1	14	31	7	1	3	8	70
	Neither/nor	0	0	0	0	9	17	13	0	5	2	46
	Rather satisfied	0	0	1	0	11	25	9	0	6	7	58
	Very satisfied	1	1	0	0	11	10	6	0	4	6	39

Table 2 above shows satisfaction with transport. Yellow indicate cells containing more than 10% of sample (# participants being at least 26), except in totals column for Satisfaction Level, which uses traffic light colouring to indicate good and bad being above 20% (52). More than 40% of the sample are either Very dissatisfied or Rather dissatisfied, and less than 40% of the sample is Rather satisfied or Very satisfied. The neutral group is also nearly 20% of the overall sample.

Impact of Pandemic-related restrictions

The majority of respondents reported that they were currently able to get to where they want to go and participate in desired activities without problems. Whilst there was no strong intention to use personal car more in the future due to Covid-19, there were high levels of disagreement to the proposition that people will use taxis/car lifts more in the future due to Covid-19, and around half of respondents disagreed that they would use cycling/bike share more due to Covid-19. Slightly fewer respondents disagreed that they would reduce their public transport use due to Covid-19.

Demographics and economics

Using the STPR2 Highlands and Islands Case for Change report 2020, we can see that the working age population in the region has a higher economic activity rate than the average for Scotland, but lower than average incomes. Longer travel distances can mean that transport costs constitute a relatively higher proportion of income, and thus transport poverty is a real risk for the region, with most of it classed as at medium to high risk.

Figures 4 and 5 on the right page show how the baseline survey respondents perceive their transport costs relative to gender and income and their car costs by age and income. Sample sizes are not statistically representative, but it appears that between a fifth and a quarter of both men and women are finding their transport costs high in relation to their income. Unsurprisingly, more people in the lower income brackets report this. For car costs against age group and income, there is an inconclusive and mixed picture.

Introduction

	Gender/Expensive			
Income group	Female	Yes	Male	Yes
Prefer not to say	31	5	15	4
not sure	11	4	3	2
no response	9	6	4	3
≥ £7,000	12	2	12	0
£5,501- £7,000	4	2	4	0
£4,001 - £5,500	12	0	17	5
£3,001 - £4,000	14	2	14	2
£2,001 - £3,000	20	4	18	4
£1,001 - £2,000	28	7	17	5
total	141	32	104	25
Overall %	55%	23%	41%	24%

Figure 4 Perceived expense of transport costs by income group and gender (Source: GO-HI Baseline Survey, 2021)

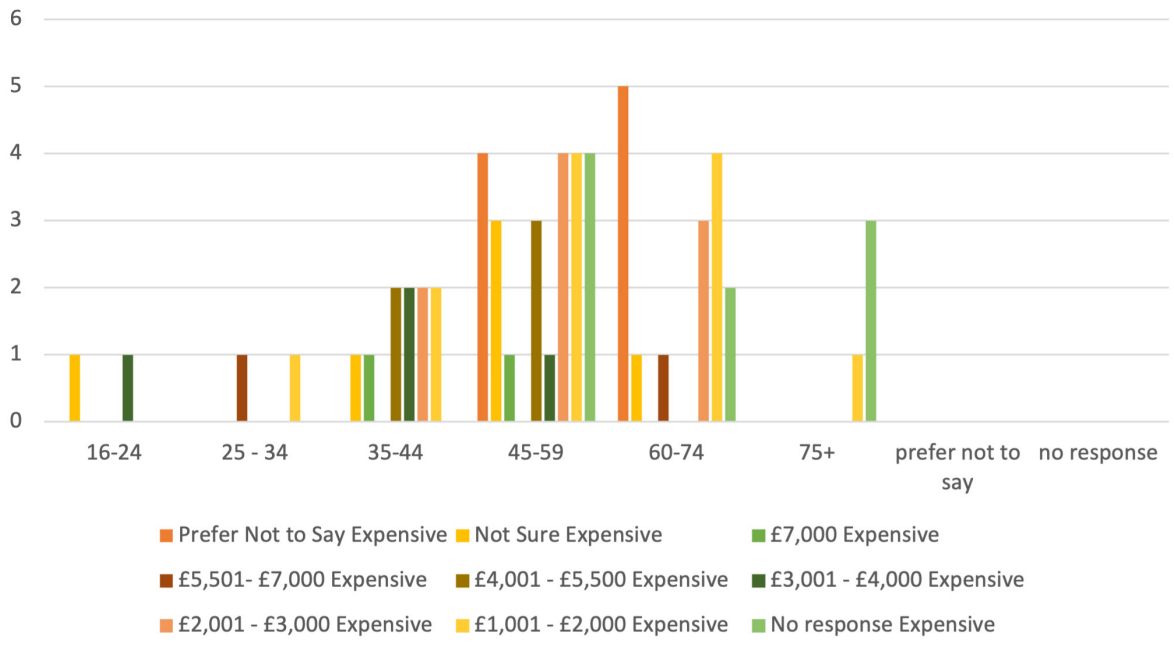


Figure 5 Perceived expense of running a car by age and income (Source: GO-HI Baseline survey, 2021)

Technology adoption for transport purposes

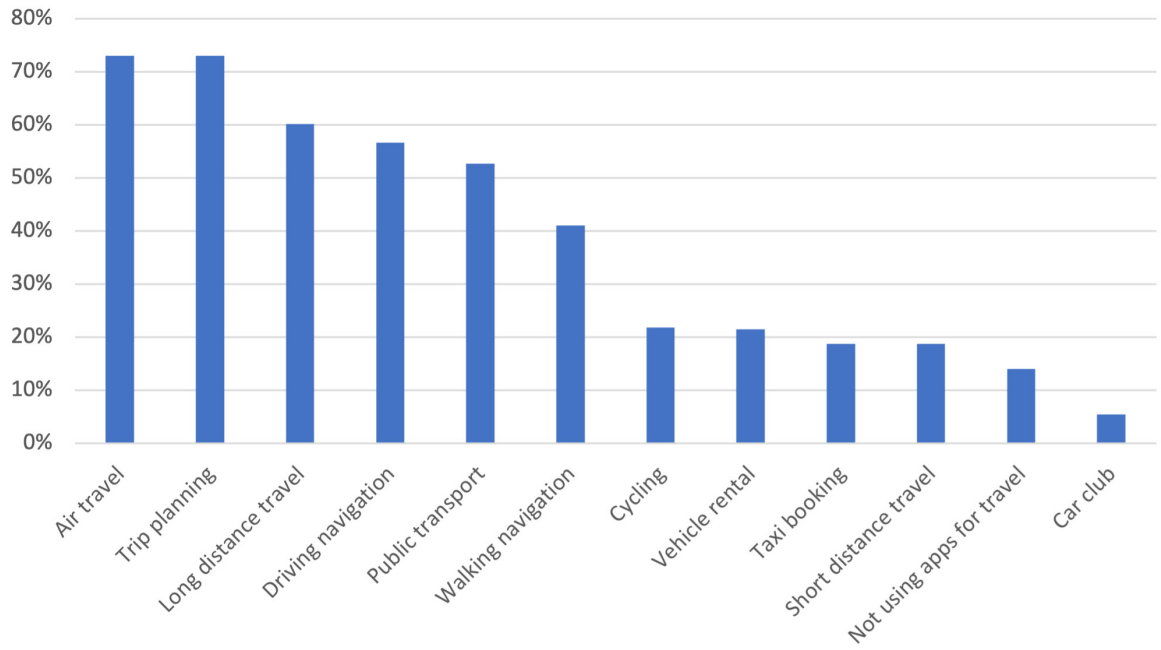


Figure 6 Percentage of respondents to the 2023 Regional Survey reporting that they use apps for different travel purposes (n=256)

Figure 6 reports the findings to the question about the use of information technology and apps for journey planning, booking and paying for different modes of transport. At least half of respondents reported doing this for air travel, general trip planning, long distance travel, driving navigation and public transport. Around 40% used it for walking navigation. Around 20% of respondents were using IT to support journeys by cycling, vehicle rental, taxi booking, and for short distance travel planning. Only 5% of respondents reported using IT for car club booking and 14% are not using IT for these purposes at all.

Of those who are using applications for travel purposes, they were split between using them on smartphones versus personal computers/laptops. However, there was more dependence on PC/ laptops rather than mobile IT for air travel, vehicle rental, car clubs and journey planning.

An overall majority felt it was important to be able to book and pay online as well as get information (61% compared to 21%). Around 18% had no opinion. Twenty-seven per cent agreed that they would like one app that could serve all their mobility needs, but 31% saw no need for this. Nevertheless, 55% agreed that they found it convenient to be able to make reservations/bookings from a mobile device.

Overview of partner 'lessons learnt' mid project evaluation

This exercise was carried out by Keri Stewart of Arcadis in 2022. Key learnings were:

Project management: this type of project needs a project manager who is able to have an overview of the different elements and to drive continuous progress.

Project communications: regular 'all-hands' meetings are an important tool for such a complex project with many partners.

Collaboration: many partners have been generous with their time and commitment. Having a monthly Partners' Forum, that also included transport operators, would have supported a collaboration that could deepen the sense of shared endeavour.

Technology/Technical Development: technical coordination worked really well, but an earlier stage clarity of scope between different technical partners and a better understanding of the GO-HI app amongst other partners would have helped the project to bed down more quickly. Onboarding of transport operators was one of the biggest hurdles. This finding led to the transport provider interviews in the final evaluation.

Marketing: we learned that continued marketing is essential for a new service concept such as MaaS. This finding resulted in key project partners using their in-house expertise and brand knowledge to continue promoting GO-HI through the pilot project. A key learning was that a greater commitment to public sector money for this essential activity would have been beneficial in supporting the potential for MaaS to deliver public goals (i.e. transport decarbonisation and social inclusion), including being able to reduce the premium paid by users to book via the app. Ideally using MaaS should be the same or cheaper than the alternatives to encourage uptake and hence the potential for more multi-modality/modal shift. The Marketing Report is in Appendix 2.

Monitoring & Evaluation: It was felt that having a lead academic partner in this role is essential. It proved challenging to obtain baseline data and more input from partners would have been helpful. This has been acted upon, with FOD Mobility Group taking the lead on surveying app users, partner transport providers providing data on usage more regularly, and the lead academic partner has been able to focus on surveys and spatial analysis that contextualise GO-HI in the absence of appropriate data at the regional level.

Interim technical recommendation: Future tenders for travel options in the region (including contracts awarded by Transport Scotland) should include API integration with GO-HI and account should be taken of poor phone coverage in an area and the need to use roaming SIMs to overcome this.

MaaS State of the Literature Review

We conducted an umbrella review, synthesizing literature from multiple existing review studies to provide an updated overview of the landscape of MaaS research. The compiled literature was categorized into two primary themes: major and minor, based on the frequency of discussion within each theme. Major themes encompassed topics such as the core concept of MaaS, challenges related to its adoption, and its intersection with smart cities—subjects extensively explored in the existing literature covered by the reviews. In contrast, minor themes included sustainability considerations, issues of vulnerable groups and gender, and the implications of MaaS in rural areas—areas that have received comparatively less attention in the research and subsequently in reviews.

The scarcity of research on minor themes, particularly regarding the sustainability impacts of MaaS and gender-related issues, poses a dual challenge. While it underscores the need for further investigation to enhance MaaS, it also raises concerns about the potential amplification of transport system inequalities. Additionally, several theoretical concepts associated with MaaS have only been validated in pilot projects, emphasizing the necessity to shift focus towards larger-scale implementations. Furthermore, the literature highlights a notable absence of even initial discourse on the development of Level of Service metrics for assessing the user experience in MaaS, a factor that could significantly impact its long-term adoption.

For the purposes of the GO-HI project we focus only on the literature on adoption, environmental and social sustainability and assessment of user experience.

Literature on MaaS Adoption

Several of the studies found for this umbrella review have scrutinized the complexities associated with MaaS adoption. For example, Kriswardhana and Esztergár-Kiss (2023) conducted a review of 29 MaaS articles, with a particular focus on socio-technical factors influencing MaaS adoption. Their analysis encompassed the examination of i) research methodologies employed in previous MaaS studies, including data collection and analysis methods; ii) socio-demographic, travel-related, psychological, and built environment variables; iii) mobility packages and bundles; and iv) subscription models and add-on features. Their findings indicated that socio-demographic factors exhibit variations in their impact on user preferences, whereas indicators related to travel patterns reveal greater consistency. Also, mobility bundles are often tailored based on prevailing travel pattern information.

Similarly, Butler et al. (2021) review of 91 articles, categorizes the barriers to MaaS adoption. These classifications encompass (a) desired outcomes associated with MaaS, such as reduced travel distances, heightened trip awareness, decreased parking demands, reduced vehicle ownership, and enhanced social equity; (b) supply-side barriers to MaaS, which include challenges related to public-private collaborations, business support, service coverage, shared vision, as well as data and cybersecurity; and (c) demand-side barriers to MaaS, encompassing limited appeal to older generations, public transit users, and private vehicle owners, the allure of digital platforms, and user willingness-to-pay.

Schikofsky *et al.* (2020) employed a multifaceted approach, involving literature analysis, interviews, and quantitative analysis, to uncover key motivational determinants and investigate their interrelations concerning MaaS adoption. Their findings revealed that anticipated benefits related to autonomy, competence, and a sense of belonging to a social peer group influence hedonic motivation and the perceived usefulness of MaaS offerings. These factors, in turn, significantly impact behavioral intentions. Similarly, Lopez-Carreiro et al. (2020) scrutinized the essential services that MaaS should offer to meet daily traveler needs and personalize their mobility solutions. Through six Focus Groups, they examined these considerations in comparison to existing ones in the literature. They identified six new services that had not been previously addressed, including route optimization and the provision of real-time information in the

following five categories: passenger crowding, pollution levels, route facilities, vehicle conditions, and urban security.

Furthermore, the presence of new technologies and evolving transportation modes can influence the adoption of MaaS. In their review of new mobility technologies and services, with a particular focus on autonomous vehicles, drones, micromobility, and MaaS, Zhang and Kamargianni (2023) aimed to gain deeper insights into factors affecting the adoption or preferences of these technologies and services. They identified various factors influencing MaaS adoption, such as socio-demographic characteristics, the built environment, travel behaviour, user personalities and attitudes, as well as perceived usefulness and social influence. For instance, incentives promoting increased autonomous vehicle ownership may deter public interest in MaaS adoption. Therefore, comprehending the dynamics between different new mobility technologies and services can inform strategic policy decisions regarding their launch and development priorities.

Sustainability

MaaS holds the promise of making substantial contributions to environmental, social, and economic sustainability. However, an in-depth thematic analysis of the literature reveals a significant gap in research regarding the sustainability aspects and impacts of MaaS systems. For example, Lindkvist and Melander (2022) conducted a comprehensive review of 137 studies on MaaS and urban consolidation centres, comparing the environmental, social, and economic sustainability of these two urban transport concepts. Their review indicated that while these new transport services hold the potential to deliver both social and environmental sustainability, these promises are yet to be fully evaluated.

Several studies have pointed to challenges related to social and environmental sustainability. In the context of social sustainability, despite the potential for MaaS to offer affordable, accessible, and healthier transport options, doubts persist regarding the uptake of these healthier alternatives. Additionally, users often need to access digital solutions and share data, potentially excluding certain groups from benefiting.

Regarding environmental sustainability, while these urban transport services initially appeared to have a substantial positive impact by reducing emissions, alleviating congestion, and decreasing the number of vehicles in urban areas, their actual environmental benefits remain uncertain. Lastly, while these services show potential for economic viability, they have struggled to demonstrate this in the long term. Some business models rely on government funding for pilot projects, and their ability to achieve sustained economic viability remains unproven.

Given the multidimensional nature of sustainability impacts associated with MaaS, there is a pressing need to develop robust methodologies for their assessment. Muller et al. (2021) conducted a review of existing methodologies for assessing the sustainability impact of potential MaaS implementations, considering a comprehensive whole-system perspective known as STEEP (Social, Technical, Economic, Environmental, and Political). The comparison among methodologies revealed that various sustainable mobility indices do consider the broad spectrum of social, technological, economic, and political elements encompassed by STEEP. However, disparities exist in the extent to which these indices cover the

five STEEP categories compared to the primary categories outlined within the three indices. This underscores the need for standardized and comprehensive methodologies to effectively evaluate the sustainability impact of MaaS systems across their diverse dimensions.

Gender disparity has emerged as a significant concern in the utilization of various modes of transportation. For example, multiple studies have indicated that emerging transport modes like e-scooters are predominantly used by young adult males (Kazemzadeh & Sprei, 2022), exacerbating gender imbalances in this mode of transport. This trend of overrepresentation among a specific demographic may also extend to MaaS. However, limited research has explicitly addressed the gender-related aspects of MaaS.

McIlroy (2023) conducted a review of MaaS literature with a specific focus on gender-related issues. The review highlighted a conspicuous lack of genuine inclusion of gender considerations in previous studies. Out of the 171 articles reviewed, only 31 briefly touched upon gender-related aspects. In these cases, although the term 'gender' appeared within the text, it did not guide the research design or focus, was not included as a variable of interest, and was not central to the discussions. In 28 articles, gender was discussed only in reference to the work of others, without generating research results. These articles might have collected data from users (or potential users) or not. In seven instances, gender-related issues were mentioned but were not central to the research, such as a passing reference within a broader discussion of societal implications. These were categorized under both "Gender mentioned in passing" and "Only others' work discussed."

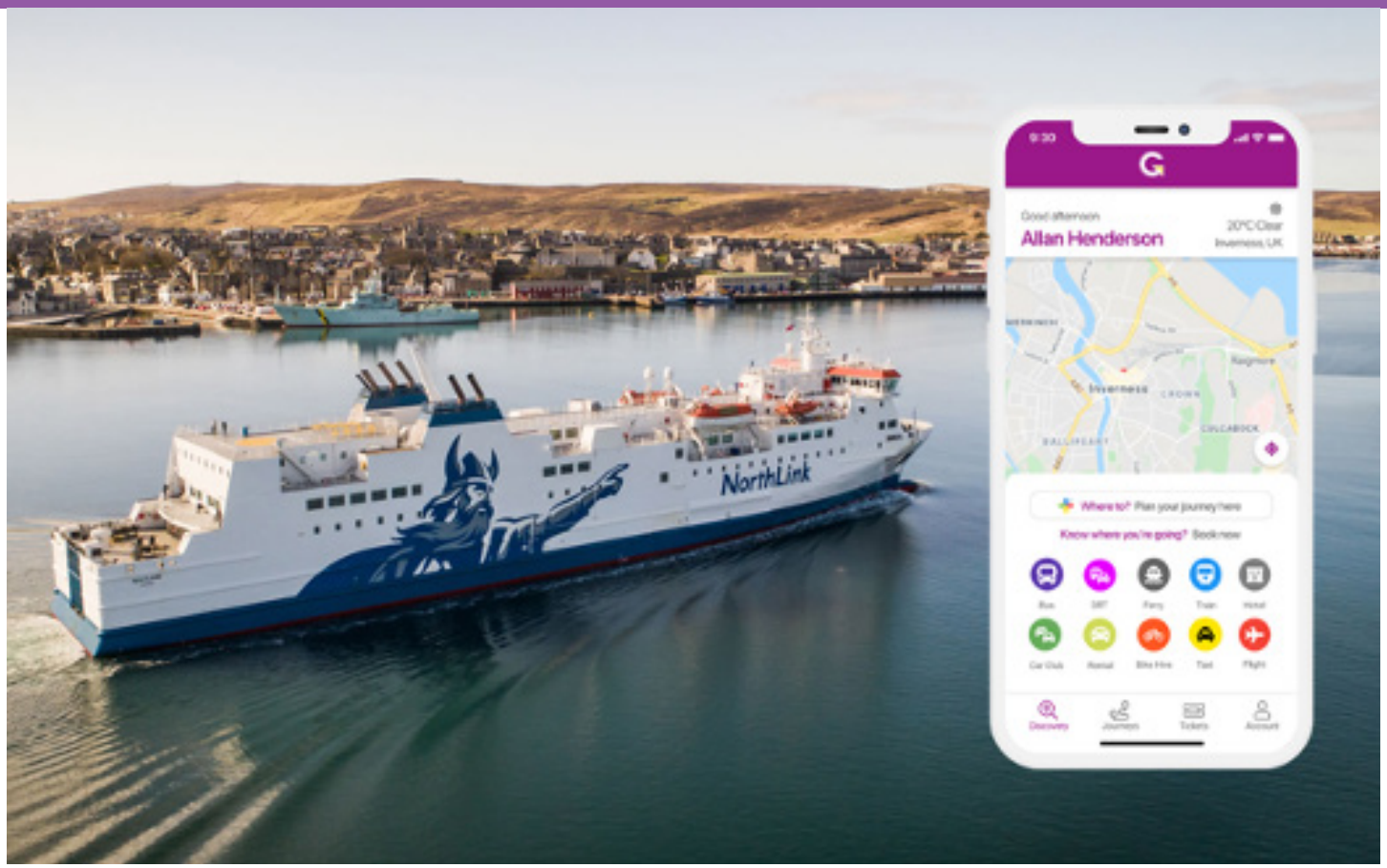
Dadashzadeh et al. (2022) conducted a literature review to explore the link between MaaS and vulnerable road users. Furthermore, they underscored the necessity for further research aimed at integrating equity into transport policy evaluation and policy implications, with a particular focus on distinguishing between various types and principles of equity, such as equality of opportunity or equality of outcome. The affordability of MaaS emerged as another crucial issue highlighted in this research, directly linked to Sustainable Development Goal No. 11. Affordability can be facilitated through subsidies for mobility services for vulnerable social groups. In deregulated jurisdictions, where subsidies are less prevalent, incentivizing operators to engage in MaaS schemes can be challenging, making it even more vital to ensure that MaaS offerings remain affordable and inclusive services.

Rurality

Rural areas constitute substantial portions of many countries, especially in Europe, and are home to a significant population. Ensuring efficient transportation systems in these areas is often challenging due to long distances and limited population flow (Eckhardt et al, 2018). It is widely recognised that there are economic issues and service challenges with maintaining conventional public transport for these regions. In this context, integrated shared mobility services within MaaS have been proposed as having potential to provide better rural mobility that avoids total car dependence. These services could address the transportation needs of rural and sparsely populated areas by replacing underutilized public transport options (Becker, Balac, Ciari, & Axhausen, 2020).

Currently, shared mobility alternatives are scarce or non-existent in rural and even suburban areas, as ride-hailing services primarily focus on densely populated urban centres with robust public transport (Barajas & Brown, 2021). Shared use mobility services can also complement public transport systems by improving accessibility in areas with infrequent public transport schedules or limited infrastructure (Smith et al, 2018). For example, users of NaviGoGo MaaS in rural Scotland have reported improved connectivity to employment and training opportunities (https://www.systra.com/en/project/navigogo-project-scotland/).

MaaS State of the Literature Review



However, it is worth noting that while the benefits of MaaS in rural areas may be significant, previous research has predominantly focused on MaaS as an urban solution, giving rural areas limited attention (Eckhardt et al., 2018).

Limited knowledge exists regarding the application of MaaS in rural areas, and few studies have specifically addressed this context. Amaral et al. (2020) provided an overview of MaaS in rural regions, emphasizing its potential to enhance rural mobility and promote sustainable solutions that integrate various forms of transportation. This approach is considered essential for promoting social inclusion in rural areas, particularly for residents who may lack access to private vehicles, face mobility challenges, or have limited familiarity with technological solutions. Moreover, findings by Mulley et al. (2023) indicate that MaaS in rural contexts is characterized by numerous short-lived pilot projects with a limited user base, even in pioneering regions like Finland and Sweden.

Survey Data

Onboarding survey

A survey designed by the University of Leeds team was sent to registered users of GO-HI was sent out by FOD Mobility Group on 21st July 2021 (see Figure 7). The survey questions had been mapped to the KOMPIS evaluation framework.

The response rate was too low to do any useful analysis with fewer than 35 respondents.

GO-HI user survey

A user survey was designed and carried out by FOD Mobility in 2023. There was discussion with University of Leeds team during the survey design phase.

The objective was to gain insight into user satisfaction e.g. usability of the interface, service availability, range of services, confidence in making multi-modal journeys. Hence, this can be regarded as a User Experience (UX) survey.

Methodology

The 3,200 registered GO-HI users at the time received a survey invitation by email, with a prize offered as a completion incentive (£100 Amazon voucher). A reminder invitation was emailed in the third week after launch.

Sample

There were 54 usable survey responses, a response rate of 2%. This is not a surprising number. Delighted (a Qualtrics survey product) reports an average return rate for email surveys of 6%, based on a benchmarking exercise carried out on their 2021 user data (Chung, no date).

Dear [Name],
Thank you for downloading and registering with GO-HI, we are excited to have you on board and hope you find the app useful in making travel simple in the Highlands.

The concept of putting lots of transport operators into a single app is very new, and we are keen to better understand how providing such a platform might help change travel behaviour more widely in the future.

We would love it if you could help us evaluate GO-HI. We have partnered with the University of Leeds to understand more about how using GO-HI helps people to get around the region and whether it supports reducing carbon emissions from transport.

There will be three survey links e-mailed to volunteers over the next 12 months, and to show our appreciation, participants who complete all the surveys will be entered into a draw to win one of five hampers of fine Highland foods.

If you would like to help us please click the button below, which will take you to the survey, along with more information about what is involved.

Figure 7 Email invitation to the Go-Hi onboarding survey

Results

The majority of GO-HI users live in the HITRANS region, though there are some based elsewhere in Scotland and also in England. This suggests the marketing at Inverness Airport was effective.
The main concentration of GO-HI users are found in and around the Inverness area. Again, this area had a concentrated marketing programme relating to the opening of the Airport Railway station, and also has the highest concentration of different modes of transport accessible via the App.
Table 3 Frequency of mode use

Survey Data

Table 3 Frequency of mode use

	NEVER	EVERYWEEKDAY	2 TO 4 DAYSPER WEEK	ONCE AWEEK	AT LEAST ONCEA MONTH	ONCE EVERY 2TO 3 MONTHS	LESSFREQUENTLY	TOTAL	WEIGHTEC AVERAGE
Own car	16.67% 9	20.37% 11	38.89% 21	20.37% 11	0.00% 0	3.70% 2	0.00% 0	54	2.1
Own bicycle	40.74% 22	9.26% 5	9.26% 5	11.11% 6	7.41% 4	9.26% 5	12.96% 7	54	2.6
Walking	7.41% 4	62.96% 34	22.22% 12	3.70% 2	3.70% 2	0.00% 0	0.00% 0	54	2.0
Bus	11.11% 6	7.41% 4	12.96% 7	7.41% 4	18.52% 10	14.81% 8	27.78% 15	54	3.8
Train	11.11% 6	0.00% 0	11.11% 6	3.70% 2	12.96% 7	24.07% 13	37.04% 20	54	4.3
Ferry	29.63% 16	0.00% 0	0.00% 0	0.00% 0	5.56% 3	11.11% 6	53.70% 29	54	4.3
Taxi	29.63% 16	0.00% 0	3.70% 2	3.70% 2	9.26% 5	14.81% 8	38.89% 21	54	3.9
Car Hire	44.44% 24	0.00% 0	0.00% 0	0.00% 0	0.00% 0	9.26% 5	46.30% 25	54	3.6
Car Club	79.63% 43	0.00% 0	0.00% 0	0.00% 0	0.00% 0	1.85% 1	18.52% 10	54	2.0
Bicycle Hire	77.78% 42	0.00% 0	0.00% 0	0.00% 0	1.85% 1	1.85% 1	18.52% 10	54	2.0
Flights	14.81% 8	0.00% 0	0.00% 0	0.00% 0	1.85% 1	18.52% 10	64.81% 35	54	5.0
Hotel	12.96%	0.00%	0.00%	0.00%	7.41%	35.19%	44.44%		

Highlands and Islands Travel Survey

Objectives

It was decided that there should be a follow up survey of residents within the broad catchment area of GO-HI at the end of the project, to compare with findings from the Background Survey and from the User Survey.

In addition to surveying travel behaviour, trip making, demographics and technology adoption for travel planning, for comparison with baseline information, the wording of some questions was aligned with the user survey. The opportunity was taken to add some additional questions focused on post-pandemic working practices, active travel, and the relationship between concern for the environment and travel choices. Two questions also investigated how weather related disruption is impacting on travel. The survey questions can be found in Appendix 2.

Methodology

A survey was created using JISC Online Surveys. Care was taken to have a compatible set of questions with the GO-HI user survey for comparison. The opportunity was taken to add further useful questions for subsequent analysis, some of which is outside the scope of this report but will be shared at a later date. The survey URL was shared via Prolific to their user group. Prolific is an online participant pool provider (https://www.prolific.com/).

Prolific has the ability to screen participants for projects using different criteria whilst maintaining their anonymity. For this study, the screen was set to "Living in Scotland" AND in one of the following postcodes: AB, HS, IV, KW, PH. These postcodes cover a slightly wider area than that of the HITRANS area, but the participant pool is relatively low in Scotland. For these five postcode areas, Prolific has a participant pool (sampling frame) of 451. The participants recruited via Prolific were paid £4 each for completing the survey, based on a wage rate of £12/hour and an estimated completion time of 20 minutes. The target number of participants from Prolific was set to 300, but the expectation was that anything more than 100 would be acceptable statistically. Usable surveys were received from 202 participants.

Sample key characteristics

Gender: women	63%
Disability	12%
Have a driver's licence	81%
Educational level	
Master's or above	23%
Bachelor's degree	38%
College/vocational training	26%
Secondary school	12%
Employment	
Employed/self-employed full time	57%
Employed/self-employed part time	25%
Student	8%
Unemployed	4%
Not working for other reasons	8%
Home tenure	
Own outright or with mortgage	63%
Some form of rental	30%
Living rent free	9%

The Regional Survey sample is biased toward women and people holding a driving licence. In general the sample is well educated and predominantly employed either full or part-time. The majority own their home either outright or with a mortgage. There is a spread of age group, skewed towards younger working-age groups. The income spread of the respondents is shown in Table 4. From the table it can be seen that 41% earn less than £2000 per month and 39% are earning between £2001 and £4000 per month.

Table 4 Income groupings of Regional Survey respondents

< £1000	15%
£1001-£2000	26%
£2001-£3000	22%
£3001-£4000	17%
£4001-£5000	6%
£5001-£7000	4%
>£7000	3%
Prefer not to say	7%

Survey Data

Frequency of use of different transport modes

	Own car (passenger or driver)	Car-sharing (giving or getting a lift)	Car hire	Car club	Motorcycle/ moped	Cycle/ e-cycle	Hire/ shared cycle	Bus	Train	Walk whole trip	Ferry	Flight
Every week day	37%	2%	0	0	0	1	0	5	2	19	0	0
2-4 days per week	32%	8%	<1%	0	0	5	0	7	0	24	<1	0
Once a week	6%	13%	<1%	0	0	4	0	8	4	13	1	0
At least once a month	3%	18%	<1%	1%	1%	7	0	14	12	14	<1	3
Once every 2-3 months	2%	10%	3%	0	0	5	2	19	24	6	4	9
Less frequently	3%	15%	21%	3%	2%	7	<1	26	34	8	23	49
Never	17%	36%	74%	96%	97%	71	98	23	26	18	72	40

Number of trips made in the last week varied from 4 to 14, with a mean of 8 trips.

79% of survey participants reported that the previous week was typical for them, while 5% reported they had made more trips than usual, and 16% reported making fewer trips than usual.

We asked how often people make multi-modal trips (e.g. drive a car/van to a park and ride then take a bus, or cycle then catch a train). 17% reported being multi-modal fairly or very often. 50% very occasionally, and 29% never.

School transport

31% of survey participants have at least one child travelling to school during term time. For those who are using a car to take their child to school (36% of primary school parents and 5% of secondary school parents), MaaS is unlikely to be useful for those journeys, which may be combined with commute journeys.

	Primary school	Secondary school
Walk	40%	15%
Car/Van	36%	5%
School bus	10%	21%
Bicycle	2%	0
Taxi	2%	2%
Ferry	0	2%
College free bus	0	2%

Post-pandemic working from home

Half of survey participants (53%) reported working from home all of some of the time. Figure 8 shows the variation in working pattern for these participants.

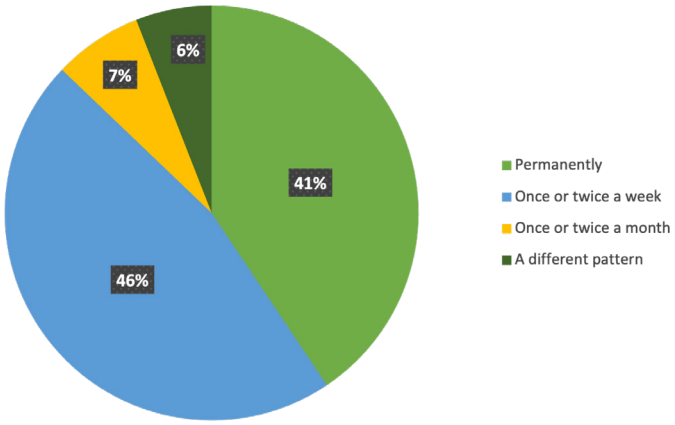


Figure 8 Regional survey participants working from home habits for 53% who work from home some of the time

Cycles and cycling

Around half the respondents reported no access to a bicycle or e-cycle. 19% had access to one and 19% had access to 2. 11% had access to 3 or more. 63% reported not cycling at all. No one reported using a local bike hire scheme, though 40% were aware of a bike hire scheme where they live but don't use it. Leisure cycling is more likely than cycling solely to make journey (see Table 5).

Table 5 Types of trip made by cycling or electric assist cycle

	Standard cycle	Electric assist cycle
For leisure/ exercise only	23%	3%
At least some of my trips	9%	3%
Ferry	0	2%
College free bus	0	2%

Figure 9 shows responses for perceived feasibility of cycling more trips, coded from qualitative responses. 71% said it was not feasible to cycle more of their trips. However, 23% thought it might be feasible to cycle more trips. 3% said they already cycled as many trips as they could. There was missing data for 2% of the sample.

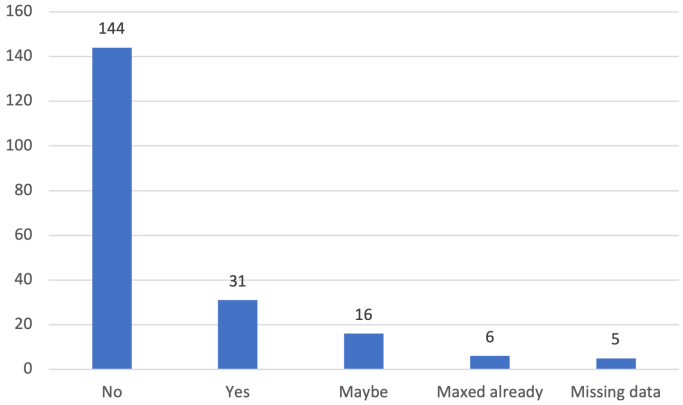


Figure 9 Perceived feasibility of cycling more trips

Survey Data

Satisfaction with transport costs in relation to income

Table 5 displays the levels of satisfaction with transport costs in relation to income. It is notable that levels of dissatisfaction are higher for both bus and train, whereas there is a fairly even spread of opinion for car and ferries/flights. Ferries/flights are much less applicable to the sample overall.

Table 6 Level of satisfaction with transport costs relative to income, by mode

Level of satisfaction	Car	Bus	Train	Ferries/Flights
Very or rather satisfied	38%	20%	11%	9%
Neutral	11%	8%	10%	8%
Very or rather dissatisfied	31%	34%	42%	9%
Not applicable or don't know	20%	37%	1%	75%

Willingness to adopt MaaS

NB fewer respondents answered these questions 83% of respondents reported that it would be important to them to be able to use a single app to handle all their mobility needs. 82% said they appreciate being able to make bookings from a mobile device. 41% said it wasn't important or only slightly important to be able to print a ticket or collect it at the station rather than use a mobile device, compared to 59% saying it was moderately or highly appreciated.

62% said they were interested in trying MaaS compared to 34% saying they were not interested. 15% wanted to be able to use it for regular commute style trips, 45% for shopping trips, 12% for visiting family/friends and 28% for use to go on holiday or whilst on holiday. However, 97% had not heard of GO-HI, and only 1.5% had both downloaded and used it.

40% did not want to share their transport data such as their travel patterns of location data with MaaS providers. 17% didn't mind if the provider was managed by the public sector, whereas 43% didn't mind either way if it meant they could get personalised recommendations or discounts. However, when it comes to ease and comfort of booking via multiple apps even for a single trip, no clear usability issue emerged that would give MaaS an advantage. 11% thought it was unimportant to be able to book all journeys with one app, 46% rated it only slightly or fairly important, and 43% rated it important or very important.

The picture for having all trip information in one place, or paying securely using one app was more encouraging, with the majority thinking this was Fairly to Very Important. Finding nearby services was also rated as Fairly to Very important by a majority of survey respondents.

MaaS features/benefits such as personalising trips by features such as journey duration, cost, comfort or environmental friendliness was seen as important, as was having dedicated customer support.

Some comparisons between surveys

NB all percentages are rounded to the nearest whole number (totals may not be exactly 100%).

	Baseline Survey	Regional Survey
Have a driving licence		82%
Last week was a typical week for trip making	68%	79%
Last week I made more trips than usual	16%	5%
Last week I made fewer trips than usual	13%	16%

Car availability at household level

The question on car access was asked differently in the Baseline Survey, where 92% said they had access to a car. Comparing the GO-HI User Survey with the Regional Survey, the same percentage (85%) in each sample report access to at least one household vehicle; this compares with 69% for Scotland as a whole, based on 2011 census data. This is consistent with the higher rate of car ownership for rural areas. In the Regional Survey we also asked about household vans. 91% reported no vans, 9% reported 1 van and 0.5% reported 2 vans.

Table 7 Household car availability, comparing GO-HI User Survey and the Regional Survey

Number of vehicles	Baseline Survey	Regional Survey
None	8/15%	33/16%
1 car	24/44%	98/49%
2 cars	17/32%	54/27%
3 cars	5/9%	9/5%
More than 3 cars	Not asked	8/4%

Some comparisons between surveys

Transport Habits

The GO-HI user survey and the Regional Survey asked aligned questions about the frequency of using different transport modes. Table 8 below shows the frequency of Mode use from the Regional Survey and should be compared with Table 3 above. The Regional Survey sample appears to be more car dependent in terms of frequency of car use and less varied in use of other modes than the GO-HI user survey sample.

Table 8 Frequency of mode use from Regional Survey

	Own car (passenger or driver)	Car-sharing (giving or getting a lift)	Car hire	Car club	Motorcycle/ moped	Cycle/ e-cycle	Hire/ shared cycle	Bus	Train	Walk whole trip	Ferry	Flight
Every week day	37%	2%	0	0	0	1	0	5	2	19	0	0
2-4 days per week	32%	8%	<1%	0	0	5	0	7	0	24	<1	0
Once a week	6%	13%	<1%	0	0	4	0	8	4	13	1	0
At least once a month	3%	18%	<1%	1%	1%	7	0	14	12	14	<1	3
Once every 2-3 months	2%	10%	3%	0	0	5	2	19	24	6	4	9
Less frequently	3%	15%	21%	3%	2%	7	<1	26	34	8	23	49
Never	17%	36%	74%	96%	97%	71	98	23	26	18	72	40

Both Baseline and Regional Surveys had a question about multimodality in a single trip. Willingness to be multimodal within a single trip is likely to be a factor in willingness to use MaaS.

Multi-modality within a single trip	Baseline Survey	Regional Survey
Never	43%	29%
Occasionally	30%	50%
Fairly + Very often	25%	21%
Every trip	-	-
No response	2%	-

Some key differences are highlighted in Table 9. This highlights that the GO-HI users are more varied in mode use and less car dependent than the Regional Survey respondents, though there is little difference in cycling and bus use. This highlights that there are key travel characteristics that differ between early adopters of MaaS and the wider population.

Table 9 Key mode use differences between GO-HI user survey and the Regional Survey

Mode use	GO-HI users	Regional survey
Use own car every week day	20%	37%
Never use a ferry	30%	72%
Occasionally use a car club vehicle	21%	4%
Never hire a bike/never cycle	78%	71%
Use a bus	81%	77%

Table 10 Booking/paying for public transport – comparisons between User and Regional Surveys

	User Survey	Regional Survey
I don't use public transport	15%	14%
I pay when I arrive at the station/point of travel	39%	28%
I use pre-paid travel card/season ticket	17%	4%
I pre-book journeys via an app on my tablet or smartphone	63%	31%
I pre-book journeys via a website on my computer	35%	17%
I pre-book journeys by telephone	7%	0
Other	13%	7%

Table 10 shows the adoption of digital access to public transport comparing the GO-HI User survey with the Regional Survey. The figures suggest that there is likely to be a difference in terms of readiness to adopt technology for transport purposes between the GO-HI users and the wider regional population, as the reported percentages of pre-booking via mobile apps/websites is much higher for the GO-HI respondents. However, in the technology adoption questions, the Regional Survey sample displayed high levels of technology adoption in general, and their satisfaction with their at home download/upload speeds and stability of connection were very high.

System and Operator Data

Mobilleo

End of project GO-HI data summary:

- Number of downloads ~5000
- Number of registrations 3553
- Number of bookings ~450
- Number of concierge requests ~20

Integrations: A key advantage of utilising a mature platform for the GO-HI project was that from day 1, GO-HI could give travel information and take bookings. Table 11 sets out the timeline of progress in widening mode integration with GO-HI.

Table 11 Timeline of mode/operator integrations to GO-HI

2021 Go Live	2022 Additions	2023 Additions	2024 Additions
Journey planning	Car club	Northlink Ferries	Scottish Citylink
Integrated payment	Brompton Bike Hire	HI-bike	DRT (Liftango)
Train		Bus ticketing (Aberdeen City and Shire)	Enhanced Traveline data
Taxi		Mobility Credits Interface	ITSO Integration Readiness
Hotel		B2B Accounts Interface	ScotRail eticket API
Flight			Native App
Bus ticketing			Bus ticketing (Stagecoach East Scotland – Fife, PKC)
Car rental			eCargo Bike
DRT (Shotl)*			Extended Bike Hire

* superseded by MooveFlexi app from Liftango, launched 2022 (see next page)

Enterprise Car Club

Vehicle deployment, characteristics and utilisation

	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Vehicle 5	Vehicle 6	Vehicle 7	Vehicle 8	Vehicle 9	Vehicle 10	Vehicle 11
Total trips	29	55	30	17	11	46	54	19	76	45	108
#Months	4	8	8	6	5	4	3	6	8	6	6
Total hours	230.25	1761.5	1271.25	687.5	617.75	683.75	542	348.75	1615	974.5	1192
Total miles driven	2429	6741	3867	2827	3077	6383	6017	2948	8586	5749	6107
Total KM driven	3909.09	10848.56	6223.32	4549.60	4951.94	10272.42	9683.40	4744.33	13817.79	9252.10	9828.24
CO2	500363.12	1106553.22	634778.41	464059.63	505097.80	1047786.56	987706.68	483922.10	1409414.91	943713.76	1002480.42
diff from average fleet	-40654.50	-394887.62	-226528.77	-165605.59	-180250.59	-373915.99	-352475.72	-172693.77	-502967.67	-336776.28	-357747.91
diff from average new vehicle	**46127.22**	**-154049.57**	**-88371.11**	**-64604.38**	**-70317.54**	**-145868.32**	**-137504.26**	**-67369.55**	**-196212.66**	**-131379.76**	**-139561.00**
average trip km	134.80	197.25	207.44	267.62	450.18	223.31	179.32	249.70	181.81	205.60	91.00
average trip CO2	17253.90	20119.15	20329.50	27297.63	44117.28	22777.97	16856.29	24470.78	18544.93	20149.01	9282.23
diff from average fleet CO2	-1401.88	-7179.77	-8380.73	-9741.51	-18187.12	-8128.61	-7961.91	-10087.95	-6618.00	-8306.33	-3312.48
diff from average new vehicle	**1590.59**	**-2800.90**	**-3775.48**	**-3800.26**	**-8193.21**	**-3171.05**	**-3980.95**	**-4544.57**	**-2581.75**	**-3741.96**	**-1292.23**

As a result of the potential for the GOHI project to increase uptake of car-sharing and through synergy with related projects, Enterprise has extended its car club vehicles from 6 to 15, with 8 new locations added to the 6 that were already in place, to support the objective to increase vehicle sharing supported by MaaS. Average monthly bookings per vehicle vary from 2-18, which suggests that some locations have a lot of potential for increased sharing without additional vehicles being required.

ECC provided mileage data for 11 cars available at the time. We used this data to compare the vehicle utilisation of car club vehicles with the ByMiles analysis of DVLA MOT data which shows mileages by postcode for vehicles three years and older (i.e. those that have to have MOTs).

We also calculated the percentage of available time the vehicles are utilised (assumed to be 350 days per year per vehicle) for each location (dividing the total number of hours of hire by the number of vehicles). The least used location has a 17% utilisation of time, rising to 50% for the two busiest locations. For all sites, this represents a substantially better vehicle utilisation than for the average household car, which is only 4% according to RAC Foundation data.

Based on distance (km), and calculated only for vehicles that have been available for 12 months or more, only one vehicle has travelled less than the average UK annual km. The eight other vehicles that meet this criterion have all travelled between 145 km (101%) and 11,721 km (196%) more than the average UK annual km. Two further vehicles have been available for 7 or 8 months, and both have exceeded the average UK annual km in that period (143% and 188% respectively). The remaining vehicle has only been available for one month.

Vehicle utilisation in miles compared to annual average mileage for postcode (calculated on 2022 ECC data for the HITRANS region located vehicles):

KW: 135% PH: 150% IV: 131%

System and Operator Data

Bookings data

Encouraging car-sharing is important for the region because there is a high rate of licence holding. The background survey data showed that 97% of respondents held a driving licence, and 96% had access to a private car. Given the profoundly rural nature of most of the region, it is not realistic to expect big drops in private car usage. However, there are urban centres within the region where this is a realistic goal.

A total of 1,721 trips have been made using ECC vehicles between the start of the GO-HI pilot and 31st August 2023. A total of 301,203 km (187,159 miles) has been driven over 30,513 hours. The maximum trip number for a single vehicle is 262, and the minimum is 6 (the most recently deployed vehicle). The median total driven distance for a vehicle is 27,812 km and 2,016 hours. The mean trip distance is 176 km (109 m). This shows that car club vehicles are serving the needs for long distance trips. We cannot detect from this data whether the journey could have been made by public transport at reasonable cost and time.

Assessment of potential carbon emissions reductions through increased car sharing

In order to understand the potential for carbon emissions savings potential from a switch to car club use instead of private car dependence, the difference in CO2 g/km for the car club vehicles in ECC's highland fleet (on average newer and/or hybrid vehicles) and the CO2 g/km for an average UK fleet car and average UK new car has been worked out for all vehicle types deployed by ECC in the region (except for a single Suzuki Swift with 155 CO2 g/km).

Table 12 CO2 g/km characteristics of ECC vehicles in HITRANS region - differences to UK fleet

Vehicle	CO2 g/km	Difference in CO2 g/km from average UK fleet car*	Difference in CO2 g/km from average UK new car CO2 g/km**
1 x Vauxhall Corsa	128	-10.4	11.8
5 x Hyundai Ioniq	102	-36.4	-14.2
4 x Toyota Yaris Hybrid	98	-40.4	-18.2
1 x Toyota Auris Estate Hybrid	94	-44.4	-22.2

* 2020 data ** 2021 data

Brompton Bike Hire

Brompton Bike Hire has been introduced into the GO-HI region as a result of ECC's involvement in the GO-HI project at the time they launched their collaboration with Brompton. There are now a total of four locations, where there were none at the start of the project (see Figure 10).

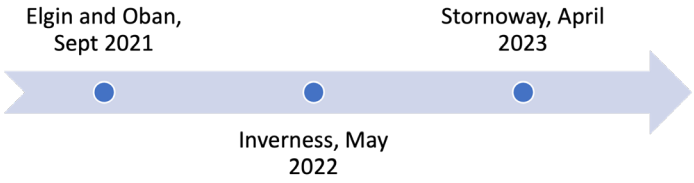


Figure 10 Timeline of Brompton site openings

Brompton bike hire is a cycle by the day automated hire solution which uses a locker based solution and it was integrated into the Go Hi MaaS app to provide a zero carbon First mile, final mile option (around 90% of hires across the UK are associated with either a train or a car club vehicle). The Brompton docks in the HITRANS area are more seasonal than those in the rest of the UK, suggesting that they are primarily being used by tourists and/or for leisure purposes. The data is shown graphically in Figure 11. Wider data about Brompton users suggests that they go on to become regular cyclists. The nature of the integration means that Brompton Bike Hire is available nationally (85 locations) to GO-HI users.

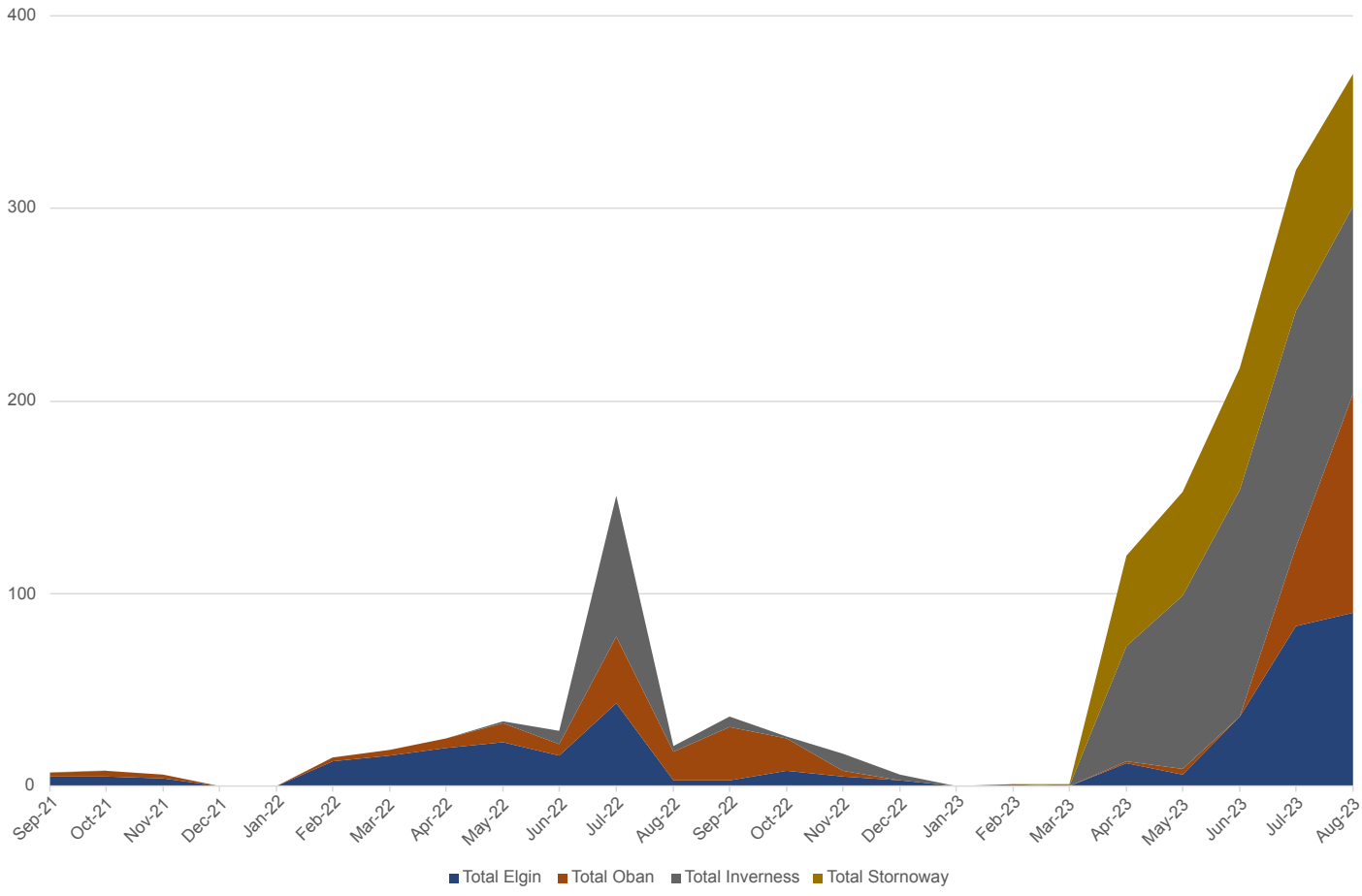


Figure 11 Total Hires for Brompton bike hire locations

System and Operator Data

Hi-Bike

The Hi-Bike scheme, operated Bewegen, pre-exists GO-HI, but it has been extended to a new area as a result of the project. The ability to book and pay for a Hi-Bike has been fully integrated into GO-HI.

Hi-Bike now has 11 stations and 90 bikes in the region. Hi-Bike cycles are fitted with mileage tracking. The most popular pick up/drop off points are Inverness Railway Station followed by Inverness Campus. The third most popular pick up point is Inverlochy, and Caol is the third most popular drop off point. Table 13 below shows the split of distances, durations and one-way/round trips by membership type.w

Table 13 Trip data by Hi-Bike membership type

Membership types	#	Total distance	Total duration	Round trips	One way trips
Pay per ride	26	72.06	647.60	1974	3863
3 hour pass	24	124.73	1312.81	1254	607
Monthly Membership	26	57.40	891.67	5365	9465
Annual membership	23	74.69	955.93	627	3456
Free membership	2	13.43	243.69	0	2
Student FW	11	37.16	384.12	58	250
Student Inv	16	47.07	510.41	210	1394
All student	27	84.23	894.53	268	1644
Totals	**128**	**426.54**	**4946.22**	**9488**	**19037**

DRT - Moove Flexi

Following insurmountable technical issues with the Shotl solution to effectively support ongoing service delivery in rural Moray of DRT at the beginning of the GO-HI project, the initial integration was withdrawn. However, the work with Shotl generated very useful learnings and had moved to a point where the full integration and interface within GO-HI was built and User Testing took place with live booking available in GO-HI which included a demonstration to the then Minister for Transport in September 2021.

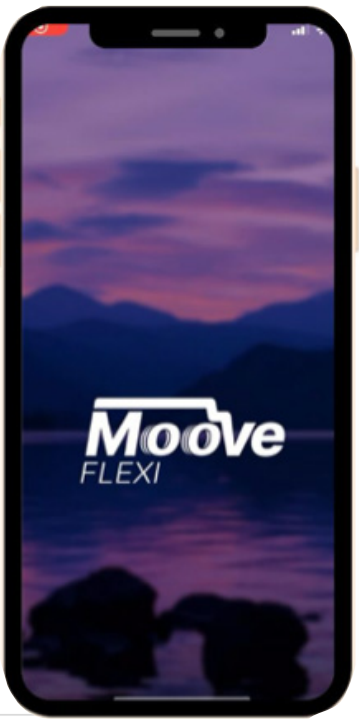
HITRANS decided to investigate other market solutions that would deliver the capability needed to support digitisation of DRT service delivery across the Region. Liftango were appointed to support widescale delivery of Digital DRT across the Highlands and Islands, joining the wider GO-HI consortium. The result of this is the creation

of Moove Flexi to provide a single platform for the providers of demand responsive transport (DRT) within the HITRANS area.

Moove Flexi was launched in October 2022, with the following providers: The Durness Bus, Ferintosh Wee Bus, Wheels in Nairnshire (WIN) and Tain Area Dial-a-Bus. The WIN bus operates in the full Nairn and Nairnshire area but won't accept journeys that could be made by scheduled bus services. Background information about the individual services is provided in the appendices.

The population covered by the current service integrations is more than 15,000. For example, the Ferintosh council area has over 2,000 residents (Ferintosh Community Council | Home (ferintoshcc.co.uk) and the Nairn and Nairnshire population is approximately 13,670 in 2021 (3-3-2-district-profile-nairn.pdf (scot.nhs.uk)).

The integration of Moove Flexi with GO-HI will enable a single point of access to DRT as an equal alongside other transport services across the region. Figure 12 below shows that the general trend in users and books is upward for Ferintosh since MooveFlexi was introduced.



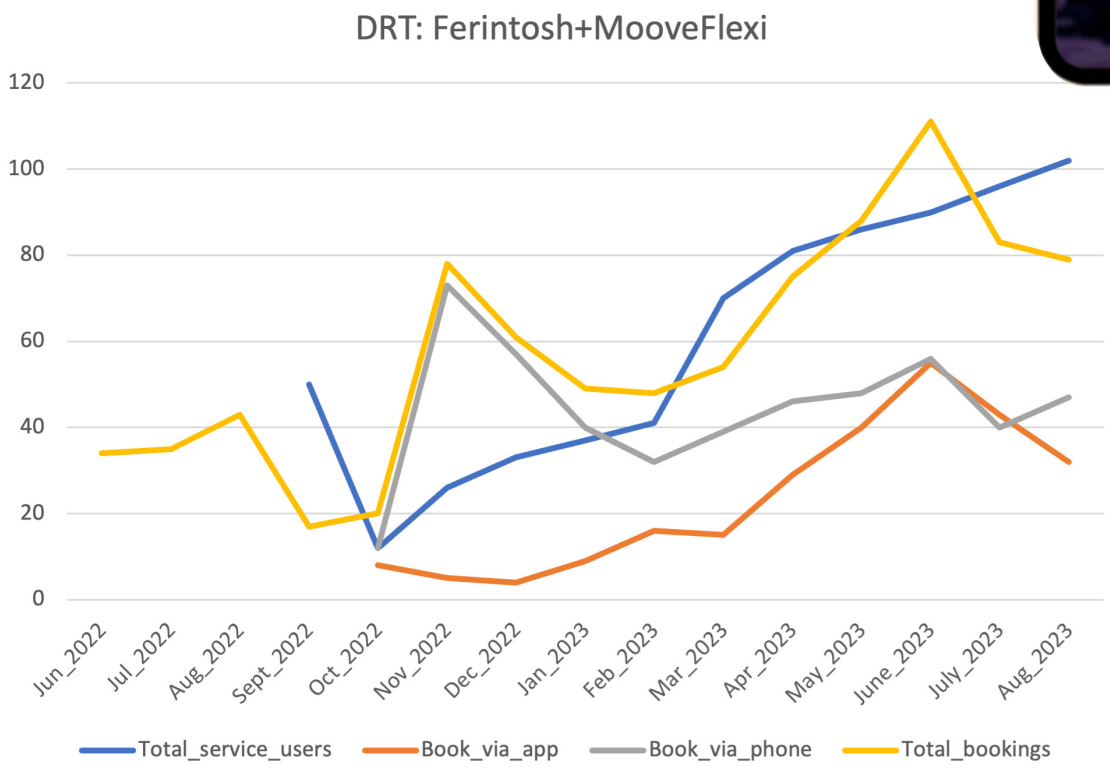


Figure 12 Time series of service users and bookings

Transport provider interviews

Interviews with providers of transport services that had to be integrated to GO-HI during the life of the project. These interviews were designed to answer the questions “What challenges were anticipated?” “What challenges were unanticipated?”.

Key Quotes

> “it was important that our network went onto the MaaS project in in the Highlands simply because it just allows people to complete a journey or part a journey. You know, it might involve someone who might either take a train or they might even go as far as hiring a car, things like that.”

> “it will evolve and develop and I think it needs the chance to be able to do that, so I certainly think it’s worth seeing through. I just think we needto get the public to understand it a bit better, and I think we’ve all got to play our part in that marketing, not just one party.”

Overall, the research questions are answered as follows:

What challenges were anticipated?

From the interview transcripts, we carried out an analysis to pull out key themes relating to challenges in general. These highlighted strengths, weaknesses, opportunities and learnings, and are collated in Table 14. The need to work collaboratively was recognised at the outset; an initial round of monitoring of progress was used to tweak the process were necessary. The shared ambition to keep things as simple as possible in order to handle the complexity of modes to be integrated was planned for from the start.

What challenges were unanticipated?

Referring again to Table 14 it is clear that the challenge of marketing and promotion of a new concept (especially during the pandemic) was not fully recognised. Remedial action had to be taken, which drew on core partners. The Marketing Report is in Appendix 2. Further learning needs to take place around how to transition customers to a MaaS platform where they are accustomed to using a proprietary single-operator app.

Time, resource, data shortcomings and specialist requirements (e.g. for ID Verification) also increased the level of technical challenge.

Table 14 Themes from operator interviews

Strengths	Weaknesses
Vision MaaS empowers people to use the most appropriate mode of transport for the journey they are making as well as supporting multi-modality Collaboration has been excellent (willingness to take risk) The human-technical project interface has been very good (after initial issues were resolved) Breadth of modes available The most exciting project we have been involved with because of the learnings Opened up other business opportunities because of the collaborative cross-modal experience Kept things as simple as possible	Marketing and promotion was under resourced (not unique to GO-HI) ID Verification adds an additional third party service provider to the mix Lack of standardised automated data reporting Sharp learning curve Transitioning customers from proprietary apps to GO-HI Optimism bias – more contingency time and resource for integrations and challenges was needed
Opportunities	
Untapped potential to increase active travel as a first/last mile solution via MaaS Role for Local Authority via requirements for bus operator licence renewal Synergies with related projects (e.g. e-Mobility Hubs) Business travel through employer accounts Power to generate new users	
Learnings	
It is worth sticking with and to be promoted more though take up was lower than expected Ongoing pandemic impacts have been an issue Differing requirements for ID verification between modes and service providers Cost of keeping up to date technologically (e.g. updating APIs as offers evolve) Reluctance by some operators to 'share' their customers MaaS as a term is not customer-friendly	

Travel and public transport data analysis for future prioritisation

Overview

We have used innovative spatial analysis synthesising different data sources to answer the question "Which places in/adjacent to the HITRANS area have the highest transport decarbonisation challenge?". This analysis has been carried out in order to provide a steer for MaaS in the region acting as a fulcrum for improving rural and urban accessibility and sustainability (e.g. in contributing to the Scottish Government's target of reducing vehicle miles travelled by 20%).

Vehicle characteristics for highlighting emissions hotspots

Data held by the Department for Transport regarding anonymised MOT test history provides information vehicle brands, engine size, fuel type, mileage and can be analysed by postcode area. Institute for Transport Studies has access to this data and has carried out some analysis for the GO-HI project. Figure 13 shows the total number of vehicles having MOT tests in each year from 2017 and 2021 for five relevant postcode areas (AB, HS, IV, KW and PH). What can be seen is that there is a small upward trend in the total number of three-year old plus vehicles in each postcode area.

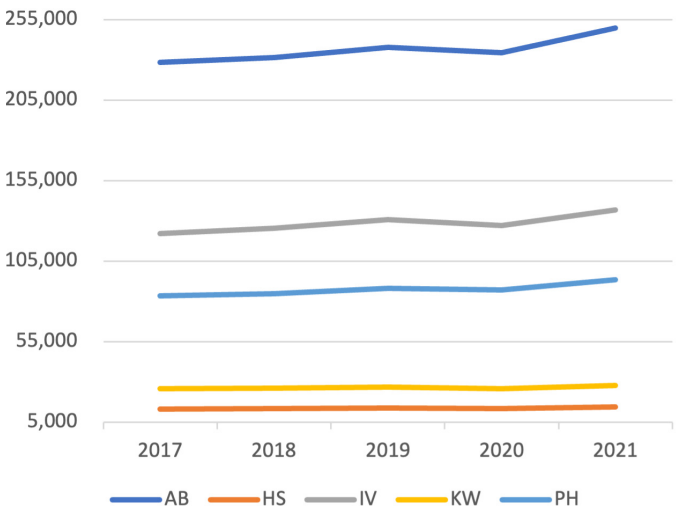


Figure 13 Total number of vehicles having MOTs in each HITRANS postcode area between 2017 and 2021

However, the data on total annual mileage for MOT'd vehicles of three different fuel types (petrol, diesel, electric) appears to show clearly that mileage has gone down in all postcode areas between 2017 and 2021 (see Figures 11 to 15).

Data limitations: Information on mileage by vehicles of less than 3 years old would be needed to judge whether this is a downward trend overall, whether the fleet is ageing and reducing in mileage, or whether the 'disappearing' mileage has been transferred to the newer vehicles in the fleet. This information is not currently available. Also, only vehicles that book an MOT in the period are represented (and therefore cars registered after 2020 are not in the data at all). All vehicle types are in the data (i.e. more than private cars).

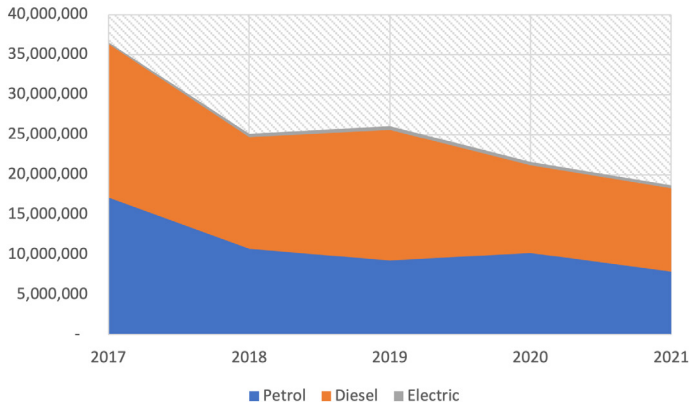


Figure 14 Total mileage of MOT'd vehicles in AB postcode over 2017-2021

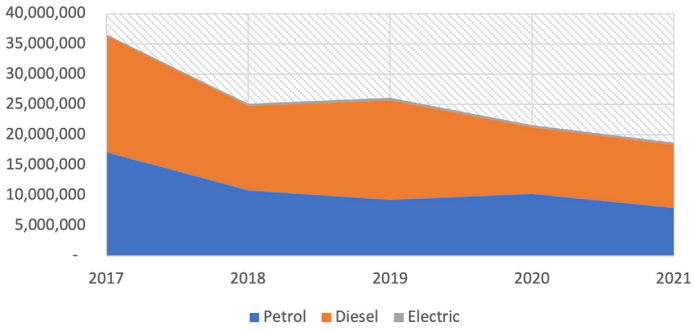


Figure 15 Total mileage of MOT'd vehicles in HS postcode over 2017-2021

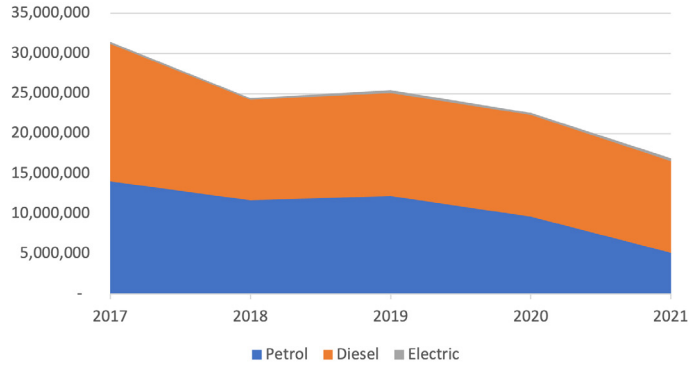


Figure 16 Total mileage of MOT'd vehicles in IV postcode between 2017-2021

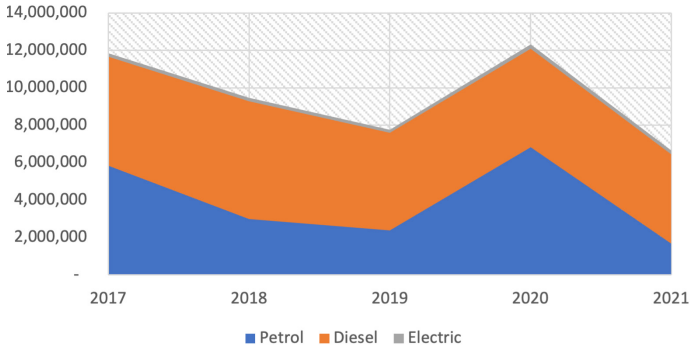


Figure 17 Total mileage of MOT'd vehicles in KW postcode between 2017-2021

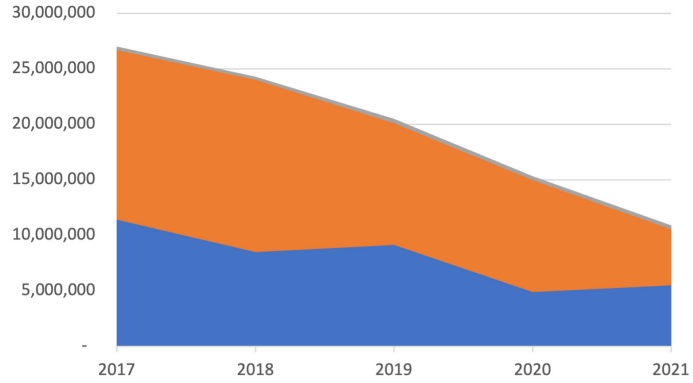


Figure 18 Total mileage of MOT'd vehicles in PH postcode between 2017-2021

Travel and public transport data analysis for future prioritisation

Car Ownership

Whilst we also have data on the number of cars/ motorbike/other registered in each Output Area which could be used to measure rates of car ownership, as well as average emissions per km for small areas, this represents a significant data analysis effort that was outside the scope of the project.

Understanding bus provision over time in the HITRANS region

There is a general consensus that the 'backbone' of MaaS is public transport (UITP, 2019). The HITRANS region has a limited rail network, which would be costly to develop, though rail has obvious benefits on existing corridors (and perhaps some restored corridors in future). Therefore, bus services are the public transport 'backbone' for this region. They are also a more flexible mode than train for increasing accessibility to public transport.

However, bus provision has seen a considerable disinvestment and a vicious spiral of viability issues in rural areas, particularly since 2007. ITS has carried out an innovative analysis of archived digital bus timetable data to show the change in bus frequency with data for most years from 2005 – 2023.

A potential use for these visualisations is in prioritising where to invest in strengthening bus provision (routes, frequencies, speed) to unlock decarbonisation benefits and stimulate more users for MaaS.

Diagnosing public transport opportunities from travel demand

Spatial analysis using a variety of data sources, including 2011 commuter flows (Census data), to answer the question "What routes have a commuting time by public transport that is 3 times longer than driving by car?". We created a dynamic scrollable map for Scotland, from which we have selected map extracts for this report to demonstrate where, in the region covered by HITRANS, there are the largest commuter flows travelling routes by car that would take them 3x longer to travel by public transport (journeys of less than 1km have been excluded). On the dynamic map, scrolling over a route would show the exact number of drivers using it for commuting. The darker the colour, the larger the number of drivers commuting on that route. The maps for the commuting networks between Brora, Inverness and Forres-Elgin (Figure 19), Orkney (Figure 20) and the Inner and Outer Hebrides (Figure 21) are included here.

Before using these maps to prioritise bus routes, the post Covid commuter flows need more analysis, since it is probable that a larger proportion of the workforce who are able to now work from home for at least part of the month than before Covid. As part of the final regional survey, we included a question about working from home (see Figure 8 above).

Figure 19 Commuter flows where PT travel time is 3x longer than by car, Brora – Tain – Invergordon – Dingwall – Inverness – Nairn – Forres - Elgin.

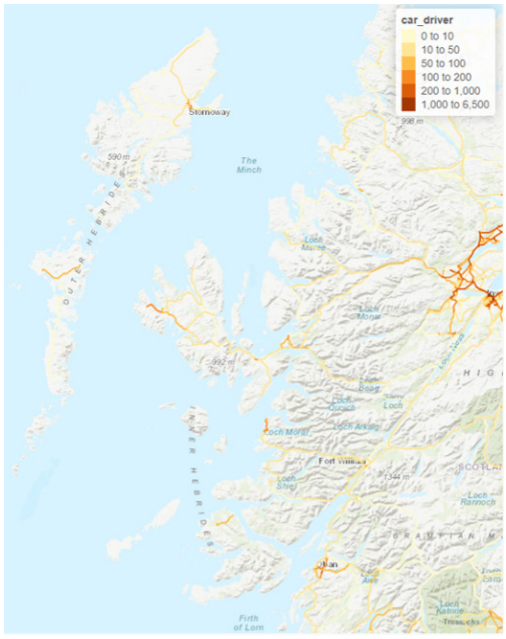
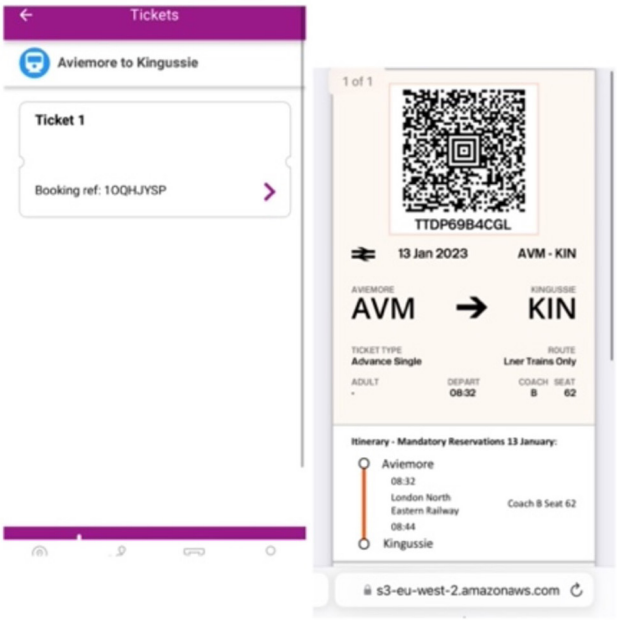


Figure 21 Commuter flows where PT travel time is 3x longer than by car, West Coast, Inner and Outer Hebrides

Figure 20 Commuter flows where PT travel time is 3x longer than by car, Orkney.

Travel and public transport data analysis for future prioritisation



Travel time estimates and accessibility to destinations for different modes

We have also considered what other questions could be asked that would be useful for a regional MaaS covering large rural areas. We believe that spatial analysis using travel time data and a database of Ordnance Survey (OS) Points of Interest could be used to visualise accessibility to different destination types, to answer the question “Where is car dependence deepest?”. Using OpenTripPlanner (walk, cycle, public transport, drive (no traffic)) and Bing Maps (drive with traffic) could be used to produce travel time estimates and compare travel times. E.g. the ratio of driving and PT time. There are conceptual and definitional challenges to this type of analysis, and it whilst it would be useful for locating strategic priorities on the journey towards a fully MaaS integrated transport system that is accessible to all, it was outside the scope of the evaluation to undertake the work.

Discussion

The Scottish policy context frames what contribution MaaS deployment needs to make in Scotland:

- Legislation: Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
  - Net zero by 2045
- Plan: Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update (Specifically Chapter 3)
  - "Whilst a key focus will be on technological advances to green vehicles in Scotland, it is self-evident that managing transport demand and embedding behaviour change will also be of vital importance." (Climate Plan, section 3.3.3)
- Transport Strategy: NTS2
  - Target of a 20% cut in car kilometres by 2030
  - An overall reduction in transport emissions of 75% by 2030
  - Transport is Scotland's biggest emitting sector, accounting for 35.8% of emissions (2018), and nearly 40% of those transport emissions come from cars (Carbon Account for Scotland)
- The challenge of rebuilding public transport use post-Covid
- Just Transitions and transport decarbonisation

Arguably, the biggest challenge facing the transport sector is not decarbonisation per se, but realising the permanent and widespread travel behaviour change that decarbonisation requires at a speed that had been unimaginable until the pandemic impacts on behaviours were seen. It is essential that Mobility as a Service is governed to support, promote and enable that behaviour change at scale and pace.

Whilst precise definitions of Mobility as a Service are still to converge to a full consensus, at heart it seems clear that MaaS is the use of software platforms and data and a single user interface that integrates the users' access to information about mode choice and journey planning with the organisation of access to the modes and associated journeys (i.e. planning, booking or paying)

(Hensher et al., 2023), either via making a journey without using a private car, or having something brought to you without using a private car, or indeed perhaps by enabling virtual mobility, where no trip is necessary. It remains a moot point whether MaaS necessitates a subscription model, or whether Pay as You Go is the better option. User requirement is key here.

GO-HI is a platform that has succeeded in integrating a wider variety of available modes into a usable tool for residents, businesses and visitors to the Highlands and Islands. Some unanticipated challenges around integrations, and around uptake during a period of travel turmoil, have been significant, but the foundations for GO-HI going forward are solid, and valuable lessons have been learned as a result of the Scottish Government's investment. Indeed, GO-HI, being built on a mature platform, can already be used beyond the region for many of the core features (trains, flights, hotels, car hire/car club, and Brompton bike hire), and should be easily extendable as such for integrated operators who have national presence (such as Stagecoach). Indeed, Stagecoach bus ticketing has already extended to include Aberdeen City and Shire ticketing to ensure more extensive coverage of the full range of travel options available in the Cairngorms National Park area. Scottish Citylink and ScotRail ticketing also allows travel for all the services operating across Scotland. Enterprise Car Club and Brompton Bike Hire Booking bring UK wide coverage.

Discussion

Supporting the continued development of MaaS through good governance (e.g. particularly around data as well as different modes) can be used to provide the framework for transport behaviour shift. MaaS is well placed to be one of the pillars of travel behaviour change (given that travel behaviour is the visible tip of the iceberg of a web of social practices which shape our relationships and engagement with employers, educators, healthcare, retail, leisure, etc. The timings of opening hours, the expectation of presence (or more recently work from home orders), are the forces that exist in a chicken and egg cycle with transport and travel. Adopting MaaS involves a change in practice, in which one set of habits is extended to include a new one, using a MaaS app, which may, given the right circumstances and features, give rise to a new set of habits. MaaS platform developers and the stakeholders who commission them therefore have a great social responsibility. When we are thinking about what governance should be in place when supporting the development of MaaS, it should be placing an expectation that MaaS will deliver certain results, and that the wider policy environment exists for that to happen.

However, MaaS on its own cannot provide key elements that would make MaaS a success. Wider transport governance is already in place, and needs to ensure that the experience of using public transport is convenient (i.e. available, accessible and affordable), pleasant and dignified. It needs to be reasserted that public transport modes are the backbone of both transport decarbonisation and the MaaS system. Operators of different sizes, and with varied offerings from community transport and DRT, ferries and island air links, right up through the larger players who run urban bus networks and intercity coaches, trains and trams, all need a specification for how to be integrated into the system, and to know that they are expected to integrate into MaaS systems - the time it takes to negotiate new providers into pilots and trials is hindering progress.

There is also currently little incentive for the end user to adopt MaaS instead of the transport operators' myriad individual branded applications, either in terms of accessing a wider range of transport-adjacent services, direct cost benefits, reward-based incentives or intangible value propositions (such as user dashboards, monitoring metrics of interest to users (such as active travel levels) and behavioural messaging). There is also scope for supporting social inclusion and a just transition by utilising MaaS for mobility credits, directly and discretely through the users' accounts. The ongoing Motability trial with GO-HI has shown some significant potential in contributing to closing the 38% gap in access to transport experienced by disabled people (and their carers). Support for travel costs has shown to be important for social inclusion for those experiencing a transport deficit at different ages. This is especially the case for young people. Both Over 60s and Under 22 bus concession cards have had a dramatic impact on the ability to travel but is spatially unequal due to stark differences in bus provision: an Edinburgh resident over 60 uses their NEC 9 times more often than the average Orcadian. A recent FOI request highlights this for younger people, as can be seen in Table 15. The figures for Under 22 Free Travel shows that card holders in Edinburgh use their card more than four times as often as a Western Isles cardholder and twice as many Edinburgh Under 22s have applied for a card (Scottish Government, 2023). These figures show that young card holders in the GO-HI area are barely making 1 trip per week by bus, compared to four trips per week in Edinburgh.

Table 15 Under 22s concession card uptake and use for 5 Local Authorities relevant to GO-HI coverage, compared to City of Edinburgh (Source: calculated from Scottish Government, 2023)

Local Authority	Uptake estimate against eligible population (ages 5-21)	Number of trips per cardholder per year	Weekly trips calculation
City of Edinburgh	93%	200	3.9
Aberdeenshire Council	66%	62	1.2
Comhairle nan Eilean Siar	48%	46	0.9
Highland Council	47%	67	1.3
Moray Council	56%	63	1.2
Orkney Islands	51%	49	0.9

MaaS, Just Transition and Carbon Emissions Reduction

Going forward, our evaluation suggests that the expectation and emphasis for MaaS should be on achieving social benefits and reducing carbon emissions.

Social Benefits

Making more use of Mobility Credits through MaaS can contribute to correcting this inherent spatial unfairness in the current Scottish approach to delivering concessionary travel, by allowing travel on primary modes of travel in areas where the bus is of limited value, such as islands where ferry and even air service are essential for access to leisure, education (including further education), and rural areas where rail is the only public transport service. This would deliver equity and fairness to the concessionary travel system that as currently designed and delivered offers greater benefits to urban areas than rural. This would deliver equity and fairness by correcting the systemic bias towards urban areas where bus services are more available.

Carbon Emissions Reduction

Future work could include undertaking a series of Transport Scotland-led workshops to understand what it would take for MaaS to enable a 20-25% reduction in vehicle kilometres travelled. For example it could be to use the platform to incentivise rather than monetise walking and cycling alongside promoting new modes such as car clubs, bike hire and electric scooters (something which Scotland has not yet trialled). MaaS apps are also a great way to make new offerings visible to the public: a new icon pops up on the home screen, users can be pushed messages and given special introductory offers to encourage mode shift away from the private car.

There is a need to think about requiring that MaaS apps have user dashboards so people can see all their past trips in one place, with useful metrics like cost, calories, mileage, CO2 emissions. This provides opportunities to nudge unsustainable behaviours, with messaging suggesting change, perhaps offering rewards. Having rewards is one way to encourage people to allow apps to track and detect mode, so all journeys can be analysed, not just those booked through the app. This gives

much richer data for service development, so whilst incentives need to be funded, this should be a virtuous circle. A better value proposition for the end-user, and the ability to incentivize behaviour change are both priorities. GO-HI is working with BetterPoints Ltd to achieve this.

Alignment with the National Transport Strategy 2

Finally, mapping MaaS/GO-HI to the Sustainable Investment Hierarchy (Figure 22), it is an innovation that addresses "Making Better Use of Existing Capacity" and where the services are in place "Reducing the need to travel unsustainably".
We have endeavoured to provide some analysis ideas regarding how to target infrastructure improvements to improve the MaaS backbone. However, switching to using MaaS for trip planning, booking and paying, whether as a B2B proposition, for households or for individuals, both resident and visiting, is a major change to social practices. The scale of this challenge should not be under-estimated; it is not something that can happen rapidly but requires sustaining commitment.

Figure 22 The Sustainable Investment Hierarchy (Source: Scottish Government, 2019)

Conclusions and recommendations

Project objectives

Evaluation risk mitigation in the Business Case was that agreed priority evaluation locations were Inverness, Skye and Orkney. We can say the following about these locations:

Inverness	A core area from which to build normalisation of MaaS across the region.
Skye	Congestion from visitors arriving by private car/camper van remains a key challenge, impacting on emissions and quality of life. Whilst private car users can be encouraged to use MaaS to book and pay for alternative ways of accessing the island, through reflecting on regional knowledge and the experience of the MaaS project, there is not currently a means to manage the caravans/camper vans. Enhancing MaaS products to incorporate overnight stance booking for visitors bringing caravans and camper vans may enable stronger messaging about space availability, and alternative destinations could be suggested via an enhanced MaaS interface.
Orkney	We have used innovative data analysis to show that there is an opportunity to switch car commuting to public transport use for one specific route (see Figure x); otherwise the main opportunities for MaaS in Orkney relate to providing high quality mobility access to visitors particularly, and enabling greater use of Demand Responsive Options.

Outcomes (Performance against KPIs)

The outcomes are largely evaluated qualitatively as small sample sizes reduce the meaning of quantification.

Conclusions and recommendations

Table 16 GO-HI Performance Indicators

Outcome area	ID	Outcome	Performance
Impact on travel behaviour	O1	Overall car use should be reduced as a result of using GO-HI	Demonstrable potential
	O2	Overall active travel (including PT) should increase as a result of using GO-HI	Demonstrable potential amongst tourists
Supporting digital innovation	O3	Users should find GO-HI a compelling proposition that is easy to use	Mixed results
	O4	User retention should be more than 10% over an 8 week period	Insufficient uptake to measure meaningfully
Impact on viability of transport services	O5	Service providers should find providing access to their service through GO-HI a compelling proposition that is cost-effective and increases custom	Demonstrable potential
Impact on mobility and accessibility	O6	GO-HI users should report that they have improved mobility and access as a result of using the app	Difficult to measure meaningfully; results from the Motability trial suggest that this is the case for disabled people.
	O7	Tourist users report improved travel experiences	Insufficient uptake to measure meaningfully; uptake of Hi-Bike and Brompton Bike Hire suggests positive effect.
	O8	Users disadvantaged by remoteness, disability or deprivation report improved access to key activities	We can infer that access to activities has improved for users eligible for Moove Flexi, since there has been a notable upward trend in use since launch. Motability trial suggests improvements in access for disabled people.
Impact on carbon emissions	O9	Business travel managed through GO-HI is lower carbon than previously.	Timing of integration delayed; our alternative measure was to evaluate emissions savings from the use of Car Club vehicles instead of private car. There is potential for significant CO2e savings (between 20% and 26%), due to better fleet characteristics, and there is also more efficient vehicle utilisation.
	O10	There is less reliance on private car and more walking, cycling and public transport use by GO-HI users than the average population.	Insufficient uptake to measure meaningfully; our alternative approach was to calculate potential for targeted improvements to bus services to reduce reliance of car commuting.
	O11	GO-HI users show a shift towards lower carbon modes between Onboarding and end of pilot.	Insufficient uptake to measure meaningfully; our alternative measure was to evaluate emissions savings from the use of Car Club vehicles instead of private car. Significant CO2e savings are possible (between 20% and 26%), combined with more efficient vehicle utilisation and better fleet characteristics.
Impact on health	O12	Frequent travellers using GO-HI increase their active travel, in part through greater use of public transport.	Insufficient uptake to measure meaningfully;
	O13	Tourist users use GO-HI to access shared bicycles and public transport, even if they arrived at their holiday destination by car.	We can show that uptake of Hi-Bike and Brompton Bike has been strong, and mostly by visitors.
	O14	Users report that they would have used a car if they had not used GO-HI.	Insufficient uptake to measure meaningfully;

Evaluation of GO-HI Successes

GO-HI, as a UK first in terms of launching a regional MaaS, has achieved some notable successes. It has UK national and international reach for rail, flights, car rental, car club, Brompton bike hire, taxi and hotel bookings. Scotland wide travel on ScotRail is included and Scottish Citylink is being integrated in March 2024 for all of their Scottish services. Beyond the HITRANS region the integration of Northlink Ferries includes travel to Shetland from Aberdeen in addition to those services to Orkney. Stagecoach ticketing initially focussed on the HITRANS region but has now extended to include Stagecoach Bluebird ticking products in Aberdeen and Aberdeenshire and this will extend further to include Stagecoach East Scotland tickets in Spring 2024. All this makes GO-HI good for tourists, business users and anyone in the Hitrans area who needs to travel outside of that area, as well as people travelling to the region to visit friends and family. Reach for bus users is also steadily extending through key operators, such as Stagecoach and Scottish Citylink, seeing the benefits of integration and extension.

Innovation

GO-HI has been judged as excellent in a number of awards schemes: winning Scottish Transport Awards 2023 - Excellence in Technology and Innovation; SCDI Highlands & Islands Business Excellence Awards 2023 - Excellence in Innovation; and CiTTi Magazine Awards 2023 – Shared Mobility Award.

GO-HI is awaiting the outcome as a finalist in Transport Ticketing Awards 2024 – Best MaaS initiative, and was also a finalist in several other awards: Transport Ticketing Awards 2022 - Best MaaS initiative; CiTTi Magazine Awards 2022 – Shared Mobility Award; Transport Ticketing Awards 2023 – Best MaaS Initiative; CiTTi Magazine Awards 2023 – Public Sector Award; CiTTi Magazine Awards 2023 – Transport Accessibility Award.

GO-HI Limitations

Value proposition

In practice, transport operators who have their own apps for journey planning, booking and paying for their services are not yet likely in the short-medium term to abandon those apps and switch entirely to a MaaS platform instead. Therefore there needs to be added value for both the operator and the end user for adopting the MaaS app, and this raises questions about generating a self-sustaining product over the longer term. Ideally, continuous improvement and extension of the offer, particularly into transport-adjacent services (though note that GO-HI already includes hotel bookings) that are related to mobility need to be built in to future projects/products. Continued movement towards a B2B product that may subsidise the B2C delivery is a priority.

A means also has to be found to enable MaaS platforms to act as a focal point for enabling social change in mobility practices. Understandably, the early innovation stage had to focus on individual preferences in MaaS product design to drive uptake, but as argued by Pangbourne et al (2018) this risks drawing us away from the collective good by reducing the ability for government to steer outcomes if key incentives are not built into MaaS platforms in some way.

Scale and density remains an issue – periurban and rural areas with less public transport are being left behind by MaaS developments because of the importance of public transport to MaaS. GO-HI has addressed this by progressing the integration of demand responsive services, a significant challenge given the number of small, volunteer-based operators in this sector. GO-HI also faced a significant challenge in deploying across a geographically large and complex region with profound rurality and only small pockets of urbanisation, coupled with particular seasonal congestion issues related to tourism, and how these characteristics impact on achieving the sustainable transport hierarchy.

Conclusions and recommendations

Marketing

We have learned very clearly that effective marketing is not a 'nice to have' for a new product such as MaaS. It is essential to be able to inform potential users and to clearly communicate the benefits that users can gain from taking up usage of MaaS. The app market is very full with journey planners and other transport-related tools, and therefore the evident pool of potential users needs to have more opportunities to discover GO-HI and be presented with compelling reasons to use it. Distinguishing GO-HI as a truly integrated service that offers the ability to plan, book and pay for a wide range of transport services can be a challenge. Marketing also needs to be contextual – hyperlocal marketing of GO-HI works best, as it can be tailored to the local context, linked with launches of key transport initiatives, and special events in order to drive membership and increase use of alternatives to the private car.

Inclusion and usability

The GO-HI platform has not been assessed against any inclusion criteria, as none currently exist for MaaS, and hence there are some design features that may not fully meet inclusivity and universal design standards. Academic work is starting to emerge in this area, such as the MaaSINI framework (see Figure 23) (Dadashzadeh et al., 2022).

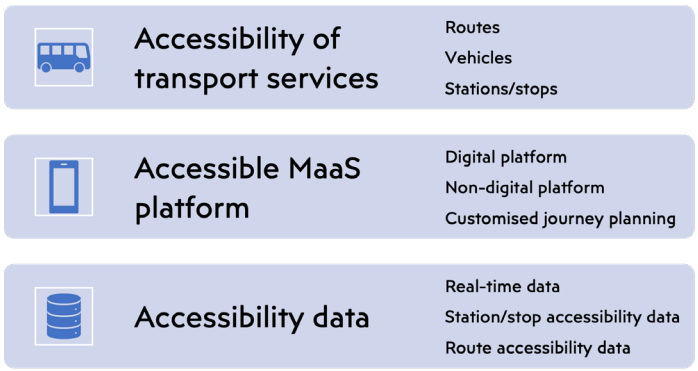


Figure 23 The MaaSINI framework for accessibility and inclusion (source:)

The MaaSINI framework includes Accessibility of transport services, which is not within the gift of MaaS platform providers, except in terms of providing better information about the range of modes available. However, the other two pillars of the framework relate to inclusive platform usability, and having accessibility data, factors which are very relevant to users, but thus far less addressed within the MaaS sector. We have some observations from partners that suggest that 'clunky' registration processes are a barrier to uptake. A very low friction sign up process is needed and should be a focal point for future projects. However, GO-HI has a good potential score for some factors in the Accessible MaaS platform criteria, with telephone booking available for the Demand Responsive Service, and a concierge service built in to the GO-HI application. Including Accessibility Data is an important area for further development but needs greater investment in data standards and quality across the transport industry.

Integrating new service providers

Integration of a new service into GO-HI (and MaaS in general at this time) can be a difficult process that currently takes too long due to a lack of standardisation, in addition to the variation in data needs according to mode. This is another area that should be a focal point of future projects, and in part is related to data quality issues, as well as the specific data requirements for booking some modes (such as ferries, which require the ability to book cabins, and need information about gender, which goes far beyond the 'light touch' user registration information in GO-HI).

Recommendations from the GO-HI project

This final evaluation synthesises insight derived from four perspectives over the course of the GO-HI Project: academic, transport authority, technology provider and transport operator, and considers how to ensure that MaaS deployments can support Scotland's challenging climate change and Just Transition goals.

Technical:

Future tenders for travel options in the region should include API integration with GO-HI. This could take the legislative route. This was done in Finland where a requirement to enable MaaS was built in. For example, requiring APIs could be done through choices as to how to implement Open Data under the Transport (Scotland) Act 2019.
Poor phone coverage in some areas remains an issue. Roaming SIMs are needed to overcome this.

Marketing:

A core activity for MaaS in order to raise awareness and drive adoption. Hyperlocal marketing linked to key transport-related developments or events that generate travel (such as festivals) is effective.
Geographic coverage:
Early adopters of MaaS are more mobile than the majority of the population – as core users they need to be able to use a MaaS platform for journeys outside the core region, potentially nationally.

Research:

Spatial analysis using travel time data and a database of Ordnance Survey (OS) Points of Interest could be used to visualise accessibility to different destination types, to answer the question "Where is car dependence deepest?" as a means of identifying strategic priorities for strengthening transport options that feed through to the MaaS value proposition.

Operator value proposition:

Integrated ticketing still challenging for some bus operators; national engagement with bus operators around MaaS should be encouraged.

User value proposition:

Greater personalisation through user dashboards that summarise trip making behaviours, providing metrics like cost, calories, distances, mode split, CO2 emissions.

Behaviour:

User dashboards can help nudge behaviour, especially if supported by more personalised messaging and incentives.

Data:

App look and feel is not enough: Source data for journey planning needs to improve. Provision of accurate open data should be a priority for Scotland.

With a better user value proposition, mode tracking becomes more acceptable. Unlocking this data source is one key policy and commercial benefit of MaaS that is not yet fully harnessed.

Service offering:

Much of the current literature is looking at how the user value proposition and the viability of MaaS can be enhanced by extending the services included to those which are adjacent to trip making.

References

Amaral, A.M., Barreto, L., Baltazar, S., Silva, J.P. and Gonçalves, L. eds., (2020). Implications of mobility as a service (MaaS) in urban and rural environments: Emerging research and opportunities: Emerging research and opportunities.

Barajas, J.M. and Brown, A., 2021. Not minding the gap: Does ride-hailing serve transit deserts? *Journal of Transport Geography*, 90, p.102918.

Becker, H., Balac, M., Ciari, F. and Axhausen, K.W., (2020). Assessing the welfare impacts of Shared Mobility and Mobility as a Service (MaaS). *Transportation Research Part A: Policy and Practice*, 131, pp.228-243.

Butler, L., Yigitcanlar, T., & Paz, A. (2021). Barriers and risks of Mobility-as-a-Service (MaaS) adoption in cities: A systematic review of the literature. Cities, 109, 103036.

Carbon Account for Scotland (P4) https://www.transport.gov.scot/media/48199/sct07209535161.pdf

Chung, L. (no date). What is a good survey response rate for online customer surveys? *Delighted by Qualtrics*. https://delighted.com/blog/average-survey-response-rate

Dadashzadeh, N., Woods, L., Ouelhadj, D., Thomopoulos, N., Kamargianni, M., & Antoniou, C. (2022). Mobility as a Service Inclusion Index (MaaSINI): Evaluation of inclusivity in MaaS systems and policy recommendations. *Transport Policy,* 127, 191-202.

Doub, A., Levin, A., Heath, C. et al. Mobile app-etite: Consumer attitudes towards and use of mobile technology in the context of eating behaviour. (2015) *J Direct Data Digit Mark Pract* 17, 114–129. https://doi.org/10.1057/dddmp.2015.44

Eckhardt, J., Nykänen, L., Aapaoja, A., & Niemi, P. (2018). MaaS in rural areas - case Finland. *Research in Transportation Business & Management*, 27, 75-83.

Hensher, D. A., Mulley, C., & Nelson, J. D. (2023). What is an ideal (Utopian) mobility as a service (MaaS) framework? A communication note. *Transportation Research Part A: Policy and Practice*, 172, 103675. https://doi.org/https://doi.org/10.1016/j.tra.2023.103675

HERE. (2020). The state of mobility 2019. Available from https://mobility.here.com/research/e-book/state-of-mobility-2019

Hoerler, R., Stünzi, A., Patt, A. *et al.* (2020). What are the factors and needs promoting mobility-as-a-service? Findings from the Swiss Household Energy Demand Survey (SHEDS). *Eur. Transp. Res. Rev.* 12, 27. https://doi.org/10.1186/s12544-020-00412-y

Karlsson, MA., Akram, A., Diener, D., Fallahi, S., Sarasini, S., Pernastal, A., Zhao, X., (2019). *Kombinerad Mobilitet - Ett ramverk för utvärdering av ekologiska, ekonomiska och sociala effecter.* https://kompis.me/wp-content/uploads/2019/06/KOMPIS_Utva%CC%88rderingsramverk-och-KPIer.pdf

Kazemzadeh, K., & Sprei, F. (2022). Towards an electric scooter level of service: A review and framework. *Travel Behaviour and Society*, 29, 149-164.

Lindkvist, H., & Melander, L. (2022). How sustainable are urban transport services? A comparison of MaaS and UCC. *Research in Transportation Business & Management*, 43, 100829.

Lopez-Carreiro, I., Monzon, A., Lopez, E., & Lopez-Lambas, M. E. (2020). Urban mobility in the digital era: An exploration of travellers' expectations of MaaS mobile-technologies. *Technology in society*, 63, 101392

Lucas, K. Stokes, G., et al. (2019). Inequalities in mobility and access in the UK transport system. [for surveys pg. 17/ MaaS]

Kamargianni, M., Matyas, M., Li, W., and Muscat, J. (2018). Londoners' attitudes towards car-ownership and Mobility-as-a-Service: Impact assessment and opportunities that lie ahead. MaaSLab - UCL Energy Institute Report, Prepared for Transport for London.

Kriswardhana, W., & Esztergár-Kiss, D. (2023). A systematic literature review of Mobility as a Service: Examining the socio-technical factors in MaaS adoption and bundling packages. *Travel Behaviour and Society*, 31, 232-243.

McIlroy, R. C. (2023). Mobility as a service and gender: A review with a view. *Travel Behaviour and Society*, 32, 100596.

Muller, M., Park, S., Lee, R., Fusco, B., & Correia, G. H. d. A. (2021). Review of whole system simulation methodologies for assessing mobility as a service (Maas) as an enabler for sustainable urban mobility. *Sustainability*, 13(10), 5591.

Mulley, C., Nelson, J. D., & Wright, S. (2018). Community transport meets mobility as a service: On the road to a new a flexible future. *Research in Transportation Economics*, 69, 583-591.

Mulley, C., Nelson, J.D., Ho, C. and Hensher, D.A., 2023. MaaS in a regional and rural setting: Recent experience. *Transport Policy*, 133, pp 75-85.

National Literacy Trust (no date). Available at: https://literacytrust.org.uk/parents-and families/adult-literacy/

Schikofsky, J., Dannewald, T., & Kowald, M. (2020). Exploring motivational mechanisms behind the intention to adopt mobility as a service (MaaS): Insights from Germany. *Transportation Research Part A: Policy and Practice*, 131, 296-312.

Scottish Government (2019) National Transport Strategy 2.

Scottish Government (2023) Free bus pass scheme costs and uptake: FOI release - gov.scot (www.gov.scot)

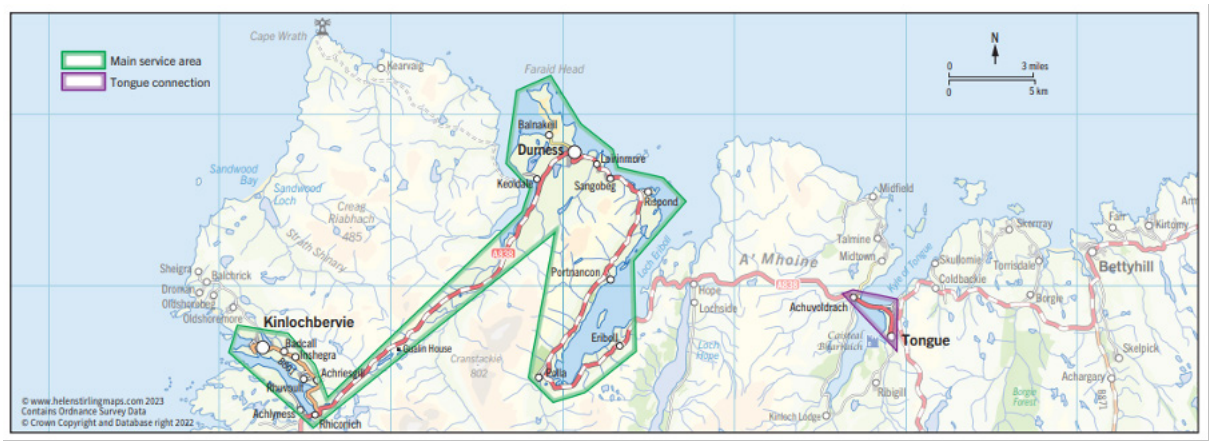
Smith, G., Sochor, J., & Karlsson, I. M. (2018). Mobility as a Service: Development scenarios and implications for public transport. *Research in Transportation Economics*, 69, 592-599.

UITP (2019) Ready for MaaS? Easier mobility for citizens and better data for cities. https://cms.uitp.org/wp/wp-content/uploads/2020/07/Policy-Brief_MaaS_V3_final_web_0.pdf

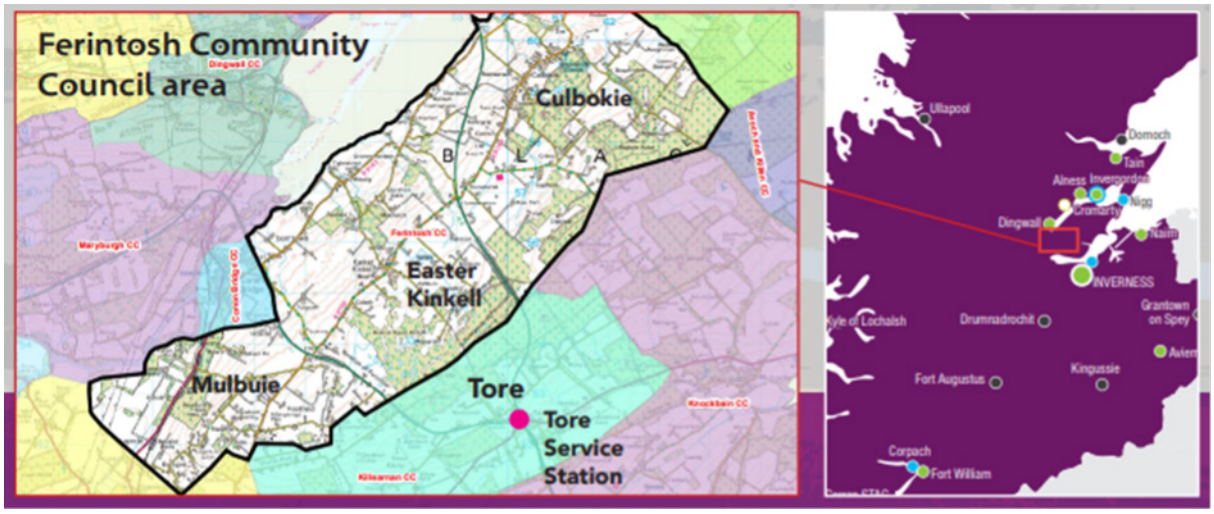
Zhang, Y., & Kamargianni, M. (2023). A review on the factors influencing the adoption of new mobility technologies and services: autonomous vehicle, drone, micromobility and mobility as a service. *Transport Reviews,* 43(3), 407-429.

Appendix 1

The Durness Bus

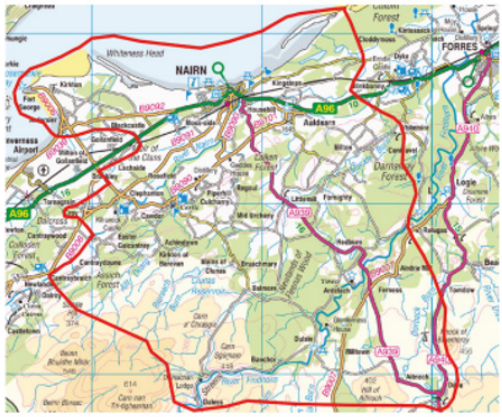


Ferintosh Wee Bus



Wheels in Nairnshire (WIN)

The service covers all public roads within Nairnshire, and to and from Croy and Ardersier.



It does not cover journeys which could be made by:

- The Nairn town bus service;
- The Stagecoach Services 10 and 11 along the A96 corridor, including Ardersier and Auldearn, and into Lochloy.

The bus may also make journeys between Croy and Ardersier.

Tain Area Dial-a-Bus

Where the bus operates in the Tain and Nigg area

The service covers Tain and between Tain and:

- Scotsburn, Quarryhill, and Edderton including Balleigh, Ardmore and nearby minor roads; and
- Nigg ferry terminal, by the B9175 and on minor roads within two miles of the B9175.

The service does not cover journeys between Edderton and Tain if they could reasonably be made by the Tain to Lairg public bus.

On Saturdays only the area between Tain and Portmahomack (using direct roads and nearby minor roads for example, to Lochslin and Inver) is also included.

Appendix 2

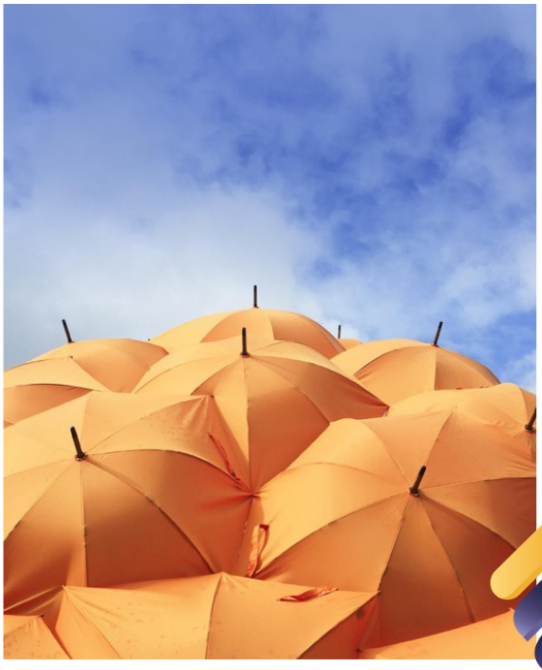
GO-HI KPI REPORT

Phase Two Digital Report

FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE

FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE

Key Takeouts - GO-HI



Glossary

Sessions - A group of user interactions with your website that take place within a given time frame. For example a single session can contain multiple page views, events, social interactions, and ecommerce transactions.
Page Views - The total number of pages viewed. Repeated views of a single page are counted.
Bounce Rate - Single-page sessions divided by all sessions, or the percentage of all sessions on your site in which users viewed only a single page and triggered only a single request to the Analytics server.
Users - The number of unique visitors to your site.
Avg Session Duration - The metric that measures the average length of sessions on a website. Google Analytics begins counting a session once a user lands on a site, and continues counting until the user exits the site or is inactive for a predetermined amount of time.
Position - The "position" metric is an attempt to show approximately where on the page a given link was seen, relative to other results on the page.
CTR - The number of clicks that your ad receives divided by the number of times your ad is shown: clicks ÷ impressions = CTR.
CPC - The average amount that you've been charged for a click on your ad. Average cost-per-click (avg. CPC) is calculated by dividing the total cost of your clicks by the total number of clicks.
Click Conversion Rate - A metric that is calculated as the number of conversions divided by clicks, expressed as a percentage.
ER or Engagement Rate - ER are metrics that track how actively involved with your content your audience is. It is calculated as total engagement divided by total impressions, multiplied by 100
CPM - Stands for Cost Per Mille, or thousand, and is basically the amount an advertiser will pay for a thousand impressions.
Reach - The total number of people who see your content.
Impressions - The number of times your content is displayed, no matter if it was clicked or not.
CPA - Cost per acquisition refers to the fee a company will pay for an advertisement that results in a converion.

Google Analytics Overview - GO-HI

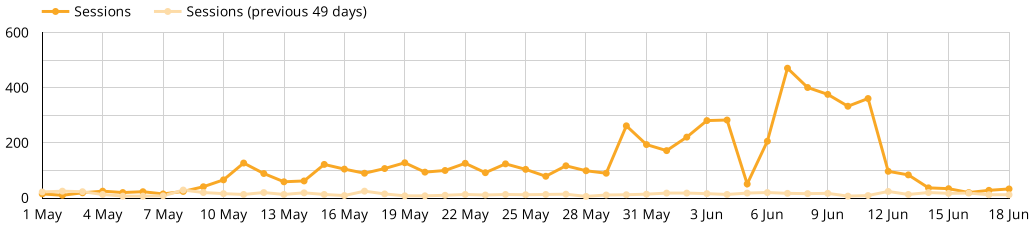
1 May 2023 - 18 Jun 2023

Google Analytics is a platform that collects data from your websites and apps to create reports that provide insights into your business

Performance Snapshot

New users	Total users	Event count	Sessions
5,106 ↑ 870.7%	5,130 ↑ 827.7%	22,615 ↑ 642.9%	6,160 ↑ 748.5%

Page View Overview



Top Pages by Page View

	Landing page	Views ▾	% Δ
1.		6,193	1,726....
2.	/news/top-10-sco...	336	3.7% ↑
3.	/stagecoach-offer	130	-
4.	/about	122	139.2...
5.	/news/the-most-i...	99	350.0...
6.	/contact	32	220.0...
7.	/	22	-
8.	/news	12	500.0...
9.	/for-business	8	700.0...
1...	/sitemap	7	40.0% ↑

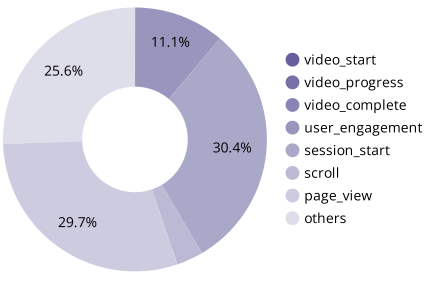
1 - 10 / 19

Number of Sessions Per Traffic Channel

	Default channel g...	Sessions ▾	% Δ
1.	Paid Search	2,825	-
2.	Organic Search	749	86.8% ↑
3.	Display	619	-
4.	Direct	334	398.5% ↑
5.	Paid Video	264	-
6.	Referral	161	192.7% ↑
7.	Organic Video	130	-
8.	Organic Social	18	800.0% ↑
9.	Unassigned	5	-
10.	Paid Other	2	-

1 - 10 / 11

Events by Sessions



Appendix 2

FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE

Google PPC Overview - GO-HI

Go-Hi | 1 May 2023 - 18 Jun 2023

Performance Snapshot

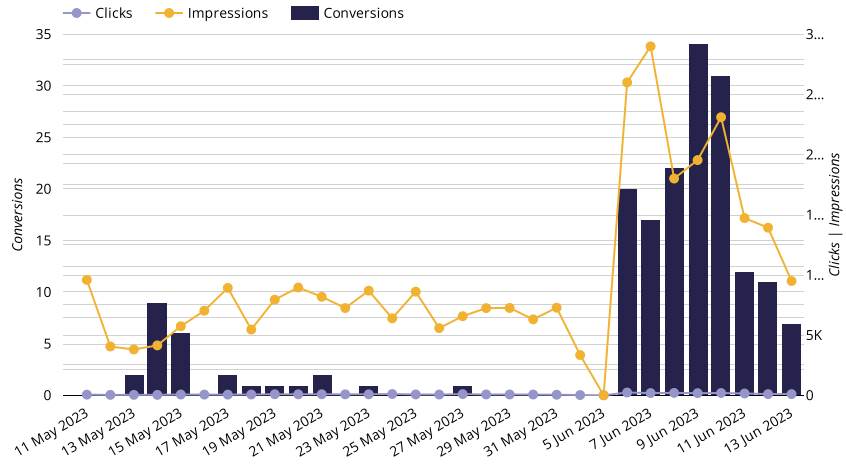
Clicks	Impressions	CTR	Video view rate	Click conversion rate	App Install's (android)
2,734	302,078	0.91%	7.74%	0.34%	185

Campaign Performance Breakdown

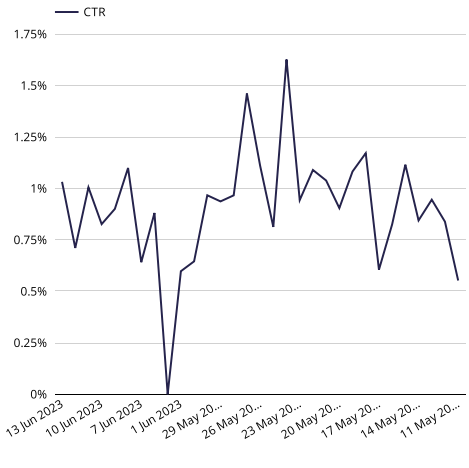
Ad group	Clicks	Impressions	All conv.
1.. Youtube	1,299	229,635	0
2.. Search Ad Installs ...	818	30,131	5
3.. Android - Launch	617	42,312	180

1 - 4 / 4

Weekly performance Breakdown



Click Through Rate Snapshot



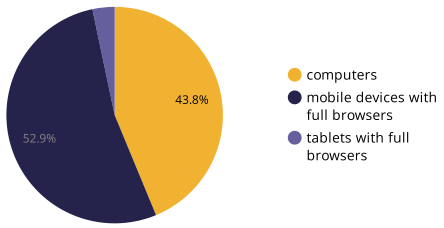
Google PPC Search Campaign - GO-HI

Go-Hi | 1 May 2023 - 18 Jun 2023

Performance Snapshot

Clicks	Impressions	CTR	Impression (Top) %
818	30,131	2.71%	95.18%

Impression Share by Device



Top performing Keywords

Campaign: Equals App-Install...

Search term	Clicks	Impressions
go hi app	41	68
journey to fort william scotland scots pinay vlog	30	115
our weekend escape fort william scotland	28	130
go hi	28	45
journey to fort william scotland scots pinayvlog	7	17
transportation fort william to inverness	4	173
scotland itinerary 7 days	4	29
scotland trip planner	4	35
isle of skye day tour from inverness	3	5
visiting scotland in march	3	11
scotland by public transport	3	4
scotland train tours	3	12
taj tours scotland	3	3
travel agency scotland	3	22
hogwarts express scotland	2	5
ferries to orkney islands	2	4
best uk holiday destinations for young adults	2	2

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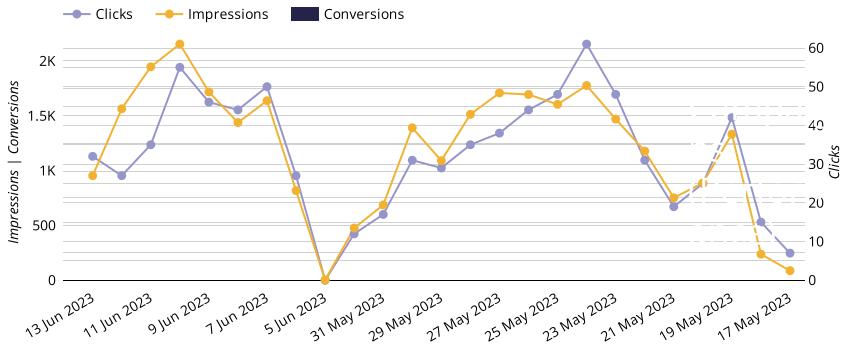
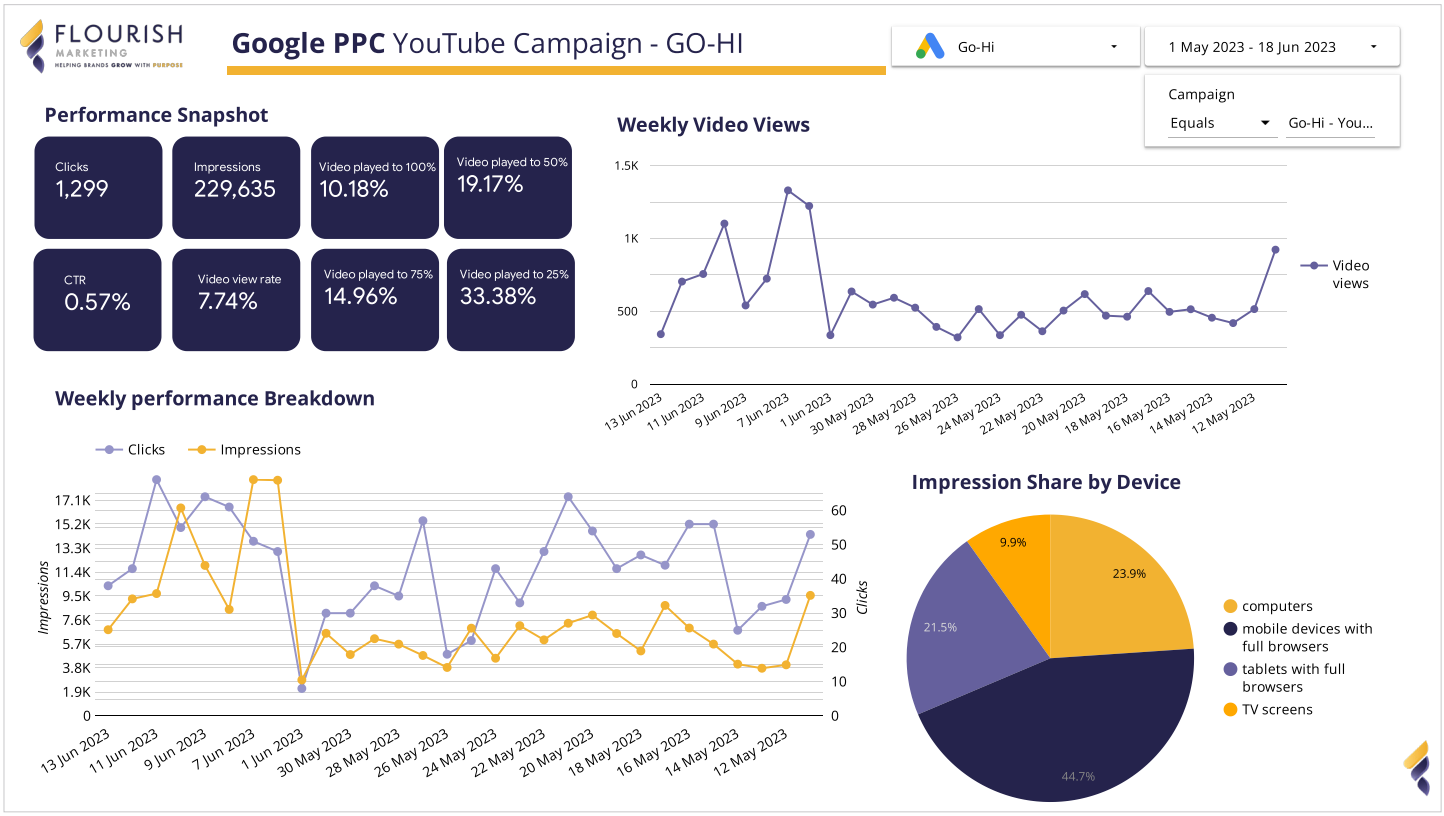
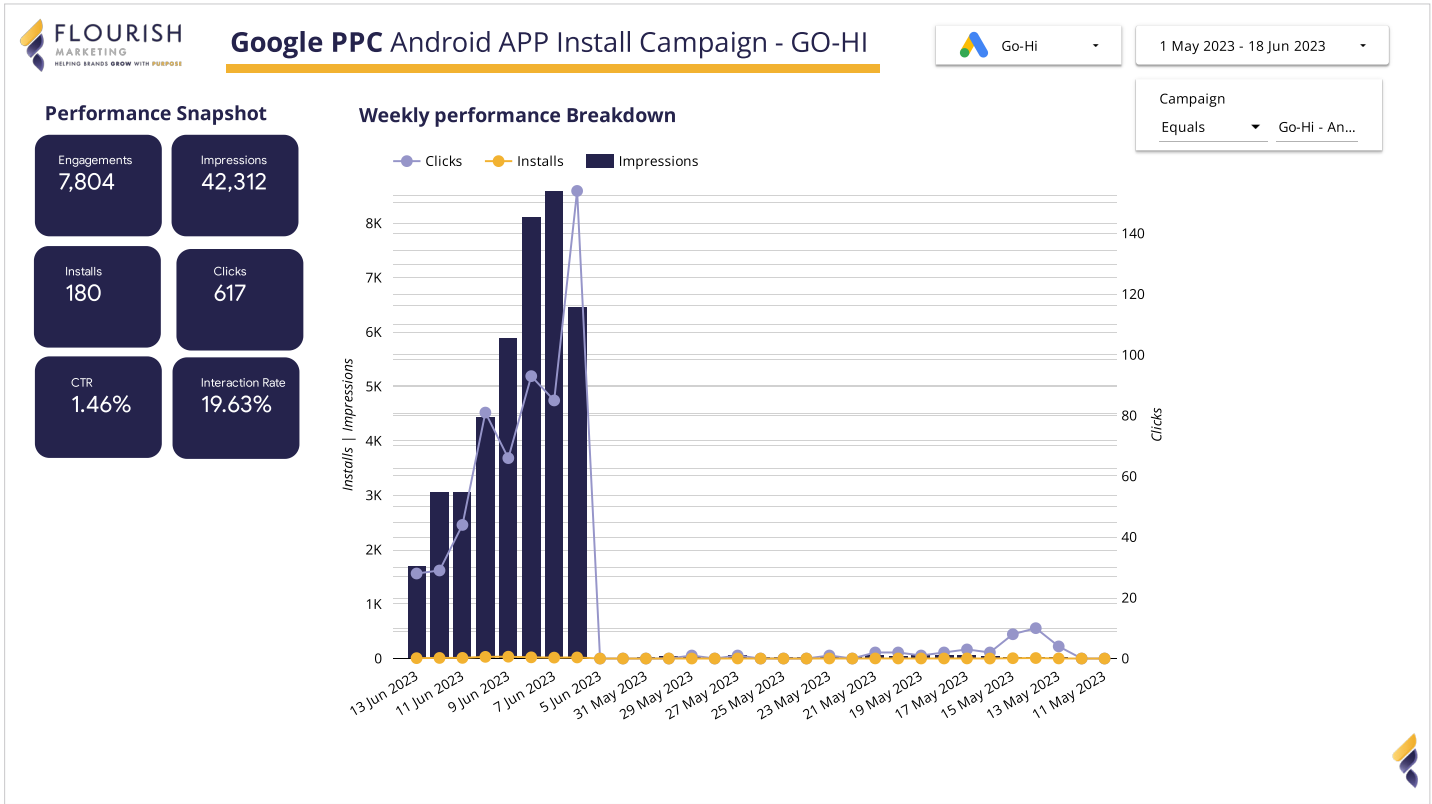
Weekly performance Breakdown




FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE
Google PPC YouTube Campaign - GO-HI
Go-Hi
1 May 2023 - 18 Jun 2023
Campaign
Equals
Go-Hi - You...
Performance Snapshot
Clicks 1,299
Impressions 229,635
Video played to 100% 10.18%
Video played to 50% 19.17%
CTR 0.57%
Video view rate 7.74%
Video played to 75% 14.96%
Video played to 25% 33.38%
Weekly Video Views
1.5K
1K
500
0
Video views
13 Jun 2023
11 Jun 2023
9 Jun 2023
7 Jun 2023
1 Jun 2023
30 May 2023
28 May 2023
26 May 2023
24 May 2023
22 May 2023
20 May 2023
18 May 2023
16 May 2023
14 May 2023
12 May 2023
Weekly performance Breakdown
Clicks
Impressions
Impressions
17.1K
15.2K
13.3K
11.4K
9.5K
7.6K
5.7K
3.8K
1.9K
0
Clicks
60
50
40
30
20
10
0
Impression Share by Device
9.9%
23.9%
21.5%
44.7%
computers
mobile devices with full browsers
tablets with full browsers
TV screens


FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE
Google PPC Android APP Install Campaign - GO-HI
Go-Hi
1 May 2023 - 18 Jun 2023
Campaign
Equals
Go-Hi - An...
Performance Snapshot
Engagements 7,804
Impressions 42,312
Installs 180
Clicks 617
CTR 1.46%
Interaction Rate 19.63%
Weekly performance Breakdown
Clicks
Installs
Impressions
Installs | Impressions
8K
7K
6K
5K
4K
3K
2K
1K
0
Clicks
140
120
100
80
60
40
20
0
13 Jun 2023
11 Jun 2023
9 Jun 2023
7 Jun 2023
5 Jun 2023
31 May 2023
29 May 2023
27 May 2023
25 May 2023
23 May 2023
21 May 2023
19 May 2023
17 May 2023
15 May 2023
13 May 2023
11 May 2023

Appendix 2

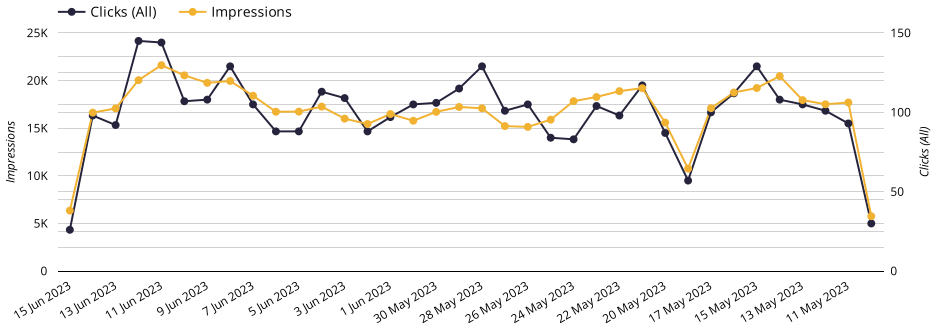
Facebook Paid Overview - GO-HI

1 May 2023 - 18 Jun 2023

Overview Key Performance Statistcs

Reach	Clicks (All)	Impressions	CTR (All)	Frequency
37,264	3,606	607,224	0.6%	16.3

Impression and Click Overview



Performance by Age

	Age (Ad Set Settings)	Clicks (All)
1.	65+	1,633
2.	55-64	653
3.	35-44	480
4.	45-54	429
5.	25-34	354
6.	18-24	57

1 - 6 / 6

Campaign Split by Impressions

	Campaign Name	Impressions...
1.	Go-Hi Phase Two Highlands and Isl...	211,923
2.	Go-Hi Phase Two Moray	167,536
3.	Go-Hi Phase Two Inverness	141,051
4.	Go-Hi Phase Two Orkney	86,714

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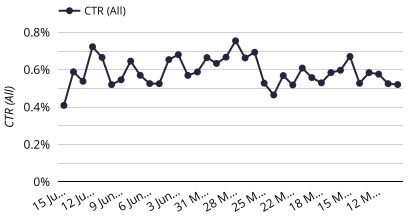
CTR by Date



Facebook Paid Orkney - GO-HI

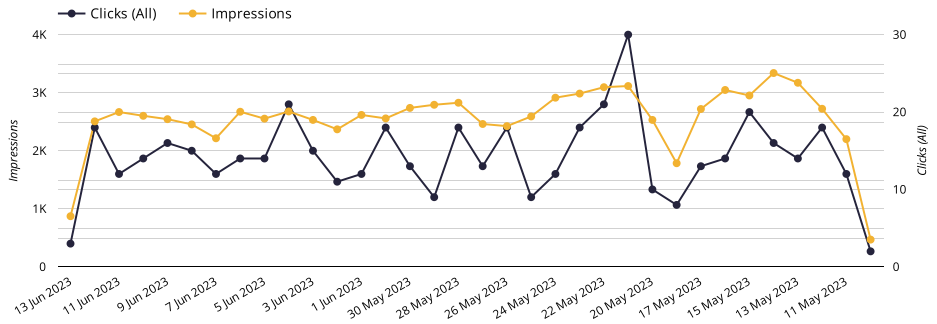
Campaign Name Equals Go-H...

1 May 2023 - 18 Jun 2023

Overview Key Performance Statistcs

Reach	Clicks (All)	Impressions	CTR (All)	Frequency
4,209	483	86,714	0.6%	20.6

Impression and Click Overview



Ad Set Breakdown

	Ad Set name	Impressions	Clicks (All)	Post Engageme...
1.	Orkney - Leisure - IOS	7,270	20	20
2.	Orkney - Leisure - Android	18,065	141	139
3.	Orkney - Explore - IOS	7,971	19	20
4.	Orkney - Explore - Android	24,227	146	148
5.	Orkney - Commuter - IOS	8,124	27	27
6.	Orkney - Commuter - Android	21,057	130	134

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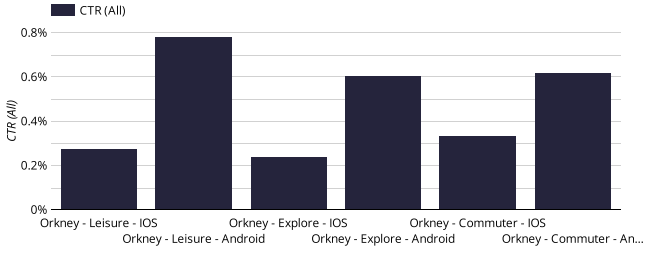
Engagement Overview



Facebook Paid Moray - GO-HI

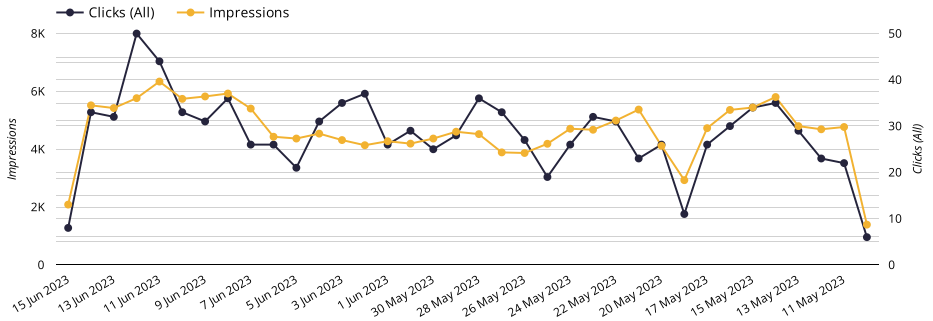
Campaign Name: Equals Go-H...

1 May 2023 - 18 Jun 2023

Overview Key Performance Statistcs

Reach	Clicks (All)	Impressions	CTR (All)	Frequency
9,838	1,020	167,536	0.6%	17.0

Impression and Click Overview



Ad Set Breakdown

	Ad Set name	Impressions	Clicks (All)	Post Engageme...
1.	Moray - Leisure -IOS	12,404	31	32
2.	Moray - Leisure - Android	36,906	277	278
3.	Moray - Explorer - IOS	13,838	36	39
4.	Moray - Explorer - Android	49,630	333	329
5.	Moray - Commuter - IOS	13,836	28	29
6.	Moray - Commuter - Android	40,922	315	313

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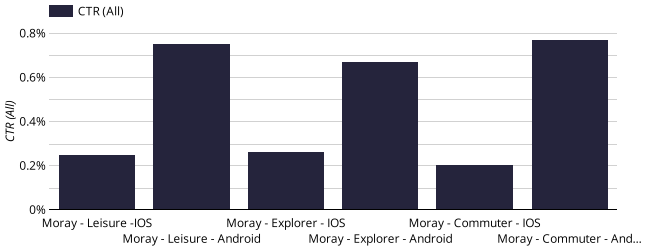
Engagement Overview



Facebook Paid Inverness - GO-HI

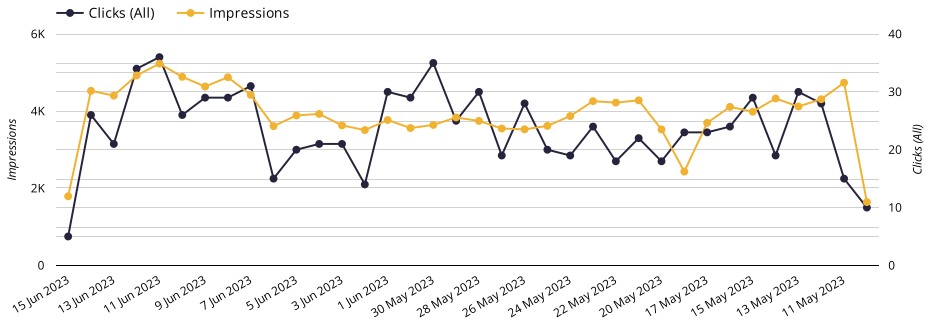
Campaign Name: Equals Go-H...

1 May 2023 - 18 Jun 2023

Overview Key Performance Statistcs

Reach	Clicks (All)	Impressions	CTR (All)	Frequency
10,370	846	141,051	0.6%	13.6

Impression and Click Overview



Ad Set Breakdown

	Ad Set name	Impressions	Clicks (All)	Post Engageme...
1.	Inverness - Leisure - IOS	5,688	8	8
2.	Inverness - Leisure - Android	32,764	260	264
3.	Inverness - Explorer - IOS	9,296	22	25
4.	Inverness - Explorer - Android	40,376	275	275
5.	Inverness - Commuter - IOS	5,651	13	13
6.	Inverness - Commuter - Android	38,244	248	249
7.	Inverness - Airport - IOS	4,398	8	8
8.	Inverness - Airport - Android	4,634	12	13

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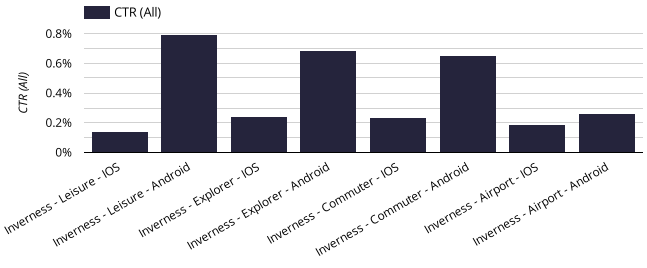
Engagement Overview



Appendix 2


FLOURISH MARKETING
HELPING BRANDS GROW WITH PURPOSE
Facebook Paid Highlands & Islands - GO-HI
Campaign Name
Equals
Go-H...
1 May 2023 - 18 Jun 2023
Overview Key Performance Statistcs
Reach
13,060
Clicks (All)
1,257
Impressions
211,923
CTR (All)
0.6%
Frequency
16.2
Impression and Click Overview
Clicks (All)
Impressions
Impressions
Clicks (All)
8K
6K
4K
2K
0
60
40
20
0
15 Jun 2023
13 Jun 2023
11 Jun 2023
9 Jun 2023
7 Jun 2023
5 Jun 2023
3 Jun 2023
1 Jun 2023
30 May 2023
28 May 2023
26 May 2023
24 May 2023
22 May 2023
20 May 2023
17 May 2023
15 May 2023
13 May 2023
11 May 2023
Ad Set Breakdown
Ad Set name
Impressions
Clicks (All)
Post Engageme...
1. Highlands and Islands - Explorer- I... 23,192 52 52
2. Highlands and Islands - Explorer - ... 22,638 64 67
3. Highlands and Islands - Commuter... 62,286 496 487
4. Highlands and Island - Leisure - IOS 20,990 68 71
5. Highlands and Island - Leisure - An... 59,053 519 508
6. Highlands and Island - Commuter ... 23,764 58 59
1 - 6 / 6
Engagement Overview
CTR (All)
CTR (All)
1%
0.8%
0.6%
0.4%
0.2%
0%
Highlands and Islands - Explorer- IOS
Highlands and Islands - Explorer - Andr...
Highlands and Islands - Commuter - An...
Highlands and Island - Leisure - IOS
Highlands and Island - Leisure - Android
Highlands and Island - Commuter -IOS

Go-Hi:
Highlands & Islands

Post Campaign Analysis

16.08.2021
By
Kerim McAteer
Sarah Adam

Digital Performance Summary

The Go-Hi activity captured strong levels of engagements through – out the campaign – delivering the planned budget in full.

The campaign ran across
- Radio
- Online Search
- Online Display
- Social

Overall the campaign delivered:

+3.2M IMPACTS

+15k LINK CLIKS

+800 Installs (Android only)

CHANNEL:	IMPRESS-IONS	LINK CLICKS	CTR %	CPC *(net for PPC)*	CPM
Google					
Search	330,351	3,759	1.1%	£0.62	£6.65
Social					
FACEBOOK	1,067,457	8,281	0.78%	£0.46	£3.55
Display					
DV360	1,885,760	2,980	0.16%	£1.34	£3.00
	3,283,568	**15,020**	**0.46%**	**£0.78**	**£3.6**

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Appendix 2

Digital Performance Summary

!!! Please note!!!

Due to tracking limitations (i.e. unavailability of Firebase app tracking) the App Installs could only be tracked from Android devices via the Google promotion. App installs from IOS devices and other channels are not included in the above figure.

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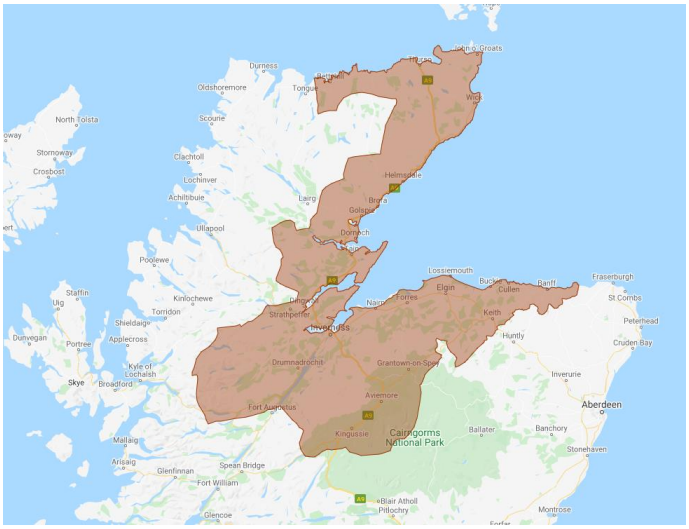
RADIO

RADIO



MFR (Moray Firth Radio) was selected due to it's standalone coverage of some of our key geographies including the Scottish Highlands, Moray, and North West Aberdeenshire.

Our week on week off approach gave us a presence across the 8 week campaign period.

In total the campaign reached 151,000 Adults (59.21% of the MFR transmission area) on average 9.87 times with as a result delivered over 1.48 million impacts.

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SEARCH

Appendix 2

SEARCH - Overview

Google

CHANNEL:	IMPRESS-IONS	LINK CLICKS	CTR %	CPC *(net for PPC)*	CPM
Search	330,351	3,759	1.1%	£0.62	£6.65

Google Search and App install campaigns delivered over **+330k impressions**, driving over **3.7k clicks** to site.

Multiple keyword and targeting strategies were tested throughout the activity –with the 'App Install' and 'Bus App' targeting delivering strongest results.

829 direct app installs were tracked directly rom Android devices. However this figure excludes IOS devices The actual app installs is expected to be greater than the figure.

Further data can be found on report details

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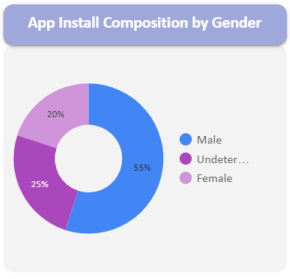
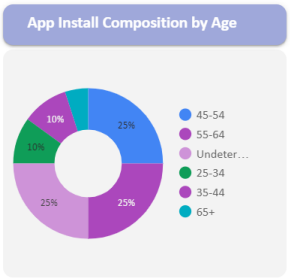
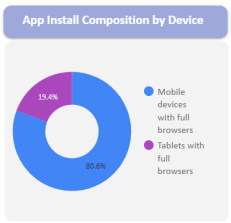
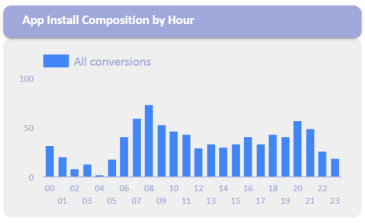
SEARCH– Performance Overview









Device delivery was optimised towards mobile

- Mobile - 86%
- Tablets 14%

- A balanced distribution of app installs was seen across age demographics
-
  - 25-34 - 10%
  - 35-44 - 25%
  - 45-54 - 25%
- Higher view and engagement rates were seen from male audiences (55% Male – 25% Female)
- Highest volume of app installs were seen in morning 8-9 am

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SEARCH - Overview

Campaign name	Impressions	Clicks	CTR	CPC	Search impression share	Conversions
Go-HI: App Download - Android	296,484	2,943	1%	0.5	5.00%	809
Go-HI: Search ANDROID - #3 Bus App	10,228	181	2%	1.0	5.00%	2
Go-HI: Search ANDROID - #2 Travel App	3,885	110	3%	1.6	10.05%	2
Go-HI: Search ANDROID - #4 Com. Apps	3,798	103	3%	1.3	5.00%	2
Go-Hi - Search -IOS	2,777	94	3%	1.5	21.20%	0
Go-HI: Search ANDROID - #2 Ferry App	4,457	85	2%	1.3	5.00%	0
Go-HI: Search ANDROID - #1 Brand	169	67	40%	0.9	79.13%	14

Multiple keyword and targeting strategies were tested throughout the activity.

- 'Travel apps' and 'Bus/Ferry times' related search terms delivered strong reach captured positive engagements
- Strongest level of results were seen from Android app install activity.
- Branded keywords were targeted to support incoming direct traffic and delivered 14 app installs

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Facebook - Instagram

Appendix 2

FACEBOOK / INSTAGRAM - Overview

						MEDIA ENGAGEMENTS			
CHANNEL:	IMPRESS-IONS	LINK CLICKS	CTR %	CPC *(net for PPC)*	CPM	VIDEO VIEWS	THRU PLAY	CPV	POST REACTION S/ENG.
FACEBOOK	1,067,457	8,281	0.78%	£0.46	£3.55	122,272	2,625	£0.04	187

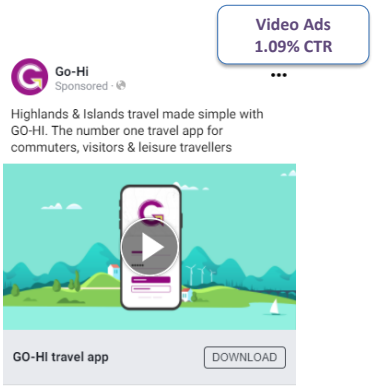
Facebook/Instagram delivered +**1m Impressions** and **8,2k link** clicks to site.

- 134k people were reached, with an average frequency of 6.3.
- 187 Post engagements were seen as a direct results of media – including 145 Reactions, 17 Saves and 16 Post Shares
- 122k video views were delivered, averaging a CPV of £0.04.

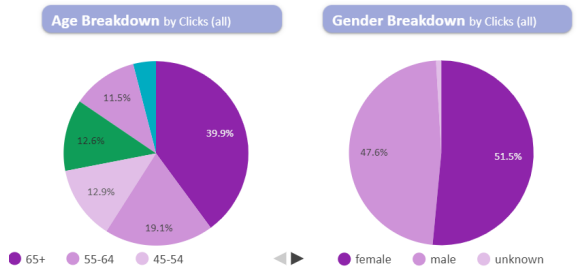
The activity has successfully driven reach and penetration across target audience groups.

FACEBOOK / INSTAGRAM – Creative Performance

Across all creatives - the below **Video and Image Ads have** consistently delivered the strongest engagements …



FACEBOOK / INSTAGRAM - Overview



Facebook video and news feed ads have delivered the highest engagement rates.

- Age distribution by engagement have been balanced, with the 45+ segment showing highest click thru rates
- Male female split has been has been balanced (52% Male vs 48% Female).
- Highest rate of engagement were seen on Tuesdays (5-8pm).

DV360

Appendix 2

DV360

Display & Video 360

CHANNEL:	LIVE LINKS	IMPRESS-IONS	LINK CLICKS	CTR %	CPC *(net for PPC)*	CPM
DV360	:	1,885,760	2,980	0.16%	£1.34	£3.00

Google's DV360 was used to showcase display ads across online websites and apps. The activity delivered over **1.8 million Impressions** driving **2.9k link click** to site.

- Overall the campaign delivered in full, generating a strong CTR of 0.16%.
- In terms of time of day, we saw user engagement fluctuate throughout the day however, midday and late evenings between 8pm-11pm drove highest CTR. This could be explained by when users are browsing devices outside of working hours.
- Top performing sites include local news sites like The ScottishSun and the Daily Record, as well as travel websites like Traveller Door.
- Top performing audiences were related to older age groups, family focused people interested in travel and sports.

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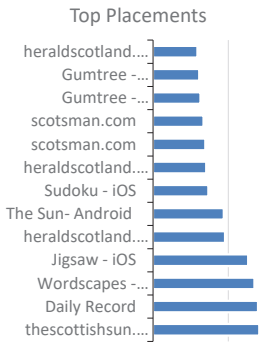
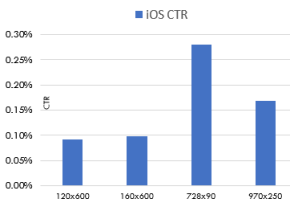
DV360 – Creative Performance



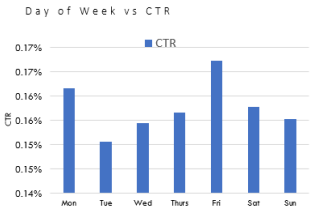
Top placements

- Highest engagement rates were seen from national news sites



Top creatives

- Android 970x250 and the iOS 728x90 generated the highest user engagement.



Top Audiences

- Users engaged the most on Mondays and Fridays, possibly when users are planning weekend activities.

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CAMPAIGN HIGHLIGHTS

Overall the 'campaign delivered strong levels of awareness and engagements across target regions – indicating there is demand for the app within market.

Moving forward…

- We recommend building on the existing campaign structure and creatives
- Driving further reach and penetration via social and programmatic channels
- Establishing stronghold positions on app stores (Google Play and AppStore) as well as maintaining a continuous presence on Search Engines (paid and organic).

Campaign Summary

+ 3.9 million Impressions

+ 15k Link Clicks

+ 829* Android app installs

Thank you

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GO-HI

Highlands & Islands
Travel Made Simple