SATE 2 FUTURE FLIGHT DEMAND MODELLING A BRIEF OVERVIEW

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What are trying to understand?

- Geography
 - Highlands and Islands firstly, rest of Scotland secondly.
- Technology
 - Emerging generic future flight technologies e.g., a generic retrofitted 10+PAX Zero emission light aircraft, a generic 4+PAX eVTOL.
- Potential demand
 - To and from **existing H&I airports** firstly, leading onto consideration of services to and from other locations (dependent on technology and level of potential demand)





What is the purpose of the model?



Develop a high-level demand model for the Highlands and Islands with the ability to forecast the likely mode shift from existing private vehicle and public transport trips to new sustainable aviation services. The model will allow assessment of demand between existing airports and other potential locations within the study area.





Other model data inputs

Telefonica Mobile phone Network Data (MND)

• Car and PT demand by purpose and time period to calibrate (2019)

Transport Scotland LATIS data

- Skim matrices travel time by car and public transport (PT)
- Car and PT demand to validate MND (2019)

MBI smartphone data (2022)

- Household records of users that visited certain locations in a year
 - Allow us to understand catchment areas of airports, shopping centres, etc.





Other model assumptions

General assumptions

- Baseline 2019 forecast 2030
- Purposes modelled are home-base work, homebase other and nonhome-base

Mode of transport

- 1 Private motor vehicles
- 2 Public Transport (rail, buses)
- 3 Zero Emissions Flights (ZEF)

Mode of transport assumptions

Future flight service

characteristics

- Flight speed, Boarding time, Alighting time, Cost ~£0.6/km, 10+ seater aircraft, baggage allowance, catchment area from airport (dist. or time), flight range, and frequency
- Car characteristics
 - Cost based on trip from Inverness to Kirkwall (includes ferry cost): ~13£/h
 - Frequency per day: 5

Public transport

characteristics

- Considered a mix of train, bus and ferry
- Cost based on trip from Inverness to Kirkwall (includes ferry cost): ~8£/h
- Frequency per day: 3



Demand model

Demand inputs

- Transport Scotland LATIS
 data
- Telefonica mobile phone
 network data
- MBI smartphone data

Stated Preference Survey (~1500 respondents) undertaken for mode choice model

Using this we can answer questions like:Mode shift changes due to the

- introduction of a sustainable aviation service;
- Identify the routes with potential demand;
- Extract the top routes and evaluate the feasibility;
- Use case evaluation;
- Price elasticity, willingness to pay for the new service
- High-level impact on CO₂ emissions and energy requirements;





Initial outputs for Kirkwall in GIS App

Similar outputs in process for Inverness, Stornoway, Sumburgh, Wick



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