

Transport Model for Scotland TMfS05A Audit - Executive Summary (Final)

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Author : **Boris Johansson**

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SIAS Limited www.sias.com

37 Manor Place, Edinburgh EH3 7EB, Tel: 0131 225 7900, Fax: 0131 225 9229

13 Rose Terrace, Perth PH1 5HA, Tel: 01738 621377, Fax: 01738 632887

Room 7, 1st Floor, George House, 36 North Hanover Street, Glasgow G1 2AD, Tel: 0141 572 8321

49 Frederick Road, Edgbaston, Birmingham B15 1HN, Tel: 0121 454 5654, Fax: 0121 454 7656

70 Cowcross Street, London EC1M 6EJ, Tel: 020 7336 6653

Transport Model for Scotland : TMfS05A Audit - Executive Summary

SIAS Limited acting as the Traffic and Transport Advisor and Auditor (TTAA) to Transport Scotland was requested to undertake an audit of the transport model development for the Transport Model for Scotland (TMfS). The latest development phase for TMfS involved expanding the coverage of and updating the model to create a new release version entitled TMfS05A. The main focus of the TMfS05A development was to improve spatial detail and the representation of the supply side of the model in previously “external” areas of the road traffic and public transport assignment models. This occurred mainly in Argyll and Bute, the Highlands and Islands, which is referred to in this document as the “extended” model area. Furthermore new Roadside Interview (RSI) data was incorporated in Ayrshire and Dundee.

The audit concentrated on examining the main components of the model that were altered during this process, namely the Road and Public Transport (PT) networks, the Road and PT model calibration/validation and the Park & Ride Model calibration/validation.

The audit relied heavily on information supplied by MVA, which was generally in the form of the Draft Model Development, Calibration and Validation Reports for the Road, PT and Park & Ride models. The TMfS05A networks were also supplied along with other supporting information to enable a review by the TTAA.

Road Network Coding

The review of the road network generally demonstrated that it was appropriately coded and that appropriate refinements had been incorporated in the extended model area. The TTAA examined the zoning system, link lengths, link types, jurisdiction codes, capacity indicators and some junction coding. The updated TMfS05A zoning system was refined only in Argyll and Bute, the Highlands and Islands to enable a better representation of travel costs in these areas and, as such, represents an improvement over the TMfS05 zoning. It should be noted that the travel demand in these areas has not been represented and the model’s potential application in these areas is limited accordingly.

The review of the highway network coding did identify some minor errors and issues that had not been fully addressed from the audit of TMfS05. These issues would generally not be expected to have a significant impact on the TMfS05A operation as a whole. Nevertheless, users of the model should bear these errors in mind when examining outputs in a local context.



Road Traffic Assignment Model Development, Calibration and Validation

The assignment model procedure and parameters remain unchanged from TMfS05, therefore in reviewing the TMfS05A Road Traffic Assignment Model the trip matrix development, recalibration and revalidation were examined. This process generally demonstrated that the changes to the trip matrices between TMfS05 and TMfS05A were in line with expectations, with the major changes occurring in locations where new RSI data was added (e.g. Ayrshire and Dundee). While some detailed comments about the matrix development are provided in the audit report, overall the TTAA is content that the changes in the trip matrices between TMfS05 and TMfS05A are acceptable.

The recalibration to traffic counts demonstrates that TMfS05A achieves a very similar level of global calibration to TMfS05 with 61% or more GEH values less than 5 in all time periods. This does not conform to the *DMRB* guidelines which state that 85% or more GEH values should ideally be less than five. Nevertheless, this level of calibration is not unusual for a model of the scale, nature and spatial variability of TMfS. Overall, while not ideal, this level of calibration is considered acceptable, particularly at a strategic level. Users are advised to review the calibration in their local area of interest prior to any model application or use of TMfS outputs due to regional and local variability in the quality of calibration. Users are referred to the TMfS05 and TMfS05A audit reports for more detailed commentary.

The revalidation to independent counts, journey times, trip length distribution and Census data were all considered acceptable for a model of this scale. Again, users are referred to the full audit report for detailed conclusions and specific recommendations relating to the future development of the model.

Public Transport Network Coding

The PT network and services audit examined the coding of ferry links, bus and rail services within the extended area of the model. Generally, the ferry service coding was demonstrated to be acceptable with the majority of services being represented. It should be noted that some smaller islands and some inter-island services are not represented. The TMfS05A rail network has been extended to include services to Oban, Fort William, Mallaig, Kyle of Lochalsh, Wick and Thurso. While the TTAA has not undertaken an exhaustive review of all services and timetables coded, the general representation of the services in the extended model area appears to reflect the rail service coverage adequately.

Similarly the bus service coding has been expanded to include Stagecoach services in Aberdeenshire, Moray and the Highlands and to represent services to locations such as Campbeltown, Inveraray, Oban, Skye, Thurso and Brora. Additionally, services are represented on the most populous islands including the Outer Hebrides, Orkney, Shetland, Mull and Islay. Again, while the TTAA has not undertaken an exhaustive review of all bus services and timetables coded, the general representation of the services in the extended model area appears to reflect the main service coverage adequately.

Public Transport Assignment Model Development, Calibration and Validation

The PT assignment model and parameters remain unchanged between TMfS05 and TMfS05A. The only significant alteration was the refinement of the fares model to reflect fares for the new services added in the extended model area. While simplifications were necessary the modifications to the fares model were considered acceptable given the limited application of TMfS05A in the extended model area.



Similarly, the TMfS05A PT matrices remained unaltered from TMfS05 other than being expanded to the updated zoning system. Users are therefore referred to the TMfS05 audit report for details of the TTAA's comments on the PT assignment model and matrices.

The rail model validation was very similar between TMfS05 and TMfS05A. This compared modelled flows with the LENNON data and generally demonstrated an acceptable match between the modelled and observed values. As expected, the level of validation is more variable on an individual link by link basis. Rail passenger boarding and alighting comparisons generally demonstrate a good match between modelled and observed values. It should be noted that the match is better at a city-wide level rather than individual station level in central Glasgow, while a local anomaly has also been identified at Lockerbie.

Bus validation to historic passenger flow data was also similar between TMfS05 and TMfS05A and showed a significant degree of variability. This can be attributed to a number of factors including limited data availability for both trip matrix development (no new bus data in TMfS05 or TMfS05A) and model validation and the variable quality of available observed data. The TTAA considers that this element of the TMfS development is one which would benefit significantly from additional data collection for future versions of the model. More detailed commentary on specific PT validation issues can be found in the main report.

Park & Ride Model Development, Calibration and Validation

The Park & Ride model reflects 67 Park & Ride sites, whether formal or informal, across the TMfS05A study area. The model was recalibrated using cost matrices from the TMfS05A assignment model which resulted in some minor changes to model parameters. Calibration involved comparison with observed car park occupancies where data was available, or against the capacity where no data existed. This generally demonstrated an acceptable level of match between modelled and observed. The Park & Ride model is considered fit for purpose as a strategic Park & Ride model, although the detailed commentary provided by MVA and the TTAA in the main report should be recognised by potential users.

Overall Summary

The TTAA considers that the TMfS05A development has been undertaken with due skill and care and making best use of the available data sources. In view of this, TMfS05A is considered to be suitable for its intended application. The lack of representation of travel demand in the extended model area does place an obvious limitation on the model's applicability in this area. Users are advised to take cognisance of the findings and recommendations in this audit.

