

What is TELMoS?

The *Transport, Economic and Land use Model of Scotland* is a land-use and economic model which works alongside the *Transport Model for Scotland (TMfS)*. The combined modeling toolkit provides a comprehensive Transport, Economic and Land Use modeling capability across the whole of Scotland as part of Transport Scotland LATIS Service.

The relationship between TELMoS and TMfS can be summarised as follows:

- TELMoS supplies TMfS with forecasts of the land uses which generate the demands for travel, and
- TMfS supplies TELMoS with the transport data which influences the subsequent location of households and jobs.

How does TMfS/TELMoS work?

The model system forecasts forward through time, with TELMoS forecasting land-use and economic change in one-year steps, and TMfS forecasting the state of the transport system in a number of chosen years. The model start from a base year of 2007, with forecast runs of TMfS for 2012, 2017, 2022, 2027 and 2032. The land-use outputs can therefore be presented as annual time-series, whilst the transport outputs are at five- or ten-year intervals. The 2007 base year situation is itself partly a forecast produced by running the model forward from the Census year of 2001.

The users of the TMfS/TELMoS models define:

- demographic and economic scenarios for Scotland in total;
- planning policy inputs, mainly in terms of how much development is permissible in each zone for each period; and

- transport networks, pricing and public transport services.

The model then forecasts the regional and zonal households, population, employment, economic production, property markets, new floorspace, and the patterns of travel and goods transport. All these are forecast by TELMoS/TMfS, taking account of a wide range of dynamic linkages between land-uses and between land-use and transport, given the fixed scenarios for Scotland as a whole and the fixed policy inputs for development and transport. This design means that:

- changes in transport infrastructure, public transport services, transport pricing and congestion affect the subsequent distribution of land-uses and economic activity across Scotland; and
- changes in the distribution of land-uses and economic activity affect the demands for transport and hence the levels of congestion arising in the networks.

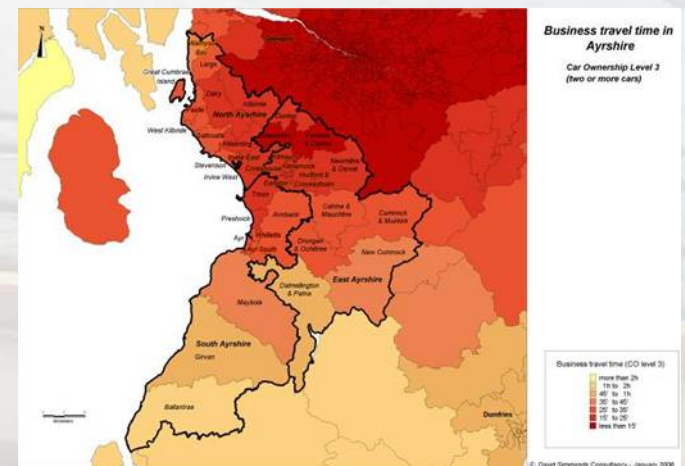
How is TELMoS used?

TELMoS/TMfS are usually used first to produce a Reference Case based on a given set of economic/demographic scenarios and a given set of policy and investment assumptions for transport and land-uses. This includes runs of TMfS for the defined "transport model years". Planning policy information for the Reference Case is periodically requested from local authorities. The Reference Case results are sometimes used directly, eg to provide inputs to other, more local transport models, but typically most use of the TELMoS and TMfS involves examining the impacts of proposed plans or policies by modelling variations around the Reference Case. This may involve:

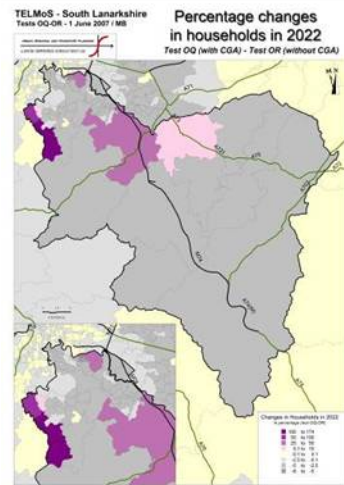
- conventional transport-only modelling;
- forecasting the economic and activity location impacts (EALI) of transport schemes; and
- forecasts of the impacts of alternative economic/demographic scenarios, and/or of alternative planning policies.

Transport-only modelling is undertaken by varying the infrastructure and service inputs to TMfS and running that alone, keeping the land-use inputs from TELMoS constant.

EALI forecasts for the **impacts of transport schemes** are made by testing the transport scheme in TMfS, then running TELMoS for the subsequent years with the changed transport results. For complete assessment, the changed land-use forecasts for the next transport model year are passed back to TMfS, and so on. Conversely, in some very simple cases, broad-brush transport changes can be made to the TMfS travel cost outputs which are then input to TELMoS, without the need to run TMfS itself.



Alternative scenarios and/or **alternative planning policies** are tested by running the models with changes to the relevant inputs to TELMoS. If the transport effects of the scenario or policy are of concern, these runs are undertaken with the full TELMoS/TMfS system. If the focus is on impacts within the land-use/economic modelling, such as the distribution of additional economic growth, then it may be sufficient to run TELMoS alone.



Tests can be carried out to forecast the combined impact of linked changes in transport and in land-use policy – though it is recommended that in this case the effect of each change should also be tested separately, in order to understand the contribution that each change is making to the overall results.

The impacts of schemes, policy changes or variant scenarios are in all cases measured by comparison with the appropriate Reference Case. Alternative scenarios can be set up either for Scotland as a whole or by adjusting model inputs so as to modify rates of economic growth in particular areas (hence using the model to examine the consequences of such growth rather than to forecast whether particular transport or land-use policies will achieve that growth).

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For further information on the model system, please visit the LATIS website www.latis.org.uk.

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LAND-USE AND TRANSPORT INTEGRATION IN SCOTLAND

Land-Use Modelling Overview

