Rail Research UK

The universities' centre for railway systems research

Users, Community and Environment

PhD Project: Forecasting the Use of New Local Railway Stations and Services Using GIS

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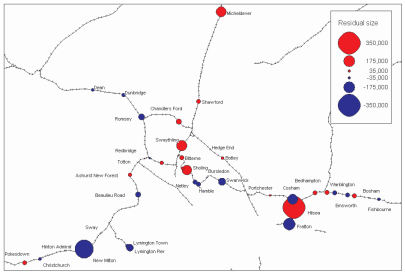
Background:

Many local rail services in the UK are under review, with new stations proposed and little used stations threatened with closure. Existing demand models are calibrated on data from the early 1980s and data constraints can limit their usefulness. A generic tool to model local rail demand is therefore needed.



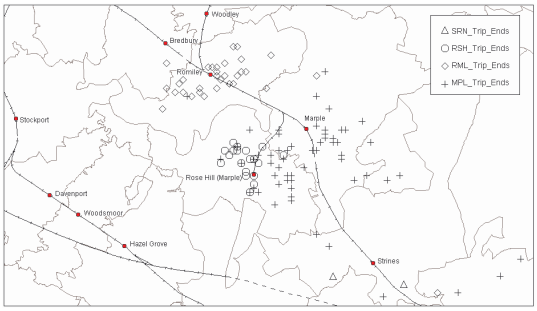
Mapped residuals from South Hampshire trip end model

Progress:

Review of existing rail demand models and techniques carried out.

Several trip rate and trip end models developed and calibrated for Avon (Bristol) and South Hampshire areas, with the best giving adjusted R^2 values of around 0.80. A variety of explanatory variables were included in these models, including population, service frequency, employment levels, commuting patterns and distance to London.

Accuracy of catchment definition methods investigated using data on ultimate trip destinations in Greater Manchester from GMATS survey.

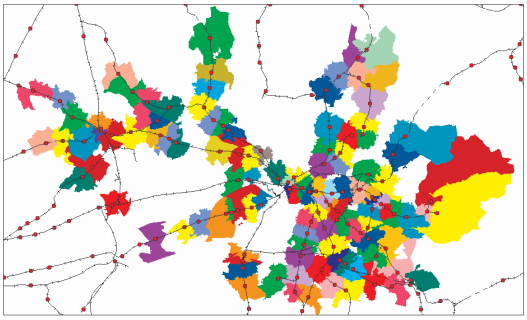


Ultimate destinations for rail trips to stations in Marple (GM) area

Integration of datasets in MapInfo

Novel Aspects:

These mainly relate to the application of the MapInfo GIS package to local rail services. It enables spatial and non-spatial datasets on population characteristics, rail usage, administrative boundaries and transport networks to be integrated, and speeds the preparation of data for modelling. It also enhances the presentation of model results, allowing potential enhancements to models to be identified more easily.



Population-weighted station catchments in Greater Manchester

What's Next?:

Calibration of direct demand models using GMATS and LENNON (ticket sales) data
Use of local analysis techniques such as the spatial expansion method and geographically weighted regression to investigate spatial variation in model parameters
Refinement of search procedure for potential new station sites
Investigation of disaggregate modal split models

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