

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

### Researcher:

Simon Blainey, Transportation Research Group, University of Southampton

### Supervisor:

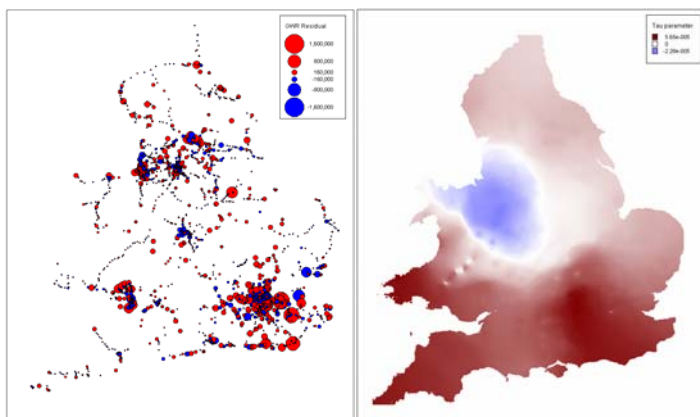
Prof. John Preston, Transportation Research Group, University of Southampton

### 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.

### Novel Aspects:

- Application of MapInfo and ArcInfo GIS packages to local rail demand modelling, enabling datasets to be integrated and enhancing presentation of results
- Use of local analysis techniques such as geographically weighted regression to enhance rail demand models.



Mapped residuals and spatially varying parameter estimates from England & Wales trip end model



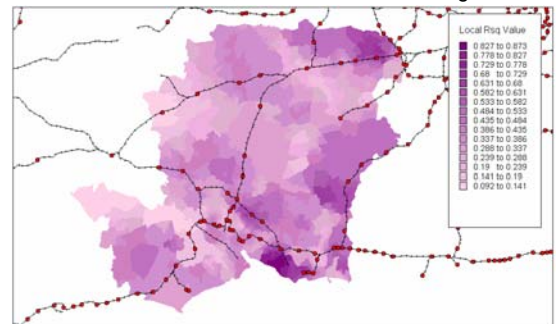
Potential station sites identified by automated search procedure

### Progress:

- Review of existing demand modelling techniques
- Site search procedure for potential new station locations developed and tested on Hampshire area
- Over 100 variants of trip end models tested for local stations in Hampshire area and/or for all Category E/F stations in England and Wales
- Variety of methods for defining station catchments tested
- Investigation of potential of travel survey data on ultimate trip origins/destinations to validate catchment definition methods
- Geographically weighted regression used to investigate spatial variation in model variables and to identify outliers
- Disaggregate logit models calibrated for travel to work in Southampton based on 2001 Census data
- Output area level trip end model models calibrated for Hampshire based on Census Journey to Work data

### What's Next?:

- Calibration of direct demand models using LENNON (ticket sales) data for South Wales area
- Investigation of spatial variation in parameters from direct demand models using geographically weighted regression
- Use of NRTS data to test accuracy of catchment definition methods used in trip end and direct demand models
- Development of easy to use procedure to identify sites for, and model demand at, new local stations in a given area



Local model fit for Hampshire output area trip end model

All map data © Crown Copyright/database right 2007. An Ordnance Survey/EDINA supplied service.  
Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland  
Source: 2001 Census; Key Statistics

### Contact:

Email: [S.Blainey@soton.ac.uk](mailto:S.Blainey@soton.ac.uk), Telephone: 01865 456325  
Web: [www.sr2.soton.ac.uk/tostudents](http://www.sr2.soton.ac.uk/tostudents)