



Keeping London on the Move

Train Service Model

Transport for London (TfL) has the challenge of keeping millions of people on the move across one of Europe's most densely populated cities. The bus and train services are heavily loaded by the usual day to day demand, let alone the additional stress caused by special events such as Euro 96 and the Millennium. Transport planning is particularly important when bidding for global events like the Olympics, where public transportation is a major consideration.

Understanding passenger flow

Accurate modelling of these services is vitally important to the understanding of passenger flow and to capacity planning. Tessella have worked with TfL's predecessor, London Transport, to produce a dynamic simulation of passengers as they flow through the system.

The model incorporates a wide range of parameters, freely adjustable during a simulation run, that tune the generic model to real life situations. This flexibility, for example

- Time of day
- Carriage size and number
- Entrance and exit constraints
- Passenger density distribution

allows many scenarios to be explored and a sophisticated picture of the integrated transport system to be developed.

The scale of the problem

Simulating London's transport network is a big task. The model has to map all of the possible routes and track the relative position of every train. Unfortunately, the complexity of the simulations grows exponentially with the size of the model. Over simplification of the model, however, results in a simulation that is insufficiently detailed to represent the real life situation accurately.



Managing the complexity

By adopting a radical approach to the architecture of the system, Tessella have produced a simulation tool that combines accuracy with scale. Dynamic, on demand, route generation replaced existing techniques based on permanent storage of full network route data. By only handling a specific route as and when it is needed by the simulation, a significant factor in the scaling problem is overcome. The central management of all station and associated platform data, independent of any specific route of which it forms a part, also greatly improves the maintainability of the system.

Maximizing the benefits

A good user interface can hide the inherent complexity behind a sophisticated model, and by guiding the inexperienced user carefully through each step, allow the benefits to be spread across an organization. This is what Tessella has achieved for Transport for London, delivering a scalable, graphically driven tool which allows a wide range of planning staff to assess the passenger impact of both line infrastructure and service level changes, all within a framework of realistic performance figures and operational constraints.

Planning for the future

As passenger numbers continue to rise, the Train Service Model will be an invaluable aid to the planners who deliver the capacity that gets us swiftly and safely around London.



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