Changes in the way Transport Plans are evaluated have resurrected the importance of understanding the role of Accessibility in the transport network

Accessibility analysis has been long established as an analytical tool, often forgotten and then rediscovered. The recent round of Local Transport Plans has brought this topic back onto the agenda again and raised its importance as a method of providing a view on how the transport system operates, focussing more on social interaction and opportunity than perhaps conventional scheme appraisal.

Although a range of software tools have typically been used to model accessibility, some bespoke and some as adaptations of GIS systems, a natural environment for hosting this capability is the transport planning model. The data requirements are precisely the same and an aspect of accessibility analysis is the desire to compare accessibility across and between forecast scenarios. These are the natural outputs of the transport model.

modelling capabilities and can deliver the analyses and outputs required for understanding accessibility.

To facilitate this functionality, Minnerva has developed a special 'Plug-in' to help the user specify and invoke an accessibility model run.

The Plug-in, which is an 'extra' module for OmniTRANS, provides a series of menu based forms which guide the user through formulating an accessibility model and how the output is to be displayed.

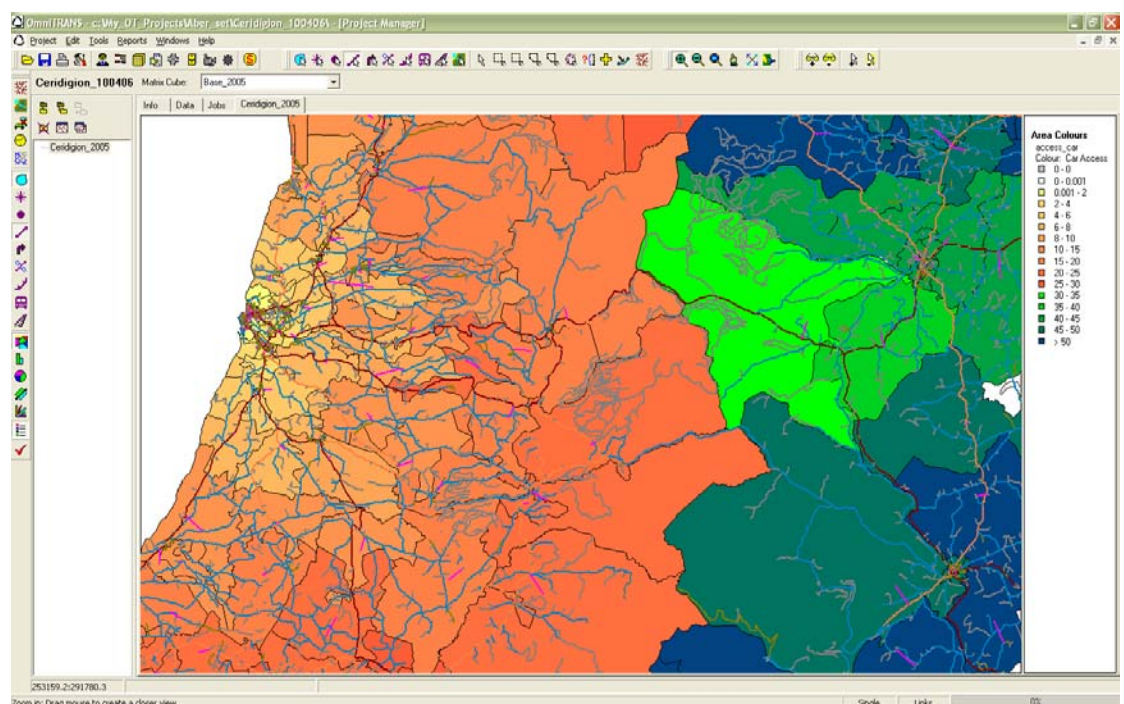Various forms of accessibility model are supported. These are:

Network Cost: This takes the 'cost' of travel between zones (distance, time or generalised cost) for a given mode and time period, and plots a thematic map showing

costs to or from a zone or set of zones. Although the simplest form of model, these outputs can be very powerful and useful for comparison of scenarios.

Network Cost Threshold: Similar to the Network Cost Model, this supports the notion of a specified cost threshold to identify zones that are within, or beyond, a given cost value. Further, if zonal census/land use data is available in the model then study wide statistics can be generated. For example, "65% of the population is within 30 minutes travel time by car to a hospital in the am peak period"

Simple Hansen Measure: This form of model extends the analysis by taking

The data requirements for describing the highway and public transport infrastructures are not insignificant, if transport modelling and accessibility analysis can be achieved within the same modelling environment it is clear that many synergies and efficiencies can be obtained. These include greater productivity, data integrity and consistency, as all modelling is done within a unified data environment.

OmniTRANS provides an ideal tool within which to achieve these benefits. It has excellent data management and

Travel time accessibility by road to the Town Centre

account of the deterrence to travel as cost increases. In a typical analysis one or more Destination zones is defined offering a service or activity, and a set of Origin zones for which we want to measure accessibility to these services. Indices are calculated for the Origin zones which are the sum of the activity of each zone in the Destination zone set weighted by a function of cost between the given Origin-Zone pair. This provides an absolute measure of the land use opportunities in the Destination zone.

By considering the size of the activity and a deterrence effect to the cost of travel, an Origin zone can be 'equally' accessible to a 'nearby zone' with a low activity as a 'more distant zone' with a higher activity.

Relative Hansen Measure: This is a variation on the Simple Hansen Measure where the calculated index per Destination zone is divided by the sum of the activity or service for the selected Destination zone set. It provides a measure of the relative proportion of land use opportunities in the Destination zone rather than the absolute level.

Weighted Hansen Measure: With this model one or more Destination zones is defined that offer a service or activity, and a set of Origin zones. An accessibility index is calculated for each of the Origin zones. The index is the sum of the activity of each zone in the Destination zone set weighted by a function of cost between the given Origin-Zone pair, which in turn is weighted by the population (or other origin based variable) for the zone.

This form of model takes into account of 'activity' at both the origin and destination ends of the trip and as such appropriate zonal variables must be selected when running this model.

Origin or Destination Based Models: The Network Cost, Simple and Relative Hansen models can be specified as either 'Origin' or 'Destination' based.

The former calculates accessibility indices for a set of Origin zones to one or more destinations offering a service of some kind. The indices indicate how accessible the Origin zones are to these services.

The latter form reverses this view where indices are calculated for the Destination zones, showing their relative attractiveness, for the services offered, to the associated Origin zones.

Mode and Time Period: The analyses can be run for the modes and time periods defined in the model. OmniTRANS supports multi-modal networks, including walk and cycle. Time can be 'period in the day' (am peak, pm peak etc) and/or 'time in the future' represented by scenarios which are variants on the base network(s).

User Segmentation: This is dealt with by the zone-based data that the user has input to the model. For example, population (per zone) can be recorded in several ways, e.g. total, car/non-car owning, unemployed and so on. These differing segments can be used in conjunction with variable mode/time combinations to see how accessibility can vary for these user groups.

Comparative Plots: The Plug-in supports

the output of comparative plots where differences are displayed between any two previously run accessibility models. This allows changes in accessibility for a given mode to be examined between different time periods, or for the differences between two modes in the same time period to be understood.

Requirements: The Accessibility Plug-in requires the following OmniTRANS packs to function:

- The Data Manager
- Static Highway (for modelling Highway based modes)
- Public Transport (for modelling Public Transport modes)
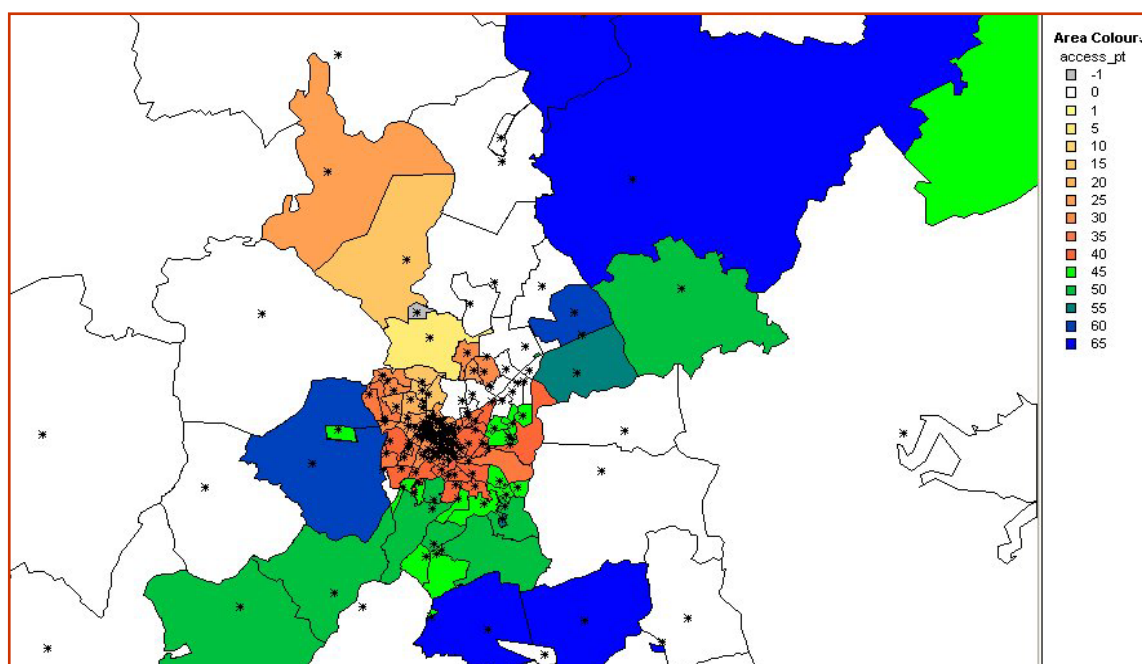
Access by Public Transport to a hospital in the am peak with a maximum of 25 minutes walk component of journey time