



Spatially Based Planning and GIS

Description

Spatially-Based Planning is a grouping of a large number of tools and techniques that effectively display spatial information. Many planning and management processes – including tourism planning - need to display spatial information, and this is done through spatially-based planning. Traditionally, spatially-based tools used maps and plans printed on paper. For example, all zones ([zoning](#)) are spatially based. The development of computer technology has widened the range of spatial information presented in map and plan form, from traditionally mapped geographical information. It has also enabled a huge range of applications of complex analysis and presentation of spatial data.

A Geographic Information System (GIS) is a widely used modern spatially-based planning tool. It is a system that uses a combination of data (information), computer hardware and software to integrate, store, edit, analyse and display spatial information attributes. Many functional capabilities of a computer-based GIS enable important tourism planning questions to be analysed and answered, thereby assisting decision-making in tourism planning.

For example:

- Data entry, storage and manipulation - tourism resource inventories
- Map production - identifying new opportunities for tourism development
- Database integration - measuring tourism impacts
- Data queries and searches - visitor management
- Spatial analysis - analysing relationships associated with resource use
- Spatial modelling - assessing potential impacts of tourism development

GIS data most commonly exists in one of two formats: vector or raster, which enabling contrasting types of data to be shown:

- Vector data consists of discrete features such as points (manholes), lines (roads), or polygons (land parcel boundaries).
- Raster data consists of continuous data made up of pixels. This allows images including aerial photography to be shown.

When vector data is overlaid on raster data this enables a powerful and visually attractive way of presenting data.

How and when the tool is used

A GIS is simply a mechanism for presenting information so that it can be communicated between different groups. Mapped information and data from GIS is now commonly accepted as part of statutory processes for tourism planning, .e.g. hearings of resource consent applications for tourism developments in [Resource Management Act framework](#) processes. It is also widely used in other types of planning in New Zealand such as Conservation Management Strategies (see [Conservation Act framework](#)), [master plans](#) and [structure plans](#)).

Mapped information can include cultural dimensions. For example, many council GIS now include a data layer that includes the location of urupa (Maori burial site) or waahi tapu, to indicate areas that need to be avoided in developments. These data layers can be filtered so that the exact location of waahi tapu remains secret or restricted.

Application

The Tourism Flow Model (TFM) is a New Zealand application of a GIS-based spatial analysis tool in the tourism sector. The model is presently being refined and tested. Potential users of the model include Department of Conservation, Transit New Zealand and Transfund for transport planning, and local government including regional tourism organisations and marketing organisations.

The purpose of the TFM is to help tourism stakeholders study the movements of international and domestic travellers in New Zealand and understand the impact of tourism growth on publicly provided infrastructure. Users can identify trends and potential capacity constraints before they occur by accessing powerful forecasting data. It gives a spatial representation of the dynamics of tourism and aims to facilitate informed



decision-making on where to invest and where to adopt pro-active policy, planning and resource allocation practices.

The TFM takes information from the Core Tourism Dataset (International Visitor Survey and Domestic Travel Survey) and brings it together with other relevant datasets to build a picture of current and future tourism flows in New Zealand. The TFM allows the behaviour of international and domestic tourists to be segmented based on region of origin, year and mode of transport. Interactive maps and tables can be produced to analyse, for example:

- The flows of different types of tourists by road and air
- Changes in tourist flows over time (forecast up to 7 years ahead)
- Tourism intensity (nights) in different destinations
- Tourist behaviour by destination (e.g. purpose, activities)

Our evaluation

Spatially-based tools, especially GIS, are very useful for displaying and evaluating spatial information, and are widely used and accepted. It is important to recognise that the quality of output information and support for decision-making is only as good as the base information.

The TFM is potentially a very important tool for tourism planning in New Zealand. It is needed to provide public agencies with robust, easily accessible information on future tourism demand at a sufficiently refined geographic level to make important infrastructure-related decisions. The model would ideally contain current and future information on transport infrastructure (road, air and other), as well as informing decisions on the provision of tourism-related services such as water, waste, toilets, information centres and land development administration. Therefore its predictive ability is directly related to the quality of the future demand modelling information which it uses.