exponentially. The councillors were seeing this for the first time. They began to realise why certain places were not good candidates for development.'

To extend the model's communication abilities, urbanISM can be combined with map-based board games to be played with the public, helping a wide range of participants to understand the results of different planning decisions. In itself, the game/model is a simple interface between a stakeholder and ways of approaching masterplanning. 'It helps to bring our thinking together and then stakeholders understand our specialist advice in a better way – we're not just a bunch of a consultants telling them what to do,' says Tricker.

The model's strength is to test many scenarios, each of which may attain desired development targets, across in a range of different configurations. Preferred characteristics such as the percentage of homes within 10 minutes' walk of green space, or within 20 minutes' walking or cycling distance of employment opportunities, are factored in. The game 'score' becomes higher as the configuration is refined to deliver more desirable outputs. Custom-collated GIS, street, cycling route and road network data underlies and informs the generation of actual walking, driving and cycling times.

The model also assesses the requirement for, and viability of, infrastructure and amenities: development for housing and employment would normally use the national grids for energy, for example, but once a critical mass is reached, as indicated by the model, the creation of new energy centres becomes an option. These can deliver 20-25 per cent savings on energy consumption across a development. Once the energy centre option is 'triggered', the model records a reduction in energy consumption and related carbon savings.

DESIGN FINGERPRINTING

The team has used the model to explore specific scenarios. For one client, for example, it was able to demonstrate that typical low density development was not efficient: such configurations scored very poorly on proximity to local centres and transport carbon. An 'urban village' model of the type favoured by the Prince's Foundation, with defined green space around the edge to establish character, scored as an improvement over the typical developer model – but still

Complexity mode: measures land use diversity and catchments

Compactness mode: measures development compactness

Connectedness mode: measures grid permeability and accessibility