CSIR Built Environment has recently completed an assessment of social facility backlogs for the City of Tshwane.

The empirical evidence and results of the analysis serve as key inputs to the social facility planning of the City, the facility management plans for individual line departments and the City’s Integrated Development Planning (IDP) process. The goal of the analyses was to support sustainable and high impact capital investment / expansion. Social facility location planning involves a process of accessibility analysis, which has been developed and effectively applied by the CSIR in several metros over the past decade. The assessment was undertaken for the City of Tshwane’s 2014 population and its 2021 projected population. Considering projected population growth, the approach enables metros to ensure that access for citizens to key services is improved over the medium-long term.

The project undertook a status quo analysis for the supply and demand of social facilities which includes a range of municipal facilities such as ambulance services, fire stations, community halls, parks and sports facilities, as well as provincial and national facilities such as libraries, schools and clinics. The accessibility analysis uses agreed upon social facility provision standards with regard to acceptable access distances and minimum facility thresholds (capacity) as key input parameters and makes use of a GIS-based accessibility analysis tool. Recommendations have been made with respect to the need for both new and expanded facilities.

Read more

By Hunadi Mokgalaka (hmokgalaka@csir.co.za) and Chéri Green (cgreen@csir.co.za)
The Nelson Mandela Bay Metropolitan Municipality (NMBM) and the CSIR have been collaborating on a project sponsored by the Department of Science and Technology to establish an Urban Simulation Model for the NMBM since December 2009. The project set out to harness information and communication technology to establish an Urban Simulation Model for South Africa to support integrated planning, development and service delivery.

The Model:
The Urban Simulation Model is a numerical modelling and simulation tool developed to study urban growth patterns 30 years into the future. It simulates the choices made by:
- individual households and businesses as consumers of property and services
- developers as suppliers of property
- the government as supplier of infrastructure and services.

The future demand for these services is heavily dependent on the choices made by households about where they live, where they work and how they commute between home and work given the transportation networks provided.

The resulting spatial distributions of growth allow planners and decision-makers to assess the likely outcome of various policy scenarios, improve long term planning for the provision of social facilities and major investment decisions such as mass transit schemes.

Nelson Mandela Bay Metro Case Study: The collaboration with NMBM took the form of a series of workshops held under the auspices of the Multi-Disciplinary Technical Task Team (MDTTT) through which the Urban Simulation Model was introduced as a concept, populated with NMBM specific data and finally used to simulate four different policy scenarios developed over a period of time through the MDTTT.

The objective of the NMBM project was to analyse and compare the long-term growth patterns that could result from the implementation of specific spatial planning scenarios and how the resulting demand for services would impact on the Long Term Financial Sustainability Plan.

A specific objective of the project was to overcome a major deficiency in current planning practice (not only in NMBM) that results from a lack of integration between sector plans. Different sector plans are often based on different population and employment projections. This is particularly problematic in transportation planning where the practice is for one group of consultants to estimate the future demand (based on projected future population distributions) and another group to model traffic patterns and design a network to meet the expected future demand. The lack of integration between these studies is equivalent to assuming that the availability of transportation services has no influence on the decisions of households about where they live and where they work.

Conclusion: With the advent of the Urban Simulation Model, which fully integrates UrbanSim and OpenTripPlanner in such a way that the future population distributions are dependent on the availability (or lack thereof) of future transportation services, it has now become possible to base all sector plans (including transportation) on the same projections of future demand. The achievement of this objective in NMBM is considered to be a first for South Africa.

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The Department of Rural Development and Land Reform recently launched the first web-based toolkit to support a differentiated application of social facility provision standards in non-metropolitan areas. The toolkit provides users with profile information on all non-metropolitan areas in South Africa and enables users to calculate the required social facility provision targets for each service region, based on a set of differentiated standards.

The toolkit was developed for the Department of Rural Development and Land Reform by the CSIR in collaboration with Retro Rabbit. According to Chéri Green (project leader from the CSIR): "The differentiated standards for access to rural services and the web-based toolkit were presented to the Honourable Minister Gugile Nkwinti on 4 October 2016 and are now being rolled out for application in all provinces. A series of workshops will be held to train key people who have been identified in each of the provinces."

What it does:
- Supports planning & budgeting of social facility provision
- Provides guidelines on standards & their application especially in rural areas
- Provides demographic & morphological profiles of service catchment areas across South Africa
- Calculates typical social facility service provision for catchments

How to use it:
Freely available at www.socialfacilityprovisiontoolkit.co.za
Easy to navigate & users are provided with application & user guides
Users need to apply the standards & guidelines with due consideration of the development context & other area-specific aspects

Chéri Green, Built Environment, CSIR Tel: 021 888 2657
Read more on the background...
Tracking spatial change in cities - New set of fine grained indicators for 9 Cities

The use of a fine-grained uniform spatial resolution to depict economic and population change enabled the CSIR team to create population and economic production change indicators for the nine largest cities in South Africa. The July version of this newsletter reported on the latest State of the Cities Report (SOCR) 2016 release and the assistance provided by the CSIR in developing a number of spatial indicators to measure spatial change, and report on levels of growth and spatial transformation at the sub-city level. The urgency for spatial transformation and need for indicators to track spatial outcomes is clearly highlighted by the SOCR (2016) and the Spatial Planning and Land Use Management Act, 2013.

Even though some spatial information is available in smaller units such as Wards, Sub-places or even Small Area Units, these demarcations often vary from one census to the next which does not allow for direct comparison over time. Using different units to group information presents challenges in comparing spatial change statistically and visually. To enable sufficient pattern detection of spatial features it is necessary that the scale be sufficiently fine (for purposes of detecting spatial transformation for example).

To address this issue, the CSIR explored an approach that uses a single-sized uniform tessellation to create demographic and economic indicators. Hexagons with an edge length of 250m were used. Population and economic information for different census periods was assigned to these zones using a dasymetric assignment process.

Using this fine-grained uniform spatial framework, the CSIR has created population and economic production change indicators for the nine largest cities in South Africa. The CSIR will continue to explore the use of this framework and would also welcome any feedback.

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