

Title	Building and Establishment Automated Mapper (BEAM)
Organisation	City of Cape Town
Innovation	BEAM is a digital mapping tool that automates the detection of informal structures using machine learning applied to geospatial datasets. The tool processes aerial imagery and LiDAR data to identify buildings in informal settlements and backyard areas. This solution addresses a challenge of incomplete or outdated spatial data, which hampers effective service delivery and urban planning. The project is grounded in UNITAC's Guiding Principles for Digital Innovation, ensuring ethical use of technology, protection of personal data, and respect for human rights. BEAM is designed to be scalable, with potential application in other South African cities. It also emphasises local capacity building, with knowledge transfer to municipal teams. The City of Cape Town has established Geomatics and Data Science capabilities which will enhance the solution going forward. By integrating BEAM into Cape Town's planning systems, the City can better allocate resources, plan infrastructure upgrades, and respond to the needs of underserved communities.
Impact	BEAM has significantly the City of Cape Town's ability to identify and plan for informal settlements and backyard dwellings. By automating the detection of structures, the tool has reduced the time and cost associated with manual mapping. This has enabled faster and more accurate infrastructure planning, particularly in areas previously underserved or undocumented. The project has enhanced co-ordination across municipal departments, allowing for integrated planning and targeted service delivery. For example, sanitation, water, and waste management teams can now access updated spatial data to prioritise upgrades and expansions. The tool also supports disaster risk reduction by identifying high-density areas that are vulnerable to flooding or fire. BEAM has contributed to job creation through local capacity building, training municipal staff in digital mapping and machine learning applications. By improving data quality and accessibility, BEAM empowers decision-makers to allocate resources more efficiently and equitably.