Geospatial technology helps to ensure no cracks appear in an Australian city’s asset management system.

Most people assume that their local infrastructure such as roads, footpaths, parklands, and public facilities will be cared for. In reality, regular maintenance of these assets involves significant investment in terms of time, money and resources. It also demands regular monitoring and a coordinated approach to planning and executing asset renewal, upgrades and repairs in a timely manner. Near Melbourne, the City of Whitehorse is using geospatial technology to help maintain infrastructure and keep its citizens safe.

Located in Melbourne’s eastern suburbs, much of the City of Whitehorse was developed in the 1950s and 60s. The development included construction of a network of footpaths through neighbourhoods, commercial areas, bushland and parks.

Today, Whitehorse has an estimated 1,180 km of footpaths serving a geographic area roughly 64km². Many footpaths are aging and require maintenance and upgrades. Tripping hazards caused by damaged and cracked concrete due to the expansion of tree roots presents a public liability concern, particularly for elderly residents, vision-impaired and disabled pedestrians. With roughly 22 per cent of Whitehorse’s 160,000 residents aged 65 years and over, footpath safety is a public health issue and a key priority for the Whitehorse Council.

For years, the council’s system for managing footpath maintenance was a manual, paper-based system that employed contractors and data entry clerks. Today, it is a fully integrated digital data collection workflow and database system that is managed end-to-end by council’s in house City Works Department.

Eliminating paper maximises efficiency

Like all municipalities in Victoria, Whitehorse must comply with the regulations and obligations of the Road Management Act 2004. The council reports regularly on the quality and condition of footpaths and its process for organising and prioritising maintenance. When cracks appear, the council must act in accordance with the plan. For serious tripping hazards such as defects with a greater than 40mm vertical displacement, a temporary repair must be completed within five working days. Failure to comply impacts both the council’s performance rating and risk of financial liability. Given council relied on a paper-based approach to manage the condition and upkeep of its footpaths, it faced inefficiencies in meeting compliance requirements with its Road Management Plan.

Council’s manager City Works Ilias Kostopoulos explained there were previously no digital records that accurately identified and recorded defects to assist with the city’s works planning and work order processes. Information collected using the paper-based system passed through several pairs of hands, including external contractors, causing delays and community dissatisfaction.

Mr Kostopoulos said: “Officer ownership of the manual, paper-based system was challenging, further impacting upon performance requirements and response times of the plan. To bring footpath management practices in line with the council’s Road Management Plan required the adoption of a coordinated, automated approach and elimination of the paper-only trail”.

Field-to-office workflow

In 2009, the council’s Asset Management Strategy Team and City Works Department worked with Australian geospatial company UPG to implement and support a high-accuracy GPS data capture system with a fully integrated field-to-office workflow. The system uses Trimble GPS handheld receivers for field data collection, together with application software that enables field-to-office workflow.

In the field, the system provides a simple data collection process built around Trimble TerraSync field data capture software and Trimble GPS Pathfinder Office software. The council’s City Works asset inspector uses a Trimble GeoXH 6000 series handheld device to record the distinct attributes of each defect: location, size and severity of the hazard, and time and date of inspection. Entering data is a simple process of selecting from a series of check boxes and pull-down menus on the handheld.
unit. The field data includes photos and location accurate to within 10cm.

“Our asset inspector utilises an appropriate device to quickly and easily record the attributes of a footpath defect.”

Mr Kostopoulos said.

Each night, the collected data is automatically transferred into the council’s database. The most severe trip hazards measuring greater than 40mm in vertical displacement are automatically flagged, so temporary make-safe work can be scheduled and carried out within the prescribed five working days. The office software tracks the defects through completion of repairs, closing the loop on each individual record and enabling auditors to measure the efficiency of the asset management system.

Mr Kostopoulos said the City Works asset inspector uses the Trimble unit to capture other maintenance information during programmed footpath inspections, recording data such as overhanging trees that need pruning, damaged kerb and channel, potholes, or vegetation growth that affects pedestrian footpath access and safety. The fact that a single person can complete this critical public health activity is an indicator of the solution’s strength and council’s innovative approach to managing and delivering its obligations under its Road Management Plan.

The electronic footpath inspection program allows the Whitehorse City Works Department to identify and catalogue a database of footpath defects. Ultimately, the program ensures make-safe and renewal works are prioritised, planned and executed in a coordinated, efficient way. The program has consistently demonstrated compliance with the statutory framework for the management of the road network in the City of Whitehorse and compliance with the City’s Road Management Plan has earned the council a six-out-of-six rating through its recent insurance audit.

a single inspector can carry out all the field inspection work, the council no longer needs to employ contractors to perform this role, which further reduces labour costs and is important to local governments facing tight budgets.

Based on the success of the City Works footpath inspection, maintenance and renewal program that has been in place since 2009, Whitehorse plans to use the system to other areas of the council’s Corporate Asset Management System. The council’s asset management strategy coordinator David Braby said: “This is the obvious next step—using such technology for our broader asset management system.”

The system for inspecting and maintaining council’s footpaths will soon expand to other infrastructure assets including parks, street furniture, public facilities, sporting fields, street lighting, car parks and gardens.

Expanding the program

From a regulatory standpoint, the technology has delivered a dramatic improvement in the City’s Road Management Plan scorecard. With more than 85,000 documented cases, auditors can correlate the date and frequency of inspection, and details for every defect identified including maintenance response times. The result is a far more proactive and responsive management process.

Beyond the auditor’s score, Whitehorse City Council is also in a better position to manage risk of public liability associated with footpath usage. Given