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IN MAY 2014, WELLINGTON CITY COUNCIL (WCC) AND NEC SIGNED A COLLABORATION AGREEMENT TO EXPLORE HOW TECHNOLOGY COULD IMPROVE CITY SERVICES, CREATE ECONOMIC GROWTH, REDUCE ENVIRONMENTAL IMPACT AND ENHANCE COMMUNITY WELLBEING.

This project came from the Wellington City Council's Community Services team working with NEC to explore how to use technology to solve those hard urban problems and improve safety outcomes for the city and its residents. Early discussions were about progressing ideas on how technology could assist with an interagency collaborative approach to developing solutions tailored to local issues and opportunities. Of particular interest was developing a platform enabling agencies to share, collect and analyse data and improve the situational awareness in Wellington.

### **Safe city workshop – November 2014**

We recognised that a locally delivered project must be developed in collaboration with partners and key stakeholders and the Council and NEC facilitated a Safe City Workshop to progress a co-design approach. The workshop was attended by over 100 stakeholders from local and central government agencies such as NZ Police, NZ Fire Service, Capital and Coast DHB and Regional Public Health. Participants also included Wellington free ambulance, health and social service providers, residents, retailers and agencies working with the city's vulnerable – homeless and street people.

The workshop identified there was a common interest in developing a mechanism for evidence based future planning and a more informed situational tactical response to local incidences and wider issues affecting Wellington.

At the time there was a growing concern with inner city

alcohol and psychoactive substance abuse and subsequent antisocial behaviour and overt begging.

A key element in addressing these challenges was identified as improved data and information sharing, including mapping and the integration of numerous data sources. This integration of data and mapping (geocoding information) would add significant value to situational awareness and the ability to respond and plan. It was also identified that new technology, such as video and acoustic analytics, could assist with data collection and provide new insight into day-to-day street level trends, patterns and hot spots, all while being tested in a low-risk, cost-effective manner.

From these discussions there was agreement that Cuba Mall (*Figure 1*) was an ideal location in which to develop a "Living Lab" as a proof of concept;

- Cuba Mall is a clearly defined geographic location with layers of complexity both in design and street environment
- There is a diverse range of people and retail and residential activity and there were common issues to be addressed.

### **Living lab approach**

Through the NEC and Wellington City Council partnership, there was an agreement to implement a Living Lab Proof of Concept (POC) in Cuba Mall to test and understand the new technology and use of the situational awareness and the collaboration platform.



Figure 1 – Cuba Mall

The Safe City Living Lab is a collaborative initiative way to explore benefits to business and community of using technology in a low-risk way. This model provides the opportunity to test ideas and change quickly – an iterative and agile approach to the development of the project.

Most importantly it provides a platform that leverages off the collective impact of this collaboration to ensure the whole of the city can benefit. Crucial to the project was the acknowledgement of the need to complement existing as well as informing future planning and delivery of programmes and services for the city. This project provides the opportunity to use existing assets and sources of data and information in a streamlined and integrated way coupled with new sensory and analytical methods and technologies.

The POC also gave us a chance to test a number of use cases for analytical sensors and these include glass breaking, detection of beggars/rough sleepers and behavioural changes. It also provided a situational view in the form of a GIS Map overlaid with real-time alerts/detections and shared data from external partners.

We have worked with the Privacy Commission to ensure the way information we collect, use and share complies with the principles of the Privacy Act. The flexibility of the

co-design approach has enabled customisable solutions including air-gapped security and individual user account settings, to ensure the principles are upheld whilst maximising the effectiveness of the system.

## A platform for inter-agency collaboration

The resulting inter-agency platform allows for the collection and analysis of data, sharing of data between agencies, and integration of third party data sources. The Smart Board also provides a situational awareness platform which assists understanding of incident patterns in certain locations over time through tools such as heat-mapping and incident reports. Not only does this provide the Council and its partners with the ability to respond in real-time, it also allows evidence-based planning for deployment of resources and future urban design. The platform also provides ability for insight into day-to-day street level trends, patterns and hotspots such as the incidents of rough sleeping and presence of begging in the city over time.

A real-time situational awareness is provided through data from an acoustic sensor, local hosts reporting and the CCTV camera observations – allowing cross-agencies to develop a targeted response to issues as they occur.

It is important that when we do identify social issues we are able to ensure appropriate support is in place. For example, we currently work closely with a number of social organisations in the city that provide support through an outreach team for people who beg and/or are homeless. The use of sensor analytics for begging gives us the ability to provide a multi-agency response to those in need in real-time once an alert is received.

Once an alert is received we can then email the support outreach team asking them to visit the person ensuring they are connected to appropriate support services.

While the platform supports a real-time response it



Figure 2 Alert of incidence of begging and subsequent email to the outreach team



also provides for improved tactical and planned responses through situational awareness. We are able to overlay multiple and shared datasets to assist with identifying trends and patterns and providing a framework for evidence based decision making and future planning.

It also allows us to visualise incidents in a defined geographic area and/or within a defined buffer zone from a centralised point. The example below shows incidences of begging obtained through numerous data sources which are further defined within a geographic location (purple hexagon) and within 500 meters of a landmark.

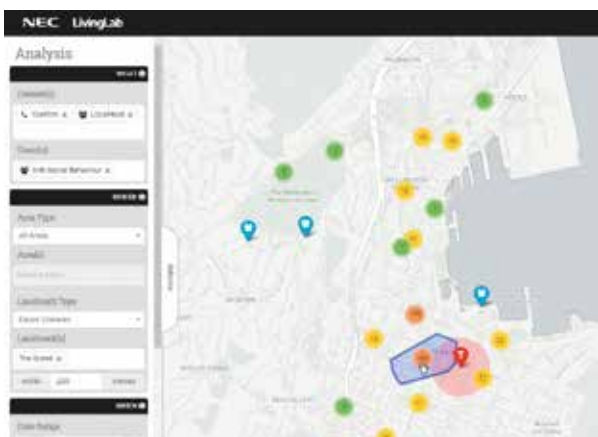


Figure 3

The Living Lab Platform also allows the integration of third-party data sources to provide further insight into patterns and trends associated with other social issues. For example, the national data base 'Stop Tags' is used by the council to record and monitor the graffiti in the city. Integrating this data provides insight into exactly where

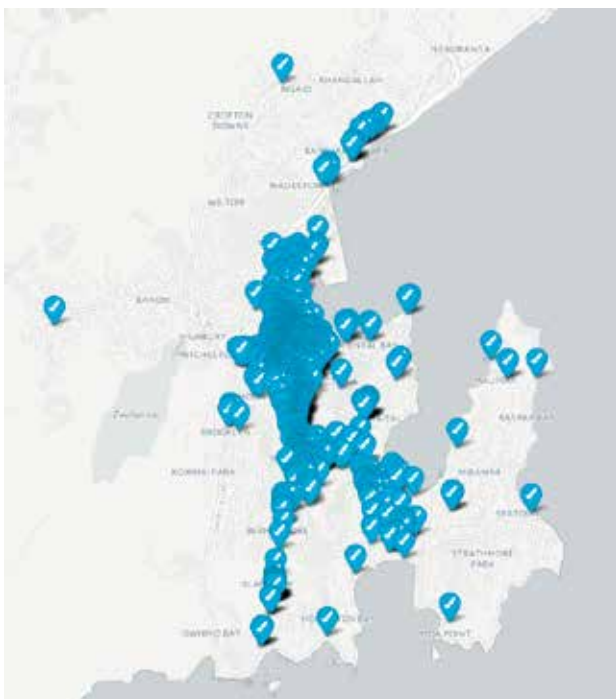


Figure 4

new graffiti emerges and analyses trends and patterns over time. This can then be correlated to other events – such as school holidays, determining if graffiti appears along particular routes at particular times, and if it is related to the weather and/or time of year. This overlay of other factors assists the council and its partners (including the police) in all aspects of graffiti management.

The NEC Living Lab system is scalable and can show patterns in small datasets across short timeframes or large datasets across long timeframes. Figure 4 shows how a large dataset of the instance of graffiti over a year is not really useful when visualised this way. However, a cluster map of the same information is more readable and can be interpreted for spatially enabled decision making.

Clustering the data does not lose the fine-grained aspects of the visualisation. Hovering over clusters shows the zone they cover and clicking on them reveals the associated attribute data of the points. Further information about each incident can be visualised through the third party database. The example on the next page shows a geocoded record of the graffiti incident – this allows searching on the tag, location and type of asset. It also shows the type of graffiti, for example paint, felt pen or glass etchings. The 'Stop Tags' database also provides us with a record of the tag being removed. The geotagged photos and accompanying information is captured and loaded via a phone app and is mandatory for all our contractors.

While the visualisation of discrete data sets is essential for quantitative analysis, the platform provides a facility for the same data to be visualised; heat maps are also

