Business Case

Monitoring Pedestrian Impact on the city centre SMART CITIES

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Auckland Council
Te Kaunihera o Tāmaki Makaurau

Document control

1.1 Document purpose

This Business Case outlines the justification for the project to proceed; it aims to:

- gain a better understanding of the problem or opportunity.
- identify options evaluated and propose the best solution.
- outline benefits and costs associated with the preferred option.
- secure funding.

1.2 Document history

Version	Date	Update by	Update details

1.3 Associated documents

Version	Date	Document name and storage location

1.4 Distribution

Title	Name

1.5 Document review

Role	Name and signature	Date
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Comments:

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Executive summary

The purpose of this business case is to:

Outline the benefits of, and the means by which the impact of pedestrians will be monitored in the city centre.

This business case seeks formal approval to invest up to $500,000 in the 2017/18 and 2018/19 financial years. This investment will set up the project team to assess options, plan the network and fund the project for its first year of operation; it will also partially fund its second year of operation.

The scope of this proposed project includes:

- Continuing engagement with Heart of the City, ACCAB and other key stakeholders on how the proposal fits with existing systems and other data sources, and how best to manage the network moving forward;
- Installation of infrastructure to monitor pedestrian movement;
- Analysis of the data collected;
- Determination of infrastructure owner and business as usual management of collection, analysis and dissemination.

The scope of this proposed project specifically excludes the ongoing management of the infrastructure and data collection. Responsibility for this will be handed over to AT.

Introduction

The Auckland Council family performs many integral services that ensure the city centre functions effectively, now and in the future. This is important at a time of unprecedented private and public realm investment, putting pressure on the way people use the city centre.

In order to make sound decisions moving towards our goals, it is important that we use evidence based data to understand what is happening in the city, how this impacts movement around the city and how people enjoy, access and interact within the city.

The Council family is keen to put in place infrastructure which facilitates and encourages active modes of transport, however currently there is insufficient accurate data on these modes to ensure informed decision making and quantify the delivery of walking outcomes as stated in the Auckland Plan, the City Centre Master Plan and the Integrated Transport Programme.

Opportunity/problem

A. Inadequate data

Currently there are two main types of data collected on the movement of people.

AT measures vehicle movements using data collected from traffic signal detectors; public transport users are measured using HOP card date and other movements (people walking and cycling) are captured four times a year using a screenline count. Cameras record movements and someone physically counts the people and bikes. Data is collected for four hours (two hours a day for two days) four times a year. The above data is then used for the next three months to estimate the

number of people walking and cycling into the city each week day morning. This is not comprehensive for the following reasons:

- Data is only correct for the four hours it is collected.
- This data cannot be adequately compared to vehicular movement data or public transport use, which is collected every day throughout the year.
- Cameras are located on the roads leading into the city, areas such as parks (eg. Victoria Park, which a lot of people walk and cycle through, is not covered). So a sizeable proportion of pedestrians and cyclists will not be captured.
- Anyone already within the city ring is not captured (40,000 residents).
- Repeat journeys (lunch, shopping etc.) are not reflected in the data.

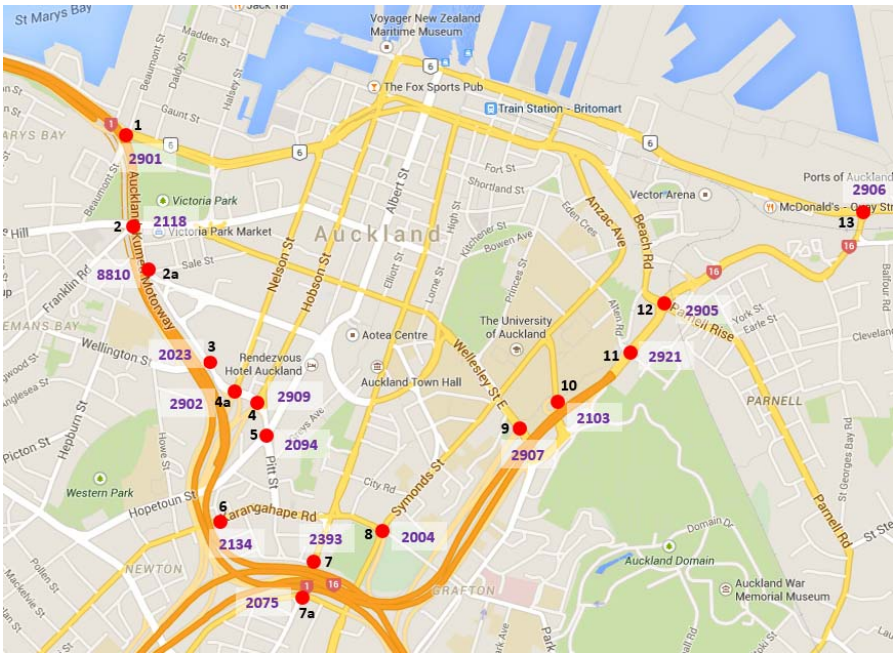

Fig 1 – screenline monitoring locations

Additional to the work of AT, within the city centre, there are static cameras located in areas bordering Queen Street (managed by Heart of the City), these record absolute numbers of people walking past; they do not give any additional information on direction of travel, different modes of active travel, pedestrian traffic flow or dwell times. This data is useful for determining 'crunch' points on a number of main roads, it also provides information for businesses in terms of absolute numbers of possible users/customers; but this network limited in its ability to give meaningful data for project planning or evaluation. Generally the data is used for tracking levels of foot traffic around shopping locales and for measuring changes around city centre events.

B. Data for project planning

The data collected is limited in its ability to give a true picture of any issue that future public realm or transport projects would seek to improve. With regards to safety improvements, there is currently limited pedestrian data which makes planning and evaluation of high risk routes and intersections difficult. In the private realm, the data collected offers the business community information on absolute numbers of people, it doesn't show where these people have come from or which direction they are heading in, it doesn't give intelligence around likely shoppers, commuters and workers. In comparison, a multi-sensory approach would give an accurate picture

or people coming to work, people passing through and people wandering from shop to shop. For example, tracking the numbers of would-be shoppers following the Laneways circuit would be of interest to a High Street business.

C. Data for project evaluation

Determining the success of a project is data driven. Reliable pre and post data is necessary to evaluate the success of developments, policies and strategic plans and projects. Currently projects approach this is piecemeal fashion, it is an additional project cost and does not give persistent qualitative data which can be reapplied to subsequent projects.

1.6 Strategic alignment

This proposed investment is aligned to the following 'transformational shifts' outlined in the Auckland Plan:

> Radically improve the quality of urban living: about the built environment matching our natural environment. High quality urban areas. Radical improvement in the way we plan, design and build urban Auckland.

Additionally, this proposed investment addresses the following strategic direction outlined in the City Centre Master Plan:

> The City Centre needs to play a greater role in Auckland's international competitiveness and future success. To achieve this, a City Centre Masterplan was developed in parallel with the Auckland Plan. This Masterplan provides a 20-year transformational direction for the future of the City Centre.

The proposed investment in city centre pedestrian monitoring supports both plans by supplying data for better informed decision making.

1.7 Objectives

The high-level objective of the data monitoring project is to efficiently and accurately collect and monitor:

- The quantum and direction of pedestrians
- The flow of pedestrians
- The popular routes for travel between main points
- The environmental context of the data (external factors which influence behaviour)

This will aid planning around projects involving active modes of transport and evaluate the success of the projects once completed. It will allow for a true comparison of all modes of transport. And it will provide in-depth data for all city centre stakeholders (for example retail businesses, developers and residents).

The proposed investment will allow for evidence based insight into the types of programmes that contribute to the Council family reaching its goals, targets and objectives.

Broadly, the monitoring will:

- facilitate comparative analysis with other modes of transport
- inform decisions about urban planning and management
- identify opportunities to improve city walkability and transport
- measure the impacts of events and specific marketing campaigns on pedestrian activity
- measure the impacts of the environmental context on pedestrian patterns
- monitor retail activity in the city
- assist the business community in developing marketing strategies to maximise their exposure and identify staffing, security and resource requirements
- assist start-up enterprises in determining the right location
- assist developers make sound development choices
- assist in the assessment of safety (real and perceived) within the city
- assist emergency planning
- allow for comparison between projects

In detail, the monitoring will:

- support project planning with reliable pre and post evaluation
- monitor pedestrian activity in the city over time and determine variations throughout the day, week, month and year
- understand changes in pedestrian activity, in relation to facilities provided, at various locations
- understand pedestrian activity patterns at various locations throughout the city
- plan and respond to emergency situations
- understand the impact of major events and other extreme conditions on pedestrian activity in the city
- inform other planning and implementation activities
- identify locations for pedestrian facility improvements
- identify locations where high volumes of pedestrians are not well served by shops/cafes
- Identify areas where pedestrians don’t go at night and assess security issues that may exist
- develop pedestrian flow models
- assess economic and social impacts of pedestrian facilities
- CO2 levels and air quality is constantly recorded as part of the environmental scan (NB: air quality data is currently collected from eight points in the city, a new sensor network would allow for the air quality monitoring at all sensor points)
- support the business case for the expenditure of public resources on improving walkability

Options analysis

The following options have been considered (see appendix 9.1):

Option 1: Continue as is (with quarterly screenline count and limited static cameras).

Option 2: Establish a city centre monitoring Opex programme, utilising hardware owned and managed by a third party.

Option 3: Establish a city centre monitoring Capex programme, hardware owned and managed by the Council family.

The details for both option 2 and 3 are yet to be confirmed but broadly the expectation and advice to date, is a multi-sensory approach to data capture and analysis. Initial assessment estimates 25 kite platforms are needed which feed into a software platform. Each kite platform is a mini network of stereoscopic cameras, Wi-Fi sensors and environmental enclosures. The raw data is bundled together in the kite platform and processed by the software. The information can be presented in anywhere required by the audience, for example from sheer numbers through to digital 3D imaging using gaming technology.

In the future, this information will interface with the Smart Growth Portal to provide another layer for comparison. It is also anticipated that interface with Telecom Service Provider data will lead to data on where people have come from (using the Wi-Fi). The potential for this has as a planning tool is huge.

Preferred option

The preferred option is **option 2** for the following reasons.

1.8 Benefits

Benefits realisation is expected to start immediately after the network is installed.

Benefit owners identified agree that benefits claimed in this business case are achievable under the current conclusions and assumptions.

Financial benefits	Estimated benefit value	Cost centre
Cost effective transport planning with stronger cost-benefit analysis	The AT Walking & Cycling Team as an operational monitoring budget of $90-100k for 2016/17 (Auckland wide). This covers operation and maintenance of existing ped/cycle counters and other misc. monitoring activities. In addition, on average, $80k is spent on specific project monitoring pa. Some of these costs will remain (screenline camera monitoring etc.) but before and after project evaluation costs will be removed ($80k pa)	AT Walking & Cycling
Cost of repairing and upgrading equipment sits with the third party owner. Technology quickly develops. Assuming a five year lifecycle	To buy the hardware (option 3) will cost $1.3M capex cost, plus $780K opex cost over a five year period. For option 2 there will be a $1.48M opex cost over five years. This	All of council (including AT)

of the hardware	amounts to a $600k saving.	
Non-financial benefits	Estimated benefit value	Business area
Accurate real time data	This will allow for informed decision making and positive messaging around the promotion of active modes of transport	All of council
Accurate real time data	Assist for informed decision making in the business community and other private enterprises	All of Auckland
Support transport planning and urban design that meets the city's needs	Better decision making taking into account all information	All of council.
Highlight safety issues around the city centre	Issues such as safety at night and overly crowded pavements and intersections can be flagged before accident raises the issue	All of council.
Continual tracking of air quality	Opportunity to warn people in risk groups	All of Auckland
Deeper understanding of the impact of weather	To allow for better forward planning or infrastructure changes	All of Council
No risks attendant on capital works programme	Project can be definitively costed	All of council
Disadvantages / Dis-benefits	Description of disadvantage	Business area
Cost	$1.48M over five years	All of council

1.9 Risks and Issues

The following project risks were identified in the option assessment relating to this project which will need to be considered for in the achievement of the objectives for this project.

Option	Risk	Managed
2		
	Data not supplied as expected	*By contract*
	Data not supplied in timely fashion	*By contract*
	Algorithms not up to standard	*The hardware and software currently being trialled in Wellington and Christchurch. Learning will be applied to Auckland project. Output managed by contract*

1.10 Cost and funding

$	2017/18	2018/19	2019/20	2020/21	2021/22
Opex	$296,000	$296,000	$296,000	$296,000	$296,000
Requested funding CCTR	$296,000	$204,000	n/a	n/a	n/a
Funding from outside the CCTR (AT)	n/a	$92,000	$296,000	$296,000	$296,000

First year funding requested from City Centre Targeted Rate

Second year funding partially requested from City Centre Targeted rate, rest of funding to be met by data owner – AT (collaboration of Network Performance and Walking & Cycling Teams).

1.11 Contingency

10% as costs are based on a number of assumptions.

1.12 Consequential opex

The data owner (AT) has confirmed there is budget available for ongoing consequential costs, and is prepared to accept these cost as part of their future operational budget.

Conclusion and recommendation

The proposal seeks ACCAB support, and financial contribution from the CCTR, to progress with the formation of a project team to further assess the options, engage with stakeholders, plan and implement a network capable of monitoring the impact of pedestrians on the City Centre.

Appendices

1.13 Appendix 1 Options detail

Option 1 – Baseline

The status quo or do "nothing option" is considered the baseline for comparison purposes.

- Screenline counts four times a year – $95,000pa (Auckland wide)
- On average yearly cost of project pre and post evaluation – $80,000pa (Auckland wide)
- Yearly cost for Queen Street pedestrian counting (Heart of the City) - $57,000pa

Option 2 – Service Model

- Smart City platform provided "as a service" based on 25 Kite Gateways, plus 20 stereoscopic cameras and 200 Wi-Fi motes
- Service cost of $24,000pm - $296,000pa
- Over five years $1.480M

Option 3 – Capex Model

- Smart City platform capex model – platform supplied with individual camera licences $1.3M one off cost.
- Additional support cost for data $156,000pa
- Over five years $2.08M