

# Advanced Network Management Hamilton and the Wider Transportation Network

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**AECOM**

# Agenda

- Introduction
- Background
- Problems and Benefits
- Evidence and Engagement
- Investment Objectives
- Option Generation and Assessment
- Recommended Investment
- Next Steps

# Strategic Case

Robyn Denton

# Introduction

- People need to reach their destinations every day
- RCAs aim for safe and reliable trips
- Events affect these trips, for minutes, hours or days. These include:
  - Planned events
    - Roadworks, Fieldays etc.
  - Unplanned events
    - Crashes, floods or slips etc.
  - Recurrent events
    - Peak hour congestion, Public Holidays etc.

## Background

- Hamilton City Council manages >100 sets of traffic signals and numerous ITS assets
- Rapid population growth is increasing ITS demand and congestion in the transport network
- Events and assets are currently managed **reactively**, with a response only when an issue arises
- Opportunities to **proactively** manage the network
  - Better network management is the ‘first stop’ in **delaying, reducing, or removing** the need to invest in costly new transport infrastructure

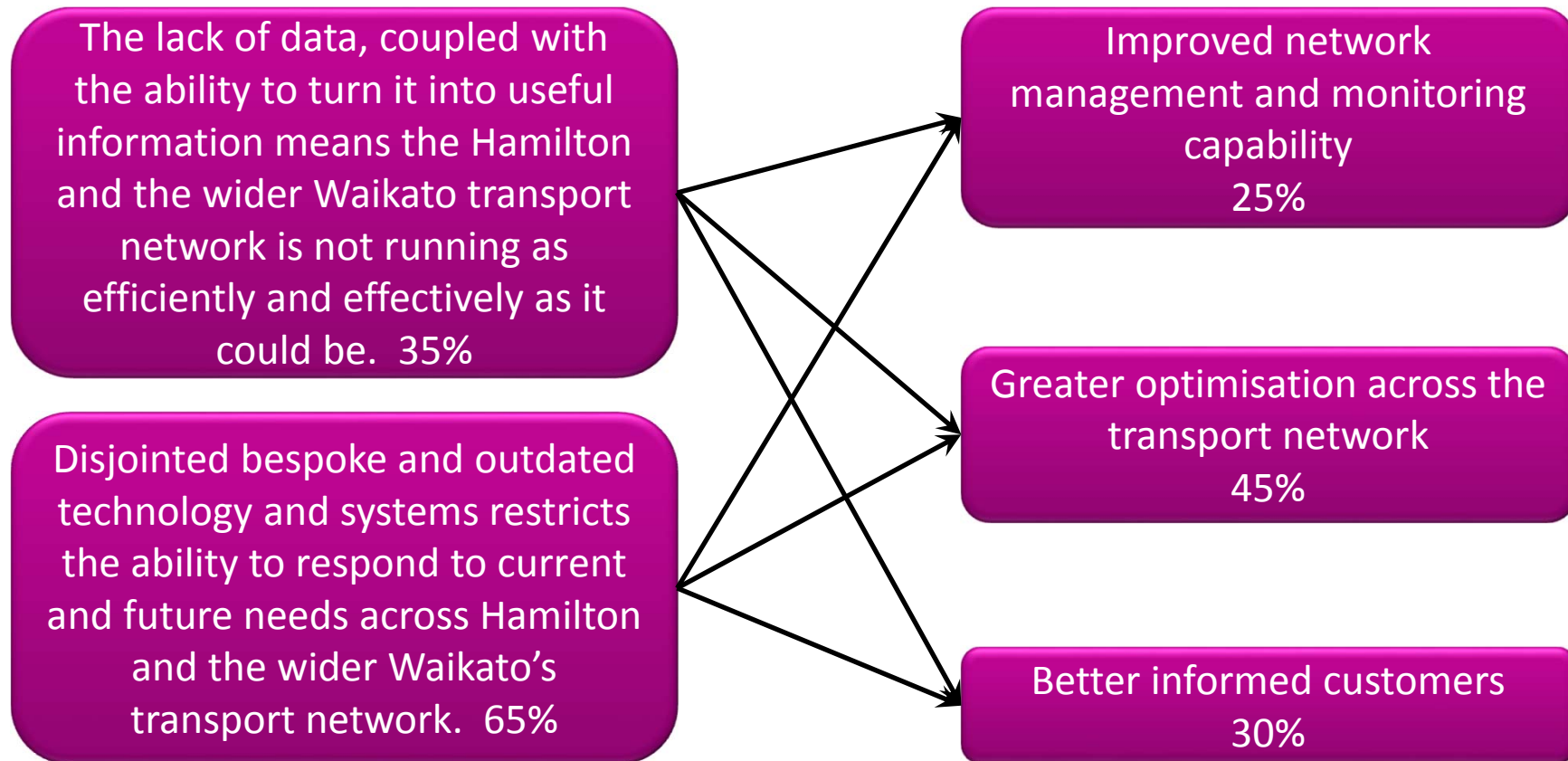
## OneNetwork Steering Group

- OneNetwork Steering Group, formed in May 2013
  - Hamilton City Council
  - Waikato Regional Council
  - New Zealand Transport Agency
- ‘OneNetwork Charter’ which aims to increase focus on **integrated transport networks** by encouraging a **combined approach** to the management, operation and future planning of Hamilton City.
  - Network Operating Framework
  - **Advanced Network Management**

# Detailed Business Case

Nathan Harper

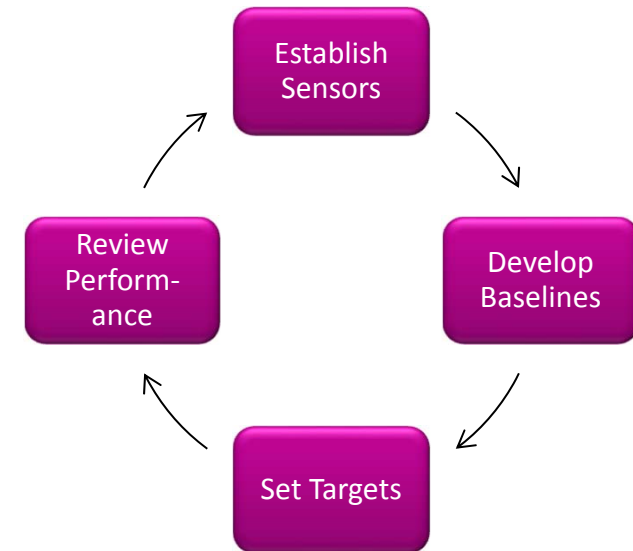
## Problems and Benefits





## Evidence and Engagement

- Little performance data available
- Information supports problems are **significant**, and will get worse
- Therefore the first opportunity to improve ANM is to **collect and analyse network data**
- Stakeholder engagement
  - Workshops, interviews and TOC site visits
- Key outcome is collective agreement that ANM activities would benefit from integration and **co-location**



# Investment Objectives

BENEFIT	INVESTMENT OBJECTIVE
Improved network management and monitoring capability (25%)	1. To improve the time taken to be notified and to <b>respond to incidents and unplanned events</b> 2. To improve the business capability to <b>manage planned events as OneNetwork</b> 3. To improve the business capability to <b>detect incidents and monitor congestion in real time</b>
Greater optimisation across the transport network (45%)	4. To improve <b>travel time reliability</b> so that if people allow 30% extra travel time, they can be 95% confident they won't arrive late
Better informed customers (30%)	5. To improve the <b>quantity, accuracy and timeliness of local information</b> communicated to customers 6. To improve the business capability to <b>make decisions based on quality data</b>

# Option Generation

Increasing intervention / cost

ANM Activities

Description of Options by Activity		Do Minimum	Option 1	Option 2	Option 3	Option 3A	Option 4	Option 4A	Option 4B	Option 4C
Planned Events	Network optimisation	Nil	Nil	WaitOC	WaitOC	WaitOC	WaitOC	WaitOC	WaitOC	WaitOC
	Site optimisation	Ad hoc locally, big events coordinated by ATOC	Ad hoc locally, big events coordinated by ATOC	WaitOC Major and local events; ATOC support	WaitOC Major and local events; ATOC support	Proactive, co-ordinated event management at WaitOC	Proactive, co-ordinated event management at WaitOC	Proactive, co-ordinated event management at WaitOC	Proactive, co-ordinated event management at WaitOC	Proactive, co-ordinated event management at WaitOC
	CARs and TMP approval	HCC Infrastructure Alliance, NZTA NOC TMCs	HCC Infrastructure Alliance, NZTA NOC TMCs	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support	Co-ordinated access management in greater Hamilton, e.g. TMPs and CARs etc	HCC Infrastructure Alliance, NZTA NOC TMCs, WaitOC support
	Delivery									
Unplanned Events	Detection	SH: ATOC, HCC: Ad hoc	Local events, existing sources	Local events, existing sources	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Full 2-way co-ordination across NW Waikato
	Validation	SH: ATOC, HCC: Ad hoc	Local events, existing sources	Local events, existing sources	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Regional events, data from Upper NI	Full 2-way co-ordination across NW Waikato
	Response	Ad Hoc CTU / IA / ATOC / FH	HCC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH	WaitOC / IA / ATOC / FH
	Scene management	IA / FH	IA / FH	IA / FH	IA / FH	IA / FH / WaitOC	IA / FH / WaitOC	IA / FH / WaitOC	IA / FH / WaitOC	IA / FH / WaitOC
Day to Day Operations / Recurrent Activities	Data collection	Existing	Upgraded for KPI reporting	Upgraded for KPI reporting	Limited network sensors	Limited network sensors	Full network sensors, e.g. Adelaide	Full network sensors, e.g. Adelaide	Full network sensors, e.g. Adelaide	Full network sensors, e.g. Adelaide
	Analysis	Ad Hoc	Basic systems	Basic systems	Analyst on site	Analyst on site	Live analytics	Live analytics	Live analytics	Live analytics
	Real time monitoring and management	Ad Hoc	Ad Hoc	AM, PM peak monitoring	Workday monitoring	Workday monitoring	Active monitoring 24/7	Active monitoring 24/7	Active monitoring 24/7	Active monitoring 24/7
	Inform	HCC social media, NZTA NTIT	HCC social media, NZTA NTIT	WaitOC local information, NTIT	WaitOC local information, NTIT, Dedicated Comms	WaitOC local information, NTIT, Dedicated Comms	WaitOC local information, NTIT, Dedicated Comms	WaitOC local information, NTIT, Dedicated Comms	WaitOC local information, NTIT, Dedicated Comms	WaitOC local information, NTIT, Dedicated Comms
Periodic Activities	Parking operations	HCC	HCC	HCC	HCC	HCC	HCC	HCC	HCC	Co-location
	Public Transport operations	WRC	WRC	WRC	WRC	WRC	WRC	WRC	WRC	WRC
	Personal Safety / Crime Prevention	City Safe - Proactive in the CBD, reactive elsewhere	City Safe - Proactive in the CBD, reactive elsewhere	Share cameras	Share cameras	Co-located at WaitOC, integrated systems	Co-located at WaitOC, integrated systems	Co-located at WaitOC, integrated systems	Co-located at WaitOC, integrated systems	Co-located at WaitOC, integrated systems
	ITS Assets	Context Planning Commissioning Maintenance Renewals / upgrades	CTU / NZTA CTU / NZTA CTU / NZTA Infrastructure Alliance / CTU, FH / NZTA Infrastructure Alliance / CTU, FH	CTU / NZTA CTU / NZTA WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH	WaitOC WaitOC WaitOC WaitOC WaitOC with IA / FH WaitOC with IA / FH
Periodic Activities	Corridor Optimisation	Ad Hoc through CTU	Ad Hoc through CTU	Every 2 years on key routes, outsourced	Every 2 years on all sites	Every 2 years on all sites	Proactive systematic optimisation - every year all sites	Proactive systematic optimisation - every year all sites	Proactive systematic optimisation - every year all sites	Proactive systematic optimisation - every year all sites
	Reporting	Ad Hoc through CTU / NZTA	Regular WaitOC reports Hamilton Urban	Regular WaitOC reports Hamilton Urban	Regular WaitOC reports on all modes for Hamilton Urban and State Highways	Regular WaitOC reports on all modes for Hamilton Urban and State Highways	Regular WaitOC reports on all modes for Hamilton Urban and State Highways	Regular WaitOC reports on all modes for Hamilton Urban and State Highways	Regular WaitOC reports on all modes for Hamilton Urban and State Highways	Regular WaitOC reports on all modes for Hamilton Urban and State Highways
	Implement NOP: Informing NIP	Infrastructure Alliance / CTU, City Development	Infrastructure Alliance / CTU, City Development	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC	Infrastructure Alliance / CTU, City Development; WaitOC
Periodic Activities	Standards, SOPs, Specifications etc.	Ad Hoc	Collate	Collate	Collate	Develop key documents	Live suite of documentation	Live suite of documentation	Live suite of documentation	Live suite of documentation

# Option Assessment

## Multi-criteria analysis

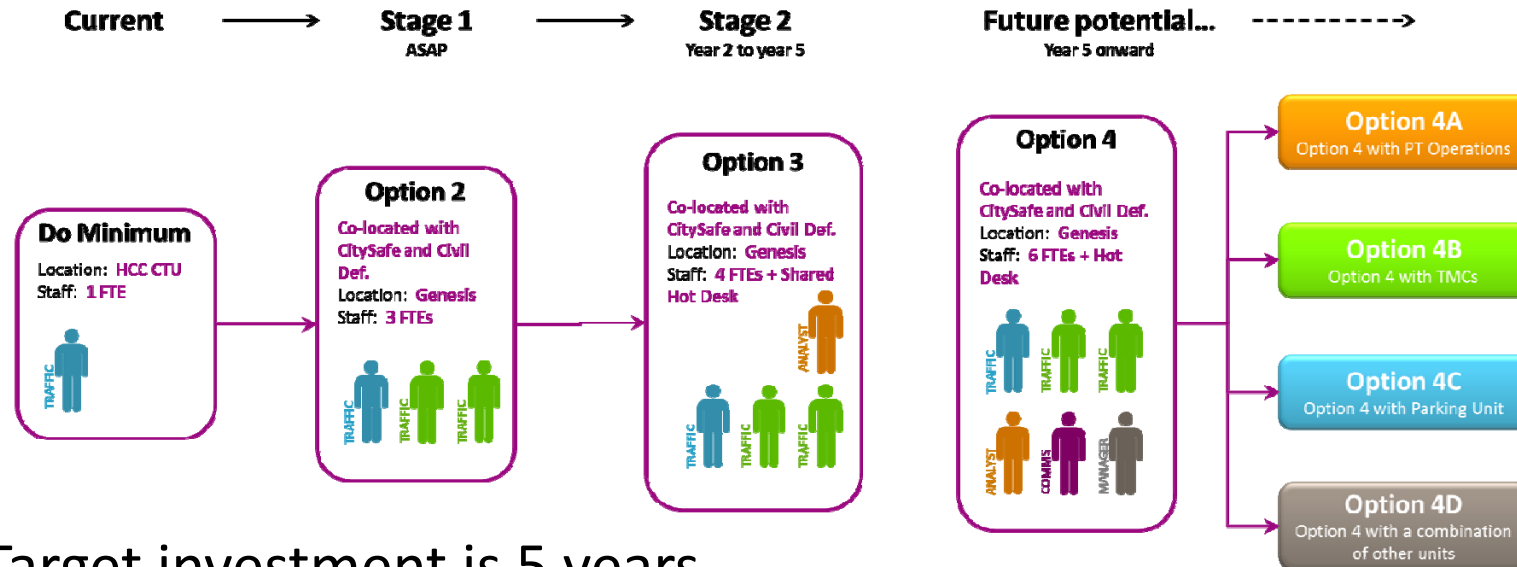
- Investment objectives
- Cost
- Timeframe
- Risks
- Benefits and dis-benefits
- Dependencies
- Investment profile

Advanced Network Management  
 Road and Delivery Network - 9 September 2016

**Summary of the Options**

Option	Option Description	Investment Objectives	Cost	Timeframe	Risks	Benefits and Dis-benefits	Investment Profile
Option 1	...	...	...	...	...	...	...
Option 2	...	...	...	...	...	...	...
Option 3	...	...	...	...	...	...	...
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Option 24	...	...	...	...	...	...	...
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Option 27	...	...	...	...	...	...	...
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Option 29	...	...	...	...	...	...	...
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Option 99	...	...	...	...	...	...	...
Option 100	...	...	...	...	...	...	...

# Recommended Investment



- Target investment is 5 years
- Staged approach
  - Stage 1: Collect data, setup Stage 2
  - Stage 2: **M**onitor, **I**nform, **M**anage, **O**ptimise

## What it means...

Metric	Now	Stage 1 – Baby	Stage 2 – WaiTOC
<b>Planned Events</b>	- Ad hoc	- Major event co-ordination, ATOC	- Proactive & co-ordinated, ATOC
<b>Unplanned Events</b>	- Ad hoc local & response - ATOC for SH	- Co-ordination of local events & response - ATOC for SH	- Co-ordination of Regional Waikato <u>with</u> ATOC
<b>Monitoring</b>	- Complaints response	- 21/7 real time	- 24/5, 21/2 real time
<b>Net. Perform.</b>	- Sparse sensors	- New sensor network	- New sensor network
<b>Inform</b>	- Social media	- WaiTOC local info.	- WaiTOC comms.
<b>Management</b>	- Ad hoc, complaints response	- Manage to NOP all modes	- Manage to NOP all modes
<b>Optimisation</b>	- Ad hoc	- Outsourced every 2 yrs on key routes	- In house every 2 yrs on all sites

## Next Steps

- Complete DBC
- Negotiate a Multi Party Funding Agreement
- Approvals from OneNetwork Partners
- Secure premises in the Genesis IL4 building
- Open **WaiTOC Stage 1**

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## Advanced Network Management in Hamilton and the Wider Network

Nathan Harper

March 2017

VERSION 0.1

Advanced Network Management in Hamilton and the Wider Network

Detailed business case to proceed from initiation to implementation



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# Thank You

## Questions?

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