

# Case Study: Auckland Transport Lighting Asset Management

Delivering socio-economic improvement through better asset management of Auckland's Lighting | Ashley Barret, David Dick, Joe Inniss, and team

## Introduction

Over the last 10 years Auckland Transport, the owner and manager of the Southern Hemisphere's largest streetlighting asset base embarked upon a renewal and upgrade programme aimed at meeting the objective of assisting delivering Auckland the title of 'world's most liveable city'.

Auckland Transport owns and maintains more than 110,000 streetlights, approximately one third of New Zealand's total lighting stock and the largest source of direct electricity consumption of all of Auckland Transport's assets.

Most of the region's streetlights will change from golden yellow light to white light. A policy change has seen the establishment of an accelerated renewal LED conversion programme which enables all councils to access capital fund to undertake this type of work.

International experience has shown that white light is also a factor in crime prevention; delivers greater comfort and security and improves visibility and reaction times for drivers and pedestrians, resulting in fewer vehicle crashes and injuries.

## Project Delivery

The project was delivered in two stages:

### Stage 1

In October 2014, Stage 1 was approved and saw 44,000 high-pressure sodium streetlights replaced with energy efficient LED lights over five years. This provided Auckland Transport with 11.2 GWh of energy savings and an estimated \$1.7 million reduction in electricity bills each year. The LED technology also saves Auckland Transport an additional \$1.2 million per year in maintenance costs. The project is expected to see net savings of \$32 million over the 20-year design life of the LED luminaires.

### Stage 2

Stage 2 of the streetlight retrofit will replace an additional 49,000 high-pressure sodium lights over five years. This next stage of upgrades is expected to deliver an additional 16.3 GWh of savings, resulting in a cost reduction of \$2.6 million per year. Maintenance costs will be further reduced by \$1.3 million per year.

When the project concludes the energy saved through upgrading streetlights with LEDs is enough to power over 3,500 homes a year.

All the LED streetlights are connected to a central management system (CMS). This system can provide a daily

report to contractors advising of any problems on the network, reducing the numbers of calls to our call centre. Additionally, the CMS can decrease light levels with dimming functions. This allows for reduced nightglow (and associated light pollution) and delivers further energy savings during off-peak hours.

## Applied Asset Management

Fundamental to the success of this project was the development of a clear Asset Management Strategy.

This enabled the project stay aligned to the objectives over the extended project lifetime and enabled critical decisions to be made with full stakeholder participation.

Economic Value Added (EVA) was explicitly calculated for the project, serving as an indicator of the social profitability of the project, with the underlying premise being that the project investment should be justified by the reduction in Whole Life Cost of the assets and increased Social Value, such that the Total Cost of Ownership is reduced.

The feasibility and pre- feasibility stages of the project reflected half of the project duration. The time invested in these phases was critical to project success. Had they been shortened or omitted the projects benefits would not have been delivered.

## Benefits of Asset Management

The primary benefit of deploying the Asset Management Strategy was that it created a link between the lighting objectives and their fulfilment. This 'line of sight' was fundamental for stakeholder understanding and enhanced overall stakeholder engagement.

The concept of Economic Value Added has been tested with some impressive outcomes in respect of operational cost savings. Both capital cost and operational costs have been set to be new benchmark with total cost of ownership being lowered with increasing utility and enhanced performance.

In public projects there is often scrutiny of options and outcomes: in this project the community themselves have been active and the transformational effect on delivering Auckland's goal as a 'liveable city' has been obvious.

The concept of benefits realisation enabled this project to draw more holistically to support the 'liveable city' goal.

These have enabled the project benefits to be more readily understood by stakeholders and to link the project to the larger context of city-wide infrastructure. This reinforces the link with Auckland Council's Annual Plans and Long-Term Plan.

## Lessons Learned

The project conveyed benefits to Auckland Transport beyond those explicitly called for in its planning documentation.

A project of this magnitude - delivered over an extended period – clearly manifests many lessons.

Primary among these was that even relatively straightforward solutions must often be delivered over time. This observation is especially important to Asset Management professionals.

1. Building a Business Case often takes longer than anticipated. In this project the development was iterative and involved the input of many stakeholders. Ultimately the right outcome was delivered, balancing efficiency and effectiveness is a fine line and requires skill and good judgement. The speed with which you deliver results is secondary to their complete and knowing adoption by all parties affected by them. Seeking input from others might add time to the project's schedule, but it greatly decreases the need for follow-up work. A clear Asset management strategy is one key to structuring your project in such a way that all stakeholders are adequately informed.

2. Gathering data is time-consuming in and of itself; analysing that data in a way that informs both your processes and the stakeholders who depend on

the project's success can take even more time. In this case, the project team spent a good deal of time enhancing asset-condition data before concluding that its quality could not be made to support the project's objectives. Enhancing data is rarely a quick or simple process, and it is never a substitute for a clear understanding of the project's objectives, the advice of experts and stakeholders, or the insights of experienced and creative project staff.

3. The project succeeded in building a stakeholder ecosystem that enhanced collaboration and helped the project team generate broad-based value. This produced a wider range of insights than a more streamlined approach would have managed, effectively trading a more challenging project timeline for a more satisfied stakeholder base when the project was completed. It helped that Auckland Transport already had extensive experience working with most of the project's major stakeholders. This encouraged stakeholders to collaborate across silos, which in turn mitigated against vendor capture.

### TL;DR

1. Improving Lighting systems is good for the environment and has social and economic benefit.
2. Good Asset Management leads to good programme delivery