

Street Lighting Procurement – Stage 2

Recommendations

That the Board:

- i. Approve Stage 2 of the accelerated street lighting renewals of 49,000 High Pressure Sodium (HPS) lights with Light Emitting Diodes (LED) lights over a period of five years and connect them to the Central Management System (CMS) at a total capital cost of \$43.1 million.
- ii. Delegate authority to the Chief Executive to approve the Procurement Plan and subsequent contract for the purchase of the LED lights.
- iii. Note that Stage 2 of the LED Replacement Programme will be funded from AT's capital envelope and subsidised by NZTA at a rate of 51%. Provision is made in the draft LTP and RLTP.
- iv. Note anticipated net savings in energy and maintenance arising from the completion of Stage 2 of the LED replacement programme will be \$73.1 million over 20 years.

Executive summary

1. In October 2014, the AT Board approved Stage 1 (residential roads) of an accelerated street lighting renewals programme, replacing 40,000 70W HPS lights with LED lights over a period of five years, including the installation of a CMS at a total capital cost of \$22 million.
2. The changing of the existing HPS lights to energy efficient LED lights is a major contributor towards the Government's and Auckland Council's objective of reducing energy use and carbon emissions by 40% by 2040.
3. Street light networks around the world are being changed over to LED lights at an increasing pace with Auckland leading the way in Australasia. AT will have changed over 50% of its existing lights to LED lights by June 2018. The old HPS technology will become increasingly more difficult to source for replacements in future years.
4. The average cost of supplying and installing a Stage 1 luminaire is around \$500 per luminaire. The estimated average cost to install a Stage 2 luminaire will be \$890 per luminaire. The difference in cost is due to the higher cost of the required higher powered luminaires and higher installation costs due to the traffic management required on the feeder and arterial roads.

5. As at the beginning of February 2018, 36,000 Stage 1 lights have been changed to LED and connected to the CMS. The programme is on track to be completed by June 2018. The completion of Stage 1 was brought forward by one year, from the initial five year programme agreed by the Board, to take advantage of increased Government funding.
6. Stage 1 is forecast to remain within budget. The 40,000 lights identified in the 2014 Board paper have increased to 43,000 as the database has been improved with the cost of these additional 3,000 lights offset by the average cost of the luminaires being lower than forecast.

Background

7. The CMS is working well, however the full benefits of the CMS will not be realised until all the street network (Stage 1 and 2) is completed. For example, when all streetlights are connected to the CMS, night patrols will not be necessary. In the winter months responding to lights out being reported through the call centre occupy one person's time. In the future, the CMS will provide a daily report to each contractor advising any problems on the network, which will reduce the number of calls through the call centre significantly.
8. AT has been working with the Electricity Authority (AE) to have the CMS metered energy accepted for charging purposes. The present method of charging uses the installed load to calculate the energy used. This also means AT pays for any lights "not on" at night because there is no means of monitoring lights not working. With the CMS metering AT will pay on actual energy use.
9. Choosing an equivalent light for Stage 1 was relatively easy because the street width and light mounting heights do not vary significantly. This allowed AT to purchase one luminaire type to fit all streets. Stage 2 lights will be installed on the arterial and feeder roads where vehicles are dominant and traffic speeds are 50 km/h or higher. Stage 2 roads vary in width from two lanes through to three lanes in each direction. The configuration of the existing lights also varies, together with the mounting height. It is a requirement of NZTA, for subsidy, that we maintain the same or better light distribution on the road. As a result, the Stage 2 rollout will require a much greater level of design input.

Benefits of Stage 1

- 43,000 lights will be changed from 70 Watt HPS to 24 Watt LED and connected to the CMS.
- Energy costs will reduce by \$1.7 million/year (11.2 GWh/year)
- Maintenance costs will reduce by \$1.2 million/year due to the longer life of the LED's and reduction in reactive maintenance.
- White light provides an improved night time environment with faster response times for drivers and increased pedestrian safety through greater visual perception and facial recognition.

- LED lights reduce upward light to near zero and reduces spill light onto adjoining properties.
- The CMS provides the opportunity to reduce light levels between 11.30pm and 6.00am each night further reducing energy and nightglow.
Note: "Dark Sky NZ" has complimented AT for this.
- The CMS reports faults and records actual energy used.

Further benefits of Stage 2

- Further reduction in energy costs of \$2.6 million/year (16.3 GWh/year)
- When Stage 2 is completed, there will be no requirement for night patrols as all the lights will be connected to the CMS.
- Customer calls through the call centre will reduce to near zero as the CMS continuously monitors the lights and immediately reports any faults.
- Maintenance costs will further reduce by \$1.3 million/year.



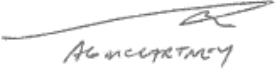


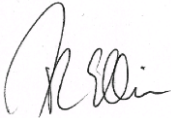
Funding

10. Stage 1 of the programme has been funded from AT's capital envelope with subsidy from NZTA of 85%. The 85% subsidy was a Government initiative to encourage Councils to change lights to more efficient LED's.
11. The 85% subsidy expires on 30 June 2018. The subsidy will then revert to the 51% rate for capital work from 1 July 2018. This is the reason AT accelerated Stage 1 to take advantage of the increased subsidy available.
12. The Stage 2 capital cost of \$43.1 million will be subsidised at 51% by NZTA. AT's contribution will be \$21.1 million, and is provisioned in the draft LTP and RLTP.

Next steps

- The next steps are to purchase the first year's supply of lights for Stage 2 targeting the 100 Watt HPS lights. The preferred outcome would be to purchase from up to three suppliers to reduce risk.
- The design process will also begin to identify the best-fit luminaires for each road section.

Document ownership

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Attachment 1 – Comparison of total cost (energy, maintenance, renewals) for proposed retrofit and status quo

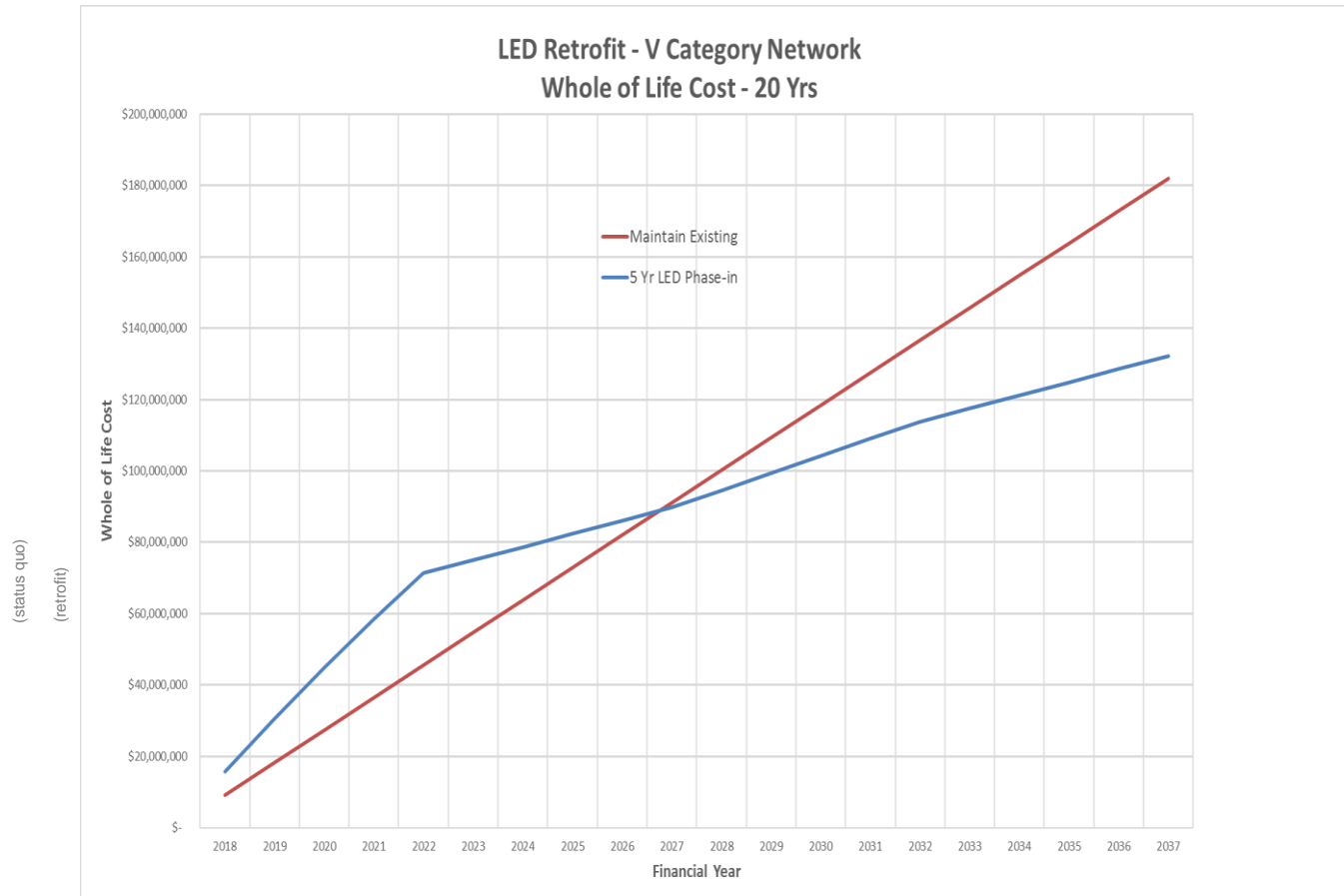




Figure 2: View from Mt Eden October 2016 showing some areas of retrofit

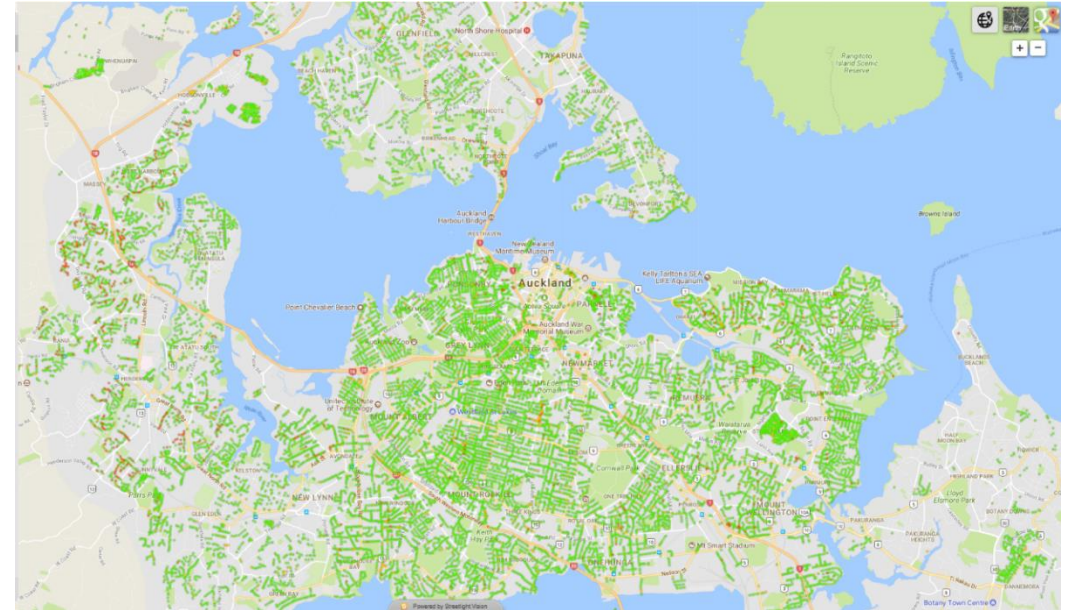


Figure 1: CMS view showing lights under control (retrofitted shown in green area south of bridge)