

illuminating the way ahead

Understanding New Lighting Technology

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New Technology:

A host of new lighting technologies has recently become available, which is most suitable for you?

Which offer better road safety & efficiency

- Metal Halide?
- Induction lamps?
- LED lighting?
- Cosmo Polis lamps?
- Compact fluorescents?

Test these new lamps, obtain accurate data, then decide

Electrical Load & Carbon Emissions:

- Street lights in Australia consume around 1,100GWh (1,100,000,000kwh) of electricity per year.
- This power produces around 880,000 tonnes of CO₂ per year (78% of power is produced from coal).

In Melbourne Metropolitan area, the lights would have an ODV asset value in the region of A\$200m.

Lights are a Councils' most visible user of power.

What good lighting should achieve:

- Light output is maximised and broadcast where required
- Light pollution and sky glow are minimised
- Electrical load and CO₂ emissions are minimised
- The required level of service (LOS) is provided
- Maintenance costs are kept to reasonable levels

Councils and lighting providers, need to determine, with the local community, the level of lighting that is required.

This LOS should be provided as efficiently as possible.

Proof of LOS Delivery

- Don't assume: - **measure it.**
- It is **economically possible.**
- Measurement is required to demonstrate satisfactory asset management (PAS 55).
- Road lighting must be treated like other roading assets

Maintenance Costs

Q. How many psychiatrists does it take to change a bulb?

A. 1 but the bulb must be willing to change.

Maintenance Costs

Q. How many maintenance contractors does it take to change a light bulb on a State Highway?

A. 6

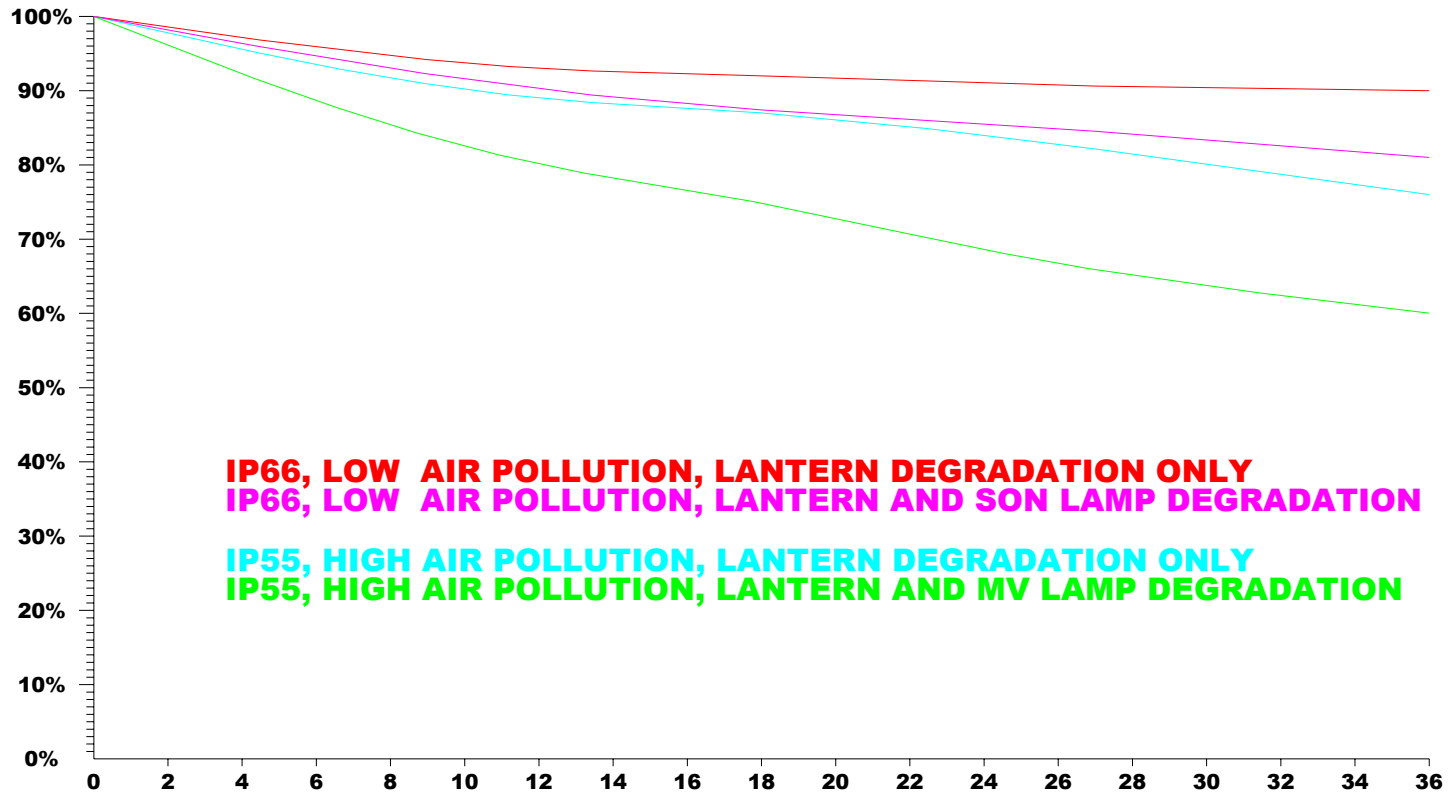
1 to change the bulb, 1 safety observer, 2 crash truck drivers, 1 flagman plus 1 administrator to update the records.

Plus

1 bucket truck, 2 attenuated trucks and a ute.

(\$500/hr in plant and personnel)

Effects of Degradation on Lumen Output



Luminaire Comparison

Comparison Between New & Old Lights installed in the same location
(both fitted with new 80W MV lamps)

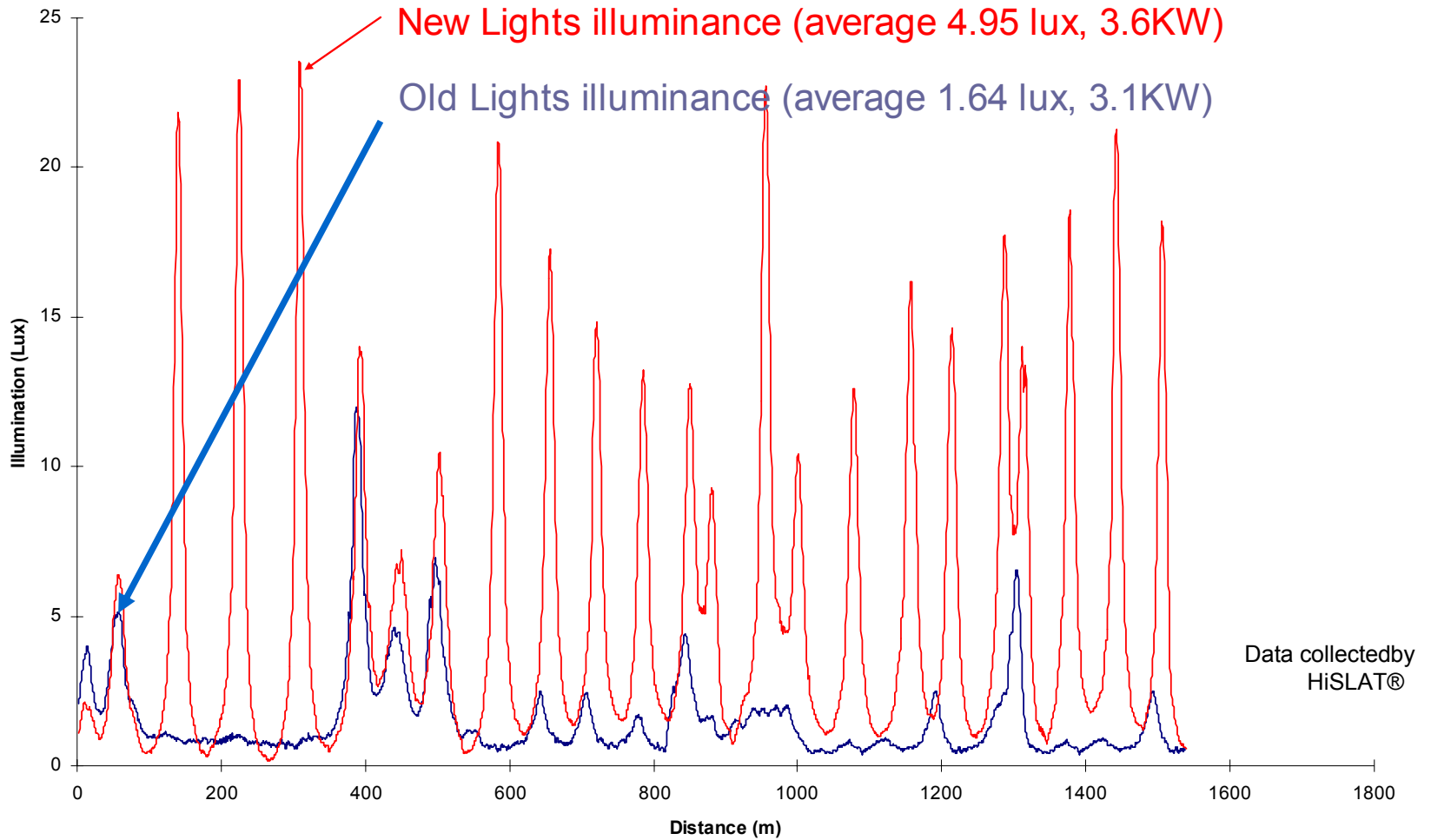
New luminaire (96w)



Old luminaire (96w)

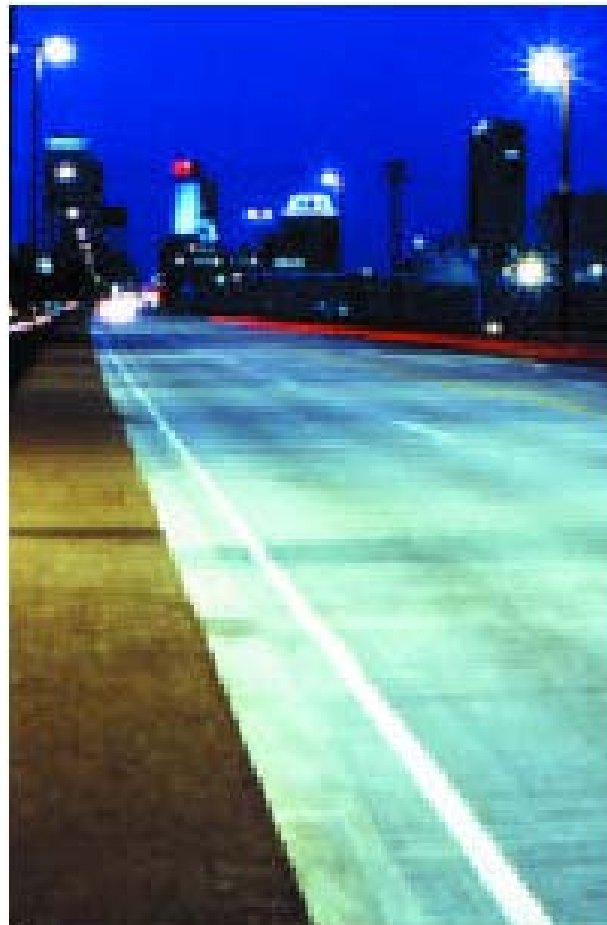


Road Safety improvements following upgrade



Effects of Proactive Maintenance

	2002	2004	2006	2012 (existing tech)	2012 (BAT)	2012 (BAT & Controlled switching)
Total load (KW)	246	268	274	267	241	241
Lumen output (Klux)	9,292	13,423	15,322	17,534	17,820	17,820
Cost per lumen (power + lamp change)	\$15.52	\$10.11	\$9.04	\$7.69	\$6.83	\$5.72
Lumens per watt	37.8	50.0	55.9	65.7	73.9	73.9
CO ₂ emissions (tonnes)	166	181	185	180	163	136
CO ₂ emissions per lumen (kg)	4.39	3.63	3.31	2.75	2.20	
Annual maintenance	\$128,812	\$194,303	\$78,601			



Concrete pavement reflects up to 27% of light. Black asphalt pavement reflects only 5% of light.

Performance Measurement in Action

- HiSLAT (**H**igh **S**peed **L**ighting **A**ssessment **T**echnology) is a vehicle based “real time” surveying system that collects the lighting data at actual road speed.
- This data is collected and processed during the survey and clearly shows how the asset is performing.
- Post processing can detail the costs required to bring the asset up to Standards and produces a strategic upgrade plan based on a “worst first” philosophy

A full HiSLAT service is available from Austraffic

Austraffic are the sole supplier of HiSLAT in Australia

To Conclude

Performance measurement of lights:

Shows where any problems areas are and provides accurate data on how your asset is performing (can also be used to trial new light technologies)



This data allows strategic planning to be introduced



Which can be used to proactively manage your asset



A managed asset can provide better lighting for less \$