

## **IES Street and Area Lighting Conference**

# **New Zealand & Australian LED Street Lighting**

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**Next Energy**

# New Zealand Street Lighting







# Australian Street Lighting

# Overview

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1. Introduction to Australia & NZ
2. Australia / New Zealand lighting standards
3. New Zealand street lighting
4. Australian street lighting
5. Improved street lighting governance





# USA

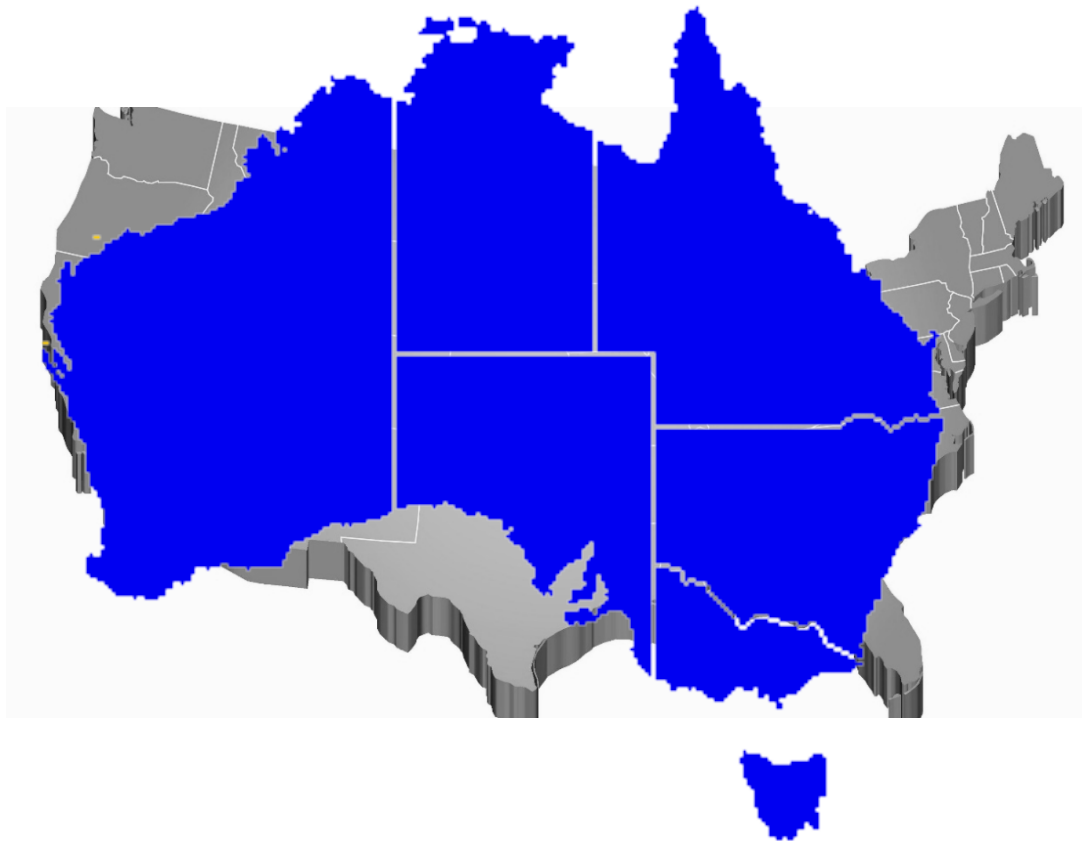
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SALC October 4-7, 2015 Savannah, GA

# USA, Australia & New Zealand

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# Population

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	NEW ZEALAND	AUSTRALIA	USA
Population	4.5 million	23 million	320 million





# Population Density

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Population	4.5 million	23 million	320 million
Density (people/mile <sup>2</sup> )	42	7	86



# Street Lighting

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	NEW ZEALAND	AUSTRALIA	USA
<b>Population</b>	4.5 million	23 million	320 million
<b>Density</b> (people/mile <sup>2</sup> )	42	7	86
<b>Street Lights</b>	350,000	2.4 million	26 million



# Street Lighting Metrics

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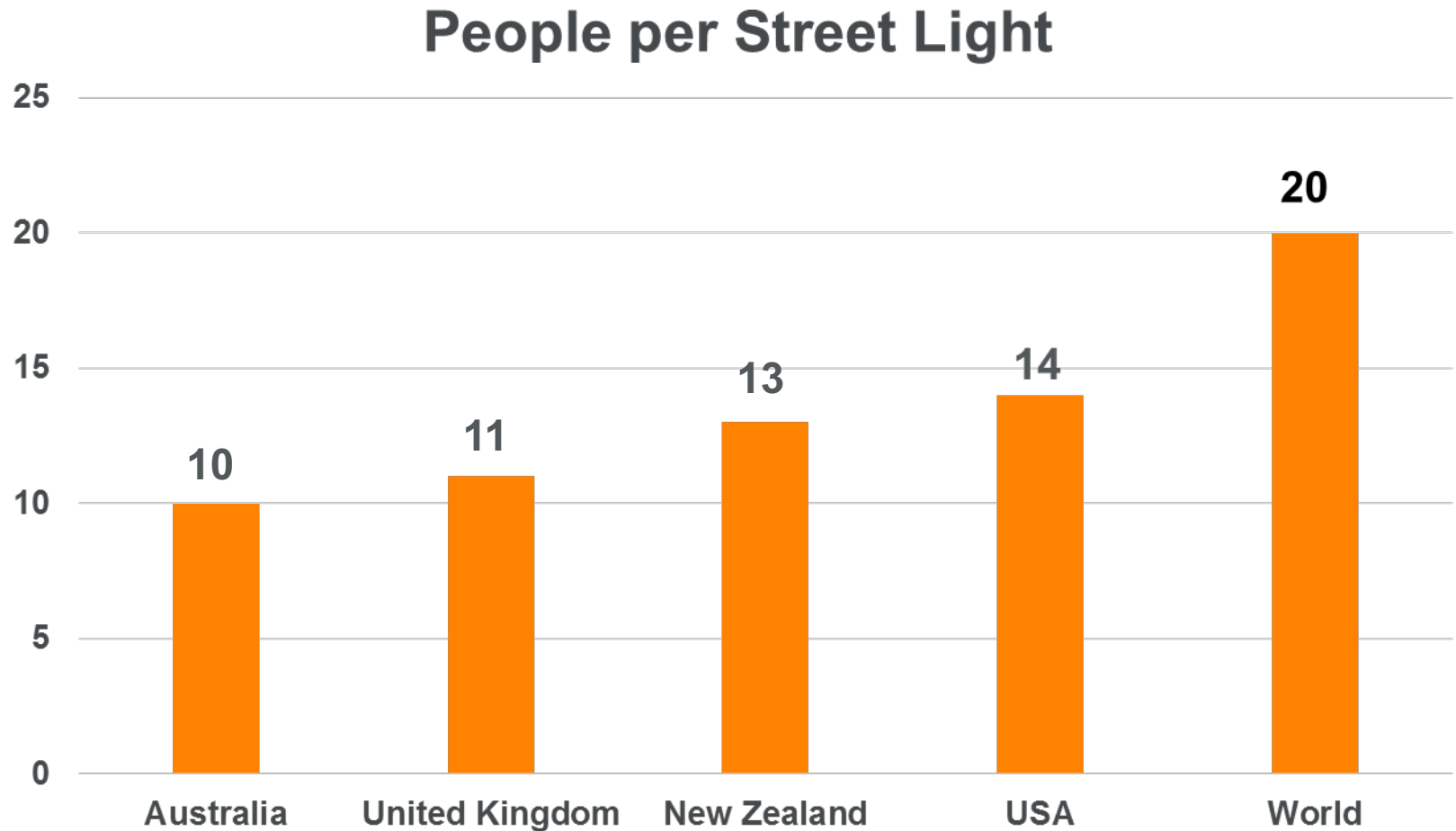
	Australia	New Zealand
Mercury Vapor	45%	5%
High Pressure Sodium	40%	85%
LED	5%	3%
Other	10%	5%





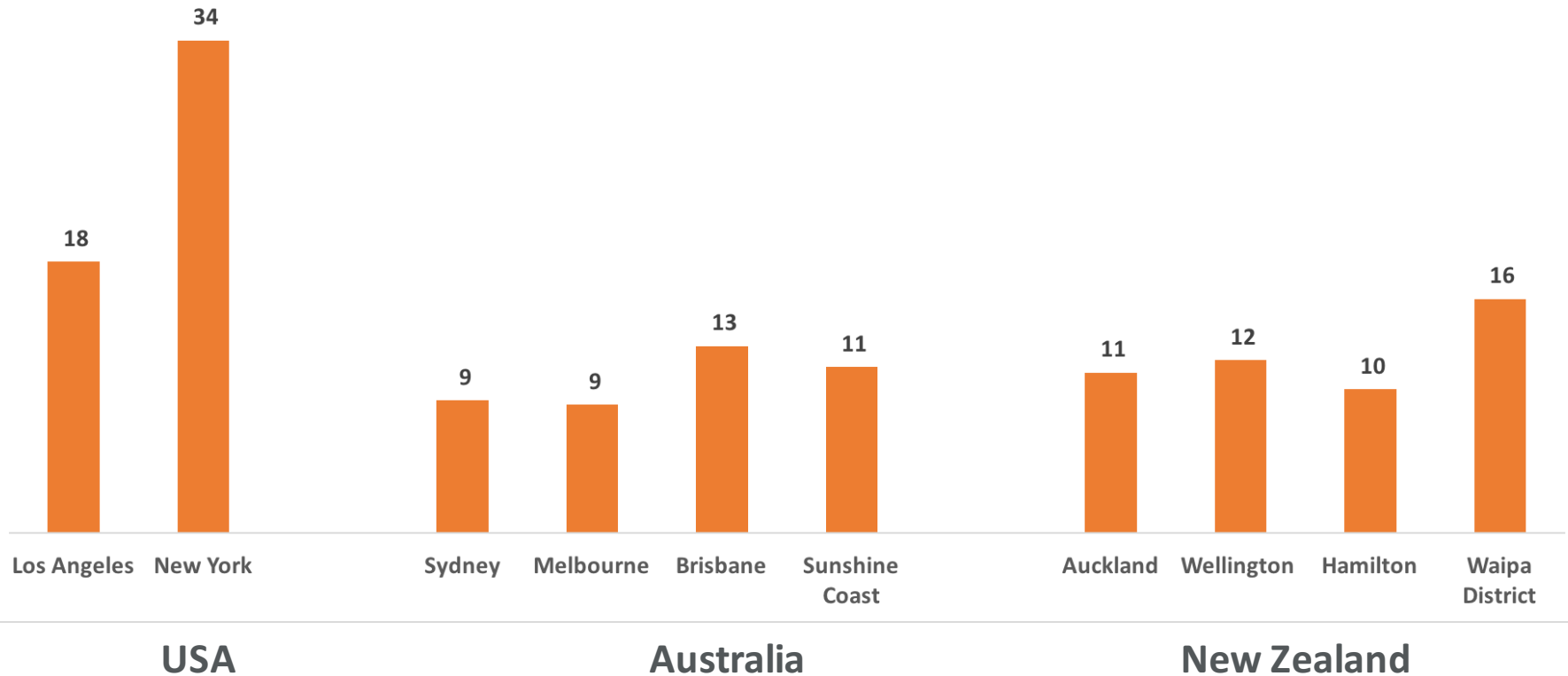
# Nation - People per Street Light

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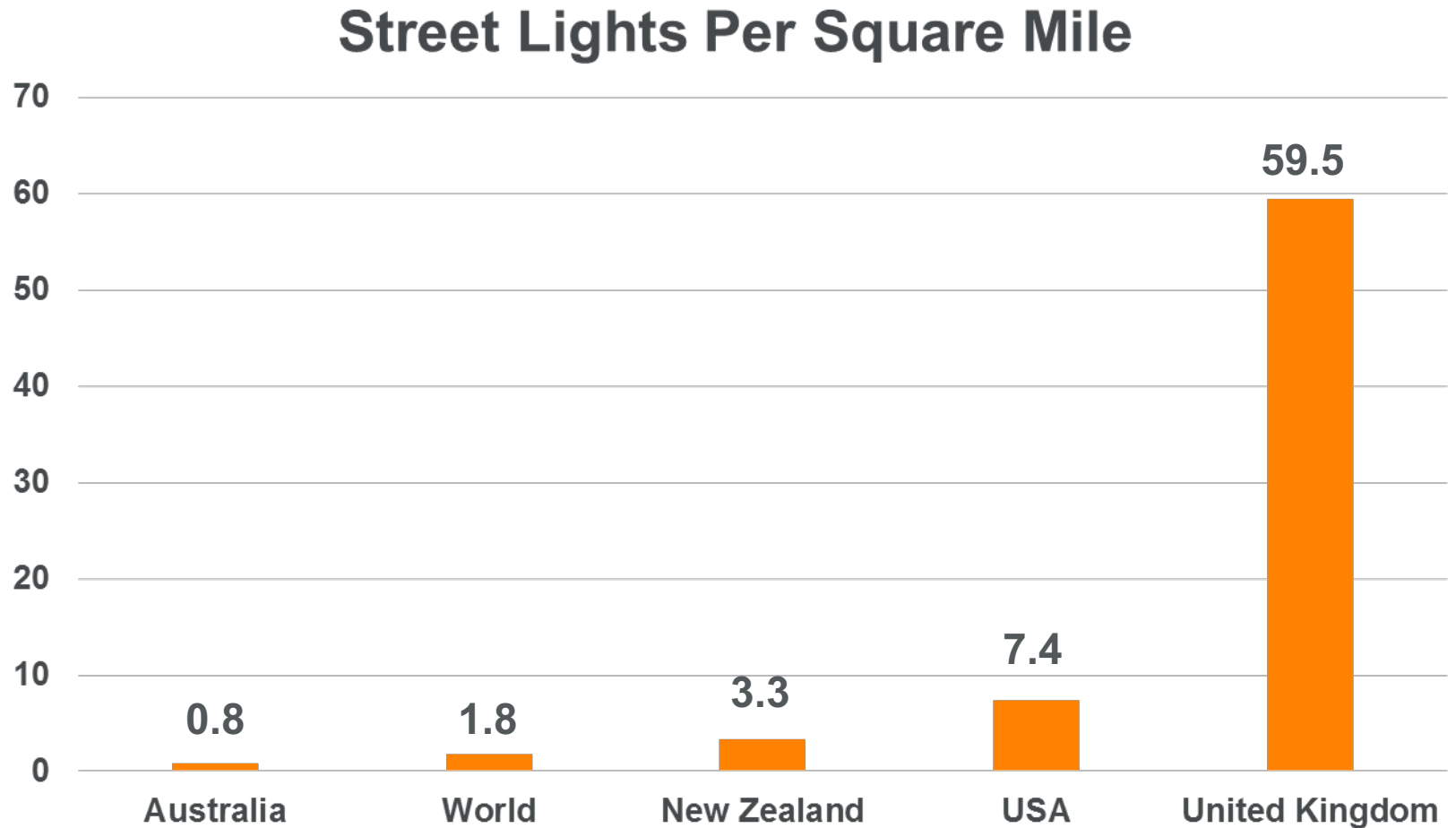
# Urban - People per Street Light

People per Street Light - Cities and 1 Rural District



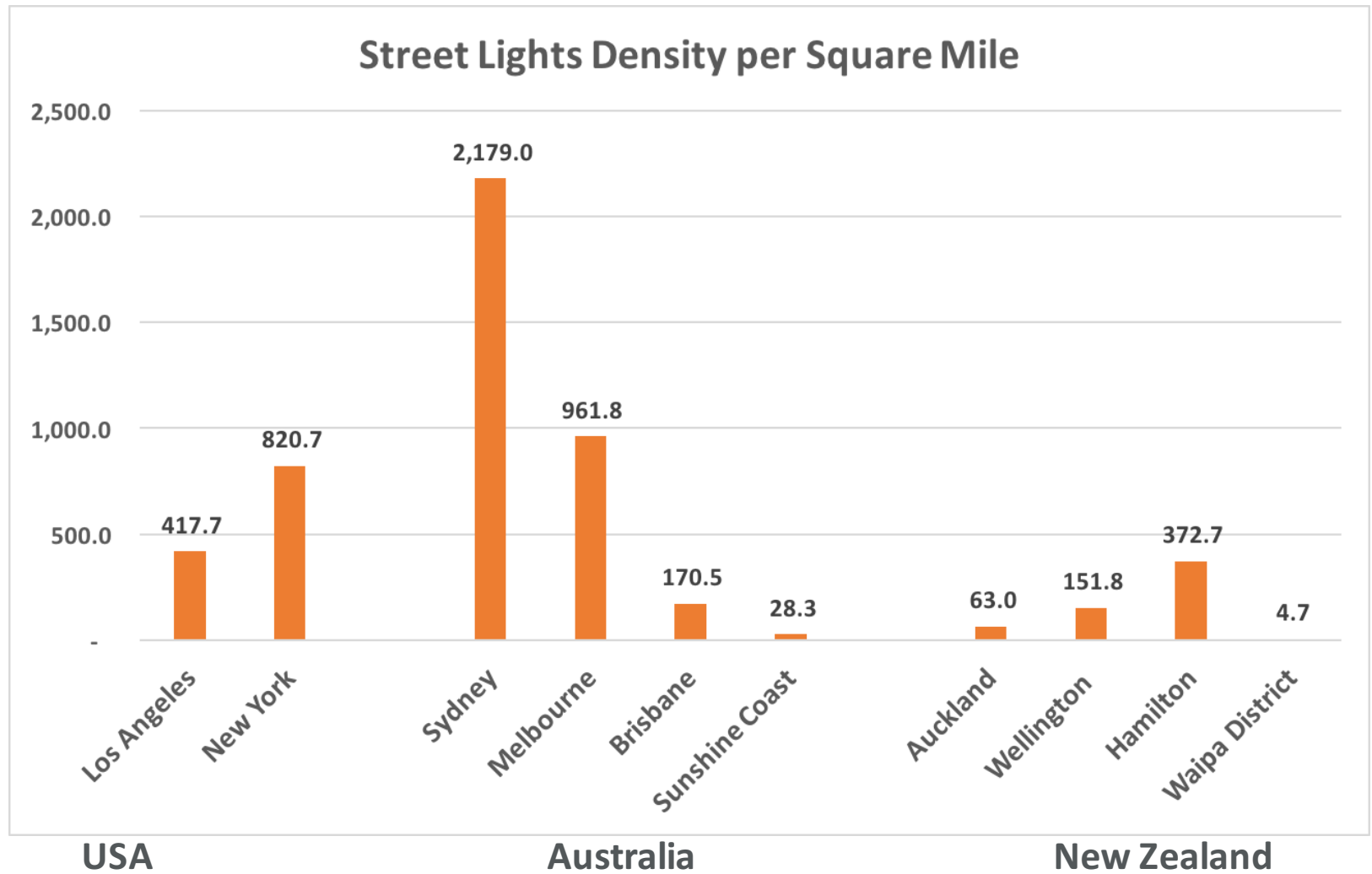
# Street Lighting per Square Mile

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# Urban Street Light Density



# Social Cost of Night Time Injuries

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	NEW ZEALAND	AUSTRALIA	USA
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<b>Density</b> (people/mile <sup>2</sup> )	42	7	86
<b>Street Lights</b>	350,000	2.4 million	26 million
<b>Night time injuries social cost US\$</b>	<b>\$0.9 Billion/yr</b>	<b>\$7 Billion/yr</b>	<b>\$292 Billion/yr</b>



# Best Benefit Cost Ratio

## Why do we have so much lighting?

**1974 - 1995**

**26.8 benefit-cost ratio**

Federal Highway Administration (1996).  
*The 1996 Annual Report on Highway Safety Improvement  
Programs*, Publication No. FHWA-SA-96-040;  
referenced in [http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP05-19\\_LitReview.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP05-19_LitReview.pdf)

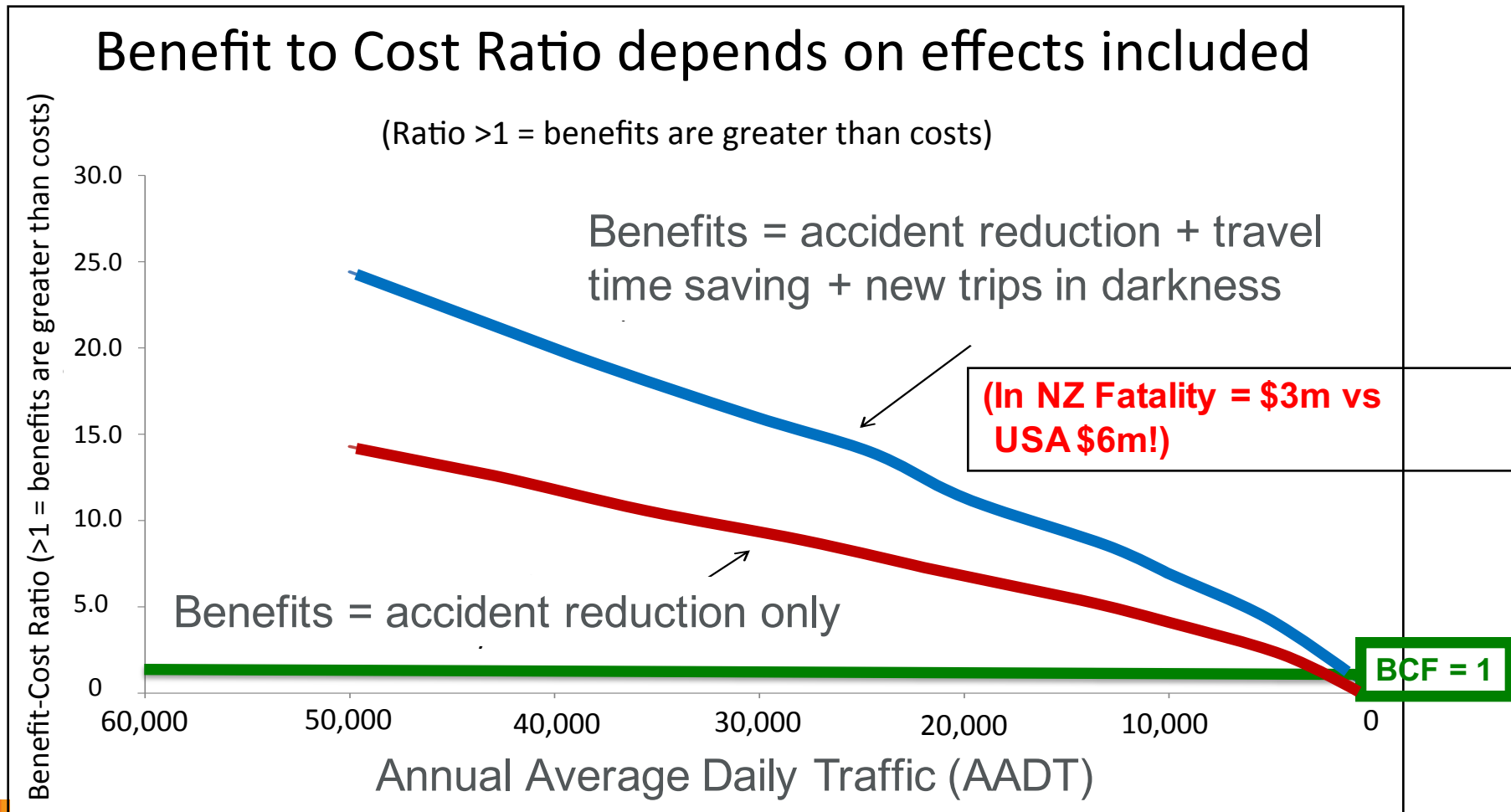
HIGHWAY SAFETY IMPROVEMENTS WITH THE HIGHEST BENEFIT-COST RATIOS 1974-1995		
Rank	Improvement Description	Benefit-Cost Ratio
1	Illumination	26.8
2	Upgrade Median Barrier	22.6
3	Traffic Signs	22.4
4	Relocated/Breakaway Utility Poles	17.7
5	Remove Obstacles	10.7
6	New Traffic Signals	8.5
7	Impact Attenuators	8
8	New Median Barrier	7.6
9	Upgrade Guardrail	7.5
10	Upgrade Traffic Signals	7.4
11	Upgrade Bridge Rail	6.9
12	Improve Sight Distance	6.1
13	Median for Traffic Separation	6.1
14	Groove Pavement for Skid	5.8
15	Improve Minor Stricture	5.3
16	Turning Lanes and Channelization	4.5
17	New RR Crossing Gates	3.4
18	New RR Crossing Flashing Lights	3.1
19	Pavement Markings and Delineation	3.1
20	New RR Crossing Lights & Gates	2.9

**Source:** Dr John Milton, Washington State Department of  
Transportation, March 2015, *Road Lighting 2015*, New Zealand

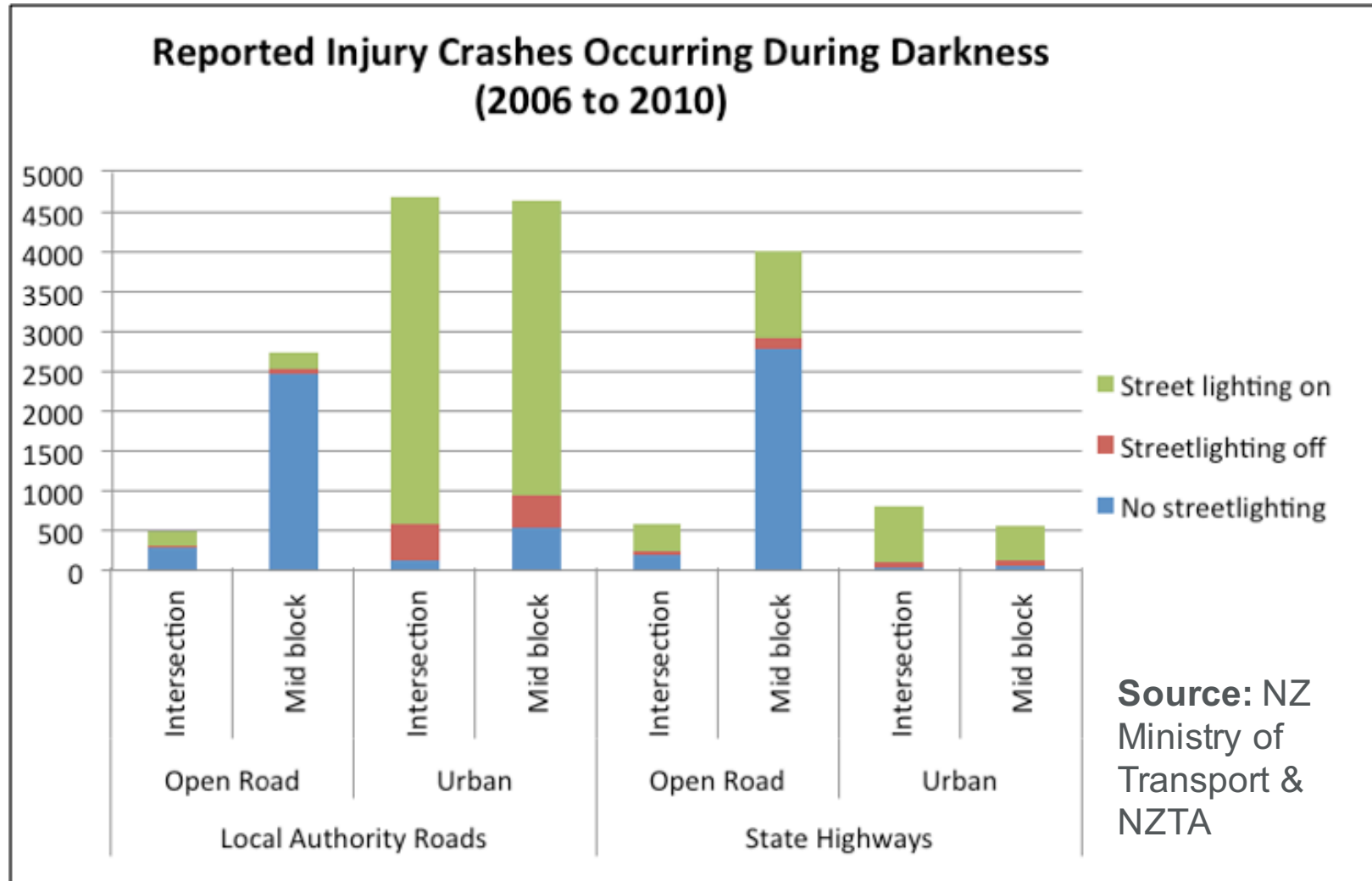




# Worldwide Amalgamated Benefit-Cost-Ratio of Street Lighting – Elvik 2014

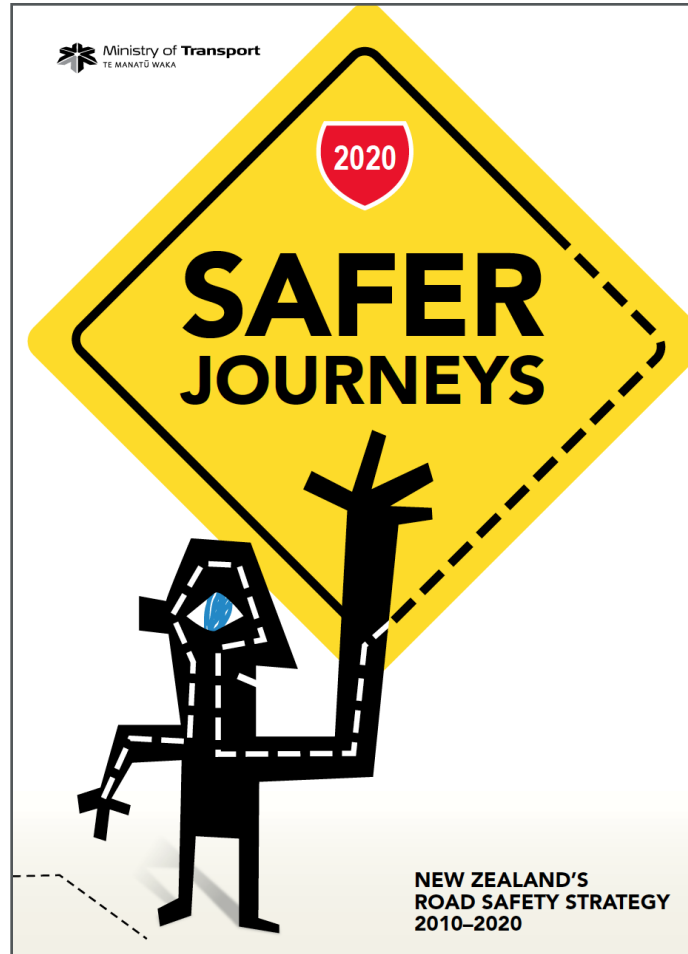


# Data availability is excellent



# No Policy Drivers

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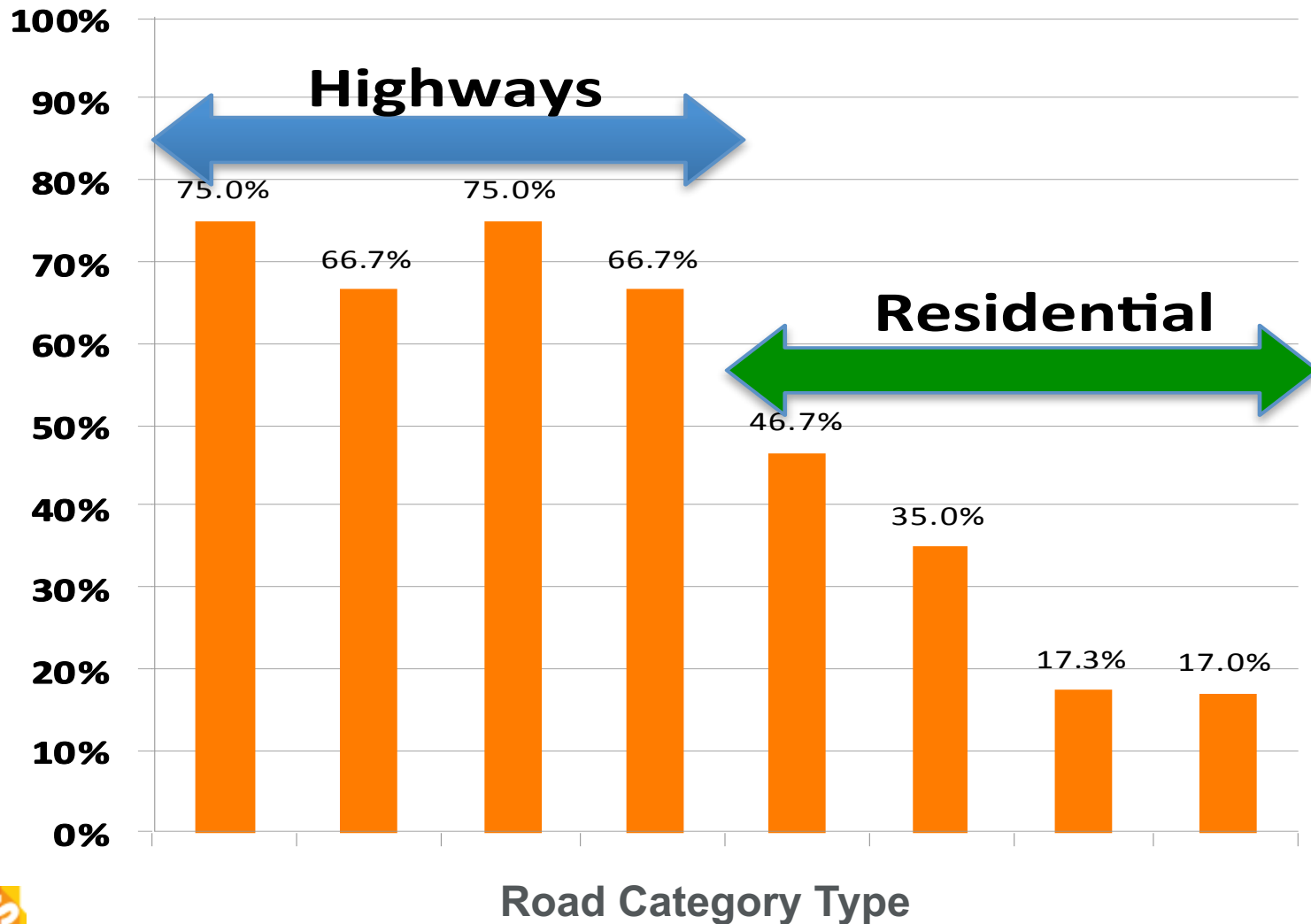
# Standards Compliance is not Governance

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- Australia and New Zealand common road lighting standard
- Major road requirements ~75% US
- Local roads ~17-50% US:
  - Long spacings of up to 240 feet
  - Low lighting levels (as low as 0.05 foot candles average maintained illuminance)



# ANZ Street Lighting Standards



# New Zealand Street Lighting





Auckland Municipality  
luminaire & bracket

Utility power pole





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- Central government funds  $\frac{1}{2}$  street lighting costs
  - 2014 Specification that effectively mandated LEDs






- \$50m funding announced 2015 for accelerated replacements



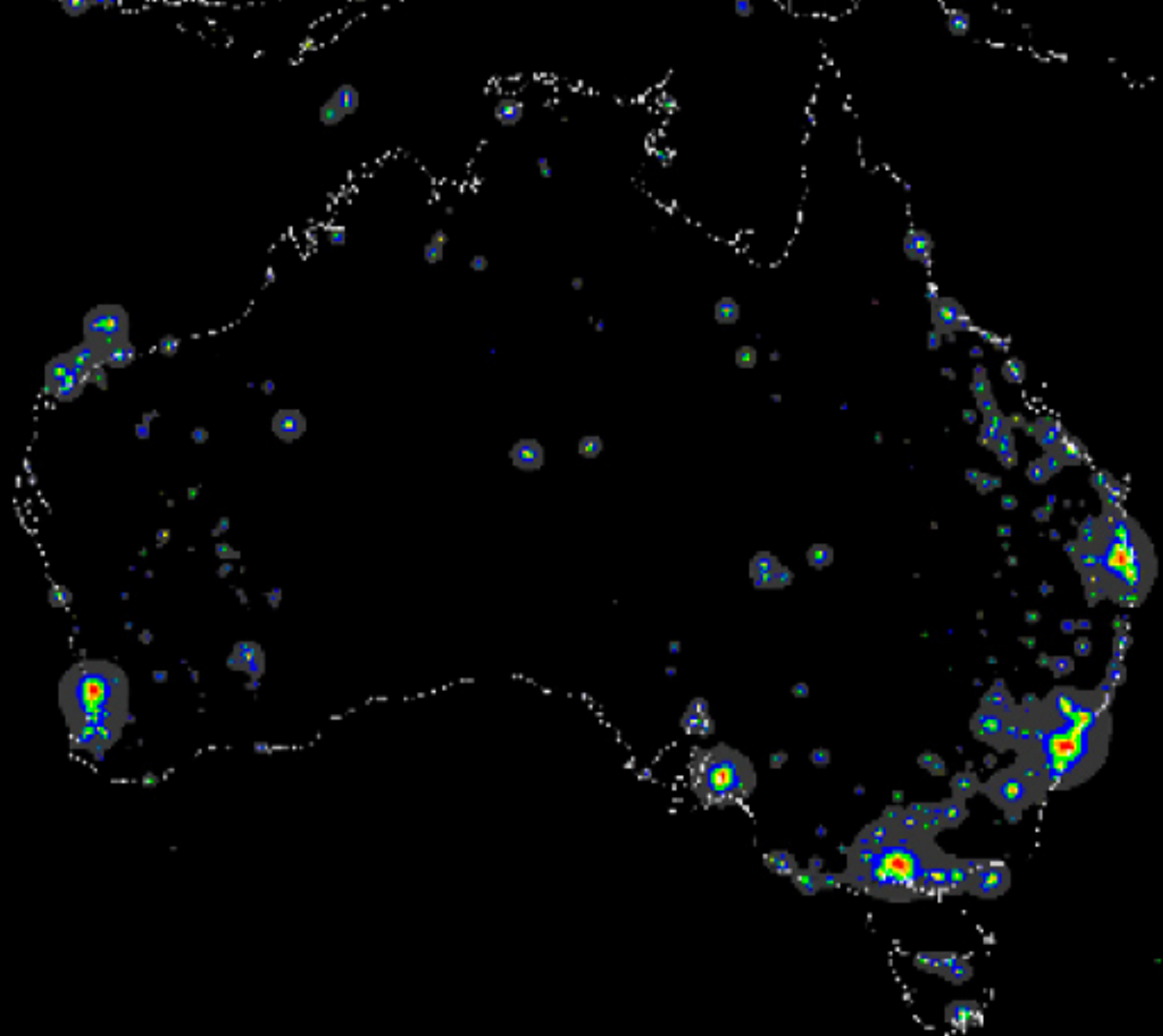
# New Zealand LED Installations

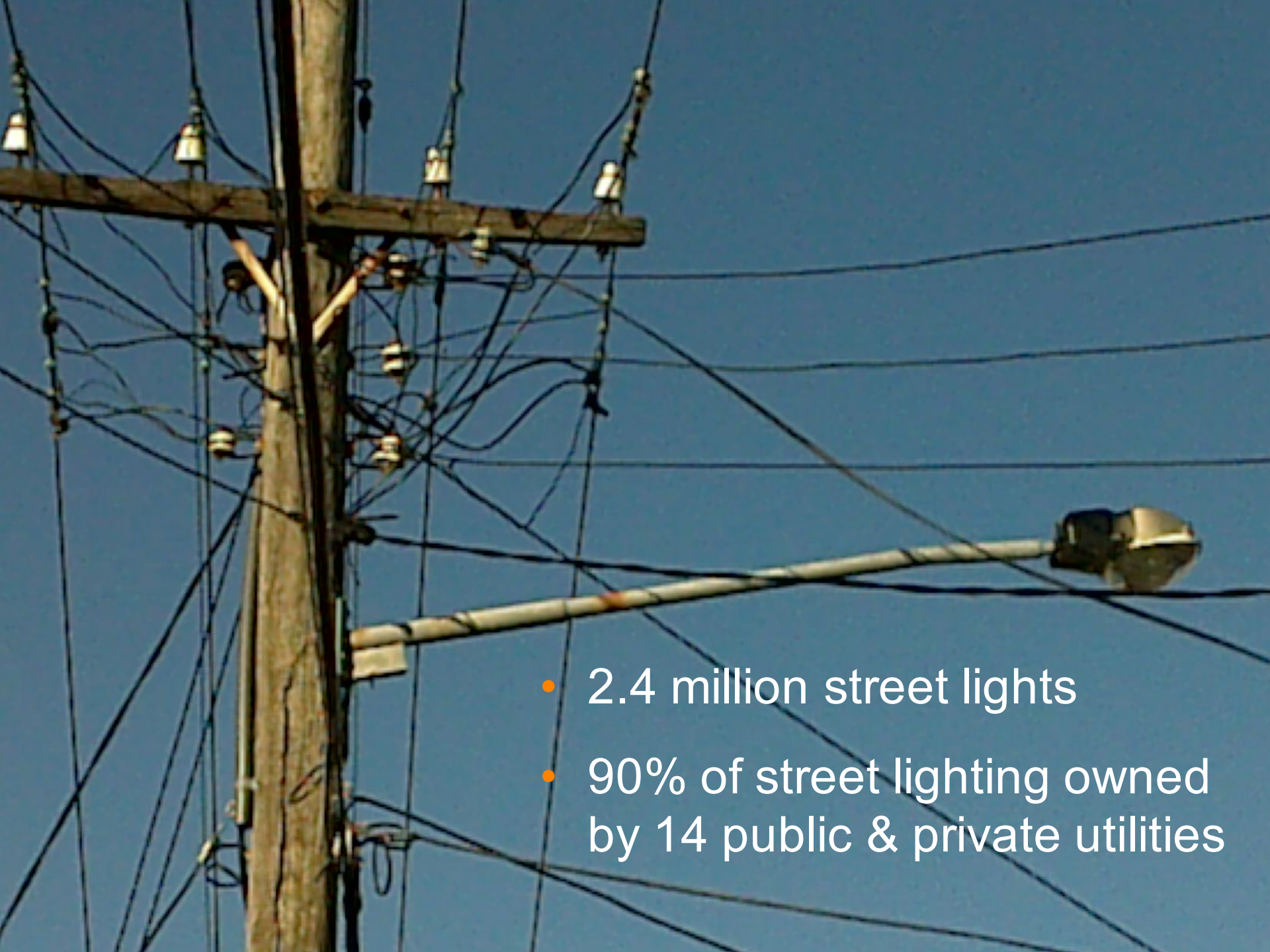
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- 10,000 LEDs installed across New Zealand
  - Another 44,000 committed



# Australian Street Lighting







- 2.4 million street lights
- 90% of street lighting owned by 14 public & private utilities

# Municipal Collaboration in Sydney

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- 35 municipalities covering 235,000 street lights in Sydney area working together
- Technology, maintenance, regulatory pricing decisions
- Agreed with utility on energy efficient lights
  - Only LEDs on residential roads from 2013
  - 20,000 installed to date
- Negotiations focused on accelerated replacements

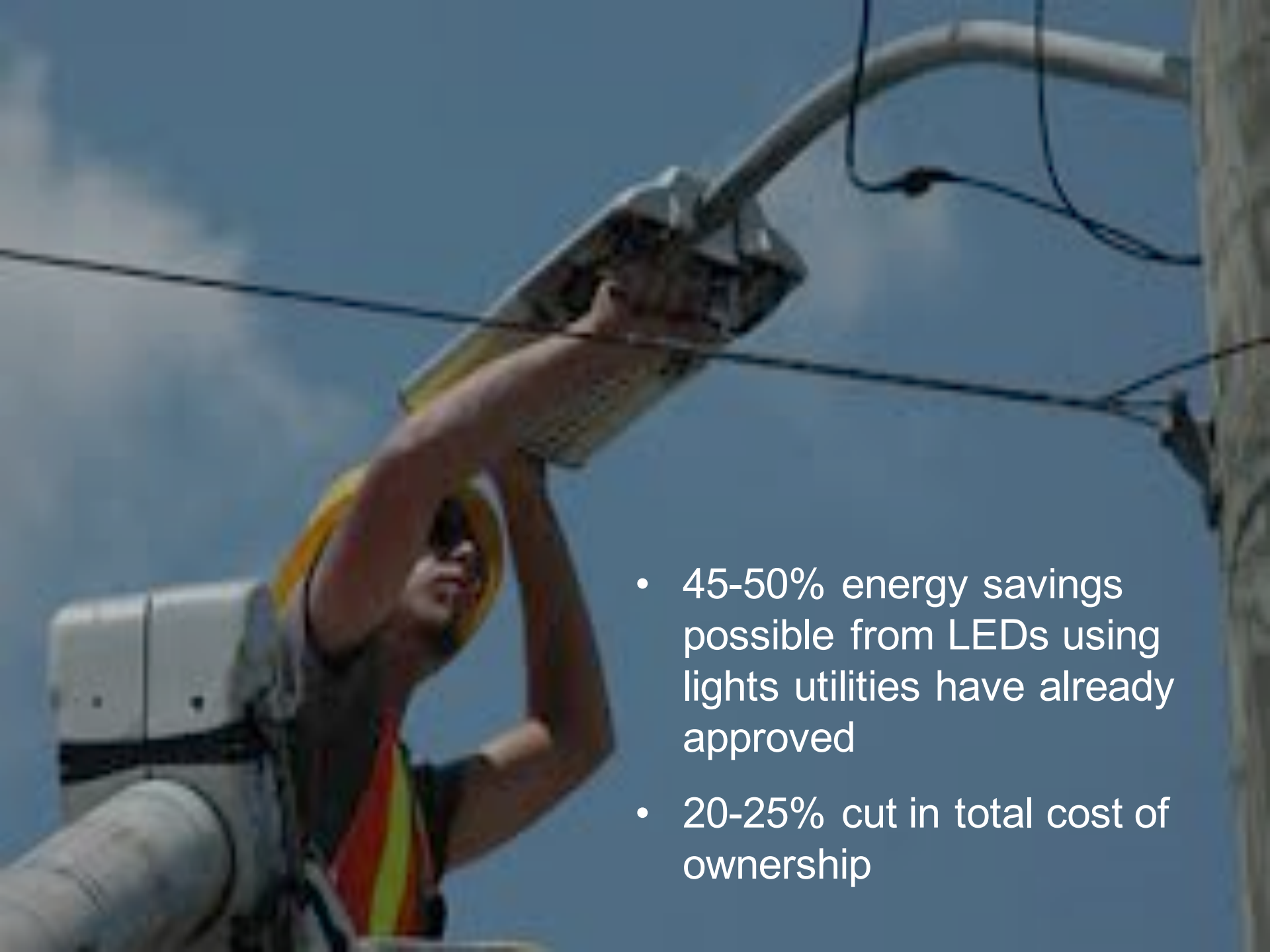




# Australian LED Installations

- 145,000 LEDs installed across Australia
- Another 100,000 committed
- Generally 23-29W





- 45-50% energy savings possible from LEDs using lights utilities have already approved
- 20-25% cut in total cost of ownership





# Utility Angst?

- No robust regulatory basis for street lighting?
- Disputes over high claimed residual values?
- Slow adoption of LEDs and controls?
- No clear drivers on utilities to prioritise:
  - Energy efficiency / GHG
  - Standards compliance
  - Public amenity
  - Lighting quality
  - Light pollution
- You are NOT alone

# Privatization a Catalyst for Change?

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- Municipalities now advocating for either:
  1. Reform of current utility approach
  2. Return of street lighting to municipal control
- Privatization a major catalyst for reform
- Watching large US programs with interest



# Presenters

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# New Zealand & Australian LED Road Lighting

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Thank you for coming!

ANY QUESTIONS?

