

VALUING DARKNESS 2025: *CREATING SAFE AND INCLUSIVE URBAN SPACES THROUGH EVIDENCE-BASED LIGHTING DESIGN*

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Lighting Design Leader
Digital Leader
Arup

WHAT WE'LL COVER:

- ***THOUGHTS FROM A LIGHTING PROFESSIONAL***
- ***WHY WE NEED LIGHT AT NIGHT***
- ***CRITICISMS OF THE SYSTEM***
- ***ADVOCATING WITH THE RIGHT PEOPLE***
- ***RESEARCH AND EXPERTISE ARE CRITICAL***

INTRO

LIGHTING DESIGN

ARCHITECTURE

URBAN DESIGN

PRODUCT DESIGN

INTERIOR DESIGN

LANDSCAPE ARCH

PHYSICS



ARCHITECTURAL LIGHTING



Fed Square

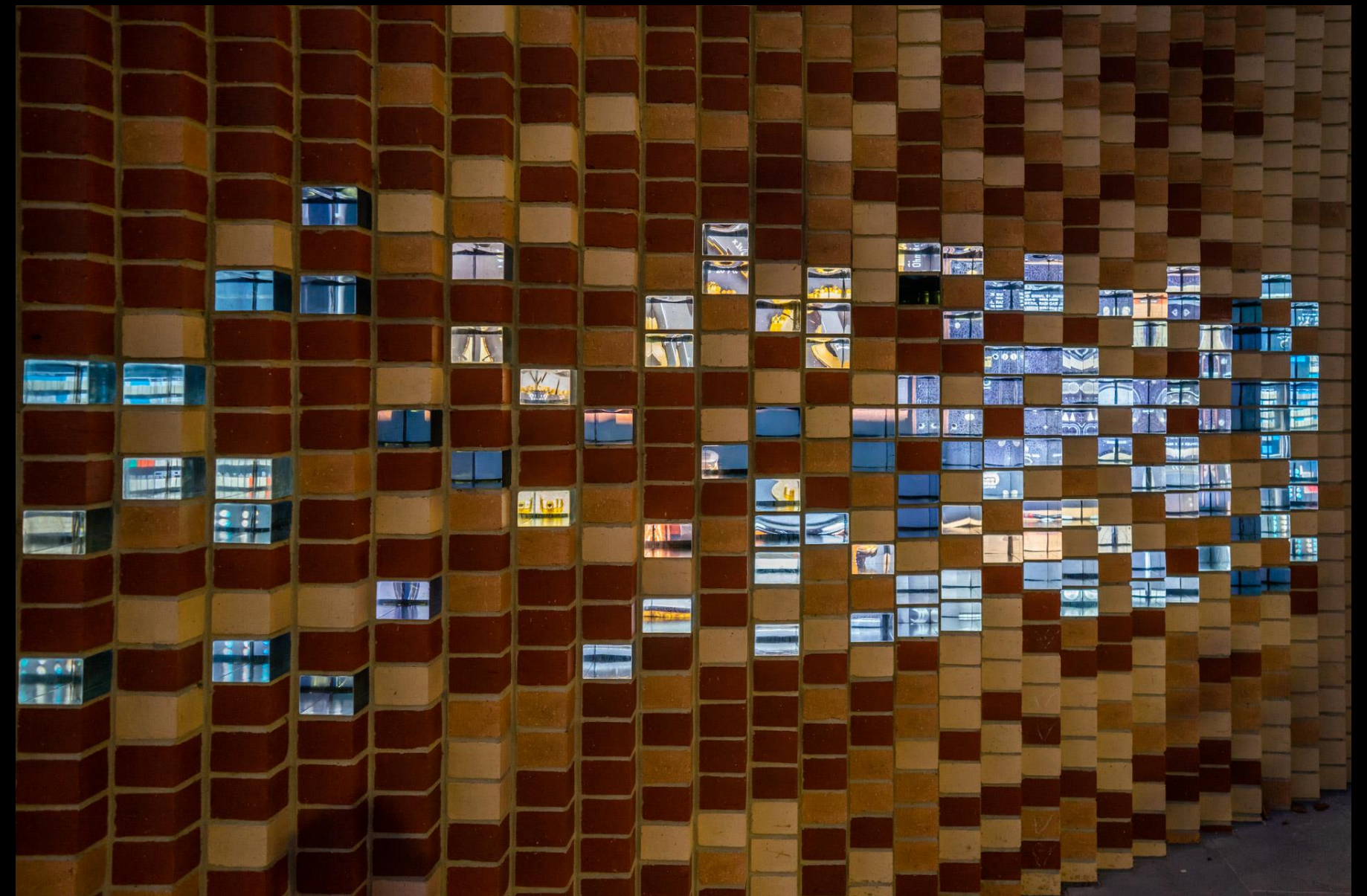


Alba Spa

ARCHITECTURAL LIGHTING



ACMI – Story of the Moving Image



Digital Bricks – Science Gallery Melbourne



MELBOURNE KNOWLEDGE WEEK 2018



PURPOSE

The Three E's

1. Economy

2. Ecology

3. Equity

Perceptions of safety

Lighting study

XYX Lab x Arup

by Arup Lighting

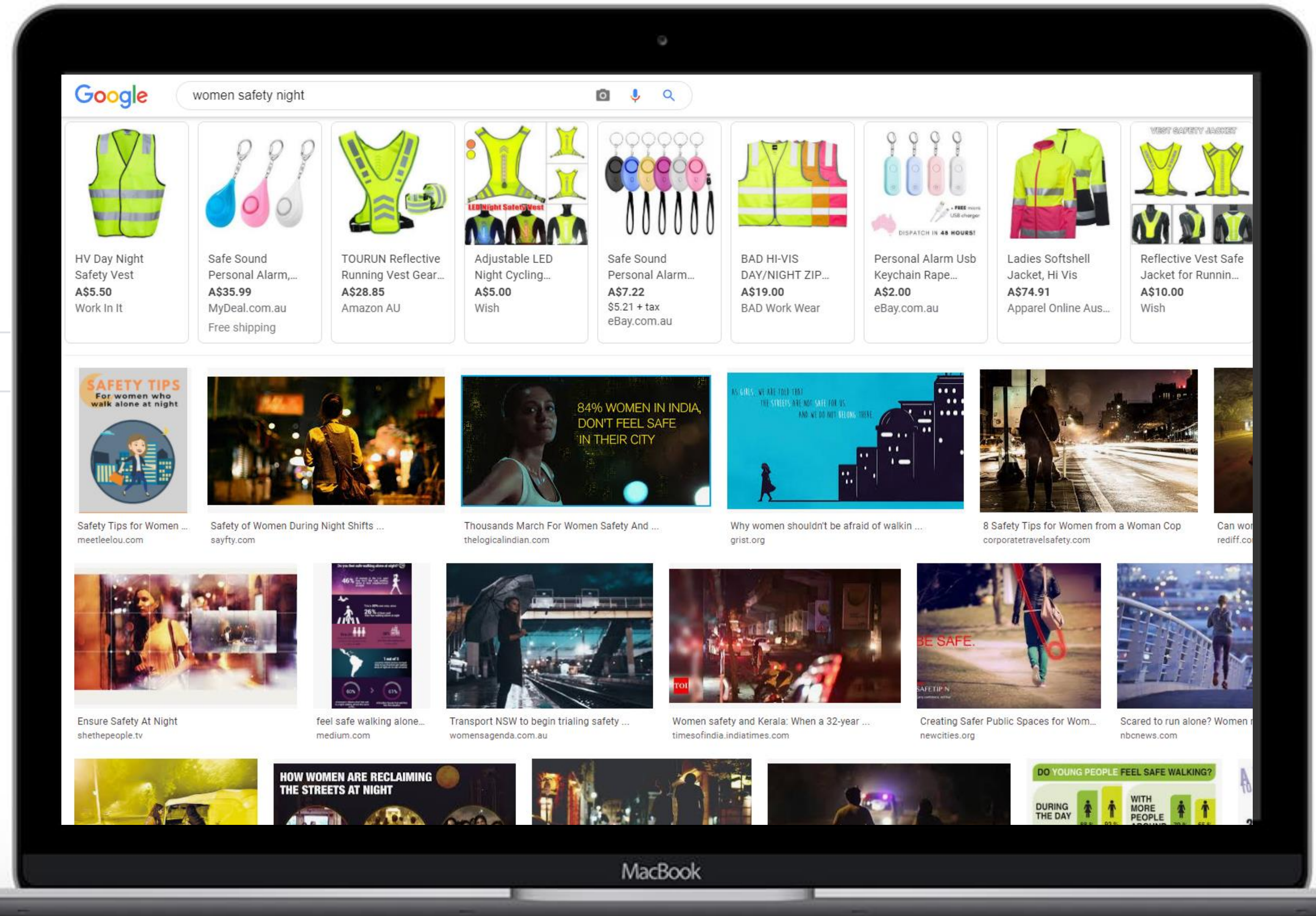
Chris Alexander
Michael Byrne
Tim Hunt
Dean Morris
Chris Simmons
Bree Trevena
Hoa Yang

In Collaboration with
XYX Lab, Monash University
Plan International



Google

women safety night



Australian/New Zealand Standard™

Lighting for roads and public spaces

Part 3.1: Pedestrian area (Category P) lighting—Performance and design requirements

TABLE 2.1
LIGHTING CATEGORIES FOR ROAD RESERVES IN LOCAL AREAS

1	2	3	4	5	6
Type of road or pathway		Selection criteria ^{a,b}			Applicable lighting subcategory ^{c,d}
General description	Basic operating characteristics	Pedestrian/cycle activity	Risk ^e of crime	Need to enhance prestige	
Collector roads or non-arterial roads which collect and distribute traffic in an area, as well as serving abutting properties	Mixed vehicle and pedestrian traffic	N/A	High	N/A	P1
		High	Medium	High	P2
		Medium	Low	Medium	P3
		Low	Low	N/A	P4
Local roads or streets used primarily for access to abutting properties, including residential properties	Mixed vehicle and pedestrian traffic	N/A	High	N/A	P1
		High	Medium	High	P2
		Medium	Medium	Medium	P3
		Low	Low	N/A	P4
		Low	Low	N/A	P5 ^d
Common area, forecourts of cluster housing	Mixed vehicle and pedestrian traffic	N/A	High	N/A	P1
		High	Medium	High	P2
		Medium	Low	Medium	P3

Codes for Compliance

The following standard will be used to determine compliance for the external lighting:

- Australian Standard AS1158.3.1:2005 - Pedestrian Area (Category P) lighting - Performance and design requirements
- Australian Standard AS4282 - Control of Obtrusive Effects of Outdoor Lighting
- The Victoria & Vine Project Brief
- NCC Part 3.7.2.7 Allowable Encroachment

Lighting Level Requirements

With reference to Table 2.1 of AS1158.3.1:2005, shown adjacent, ADP Specialist Lighting have determined the appropriate lighting categories of the space to be Category P4 for Wellington Street and the Laneway between Wellington Street and Cambridge Street. The lighting level requirements for Category P4 shown in Table 2.1 can be achieved through the high quality LED luminaires mounted to the building and street poles

Obtrusive Light

All external lighting will be focused and aimed at non-transparent sections of the facade, preventing spill and obtrusive lighting to neighbouring occupied areas (residential and commercial). Luminaires are dimmable to allow for flexibility during commissioning processes.

Safety

The ability to see peoples faces promotes a feeling of safety when in a night time environment. The proposed scheme will allow for good facial recognition through use of vertical illumination.

With reference to the Crime Prevention Through Environmental Design (CPTED) principle, external lighting will provide illumination to deliver both background and security level response.

The lighting design will provide even and well lit spaces with no shady areas or shadow spots. Luminaires will be carefully selected to control glare and obtrusive light for a comfortable experience. Extensive night time inspections during commissioning will be undertaken to verify acceptable lighting levels.

Our light level calculations and modelling have shown that our scheme meets and exceed Australian Standards requirements

TABLE 2.6
VALUES OF LIGHT TECHNICAL PARAMETERS AND PERMISSIBLE LUMINAIRE TYPES FOR ROADS IN LOCAL AREAS AND FOR PATHWAYS

1	2	3	4	5	6
Lighting subcategory	Light technical parameters				Permissible luminaire type (see Table 2.10)
	Average horizontal illuminance ^{a,b} (E_{av})	Point horizontal illuminance ^{a,b} (E_{ph})	Illuminance (horizontal) uniformity ^c Cat. P (U_{H2})	Point vertical illuminance ^{a,b} (E_{pv})	
	lux	lux		lux	
P1	7	2	10	2	Type 4 where part of a road reserve or Types 2, 3, 4 or 6 elsewhere
P2	3.5	0.7	10	0.7	
P3 ^d	1.75	0.3	10	0.3 ^d	
P4 ^d	0.85	0.14	10	N/A	
P5 ^d	0.5	0.07	10	N/A	

^d These values are maintained.

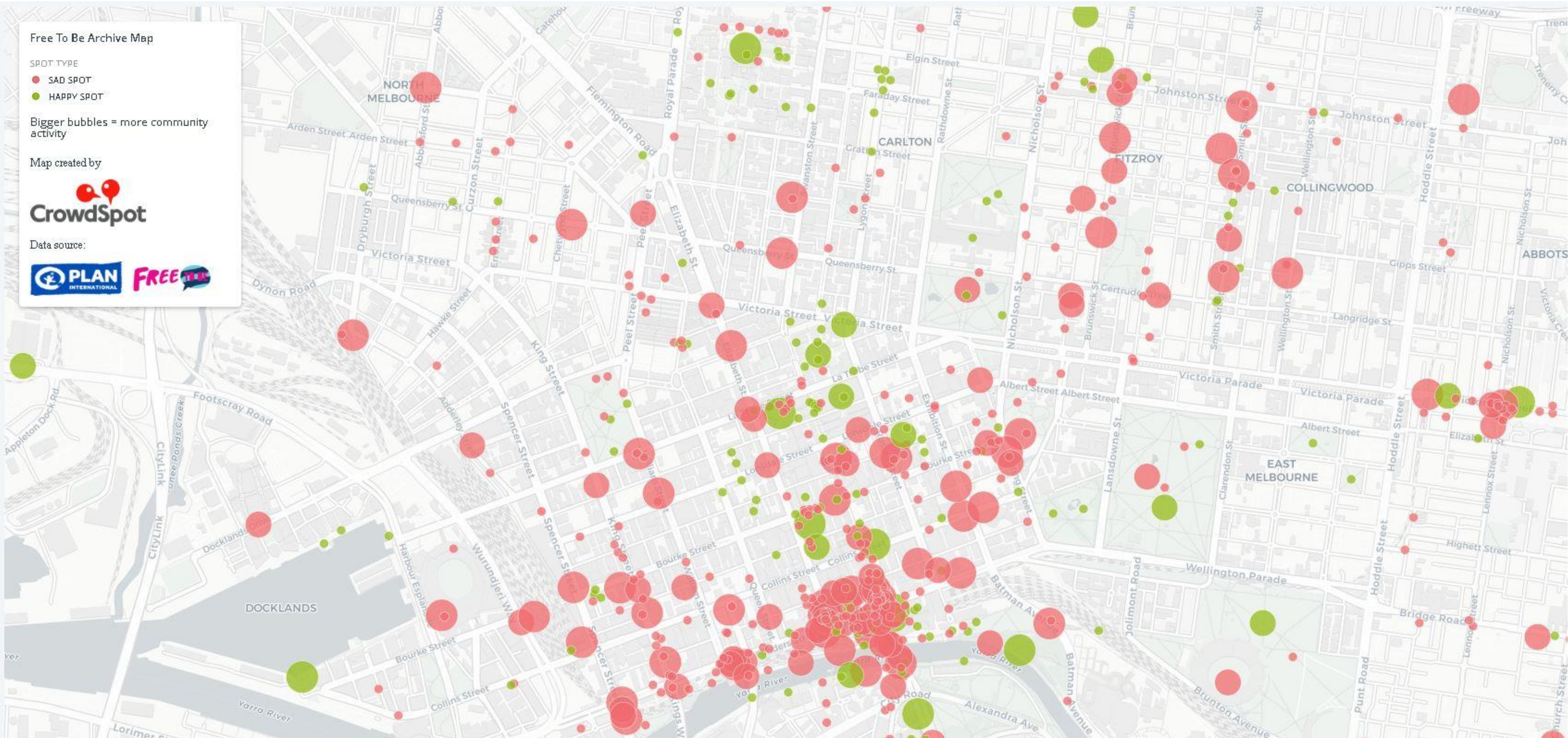
Free to Be Campaign



MONASH
University

XYXLAB
GENDER+SPACE

MONASH
ART
DESIGN &
ARCHITECTURE



Purpose

XYXLab x Arup

900 pins

collected in the
Free to Be campaign
in 2015 by
XYX Lab + PLAN
International.

5 other cities world wide

28%

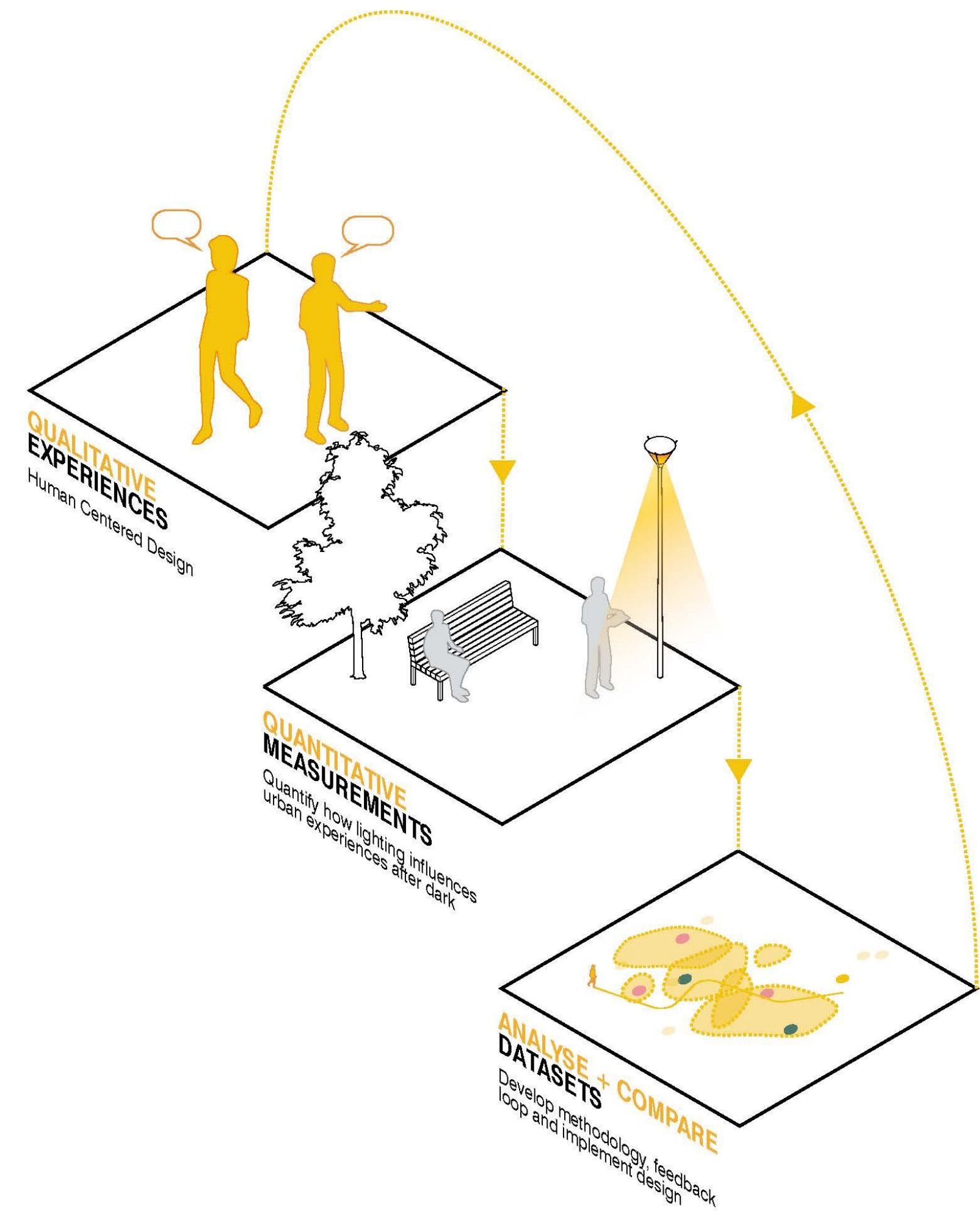
mentioned lighting
contributed to why a
space felt safe

Light

was the highest design
factor to why a space
felt unsafe

Process and purpose

XYX Lab x Arup



Why

XYX Lab x Arup



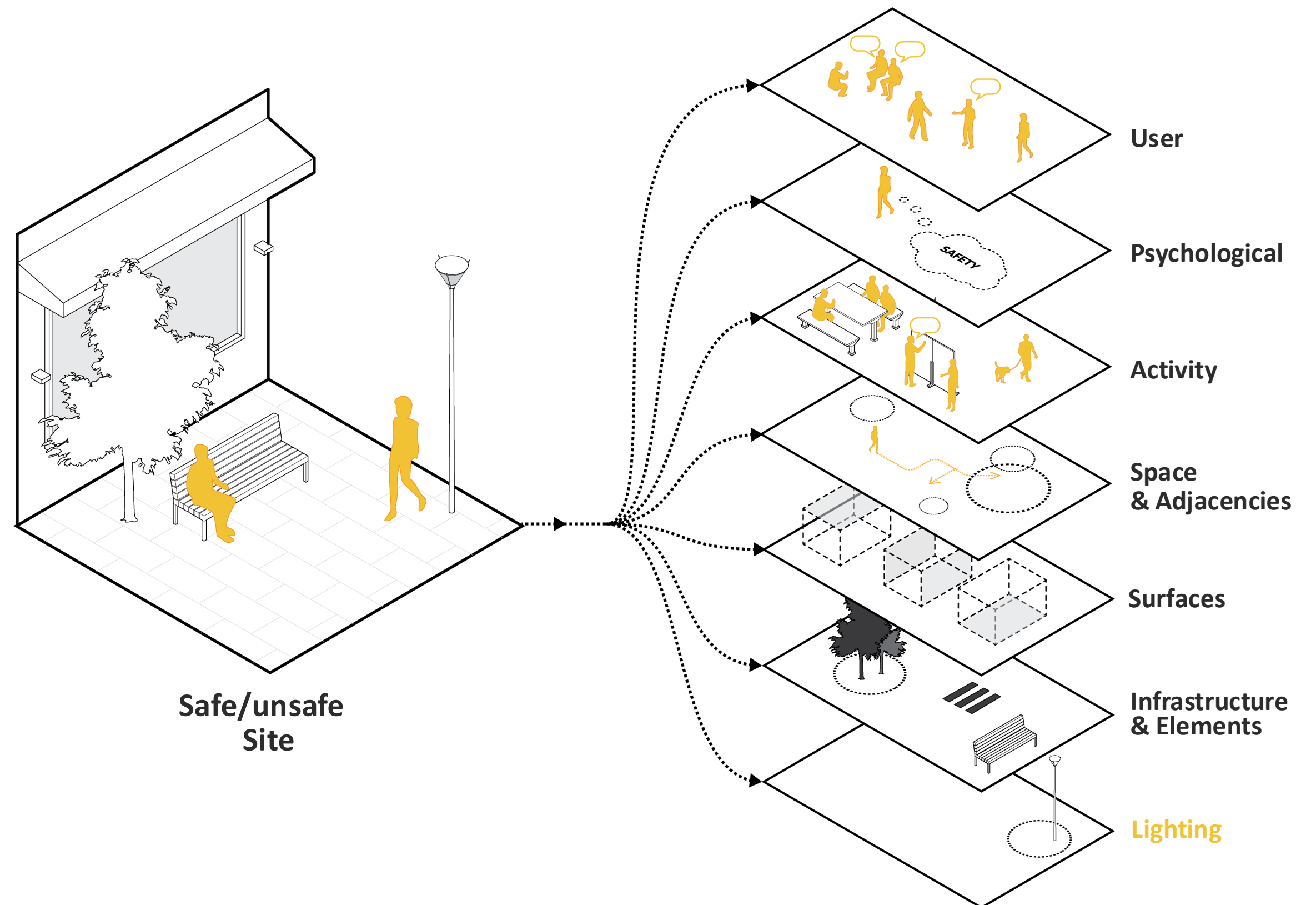
Layers of an experience

XYX Lab x Arup

84 hotspots

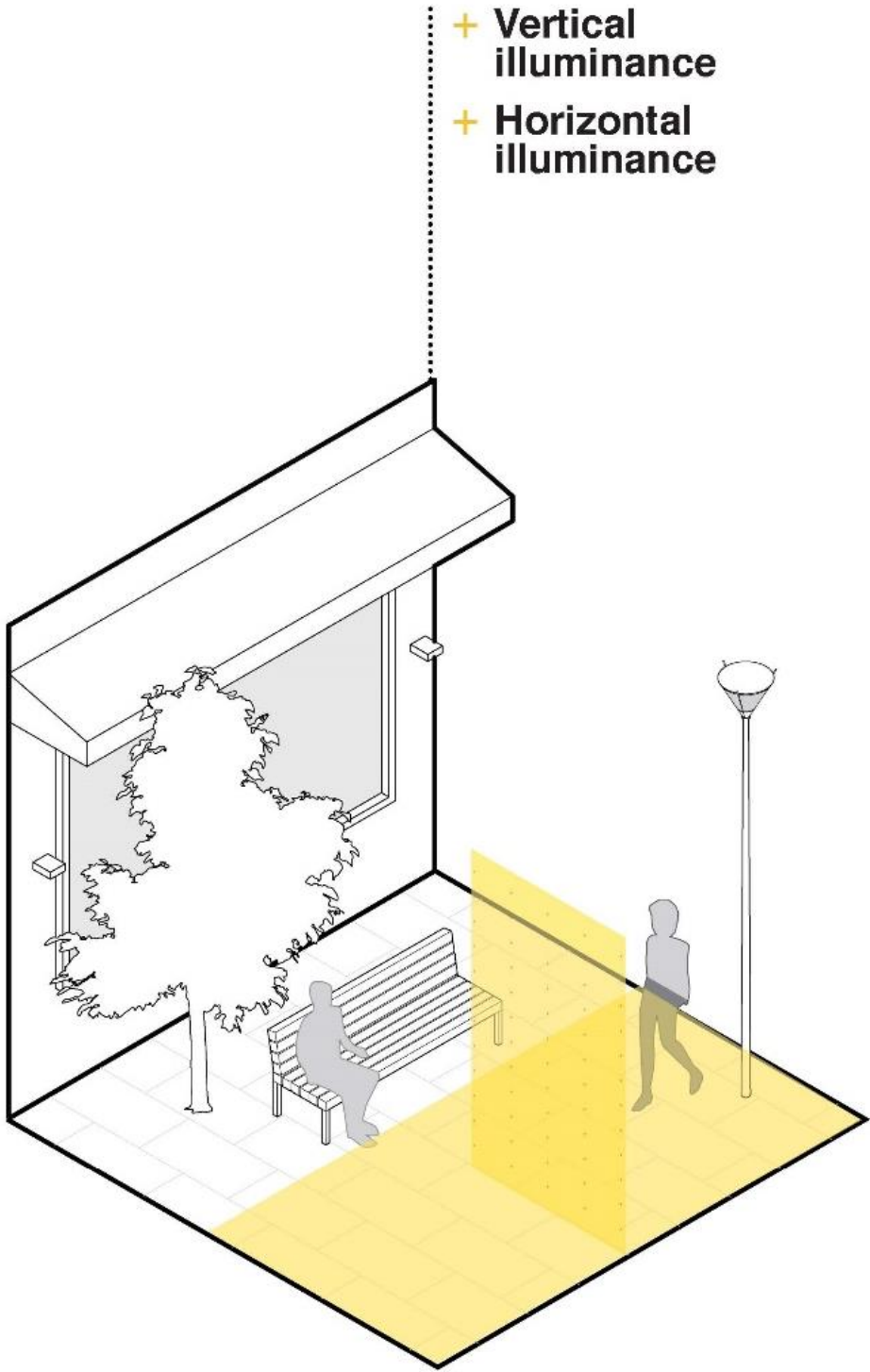
Identified to be measured
for quantitative data

26 safe spots
58 unsafe spots

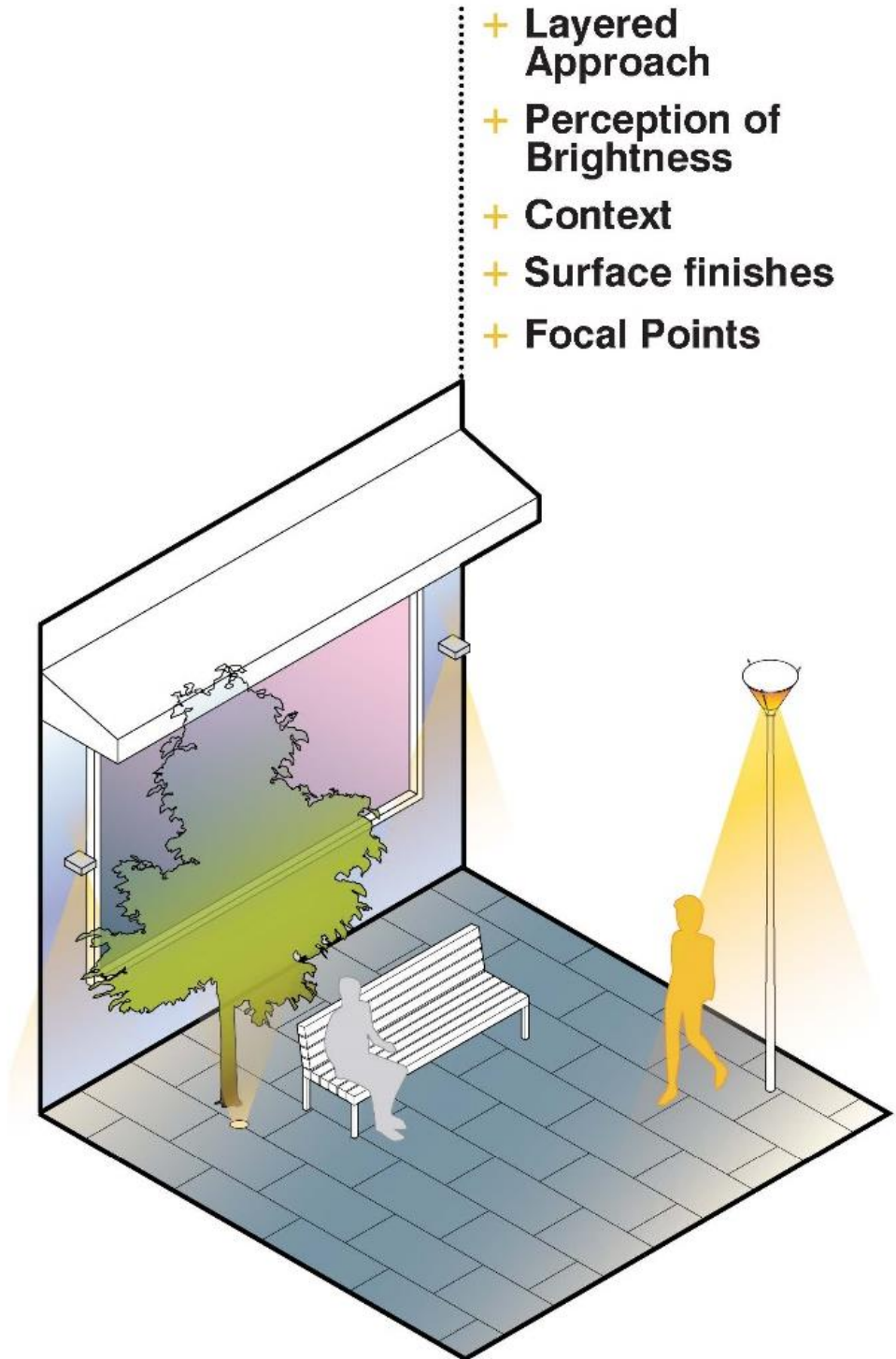


Lighting standards

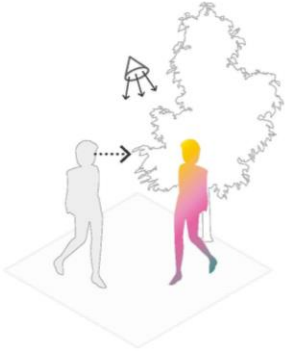
XYX Lab x Arup



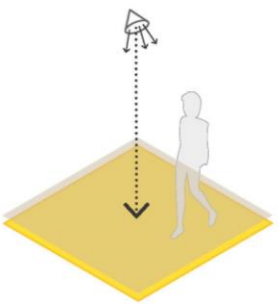
Compliance
Design
Approach



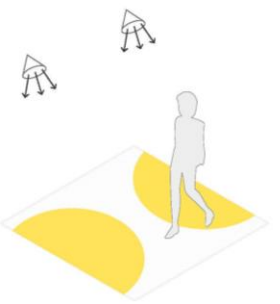
Considered
Design
Approach



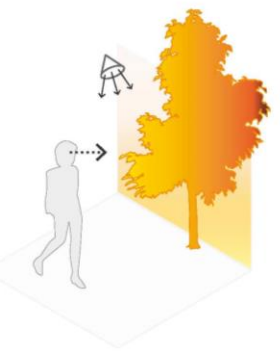
**Colour
Rendering**



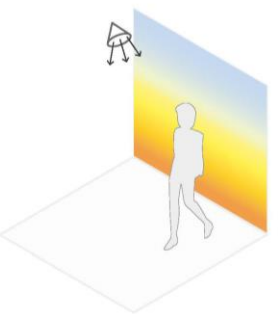
**Horizontal
Illuminance**



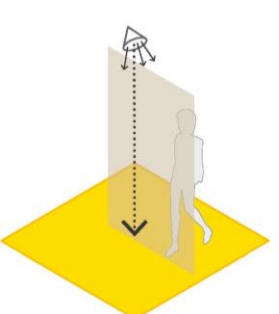
Uniformity



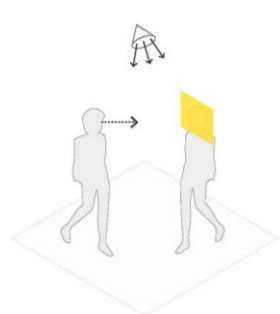
**Ambient
Luminance**



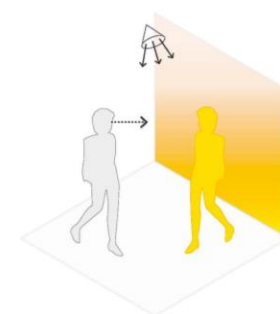
**Colour
Temperature**



**Vertical
Illuminance**



**Facial
Luminance**



**Contrast
Ratio**

**Brighter
≠
Safer**

**Quality
not
Quantity**

**Layering
+
Context**

**Contrast
+
Balance**

WE STARTED TEACHING



WE STARTED INCLUDING



WE STARTED LISTENING



WE STARTED LEARNING



WE UNDERSTAND THE OPPORTUNITY

Functional Architectural

Day Night

Pre Dawn .. Commute .. Dinner .. Entertain .. Relax

Off Controls Expertise

CLIENT FEEDBACK:

- *DON'T KNOW WHERE TO START*
- *SICK OF PEOPLE SELLING SOLUTIONS*
- *UNSURE HOW TO INVOLVE COMMUNITY*
- *STUCK WITH OLD STANDARDS OR GUIDES*
- *FEAR OF FAILURE*

RE-FRAMING THE PROPOSITION:

- *LIGHTING DESIGN >>> NIGHT TIME DESIGN*
- *EVENT >>> PERMANENT*
- *INSTANCE >>> JOURNEY*

BUT WHAT DOES ALL THIS MEAN?

*OUR INDUSTRY TENDS TO LOOK AT LIGHTING
AS A TECHNICAL CHALLENGE, WHEN WE
BELIEVE ITS A SOCIAL & ENVIRONMENTAL ONE*

STRATEGIES FOR ENGAGEMENT

1. *TORCH WORKSHOP*

2. *NIGHT AUDIT*

3. *NIGHT INSIGHT*

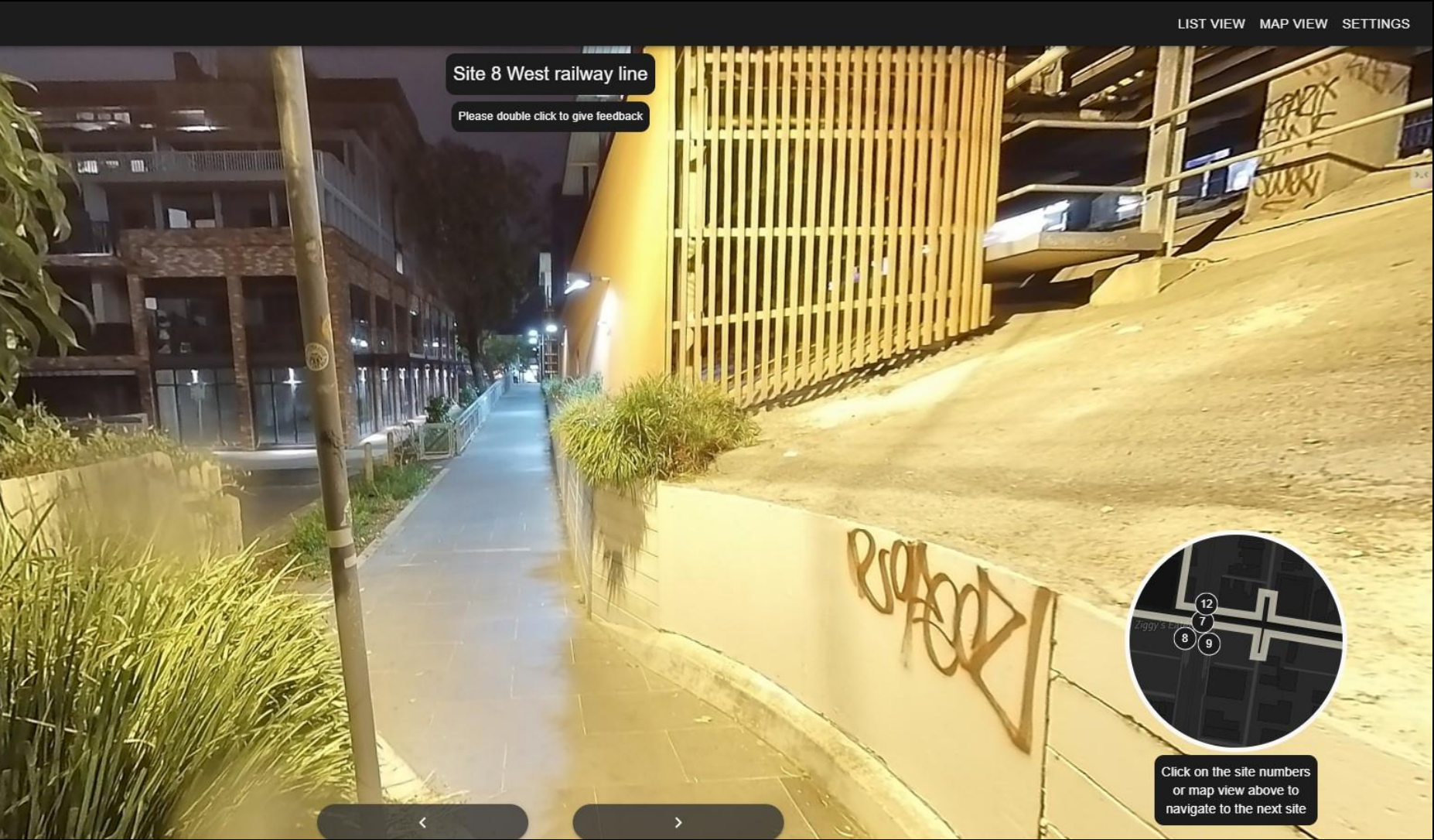
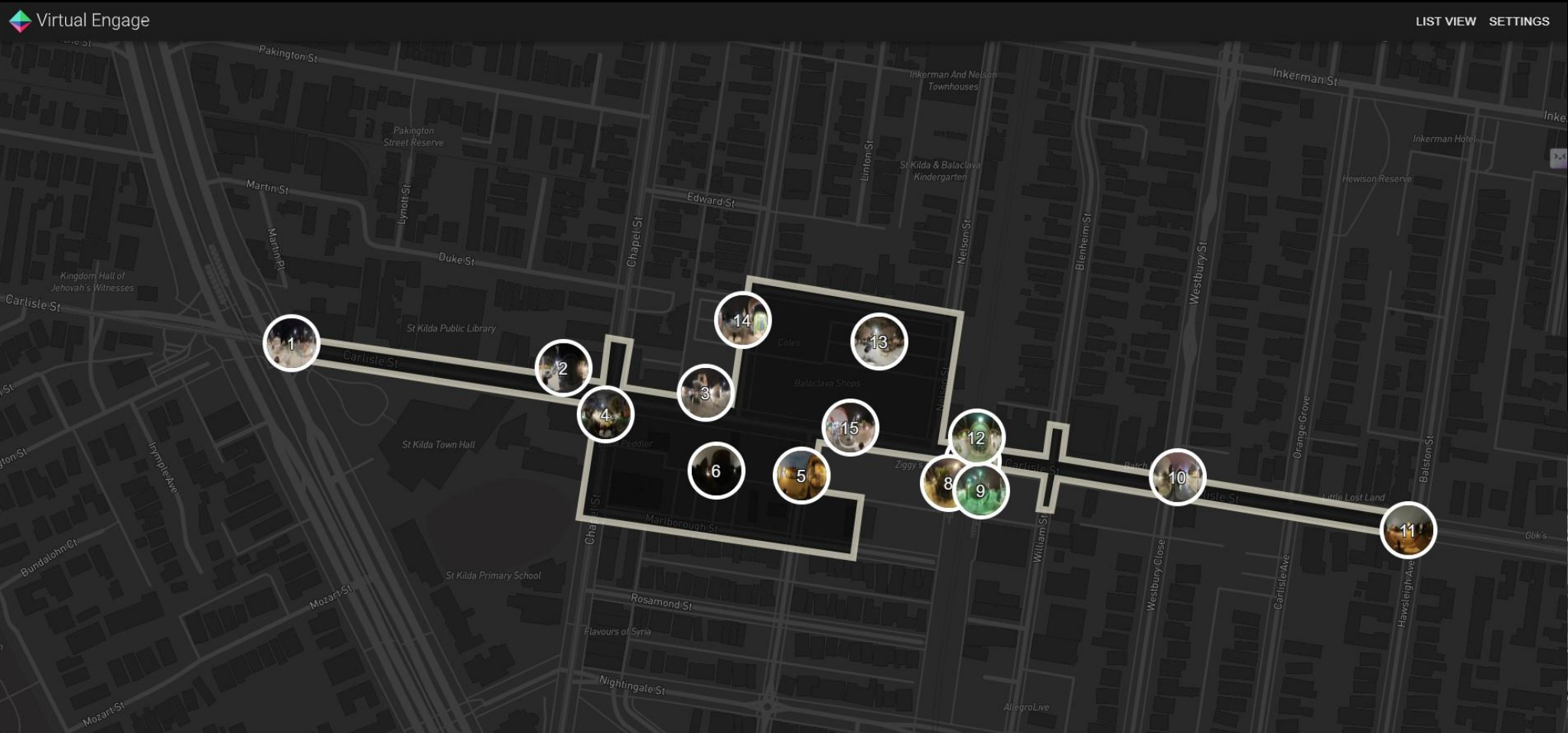
4. *NIGHT TIME VULNERABILITY ASSESSMENT (NVA)*



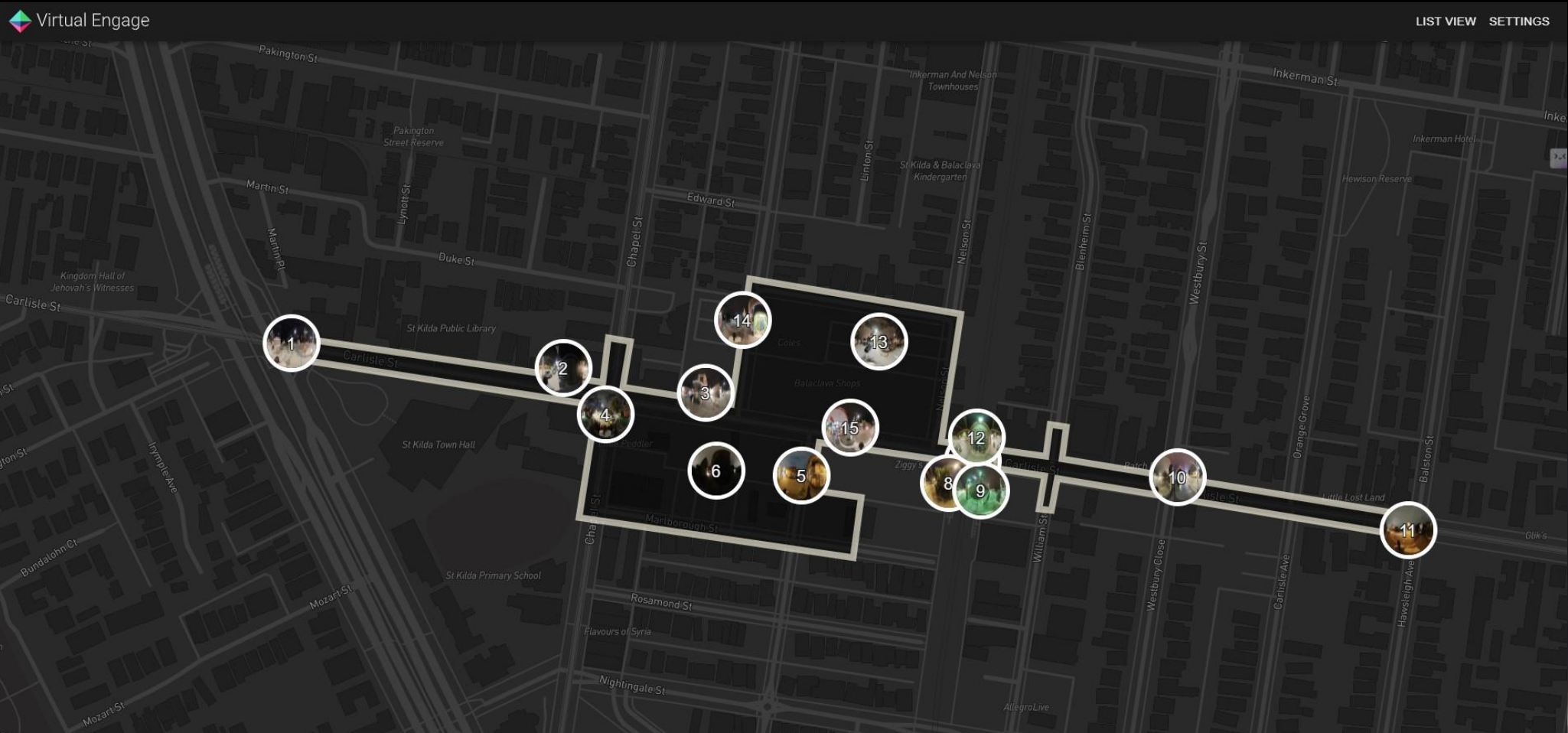
TORCH WALKSHOPS



NIGHT AUDIT



NIGHT INSIGHT





SUMMARY + KEY TAKEAWAYS:

- *TALK TO EXPERTS*
- *WE NEED TO LISTEN TO THE PUBLIC*
- *THERE ARE MULTIPLIER OPPORTUNITIES*
- *THERE ARE WAYS TO TAKE THE FIRST STEP*
- *CONSIDER YOUR SPACES AFTER DARK*