

Summary report of Benchmarking Shade in NSW Playgrounds

A summary of research by Queensland University of
Technology and University of Southern Queensland
commissioned by Cancer Institute NSW

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We acknowledge the Traditional Custodians of the lands on which we work and live and recognise the continuing connection to land, waters and community. We pay our respects to Elders, past and present.

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Executive summary

Ultraviolet radiation (UVR) causes over 95% of all skin cancers and good quality shade can reduce UVR exposure by up to 75% (Parsons et al, 1998). In 2021 researchers from Queensland University of Technology (QUT) and University of Southern Queensland (USQ) were commissioned by the Cancer Institute NSW to complete research into the quality and quantity of shade in NSW playgrounds to establish a benchmark.

The Cool and Covered designing out skin cancer in Australia research group included: Sarah Briant, Dean Brough, Louise Baldwin, Dr Elke Hacker and Erin Potter from Queensland University of Technology; in partnership with Professor Alfio Parisi, Dr Nathan Downs and Damien Igoe from University of Southern Queensland.

For the purposes of this research, playgrounds are defined as outdoor play spaces with play equipment, soft fall-type ground cover and dedicated seating.

The playground study included:	 A review of shade related literature .
	 2,592 community playgrounds across 91 of 128 NSW Local Government Areas (LGAs) were mapped and audited virtually to determine the quality and quantity of shade.
	 92 There were onsite visits to 82 council playgrounds and 10 school playgrounds. These field visits were distributed across 52 metropolitan and regional LGAs in NSW , 29 of these were in Sydney.
Findings:	 19% of surveyed playgrounds had no shade at all .
	 81% of surveyed playgrounds had some shade, either built or from trees. Of those playgrounds 14% had both built and tree shade . This combination is ideal for heat and UV protection.
Built shade:	 19% Built shade was found in 19% of playgrounds.
	 3/4 Of those with built shade, most common shade coverage is 3/4 of the playground (30% of the sample).
Tree shade:	 75% Three quarters (75%) had tree shade . A little over half (58%) of these trees provided dense shade coverage.
	 39% Most commonly 1/4 of the playground (39% of the sample) was covered by tree shade .

Survey findings:	 386 Surveys were conducted with 386 community members, 117 parents, guardians and caregivers and 30 secondary school students.
	 97% of community members reported having shade in local playgrounds was extremely important or very important .
	 83% Of this group 83% of community members considered shade specifically for effective protection from UVR to be extremely important.
	 62% considered shade to be extremely important to provide effective heat control. <ul style="list-style-type: none">• Almost half (43%) of the community members preferred that three quarters of the seating and play equipment space be covered by shade.• School staff (84%) and parents, guardians or carers (85%) of a school student in NSW perceived shade in school playgrounds as extremely important.• In contrast, 43% of high school students reported that it is extremely important to have shade in school playgrounds.
Focus groups:	 20 Focus groups with 20 planners, landscape architects and community advocates revealed the importance of shade for the accessibility and comfort, or liveability, of the playground by all users. Participants mentioned the importance of not taking a one size fits all approach to shade, noting the range of playgrounds size, equipment and usage as well as budget.

Based on the evidence, including this research, the Institute recommends a combination of built and tree shade in every playground, covering at least 70% of the play equipment and nearby seating, including 45% of tree shade, to reduce children and caregivers' overexposure to UV radiation.

Human Research Ethics approval was obtained: QUT (#2021000018). SERAP (#2021091).

The literature review is available on the Cancer Institute [website](#).



Background

Australia has high ultraviolet radiation (UVR) levels and skin cancer risk increases with excessive sun exposure, particularly during early childhood and adolescence. (Australian Institute of Health and Welfare, 2016).

Good quality shade can reduce UVR exposure by up to 75% (Parsons et al, 1998). Primary prevention initiatives which improve access to shade in the built environment have been shown to be effective at reducing overexposure to UVR (Makin et al., 2018).

However, there is evidence to suggest that some people have less access to effective shade in public outdoor spaces such as playgrounds, especially in lower socio-economic areas of Sydney (Anderson et al., 2014). Effective shade has a range of co-benefits such as heat reduction, increased walkability and community connectivity as well as reduced UVR exposure. (Hyndman, 2017)

The Cancer Institute NSW (the Institute) funded Queensland University of Technology (QUT), in conjunction with University of South Queensland (USQ), to undertake quantitative and qualitative research to establish a benchmark of shade in NSW Playgrounds.

For the purposes of this research, playgrounds are defined as outdoor play spaces with play equipment, soft fall-type ground cover and dedicated seating.

Human Research Ethics approval was obtained: QUT (#2021000018). SERAP (#2021091).


Guiding research questions

The research set out to address the following three questions:

1. What is the current benchmark and are there variations in the quantity and quality of shade available in NSW local government areas (LGAs) and school playgrounds for UV and heat protection, and what are the drivers of variance across NSW?
2. What do users of NSW council and school playgrounds think about the quantity and quality of shade in playgrounds in their local area?
3. Based on the best practice evidence and user perspectives, are there recommended achievable targets for the provision of adequate shade in NSW council LGAs and school playgrounds for UV and heat protection?

Methods

This research employed a mixed methods approach, utilising quantitative and qualitative methodologies to address the three research questions, as summarised below.



Research question 1

What is the current benchmark, and are there variations in, the quantity and quality of shade available in NSW council and school playgrounds for UV and heat protection, and what are the drivers of variance across NSW?

To determine the current benchmark of shade in NSW council and school playgrounds, a mapping tool and database were developed. These were used to conduct a virtual site audit with the approach then validated with a select number of on-site audits.

Over a one-year period, between 2020-2021, 2,592 community playgrounds across 91 of 128 NSW LGAs were mapped virtually to determine the quality and quantity of shade. There were also 92 onsite visits by the Queensland-based research team for physical mapping, which included 82 council playgrounds and 10 school playgrounds. These field visits were distributed across 52 metropolitan and regional LGAs in NSW, with 29 of these in Sydney.

Location identification: Council playgrounds

A desktop search of available databases and public lists of NSW local government playgrounds, including relevant NSW Department of Planning, Industry and Environment programs, was scanned for eligible playgrounds which were then added to the research database. The database includes each playground’s location, categorised by latitude and longitude, location type (urban or regional), the approximate available land area for each playground, and proximity to population centres. The playgrounds were then examined virtually and compared with publicly accessible aerial photographs within each municipal state district. Any duplicates or ineligible playgrounds were removed. This formed the sample for the virtual assessment of shade in NSW council playgrounds.

Onsite audits were conducted in as many local government areas as possible on data collection trips from Queensland to Northern NSW and Sydney.

Location identification: School playgrounds

The wide variation in configuration of school playgrounds meant they could not be defined within the parameters necessary for inclusion in the virtual playground audit, as originally intended. Restrictions in school access due to COVID-19 during the data collection period impacted school playground onsite audits. However, when access was again possible, a convenience sample of 10 schools in the north of NSW, close to the border for Queensland based researchers, was identified and accessed for onsite audits. The schools are de-identified.

Virtual Measures

Virtual mapping technology was used to assess identified local government playgrounds in NSW. The virtual audits focused on two different types of data, ‘solstice audits’ and ‘non-solstice audits’:

Solstice audits: The quantity of the shade provided by both trees and built shade structures were measured in the area of the playground equipment and nearby seating.

The predictive calculation of the sun’s position and the resulting shade was determined during the winter solstice (21 June 2021) and the summer solstice (21 December 2021). Google Maps and Google Street View were then utilised to complete the mapping process.

Sun angle movements were calculated to allow the prediction of the effectiveness of the shade cast over the playground -at different times of day and across the seasons. This calculation was validated with onsite measures outlined below at a sample of sites.

This method has previously been used to map shade, paths and seating in public parks in Southeast Queensland (Baldwin, 2019). It was judged that for a state the size of NSW this provides a valid and cost-effective method to achieve a state-wide benchmark.

Non-solstice audits: The quality and quantity of shade was measured by virtual mapping using Google Maps and Google Street View to analyse:

The location of built and tree shade including tree locations (north, south, east or west of the play equipment) and canopy density.

- What materials were used to block direct solar radiation (e.g. shade cloth sails or roof covering, or solid roofing)
- Presence of trees, including tree canopy densities.
- Seating and pathways leading to the shaded area of the playground. From the above data, a ‘shade quality’ rating system was developed using plain English definitions to rank playgrounds depending on built and tree shade.

Onsite measures

Onsite measurements were completed for council playgrounds in 82 NSW LGAs and 10 school playgrounds (eight primary schools and two high schools) in northern NSW and Sydney. Playground site surveys were undertaken by trained members of the research team from University of Southern Queensland.

The onsite measurements helped identify which environments provide the best shade protection year-round, and what were the characteristics of environments that did not provide adequate shade for UV protection.

UVR protection from both built shade structures and tree species within and surrounding established playground environments was measured using quantifiable and testable assessment metrics, including an annual average assessment of the site:

- Ultraviolet Protection Factor (UPF)
- Playground Heat Index (HI) and
- Shade Protection Index (SPI).

To measure the quality of each environment, the team employed specialist UV radiometers and temperature sensors coupled with proven virtual environment monitoring techniques (Downs et al. 2019a). A pre-validated assessment form was used, including real time UVR and Heat Index measurements, and local environment mapping of the dynamic shade range using whole sky video imaging. This included employing fish-eye lens cameras to capture the movement of shade from local tree canopies and built shade structure positions with respect to annual variations in solar position.

The assessment team had previous experience deriving annual shade quality assessment metrics for local government (Downs et al., 2019b) that was applied and augmented for this study. This was combined with techniques developed by the research team to assess the ultraviolet protection factor (UPF) of built shade structures (Parisi et al. 2019), and measurements of the local Heat Index (HI) taken on site seasonally at each of the playgrounds (Detailed findings in appendices. Technical reports are available on request).

Validation of measures for onsite and virtual

A sample of five playgrounds were selected from the onsite audit data (n=82) to compare with the findings from the same playgrounds included in the non-solstice virtual mapping. This comparison showed the virtual audit provided an accurate measure of the shade in each playground with the condition that the non-solstice virtual audits are dependent on Google Map currency of the image/s capture.

Research question 2

What do users of NSW council and school playgrounds think about the quantity and quality of shade in playgrounds in their local area?

To support the quantitative analysis, between March and May 2021, extensive stakeholder engagement and consultations took place.

The observational, non-interventional, cross-sectional study included:

- Online questionnaire to school staff members – 75 participants. (Phase one)
- Classroom activity mapping shade in the school playground – 1 classroom cohort. (Phase two)
- Online questionnaire to parents, guardians, caregivers – 117 participants. (Phase three)
- Online questionnaire to secondary school students – 30 participants. (Phase four)
- Online questionnaire to the community about quantity and quality of shade in local playgrounds – 386 participants. (Phase five)
- Focus groups with stakeholders that included industry experts, built environment professionals, local and state government staff and school infrastructure professionals – 22 participants in 3 focus groups plus 2 written submissions. (Phase six)

The three online questionnaires were hosted by QUT and accessed via links on the Cancer Institute NSW website. Stakeholders assisted with promoting the surveys.

Research question 3

Are there recommended achievable targets for the provision of adequate shade in NSW council and school playgrounds for UV and heat protection, based on the best practice evidence and user perspectives?

To answer this question, researchers reviewed the evidence base for global scientific and grey literature, local and international policy and guidelines, and national and state legislative requirements for shade provision in playgrounds. A literature review was prepared and is available as a separate document to this report.

Limitations

This study had the following limitations:

Scope

In NSW, school playgrounds are meaningfully different from community-based (i.e. council) playgrounds, with greater variation, so were not able to be included in the virtual audit. However, ten school playgrounds were examined onsite during this project to provide some understanding of shade in school playgrounds in comparison to council playgrounds. Given this small sample size, it is recommended that the findings from this report mainly inform the enablers for community-based playgrounds, rather than school-based playgrounds.

The sampling method used for community-based playground

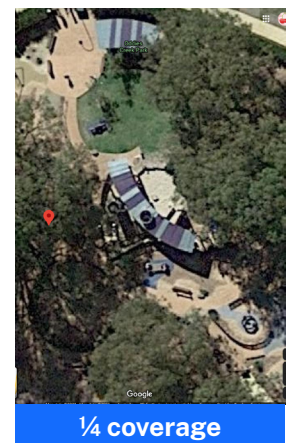
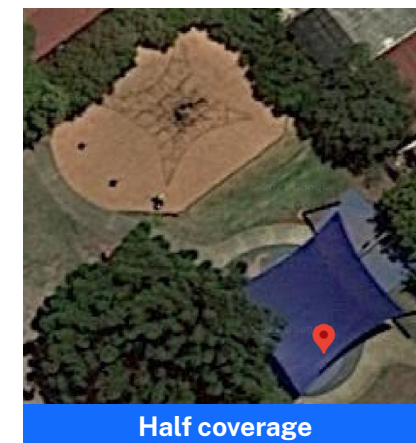
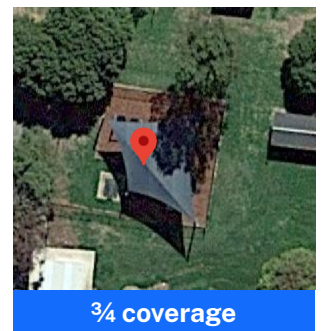
The researchers identified and developed a database of NSW community playgrounds drawn from publicly available lists on LGA websites/internet searches. However, many councils have far more playgrounds than are listed on their websites. Whilst some playgrounds from the majority of NSW LGAs were included in the virtual audit sample (i.e. database), the sample chosen was not randomly selected from a mix of LGAs in a way which gave appropriate representation to each. As a result, some LGAs in the sample have only a very small proportion of their playgrounds included whilst others have a substantially higher proportion of their playgrounds included. Therefore, this database cannot be seen as representative of all the playgrounds in NSW and comparison of the findings across LGAs is not appropriate.

For the purposes of this research, a playground was defined as an outdoor play space with play equipment, soft fall-type ground cover and dedicated seating. This definition includes a diverse range of playgrounds. Each playground was located on Google Maps and added to the database with aerial and street view images.

Virtual data mapping

Virtual data mapping (via Google aerial satellite and street view) is a highly effective methodology for mapping shade across a large number of community-based playgrounds. However, this approach has some limitations. The first limitation is that Google Maps is a snapshot of a point in time for satellite and street views. At times during the virtual mapping, it was evident there can be variance between image creation date for aerial street view (generally 2021) and satellite view (which was often less current).

The second limitation for virtual data mapping relates to sun angles. For the 'non-solstice' virtual audits the amount of shade was determined solely as if it was midday with direct overhead sun angles. Directional sun angles that may occur at different times during the day were not considered.



Onsite mapping

During parts of this investigation significant COVID-19 travel restrictions were in place and there were severe weather events which hindered the breadth of sites that could be accessed. Regardless, 92 onsite field visits at 82 council playgrounds and 10 playgrounds at schools were conducted. These field visits were distributed across 52 metropolitan and regional LGAs in New South Wales (with 29 of these LGAs in Sydney), and 10 schools.

Findings

Council playground audit

Of the 2,592 reviewed community playgrounds, 81% had **either** built or tree shade, and 14% had **both** built and tree shade.

Built shade

The study found that the current benchmark for built shade in NSW council playgrounds is less than one fifth (19%). The majority (81%) of audited playgrounds did not have built shade structures available.

Of the playgrounds with built shade, a quarter (26%) had enough built shade structure to cover the whole playground. The majority (79%) of the built structures were made of shade cloth sail, and 3% were made from solid, more permanent materials.

Table 1: Built shade in NSW Playgrounds

Built shade over NSW Playgrounds	n	Percentage (%)
Yes	499	19
No	2093	81
If built shade available, what portion of playground does it cover?	n	Percentage (%)
Whole Playground	130	26
Three quarters of playground	143	29
Half of the playground	131	26
One quarter of the playground	68	14
Less than one quarter	77	5
Type of built shade	n	Percentage (%)
Shade cloth roof	87	17
Shade cloth sail	395	79
Solid roof	13	3
Other	4	1

Note: ‘Shade cloth roof’ refers to a fixed roof type structure with a fabric membrane, ‘shade cloth sail’ is the use of fabric membrane stretched between angled poles normally in a triangle pattern/s, and ‘solid roof’ is a permanent structure made from wood or metal with either tiles or corrugated roofing.

‘Whole playground’ refers to the area defined by soft fall material such as bark or artificial turf and often with a fixed border perimeter material delineating playground area. For playgrounds without soft fall material, whole playground refers to coverage of all equipment.

Tree shade

Of the NSW Council playgrounds reviewed, three quarters (75%) have tree shade, this is the current benchmark. Thirty-nine percent (39%) of the tree-shaded playgrounds had enough shade to cover a quarter of the play area. Six percent of playgrounds had enough tree shade to cover the whole playground. A little over half (58%) of the trees provided dense coverage.

Table 2: Tree shade in NSW Playgrounds

Tree shade	n	Percentage (%)
Yes	1944	75
No	648	25
Portion of playground with tree shade	n	Percentage (%)
Whole playground	121	6
Three quarters of playground	258	13
Half of the playground	443	23
One quarter of the playground	762	39
Less than one quarter	360	19
Are the trees densely or sparsely planted?	n	Percentage (%)
Sparse	379	19
Moderately dense	429	22
Dense	1136	58

These findings confirm that variations exist in the quality and quantity of shade in NSW council playgrounds due to the inclusion of built and tree shade, shade density due to tree coverage and placement, and the types of materials used for built shade.

A key driver of discrepancy is varying terminology and descriptions regarding requirements for shade and best practice shade strategies in LGA guidelines and policies. The [literature review](#), completed by QUT, suggests that while shade is mentioned as an important inclusion for public spaces including playgrounds, this information was often included at a strategic level.

*See Appendix A for a complete analysis of playgrounds by LGA.



Community based playgrounds (user findings)

When asked how important it is to have shade in local playgrounds, 82% of community members reported it was extremely important and 15% responded it was very important. User perspectives on how important shade was considered for effective protection from UVR showed 83% of community members reporting it to be extremely important, however only 62% considered shade to be extremely important to provide effective heat control.

When asked how important shade was considered for the overall look and design of the playground, 18% of community members reported it to be extremely important. When asked how important shade was considered to provide sheltered seating or resting spaces, 59% of community members reported it to be extremely important.

Almost half (43%) of the community members reported that three quarters of the seating and play equipment space should be covered by shade. Furthermore, 38% reported the entire playground, including seating, should be covered. Opinions on shade in local playgrounds showed a preference for a combination of built and natural shade, which was reported by 92% of community members.

Table 3: User preference for effective shade – Community playground setting

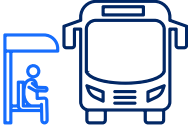
Community members n=386		
How important do you think it is to have shade in local playgrounds?	n	Percentage (%)
Extremely important	317	82.1
Very important	59	15.3
Important	9	2.3
Somewhat important	0	
Not important	1	0.3
How important do you consider shade to be for local playgrounds to provide effective protection from ultraviolet radiation (UVR) from the sun?	n	Percentage (%)
Extremely important	320	82.9
Very important	52	13.5
Important	13	3.4
Somewhat important	0	
Not important	1	0.3
How important do you consider shade to be for local playgrounds to provide effective heat control?	n	Percentage (%)
Extremely important	239	61.9
Very important	101	26.2
Important	36	9.3
Somewhat important	9	2.3
Not important	0	
Missing Data	1	0.3
How important do you consider shade to be for local playgrounds to add to the overall look and design of the playground?	n	Percentage (%)
Extremely important	69	17.9
Very important	51	13.2
Important	96	24.9
Somewhat important	103	26.7
Not important	67	17.4

How important do you consider shade to be for local playgrounds to provide sheltered seating, gathering or rest spaces?	n	Percentage (%)
Extremely important	227	58.8
Very important	104	26.9
Important	45	11.7
Somewhat important	7	1.8
Not important	3	0.8
What portion of a local playground do you think should be covered by shade?	n	Percentage (%)
The entire playground including seating space	146	37.8
The play equipment space but not seating	4	1.0
Three quarters (75%) of the seating and play equipment space	165	42.7
Three quarters (75%) of the play equipment	10	2.6
Half (50%) of the seating and play equipment space	54	14.0
Half (50%) of the play equipment	4	1.0
Shade should not be provided	3	0.8
Which of the following statements best describes your opinion on shade in local playgrounds?	n	Percentage (%)
Only have built shade	4	1.0
Only have natural shade	6	1.6
Have a combination of built and natural shade	355	92.0
Have no shade	1	0.2
Other	20	5.2

Community member responses:



82% reported shade in local playgrounds was extremely important



62% considered shade extremely important to provide effective heat control



38% reported the entire playground, including seating, should be covered by shade



83% considered shade extremely important for effective protection from UVR



43% reported that three quarters of the seating and play equipment space should be covered by shade



92% showed a preference for a combination of built and natural shade

Perceptions of schools playgrounds (students, carers and staff)

School staff (84%) and parents, guardians or carers (85%) of a school student in NSW perceived shade in school playgrounds as extremely important. In contrast, 43% of high school students reported that it is extremely important to have shade in school playgrounds.

Noting the variation in what is considered a playground in schools, opinions on shade in school playgrounds showed a preference for a combination of built and natural shade with more natural shade over playgrounds, as there was concern about too much of the surfaces being concrete.

From a survey of school students, over 70% reported they can only access shade when off the playing field, or not at all when playing organised sport at school. Only 13% reported being able to access shade most of the time when watching sport at school. Less than half (43%) reported being able to access shade most of the time when having lunch or sitting with friends outdoors. Over 70% of school student participants reported that more built and natural shade is needed in areas where they play sport and are active and 50% reported needing more built and natural shade in areas where they sit during breaks.

Funding constraints for new natural or built shade or maintenance is considered the prime barrier for increasing shade in school playgrounds.

School playgrounds (user findings)

When asked how important it is to have shade in school playgrounds, 84% of school staff and 85% of parents/ carers (but only 43% of high school students) reported that it is extremely important to have shade in school playgrounds. (Table 4)

Shade specifically for effective protection from UVR was rated the highest of all the benefits of shade. School staff (77%), parents/carers (75%) and high school students (63%) rated shade for UVR protection as extremely important.

The results for non-UVR related co-benefits of shade were:

- Shade rated as extremely important to provide effective heat control – school staff (60%) and parents/carers (61%), school students (33%).
- Shade rated as extremely important for the overall look and design of the playground participants – school staff (25%), parents/carers (15%) and high school students (20%).
- Shade rated as extremely important to provide sheltered seating or supervision spaces – school staff (65%), parents/carers (59%) and high school students (40%).
- Shade rated as extremely important to provide an additional outdoor learning space – school staff (49%), parents/carers (37%) and high school students (30%).

Stakeholder focus group findings

Feedback from stakeholders indicated shade in community-based playgrounds to be extremely important and adding ‘more shade’ was a common theme to advance shade in community playgrounds.

Playground users indicated a desire for built shade to be used while waiting for immature trees to grow. Feedback indicated a desire to improve planning and design of playgrounds to match seasonal and regional variations with preference for some winter sun, but shade in summer to reduce heat.

Stakeholders highlighted numerous interconnected factors influencing shade including: socio-economic, inclusive playground spaces, council decision making, vandalism, regional and climatic variances, type of playground (‘destination’ vs. ‘pocket’), aesthetic considerations, collaboration with community designers, planners and councils.

See Appendix B for the themes and quotes from stakeholder and industry focus groups about shade in NSW playgrounds.

In terms of shade in areas where students play sport and are active:

- 65% of school staff and 56% of parents/carers reported half of the space should be covered by shade.
- 23% of school staff and 31% of parents/carers reported three quarters of the space should be covered.

When asked about areas where the students eat and sit during breaks, 36% of school staff and 49% of parents/carers reported the entire space should be covered by shade.

School students were also asked about their perceptions of shade at school: (Table 5)

- Over 70% of school student participants reported they can only access shade when off the field or and not any of the time when playing organised sport at school.
- Only 13% of school student participants reported being able to access shade most of the time when watching sport at school while 43% reported being able to access shade most of the time when having lunch or sitting with friends outdoors.
- Over 70% of school student participants reported that more built and natural shade is needed in areas where they play sport and are active and 50% reported more built and natural shade is needed in areas where they sit during breaks.

There was a preference for a combination of built and natural shade from 98% of school staff, 96% of parents/carers and 93% of high school students. Shade from a combination of both deciduous and evergreen trees was preferred by 74% of school staff and 70% of parents/carers.



Table 4: Preferences for effective shade – School playground setting

	School staff n=75		Parents/carers n=117		High school students n=30	
	n	Percentage (%)	n	Percentage (%)	n	Percentage (%)
How important do you think it is to have shade in school playgrounds?	Q1		Q1		Q1	
Extremely important	63	84.0	100	85.5	13	43.3
Very important	12	16.0	12	10.3	9	30.0
Important	0		4	3.4	5	16.7
Somewhat important	0		1	0.9	2	6.7
Not important	0		0		1	3.3
How important do you consider shade to be for school playgrounds to provide effective protection from ultraviolet radiation (UVR) from the sun?	Q2a		Q2a		Q3a	
Extremely important	58	77.3	88	75.2	19	63.3
Very important	14	18.7	21	17.9	4	13.3
Important	3	4.0	6	5.1	6	20.0
Somewhat important	0		1	0.9	1	3.3
Not important	0		1	0.9	0	
How important do you consider shade to be for school playgrounds to provide effective heat control?	Q2b		Q2b		Q3b	
Extremely important	45	60.0	72	61.5	10	33.3
Very important	22	29.3	33	28.2	11	36.7
Important	8	10.7	10	8.5	8	26.7
Somewhat important	0		1	0.9	1	3.3
Not important	0		1	0.9	0	
How important do you consider shade to be for school playgrounds to add to the overall look and design of the playground?	Q2c		Q2c		Q3c	
Extremely important	19	25.3	18	15.4	6	20.0
Very important	16	21.3	24	20.5	6	20.0
Important	16	21.3	27	23.1	8	26.7
Somewhat important	18	24.0	30	25.6	7	23.3
Not important	6	8.0	18	15.4	3	10.0

Table 4: Preferences for effective shade – School playground setting (continued)

	School staff n=75		Parents/carers n=117		High school students n=30	
	n	Percentage (%)	n	Percentage (%)	n	Percentage (%)
How important do you consider shade to be for school playgrounds to provide sheltered seating or supervision spaces?	Q2d		Q2d		Q3d	
Extremely important	49	65.3	69	59.0	12	40.0
Very important	20	26.7	32	27.4	11	36.7
Important	6	8.0	13	11.1	5	16.7
Somewhat important	0		1	0.9	1	3.3
Not important	0		2	1.7	1	3.3
How important do you consider shade to be for school playgrounds to provide an additional function to the playground space such as an outdoor learning space?	Q2e		Q2e		Q3e	
Extremely important	37	49.3	44	37.6	9	30.0
Very important	22	29.3	40	34.2	11	36.7
Important	14	18.7	25	21.4	7	23.3
Somewhat important	1	1.3	4	3.4	3	10.0
Not important	1	1.3	4	3.4	0	
In areas of the school playground where students play sport and are active, what portion of this space do you think should be covered by shade?	Q3		Q3		ND	
The entire space	6	8.0	7	6.0		
Three quarters (75%) of the space	17	22.7	37	31.6		
Half (50%) of the space	49	65.3	65	55.6		
Shade should not be provided	3	4.0	8	6.8		
Other	0		0			
In areas of the school playground where students eat and sit during breaks, what portion of this space do you think should be covered by shade?	Q4		Q4		ND	
The entire space	27	36.0	57	48.7		
Three quarters (75%) of the space	29	38.7	39	33.3		
Half (50%) of the space	18	24.0	18	15.4		
Shade should not be provided	1	1.3	3	2.6		
Other	0		0			

Table 4: Preferences for effective shade – School playground setting (continued)

	School staff n=75		Parents/carers n=117		High school students n=30	
	n	Percentage (%)	n	Percentage (%)	n	Percentage (%)
Which of the following statements best describes your opinion on shade in school playgrounds?	Q5		Q5		Q2	
Only have built shade	1	1.3	0		1	3.3
Only have natural shade	0		4	3.4	0	
Have a combination of built and natural shade	74	98.7	113	96.6	28	93.3
Have no shade	0		0		1	3.3
Other	0		0		0	
Which of the following statements best describes your opinion on tree shade in school playgrounds?	Q6		Q6		ND	
Only have evergreen trees	16	21.3	32	27.4		
Only have deciduous trees	0		1	0.9		
Have a combination of both types of trees	56	74.7	83	70.9		
Have no shade	0		0			
Other	3	4.0	1	0.9		

ND = data not collected

Table 5: Student feedback on shade in school playgrounds

	n=30	
How easily can you access shade when playing organised sport at school?	n	Percentage (%)
Most of the time	0	
Some of the time	8	26.7
Only when off the field or main playing area	15	50.0
Not in the shade any of the time	7	23.3
How easily can you access shade when watching sport at school?	n	Percentage (%)
Most of the time	4	13.3
Some of the time	20	66.7
Not in the shade any of the time	6	20.0
How easily can you access shade when having lunch or sitting with friends outdoors?	n	Percentage (%)
Most of the time	13	43.3
Some of the time	14	46.7
Not in the shade any of the time	3	10.0
Do you think there needs to be more or less shade at your school in areas where you play sport and are active?	n	Percentage (%)
More built shade	6	20.0
More natural shade	1	3.3
More of both built and natural shade	23	76.7
No need for more shade	0	
Do you think there needs to be more or less shade at your school in areas where you eat and sit during breaks?	n	Percentage (%)
More built shade	4	13.3
More natural shade	4	13.3
More of both built and natural shade	15	50.0
No need for more shade	7	23.3

Recommendations

The researchers provided the following **10 recommendations** to the Institute for sharing with related sectors. The researchers note there are multiple complex and intertwined factors involved to advance the quality and quantity of shade in NSW playgrounds. The recommendations focus on enablers identified through the research.

It is recognised that many NSW councils have financial constraints that are a significant barrier to the upfront and ongoing infrastructure asset costs associated with providing the necessary quality and quantity of playground shade. However, requirements for a combination of built and natural shade can be established for greenfield and site redevelopment when councils have a commitment to a healthy built environment.

Based on this research and subsequent advice of the NSW Shade Working Group, the Institute recommends a combination of built and tree shade in every playground, covering at least 70% of the play equipment and nearby seating, including 45% of tree shade, to reduce children and caregivers' overexposure to UV radiation.

Schools can also utilise this research and recommendations to increase shade as a priority alongside other play area considerations.

The following **10 recommendations** align with the ['Playground shade best practice principles for action'](#), that was developed in response to this research, outlining 10 ways to improve the quality and quantity of shade and reduce overexposure to UV radiation in NSW playgrounds.

1 Engage the community

Engagement with the local community to work closely and collaboratively is a potential driver to enhance shade in NSW playgrounds. Adopting a co-design methodology provides a better understanding of specific community needs for playgrounds.

Incorporate a community centred approach, such as 'friends of the park' into the design, maintenance and 'ownership' of the playground as an enabler. Community advocates that participated in the focus groups noted the impact the community can have on influencing and advancing quality and quantity of shade in NSW playgrounds.

2 Educate

Defining best practice for shade in playgrounds for design professionals, planners, shade manufacturers, community groups, and council representatives is a critical enabler. Education will enhance knowledge of:

- Tree species selection for shade
- Innovations in the sector for built shade structure design and associated textiles
- Geographical considerations for playground sites
- Avenues to reduce asset maintenance, in particular due to vandalism.

Educative approaches should include working with professional bodies, university and vocational training sectors and potentially community forums.

3 Adopt Design Innovation

Design innovation is considered a strong enabler for advancing quality and quantity of shade in NSW playgrounds. This innovation may include:

- Development of a 'design innovation checklist' for NSW councils or schools would help inform best practice principles for effective shade design in playgrounds.
- Exploring novel approaches to play equipment design doubling as shade structures. Public art design can also incorporate shade in an aesthetic way.
- Seeking and utilising new design solutions including textile innovations for shade structures that provide enhanced durability, protection from UV and greater cooling effects, including kinetic shade structures that move with the sun, to provide optimal UV protective shade relative to time of the day and year.

4 Disseminate best practice case studies

Use a case study approach to highlight and examine multiple examples of best practice for shade provision (for NSW and potentially across Australia). This could be utilised to develop a detailed reference guide for what constitutes best practice for shade reducing exposure for UV in council and school playgrounds.

Ideally this resource should intersect with aspects of good playground design, mitigating over heating and promoting inclusive play, thereby considering shade in playgrounds is part of a holistic approach to playground design.

5 Establish and introduce targets

The development of measurable targets for the percentage of 'required' shade in NSW playgrounds appears to be a significant enabler for advancing quality and quantity of shade.

It is noted that requirements for a total amount of shade in playgrounds may also have potential for a negative effect. For example, councils meeting only the minimum requirement when they previously exceeded it, not creating new playgrounds due to potential increased costs, and/or adopting a 'cookie-cutter' approach to playground design as a quick solution to meet shade percentages rather than developing a best practice approach.

6 Draw on Aboriginal and Torres Strait Island knowledge

Many councils and schools already work closely with local Aboriginal and Torres Strait Island communities. Close relationships with local elders are recommended to identify and include cultural and practical principles when designing new spaces. Design that incorporates cultural knowledge can also help people connect with nature.

7 Bolster collaboration across the sectors

Greater collaboration between designers, shade manufacturers, councils and community, particularly in the design and construction phase of NSW playgrounds, has potential to be a significant enabler to advance the quality and quantity of shade. Using design thinking and design-led methodologies to heighten collaboration is recommended particularly during the 'design thinking' phases.

8 Develop transition strategies from built shade to natural shade

A critical enabler is the need to develop and apply long-term strategies (ten years or more) to transition from built shade to an increased proportion of natural shade in playgrounds, as canopy increases in size and density.

The findings from this report indicate there is a user preference for natural shade over built shade in playgrounds for aesthetic reasons as well as the potential for enhanced heat reduction. A planned long-term strategy for planting appropriate tree species in conjunction with built structures would improve shade in NSW playgrounds. As trees grow and provide more shade there is the potential to remove built shade that requires renewal, such as shade sails that deteriorate over time.

9 Establish and pilot an LGA based playground ranking approach for shade, in conjunction with other playground attributes

Users of playgrounds often seek out ones that have excellent shade, as well as other aspects including engaging play equipment, sufficient parking or access by public transport and inclusive spaces. There is merit in developing a web-based 'decision-making' comparative ranking system to empower and inform playgrounds users to select playgrounds that meet their needs. This could potentially be piloted in one or more LGAs.

10 Engage with councils to assess shade in playgrounds in 7-10 years

There is potential and value for 're-audits' of all NSW community-based playgrounds in 7 to 10 years to ascertain any shifts or patterns in advancement of shade in playgrounds.

Conclusion

Shade in playgrounds provides aesthetically pleasing environments, increased societal engagement, a range of improved health outcomes including protection against UVR, and is associated with greater learning and educational opportunities around school outdoor spaces.

Currently there is an absence of targets, indicators and agreed measures or metrics for community-based playground shade. There is potential to include specific shade measures for playgrounds in policy and guideline documents.

There are opportunities for sharing best practice examples of how to implement shade strategies both for retrofitting existing playgrounds and for the design and delivery of new playgrounds.



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Glossary

Abbreviation	Explanation
CI	Cancer Institute NSW
LGA	Local Government Area
PHN	Private Health Network
QUT	Queensland University of Technology
UVR	Ultraviolet Radiation
USQ	University of Southern Queensland

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Appendix A

Analysis of audited playgrounds by LGA

Local Government Area (LGA)	No. of playgrounds audited	No. of playgrounds with no shade (built or tree)	% playgrounds with no shade (built or tree)	No. playgrounds with built AND tree shade	% playgrounds with built AND tree shade	No. playgrounds with TREE shade	% with TREE shade	No. playgrounds with BUILT shade	% with BUILT shade
NSW Overall	2592	504	19%	355	14%	1944	75%	499	19%
Albury City Council	44	16	36%	4	9%	33	75%	4	9%
Armidale Regional Council	5	3	60%	1	20%	3	60%	1	20%
Ballina Shire Council	15	2	13%	3	20%	10	67%	7	47%
Balranald Shire Council	1	1	100%	0	0%	0	0%	1	100%
Bathurst Regional Council	23	11	48%	3	13%	20	87%	4	17%
Bayside Council	31	6	19%	4	13%	31	100%	4	13%
Bega Valley Shire Council	3	0	0%	1	33%	3	100%	1	33%
Berrigan Shire Council	5	1	20%	3	60%	4	80%	3	60%
Blacktown City Council	273	101	37%	7	3%	203	74%	10	4%
Bland Shire Council	9	0	0%	6	67%	9	100%	6	67%
Blayney Shire Council	4	0	0%	3	75%	3	75%	4	100%
Blue Mountains City Council	16	3	19%	0	0%	14	88%	1	6%
Bogan Shire Council	2	0	0%	0	0%	1	50%	0	0%
Broken Hill Shire Council	4	0	0%	3	75%	4	100%	3	75%
Burwood Council	19	1	5%	10	53%	16	84%	12	63%
Byron Shire Council	16	6	38%	3	19%	11	69%	4	25%
Cabonne Council	2	2	100%	0	0%	0	0%	0	0%
Campbelltown City Council	79	20	25%	3	4%	46	58%	8	10%
Camden Council	30	10	33%	3	10%	19	63%	4	13%
City of Canterbury Bankstown	21	1	5%	8	38%	12	57%	12	57%

Local Government Area (LGA)	No. of playgrounds audited	No. of playgrounds with no shade (built or tree)	% playgrounds with no shade (built or tree)	No. playgrounds with built AND tree shade	% playgrounds with built AND tree shade	No. playgrounds with TREE shade	% with TREE shade	No. playgrounds with BUILT shade	% with BUILT shade
Central Coast Council	36	5	14%	2	6%	24	67%	4	11%
Cessnock City Council	13	0	0%	0	0%	7	54%	1	8%
City of Canada Bay	43	5	12%	20	47%	39	91%	23	53%
City of Newcastle	76	33	43%	0	0%	40	53%	2	3%
City of Parramatta	133	28	21%	16	12%	113	85%	22	17%
City of Ryde	61	9	15%	15	25%	54	89%	17	28%
City of Sydney	88	6	7%	23	26%	81	92%	26	30%
City of Wagga Wagga	4	1	25%	1	25%	3	75%	2	50%
Clarence Valley Council	8	1	13%	4	50%	8	100%	4	50%
Cobar Shire Council	2	0	0%	1	50%	2	100%	1	50%
Coffs Harbour City Council	8	2	25%	1	13%	6	75%	1	13%
Coolamon Shire Council	2	1	50%	0	0%	1	50%	0	0%
Cootamundra-Gundagai Regional Council	2	1	50%	0	0%	1	50%	0	0%
Cumberland City Council	19	4	21%	2	11%	17	89%	2	11%
Dubbo Regional Council	13	0	0%	6	46%	13	100%	6	46%
Eurobodalla Shire Council	19	5	26%	0	0%	13	68%	0	0%
Fairfield City	30	10	33%	1	3%	21	70%	2	7%
Federation Council	7	1	14%	1	14%	6	86%	1	14%
Georges River Council	8	0	0%	3	38%	8	100%	3	38%
Greater Hume Council	5	0	0%	3	60%	4	80%	4	80%
Gunnedah Shire Council	10	1	10%	3	30%	9	90%	3	30%
Hawkesbury City Council	8	2	25%	1	13%	7	88%	1	13%
Hay Shire Council	2	2	100%	0	0%	1	50%	0	0%
Hilltops Council	3	1	33%	2	67%	3	100%	2	67%
Hornsby Shire Council	76	22	29%	1	1%	66	87%	1	1%

Local Government Area (LGA)	No. of playgrounds audited	No. of playgrounds with no shade (built or tree)	% playgrounds with no shade (built or tree)	No. playgrounds with built AND tree shade	% playgrounds with built AND tree shade	No. playgrounds with TREE shade	% with TREE shade	No. playgrounds with BUILT shade	% with BUILT shade
Hunter's Hill Council	7	1	14%	2	29%	5	71%	3	43%
Inner West Council	26	3	12%	7	27%	24	92%	8	31%
Inverell Shire Council	3	0	0%	2	67%	2	67%	3	100%
Kempsey Shire Council	2	0	0%	0	0%	2	100%	0	0%
Kiama Municipal Council	20	8	40%	0	0%	12	60%	1	5%
Ku-ring-gai Council	70	5	7%	2	3%	68	97%	3	4%
Lake Macquarie City Council	104	30	29%	0	0%	78	75%	0	0%
Lane Cove Council	31	2	6%	2	6%	27	87%	2	6%
Lismore City Council	4	1	25%	0	0%	1	25%	2	50%
Liverpool City Council	6	1	17%	1	17%	3	50%	3	50%
Maitland City Council	37	10	27%	6	16%	14	38%	19	51%
Midcoast Council	33	17	52%	2	6%	13	39%	4	12%
Mid-Western Regional Council	13	1	8%	1	8%	8	62%	5	38%
Mosman Council	13	0	0%	7	54%	12	92%	8	62%
Murray River Council	5	0	0%	2	40%	4	80%	3	60%
Muswellbrook Shire Council	6	1	17%	3	50%	5	83%	3	50%
Nambucca Valley Council	8	4	50%	0	0%	2	25%	2	25%
Narrandera Shire Council	2	0	0%	0	0%	0	0%	2	100%
North Sydney Council	29	1	3%	5	17%	29	100%	5	17%
Northern Beaches Council	157	33	21%	24	15%	122	78%	27	17%
Oberon Council	4	0	0%	0	0%	4	100%	0	0%
Penrith City Council	121	41	34%	13	11%	82	68%	24	20%
Port Macquarie Hastings Council	5	2	40%	0	0%	3	60%	0	0%
Port Stephens Council	20	13	65%	2	10%	9	45%	4	20%

Local Government Area (LGA)	No. of playgrounds audited	No. of playgrounds with no shade (built or tree)	% playgrounds with no shade (built or tree)	No. playgrounds with built AND tree shade	% playgrounds with built AND tree shade	No. playgrounds with TREE shade	% with TREE shade	No. playgrounds with BUILT shade	% with BUILT shade
Queanbeyan-Palerang Regional Council	45	24	53%	2	4%	18	40%	9	20%
Randwick City Council	54	7	13%	28	52%	39	72%	40	74%
Shellharbour City Council	71	39	55%	0	0%	38	54%	0	0%
Shoalhaven City Council	51	21	41%	1	2%	35	69%	1	2%
Singleton Council	9	2	22%	3	33%	7	78%	3	33%
Snowy Monaro Regional Council	12	6	50%	0	0%	6	50%	0	0%
Strathfield Council	23	0	0%	18	78%	22	96%	19	83%
Sutherland Shire Council	119	14	12%	19	16%	101	85%	26	22%
Tamworth Regional Council	29	12	41%	4	14%	9	31%	13	45%
Temora Shire Council	3	0	0%	1	33%	1	33%	3	100%
Tenterfield Shire Council	6	2	33%	1	17%	4	67%	2	33%
The Hills Shire Council	27	8	30%	2	7%	18	67%	5	19%
Tweed Shire Council	13	3	23%	0	0%	10	77%	0	0%
Upper Lachlan Shire Council	5	1	20%	1	20%	2	40%	3	60%
Warrumbungle Shire Council	4	1	25%	0	0%	4	100%	0	0%
Waverley Council	29	5	17%	3	10%	25	86%	3	10%
Willoughby City Council	32	2	6%	3	9%	30	94%	4	13%
Wingecarribee Shire Council	20	5	25%	1	5%	15	75%	2	10%
Wollondilly Shire Council	7	1	14%	2	29%	6	86%	2	29%
Wollongong City Council	12	8	67%	1	8%	4	33%	3	25%
Woollahra Municipal Council	22	0	0%	11	50%	21	95%	11	50%
Yass Valley Council	12	0	0%	1	8%	10	83%	1	8%

Appendix B

Themes and quotes from stakeholder and industry focus group about shade in NSW playgrounds

Key themes from focus groups	Description	Participant quotes (de-identified)
1. Adequacy of shade in NSW playgrounds	Participants mainly considered the amount of shade in NSW playgrounds as inadequate.	“...it’s very rare that you find a playground that has adequate shade.” (Shade Manufacturer) “I go looking for the playgrounds with shade and there’s very few of them.” (Community Advocate)
2. Useability of playgrounds	Participant comments indicated that shade in playgrounds enhanced usability of playground equipment and overall useability of playground spaces–slippery dips being too hot to use was a common example.	“So my perception of shade is that it’s contributing to usability and the value of that playground to that community’s overall health and wellbeing.” (Planning and Design Professional) “But one of the fundamental things is that it has to be usable, and that means it’s got to be comfortable to be in, it can’t be too hot, and we’ve got this safety element over the top.” (Planning and Design Professional) “So, we have a number of playgrounds now in Western Sydney where signs go up ...saying, “This play equipment may burn you.” (Community Advocate)
3. Liveability of playground area	Heat reduction, and associated enhanced liveability, was a common theme mentioned by the participants for the need to increase shade playgrounds.	“For me, it’s a safety issue for families being exposed, and not just the kids, but also the parents, it’s very unpleasant being out in the heat.” (Community Advocate)
4. Inclusive playground spaces	Several participants mentioned the need for inclusive play spaces and the connection to sufficient levels of shade.	“Shade is probably number one, if not two or three, on the list of absolute fundamentals for an inclusive play space.” (Inclusive Play Professional) “But I would suggest that ... it’s the skill and awareness in our designers, about it not being sort of drummed into you that if you don’t consider shade you’re actually not achieving your brief (for inclusive design) in Australia.” (Playground Advisory Professional)
5. Preference for natural shade over built shade	Participants preferred natural shade over built shade, but also recognised the need for both built and natural shade. There were references made for the need to have transitional shade approaches–built shade first until sufficient trees grow to provide enough shade. Plus, some participants commented that trees provide enhanced and cost-effective cooling over built shade as a cooling approach.	“Plan forward from transitioning from manmade shade into natural shade, tree shade.” (Academic, Urban Studies) “Natural shade will provide the filtered air and light which is really beautiful and it’s very valuable.” (Playground Advisory Professional) “I think a bit of a holistic approach between the nature and the structure.” (Shade Manufacturer) “You just don’t want a playground that’s covered to look like some of the big car parking spaces at the airport.” (Landscape Architect) “Again, natural shade has a huge value in terms of cooling, which I’ve been advocating a lot for. Parents, again, just want a big structure and that costs a lot.” (Community Advocate)

Key themes from focus groups	Description	Participant quotes (de-identified)
6. Volume of shade	Numerous participants preferred, in the main, for playgrounds to not be fully shaded. There were comments about seasonal and regional location variations affecting volume of shade needs.	“We need a balance with winter, and you don’t want playgrounds with all shade sails and they’re freezing cold in winter and no natural light.” (Community Advocate) “I don’t think we should cover all of the playground, because for cost, for visual and aesthetic reasons and I think we all need a bit of Vitamin D for our health.” (Planning and Design Professional). “Ideally, all of the necessary equipment is covered in shade, so that’s still a safe place to play.” (Local Health District Representative)
7. Type of playground influencing approach	Several participants mentioned the need to not have ‘one-approach’ for shade considering the diversity of playground types with some being destinations and others smaller pocket (local) playgrounds.	“I think in the smaller playgrounds, it’s more about trees and the natural shade, and choosing appropriate trees to do that, but I think in the larger playgrounds it’s a combination of both.” (Inclusive Play Professional) “There’s no one-size-fits-all approach, but there are a lot of different tactics that can work.” (Strategic Health Planner) “Yeah, sometimes you get a cookie cutter playground that just gets bought from Scandinavia and shipped over here and plonked on the ground.” (Social Impact Strategist)
8. Vandalism	Several participants commented on the financial challenges of built structures for asset maintenance due to vandalism. Plus, some participant comments referred to the need for more information around approaches to reduce vandalism in playgrounds.	“The council is a bit shy about putting in the structures because of having them vandalised in the past.” (Shade Manufacturer) “I’d really like to see what new materials are out there and how they withstand vandalism and things like that.” (Planning and Design Professional) “Putting more budget into creating designs that are more practical, more-vandal proof and blend in more aesthetically with the natural environment.” (Shade Manufacturer)

Key themes from focus groups	Description	Participant quotes (de-identified)
9. Design and planning of built shade	Participants mentioned the need for built shade structures to be designed well, functional and placed in the right location. Alongside this, several participants mentioned the need for design of shade in playgrounds to be at the forefront of the build not retrospective, as the end outcome is enhanced and more cost effective. Several participants mentioned the need for less 'cookie-cutter' approach to the build design of shade structures. 'Right' tree selection was mentioned by several participants.	<p>"There's not enough consideration of the role that shade could play in a playground, overall playground design and construction. It tends to be a bit of an afterthought." (Shade Manufacturer)</p> <p>"They get built, they get rushed through the design stage, everything gets put up and then a couple of months down the track you sit there and you go, "The whole playground should be shifting across to get underneath the shade." (Shade Manufacturer)</p> <p>"If you're planning it well and designing it well, allowing for shade even if it's down the track, it's a lot better than having to add it in retrospectively." (Community Advocate)</p> <p>"I think you've got to consider the holistic site, and all the site features, as well. You've got to understand the solar aspects, a lot of people just go and just plant trees where they think or put them up wherever without understanding the features. Even as far as the geology of the site, we'll go, "So, what trees will grow well there," and deal with trees that are going to be deciduous, so come winter you're going to get a little bit more light in the area." (Council Coordinator for Recreation and Facilities)</p>
10. Trees	Participants, often passionately, preferred trees over built shade for aesthetic reasons and potential heat reduction. Maintenance issues, costs, and risk of trees in/near playgrounds was raised by some participants. Appropriate tree species selection was mentioned by several participants.	<p>"And particularly the trees, that's a big deal. They tend to be trickier or more costly to maintain than manufactured shade." (Strategic Health Planner)</p> <p>"I think we're getting a lot better at thinking about the playground as a really important asset that needs to be maintained and updated, and that includes the trees that are around them and getting a better management about that, thinking you've got to maintain the trees, keep them healthy, keep an eye on them as an asset, a living asset." (Social Impact Strategist)</p> <p>"Important to select the right species that provide the most shade with the least chance of falling branches." (Planning and Design Professional)</p>

Key themes from focus groups	Description	Participant quotes (de-identified)
11. Design Innovation	Numerous participants mentioned the need for greater design innovation in shade for playgrounds.	<p>"I think we've been so used to, for a better word, off the shelf thinking. It's the rectangular shade structure for a price point, throw it on the playground." (Landscape Architect)</p> <p>"And there needs to be, in my view, a lot of innovation in play space design and public domain design more generally." (Planning and Design Professional)</p> <p>We (with Architects) designed these structures which were fabric, but also steel frame structures that were louvered. They actually, as the sun tracked down lower in winter, were opening up areas of sun and as the sun tracked over, the surface area of all the play equipment got 10, 15 minutes of direct sun all the way through the day in winter." (Shade Manufacturer)</p>
12. Infrastructure decisions	Some participants noted council infrastructure preference for built shade over picnic tables, but not over playgrounds.	<p>"There's a great emphasis on providing shade for picnic tables and infrastructure... and not necessarily for the play space." (Design and Planning Professional)</p> <p>"Your bigger regional parks, you'd certainly want to make sure that where you've got your bench seats and your tables, you've got picnic shelters over them, or you've got trees next to the bench seats, so that the carers that are attending as well, have got somewhere comfortable they can sit." (Council Coordinator for Recreation and Facilities)</p>
13. Socioeconomic	Some participants commented on the differing quality and quantity of shade across regions with varying socioeconomic profiles.	<p>"Not every playground is lucky enough, fortunate enough to be in... a socioeconomic area where there's enough money for the council to spend on a good shade structure." (Shade Manufacturer)</p>
14. Financial	Participants frequently mentioned budgetary and financial constraints for asset purchase and forward asset maintenance in respect of playground shade.	<p>"Well, we can only afford to get the playground in, we can't afford the shade, and we can't afford to replace the shade on our renewal budget." (Design and Planning Professional)</p> <p>"Budgets are so tight that people are throwing up shade structures that are either un-engineered or don't have proper clearance heights." (Shade Manufacturer)</p> <p>"It's the first thing (shade) that people ask for but it's also the first thing they say can't be included in the playground upgrade." (Community Advocate)</p>

Key themes from focus groups	Description	Participant quotes (de-identified)
15. Education	Numerous participants mentioned the need for greater education across the public, government and industry sectors (including design, planning and shade manufacturing) regarding best practice.	<p>“There’s definitely a councillor lack of knowledge when it comes to urban heat island effects, so this lack of appreciation of it is happening. Because it’s not in the curriculum, it’s not in the Australian Building Codes Board around urban heat island effects, so if it’s not there and we’re not teaching it, it’s not something that’s being considered at that very important design phase.” (Social Impact Strategist)</p> <p>“Educating the people that make the decisions, so whether it’s the designers or the playground owners. We also try and educate families to choose spaces with shade so perhaps pushing from that angle as well.” (Playground Advisory Professional)</p>
16. Aesthetic consideration	Several participants referred to the importance of heightened aesthetic considerations for playground shade.	<p>“And I think the point about this is they need to be treated as an artwork that delivers a higher community benefit.” (Landscape Architect)</p> <p>“I think the trees are a beautiful thing. They are lovely. They’re gorgeous.” (Shade Manufacturer)</p> <p>“They’re pretty ugly (shade type sails). It’s highly effective, highly practical, but bloody ugly. So, you’ve got to come up with the right design. This is where architects comes in.” (Shade Manufacturer)</p>
17. Planning	Several participants commented on the need for long-term, connected, evidenced-based, and holistic council planning approaches for playgrounds (in respect of shade), as opposed to current perception of ‘adhoc’ approaches. Participants expressed a desire for shaded transition points to and from the playground. Alongside this, several participants commented about the need for playgrounds to be viewed as a community ‘asset’.	<p>“You’re better off with having one of the three parks that are local to one area that provides good quality shade. And also, too, you throw in a \$30,000 shade structure and a better version might be \$50,000 right? But that could last 10 years without you touching it. Whereas, you could go down the path of the \$30,000 one and spend another \$20,000 every three years replacing the sails or doing work.” (Shade Manufacturer)</p> <p>“So, it would be great if the people that actually control the tenders actually know what they’re doing. It’s a 10, 20 million dollar tender and there’s a little square (shade material) in a corner where a big chunk of the playground (is left uncovered). So, that’s a design and construct sort of project which we can get our teeth around, but, gee, it’s fabulous when someone (designer/planner) comes in with forethought before that.” (Shade Manufacturer)</p>

Key themes from focus groups	Description	Participant quotes (de-identified)
18. Location/ type of park and seasonal variance	Several participants mentioned the diversity of park type, such as destination vs. pocket park, influencing the type and need for shade. Seasonal variance was also mentioned in respect of need for shade.	<p>“The way I class them is the amount of time I’m likely to spend there, or my kid. Sometimes a pocket park we can stay there for hours, because we’re off in the bush and we’re playing... I think when there’s a higher level of usage, it warrants having the shade.” (Community Advocate)</p> <p>“Another element that’s been raised a lot is in winter, parks with built shade get quite cold and so, it’s having ...the balance. For me, I promote parks as being great in winter or great in summer.” (Community Advocate)</p>
19. Standards/ targets/ guidelines	Whilst participants commented on the need for standards/ targets/guidelines to be introduced for shade in playgrounds, there was not a consistent notion of what the shade percentage should be. Some participants commented for the preference for somewhere between 40% to 60% shade coverage. It was noted by some participants a one-size approach of a target may not work due to the diversity of playground types and differing regional geographic locations. Having a standard, target, and/or guidelines was considered an enabler by several participants including helping with associated council budget allocation. However some participants commented there can be negative outcomes, including only minimum specifications being met or less playgrounds being shaded/built due to funding constraints.	<p>“The enablers I see are shade guidelines or requirements included in relevant standards.” (Design and Planning Professional)</p> <p>“Yeah, targets are great. Speaking as a planner, anything that helps –particularly the DA planners, anything that empowers them to make decisions that are good for health is good news for me, so targets really help with doing that. And the higher the target the better.” (Health Planner)</p> <p>“You’ve got an Australian standard that has been prepared for play spaces, but it’s silent on shade and UV. Therein lies the problem.” (Landscape Architect)</p> <p>“I kind of have a view it probably should be between, say, a third to 40%, up to maybe 60%, two-thirds of a playground to be covered, depending on its size.” (Design and Planning Professional)</p> <p>“So, yes, there could be some guidelines that will give us some direction. I’m not sure if 50% is achievable. I would say it’s certainly not achievable in the local parks.” (Design and Planning Professional)</p> <p>“It’s amazing that we’re spending all this money on these facilities without that standard around shade.” (Community Advocate)</p> <p>“I suppose there’s always the risk that everyone just meets the target (in reference to a standard or shade %) and stops at the bare minimum, but maybe it just helps raise the quality of shade across a larger number of parks.” (Local Health District Representative)</p> <p>“Councils like targets. Anything that’s best practice, or targets that they can bring out and use to justify adding something or not adding something, is always a benefit.” (Council Coordinator Recreation and Facilities)</p>

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20.Development of new playgrounds	Some participants mentioned both challenges and advantages of newly developed greenfield playground sites and working with developers. Challenges included shade being planned for, but removed, in final construction. Some participants commented on contextual issues with new development sites/regions in poorer quality sites such as fire risk, trees and planning requirements. Some participants commented on the advantages working collaboratively with planners, architects etc.	<p>“..With new playgrounds that are coming in that are provided by the developer, we will try and negotiate with them through a voluntary planning agreement... that they need to put in shade as one of their embellishments or address it.” (Design and Planning Professional)</p> <p>“... In developer contribution plans, (shade can be seen) as... “gold-plating and luxury” (and that) you only need the playground.” (Design and Planning Professional)</p> <p>“It’s the site; generally the quality of land that’s been coming across for parkland is degrading a lot because of land pressure, so we’re getting worse pieces of land so it’s harder to do much on them. And it’s also siting within the site; being able to have some choices where there’s good visibility, so you’ve got a range of locations you can put a playground that’s visible but takes advantage of natural shade.” (Design and Planning Professional)</p>
21. Consistency	Participants commented on the differing approaches by, and within, councils for shade with some councils ‘better’ than others.	<p>“It’s clearly pathetic. You’ll find sporadic councils that have a policy on shade.” (Shade Manufacturer)</p> <p>“They’ve planted in lots of trees, but...they’re not always in the best place. I think it’s a different department of council without a lot of forethought. Not always the best (type) trees.” (Community Advocate)“Being clear about what the strategy is and what our approach is and how we’re addressing it, but it just seems to be very ad hoc and very reactive.” (Community Advocate)</p>
22.Community	Participants commented on the need for greater community involvement in the planning phase of playgrounds, as well as long term involvement with the asset management. Some participants expressed the need to involve friends of the park type community groups into the design and maintenance/ ownership..	<p>“And I think (one of) the enablers (for better shade) needs to be the voice of the community.” (Shade Manufacturer)“There’s no clear policy about where shade gets put in except when the community makes a very loud noise to get it done.” (Community Advocate)</p> <p>“My argument to council is that we’ve put bus shelters in for people to wait out of the sun and out of the rain for 10 minutes, but we let kids play for hours outdoor in the sun.” (Community Advocate)</p> <p>“A lot of work that needs to be done in those local councils to be educating the community, and to be working with them, so that those trees aren’t ripped out or vandalised, because that has been happening quite frequently.” (Local Health District Representative)</p>

Key themes from focus groups	Description	Participant quotes (de-identified)
23.Collaboration	Some participants mentioned the need for a collaborative approach with councils/ architects/landscape architects/ engineers/planners/shade companies to enhance design quality of shade in playgrounds. Several participants mentioned the need to work closer and more collaboratively with professional/industry associations.	<p>“When we get tenders coming through, very often the tender is not very specific at all. It might just be a square on a drawing as an afterthought. So, very little thought has been put (into it)... not always, sometimes it’s fantastic and the architects and landscape architects come up with magnificently thought out structures that we’ve been asked to be involved in.” (Shade Manufacturer)</p> <p>“It’s about getting the right scope and it’s a partnership between policy makers, designers, managers, providers, installers, the whole lot.” (Landscape Architect)</p> <p>“I’m a strong advocate for detailed and collaborative design in the early stages.” (Shade Manufacturer)</p> <p>“I think the professional associations could get involved, Parks and Leisure Australia have several awards for different budgets for playgrounds, so maybe they could have some role in their awards program or education courses, that kind of thing.” (Design and Planning Professional)</p>
24.Schools and playgrounds	Participants commented schools require long term asset value from shade. In schools, shade areas also embrace all weather outdoor learning spaces, not just traditional notions of playground spaces. Participants commented that traditional shade structures such as sails are not funded due to fire/safety risks and not viewed as a long term ‘investment’.	<p>“ Considerations include the length of time that these schools are going to be there...Even though it may be more expensive... to start with, the life expectancy of solid structures compared to these shade sails (which do deteriorate quite fast with time) and the weather that they’re in, is of course, another consideration as well.” (School Infrastructure Professional)</p> <p>“A lot of the schools out in the new developed areas, they’re quite large spaces, so they’ve got massive areas of land to cover. It becomes an issue.” (Shade Manufacturer)</p> <p>“The heat aspect has got to affect learning as well. To have kids ultimately hot and bothered all the time when they come in from the playground, obviously it’s going to affect their learning as well.” (Shade Manufacturer)</p>

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