CPP WIND ENGINEERING CONSULTANTS

PEDESTRIAN WIND ASSESSMENT, RESPONSE TO SUBMISSIONS
CPP PROJECT 20269
9 APRIL 2026

164-194 William Street

Woolloomooloo, NSW

PREPARED FOR:

William St. Residential Pty. Ltd.
Suite 4, Level 8, 68, 14 Martin Place
Sydney, NSW 2000

John Fitzgerald
0421 721 702
jfitzgerald@rebelproperty.com

PREPARED BY:

Audrey Standfield
Graduate Engineer
astandfield@cppwind.com

Jordan Black
Project Engineer
jblack@cppwind.com

Graeme Wood, PhD
Senior Principal
gwood@cppwind.com

CPP Wind Engineering Consultants
2/500 Princes Highway
St Peters NSW 2044,
Australia

Info-syd@cppwind.com

cppwind.com

Executive Summary

This environmental wind assessment report has been prepared by CPP to accompany the proposed State Significant Development Application (SSDA) for a mixed-use infill affordable housing development at 164-172 and 174-194 William Street, Woolloomooloo. The site is made up of two (2) lots. The legal description of the site is outlined in Table 1.

Table 1: Legal Description

Property Address	Title Description
164-172 William Street, Woolloomooloo	Lot 52 in DP1049805
174-194 William Street, Woolloomooloo	Lot 1 in DP816050

The report was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-80211463) and has been updated to include additional testing and to address stakeholder feedback received in response to submissions.

This report concludes that the proposed development is suitable and warrants approval with no additional mitigation requirements over that incorporated in the current design to improve wind conditions and support their intended use.

A wind tunnel study of the development was conducted to assess the pedestrian wind environment within and surrounding the site. Measurements of winds likely to be experienced by pedestrians were combined with wind statistics and compared to wind comfort and safety criteria.

The wind tunnel testing was performed in a natural boundary layer wind tunnel of CPP. A model of the project was fabricated to a 1:300 length scale and centred on a turntable in the wind tunnel. Replicas of existing and approved surrounding buildings within a 430 m radius were constructed and placed on the turntable. Approach boundary layers representative of the environment surrounding the proposed development was established in the test section of the wind tunnel.

Measurements of winds likely to be experienced by pedestrians were made with a hot-film anemometer at 26 locations for 16 wind directions each. These points were tested around the development site focusing on pedestrian access routes, entries, and outdoor seating or recreation areas. The measurements were combined with site specific wind statistics to produce results of wind speed versus the percentage of time that wind speed is exceeded for each location.

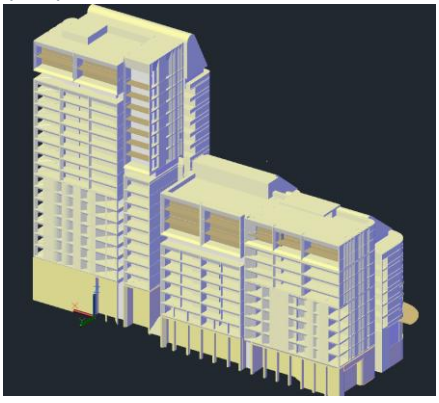
In general, the proposed site made little impact on wind conditions at specific locations around the site. From an equivalence perspective for pedestrian comfort, based on the average ratings in Table 6 for each of the configurations, the concept DA scheme provides a marginal improvement compared to existing wind conditions, the proposed SSDA scheme results in a slight worsening, and Uniform Uplift scheme produces conditions equivalent to the existing configuration. The average comfort classification is at the lower end of pedestrian walking in all configurations.

Wind conditions in the proposed Central Plaza area to the north of the site are comparable with other city parks, such as Belmont and Wynyard Parks. Locations in the park are rated as suitable for Pedestrian Sitting to Pedestrian Standing in all configurations tested. Location CP is an amalgam of directional results across all measured point in the parkland, demonstrating that for any wind direction there is at least one location in the park that has a pedestrian sitting classification. The proposed additional landscaping and screening would be expected to further improve the wind conditions in the park area.

Three locations on the south-west corner of the site exceeded the Lawson safety criterion in the existing configuration and rated for Able-Bodied pedestrians. With the inclusion of the proposed development, the safety wind conditions around this corner improved, with only two exceedances for the Concept DA configuration, and a single exceedance for the SSDA and Uniform Uplift configurations. All other locations passed the Lawson safety criterion.

Specific responses to DPHI queries are presented in Table 2.

Table 2: Response to DPHI

DPHI REQUEST	OUTCOME
Confirm "Configuration B' in the wind report is the approved concept envelope/development. Wind analysis should also compare against the blanket 30% uplift scheme to be consistent with the approach to analysis of other impact issues	In general, the proposed SSDA development (Configuration C) has little impact on the measured wind conditions in and around the site. From an equivalence perspective, compared with the existing conditions, the wind conditions in the concept DA, SSDA, and Uniform Uplift schemes (Configurations B, C and D respectively) were marginally improved, worsened, and produced the same conditions respectively. Amendments have been made to the development since wind tunnel testing of the SSDA design (Configuration C) in May 2025. From a wind perspective, the amended SSDA envelope is very similar to tested Configuration C, with the current proposed building on the corner of William and Forbes being one storey taller, and the William Street building being 1 story lower. Wind conditions for the current SSDA envelope would be expected to be similar to those tested in Configuration C and retesting of this configuiration is considered unnecessary. Additionally, wind mitigation measures have been incorporated within the Central Plaza to create localised calmer areas suitable for pedestrian sitting. With these measures in place, the SSDA scheme is expected to achieve wind conditions broadly equivalent to the existing configuration from an overall equivalence perspective. 
The Central Plaza achieves a comfort rating of "Pedestrian standing"	The measured wind conditions in the park without landscaping are similar to those experienced in Belmont and Wynyard Parks. The proposed mitigation measures incorporating vertical

which is a reduction in comfort compared with the "Pedestrian sitting" rating of the earlier comparative scheme. The proposal must consider further mitigation measures to maintain comfort for sitting.	screens between seating areas, and tree planting to the north of the plaza (Figure 9) would be expected to improve the wind conditions in the Central Plaza space. These measures are considered appropriate for achieving the desired outcome. The combined wind conditions in the Central Plaza are shown to be suitable for pedestrian sitting in the concept DA and Uniform Uplift schemes (Configurations B and D, respectively). With the proposed mitigation measures, Pedestrian Sitting is expected to be achieved in the Central Plaza for the SSDA design (Configuration C).
Prepare an updated wind assessment that addresses the rooftop communal open space areas and private open spaces. Demonstrate the proposal will achieve acceptable safety and comfort levels of these areas. Provide further plans/details and mitigation measures, as needed, to demonstrate that the wind conditions in these areas will provide comfortable conditions for the intended use of the spaces.	Rooftop testing was conducted on a flat roof in Configuration D to determine baseline results for use in predicting the conditions in the final configuration. The proposed roof layout (Figure 10 and Figure 11) includes a perimeter balustrade or parapet, landscaped zones and semi-enclosed areas. In addition, roof articulation to the south and the plant/lift overrun would provide shielding from certain wind directions, increasing the proportion of time that the rooftop open spaces are suitable for resident use. For the rooftop private terraces, the proposed parapet height is 1.1 m. For the West building communal terrace, the combined perimeter screening height is 1.9 m (Figure 12). The expected wind comfort on the rooftop areas of the final design is anticipated to range from Pedestrian Sitting in the semi enclosed spaces and more sheltered southern areas, to Pedestrian Walking near the northern edges. These conditions are typical for rooftop environments and is considered appropriate for the proposed development. Calm areas, suitable for sitting, are expected to be available for most wind directions. The rooftop terrace areas of the final design are expected to satisfy the Lawson safety criteria.

Document Tracking and Version Control

REVISION	RELEVANT INFORMATION	
R00	Date Issued:	29 October 2024
	Prepared by:	Tomer Libman
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R00.pdf
R01	Date Issued:	28 May 2025
	Prepared by:	Tomer Libman
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R01.pdf
R02	Date Issued:	8 August 2025
	Prepared by:	Tomer Libman
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R02.pdf
R03	Date Issued:	18 August 2025
	Prepared by:	Graeme Wood, PhD
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R03.pdf
R04	Date Issued:	3 March 2026
	Prepared by:	Audrey Standfield
	Reviewed by:	Jordan Black
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R04.pdf
R05	Date Issued:	3 March 2026
	Prepared by:	Jordan Black
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_180 William Street_REP_PW_R05.pdf
R06	Date Issued:	11 March 2026
	Prepared by:	Jordan Black
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Graeme Wood, PhD
	Document Name:	CPP20269_164-194 William Street_REP_PW_R06.pdf

R07	Date Issued:	1 April 2026
	Prepared by:	Jordan Black
	Reviewed by:	Graeme Wood, PhD
	Approved by:	Joe Paetzold, PhD
	Document Name:	CPP20269_164-194 William Street_REP_PW_R07.pdf
R08	Date Issued:	9 April 2026
	Prepared by:	Jordan Black
	Reviewed by:	Joe Paetzold, PhD
	Approved by:	Joe Paetzold, PhD
	Document Name:	CPP20269_164-194 William Street_REP_PW_R08.pdf

Contents

1. Introduction

STANDARD CONSULTANT TEXT

CPP has been commissioned by William Street Residential Pty. Ltd. to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD-80211463) for the proposed mixed-use infill affordable housing development at 164-172 and 174-194 William Street Woolloomooloo. This is an amended report in response to DPHI feedback including additional testing and additional commentary.

Following the Design Excellence Competition, the scheme has been revised to include In-fill Affordable Housing (IAH) in line with the NSW Government's policy under the *State Environmental Planning Policy (Housing) 2021 (Housing SEPP)*. This policy allows for a 30% increase in Floor Space Ratio (FSR) and building height when 15% of the total FSR is provided as affordable housing for 15 years. The proposed development meets these criteria and is eligible for the bonus uplift.

Given the residential component's Capital Investment Value (CIV) exceeds $75 million, an SSDA pathway can be taken. The proposal retains key design principles recommended by the Design Excellence Panel and aims to provide additional residential dwellings with a 30% increase in GFA and building height, in accordance with the Housing SEPP.

The purpose of the project is to facilitate the delivery of a high-quality mixed-use development containing residential and retail uses as well as a centrally located park, public domain improvements and improved through-site connectivity at a strategically located site. The proposal seeks to deliver a built form outcome that responds appropriately to its location on William Street in Woolloomooloo and in close proximity to Kings Cross Station and the Sydney CBD. Furthermore, the proposed scheme seeks to deliver an outcome that is consistent with the desired and evolving character of the Woolloomooloo and Potts Point area.

This report has been prepared in response to the requirements contained within SEARs dated 21 February 2025 and the letter from the City of Sydney dated 11 November 2025, issued for SSD-80211463. Specifically, this report has been prepared to respond to the SEARs requirement issued in Table 3 and paragraph 11, 'Wind Comfort' in the letter.

Table 3: SEARs Requirements

Item	Description of Requirement	Section Reference (this Report)
7. Environmental Amenity	Assess amenity impacts on the surrounding locality, including... **wind**... impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated.	Section 3 (Results)
23. Public Space	If public space is proposed as part of the development, demonstrate how the development: ... • maximises the amenity of public spaces in line with their intended use, such as through adequate facilities, solar access, shade and **wind** protection...	Section 3 (Results)

The site is located at 164-172 and 174-194 William Street Woolloomooloo within the City of Sydney LGA, Figure 1. The site is comprised of multiple allotments and is legally described as:

- 164-172 William Street, Woolloomooloo Lot 52 in DP1049805, and
- 174-194 William Street, Woolloomooloo Lot 1 in DP816050.

The land size totals 6,398 m^2 and consists of a southern frontage to William Street, an eastern frontage to Dowling Street, a western frontage to Forbes Street and northern frontage to Judge Lane, Figure 2.

The immediate urban context surrounding the site is characterised by a mix of medium density residential, commercial, and retail uses. The site is in close proximity to Hyde Park, The Domain, and Rushcutters Bay Reserve. There are a number of educational and health services in proximity to the site, providing ample infrastructure support for the community.

William Street, to which the site fronts, is a classified road providing connection between the Eastern Suburbs of Sydney and the CBD. Vehicle access is currently provided from six points on the site from Judge Lane, Forbes Street, and Dowling Street. Pedestrian access to the site is currently available from all frontages.

The site is highly accessible to both bus and rail services, being approximately 300m away from Kings Cross Railway Station and having direct access to bus services on William Street that provide connections through the Metropolitan Transport Network.

At the time of lodgement, the site is improved by a warehouse style structure and glass office building to the site's frontage and an at-grade private carpark to the northwestern portion of the site.

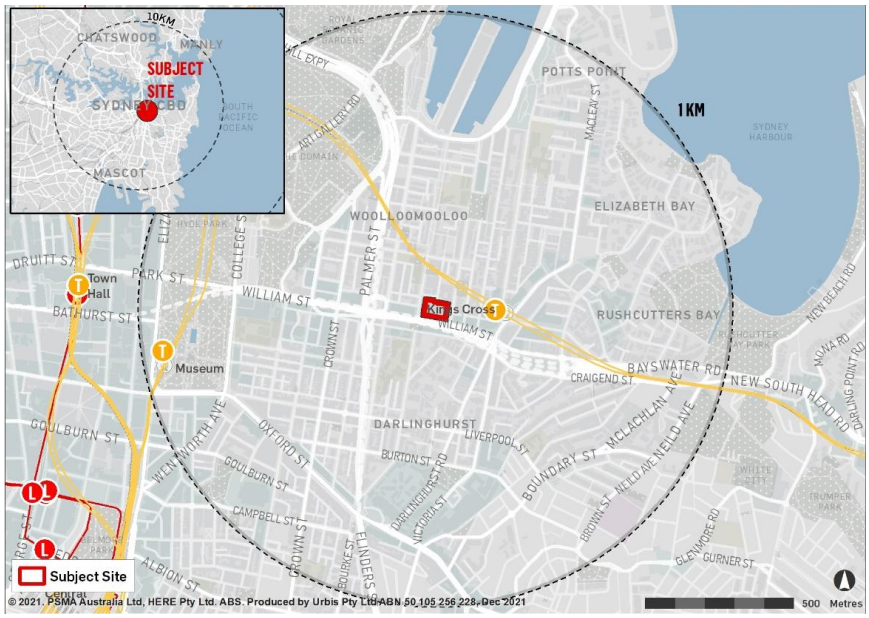


Figure 1: Local Context

Figure 2: The Site

GENERAL INFORMATION

Pedestrian wind studies are conducted to investigate pedestrian comfort and safety in and around developments. This assessment of the wind environment around developments can inform designers about the suitability of outdoor areas for their intended uses. Where necessary, design modifications can be made, or intervention measures added to mitigate areas with the potential for excessive wind speeds.

This report contains information regarding the local wind climate analysis, wind tunnel testing and analysis procedures, a discussion of the test results, and recommendations to improve wind conditions in areas where any adverse wind conditions may be identified. The test parameters and configurations are summarised in Table 4.

All data collection was performed in accordance with the guidelines of the Australasian Wind Engineering Society (2019), and the American Society of Civil Engineers (1999, 2021). While analytical methods such as Computational Fluid Dynamics (CFD) have some utility in the field of pedestrian wind comfort, they are not yet capable of reliably and accurately predicting gust wind speeds for assessment of wind conditions from a safety perspective.

Table 4: Wind Tunnel Test Parameters

SUMMARY OF TEST PARAMETERS	
GENERAL INFORMATION	
Model Scale	1:300
Surrounding Model Radius (full scale)	430 m
Approach Terrain Category	Open Country/Water approach (0° – 67.5°) Built-up environment approach (90° – 337.5°)
ENVIRONMENTAL WINDS STUDY	
Number of test locations	26
Reference height (full scale)	150 m
TEST CONFIGURATION(S)	
Configuration A	Site and surroundings as they currently exist and any/all approved or under construction developments within the modelled test radius as shown in Figure 3 (top left).
Configuration B	Configuration A with the concept DA scheme, as shown in Figure 3 (top right).
Configuration C	Configuration A with the SSDA Scheme, as shown in Figure 3 (bottom left)
Configuration D	Configuration A with the Uniform Uplift scheme, as shown in Figure 3 (bottom right).

2. Methodology

WIND TUNNEL MODEL

The anticipated wind conditions around the project site were evaluated through wind tunnel testing of a 1:300 scale model of the development and surrounding area. This scale allowed for an adequate portion of surrounding developments and terrain to be included within an approximately 430 m radius of the site and all the relevant building details to be modelled accurately. The boundary-layer wind conditions beyond the modelled area were appropriately simulated in one of CPP's wind tunnels (see Appendix A). The models were mounted on the turntable, located near the downstream end of the wind tunnel test section, allowing rotation of the modelled area for examination of wind speeds from any approach wind direction.

Photographs of the test and surrounds models installed in the wind tunnel are given in Figure 3.

MEASUREMENT POINTS

For this study, wind speed measurements were recorded at various locations to evaluate pedestrian wind comfort and safety in and around the project site, as presented in Figure 5. For configuration A, the existing site, 18 locations were tested, for configurations B and C, 24 locations were tested, and for Configuration D, the 30% uniform uplift scheme, 26 locations were tested, including the roof.

Wind speed measurements were made at the model scale equivalent of 1.5 to 2.1 m above the surface for 16 wind directions at 22.5° intervals. Locations were chosen to determine the degree of pedestrian wind comfort and safety at building corners where relatively severe conditions are frequently found, near building entrances and passageways, at outdoor recreation areas and terraces.

The hot-film signal was sampled for a period corresponding to one hour in full scale. All velocity data were digitally filtered to obtain the two to three second running mean wind speed at each point; this is the basis for the various acceptability criteria. These local wind speeds, U, were normalised by the tunnel reference velocity, U_{ref}. Mean and turbulence statistics were calculated and used to calculate the normalised effective peak gust using:

$$\frac{U_{pk}}{U_{ref}} = \frac{U + g_f . U_{rms}}{U_{ref}},$$

Where the peak factor g_f is equal to 3 for a 3-second gust, and 3.6 for a 0.5-second gust.

The mean and gust equivalent mean wind speeds relative to the free stream wind tunnel reference wind speed (wind speed ratio) at a full-scale elevation of 150 m are plotted in polar form in Appendix B. The graphs show the directional magnitude of the wind speed ratio from where the wind was blowing from. The polar plots aid in visualisation of the effects of the nearby structures or topography, the relative significance of various wind azimuths, and whether the mean or gust wind speed is of greater importance.

The measured local wind speeds were combined with wind climate data described in the following section to allow assessment of the pedestrian wind environment.

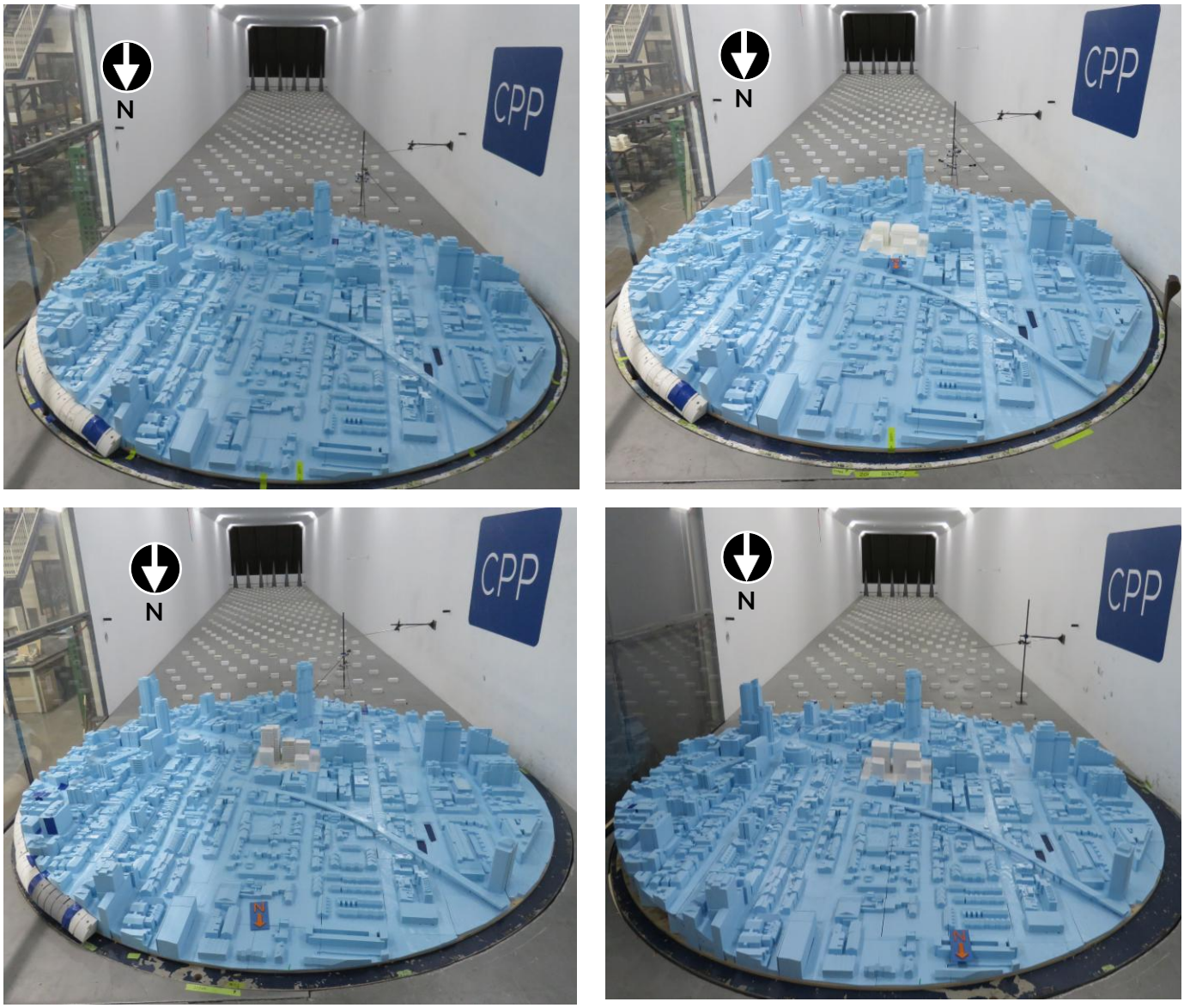


Figure 3a: Photographs of Wind Tunnel Test and Surrounds Model looking south – Configurations A (top-left), B (top-right), C (bottom-left), and D (bottom-right)

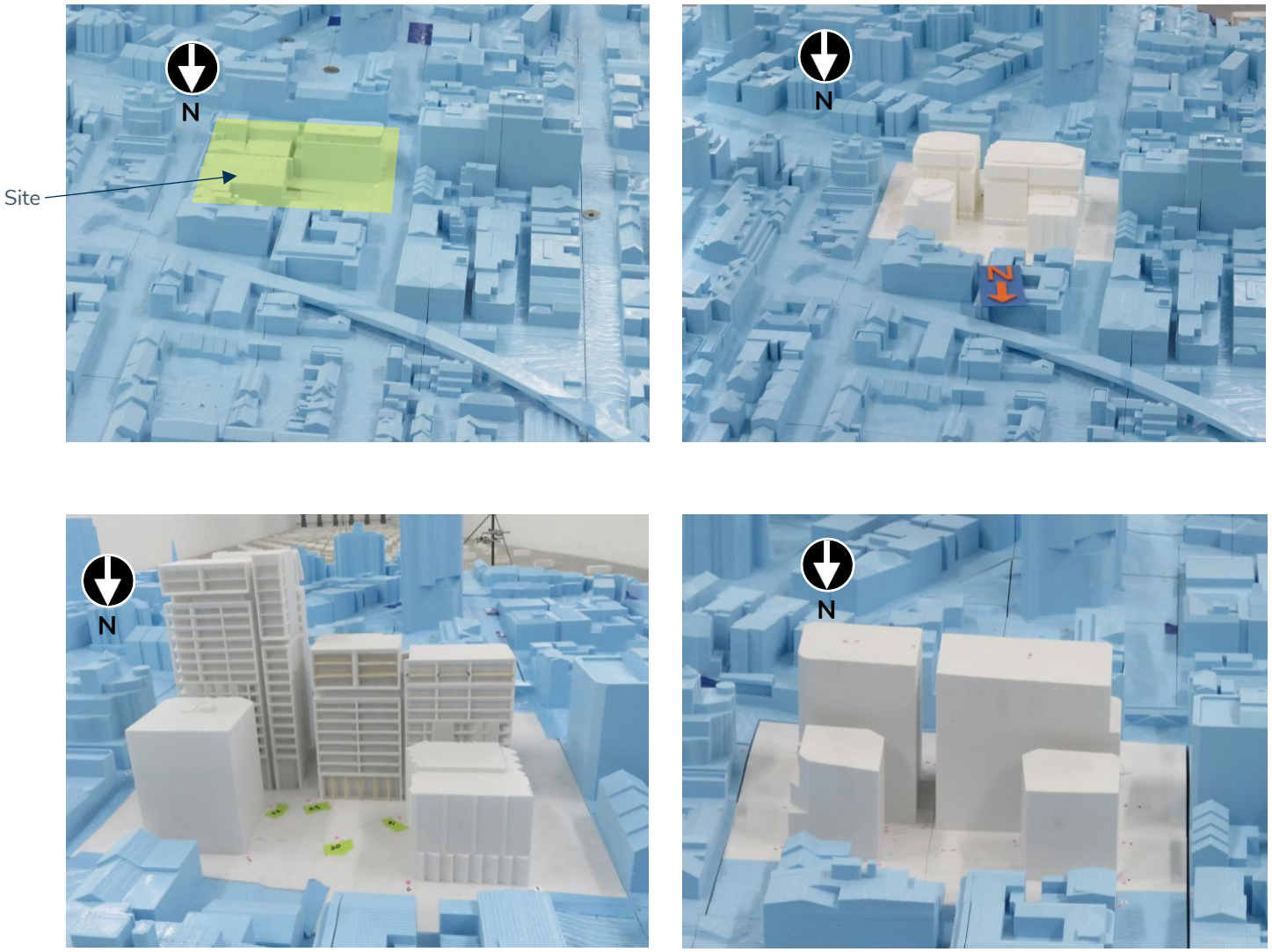


Figure 3b: Photographs of Wind Tunnel Test Model, Configurations A (top-left), B (top-right), C (bottom-left), and D (bottom-right)

WIND CLIMATE

The measured wind speed data were normalized to an approach reference wind speed and then combined with a climatological model (wind frequency and direction) derived from data measured at a standard height of 10 m at Sydney International Airport. The project site is located approximately 10 km to the north-north-east of the anemometer that provides the best source of historical wind data for the project.

The measured data are portrayed in the wind rose in Figure 4. The arms of the wind roses point in the direction from where the wind is blowing from, the width and colour of the arm represent the wind speed, and the length of the arm indicates the percent of the time that the wind blows for that combination of speed and direction. These data were then adjusted to the site location using an analytical method to account for the exposure of the project site for each direction.

The distribution and frequency of winds on an annual basis were analysed to assess the project with regards to wind comfort and safety. As can be seen from the wind rose in Figure 4, winds from the north-east, south, and north-west quadrants are predominant. The locations tested around the development site may be susceptible to winds from these directions, depending on the relative position of the location tested to the geometry of the proposed development and surrounds.

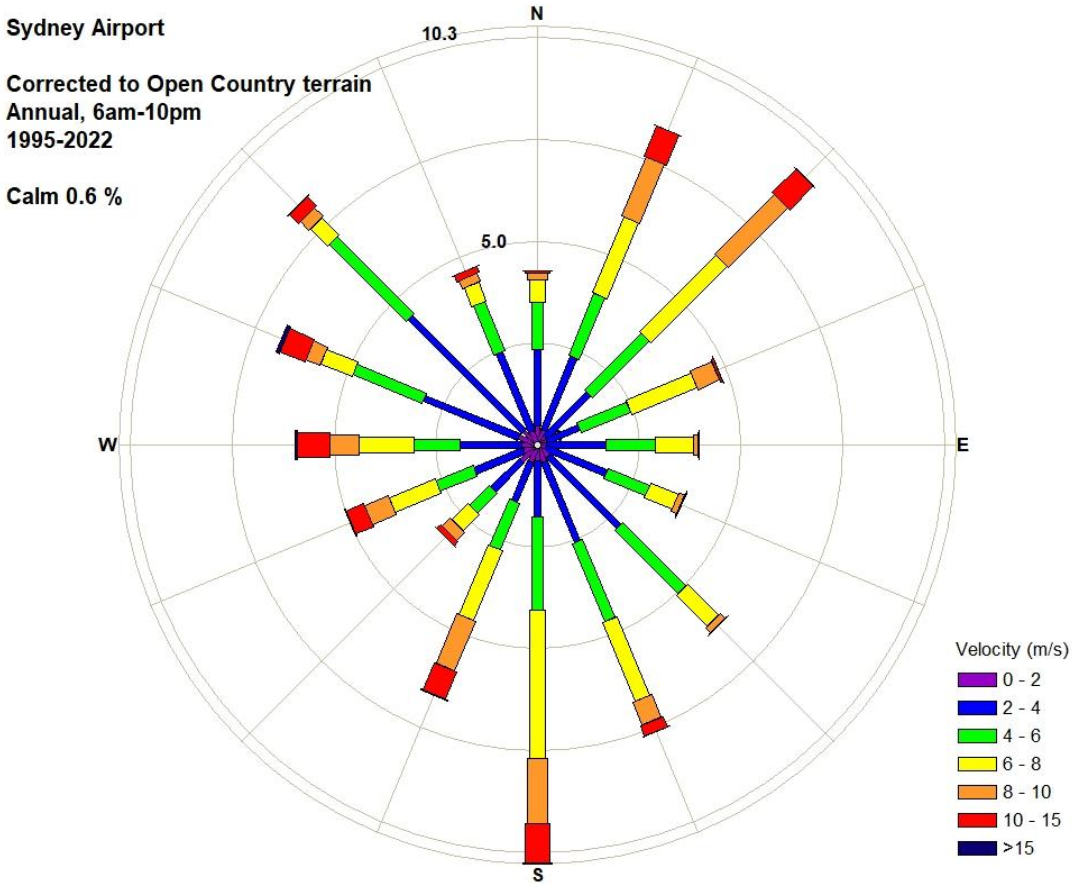


Figure 4: Probability of Wind Speeds by Direction – Sydney International Airport

WIND ASSESSMENT CRITERIA

To enable a quantitative assessment of the wind environment, the wind tunnel data and climatological model are combined to calculate wind speeds for comparison with pedestrian wind comfort and safety criteria at each test point.

A number of researchers have suggested quantitative methods for assessing wind comfort and safety based on wind tunnel data and local climate statistics. CPP uses a modified form of the widely-accepted pedestrian-level wind criteria developed by Lawson (1990). Lawson's criteria are divided into separate categories of comfort and distress (safety). The comfort criteria allow planners to assess the usability, with respect to the wind environment, of different locations for various purposes, such as for long-duration activities (e.g., sitting at an outdoor café) or strolling on walkways.

Lawson's criteria are based on wind speeds exceeded 5% of the time, and are described as categories for comfort ranging from 'Pedestrian Sitting' to 'Business Walking', allowing planners to judge the usability of locations for various intended purposes. The criteria also include a distress rating, for safety assessment, which is based on occasional (once or twice per year) wind speeds, to identify locations where wind speeds may be hazardous to pedestrians.

The categories and criteria are specified in Table 5.

Table 5: Wind Comfort and Safety criteria (after Lawson, 1990)

COMFORT RATING	U_{EQUIV}*	DESCRIPTION
Dining**	≤2 m/s	Calm / light breezes suitable for outdoor restaurant uses, seating areas.
Sitting	>2-4 m/s	Calm or light breezes suitable for long duration seating areas, and other amenities.
Standing	>4-6 m/s	Gentle breezes suitable for sitting for shorter periods, main entrances and bus stops where pedestrians may linger.
Pedestrian Walking	>6-8 m/s	Moderate winds appropriate for window shopping and strolling along a downtown street, or park.
Business Walking	>8-10 m/s	Relatively high speeds that can be tolerated if one's objective is to walk, run, or cycle.
Uncomfortable	>10 m/s	Strong winds unacceptable for all pedestrian activities; wind mitigation is typically required.

*U_{Equiv} = Max (U_{Mean}, U_{Gust} / 1.85), based on an annual exceedance of 5% (~8 hours / week) assessed over all hours.
** For regular outdoor dining, and in semi-enclosed spaces, it has been the experience of CPP that the comfort rating of Sitting may be windier than desired and a comfort criterion of 2 m/s or less may be more applicable.

SAFETY RATING		U_{EQUIV}*	DESCRIPTION
○	Pass	≤15 m/s	Meets wind safety criterion.
○	Able-Bodied	>15-20 m/s	Acceptable where only able-bodied people would be expected; not acceptable for frail persons or cyclists
○	Fail	>20 m/s	Excessive wind speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is often required.

* U_{max} = Max (U_{Mean}, U_{Gust} / 1.85), based on an annual exceedance of 0.022% (~2 / year or 1 / season) assessed over all hours.

Pedestrians' perception of wind can often be subjective and vary depending on regional difference in wind climate and thermal conditions, as well as by individual. Calibration to the local wind environment should be taken into account when evaluating predicted wind comfort conditions. Note that the ratings of 'Uncomfortable' and 'Safety' are the words of the published wind criteria and applicability may vary by project and location.

3. Results

A summary of the assessed comfort and safety ratings for each test location is given in Table 6. The results of the study are graphically presented in Figure 5 and Figure 6 in which measurement locations are displayed on a site plan and colour coded to denote the predicted wind comfort and safety rating. The number (XX.Y) combines the location identifier (XX) and the test configuration (.Y): XX.1 existing, XX.2 concept DA, XX.3 SSDA, and XX.4 Uniform Uplift. As well as location CP under Configurations B, C and D, which represents a combination of the Central Plaza test locations from various wind directions to provide an overall average rating for the area allowing pedestrians to select a seating location depending on the current wind conditions. The central and outer ring colours indicate the comfort rating and safety rating respectively.

From the cumulative wind speed distributions for each location, the percentage of time each of the Lawson comfort rating wind speeds are exceeded are presented in tabular form under the polar plots in Appendix B. These plots include directional criterion lines for the Lawson comfort levels to provide additional information regarding directional sensitivity at each location.

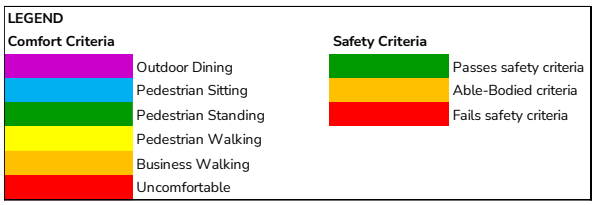
In general, wind conditions comfortable for Sitting and Standing are considered appropriate for areas such as entrances where pedestrians are likely to gather for longer durations, while wind conditions comfortable for Pedestrian Walking are more appropriate for sidewalks where pedestrians are actively in transit. Locations rated as Uncomfortable are generally less suitable for most pedestrian activities and wind control solutions are often sought. Whether mitigation is needed at a location depends upon the intended pedestrian use of the location. Although conditions may be classified as acceptable, there may be certain wind directions that cause regular strong events.

Satisfaction of the safety rating is generally required for areas accessible to the general public. A rating of 'Able-Bodied' may be acceptable for areas with managed access or where pedestrians are unlikely to be present under adverse conditions. Mitigation measures are generally required to address any locations deemed to fail the safety assessment.

Table 6: Summary of wind comfort and safety assessment results

Description / Location		Wind Tunnel Results							
		Comfort rating, 5% exceedance wind speed (m/s)				Safety rating, 0.022% exceedance wind speed (m/s)			
		Configuration				Configuration			
		Existing	Concept DA Scheme	SSDA Scheme	Uniform Uplift Scheme	Existing	Concept DA Scheme	SSDA Scheme	Uniform Uplift Scheme
		XX.1	XX.2	XX.3	XX.4	XX.1	XX.2	XX.3	XX.4
Surrounds	1	4.3	4.6	4.3	4.4	8.7	9.6	8.7	9.5
	2	10.4	9.8	10.0	8.8	18.9	19.4	18.7	16.0
	3	6.9	6.0	5.7	5.3	12.2	11.3	10.9	10.8
	4	6.8	6.2	6.1	6.2	13.0	10.7	10.9	10.4
	5	4.0	4.4	5.2	5.3	6.9	8.0	9.3	9.6
	6	5.3	5.2	4.9	4.8	9.8	10.0	4.9	9.4
Site Edges	7	4.8	5.1	4.3	4.4	8.5	9.3	7.8	7.7
	8	5.5	6.5	5.7	6.9	10.4	12.2	10.2	12.6
	9	5.5	6.7	7.2	6.0	9.8	12.4	13.6	12.8
	10	8.2	8.0	8.2	7.9	16.6	15.5	14.4	14.8
	11	7.9	7.1	7.7	7.1	15.2	12.9	13.6	14.1
	12	7.0	6.8	5.3	5.8	13.7	14.0	11.7	12.6
	13	6.0	6.0	7.6	6.6	12.0	11.3	14.7	12.2
	14	5.4	5.0	5.3	5.7	11.6	11.1	11.1	12.8
	15	7.1	6.7	6.5	7.4	14.4	11.5	14.4	12.8
	16	6.8	4.9	6.3	5.9	13.4	8.6	11.5	10.8
	17	5.4	6.6	6.6	6.7	9.2	12.5	12.6	14.0
	18	5.0	5.5	6.6	7.1	8.8	9.7	12.9	13.5
Central Plaza	19		4.0	5.3	4.9		7.3	9.7	9.6
	20		3.3	5.1	4.7		6.8	9.9	10.2
	21		4.2	4.7	4.0		8.3	8.6	7.4
	22		3.6	4.4	4.1		8.8	8.3	8.6
	23		3.9	5.1	4.5		7.1	9.0	8.3
	24		5.4	5.2	5.5		10.1	9.1	10.8
	CP		3.2	4.2	3.7				7.8
Roof	25				8.5				16.1
	26				7.5				15.1
Average (1-18, -6)		6.3	6.2	6.4	6.3				

*Note: Roof locations were measured on a flat roof without any amelioration such as balustrades or landscaping.



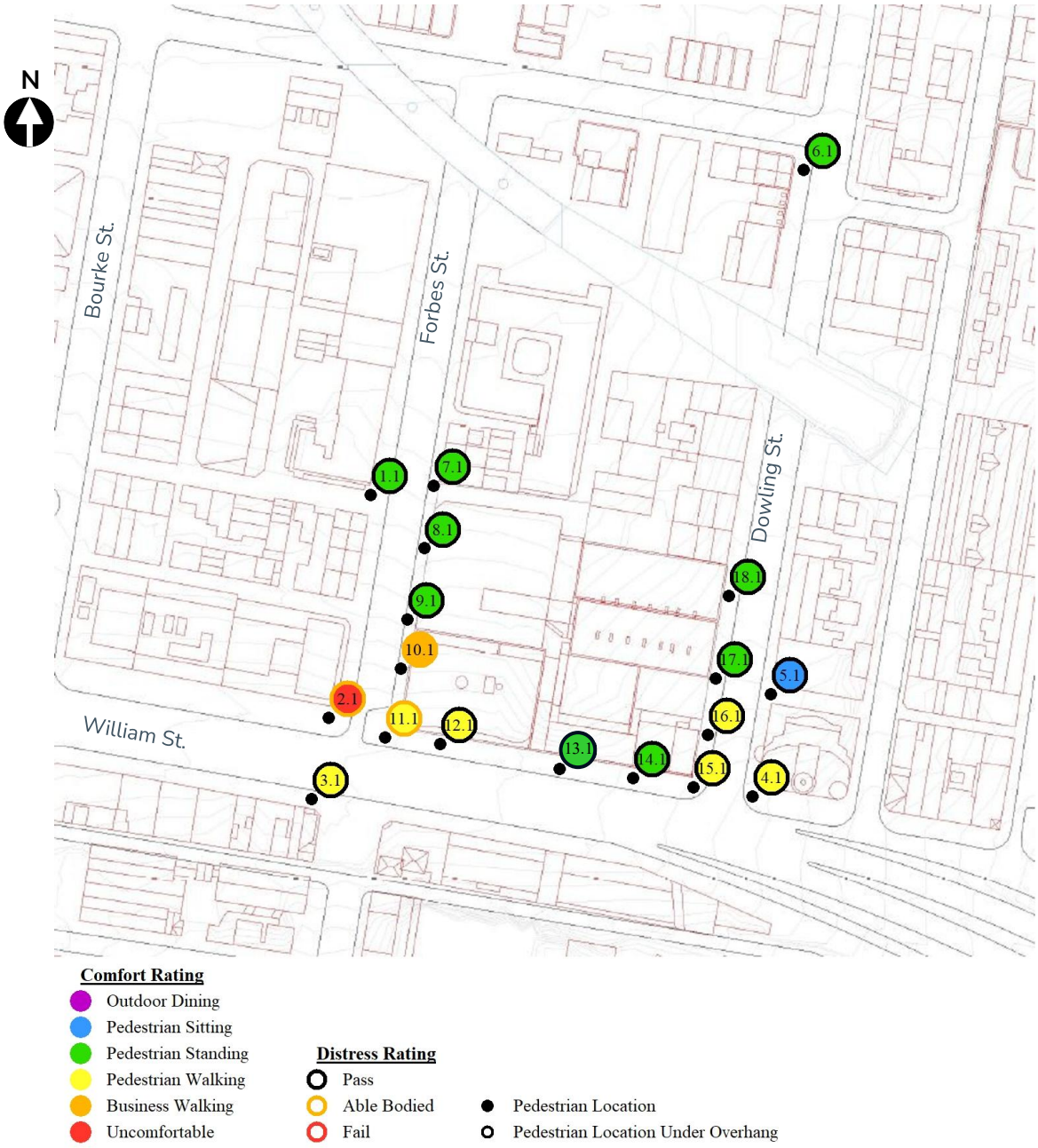


Figure 5: Pedestrian wind speed measurement locations with comfort/safety ratings – Existing Site (Configuration A)

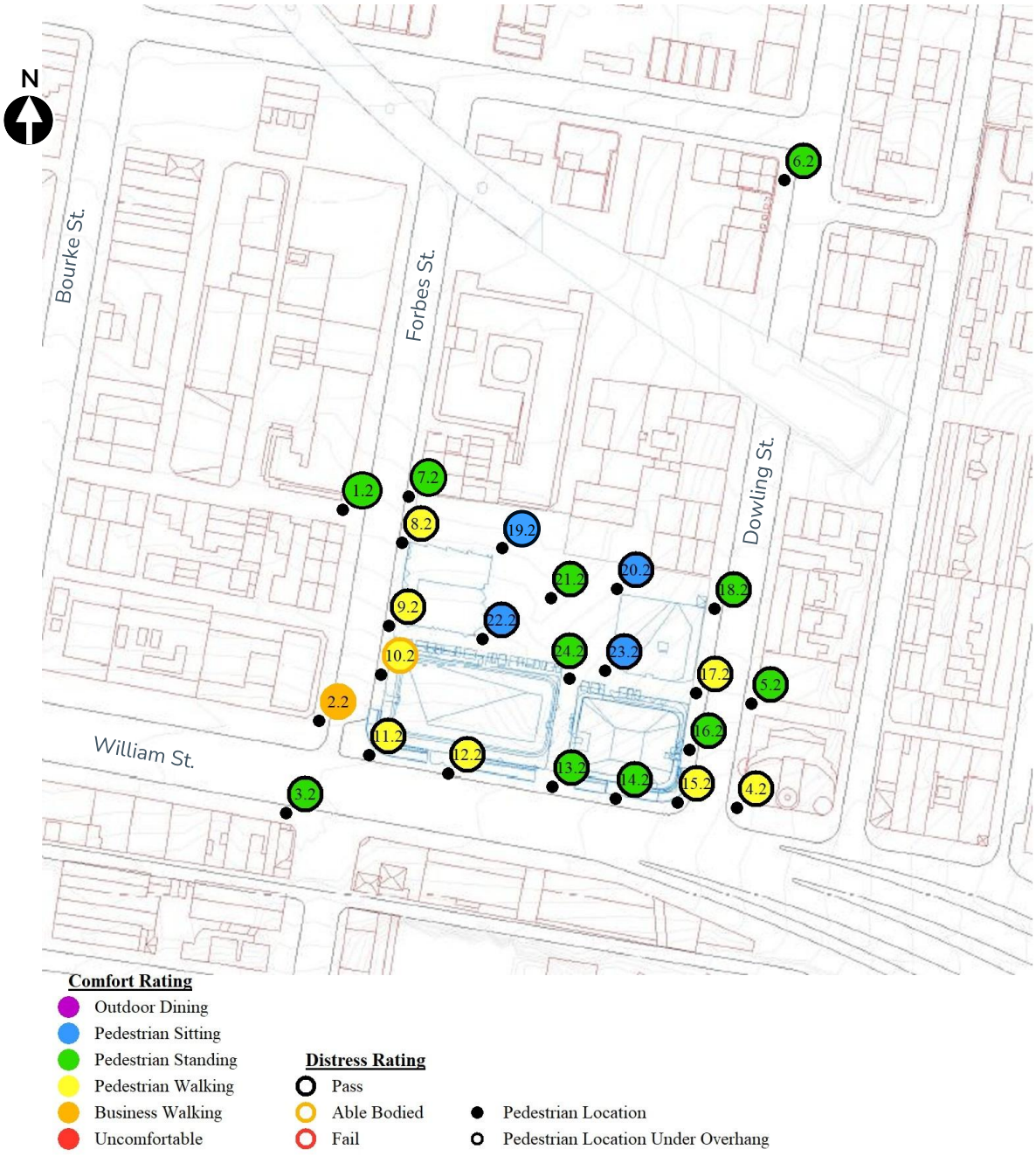


Figure 6: Pedestrian wind speed measurement locations with comfort/safety ratings – Concept DA (Configuration B)

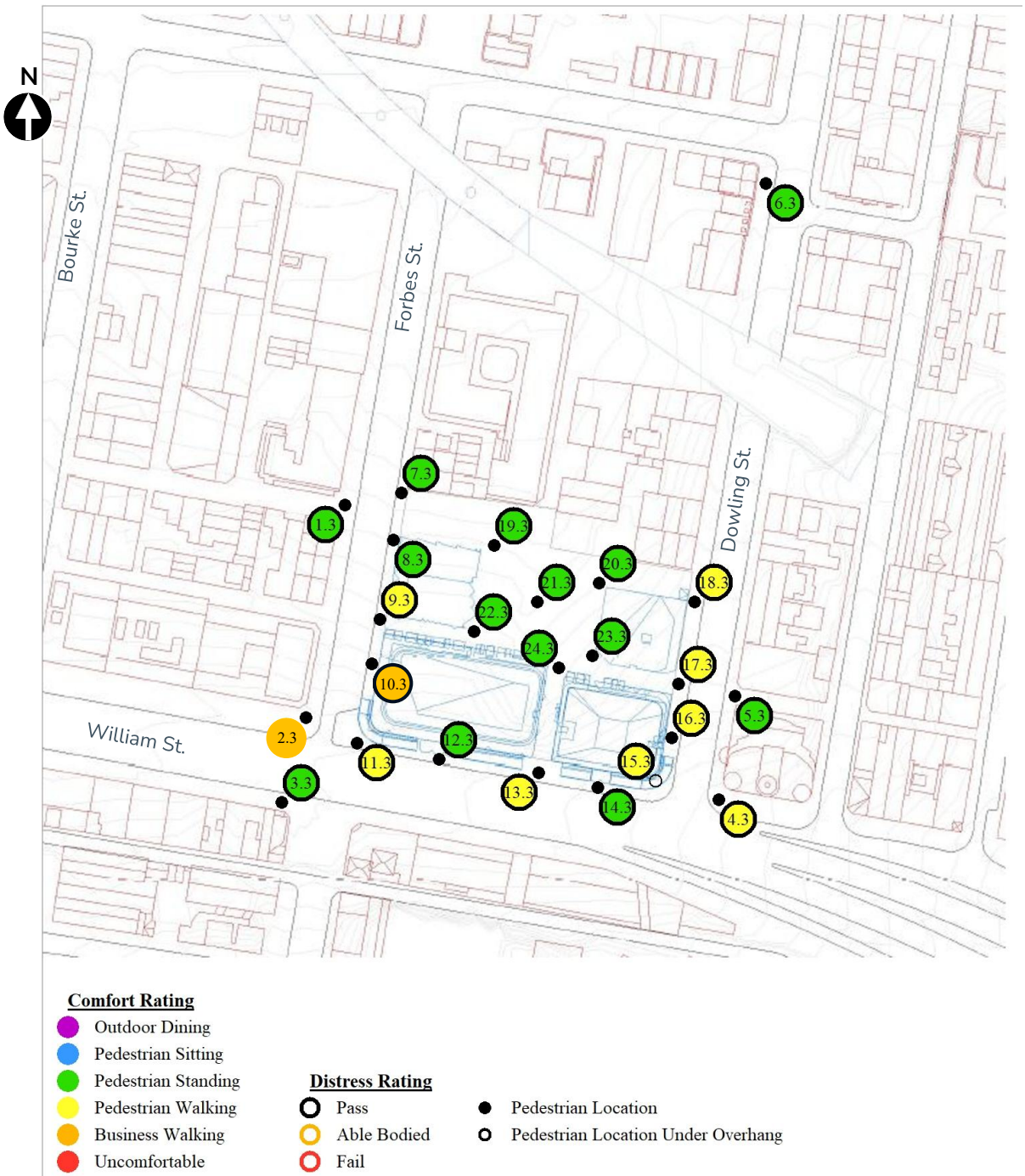


Figure 7: Pedestrian wind speed measurement locations with comfort/safety ratings – SSDA Scheme (Configuration C)

Figure 8: Pedestrian wind speed measurement locations with comfort/safety ratings – Uniform Uplift (Configuration D)

4. Discussion

GENERAL CONDITIONS

Pedestrian level winds in Sydney tend to be governed by exposure to prevailing winds from the north-east, south, or west. In general, slightly stronger local winds are found near street block corners, or in more open areas such as large parks, while milder areas are available where nearby buildings can provide shielding from these prevailing wind directions.

For all configurations, in the street-level areas surrounding the site (Locations 1-6, Figure 5 to Figure 8) comfort conditions are generally classified as suitable for Pedestrian Standing or Pedestrian Walking with the exception of Location 2, which is classified as Uncomfortable under the existing site and as Business Walking for the DA, SSDA and Uniform Uplift configurations. The high wind speeds at Location 2 are caused by the large building massing on William Street between Forbes and Bourke Streets to the immediate west of the site. From an equivalence perspective, compared with the existing configuration, wind conditions in the surrounding areas are improved in the concept DA, SSDA, and Uniform Uplift schemes (Configurations B, C, and D).

The proposed site has little measurable impact on the wind classifications in the surrounding area.

Location 2 exceeds the Lawson safety criterion, recording an Able-Bodied rating in all configurations.

SITE PERIMETER

The comfort and safety ratings along Forbes, William, and Dowling Streets, Locations 7 to 18, are presented in Figure 5 to Figure 8. In general, the wind conditions are similar to the surrounding areas being classified as suitable for Pedestrian Standing or Walking. In general, the proposed SSDA development makes little difference to the wind conditions around the site edges, with the exception of Locations 9, 13, 17, and 18. These locations are at the ends of new pedestrian thoroughfares in transient areas. In these cases, the proposed development tends to increase the local wind speed through pressure-driven flow along the laneways during winds from the north-east. These winds are temperature driven and typically occur on summer afternoons and can provide some thermal comfort. At these locations, the Lawson wind comfort classification changes from Pedestrian Standing to Pedestrian Walking, hence the measured comfort conditions are considered suitable for the intended use of the space. The windier locations would only be experienced at the laneway entrance and not in the approaching areas. All of these locations pass the safety criterion.

At Locations 10 and 11, strong wind conditions are caused by winds from the south-west quadrant being channelled along William Street by the existing buildings and accelerating into Forbes Street. Wind conditions improve in Configurations B and D for comfort and safety (particularly Location 10), due to the shielding offered to winds from the south-west by the awning along the corner of William Street and Forbes Street, as well as the building massing for winds from the north-east. In Configuration C, wind comfort ratings at Locations 10 and 11 are equivalent to the existing configuration, with the larger building massing creating slightly stronger wind conditions for winds from the north by channelling the flow through Forbes Street concentrated at ground level. In Configurations B and D, Location 10 and 11 are classified as suitable for Pedestrian Walking. In configurations A and C, Location 10 is classified as Business Walking and Location 11 is rated Pedestrian Walking.

From a safety perspective, Location 10 is classified as Able-Bodied in the existing configuration and the Concept DA scheme (Configuration B), while Location 11 marginally exceeded the safety criterion in the

existing configuration. These locations satisfy the safety criteria in both the SSDA and Uniform Uplift scenarios.

CENTRAL PLAZA

Wind conditions within the open Central Plaza, to the north of the site, are shown in Figure 6 to Figure 8 (Locations 19-24). Wind comfort levels in this region are milder than in the surrounding area, due to shielding from the courtyard massing of the proposed development. The comfort classification for Configuration B is between Pedestrian Sitting and Pedestrian Standing. The increased height of the south-eastern building in Configuration C increases flow into the plaza, with comfort classifications as suitable for Pedestrian Standing. The reduction in height of the south-eastern building and increase in height of the south-western building for Configuration D, reduced the overall wind speeds for the central plaza compared to Configuration B, however comfort classification for all locations remain similar and are generally rated suitable for Pedestrian Standing. On average, for locations within the central plaza area, the SSDA and Uniform Uplift schemes meet the wind speed associated with the Siting comfort rating approximately 88% and 90% of the time respectively.

For configurations B to D, location CP was included, which combined all the locations in the Central Plaza (19-24) into one using the minimum wind speed in each direction for these locations. This is considered appropriate for a public park where pedestrians would select a location based on the environmental conditions. The wind conditions of the combined location were classified as suitable for Pedestrian Sitting, for Configurations B and D, indicating that there would be somewhere in the park with milder conditions regardless of incident wind direction.

All locations pass the Lawson safety criterion.

Testing was conducted without landscaping. Wind mitigation for seating areas within the Central Plaza region is proposed in the form of vertical screens between seating areas, and landscaped areas as outlined in Figure 9. Appropriately designed, these measures would have a significant benefit to the local wind conditions to create localised calm areas suitable for longer-term stationary activity meeting the Sitting classification.

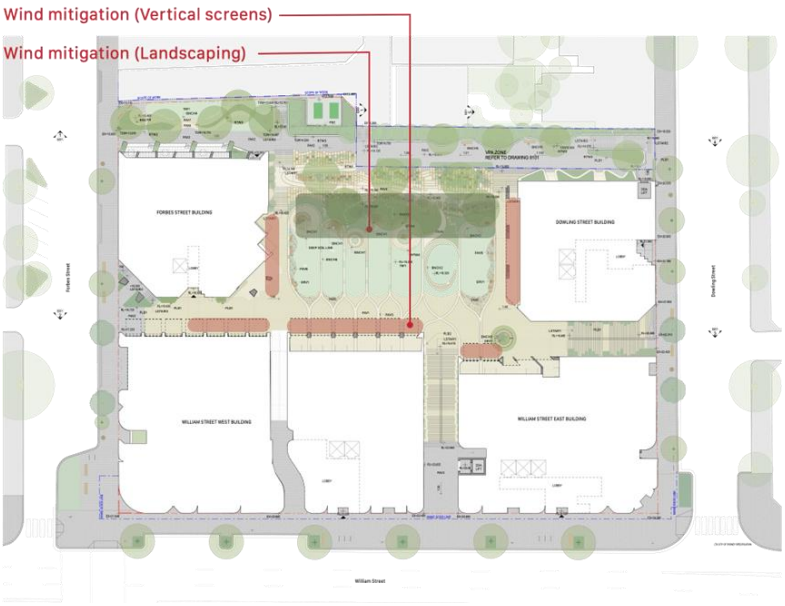


Figure 9: Public domain plan – Outdoor seating zones, with wind mitigation strategy outlined

ROOF

Wind conditions at representative locations on the rooftops of the southern towers in Configuration D were tested to assess the general usability of these spaces (Locations 25 and 26). These areas were taken on the flat roof without any amelioration such as balustrades or landscaping. Pedestrian wind comfort is classified as suitable for Pedestrian Walking on the south-west tower, and Business Walking on the south-east tower. Both locations exceed the Lawson safety criterion and are assessed as Able-Bodied.

These roof locations are subject to strong winds due to their elevation and exposure to winds from most directions. To ensure a level of amenity suitable for longer term stationary activity, high perimeter balustrades (at least 1.8 tall) as well as partial enclosure of portions of these terraces would be necessary. Local treatments such as cabana-type structures, sunken or booth style seating, screening with solidity greater than 70%, and landscaped zones are encouraged and developed through detailed design to provide an improved wind environment in the communal rooftop areas.

The proposed roof layout and landscaping plan is shown in Figure 10 and Figure 11 and includes a perimeter balustrade or parapet, landscape zones and semi enclosed areas. In addition, roof articulation to the south and the plant/lift overrun would provide significant shielding from certain wind directions, increasing the proportion of time that the rooftop open spaces are suitable for resident use. The private rooftop terrace areas include perimeter landscaping and a 1.1 m parapet. The West building communal terrace incorporates a 0.7 m planter with a 1.2 m balustrade above, providing a combined perimeter screening height of approximately 1.9 m (Figure 12). Wind conditions on the West building communal terrace are expected to be suitable for the intended use. On the private terraces, wind conditions are expected to be acceptable for most wind directions. If, following completion and occupation, wind conditions on the private terraces are found to be strong for a significant proportion of the time, the addition of a 1.2 m balustrade above the existing 0.7 m planter, consistent with the West building communal terrace, could be considered as a mitigation measure.

Similar wind conditions are anticipated for Configurations B and C, and the mitigation recommendations outlined above are equally applicable to these configurations.

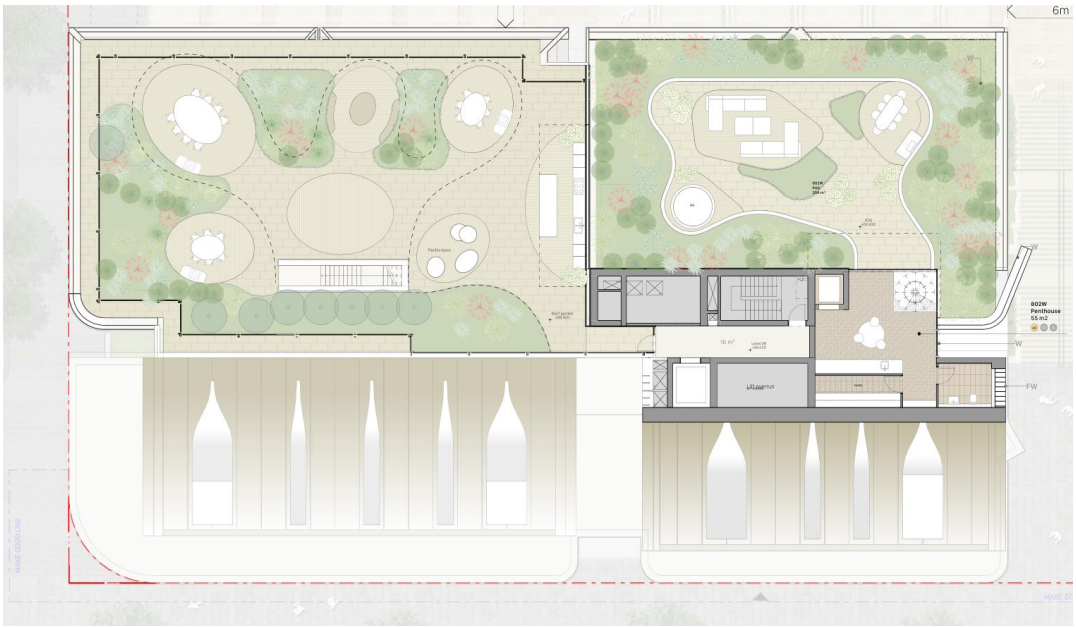


Figure 10: General Arrangement Plan – Level 9 – William Street West Building

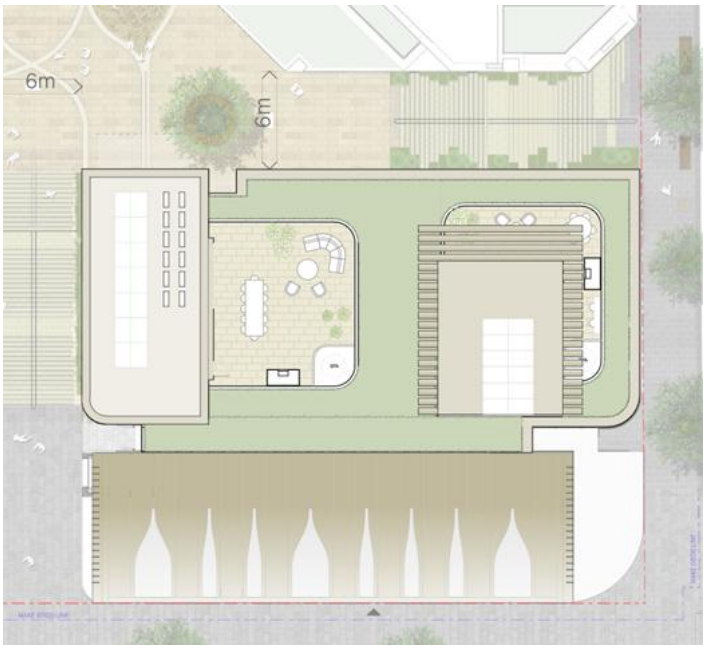


Figure 11: General Arrangement Plan – Level 18 – William Street East Building

Figure 12: North elevation, indicating balustrade height

APPLICABILITY

Testing was performed without landscaping to provide a worst-case assessment. Heavy landscape planting typically reduces wind speeds by less than 10% and in general should not be relied upon to mitigate strong winds due to variation in size and foliage and difficulty in accurate modelling. Further, trees or other plantings may pose a safety risk if damaged during high winds.

The results presented within this report are based on the 3D model, 240918 – Model to CPP.3dm, received by CPP on 18 September 2024 for Configuration B, the 3D drawing, H180W - Massing Model for Wind Testing.dwg, received by CPP on 1 May 2025 for Configuration C and the 3D Drawing, 206114 Uplift Study_30% LEP Model, received by CPP on 14 January 2026 for Configuration D. The preferred design has been amended since the wind tunnel testing, based on drawings received in February and March 2026. The preferred building envelope remains similar to the Configuration C tested and no significant changes have occurred. Accordingly, from a wind perspective, the results presented in this report remain applicable and additional testing is not considered necessary. If significant changes to the design of the development have occurred beyond these dates or new information regarding the status of surrounding buildings becomes available, it is recommended that CPP be contacted to evaluate the impact of any changes.

5. Conclusion

CPP has conducted a wind tunnel study to quantify the impact of the proposed 164-194 William Street development on the pedestrian-level wind environment. In general, most pedestrian-accessible areas around the site are assessed as suitable for Pedestrian Standing or Pedestrian Walking under the Lawson comfort criteria. These wind conditions are typical of the surrounding areas and considered appropriate for the intended use of public domain spaces. Milder wind conditions are available within the central plaza area to the north of the site. The proposed screening and landscaping within the internal plaza area for Configuration C (proposed SSDA) would create localised calm areas suitable for longer-term stationary activity, meeting the Sitting comfort criteria.

The proposed roof layout is expected to provide localised calm areas in some locations for most wind directions, with these areas likely to be suitable for sitting under the Lawson Comfort criteria.

In general, the proposed development has little impact on the measured wind conditions in and around the site. From an equivalence perspective, compared with the existing conditions the wind conditions in Configurations B, C, and D were marginally improved, marginally worsened, and produced the same conditions respectively.

Three locations on the south-west corner of the site exceeded the Lawson safety criterion in the existing configuration and rated for Able-Bodied pedestrians. With the inclusion of the proposed development, the safety wind conditions around this corner improved, with only two exceedances for the concept DA configuration, and a single exceedance for the SSDA configuration and Uniform Uplift configuration. All other locations, excluding the rooftops, passed the Lawson safety criterion.

References

American Society of Civil Engineers (1999), Wind tunnel studies of buildings and structures, ASCE Manuals and reports on engineering practice No.67.

American Society of Civil Engineers (2021), *Wind Tunnel Testing for Buildings and Other Structures* (ASCE 49-21).

Australasian Wind Engineering Society (2019), Wind Engineering Studies of Buildings (AWES-QAM-1-2019).

City of Sydney (2022), Central Sydney Planning Strategy 2016-2036.

Lawson, T.V. (1990), "The Determination of the Wind Environment of a Building Complex before Construction" Department of Aerospace Engineering, University of Bristol, Report Number TVL 9025.

Standards Australia (2021), *Australian/New Zealand Standard, Structural Design Actions, Part 2: Wind Actions* (AS/NZS1170.2:2021).

Appendix A – Wind Tunnel Test Facilities

The wind tunnel testing was performed at the CPP wind engineering laboratory in Sydney, Australia. Specifications for the wind tunnel used for this project are given in Figure A2.

The mean velocity profile approaching the modelled area for each direction has the form:

$$\frac{U}{U_{ref}} = \left(\frac{z}{z_{ref}}\right)^{n}$$

in which U is the mean velocity at height z, U_{ref} is a reference wind speed at reference height z_{ref}, and n is a constant which depends on the characteristics of the upstream roughness for each direction.

Mean velocity and turbulence intensity profiles for the boundary layer flow approaching the model are shown in. The turbulence intensities are appropriate for the approach mean velocity profiles selected.

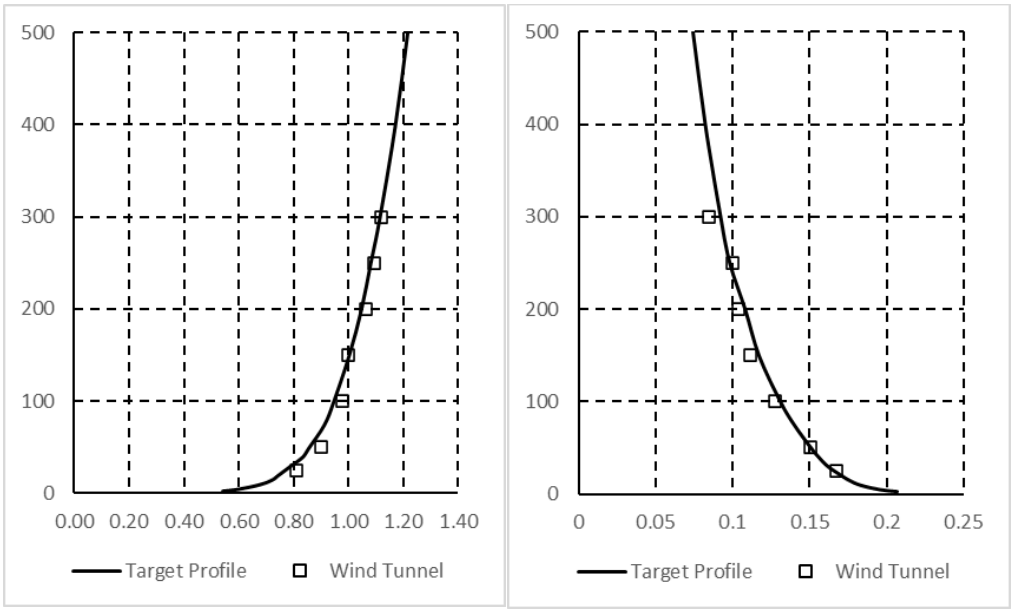


Figure A1a: Mean wind speed (L) and turbulence intensity (R) profiles approaching the model, Open Water approach

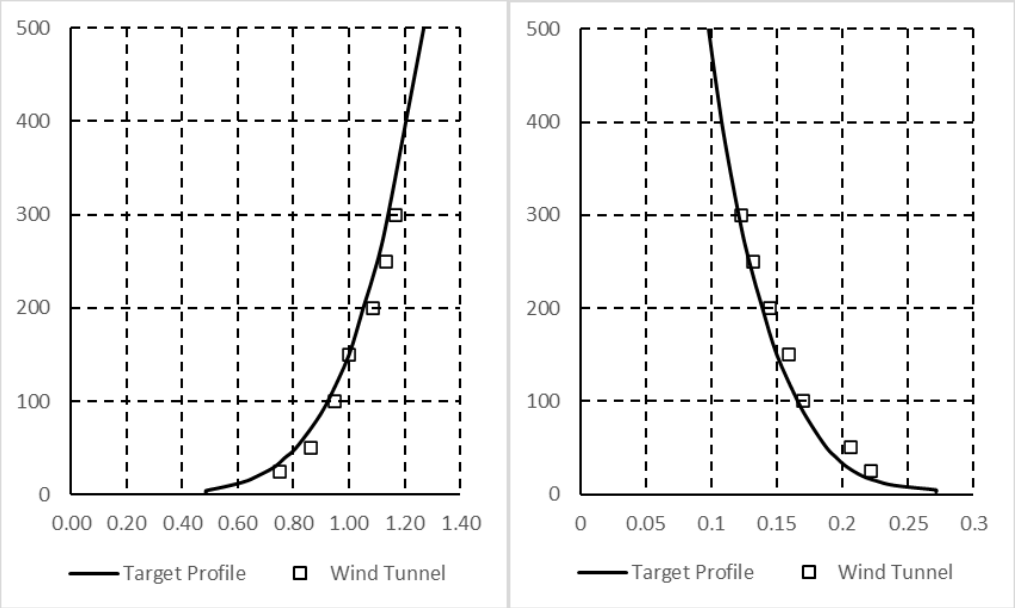


Figure A1b: Mean wind speed (L) and turbulence intensity (R) profiles approaching the model, Built-up approach

CPP SYDNEY WIND TUNNELS	
DIMENSIONS	
Test section length	21 m
Test section width	3 m
Ceiling height	2.4 m
DRIVE SPECIFICATIONS	
Total power	110 kW
Type of drive	Single Axle motor/12 blade axial fan
Speed Control	Variable frequency drive
FLOW CHARACTERISTICS	
Mean Velocity	0 to 20 m/s
Boundary-layer thickness*	1.2 m (nominal)
Turbulence	About 2% at entrance to test section
Longitudinal pressure gradient	Zero by blockage tolerant roof

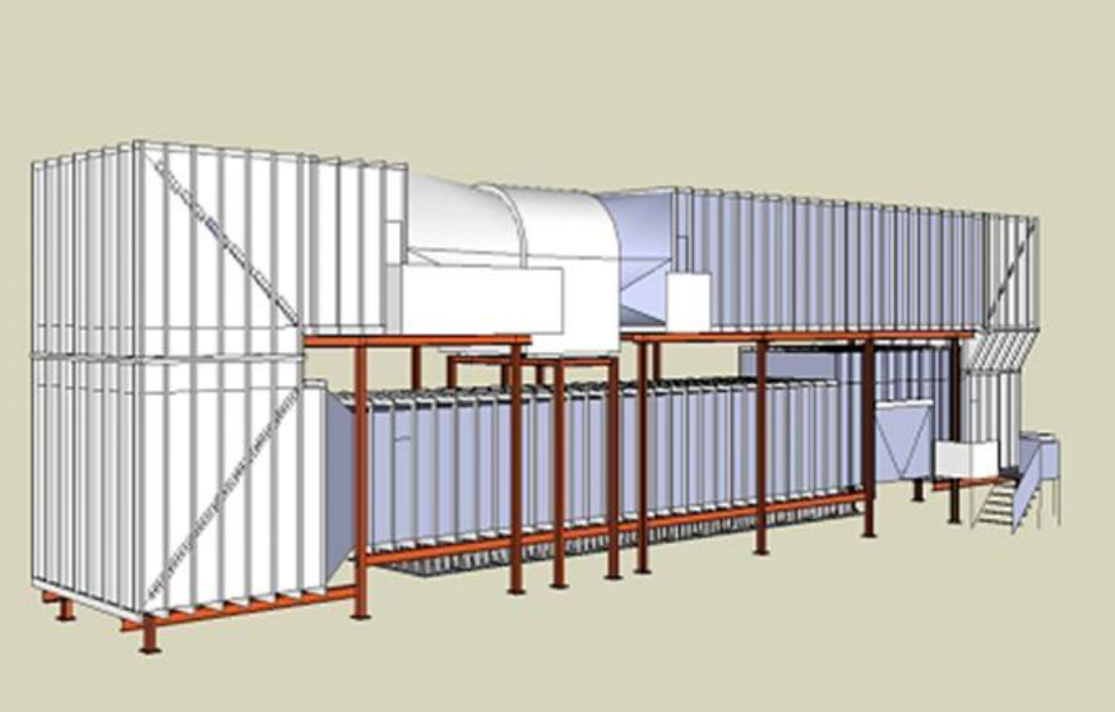
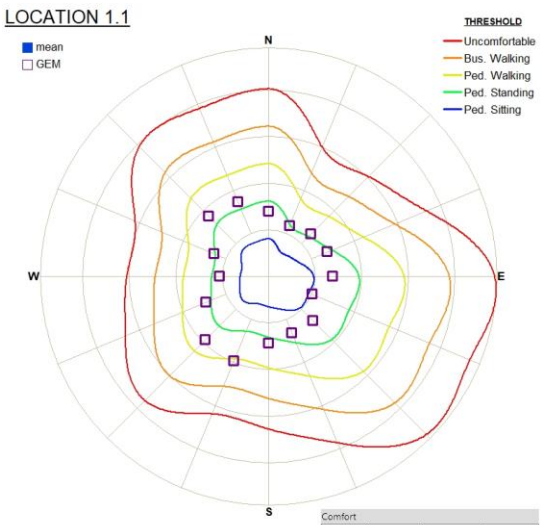


Figure A2: CPP Wind Tunnel - Sydney, Australia

Appendix B - Directional wind results

LOCATION 1.1



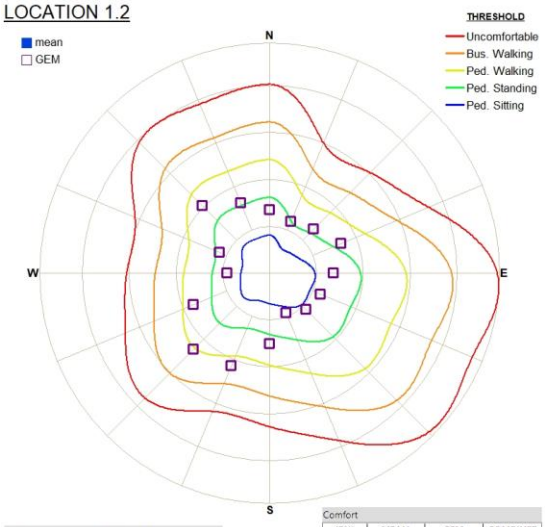
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	21.65	50.03	50.03
4	2.83	7.19	7.19
6	0.31	0.65	0.65
8	0.02	0.06	0.06
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.4	4.3	4.3
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 1.2



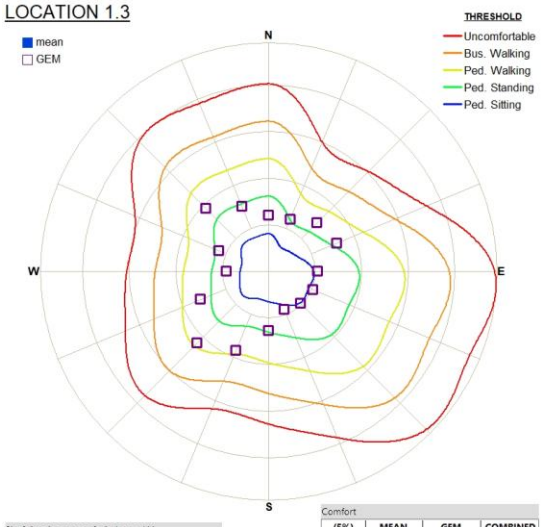
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	22.51	48.03	48.03
4	3.23	9.35	9.35
6	0.41	1.23	1.23
8	0.03	0.15	0.15
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.4	4.6	4.6
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 1.3



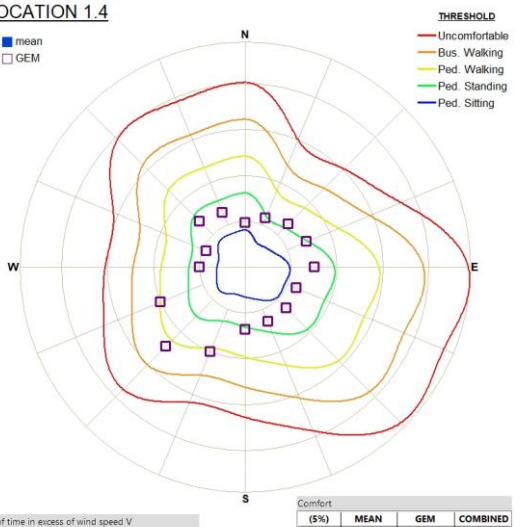
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	21.78	43.62	43.62
4	1.55	7.75	7.75
6	0.09	0.65	0.65
8	0.00	0.05	0.05
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.1	4.3	4.3
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 1.4



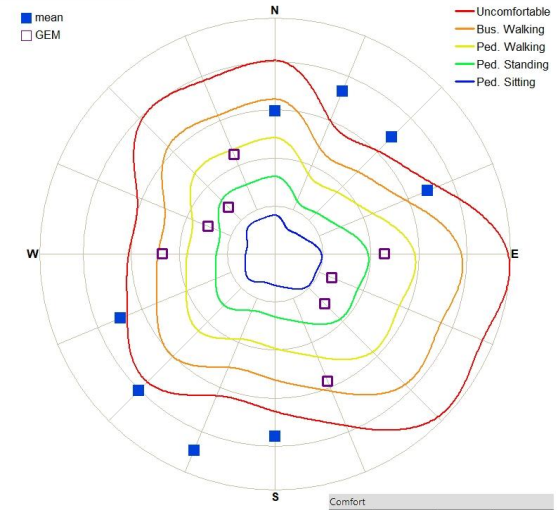
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	16.90	46.25	46.25
4	0.82	7.76	7.76
6	0.03	0.98	0.98
8	0.00	0.11	0.11
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.8	4.4	4.4
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 2.1



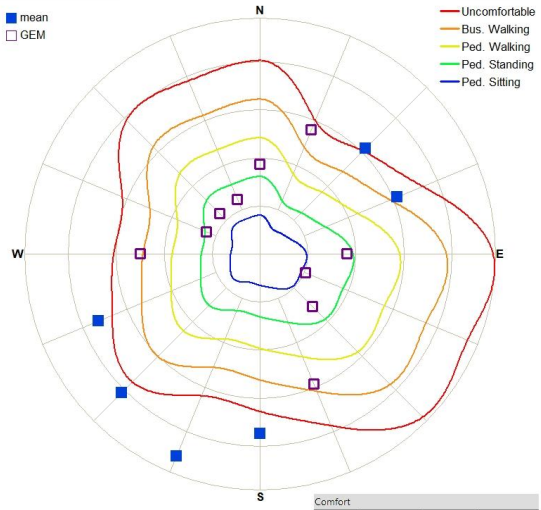
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	66.21	72.57	73.86
4	45.14	44.48	47.94
6	29.55	25.16	30.50
8	15.73	9.38	15.97
10	6.56	2.81	6.60

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	10.4	9.0	10.4
Rating	Uncomfortable	Bus Walking	Uncomfortable

LOCATION 2.2



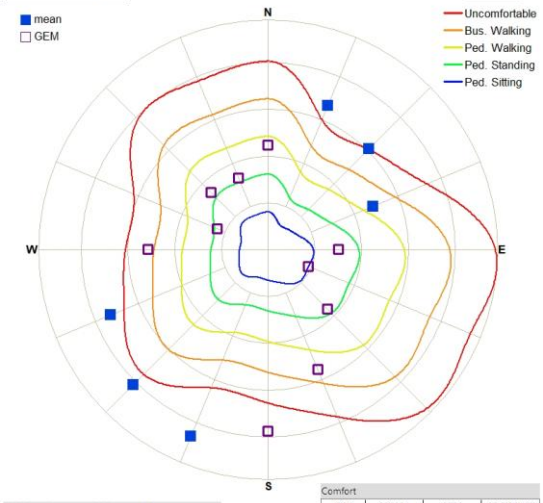
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	60.07	67.13	67.78
4	40.43	42.04	43.53
6	25.73	24.56	27.54
8	11.60	9.50	12.48
10	4.48	3.03	4.70

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	9.7	9.1	9.8
Rating	Bus Walking	Bus Walking	Bus Walking

LOCATION 2.3



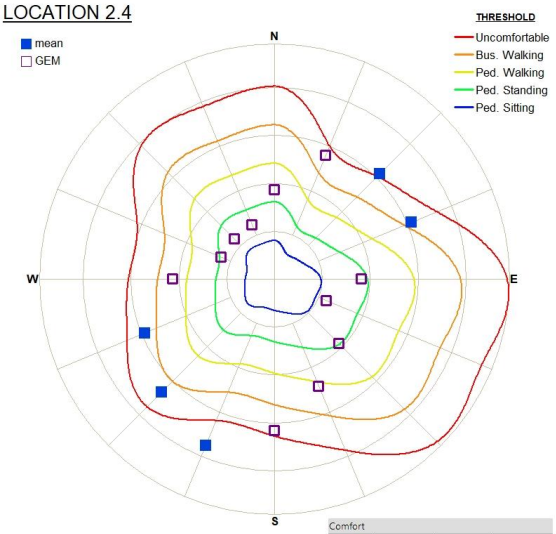
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	62.61	71.02	71.70
4	40.67	42.69	44.47
6	25.54	24.30	27.10
8	12.45	10.15	13.32
10	4.92	3.55	5.25

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	9.9	9.3	10.0
Rating	Bus Walking	Bus Walking	Uncomfortable

LOCATION 2.4



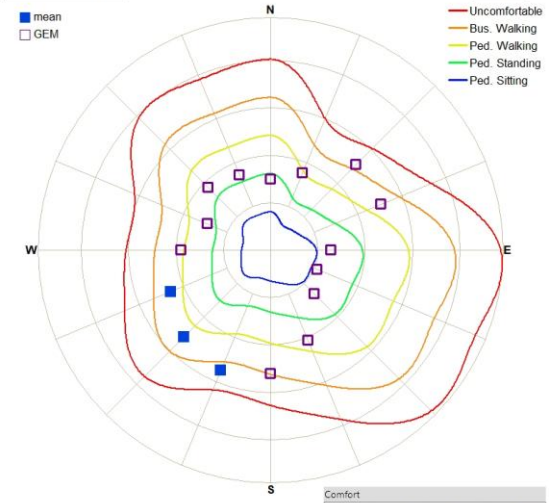
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	59.04	67.17	67.66
4	34.94	38.93	40.14
6	19.55	19.67	21.93
8	7.47	6.81	8.53
10	1.94	1.68	2.27

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	8.6	8.4	8.8
Rating	Bus Walking	Bus Walking	Bus Walking

LOCATION 3.1



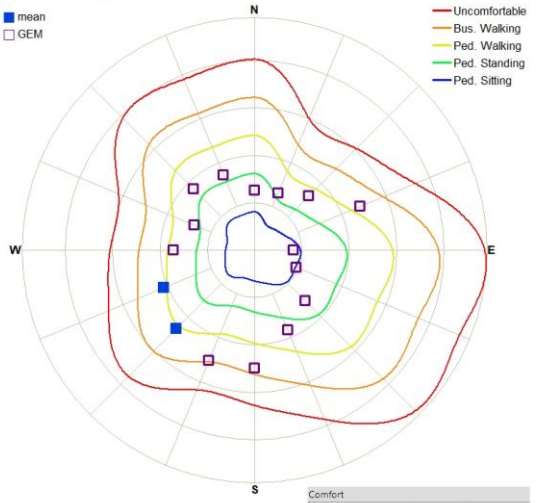
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	49.59	63.22	63.69
4	19.25	30.75	31.59
6	4.76	9.51	10.22
8	0.89	1.72	1.97
10	0.14	0.23	0.28

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.8	6.8	6.9
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 3.2



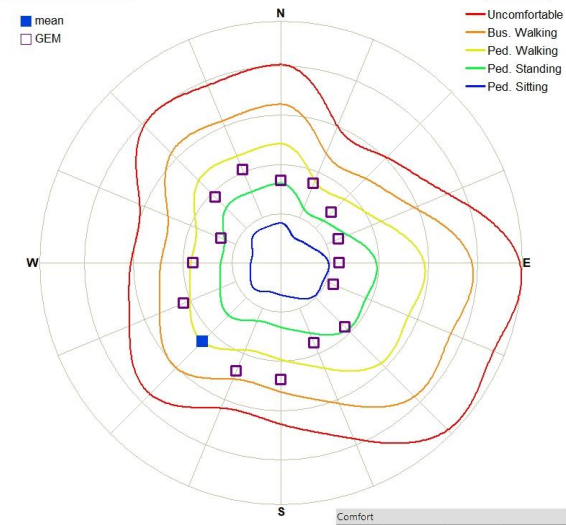
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	42.67	58.03	58.24
4	12.14	22.69	23.03
6	2.77	4.86	5.02
8	0.40	0.73	0.76
10	0.06	0.10	0.10

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.2	5.9	6.0
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 3.3



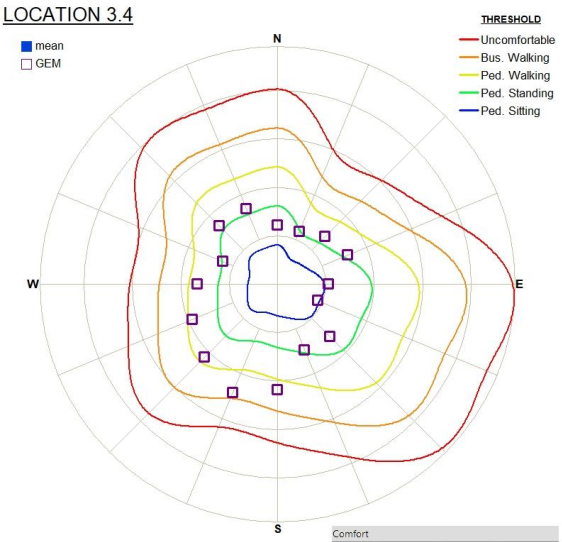
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	45.77	61.45	61.55
4	13.16	20.76	20.88
6	2.37	4.06	4.11
8	0.28	0.54	0.55
10	0.03	0.06	0.06

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.1	5.7	5.7
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 3.4



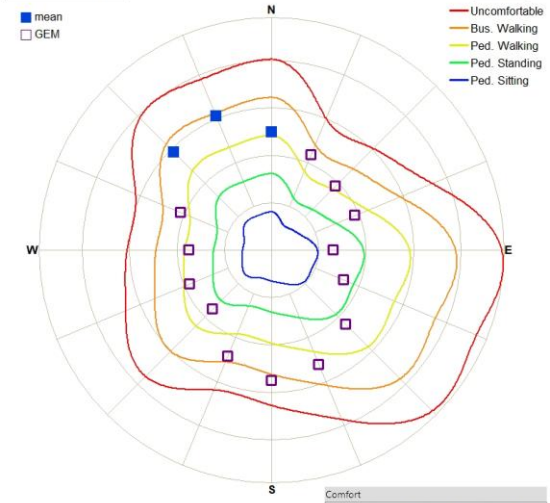
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	34.54	53.90	53.90
4	6.60	15.16	15.16
6	0.90	2.81	2.81
8	0.09	0.37	0.37
10	0.01	0.05	0.05

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.3	5.3
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 4.1



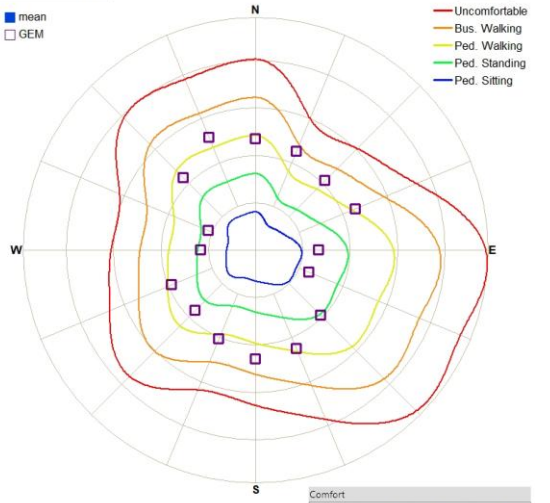
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	67.07	74.82	75.52
4	23.75	33.58	34.18
6	5.22	9.00	9.27
8	0.96	1.82	1.98
10	0.16	0.28	0.32

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.0	6.7	6.8
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 4.2



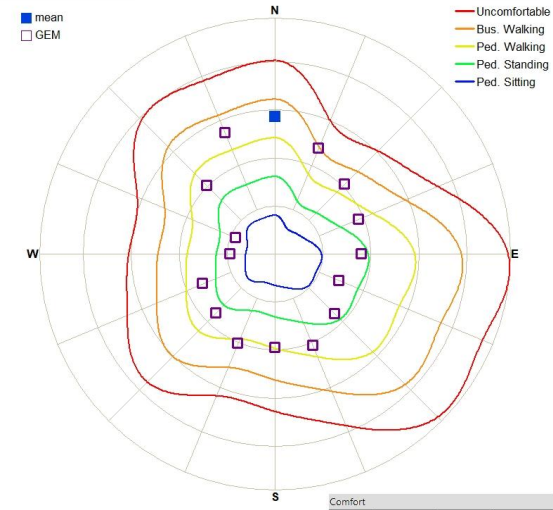
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	54.07	66.92	66.92
4	15.90	27.78	27.78
6	2.22	6.51	6.51
8	0.14	0.82	0.82
10	0.01	0.06	0.06

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.2	6.2	6.2
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 4.3



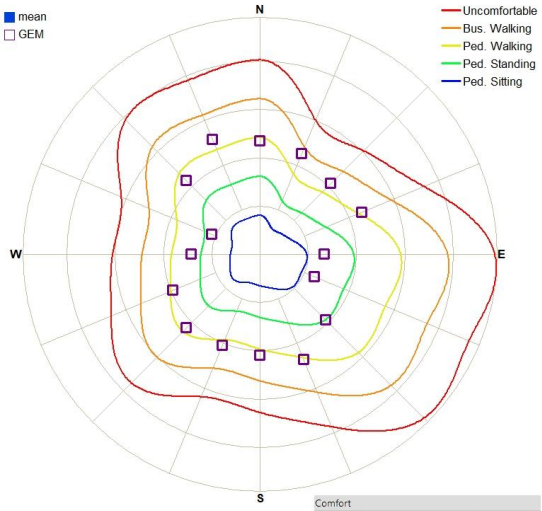
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	49.52	65.04	65.11
4	12.55	23.29	23.41
6	2.44	5.57	5.64
8	0.34	0.83	0.86
10	0.03	0.07	0.07

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.0	6.1	6.1
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 4.4



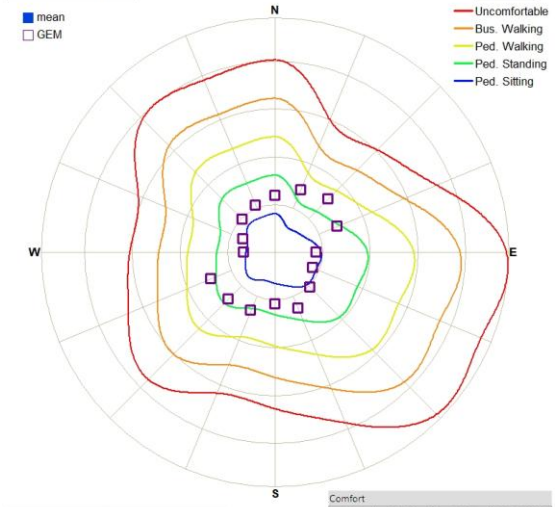
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	52.23	67.98	67.98
4	13.70	27.75	27.75
6	2.00	6.32	6.32
8	0.13	0.74	0.74
10	0.01	0.05	0.05

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.1	6.2	6.2
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 5.1



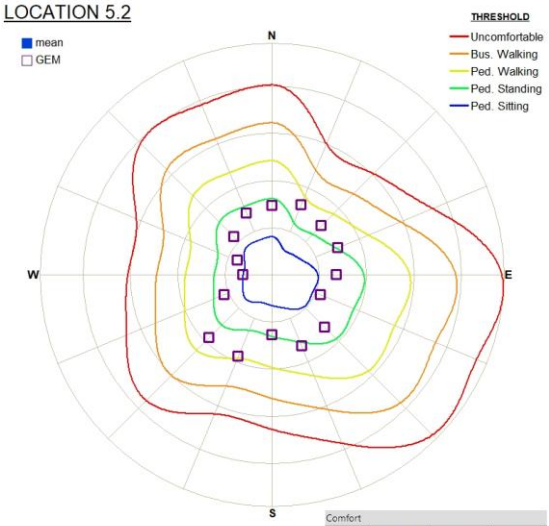
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	17.00	36.19	36.19
4	0.64	5.17	5.17
6	0.00	0.21	0.21
8	0.00	0.00	0.00
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.9	4.0	4.0
Rating	Ped Sitting	Ped Sitting	Ped Sitting

LOCATION 5.2



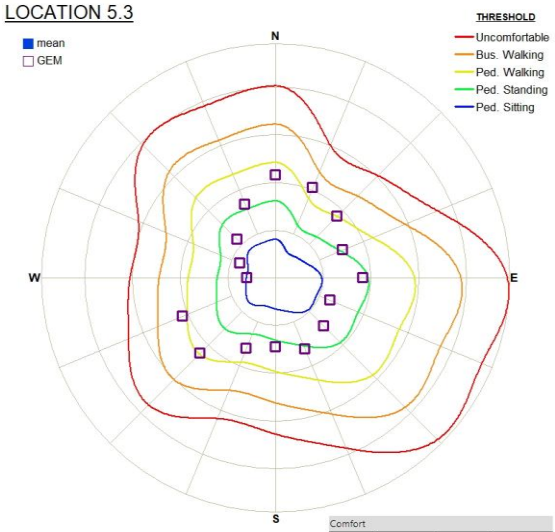
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	25.45	46.08	46.08
4	1.85	8.41	8.41
6	0.03	0.56	0.56
8	0.00	0.03	0.03
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.4	4.4	4.4
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 5.3



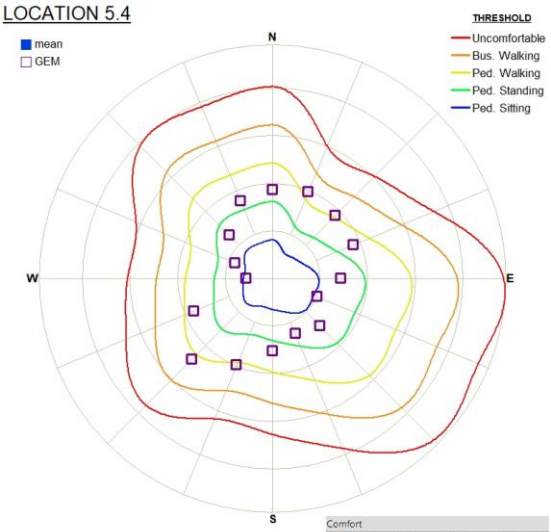
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	39.69	52.92	52.92
4	5.78	14.91	14.91
6	0.26	2.40	2.40
8	0.00	0.14	0.14
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.1	5.2	5.2
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 5.4



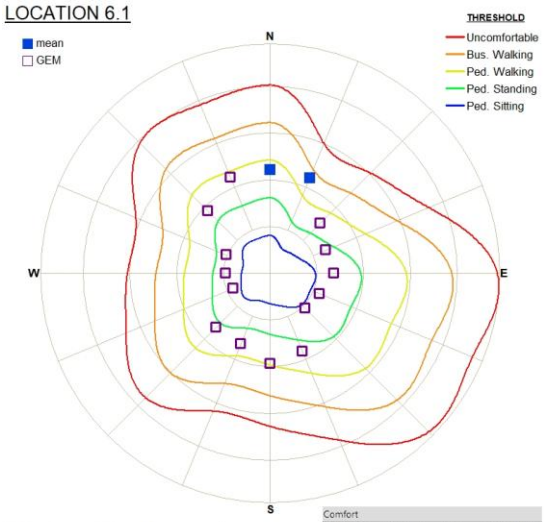
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	32.62	51.10	51.10
4	4.09	16.15	16.15
6	0.31	2.32	2.32
8	0.02	0.15	0.15
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.8	5.3	5.3
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 6.1



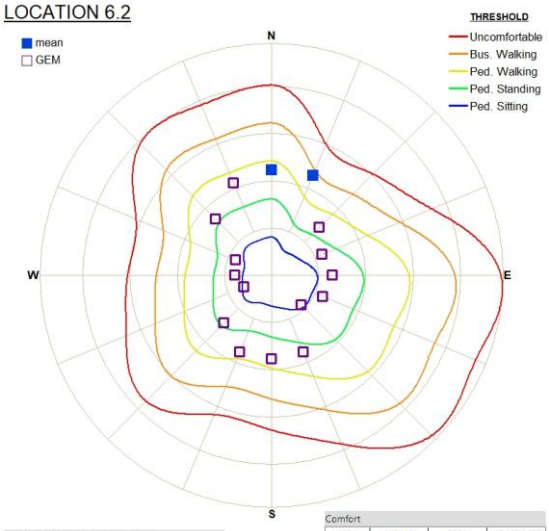
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	30.43	53.77	53.98
4	6.42	14.26	14.42
6	1.77	2.66	2.76
8	0.20	0.25	0.28
10	0.01	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.4	5.3	5.3
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 6.2



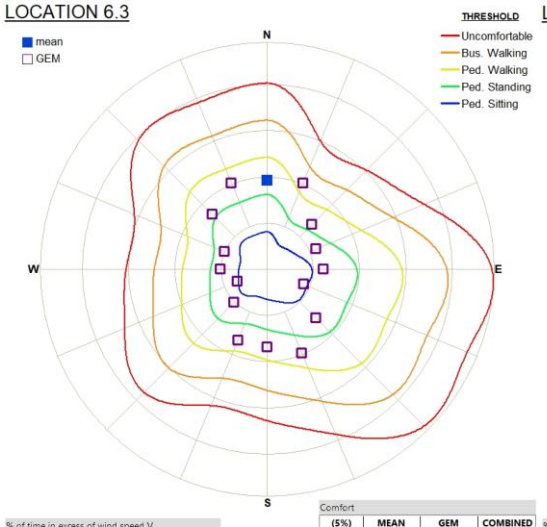
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	26.20	49.15	49.28
4	6.09	12.82	12.94
6	2.00	2.57	2.69
8	0.28	0.28	0.32
10	0.02	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.2	5.2
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 6.3



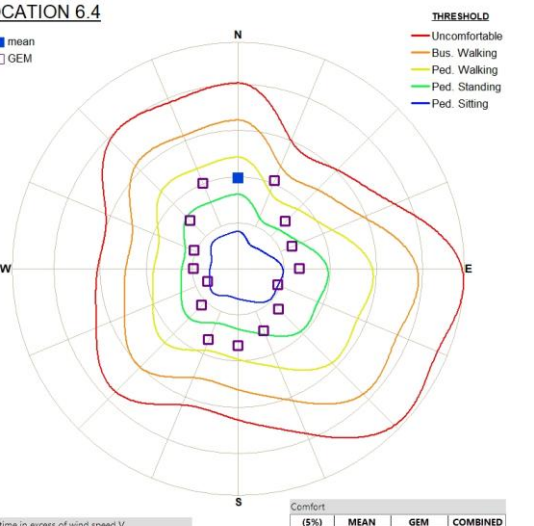
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	25.79	50.46	50.47
4	4.91	11.49	11.50
6	0.80	1.60	1.60
8	0.04	0.07	0.08
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.9	4.9	4.9
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 6.4



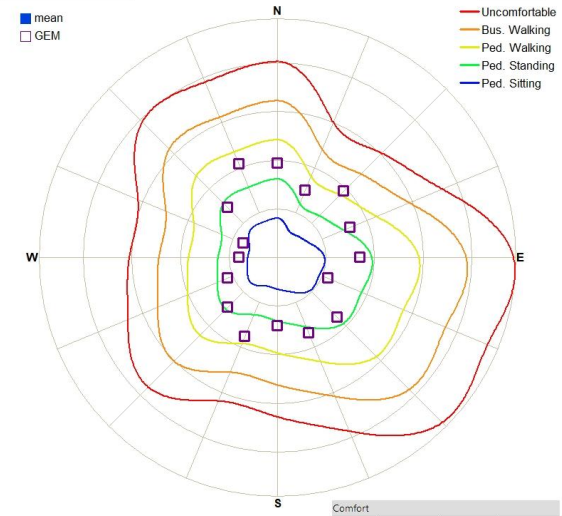
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	21.15	48.32	48.38
4	4.51	10.86	10.89
6	0.81	1.59	1.60
8	0.04	0.09	0.09
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.8	4.8	4.8
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 7.1



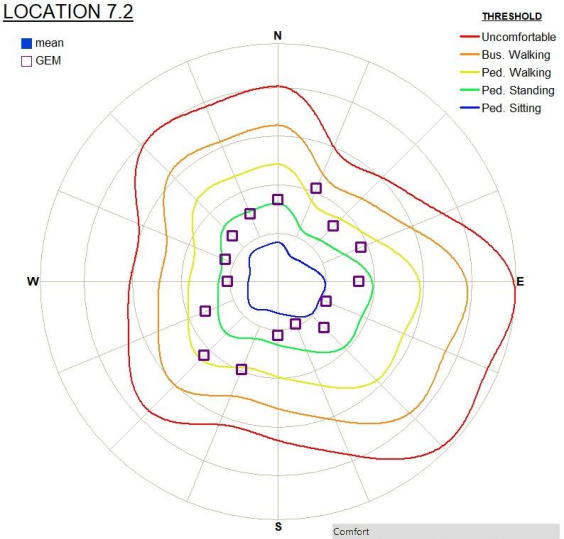
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	26.21	52.10	52.10
4	1.80	11.82	11.82
6	0.03	1.24	1.24
8	0.00	0.07	0.07
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.3	4.8	4.8
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 7.2



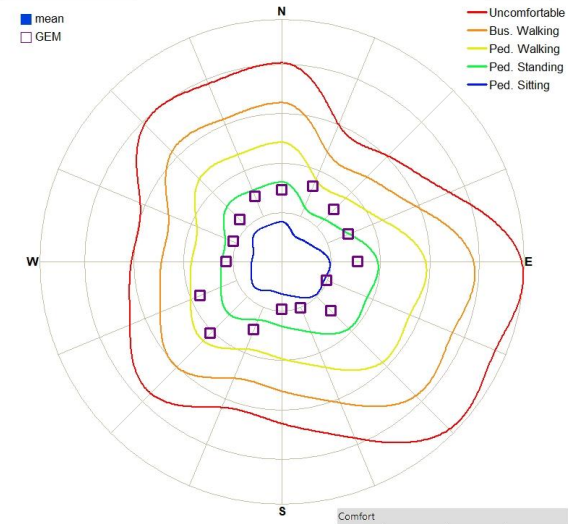
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	25.53	47.88	47.88
4	2.51	13.36	13.36
6	0.06	2.03	2.03
8	0.00	0.15	0.15
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.5	5.1	5.1
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 7.3



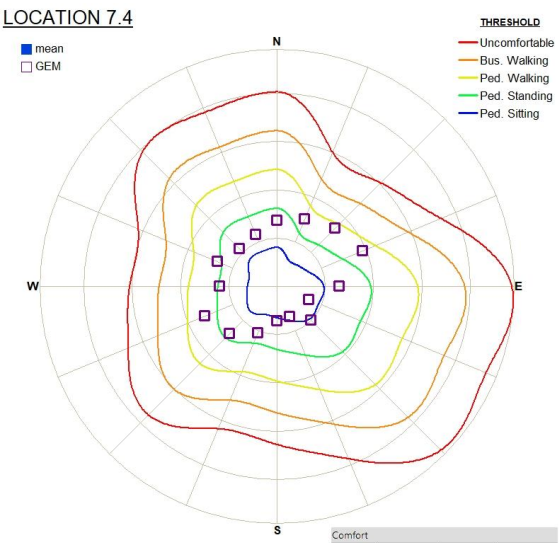
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	18.57	43.15	43.15
4	0.43	7.90	7.90
6	0.01	0.50	0.50
8	0.00	0.02	0.02
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.8	4.3	4.3
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 7.4



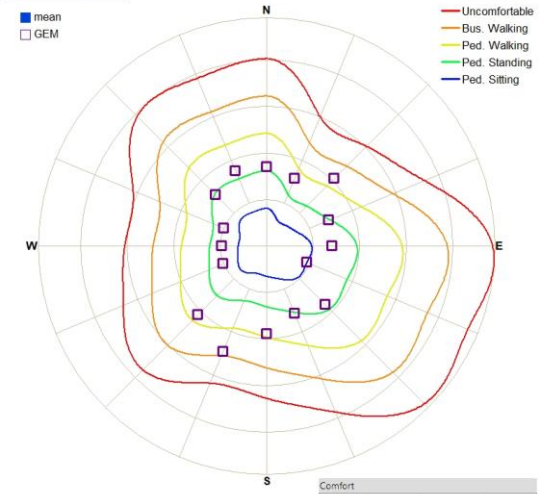
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	12.37	35.49	35.49
4	0.05	8.33	8.33
6	0.00	0.45	0.45
8	0.00	0.01	0.01
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.5	4.4	4.4
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 8.1



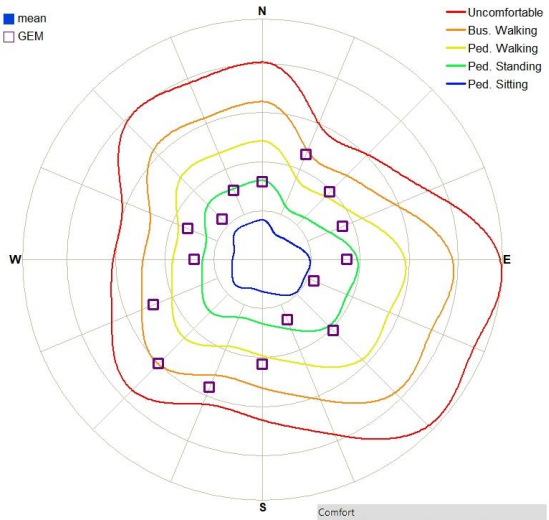
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	29.62	54.25	54.25
4	4.15	16.46	16.46
6	0.28	3.21	3.21
8	0.02	0.39	0.39
10	0.00	0.04	0.04

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.8	5.5	5.5
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 8.2



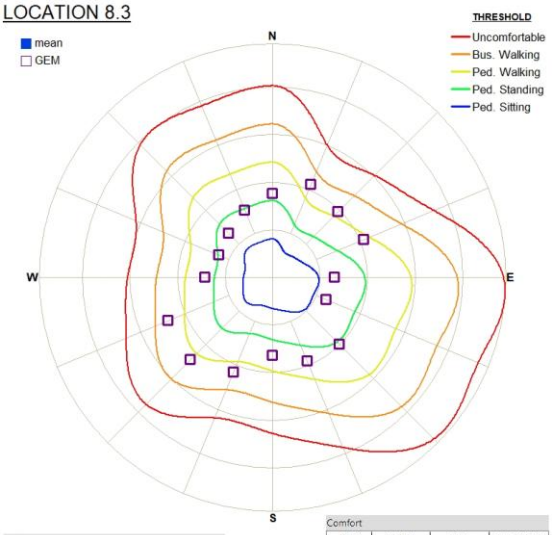
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	41.86	61.87	61.87
4	10.78	25.27	25.27
6	1.70	7.26	7.26
8	0.21	1.32	1.32
10	0.02	0.20	0.20

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.8	6.5	6.5
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 8.3



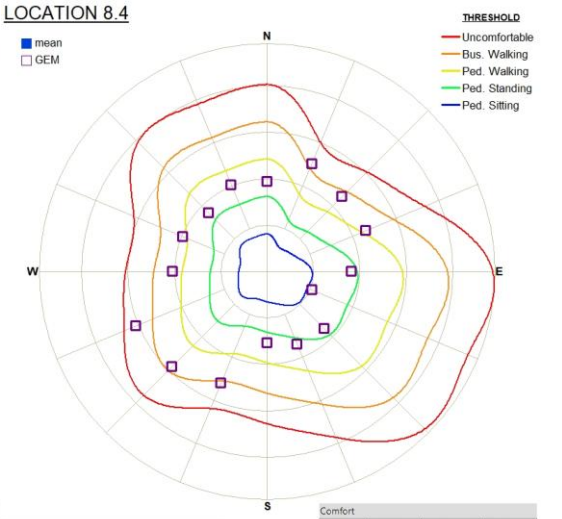
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	40.75	60.64	60.64
4	7.64	22.16	22.16
6	0.49	4.00	4.00
8	0.01	0.41	0.41
10	0.00	0.03	0.03

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.7	5.7
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 8.4



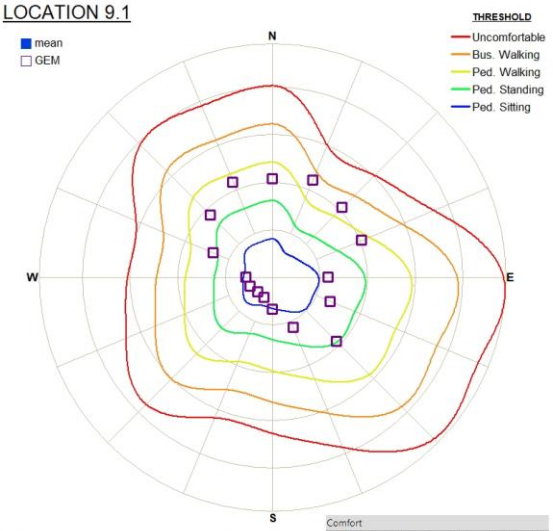
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	45.67	67.81	67.81
4	17.67	28.85	28.85
6	3.67	10.26	10.26
8	0.44	2.15	2.15
10	0.04	0.29	0.29

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.7	6.9	6.9
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 9.1



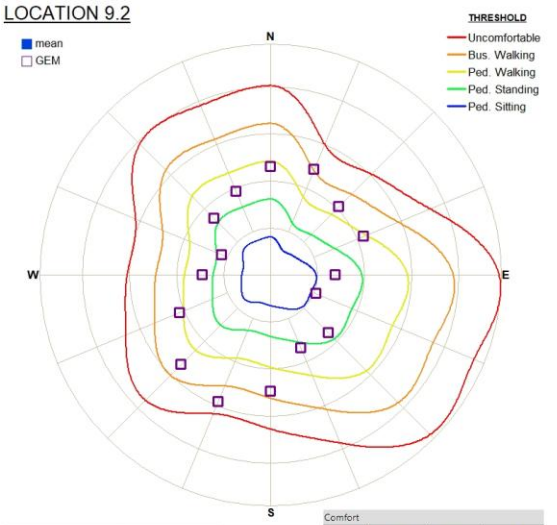
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	24.92	40.09	40.09
4	7.27	14.29	14.29
6	0.98	3.37	3.37
8	0.04	0.36	0.36
10	0.00	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.4	5.5	5.5
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 9.2



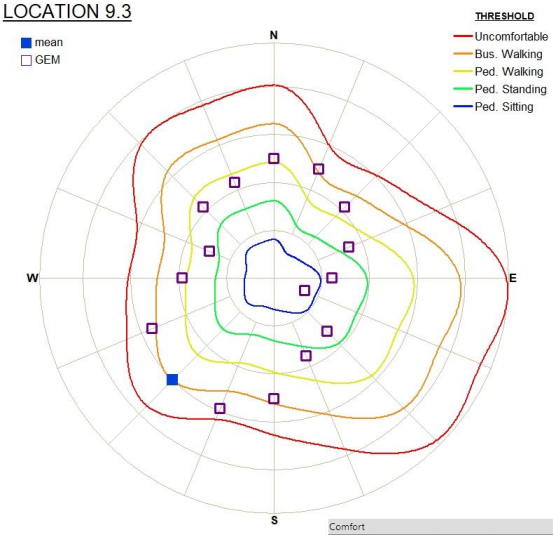
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	49.37	64.47	64.47
4	17.61	29.30	29.30
6	4.65	8.97	8.97
8	0.72	1.78	1.78
10	0.09	0.26	0.26

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.8	6.7	6.7
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 9.3



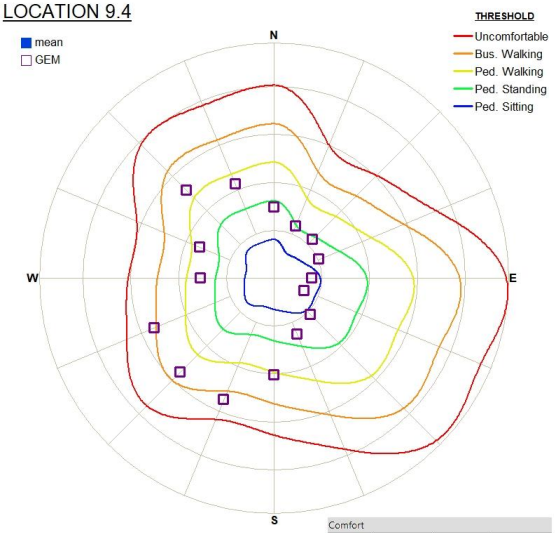
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	56.61	67.37	67.38
4	23.02	31.78	31.79
6	7.21	10.96	10.97
8	1.45	2.44	2.44
10	0.25	0.37	0.38

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.5	7.2	7.2
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 9.4



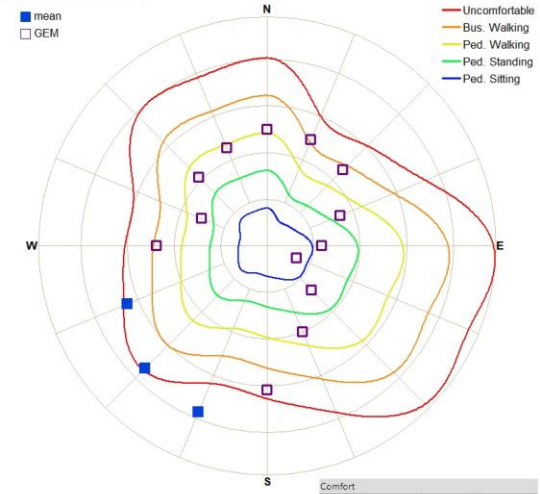
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	31.58	54.86	54.86
4	8.87	16.66	16.66
6	2.18	5.06	5.06
8	0.34	1.15	1.15
10	0.04	0.22	0.22

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.8	6.0	6.0
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 10.1



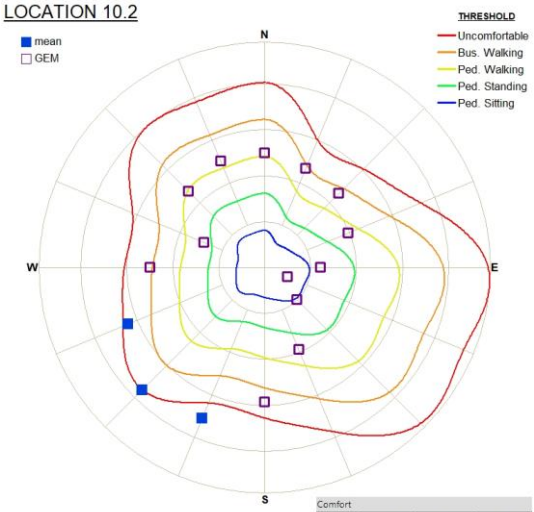
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	57.00	68.84	69.15
4	29.06	36.55	37.03
6	12.18	16.43	17.30
8	4.47	5.20	5.97
10	1.53	1.27	1.80

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.7	8.0	8.2
Rating	Ped Walking	Ped Walking	Bus Walking

LOCATION 10.2



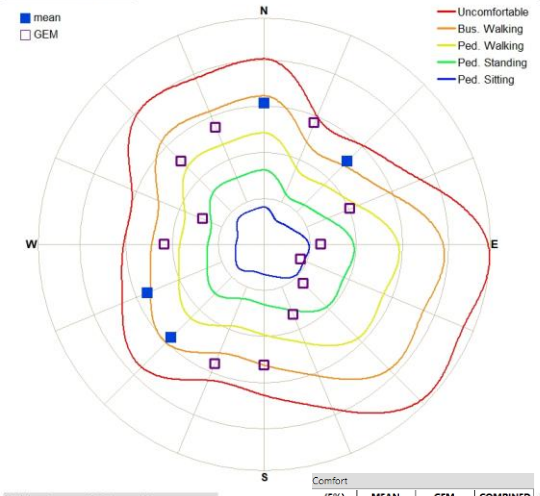
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	58.20	68.40	68.61
4	27.24	37.17	37.47
6	9.93	15.70	16.19
8	3.53	4.73	5.10
10	1.07	1.14	1.35

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.3	7.8	8.0
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 10.3



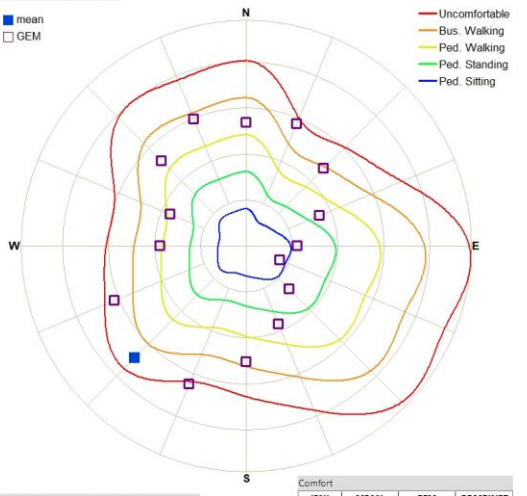
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	60.48	68.96	69.28
4	31.74	35.84	36.53
6	12.99	14.24	15.23
8	3.37	3.73	4.17
10	0.54	0.63	0.73

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	8.0	7.7	8.2
Rating	Bus Walking	Ped Walking	Bus Walking

LOCATION 10.4



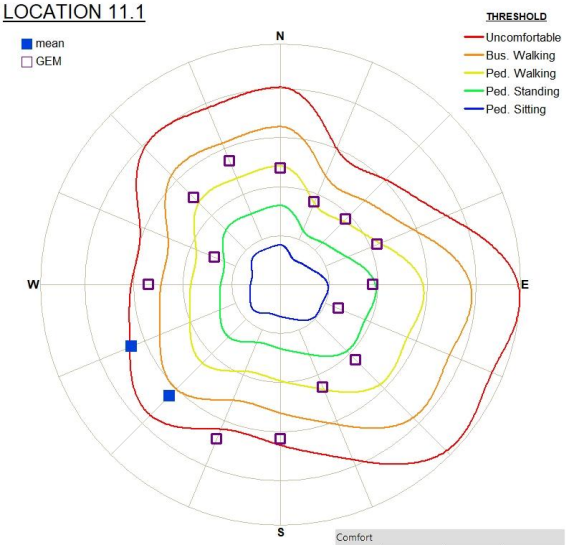
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	57.99	70.80	70.90
4	25.73	35.92	36.06
6	9.23	15.66	15.82
8	2.61	4.80	4.90
10	0.62	1.05	1.09

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.9	7.9	7.9
Rating	Ped Walking	Ped Walking	Ped Walking

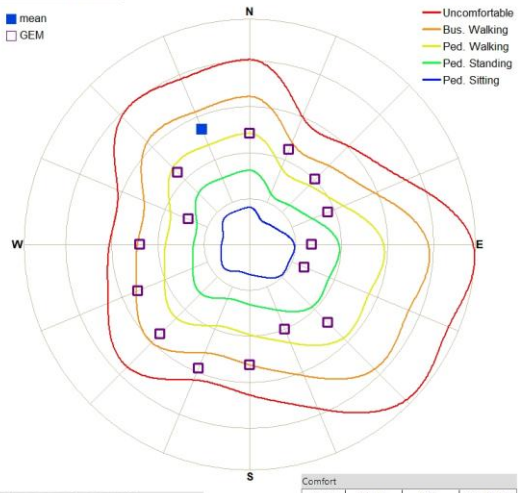
LOCATION 11.1



% of time in excess of wind speed V			
V (m/s)	MEAN	GEM	COMBINED
2	61.32	75.32	75.42
4	22.48	37.80	37.92
6	8.94	13.95	14.23
8	3.06	4.72	4.83
10	0.82	1.26	1.35

Comfort			
(5%)	MEAN	GEM	COMBINED
V (m/s)	7.1	7.8	7.9
Rating	Ped Walking	Ped Walking	Ped Walking

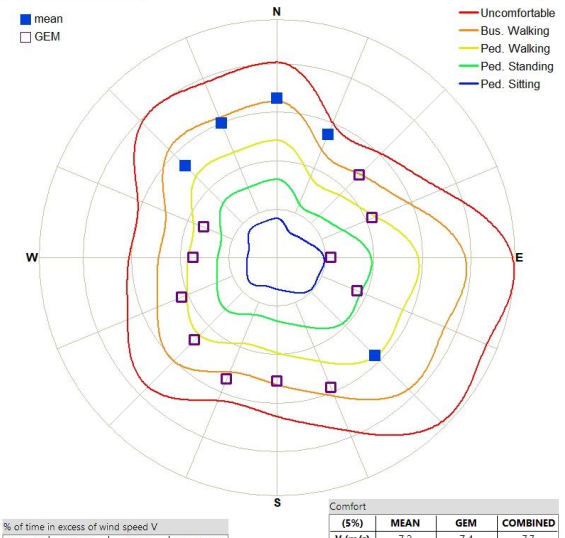
LOCATION 11.2



% of time in excess of wind speed V			
V (m/s)	MEAN	GEM	COMBINED
2	61.44	73.02	73.11
4	20.14	34.89	34.95
6	4.53	10.94	10.96
8	0.79	2.31	2.33
10	0.11	0.36	0.36

Comfort			
(5%)	MEAN	GEM	COMBINED
V (m/s)	5.8	7.1	7.1
Rating	Ped Standing	Ped Walking	Ped Walking

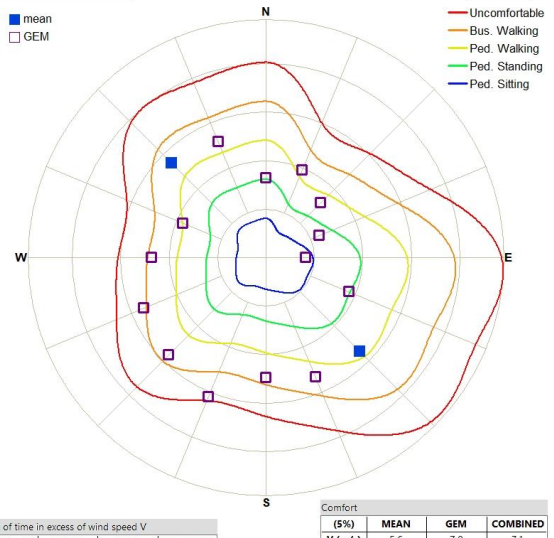
LOCATION 11.3



% of time in excess of wind speed V			
V (m/s)	MEAN	GEM	COMBINED
2	71.76	75.74	77.05
4	32.69	38.61	40.26
6	10.38	13.28	14.42
8	2.48	2.83	3.46
10	0.42	0.40	0.58

Comfort			
(5%)	MEAN	GEM	COMBINED
V (m/s)	7.2	7.4	7.7
Rating	Ped Walking	Ped Walking	Ped Walking

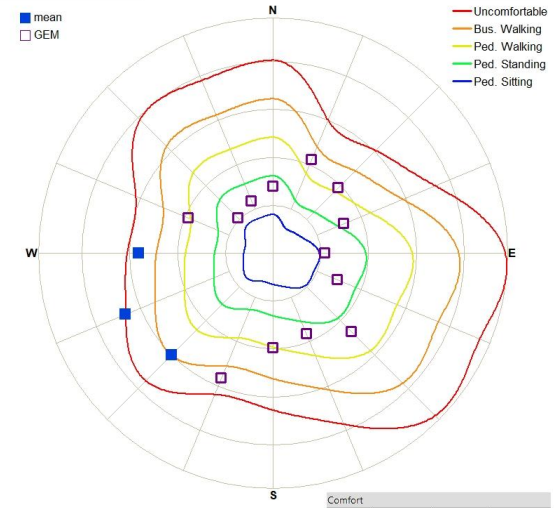
LOCATION 11.4



% of time in excess of wind speed V			
V (m/s)	MEAN	GEM	COMBINED
2	57.46	72.71	72.91
4	17.24	33.15	33.56
6	3.59	10.27	10.35
8	0.63	2.60	2.62
10	0.11	0.51	0.51

Comfort			
(5%)	MEAN	GEM	COMBINED
V (m/s)	5.6	7.0	7.1
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 12.1



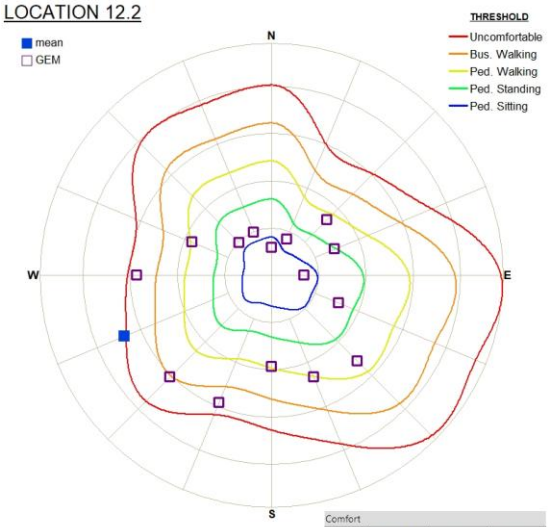
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	50.52	64.05	64.34
4	19.02	28.04	28.43
6	5.94	8.76	9.51
8	1.66	2.06	2.45
10	0.45	0.38	0.59

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.2	6.8	7.0
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 12.2



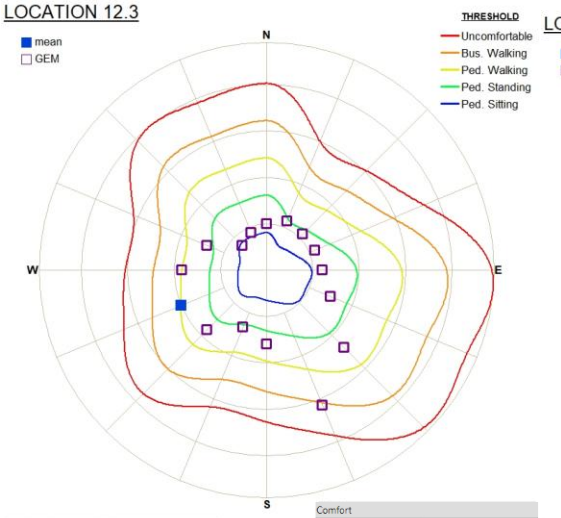
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	40.91	58.10	58.26
4	13.17	24.09	24.26
6	4.89	7.87	8.31
8	1.72	2.28	2.52
10	0.48	0.53	0.68

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.9	6.7	6.8
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 12.3



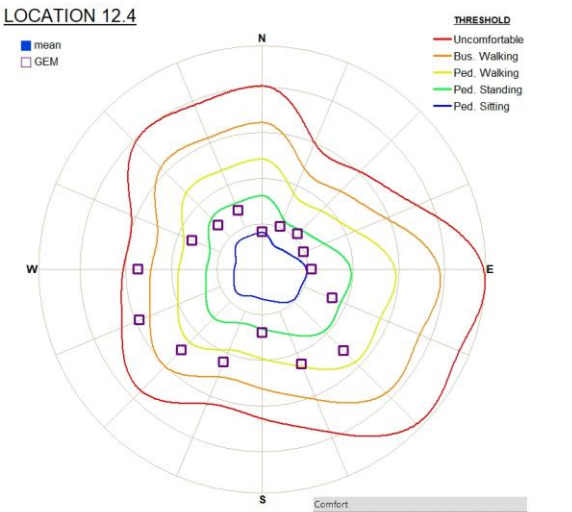
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	31.07	52.10	52.19
4	6.61	11.88	12.04
6	0.92	2.51	2.56
8	0.09	0.47	0.47
10	0.01	0.10	0.10

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.3	5.3
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 12.4



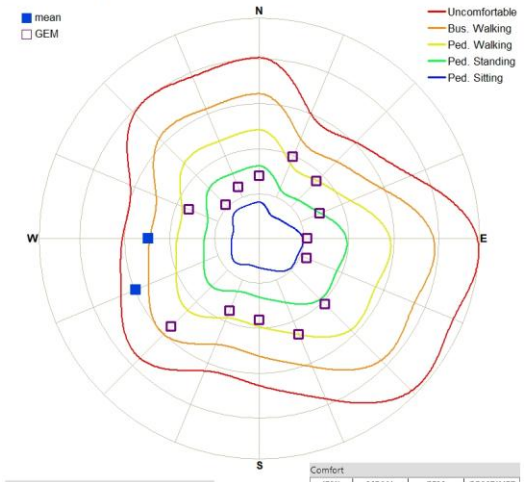
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	34.86	55.13	55.13
4	9.40	16.72	16.72
6	3.01	4.57	4.57
8	0.97	1.25	1.25
10	0.18	0.23	0.23

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.0	5.8	5.8
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 13.1



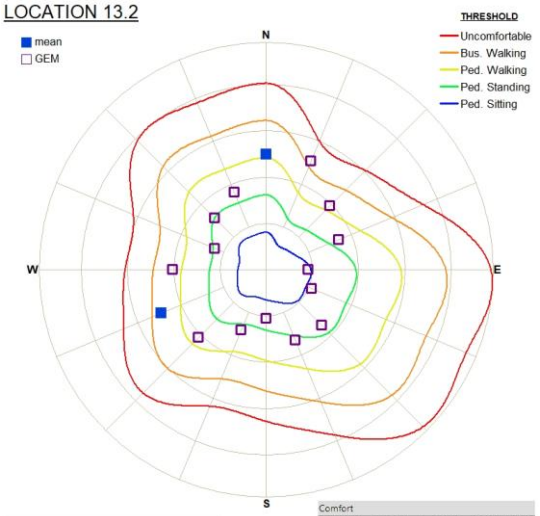
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	45.36	60.73	60.84
4	14.85	23.26	23.46
6	3.80	5.07	5.34
8	0.88	0.92	1.05
10	0.17	0.13	0.18

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.5	6.0	6.0
Rating	Ped Standing	Ped Standing	Ped Walking

LOCATION 13.2



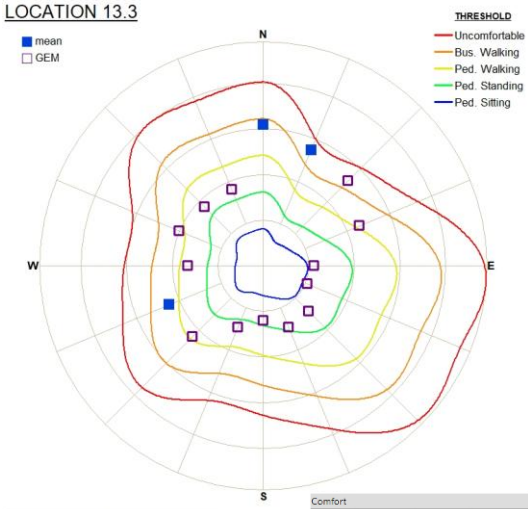
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	41.71	55.61	55.73
4	11.27	18.71	18.91
6	3.00	5.08	5.17
8	0.45	0.94	0.98
10	0.03	0.07	0.08

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.3	6.0	6.0
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 13.3



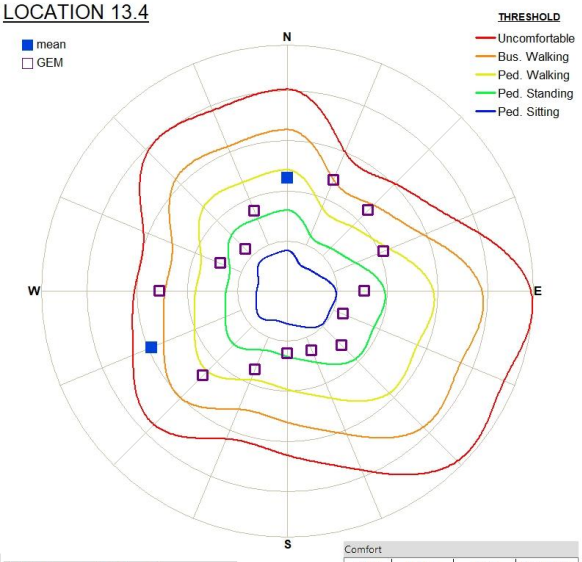
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	49.75	61.13	61.30
4	19.80	23.26	23.62
6	8.45	9.03	9.42
8	2.24	2.12	2.40
10	0.38	0.31	0.39

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.4	7.2	7.6
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 13.4



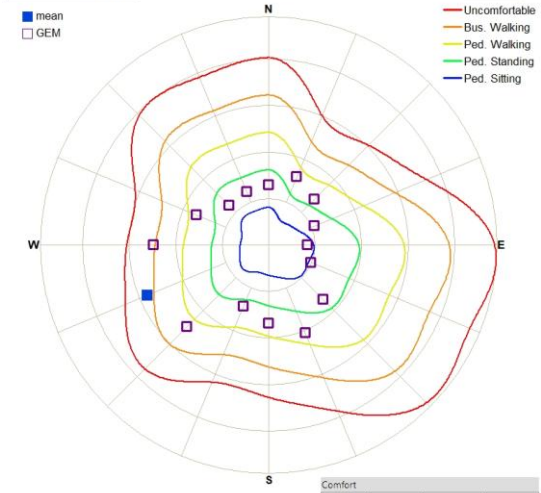
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	46.59	59.58	59.70
4	18.43	23.42	23.63
6	5.72	7.54	7.82
8	1.05	1.52	1.66
10	0.14	0.18	0.22

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.1	6.5	6.6
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 14.1



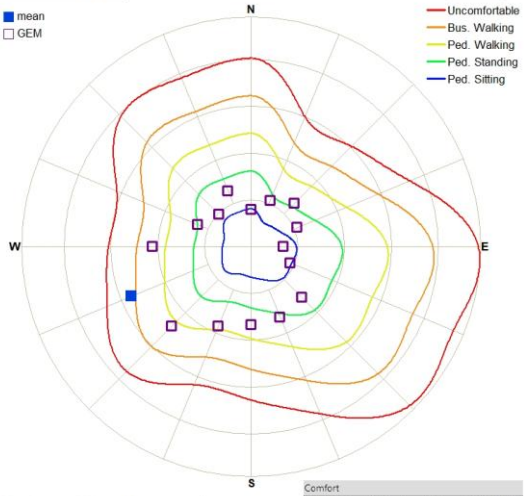
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	38.06	54.00	54.01
4	9.10	15.59	15.61
6	2.37	3.34	3.36
8	0.61	0.78	0.79
10	0.09	0.13	0.13

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.8	5.4	5.4
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 14.2



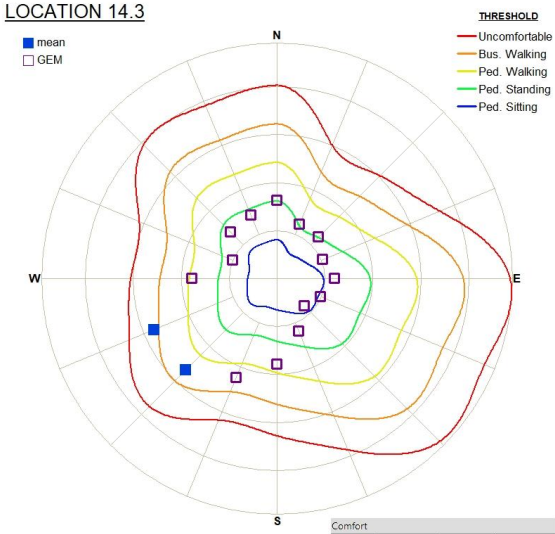
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	29.63	47.77	47.96
4	4.81	11.30	11.69
6	1.37	2.03	2.45
8	0.36	0.29	0.47
10	0.06	0.03	0.07

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.9	4.9	5.0
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 14.3



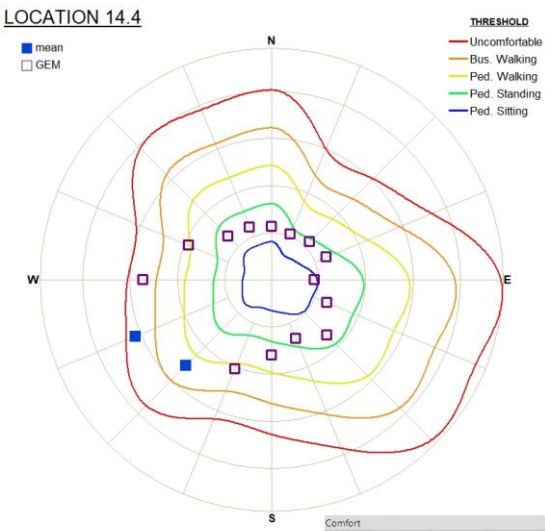
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	28.36	47.13	47.40
4	7.41	12.32	12.82
6	1.97	2.31	2.83
8	0.46	0.35	0.56
10	0.07	0.04	0.08

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.6	5.1	5.3
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 14.4



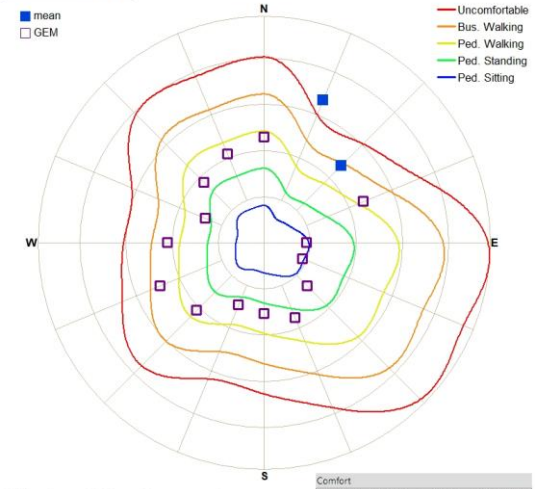
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	33.10	52.15	52.34
4	9.51	13.57	13.86
6	3.53	3.96	4.47
8	1.06	1.10	1.33
10	0.24	0.19	0.29

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.2	5.6	5.7
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 15.1



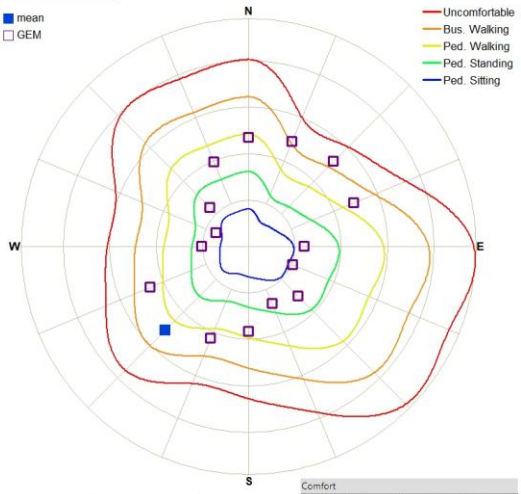
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	44.42	61.48	62.01
4	17.81	23.97	25.35
6	7.64	7.47	9.45
8	2.96	1.31	3.20
10	0.98	0.11	1.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.8	6.5	7.1
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 15.2



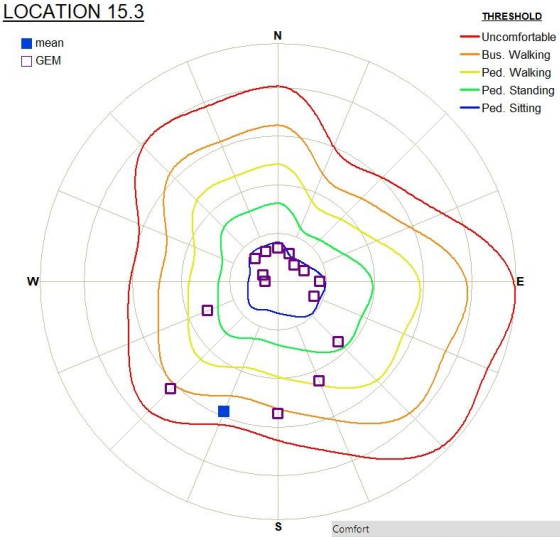
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	44.75	56.77	56.95
4	19.91	24.39	24.63
6	6.70	8.43	8.58
8	1.18	1.54	1.58
10	0.11	0.19	0.20

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.3	6.7	6.7
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 15.3



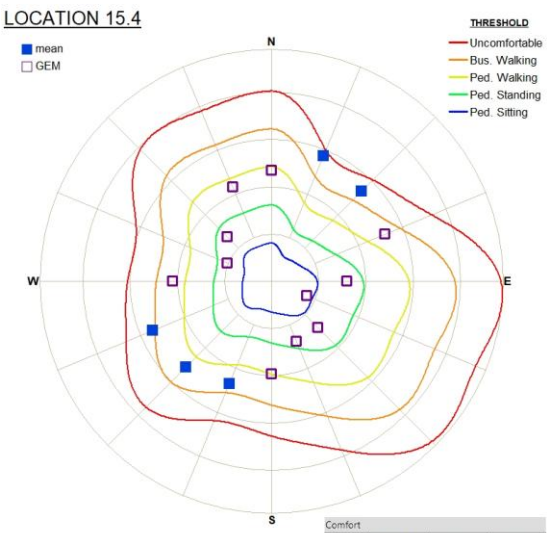
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	21.96	31.32	31.34
4	11.64	15.76	15.82
6	4.14	5.71	5.83
8	1.00	1.52	1.57
10	0.20	0.29	0.31

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.0	6.4	6.5
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 15.4



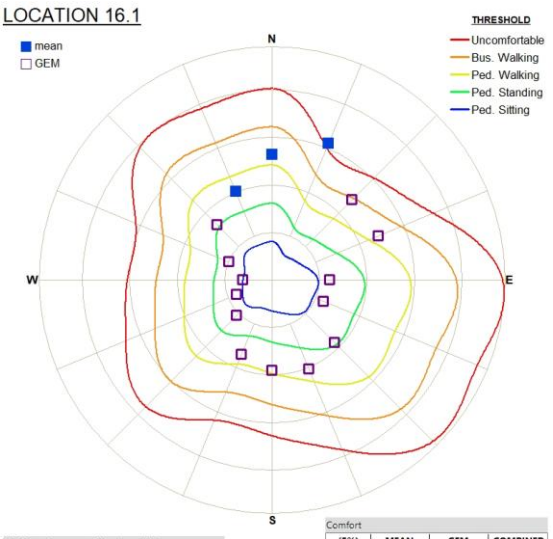
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	51.43	61.67	62.40
4	25.82	28.43	30.19
6	10.88	10.34	12.47
8	3.07	1.99	3.22
10	0.58	0.25	0.59

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.2	7.0	7.4
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 16.1



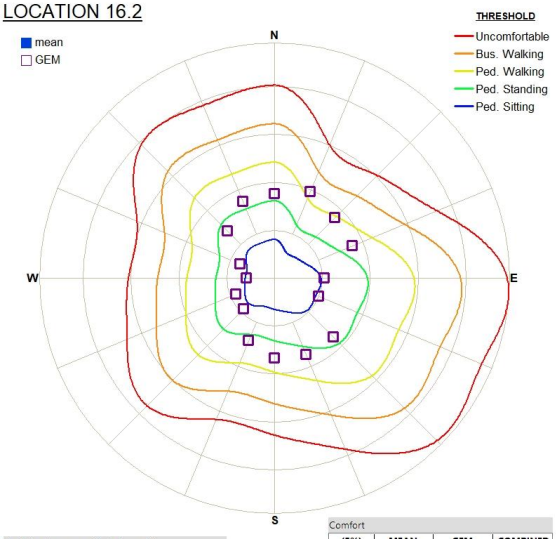
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	49.22	55.66	56.74
4	18.56	21.60	23.24
6	7.06	6.38	8.45
8	2.41	0.88	2.52
10	0.61	0.07	0.63

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.6	6.3	6.8
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 16.2



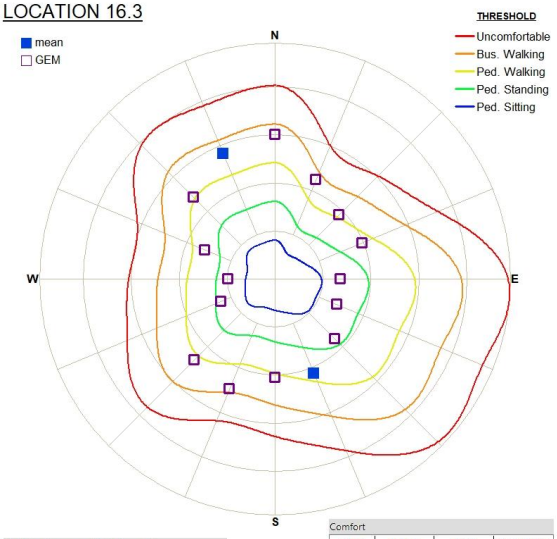
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	31.16	47.56	47.56
4	3.40	12.72	12.72
6	0.07	1.44	1.44
8	0.00	0.06	0.06
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.7	4.9	4.9
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 16.3



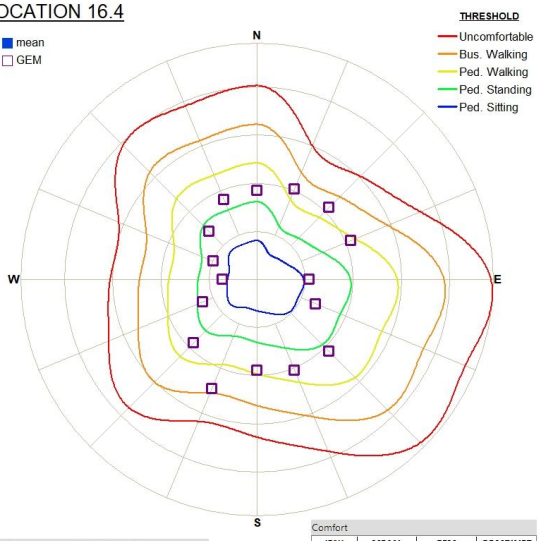
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	53.88	67.53	67.63
4	13.91	26.01	26.14
6	2.35	6.45	6.49
8	0.36	1.01	1.02
10	0.05	0.14	0.14

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.1	6.2	6.3
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 16.4



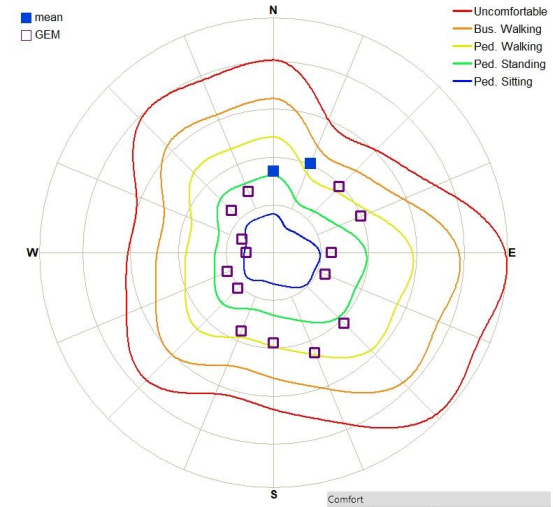
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	39.94	57.45	57.45
4	9.15	22.16	22.16
6	0.77	4.74	4.74
8	0.02	0.53	0.53
10	0.00	0.05	0.05

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.6	5.9	5.9
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 17.1



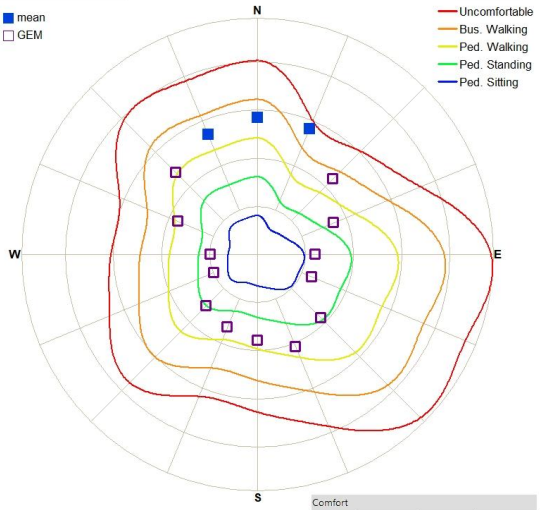
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	39.55	51.74	52.42
4	8.35	17.65	18.60
6	1.21	2.19	2.82
8	0.05	0.14	0.18
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.5	5.3	5.4
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 17.2



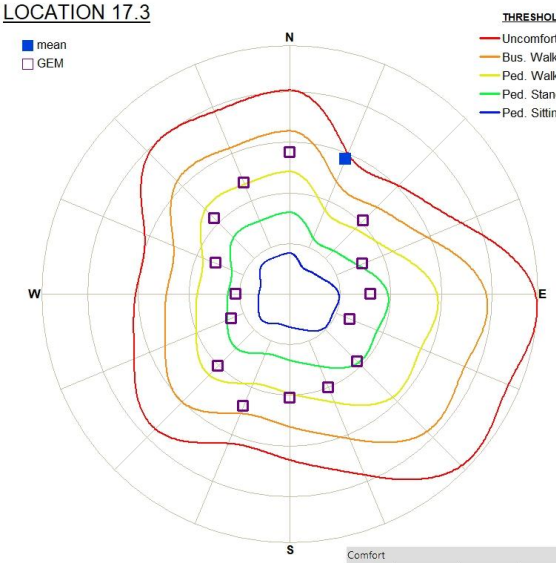
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	53.74	64.54	64.94
4	16.19	21.97	22.56
6	5.31	6.98	7.47
8	1.64	1.59	1.95
10	0.30	0.19	0.32

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.0	6.4	6.6
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 17.3



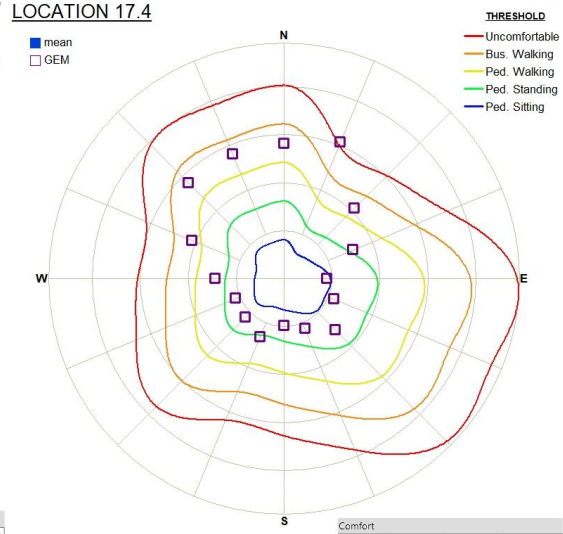
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	54.45	67.04	67.18
4	18.96	24.64	25.03
6	5.60	7.51	8.04
8	1.63	1.55	2.02
10	0.31	0.18	0.35

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.1	6.5	6.6
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 17.4



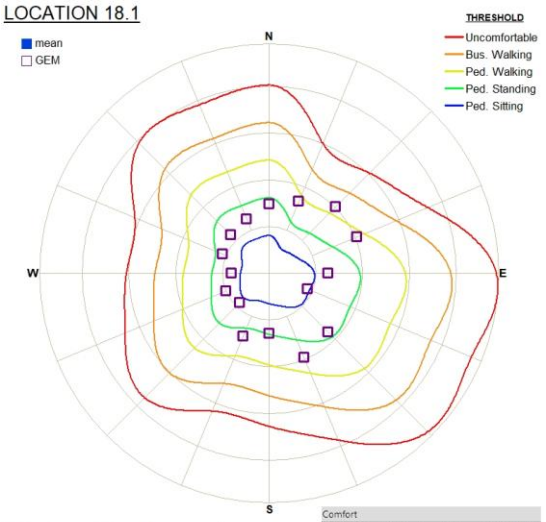
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	41.12	56.46	56.46
4	13.08	18.47	18.47
6	5.42	7.44	7.44
8	1.85	2.71	2.71
10	0.38	0.65	0.65

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.1	6.7	6.7
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 18.1



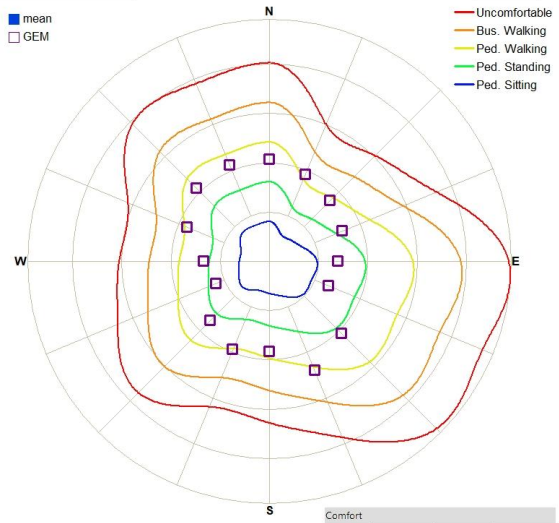
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	25.00	47.58	47.58
4	3.16	12.47	12.47
6	0.11	1.53	1.53
8	0.00	0.09	0.09
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.6	5.0	5.0
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 18.2



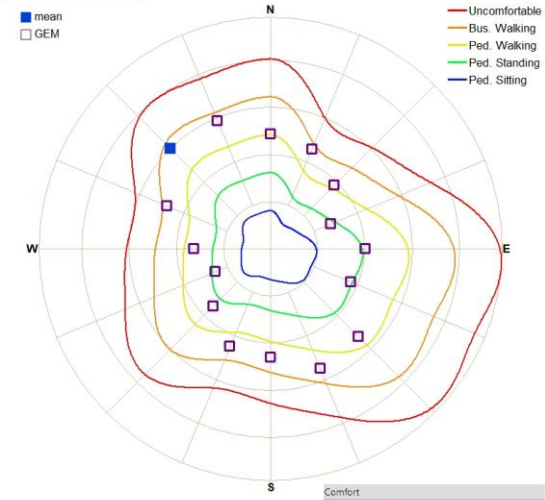
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	46.32	65.78	65.78
4	7.98	20.08	20.08
6	0.86	2.97	2.97
8	0.07	0.24	0.24
10	0.01	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.4	5.5	5.5
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 18.3



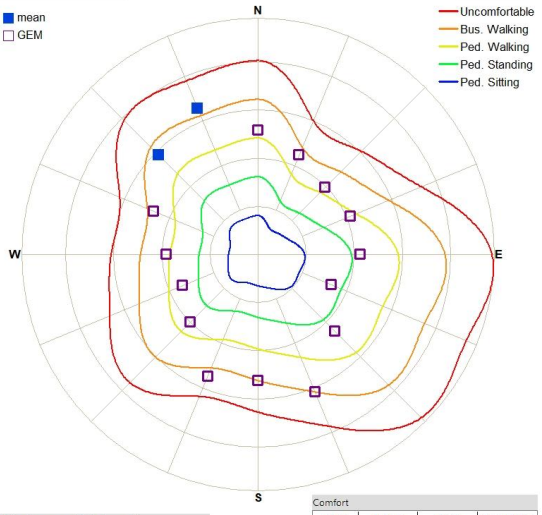
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	65.67	75.93	76.10
4	21.87	31.04	31.22
6	4.81	8.04	8.10
8	0.96	1.61	1.65
10	0.17	0.26	0.28

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.9	6.6	6.6
Rating	Ped Standing	Ped Walking	Ped Walking

LOCATION 18.4



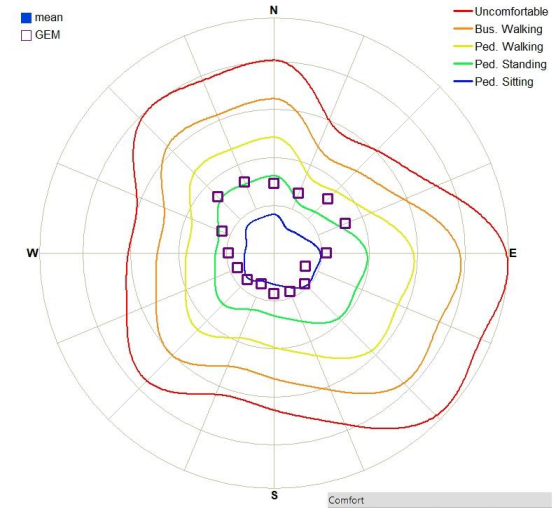
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	68.43	78.58	78.83
4	23.05	37.29	37.50
6	5.90	11.47	11.59
8	1.40	2.59	2.67
10	0.27	0.44	0.47

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.2	7.1	7.1
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION 19.2



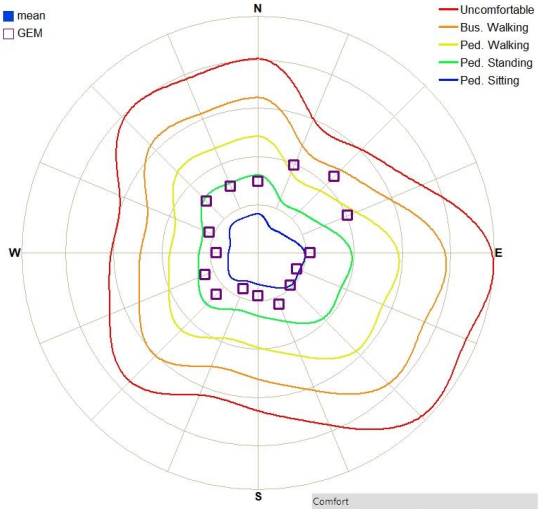
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	12.08	30.76	30.76
4	0.16	5.50	5.50
6	0.00	0.30	0.30
8	0.00	0.01	0.01
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.5	4.0	4.0
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 19.3



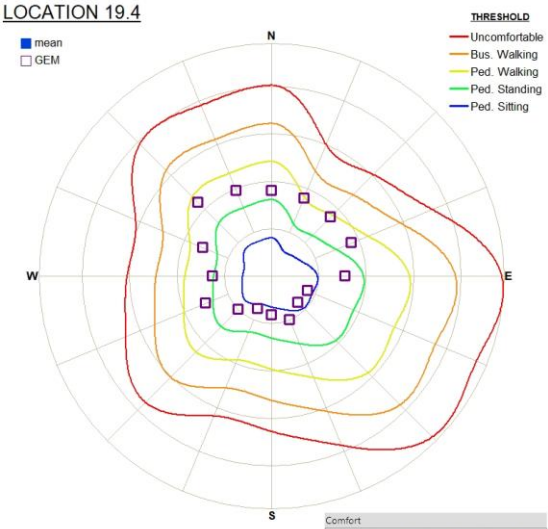
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	20.85	37.68	37.68
4	2.81	12.45	12.45
6	0.07	2.92	2.92
8	0.00	0.32	0.32
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.6	5.3	5.3
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 19.4



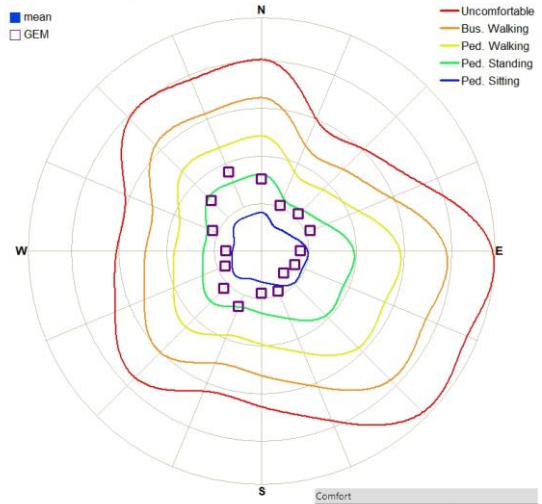
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	25.73	43.34	43.34
4	2.08	11.68	11.68
6	0.12	1.36	1.36
8	0.01	0.10	0.10
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.4	4.9	4.9
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 20.2



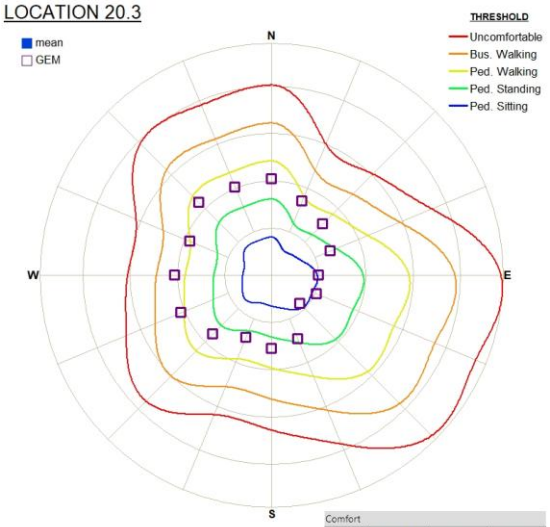
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	6.95	29.26	29.26
4	0.12	1.78	1.78
6	0.00	0.08	0.08
8	0.00	0.00	0.00
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.2	3.3	3.3
Rating	Ped Sitting	Ped Sitting	Ped Sitting

LOCATION 20.3



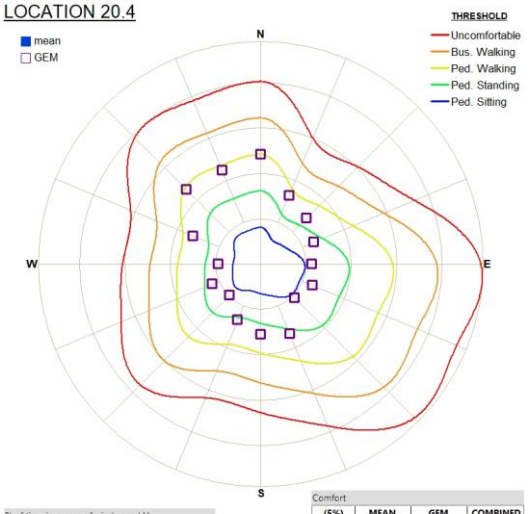
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	30.26	57.01	57.01
4	4.23	14.64	14.64
6	0.36	2.25	2.25
8	0.02	0.23	0.23
10	0.00	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.8	5.1	5.1
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 20.4



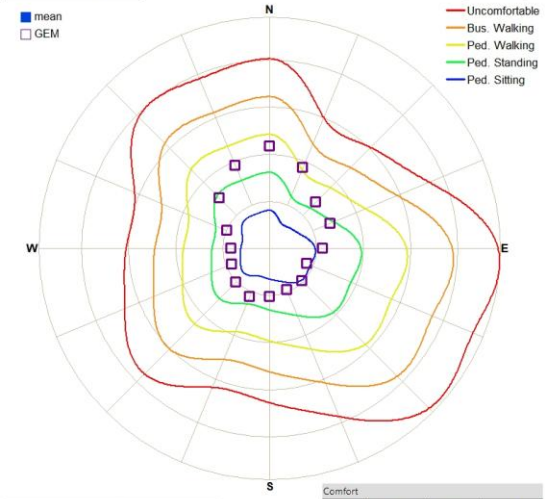
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	17.69	53.54	53.54
4	1.23	10.12	10.12
6	0.09	1.24	1.24
8	0.01	0.15	0.15
10	0.00	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.8	4.7	4.7
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 21.2



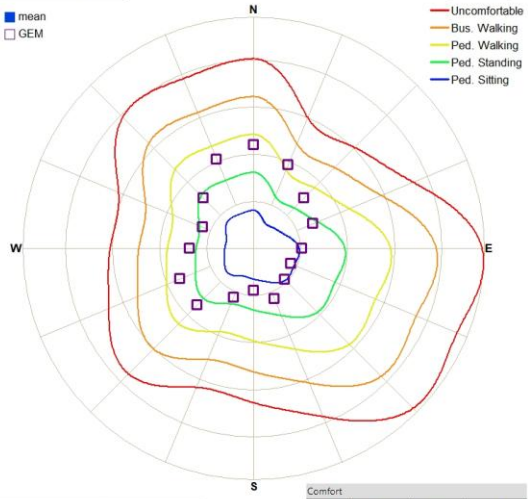
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	16.63	37.05	37.05
4	1.68	6.59	6.59
6	0.05	0.82	0.82
8	0.00	0.04	0.04
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.0	4.2	4.2
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 21.3



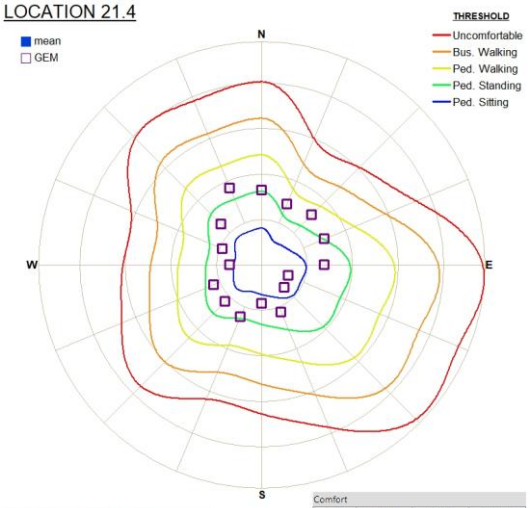
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	22.79	43.42	43.42
4	2.37	9.58	9.58
6	0.06	1.17	1.17
8	0.00	0.06	0.06
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.4	4.7	4.7
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 21.4



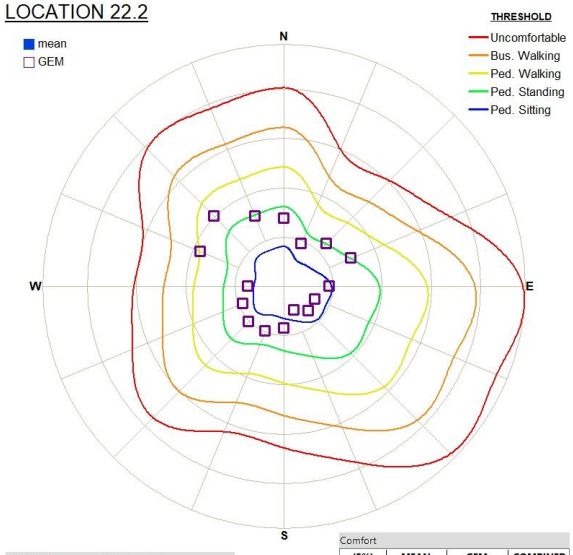
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	9.26	36.07	36.07
4	0.02	5.33	5.33
6	0.00	0.23	0.23
8	0.00	0.00	0.00
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.3	4.0	4.0
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 22.2



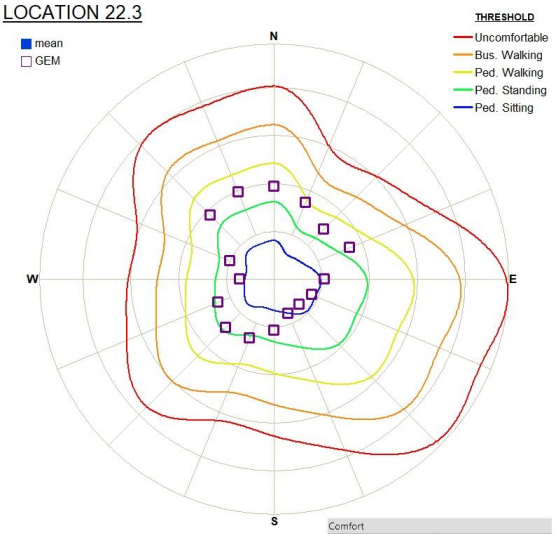
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	9.89	31.25	31.25
4	0.47	3.09	3.09
6	0.01	0.54	0.54
8	0.00	0.07	0.07
10	0.00	0.01	0.01

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.3	3.6	3.6
Rating	Ped Sitting	Ped Sitting	Ped Sitting

LOCATION 22.3



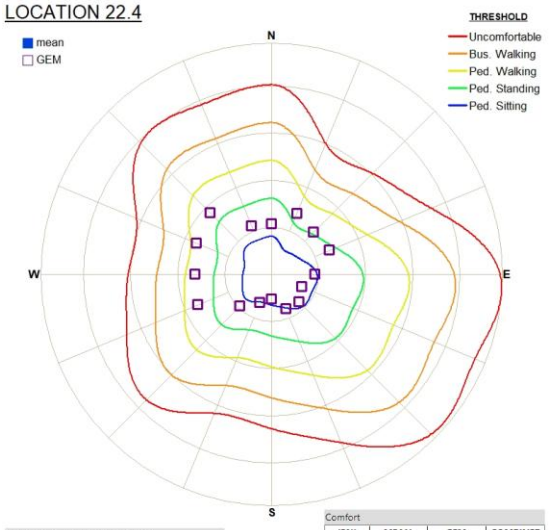
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	20.20	41.12	41.12
4	1.13	8.16	8.16
6	0.02	0.67	0.67
8	0.00	0.03	0.03
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.0	4.4	4.4
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 22.4



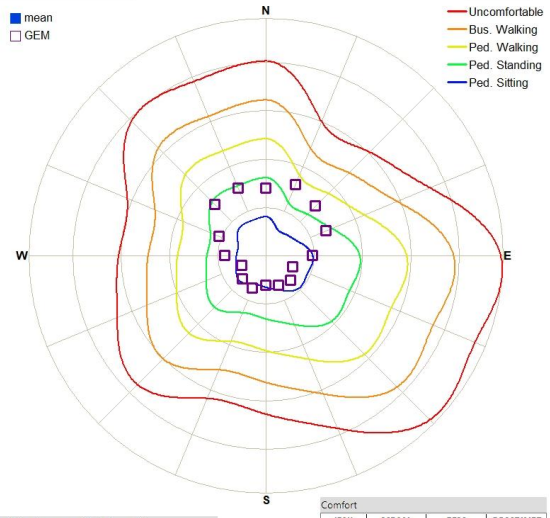
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	15.62	32.28	32.28
4	0.73	5.62	5.62
6	0.02	0.57	0.57
8	0.00	0.04	0.04
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.8	4.1	4.1
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 23.2



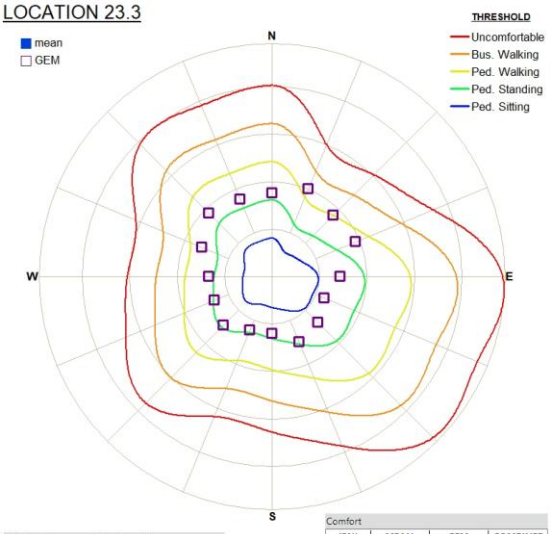
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	12.49	25.20	25.20
4	0.28	4.68	4.68
6	0.00	0.20	0.20
8	0.00	0.00	0.00
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.6	3.9	3.9
Rating	Ped Sitting	Ped Sitting	Ped Sitting

LOCATION 23.3



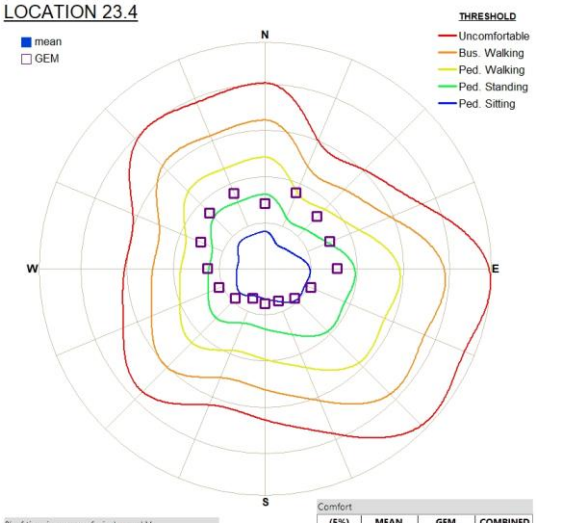
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	35.72	55.42	55.42
4	4.12	13.44	13.44
6	0.14	1.88	1.88
8	0.00	0.09	0.09
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.8	5.1	5.1
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 23.4



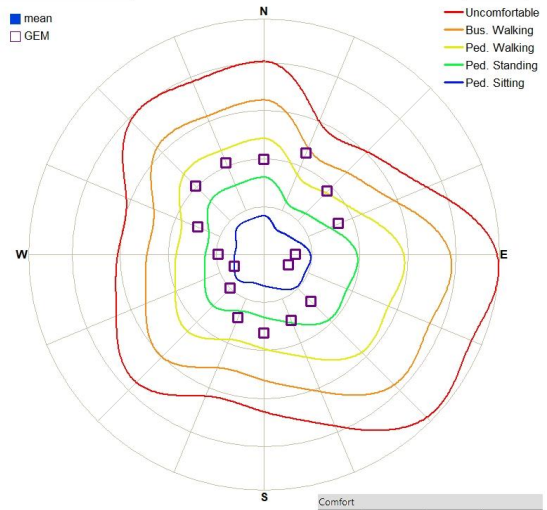
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	17.77	36.62	36.62
4	1.22	8.18	8.18
6	0.02	0.75	0.75
8	0.00	0.02	0.02
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.0	4.5	4.5
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION 24.2



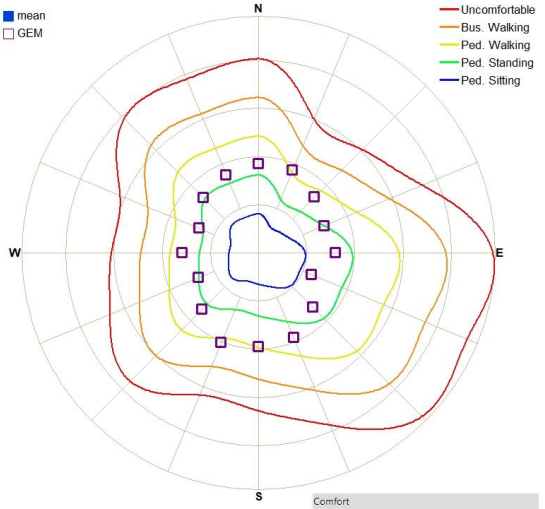
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	38.06	52.36	52.36
4	8.45	14.95	14.95
6	1.63	3.08	3.08
8	0.13	0.35	0.35
10	0.01	0.03	0.03

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.6	5.4	5.4
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 24.3



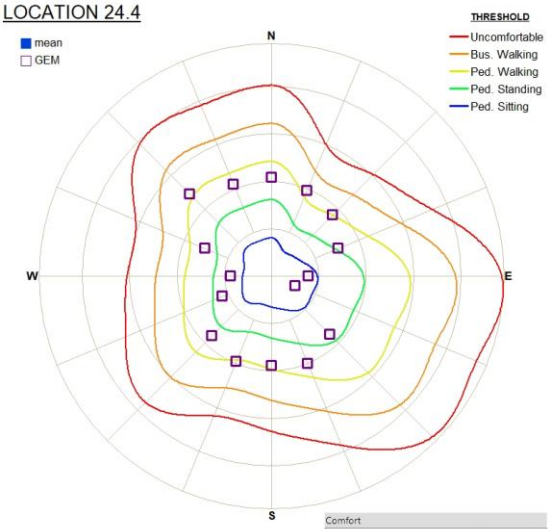
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	43.78	59.50	59.50
4	7.76	16.81	16.81
6	0.63	2.08	2.08
8	0.03	0.12	0.12
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.2	5.2
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 24.4



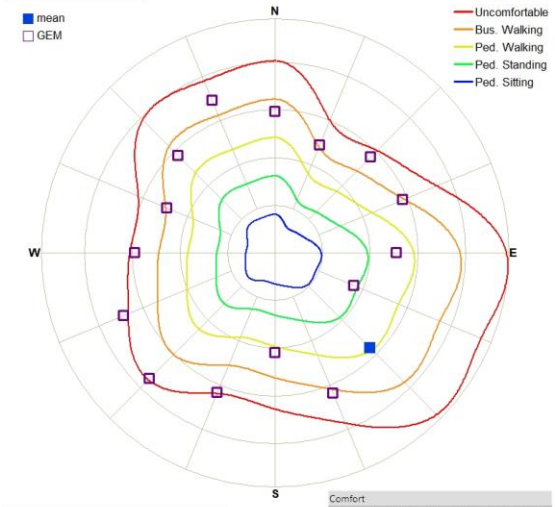
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	48.10	59.44	59.44
4	11.69	18.68	18.68
6	1.22	3.01	3.01
8	0.07	0.26	0.26
10	0.01	0.03	0.03

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.8	5.5	5.5
Rating	Ped Standing	Ped Standing	Ped Standing

LOCATION 25.4



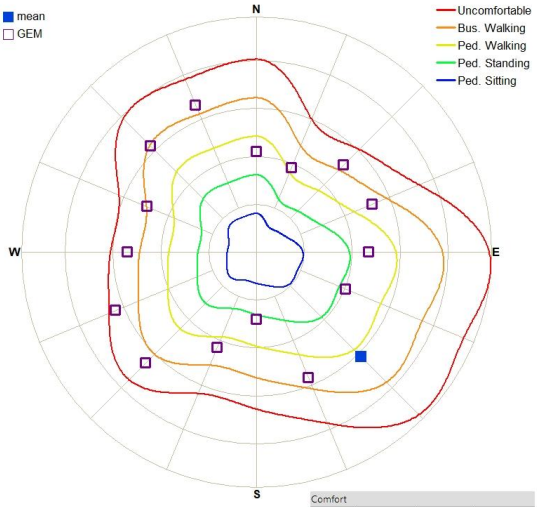
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	77.54	84.86	84.94
4	35.29	47.11	47.34
6	12.93	22.07	22.14
8	3.24	7.14	7.15
10	0.67	1.79	1.79

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.4	8.5	8.5
Rating	Ped Walking	Bus Walking	Bus Walking

LOCATION 26.4



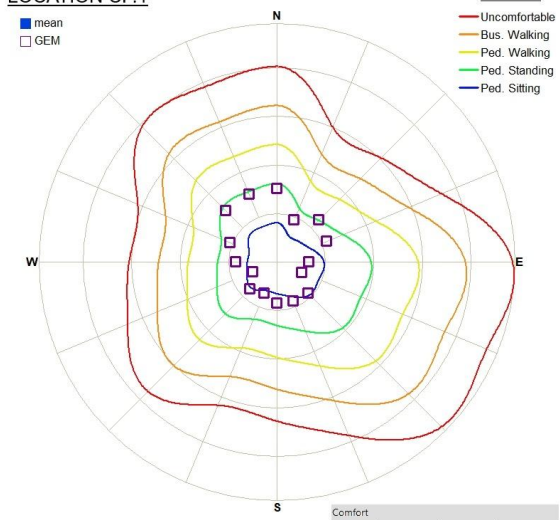
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	67.97	80.92	80.92
4	25.71	39.14	39.16
6	7.35	13.98	13.99
8	1.55	3.65	3.65
10	0.32	0.84	0.84

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.4	7.5	7.5
Rating	Ped Walking	Ped Walking	Ped Walking

LOCATION CP.1



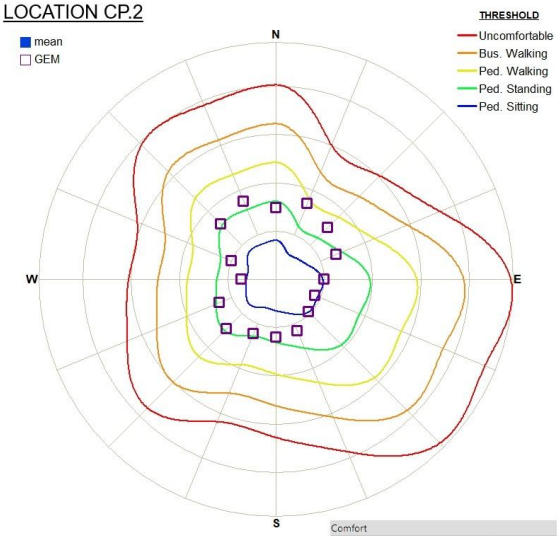
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	4.53	23.58	23.58
4	0.12	1.42	1.42
6	0.00	0.04	0.04
8	0.00	0.00	0.00
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	1.9	3.2	3.2
Rating	Outdoor Dining	Ped Sitting	Ped Sitting

LOCATION CP.2



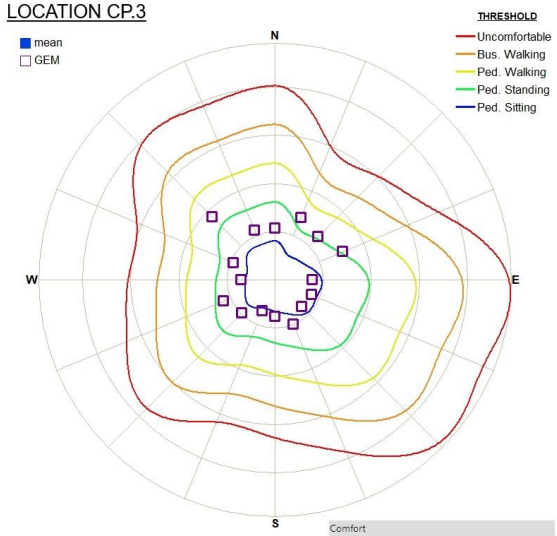
% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	22.70	41.57	41.57
4	1.28	6.71	6.71
6	0.02	0.43	0.43
8	0.00	0.01	0.01
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.1	4.2	4.2
Rating	Ped Sitting	Ped Standing	Ped Standing

LOCATION CP.3



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	11.34	28.39	28.39
4	0.09	3.12	3.12
6	0.00	0.16	0.16
8	0.00	0.02	0.02
10	0.00	0.00	0.00

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.5	3.7	3.7
Rating	Ped Sitting	Ped Sitting	Ped Sitting