University of Guelph Research Park
150 Research Lane, Suite 105
Guelph, ON, N1G 4T2
226.706.8080 | www.slrconsulting.com

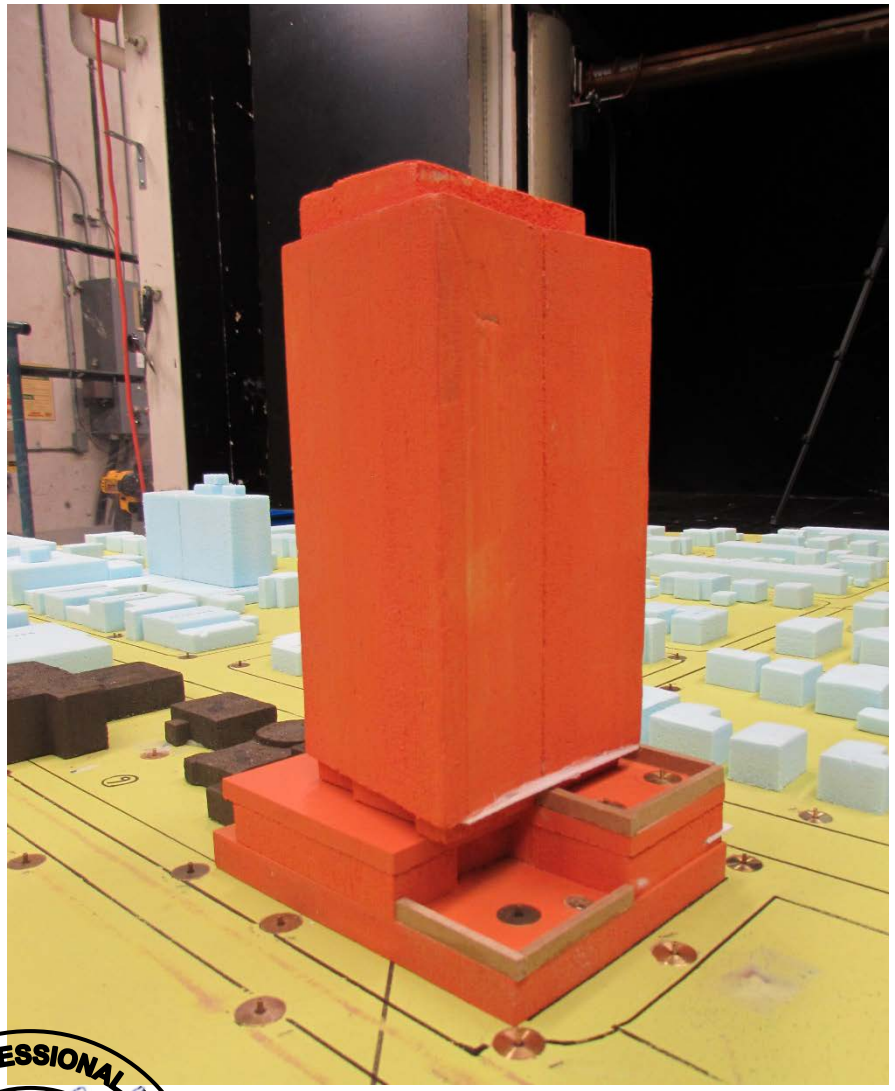
Date: January 11, 2021

To: Renimmob Properties Limited
2069 Lakeshore Road, Suite 201
Burlington, Ontario L7R 1E2

Re: **Pedestrian Wind Study**
535 Brant Street
Burlington, Ontario
SLR Project #241.18271.A0000

Team: Jenny Graham, P.Eng.
Senior Engineer

Tahrana Lovlin, MAES, P.Eng.
Microclimate Specialist



LICENSED PROFESSIONAL ENGINEER
T.B. LOVLIN
100056279
11/01/2021
PROVINCE OF ONTARIO

TABLE OF CONTENTS

1.0 Introduction 2
1.1 Existing Development 2
1.2 Proposed Development 4
1.3 Areas of Interest 4
2.0 Approach 6
2.1 Scale Model Construction 6
2.2 Wind Tunnel 6
2.3 Wind Climate 9
3.0 Pedestrian Wind Criteria 10
4.0 Results 11
4.1 Building Entrances & Walkways 11
4.2 Amenity Terraces 16
4.3 Surrounding Sidewalks 16
4.3 Wind Safety 16
5.0 Future Considerations 21
6.0 Conclusions & Recommendations 22
7.0 Assessment Applicability 22
8.0 References 23
Appendix A 24
Appendix B 32

1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. (SLR) was retained by Renimmob Properties Limited to conduct a pedestrian wind study for the proposed 535 Brant Street development in Burlington, Ontario. This report is in support of the Zoning By-law Approval (ZBA) application for the project.

1.1 Existing Development

The proposed development is located at 535 Brant Street, on the north side of the road between Caroline Street and Victoria Avenue. The site is currently occupied by low-rise commercial buildings. Figure 1 provides an aerial view of the immediate study area. A virtual site visit was conducted by SLR using Google Earth images dated August 2018 and June 2019; some of these images are included in Figures 2a through 2d.

Immediately surrounding the site are low-rise commercial developments to the north and southeast, with low-rise residential buildings to the south through west. In the remaining directions there are parking lots immediately surrounding the site. Beyond the immediate surroundings there are low-rise residential buildings to the north through east, the downtown core of Burlington with mid-rise and high-rise buildings is southeast, and there are low-rise residential buildings to the south through northwest. Lake Ontario is approximately 800 m to the southeast, beyond the downtown core.

Developments with site plan approval (SPA) and developments under construction in the surrounding area were also included as existing surroundings for the analysis. For this assessment we have included the SPA-approved developments at 421 Brant Street and 2025 Maria Street.



Figure 3: Aerial view of existing site & surroundings
Credit: Google Earth Pro™, dated May 7, 2018



Figure 2a: Looking north at existing site



Figure 2b: Looking northeast along Caroline Street

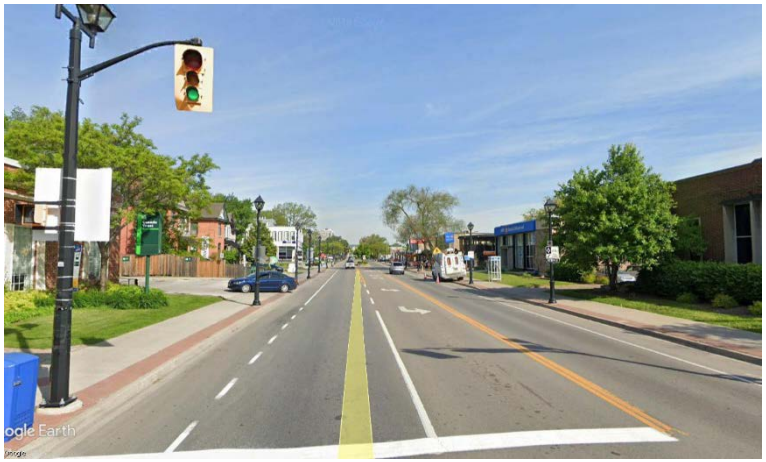


Figure 2c: Looking northwest along Brant Street



Figure 2d: Looking southeast along Brant Street

1.2 Proposed Development

The proposed development is approximately 86 m tall. It includes a 25-storey tall (total) tower a top a three-storey tall podium, and a mechanical penthouse. A rendering is shown in Figure 3.

The main residential entrance is located on the west facade, along Brant Street. There are additional retail entrances along the west facade, with secondary entrances and exits on the east facade. Outdoor amenity spaces are located on the northeast corner of the podium on Level 2 and on the northwest corner of the podium on Level 4. These on site areas are shown in Figure 4.

1.3 Areas of Interest

Areas of interest for pedestrian wind conditions include those areas which pedestrians are expected to use on a frequent basis. Typically these include sidewalks, main entrances, transit stops, plazas and parks. There are two transit stops along Brant Street in the vicinity. In addition, there is an outdoor patio associated with the nearby Joe Dog's Gasbar Grill.

These on site areas, as well as the nearby business, are shown in Figure 4.

Note: Project North is approximately 45° counter-clockwise from True North. References to wind use True North, while discussion of the building references Project North.



Figure 3: Rendering of proposed development
Credit: Turner Fleischer

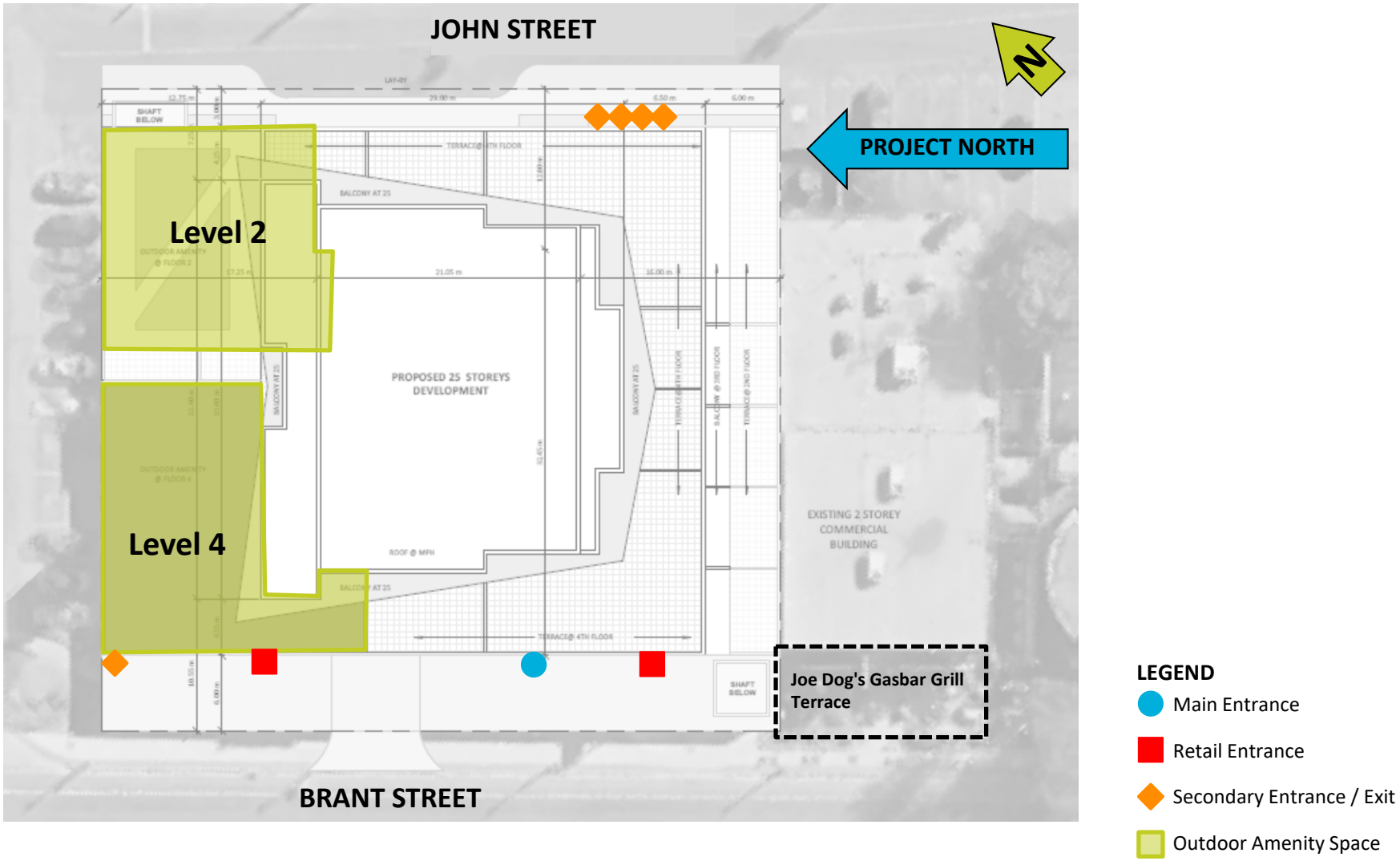


Figure 4: Areas of interest

2.0 APPROACH

The objective of the wind tunnel study is to assist the design team and City Planning officials in making informed decisions about the building form considered and its influence on pedestrian comfort. This quantitative analysis involves the construction of a physical model of the development and surrounding features that influence wind flow. The physical model is instrumented with probes and tested in a wind tunnel. Afterwards, the wind tunnel data are combined with regional meteorological data; this analysis is then compared to the relevant wind criteria and standards in order to determine how appropriate the wind conditions are for the intended pedestrian usage. In our opinion, wind tunnel studies are the most comprehensive and quantitative approach for pedestrian wind comfort analysis.

2.1 Scale Model Construction

A 1:400 scale model of the 535 Brant Street development was constructed based on up-to-date drawing information received by SLR on January 27 and September 14, 2020. The proximity model of the surrounding area was built in block form for a radius of approximately 480 m from the site centre. As existing buildings surrounding the site will influence wind characteristics, existing buildings, those under construction and those buildings with Site Plan Approval (SPA) were included in the model for both the Existing and Proposed Configurations. Information regarding which approved developments to include within the existing surrounds was determined through discussions with the design team. A list of the approved surrounding development applications was provided to the design team for review and comment. Grade differences within the limits of the model were found to be minor, thus the site was modeled as flat.

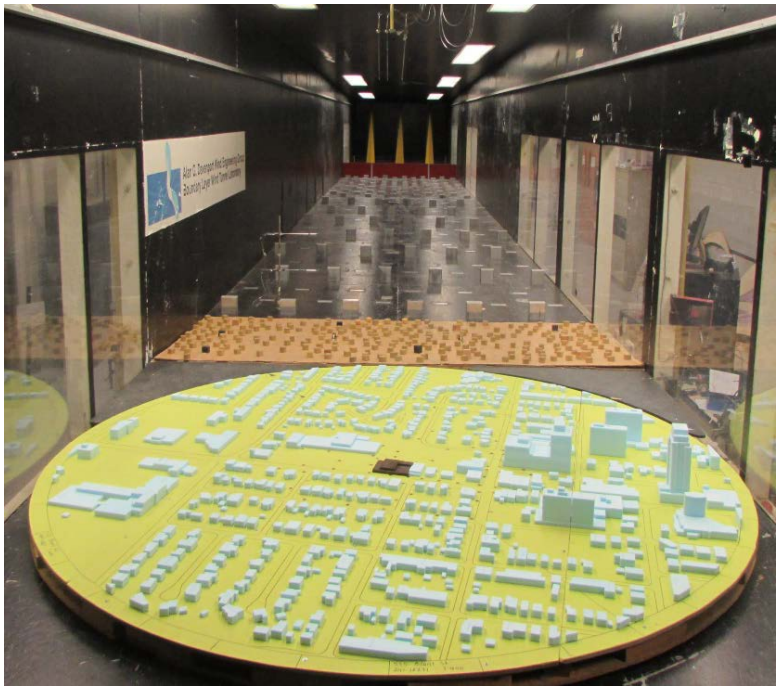
Two configurations were tested in the wind tunnel:

- **Existing Configuration:** with surrounding existing buildings, including those with SPA approval (see Section 1.1), and existing building on site (**Figure 5a**).
- **Proposed Configuration:** with surrounding existing buildings, including those with SPA approval, and the proposed development which included a canopy along the south facade, a canopy along the west side of the tower, and vertical wind screens around the amenity spaces on Levels 2 and 4 (**Figure 5b**).

2.2 Wind Tunnel

Wind tunnel tests were conducted in the Alan G. Davenport Wind Engineering Group Boundary-Layer Wind Tunnel Laboratory at the University of Western Ontario. The upstream test section of the wind tunnel included generic roughness blocks and turbulence-generating spires to modify the wind flow approaching the model. These features develop characteristics of the wind flow that are similar to the actual site. The test model is rotated on a turn-table to simulate different wind directions with the upstream terrain being changed as appropriate to reflect the various upwind conditions encountered around the site.

The test model was equipped with 70 omni-directional probes to record wind speed at the pedestrian-level (approximately 1.5 m above grade). The orientation of the model was rotated in 10° intervals on the turn-table to permit measurement of wind speed at each probe location for 36 wind directions. The wind tunnel data were then combined with the wind climate model for this region to predict the occurrence of wind speeds in the pedestrian realm and compare against wind criteria for comfort and safety.





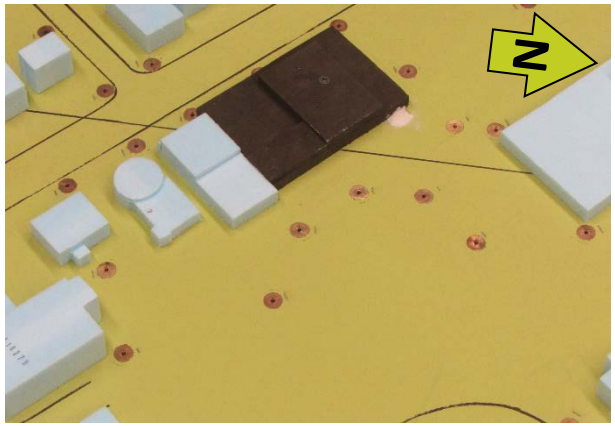


Figure 5a: Existing Configuration

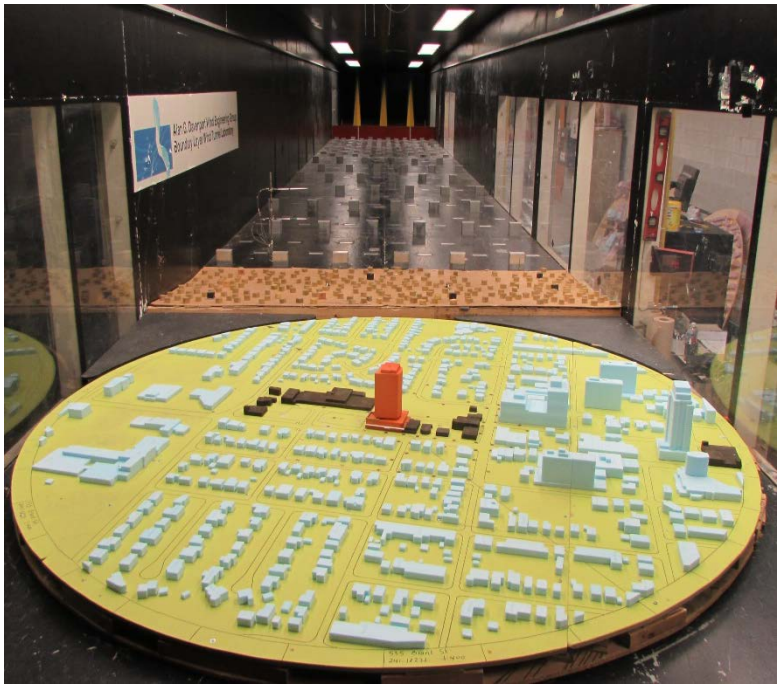






Figure 5b: Proposed Configuration

2.3 Wind Climate

Wind data recorded at John C. Munro International Airport in Hamilton for the period of 1993 to 2019 were obtained and analysed to create a wind climate model for the region. Annual and seasonal wind distribution diagrams ("wind roses") are shown in Figure 6. These diagrams illustrate the percentage of time wind blows from the 16 main compass directions. Of main interest are the longest peaks that identify the most frequently occurring wind directions. The annual wind rose indicates that wind approaching from the southwest and northeast quadrants are most prevalent. The seasonal wind roses readily show how the prevalent winds shift throughout the year. The seasonal wind roses show daytime winds, from 6:00 – 23:00, while the annual wind rose shows all hours.

The directions from which stronger winds (e.g., > 30 km/h) approach are also of interest as they have the highest potential of creating problematic wind conditions, depending upon site exposure and the building configurations. The wind roses in Figure 6 also identify the directional frequency of these stronger winds, as indicated in the figure's legend colour key. On an annual basis, strong winds occur from the southwest and northeast quadrants. All wind speeds and directions were included in the wind climate model.

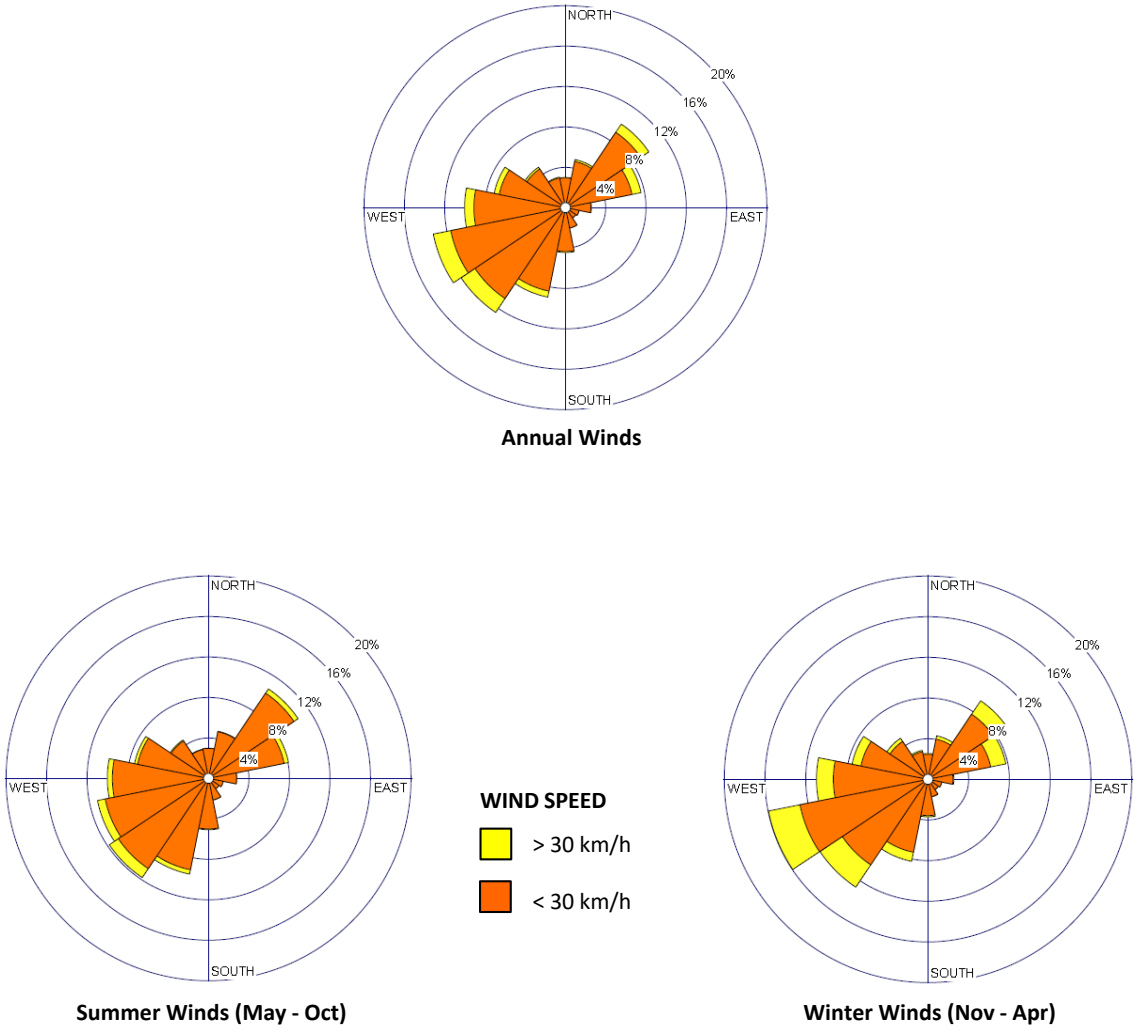


Figure 6: Wind Roses for John C. Munro International Airport (1993-2019, 6am–11pm)

3.0 PEDESTRIAN WIND CRITERIA

Wind comfort conditions are discussed in terms of being acceptable for certain pedestrian activities and are based on predicted wind force and the expected frequency of occurrence. Wind chill, clothing, humidity and exposure to direct sun, for example, all affect a person's thermal comfort; however, these influences are not considered in the wind comfort criteria.

The criteria utilized for this analysis is provided by the City of Burlington, in the document *Pedestrian Level Wind Study Guidelines and Terms of Reference (June 2020).* The comfort criteria, which is based on certain predicted hourly gust-equivalent mean (GEM) wind speeds being exceeded 20% of the time, are summarized in Table 1. By allowing for a 20% exceedance, it assumes wind speeds will be comfortable for the corresponding activity at least four out of five days. The comfort criteria consider only daytime hours, between 6:00am and 11:00pm. GEM is defined as the maximum mean wind speed or the gust wind speed divided by 1.85.

The criterion for wind safety in the table is based on hourly gust wind speeds that are exceeded nine hours per year (approximately 0.1% of the time). When more than one event is predicted annually, wind mitigation measures are then advised. The wind safety criterion is shown in Table 2.

Table 1: Wind Comfort Criteria

Activity	Comfort Ranges for GEM Wind Speed Exceeded 20% of the Time		Description of Wind Comfort
Sitting	0 to 10 km/h	0 to 2.8 m/s	Calm or light breezes desired for outdoor restaurants and seating areas where one can read a paper comfortably.
Standing	0 to 14 km/h	0 to 3.9 m/s	Gentle breezes suitable for main building entrances and transit stops.
Leisurely Walking	0 to 17 km/h	0 to 4.7 m/s	Moderate breezes suitable for walking along pedestrian thorough fares.
Fast Walking	0 to 20 km/h	0 to 5.6 m/s	Strong breezes that can be tolerated if one's objective is to walk, run or cycle without lingering.
Uncomfortable	> 20 km/h	> 5.6 m/s	Strong winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.

Table 2: Wind Safety Criterion

Activity	Safety Criterion Gust Wind Speed Exceeded Once Per Year (0.1%)		Description of Wind Effects
Any	90 km/h	25 m/s	Excessive gust speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.

4.0 RESULTS

Results are presented through discussion of the wind conditions on the site, and along nearby major streets. The analysis of wind comfort was undertaken for two seasons in this study and these results are displayed on plans. Full detailed results for the summer and winter can be found in Appendix A. Annual wind safety is provided in Appendix B.

Note: The comfort criterion are based on wind force alone, thus climate issues that influence a person's overall "thermal" comfort (e.g., temperature, humidity, wind chill, shade, etc.) are not considered in this analysis.

Note: Project North is approximately 45° counter-clockwise from True North. References to wind use True North, discussion of the building references Project North.

There are generally accepted wind comfort levels that are desired for various pedestrian uses. For example, for sidewalks and walkways, wind comfort suitable for leisurely walking would be desirable year-round. For main entrances and transit stops, wind conditions conducive to standing would be preferred throughout the year, but can be difficult to achieve in regions where winter winds are inherently harsh. For amenity spaces, wind conditions suitable for sitting and/or standing are generally desirable during the summer months. The most stringent category of sitting is considered appropriate for cafes and dedicated seating areas, while for parks sitting and/or standing would be appropriate in the summer.

4.1 Building Entrances & Walkways (Locations 1–7)

In the Existing Configuration wind conditions around the site are suitable for sitting or standing year-round (Figures 7a and 7b).

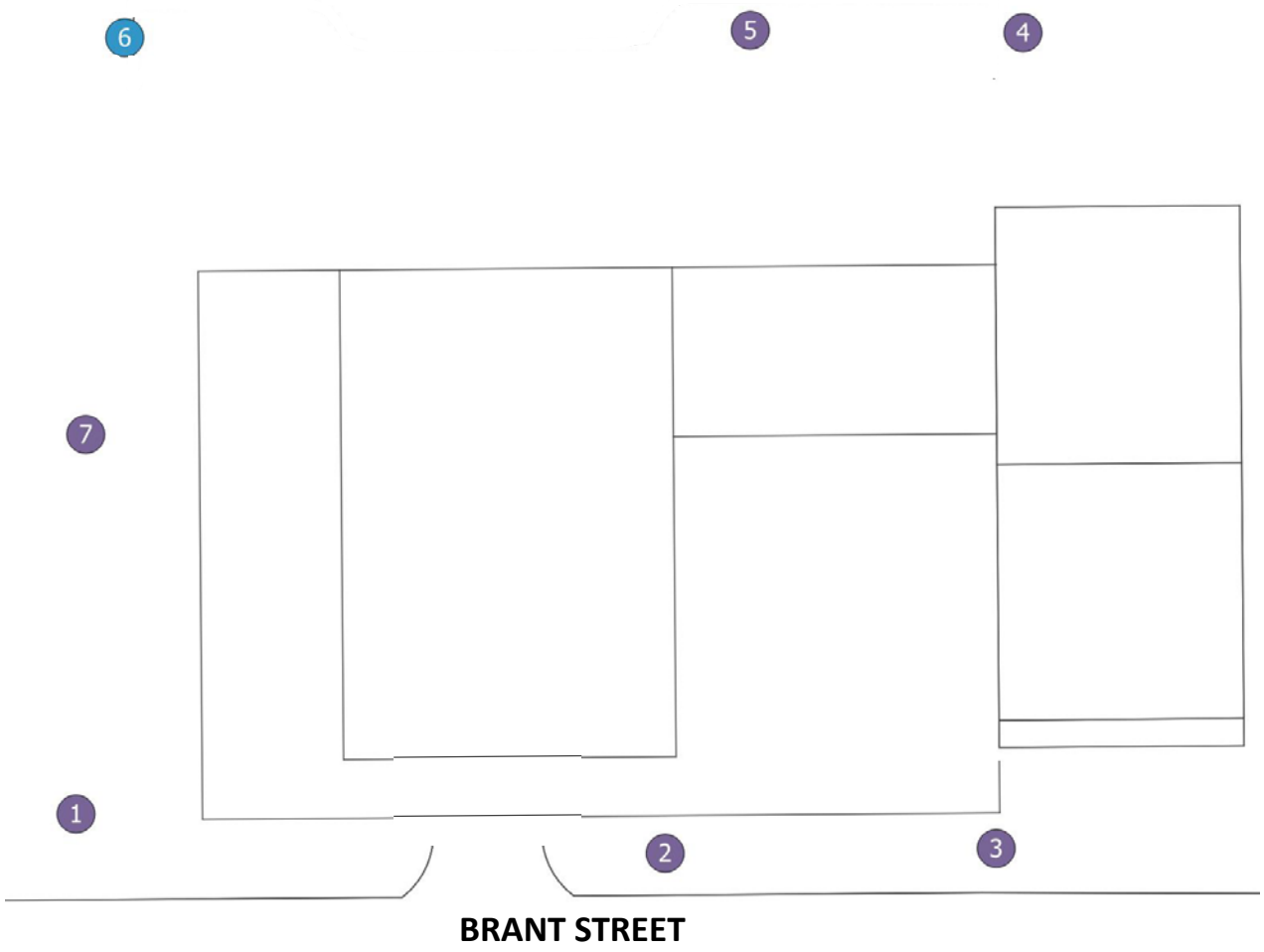
In the Proposed Configuration wind conditions at the main entrance (Location 2) are suitable for standing year-round (Figures 7c and 7d). Similar wind conditions are expected at the two nearby retail entrances. At the secondary entrances and emergency exits on the east facade wind conditions are comfortable for standing in both the summer and winter seasons (Location 5). At the emergency exit at the northwest corner of the building (Location 1) wind conditions are conducive to standing in the summer and leisurely walking in the winter.

On the walkways surrounding the building, wind conditions are generally suitable for leisurely walking or better year-round (Figures 7c and 7d). Along the north facade (Location 7) and at the southwest corner (Location 3) wind conditions are comfortable for fast walking in the winter. In addition, wind conditions at the northeast corner of the building are conducive to fast walking in the summer and are uncomfortable in the winter. These strong wind flows due to the prevailing southwesterly and northeast winds channeling between the proposed development and the nearby existing commercial building.

SLR will work with the design team prior to the SPA submission to further refine practical and effective wind mitigation measures.

Sensor Location Description

Main Entrance	--
Outdoor Amenity	--
Secondary Entrances / Exits	--
Sidewalk	1-7



PROJECT NORTH

N

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

Notes:

1) Not to scale.

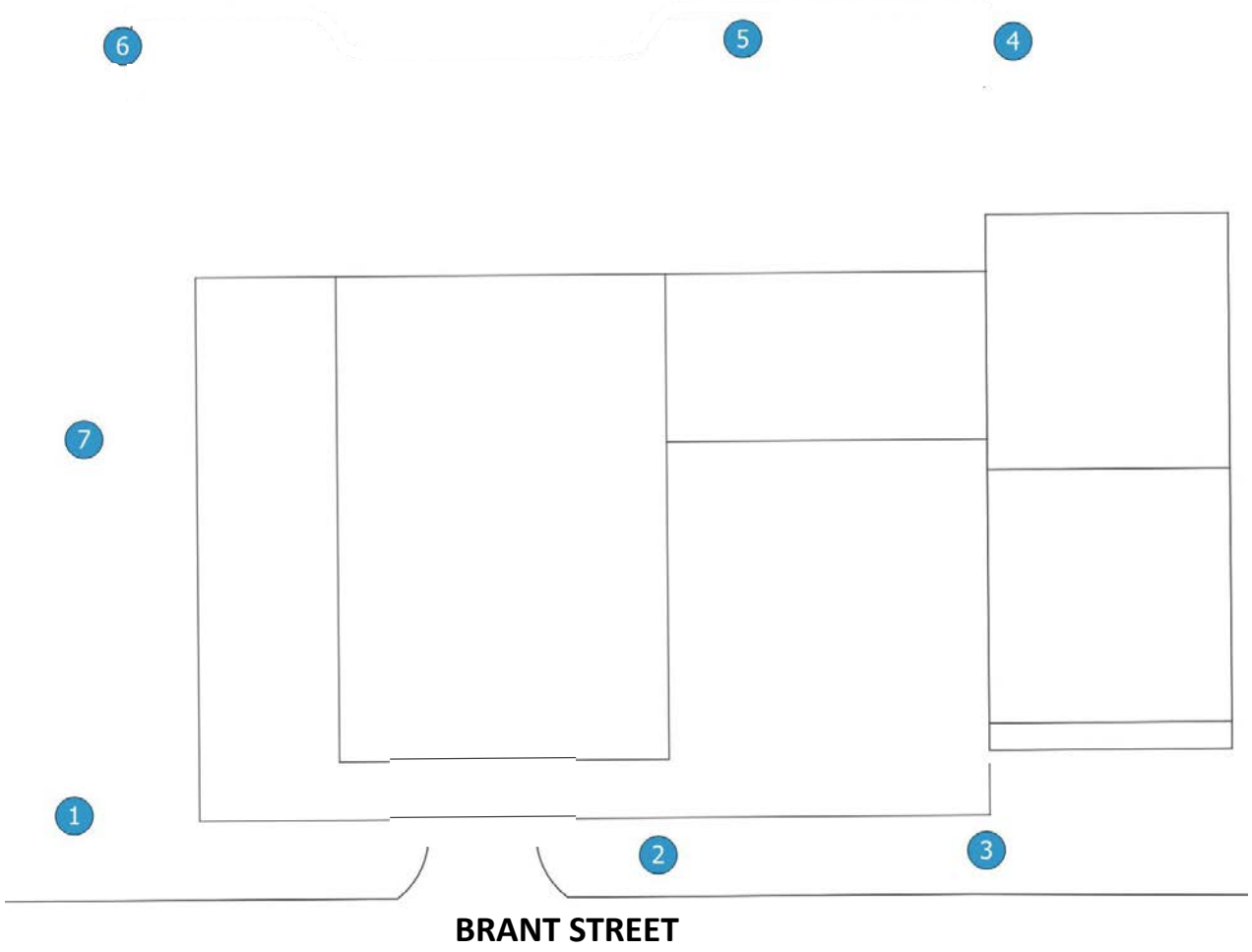
2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 7a: Existing Configuration – Pedestrian Wind Comfort – On-site – Summer

Sensor Location Description

Main Entrance	--
Outdoor Amenity	--
Secondary Entrances / Exits	--
Sidewalk	1-7



PROJECT NORTH

N

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

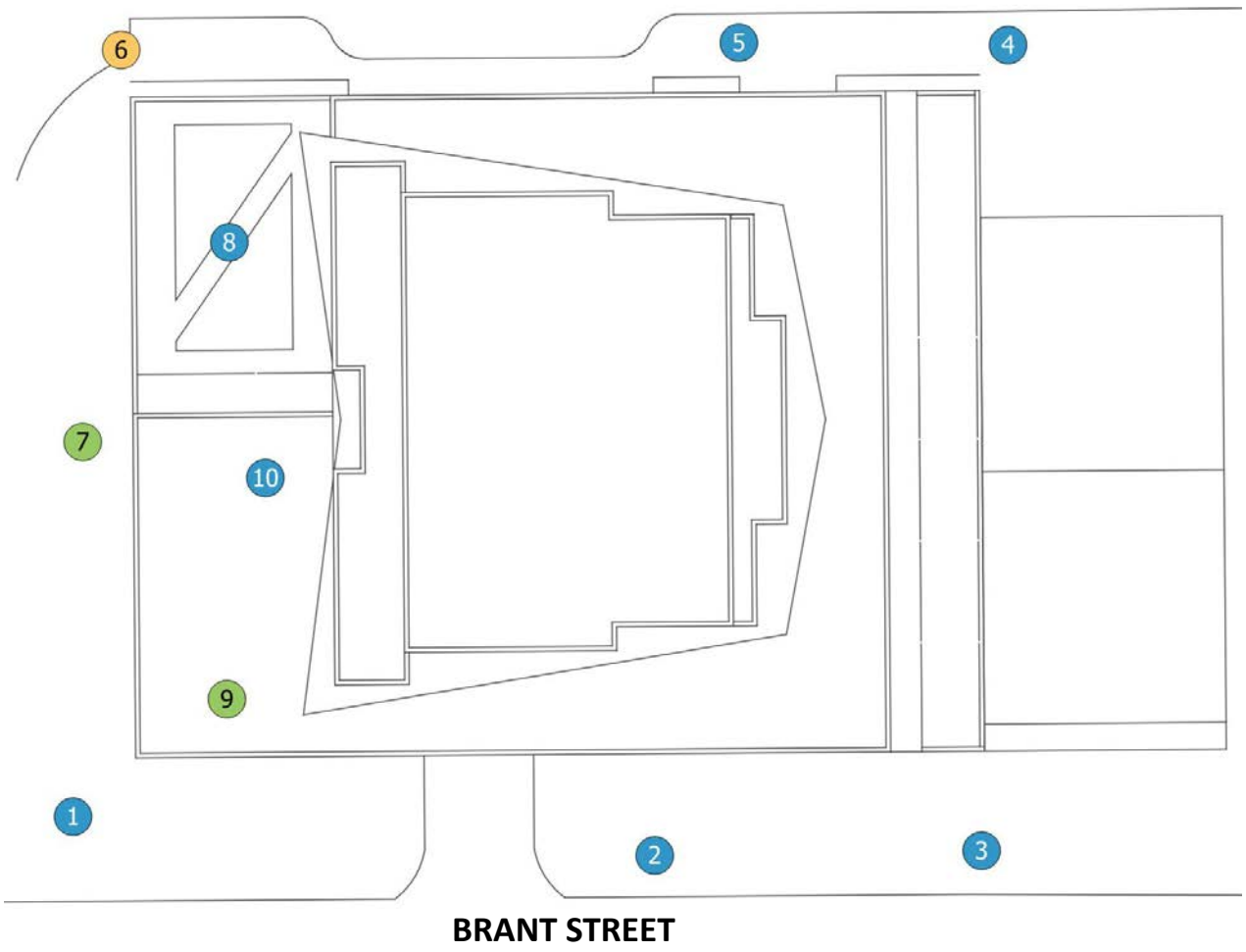
Notes:

1) Not to scale.

2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 7b: Existing Configuration – Pedestrian Wind Comfort – On-site – Winter



Sensor Location Description

Main Entrance	2
Outdoor Amenity	8-10
Secondary Entrances / Exits	5
Sidewalk	1, 3, 4, 6, 7

PROJECT NORTH

N

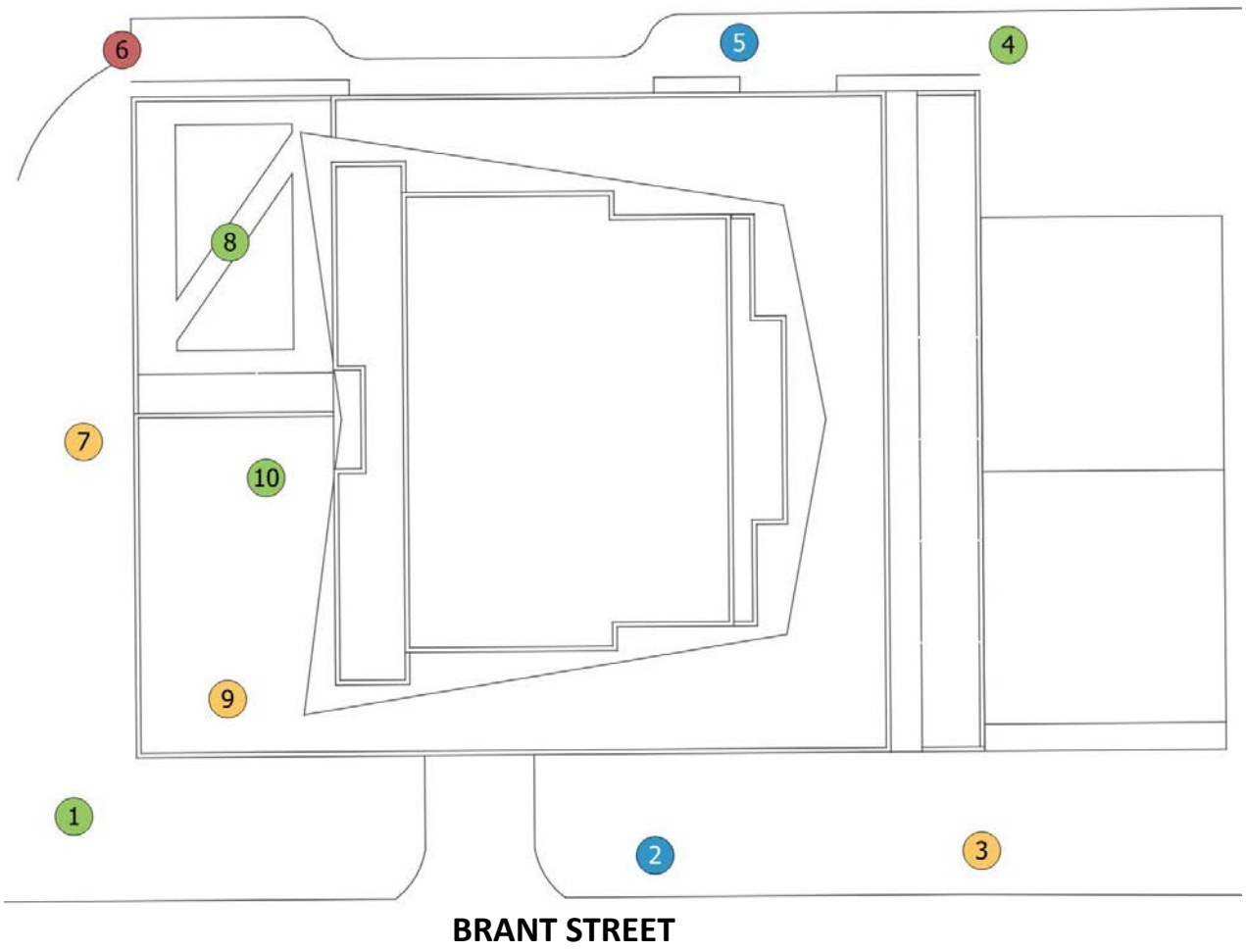
Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

Notes:

1) Not to scale.
2) Pedestrian level wind sensor location (#)
3) Diagram includes grade, Level 2 and Level 4.

Figure 7c: Proposed Configuration – Pedestrian Wind Comfort – On-site – Summer



Sensor Location Description

Main Entrance	2
Outdoor Amenity	8-10
Secondary Entrances / Exits	5
Sidewalk	1, 3, 4, 6, 7

PROJECT NORTH

N

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

Notes:

1) Not to scale.
2) Pedestrian level wind sensor location (#)
3) Diagram includes grade, Level 2 and Level 4.

Figure 7d: Proposed Configuration – Pedestrian Wind Comfort – On-site – Summer

4.2 Amenity Terraces (Locations 8–10)

In the Proposed Configuration wind conditions on the Level 2 amenity terrace (Location 8) are suitable for standing in the summer and leisurely walking in the winter (Figures 7c and 7d). If improved wind conditions are desired in the winter the design team could consider the inclusion of additional local wind mitigation measures such as dense landscaping, vertical wind screens, umbrellas, etc. These features, if appropriately designed, could improve local wind conditions on the terrace.

On the Level 4 amenity terrace wind conditions are comfortable for standing or leisurely walking in the summer (Locations 9 and 10 in Figure 7c). In the winter, wind conditions are suitable leisurely walking (Location 10) or fast walking (Location 9). To improve wind conditions on this terrace in the summer we suggest the design team consider the inclusion of additional local wind mitigation measures such as dense landscaping, local vertical wind screens, umbrellas, etc. These features, if appropriately designed, could improve local wind conditions on the terrace.

SLR will work with the design team prior to the SPA, during the detailed design phase, to confirm the details of the wind mitigation measures. The design team could also consider the option of closing the outdoor terraces during the winter months.

4.3 Surrounding Sidewalks (Locations 11–70)

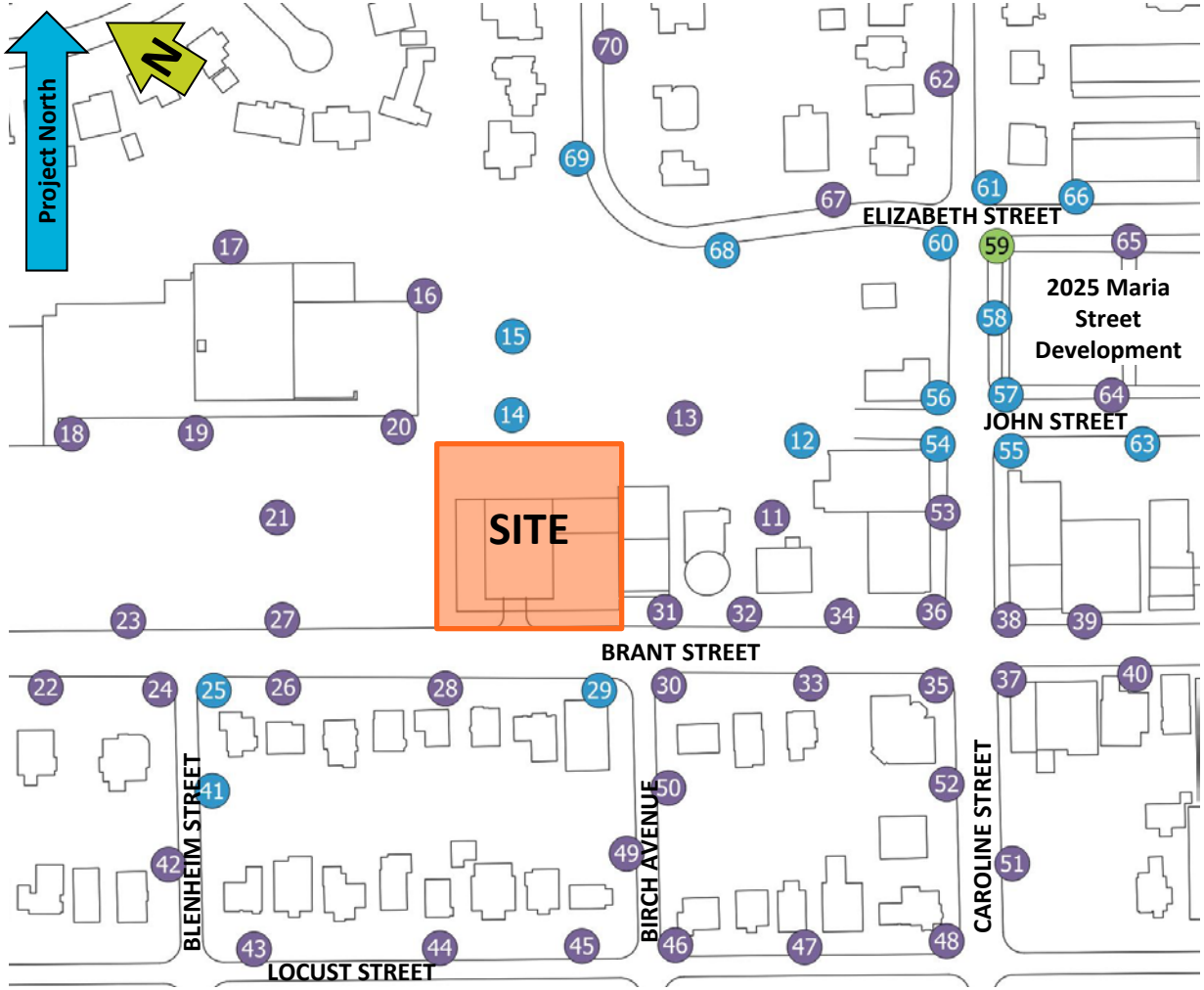
In the Existing Configuration, wind conditions are generally suitable for leisurely walking or better year-round on the surrounding sidewalks of Brant Street, John Street, Blenheim Street, Birch Avenue, Caroline Street, and Elizabeth Street (Figures 8a and 8b). The exception is at the intersection Elizabeth Street and Caroline Street (Location 59), where wind conditions are suitable for fast walking in the winter at the base of the 2025 Maria Street development. At the nearby transit stops (Locations 27 and 35) wind conditions are suitable for sitting or standing year-round. On the nearby outdoor patio (Location 31) wind conditions are suitable for sitting in the summer season and standing in the winter season.

In the Proposed Configuration wind conditions are generally remain comfortable for leisurely walking or better throughout the year on the surrounding sidewalks (Figures 8c and 8d). One exception is to the north of the development, in a parking lot (Location 15) where wind conditions are conducive to standing in the summer and fast walking in the winter.

At the nearby transit stops (Locations 27 and 35) wind conditions remain comfortable for sitting and/or standing throughout the year. On the nearby outdoor patio (Location 31) wind conditions are suitable for leisurely walking in the summer and fast walking in the winter. These strong wind flows are due to the redirection of the prevailing southwesterly winds to the corners of the proposed development. If improved wind conditions are desired for the outdoor patio, the design team could consider the installation of wind screens around key seating areas.

4.4 Wind Safety

The wind safety criterion was met at all locations in both the Existing and Proposed Configurations.



Sensor Location Description

Outdoor Amenity	31
Parking Lot	11, 15-17, 21
Sidewalk	12-14, 18-20, 22-26, 28-30, 32-34, 36-70
Transit Stop	27, 35

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

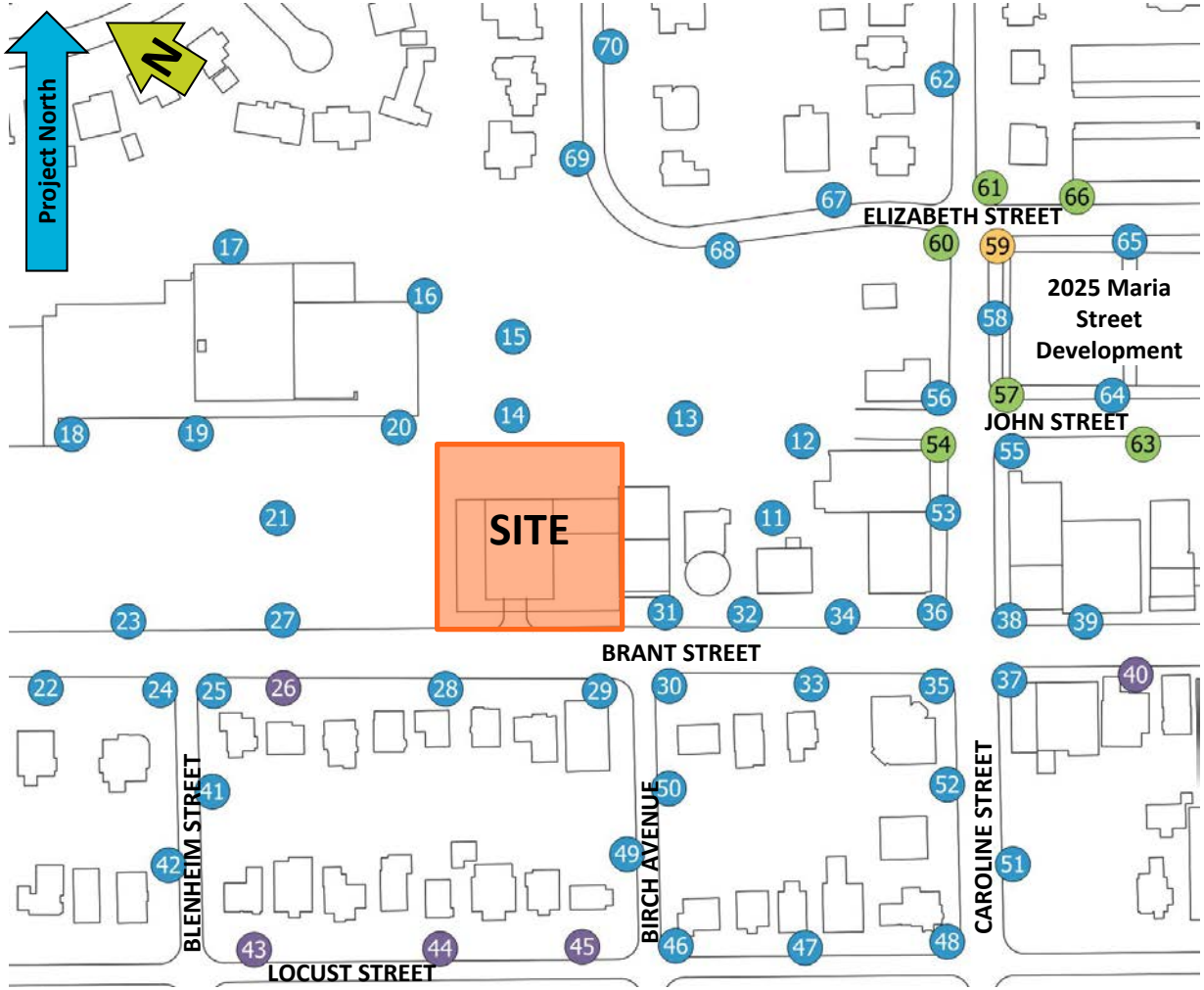
Notes:

1) Not to scale.

2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 8a: Existing Configuration – Pedestrian Wind Comfort – Off-site – Summer



Sensor Location Description

Outdoor Amenity	31
Parking Lot	11, 15-17, 21
Sidewalk	12-14, 18-20, 22-26, 28-30, 32-34, 36-70
Transit Stop	27, 35

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

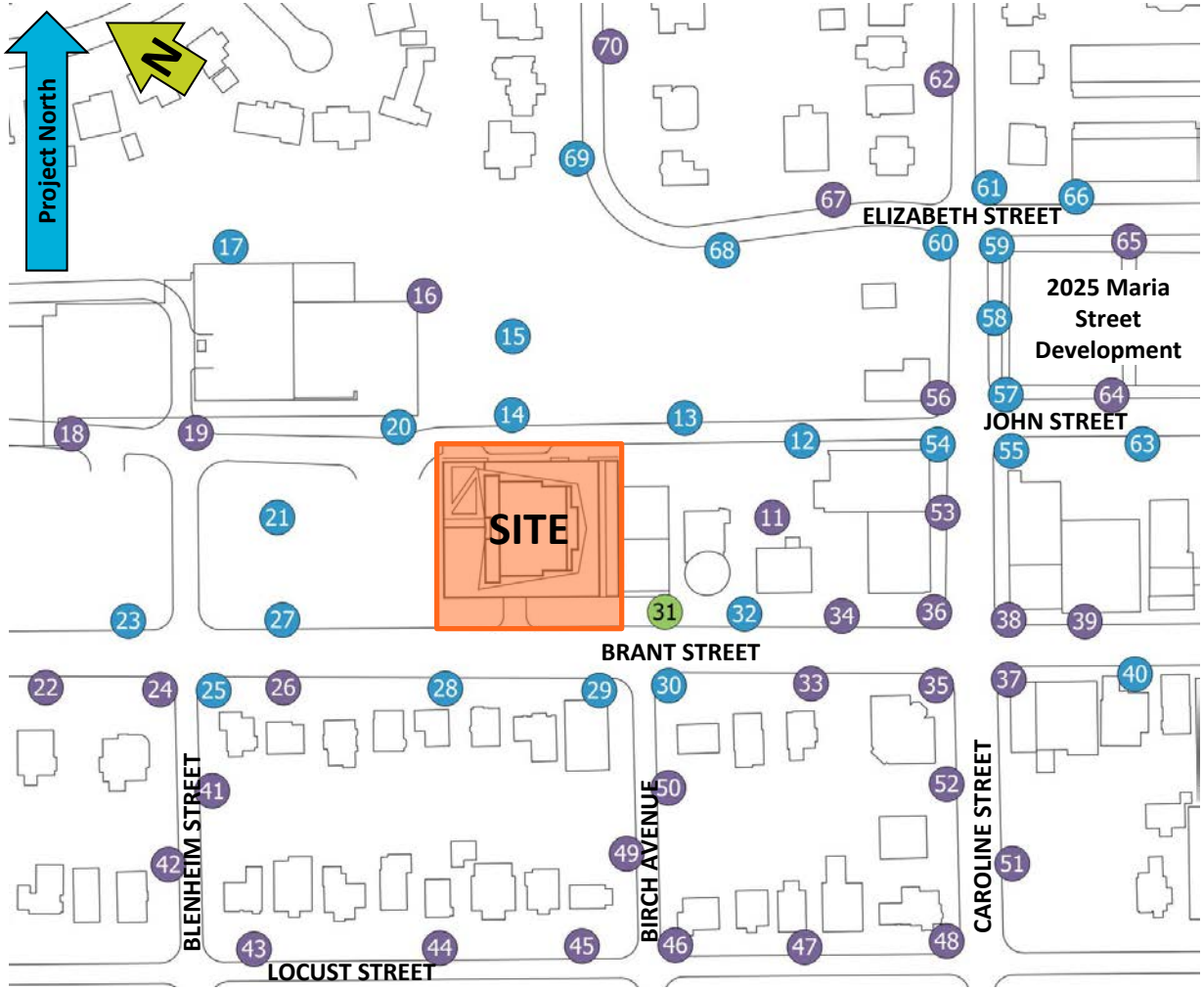
Notes:

1) Not to scale.

2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 8b: Existing Configuration – Pedestrian Wind Comfort – Off-site – Winter



Sensor Location Description

Outdoor Amenity	31
Parking Lot	11, 15-17, 21
Sidewalk	12-14, 18-20, 22-26, 28-30, 32-34, 36-70
Transit Stop	27, 35

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

Notes:

1) Not to scale.

2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 8c: Proposed Configuration – Pedestrian Wind Comfort – Off-site – Summer



Sensor Location Description

Outdoor Amenity	31
Parking Lot	11, 15-17, 21
Sidewalk	12-14, 18-20, 22-26, 28-30, 32-34, 36-70
Transit Stop	27, 35

Predicted Comfort Classes

- (#) Sitting
- (#) Standing
- (#) Leisurely Walking
- (#) Fast walking
- (#) Uncomfortable

Notes:

1) Not to scale.

2) Pedestrian level wind sensor location (#)

3) Diagram may be divided by levels (e.g., Grade, Amenity Floors, etc.).

Figure 8d: Proposed Configuration – Pedestrian Wind Comfort – Off-site – Winter

5.0 FUTURE CONSIDERATIONS

We understand this block of Brant Street has the potential to undergo significant redevelopment over the next twenty years. As taller buildings are expected to be constructed to the north and northeast of the proposed development, wind conditions in the vicinity will change as these “upwind” buildings will provide a partial obstruction to the prevailing southwesterly and northeasterly winds. The massing of the future buildings and their proximity to the site, have the potential to improve wind conditions around the proposed 535 Brant Street development.

6.0 CONCLUSIONS & RECOMMENDATIONS

The pedestrian wind conditions for the proposed development at 535 Brant Street in Burlington have been assessed through wind tunnel modelling techniques. Based on the results of our study, the following conclusions and recommendations have been reached:

- All locations passed the wind safety both the Existing and Proposed Configurations.
- Wind conditions around the proposed development, including the main entrance, are generally suitable for the intended usage.
- Wind conditions on the outdoor amenity terraces of the building are slightly windier than desired for the intended summer usage. Wind mitigation measures are suggested in specific areas to improve conditions.
- Wind conditions on the surrounding sidewalks and at the nearby transit stops generally remain suitable for the intended usage with the proposed development in place.
- SLR will work with the design team prior to SPA to refine the incorporation of practical and effective wind control measures.

7.0 STUDY APPLICABILITY

This study is based on wind tunnel testing and provides a quantitative analysis of the pedestrian wind comfort conditions on and around the proposed development. Any subsequent alterations to the design may influence these findings. SLR should be contacted to provide additional comments and/or recommendations for additional analysis of the design revisions. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely,

SLR Consulting (Canada) Ltd.



Jenny Graham, P.Eng.
Senior Engineer



Tahrana Lovlin, MAES, P.Eng.
Specialist- Microclimate

8.0 REFERENCES

Alan G. Davenport Wind Engineering Group, “Wind Tunnel Testing: A General Outline” May 2007.

Blocken, B., and J. Carmeliet (2004) “Pedestrian Wind Environment around Buildings: Literature Review and Practical Examples” Journal of Thermal Environment and Building Science, 28(2).

Burlington. “Pedestrian Level Wind Study Guidelines and Terms of Reference”. June 2020.

Cochran, L. (2004) “Design Features to Change and/or Ameliorate Pedestrian Wind Conditions” ASCE Structures Conference 2004.

Davenport, A.G. (1972) "An Approach to Human Comfort Criteria for Environmental Wind Conditions", Colloquium on Building Climatology, Stockholm, September 1972.

Irwin, P.A. (2004) “Overview of ASCE Report on Outdoor Comfort Around Buildings: Assessment and Methods of Control” ASCE Structures Conference 2004.

Isyumov, N. and Davenport, A.G., (1977) “The Ground Level Wind Environment in Built-up Areas”, Proc. of 4th Int. Conf. on Wind Effects on Buildings and Structures, London, England, Sept. 1975, Cambridge University Press, 1977.

Isyumov, N., (1978) “Studies of the Pedestrian Level Wind Environment at the Boundary Layer Wind Tunnel Laboratory of the University of Western Ontario”, Jrnl. Industrial Aerodynamics, Vol. 3, 187-200, 1978.

Kapoor, V., Page, C., Stefanowicz, P., Livesey, F., Isyumov, N., (1990) “Pedestrian Level Wind Studies to Aid in the Planning of a Major Development”, Structures Congress Abstracts, American Society of Civil Engineers, 1990.

Koss, H.H. (2006) “On differences and similarities of applied wind criteria” Journal of Wind Engineering and Industrial Aerodynamics 94.

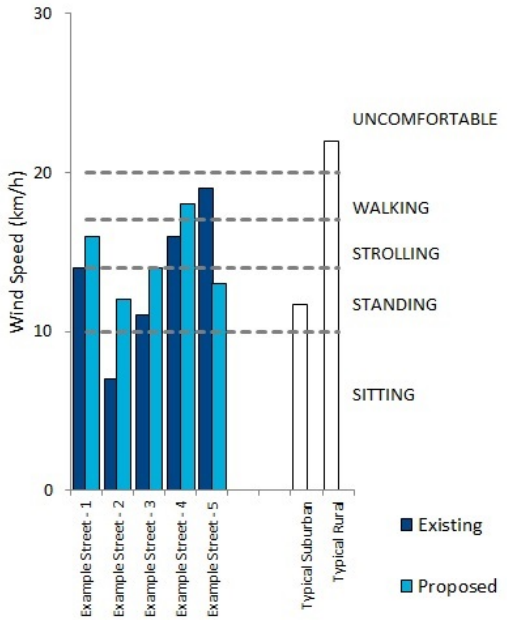
Appendix A

Pedestrian Wind Comfort
Summer (July – September) & Winter (January – March)

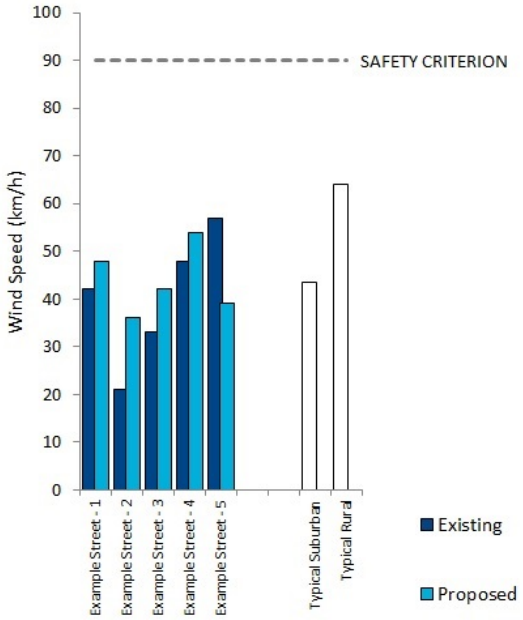
INTERPRETATION OF RESULTS

The figure below illustrates comfort criteria. The vertical bars represent the GEM wind speed (in km/h) exceeded 20% of the time for the test configurations at each location. The dashed horizontal lines represent wind speed thresholds for the wind comfort criteria. At the right side of each graph are white bars that represent ambient wind conditions for typical suburban and rural areas of this region.

The dark blue bars represent wind conditions in the Existing Configuration, while the light blue bars represent the Proposed Configuration. For example, wind conditions at Sensor #2 were suitable for sitting in the Existing Configuration and standing in the Proposed Configuration. The figure below illustrates the safety criteria, which should not exceed 90 km/h more than 0.1% of the time. For example, all sensors passed the wind safety criterion in both configurations.



Example Results – Comfort Criteria (20% GEM Wind Speeds)



Example Results – Safety Criteria (Annual 0.1% Gust Wind Speeds)

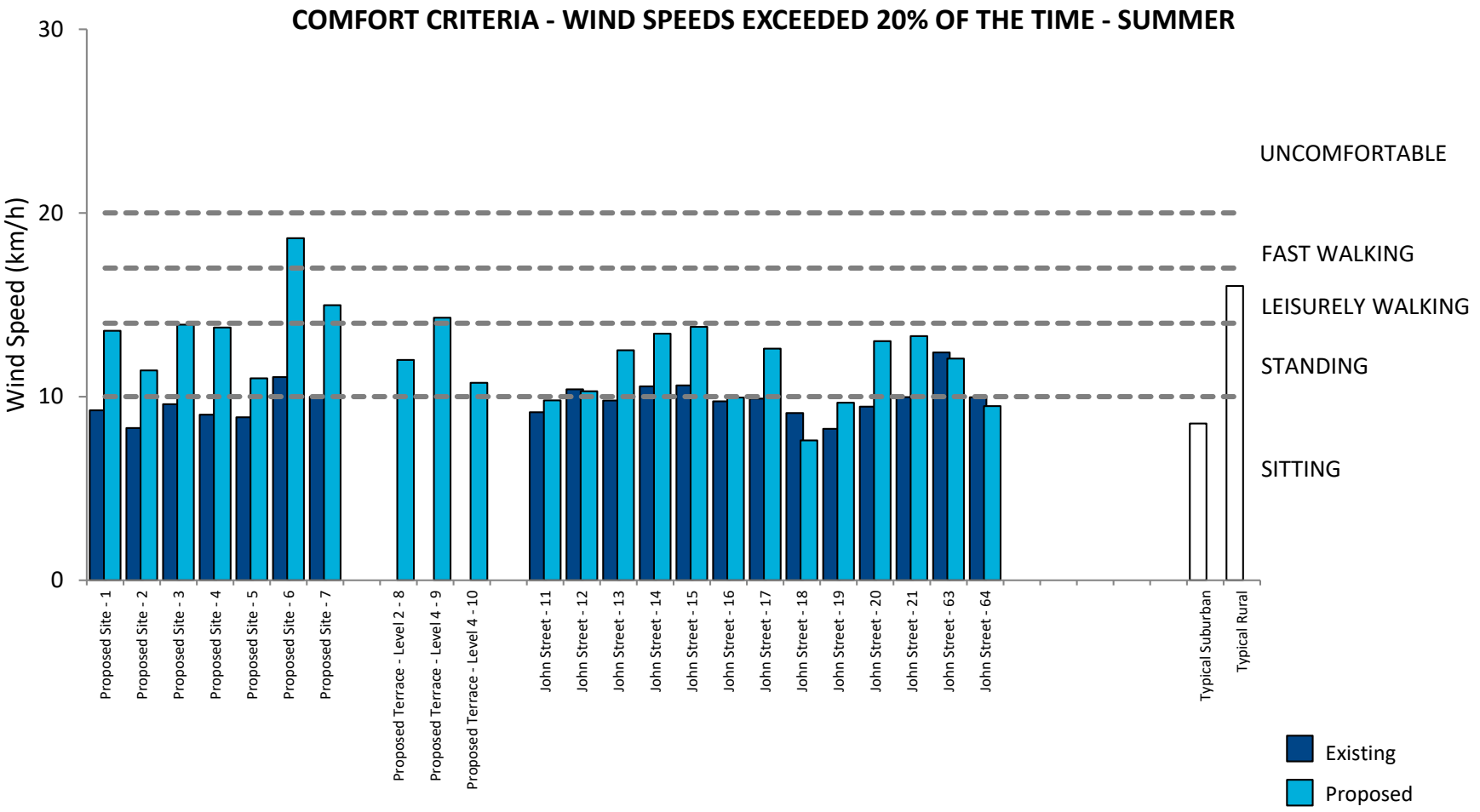


Figure A1a: Pedestrian Wind Conditions – Summer Season – Building Entrances, Walkways & Amenity Terraces, John Street

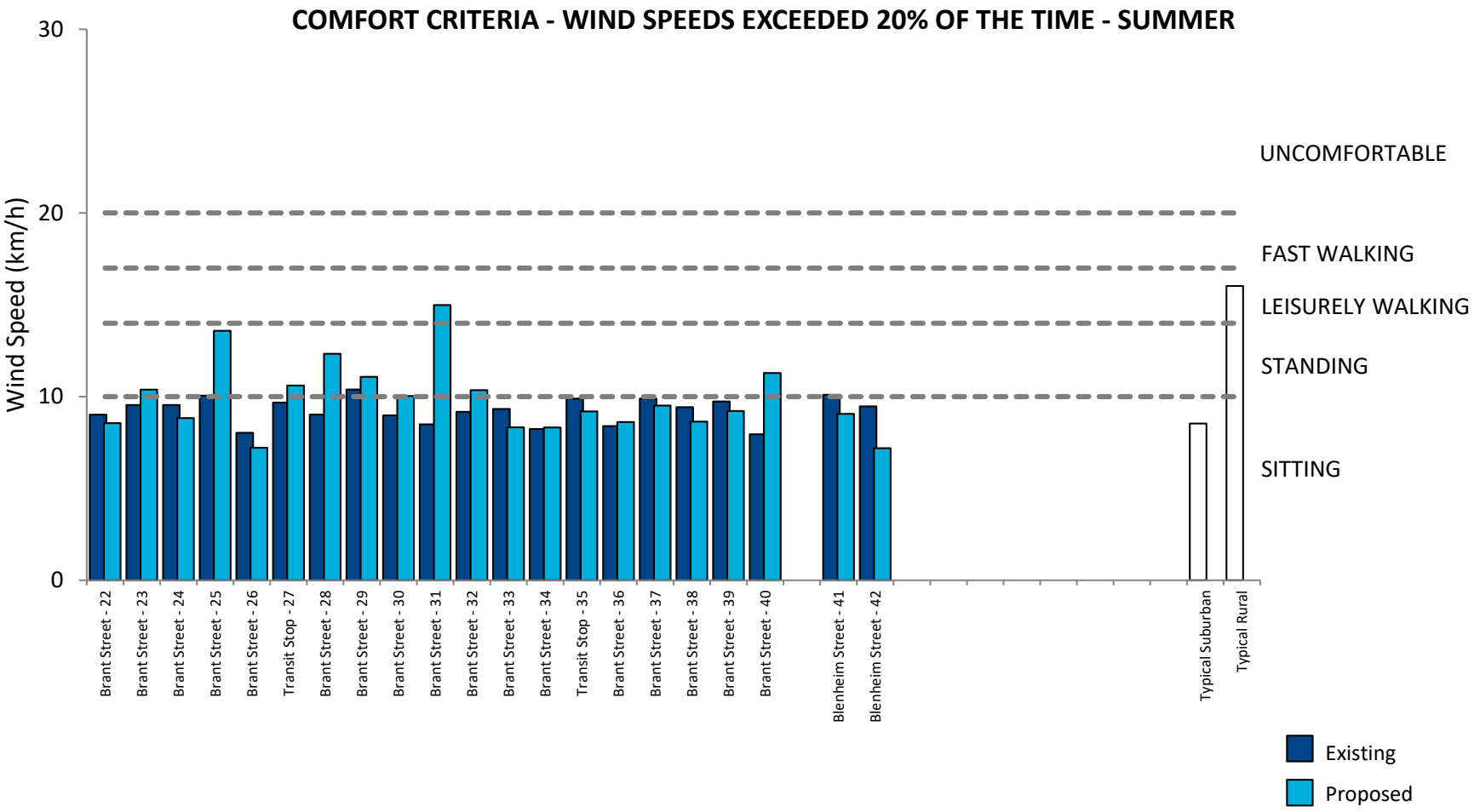


Figure A1b: Pedestrian Wind Conditions – Summer Season – Brant Street & Blenheim Street

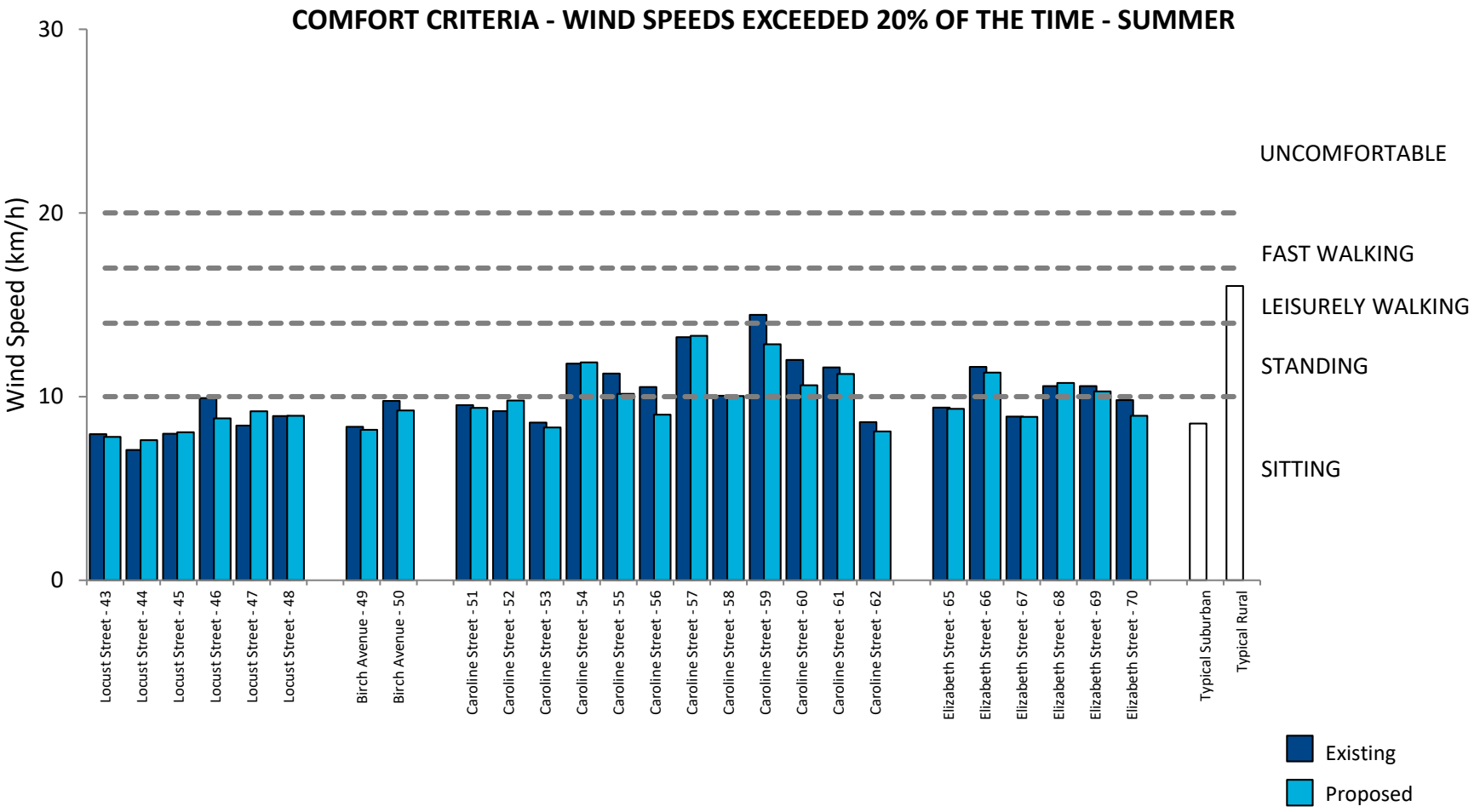


Figure A1c: Pedestrian Wind Conditions – Summer Season – Locust Street, Birch Avenue, Caroline Street & Elizabeth Street

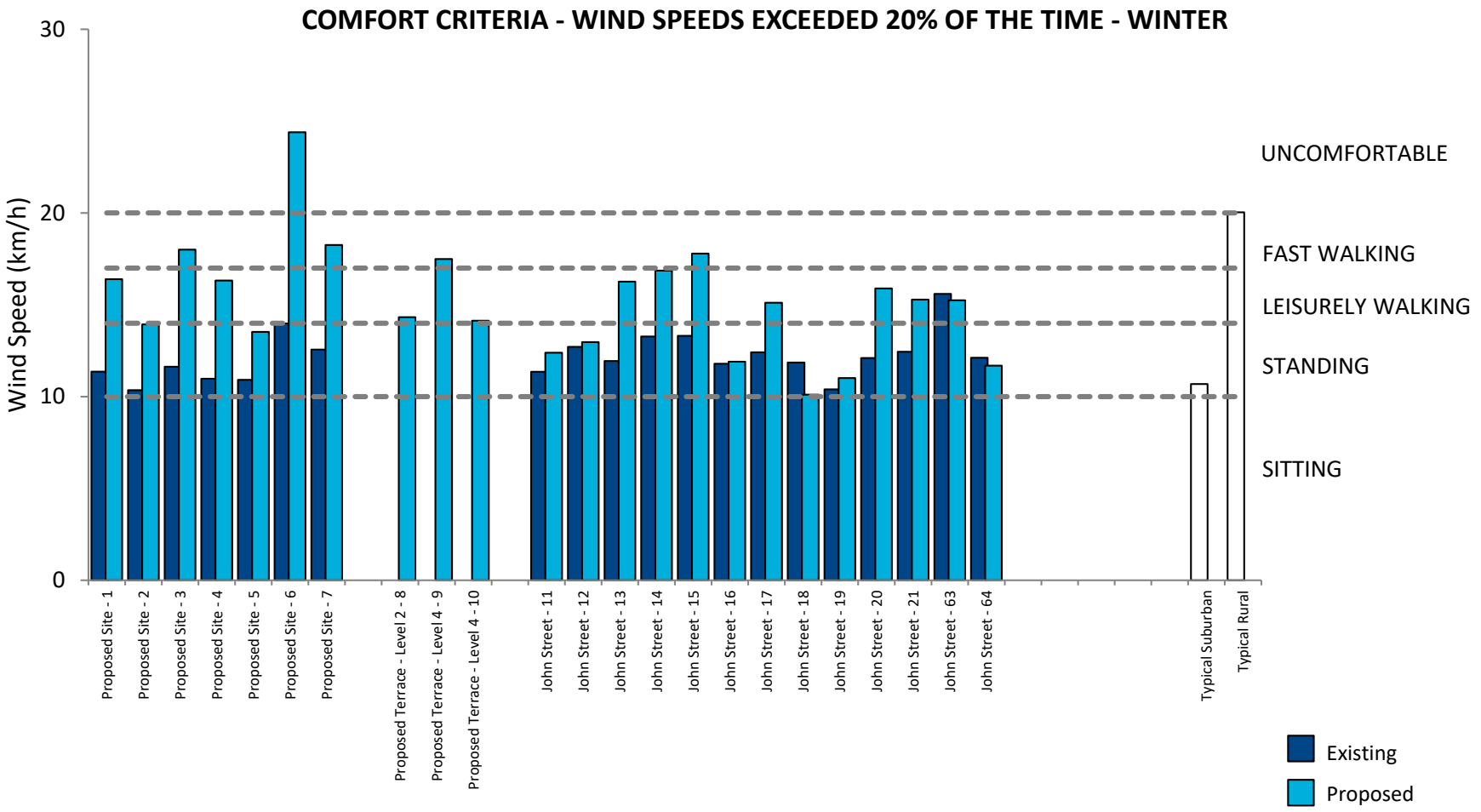


Figure A2a: Pedestrian Wind Conditions – Winter Season – Building Entrances, Walkways & Amenity Terraces, John Street

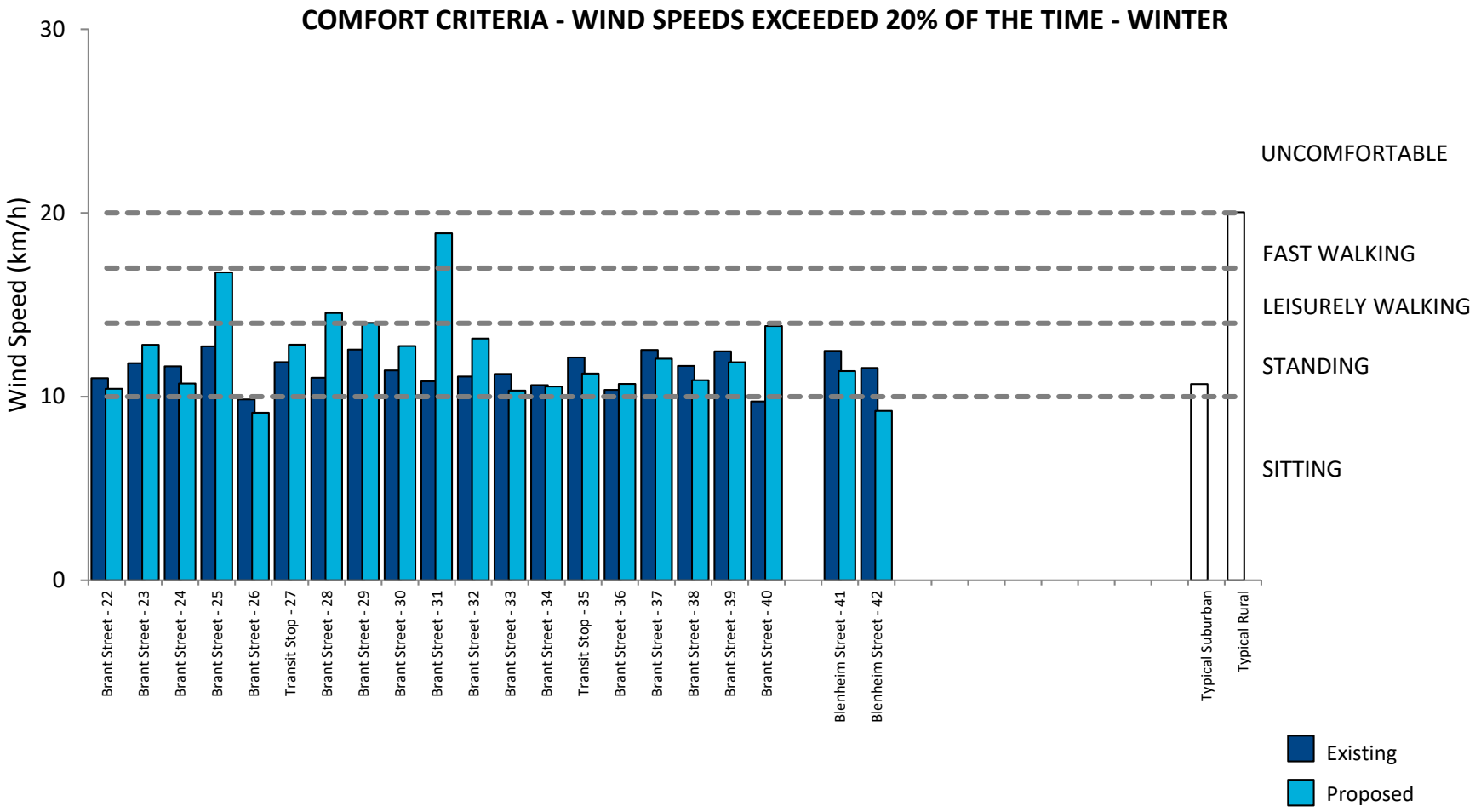


Figure A2b: Pedestrian Wind Conditions – Winter Season – Brant Street & Blenheim Street

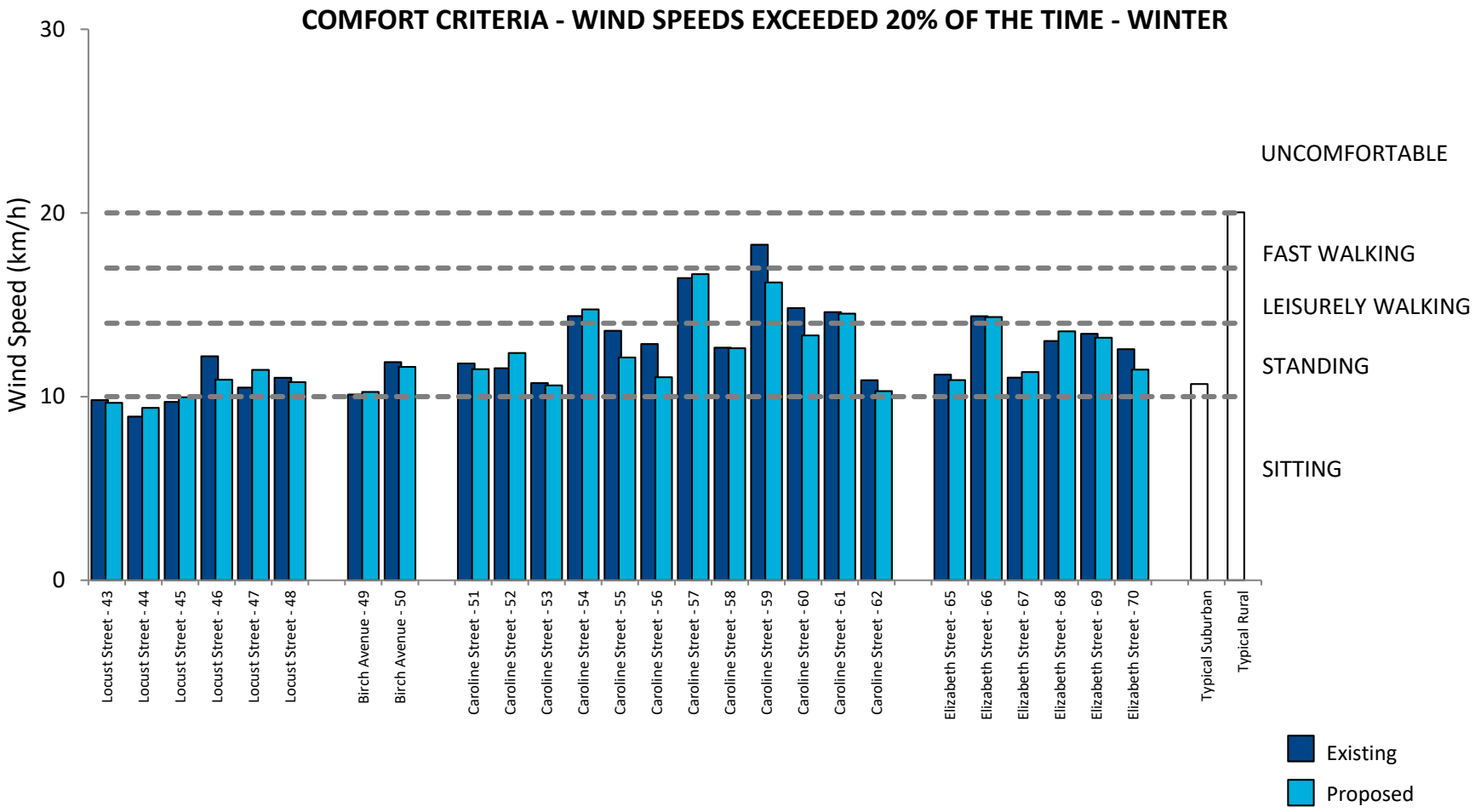


Figure A2c: Pedestrian Wind Conditions – Winter Season – Locust Street, Birch Avenue, Caroline Street & Elizabeth Street

Appendix B

Pedestrian Wind Safety Results
Annual

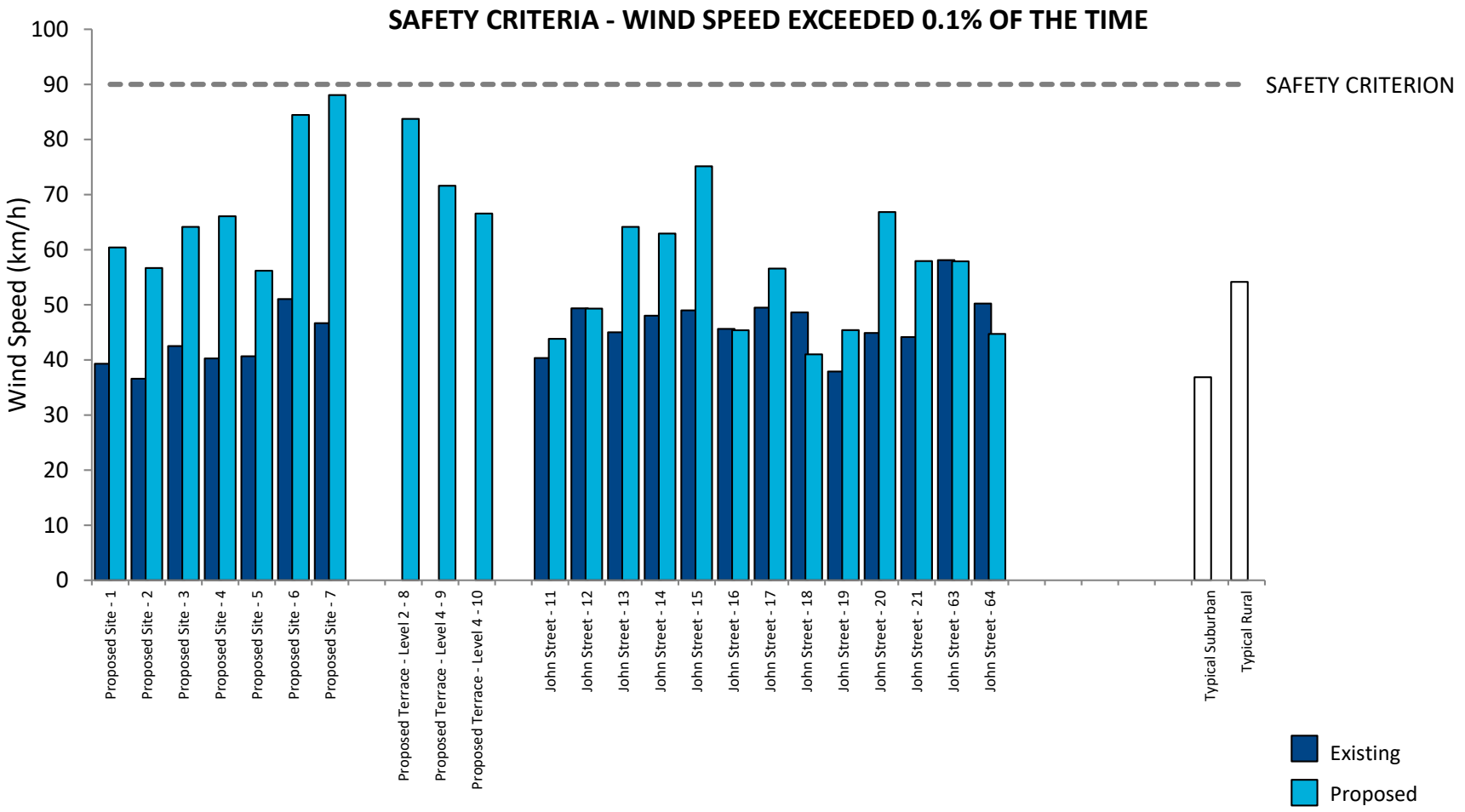


Figure B1a: Pedestrian Wind Safety – Annual – Building Entrances, Walkways & Amenity Terraces, John Street

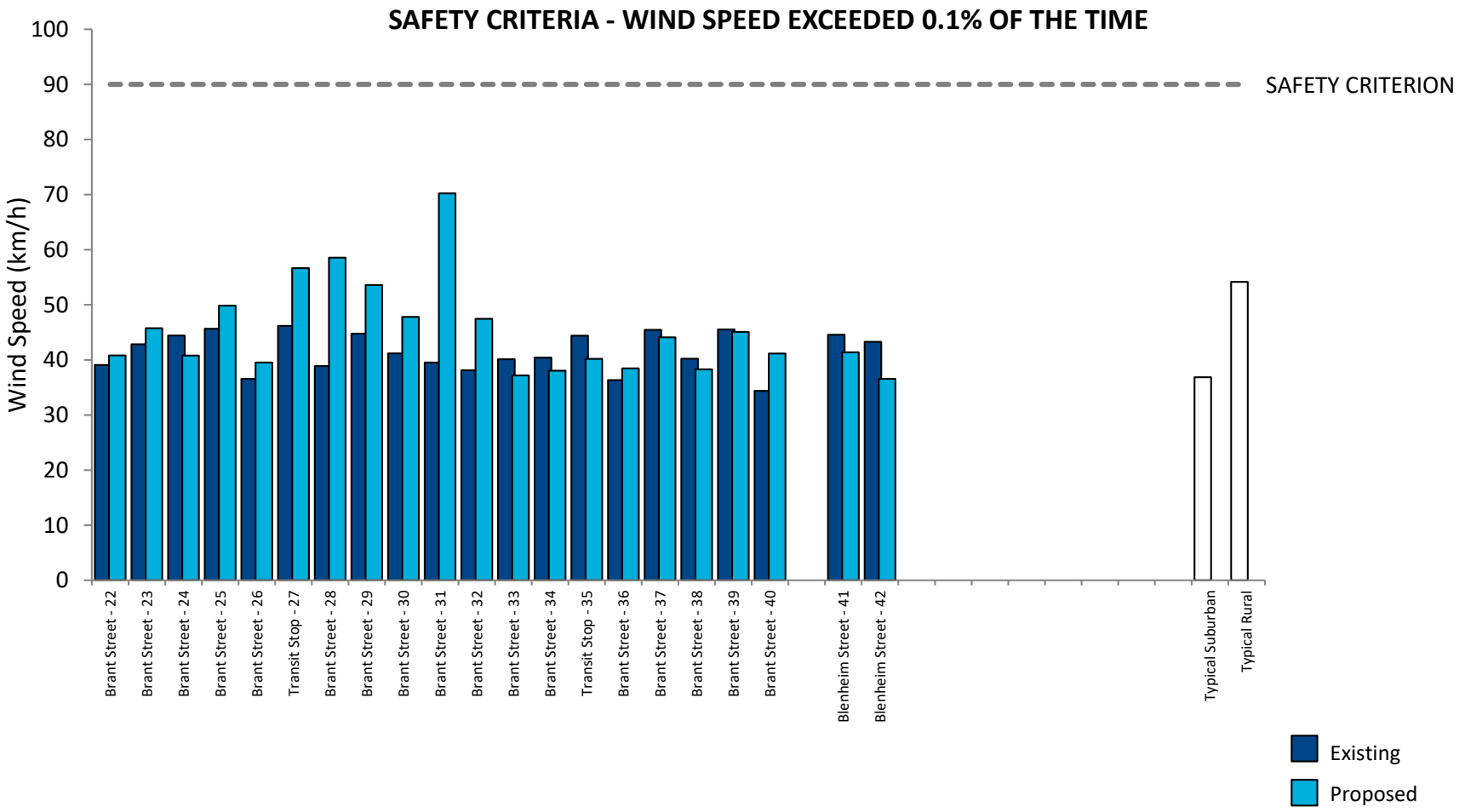


Figure B1b: Pedestrian Wind Safety – Annual – Brant Street & Blenheim Street

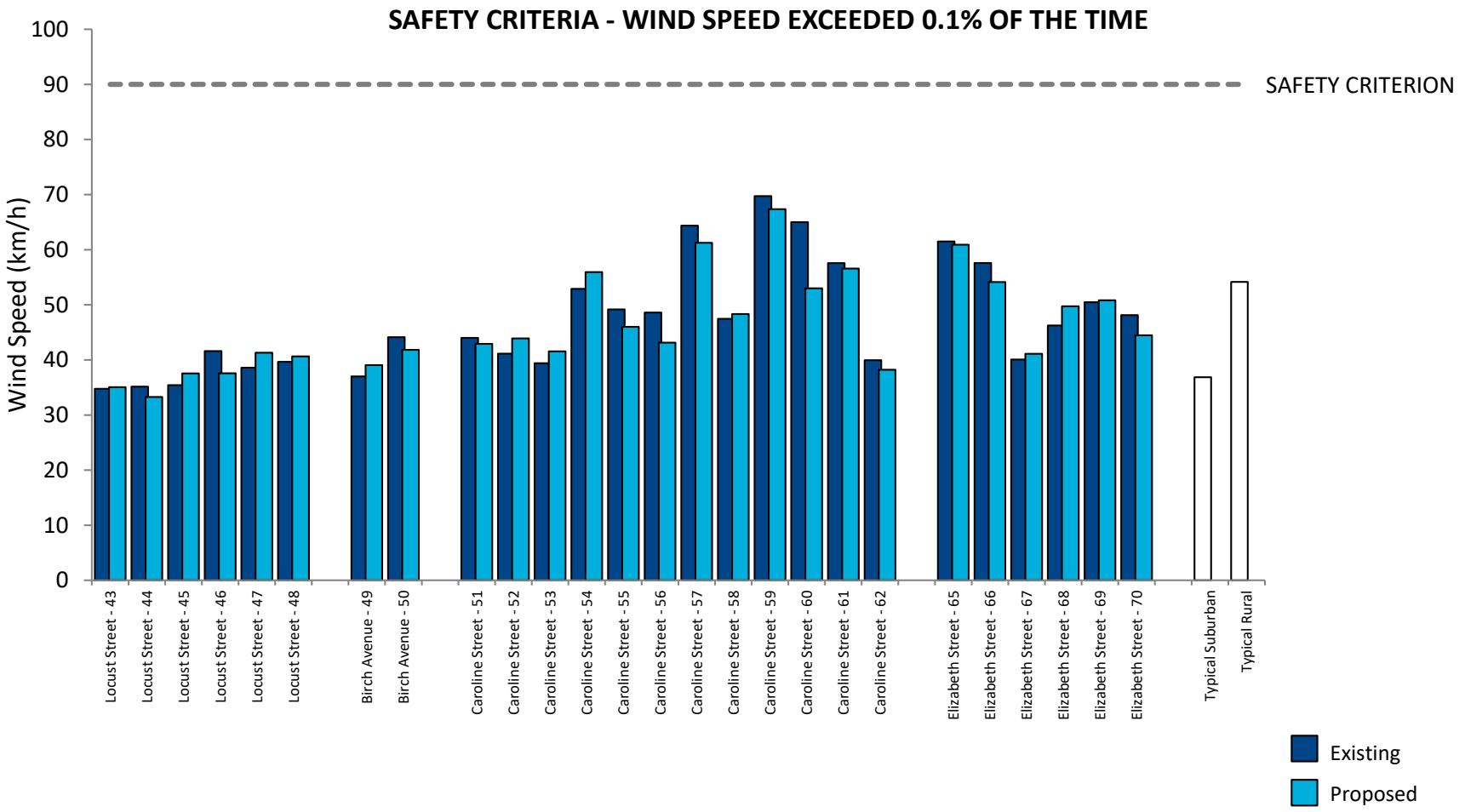


Figure B1c: Pedestrian Wind Safety – Annual – Locust Street, Birch Avenue, Caroline Street & Elizabeth Street