

Supplemental Writing for

Cool and Covered

An interactive Qualifying Project submitted to the faculty of
WORCESTER POLYTECHNIC INSTITUTE

by
Veronika Gorski
Lottie McLeod
Rohan Prasad
Drew Trust



WPI



創建
Designing
HongKong
香港 .com

Professor Brajendra Mishra and Professor Stephan Sturm

1 March 2024

Acknowledgments

We thank the following organizations and individuals for aiding us in the completion of this project: Designing Hong Kong and The University of Hong Kong (HKU), specifically the Faculty of Architecture in the Department of Urban Planning and Design; as well as the WPI Global School for making this project possible.

We would like to thank our advisors, Professor Mishra and Professor Sturm, for advising their project over the past two terms. We appreciated their insightful feedback.

Additionally, we would like to thank our liaisons, Alain Chiaradia, Samuel Wong, and Paul Zimmerman, for providing continuous direction. We appreciate their support and attention to the team for this project.

Table of Contents

Acknowledgments.....	2
Table of Contents.....	3
Authorship Table.....	4
Supplemental Writing.....	6
Description of Sponsors.....	6
Description of Waterfront Locations.....	8
Waterfront Observations.....	9
Schedule.....	12
Gantt Chart.....	12
Findings.....	13
Weather Patterns.....	13
Consistency Throughout the Waterfronts.....	14
Bibliography:.....	16

Authorship Table

Section	Main Writer(s)	Main Editor(s)
Abstract	Lottie McLeod	
Introduction	Lottie McLeod	Veronika Gorski
Background	Veronika Gorski, Lottie McLeod	Drew Trust
Impacts of Climate Change	Veronika Gorski, Lottie McLeod, Rohan Prasad	Drew Trust
Benefits of Implementing Green-Blue Spaces	Lottie McLeod	Veronika Gorski
Current Configurations of Public Space	Veronika Gorski	Lottie McLeod
Methods	Veronika Gorski, Lottie McLeod, Rohan Prasad, Drew Trust	Veronika Gorski, Lottie McLeod, Rohan Prasad, Drew Trust
Waterfronts of Interest	Veronika Gorski	
Document Visitors' static locations on the waterfronts	Lottie McLeod	Veronika Gorski, Rohan Prasad, Drew Trust
Record the activities of visitors on the waterfront and their relationship to cover	Lottie McLeod	Veronika Gorski, Rohan Prasad, Drew Trust
Static Activity Chart	Rohan Prasad	Lottie McLeod
Findings	Veronika Gorski	Rohan Prasad, Drew Trust
Behavioural Patterns	Veronika Gorski	Rohan Prasad, Drew Trust
Seating Configurations	Lottie McLeod	Drew Trust
Balance of cover and non-cover structures	Veronika Gorski, Lottie McLeod	Drew Trust
Recommendations	Lottie McLeod	Rohan Prasad, Drew Trust
Addition of Circular Seating Arrangements	Lottie McLeod	Veronika Gorski, Drew Trust
Further Consideration into the Species of Trees Planted	Veronika Gorski, Lottie McLeod	
Continue the research into the summer months	Veronika Gorski	Lottie McLeod
Conclusion	Veronika Gorski	Drew Trust
Data Charts	Rohan Prasad	
Static Activity Maps	Rohan Prasad, Drew Trust	
Sponsor Description	Lottie McLeod	Veronika Gorski, Drew Trust
Description of Waterfront Locations	Veronika Gorski	

Waterfront Observations	Veronika Gorski, Lottie McLeod,	
Schedule	Lottie McLeod	
Gantt Chart	Lottie McLeod	
Weather Patterns	Veronika Gorski	Rohan Prasad
Consistency Throughout the Waterfronts	Veronika Gorski	Rohan Prasad
Waterfront Maps Split up by Noticeable Features	Veronika Gorski	Lottie McLeod
Waterfront Maps used for Static Activity Mapping	Lottie McLeod	Drew Trust

Supplemental Writing

Descriptions of Sponsors

The following organizations sponsored the Worcester Polytechnic Institute (WPI) Inter Qualifying Project, Cool and Covered 2024, an initiative to study cool and covered public spaces in urban contexts of Hong Kong.

Paul Zimmerman is the co-founded Designing Hong Kong and has been the CEO since 2009. Designing Hong Kong is a not-for-profit organization with the purpose of promoting sustainable and urban planning within Hong Kong. The goal of Designing Hong Kong is to increase public awareness and collaboration when areas of the city seem poorly planned, ultimately adapting and creating “a beautiful city”.¹ The types of projects Designing Hong Kong work on are related, but not limited to, waste reduction, conservation, sustainable urban development, and the idea of a livable city. Past projects include the analysis of a ventilation building, the implementation of a recycling station at public markets, and the proposal of a bike trail around the perimeter of Hong Kong Island. With ideas like public well-being, usability, and environmental sustainability at the company’s core beliefs, enhancing the city’s services to protect against extreme weather conditions ensures functionality, and encourages various activities within the community. Designing Hong Kong’s advocacy for protective and covered spaces exemplifies their commitment to public well-being. By fostering community engagement, promoting environmental sustainability, enhancing urban livability, and addressing the challenges of climate change, they actively contribute to the betterment of Hong Kong’s community.

Alain Chiaradia became an Associate Professor and Deputy Head of the University of Hong Kong’s (HKU) Department of Urban Planning and Design in the Faculty of Architecture in 2016. Founded in 1912, The University of Hong Kong stands as the oldest and leading tertiary institution in Hong Kong. The Department of Architecture was first introduced in 1950, with professional recognition of the degree being granted by the Royal Institute of British Architecture Association (RIBA), the Architect’s Recognition Council of the United Kingdom (ARCUK), and the Hong Kong Institute of Architects (HKIA). Currently, HKU boasts an enrollment of 27,440 with the architecture department offering programs in three different departments and one division that covers breadth and depth in the professional as well as the academic research fields of Architecture, Real Estate and Construction, Urban Planning, and

Landscape Architecture. Furthermore, the Department of Urban Planning and Design at HKU is dedicated to understanding the intricacies of urban environments and the systems intertwined within cities. This includes studying the interactions between public policies, urban management strategies, and design interventions. Therefore, it enables the Department of Urban Planning and Design to create solutions to the challenges faced by the city of Hong Kong, including challenges such as those resulting from climate change.²

Description of Waterfront Locations

In this study there were seven waterfronts of particular interest: Sheung Wan, Quarry Bay, Kwun Tong, Sha Tin, Ma On Shon, Lam Tsuen and Tai Po. A breakdown of each has been included to enhance the readers' understanding.

Sheung Wan is on the northwestern part of Hong Kong Island and is a vibrant and historic neighborhood known for its mix of traditional and modern elements.

Quarry Bay is situated on the eastern side of Hong Kong Island and is predominantly a residential and commercial area known for its high-rise buildings and bustling atmosphere; it has a combination of office towers, shopping malls, and residential complexes. Quarry Bay has undergone significant modernization with well-connected public transportation.

Kwun Tong is on the Kowloon Peninsula and is a dynamic district that has transformed from an industrial area to a commercial and residential hub. It is best known for its waterfront promenade and cultural spaces.

Sha Tin is a suburban area in the New Territories, known for its residential communities, parks, and recreational facilities, and offers more of a tranquil environment in comparison to the other urban areas.

Lastly, Tai Po, located on the eastern portion of the New Territories is characterized by its mix of residential, commercial, and recreational areas; It is best known for its parks, including Tai Po Waterfront Park and cultural attractions. Understanding the unique characteristics and developments of the different waterfronts not only highlights the diversity of living environments within the waterfronts but also sheds light on the varying needs and lifestyles of its inhabitants.

Waterfront Observations

Lam Tseun, Thursday, January 11th 2024:

10:49-11:46 am

- Partly cloudy
- Noticed a significant bird population
 - o Feces cover many benches and roads
- Western portion, towards deeper residential areas seems neglected
 - o Trash
 - o Bicycles improperly stowed
 - o Unkept greenery
- Significant elderly population
 - o Some handicapped, with wheelchairs in most cases
- Walkways are fairly patch, there is no consistent paving
 - o Could be negative for bikers, wheelchair users, strollers, etc.
 - o There is a bike path in the eastern portion
- Benches
 - o Original concrete
 - o “Normal” park benches with dividers and without
 - Some have shading while some don't, some rely on shading from overhangs from trees or overpasses
 - The directions of the shading are not effective on the north side, sun is still facing you
 - Many benches have trash bins directly next to them; not pleasant
- Greenery: many palms and soft bristle trees present
- Many fishermen and bikers
- Overpasses are grim and house squatters
- Many seem to be using the area for transit and not leisure

Tai Po, Thursday, January 11th 2024:

1:14 – 1:58 pm

- Overcast
- Beautiful and consistent greenery, very lush
 - o Greenery overlaps benches significantly
 - o Greenery also overhangs on benches
- Many variations of scenery
 - o Pavilions: off to the side, more inland *rest stop for bikers
 - o Amphitheatre: provides significant shading and space

- Garbage bins are near seating but not directly next to them
 - o They also have covers
- Restrooms and vending machines are available periodically
- Space is definitely used more for leisure
 - o Fishing
 - o Sitting/relaxing with tents
 - o Taichi
 - o Kite flying
 - o Running --> most popular
 - o Biking --> designated path adjacent to walking path
- Population here is generally more elderly but there is a significant population of younger people (16-35 years old)
- Paving is consistent and even
- Variety of shading is present
 - o Green and grey
- Pet friendly but still clean

Quarry Bay, Friday, January 26th 2024:

1-2 pm:

- A lot more runners this morning, particularly solo
- Groups of 2-4 people are common
- Many people use ledges closest to water or by stairs to stretch
- In general, more people sit under pavilions

Quarry Bay, Saturday, January 27th 2024:

9am: Very busy, almost all joggers. Lots of joggers.

1pm: Sun came out, wind makes it feel much cooler, feels like a breeze off the water. Smells salty. Feels cooler in the shade- a chill breeze. A wall extends along most of the waterfront- people exclusively sit on the benches though. Some stop to talk or go in their bags along the walls, no one sits, however.

5pm: Not grey but feels cold, wind feels stronger. Not many people sitting at this time of day in sections 2&3. Mostly joggers and walkers but groups congregate with their dogs.

Lam Tsuen Tuesday February 6th 2024:

9am: Multiple elderly people in wheelchairs.

1pm: Lots of people are out and walking doesn't feel like many office workers taking lunch. There are not many people stopping to sit. A high number of people were not under cover at lunch time, it was fully cloudy.

5pm: Majority of people under grey cover are sitting most likely because that's where the benches are. The majority of places stopped under are not green at 5pm given the sun has no effect and people stop wherever.

Tai Po Saturday February 17th 2024:

9am: No one stopped or sat in the first section. Group gathered at pavilion chatting.

1pm: Feels almost warm. Far more people in the first area than earlier. A group standing looking at a cat.

5pm: So busy with people, in the park and lots of bikers. Clouds have almost cleared. Lots of people mostly moving- walking or jogging. There are many more people in the tree covered area and park later in the day. Also, a lot more people are here in general later in the day.

Findings

Weather Patterns

To analyse our observations in relation to weather patterns, we relied on data including wind speed and temperatures from the Hong Kong Observatory regional weather data. From the three weather patterns observed, sunny, and cloudy conditions had the largest percentage of people in non-covered areas, in comparison to partly cloudy which had a proportion of just below 50% of people in non-covered areas.

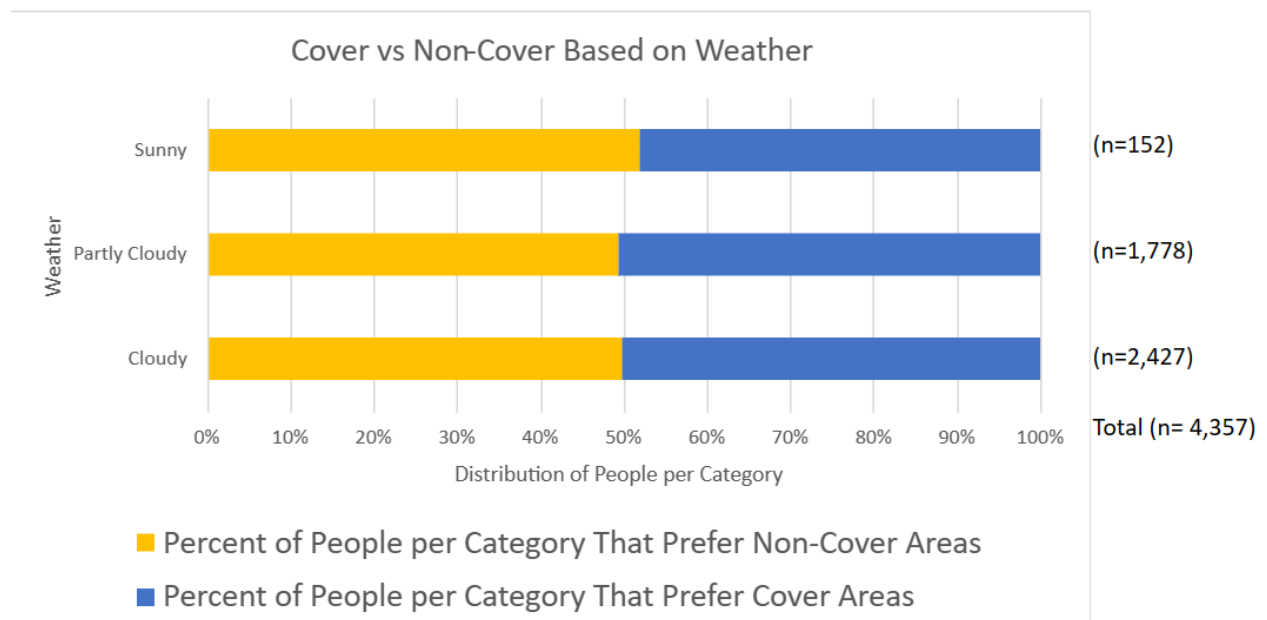


Figure S1: More people prefer to be in non-cover areas later in the day.

The group found that the average number of people in grey covered space increased, as the wind speed increased. However, in the broader aspect of coverage usage, there was no correlation to coverage usage in terms of the wind speed. In later analysis the differentiation in grey cover use was credited to temperature instead therefore annulling any correlation between the use of cover structures and wind speed.

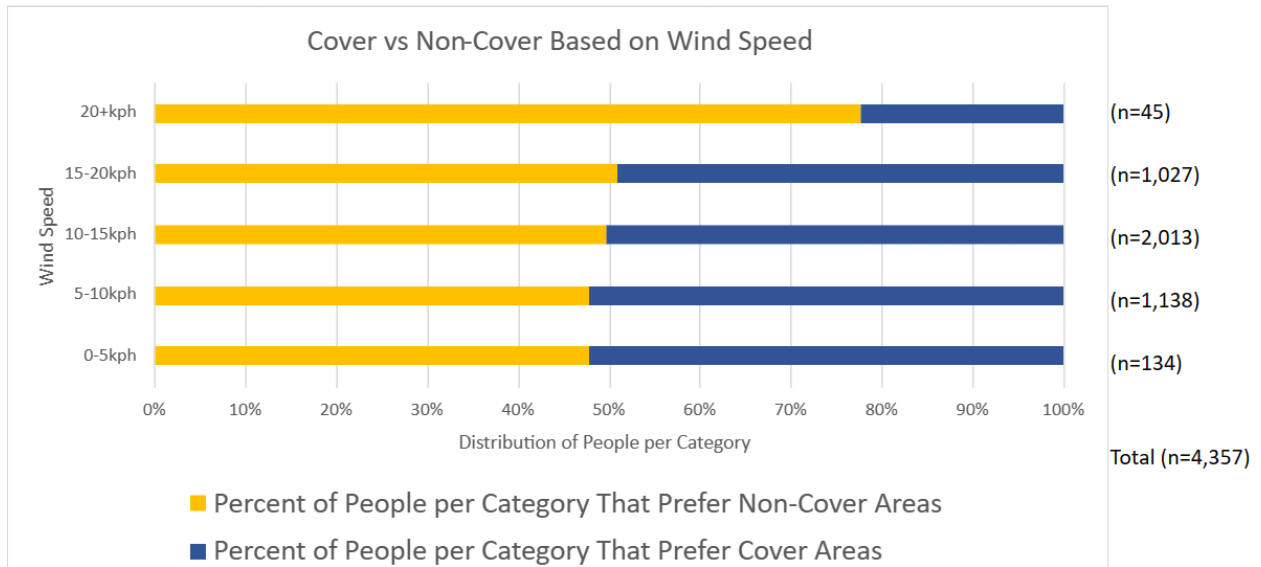


Figure S2: Windier days correlate to a greater preference for non-cover areas.

Consistency Throughout the Waterfronts

We took data collected from all observed waterfronts to observe the general patterns of waterfront usage in Hong Kong. The individual waterfronts had mostly varying preferences in terms of what type of cover to use. This could be due to the availability and distribution of green and grey coverage options throughout the waterfronts. Every waterfront was unique in its features including the location of the waterfront, the structures provided along them, and even the species of the trees present. After analyzing data from individual waterfronts, we determined that solutions should be tailored to waterfronts of similar patterns.

For example, in terms of preferences in green versus gray coverage in the context of increasing temperatures, in Sha Tin 52% of the people used green coverage, the largest percentage among all waterfronts. In contrast, Quarry Bay averaged the largest percentage of individuals using grey covered space, which refers to man-made structures such as benches or pavilions. This difference likely stems from the differences in dominant types of coverage options present. Generally, Sha Tin, had many green coverage options in the observed sections of the promenade, in comparison to Quarry Bay which had pavilions and covered benches that were more prevalent.

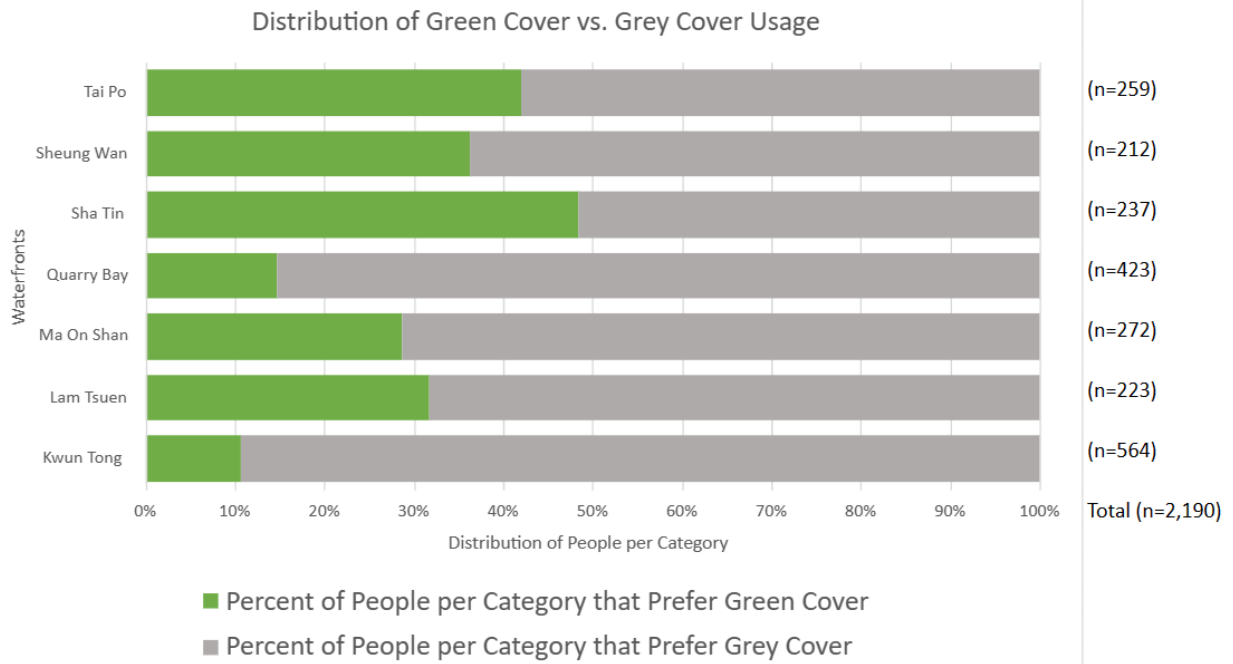


Figure S3: Most waterfronts have varying preferences for what type of cover to use.

Bibliography:

- (1) “Mission – Designing Hong Kong.” Designing Hong Kong (2023).
www.designinghongkong.com/v5/mission/. Accessed 29 Oct. 2023.
- (2) “Master of Science in Urban Design and Transport | HKU Faculty of Architecture.” The University of Hong Kong Faculty of Architecture. (2023).
www.arch.hku.hk/programmes/upad/master-of-science-in-urban-design-and-transport/.
Accessed 29 Oct. 2023.