

Task Force on Harbourfront Developments In Kowloon, Tsuen Wan and Kwai Tsing

For discussion
on 27 September 2022

TFK/05/2022

Project Development Study of The Green Deck By The Hong Kong Polytechnic University

PURPOSE

This paper seeks Members' views on the Project Development Study of the Green Deck ("the Study") undertaken by The Hong Kong Polytechnic University ("PolyU").

BACKGROUND

2. Rapid urban development in the last century has brought about prosperity to Hong Kong. While the rest of the city is enjoying the fruit of success, Hung Hom, an old neighbourhood in Kowloon, is paying high price as a result of deteriorated environment and degraded living quality. PolyU as a major stakeholder in the neighbourhood, has conceived the concept of a "Green Deck"; being an innovative social project to provide a green and sustainable deck over the Hung Hom Cross Harbour Tunnel ("CHT") Toll Plaza to address the current problems, and to bring long-term benefits to our society.

3. A preliminary feasibility study about this innovative social project was carried out 2014 with rather encouraging results. These proposals were shared with local communities, business, professional bodies, green groups, District Council members and the Government with many positive responses¹. With its environmentally-friendly features and sustainable benefits, the project was recognized with the Merit Award in Green Building Award 2014 (Research and Planning).

4. The Study was included in the Chief Executive's Community Project List in 2019. Subsequently, PolyU obtained

¹ A forum on Green Deck was held in PolyU on 2 February 2015 and attended by members of the Harbourfront Commission.

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the necessary funds from the Hong Kong Jockey Club Charities Trust to embark on the Study. In November 2020, we engaged consultants and commenced the Study³.

Existing Conditions

5. The Study site forms a major transport interchange in the private and public transport networks, serving 250 000 daily passengers, which is expected to increase further in future. The bus stop at the CHT Toll Plaza is one of the busiest bus stops in Hong Kong; serving more than 30 bus routes. Also, about 104 800 vehicles pass throughout the CHT Toll Plaza daily. The air quality in and around the toll plaza remained to be extremely poor during most parts of the day due to constant traffic congestion and slow-moving vehicles.

6. Roads, toll plaza and railroad tracks split up nearby neighbourhoods into isolated islands, taking up most of public space and leaving almost no rooms for pedestrians. Street environment has deteriorated and become extremely confusing to pedestrians. Connectivity amongst communities in Hung Hom, Ho Man Tin, King's Park and East Tsim Sha Tsui is entirely broken down. There are two old pedestrian footbridges spanning across the toll plaza linking Hung Hom MTR Station to PolyU, which connect to outside areas, and they are heavily utilized especially during morning and evening peaks. The PolyU adjoining the study site also serves as an important part of the pedestrian network.

7. For the local communities including PolyU staff and students, bus and rail commuters, pedestrians passing through local streets, footbridges, walkways and tunnels, there is a lack of public amenities to serve them. Urban spaces and facilities devoted for pedestrian uses are extremely limited.

³ Ove Arup & Partners Hong Kong Limited was appointed Consultants for the Study with Rocco Design Architects Associates Ltd. as their architectural subconsultant. The Study commenced in November 2020 for completion in 27 months.

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Planning Context

8. The Study site is currently largely zoned “Other Specific Uses” annotated “Cross Harbour Tunnel Toll Plaza” and “Road” under the Approved Tsim Sha Tsui OZP No. S/K1/28 (“TST OZP”) (**Appendix A**). A rezoning exercise (not part of the Study) is therefore required when the Green Deck is to be implemented in future. This area has emerged as an important commercial and tourist centre in Kowloon and includes various cultural and recreational attractions of territorial importance such as Kowloon Park; Hong Kong Cultural Centre, Hong Kong Space Museum, the Hong Kong Science Museum, and the Hong Kong History Museum.

9. The existing built-up area of Hung Hom district east of the Study site generally consists of private residential buildings, commercial uses, public housing and industrial uses. This area is showing signs of urban decline, including dilapidated housing stock.

10. The Study Site has interface with the Victoria Harbour, the Hong Kong Coliseum, Hung Hom MTR Station and the Hong Kong Polytechnic University as well as the broader Tsim Sha Tsui East and Hung Hom areas. However, connectivity of these facilities and areas is severely constrained due to the Study Site as a heavily trafficked toll plaza area creating a significant barrier limiting cross-district and intra-district movements while existing pedestrian provisions are convoluted, inconvenient and undesirable.

11. The Study Site’s proximity to the Victoria Harbour presents an opportunity to explore a panoramic viewing deck/inclusion of tourism facilities; whilst maintaining and enhancing visual and physical connections to harbourfront. Furthermore, there exists an opportunity for enhancing harbourfront accessibility from inland neighbourhoods such as Hung Hom, Ho Man Tin, King’s Park and East TST; thus, making it desirable to formulate a comprehensive planning with adjacent areas, which led to the 2014 Feasibility Study.

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The 2014 Feasibility Study

12. In 2014, PolyU undertook a preliminary feasibility study (“the 2014 Study”) of a Green Deck over the existing Harbour Toll Plaza, aiming at fundamentally improving the local environment and restoring community connectivity and vitality. An artist’s impression of the conceptual design of the Green Deck in the 2014 Study is given in **Appendix B**. The 2014 Study aims to achieve the following objectives which are carried continuously throughout to the current Study:

1. Improve air quality and uphold community health;
2. Rebuild community connectivity through pedestrian /vehicular separation;
3. Satisfying social needs by enhancing local amenities; and
4. Revitalising depressed urban economy and upgrading local economy.

13. The Green Deck serves to connect the Hung Hom MTR Station podium on the east side and the PolyU pedestrian podium on the west side, forming an area-wide pedestrian platform free of vehicular and rail traffic.

14. The open deck serves as a district park with greeneries following the principle of biodiversity and urban landscaping. The park also comprises of a modest provision of cultural, leisure and recreational facilities and amenities, such as outdoor exhibition/performance venues and Food & Beverage (F&B) facilities.

15. Making use of the space created by the deep supporting structures, a mezzanine level would be created below the deck for a variety of use:

- Air filtration system for removal of pollutants from foul air collected from cross-harbour traffic on ground level below;
- Bus waiting facilities with bus-arrival signalling system;
- Weather protected pedestrian concourse; and

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- A variety of community uses and some shops.

Public Engagement

16. As early as 2013, a wide variety of programmes, including forum, presentation, luncheon meetings, exhibitions, social media publicity and direct mailing have been launched to Government officials, district councils, community influential business, professional, groups, students and residents nearby. The idea of the Green Deck has received overwhelming support with many positive inputs. A list of individuals and organizations providing support to the concept of Green Deck is in **Appendix C**.

THE PROJECT DEVELOPMENT STUDY

Purpose and scope of the Study

17. The aim of the Study is to further develop the Green Deck Project and demonstrate its technical feasibility on the basis of the 2014 Study. The Study serves to develop the planning and design concepts of the Green Deck in greater details, and to identify as much as possible all the technical issues so as to resolve them satisfactory in order to facilitate the adoption and implementation of the Project by the Government. Unlike the 2014 Study, the scope of the Study has been confined largely to the Green Deck project site, including its connections to its neighbouring developments and immediate vicinity.

18. The scope of the Study includes:

- (a) Preparatory Site Studies;
- (b) Landscaping Design;
- (c) Building Design including Fire Safety Studies;
- (d) Structural Engineering Design;
- (e) Building Services Engineering Design;
- (f) Preliminary Environmental Review;
- (g) Construction Operation Planning;
- (h) Traffic and Transport Impact Assessment Studies; and
- (i) Public Consultation and Engagement.

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Design Elements of the Green Deck

19. The design elements of the Green Deck are illustrated in **Appendix D**.

20. The design of the Green Deck consists of three principal levels: the ground level (G/F), mezzanine level (M/F), and deck level (D/F). The G/F is provided with air-conditioned indoor bus waiting lounges, one at each bound, to significantly improve the bus passengers' waiting experience. Also, there will be more vertical connection points between G/F bus passenger waiting areas and the levels above.

21. The M/F will accommodate a range of community, retail and F&B facilities as well as a public circulation network to enhance connectivity to surrounding neighbourhoods and facilitate public transportation modal-transfer between buses and the rail system by commuters. This level also accommodates plant rooms and the reprovisioned CHT Tunnel Administration Building.

22. The D/F is mainly composed of the landscaped park with the low-rise pavilions protruding above. The D/F extends towards the harbourfront to form the Islet, which is an outlying observation deck. The Islet has two more levels above D/F, featuring an open-air harbour-viewing deck and performance venue on the roof, a F&B space in the upper deck level and a covered harbour-viewing deck and a retail space on the D/F. The Islet is designed to be opened to the general public and enhance the public's harbour viewing experience. The Islet will also provide pedestrian connection to the promenades at Tsim Sha Tsui and Hung Hom via two sets of lifts and stairs.

23. Potential uses on the Green Deck are predominantly of public services, with commercial interests as secondary consideration. Arts and cultural uses are also proposed for the Green Deck to leverage and extend the culture corridor created by the existing museum cluster in Tsim Sha Tsui East.

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24. Rebuilding district-wide community connectivity is one of the main objectives of the Green Deck. It aims to serve as a catalyst for restoring the currently constrained pedestrian connectivity in the CHT Toll Plaza Area. As such, in our proposed scheme, the two existing footbridges spanning east-west will be replaced by a much superior multi-level and multi-directional circulation network installed on the Green Deck. The main deck is proposed to have 11 pedestrian connections to various surrounding areas of the Green Deck that will enhance overall connectivity of the area, including connection to the Tsim Sha Tsui and Hung Hom waterfront.

25. The Green Deck is designed to provide an urban open space with 24-hour multiple urban activities for enhancing the district vibrancy. There are four basic components to be integrated in the landscape activity programme, including culture, sharing, natural and life. These components are related to providing a full range of municipal services and activities for all people and social groups within the community. The night activities are mainly connected to entertainment and hobbies, and the main users of these programmes are thus young people who gather at certain places.

26. The overall landscape design comprises open lawn, playgrounds, gardens, plazas, courtyards/ or landscape rooms which provide flexible and attractive open space for the future visitors whilst maximising the available green coverage to assist with visually softening the visibility of built form from the surrounding areas.

27. The landscaped park on top of Green Deck is generally differentiated into seven areas of different design characters including a central lawn embracing an oval shape multi-purpose hall to cater for the diverse tastes and desires of visitors from all kinds of social backgrounds. In addition, the landscape design has integrated the viewing deck with the roof garden at the Islet, which is located at high points of the park close to seafront promenade to capture the best views of Victoria Harbour.

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Impact Assessments

28. The Study has conducted various investigations and assessments to ensure the constructability of the Green Deck and its impact to its surroundings mitigatable, including traffic, environmental, drainage, fire safety and construction operations. So far, no insurmountable technical difficulties have been identified.

29. A review has been conducted on the impact of the Project to the existing vehicular and pedestrian traffic flow. With the implementation of Free Flow Tolling System (“FFTS”) at Cross Harbour Tunnel in 2024, the existing tolling booths will be removed and the area for carriageway use will be reduced. The spare area originally for the carriageway can now provide space to construct the Project over one of the busiest roads in Hong Kong. By using a phased construction programme, the temporary traffic management (TTM) plan under development will ensure the number of traffic lanes maintained will be the same under the FFTS and access to existing bus stops on both directions will not be affected by the construction of the Project. Moreover, traffic movement will return to normal under the FFTS upon completion of Project construction. Hence, no major adverse impact on tunnel traffic is expected.

30. A Preliminary Environmental Review has been carried out to ensure that the Project will be designed and developed in a manner that will generate maximum environmental benefits and with acceptable environmental impact as a result of project implementation.

31. A preliminary quantitative air quality assessment has been conducted for the operational phase of the Project. The assessment has identified and incorporated the key air pollutant sources (including vehicular emissions) in the vicinity. The Project will utilise an Air Purification System (“APS”) to remove pollutants from the heavy trafficked G/F. There are many successful applications of APS in HK and overseas, such as Mainland China, Netherlands, etc. Upon the implementation of the Project, there would be significant improvements on annual emission of NO₂ as

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well as other pollutants including Respirable Suspended Particulates (“RSP”) and Fine Suspended Particulates (“FSP”) in the general area of the Project.

32. Review has also been conducted for noise impact due to construction of the Project, which could be properly controlled by the implementation of mitigation measures such as the use of quiet construction plant, temporary noise barriers etc. With the implementation of these mitigation measures, it is considered that any residual construction noise impacts would be insignificant. For the Project’s operation, a review has been conducted for fixed noise sources such as APS, chillers, ventilation fans etc. For those fixed noise sources identified, the noise could readily be mitigated by implementing sound attenuators and designing the relevant plant rooms with sufficient sound transmission loss. It is considered that any residual fixed noise source impacts would be insignificant.

BENEFITS OF THE GREEN DECK TO THE COMMUNITY

33. The areas adjacent to the Toll Plaza are facing different problems such as heavy traffic, air and noise pollution, poor pedestrian connectivity, lack of open space and many others. It is expected that the Green Deck will help improve the situation and bring the following benefits to the community:

- (a) Improve air quality and promote healthy living
 - The poor air quality in the Toll Plaza area imposes a potential health risk for the pedestrians, bus passengers and the nearby communities.
 - The Green Deck will incorporate air treatment facilities such as an air purification system to help reduce the pollutants. The proposed waiting lounges for bus passengers will also help protect passengers from exposure to polluted air.

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- The proposed green environment with nicely built walking paths and bicycle tracks, will not only enhance the connectivity of different areas, but also encourage people to walk and exercise more regularly.
- The Green Deck would introduce urban greening to help mitigate the Urban Heat Island (UHI) effect and improve thermal comfort by moderating micro-climatic conditions and providing shading. It can bring other benefits including the ability to attenuate noise levels, improve air quality, reduce urban storm water runoff and enhance stress recovery of the public and nearby residents.

(b) Enhance community connectivity

- Neighbouring communities are spilt up by the Toll Plaza, roads and railway tracks, which take up much public space and leave very little room for pedestrians. Connectivity among communities in Hung Hom, Ho Man Tin and East Tsim Sha Tsui is seriously affected.
- The Green Deck will segregate vehicular traffic from pedestrians and become one single platform that facilitates connectivity of pedestrians among communities in Hung Hom, Ho Man Tin, East Tsim Sha Tsui. In addition, there is a potential for bicycle tracks, which will provide enhanced connectivity and convenience.
- The Intermediate Level of the Green Deck will furthermore serve as an all-weather pedestrian passageway. Pedestrians will be able to access the bus stations or railway station safely and efficiently in a pleasant environment.

(c) Provide more space for community facilities

- Within one kilometre of the proposed Green Deck site, there is no large park, no major community facility and only limited sports and recreation facilities. The Green Deck will help address the needs of the community by

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providing a landscaped park on the Deck Level and northern part of the Mezzanine Level with a total area of about 24 300 m², consisting of footpaths, a variety of outdoor/semi-outdoor recreation venues, and cultural facilities for public use.

- The Mezzanine Level will make available about 13 800 m² indoor space for pedestrian concourse, various community facilities for different purposes such as meetings, exhibitions, food & beverage and retail, thus satisfying the needs of different user groups, for example, the local community, the business sector, tourists, etc.
- The Ground Level will continue to serve cross-harbour traffic and provided with indoor bus waiting lounges to serve commuters going in both directions.

(d) Revitalise the local districts and support the economy

- The MTR Hung Hom Station podium and the East Tsim Sha Tsui area are prime urban sites that have been underutilised. The Green Deck will enable revitalization of these urban sites, taking advantage of existing hotels and retail/entertainment facilities in East Tsim Sha Tsui. It is expected more job opportunities will be created, benefitting Hong Kong society as well as the neighbouring communities.
- Tourism is one of the pillar industries in Hong Kong. The Green Deck would be a unique attraction on top of other nearby tourist destinations such as the clock tower, the Avenue of Stars, Tsim Sha Tsui promenade, the Science Museum and the History Museum⁴.

⁴ The study on “The Economic Contribution of the Green Deck Project” by Prof. Haiyan Song of PolyU concluded that the Green Deck may significantly contribute to Hong Kong’s economy in different ways, such as through tourism revenue, saved energy consumption, pollution reduction, health benefits and real estate rental revenue. Tourism dominates the impacts of the Green Deck Project on the Hong Kong economy and international visitors.

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- It is believed that the Green Deck will also help support the economy by bringing economic benefits to society in addition to the intangible benefits⁵.

HARBOUR PLANNING GUIDELINES AND PRINCIPLES

Principle 1: Preserving the Victoria Harbour

34. The proposed Green Deck does not involve any reclamation within the Victoria Harbour, and thus the objective to preserve the harbour is fulfilled. The proposed developments will be mainly confined in the areas of existing roads and will not jeopardise the use and enjoyment of the existing Tsim Sha Tsui waterfront.

Principle 2: Stakeholder engagement

35. The concept of the Green Deck has been shared with local communities, business, professional bodies, green groups, District Council members and the Government with many positive responses. In planning the facilities to be provided in the Green Deck, we will consult the relevant stakeholders including the District Councils.

36. Interim findings of the Study were presented to the Yau Tsim Mong District Council and the Kowloon City District Council in May 2022. Members in general support the idea of the Green Deck but queries were raised on construction impacts, funding sources, operation model and opportunity for integrated development with nearby properties. We will consult the two district councils again near the end of the Study when more information is available⁶.

⁵ The study on “Cost-benefit Analysis of the Green Deck Development” by Dr. S.C. Hsu of PolyU concluded that social benefits consist of about 2/3 of the total benefits, which further confirms the positive effect that the Green Deck is able to bring into the society.

⁶ The Community, Building and Facilities Management Committee of Yau Tsim Mong District Council was consulted on 17 May 2022 and the Culture, Recreation and District Facilities Management Committee of Kowloon City District Council was consulted on 19 May 2022.

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Principles 3 and 4: Integrated planning and sustainable development

37. The proposal is planned in the context of available educational, cultural, recreational and transportation resources in the vicinity of the site. Subject to detailed design in the next stage of development, the Green Deck will be designed to meet the prevailing environmental design standards and provides a lot of opportunities for including sustainable design features.

Principles 5 and 6: Proactive harbour enhancement and vibrant harbour

38. The Green Deck itself will become a destination and icon in the harbourfront. Provision of open space with quality design will be significantly increased, and with all the different kinds of activities to take place on the deck, the vibrancy of the harbour will be enhanced.

Principle 7: Accessible Harbour

39. An important role of the proposal is to improve the pedestrian accessibility of the hinterland to the harbour-front, by providing high quality landscaped access through the deck to enhance visual and physical access to the harbour. The Green Deck development will enhance pedestrian connection to the harbourfront, including a new connection by lifts from the Green Deck to the eastern end of the Tsim Sha Tsui Promenade on the G/F at the Islet (**Appendix E** refers). There will also be additional connection points to neighbouring destinations, which will conveniently bring people to the harbour and vice versa.

Principle 8: Public enjoyment

40. The proposal allows sufficient amounts of community, retail and F&B facilities to be provided for public enjoyment. There is also ample space on the deck level for carrying out of active and passive activities in both day and night time.

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WAY FORWARD

41. Members' comments and other comments received on the Green Deck project will be taken into account in further refinement of the proposal in the later stage of the Study.

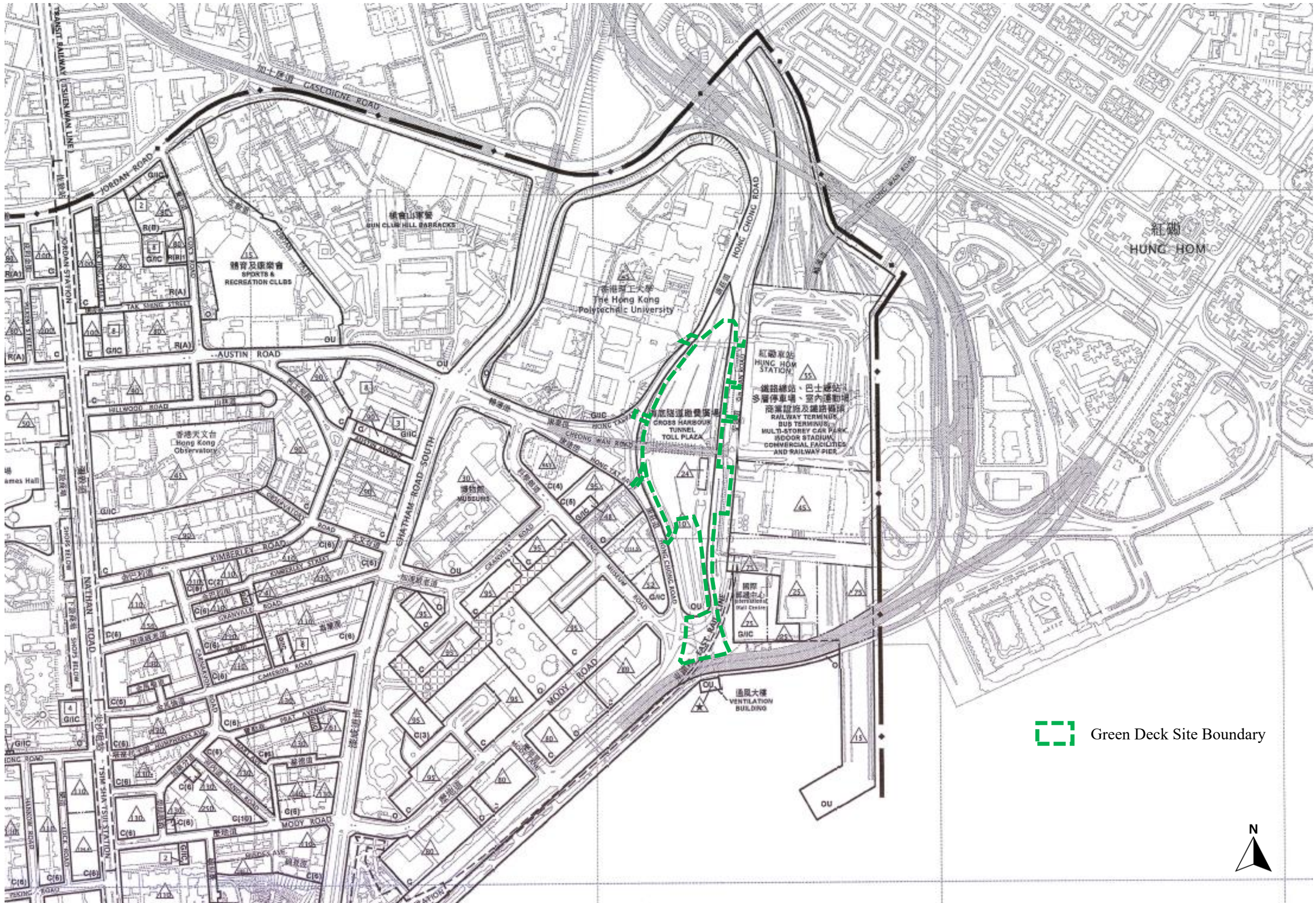
ADVICE SOUGHT

42. Members' views are sought on the proposed Green Deck.

**Green Deck Project Management Office
The Hong Kong Polytechnic University
September 2022**

ATTACHMENTS

| | |
|------------|--|
| Appendix A | Extract of Approved Tsim Sha Tsui Outline Zoning Plan No. S/K1/28 |
| Appendix B | Artist's Impression of the Conceptual Design of the Green Deck in the 2014 Study |
| Appendix C | List of Individuals and Organizations Providing Support to the Concept of Green Deck |
| Appendix D | Design Elements of the Green Deck |
| Appendix E | Connection from Green Deck to Tsim Sha Tsui Waterfront |





Source: DLN

Artist's impression of the conceptual design of the Green Deck in the 2014 Study

List of individuals and organizations providing support to the concept of Green Deck

List of Support Letters received from Individuals or Organizations

- | | |
|--|----------------------------|
| 1. Legislative Council member | Ir Dr LO Wai-kwok |
| 2. Kowloon City District Council Chairman | Mr PUN Kwok-wah |
| 3. Kowloon City District Council Vice-Chairman | Mr CHO Wui-hung |
| 4. Kowloon City District Council member | Ir Dr CHENG Lee-ming |
| 5. Kowloon City District Council member | Ir CHEUNG Yan-hong |
| 6. Kowloon City District Council member | Mr NG Fan-kam |
| 7. Kowloon City District Council member | Mr YUE Chee-wing, Admond |
| 8. Yau Tsim Mong District Council Chairman | Mr IP Ngo Tung, Chris |
| 9. Yau Tsim Mong District Council Vice-Chairman | Ms WONG Shu Ming |
| 10. Yau Tsim Mong District Council member | Mr CHAN Siu-tong |
| 11. Yau Tsim Mong District Council member | Mr CHOW Chun Fai |
| 12. Yau Tsim Mong District Council member | Mr CHUNG Kong-mo |
| 13. Yau Tsim Mong District Council member | Mr HUNG Chiu-wah, Derek |
| 14. Yau Tsim Mong District Council member | Mr JO Chun Wah, Craig |
| 15. Yau Tsim Mong District Council member | Ms TANG Ming Sum, Michelle |
| 16. Yau Tsim Mong District Council member | Mr YU Tak-po |
| 17. Building Environmental Assessment Method (BEAM) Society Limited | |
| 18. Centre of Architectural Research for Education, Elderly, Environment and Excellence Limited (CARE) | |
| 19. Civic Exchange | |
| 20. DLN Architects Limited | |
| 21. Federation of Hong Kong Chinese Travel Agents | |
| 22. Gammon Construction Limited | |
| 23. Green Sense | |
| 24. Hong Kong Association of Travel Agents | |
| 25. Hong Kong Green Building Council | |
| 26. Hong Kong Japanese Tour Operators Association | |
| 27. Hong Kong Institute of Architects | |
| 28. Hong Kong Institute of Landscape Architects | |
| 29. Hong Kong Institute of Planners | |
| 30. Hong Kong Institute of Surveyors | |
| 31. Hong Kong Institute of Urban Design | |
| 32. Hong Kong Tourism Board | |
| 33. Mass Transit Railway Company | |
| 34. Planning Department, HKSAR Government | |
| 35. Shui On Group | |
| 36. Society of IATA Passenger Agents Limited (SIPA) | |
| 37. The Conservancy Association | |
| 38. Travel Industry Council of Hong Kong | |
| 39. Tsim Sha Tsui District Kai Fong Welfare Association | |

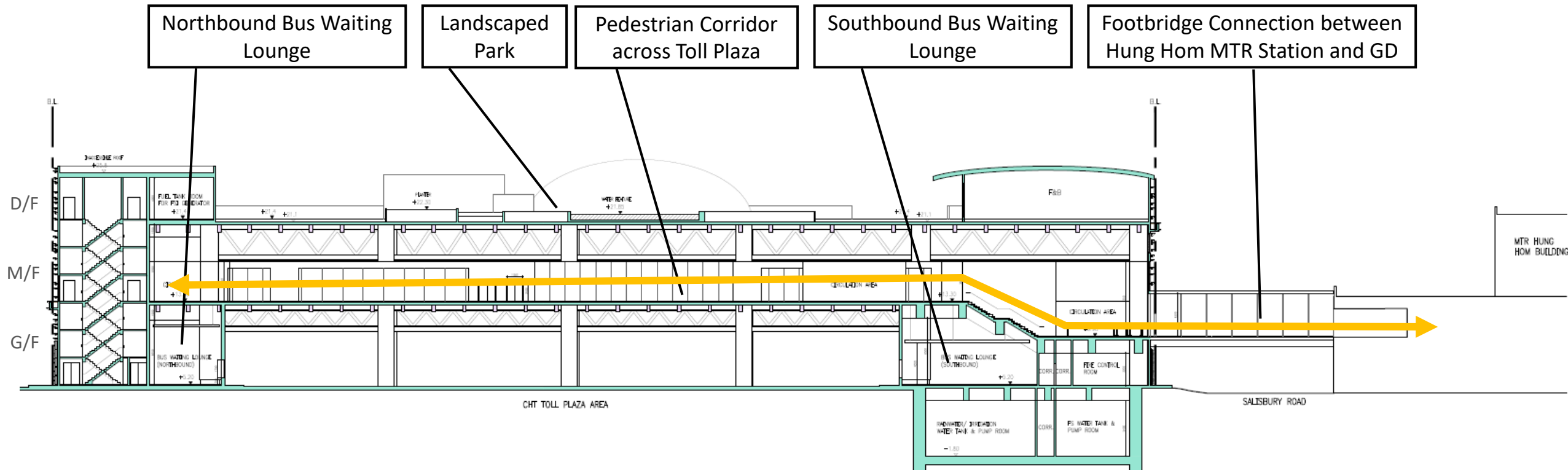
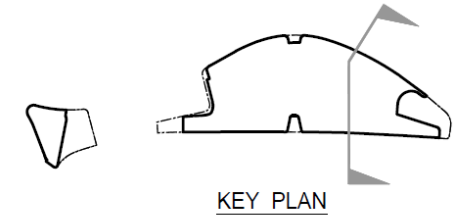
Design Elements of the Green Deck

Schematic Building Design



Section of the Green Deck

- The proposed Green Deck has 3 Principal Levels:
 - Ground Level (G/F)
 - Mezzanine Level (M/F)
 - Deck Level (D/F)

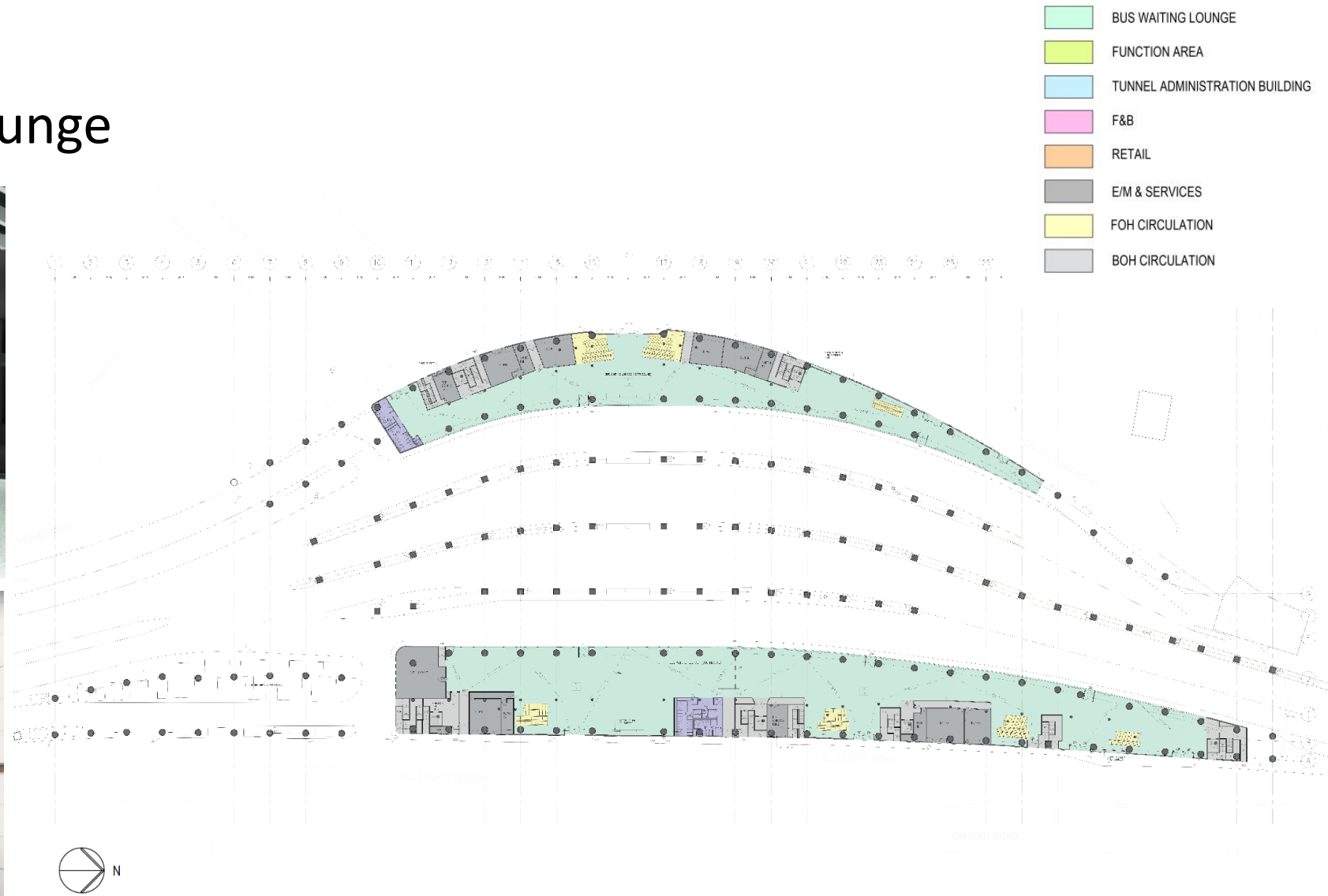


Ground Level

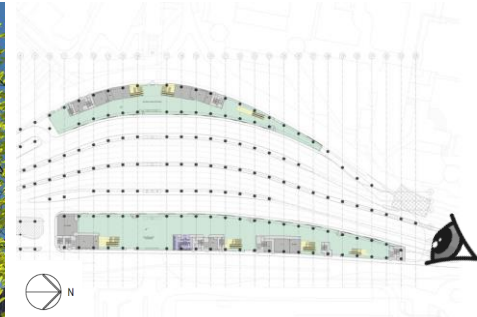
• Indoor Bus Waiting Lounge



Indoor bus waiting lounge example from Kwun Tong Yue Man Square PTI



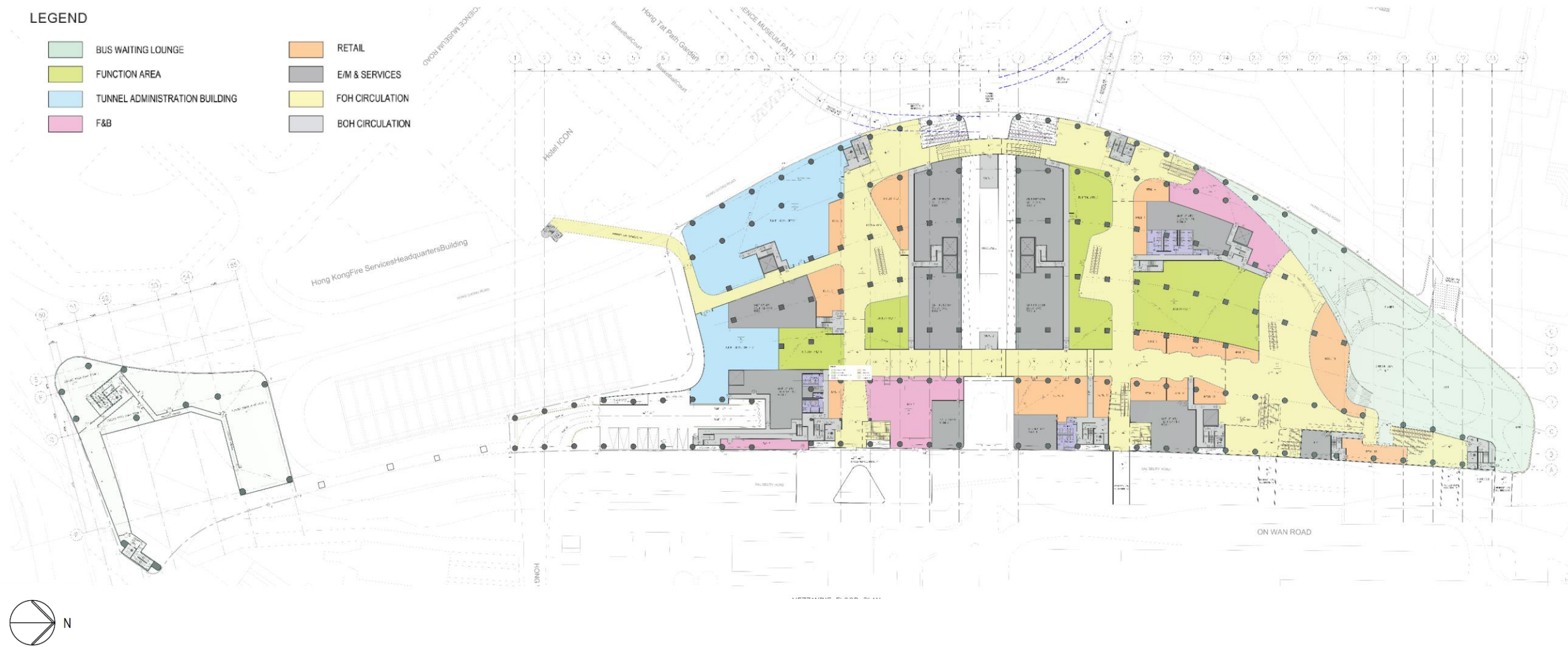
Ground Level - View of GD from Southbound Traffic



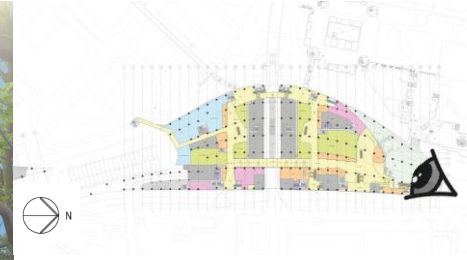
Mezzanine Level

LEGEND

- | | | | |
|---|--------------------------------|---|-----------------|
|  | BUS WAITING LOUNGE |  | RETAIL |
|  | FUNCTION AREA |  | E/M & SERVICES |
|  | TUNNEL ADMINISTRATION BUILDING |  | FOH CIRCULATION |
|  | F&B |  | BOH CIRCULATION |



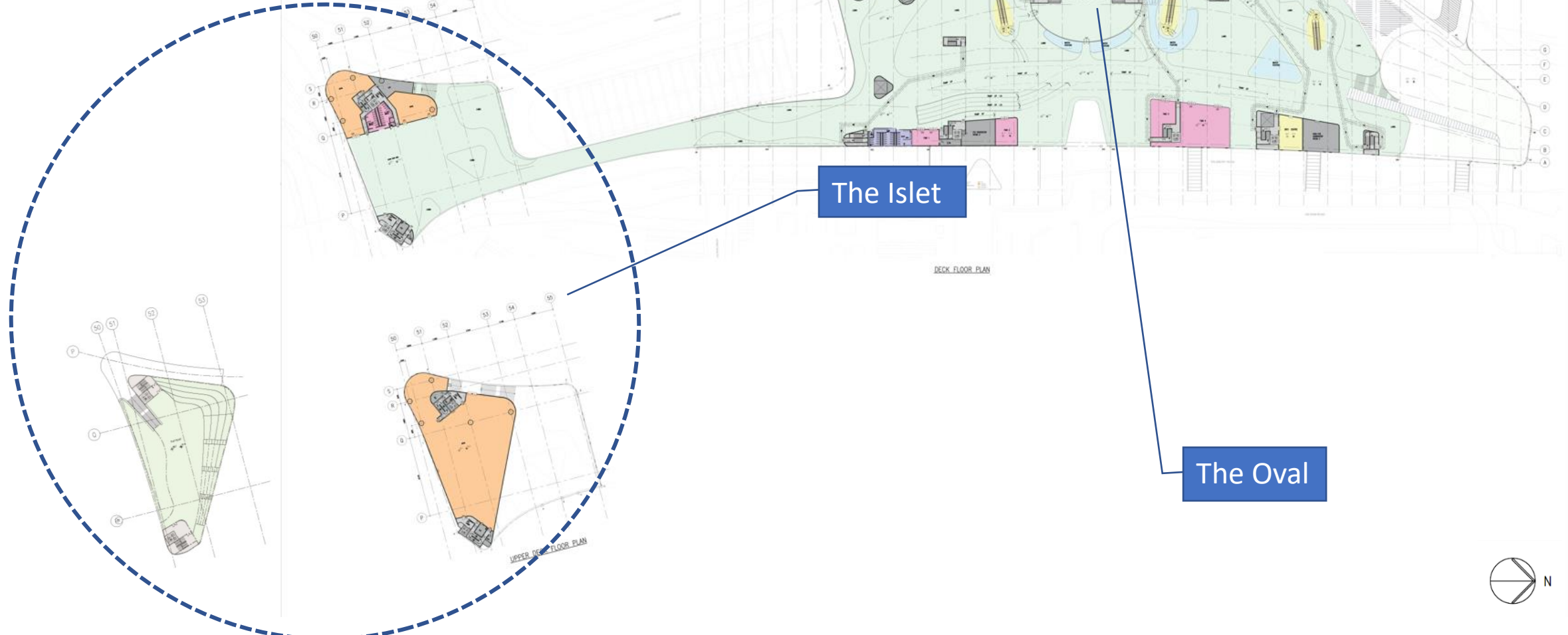
Mezzanine Level - Mezzanine Outdoor Deck



Deck Level

LEGEND

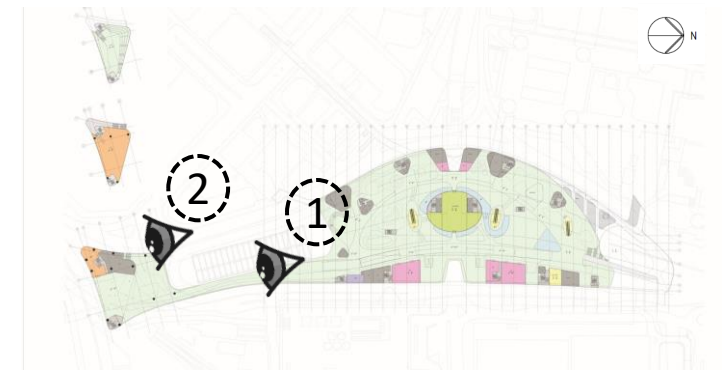
- BUS WAITING LOUNGE
- FUNCTION AREA
- TUNNEL ADMINISTRATION BUILDING
- F&B
- RETAIL
- EM & SERVICES
- FOH CIRCULATION
- BOH CIRCULATION



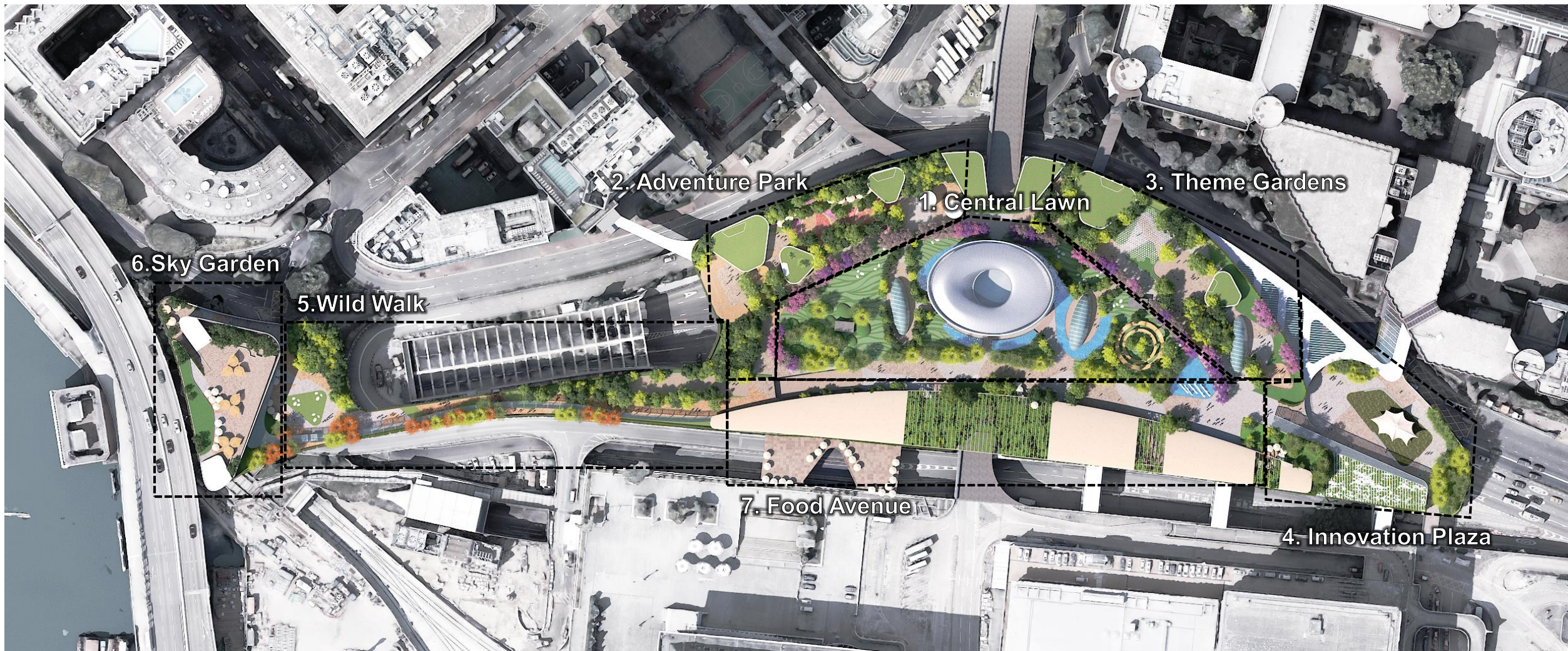
Deck Level - The Oval



The Islet – Public Observation Deck

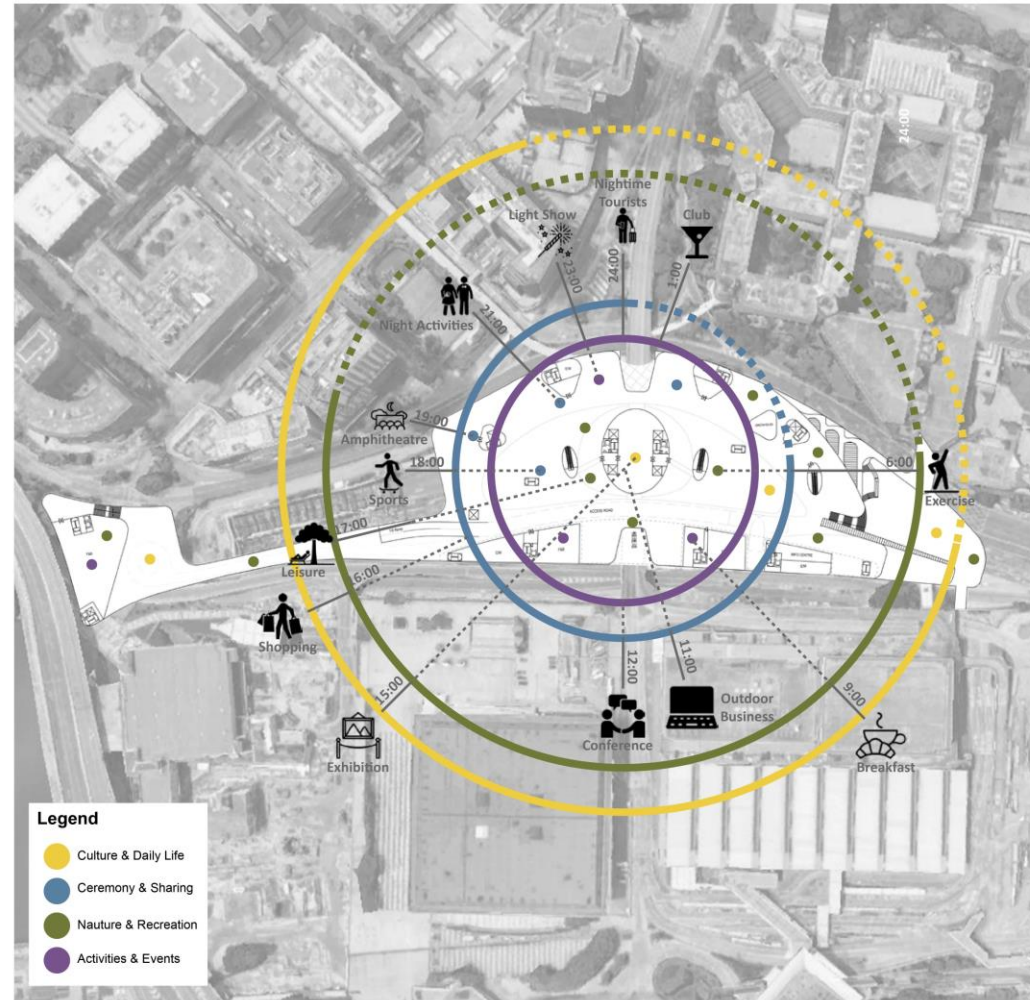
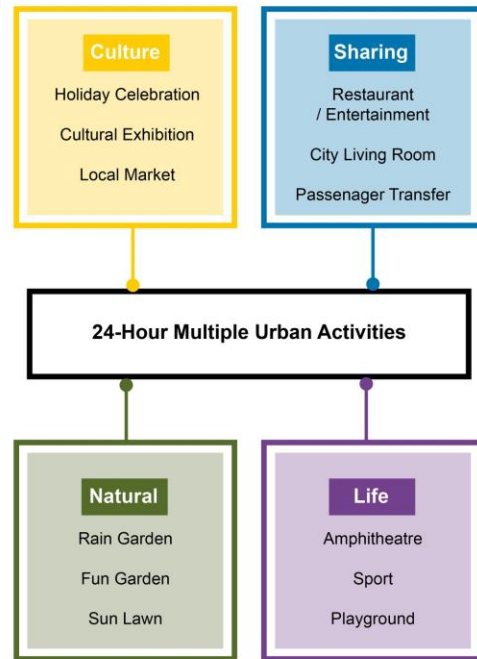


Landscape Character Zones



24-Hour Multiple Urban Activities

24-Hour Multiple Urban Activities



Target Users & Activities



Tourist



Family Group



People Commuting to Work



Young Professionals



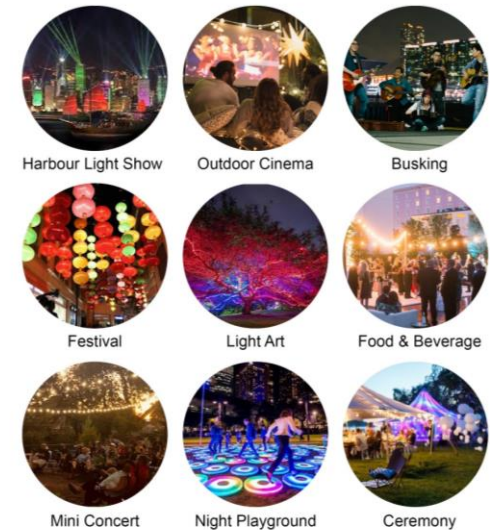
Student Group



Day-time Activities



Night-time Activities



Art Installation & Outdoor Furniture



Art & Sculpture (Hanging Sculpture)



Art & Sculpture (Usable)



Art & Sculpture (Wind Dynamic)



Planter with Seating

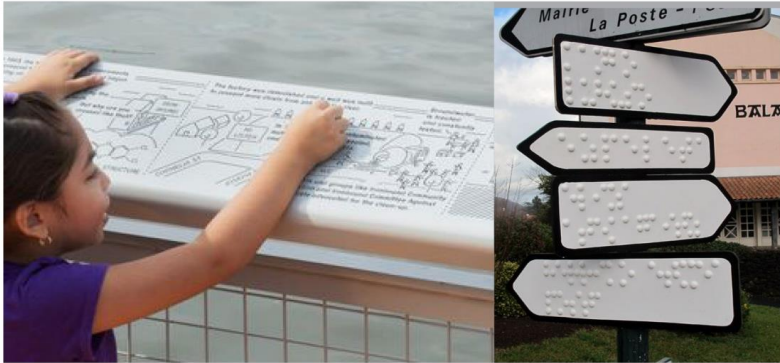


Outdoor Dining Set

Inclusive Design Elements



Design with Accessible Ramps



Tactile Map/ Signage



Accessible Surface



Inclusive Play Design



Inclusive Drinking Fountains

