

Urban Skywalk as Public Space in Context of Creating Urban Place

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Abstract: Skywalk as one of the elements of urban linkage in its current development not only acts as a space for crossing but has evolved so that it can also become a public space that triggers the optional and social activities. However, to be able to provide meaning and sense of place for the users, it is necessary to create a city public space that is not just a "space" but to be a "place". This research begins by observing the Placeness of skywalk from Physical and social settings, Functions, and Images of the skywalk using several theories such as Urban Place, Skywalk, and Public Space Theory. It was used to find the guidelines and design ideas, especially for skywalk Cihampelas Terrace that has been a public space in Bandung as the case study. To become an urban place that gives a sense of place for its users, Cihampelas Terrace needs to represent the identity of the context as an elevated pedestrian and multilevel window shopping and tourism area. It certainly needs to be supported by the physical design especially to create a continuous and leisure atmosphere, by dynamic and attractive architectural element that has integration with the surrounding, and can accommodate Functional Activity, Optional Activity, and Social Activity proportionally.

Keywords: skywalk, public space, urban place, sense of place

1. Introduction

Skywalk is a crossing space and connective tissue that has a certain height above the ground and serves as networks of above-grade interconnecting pedestrian walkways consisting of sky bridges over streets, second-level corridors within buildings and various activity hubs, such as shops and offices [1]. In its current development, the skywalk not only acts as a space for crossing to accommodate functional activities but has evolved so that it can also become a public space that triggers the optional and social activities. However, to be able to provide meaning and sense of place to improve the quality of life of the community, it is necessary to create a city public space that is not just a "space" but to be a "place"—gives meaning, value, and sense of attachment to society [2], [3]. Therefore, this study aims to discover what are the activities and physical elements of skywalk as a public space to become an urban place, and find out the design guideline and recommendation for Cihampelas Terrace Skywalk at Bandung.

2. Case Study and Methods

The selected study case is a skywalk that still has an active role as a city public space that not only accommodates functional activity but has triggered optional and social activity. Therefore, the selected study object is Cihampelas Terrace Skywalk, Jalan Cihampelas, Bandung, Indonesia. Skywalk with a width of 7.6 meters, length 450 meters, and height of 4.6 meters, extending along a part of the Cihampelas Street. The skywalk was designed to enable multilayer public spaces for shopping districts and to reorganize street vendors that previously located on sidewalk areas. Located on contoured land, this skywalk is divided into several levels with each function zone (Figure 1 – Figure 7).

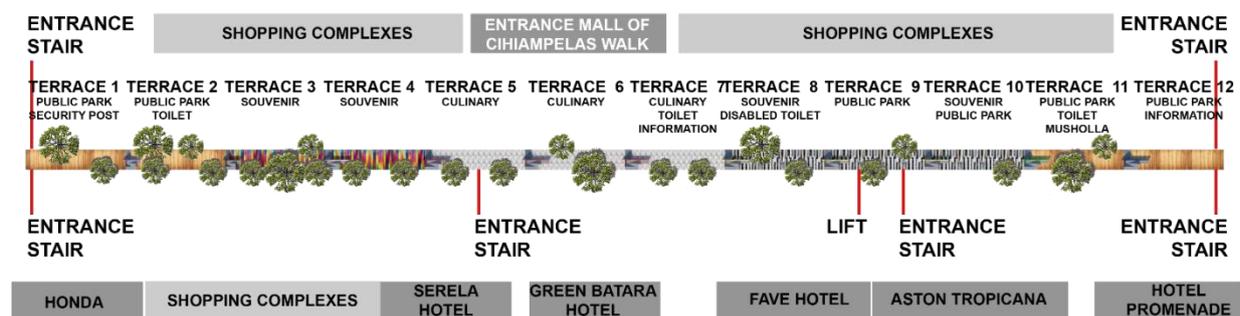


Figure 1: Plan and Zoning of Cihampelas Terrace Skywalk



Figure 2: Cross Section

Figure 3: Longitudinal Section



Figure 4: Bird Eye View



Figure 5: Public Park Area



Figure 6: Souvenir Area



Figure 7: Culinary Area

This research began by observing the physical and social settings, functions, and images of the skywalk, as well as observations and interviews of skywalk users. The design problems analyzed based on Public Space Theory and Urban Place Theory : To create a skywalk as an urban place, it takes three components: (1) The Form / Physical Setting of the Skywalk associated with cognitive relationships, namely the perception of a person in understanding the geometry of the space and oriented within the skywalk, based on Skywalk Theory related to location, entrance, room layout, node, public furniture, landscaping and trees, facilities, shelter, materials, etc. (Ujang N., 2009); (2) Skywalk Activity associated with behavioral relationship, ie perception of the ability of space to accommodate user needs, ranging from Functional Activities, Optional Activities, and Social Activities; and (3) The Meaning of Skywalk associated with the emotional relationship, namely the perception of satisfaction and community attachment to the skywalk based on Walking Activity Needs & Behavior Theory.(Figure 8)

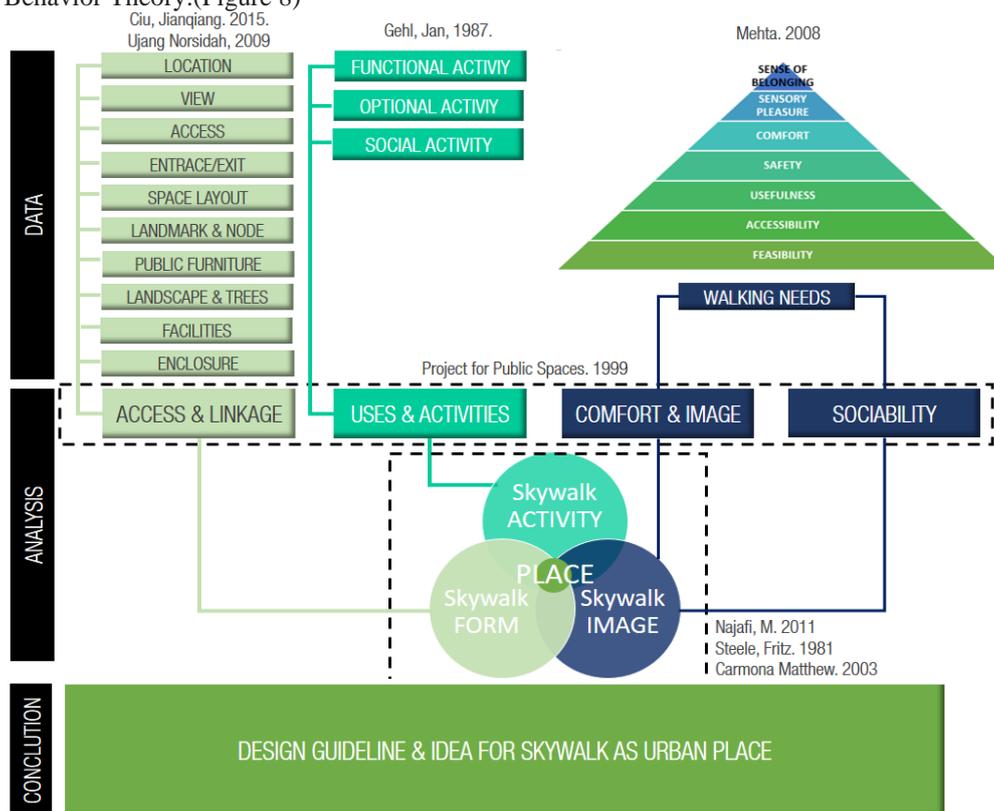


Figure 8: Diagram of Research Analysis and Theory

3. Placeness of Cihampelas Terrace Skywalk

A good urban place is a place that is able to provide a sense of place that is right for its users. It is supported by the physical and social settings in the place, how the interaction of the user is able to cause or create a sense of a certain sense of place and can be shown through the activities of users [4]. The following is the evaluation about placeness of Cihampelas Terrace Skywalk through its Form/Physical Element, Activities, and Image/Meaning.

3.1 Physical Settings of Cihampelas Terrace Skywalk

There are some important condition and character of physical elements in skywalk as a public space that can affect the feelings of the skywalk users [5]. The effects from those physical settings will be analyzed one by one based on their suitability to the user and to create a suitable sense of place at Cihampelas Terrace as an elevated pedestrian for window shopping and tourism.

3.1.1 Location: located between shopping district, hotel and office district, Cihampelas Terrace is potentially becoming a shopping street and tourism destination due to its high-density mobilization path.

3.1.2 View: the view is dominated by booths of street traders and a row of lush trees on the background. On the other hand, the buildings on bothsides of Cihampelas Terrace is a row of shops that have not been multi-storey, so what appears from above is the billboards and roofs of buildings that are unorganized and unclear. Behind the trees and rows of shops, there is a glimpse of Bandung City View and Pasupati Bridge as one of Bandung City Icon. These areas become a potential view of interest to be enjoyed by the users, so it needs to be accommodated with a comfortable relaxing space.

3.1.3 Access: Access to enter and exit from Cihampelas Terrace from the ground floor has spread over several points, but mostly located on the East side—mostly hotels or office building. While the West side is a row of shops, there are only two access points on both ends of that side. The number of the entrance is too less so that the distance between those points is quite far apart, and the placement is unbalanced. It causes the pedestrian with the higher flow on the side of the shopping complex and the shopping mall must walk to the end of the skywalk or cross the street first to reach the nearest entrance. It reduces the connectivity of Cihampelas Terrace Skywalk to the shopping street on Jalan Cihampelas which has become the identity of the place (Figure 9). In addition, Cihampelas Terrace Skywalk also has not connected with certain destinations on skywalk level, especially anchor tenants that have the potential of the flow of citizen activities (Figure 10). There is only one restaurant that has been connected directly with the skywalk in the period of this research (Figure 11). It is because the surrounding buildings have not been multi-storey buildings, so it has unconnected network system. The lack of connectivity indicates that Cihampelas Terrace has not functioned as a path nor node on the second-level / skywalk level.

The disabled facility has been available on Cihampelas Terrace, starting from the elevator, as well as the ramp between each different elevation level of Cihampelas Terrace, and ramp to the disabled toilet but unfortunately it does not have enough width and turning radius, so it is not effective for disabled with a wheelchair (Figure 12). There is also a ramp from the elevator that takes the main circulation path of Cihampelas Terrace. It is unsafe for the mobilization of the disabled user or the other users (Figure 13).



Figure 9: Ground / Street Level Access

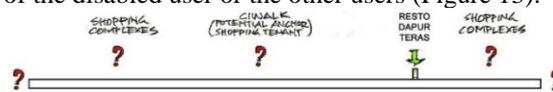


Figure 10: Above / Skywalk Level Access



Figure 11: Connection to Skywalk Level



Figure 12: Unsuitable Wide and Radius of Ramp

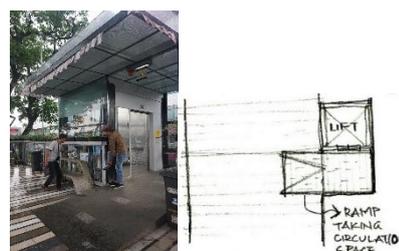


Figure 13: Ramp Taking Circulation Space

3.1.4 Entrance: The entrance to Cihampelas Terrace is marked with a gate, but still needs to be designed to be more attractive and representative for visitors. This is due to the design of the shape, dimensions, and composition of the gate that has not yet integrated with the Cihampelas Terrace Skywalk (Figure 14). In

addition, the road space under Cihampelas Terrace tends to be too enclosed and does not represent the vitality of the space above the skywalk, making it less inviting to the users (Figure 15). People also have to use stairs to access the skywalk but it is not accessible for disabled, while the lift is only available at one point in the middle of the skywalk. On the other hand, the stairs did not use finishing material, thus causing a less representative impression for the people, and does not have welcoming area that integrated with the pedestrian to invite visitors (Figure 16, Figure 17).



Figure 14: Entrance Gate



Figure 15: Street View



Figure 16: Entrance Stair



Figure 17: Entrance Stair

3.1.5 Space Layout: Each level of Cihampelas Terrace has different spatial arrangement according to its activity zoning. It has to consider the context of building surrounds especially the connectivity to each building function. The arrangement of furniture, shopping booths, installations, and others will impact on the formation of spaces that affect behavior patterns and people activities (Figure 18). First of all, the arrangement of the booth on the skywalk needs to be arranged so it is not blocking the welcoming space of the entrance to provide a wide area for people to be oriented. And then, the booths that were arranged diagonally to the skywalk linearity actually make the circulation space become narrow, so it is less effective and less comfortable for both crossing activity and buy-sell activity (Figure 19). If the booths are placed perpendicularly following the order of linearity skywalk, then the circulation space will be more spacious and comfortable (Figure 20). The arrangement of the booth also has to consider the potential of view so it will not block the area of view.

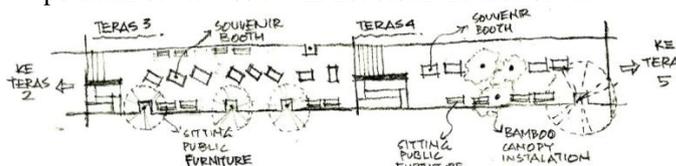


Figure 18: Space Layout



Figure 19: Diagonal Arrangement of Booth



Figure 20: Linear Arrangement of Booth

3.1.6 Public Furniture

- Signage and Lighting:** The activity zoning at each level on Cihampelas Terrace are clearly illustrated on the signage through icons and visualizations that help the visitor to find the destination easily. There are two types of signage boards on Cihampelas Terrace, Global Signage that describes the entire skywalk segment which is more useful rather than the Partial Signage that describes each skywalk segment only. However, the Global Signage is only placed on the first segment of skywalk while it is actually needed on every segment to help people's orientation. In addition, the signage boards are also united with the lighting furniture that needs to be maintained to light up the skywalk in the dark of night.
- Sitting:** There are two types of seats that are designed specifically by using a modular system also multifunction that can create the flexible configuration. The combination of organic and geometric forms creates a dynamic space. Placement of seats in the room can form a different atmosphere. By placing the sitting furniture on the space subtraction creates a more intimate atmosphere for socializing or just relax sitting and not be disturbed by the flow of circulation.
- Safety and Cleanliness Features:** CCTV cameras that need to be maintained to be able to provide recordings and monitoring conditions in the skywalk. The security post is already available, but it needs to be occupied by providing security guard personnel who patrolling and monitoring the circumstances and CCTV. For cleanliness facilities, there are trash bins that are spread along the skywalk, making it easier for the people to keep the skywalk clean.

3.1.7 Landscape and Trees: There are various of vegetation and shading trees along the Cihampelas Terrace. Those trees create a refreshing and shady atmosphere. They also become aesthetic elements as background, framing, and datum of the skywalk.

3.1.8 Facilities: Public facilities are provided and distributed at several points along Cihampelas Terrace, including: toilets, disabled toilets, musholla, charging booths, security posts, and information centers for visitors. It is easier for visitors if they need those facilities without having to find another location outside the skywalk area.

3.1.9 Enclosure:

- a. **Overhead Plane:** Cihampelas Terrace that uses open space design concept has a row of lush trees that have grown along the skywalk which can provide shade for skywalk users. However, Cihampelas Terrace still has problems when it rains. There are no visitors and the activity above there was almost entirely stopped because there was no shelter at all (Figure 21). Most of the shopping booths are closed with plastic to avoid water splash from the rain (Figure 22). The weather condition of Bandung city which has a high intensity of rainfall should be considered here.
- b. **Side Plane:** The side of the Cihampelas Terrace is enclosed by 1.2 meter high guardrail made from steel grill that is safe for both children and adults (Figure 23). In addition, the guardrail is decorated with creepers that give freshness to the skywalk space. Maintenance is required periodically to keep those plants fertile and aesthetics.
- c. **Base Plane:** The flooring uses various finishing material such as textured homogenous tiles, synthetic wooden boards, colorful ceramic, and glass block. But the glass block and some ceramics have a slippery surface that is unsafe for semi-outdoor uses (Figure 24). At some points, the leveling of base plane is not flat and causes puddles after the rain. The gutter along the side of skywalk is not wide and deep enough to gather the rainwater and causes a flood on skywalk area.



Figure 21: No Activity When Raining



Figure 22: Extension for Shelter



Figure 23: Skywalk Guardrail



Figure 24: Slippery Glass Block & Ceramics

3.2 The Activity of Cihampelas Terrace Skywalk User

There are three types of human activity in the public space that were used to evaluate the quality of the skywalk as a public space: Functional Activity: required activities such as walking to work, shopping, changing transportation modes; Optional Activity: walking around, sitting around, etc. conducted only if the conditions and places were inviting for such activities; Social Activity: talking, joining community events, which depend on the presence of others. The best design of public spaces is the one that can trigger Optional Activities and Social Activities more frequently [6]. The public activities that are found on Cihampelas Terrace are mostly optional activities and social activities. It is actually very appropriate to create a good public space (Figure 25). But the functional activity is still poorly accommodated by Cihampelas Terrace, due to its lower occupancy rates on weekdays and rainy days, also rarely repeated visits. In addition, activities that create the characteristics of Cihampelas Terrace such as window shopping, gathering with the community, exhibition, and another tourism activity need to be accommodated on this skywalk.

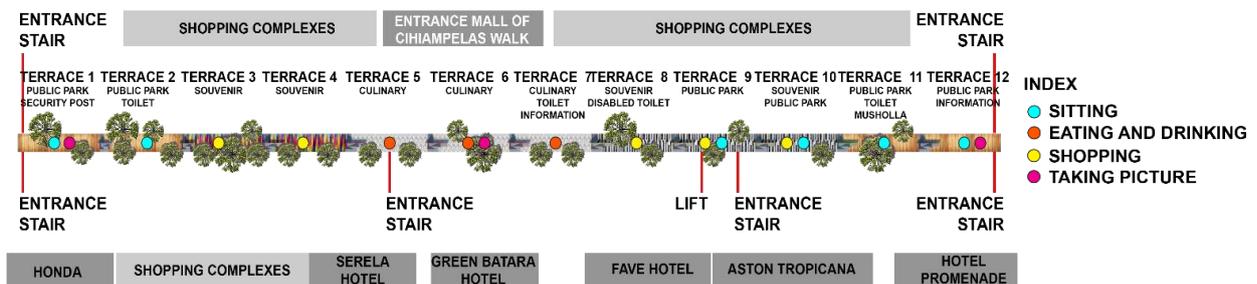


Figure 25: Activity of Cihampelas Terrace Skywalk User Mapping

3.3 Image of Cihampelas Terrace Skywalk

Associated with the emotional connection, the perception of satisfaction and community attachment to the skywalk. With the achievement of all levels of pedestrian needs, a skywalk is expected to have meaning and attachment to the user. The integration of interaction between humans and the built environment to create the suitable sense of place becomes one of the benchmarks in creating public space as a place [7]. The result of the interview with the skywalk users, there are some people who feel it is quite fun and they were enjoying their experience of walking along Cihampelas Terrace. They have space for recreation and socializing. But there are also some people who feel the atmosphere is not memorable, caused by the lack of character of the place and connectivity on Cihampelas Terrace. Some of the citizen that hasn't been there yet also said they haven't been attracted because it needs to be more accessible, protected from the weather, yet attractive and representative.

From the discussion of all the elements of Urban Place, the following is an overall evaluation of the placeness of the Cihampelas Terrace skywalk (Table 1):

Table 1: Placeness of Cihampelas Terrace Skywalk

Image - Meaning	Activity	Physical Setting	
Feasible	Necessary Activity: walking for a compulsory purpose.	<ul style="list-style-type: none"> • Location • Destination • Alternative transportation 	<ul style="list-style-type: none"> √ √ √
Accessible	Necessary Activity: walking for a compulsory purpose.	<ul style="list-style-type: none"> • Entrance • Disabled Access • Access and Connectivity 	<ul style="list-style-type: none"> – – –
Useful	Necessary Activity: walking for a compulsory purpose.	<ul style="list-style-type: none"> • Booth Layout • Connectivity • Signage 	<ul style="list-style-type: none"> – – √
Safe	<ul style="list-style-type: none"> • Necessary Activity: walking for a compulsory purpose. • Optional Activity: Strolling around, sitting, watching, taking pictures, eat and drink. 	<ul style="list-style-type: none"> • Skywalk railing • Material • CCTV • Lighting 	<ul style="list-style-type: none"> √ – √ √
Comfortable	<ul style="list-style-type: none"> • Necessary Activity: walking for a compulsory purpose. • Optional Activity: Strolling around, sitting, watching, taking pictures, eat and drink. • Social Activity: talking, socialize, window shopping. 	<ul style="list-style-type: none"> • Enclosure • Space Layout • Street furniture: chair, table • Landscape & Trees • Utility 	<ul style="list-style-type: none"> – – √ √ –
Joy	<ul style="list-style-type: none"> • Necessary Activity: walking for a compulsory purpose. • Optional Activity: Strolling around, sitting, watching, taking pictures, eat and drink. • Social Activity: talking, socialize, window shopping, joining community events. 	<ul style="list-style-type: none"> • Texture, colour, shape, pattern, the scale of streetscapes and skywalk architectural elements • Street furniture • Relaxing area • View 	<ul style="list-style-type: none"> – √ √ –
Sense of attachment	<ul style="list-style-type: none"> • Necessary Activity: walking for a compulsory purpose. • Optional Activity: Strolling around, sitting, watching, taking pictures, eat and drink. • Social Activity: talking, socialize, window shopping, joining community events. 	<ul style="list-style-type: none"> • Architecture that represents the identity of place • Facilities and space for community 	<ul style="list-style-type: none"> – –

4. Design Guidelines and Recommendation to Create Cihampelas Terrace Skywalk as Urban Place

Based on the placeness analysis that has been done on the Cihampelas Terrace, there are strength, opportunity, weakness, and threats (SWOT) that affect the sense of place in the skywalk. It is used as a consideration for creating the design guidelines. The strength and opportunity could be enhanced, while the weakness and threats on the Cihampelas Terrace should be improved and developed, to solve the design problem and achieving the design goals, values, and the sense of place that was desired to be created on Cihampelas Terrace.

4.1 Design Concept Guidelines

The design guidelines for Cihampelas Terrace is founded based on the critical analysis of its context. The first thing to note is the context of place and time is important in accommodating the activities and needs of the users. The skywalk location on Cihampelas Street has an identity as a shopping street and tourism destination of Bandung City, so the skywalk design should represent that potential. The atmosphere that will be created tends to be continuous, interactive, attractive, and leisure for the people, especially to support window shopping tourism which has distinctive features and uniqueness that are not found elsewhere, so it has the character of the place to become a place that provides a suitable sense of place.

4.2 Design Principle Guidelines

The skywalk spaces can be designed with dynamic, flowing, and attractive shapes, patterns, colors, and textures. The integration of space becomes an important thing, either horizontally to the buildings around the skywalk, or vertically by the interaction between the skywalk space and the street space below the skywalk. It provides a different space experience, with a sense of place that empowers the character of the place so that the skywalk can be transformed as an urban place. The skywalk also has to provide space based on the needs of people activities and context of place, ranging from space to accommodate functional activities, optional activities, and social activities, such as: Transportation exchange point, circulation, window shopping area (also related to access and surrounding buildings), community space, exhibition space, performance space, tourism spaces including culinary, fashion, art, nature, and others. Then the zoning of activity was arranged based on the site conditions and function of surrounding building.

4.3 Design Technical Guidelines

Physical elements such as access, entrance, space layout, landmark and node, public furniture, landscape, facilities, and definer space, which is attractive, aesthetic, and should have the contextual characteristic. It is necessary to create the image or sense of place that the user needs in the skywalk starts from makes them feel feasible, accessible, useful, safe, comfortable, happy, then have a sense of attachment/belonging.

- Various modes of transportation makes it easier for people to come to Cihampelas Terrace, so it needs to provide transportation drop-off point, both for private vehicles and public transportation, and also its parking pockets. In addition, the skywalk should have a minimum height of at least 4.6 meters (for tour and double-decker bus).
- Entrance:
Cihampelas Terrace should provide a number of entry points for every sufficient walking radius \pm 100meter – 150meters, which are placed on both sides of the skywalk. The entrance must be integrated with the ground floor, providing conveniences by using elevator and escalators to create a continuous and integrated circulation. It is also important to create an entrance that is welcoming, inviting and representative, with an integrated design with the skywalk.
- Access :
Creating connectivity to some activity generators such as anchor shopping tenants, shops, hotels, and transportation exchange point so that the mobilization on the skywalk keeps flowing and active. It should provide opportunities for each of the shops and buildings along the Cihampelas Terrace to be connected on skywalk level, so the utilization of the skywalk becomes effective comes alive by supporting the activities of window shopping and sightseeing at the skywalk level. It can be supported by providing a circulation path right along the front side of the shops and buildings. The contoured land makes some difference of elevation at every segment of the skywalk that can be overcome by the use of stair and ramp continuously with several decks as the node. It provides window shopping path that can also shade the pedestrian at street level. Skywalk height was adjusted nearly to the elevation of the height of developed multi-storey surrounding buildings.
- Disabled Access:
Cihampelas Terrace should accommodate every people without exception to get there easily, so it provides access for disabled start from the skywalk entrance such as an elevator that has been equipped

with a special disable button. There is also ramp on each different level segment with sufficient width and radius.

- **Space Layout:**

The zoning of activity was based on the context such as potential view area and the surrounding building according to its function. Then, the space layout on the skywalk is adjusted to the proportion of space and ergonomic for human activity. For example:

- Layout in the entrance area needs to be made welcoming and wide enough for people orientation.
 - The circulation space minimum width at least 200cm for two people and a wheelchair.
 - Social area layout can be placed in space subtraction to create a comfortable node.
 - Shopping Booth layout needs to pay attention to the circulation space, buying and selling activities, and view area. Booth design should be made attractively and integrated with the skywalk.
- **Street furniture:** Provide public furniture such as seating, tables, lights, signage, and others designed specifically for the Cihampelas Terrace Skywalk. It can be made with the modular yet multifunctional concept.
 - Ergonomic yet attractive seatings and tables that can create a flexible configuration. Can be placed in the subtraction of space that forms a node to avoid disturbed circulation.
 - Provide and maintain CCTV cameras.
 - Lightings with sufficient lux and regularly maintained to be operated optimally.
 - Signage that provides detail information for users that placed in every segment of skywalk to be easily read.

- **Landscape and Trees :**

The landscape on the skywalk should be designed with dynamic, attractive, and aesthetic, with various types of vegetation to be a tourist attraction. The existing trees also have to be maintained for shading and become space definer.

- **Additional Facilities:** Additional facilities such as toilets, musholla, charging booths, etc. can be provided in several points to help people who need it without having to find it in other location outside the skywalk area. For security posts and information center can be placed in the entrance area.
- **Utility :**

Besides providing trash bins in radius 50-100 meter to help people for keeping the skywalk clean, Cihampelas Terrace also has to provide integrated drainage and other utility systems with sufficient capacity.
- **Enclosure:** Created with attractive architectural elements, both structures and spaces, which accommodate functional, optional, and social activities. The selection of materials, colors, shapes, scale, and patterns should be attractive, integrated, comfortable, and safe to enhance the leisure atmosphere with high quality and durability materials.
 - **Canopy:** Provides shade for weather protection. The shady trees can provide protection from the sun's heat. And for the protection from the rain, it is necessary to provide some shelters in several points to become a meeting point.
 - **Fence or guardrail** of the skywalk at least as high as 1.2 meters.
 - **Floor:** Skywalk as semi-outdoor space is better to use textured materials for its flooring that will not be slippery when it rains. The flatness of the floor surface is important and should have minimum slope of 1° for water to flow.
- **Sustainable:** using an integrated and sustainable system. Create a passive design by minimizing the use of electrical energy such as provide air and natural lighting, air flow, shade, utilization of renewable energy system such as solar panels, etc.

4.4 Design Recommendation

The Design Recommendation is made by implementing the design guidelines that based on its contextual analysis to solve the problem design and creating Cihampelas Terrace Skywalk as an urban place. It creates a window shopping and tourism place that brings dynamic and leisure atmosphere for people to feel its sense of place (Figure 26 – Figure 33).

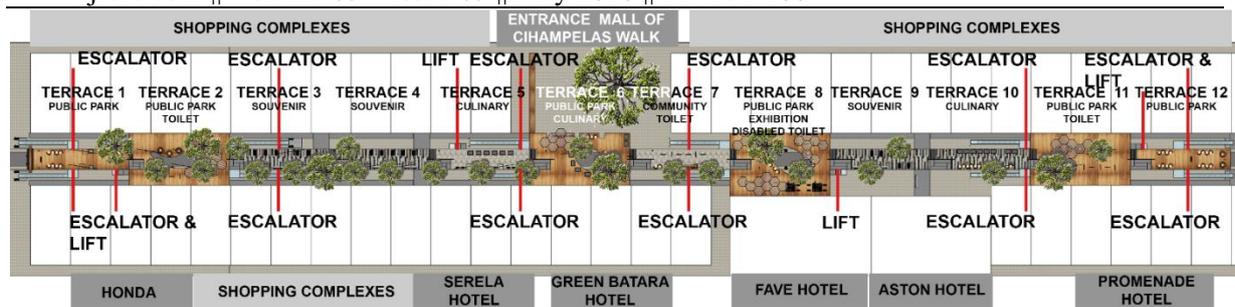


Figure 26: Cihampelas Terrace Design Recommendation Plan



Figure 27: Cihampelas Terrace Design Recommendation

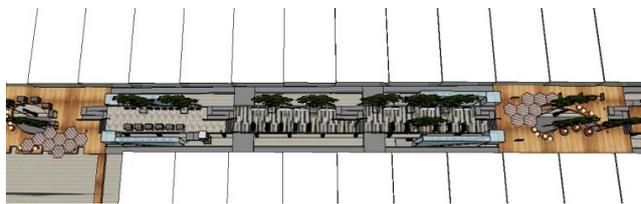


Figure 28: Node and Path Design



Figure 29: Street View



Figure 31: Community and Exhibition Area



Figure 32: Social Node



Figure 33: Shopping Path

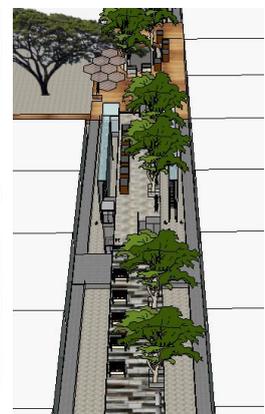


Figure 30: Window Shopping and Tourism

5. Conclusion

Cihampelas Terrace Skywalk not only accommodate Necessary Activity but has empowered Optional Activities and Social Activities to become good public spaces. Therefore, the physical elements design should be able to support all types of activities on the skywalk without exception. To become an urban place, Cihampelas Terrace also needs to enhance its identity as an elevated pedestrian skywalk with window shopping and tourism area concept by creating dynamic, leisure, attractive, and interactive atmosphere. It has to provide spaces for its users' needs and their behavioral activities, such as circulation area, seating area, eat and drink area, window shopping area, community area, attractions area, exhibition area, and another tourism area including culinary, fashion, art, nature, etc. The factors of design elements that optimize the performance of skywalk as a public space to become an urban place is associated with: Access of the skywalk that requires integration to transportation mode exchange, circulation paths such as sidewalks, entrance nodes, and surrounding buildings to support the concept of elevated window shopping; The welcoming entrance; Space layout that considers human dimension standard and activity zoning based on contextual surrounding buildings function; Landmark and nodes to be an orientation and social node for people; Public furniture specifically designed to support activities; Landscapes and trees to be a shade and aesthetic space definer; Additional facilities to support activities; The space definer such as shades, walls, floors that have permeability such as openness, transparency, or voids to create integration and interactive between upper and below skywalk space; with safe, harmonious, and attractive finishing materials.

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