Playing under the flyover in Bangkok from the children’s point of view

Pilaiporn Nunma and Kiyoko Kanki

Department of Architecture and Architectural Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan

ABSTRACT
The aim of this study was to investigate the characteristics of the playground areas under flyovers/expressways in Bangkok and the children’s point of view regarding the utilization of the areas under flyovers/expressways as playgrounds. To understand the current playground situation in Bangkok, the play patterns of the children therein were observed. Children’s need to play and their satisfaction with using the areas under flyovers/expressways as playgrounds were studied through observation, a visual questionnaire field survey, and an interview. It was found that the playground areas under flyovers/expressways in Bangkok have three main characteristics: (1) they are equipped with typical preformed play equipment surrounded by sports and adult areas; (2) the play zone has been extended naturally, and free play has been made possible; and (3) vertical movements made with the provided play equipment, such as swinging, sliding, and climbing, are the common play patterns in such areas.

1. Introduction

1.1. Research background and objective

Outdoor play enables children to develop their cognitive skills and social and physical abilities (Robin C. Moore 1986). In Bangkok, outdoor play areas have recently been promoted in the GreenBKK2030 Master Plan, which aims to develop vacant areas under flyovers/expressways for use as public spaces (Chamnankaa 2020). These under-the-flyover/expressway play areas can be beneficial for the children in densely populated cities, in which outdoor play areas near the homes and communities are hard to find (Dewi 2012). To understand this new play environment, this study investigated the various uses of the playgrounds under the flyovers/expressways in Bangkok and the activities that occur naturally therein. All the data in this study were collected by observing a total of 58 children in seven playgrounds under Si Rat Expressway and by asking them to accomplish a visual questionnaire and interviewing them. On the basis of the study results, suggestions for the effective utilization of the areas under flyovers/expressways as children’s playgrounds and for use in urban space development planning in the future are given herein to the relevant authorities and to designers.

1.2. Necessity of conducting research on playgrounds under flyovers/expressways

1.2.1. Research about the areas under flyovers/expressways (especially in Southeast Asian metropolitan cities)

Flyovers/expressways are unique because they are overhead shelters with a generous space underneath that is longitudinal and barrier free. The benefit of shading can be very practically utilized in the tropical countries in Southeast Asia. Previous researches on the Southeast Asian metropolitan cities looked into the opportunities for developing the areas under flyovers/expressways into natural-use spaces by the local community. Narulhasna Qamaruz-Zaman reviewed two case studies in Kuala Lumpur, Malaysia to identify the activities that occurred naturally under the country’s flyovers/expressways. Such activities (e.g., recreational activities and local businesses and services) were initiated without designer-specified structures such as stalls, cafés, and an evening market. Freedom and flexibility to create changes are the key factors that stimulate these temporary activities (Qamaruz-Zaman, Samadi, and Azhari 2012). In addition, for authorities to come up with promising plans for the utilization of such areas, community participation is very crucial.
In Bandung, Indonesia, the area under the Pasupati Flyover has been transformed by the local community into a multi-use space by installing various equipment for play, education, and entertainment. Various activities, such as informal play, musical performances, discussions, workshops, and exhibitions, have been held in this area. Children have also been provided with a free informal school program, Sekolah Taman (Park School), in this area. The addition of public facilities and amenities in such an area can be expected to further draw the interest of various groups, including commercial establishments and the government (Prasetyo and Martin-Iverson 2015).

According to the aforementioned previous studies from Southeast Asia, the allowing of flexible use of the areas under flyovers/expressways, the uniqueness of such areas, and the strong self-organized communities are the main factors that contributed to the development of the areas under flyovers/expressways. Also, the establishment of the Sekolah Taman program is a good example of providing an alternative activity for children in the vacant areas under flyovers/expressways as a crucial part of development planning.

1.2.2. Case study of playgrounds under flyovers/expressways in other countries

1.2.2.1. Toronto Underpass Park, Canada. This underpass park is located under an elevated street in one of Toronto’s newest neighborhoods, West Don Lands. It was the result of a project that transformed a vacant 1.05-hectare area into a community hub. The concept of the landscape architectural firm that took charge of the project was a space where there are several structures “that can facilitate all aspects of play and recreation, or just a social space for the very youngest and the very oldest.” The underpass park consists of three areas: two covered by the expressway (basketball court and skateboard area) and an open area (playground). The central section is a flexible and gathering space. There are also play equipment, including swing sets, a teeter-totter or seesaw, a jungle gym, climbing structures (with a soft surface underneath them to protect the children in the event of a fall), and hopscotch and four-square grids (Deidre Tomlinson 2013).

1.2.2.2. A8ernA, Zaanstad, Netherlands. Koog aan de Zaan is a town in the Amsterdam metropolitan area located 10 km northwest of the city.

A8ernA in this town used to be a vacant area mostly used as a parking space. A project was undertaken with the aim of restoring the connection between the two sides of the town and of activating the space under the flyover/expressway by redesigning it to include a supermarket, a flower store, a fish shop, and recreational facilities, including a park, a children/teenager playground, and a marina that would reconnect the two sides of the city and link them to the nearby river (Global Designing Cities Initiative 2020).

1.2.2.3. The Bentway, Toronto. The Bentway is a public space connected to the waterfront. The “bents,” the main concept, are used as exhibition canvases, wayfinding signage, and as structures for suspended lighting throughout the space. Pathways, seats, plants, and photos have been installed therein. The large areas between the bents act as special spaces where art, music, and lighting can be provided. Regarding the children’s area, water play is provided through a kids’ splash pad in summer, and a skating trail is installed in winter (Future Landscapes Design 2020).

The data obtained from case studies and related researches are summarized in Table 1. Such data on area usage, play equipment, and characteristics were used as the criteria for the observation survey of the target playgrounds under flyovers/expressways in this study.

It can be seen in Table 1 that the creation of under-the-flyover/expressway public spaces for the local community can have considerable effects. With regard to the current situation in the new areas and of the people who will directly utilize them, not only the adults’ but also the children’s perspectives should be considered. The city development plan, such as land use and construction of new roads and transport facilities, should consider how the development could complement the play behaviors of the children in the community (Amornsriwananukul et al. 2016). Thus, this study investigated how the children in Bangkok are utilizing the provided play facilities in the areas under flyovers/expressways and what they think about such facilities.

1.2.3. The outdoor play spaces in Thailand

Children’s active play in outdoor spaces in Thailand can be divided into two types, as shown below.

- **Nature play**, which is related to green and natural spaces, such as swimming in a river in summer, climbing a tree, playing hide-and-seek in the garden, playing traditional Thai games, riding a bicycle around the neighborhood, playing a kite in the field, and playing sports such as football. Playing outdoors and interacting with the natural environment have been common activities for the children in Thailand but have recently decreased due to the influence of social media, video games, and technology on the whole.

- **Urban play** takes place on the local roads, areas under flyovers/expressways, public multipurpose areas, or vacant spaces near children’s homes. This includes many group games, such as rubber band skipping, catching games, and running follow each other. The play behavior of the children in Wat Phaingern, Bangkok was investigated to determine how children living in high-density
Table 1. Summarized data from relevant case studies and previous researches in other countries.

| Type                                | Place                                      | Concepts                                                                 | Area usage and facilities                          | Play equipment                          | Play equipment characteristics                  |
|-------------------------------------|--------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------|--------------------------------------------------|
| Designed by a landscape firm       | Toronto Underpass Park, Canada             | Connected community, young and old people can use the space together    | • Basketball                                      | • Swings                                 | Customized steel structure and colorful play equipment |
|                                    |                                            |                                                                          | • Skateboard                                      | • Seesaws                                |                                                   |
|                                    |                                            |                                                                          | • Free area                                       | • Climbing net                           |                                                   |
|                                    |                                            |                                                                          | • Playground                                      | • Hopscotch                              |                                                   |
|                                    | https://www.asla.org/2016awards/165332.html|                                                                          |                                                   |                                          |                                                   |
| A&erna, Netherlands                 |                                            | Transformation of the space underneath the elevated structure from a parking space into an active mixed-use space | • Community shops                                 | • Skate park                             | Colorful skateboard area                         |
|                                    |                                            |                                                                          | • Skate park                                      |                                          |                                                   |
|                                    |                                            |                                                                          | • Football                                        |                                          |                                                   |
|                                    |                                            |                                                                          | • Table tennis                                    |                                          |                                                   |
|                                    |                                            |                                                                          | • Graffiti wall                                   |                                          |                                                   |
|                                    | https://www.publicspace.org/works/-/project/d046-a&erna                          |                                                                          | • Breakdance area                                 |                                          |                                                   |
|                                    |                                            |                                                                          | • Watersport marina                               |                                          |                                                   |
| The Bentway, Toronto                |                                            | A vibrant public place where visitors can experience a diverse mix of activities and programs | • Pathway                                         | • Water splash area with stones and plants | Natural equipment; stones and water              |
|                                    |                                            |                                                                          | • Art installation                                |                                          |                                                   |
|                                    |                                            |                                                                          | • Seating areas                                   |                                          |                                                   |
|                                    |                                            |                                                                          | • Water splash and skate zone                      |                                          |                                                   |
|                                    | https://niclehoux.com/news/2018/12/2/the-bentway-toronto                        |                                                                          |                                                   |                                          |                                                   |
| Initiated by local people          | Jalan Kanan 1 and Jalan Sungai Penchala, Kuala Lumpur, Malaysia                | Public open space initiated by the local community                      | • Stalls and cafés                                | No space for children                        | -                                                |
|                                    |                                            |                                                                          | • Evening market                                  |                                          |                                                   |
|                                    |                                            |                                                                          | • Recreational activities, local businesses and services |                                          |                                                   |

(Continued)
communities play around their neighborhood. The results revealed that the children in such communities carry out many outdoor activities mainly on the streets and in the areas under flyovers/expressways, such as football, badminton, rubber band skipping, folding paper into a racing car or jet, catching games, and checkers (Tagosi 2005).

Generally, nature play activities take place in fields, public schools, or temple yards, which are usually found in the countryside or the suburban areas in Thailand. Urban play, on the other hand, takes place in urban areas or cities, where public playgrounds are hard to find. Thus, this study focused on urban play in areas under flyovers/expressways. These play activities are summarized in this chapter and were included in the questionnaire survey in this study to investigate the play situation in the under-the-flyover/expressway areas in Bangkok, as shown in Q11.

1.3. Community system relating to the playgrounds under flyovers in Bangkok

In general, the public parks in Bangkok, including the spaces under the flyovers/expressways, are supervised by the Environment Department of Bangkok. In the case of the spaces under flyovers/expressways, the expressway authority in Thailand has owned the right of properties (EXAT 2019). Thus, the development projects of the areas under the flyovers/expressways in Bangkok are joint projects of two separate sectors: the government, which provides the budget, and the expressway authority, which grants permission for the use of such areas as playgrounds (See Figure 1). The neighboring communities, who are the main users of the facilities, play an important role in such facilities' maintenance. Each community has its own committee, which has its own system of organization. In some cases, communities get support from private organizations or foundations, which empower individuals to help in developing the community area, such as in Ban-baab (see Figure 2). It can be seen that the strength of the community has a direct effect on the successful use of under-the-flyover/expressway spaces. For instance, a strong community is likely to exercise greater responsibility in maintaining such spaces and to be involved in the activities to be organized therein to make them useful and lively community spaces. Finally, the children in such communities can gain or lose play opportunities in such spaces depending on the community system in place therein.

2. Research Method

The method that was used for this research involves several stages, as described below.
Development of Public Space from Leftover Space in City Case Study: Space Under the Express Way written by Jirasin Chompaissan. The 273 places under flyovers/expressways are used in various ways: as a sports field, pocket park, community market, parking space, abandoned area, local transportation hub, playground, etc. On the basis of the review of the physical environments and usages of areas under flyovers/expressways from the aforementioned previous study, it was determined that there are eight areas under flyovers/expressways in Bangkok that are provided as play areas for children: seven under Si Rat Expressway, which connects the suburbs to the central city and commercial area, and one under Chaloem Mahanakorn Expressway, which connects Bangkok City to the regional areas.

Second, all the eight aforementioned areas were visited by the authors on 26 January 2020 as a primary observation. It was found that the seven areas under Si Rat Expressway are active spaces for the surrounding communities while the area under Chaloem Mahanakorn Expressway was temporarily closed at the time of the visit. Hence, the seven areas under Si Rat Expressway were selected as the target areas in this study, as shown in Figure 3.

2.2. Observation survey

The observation survey method was used to describe the physical environments of the areas investigated in this study and the children’s activities therein. As shown in Figure 4 the survey had four main criteria: (1) area usage and the quantity of equipment present; (2) physical appearance; (3) materials and design; and (4) play patterns. The photographs and video records of such areas and of the children’s activities therein were analyzed to determine the recent physical environments of the

Figure 1. The connections among the three stakeholders: the community, the government, and the expressway authority.

Figure 2. The Ban-ba-ab community gathering ideas to improve their public area, as facilitated by the private organization.

2.1. Study area

Under-the-flyover/expressway playground areas in Bangkok were selected in two steps: reviewing the relevant secondary data and field observation.

First, secondary data were obtained from a previous research in Thailand based on the Guidelines for...
areas, the children’s activities therein, and the problems of the playground in such areas.

2.3. Visual questionnaire field survey and additional interview

With regard to the four aforementioned observation survey criteria, the visual questionnaire aimed to connect the questions with the satisfaction and point of view of the respondents, who were the children utilizing the playground. Children were asked about their opinions through 14 simple questions that included pictures. For example, after the authors’ observation of the area usage and the quantity of equipment present (Criterion 1), the efficiency of the playground area and of the play equipment therein was assessed by the children through the visual questionnaire. Also, some children were informally interviewed regarding topics 3 and 4 of the questionnaire, particularly about their reasons for choosing their favorite playground, play equipment, and play activity. The relationships among the observation survey, visual questionnaire field survey, and interviews are shown in Figure 4.

The questionnaire that was used in this research was designed to attract 5- to 10-year-old children. The complex or potentially confusing questions were simplified through visualization to improve their comprehensibility, accuracy, and survey engagement ability. In addition, instead of using a paper questionnaire, online interactive choices by pressing and choosing what is in one’s mind, which children are likely to enjoy, were used. This questionnaire was provided via iPad (see Figure 5).

3. Results

The results of the visual questionnaire field survey are explained below.

Figure 5. Children at YD2 accomplishing a visual questionnaire, and appearance of the questionnaire on iPad.
3.1. Physical environment and activities by observation

There were two sets of data obtained from the survey on the seven playgrounds under flyovers/expressways in Bangkok conducted on January 25–3 February 2020: (1) data on the physical environment of the playgrounds and (2) data on the play pattern of the children in the playgrounds.

3.1.1. Physical environment

To understand the current situation of the children using the playgrounds under flyovers/expressways, the layout plan and photographs of the said children and the playgrounds’ locations, facilities, shading, and atmosphere are presented in Tables 3–1.

3.1.1.1. Overall characteristics of the seven target areas.

The selected areas under flyovers/expressways consist of a sports field, a playground, an exercise area for adults, a green area, and a sitting area. The areas have two main functions: a sports field for adults and a children’s area, which is the area inside the red circle in Table 2. The size of the playground is around 65–450 m². The main play equipment in almost all the areas are slides and swings. The play equipment are varied in quality and number. There are slides in almost all the areas. As for the quantity, there are one to six pieces per area. The quality of the play equipment is also different per area, ranging from poor to very good maintenance and new, as shown in Table 3.

3.1.1.2. Shading from the flyover/expressway.

Even though the main purpose of the public-space projects in Bangkok is to use the areas under the flyovers/expressways, not all the areas are shaded, especially the children’s areas. The choice of location of the playground under the flyover/expressway may cause lack of shading, which is related to the timing of the children’s activities in the playground, as was found at KLP, SL, SN, and YD1 (see the layout plan in Table 3 and Figure 6).

Lack of shading has had an impact on the children using the play area. It can be seen in Figure 6 that at KLP, some children were waiting at the bench until the playground became shaded. Some of them went back home when it turned hot and then came back again later, when the area had become shaded. At YD1, the kids are shown playing with sand under a small shaded area on the slide. These two cases indicate how important it is to situate a playground under the shade of the flyover/expressway as much as possible so that the area can be effectively used for the intended purpose.

3.1.1.3. Space utilization.

It is apparent that the biggest part of almost all the target areas in this study is the sports field, and the playground seems to be the smallest part. The largest playground, that at KLP, has a total land area of around 19,000 m² while the playgrounds in other areas have a total land area of only around 500–4,000 m². These areas, however, are not really maximizing the utilization of the space. In six of the seven areas, it was found that children have taken it upon themselves to extend their playground boundaries to the other zones around it (see Figure 7 and Table 4). The sports field is the only zone that is off limits to the children because it is surrounded by a fence and is characterized by fast-movement activities.

In the case of SL, the children were seen playing not only with the slide as their main play activity but also in the whole area, including with the exercise equipment provided for adults, which were occupied by the children at the observation time (see Figure 7). Moreover, the sitting zone in front of the gate was used for roller blading. It can be seen in Figure 7 that the areas under

Table 2. Supporting information of the seven playgrounds investigated in this study obtained from the pre-survey.

| Location/land use/facility/total size/play area size |
|---------------------------------------------------|
| 1. Suiri Ngern Playground (SN)                    |
| Pra ram six-Pahonyothin Road/high-density residential area/sports field, sitting area, and playground/720 m²/65 m² |
| 2. Kee La Pat Playground (KLP)                    |
| Pra ram Six Road/commercial area/sports field, badminton court, jogging trail, sitting area, and playground/19,000 m²/90 m² |
| 3. Sa Lak Hin Playground (SL)                     |
| Rong Meung Road/commercial area/sports field, sitting area, exercise area, and playground/510 m²/140 m² |
| 4. Baan Bab Playground (BB)                       |
| Sathorn-Jarearn Rat Road/high-density residential area/sports field, sitting area, exercise area, and playground/900 m²/450 m² |
| 5. Yoo D 1 Playground (YD1)                       |
| Jarean-rat soi 5 Road/high-density residential area/sports field, exercise area, and playground/4,038 m²/215 m² |
| 6. Yoo D 2 Playground (YD2)                       |
| Soi Yoo di 10/high-density residential area/exercise area and playground/565 m²/385 m² |
| 7. Makok Playground (MK)                          |
| Pahol Yothin 1 Road/high-density residential area/sports field, exercise area, and playground/762 m²/120 m² |
### Table 3. Layout plan and photographs showing the situations at the playgrounds under the flyovers/expressways in Bangkok.

| Place | Layout plan with details regarding the children and the surroundings | Photograph |
|-------|---------------------------------------------------------------------|------------|
| SN    |                                                                     | Observed on Saturday, 01/25/20, 3–5 p.m. |

(Continued)
| Place | Photographs |
|-------|-------------|
| KL    | ![Photographs](image1.jpg) |
| SL    | ![Photographs](image2.jpg) |

*KL* and *SL* represent different locations where the observations were made. The photographs show various details regarding the children and their surroundings, including play equipment, shaded areas, and surrounding elements such as jogging tracks and artificial grass. The layout plans illustrate the position of children and parents within these environments, providing a clear view of how these spaces are organized and utilized.
| Place | Layout plan with details of the children and the surroundings |
|-------|----------------------------------------------------------|
| YDI   | Play equipment  Children  Parent  Shading                |

| Place | Photographs |
|-------|-------------|
| YDI   | Parents playing with their kid under the shade of the trees  |
|       | Sports area  |
|       | No shade all day  |
|       | Steel materials  |
|       | Sand  |

Table 3. (Continued).
Table 3. (Continued).

| Area        | Details |
|-------------|---------|
| Kids area   | Exercise area for adult |
| Main street | Entrance |
| Kids zone   | Sport area for adult |

MK

Remark: Observed on Sunday, 01/26/20, 5–7 p.m.
- Shaded all day
- Plastic slide
- Surrounded by fences
- Entrance
- Trash
- Only a few kids
- Children enjoy the swing
- Steel materials
- Sand

Free ground:
- Exercise area for adults
- Cement floor

Observed on Monday, 01/28/20, 4–6 p.m.
the flyovers/expressways have been freely used by the children for play and that the children’s playgrounds seem larger than originally designed.

3.1.1.4. **Conclusion from the obtained observation data.** The observation data, which consisted of the physical environment, shading, and space utilization in the target areas, are summarized in Table 5. In conclusion, the areas under flyovers/expressways are multi-generation public spaces consisting of a playground, an exercise area for adults, and a sports field. The typical preformed play equipment have been provided for the children’ use. However, there was a significant relationship between the number of children and parents using the playground and the playground’s general appearance. KLP, SL, YD1, and YD2, which were provided with new play equipment and which are well-maintained areas, had more users at the observation time. Regarding shading, even though some places have a sunlight problem, the children

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**Table 4.** Zoning diagram showing how children extended their play boundaries.

| SN  | KLP | SL  |
|-----|-----|-----|
|     |     |     |
| KLP’S Zone | Sport Zone | Sitting Zone |
| Exercise Zone |       |       |

| BB  | YD1 | YD2 |
|-----|-----|-----|
|     |     |     |
| KLP’S Zone | Adult’s Zone | Sport Zone |
| Sitting area |       |       |

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**Figure 6.** Shading in the seven target areas in this study.
can freely adjust their playtime. Children also extend their play boundaries to other zones, beyond the children's playground with children's play equipment. In the next chapter, the physical survey results will be analyzed alongside the children's feedback from the visual questionnaire field survey.

### 3.1.2. Play pattern

It was found through the observation of the seven playgrounds that children enjoy playing with the **slide as a main play equipment**. This was found at six of the target areas in this study (all except KLP). With this favorite play equipment, the children were sliding, jumping, and climbing (Figure 8). In addition, the children at SN, MK, and YD2 were observed to enjoy playing with the swing (Figure 9). Some children were seen to enjoy climbing up the slide and across a fence or pole (Figure 10). Even when there were no play equipment, the children were seen socializing with their friends, running around and playing group games with them (Figure 11). Generally, the children's play pattern was likely active play. The vertical movements of **sliding, jumping, swinging, and climbing** were observed to be the most common play movements.

Two types of child’s play were observed in the target areas under the flyovers/expressways in Bangkok in this study. The **first type was defined by the main play equipment available.** As can be seen in Figures 8–9, the play behavior depended on the available play equipment. The slide and the swing were popular play equipment in many of the target areas, and have influenced the children’s play movements. **Second, the children's play was found to be characterized by the children's creativity and imagination.** As can be seen in Figures 10–11, climbing, running around, and playing group games are the activities that were carried out naturally. Children have designed their own play on the basis of the playing resources they found and the limited area they can explore.

### 3.2. Children’s point of view as gathered from the visual questionnaire field survey and interview

A visual questionnaire field survey was conducted among 58 children in the seven playgrounds in Bangkok that were selected for this study. The results were divided into three types: satisfaction with using the playground, children's perspective, and supporting opinion.

#### 3.2.1. Satisfaction with using the playground

The children's feedback regarding each play area obtained from the visual questionnaire field survey is shown below.

The scores for satisfaction with using the under-the-flyover/expressway playground given by 58 children in the seven selected areas in Bangkok and shown in Table 6 were analyzed. First, it can be seen in the table that most of the children (90%) stated that they like their playground. However, 52% gave a poor score to **sufficient play equipment**, and 46% gave a poor score to **sufficient play area**. Forty-one percent gave a fair score to cleanliness. In terms of security, 48% of the children felt **safe while playing in the area.** Furthermore, 52% of the children enjoyed playing in the provided **play area.** With regard to the frequency of using the playground, 52% of the children indicated that they went to the playground every day, and approximately 36% indicated that they went to the playground only occasionally. In addition, 80%
Table 5. Summary of the data obtained from the observation.

| Place | General appearance                              | Area usage                        | Play equipment style                  | No. of play equipment | No. of kids | No. of parents | Shading                     | Floor materials |
|-------|-------------------------------------------------|------------------------------------|---------------------------------------|-----------------------|-------------|----------------|-----------------------------|----------------|
| 1. SN | Old play equipment, much trash around, many homeless people | Playground, pathway, sitting area | Typical steel preformed play equipment | 6                     | 3           | 2              | From the trees              | Sand           |
| 2. KLP| New play equipment, clean and well maintained   | Playground, jogging track, sitting area | Customized wooden play equipment      | 2                     | 12          | 4              | Not shaded sometimes        | Sand           |
| 3. SL | New play equipment, clean and well maintained   | Playground, exercise area, sitting area | Typical plastic preformed play equipment | 1                     | 8           | 3              | Not shaded sometimes        | Artificial grass |
| 4. BB | Old play equipment, clean and quiet             | Playground, exercise area          | Typical plastic preformed play equipment | 9                     | 3           | 2              | Shaded all day               | Cement         |
| 5.    | YD1                                             | Slightly old play equipment, clean and well maintained | Playground under the trees | 6                     | 5           | 2              | Not shaded all day          | Sand           |
| 6.    | YD2                                             | Slightly old play equipment, clean and well maintained | Playground, exercise area | 5                     | 6           | 2              | Shaded all day               | Cement         |
| 7. MK | Old play equipment, much trash around, quiet    | Playground inside the children's area | Typical steel and plastic preformed play equipment | 2                     |              |                |                             | Sand           |

1) Old equipment = Some parts of the equipment are broken or loosen. Slightly old equipment = No broken equipment was found. New play equipment = Nice colors; no broken equipment found.
2) Well maintained = The area has been managed by the relevant authorities or community system.
3) Clean = No trash found.
indicated that they spent 1 hour or more in the playground each time they went there. Thus, it seems that even the children were concerned about the issues of cleanliness of the area and insufficiency of the size of the area and of the play equipment present, but they felt positive about using the provided play areas.

### 3.2.2. Children’s perspective

The children’s survey questionnaire responses regarding the ideal play equipment, activities, and play style can be seen in Table 7.

It is clear that the slide playscape was the most popular play equipment among the children, with 27% of them indicating such. **The second most popular play equipment was the swing** (16%) while the tree house and the kid’s pathway were selected by 12% and 11% of the children, respectively, as their preference. Seven percent of the children chose the sandpit, log, and stage, respectively, as their favorite play equipment. Furthermore, 6% of the children indicated that they preferred to play inside the house while 4% indicated that they preferred to play on empty ground. None of them preferred to play with flowers and leaves. To sum up, almost half of the children who participated in this research stated that the slide and the swing were their most favorite play equipment.

With regard to the children’s ideal under-the-flyover/expressway playground, **the natural playscape gained the highest percentage** (58%) among the four main kinds of under-the-flyover/expressway playground. The second most popular (32%) was a fancy and colorful playground, such as the one in Canada, while 7% of the children respondents cited KLP in Bangkok as the ideal for them. Only 3% of the children selected colorful moving equipment as their ideal playground. As for free play, more than one quarter of the children (35%) preferred to climb freely and 27% liked to rubber band skipping. In addition, 13% of the children played with flowers and leaves.
leaves, which is the third most popular free play among the children. Finally, jumping on the ground, playing police and thief, and pretending to sell things were the three least popular free play activities (selected by around 10%, 8%, and 7% of the children, respectively). However, when asked to choose from among the fancy, freestyle, and fancy & free play style types, most of the children (46%) chose the fancy play style, followed by the fancy & free play style type. Free play was chosen by the lowest percentage of the children.

The last questionnaire item concerned the children’s preferred material for the playground and play equipment. It was found that 47% of the children preferred equipment made from natural
Table 7. Children’s viewpoint regarding the play equipment and their preferred play style.

| Q9. What do you like most among these play equipment? | Q11. What traditional Thai game/free play do you like? |
|-----------------------------------------------------|-----------------------------------------------------|
| Answer | % | Count (N) | Answer | % | Count (N) |
| 1) Slide playscape | 27% | 16 | 1) Jumping game on the ground | 10% | 6 |
| 2) Pathway for kids | 11% | 6 | 2) Cooking and selling things | 7% | 4 |
| 3) Downed horse | 6% | 4 | 3) Police and thief | 8% | 5 |
| 4) Tree house/personal space | 12% | 7 | 4) Play with flowers and leaves | 13% | 8 |
| 5) Stage/amphitheater | 7% | 4 | 5) Rubber band skipping | 27% | 16 |
| 6) Logs | 7% | 4 | 6) Free climbing | 35% | 20 |
| 7) Sandpit | 10% | 6 | Total | 100% | 58 |

**Q10. Which playground under a flyover do you like the most?**

| Answer | % | Count (N) |
|------------------------------------------------|
| 1) The fancy/colorful playground in Canada | 32% | 18 |
| 2) The big lawn with sand in BKK | 7% | 4 |
| 3) Natural playscape | 58% | 34 |
| 4) The moving equipment in Hong Kong | 3% | 2 |
| Total | 100% | 58 |

**Q12. Which between free and fancy play do you prefer?**

| Answer | % | Count (N) |
|------------------------------------------------|
| 1) Free play | 20% | 11 |
| 2) Fancy play | 46% | 27 |
| 3) Like both | 34% | 20 |
| Total | 100% | 58 |

**Q13. Which between natural and fancy material do you prefer?**

| Answer | % | Count (N) |
|------------------------------------------------|
| 1) Natural material | 47% | 27 |
| 2) Fancy material | 27% | 15 |
| 3) Like both | 27% | 15 |
| Total | 100% | 58 |

Table 8. Children’s opinions obtained from the interview.

1. I like wood because nature makes me feel good. I think if I bump onto it, I will not be hurt. (T1, 10 years old, at KLP)
2. I like the natural field because it’s safe, and the grass floor does not hurt. I also like jumping on the ground over a rubber band. (F, 7 years old, at KLP)
3. I like the natural playground because when I fall, I will not be hurt compared with when another material is used. It seems scary to fall when another material is used. (C, 9 years old, at SL)
4. I prefer nature because it looks fun and does not hurt. (T2, 11 years old, at SL)
5. I like to play with sand because it’s so soft. I like being in nature because I feel cool when I’m in it. When I’m with the tree, I take leave and play with the sand. (T3, 9 years old, at SL)
6. I like a natural playground because I feel that it doesn’t hurt me. (N, 6 years old, YD2)
7. I like nature. I think trees are good; when the wind blows, I can feel the cooling air. I like play equipment made with natural materials, and I like the sand because if I fall down I won’t get hurt. (B, 7 years old, at YD2)

**Materials.** Colorful and fancy looks and mixed materials were preferred by 27% of the children, respectively.

### 3.2.3. Children’s opinions obtained from the interview

The reasons for the child respondents’ choice of favorite playground, play equipment, and play activity were asked in Q10 and Q13. Opinions from seven children were given, as shown in Table 8.

### 4. Conclusion

The objective of this study was to investigate the various uses of the playgrounds under flyovers/expressways in Bangkok and the activities that occur naturally in such playgrounds. We identified the characteristics of the playgrounds and the children’s activities therein, and we obtained the children’s opinions regarding such playgrounds, as follows: (1) there are play zones for children equipped with the typical preformed play equipment surrounded by sports and adult areas; (2) the play zone has been extended naturally, and free play was found; and (3) vertical movements while engaging with the provided play equipment (e.g., swing, slide, and climbing equipment) are the most common play movements in the playgrounds under the flyovers/expressways in Bangkok (See Figure 12).

1. **There is a play zone for children equipped with typical preformed play equipment surrounded by sports and adult areas. The limited size of this play zone and lack of shading are the physical problems that were found.** We saw children engaging in group play and running freely into the other zones rather than playing only within the area designated for children (see Figure 7). The swing and slide are the most common play equipment, which many children enjoy playing with in almost all the target areas in this study (see Figures 8–9). As for the children’s point of view, they appreciated their playground despite also mentioning that the play area and equipment are insufficient (see Table 6). The swing and the slide are the
children’s favorite play equipment. In addition, the “green” playground, with natural materials, is the most wanted playground (see Table 7).

2) The play zone has been extended naturally, and free play was found. It was found through observation that the public spaces under the flyovers/expressways in Bangkok have been designed to be multi-use for the community, and that the biggest part is the sports field. Even though the play areas are smaller than the other parts, there were freely enlarged by the children and became larger than their original designs. To support this observation finding, most of the children gave a poor score to sufficiency of play equipment, sufficiency of play area, and cleanliness in the visual questionnaire field survey (see Table 6). In addition, the activities that happen in this area seem to be free play created naturally by the children through their imagination, such as running around, climbing freely, and playing with a small group of friends.

3) Vertical movements while using the provided play equipment (e.g., swing, slide, and climbing equipment) is the common play pattern in the playgrounds under the flyovers/expressways in Bangkok. The most common play activities, which were shaped by the size, shape, height, and number of provided play equipment, were sliding, swinging, climbing, and jumping. These coincide with the results of the visual questionnaire field survey, that the slide and the swing are the favorite play equipment of most of the children (see Table 9). There is also a supporting evidence from the interview: a significant number of the children were concerned about the playground’s surface, expressing that they needed to be safe from harm in case they fall on the ground (see Table 8). These three correlated evidences from the observation, questionnaire survey, and interview strongly support the vertical playing style.

5. Discussion

In summary, the following three characteristics of the children’s playground in the areas under the flyovers/expressways in Bangkok were found: flexible use, free play by enlarging the play boundaries, and vertical play movement with the provided equipment, such as sliding, swinging, and climbing. First, the flexible-use and free-play findings supporting those of Nurulhusna Qamaruz-Zaman confirm that flexible planning is the key aspect of designing public spaces under flyovers/expressways, to support unpredictable activities. The most favorite free play style, including traditional games, climbing freely, and jumping games with a rubber band, are correlated with the findings from the study by Chadpon Tagosi (Tagosi 2005) on the play behavior of the children in the Phai Ngern community in Bangkok. However, some play activities were not found in the areas under flyovers/expressways, such as jumping games with a rubber band, folding paper, catching games, and checkers. Thus, it is also necessary to reconsider the kind of areas that can support the free-play style for the children in Bangkok.

Second, in terms of the physical environment, the seven under-the-flyover/expressway public areas have the same characteristic: they all have a sports field and a playground. Besides, similar play equipment materials were found in most of the areas: the typical performed steel and plastic. The unique function related to the local community mentioned by Nurulhusna Qamaruz-Zaman and Frans Ari Prasetyo (Prasetyo and Martin-Iverson 2015; Qamaruz-Zaman, Samadi, and Azhari 2012) seems to have been abandoned in the playgrounds under a flyover/expressway in Bangkok.
Lastly, the possible factors affecting the usage of playgrounds under flyovers/expressways in Bangkok should not be studied only in the playgrounds but also outside them. The future studies should therefore investigate such playgrounds on a larger scale, including their backgrounds and the social relationships in the surrounding communities. It is also important to further investigate how children play in their respective communities, outside the playground area.

Notably, to our knowledge, this study was the first to investigate the pattern of use of areas under flyovers/expressways from the children’s viewpoint. The study results provide insight into the playing characteristics of such children, and can help the relevant authorities develop public playgrounds in the metropolitan areas. Children’s need for play and their play behavior should be comprehensively considered when planning children’s spaces in urban environments.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

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