SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN
Lee Kuan Yew Centre for Innovative Cities

Youth Outdoor Recreation Space Playbook

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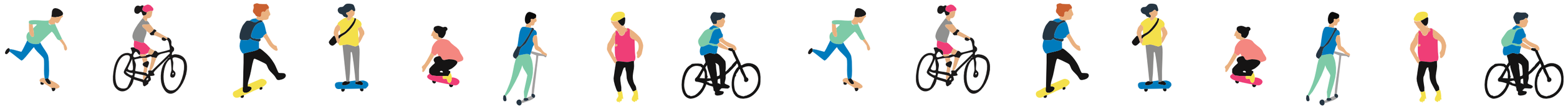

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Table of Contents

Chapter 1

Introduction

1. Introduction

Children are the future of our society and city; their well-being and development are critical to the building of healthy, liveable cities. As Enrique Penalosa, the former Mayor of Bogota (1998-2001) once said, “Children are a kind of indicator species. If we can build a successful city for children, we will have a successful city for all people.”[1] The significance of child-friendly cities for all ages is reiterated by the United Nations Children’s Fund (UNICEF): “a child-friendly city is a city that is fit for all”; a child-friendly city is “a city or community where the voices, needs, priorities and rights of children are an integral part of public policies, programmes and decisions”.[2] In 1996, the UNICEF launched the Child Friendly Cities Initiative, with the vision to “create safe, inclusive and child-responsive cities and communities” at the local level through partnership with local stakeholders.[3] As of 30 November 2025, Child Friendly Cities Initiatives have been active in 4,011 cities across 50 countries globally (Figure 1.1). Among these, 3,736 cities have been recognised as child-friendly cities, 168 are under the category of participating cities, and 107 are classified as candidate cities, but none in Singapore.[4]

In Singapore, the need for planning and design for all ages is increasingly recognised.[5] Yet, child-friendly neighbourhoods and youth outdoor recreation spaces are relatively little discussed. While there is growing literature, prior research is predominantly focused on low-density Western cities, largely in the United States, Australia, New Zealand, and Europe (Finland and Sweden) (Figure 1.2). Only a handful of studies have been conducted in high-density Asian urban settings such as Japan, South Korea, China, Malaysia, Indonesia, the Philippines, and Vietnam. No study on child-friendly environments or youth outdoor recreation spaces has been conducted in Singapore in the past 25 years.

More alarmingly, three worrying trends highlight the urgent need to address gaps in knowledge and practice for youth outdoor recreation space development in Singapore.

1 Laker, L. (2018, February 28). What would the ultimate child-friendly city look like? *The Guardian*. https://www.theguardian.com/cities/2018/feb/28/child-friendly-city-indoors-playing-healthy-sociable-outdoors#:~:text=The%20former%20mayor%20of%20Bogotá,a%20successful%20city%20for%20everyone

2 UNICEF. (2018a). *Child Friendly Cities and Communities Handbook*. https://www.unicef.org/eap/reports/child-friendly-cities-and-communities-handbook

3 UNICEF. (2018a). *Child Friendly Cities and Communities Handbook*. https://www.unicef.org/eap/reports/child-friendly-cities-and-communities-handbook

4 UNICEF. (n.d.). *Initiatives – Explore Child Friendly Cities initiatives around the world*. https://www.childfriendlycities.org/initiatives

5 Yuen, B., Bhuyan, M. R., Song, S., Moogoor, A., Yap, W., Močnik, Š., & Chua, R. (2022). *Age-friendly Neighbourhood Planning and Design Guidelines: A Singapore Case Study*. World Scientific.; Yuen, B., Chan, F., Lim, K., Siew, W., & Tan, W. M. (2023). *Community Wellness Hub Playbook: Supporting Healthy Ageing in Place*. Lee Kuan Yew Centre for Innovative Cities, Singapore University of Technology and Design.

Figure 1.1. UNICEF Child Friendly Cities Initiatives around the world, as of 30 November 2025

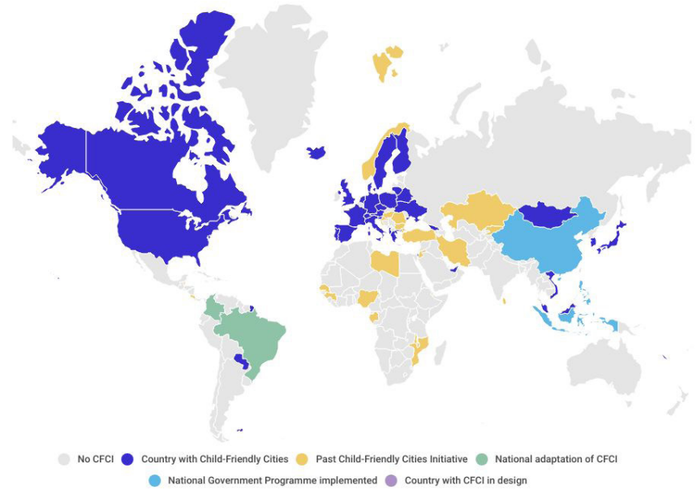
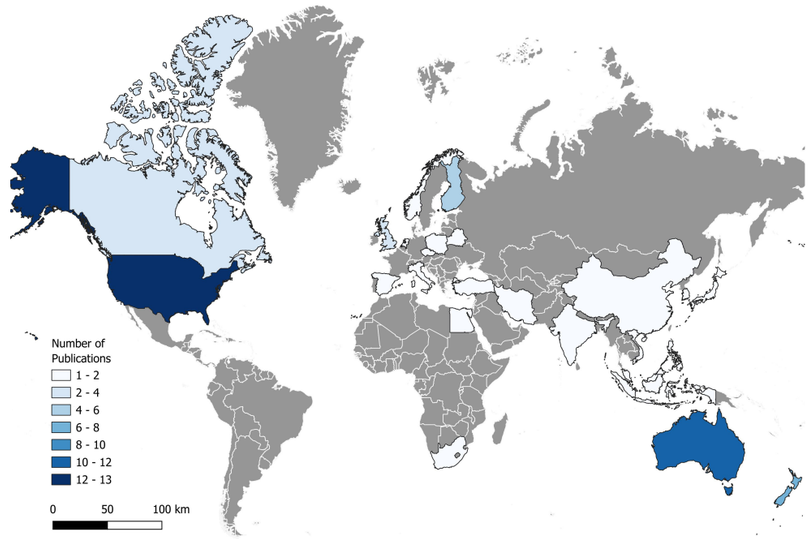


Image source: UNICEF[6]

Figure 1.2. Geographical distribution of child-friendly city literature, 2000-2025



6 UNICEF. (n.d.). *Initiatives – Explore Child Friendly Cities initiatives around the world*. https://www.childfriendlycities.org/initiatives

First, Singapore's child population (under age 18) has been gradually declining since 1980, decreasing to below 1 for the first time in 2023, the result of the downward trajectory of resident total fertility rate.[7] Second, the prevalence of childhood obesity among primary and secondary school children (aged 6-17) has increased from 13 per cent in 2017 to 16 per cent in 2021.[8] Third, children today are not spending enough time outdoors[9] and will miss out on the positive effects of time in the outdoors and nature. Youth aged 13-19 reported an average daily electronic device usage of nearly 8.5 hours in 2024,[10] underscoring an urgent need to reduce sedentary recreation time among youth. International studies have shown that children who live in urban areas are less likely to spend time outdoors and children are also less likely to play outdoors the older they are even though outdoor activity benefits children of all ages.[11] The World Health Organisation recommends that children aged five to 17 spend at least 60 minutes a day of moderate-to-vigorous physical activity but many are not achieving this.[12]

The role and importance of outdoor recreation spaces for youth development and well-being have been well documented.[13] This playbook addresses the knowledge and practice gap on how by making plain the what and how youth-centric outdoor recreation space can be developed. The overarching goal is to enable more green time and less screen time among youth.

7 Tan, T. (2024, February 28). Singapore's total fertility rate hits record low in 2023, falls below 1 for first time. *The Strait Times*. https://www.straitstimes.com/singapore/politics/singapore-s-total-fertility-rate-hits-record-low-in-2023-falls-below-1-for-first-time

8 KK Children and Women's Hospital. (2024, July 17). *"It's just baby fat": Tackling childhood obesity requires a family-based approach*. https://www.kkh.com.sg/publication/patient-care/its-just-baby-fat-tackling-childhood-obesity-requires-a-family-based-approach

9 UNICEF. (2025). *The importance of outdoor play (and how to support it)*. https://www.unicef.org/eca/stories/importance-outdoor-play-and-how-support-it#:~:text=But%20even%20as%20the%20amount,their%20concentration%20and%20school%20readiness.

10 Tang, L. (2025, February 4). Singapore teenagers spend nearly 8.5 hours a day on screens: CNA-IPS survey. *Channel News Asia (CNA)*. https://www.channelnewsasia.com/singapore/screen-time-devices-survey-teens-spend-daily-stress-4908281

11 Alla, K. (2024). Why are children spending more time indoors? *Australian Institute of Family Studies: Policy and Practice Paper*. https://aifs.gov.au/resources/policy-and-practice-papers/why-are-children-spending-more-time-indoors; Lee, E.-Y., Bains, A., Hunter, S., Ament, A., Brazo-Sayavera, J., Carson, V., Hakimi, S., Huang, W. Y., Janssen, I., Lee, M., Lim, H., Silva, D. A. S., & Tremblay, M. S. (2021). Systematic review of the correlates of outdoor play and time among children aged 3-12 years. *International Journal of Behavioral Nutrition and Physical Activity*, *18*(1), 41. https://doi.org/10.1186/s12966-021-01097-9

12 World Health Organisation (WHO). (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour*. https://www.who.int/publications/i/item/9789240015128

13 Wales, M., Mårtensson, F., Hoff, E. & Jansson, M. (2022). Elevating the role of the outdoor environment for adolescent wellbeing in everyday life. *Fronters in Psychology,* 13, 774592. doi: 10.3389/fpsyg.2022.774592; Witt, P. A. & Caldwell, L. L. (2010). The Rationale for Recreation Services for Youth: An Evidence-based Approach, National Recreation and Parks Association, USA.

What is this Playbook

Outdoor play is vital for youth development. Playing outdoors creates many opportunities including exploration, risk-taking, contact with nature, social interaction and collaboration. A growing body of research has shown that outdoor play brings many health benefits including improving physical health (fitness, motor skills), social-emotional health (confidence, teamwork), cognitive and mental health (concentration, problem-solving).[14] Drawing on empirical research of two towns with the highest absolute and relative under age-18 population in Singapore (Punggol and Sengkang),[15] the playbook presents key findings on what youth do for recreation, how youth experience outdoor play spaces, and what youth aspire to have in outdoor play spaces in the context of Singapore's high-rise, high-density, tropical urban environment. Building on these insights and relevant literature, the playbook provides a reference guide for creating recreation spaces that address youth's needs and preferences for outdoor play and environments. Key principles and strategies are illustrated with examples.

Who is this Playbook for

This playbook is for all who are interested in creating outdoor play spaces that support youth health and well-being including,

- Built environment professionals (e.g., architects, urban planners, designers, landscape architects, facility managers, etc.) who are involved in the planning, design, and management of youth outdoor recreation spaces.
- Key stakeholders (e.g., policymakers, town councils, communities) who are involved in the implementation, maintenance, and upgrading of youth outdoor recreation spaces.
- Schools and youth workers who seek to promote holistic development and well-being among youth through engaging in outdoor space and activities.
- Parents and caregivers who are keen to support their children's active lifestyle behaviours.
- Youth who would like to play an active role in making local outdoor play spaces more inclusive, engaging, and responsive to youth's needs and interests.

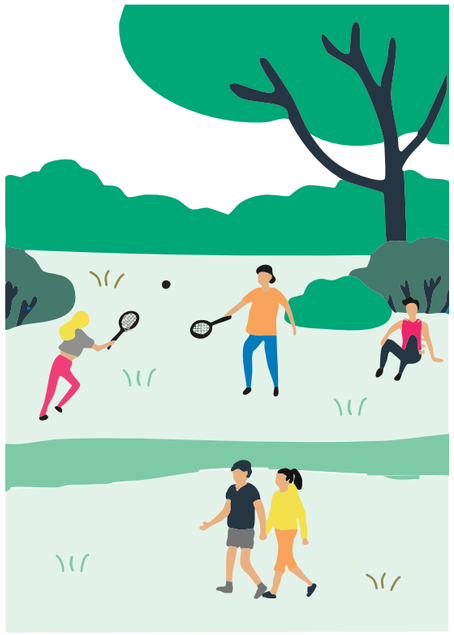
14 Li, J., Zhou, X., Huang, Z., & Shao, T. (2023). Effect of exercise intervention on depression in children and adolescents: A systematic review and network meta-analysis. *BMC Public Health*, *23*(1), 1918. https://doi.org/10.1186/s12889-023-16824-z; Kemel, P. N., Porter, J. E., & Coombs, N. (2022). Improving youth physical, mental and social health through physical activity: A Systematic literature review. *Health Promotion Journal of Australia*, *33*(3), 590–601. https://doi.org/10.1002/hpja.553.

15 Department of Statistics Singapore. (2025). *Singapore Residents by Single Year of Age and Sex*, at End June. https://tablebuilder.singstat.gov.sg/table/TS/M810731

Playbook structure

Following this Introduction, the rest of the playbook is structured into 5 chapters, covering what youth do for recreation (Chapter 2), how youth experience local outdoor play spaces (Chapter 3), what youth want in outdoor play spaces (Chapter 4), and how to design youth outdoor play spaces (Chapter 5) with a checklist to help assess if an outdoor recreation space meets youth's needs and preferences.

Chapter 2



What do youth do for recreation

2. What do youth do for recreation

Understanding how youth spend their free time and what recreational activities they do is essential for creating outdoor recreation spaces that meet their needs. These insights help to not only evaluate if youth meet recommended physical activity levels but also to pinpoint factors that may enable or hinder their attainment of these targets. This chapter presents findings on youth physical activity patterns and recreational activities in Singapore's high-rise, high-density urban context, based on our empirical research in Punggol and Sengkang involving a digital survey with youth aged 10-17 (N=101).

Youth physical activity patterns

Global literature has consistently shown that greater amounts and higher intensity of physical activity have positive impacts on youth's health and well-being such as muscular fitness, cardiometabolic health, bone health, cognitive function, and reduced risk of experiencing depression.[16] As mentioned earlier, the World Health Organisation (WHO) recommends that children and youth (aged 5-17) should have at least an average of 60 minutes of moderate- to vigorous-intensity physical activity daily. Muscle strengthening activities such as running, jumping, climbing, should be incorporated at least 3 days a week.[17] These recommendations are echoed in the Singapore Physical Activity Guidelines for School Children and Youths (aged 7-17).[18]

In contrast, sedentary behaviours, especially recreational screen time, are associated with negative health outcomes in youth such as higher risk of childhood obesity[19], depression[20], and anxiety[21]. The WHO recommends that children and adolescents (aged 5-17) should limit sedentary time, especially recreational screen use though no time limit is specified.[22] In Singapore, children and youth (aged 7-17) are recommended to limit sedentary time, particularly recreational screen time, by participating in outdoor activities of any intensity.[23] In addition, the Ministry of Health's updated Guidance on Screen Time in Children (2025) advises that children aged 7-12 should limit their daily screen time to below 2 hours unless related to schoolwork.[24]

Our empirical research in Singapore reveals a concerning phenomenon. Eight in ten youth surveyed (87%, N=101) did not meet the recommended level of moderate- to vigorous-intensity physical activity; instead, spending a substantial amount of time at home on sedentary activities (about 4 hours daily) such as reading books, watching TV, playing video games, and using their computer (Box 2.1). These findings reinforce the urgent need to limit recreational screen time and promote more outdoor play among youth in Singapore.

16 US Department of Health and Human Services. (2018). *2018 Physical Activity Guidelines Advisory Committee Scientific Report*. https://odphp.health.gov/sites/default/files/2019-09/PAG_Advisory_Committee_Report.pdf; Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J. P., Janssen, I., Katzmarzyk, P. T., Pate, R. R., Connor Gorber, S., Kho, M. E., Sampson, M., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism, 41*(6 Suppl 3), S197–S239. https://doi.org/10.1139/apnm-2015-0663; Li, J., Zhou, X., Huang, Z., & Shao, T. (2023). Effect of exercise intervention on depression in children and adolescents: A systematic review and network meta-analysis. *BMC Public Health*, *23*(1), 1918. https://doi.org/10.1186/s12889-023-16824-z; Kemel, P. N., Porter, J. E., & Coombs, N. (2022). Improving youth physical, mental and social health through physical activity: A Systematic literature review. *Health Promotion Journal of Australia*, *33*(3), 590–601. https://doi.org/10.1002/hpja.553

17 World Health Organisation (WHO). (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour*. https://www.who.int/publications/i/item/9789240015128

18 ActiveSG Circle. (n.d.). *Singapore Physical Activity Guidelines*. https://www.activesgcircle.gov.sg/campaigns/spag

19 Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., … Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, *54*(24), 1451–1462. https://doi.org/10.1136/bjsports-2020-102955

20 Wang, X., Li, Y., & Fan, H. (2019). The associations between screen time-based sedentary behavior and depression: A systematic review and meta-analysis. BMC Public Health, 19, 1524. https://doi.org/10.1186/s12889-019-7904-9; Santos, R. M. S., Mendes, C. G., Sen Bressani, G. Y., de Alcantara Ventura, S., de Almeida Nogueira, Y. J., de Miranda, D. M., & Romano-Silva, M. A. (2023). The associations between screen time and mental health in adolescents: A systematic review. *BMC Psychology*, *11*(1), 127. https://doi.org/10.1186/s40359-023-01166-7

21 Zink, J., Belcher, B. R., Imm, K., & Leventhal, A. M. (2020). The relationship between screen-based sedentary behaviors and symptoms of depression and anxiety in youth: A systematic review of moderating variables. *BMC Public Health*, *20*(1), 472. https://doi.org/10.1186/s12889-020-08572-1; Tanveer, M., Tabnjh, A. K., Yujun, C., Badicu, G., Asghar, E., Tanveer, U., Roy, N., Al-Mhanna, S. B., & Batrakoulis, A. (2025). Association of screen-based sedentary behavior with overweight and obesity among school-aged children and adolescents in Pakistan: An empirical cross-sectional study. *Sport Sciences for Health*, *21*(4), 3007–3018. https://doi.org/10.1007/s11332-025-01510-x

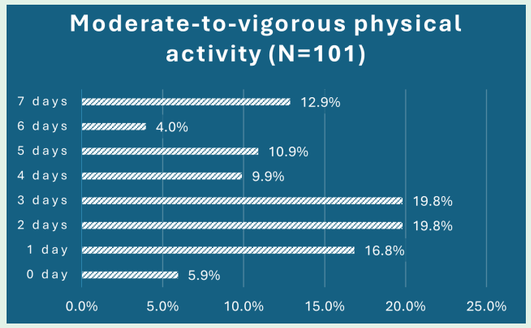
22 World Health Organisation (WHO). (2020). *WHO Guidelines on Physical Activity and Sedentary Behaviour*. https://www.who.int/publications/i/item/9789240015128

23 ActiveSG Circle. (n.d.). *Singapore Physical Activity Guidelines*. https://www.activesgcircle.gov.sg/campaigns/spag

24 Ministry of Health. (2025). *Guidance on Screen Time in Children*. https://isomer-user-content.by.gov.sg/3/dc21db37-3dde-4cdb-9b9f-773d93c93f93/Guidance%20on%20Screen%20Use%20in%20Children%20(18%20Jan)-clean.pdf

Box 2.1. Youth physical activity patterns, Singapore

The digital population survey with 101 youth (aged 10-17) in Punggol and Sengkang, Singapore, asked participants to indicate how many days they left their home and engaged in moderate-to-vigorous physical activities for at least 60 minutes per day in the past seven days. The results show that only about 13% of the youth participants met the WHO recommendation of engaging in moderate- to vigorous-intensity physical activity for at least 60 minutes per day. On average, youth participants spent 3.5 hours per day on sedentary activities at home on weekdays and 4.6 hours per day on weekends.



Youth recreational activities

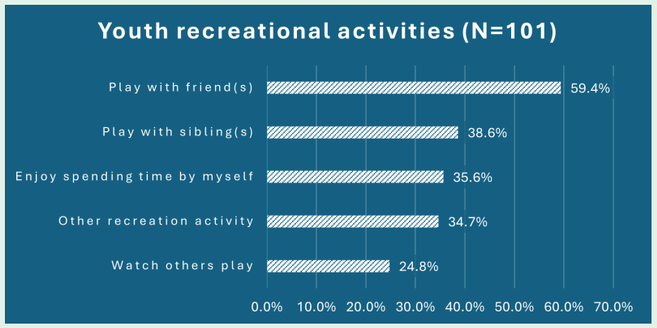
The range of recreational activities that youth engage in is context specific. It can be influenced by various factors including the provision and accessibility of recreational facilities (e.g., parks, sports courts, community centres, and unstructured play spaces), cultural traditions (e.g., cultural attitudes towards gender roles in certain recreational activities), social norms (e.g., parental and peer influence), and economic resources. There is limited literature on the types of youth recreational activities other than extracurricular activities like sports, music, arts and other youth programmes. A study conducted in Leipzig, Germany, illustrates the diversity of leisure activities reported by youth aged 10–18, ranging from spending time with family, meeting friends, relaxing ("chilling"), visiting cafés, museums, cinemas, and concerts, volunteering, reading, screen-based activities, and sports participation.[25] The study found that the most frequently participated leisure activity among youth were social: chilling, and meeting friends. Importantly, the study established that participation in active leisure activities (e.g., meeting friends, spending time with family, visiting cafés, museum, art exhibition, cinema, sports participation) was positively associated with youth well-being, whereas passive leisure activities (e.g., chilling and screen time) were associated with poorer well-being.

25 Wanka, F., Vogel, M., Grafe, N., Aßmann, M., Kiess, W., & Poulain, T. (2025). Leisure activities of adolescents—associations with demographic characteristics, well-being and parental leisure engagement. *Pediatric Research, 98*, 559-567. https://doi.org/10.1038/s41390-025-03866-9

In our Singapore study, playing with friends was the top activity at youth recreation places in the neighbourhood (59%, N=101) (Box 2.2). Other commonly reported recreational activities were playing with siblings (39%), and relaxing (36%). These findings largely align with the abovementioned study in Germany. Further, our place-based findings from environmental audit (N=17) and cognitive mapping (N=25) highlight the importance of local youth recreation spaces to facilitate social interaction and well-being in youth.

Box 2.2. Youth recreational activities, Singapore

In our study, youth participants were asked to indicate their recreational activities at their top 1 recreational place in their neighbourhoods (multiple choices were allowed). Active leisure activities such as playing with friends or siblings, were reported more frequently than passive leisure pursuits, like relaxing or watching others play.



Benefits of outdoor play for youth development

Why should youth play outdoors?

There is an extensive body of evidence that highlights the critical role of outdoor play in supporting children and youth's physical, social, mental, and cognitive development. Playing outdoors encourage exploration and imagination, which is particularly important for the brain development of young children.[26] Research suggests that nature play improves children's physical and mental health, social competence, resilience and

26 Australian Children's Education & Care Quality Authority. (2019). *Babies and outdoor play.* https://www.acecqa.gov.au/sites/default/files/2019-02/QA3_InfoSheetBabiesAndOutdoorPlay.pdf

learning.[27]

Outdoor time is strongly linked to increased physical activity participation,[28] and reduced sedentary behaviours in children and youth[29]. Beyond physical activity, outdoor play contributes to wider health and development outcomes in children and youth, including reduced hyperactivity, improved academic outcomes, enhanced social skills, and better mental health.[30] In contrast, excessive screen time is associated with poorer emotional and mental well-being.[31]

Collectively, these findings on the benefits of outdoor play (Table 2.1) underscore the importance of promoting more green time, less screen time for youth health and well-being.

Table 2.1. Outdoor play benefits for youth

Health	Key benefits
Physical	Increases overall physical activity; reduces sedentary time; improves fitness and motor skills; supports healthy growth and energy balance.
Social	Enhances social skills, cooperation, and peer interaction; encourages teamwork; supports positive socio-emotional development.
Mental	Reduces stress and hyperactivity; improves mood and emotional wellbeing; supports resilience and self-regulation.
Cognitive	Boosts attention, imagination, and problem-solving; supports brain development and learning; linked to better academic outcomes.

Source: Various sources[32]

27 Li, M., Lanca, C., Tan, C. S., Foo, L. L., Sun, C. H., Yap, F., Najjar, R. P., Sabanayagam, C., & Saw, S. M. (2023). Association of time outdoors and patterns of light exposure with myopia in children. *The British Journal of Ophthalmology*, *107*(1), 133–139. https://doi.org/10.1136/bjophthalmol-2021-318918; Tsuge, T., Matsumoto, N., Takao, S., & Yorifuji, T. (2025). Outdoor playing during preschool was associated with a reduced risk of school-age obesity in Japan. *Acta Paediatrica, 114*(2), 303–309. https://doi.org/10.1111/apa.17441; Arola, T., Aulake, M., Ott, A., Lindholm, M., Kouvonen, P., Virtanen, P., & Paloniemi, R. (2023). The impacts of nature connectedness on children's well-being: Systematic literature review. *Journal of Environmental Psychology, 85*, 101913. https://doi.org/10.1016/j.jenvp.2022.101913; Australian Institute of Family Studies (2024). *Nature play and child wellbeing.* https://aifs.gov.au/resources/policy-and-practice-papers/nature-play-and-child-wellbeing#references

28 Caldwell, H. A. T., Arthur, M., Simms, A., Mawhinney, H., Hancock Friesen, C. L., & Kirk, S. F. L. (2024). Development and implementation of a municipal outdoor play policy for children and youth in Nova Scotia, Canada: A community case study. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1334767

29 Gray, C., Gibbons, R., Larouche, R., Sandseter, E. B. H., Bienenstock, A., Brussoni, M., Chabot, G., Herrington, S., Janssen, I., Pickett, W., Power, M., Stanger, N., Sampson, M., & Tremblay, M. S. (2015). What Is the Relationship between Outdoor Time and Physical Activity, Sedentary Behaviour, and Physical Fitness in Children? A Systematic Review. *International Journal of Environmental Research and Public Health*, *12*(6), 6455–6474. https://doi.org/10.3390/ijerph120606455

30 Gorrell, L., Shen, X., MacDonald, M., Logan, S. W., Hatfield, B. E., Parkinson, C., D'Antonio, A., & Massey, W. (2024). The Effect of Outdoor Play, Physical Activity, and Screen Time Use on the Emotional Wellbeing of Children and Youth during a Health Crisis. *Leisure Sciences*, 1–18. https://doi.org/10.1080/01490400.2024.2335930

31 Gorrell, L., Shen, X., MacDonald, M., Logan, S. W., Hatfield, B. E., Parkinson, C., D'Antonio, A., & Massey, W. (2024). The Effect of Outdoor Play, Physical Activity, and Screen Time Use on the Emotional Wellbeing of Children and Youth during a Health Crisis. *Leisure Sciences*, 1–18. https://doi.org/10.1080/01490400.2024.2335930

32 Caldwell, H. A. T., Arthur, M., Simms, A., Mawhinney, H., Hancock Friesen, C. L., & Kirk, S. F. L. (2024). Development and implementation of a municipal outdoor play policy for children and youth in Nova Scotia, Canada: A community case study. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1334767 ; Gray, C., Gibbons, R., Larouche, R., Sandseter, E. B. H., Bienenstock, A., Brussoni, M., Chabot, G., Herrington, S., Janssen, I., Pickett, W., Power, M., Stanger, N., Sampson, M., & Tremblay, M. S. (2015). What Is the Relationship between Outdoor Time and Physical Activity, Sedentary Behaviour, and Physical Fitness in Children? A Systematic Review. *International Journal of Environmental Research and Public Health*, *12*(6), 6455–6474. https://doi.org/10.3390/ijerph120606455; Gorrell, L., Shen, X., MacDonald, M., Logan, S. W., Hatfield, B. E., Parkinson, C., D'Antonio, A., & Massey, W. (2024). The Effect of Outdoor Play, Physical Activity, and Screen Time Use on the Emotional Wellbeing of Children and Youth during a Health Crisis. *Leisure Sciences*, 1–18. https://doi.org/10.1080/01490400.2024.2335930 ; Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J.-P., Janssen, I., Katzmarzyk, P. T., Pate, R. R., Connor Gorber, S., Kho, M. E., Sampson, M., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. Applied Physiology, Nutrition, and Metabolism, 41(6 (Suppl. 3)), S197–S239. https://doi.org/10.1139/apnm-2015-0663

Chapter 3

How do youth experience outdoor play spaces

3. How do youth experience outdoor play spaces

Besides knowing what youth do for recreational activities, and why spending time outdoors is crucial, it is equally important to understand how youth experience their outdoor play spaces, and identify the factors that enable or hinder their outdoor play. Previous research has shown that several built environment features are essential for supporting youth outdoor play and physical activity. These include:

- **Green spaces:** The perceived availability, accessibility, and quality of parks were found to support youth's physical activity outside school hours.[33] Proximity to parks—especially those with walking paths, playgrounds, running tracks, and lighting, was associated with higher levels of moderate-to-vigorous physical activity among adolescent girls.[34] Parks with diverse amenities such as skate parks, walking paths, barbeques, picnic tables, and lighting, were nearly three times more likely to be used by youth for physical activity.[35]
- **Safe and accessible play spaces:** Ensuring that play areas meet youth's needs for safety and accessibility is crucial for giving them opportunities to explore and play—these are "actualised affordances".[36] The presence of playgrounds within 1 km of home was found to be strongly correlated with a healthy weight status among children, suggesting that targeted park facilities have a greater influence on physical health than park space alone.[37] Design considerations such as accessible wayfinding, safe entry points, and visual markers ("play beacons") are also important for activating play spaces and attracting children and youth to outdoor sites.[38]
- **Youth-friendly infrastructure:** This encompasses spatial and environmental as well as social and cultural factors that support youth's engagement with the outdoors. [39] Infrastructure that supports both active and passive recreation as well as community involvement is crucial for creating environments where youth can flourish.[40] Scholars have been advocating for the integration of youth's needs into urban planning, referencing rights-based approaches such as the UN Convention on the Rights of the Child, and calling for long-term policies that prioritise youth's well-being.[41]
- **Inclusive urban design:** It is important to recognise that the youth population is not homogeneous; there are age and gender differences. Research has found that girls and boys may use outdoor spaces differently, with parental attitudes and safety concerns influencing their mobility and play behaviours.[42] Others report age differences, e.g., older children commenting that the play space is boring, and is for little kids.[43] Socioeconomic disparities are yet another factor shown to affect access to greenery and play spaces, highlighting the need for equitable urban planning.[44] Inclusive urban design is essential to creating built environments that address the diverse needs of youth. Age- and gender-inclusive design is a frequently used strategy to achieving inclusive play spaces for youth of all ages. Another strategy is to use participatory approaches, involving youth in the planning and design

33 Ries, A. V., Voorhees, C. C., Roche, K. M., Gittelsohn, J., Yan, A. F., & Astone, N. M. (2009). A quantitative examination of park characteristics related to park use and physical activity among urban youth. *Journal of Adolescent Health, 45*(3 Suppl), S64–S70. https://doi.org/10.1016/j.jadohealth.2009.04.020; Cohen, D. A., Ashwood, J. S., Scott, M. M., Overton, A., Evenson, K. R., Staten, L. K., Porter, D., McKenzie, T. L., & Catellier, D. (2006). Public parks and physical activity among adolescent girls. *Pediatrics, 118*(5), e1381–e1389. https://doi.org/10.1542/peds.2006-1226

34 Cohen, D. A., Ashwood, J. S., Scott, M. M., Overton, A., Evenson, K. R., Staten, L. K., Porter, D., McKenzie, T. L., & Catellier, D. (2006). Public parks and physical activity among adolescent girls. *Pediatrics*, 118(5), e1381–e1389. https://doi.org/10.1542/peds.2006-1226

35 Edwards, N., Hooper, P., Knuiman, M., Foster, S., & Giles-Corti, B. (2015). Associations between park features and adolescent park use for physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 12, 21. https://doi.org/10.1186/s12966-015-0178-4

36 Kyttä, M. (2004). The extent of children's independent mobility and the number of actualized affordances as criteria for child-friendly environments. *Journal of Environmental Psychology*, 24(2), 179-198. https://doi.org/10.1016/S0272-4944(03)00073-2

37 Potwarka, L. R., Kaczynski, A. T., & Flack, A. L. (2008). Places to play: Association of park space and facilities with healthy weight status among children. *Journal of Community Health*, 33(5), 344–350. https://doi.org/10.1007/s10900-008-9104-x

38 Young, S., Church, A., Maskiell, A., Raisbeck, P., & Eadie, T. (2023). Design considerations in the activation of a temporary playspace for children and families: Perspectives of council, architects and designers. *Australian Planner*, 59(2), 143–153. https://doi.org/10.1080/07293682.2023.2219789

39 Nam, H., & Nam, S. I. (2018). Child-friendly city policies in the Republic of Korea. *Children and Youth Services Review*, 94, 545–556. https://doi.org/10.1016/j.childyouth.2018.08.033; Cordero-Vinueza, V. A., Niekerk, F. (Femke), & van Dijk, T. (Terry). (2023). Making child-friendly cities: A socio-spatial literature review. *Cities*, 137, 104248. https://doi.org/10.1016/j.cities.2023.104248; Brown, C., de Lannoy, A., McCracken, D., Gill, T., Grant, M., Wright, H., & Williams, S. (2019). Special issue: Child-friendly cities. *Cities & Health*, 3(1–2), 1–7. https://doi.org/10.1080/23748834.2019.1682836

40 Brown, C., de Lannoy, A., McCracken, D., Gill, T., Grant, M., Wright, H., & Williams, S. (2019). Special issue: Child-friendly cities. *Cities & Health*, 3(1–2), 1–7. https://doi.org/10.1080/23748834.2019.1682836

41 Brown, C., de Lannoy, A., McCracken, D., Gill, T., Grant, M., Wright, H., & Williams, S. (2019). Special issue: Child-friendly cities. *Cities & Health*, 3(1–2), 1–7. https://doi.org/10.1080/23748834.2019.1682836; Hartt, M., Lee, C., & Empey-Salisbury, M. (2023). Planning for Play? A Systematic Literature Review. *Journal of Planning Literature, 39*(1), 25-35. https://doi.org/10.1177/08854122231169228

42 Wridt, P. (2010). A Qualitative GIS Approach to Mapping Urban Neighborhoods with Children to Promote Physical Activity and Child-Friendly Community Planning. *Environment and Planning B: Planning and Design*, 37(1), 129–147. https://doi.org/10.1068/b35002

43 Whitzman, C., & Mizrachi, D. (2012). Creating child-friendly high-rise environments: Beyond wastelands and glasshouses. *Urban policy and research, 30*(3), 233-249. https://doi.org/10.1080/08111146.2012.663729

44 Łaszkiewicz, E., & Sikorska, D. (2020). Children's green walk to school: An evaluation of welfare-related disparities in the visibility of greenery among children. *Environmental Science & Policy*, 110, 1–13. https://doi.org/10.1016/j.envsci.2020.05.009

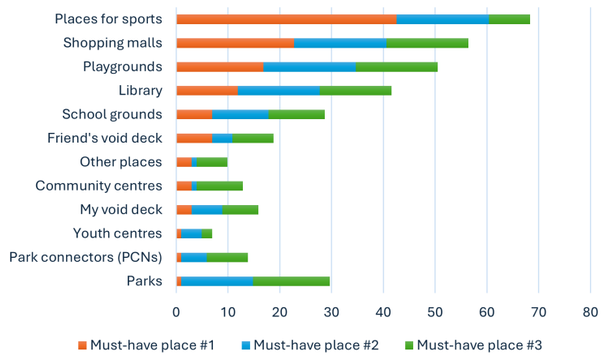
process, e.g., co-design workshops and youth-centred mapping. [45]

Where, how often, and how long do youth go for outdoor play

Although prior research has identified the essential characteristics of youth-friendly outdoor recreation spaces, there is a notable lack of place-specific knowledge. Critical questions remain about the locations, means of transport, frequency, and duration of the outdoor recreation activities undertaken by youth. To address this knowledge gap, our study in Singapore invited youth participants (N=101) living in Punggol and Sengkang to share their outdoor play experiences.

Where to go for recreation: The top 3 must-have recreation places in the neighbourhood for youth (aged 10-17) are places for sports, shopping malls, and playgrounds (Figure 3.1). Of these, places for sports are most frequently identified as the #1 place for youth recreation in the neighbourhood. The implication is that demand exists for active recreation opportunities among youth. It is important to respond to demand and provide places within the neighbourhood, with thermal comfort consideration to support youth outdoor play. The strong preference for shopping malls hints at an inclination towards vibrant, diverse, comfortable (thermal comfort) places for youth recreation activities given Singapore's tropical climate.

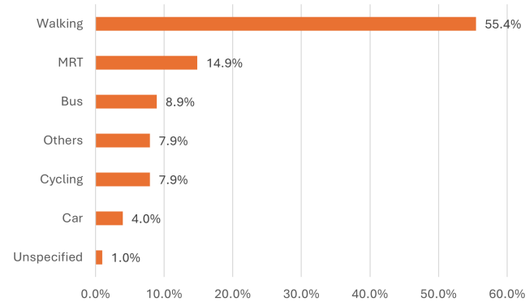
Figure 3.1. Where do youth go for recreation (N=101)



45 Winge, L., & Lamm, B. (2019). Making the red dot on the map: Bringing children's perspectives to the city planning agenda through visible co-design actions in public spaces. *Cities & Health*, 3(1–2), 99–110. https://doi.org/10.1080/23748834.2019.1604931

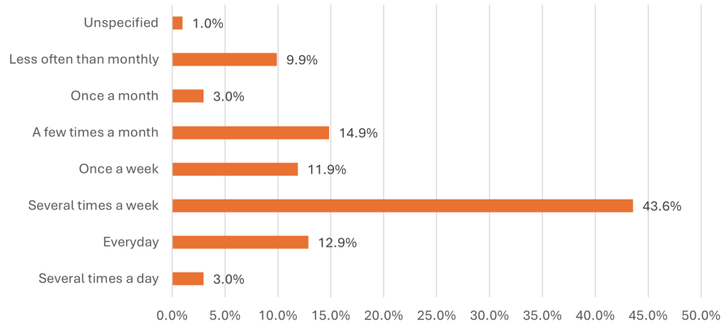
How to get there: 56% of youth surveyed walked to their #1 recreation destination in the neighbourhood (Figure 3.2), suggesting that these places are generally accessible on foot. A quarter used public transport—15% travelled by mass rapid transit and 9% by bus, while cycling accounted for 8% of the mode share. Car usage was low at 4%, likely because Singapore youths are independent, car ownership is expensive, or family resources are limited to drive youths to their recreation destinations. The implication is for providing youth recreation spaces within walking or cycling distance from home, and ensuring good public transport connectivity for youth-friendly neighbourhood.

Figure 3.2. Mode of transport to #1 recreation destination (N=101)



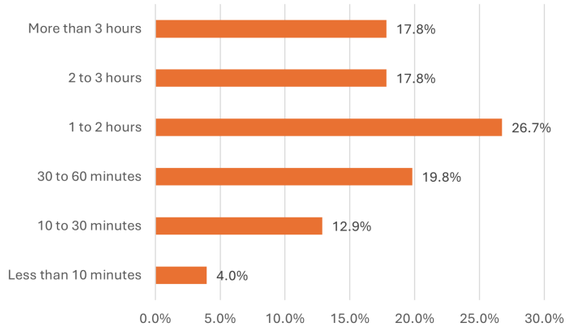
How often to go there: 59% of youth surveyed had visited their favourite recreation destination at least once a week, with a significant portion going several times a week (44%) or more (13% visited every day, and 3% several times a day) (Figure 3.3). The high frequency of visits, together with the above findings on active and public transport mode share, suggests that these recreation spaces are both accessible and valued by youth. The implication is for providing, maintaining, and enhancing spaces that encourage regular engagement in outdoor and social activities among youth.

Figure 3.3. Frequency of visiting #1 recreation destination (N=101)



How much time spent there: 62% of youth surveyed spent more than 1 hour at their favourite recreation destination in the neighbourhood (Figure 3.4). This indicates that when youth do visit their preferred recreation places, they tend to stay for extended periods. The implication is for designing and maintaining youth outdoor recreation spaces that are not only accessible but also sufficiently engaging to encourage prolonged use among youth.

Figure 3.4. Time spent at #1 recreation destination (N=101)



Enablers for youth outdoor play

While prior research has identified key built environment enablers for youth outdoor play, the evidence is predominantly generated from Western, low-density urban settings. No prior research is done in Singapore. To fill this knowledge gap, our study in Singapore invited youth (N=17) living in Punggol and Sengkang to participate in an environmental audit of outdoor play spaces in their neighbourhood (Box 3.1).

Our environmental audit of outdoor play spaces with 17 youth participants documented 156 mentions of environmental features that support outdoor play (Figure 3.5). The top 5 environmental enablers for youth's outdoor play include:

- **Amenities** (N=39, 25%), cover both facilities like seating, wayfinding, shelter, equipment and spaces—structured play spaces (e.g., playground, specific play equipment), unstructured play spaces (e.g., void deck, rooftop, community garden, exercise corner), and food places in/near the neighbourhood (Figure 3.6).
- **Comfort** (N=23, 15%), encompassing comfortable sitting, thermal comfort from shelter and shade, and feeling comfortable in the play space generally (Figure 3.7).

- **Places for social interaction** (N=18, 12%), are important for youth activities and intergenerational interaction such as void deck sitting area, BBQ pit, walking trails, multistorey car park rooftop (Figure 3.8).
- **Places for sports and other activities** (N=17, 11%), such as badminton, basketball, cycling, pickleball, running, soccer, baseball (Figure 3.9).
- **Safety** (N=15, 10%), such as fully covered drains, non-slippery surface, path marking, and feeling safe in the neighbourhood (Figure 3.10).

Box 3.1. Environmental audit of outdoor play spaces with youth, Singapore

Environmental audit of outdoor play space involves a walk-along interview with youth (aged 10-17) to systematically assess how built environment features support or hinder their outdoor play. The audit uses the Environmental Audit Toolkit for Children (EATC)[46] checklist developed by the study team and tested in past research[47]. The checklist covers 7 domains:

- Mobility within the housing block
- Mobility in the neighbourhood
- Amenity
- Safety
- Maintenance
- Imageability
- Places for social interaction

A participatory mapping activity was conducted to document geo-spatial locations and youth's comments on specific environmental features that support or hinder their outdoor play on a digital platform, *Padlet*.

46 The EATC checklist is adapted from the Age-friendly Environmental Audit Toolkit (EAT) developed by Dr Belinda Yuen and team at Singapore University of Technology and Design in the NRF-MND *Innovative Planning and Design of Age-friendly Neighbourhoods in Singapore* project. For details of EAT, see Yuen, B., Močnik, Š., Moogoor, A., Dieterich, A., Yap, W., & Bhuyan, R. (2022). *Age-Friendly Neighbourhood Environmental Audit Toolkit*. World Scientific.

47 Lee Kuan Yew Centre for Innovative Cities (LKYCIC). (2025). *Our Place, Vibrant Spaces for East Coast*. https://lkycic.sutd.edu.sg/research/our-place-vibrant-spaces-for-east-coast/

Figure 3.5. Environmental enablers for youth outdoor play

Figure 3.6. #1 Environmental enabler for youth outdoor play – amenities

Figure 3.7. #2 Environmental enabler for youth outdoor play – comfort

Figure 3.8. #3 Environmental enabler for youth outdoor play – places for social interaction

Figure 3.9. #4 Environmental enabler for youth outdoor play – places for sports and other activities

Figure 3.10. #5 Environmental enabler for youth outdoor play – safety

Barriers to youth outdoor play

Youth participants identified more environmental barriers than environmental enablers (N=260 and 156 respectively). Many of these barriers are centred on provisions (lack of), lack of age-appropriate features/equipment/playground, and a lack of cleanliness (Figure 3.11). Of the 260 mentions of environmental features that hinder youth outdoor play, the top 5 environmental barriers (including ties) are:

- **Safety issues** (N=52, 20%), cover issues such as slippery surface, uneven surface, insufficient lighting, gaps/uneven surface related to drain covers, obstacles, faded path markings, lack of pedestrian safety on shared paths, and unsafe road crossing (Figure 3.12).
- **Lack of youth-friendly amenities** (N=51, 20%), primarily refer to the absence of designated play spaces (such as playgrounds, specific play equipment, or play areas) for youth aged 10–17, and uninviting void decks for youth activities (Figure 3.13).
- **Lack of places for sports and other activities** (N=37, 14%), highlight the lack of space provision for various sports such as badminton, basketball, soccer, swimming, table tennis as well as conflict over space usage among different age groups such as older adults and pickleball players (Figure 3.14).
- **Lack of maintenance** (N=28, 11%), include issues related to insufficient cleanliness in public open spaces, inadequate facility upkeep, and flooding of pathways after rain (Figure 3.15).
- **Lack of comfort** (N=28, 11%), refer to inadequate seating areas, including hard, sharp, and uncomfortable seating materials and a lack of tables, as well as insufficient shelter from weather and poor thermal comfort (Figure 3.16).
- **Lack of spaces for social interaction** (N=25, 10%), highlight inadequate play spaces for youth aged 10–17, limited provisions for girls, and lack of spaces that support social engagement and mental well-being (Figure 3.17).

Figure 3.11. Environmental barriers to youth outdoor play

Figure 3.12. #1 Environmental barrier to youth outdoor play – safety issues

Figure 3.13. #2 Environmental barrier to youth outdoor play – lack of youth-friendly amenities

Figure 3.14. #3 Environmental barrier to youth outdoor play – lack of places for sports and other activities

Figure 3.15. #4 Environmental barrier to youth outdoor play – lack of maintenance

Figure 3.16. #4 Environmental barrier to youth outdoor play – lack of comfort

Figure 3.17. #5 Environmental barrier to youth outdoor play – lack of places for social interaction

The implication is for providing youth-centric outdoor recreation spaces that have age-appropriate, accessible, comfortable, safe, and well maintained play spaces and facilities. Key strategies include:

- **Inclusive design for diverse youth needs:** Recognise that youth population is not homogenous. Provide a diverse array of different types of age-appropriate amenities and flexible spaces. In our study, both structured (e.g., age-inclusive playgrounds, sports courts) and unstructured (e.g., open fields, parks) play spaces are frequently cited as enablers of youth outdoor play. There is a need to understand youth experiences and preferences—ask the youth, involve youth in the planning and design of outdoor play spaces, and close gaps in the provision. The extant literature shows that boys and girls have different interests and needs.
- **Prioritise spaces for active recreation:** Tap on the strong demand for places for sports and active play. Prioritise the provision and enhancement of active recreation facilities such as outdoor sports venues and youth-oriented playgrounds in parks to accommodate youth's strong demand for active, fun, engaging play. This supports not only physical health but also social connections and active lifestyles among youths.
- **Accessibility is essential:** Understand youth's mobility patterns for outdoor play. Provide accessible play spaces in the neighbourhood. Our study found that youth tend to favour recreation spaces that are within walking or cycling distance and well-served by public transport. Ensuring accessible youth play spaces within the neighbourhood and along safe routes is crucial for promoting regular outdoor activity.
- **Safety remains a top priority:** Embrace safety concerns. Adopt Prevention through Design. Entrenching safety features from the outset rather than managing safety risk later—such as through regular maintenance and upkeep and improved pedestrian infrastructure—can help increase youth autonomy, alleviate parental concerns, and make neighbourhood spaces more inviting for play and recreation.
- **Comfort and climate-responsive design matters:** Be responsive to local weather. Provide climate-responsive play spaces. The extant literature has shown that weather greatly influences outdoor play. Youth in our study place great importance on climate and comfort features such as seating, shade, and shelter. Providing shaded play spaces, comfortable seating areas, and protection from rain and sun can help increase the attractiveness and usability of outdoor recreation spaces, encouraging longer and more frequent youth visits.

Although demand exists for outdoor activities, it is important to understand what youth want for their play spaces.

Chapter 4

What do youth want in outdoor play spaces

4. What do youth want in outdoor play spaces

International research has shown that youth aspire for outdoor recreation spaces that enable opportunities for active and social play, provide a sense of safety, and support their growing independence. These aspirations can be summarised into several key elements (Figure 4.1):

- **Opportunities for independent and social play:** Youth want spaces where they can move freely, play with minimal adult supervision, and spend time with friends. Studies in dense cities like Tokyo show that youth prefer spaces that support unstructured play, social connection, and autonomy.[48]
- **Safe, comfortable, and accessible environments:** Youth want outdoor spaces where they feel physically safe and confident to explore. Parental concerns about traffic, injury, or stranger danger limit their independence, highlighting the importance of well-designed paths, soft ground surfaces, good lighting, and clear boundaries that allow both youth and parents to feel secure.[49] Temporary street closures and Play Streets expand access to safe spaces for active play and help build community ties.[50]
- **Flexible spaces with greenery and varied play options:** Youth want environments that offer a mix of activities and support both active and social play. Evidence from Melbourne shows that youth enjoy pop-up parks with diverse activities and value simple improvements such as fencing or softer ground surfaces that enhance comfort and safety.[51] Findings from Mashhad indicate that youth prefer nearby spaces for cycling, social play, and contact with greenery, highlighting the importance of accessible nature features and multiple play options.[52] Parks that include greenery, sports areas, safe paths, and natural features play an important role in supporting physical activity, play, and social interaction.[53]
- **Participatory, inclusive, and community-supported spaces:** Youth want play environments that reflect their ideas and everyday experiences. Participatory processes in cities such as Boulder show that when youth are involved in activities like workshops, field visits, or model-building, they highlight the importance of nature, inclusivity, safety, and a variety of play options.[54] These engagements produced designs that were more closely aligned with youth's needs and also broadened their awareness of neighbourhood diversity and local decision-making, encouraging them to consider social and environmental factors in shaping their surroundings.[55]

Figure 4.1. Essential elements of youth outdoor play spaces

48 Kyttä, M., Oliver, M., Ikeda, E., Ahmadi, E., Omiya, I., & Laatikainen, T. (2018). Children as urbanites: mapping the affordances and behavior settings of urban environments for Finnish and Japanese children. *Children's Geographies, 16*(3), 319–332. https://doi.org/10.1080/14733285.2018.1453923

49 Oliver, B. E., Nesbit, R. J., McCloy, R., Harvey, K., & Dodd, H. F. (2023). Adventurous play for a healthy childhood: Facilitators and barriers identified by parents in Britain. *Social Science & Medicine, 323,* 115828. https://doi.org/10.1016/j.socscimed.2023.115828

50 Umstattd Meyer, M. R., Bridges, C. N., Schmid, T. L., Hecht, A. A., & Pollack Porter, K. M. (2019). Systematic review of how Play Streets impact opportunities for active play, physical activity, neighborhoods, and communities. *BMC Public Health, 19,* Article 335. https://doi.org/10.1186/s12889-019-6609-4

51 McGlone, N. (2016). Pop-Up kids: Exploring children's experience of temporary public space. *Australian Planner, 53*(2), 117–126. https://doi.org/10.1080/07293682.2015.1135811

52 Tayefi Nasrabadi, M., García, E. H., & Pourzakarya, M. (2021). Let children plan neighborhoods for a sustainable future: A sustainable child-friendly city approach. *Local Environment, 26*(2), 198–215. https://doi.org/10.1080/13549839.2021.1884668

53 Gardsjord, H. S., Tveit, M. S., & Nordh, H. (2014). Promoting Youth's Physical Activity through Park Design: Linking Theory and Practice in a Public Health Perspective. *Landscape Research, 39*(1), 70–81. https://doi.org/10.1080/01426397.2013.793764

54 Derr, V., & Tarantini, E. (2016). "Because we are all people": Outcomes and reflections from young people's participation in the planning and design of child-friendly public spaces. *Local Environment, 21*(12), 1534–1556. https://doi.org/10.1080/13549839.2016.1145643

55 Derr, V., & Kovács, I. G. (2017). How participatory processes impact children and contribute to planning: A case study of neighborhood design from Boulder, Colorado, USA. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 10*(1), 29–48. https://doi.org/10.1080/17549175.2015.1111925

Types of space

Using cognitive mapping method, our study in Singapore invited 25 youth participants (aged 10-17) to draw and tell us about their ideal outdoor play space (Box 4.1). Key findings from these activities are triangulated to provide contextualised insights into youth preferences and aspirations for local outdoor play spaces (Figure 4.2).

Box 4.1. Cognitive mapping of an ideal youth outdoor play space, Singapore

The cognitive mapping method seeks to develop a contextualised understanding of what youth want in their outdoor play spaces. In our empirical study in Singapore, 25 youth participants were invited to draw and tell their ideal child-friendly neighbourhood, ideal youth outdoor play space, and their preferred applications of digital placemaking features in outdoor play spaces. A series of activities were conducted,

- My ideal child-friendly neighbourhood
  - Draw my ideal child-friendly neighbourhood
  - Select features that are essential for my ideal child-friendly neighbourhood
  - Identify features that are not provided in my current neighbourhood
- My ideal youth outdoor play space
  - Draw my ideal outdoor play space
  - Select features that are essential for my ideal outdoor play space
  - List intended activities at these essential play spaces
- Digital placemaking features
  - Select digital features to be added to my ideal outdoor play space. A photo collage was provided for selection. Participants were also encouraged to draw their own digital features
  - Add the preferred digital features to my ideal play space. The selected feature was cut out and pasted to the drawing of the ideal outdoor play space

When envisioning their ideal outdoor play space, youth reveal a strong desire for a variety of outdoor recreation spaces, especially those for sports, active play, and age-appropriate facilities that encourage both physical activity and socialisation among youth. They drew a total of 147 elements and 15 types of provision. Of the 147 elements, youth identified 102 as essential features to have in their ideal outdoor play spaces (Figure 4.3). The top five types of provision for ideal outdoor play space are:

- Amenities for youth (18%)
- Play equipment for youth (16%)
- Sports courts or fields (14%)
- Play spaces for youth (12%)
- Nature (12%).

Figure 4.2. Draw and tell my ideal outdoor play space – one example drawing

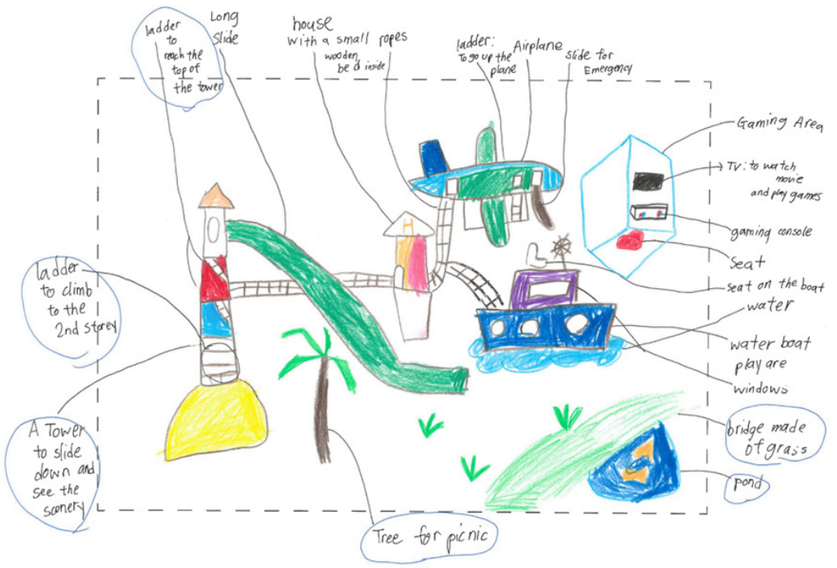
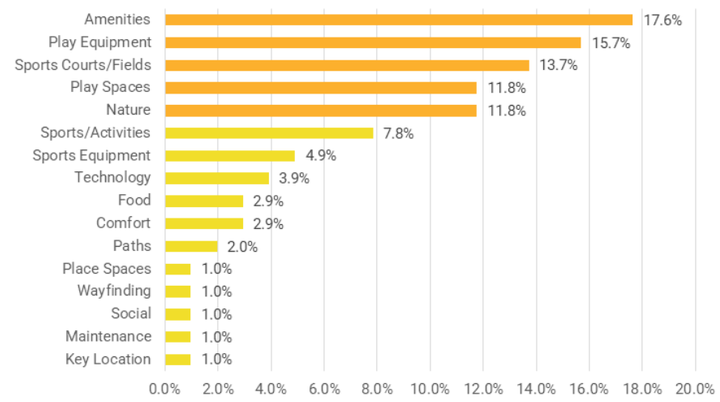


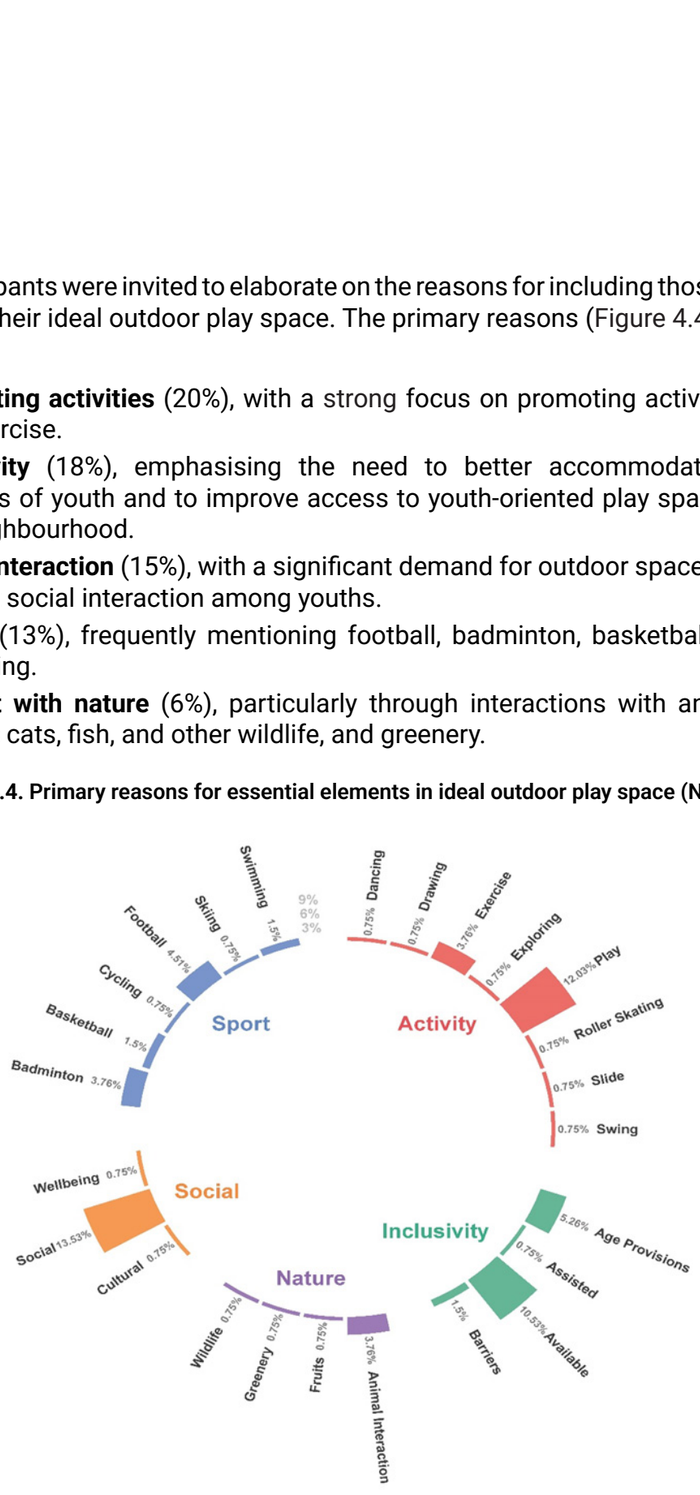
Figure 4.3. Essential elements in my ideal outdoor play space (N=102)



Youth participants were invited to elaborate on the reasons for including those essential elements in their ideal outdoor play space. The primary reasons (Figure 4.4) include:

- **Facilitating activities** (20%), with a strong focus on promoting active play and exercise.
- **Inclusivity** (18%), emphasising the need to better accommodate the interests of youth and to improve access to youth-oriented play spaces in the neighbourhood.
- **Social interaction** (15%), with a significant demand for outdoor spaces that support social interaction among youths.
- **Sports** (13%), frequently mentioning football, badminton, basketball, and swimming.
- **Contact with nature** (6%), particularly through interactions with animals such as cats, fish, and other wildlife, and greenery.

Figure 4.4. Primary reasons for essential elements in ideal outdoor play space (N=133)



Microfeatures

Zooming into specific features within the top 5 types of outdoor play space provision, several microfeatures are commonly preferred (Figure 4.5):

- **Amenities for youth**: especially swimming pool, youth exercise corner, and open activity space.
- **Sports courts or fields**: such as football field, badminton and basketball courts (Figure 4.6).
- **Play equipment for youth**: particularly swing, larger slide, and trampoline (Figure 4.7).
- **Play spaces for youth**: especially playground for youth (Figure 4.8).
- **Nature**: such as greenery, garden, and pond (Figure 4.9).

The predominance of these microfeatures demonstrates that youth aged 10-17 desire neighbourhood environments that cater to active recreation, social interaction, and mental well-being. This lends support for the use of inclusive design methodologies to create spaces that understand and enable youth of all backgrounds and abilities to participate, reinforcing the findings in previous chapter.

Figure 4.5. Microfeatures under top 5 types of outdoor play space provision (N=102)

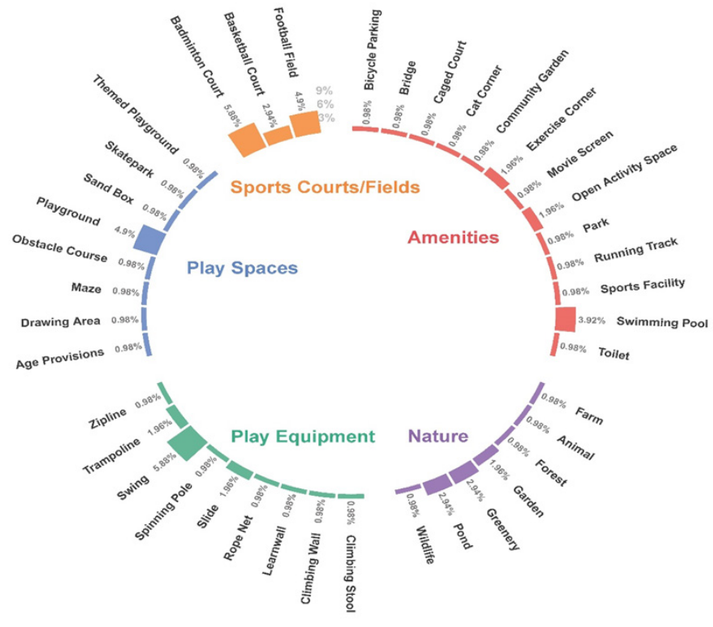


Figure 4.6. Drawings of places for sports

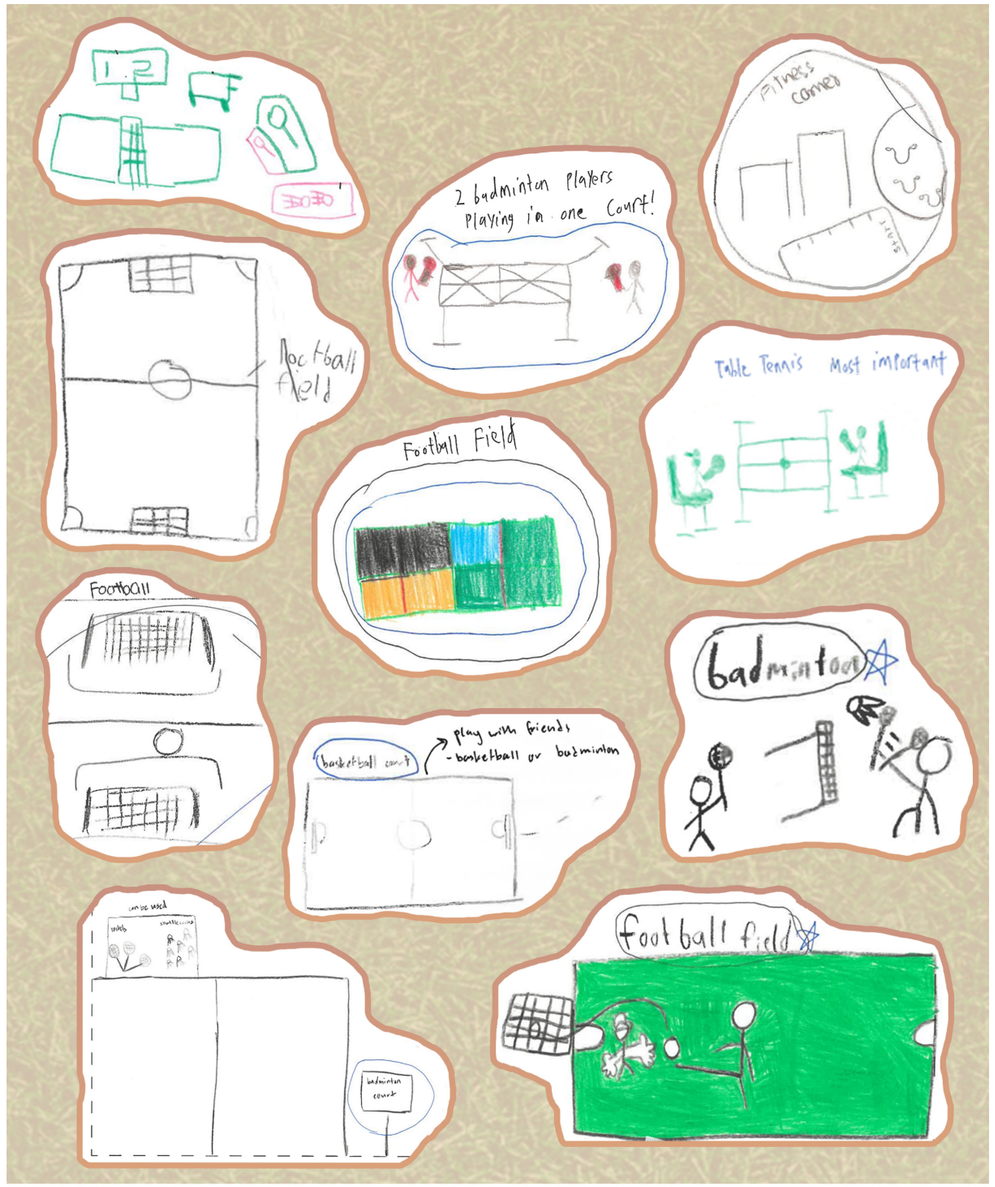


Figure 4.7. Drawings of play equipment—swings, slides and trampolines

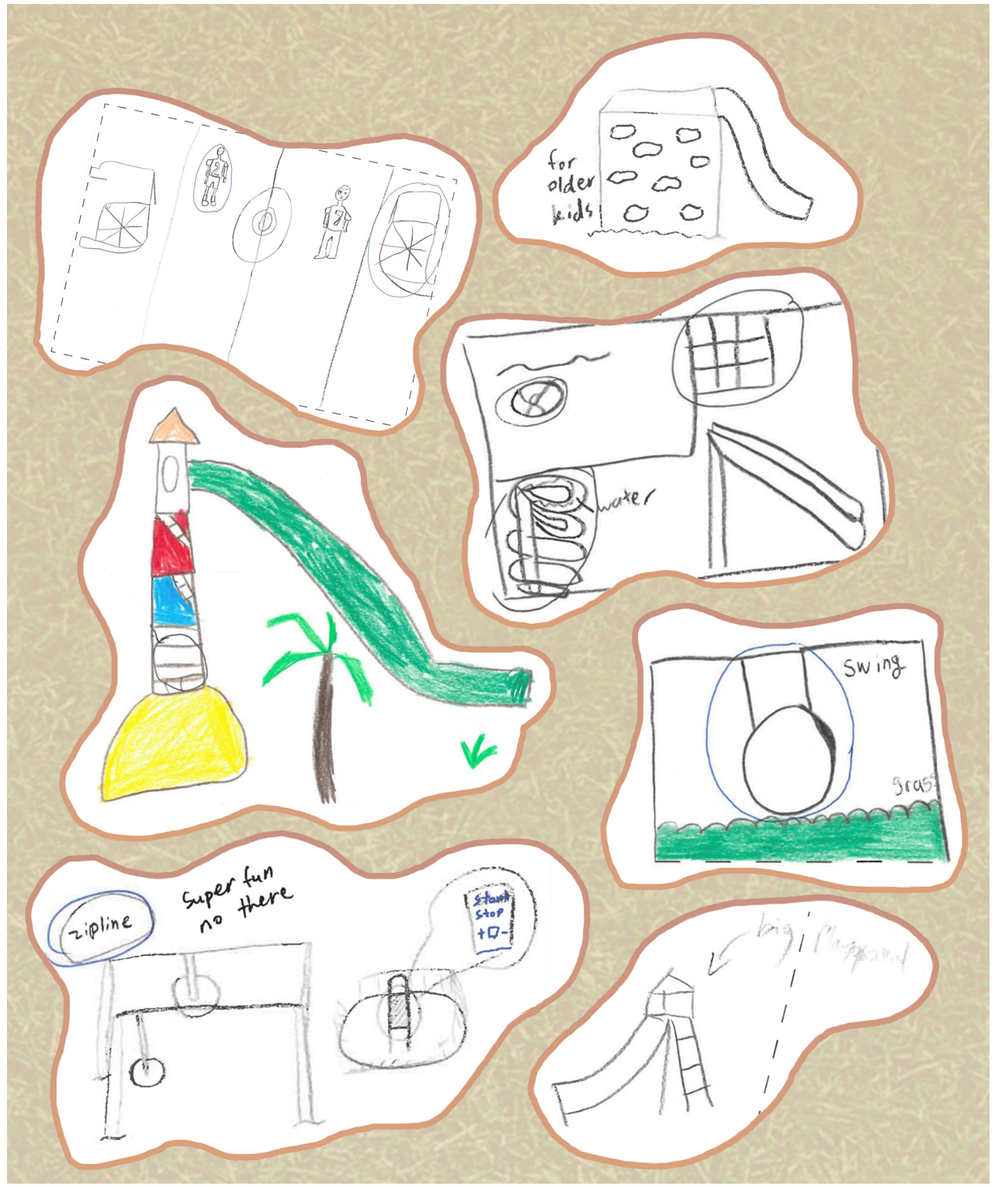


Figure 4.8. Drawings of play spaces for youth

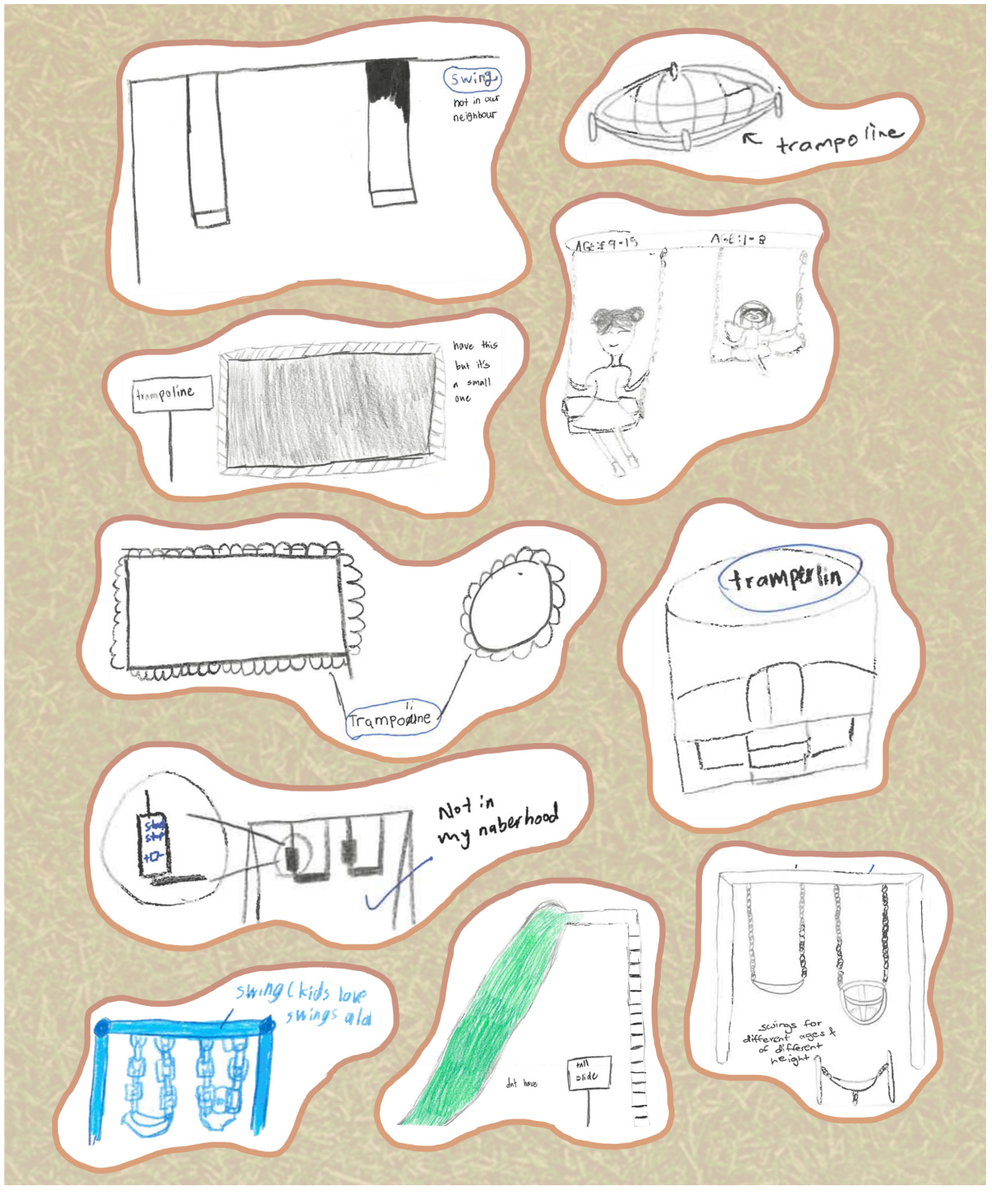
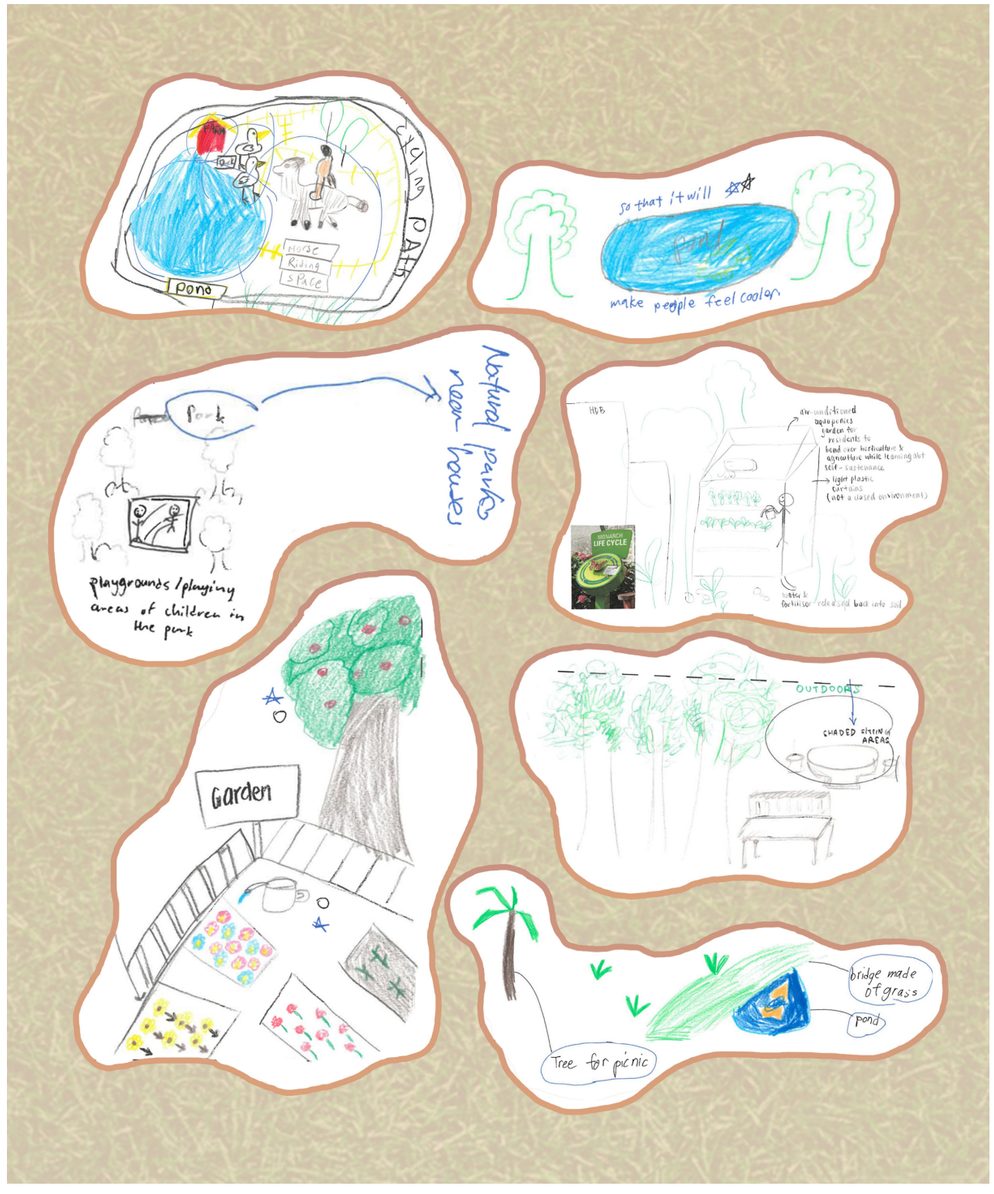


Figure 4.9. Drawings of nature-related elements



Activities

In our cognitive mapping activity, youths were also asked to indicate their preferred activities within the ideal outdoor play space. Sports or exercise ranked highest (37%), followed by Play (29%), Other activities (22%), and Contact with nature (7%). Only one participant reported infrequent outdoor play, citing barriers such as academic commitments and overcrowding in outdoor play spaces.

As shown in Figure 4.10, football, badminton, basketball, and cycling were reported as the most popular sports. Play activities that spark imagination were most preferred, followed by the use of swings, social/group games, and larger slides. For non-sport activities, gardening and socialising came up often. These findings highlight the need for targeted planning and design interventions to create outdoor play spaces that are inclusive, diverse, and responsive to the preferences and developmental requirements of youth in the 10-17 age group.

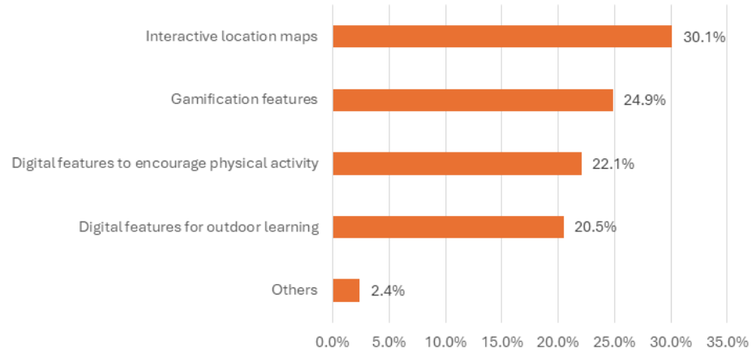
Figure 4.10. Preferred activities at essential outdoor play spaces (N=73)

Digital placemaking

Our study in Singapore explored the potential role of digital placemaking in enhancing youth outdoor play spaces using digital population survey (N=101) and cognitive mapping (N=25). In the survey, their response to various categories of digital interaction features like interactive location map, gamification, indicate that most youth are keen on integrating digital interaction features in their local outdoor play spaces. On average, each youth participant selected 2.5 digital features to enhance outdoor play experiences (a total of 249 features were chosen by 101 participants).

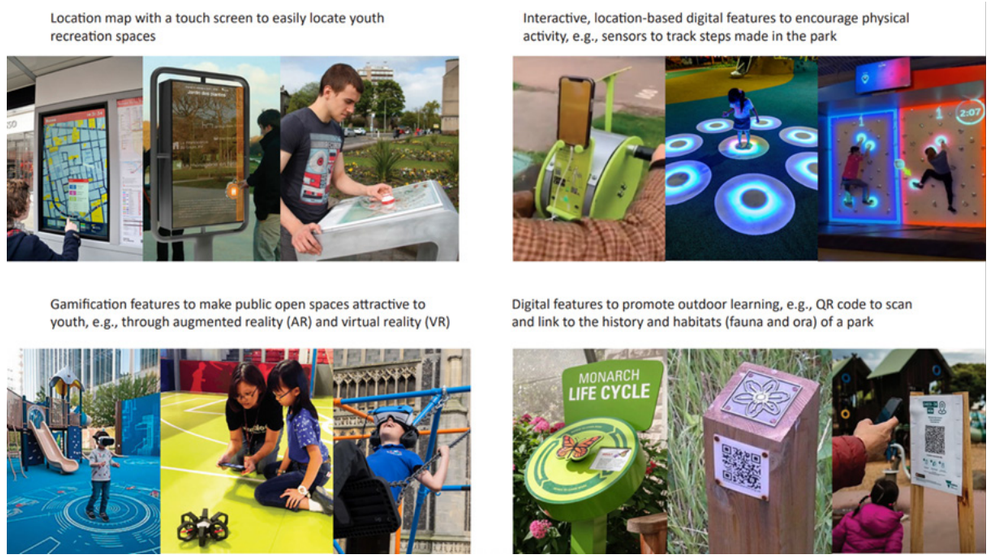
The most preferred digital feature is interactive location maps to help locate youth outdoor recreation spaces (30%). This is followed by gamification features (25%), interactive features to encourage physical activity (22%), and digital elements to promote outdoor learning (20%) (Figure 4.11). Overall, these results suggest that integrating technology, which supports navigation, physical activity, playfulness, and learning would have the potential to meet youth preferences for outdoor play spaces.

Figure 4.11. Preferences for digital interaction features in outdoor play spaces – youth digital population survey (N=249)



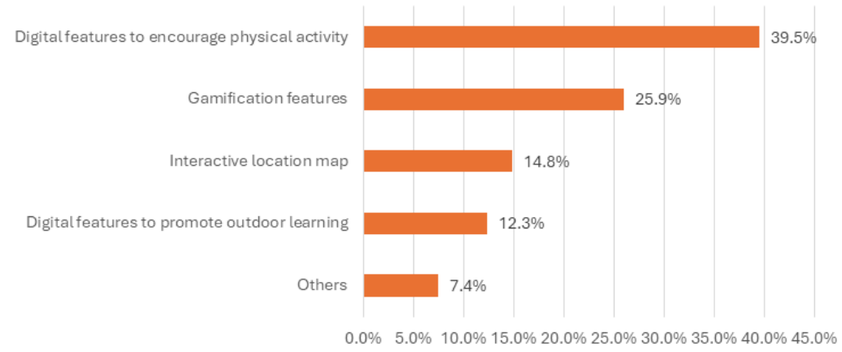
In the subsequent cognitive mapping activity, 25 participants were provided with a photo collage of the above digital features to choose from (Figure 4.12). They were encouraged to draw their own digital features. The selected feature was cut out and pasted to their drawing of ideal outdoor play space. This research design seeks to develop a more contextualised understanding of specific digital features and their role and location in youth outdoor play space development.

Figure 4.12. Photo collage of digital interaction features – cognitive mapping



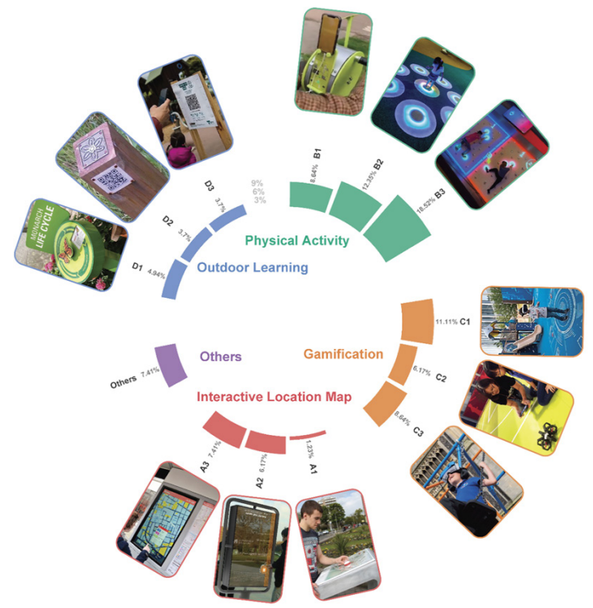
Cognitive mapping results provide further insights into youth aspirations for incorporating digital features into outdoor play spaces. On average, each participant selected or sketched 3.2 digital features for their ideal outdoor play spaces; a total of 81 digital feature were identified by 25 participants. Digital feature selections in the cognitive mapping activity closely mirror the digital survey finding (Figure 4.13). The most frequently chosen feature was digital features to encourage physical activity (40%), followed by gamification features (26%). These selections point to a desire for playful and interactive technology that makes outdoor play spaces more engaging and active. Others included interactive location maps (15%) and digital features to promote outdoor learning (12%) in their outdoor play space, suggesting opportunities to connect outdoor play space with educational content. Collectively, the findings from youth population survey and cognitive mapping reinforce a strong interest in merging technology into outdoor play environments to create more engaging, interactive, and educational experiences. The findings support the potential for digital placemaking to improve youth outdoor play experience.

Figure 4.13. Preferences for digital interaction features in outdoor play spaces – cognitive mapping (N=81)



At the level of specific digital features (Figure 4.14), the interactive climbing wall (B3) was the most popular feature, accounting for 19% of all choices. This is followed by sensors to track steps in the park (B2) at 12%. The dominance of these physical activity oriented devices underscores a strong demand for digital placemaking features that promote active recreation. There is a significant preference for immersive technology such as VR glasses (C1) at 11%, highlighting a demand for novel, exploration-based play experiences.

Figure 4.14. Specific digital features selected for outdoor play spaces – cognitive mapping (N=81)

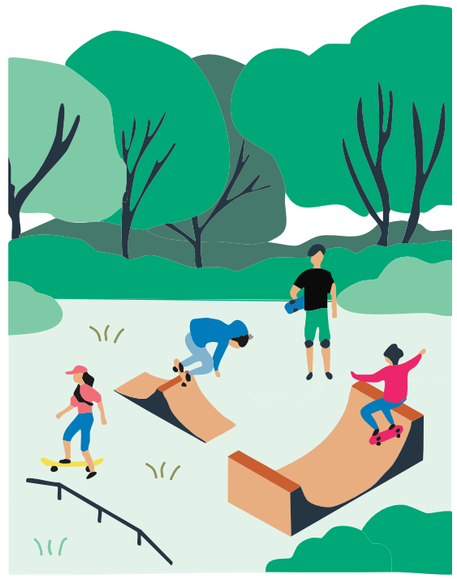


Key findings on what youth want in outdoor play spaces reiterate several implications for the planning and design of youth outdoor play spaces:

- **Prioritise active and age-appropriate recreation opportunities:** Youth strongly desire outdoor spaces that support active recreation like sports and active play. The implication is to address youth desire for active recreation and ensure that youth outdoor recreation spaces feature these highly valued elements such as sports facilities, play spaces tailored to youth (age 10-17), play equipment like swings, larger slides, and trampolines.
- **Provide places for social interaction:** Youth expressed a strong demand for outdoor play spaces that facilitate group and social activities like playing with friends, siblings and other family members, underlining the importance of outdoor spaces for fostering social interaction. The implication is for youth outdoor recreation spaces to recognise this need and provide spaces for social interaction. Programming can be introduced where appropriate, e.g., organise group games, team sports.
- **Integrate nature elements:** Youth value outdoor play environments that provide a range of nature elements such as greenery, gardens, water features, and opportunities to connect with nature and wildlife. The implication is to design and blend nature into youth outdoor play spaces, e.g., incorporating green spaces, waterbodies and other natural features to help encourage physical activity and social interaction and support youth well-being and outdoor learning.
- **Incorporate technology features:** Youth are keen on integrating digital features and tools into their local outdoor play spaces such as interactive location maps, gamification, sensors to encourage physical activity and outdoor learning. The implication is to design in technology and digital features to ease navigation, promote physical activity, improve playfulness, and facilitate learning. In an increasingly digital society, digital features and technology have the potential to make outdoor spaces more engaging and responsive to youth lifestyles.

START

Chapter 5



How to design youth outdoor play space

5. How to design youth outdoor play space

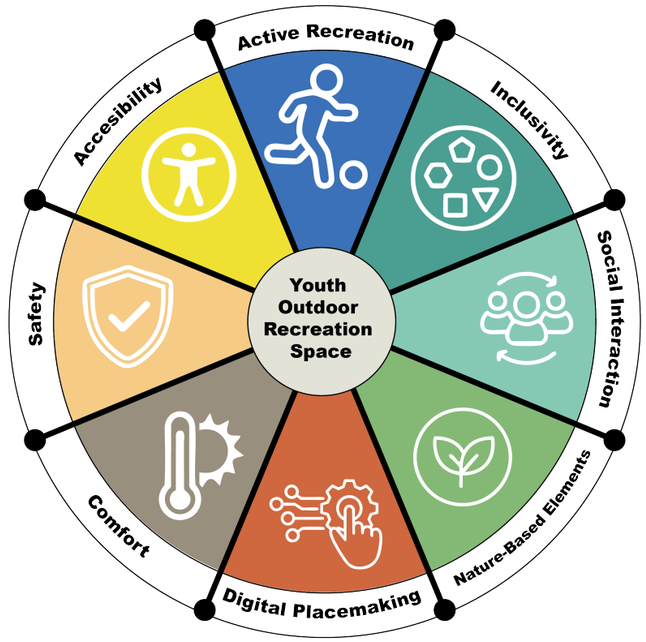
Key findings from international literature and our empirical research in Singapore reveal a critical needs gap in youth outdoor recreation spaces—outdoor activities offer multiple benefits to youth development, yet there is limited knowledge and disparities in access. In some neighbourhoods, there is a lack of youth outdoor play space availability. Research has found that urban youth with limited access to green spaces and outdoor play face distinct challenges, underscoring the need for targeted interventions.[56] Parks and green spaces are ideally situated (they are found in every neighbourhood) to supply opportunities to help youth develop themselves. The recommendation is to create not only children playgrounds for younger children but also more youth-centric outdoor play spaces in neighbourhoods. Youth prefer places that offer favourable facilities where they can express themselves and interact with friends. Our findings suggest strengthening several development characteristics—have age-appropriate, accessible, comfortable, safe, and well maintained play spaces and facilities.

Eight key strategies (Figure 5.1) are proposed:

- Prioritise spaces for active recreation
- Embrace inclusive design for diverse youth needs
- Provide spaces for social interaction
- Integrate with nature-based elements
- Incorporate digital placemaking features
- Comfort and climate-responsive design matters
- Safety remains a top priority
- Accessibility is essential

56 Akpınar, A. (2019). Green exercise: How are characteristics of urban green spaces associated with adolescents' physical activity and health? *International Journal of Environmental Research and Public Health*, *16*(21), 4281; Fromel, K., Kudlacek, M., Groffik, D., Svozil, Z., Simunek, A., & Garbaciak, W. (2017). Promoting healthy lifestyle and well-being in adolescents through outdoor physical activity. *International Journal of Environmental Research and Public Health*, *14*(5), 533; Poulain, T., Sobek, C., Ludwig, J., Igel, U., Grande, G., Ott, V., Kiess, W., Körner, A., & Vogel, M. (2020). Associations of green spaces and streets in the living environment with outdoor activity, media use, overweight/obesity and emotional wellbeing in children and adolescents. *International Journal of Environmental Research and Public Health*, *17*(17), 6321; Rivera, E., Veitch, J., Loh, V. H., Salmon, J., Cerin, E., Mavoa, S., Villanuella, K., & Timperio, A. (2022). Outdoor public recreation spaces and social connectedness among adolescents. *BMC Public Health*, *22*(1), 165.

Figure 5.1. Eight core elements for youth-centric outdoor recreation space



Prioritise spaces for active recreation

Respond to youth's strong demand for places for sports and active play. Active recreation facilities contribute to promoting physical health, social interaction, and active lifestyles among youth. A key strategy is to prioritise the provision of highly valued features in the neighbourhoods such as,

- Sports facilities, e.g., football field, badminton court, basketball court.
- Youth-oriented challenge play spaces, e.g., outdoor Ninja Warrior course (Box 5.1), multipurpose movement spaces (Box 5.2).
- Active play equipment that youth commonly find fun and engaging to play, e.g., swings (Box 5.3), larger slides (Box 5.4), and trampolines (Box 5.5).

Box 5.1. Outdoor Ninja Warrior Course, Guyatt Park — Brisbane, Australia

Guyatt Park features a free outdoor ninja-warrior-style course. The ninja course includes a sequence of 11 obstacles designed to test agility, coordination, strength and problem-solving in an open-ended, self-paced way, with the challenge of completing each section without touching the ground. A QR code at the start lets users time themselves and compare runs. The course is generally suited to older children over the age of 12 and youth as many obstacles are high and physically challenging. The park also offers two separate shaded playgrounds, picnic and BBQ facilities, paths and river views, making it a versatile outdoor space for varied ages and activities.

Outdoor Ninja Warrior Course at Guyatt Park

Source: Brisbane Kids. (2024, June 19). *Guyatt Park- St Lucia Warrior Park.* https://brisbanekids.com.au/guyatt-park-st-lucia-warrior-park/

Box 5.2. StreetDome — Haderslev, Denmark

Completed in 2014, StreetDome is one of Denmark's most prominent youth movement spaces, combining skateboarding, parkour, climbing, and outdoor fitness within a 4,500 m² open urban landscape. Developed by CEBRA Architecture and Glifberg+Lykke, the project emerged from extensive dialogue with young people, ensuring the design met the needs of diverse user groups, particularly youth. The outdoor area includes calisthenics rigs, parkour structures, climbing walls, rails, bowls, and flexible open surfaces that support unstructured movement. The space functions as an "open playground" for youth, emphasising creativity, self-directed activity, and social interaction rather than formal programming. Its mix of high-intensity, skill-based, and exploratory features makes it especially attractive to youth who use the space to train, experiment, socialise, and build confidence.

StreetDome multipurpose movement spaces
Image source: ArchDaily

Source: ArchDaily. (2019, September 1). *StreetDome / CEBRA + Glifberg + Lykke.* https://www.archdaily.com/558349/streetdome-cebra-glifberg-lykke. Inhabitat. (2014, October 17). *Massive Green-Roofed StreetDome Skate Park Pops Up in Denmark.* https://inhabitat.com/cebra-and-glifberglykkes-streetdome-redefines-urban-recreation-in-denmark/streedome-denmark/

Box 5.3. Raintree Cove, East Coast Park — Singapore

Raintree Cove at East Coast Park offers a cluster of swing types, including traditional single-seater swings, basket swings, and hammock-style swings arranged within a landscaped coastal setting. The presence of classic single-seat swings alongside adjacent multi-user swings provides options for both independent and social play. This variety allows youth to choose their preferred mode of swinging, whether individual, competitive, or collective. The site also includes a nature-play garden with logs of varying heights, balancing beams, and a small obstacle course made from up-cycled tree trunks.

Swing cluster at Raintree Cove, East Coast Park
Image source: ByKido

Source: ByKido. (2021, July 21). *Raintree cove swings and nature park at east coast park.* https://www.bykido.com/blogs/playgrounds-and-more/raintree-cove-swings-and-nature-play-at-east-coast-park; NParks. (n.d.). *Raintree Cove at East Coast Park.* https://www.nparks.gov.sg/visit/parks/east-coast-park/amenities/raintree-cove

Box 5.4. Lilidorei Play Village – Northumberland, England

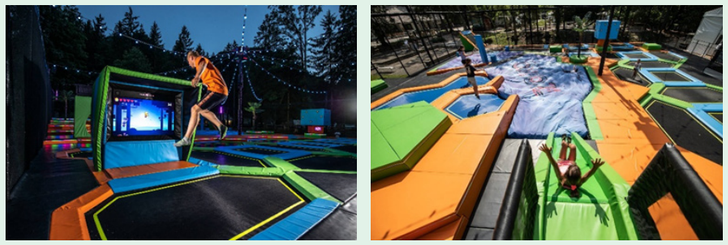
Opened in 2023 at Alnwick Gardens in Northumberland, England, Lilidorei is promoted as the world's largest play structure of its kind. Built within the grounds of Alnwick Castle at a cost of £15 million, it presents a fantasy-themed playground conceived as a mystical hamlet inhabited by clans of elves, trolls, fairies, and goblins. The design combines towering timber structures, rope bridges, wire domes, and 24-meter stainless-steel slides. These oversized slides are woven into the narrative fabric of the hamlet, enabling children to descend dramatically from height while immersing themselves in a story-driven environment. Sustainability is central to the project, with natural materials used throughout and plastics deliberately avoided. The play village is set within a forest of more than 1,500 Nordic Christmas trees, enhancing its magical atmosphere and sense of immersion.

Lilidorei Play Areas
Image source: Monstrum

Source: Pegasus Group. (n.d.). *Lilidorei, The Alnwick Garden.* https://www.pegasusgroup.co.uk/projects/lilidorei-the-alnwick-garden/; Monstrum. (n.d.). *Lilidorei Play Village.* https://monstrum.dk/en/playground/lilidorei-play-village; Visit Northumberland. (n.d.). *Lilidorei at The Alnwick Garden.* http://www.visitnorthumberland.com/explore/things-to-do/attractions/family-friendly/lilidorei-alnwick-garden

Box 5.5. Fun Park Zaka — Bled, Slovenia

Fun Park Zaka is a 600 m^2 outdoor trampoline and recreation park opened in 2022 within the green space of Lake Bled, Slovenia. As one of Europe's first large-scale outdoor trampoline parks, it combines youth and family activity with the natural landscape. The facility features interconnected jumping mats, modular trampoline layouts, inflatable bouncers, and themed play areas. Digital games are preinstalled on some trampolines, offering interactive challenges for skilled jumpers, while additional acrobatic elements such as beams and tightropes, are supported by trampolines and air cushions for safety. At dusk, the park transforms into a disco zone with lighting effects, extending its appeal into evening hours. Completed in just two months, Fun Park Zaka demonstrates the rapid feasibility of deploying outdoor trampoline infrastructure. Its scenic setting and integration with broader leisure amenities have made it a popular destination for both families and tourists, establishing an open-air, community-oriented hub that redefines youth play space by merging active recreation with place-based design.



Fun Park Zaka Trampoline Play Spaces
Image source: Zaka Fun Park

Source: Fun Park Zaka. (n.d.). *Trampoline Park*. https://funparkzaka.com/; d.o.o, A. (n.d.). *Fun Park Zaka—Bled, Slovenia*. https://www.bled.si/en/what-to-see-do/activities/2024012523294686/fun-park-zaka/; Akrobat. (n.d.). *Fun Park Zaka Trampoline park—Case study*. https://blog.akrobat.com/en/fun-park-zaka-trampoline-park-case-study

Embrace inclusive design for diverse youth needs

Recognise that youth are not homogenous. Variations by age subgroup, gender, and ability necessitate inclusive design consideration. The recommendation is to identify and integrate diverse user inputs from the outset of the planning and design process to provide flexibility and choice in how youth interact with the outdoor play environment and facilities. Strategies to advance inclusivity include:

- Provide a range of age-appropriate facilities, e.g., active recreation facilities mentioned above (Box 5.1 to 5.5) and play structure designed for older children (Box 5.6).
- Advance gender equity in outdoor play space provision through gender-responsive design (Box 5.7) and advocacy initiatives (Box 5.8).
- Involve youth in the co-design of outdoor play space using participatory methods such as community design workshops, environmental audit (Box 3.1) and cognitive mapping of outdoor play spaces (Box 4.1).

Box 5.6. Frew Park Arena Play Structure, Brisbane, Australia

Opened in November 2014, Frew Park Arena Play Structure in Brisbane transforms the historic site of the former Milton Tennis Centre and Milton Bowl into a distinct Arena designed specifically to engage older children and early adolescents (ages 10–15). While traditional playgrounds often alienate this demographic with small-scale equipment and primary colours, Frew Park embraces the concept of risk and challenge as a vital component of inclusive design. The project addresses the need for this age group to have spaces that feel physically demanding, aesthetically "cool", and socially conducive for hanging out.

By blending the site's sporting heritage with industrial aesthetics, the design moves beyond the standard playground archetype to create a space that feels like a futuristic urban ruin or a parkour training ground. It validates the diverse needs of youth by offering a range of activity: high-intensity zones for climbing, sliding, and parkour, balanced with elevated observation decks for socialising and being seen. The structure features massive raw concrete walls, suspended steel mesh cages, and a towering tube slide—elements that provide the height, challenge, and distinct sense of place required to keep youth active and engaged in the public realm.

Frew Park Arena Play Structures

Source: Brisbane City Council. (n.d.). *Frew Park*. https://www.brisbane.qld.gov.au/parks-and-recreation/parks-and-greenspaces/book-a-park-site/frew-park; Heart Foundation. (n.d.). *Frew Park Playground.* https://www.healthyactivebydesign.com.au/case-studies/frew-park-playground

Box 5.7. Frizon – Umeå, Sweden: Re-imaging outdoor play space for teenage girls

Project Frizon in Årstidernas Park (Umeå, Sweden) is a pioneering outdoor meeting and play space developed specifically for teenage girls. Conducted through the municipality's gender-equal public spaces programme, the project involved direct dialogue with girls in the city to understand their experiences of public spaces and what would make them feel welcome. The project seeks to address multiple barriers teenager gilds often face in outdoor recreation spaces: feeling unseen, unsafe or simply uninterested in typical youth play zones (like large multi-use game areas or skate parks).

By engaging with teenager girls in the planning process and then delivering a space that aligns with their desires—a comfortable, sociable, visually inviting environment where they can relax, connect with friends, listen to music, and feel a sense of ownership—the project illustrates how public open space can be re-imagined so that teenage girls are active participants rather than passive users. The play space is featured with ergonomic seating tailored to average female height, swings configured for social use, WiFi connectivity, and a colourful roof that can be seen from afar—all located in a central, well-lit and visible area of the park.

Frizon outdoor play space for teenage girls
Image source: MKSK Studios

Source: Make Space for Girls. (n.d.). *Frizon, Umeå*. https://www.makespaceforgirls.co.uk/case-studies/umea; MKSK Studios. (2023, May 12). *What would a woman-made city look like?* https://mkskstudios.com/dialogue/what-would-a-woman-made-city-look-like; Green Flag Award. (2023). *Make Space for Girls: Research Report 2023 (UK)*. https://www.greenflagaward.org/media/2428/msfg-research-report-2023-uk.pdf

Box 5.8. Make Space for Girls (MSFG)

Make Space for Girls (MSFG) is a UK-based charity and advocacy initiative dedicated to improving the accessibility of parks and public spaces for adolescent girls. The organisation points out that many urban playgrounds—like skate parks, soccer fields, and multi-use play areas—tend to attract mainly boys, leaving girls with fewer appealing recreational options. Through research, collaboration with local councils, and direct engagement with young people, MSFG delves into how design, planning, and programming can be made more inclusive. Their focus is on evidence-based strategies rather than simply adding new facilities, emphasizing that a deeper understanding of how girls interact with public spaces—socially, physically, and emotionally—is essential for creating areas that are engaging for everyone.

The initiative is significant for its emphasis on equitable access to outdoor play and social spaces, rather than promoting gender exclusivity. MSFG contends that when adolescent girls feel unwelcome in parks due to a lack of suitable spaces, communities forfeit valuable opportunities for health, social connection, and varied usage. Their recent three-year strategy, launched in 2024, champions gender-responsive public space design through co-design workshops, awareness campaigns, and practical design tools for urban planners and architects. By advocating for features like flexible activity zones, comfortable seating clusters, improved lighting, and visible access paths, MSFG aims to ensure that outdoor public spaces are safer, more inclusive, and adaptable—not only for girls but for all users seeking inviting environments in their neighbourhoods.

Image source: ArchDaily

Source: ArchDaily. (2024, March 7). *Make Space for Girls launches strategy for gender-inclusive public spaces*. https://www.archdaily.com/1034835/make-space-for-girls-launches-strategy-for-gender-inclusive-public-spaces ; Make Space for Girls. (n.d.). *Make Space for Girls*. https://www.makespaceforgirls.co.uk/

Provide spaces for social interaction

Address youth's strong demand for outdoor play spaces that facilitate group and social activities such as playing with friends and siblings, group games, team sports, performance, etc. Key strategies include:

- Repurpose underutilised public open spaces, e.g., viaducts of train tracks (Box 5.9), rooftops (Box 5.10) and for youth outdoor recreation activities
- Develop integrated youth hub to foster social connection among young people (Box 5.11).
- Introduce programming where appropriate, e.g., pop-up events to reclaim public spaces for and with youth (Box 5.12).

Box 5.9. Djerring Trail Community Open Space — Melbourne, Australia

Opened in 2018, the Djerring Trail is a 17-kilometre shared-use corridor created beneath elevated rail infrastructure in Melbourne's south-east. By raising the rail line, the Level Crossing Removal Project reclaimed the space at ground level for continuous public movement, transforming previously fragmented pockets of land into an uninterrupted walking and cycling spine. The trail connects 13 stations and integrates seamless transfers between rail and active mobility, strengthening everyday accessibility across multiple neighbourhoods. Beyond transport, the corridor incorporates a series of social and recreation spaces, sports courts, skate areas, playgrounds, fitness zones, and shaded seating, woven directly into the mobility network.

Image source: Landscape Architecture Australia

Source: Victoria State Government. (n.d.). *NEW COMMUNITY OPEN SPACE*. https://bigbuild.vic.gov.au/__data/assets/pdf_file/0006/603186/LXRP-MRPA-Carnegie-Open-Space_WEB.pdf ; Beza, B., & Ricardo, R. R. (2019). Beneath the rail line. *Landscape Architecture Australia*, (163), 26–33.

Box 5.10. Seoul Urban Pinball Machine – South Korea

The Seoul Urban Pinball Machine by Studio Heech is an experimental rooftop installation that transforms the sloped roof of the Seoul Hall of Urbanism & Architecture into a large-scale, interactive play landscape. Designed as a temporary, movable structure, the project repurposes recycled and eco-friendly materials to create a participatory "urban pinball" field where users activate motion-responsive elements by moving across the surface. Rather than functioning as a traditional playground or pavilion, the installation serves as an experiential platform for testing new forms of public engagement, sustainability practices, and spatial performance in a dense urban context.

As an open-ended play environment, the project is particularly relevant for youth aged 10–17 who benefit from spaces that support exploratory, social, and physically expressive forms of play. The tactile obstacles, sculptural play components, and performative qualities of the sloped surface invite running, climbing, group interaction, and creative use—making the rooftop a site for experimentation rather than prescriptive play. By treating the rooftop as a living laboratory for public space design, the project demonstrates how unconventional, temporary, and easily deployable interventions can expand recreation opportunities for youth and reimagine overlooked urban surfaces as vibrant social infrastructure.

Seoul Urban Pinball Machine
Image source: Archello

Source: ArchDaily. (2021). *Seoul Urban Pinball Machine / Studio Heech.* https://www.archdaily.com/970059/seoul-urban-pinball-machine-studio-heech; Archello. (2021). *Seoul Urban Pinball Machine.* https://archello.com/project/seoul-urban-pinball-machine; Studio Heech. (2021). *Seoul Urban Pinball Machine.* https://www.studioheech.com/index.php/projects/seoul-urban-pinball-machine

Box 5.11. Factoria Joven 'Youth Factory' – Merida, Spain

Factoria Joven is a highly innovative youth and community hub designed by SelgasCano Arquitectos to support street-culture, creativity, and social connection in a city where many young people are unemployed and lack safe, constructive space. The facility includes a large skate/BMX park, a rock-climbing wall, graffiti art zones, and space for free-form activities like tightrope walking, all sheltered beneath a swooping, undulating orange-and-white polycarbonate canopy. The indoor area of Factoria Joven supports broader youth engagement through a computer lab, dance studio, meeting rooms, and performance spaces (for video, street theatre, music, etc.). Its programming is as important as its design: the site hosts workshops in music, dance, and offers counselling and group support. The centre is funded by the regional government (Junta de Extremadura) and deliberately built using recycled materials and low-cost construction to reflect both sustainability and social purpose.

Factoria Joven 'Youth Factory' outdoor area
Image source: Project for Public Spaces

Source: Millard, C. (2015, June 1). Young people and placemaking: Engaging youth to create community places. *Project for Public Spaces*. https://www.pps.org/article/young-people-and-placemaking-engaging-youth-to-create-community-places; The Cool Hunter. (2011, July 9). *Youth Factory – Mérida, Spain*. https://thecoolhunter.net/youth-factory-merida-spain/ ; Katz, M. E. (2011, October 28). Factoria Joven skate park. *Design Milk*. https://design-milk.com/factoria-joven-skate-park/

Box 5.12. Esplanade Youth Plaza, Western Australia

The Esplanade Youth Plaza in Fremantle, is a purpose-built urban space designed to foster youth engagement through physical activity, creativity, and social interaction. Built in 2014, it features a world-class skate/BMX/scooter plaza, Western Australia's first outdoor parkour park, ping-pong tables, slacklining, and a rock-climbing facility—all shaped with young people's input during extensive consultation. By integrating active and passive zones, the plaza supports both high-energy sports and relaxed gathering, while its lighting and design encourage evening use too. Regarding programming, the Youth Plaza hosts events and workshops that go beyond just free play: there are youth music performances on a summer stage, skills-sharing sessions run by the onsite Dismantle bike workshop, parkour demos, and facilitated sessions for beginners. This not only builds physical literacy but empowers youth by giving them ownership through ongoing engagement, design input, and a safe, inclusive space to connect and grow.

Youth event at Esplanade Youth Plaza
Image source: Healthy Active by Design

Source: Healthy Active by Design. (n.d.). *Esplanade Youth Plaza*. Heart Foundation. https://www.healthyactivebydesign.com.au/case-studies/esplanade-youth-plaza ; Landscape Australia. (2016). *Freo's "Happy Park": Esplanade Youth Plaza*. https://landscapeaustralia.com/articles/freos-happy-park-esplanade-youth-plaza/.

Integrate with nature-based elements

Contact with nature not only improves youth's well-being but also provides opportunities for outdoor learning. Key strategies include:

- Incorporate nature-based elements into youth outdoor play spaces, e.g., green spaces, waterbodies, and other natural features to help promote play, physical activity, and learning in outdoor environments (Figure 5.2 and Box 5.13).
- Introduce nature-based programming to cultivate youth's interests in nature and outdoor learning and foster sense of belonging (Box 5.14).

Figure 5.2. Youth playgrounds made of natural elements

Top row: Lincoln Square Playground, Melbourne, Australia; bottom row: NaturePlay at Royal Park, Melbourne, Australia

Box 5.13. Terra Nova Adventure Play Environment, Richmond, Canada

Terra Nova Adventure Play Environment, completed in 2013, redefines the concept of nature play by moving away from off-the-shelf plastic structures and immersing youth in a dynamic, landscape-driven environment. Located on a historic rural site along the Fraser River estuary, the design prioritises a direct connection with the raw elements of nature, including earth, water, wood, and air, to foster physical resilience and mental well-being of older children.

The project treats the landscape itself as the primary play equipment. Instead of distinct play zones, the space flows through a meadow maze of long grasses and native plantings, encouraging exploration and hide-and-seek games that appeal to older children. Central to the design is the integration of natural topography and water. A custom log jam structure mimics the debris found in the nearby river, offering climbing opportunities, while water pumps and channels allow youth to manipulate water flow, engaging them in tactile, cause-and-effect learning. Terra Nova demonstrates that green spaces can offer high-value recreation, merging physical challenges with the restorative benefits of nature to support youth well-being and active learning.

Nature-based play features in Terra Nova Adventure Play Environment
Image source: Hapa Collaborative

Source: Hapa Collaborative. (n.d.). *Terra Nova Adventure Play Environment, a Place for "Off-Leash" Kids.* https://hapacobo.com/projects/terra-nova-play-environment/; City of Richmond. (n.d.). *Terra Nova Adventure Play Environment.* https://www.richmond.ca/parks-recreation/parks/parksearch/park.aspx?ID=116#header

Box 5.14. Freetown Farm – Columbia, Maryland, USA

Freetown Farm is a 6.4-acre community-based educational farm in Maryland that uses gardening and ecological stewardship as a platform for youth development. Through its youth internship programme, teenagers engage in hands-on outdoor learning activities such as growing organic produce, planting native pollinators, maintaining garden beds, and harvesting food. These activities are complemented by environmental education, arts-based workshops, and leadership training, giving participants a holistic understanding of sustainability while fostering confidence, teamwork, and a sense of belonging. The farm's diverse ecosystems—food forests, market gardens, medicinal-herb gardens, meadows, and ponds—serve as an immersive classroom where youth build practical skills and deepen their connection with nature as well as nurture resilience, inclusivity, and environmental stewardship.

Beyond cultivating environmental knowledge, the farm's programme helps address disparities in access to green space by intentionally involving youth from varied socioeconomic and cultural backgrounds. Participants report improved mental well-being, social connectedness, and stronger community identity as a result of their time at the farm.

Freetown Farm
Image source: yesmagazine

Source: Chawla, A. (2021, September 9). *This experiential learning farm helps youth build a better world.* YES! Magazine. https://www.yesmagazine.org/environment/2021/09/09/farm-youth-climate-land-community

Incorporate digital placemaking features

Harness digital technology to improve outdoor play space experience. Digital features that support navigation, promote physical activity, enhance playfulness, and facilitate learning are increasingly available to make outdoor spaces more engaging and responsive to youth needs and preferences for recreation activities. Key strategies include:

- Incorporate interactive music features into outdoor play spaces, e.g., outdoor DJ station (Box 5.15).
- Combine digital features with sports facilities, e.g., soccer arena, to tap on youth' strong desire for active recreation (Box 5.16).
- Use interactive public art installations to raise awareness of health through outdoor play (Box 5.17).

Box 5.15. Bicentennial Skate Park DJ Station, Chelsea – Kingston, Australia

At Bicentennial Skate Park in Chelsea, a purpose-built outdoor DJ station known as the Fono DJ Booth was installed in 2017. Commissioned by the City of Kingston and manufactured by Yalp Interactive, the installation allows teenagers and youths of all ages to plug in a mobile device, mix and share music, and socialise within the skate-park setting. Designed specifically for outdoor use, the DJ station integrates into the urban park environment and adds a creative, music-based activity into the mix of recreational facilities.

Outdoor DJ station
Image source: Lark Industries

Source: Lark Industries. *Bicentennial Skate Park DJ Station, Chelsea VIC.* https://www.larkindustries.com.au/portfolio_post_list/kingston-vic/

Box 5.16. Tengelmann Arena – Sportpark Styrum, Mülheim an der Ruhr, Germany

Opened in 2022 as part of the wider redevelopment of Sportpark Styrum, the Tengelmann Arena presents a new approach to interactive play and community sports infrastructure. The arena integrates digital play equipment and interactive floors into a multifunctional sports hall, transforming traditional recreation into a dynamic, technology-enhanced experience. Interactive play installations include the Sutu ball wall, which responds to kicks with lights and sounds, and interactive floors and walls that project games and challenges onto surfaces. These features encourage children and youth to run, jump, and compete in gamified environments, blending physical activity with digital engagement. The equipment is designed to support both spontaneous play and structured training sessions. The project has been highly successful, attracting schools, sports clubs, and families, and positioning Mülheim as a leader in innovative youth recreation.

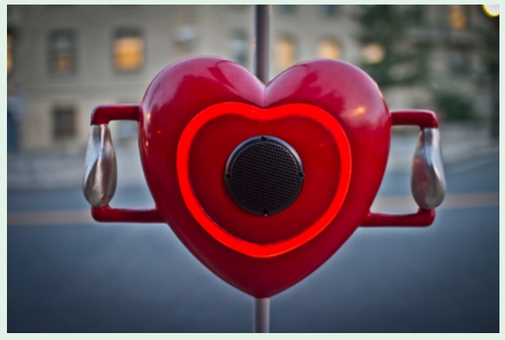
Children playing soccer on the Sutu Interactive Ball Wall
Image source: Lappset

Source: Lappset. (n.d.). *Interactive Play in Mülheim an der Ruhr's | The world of playgrounds and sports*. https://www.lappset.com/en-US/interactive-play-muelheim; Issuu. (n.d.). *Sportpark Styrum in Mülheim*. https://issuu.com/iaks/docs/sb_6-2022_en/s/17629637; Landezine. (2022, August 30). *Sportpark Styrum in Mülheim by DTP Essen*. https://landezine.com/sportpark-styrum-in-mulheim-by-dtp-essen

Box 5.17. Pulse of the City – Boston, USA

Launched in 2011 by Boston's Office of New Urban Mechanics, Pulse of the City installed five oversized, heart-shaped sculptures across the city, each equipped with sensors to capture a passerby's heartbeat and translate it into a personalised musical composition. This interactive display was conceived as a playful intersection of public art and public health, encouraging residents to reflect on their well-being while engaging with the city in a novel way. Designed by artist George Zisiadis and fabricated locally, the installations are powered by solar panels and placed strategically near transit hubs, parks, and athletic centres to maximise accessibility.

The project was first prototyped at San Francisco's Urban Prototyping Festival before being adapted for Boston. The initiative ran for nine months and recorded 16,575 uses across the five sites. Lessons learned included the importance of durability in public art as several sculptures required reinforcement after heavy use. The City of Boston also noted that more people might have used the monitors if they had signage with instructions as many people did not know how to interact with it.



Pulse of the City
Image source: City of Boston

Source: City of Boston. (2019, November 22). *Pulse of the City | Boston.gov.* https://www.boston.gov/departments/new-urban-mechanics/pulse-city; Young, M. (n.d.). Interactive Heartbeat Installations. *TrendHunter.Com.* https://www.trendhunter.com/trends/pulse-of-the-city

Comfort and climate-responsive design matters

Respond to local climate. Protection from sun and rain can help promote youth engagement with outdoor activities, especially in view of Singapore's tropical climate. Design strategies for enhancing comfort include:

- Provide shaded play spaces, e.g., under tree canopy, building shade and shelter (Figure 5.3).
- Offer comfortable seating areas for youths to rest and have conversations.
- Provide shelter over certain outdoor play spaces where appropriate, e.g., multipurpose sports courts, amphitheatres

Figure 5.3. Youth play spaces with comfort design features

Safety remains a top priority

Safety is central to the design and use of outdoor play spaces. Common concerns include playground hazards, fall risks, pedestrian safety, and crime. Rather than addressing safety only after problems arise, a Prevention through Design approach is recommended, with safety considerations integrated throughout planning, design, and maintenance. Key strategies include:

- Regular maintenance and upkeep of play spaces to ensure safe surfaces and age-appropriate equipment, and to reduce risks arising from wear, damage, or misuse (Box 5.18).
- Public education on the proper use of play spaces such as encouraging appropriate attire (e.g. closed-toe shoes), correct use of equipment, and awareness of surroundings and other users, to help prevent falls and accidents.

Box 5.18. Importance of Playground Maintenance – USA

In the USA, about 200,000 children visit the emergency room each year due to playground-related injuries, with nearly half of these injuries classified as severe. Playground design practice Miracle Recreation spotlights the importance of regular inspections and maintenance in keeping city parks safer and more welcoming for the community:

- Regular inspections help identify emerging hazards before injuries occur. Playgrounds require particular attention as ageing structures or heavy use can result in broken or chipped components, sharp edges, or protruding fasteners, all of which increase injury risk
- Ongoing maintenance and cleanliness support both safety and use. Poorly maintained equipment and accumulated litter can discourage use and create additional health risks, including unsanitary conditions that allow bacteria to proliferate

Source: Miracle Recreation. (n.d.). *6 Tips for Keeping City Parks Safer.* https://www.miracle-recreation.com/blog/tips-for-keeping-city-parks-safer/?lang=ca

Accessibility is essential

Accessible outdoor play spaces in the neighbourhood are essential for encouraging convenient, regular outdoor activity. Accessibility depends not only on the presence of facilities but also on their location, connectivity, and integration into everyday environments. Key strategies include:

- Address limited availability of youth play spaces and access disparities in local neighbourhoods, particularly in underserved areas (Box 5.19 and Box 5.20).
- Locate youth outdoor play spaces within walking or cycling distance of homes and schools to support frequent, independent use.
- Ensure easy access and good connections to public transport to provide safe and convenient access for users.

Box 5.19. Green schoolyards – Space to Grow, Chicago, USA

Green schoolyards transform public school grounds into nature-based play and learning spaces that are accessible to both students and the adjoining community. Chicago's Space to Grow programme converts underused, asphalt-dominated schoolyards into green, multifunctional spaces that support everyday outdoor play, environmental learning, and community use. Targeted primarily at underserved neighbourhoods, green schoolyards help address disparities in access to safe, high-quality outdoor play space while placing activity spaces within walking distance of homes and schools. As of 2024, 34 green schoolyards have been implemented across Chicago. Beyond play, these spaces function as neighbourhood green infrastructure, incorporating stormwater management features that reduce flooding and urban heat while improving climate resilience.

Fernwood Elementary School, Washington Heights
Image source: Space to Grow

Source: Space to Grow. (n.d.). *Space to Grow: Greening Chicago Schoolyards*. http://www.spacetogrowchicago.org; Space to Grow. (n.d.). *School Profiles*. https://www.spacetogrowchicago.org/about/school-profiles/

Box 5.20. Neighbourhood Greening and Youth Health – Project VITAL, Baltimore, USA

In USA, researchers have proposed a new greenspace-health framework, *Greening Theory of Change* that addresses the effect of greening instead of green space on youth health. The theory explores how urban greening initiatives, e.g., conversion of vacant land to community-cared-for green spaces and their possible mechanisms of change modify distal social determinants of youth health, both short- and long-term health as well as the economic and security effects of greening.

The theory has informed the design and development of Project VITAL (Vacant lot Improvement to Transform Adolescent Lives) in Baltimore, Maryland. Launched in 2020, the project has four key aims: 1) build a citywide sharable database on vacant lot restoration activities, 2) evaluate the effect of greening initiatives on youth health outcomes, 3) conduct cost-effectiveness analyses, and 4) develop best practices for greening programmes for improved youth health.

McKean vacant lot, before (left) and after transformation (right)
Image source: Johns Hopkins Bloomberg School of Public Health

Source: Kondo, M. C., Locke, D., Hazer, M., Mendelson, T., Fix, R. L., Joshi, A., Latshaw, M., Fry, D., & Mmari, K. (2024). A greening theory of change: How neighborhood greening impacts adolescent health disparities. *American Journal of Community Psychology*, *73*(3–4), 541–553. https://doi.org/10.1002/ajcp.12735; Burtka, A. T. (2025, July 16). A green path to improve teen mental health, in Baltimore and beyond. *The Hub*. https://hub.jhu.edu/2025/07/16/greening-teens-mental-health-project-vital

Final check: Does your outdoor play space meet youth's needs and preferences

Use the below checklist to quickly review whether an outdoor play space provides the key features to meet youth's needs and preferences for play spaces and facilities—is the play space age-appropriate, accessible, comfortable, engaging, safe, and well maintained? The checklist can be used by all—youth, parents, caregivers, built environment professionals, and the community, who are interested in promoting outdoor play among youth. More green time less screen time is vital to support youth's physical, social, mental and cognitive development.

Things to avoid

When implementing youth outdoor play spaces, it is important to avoid features and conditions that undermine youth engagement, safety, and comfort. Key things to avoid include:

- Spaces that are not age-appropriate or fail to accommodate the preferences of older children and youth for active recreation and social interaction.
- Play areas that are difficult for all youth to reach and use, including those with disabilities.
- Play spaces that are designed mostly for boys.
- Environments that lack comfort such as insufficient seating, shade, or shelter.
- Areas that are unsafe due to poor visibility, lack of sightlines, inadequate lighting, lack of regular maintenance, or lack of pedestrian safety.
- Facilities that are poorly maintained, unattractive, or feel unwelcoming, which can discourage use and social interaction.

Avoiding pitfalls is a proactive approach towards youth-responsive outdoor recreation spaces. The strategy is to involve and collaborate with youth through all stages of outdoor play space development.

Youth Outdoor Play Space Checklist	
Core elements	**Does your outdoor play space provide these features?**
Active Recreation	☐ Sports facilities (e.g., football field, badminton court, basketball court) ☐ Youth-oriented challenge play spaces (e.g., outdoor Ninja Warrior course, multipurpose movement spaces) ☐ Active play equipment that youth commonly find fun and engaging to play (e.g., swings, larger slides, and trampolines)
Inclusivity	☐ Age-appropriate facilities--not just for young children but also for teens ☐ Play spaces for both girls and boys ☐ Involve and collaborate with youth (e.g., co-create inclusive youth playground, youth-led placemaking in playground and neighbourhood)
Social Interaction	☐ Structured play spaces (e.g., youth-centric playgrounds, youth hubs) to play with friends, siblings or other family members ☐ Unstructured places (e.g., rooftops and viaducts) to hang out with friends and family ☐ Youth programmes to facilitate social interaction among youth (e.g., pop-events, programmes for group sports, outdoor learning)
Nature-based Elements	☐ Nature-based play features (e.g., tree houses, tree logs, climb nets) ☐ Green spaces, waterbodies or other natural features ☐ Nature-based programming (e.g., gardening, urban farming)
Digital Placemaking	☐ Digital features combined with sports facilities (e.g., interactive soccer arena) ☐ Interactive music features incorporated into outdoor play spaces (e.g., outdoor DJ station) ☐ Interactive public art installations to raise awareness of health through outdoor play
Comfort	☐ Shaded play spaces (e.g., under tree canopy, building shade and shelter) ☐ Comfortable seating areas ☐ Shelter over certain outdoor play spaces where appropriate (e.g., multipurpose sports courts, amphitheatres)
Safety	☐ Free from safety hazards (e.g., fall risks, traffic hazards) ☐ Age-appropriate facilities ☐ Well maintained play equipment and space
Accessibility	☐ Easy to find several outdoor play spaces in the neighbourhood ☐ Easy to reach outdoor play space, e.g., by walking, cycling, and public transport ☐ Outdoor play space is located along a safe route