# A CHILD'S GARDEN CITY

AN EXPLORATION OF CHILD-FRIENDLY DESIGN IN TODAY'S URBAN SPACES

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Master's Degree Project
May 2024

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Master's Degree Project in Sustainable Urban Design (ASBM01)
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# ACKNOLEDGEMENT

I would like to thank my supervisor Andreas Olsson for always being supportive and positive throughout this project. I would also like to thank my examiner Lars-Henrik Ståhl for the ideas and kindness. And I would like to thank my friends and family for being there for me through the challenges of this semester and my classmates for being in studio sp that we can support each other.

# ABSTRACT

Children do not have many spaces designed entirely for their needs in our world. This has inspired the concept of 'A Child's Garden City'. The idea includes research of how children can be included in design and the process of creating safer cities with their considerations in the center. This Master's Thesis can inspire the relationship between growing natural vegetation, self-sustaining infrastructure and community all considered from the perspective of children that will have their childhood within this environment. Urban Green Infrastructure (UGI) is a large part of 'A Child's Garden City'. UGI includes different natural sustainability features to help with greener communities. Factors such as forests, wetlands, urban agriculture, community gardens, urban trees, green roofs, rain gardens, swales and ecology on a micro-scale can help a community become more sustainable in water management, food creation and economical status. This is very significant for a future where the resources on our planet are limited and we need to find ways to work together and combat negative environmental implications. Introducing children to these factors of sustainability early on in their lives can help the future significantly. Through time, green developments will grow into larger, more used communities by children today and other future generations. Child-oriented communities should also include aspects of nature and play. Urban spaces should be created with play and nature integrated within and throughout. Cities with a children-oriented perspective to the world can encourage education, use and adaptability in different forms. It is fascinating to see how children can learn through their environment. They are more likely to care about the environment and sustainability if it was implemented around them from a young age and taught to them within a growing space. Child-friendly urban design is therefore valuable for humanity's future in sustainability and development.

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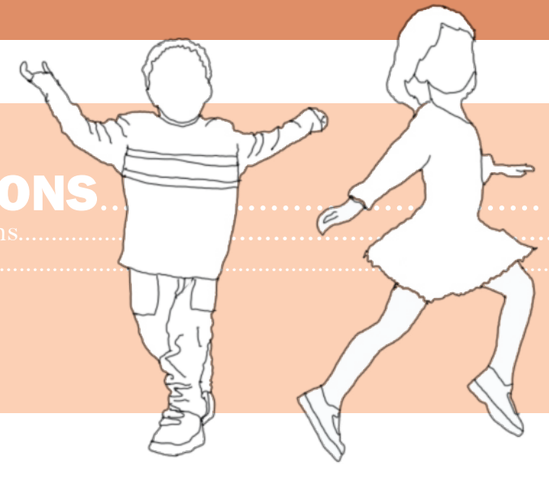


# INTRODUCTION

# 1

**“In the large, crowded conurbations many families inhabit, life feels riskier and more dangerous, and parents are naturally more protective of their children. In an ideal world a radical reorganization of the way we live might be the ultimate solution with urban planning initiatives taken to make our neighbourhoods, streets and schools more ‘human scale’”**

Tim Gill, 2007

We live in a world primarily designed for adults. This causes children to fit into a world that is not catered to them. Nelson Mandela once stated that "There can be no keener revelation of a society's soul than the way it treats its children" (Gill, 2021). Children are very valuable to our society and future. Child-friendly design is therefore necessary for all new neighborhoods being built today. "In any respects, child-friendly urban planning looks and feels like inclusive, sustainable, human-scale urban planning" (Gill, 2021). These factors are very intertwined and should be used in accessible urban design for all users. Child-friendly urban design can sometimes also be mixed up with family-friendly urban design. This means that children's needs can be misconstrued as their parents' needs in many cases. However, the needs of children can also be the needs of adults if applied properly, but not necessarily the other way around. Unfortunately, the reality is that children do not have a voice to be apart of the planning or design process or to really be heard on what makes a place better for them. Therefore, it is important that urban design and planning professionals become advocates for children's perspective moving forward into creating better long-term sustainable design (Gill, 2021).

The first eight years of a child's life are the most important when it comes to mental and physical development (Sugar et al., 2019). The environment a child grows into is very valuable to how they learn, grow and interact with the people and the world (Nebelong, 2014). Before entering adolescence, children use their surroundings in different ways to expand their knowledge and skills (Sugar et al., 2019). These surrounding influences are crucial to their development and their care for the environment (Sugar et al., 2019). If it is showcased to them from an early age, children are much more likely to take care of nature and be aware of the necessary action needed to create a healthy environment (Sugar et al., 2019). Brain development is a noteworthy reason to create child-friendly design in cities. Considering how vital it can be to encourage growth through the physical surroundings, it will be very beneficial to this project to utilize developmental and educational urban design elements. Children living in urban environments have a higher chance of resilience against poverty as a result of the economic growth in urban environments compared to rural environments (Sugar et al., 2019). For that reason, urban environments and urban planning principles are very significant for the groups of children that grow up in cities and their futures. Children can be exposed to negative aspects of their environments, such as through violence, destructive behavior and bullying due to (but not limited to) poor infrastructure or negative influences in their surroundings (Sugar et al., 2019). Through this degree project, it is my goal as an urban designer to try to limit negative environmental impacts on these surroundings. The point of urban design in this research is to showcase how important it is to include children in planning and design. It is also significant to add their needs into new or existing neighborhoods in order to improve their lives and encourage positive futures for them and everyone around them. The ideas researched will be implemented in Prague, Czech Republic on the site of Bubny-Zátory.

## LOCATION

Research Questions:

- What are the principles of child friendly design in the 21st century city?
- How can urban green infrastructure contribute to a child friendly city? Can sustainability be taught through your environment?
- What urban green infrastructure is best for a children centered neighborhood?

# CONCEPTS

# 2

# URBAN DESIGN FOR CHILDREN

Many cities around the world do not have children's needs as part of their city policies. This can make it difficult to prioritize children and the aspects that make children's needs important to urban design. The three pillars of a family-friendly city are housing, services and the public realm (Gill, 2021). This means safe housing, proximity to necessary services, and a strong sense of community through public features. In addition, the major urban design aspects to consider for children specifically are: safety, including traffic danger and criminality, physical and mental-wellbeing, fast learning and development and pollution levels (Gill, 2021). According to UNICEF, the best indicator of the quality of a community is the presence of children (Sugar et al., 2019). Children's lives in a place can showcase how the rest of the population is doing. The need for designers, planners and policy-makers to focus on children's needs is crucial to the future of urban design and its impact. The exploration of the best ways to do this will be discussed throughout this degree project.

Creating a child-friendly city is the key to creating a sustainable city for all. Child-friendly cities have the fundamental aspects of safety, education and mobility that act as a spine for strong urban design. These aspects are not only beneficial for children and their growing lives, but everyone around them. Unfortunately, there is no single definition of what a child-friendly city should be universally as it can vary according to different socioeconomic issues, which brings the issues of what was can do as urban designers to define a place dedicated to children (Vidal & Seixas, 2022). Through this research, there are strong basics to what child-friendly urban design looks like, for example, the strategies to creating a child-friendly city include:

- Walkability & mobility to school and local shops without an adult
- Playing outside within sight of home
- Feeling welcome and safe outside (in day or after dark)
- Having access to green natural space
- The access to outdoor places used for different purposes like relaxation, play or excitement
- Spaces with lots of room for gatherings
- Access to the central city through walking, biking or transit

In a perfect world, these strategies would be used in all cities and neighborhoods to create safe, welcoming and enjoyable spaces for not only children, but everyone in the community.

# AGE & GENDER

Another part of designing for children is age and gender. Younger children tend to be much more curious about their surrounding and explore them with senses more while older children want spaces to be active or be able to be social with friends (Nebelong, 2014). Many studies show that children like being a part of the planning or design process (Horelli, 1998). Children can have valuable input on how places can be designed to better benefit everyone. According to research, young boys prefer to play physical activities, while girls play through imagination a lot more (Horelli, 1998). Gender therefore affects many aspects of play, including the type of play structures that encourage different gender group use and mobility.

On the other hand, teenagers are very forgotten in urban design, sometimes more than younger children (Horelli, 1998). While many teenage boys commonly continue to play through physical activities and use spaces like sports fields which can make them feel more included in urban design, not every teenage boy plays sports. Teen girls are pretty much always forgotten as they do not have places to go in urban settings almost entirely. Overall, there are missing spaces for all adolescents in every city (Horelli, 1998). This is why we tend to see teenagers take over places like malls, coffee shops or movie theaters as they look for something fun to do and a place to belong.



# PLAY

Children can have better brain development if encouraged to explore their environment through activities. Studies show that things like mirrors, bubbles and building blocks can help early brain development (Sugar et al., 2019). Climbing on things, playing in dirt and growing plants can help children feel more connected to their surroundings and therefore teach them to care about them more (Gill, 2007). Different forms of expression, such as painting, drawing or other forms of art can help children develop their brains and become more educated in the long run (Laker, 2016). Exploring examples like these and how to use them in urban design will help with this research and design moving forward.

Play is very valuable to children's development and growth (Singer et al., 2019). From a young age children like to play by exploring, especially through senses like touch, smell, taste (Singer et al., 2019). Through this exploration they learn about the world, their environment and how things work (Krishnamurthy, 2019). An example is when children learn to cook with adults, they start learning social skills and motor skills. When children use their imagination to play, it develops their cognitive abilities, speech and critical thinking (Gill, 2007).

The idea that children have the desire to participate in risky activities and can learn from them can help with the foundation to child oriented urban design as well (Gill, 2007). This idea can include things like extreme sports and create high interest in different, more intense play areas (Gill, 2007). This creates the narrative that public playgrounds should include aspects of nature and include some sort of 'safe danger' in order to keep children learning, growing and excited. Public playgrounds have only been around for a little over a hundred years at this point in time (Gill, 2007). Therefore, there is time and room for their improvement.

According to Danish landscape architect Helle Nebelong, the principles to use when designing a good playground include not adding a lot of fixed equipment, focusing on using locally sourced materials, loose parts– which can include leftover materials (making sure to not ignore use standards in combination with common sense), plants, shrubs and other vegetation, not over protecting children, focusing on the play value not on maintenance costs and not focusing on aesthetic value as the main aim of a space rather than play (2014). These ideas contribute to how a playground can be child oriented through a childhood lens rather than an adult filter.

# AFFORDANCE

Affordance in design means what a place or thing can offer through perception (Gill, 2021). For example, an item that can have multiple uses has more affordance and is therefore more useful. This is why affordance in design is very significant to play and children oriented urban design. Children should have many different items, surfaces, textures, colours and things to play with in order to create an environment where they can be active and develop their skills and learn. Play also has well-being benefits such as physical health, bone and muscle building and mobility enhancement, which helps with child development (Laker, 2016).

Different slopes and use of topography can create opportunities to climb, slide and use in many ways

Play structures to climb on and in can stimulate excitement and be used for different purposes

Open areas can be used for endless events and things

Affordance showcased through play examples (Tim Gill, 2021)

# SAFETY & WELL-BEING

Safety is a large part of child friendly cities. Many cities prioritize cars over people, which goes to show how much emphasis is placed on different needs of adults than those of children. Children are the future of our world and should be prioritized as such. By 2025, 60% of children world-wide will live in cities (Sugar et al., 2019). Children therefore need high quality urban environments to live in to give them a bright childhood and future. Traffic accidents are the leading cause of youth death from the ages of 15-29 and second highest with children 5-14 (Adriazola-Steil et al., 2015). Many children get killed as a result of bad traffic safety measures in residential areas globally (Adriazola-Steil et al., 2015). This statistic goes to show how important traffic safety is for child-friendly cities and neighborhoods. Air pollution is also related to safety for children, as clean air relates to a healthy lifestyle and physical health (UNICEF, 2024). "Children are more susceptible to air pollution than adults, because their bodies are still developing and their body size and characteristics mean that the same dose potentially has a bigger effect" (UNICEF, 2024). This means that a better use of green infrastructure is very valuable to child friendly urban design.

Unfortunately, due to many dangerous aspects, streets and neighborhood public spaces cannot be used as playgrounds for children (Gill, 2021). The popsicle test is a great way to measure how child-friendly a neighborhood is according to Tim Gill (2021). This test is a question of whether a parent of an eight-year-old would let them go to a store for a popsicle and be able to come back before it melts (Gill, 2007). Although the answers to this question can be quite context dependent, it is an interesting discussion when designing new neighborhoods, especially for children and their families.

A child's health and well-being are a direct reflection of their physical environment and its safety (Björklid et al., 2012). According to the perspective of developmental psychology, children view space in different ways than adults do. They use the outdoors as intensely as they can to learn, develop, grow and experience. After puberty, children's physical connection to their environment becomes mostly cognitive and taken over by critical thinking instead. Children's environmental limitations as a result of unsafe environments or mobility and access issues can limit their development and social or emotional interactions with their peers (Björklid et al., 2012). This can cause problems for their connection to many aspects of their lives and their spatial skills, therefore limiting their responsibility and care for nature and the environment (Sugar et al., 2019). Parents' and guardians' lifestyles also affect the perception of children and their daily lives. For example, if a guardian of a child always drives them to school and they can never be independent in their daily commutes, that changes their attitudes towards walking and their environment (Gill, 2021). Many children do not have a 'street-wise' attitude in recent decades as they would in previous generations. This adds to the unfortunate truth than children do not have the opportunity for safety, mobility or independence in our modern world (Gill, 2021).

A child's daily life is very closely dependent on their parents or guardians. It includes a commute to school or childcare, a place to play like a playground, their guardian's workplaces and a potential spot for another caregiver like a babysitter, grandparent or other family member. This daily life web is seen in the figure below and shows just how small and valuable a child's bubble can be. These prime locations and the spaces in between are very significant

In a study done by the University of Stockholm, 100 people were given a questionnaire on how they envision and describe a child-friendly city (Björklid et al., 2012). This included 52 students aged 11-12, 42 teachers, student teachers and planners all in three schools in the inner city of Stockholm and some areas in the outer city. There were also follow up interviews with 13 children and five planners. Each group mentioned the importance of reduced traffic, access to public green spaces and gathering areas. There was also an emphasis on safety and feeling comfortable in the city and drugs and alcohol were given as examples of things that encourage unsafe environments and uncomfortable feelings.

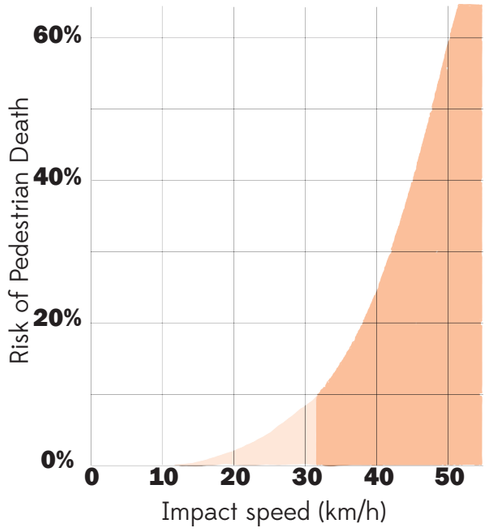
A girl in the outer city stated that cars would not exist in a perfect child-friendly city, there would be many plants, there would be things to play on everywhere. Children would always be playing and no one would need to lock their doors.

A boy from the outer city stated that there would only be pedestrian paths and no roads, every child would go to a good school, everyone would have access to a good natural environment, a large park and good food. He wrote that anyone who fought would have to leave the area. The political leaders would be willing to make good decisions and teachers would educate on important topics.

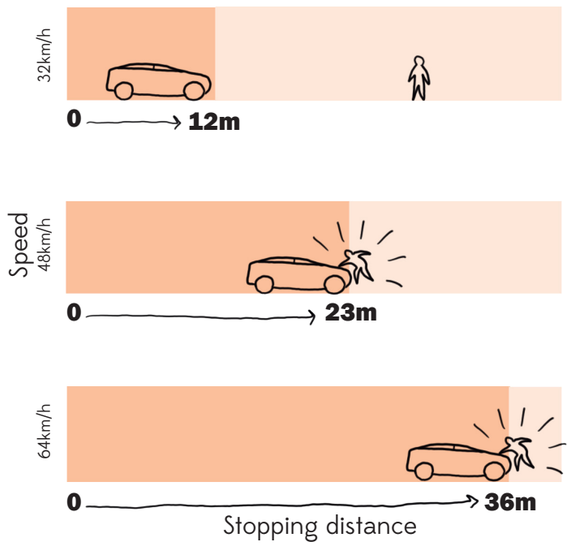
A town planner wrote about traffic safety and streets created as public spaces instead of transport routes, walkability, less noise pollution and children specifically should be able to have the independence to walk or bike without being driven.

Another town planner's ideas included that a 12-year-old should have the ability to be independent around larger city areas and feel safe. Children should be able to explore, discover and experience the city (Björklid et al., 2012).

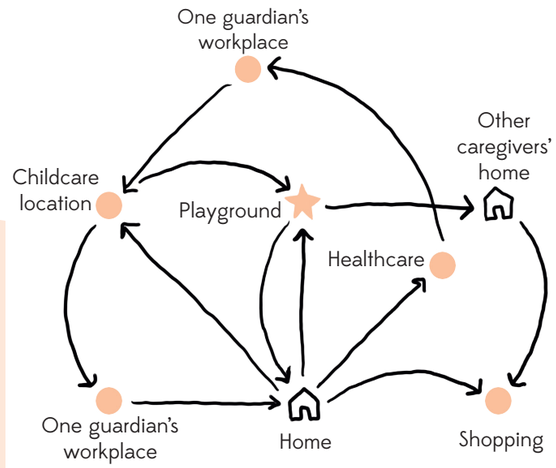
Many of these perspectives are similar from children and professionals which explains that the child centered perspective is not difficult to understand and can somewhat easily be integrated into urban design much more than it is currently.




The risk of serious injury rises above 30km/h (Tim Gill, 2021)




Stopping distances are shorter at 30km/h or less (Tim Gill, 2021)




Typical trip web for a caregiver with a young child, (Tim Gill, 2021)

**“Green Infrastructure is an interconnected network of green spaces that have many benefits to humans & the environment”**

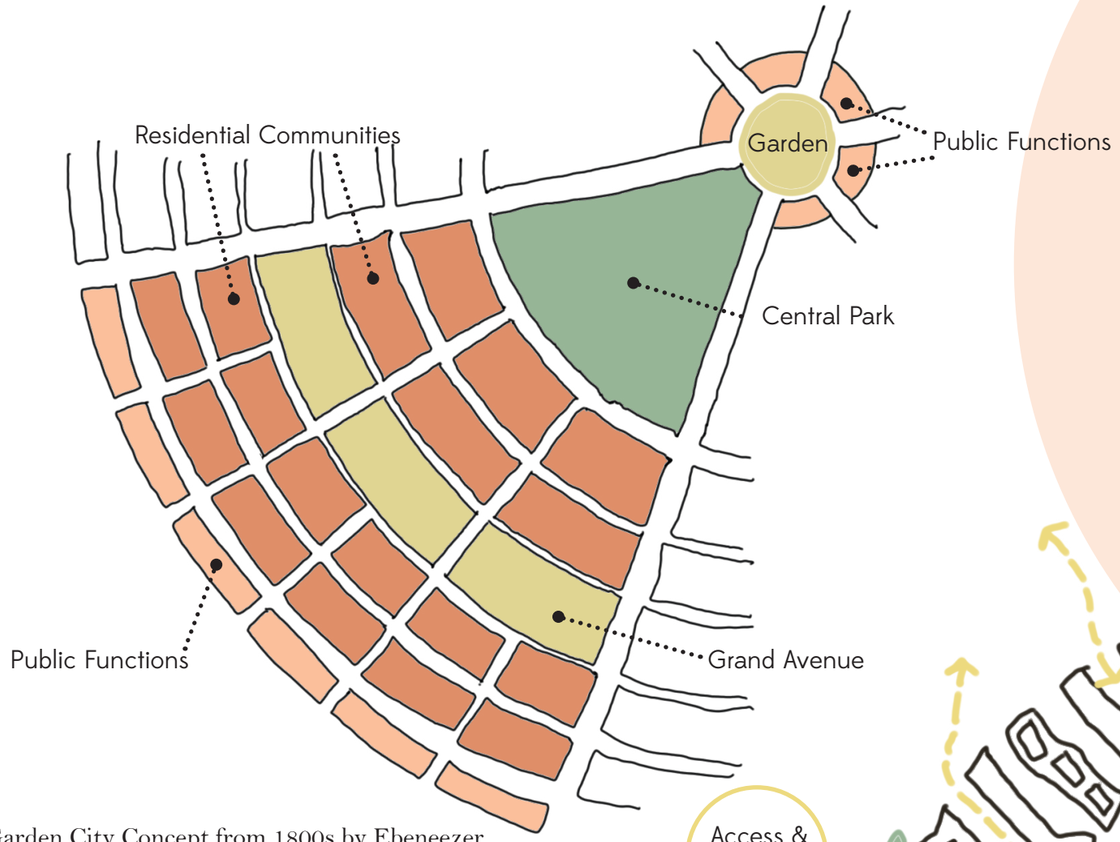
Meristem Design, 2023

# THE GARDEN CITY

The original garden city concept was created by Ebeneezer Howard in 1898 (Henderson et al., 2017). The idea was to use the best parts of urban and rural in combination. The original point was to have urban centers connected through green belt areas as corridors. This creates a direct connection to nature and the environment. Although the original concept is outdated for our present time as it encourages suburban areas and the unnecessary overuse of land, some of the main ideas are still relevant to current urban design methods. The modern garden city can be created with the best ideas to help tackle issues like climate change and the heat island effect. There are also principles that the concept can have to create the optimal solution for a city or neighborhood. The concept of the Garden city uses many factors to help a city thrive in long-term success (Henderson et al., 2017). The principles of a modern Garden city are:

- Movement & connectivity
- Walkable neighborhoods
- Diversity of housing and employment opportunities
- Healthy and active communities
- Multi-functional green infrastructure
- Human scale
- Designing for climate resilience

These principles can be used to create a great community for many types of people to be apart of. Since there is a focus on children in this research, it is important to note that these principles can help with any neighborhood, but when used effectively can be specific to children. The principles of multi-functional green infrastructure truly impact all of the other principles as it is very important to have a green system as the back-bone to a community. As a result of how education for children through their environments is the main topic here, there will be a focus on this principle within this research. According to the *Art of Building a Garden City*, at least 50% of a new garden city should be green infrastructure, most of which should be public (Henderson et al., 2017). This means




Garden City Concept from 1800s by Ebeneezer Howard (Henderson et al., 2017)

that a major factor of creating a functional new community is in the use of green infrastructure.

The modern Garden City should include:

- Local employment within the city
- Private & public gardens to connect urban to rural
- Green infrastructure networks
- Local culture
- Walkability
- Accessibility though public transport and biking

The use of these ideas can help shape a new garden city initiative that will be sustainable in many different regards. Economically, socially, environmentally and most importantly help children develop the skills they need to push sustainability forward through education and enjoyment.

From the book, the *Art of Building a Garden City*, a modern garden city can have a certain look that helps all the principles link together effortlessly. That includes having access and movement throughout the area, food and nutrition sustainability through community garden initiatives, a sense of home and community, a connection to the natural environment through green adaption and play and recreation initiatives.


An illustrative idea of the elements of a healthy-weight garden city masterplan (Henderson et al., 2017)

The last factor shows how valuable play is to strengthening a community, not just for children. The use of public, semi-public and private areas is very important in creating a garden city as different use of spaces can activate different activities, especially in a child-friendly context.

# URBAN GREEN INFRASTRUCTURE

Urban Green Infrastructure (UGI) is the key to a future full of sustainability. The concept of green infrastructure in urban areas is not new, however it is more necessary now than ever. UGI does not have a perfect definition because it should be locally adapted, but generally the term "refers to an interconnected network of green spaces that deliver a multitude of benefits - both to humans and the environment" (Pal et al., 2023). Examples of UGI include wetlands, micro forests, urban agriculture, gardens, rain gardens, green roofs, streets trees, ponds, streams, parks and green corridors (Wang et al., 2018).

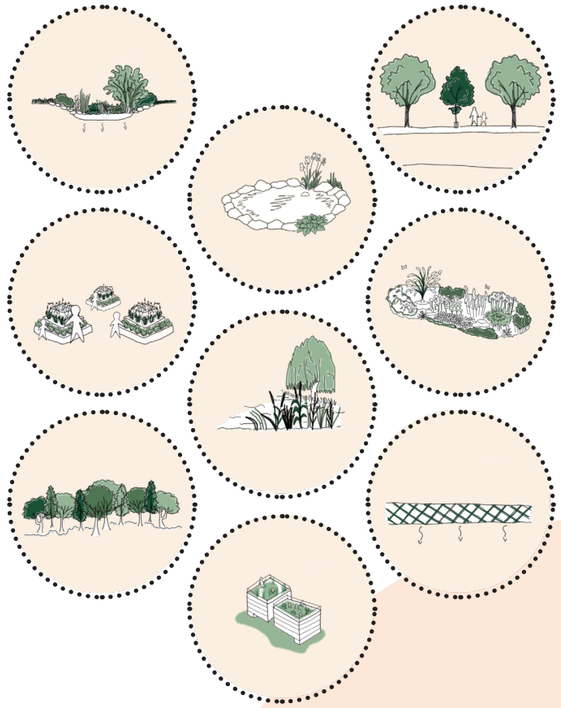
The different UGI examples can each be used to enhance the environment and help the community contribute to a healthier urban ecosystem (Wang et al., 2018). UGI can be used for many different benefits such as education, balancing local microclimate, enhances biodiversity and promotes mental and physical well-being. UGI can be used through water drainage, food production and methods that improve the daily lives of citizens (Pal et al., 2023).

Through using UGI, designers can limit flooding and the heat island effect by limiting hard surface areas, create locally grow food to encourage economic growth and in turn educate citizens of healthier ways to live. Treating a city as a network is the best way to create sustainability within the area. Every space connects to the other in different ways, which also creates a system that can function together for the community and the environment.

Landscape architect Frederick Law Olmsted stated that parks should be linked together and put within urban spaces (Davies & Lafortezza, 2017). This idea was ahead of him time as it is still necessary today when designing cities. The connection between green spaces and urban spaces is valuable in many ways. For example, water has no where to go if the system is not created with the flow in mind. Green infrastructure can be very successful if the following are adapted (Pal et al., 2023):

- The framework of conservation and development should be the green infrastructure
- Green infrastructure should be designed and planned well before development
- Linking spaces is the key
- Green infrastructure should be created at different scales

These principles can create a strong foundation for the concept of a garden city for children. Children do not need much to have a stable childhood, however the minimum necessities are very valuable. An interesting example of children's learning initiatives happen in natural environments, such as Skryllenatur in Sweden and Toronto Botanical Garden in Canada. These places are great examples of ways to include children in nature and educate children through fun activities. Educating children is



The main Urban Green Infrastructure features used in cities today

A rooftop farm in Thailand. Image: Shutterstock

an important part of sustainability in urban design. Children are the future of sustainability. Children's activities that are educational and fun are ones that are being present in nature and creating aspects within the natural environment. For example, growing their own edible plants, building natural insect hotels and exploring a body of water and its species. A large part of creating the concept of 'A Child's Garden City' stems for creating a system of natural networks throughout an area used for educating the citizens of the community.

Through specific activities, initiatives and workshops, children living in a modern garden city community can learn about different ways to encourage sustainability and utilize their skills for the future. Teaching children about sustainability early in life through their lifestyle is the best way to make sure the new generation care and then take care of their environment. UGI is a very valuable tool to use in any neighborhood, city and community, therefore teaching children about it is very important for the future.

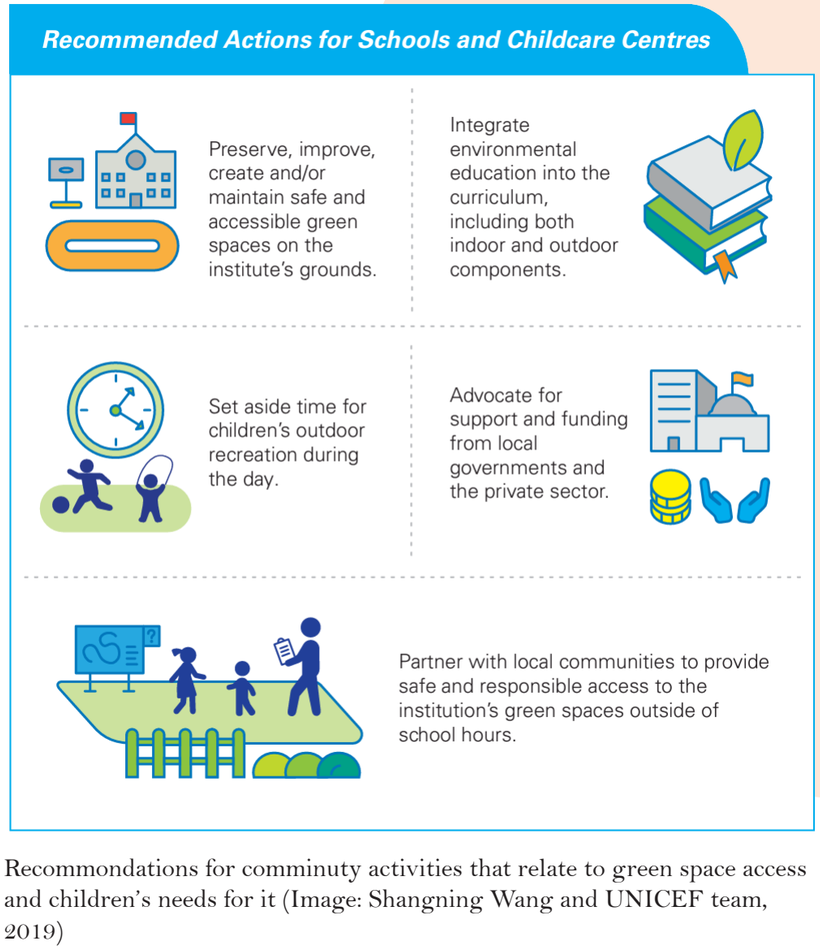
Rain garden Image: State College Pennsylvania

# THE BENEFITS OF GREEN ACCESS

Children are a very valuable group when it comes to helping the environment. Every child should have a safe green space to go to on a daily basis, not only for their own well-being but also for the well-being of the spaces and their future (Sugar et al., 2019). The definition of 'green space' has not been universally established yet and can therefore only be defined when it is specific to a local context (Vidal & Seixas, 2022). For example, some green spaces include "public and private parks, grassy lawns, home and community gardens, playgrounds, agricultural land, overgrown vacant lots, street trees, roadside verges, and green roofs" (Vidal & Seixas, 2022). Being exposed to nature also contributes to making humans more "immune" to urban stress, which in turn improves mental health outcomes (Vidal & Seixas, 2022).

It is proven through experience that public and open green spaces may lead to opportunities for developing outdoor education programs, which have positive effects on learning (Vidal & Seixas, 2022). According to UNICEF, a few good ways to involve children in the process of taking care of the surrounding green spaces and their environment is the organization of regular clean-up events, establishing non-discriminatory community monitoring in green spaces and creating nature education programs for children and families (Sugar et al., 2019). These initiatives keep the community engaged and accountable and help children learn about sustainability from a young age. Although the research presented about children's developmental benefits of green spaces is limited to primarily high-income countries, "the evidence is sufficient to assume that children universally need green space for their optimal development" (Sugar et al., 2019).


The Benefits of Green Access according to UNICEF (Image: Shangning Wang and UNICEF Team, 2019)



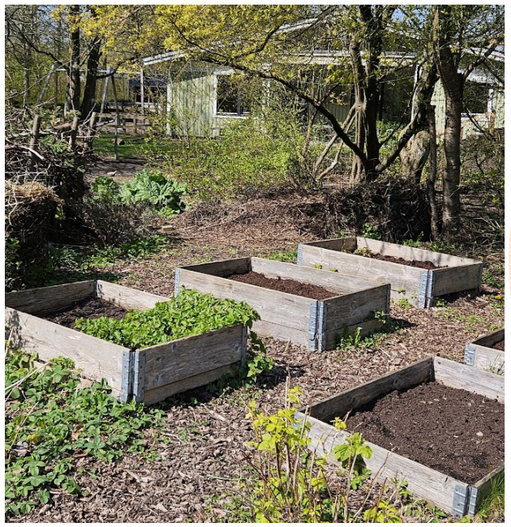

Recommondations for comminuty activities that relate to green space access and children's needs for it (Image: Shangning Wang and UNICEF team, 2019)

It is important that all places' children have access to have a green connection (Sugar et al., 2019). Sustainability development education is the key to having green space access for all children universally (Sugar et al., 2019). This includes different green initiatives taking place outside school hours (Sugar et al., 2019). "In their early years, children living in greener neighbourhoods and those living closer to city parks have fewer behavioral and social problems" (Sugar et al., 2019). The benefits of green space access for children are very significant to the future. Children's Green Infrastructure (CGI) is a concept stemming from UGI and urban infrastructure for children (Vidal & Seixas, 2022). This idea should be used when designing green spaces for children specifically to make it more inclusive and usable for different age groups. "CGI aims to promote children's rights of participation, to nature and to play" (Vidal & Seixas, 2022). It is valuable to include CGI in a multitude of spaces throughout a city in order to make it more green and encourage children's rights to play, for example redesigning streets in ways to encourage play and green access (Vidal & Seixas, 2022). The benefits of green spaces access and different green space uses are endless, especially for children and therefore are the backbone to "A Child's Garden City".

# 3

# LUND, SWEDEN

Fäladsskolan and the surrounding neighborhood of Norra Fäladen to the north is a great example of a child friendly community. There are many inspirational aspects to this school and its surrounding area. This school is near many parks, a trail network and there are many activities happening throughout the area during different times of the year. The school has nature programs included in the studies and there are effective centers to aid in children's education. Some of the activities in this area include sports fields like volleyball,



Fäladsskolan school gardening planters

Fäladsskolan school natural play features

tennis, outdoor gyms, many different playgrounds, grocery stores and community center. As seen in the image on the bottom of this page, there are safe play structures in semi-private courtyards throughout the neighborhood to create a create child-friendly community. The small streets going through the area are only for pedestrians or bicycles and help with walkability. The density of the area is also perfect for children and their families to enjoy and be safe. The details featured in the area are also perfect for children. For example, the use of topography to create different

Norra Fäladen neighborhood playground

There are also small-scale gardening options for children to explore nature as seen in the figure on the left. Some of the natural play features can also be seen in the pictures on the bottom right of this page. Children can site, explore and experience the landscape through the use of recycled materials and playgrounds.

The main interest of this area stems from the thoughtfulness of urban design for people instead of for cars. There are many enjoyable features that create a warm, welcoming and useful community for many different groups of people.

Pedestrian street in neighborhood

Natural play features

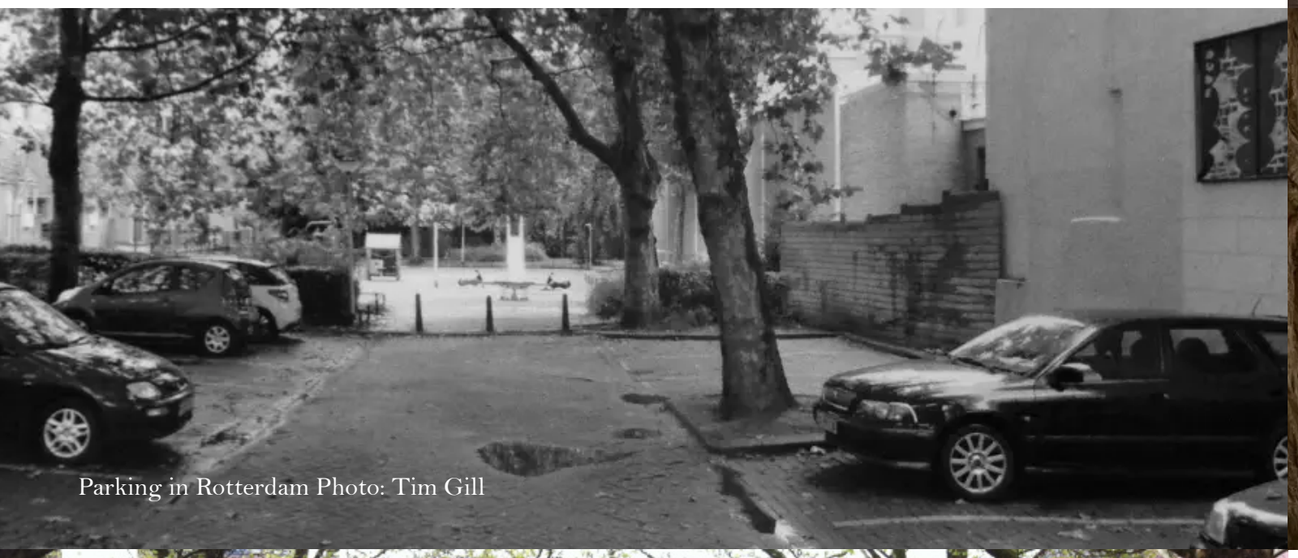
Natural play features

This area can inspire many aspects of child-friendly urban design. It is very effective to create child-friendly spaces, as they also work for everyone else. Many factors of this neighborhood can be mirrored for different local contexts and be used for child-friendly urban design ideas moving forward into this research and design.

# ROTTERDAM, NETHERLANDS

In 2007, Rotterdam launched an ambitious program to improve life for youth, improve the economic value of the city, enhance residential areas and keep families in the city (City of Rotterdam, 2018). The use of 'Building Blocks' for the changes helped the city set strong but realistic goals. These four 'Building Blocks' are: Child Friendly Housing, Public Space, Facilities and Safe Traffic Routes. The idea of 'Child Friendly Housing' included single-family housing and garden improvements as well as apartment additions and improvements. The main aspects of this 'Building Block' were the communal outdoor spaces. A large priority was having a direct connection between indoor and outdoor, entrance and street.. The 'Building Block' of 'Public Space' included specific measurements of outdoor play and sports areas bother natural and paved. There were a lot of ideas about plantings and green space for gatherings. 'Facilities' include high quality schools and accessibility to the buildings and spaces connected. The last 'Block', 'Safe Traffic Routes' includes the goals of having at least one side of every street with a three-meter sidewalk as well as walkable paths. The city has invested a lot of cost into creating

Al Ghazali School playground – before. Photo: Jantje Beton



Parking in Rotterdam Photo: Tim Gill

Al Ghazali School playground – after. Image: Jantje Beton

Parking in Rotterdam transformed Photo: Tim Gill

a child-friendly city. The whole project included twenty million euros for developments while phase one took place between 2006 and 2010. Most of the changes were added to single family neighborhoods and school yards. Many parking areas were transformed to be child and pedestrian friendly. The second phase began in 2014 with an investment of seven and a half million euros. The scope of the project was larger than Phase one. There has been some controversy about the projects as some groups believe the city of Rotterdam only targeted higher income families and areas; however, authorities deny this is the case. It can be difficult to design spaces that make everyone feel included long term. The city's modern garden city shaping through green corridors also influences the idea of child-friendliness within the city and its future potential. Rotterdam's initiatives have improved the city environmentally, culturally and even economically. The political aspects of the city are uncertain as the south of the city has not been included in the redevelopments, emphasizing a "missing middle" aspect of the city. The case study of Rotterdam shows that even with many positive aspects of an initiative or project, there can still be things missing from the greater picture. Including the children in this project through their contributed ideas helped with what can be improved, but there seems to be more room for community inclusion with lower-income groups (City of Rotterdam, 2018).

# LYON, FRANCE

This is an unprecedented project for France located in Lyon, within a peninsula that used to be industrial and is now transforming (Lyon Confluence, 2024). The idea stems from sustainability to create a new system of infrastructure and activities within the neighborhood. The goals for the neighborhood are walkability, sustainability and the creation of places to take a break from the city through greenery. Lyon Confluence has a phasing plan to be implemented through two main phases. A major factor in the phasing is the wooded area and gardens within each block. A valuable part of the project is how the project handles cars. Cars are only allowed in the area during certain times of the day and different visitors are allowed on weekends. There are car parks around the area but not within in order to encourage walkability and optimize the area for public use.

The area has everything in a five-minute walking distance which creates a structure from the north to the south of the site. It also creates a strong internal community that encourages social connections and a relationship with nature within a city (Lyon Confluence, 2024). It is difficult to tell if this project is fully completed or not as the final pictures are not easily accessible for most of the areas. However, the concept is very effective and interesting to explore for the type of site.

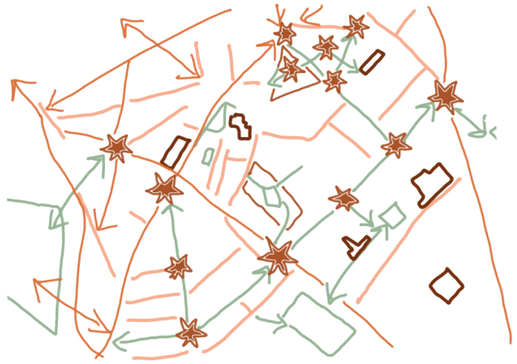
Courtyard area of new community Photo: Lyon Confluence

Courtyard area of new community Photo: Lyon Confluence

New street perspective Photo: Lyon Confluence

# ANTWERP, BELGIUM

Antwerp in Belgium is a city that has made efforts to include children's places in their city developments (Gill, 2021). An interesting part of these changes in the city is the concept of "play valley" which includes different natural objects and materials designed and placed in specific places around a natural area to encourage imagination and connection to the environment. The city has added places like these throughout playgrounds, school yards and other public areas. An example of this initiative is Park van Eden in a residential neighborhood of Antwerp. Another initiative in Antwerp is the 'Living Streets' project. This project became a way to bring back the streets to the community. The method is to shut down streets in the summer months to create safe spaces for gathering, socializing and play. During these months, there is a budget for activities like street art, gardening and new seating spaces. These activities exist to help traffic safety for children and give groups a place to spend quality time. The project is a very insightful way to create child-friendly cities, even for different parts of the year when they can be more functional. A significant example of Antwerp's child-friendly opportunities is the project 'Playspace Web' (Speelweefselplan) designed by the City of Antwerp in collaboration with Kind & Samenleving play consultants. The idea is that every child should have a space to play near their home, specifically in a short walking distance. The project combined the research of where children need to go through their daily lives such as school, where they play and where they meet with friends. Children were included in the process of figuring out what was needed and wanted in the area. The 'web' was then created to show where the new infrastructure could be added to encourage use and a child-friendly neighborhood. The main aspect of this project is the inclusion of children and having their voices and needs heard (Gill, 2021).



Natural Playground in Antwerp Photo: Tim Gill

Walkable area with natural play features Photo: Tim Gill

# FREIBURG, GERMANY

Vauban is a neighborhood just outside Freiburg in Germany. The concept was created as a modernized garden city (Fraker, 2013). The main spine of the project is the central boulevard which connects the site with a tram and creates a cultural corridor through the area. Another major aspect to this project is the green corridor on the south side of the neighborhood. This green area is connected to a larger park area, therefore connecting the site to nature. Vauban reflects the principles of the garden city in many ways while also being modernized to the current needs of the area. One of the major social plans for the site was to include children and family needs into the design. The most interesting example of this within the site is the fact the site has no cars allowed inside. There are drop-off spaces and parking around the neighborhood, however they are expensive and hard to come by which makes the community more conscious of their car use. As the area is very connected through biking, public transit and walkability, it makes it very child-friendly and much safer. should be public.

Vauban had major sustainability goals, from using the sun for energy to water drainage plans. The public transport connection with the main tram line going through the neighborhood acts as a glue to the center of Freiburg and the rest of the surrounding area. This is also very useful for creating a child friendly area (Fraker, 2013).

Vauban view from above Photo: Making Lewes

Vauban neighborhood showcasing safety Photo: Reddit

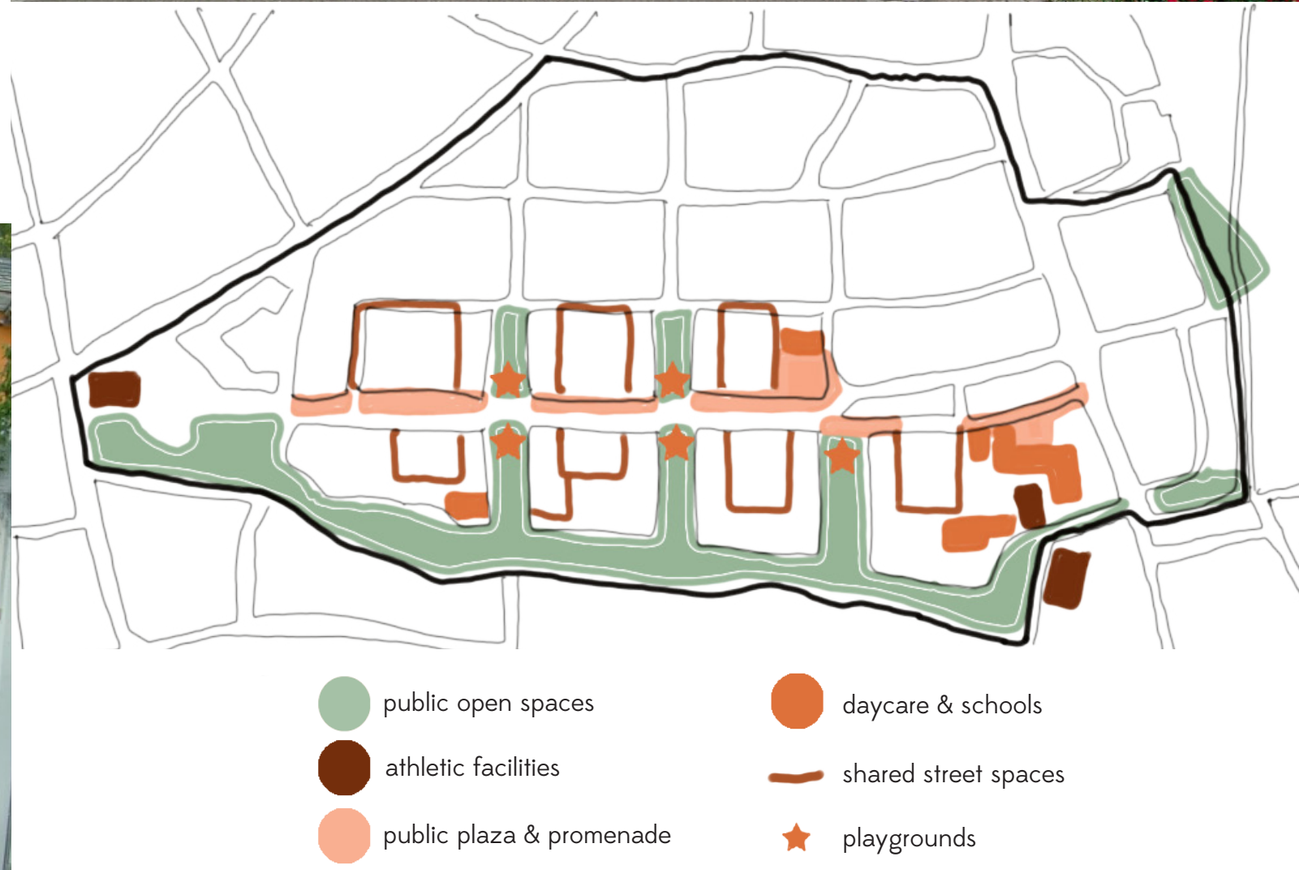



Diagram of Vauban design Source: Szibbo and Reinhalter

# LEARNING OUTCOMES

Lund:

The biggest thing that makes this site so special is that the neighborhood seems to be developed around the school and children's needs, without meaning to. It seems effortlessly created with children and their families in mind. There are natural factors that also make it very unique.

Rotterdam:

One of the main things that should be thought about from Rotterdam as a case study is how children's play and areas can be included into street design and public areas instead of just specific playgrounds. Child friendly aspects can be easily integrated. This case study shows that different phases can also help with child friendly initiatives.

Lyon:

The Lyon Confluence focuses on learning how to work with a partly industrial and partly brown-field site. It is also a good example of how different greenery can be included in different areas and be used for different functions. Studying this site which also has train tracks in the middle of the area also helped with my own site and inspiration.

Antwerp:

Antwerp's child-oriented projects show how children's areas can be integrated into a neighborhood without being separated as well as the use of natural play elements within city environments to encourage the use of nature. This case study showcases how children can be included in the planning and design process and how children enjoy being included.

Vauban:

Vauban is a great case study that showcases how a green corridor connection can work throughout a neighborhood and make greenery accessible to everyone as well as water management and urban green infrastructure. Vauban has a great method of how to not fully get rid of cars but still have a mostly walkable neighborhood. The design is also really well done when it comes to energy efficiency.

A neighborhood in Lund, Sweden that was a physical site study to look for scale, development and inspiration

Street with green and play features within the city. Photo: Gemeente Rotterdam

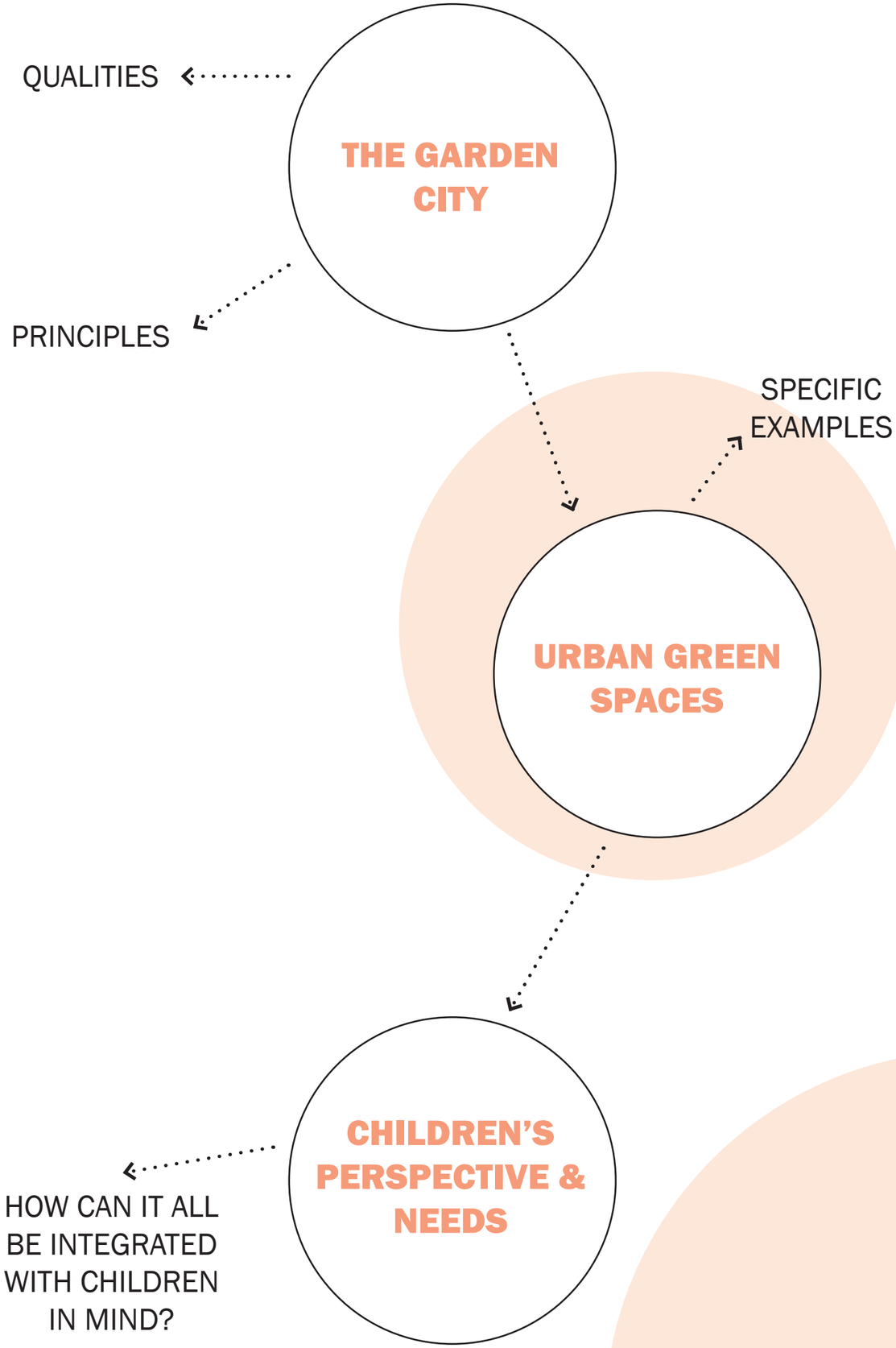
Overview on 3D model of the Lyon Confluence project. Photo: Lyon Confluence

Front yard of a school in Antwerp with natural play elements. Photo: Tim Gill

Central storm-water swale in Vauban. Photo: Thomas Schroepfer and Christian Werthmann, with Limin Hee

# PRINCIPLES

# 4




# A CHILD FRIENDLY GARDEN CITY

A garden city for children is a place where children can be themselves and enjoy their childhood without the restrictions of urban design issues or infrastructure limitations. The idea stems from Ebeneezer Howard's concept of a garden city and the Modern Garden City concept from *The Art of Building a Garden* City: Designing New Communities for the 21st Century' (Henderson et al., 2017). These concepts have fundamental principles that can be used to create safe and enjoyable places specifically for children. The challenge of using these concepts and principles came to light when researching the lack of child accessible urban design. Through research and experience it is evident that child friendly urban design is urban design that is friendly for everyone. As urban designers, making places more child oriented will in turn create better places and urban systems for all users. In order to create child friendly urban design for cities moving forward, there are some specific ideas that can be followed. These in combination of general child friendly requirements and green infrastructural elements in order to educate the new generation, create a strong community for everyone to enjoy long-term (Henderson et al., 2017).

The major principles that will be used as goals are walkability, proximity, safety, education, green integration and the school in the heart of the community. These can foster a strong and healthy community to encourage local economy, create new green public spaces and function through a series of connections.

Good governance in urban design and planning is very important for cities. Many cities do not have sufficient policies for child inclusion when it comes to design and governance. It is therefore very important to look at the principles of good governance according to UNICEF (2021).

The guiding principles of good governance are:

- Equity & Inclusion
- Accountability & Transparency
- Public participation
- Effectiveness & Responsiveness
- Adaptability & Sustainability

Some questions to consider when designing for children:

- How can we introduce a child-oriented perspective on what is needed in communities?
- How can we include children in the design/ planning process?

To think about how to answer these questions we can look at different methods of participation for children in planning and design through urban spaces and ways for them to be included. There are two major types of participation, formal and informal, and both are useful for children and youth.

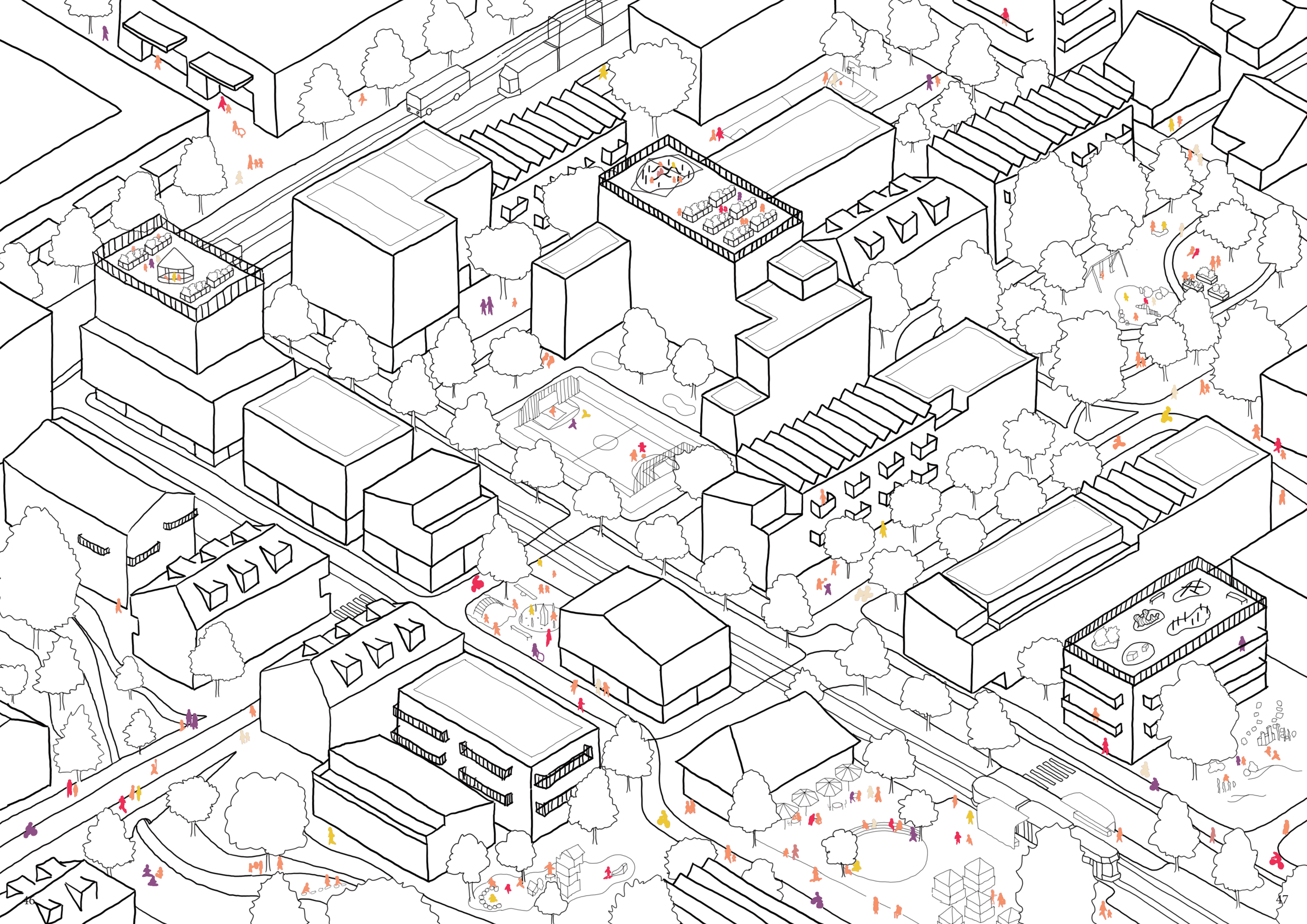
Formal youth participation:

- School, counsels, city initiatives

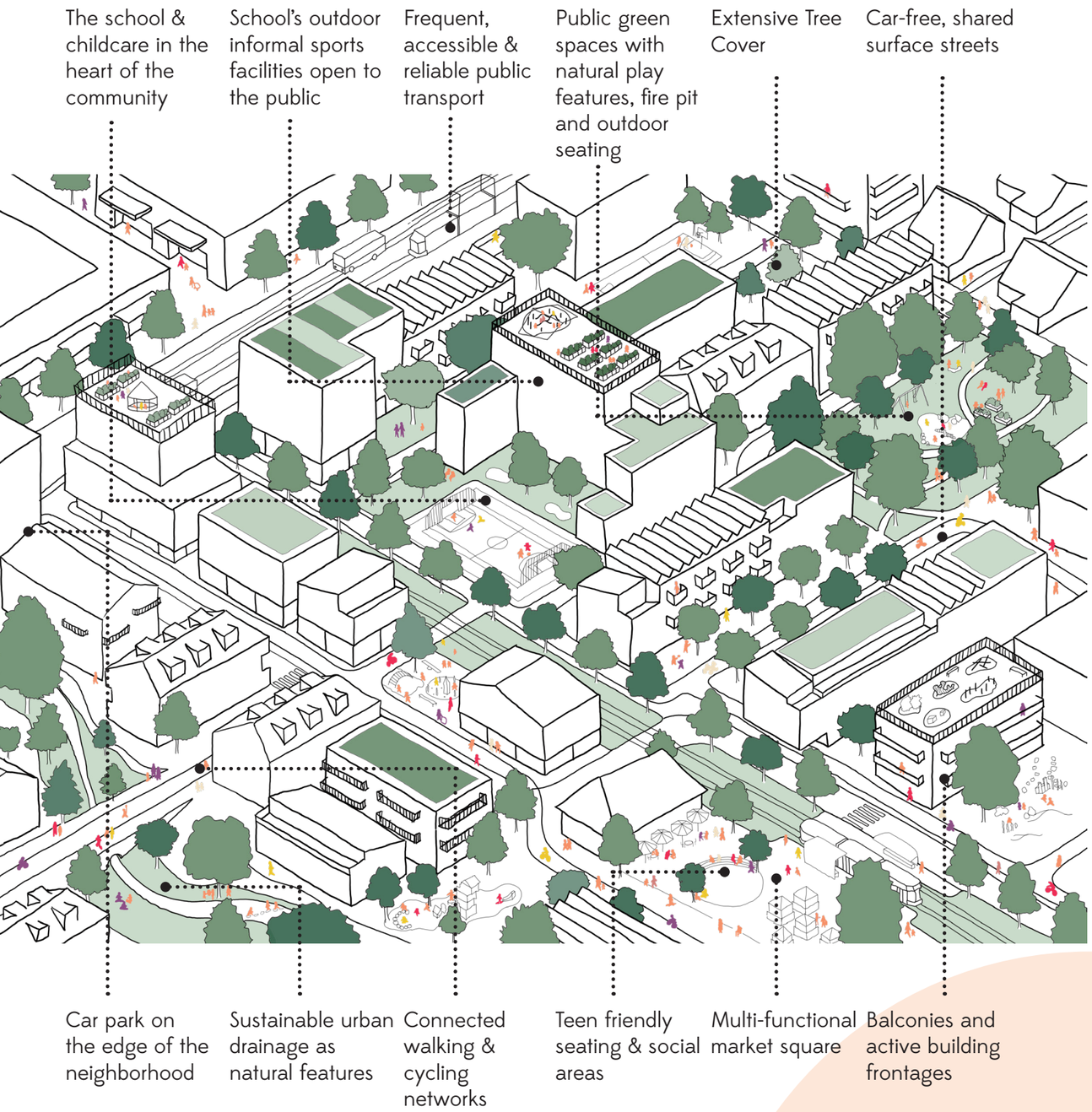
Informal youth participation

- Social media, surveys, petitions, meetings

These can be used when looking at planning a child-friendly city in order to do as much as possible to see how children and youth can be included (Wright et al., 2017). Including the community in projects can really bring the necessities to light and can help with a different perspective for urban planners and designers that we may not be aware of (Acar, 2013).



# THE ‘PERFECT NEIGHBORHOOD?’



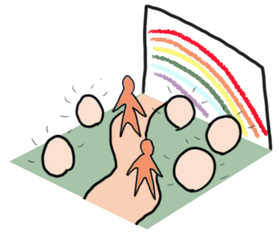

The ‘Perfect Neighborhood?’ as created by Tim Gill, 2021, illustrated & modified by Stella Boycheva

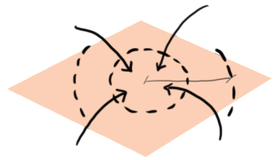


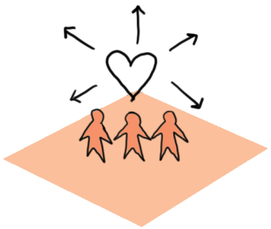
# THE PRINCIPLES USED

The “perfect” child friendly city or neighborhood can be defined quite simply in theory. There are features that can be easily used and some that are a bit more complicated. “The ultimate child-friendly neighborhood?” as shown in Tim Gill’s Urban Playground is a sketch loosely modeled after Vauban, Germany which will be discussed as a case study later on in chapter three (2021). However, there is not a perfect formula for the “perfect” child friendly city or neighborhood as it is always context specific and should be locally determined (Gill, 2021). It is difficult to label all the things that are important in child friendly urban design, but we can try and move one step further into learning how to accomplish it more often.

The discussion of how to accomplish a child-friendly city or neighborhood is one that can be thought about in maybe different ways. One way to think about it is through the lens of sociology. An example of this perspective is the concept of a heterotopia as stated in the article Of Other Places in 1986 (Foucault and Miskowiec, 1986). The idea of a heterotopia is that it is a mirror image of society that has a specific inner function and is closed off to the rest of the world (Foucault and Miskowiec, 1986). An example would be a prison or a monastery on a macro scale or a museum, a club or a library on a micro scale. The idea is interesting to consider when it comes to child-friendly environments. Would an exclusive place specifically created for children be a better option for safety? Where is the line when it comes to exclusivity in a heterotopia? When it comes to a place created for children, the better option would be to have everything be safe and adapted to children’s needs, but that is unrealistic. In the case of this project exclusivity is not the goal. The goal is to create a place for all age groups and people with the focus of a child’s perspective which can then be a model for strong urban design regardless of the context. This can be accomplished using the children’s neighborhood principles, modern garden city principles and my specified toolbox.





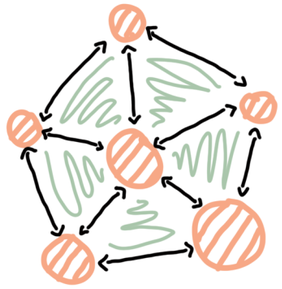


# URBAN DESIGN NECESSITIES FOR CHILDREN

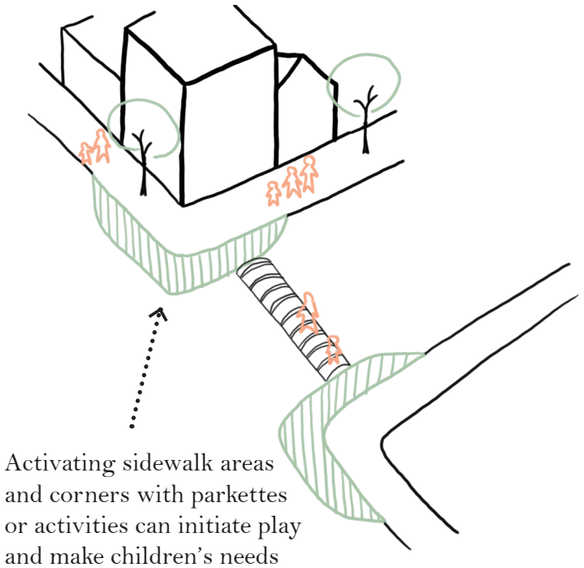
## HOW?

When looking at the necessities for children in modern urban spaces and how they can be implemented, we need to answer the questions of why. What specifics do children need in urban spaces? An example, is different workshops and activities that help children learn, grow and develop through play and their physical environment. The toolbox for this project can be seen below. This toolbox was developed using the principles, case studies and research for what makes a healthy child-oriented environment. Each goal has a specific function to the site and can be seen in specific ways within the designing process. An example is the use of many different "centers" or hubs on site that have different functions mimicking the original garden city on a micro level.

Another example is the activation of streets and street corners through small scale activities or parkettes (Sim et al, 2019). This can increase safety, education and walkability. Street elevations are also very important to traffic safety and walkability. Making sure there is ways to slow down cars and elevated crosswalks makes children and pedestrians priority for the area (Sim et al., 2019). Through these simple specific examples, a child-friendly city can be implemented much more easily for planners and designers moving forward.



Creating a mimic of the original garden city concept where there are different centers throughout the area with green corridors connecting them to each other. Children then have different places to visit and different purposes for play and education.

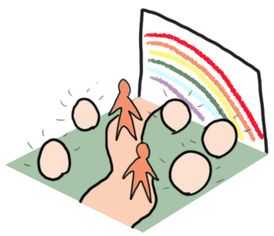


Activating sidewalk areas and corners with parkettes or activities can initiate play and make children's needs centralized (Idea mentioned in *Soft City*, 2019)

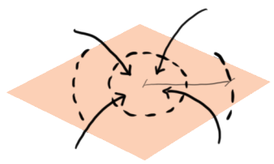
PLAY
natural play throughout area, playful amenities to appeal to children

EDUCATION
natural areas, planting, water areas, workshops, activities

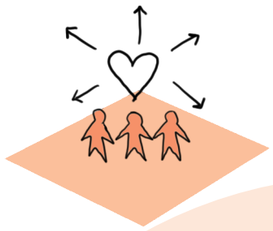
GREEN INTEGRATION
easy access to green spaces, green connections, green infrastructure use



SAFETY
lighting, traffic safety, natural playgrounds, art through the area

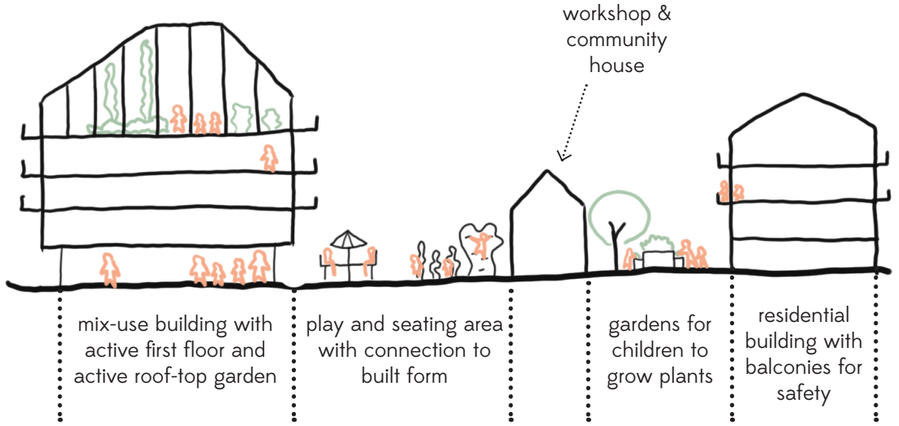


WALKABILITY & PROXIMITY
pedestrian areas, transit nearby, no car priority, 5-15min walk to every amenity, biking accessibility

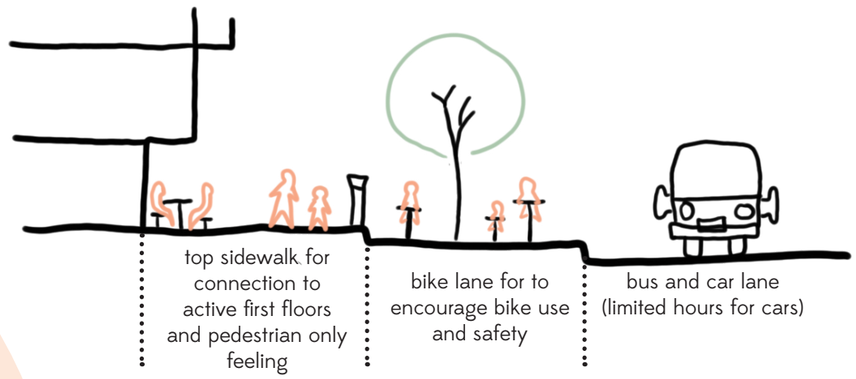


CHILDREN AT THE HEART
children's needs to be considered, schools in main part of area, near large stations, public spaces and green corridors

Toolbox adapted and created by Stella Boycheva of a child-friendly city or neighborhood to be used for this project and in the future



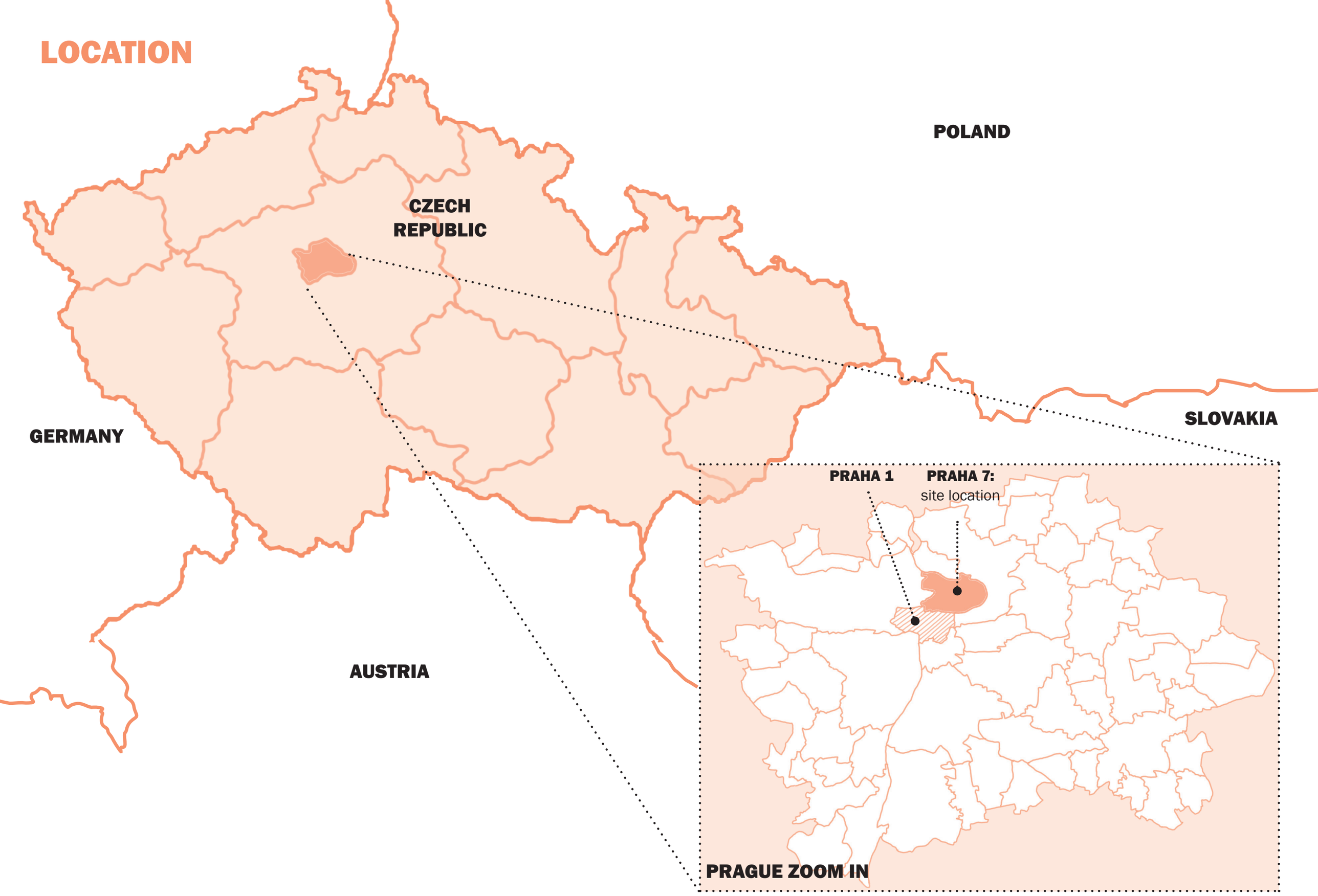

Child-friendly neighborhood adaptions, how to implement children's activities throughout an urban space




Separated and lifted sidewalks and bike lanes help with traffic safety in child-friendly communities (Idea mentioned in *Soft City*, 2019)

# 5

# LOCATION


POLAND
CZECH REPUBLIC
SLOVAKIA
GERMANY
AUSTRIA
PRAHA 1
PRAHA 7:
site location
PRAGUE ZOOM IN

# PRAGUE FACTS

Prague is the largest city in the Czech Republic and lies between the Vltava River. It is one of the historical and cultural centers of the country. The city consists of different municipality areas, the city center being located in Praha 1.

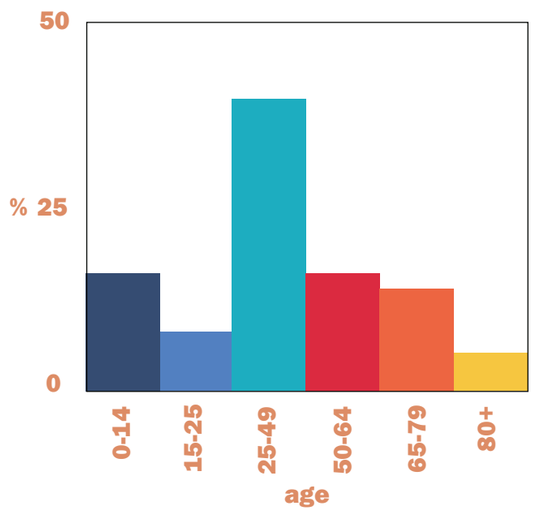
second most livable city for families in Europe

population: 1.4 million

most educated population in Czech Republic

best city for tourism with children

Demographics




Graph of demographics Source: IPR Praha

metropolitan area: 496km2

# WHY PRAGUE?

Prague is located in the center of the Czech Republic. This is a very central location in Europe. Prague is a very child friendly city already, which makes it a great place to continue with a new child-oriented neighborhood initiative in order to make the city even better. According to 'Reasurred', an insurance firm that conducted a study on most child friendly cities in Europe, in 2023 Prague was ranked number two on the list just behind Vienna. This ranking was a result of research on things like cost of living, crime rate, number of green spaces, pollution levels and cost of childcare (Reasurred, 2023). The population in Prague is not as high in the number of children as it could be for its child friendly factors. Overall, it would help the future of the city to create a community that encourages families to grow in a healthy environment.

Prague was also voted the best city to visit with children on tourism in 2023 (Reasurred, 2023). This ranking is a great indicator that children are very welcome in the city and it can be made even better through effective urban design. According to a survey for this ingoing project, citizens want more safe and comfortable public spaces, especially in this location as it is connected to the city center in Prague 1 (Johnová & Syrová, 2014). The municipalities in Prague are also very open to sustainability movements as well as new ideas that can help the city function better. However, the city has a problem with urban sprawl and cars. This issue can be improved with new ideas and ways to encourage walkability.

Prague has a plan to help public spaces become more pedestrian friendly through the use of different goals. These goals include additions of new public centers, seating areas and no vehicle access to prime locations. Prague also has a very high education rate which makes it a perfect place to enhance children's education on green infrastructure and sustainability through design as the general population is very open to learning. Therefore, Prague was a good choice for a project like this in order to gain more insight on what makes the city function now and what can make the city work better for children and families in the future.

# PRAHA 7

Praha 7 is a municipality within the city of Prague. It is very well connected to Praha 1 which is the center of the city. There are multiple modes of public transportation location in Praha 7 making it very accessible from different areas of the city. It is a very important part of Prague as it is well located and within the peninsula of the river. There is lots of potential for the site to be very well used and should therefore adapt to the citizens that will be using it.

# WHY THIS SITE?

The site, Bubny-Zátory is located in Praha 7 and it is the largest brown-field in Prague (IPR Praha, 2024). There have been issues with politics and ownership with the site. It is now privately owned, but the city worked with the company that designed the site for the research and analysis of the area. As a result of the prime location, it is a very significant site to the culture of Prague and can be made into a place for people to live in and visit. There are many cultural functions surrounding this site. Places surrounding the site including the 'Výstaviště Praha Holešovice' exhibition hall and grounds where a carnival takes place for families. Areas like this attract people to visit and create nice environments for not only children but also different age groups. The area is also beneficial to visit for children with all the things happening around. However, the area does not have appropriate infrastructure for children and families as it is currently. The very wide streets, car priority, unsafe feeling spaces and a non human scale that does not appear child friendly. The mix of cultural, social and points of interest, public transit hubs, brown-field and existing buildings makes the site challenging and interesting to work with for this specific topic. For these reasons, this site is a great opportunity to establish a child friendly community. There is a lot of potential for safer and more enjoyable spaces.


# TRANSIT CONTEXT

SITE

CENTER

35min walk
18min transit

The site is very well located when it comes to transportation as there is a metro station, two train stations and a bus and train station located on the site. It is very close to the center of the city and has the potential to be well connected to the many surrounding parkks in the area.

parks
restoration areas
forest
train routes
tram routes
bus routes

0 1 000 2 000 m

# GREEN CONTEXT

PRAGUE 7

SITE

The site has the opportunity to be well connected with the existing green network of the city. It has strong surroundings and should be considered an important hub of the city because of the river and its peninsula location. This analysis of the green connections shows how important the green system is.

0 1.000 2.000 m

# U PAPIRNY STREET BEFORE


The site has a mix of existing and blank areas. There are many interesting surrounding features, such as the mural in this picture and the small-scale street going through the space. This picture was taken in February of 2024 and showcases the car-oriented issue present in Prague and the site. This can be combated in different way to help with safety and create a better place for children to live in.

# SOCIAL CONTEXT

cultural spaces

transit hubs

commercial spaces

athletic spaces

educational spaces

industry

The site has many existing activities happening already and it is important to preserve and enhance these parts of the area. There are also very interesting things happening in the surroundings.

0 250 500 m

SITE

# SAFETY MAP

safe feeling spaces

unsafe feeling spaces

neither safe nor unsafe, potential for safety to be created

A map to showcase the feeling of safety within the site was an interesting way to analyze the area as it can show where certain areas need more help and what should be strengthened as it is well done already.

0 250 500 m

SITE

# PLAY MAP

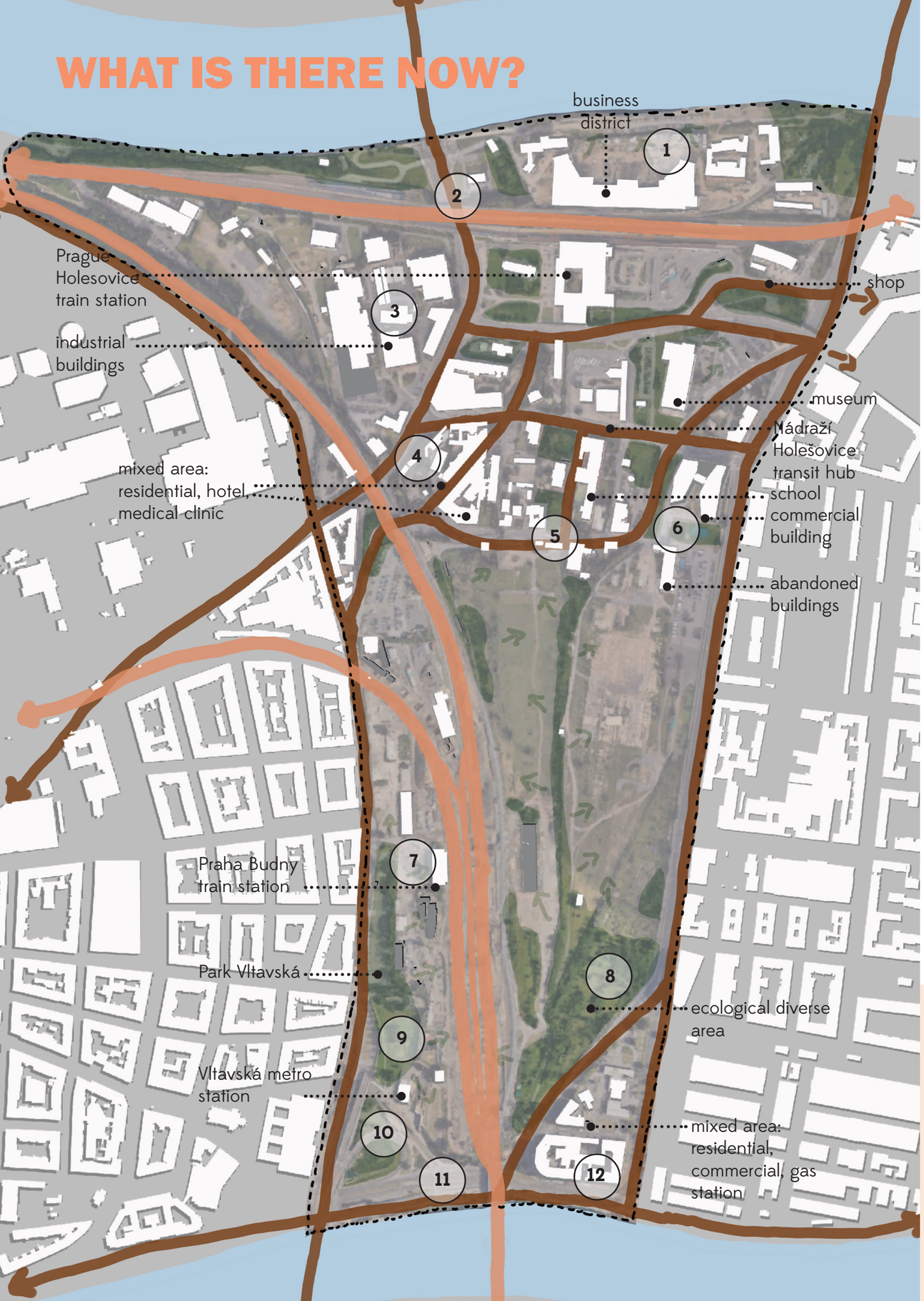
- main play & fun potential spaces
- existing 'fun' green spaces
- small-scale play space potential spaces & connections

The play map is another mental way to analyze where play can be included in the design of the project.

0 250 500 m

SITE

# WHAT IS THERE NOW?




# SITE PICTURES

**1.** boating dock, park trail

**2.** bad access to waterfront

**3.** industrial area

**4.** large, unsafe road

**5.** community garden

**6.** newly created public space of building

**7.** Praha Budny train station building

**8.** existing vegetation

**9.** park view

**10.** parkette near metro station

**11.** large road barrier towards water, no access to water

**12.** building view

# SWOT ANALYSIS

**S**
strengths

- existing buildings form typology feeling
- existing culture in site and surroundings creates lively and fun area to be designed
- many existing green spaces
- great location within the city, strong connection to Prague 1
- different parts of site have different interest

**W**
weaknesses

- wide existing streets
- overheated area because of the lack of vegetation and heat island effect
- car priority
- lack of access throughout the area
- unsafe feeling in some spaces
- train tracks can cause challenges for noise, safety and difficulty for access
- low quality soil as a result of the brown-field

**O**
opportunities

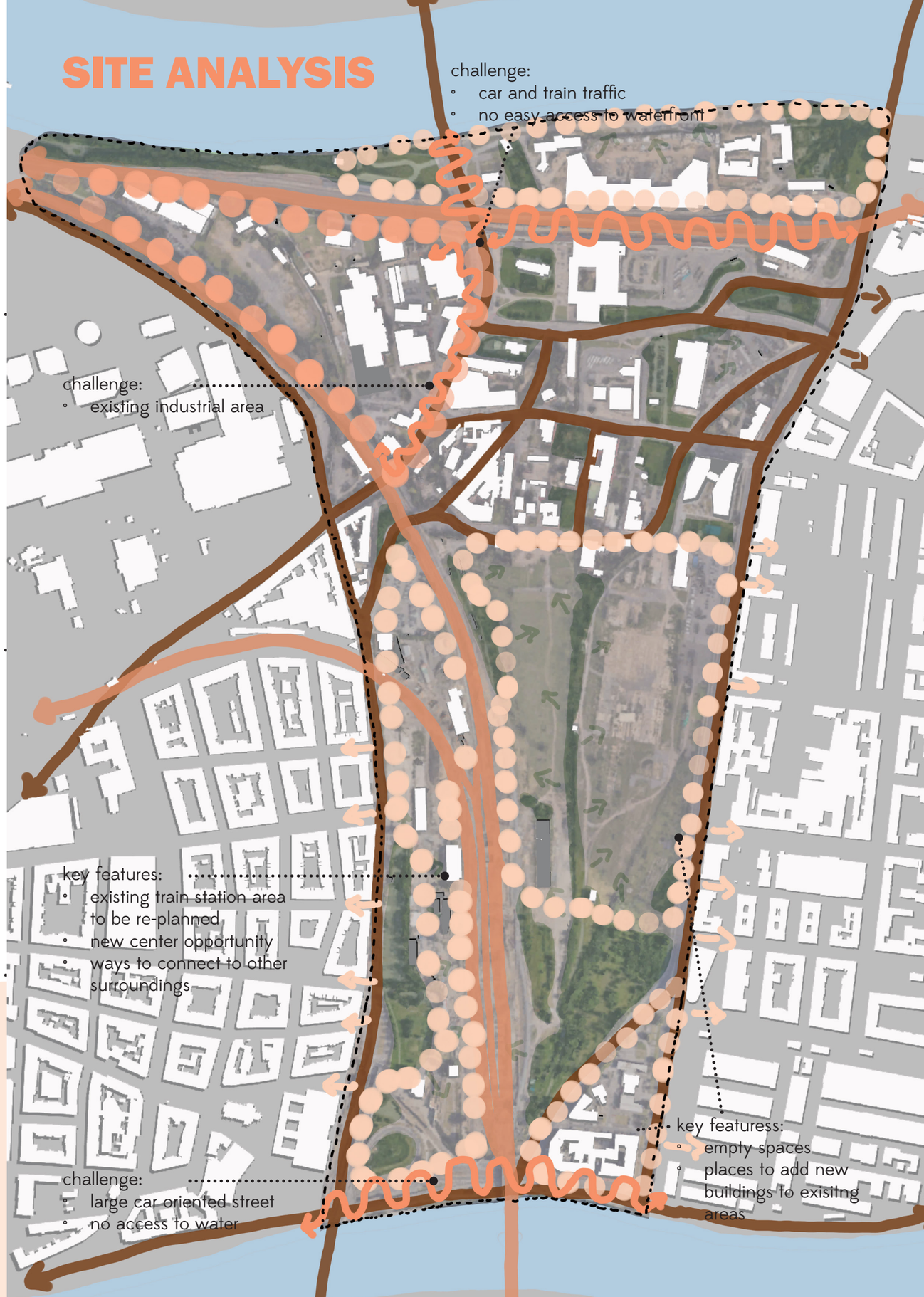
- many opportunities for new development as a result of the unused land
- existing green spaces can be enhanced and have ecological value
- new pedestrian areas can be developed
- strong surrounding connections can be made
- waterfront connection in the north of the site
- a mix of different spaces will encourage enjoyable uses

**T**
threats

- soil quality concerns
- large road danger in the south of the site, water edge and no connection to water
- noise pollution from train
- lack of lighting and safety
- separation of site because of train tracks in the middle



# SITE ANALYSIS

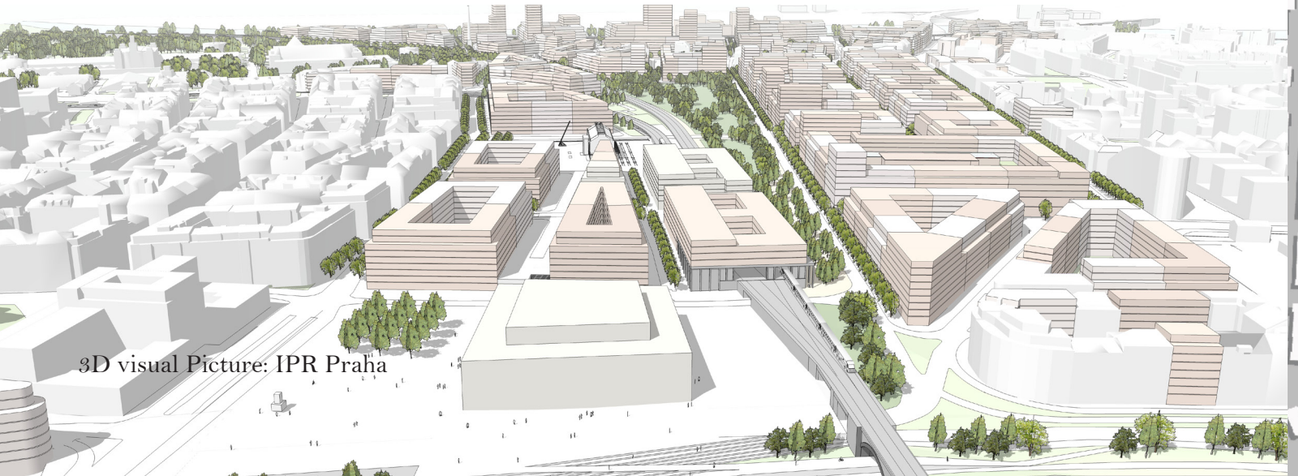


# CURRENT MASTERPLAN

The current masterplan of the Bubny-Zátory site was created by Thomas Müller Ivan Reimann Architekten GmbH and Pelcák architekti while IPR Prague worked on analysis and planning studies for the process. The main idea incorporates a central park and raised train tracks throughout the site. The area has a larger density as a result of the large building typologies.

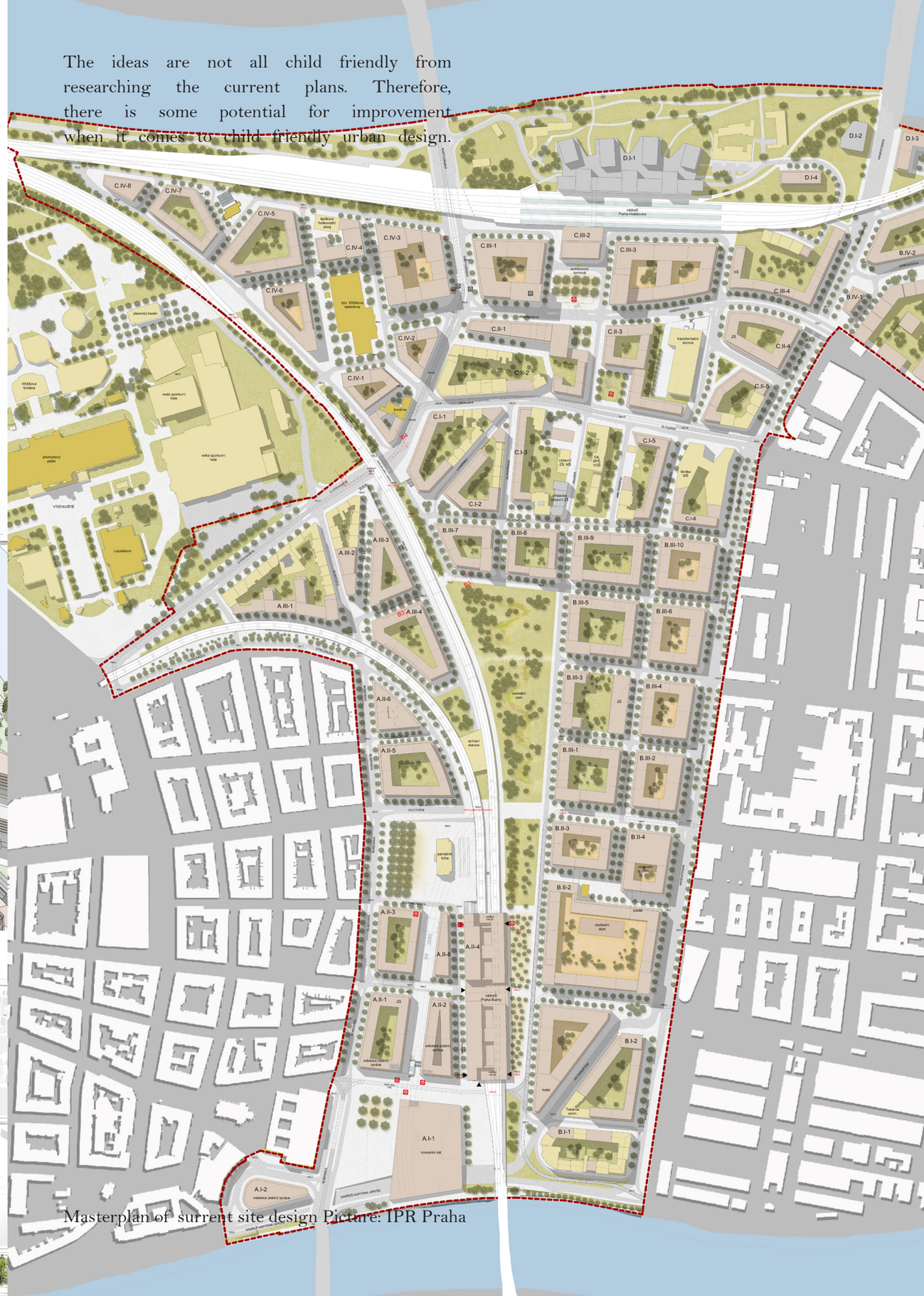
Perspective Source: IPR Praha

3D visual Picture: IPR Praha



3D visual Picture: IPR Praha

The ideas are not all child friendly from researching the current plans. Therefore, there is some potential for improvement, when it comes to child friendly urban design.




Masterplan of surrent site design Picture: IPR Praha

# 6

# VISION

My vision was to design and create a modern green neighborhood made specifically for children and foster a strong community for all who live there or visit. A special place for children and their families where access to greenery, education and safety come together for the future of sustainability.

# U PAPIRNY STREET AFTER

Improvements here can be seen in the walkability, car limitations, vegetation and play area for children. There are also improvement artwork and materiality.

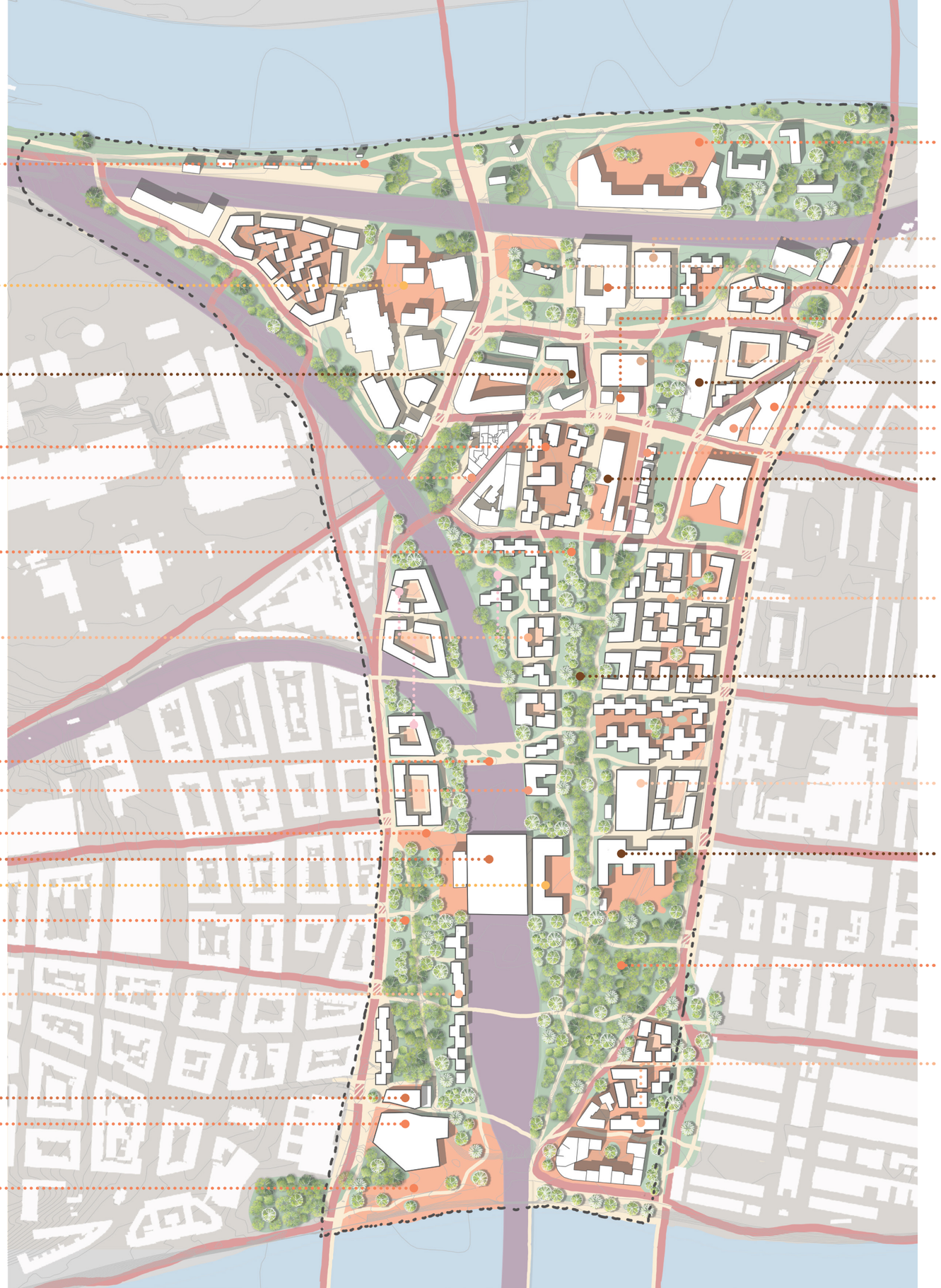
# MASTERPLAN

This is the design created for this area. The main concept stems from the main green corridor as the backbone of the community. The access to green spaces exist throughout the area making it easy for children to utilize no matter where they are. The site is also connected to the surrounding parks as well as to the rest of Prague.

The existing buildings are mostly all kept as they are with shifting of functions to make them more used. It is important that through sustainability, there is not too much demolition necessary. Some of the large streets have been made smaller or been separated to account for more walkability.

- Semi-Private spaces
- Public spaces
- Pedestrian areas
- New Vegetation/ Green Areas
- Car allowance areas & bus lanes
- Train Tracks
- Existing Vegetation/ Green Areas

# MASTERPLAN



Existing Park area with enhanced vegetation, trails and workshops along the river

Existing slow industrial area to be transformed into a historical and educational industrial heart for children to explore

Library with reading Heart hub and mix-use block

Residential community

U Papirny Street

Main Garden Heart of neighborhood

Residential Communities

Large pedestrian bridge with greenery

Grocery Store

Public Square

Praha-Bubny Train station extension

Mix-use Commercial Building

Enhanced Park Vltavská

Residential Communities

Metro Station Vltavská

Vltavská Philharmonic Hall

Public Square

Existing Business district and enhanced park area with vegetation, workshops and trails

Mobility House for car storage

Police station

Praha-Holešovice Train and metro station

Nádraží Holešovice Tram and bus stop

Mobility House for car storage

Technology museum

Greenhouses

Grocery store

Business strip

Existing High school: Obchodní akademie Holešovice

New Residential Communities

Main Green Corridor

Indoor Sport Facility

New Elementary school

Central Park

New Residential Community with art workshops

cultural spaces

transit hubs

commercial spaces

athetic spaces

educational spaces

residential spaces

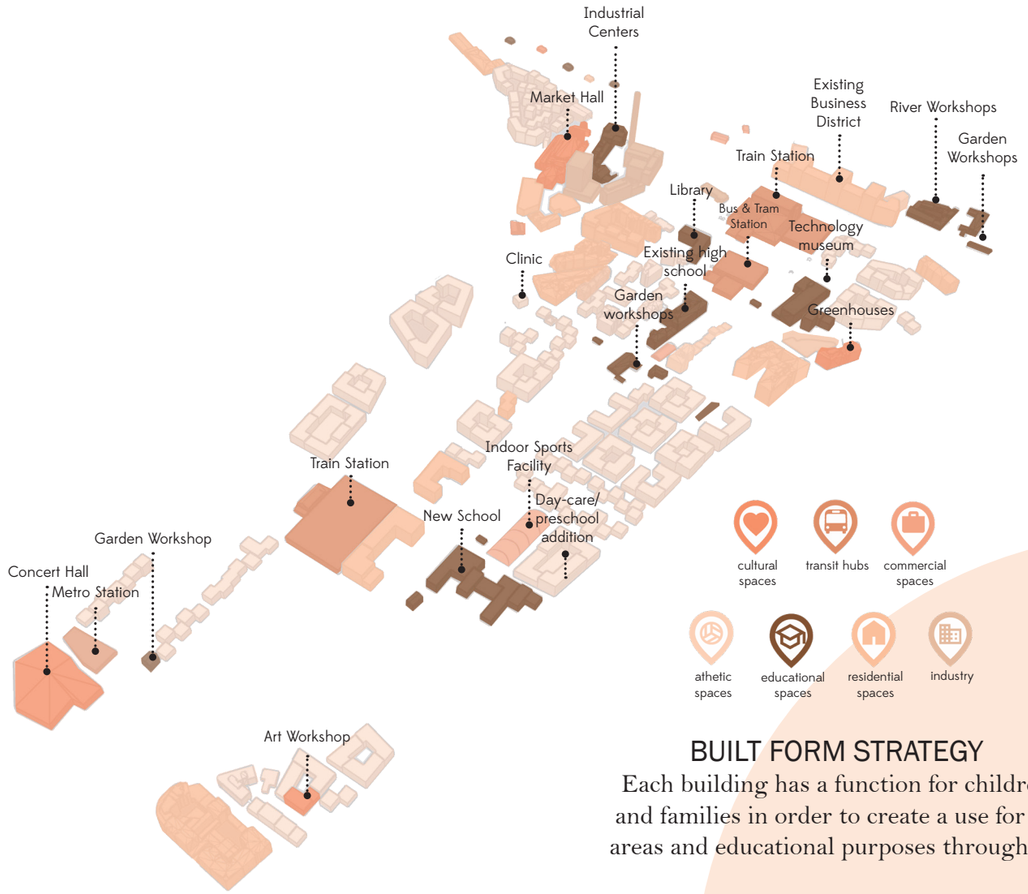
industry

# DIAGRAMS

The Built Form Strategy consists of using the existing buildings and some of their functions as they are in order to reuse the area. It also includes new built form with different functions and new functions in existing buildings that have not been used in a while. The built form is a large part of the proximity goal from the toolbox mentioned in chapter four. The specific purposes for each building makes the area diversity in typologies and functions to encourage use and walkability for anything that could be needed for children.

A green garden city made specifically for children is the key to fostering a strong community for all. Aspects of accessibility, safety and the incorporation of green spaces are used primarily in the vision of a garden city for children. The place can be very special for groups of children and their families once the vision is created in the reality.

A green garden city made specifically for children is the key to fostering a strong community for all. Aspects of accessibility, safety and the incorporation of green spaces are used primarily in the vision of a garden city for children. The place can be very special for groups of children and their families once the vision is created in the reality.

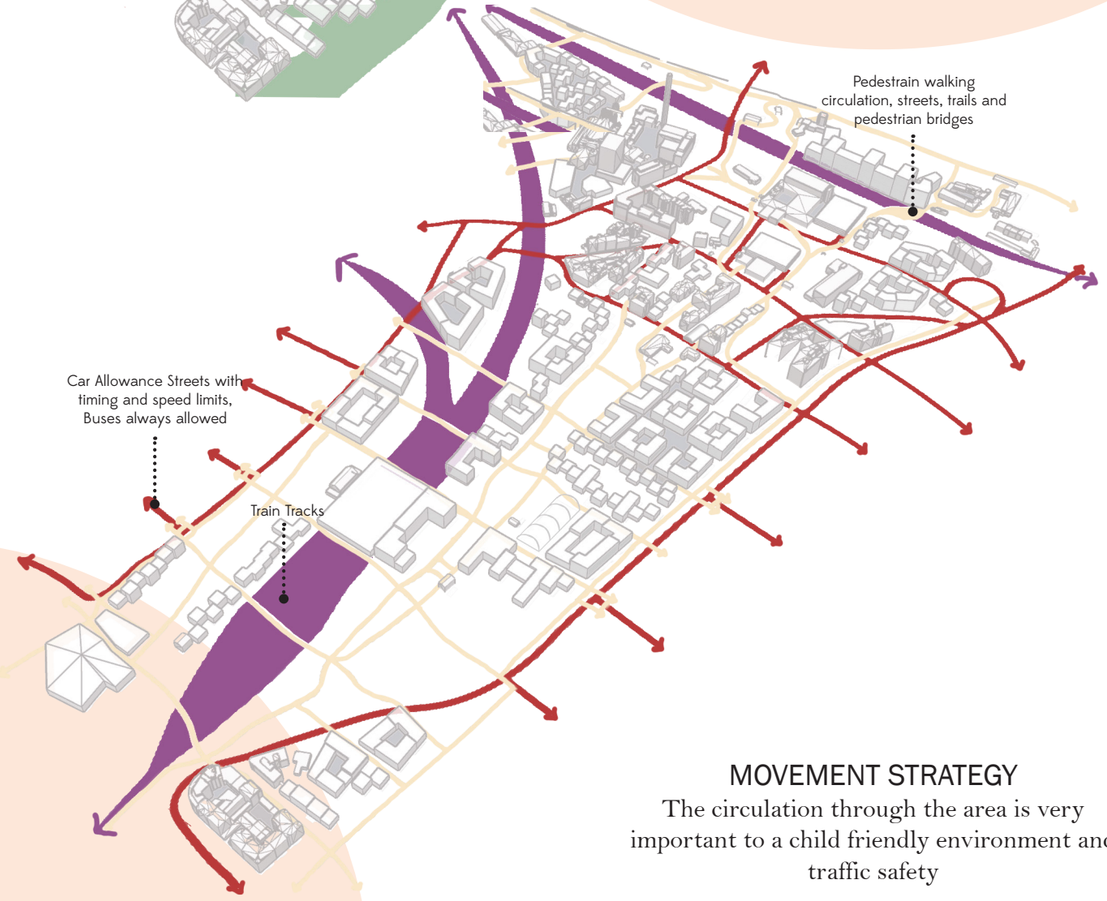



## BUILT FORM STRATEGY

Each building has a function for children and families in order to create a use for all areas and educational purposes throughout


## GREEN STRATEGY

A green network system goes through the site in order to create a safe, walkable and interactive garden city feeling for all users

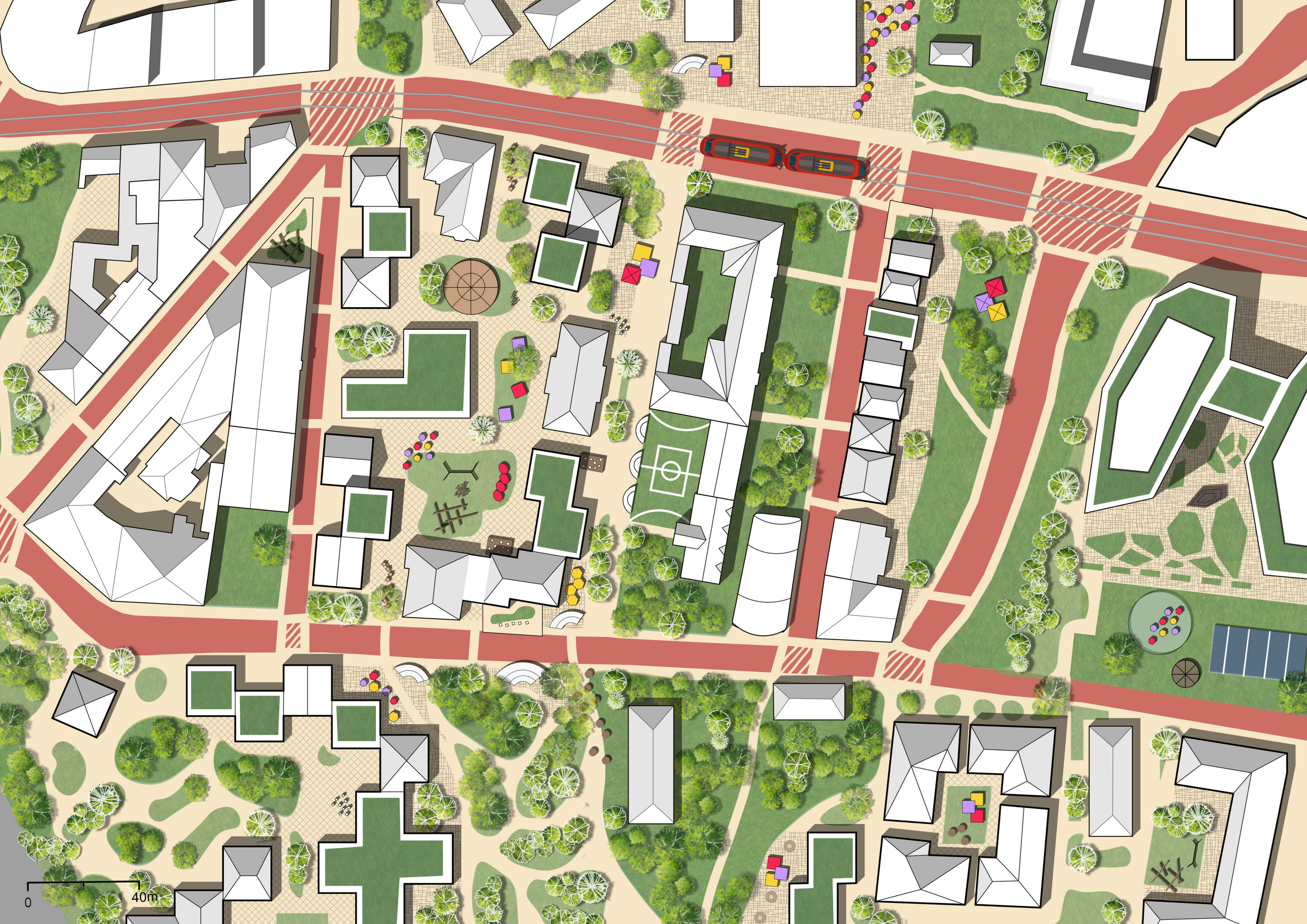



## MOVEMENT STRATEGY

The circulation through the area is very important to a child friendly environment and traffic safety

# NEW ELEMENTARY SCHOOL

This is a view of the new elementary school on site near the new train station and central park. Many of the new initiatives in the area can also be seen. For example, urban agriculture, gardening education, green roofs, art encouragement and natural play features.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# DETAILED PLAN

Semi-public courtyard area for play and other activities

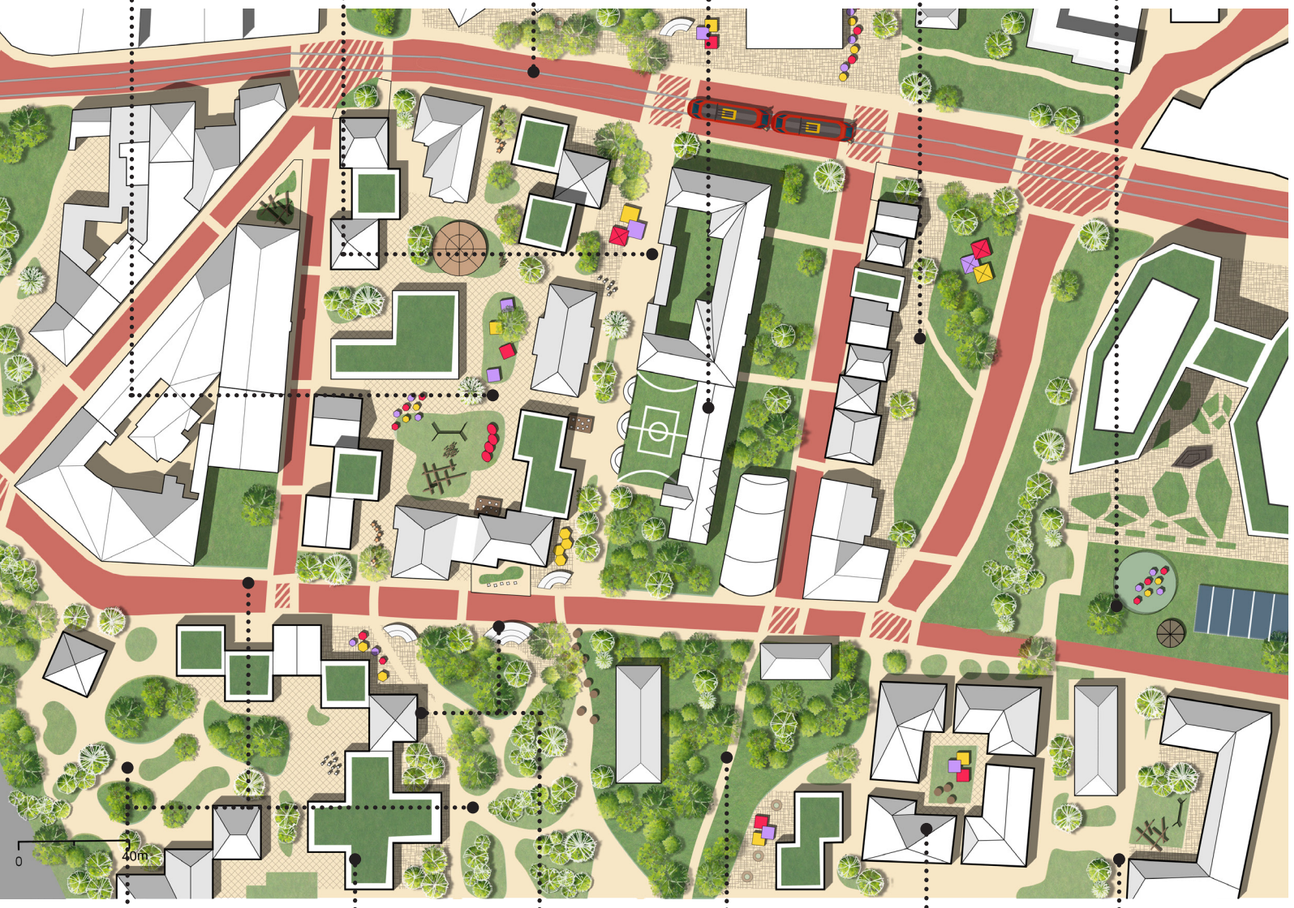
The School Corridor is a large pedestrian only street by school

Transport area with bus and tram stops and public square

Existing school with new outdoor sport facilities and more open concept

New shopping strip with local businesses

Existing play space with enhanced surroundings




Semi public community garden spaces

Active green roofs throughout the area

Interactive corners with different play & education features

Existing area to be used for gardening workshops

Private courtyards for residents to feel safe

Semi-public areas for diversity in spaces and uses



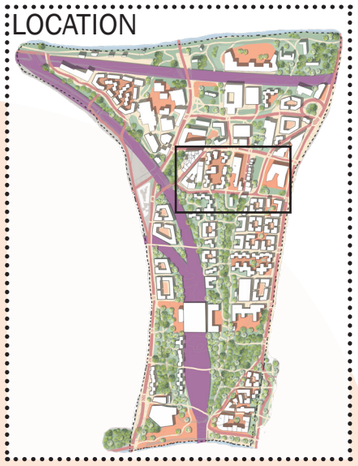
# THE AREA

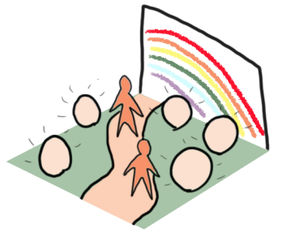
This area is located near the north part of the site where there are many existing buildings already. The largest issue is that the buildings are very largely spread apart and the spaces between, including the existing streets, are very wide. This does not account for traffic safety or walkability. When visiting the area, it was very difficult to walk around. This area therefore has a lot of potential for improvements especially as it is near an existing bus and tram station that connects the area.

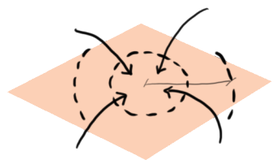
As seen in the plan, the more southern area is one of the main learning gardens on site. It includes different planters with different species, a small buildings with shared workshop equipment and many play features around for different types of interest.

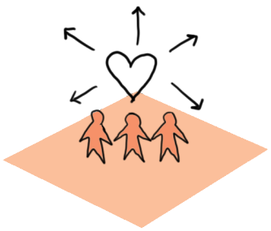
On the left east side of the plan, a new commercial street can be seen. Through this plan, aspects like the private courtyards, semi-public spaces and public streets and squares. There are also parkets and active street corners. Different Children's play infrastructure is placed around the whole area as well as different types of green infrastructure.

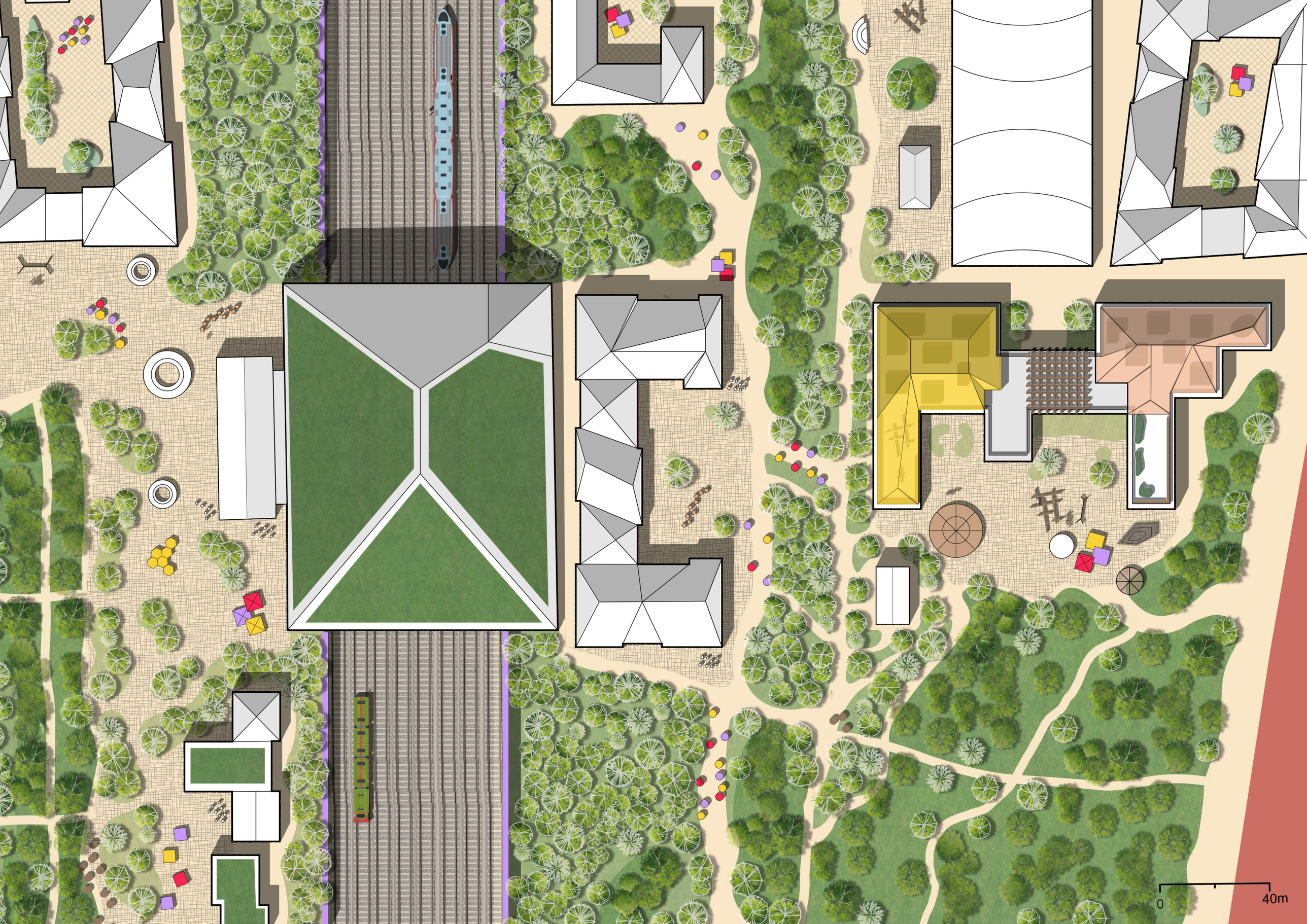
LOCATION







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# DETAILED PLAN

Train station extension and public square

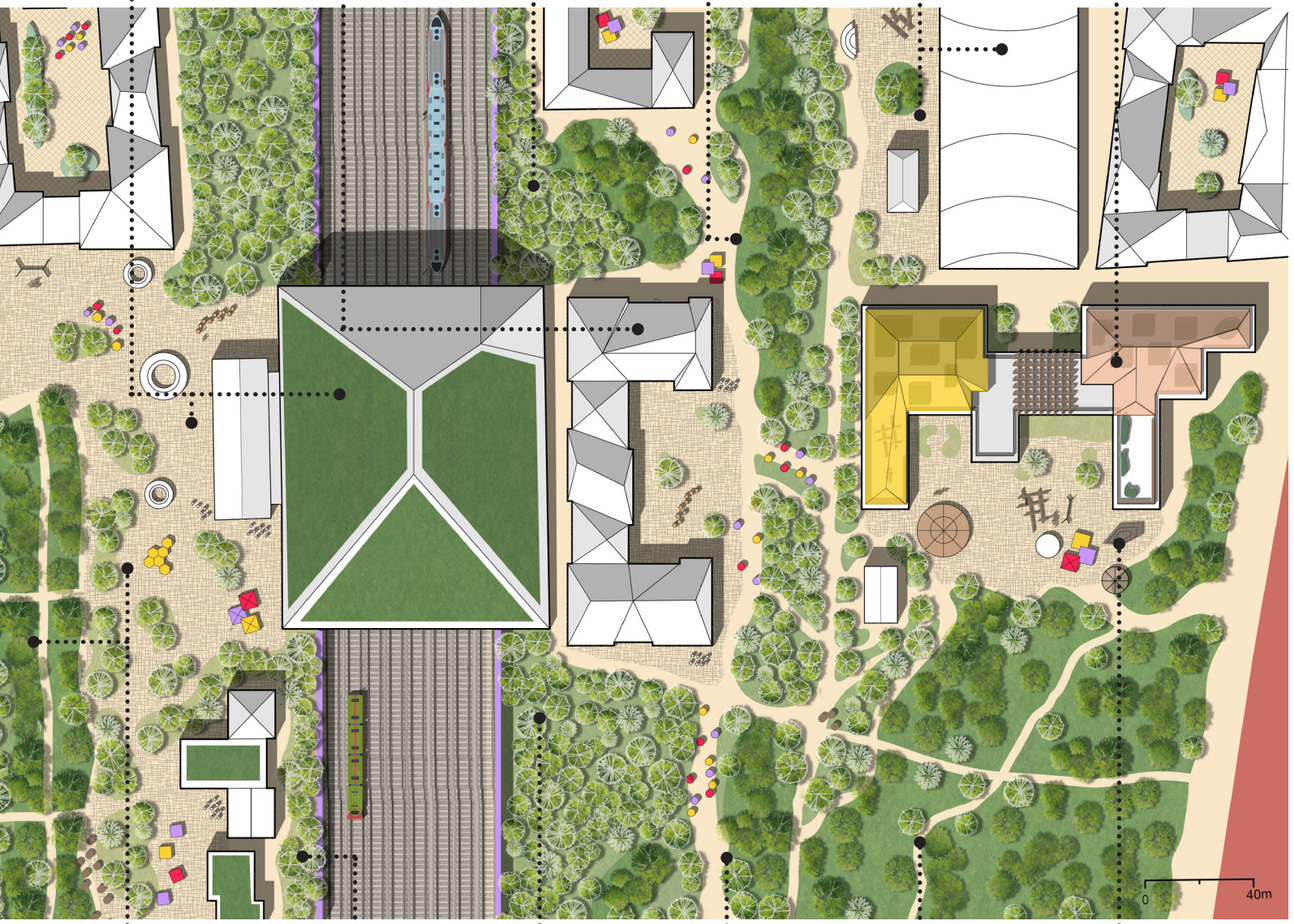
Mix-use building with commercial use like offices and shops

New forested area with different vegetation

Public green spaces with natural play features

Indoor sports facility & open space

New School with interative green roof




Enhanced park trail and play areas

Bioswales for water drainage and safety from train tracks using topography

New forested area for safety and green creating a feeling of being in nature

Pedestrian only walkways

Trail network for walking and biking easily through the area

Natural and interactive play features in school yard



# THE AREA

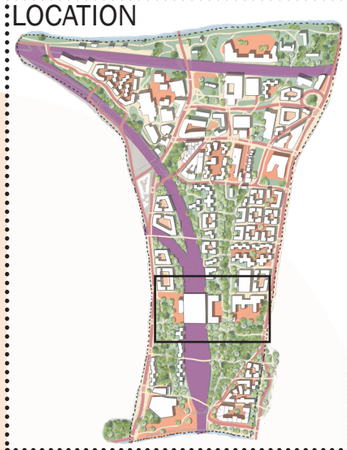
This area is located near the middle of the site and can be considered the main heart of the whole neighborhood. This is because this part of the area includes the new school, the new large train station, the main green corridor and many different public functions for children to enjoy.

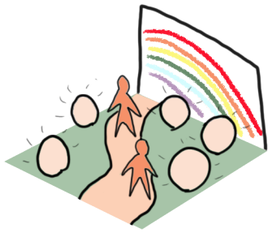
The main focal point on this plan is the school located on the eastern part of the plan. The new green roofs, school yard and trail system make the space full of life, nature and joy for the children that will be using it. The school's surrounding area can also be used for public functions throughout weekends or during summer vacations, for example for markets, craft fairs or summer camps.

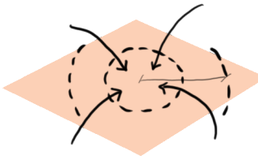
Above the school there is a new indoor sports facility that can be used all year round as well as an outdoor sports space that can be used for small scale gatherings and sports events.

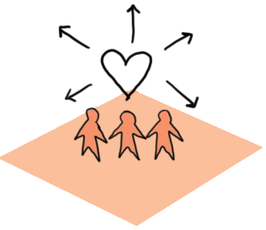
On the western side of the plan, the park trail can be seen leading into the new public square in front of the old train station building. The new train station extension is connected to the old building and will allow for many visitors and residents of the area to travel from all over Prague and the Czech Republic to this site. There ia also a commercial central building in the middle of the plan used for different purposes such as offices, shops or restaurants.

LOCATION

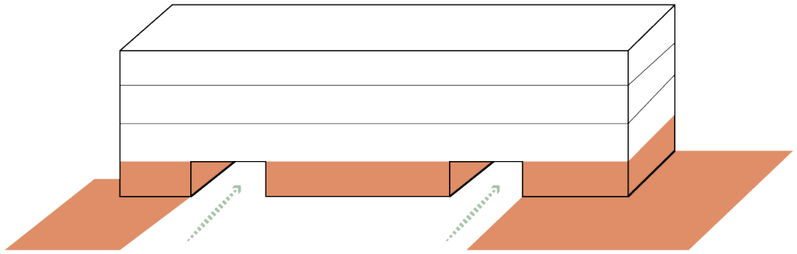








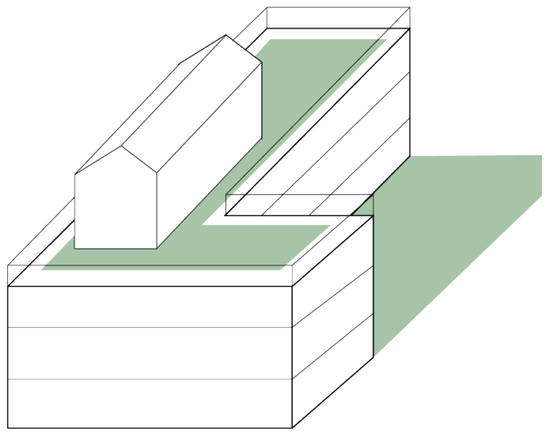
# BUILDING TYPOLOGIES



‘LONG’ MIXED USE TYPOLOGY

The new building typologies added to this area are inspired by the surrounding typologies used around Prague along with some Swedish design influence. and the site’s surroundings. The ‘Long Mixed Use Typology was developed from the long horizontal shape, fitting into many areas surrounding different park spaces. The bottom storey and in some cases the top storey work for public functions such as cafes, restaurants and local shops. Some of these buildings on site are used for offices, commercial or residential uses. In some cases there are also extensions of each side of the building to create a more ‘C’ type shape.

The ‘Green Apartment” typology was developed with the needs for children specifically. These apartments are low-medium density (two-five storeys) and leave a lot of room of outdoor observation of the outdoor/green areas surrounding them throughout the area. Many of these apartments have green roofs for activities or just for water drainage purposes. The shape of these apartment typologies varies depending on the space they are in and leave a lot of functional green space as they fit around trees or gardens. They shapes create fun little spaces for children to play nearby and the balcony additions make it easy for parents, guardians or neighbors to observe their children while playing outside. This typology is very valuable for green spaces and child-friendly use.

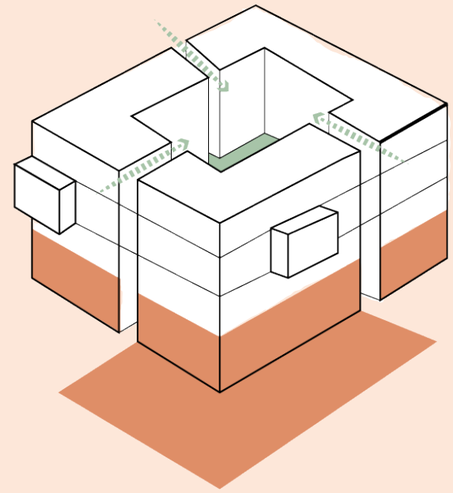


CORNER APARTMENTS

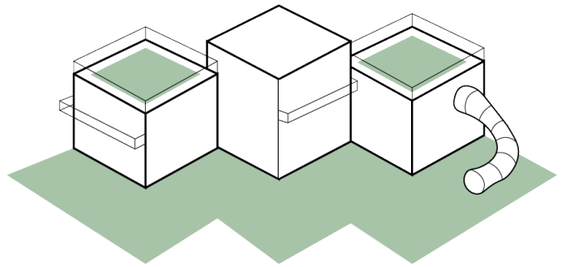
The ‘Corner Apartment’ typology is quite simply used for it’s shape. The size may vary from four to six storeys. depending on its location. The shape allows for a large functional green roof on top for playing and urban gardening. These typologies are mostly residential but some may have a few public functions in the top storey in addition to the green roofs. There is a lot of room for green space within the shape of this typology as well. It is important that these spaces are semi-public in order to create diversity of usable spaces for children and their families



The ‘Courtyard Apartment’ typology is the most like the typologies surrounding the site now. These typologies are very commonly used for the purpose of having a private courtyard in the middle of the residential units. It is very safe for children to be able to play and use a green space within the building. Parents, guardians or neighbors can observe their children as they play together in a community setting. The privacy that this typology creates also adds value to the childhood of the children living there. On the outside corners or bottom storey there are opportunities for shops or cafes. These typologies may change shapes depending on the space they are in. For example, a rectangular shape can exist or any other shape. This can also change the size of the inner courtyard and the density of the building. This typology can be from four to seven storeys. high The inner courtyards can have play areas, community play storage, community gardening, seating, outdoor dining spaces, bicycle storage and more.

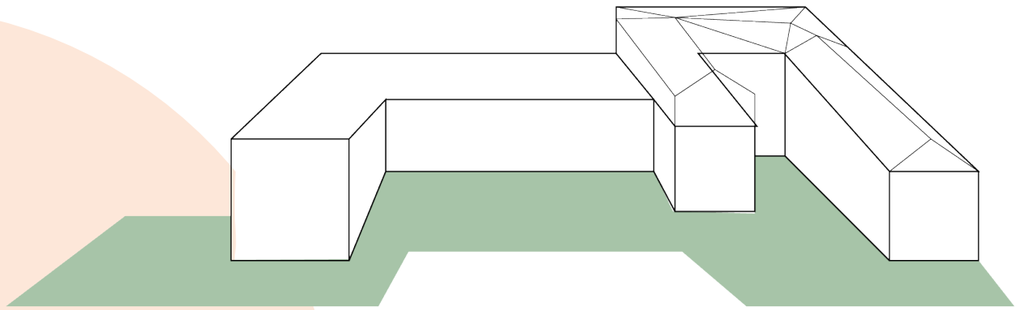


COURTYARD APARTMENTS

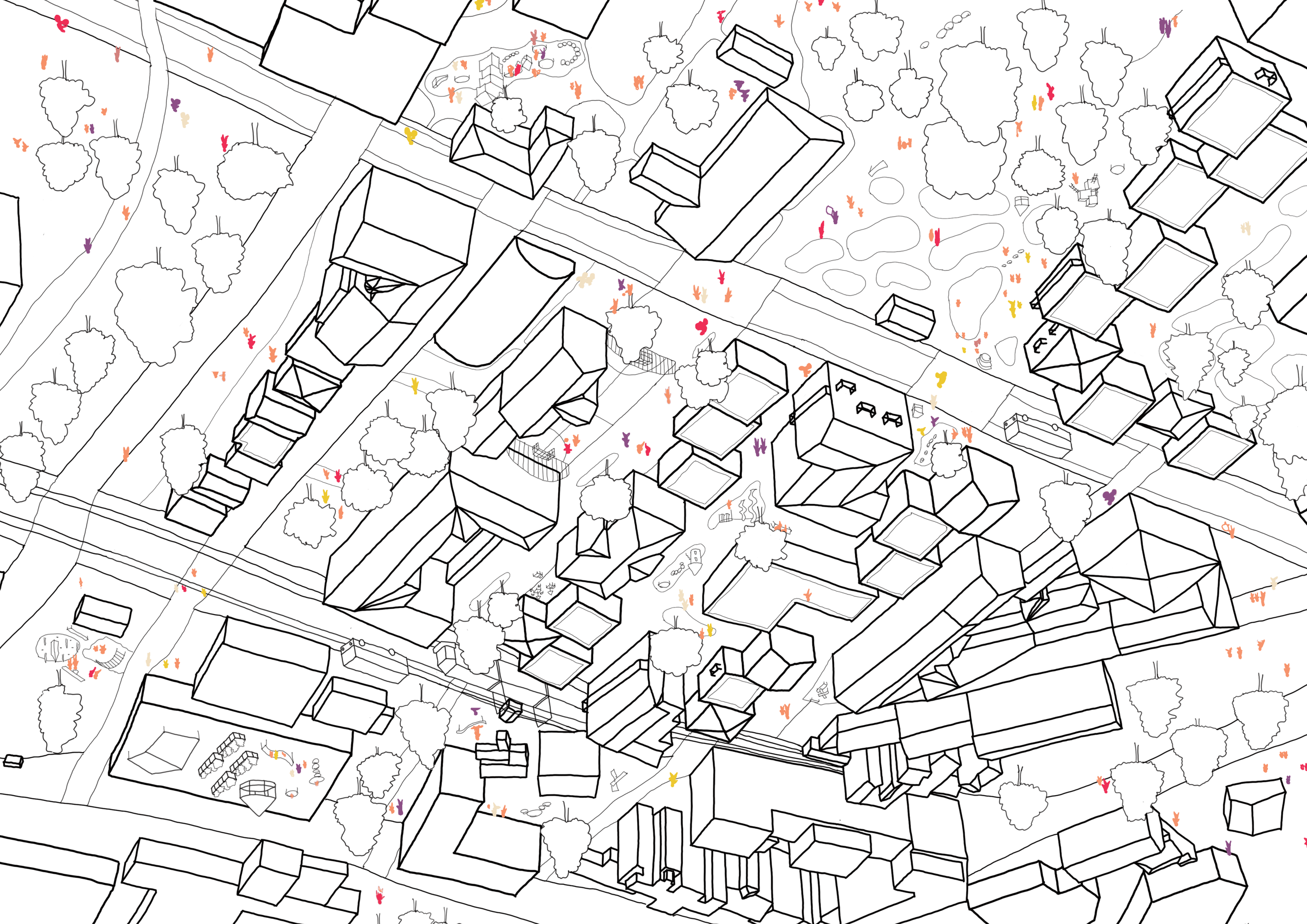


GREEN APARTMENTS

The new school typology was developed for s few different functions. As this new school will have nature programs, it was important that there was a functional, covered (greenhouse-like) green roof for all year gardening use. The long corridor in the middle acts as a ‘winter garden’ having large windows viewing to the gardens outside the school. The larger space on the first storey can act like a gym/auditorium while the many storeys above can have different sized classrooms. This school will be primarily for ages 6-13 as there is a high school and pre-school on site for the other age groups of children. The facade of this school is also important as it will be colourful, using different materials to draw interest to it.



NEW SCHOOL TYPOLOGY



# AXONOMETRIC OF DETAILED DESIGN

New sports facilities for the school and open to public

The school in the heart of the community (Existing school)

Frequent, accessible & reliable public transport

Public green spaces with natural play features and outdoor seating

Extensive Tree Cover

Pedestrian streets, trails and walkable areas

Active and stagnent green roofs throughout area

Sustainable urban drainage in parks and natural play features

Garden Heart for education on planting and community gardens

Teen friendly seating & social areas and play centers

Business street with local vendors

Public green spaces with different uses

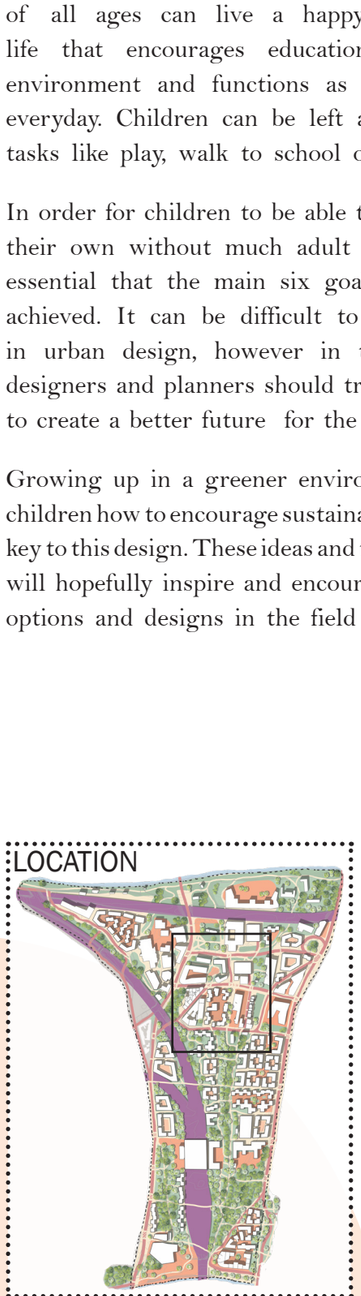
# DESIGN

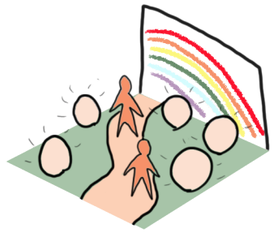
The design of this child-friendly area in Prague was created using all the data, research and ideas explained in the beginning of this project. The concepts from chapters one and two, case studies from chapter three and principles from chapter four were all included in the process.

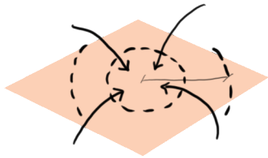
The main idea is to create a place where children of all ages can live a happy and safe daily life that encourages education through their environment and functions as an exciting area everyday. Children can be left alone to do daily tasks like play, walk to school or buy a popsicle.

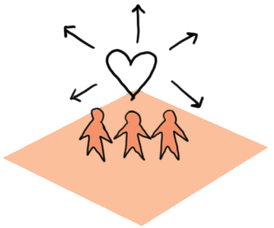
In order for children to be able to do activities on their own without much adult supervision, it is essential that the main six goals mentioned are achieved. It can be difficult to include children in urban design, however in the future urban designers and planners should try harder in order to create a better future for the next generations.

Growing up in a greener environment will teach children how to encourage sustainability which is the key to this design. These ideas and this specific design will hopefully inspire and encourage child-friendly options and designs in the field of urban design.



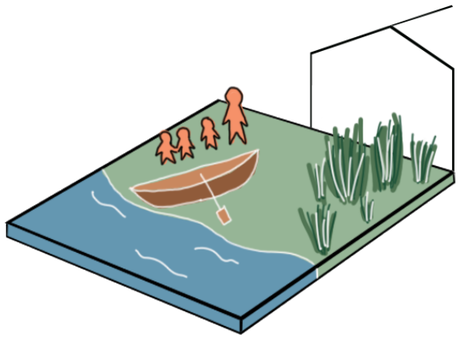





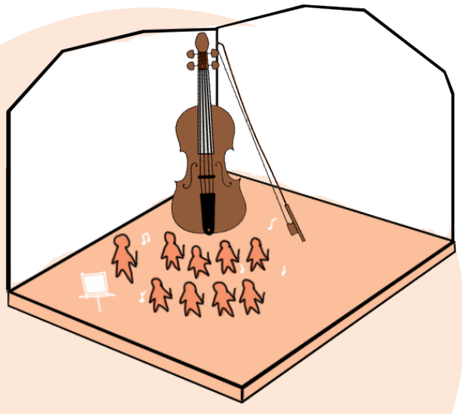


# SITE ACTIVITIES & WORKSHOPS

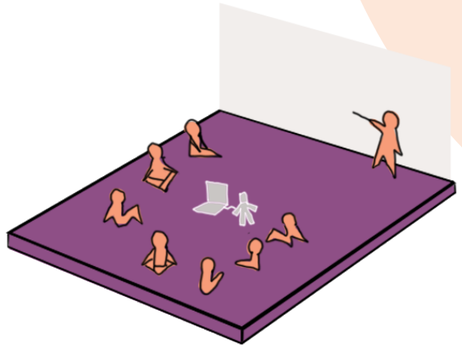
The workshops and activities within the site are what make it so unique for children, families and the environment. A garden city specifically made for children will have initiatives for different sustainability education, overall creating a safe, enjoyable and special place for children to grow up within the city of Prague. These activities and workshops will also bring people in and also create economic value to the area.



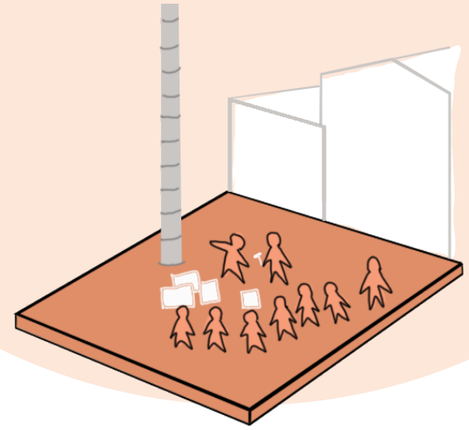
River workshops, learning about water, water ecology, boat trips, water wildlife knowledge



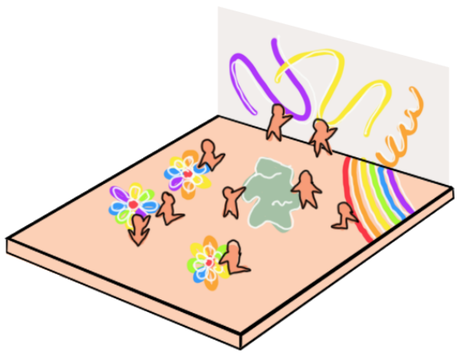
Music workshops, learning about playing instruments and enjoying music as a community



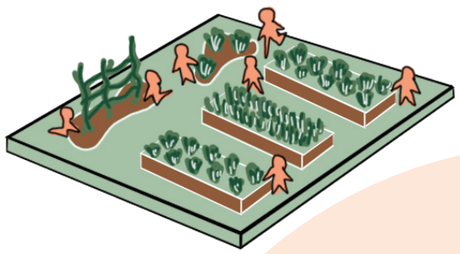
The Technology Heart helps children learn about tech, artificial intelligence and new features in our society



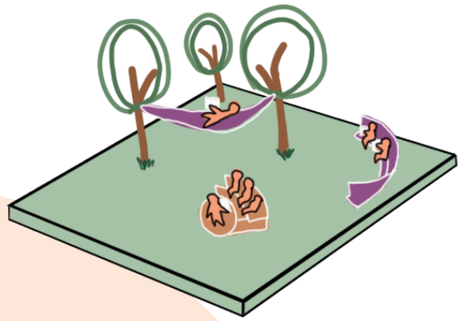
Industrial Learning Heart, to teach children about history of industry and hands on workshops where they can build different things



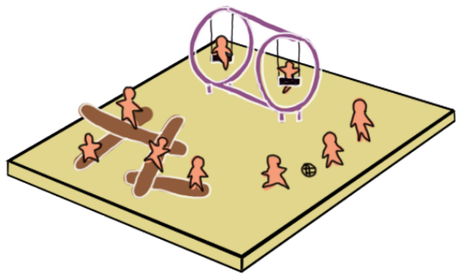
Art workshops, children being able to express themselves in different artistic ways and create safety and fun within the neighborhood



Garden workshops with different types of specifications for plating, such as urban agriculture initiatives, wetland species or indoor planting



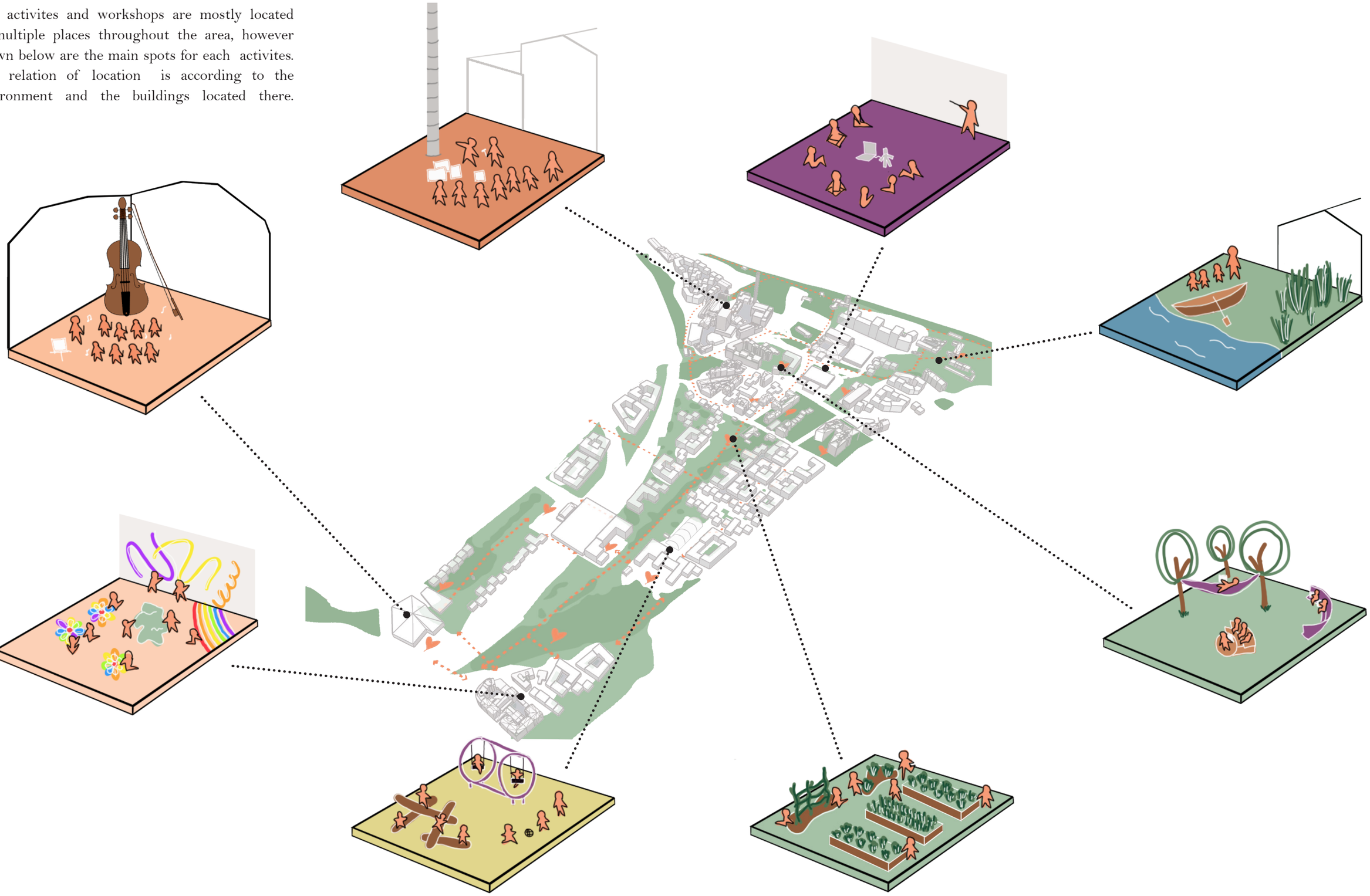
Reading spots of the community help create a safe space for children and families to read and learn together



Play and Sports activities exist throughout the site for different purposes and excitement

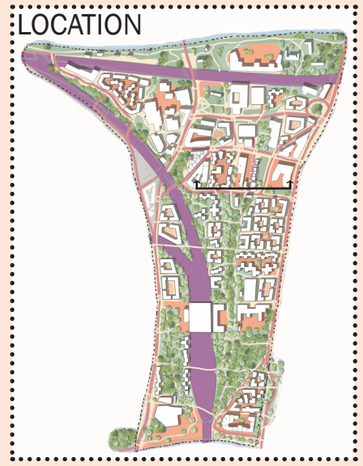
# SITE ACTIVITIES & WORKSHOPS LOCATIONS

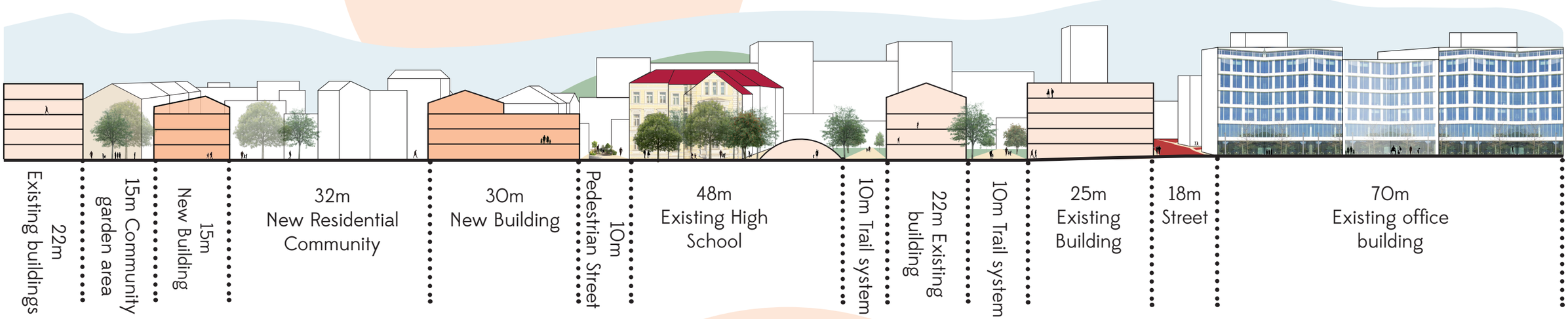
The activites and workshops are mostly located in multiple places throughout the area, however shown below are the main spots for each activites. The relation of location is according to the environment and the buildings located there.



# EXISTING AREA REDESIGNED

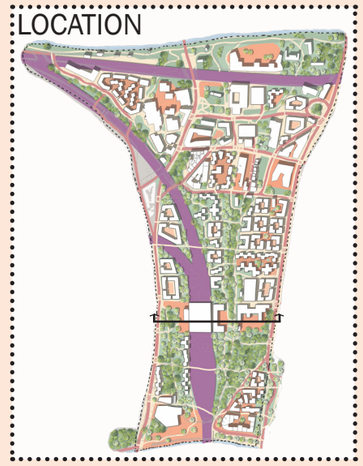
This section shows the area with the existing high school. This area has some existing buildings already and is therefore being enhanced with new community activities and child-friendly infrastructure. For example the walkable streets and new residential communities.

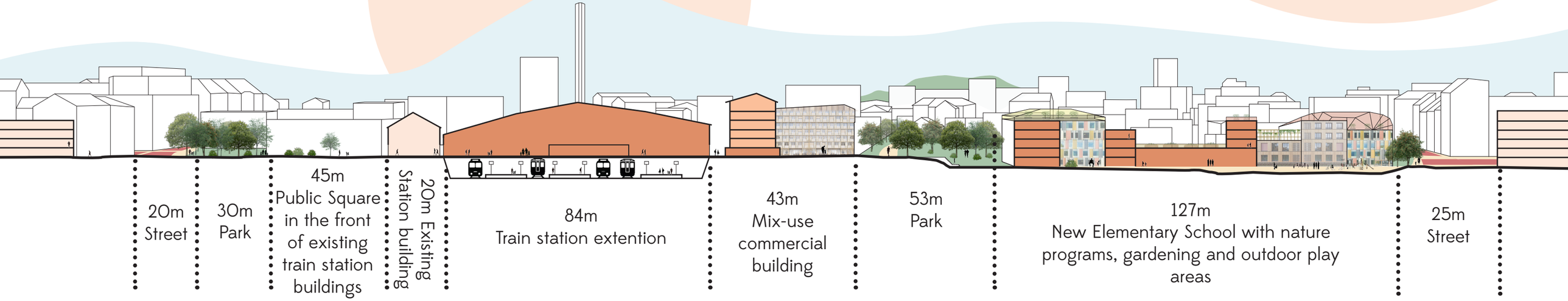



# NEW TRAIN STATION & SCHOOL

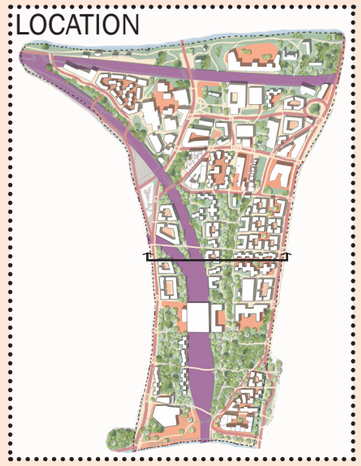
This section shows the new train station area, including the public squares and parks. The new school is also present here, where the building and yard are visible.

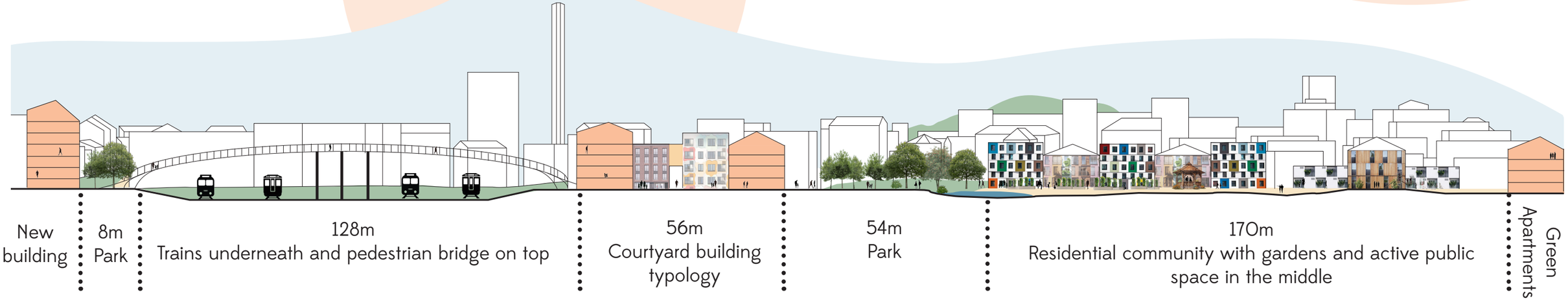


# PEDESTRIAN BRIDGES & RESIDENTIAL COMMUNITY

This section shows one of the many pedestrian bridges on site as well as a few different building typologies. The main green corridor/park area can be seen going through the center as well as the different fascades os the residential buildings.

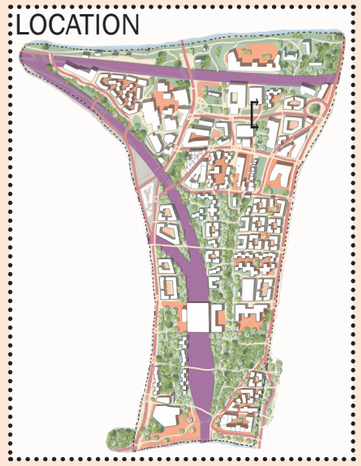


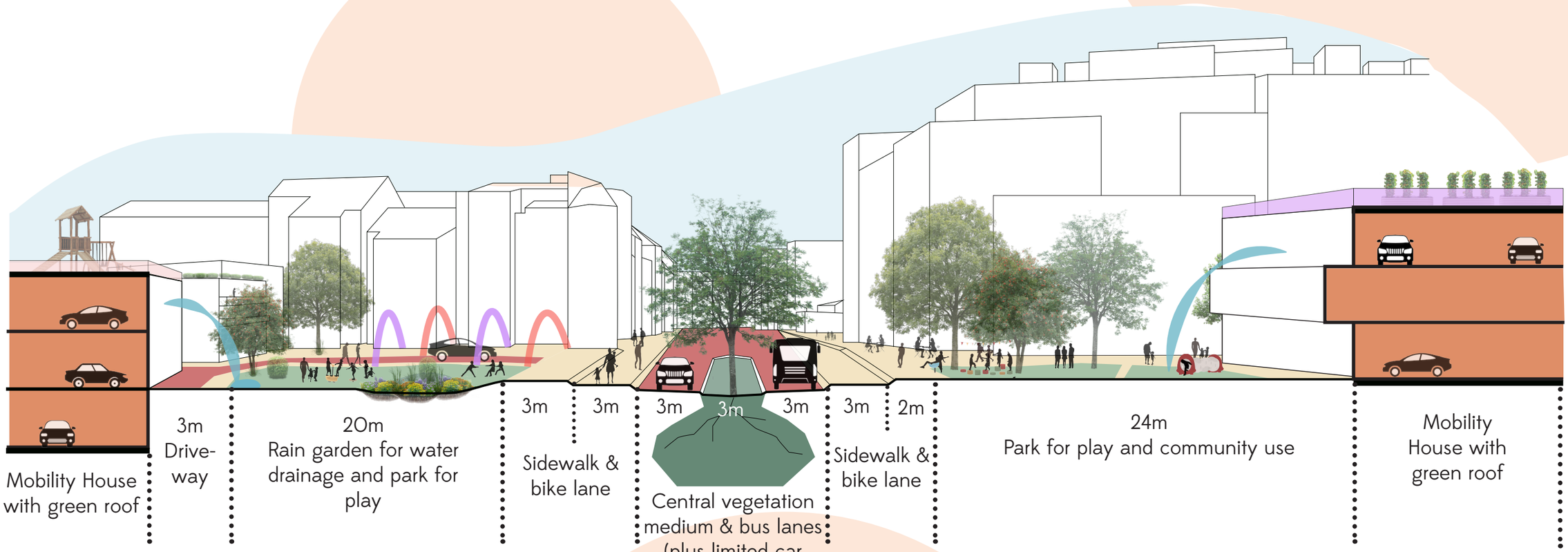




0 20 50m

# MOBILITY HOUSES STREET

As seen in this sections, there are twi mibility houses on the site to leave cars and be able to walk around. This encourages walkability and traffic safety. This section shows the street that has limited car access and bus lanes going through. Different parks and activities can be seen.

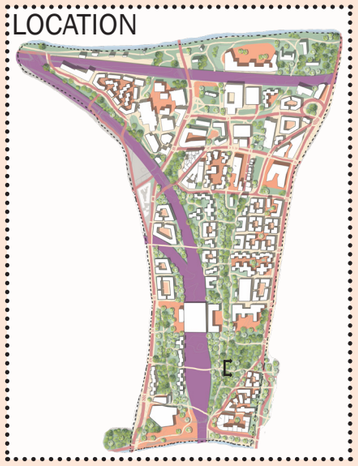


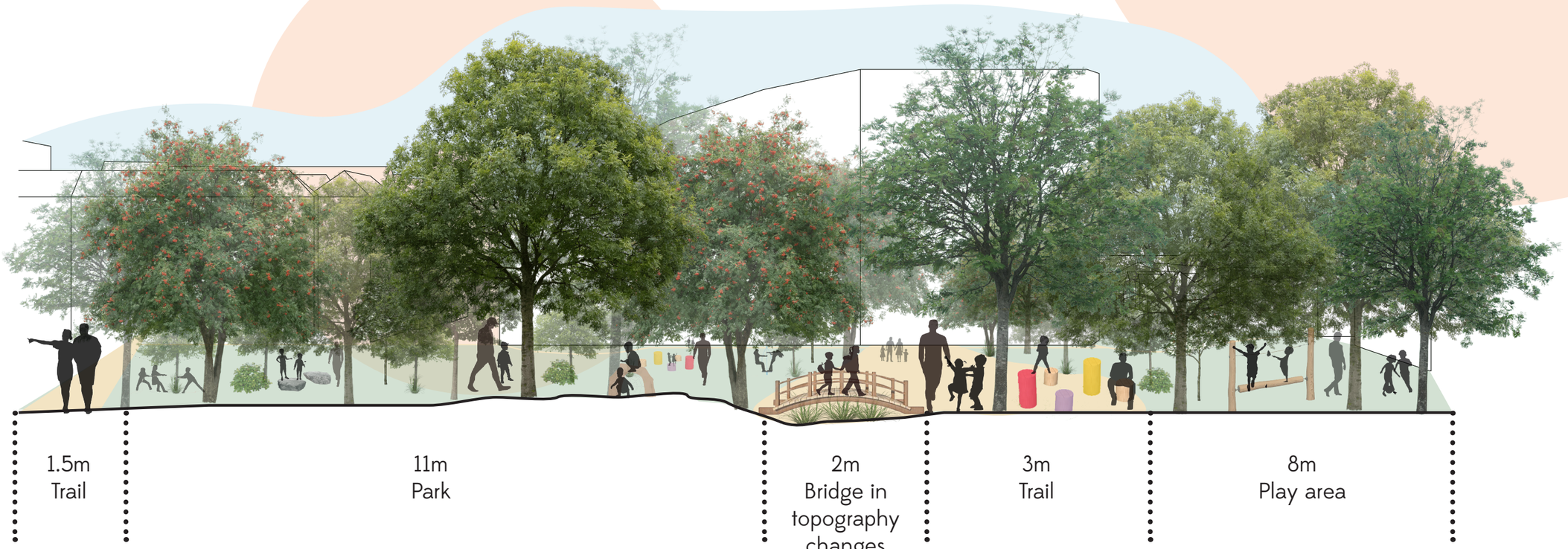




0 5 10 20m

# CENTRAL PARK & TRAILS

This section shows the main park on site and how some of the trails function through. There are many different things happening throughout the park for children and families. Some of the ideas can be referenced from the case studies, specifically in Lund where there is use of natural play elements.

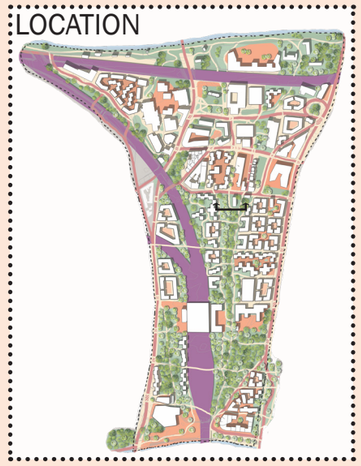


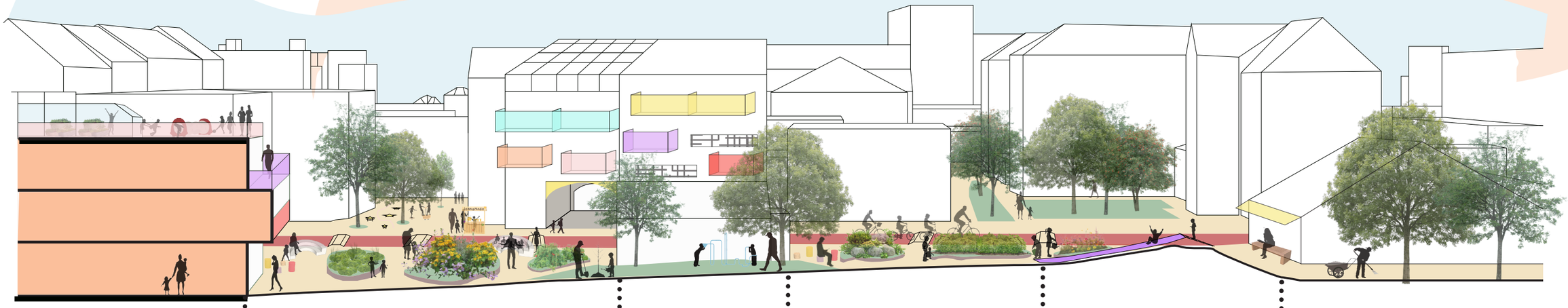




0 1 2 5m

# MAIN GARDENS

The main gardens can be seen here. Children are encouraged to use the area for play and gardening through workshops and community gardening initiatives. Using ideas from Rotterdam and Antwerp like community toys and tools within the workshop buildings for everyone to use together.



Residential building with active green roof and balconies for neighborhood observation

25m
Garden workshops with urban agriculture initiatives

10m
Garden workshop building and play activities

15m
Planters for all age groups to contribute to community garden

20m
Using the topography for natural play

Workshops building with outdoor seating area

0 5 10 20m

# PLANTING

## ANNUALS

Annuals through the area can create colourful and seasonal interest. Annuals like sunflowers can be fun to plan through some of the garden workshops and help the damaged soil on site.

All plants shown here are ideas for those that can be planted with children and can add to a healthy, diverse natural landscape in an urban environment.

SUNFLOWER
*Helianthus annuus*

SLENDER-LEAF MARIGOLD
*Tagetes tenuifolia Cav.*

SNAP DRAGON
*Antirrhinum*

MINT
*Mentha spicata L.*

## PERENNIALS & EDIBLE PLANTS

It is very effective to plant edible plants with children as they get a reward of eating after taking care of them. This teaches responsibility and care for the environment.

BIG ROOT GERANIUM
*Geranium macrorrhizum*

BASIL
*Ocimum basilicum*

LILYLEAF LADYBELLS
*Adenophora liliifolia*


BOHEMIUM EARLY GENTIAN
*Gentianella praecox subsp. bohemica*

A good selection of edible plants include: cucumber, tomatoes, swiss chard, lettuce, spinach, kale, zucchini, carrots, radishes, different pepper varieties and onions.. As well as spices like mint and basil. Many of these can be planted in gardens or planters. For children, exploring the environment and their own bodies is very important when growing up. Having plants that have physical sense dynamic is very useful in educating children. For example, annuals like sunflowers are great for sight because of their colour, grasses are great for touch, basil is perfect for smell and the edible plants are all great for taste.

## TREES

These trees can be planted through the site and its parks to create new forested communities and a nature feeling in an urban environment.

COMMON LINDEN
*Tilia europaea*

NORWAY MAPLE
*Acer platanoides*

MARSH ANGELICA
*Angelica palustris*

ENGLISH OAK
*Quercus robur*

## FOREST SPECIES

Some species are interesting to explore throug forests, especially growing a new green corridor and parks through the area. These species can be grown in Czech Republic forests and are only examples

ALPINE CINQUEFOIL
*Potentilla crantzii*

GENTIAN
*Gentianella amarella*

## GRASSES

Grasses are a great addition to any landscape for movement throughout the area and interest all year.

SILVERGRASS
*Miscanthus sinensis*

FOUNTAIN GRASS
*Pennisetum setaceum*

MARSH ANGELICA
*Angelica palustris*

EUROPEAN FEATHER GRASS
*Stipa pennata*

# PARK VLTAVSKÁ BEFORE

This park is located south of Praha-Bubny train station. It is current just a lawn with some hills and has potential for more vegtation and features to make it more unique and fun for children and other users. There is also a mico-wetland seen on the right of the picture that can be enhanced for better storm water retention, drainage and cleaning water before it enters the groundwater system.

# PARK VLTAVSKÁ AFTER

The improvements to the park can be seen here. For example, gardening features, seating areas, the use of the landscape for play, better walkability and safety with the large bulb lighting artforms.

# 7


# LESSONS & REFLECTIONS

Through this thesis project process I have learned some valuable lessons on how to research, design and communicate. I learned a lot about child-friendly infrastructure, design principles and how the value of child-friendly urban design effects everyone.

I learned a lot about how child-friendly design is not valued as much as it could or should be. I also learned how many cities around the world do value child-friendly urban design and include many policies to make children feel included. It made me feel very optimistic to find the number of municipalities that really try to make a difference for children.

I have been reflecting on including children in the planning and design process. There are very simple ways to do so from my research throughout this thesis and can therefore be implemented much more worldwide. I wonder if many adults are not open to the idea because they grew up a certain way and may continue to view children as less than because of their young age.

To answer the research questions:

- What are the principles of child friendly design in the 21st century city?

As stated in chapters two and four, there are many principles that make a city child-friendly including safety, walkability and green space access to name a few of the main ones .

- How can urban green infrastructure contribute to a child-friendly city? Can sustainability be taught through your environment?

UGI can contribute a lot of benefits to a child-friendly city including water drainage and biodiversity. The strengths to creating a modern garden city can encourage sustainability for the future as children learn how to care for their environment. It seems from the research and evidence that it is possible to teach children about sustainability through their their environment especially from a young age. Caring for plants, animals and spaces is a very valuable skill to teach children.

- What urban green infrastructure is best for a children centered neighborhood?

This question was a bit more difficult to find answers for and integrate into design. It seems as though all UGIs can be beneficial for a child oriented neighborhood. For example, parks and open green spaces can benefit affordance and have social benefits for children when it comes to brain development. Rain gardens, urban gardens and planting areas can help with education on sustainability and help limit global warming. Micro-forests and street trees can also help with warmer temperatures, shading, biodiversity and add value to spaces. So it is difficult to tell specifically which UGIs are the best for children centered neighborhoods, but we have learned that all have benefits to children and the community.

Writing this thesis and understanding more about the importance of green spaces for children has helped me strive to be a better designer and I hope to make a difference in urban design in the future. It is very important to think outside the box when it comes to children and I believe that through time and effort we as urban designers, architects and landscape architects can make a difference for children and people for generations to come.

# BIBLIOGRAPHY

## ONLINE REFERENCES:


Acar, H. (2013, July 1). *Landscape design for children and their environments in urban context.* IntechOpen. https://www.intechopen.com/chapters/45427

Adriazola-Steil, C. (2018, December 4). *Designing safer cities for children:.* TheCityFix. https://thecityfix.com/blog/urban-design-street-road-safety-children-cities-claudia-adriazola-steil-wei-li-ben-welle/

Björklid, P., & Nordström, M. (2012, June). *Child-friendly cities – sustainable cities. Sustainable Cities and Society,* Journal, ScienceDirect.com by Elsevier. https://www.sciencedirect.com/journal/sustainable-cities-and-society

Building a child friendly city. UNICEF. (2019). https://www.childfriendlycities.org/building-child-friendly-city

Johnová & Syrová. (2014, April 16). *What do child-friendly neighbourhoods look and feel like?. Cities4Children.* https://cities4children.org/blog/what-do-child-friendly-neighbourhoods-look-and-feel-like/

City for citizens, Citizens for City. Slovak governance institute. (2014, May). https://www.governance.sk/gov_project/city-for-citizens-citizens-for-city/

City of Rotterdam. (2010, October). *Rotterdam, City with a future - playing out. Rotterdam, City with a Future: How to build a Child Friendly City.* https://playingout.net/wp-content/uploads/2022/11/Rotterdam-How-to-build-a-Child-Friendly-City.pdf

Davies, C., & Lafortezza, R. (2017). Urban Green Infrastructure in Europe: Is Greenspace Planning and policy compliant? Land Use Policy, 69, 93–101. https://doi.org/10.1016/j.landusepol.2017.08.018

Foucault, M., & Miskowiec, J. (1986). *Of other spaces.* Diacritics, 16(1), 22. https://doi.org/10.2307/464648

Fraker, H. (1970, January 1). *Vauban, Freiburg, Germany.* SpringerLink. https://link.springer.com/chapter/10.5822/978-1-61091-409-3_5

Gill, T. (2007, October 28). *No fear: Growing up in a risk averse society*. Calouste Gulbenkian Foundation - UK Branch. https://cdn.gulbenkian.pt/uk-branch/wp-content/uploads/sites/18/2007/01/No-fear-text-only-19-12-07.pdf

Horelli, L. (1998). *Creating child-friendly environments.* Childhood, 5(2), 225–239. https://doi.org/10.1177/0907568298005002008

How a focus on child-friendliness revived one city's fortunes. Rethinking Childhood. (2018, April 26). https://rethinkingchildhood.com/2018/04/26/rotterdam-child-friendly-city-urban-planning-gentrification/

IPR Praha (n.d.). *Bubny-Zátory*. https://iprpraha.cz/project/66/bubny-zatory

Krishnamurthy, S. (2019). *In Sixteen Nations Is Free-Play Declining?* American Journal of Play. https://files.eric.ed.gov/fulltext/EJ1285764.pdf

Reclaiming spaces: *Child inclusive urban design.* Cities & Health, 3(1–2), 86–98. https://doi.org/10.1080/23748834.2019.1586327

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 Masarykova univerzita, B. ústav A. vd. a J. univerzita. (n.d.). Pladias. Pepnout na eštinu. https://pladias.cz/en/

Nebelong, H. (2014, Summer). *Design in urban settings with children and nature in mind.* Play for Wales. http://www.hellenebelong.com/?page_id=25

The necessity of urban green space for children's Optimal Development. UNICEF. (n.d.-b). https://www.unicef.org/documents/necessity-urban-green-space-childrens-optimal-development

Our plant collections. Botanická zahrada Praha. (n.d.). https://www.botanicka.cz/en/odborna-cinnost/plant-collections/

Pal, K. (2023, July 27). *Green Infrastructure Planning: Creating Sustainable Urban Environments.* Meristem Design. https://www.meristemdesign.co.uk/blog/green-infrastructure-creating-sustainable-and-resilient-urban-environments

Sensory garden plants. KidsGardening. (2022, June 22). https://kidsgardening.org/resources/growing-guide-sensory-garden-plants/

Singer, D. G., Singer, J. L., D'Agostino, H., & DeLong, R. (2009, Winter). *Children's Pastimes and Play in Sixteen Nations Is Free-Play Declining?* American Journal of Play. https://files.eric.ed.gov/fulltext/EJ1285764.pdf

Sugar, S. (n.d.). *The necessity of urban green space for children's Optimal Development.* UNICEF. https://www.unicef.org/documents/necessity-urban-green-space-childrens-optimal-development

Vidal, D. G., & Castro Seixas, E. (2022, March 9). *Children's Green Infrastructure: Children and their rights to nature and the city*. Frontiers. https://www.frontiersin.org/articles/10.3389/fsoc.2022.804535/full

Jingxia Wang, In the last decade GI has been applied in land use and conservation plans, Based on a comprehensive analysis of key definitions of Green Infrastructure (GI) and their conceptual evolution, Alavipanah, S., Banzhaf, E., Baptiste, A. K., Barredo, J. I., Brussard, P. F., Cameron, R. W. F., Connop, S., Groot, R. S. D., Barrera, F. D. la, Demuzere, M., Edwards, P. E. T., Garmendia, E., Gill, S. E., Hostetler, M., … (EC), E. C. (2017, November 22). *Towards a better understanding of Green Infrastructure: A Critical Review.* Ecological Indicators. https://www.sciencedirect.com/science/article/abs/pii/S1470160X17305861

Wright, H., Williams, S., Hargrave, J., & zu Dohna, F. (2017, December). *Cities alive: Designing for urban childhoods.* Arup. https://www.arup.com/perspectives/publications/research/section/cities-alive-designing-for-urban-childhoods


## BOOKS:


Gill, T. (2021). Urban Playground: *How Child-Friendly Planning and Design Can Save Cities* (1st ed.). RIBA Publishing. 2024, https://www.taylorfrancis.com/books/mono/10.4324/9781003108658/urban-playground-tim-gill

Henderson, K., Lock, K., & Ellis, H. (2017). *The Art of Building a Garden City: Designing new communities for the 21st century.* RIBA Publishing.

Sim, D., & Gehl, J. (2019). Soft City: *Building density for Everyday Life.* Island Press.