CHILD-FRIENDLY URBAN DESIGN

Observations on public space from Eindhoven (NL) and Jerusalem (IL)

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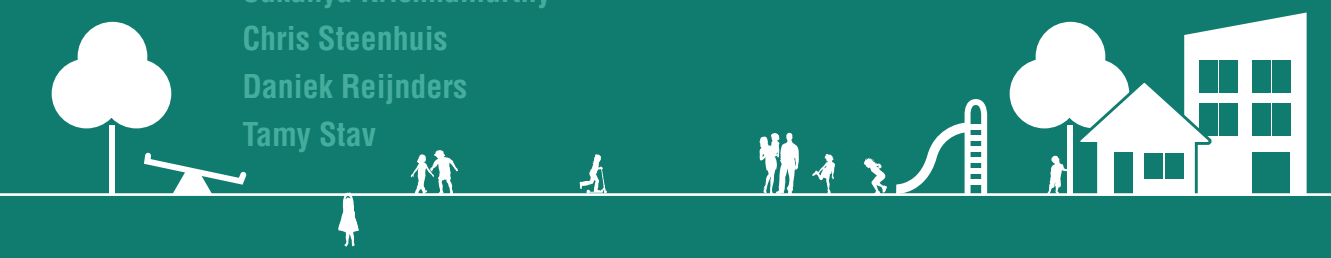

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Funded by
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Executive summary

This report presents our findings on urban design solutions for increasing child-friendliness at the neighbourhood level based on the project ‘Child-Friendly Urban Design’. Funded by the Bernard van Leer Foundation, this project took place consecutively in Eindhoven (NL) and Jerusalem (IL) during 2016-17 and used built environment indicators to observe and analyse child-friendliness of public spaces at the neighbourhood level.

Four main issues make up this report. First, a review on the literature and best practices on the role of urban design in realising child-friendly built environments. Second, we present an analysis of indicators that provide data on the suitability of the public sphere for young children and their parents. Third, we present and discuss empirical data on neighbourhoods from Eindhoven (NL) and Jerusalem (IL). Based on these case studies, in the fourth part of the report, we develop a list of recommendations for better design of streets, public spaces and neighbourhoods to fit the needs of young children and their families.

The main focus of this report is the influence urban design has on the ways families with children can access and use public space. The quality of public space in urban and suburban spaces is crucial for physical, social and cognitive development of young children and as opportunities of outside play. Today, various initiatives, plans, and ongoing projects discuss the importance of city and neighbourhood level interventions for child friendly planning. Initiatives such as co-creative design of public space with children and parents, bottom-up neighbourhood design initiatives are some examples that highlight the increasing need for family and child directed consumption spaces in cities.

Based on current knowledge, we created a typology of indicators on the child friendliness of three important daily living domains – the street, green spaces and play spaces. We provide an analysis of these three domains through observations, surveys, workshops and interviews in Eindhoven and Jerusalem. The empirical data gives us neighbourhood-level understanding on the supply of suitable public space for children, and the demand and consumption of public space by them.

Data from Eindhoven reflects that though there are mechanisms (policy and design) in place that progressively contribute towards the inclusion of changing urban lifestyles, concerns on the importance of outside play, safety, multi-age/ multi-use, and inclusive public spaces remain high. The data from Jerusalem - while repeating concerns with safety and the need for outside play revealed in Eindhoven - displays at times extreme settings that to some degree nullify the indicators. Thus, the two data sets combined provides learnings on the need for more nuanced transfer of indicators. At the same time, the data shows us the underlying common needs and concerns that apply to the upbringing of children in an urban setting.

The correlation between urban planning and design with existing physical and social infrastructure is expanded on through a list of design recommendations in the last section. Examples such as street furniture, greening streets, natural play areas, flexible spaces, street art, co-creating neighbourhood child route, etc. are proposed to accommodate for more family friendly spaces at various scales (street and neighbourhood). It is argued that when planning future city spaces, the role of urban design combined with the use of child-friendly indicators adjusted to local factors needs to be strengthened. This report points out the wider significance of spatial transformation of the city's needs to accommodate various demographics and requirements.

Example of a possible neighbourhood improvement (more green landscapes), suggested by a child during the workshop with school children in neighbourhood Bergen, Eindhoven (NL),

Acronym	Definition
AUP	Algemeen Uitbreiding Plan (General Expansion Plan Amsterdam)
BvL Foundation	Bernard van Leer Foundation
CBS	Centraal Bureau voor de Statistiek (Central Bureau of Statistics)
CFC	Child Friendly City
CFCI	Child Friendly City Initiative
CFP	Child Friendly Planning
CFSC	Child Friendly Smart Cities
CROW	Centrum voor Regelgeving en Onderzoek in de Grond-Water- en Wegenbouw en de Verkeerstechniek (Centre for Regulatory and Research in Ground, Water- and Road Construction and Traffic Engineering)
DIY	Do It Yourself
ECF	Environment Child Friendliness
MOST	Management of Social Transformations Programme
NIUA	National Institute of Urban Affair
NGO	Non-Governmental Organization
NL	The Netherlands
NOS	Nederlandse Omroep Stichting (Dutch Broadcasting Foundation)
PBL	Planbureau voor Leefomgeving (Netherlands Environmental Assessment Agency)
RGL	Raad voor het Landelijk Gebied (Council for rural areas)
TNS NIPO	Taylor Nelson Sofres Nederlands Instituut voor Publieke Opinie (Taylor Nelson Sofres Dutch Institute for the Public Opinion)
TU/e	Eindhoven University of Technology
UGS	Urban Green Spaces
UN	United Nations
UNESCO	United Nations Education, Scientific and Cultural Organization
UNICEF	United Nations Children's Emergency Fund
UN-Habitat	United Nations Human Settlements Programme

1. Introduction

Following the current trend of global urbanisation and the growing attraction of cities for families with children, urban environments are becoming principal contexts wherein a new generation of children will thrive and grow. With the expanding reach of children's studies within the social sciences, urban analysis is essential to improve contextual understanding of children's contemporary problems and needs in the city. Through the creation of mechanisms for children's participation in decision-making, equal opportunities, quality of public space and safety, various child-friendly strategies can be incorporated into planning and design. Within advocating for child-friendly practices, the role of urban design and planning can be vital for creating built environments and should not be ignored.

Within this context, researchers from the Built Environment at Eindhoven University of Technology (NL) and the University of Jerusalem (IL), by partnering with the Bernard van Leer Foundation, aimed to develop on the role of urban design and planning focused on public spaces and child-friendly environments. By developing an initiative that works towards learnings from two countries with different degrees of child-friendly planning, we aim to outline the similarity between the challenges that exist within the needs and concerns that apply to the upbringing of children between the ages of 0-12 within urban environments.

Creating child friendly communities is central to building strong and vital neighbourhoods, cities and regions, though concerns have been put forward on the insufficient response from the field of the built environment. This report is a starting point to develop on the role of child-friendly practices within the fields of urban design and planning. Through a literature review, the report develops an overview of planning for families with children, after which a few examples highlighting various efforts of child-friendly environments from around the globe are highlighted. Based on existing work, the report builds on three important daily living domains – streets, green spaces and play spaces. Through case study analysis from four neighbourhoods in Eindhoven and Jerusalem, the report positions concerns, challenges and exiting initiatives that build or deter child-friendly design practices. Further, the report builds a set of possible recommendations for interventions based on empirical findings for public spaces.

Objectives of the report

The aim of this report is to explore the role of urban design in the relationship between public space and families with children and its impact on child-friendly planning. The research aims to answer the following questions:

- How can the role of urban design be expanded to address public space and child friendly environments?
- How can existing built environment indicators focused on child-friendliness be devel-

Reclaiming the street by chalking lines to play hopscotch in neighbourhood Bergen in Eindhoven (NL).
Source: Authors

oped on through descriptive quantitative, qualitative, and design knowledge?

- How can the interest of families with young children be better accounted for within planning for child-friendly cities?

Rationale and reading guide

The rationale of the work stemmed from the need to build on the role of urban design and planning within child-friendly city initiatives. The report aims to add to ongoing work on the following points:

- First, identify the role of urban design within existing built environment for child friendly environments through a review of literature and approaches used.
- Second, to develop descriptive knowledge based on using environmental indicators focused on play, green and streets.
- Third, conduct case study analysis based on the empirical data from Eindhoven (NL) and Jerusalem (IL).
- Fourth, develop a list of recommendations for possible design interventions at street and neighbourhood level.

The report is also structured in the following way:

- First section develops a literature review, the objectives and methodology used to create the typology of the indicators on three important daily living domains – streets, green spaces and play spaces.
- Second, context of planning for children in cities in both the Netherlands and Israel is outlined and existing initiatives are expanded on.
- The third section, provides analyses of three important daily living domains – streets, green spaces and play spaces - through observations, surveys, workshops and interviews in Eindhoven and Jerusalem.
- The last section outlines possible design recommendation and interventions that address challenges for public space within child-friendly planning.

Purple wool thread in one of the playgrounds in neighbourhood Bergen, Eindhoven (NL). Source: Authors

2. Children, planning, and cities: a review

Rapid urbanization around the world is now a well-documented trend. This ongoing development has a number of effects including a shifting trend where not only young urban professionals are choosing to move into city-areas, but also families (Bowles, Kotkin, and Giles 2009, Boterman 2012, Karsten 2013). It is estimated by the UN that 60 percent of the world's children will live in cities by the year 2025. What this is indicative of is that for millions of children the contours of their everyday life and experience will be shaped by urban environments. Boterman and Karsten (2015) have titled this ongoing urban transition as the march of city families worldwide.

This has renewed an interest on children's lives in cities within the fields of social sciences, geography, planning and design (Matthews 2003, Karsten and Vliet 2006b, Wridt 2010), and welcomed different perspectives into the broad field of child friendly urban environments. The impacts of these ongoing demographic shifts have initiated a discussion on urban planning discourses for their inclusiveness of family life in cities. These discussions are focused on social and psychological aspects, health, education, and a growing awareness of the role of urban planning and design. For cities in the north, families moving into or deciding to stay in inner city-areas belong largely to a well-educated middle classes with enough resources to buy themselves an urban family home, and afford daily care of children (Karsten 2013). However, families of lower income face challenges related to housing prices, quality of housing, services and living in transient or less than desirable neighbourhoods. See the following work for more examples, Lilius 2014, Butler 2003, Authier and Lehman-Frisch 2012, Karsten 2013. Not restricted to the west, examples can also be found in countries that are on the rise like India, where 41.2 million children under the age of six live in urban spaces. For cities in countries like India, Brazil, Peru, Turkey, etc. the challenge of growing up brings concerns related to healthy and safe living conditions, recreational spaces, transport, and urban poverty.

The advantages of city living are many: services, social networks, cultural resources, shorter commutes between work and home, and it is this daily combination of tasks, preferences, and budgets that motivates families to opt for an urban residential location (Hjorthol and Bjornskau 2005). What this implies for urban planning is (re)defining the nature of planning for families in urban areas. Karsten and Vliet (2006a) for example have identified the lack understanding and recognition by planners of the importance of the local scale in the everyday lives of children and their parents, and plea for more family inclusive policies. With obesity levels increasing and social capital decreasing among children (Niekerk 2012), themes such as importance of outside play, independent mobility, urban green, safety, urban health, are pushing the role that planning can play in the creation of child friendly cities. These foci can be well served by developing an urban understanding of the interdependencies between the different dimensions shaping child-friendly spaces and their impacts.

2.1. Planning for families with children

Cities are dynamic social spaces where transformations are constantly underfoot and are shaped by the communities that inhabit them (Gleeson and Sipe 2006). Following the current trend of global urbanisation and its growing attraction for families with children in cities, an understanding of the possible urban challenges is crucial. More so as urban environments are becoming the principal context that needs to provide flourishing conditions for new generations of children. To improve contextual and rigorous understanding of children's contemporary problems and needs in the city, urban analysis is essential. Especially since the needs of children vary depending on their age group. The needs of younger children are closely tied to the direct vicinity of their home and parents. Older children on the other hand can have a larger mobility radius, participate in neighbourhood initiatives (with regards to decision making), and be more independent (playing on the street for example). While in both cases, it is important that parents feel safe, secure and have access to services for themselves and for their children (this is especially crucial for 0-3 age groups). As this research focused on the 0-12 cohort, the next section briefly expands on the role of planning as related to the domains of, spatial, social, and governance for child friendly environments.

SPATIAL DOMAIN

Role of housing

One of the most important prerequisite for living in the city is the availability of suitable housing. There is often a mismatch between the demands of families and the available housing stock. This mismatch has been the focus of much academic work, including, Nitta (1980) who highlights the unsuitability of high rises for families, "for...families with small children, the evidence demonstrates that high-rise living is an unsuitable form of accommodation". Research has also shown that children in high rise play less outdoors (Nitta 1980) and show slower development (Oda et al. 1989). These studies showed a strong dissatisfaction with high rise living for families, the livability of these places and includes the impact on children within their analysis. A literature review done by Grinsven (2011) for example on studies conducted between the 1960s and 1990s on high rise living showed there is insufficient data on the detrimental impacts on children's development. More recently a growing body of literature shows a more nuanced version of studying high rise living is necessary and that it is not by definition unsuitable for families, and in some cases, can be attractive family environments. Karsten, Bekius, and Dijkers (2011) elaborate that in the Netherlands as well as in other European cities living in apartments is becoming a more accepted form of living for families, when children are thought of as active occupants. Children can and will play anywhere they can, playing in shared spaces, courtyards, parking garages, are examples.

The role of transportation

Valentine and McKendrick (1997) describe an influential study done by Hillman, Adams, and Whitelegg (1990) that compares the children's independence of mobility between 1971 and 1990 in the UK. The study reports a drop of respectively 80 percent to 9 percent of children who are permitted to go to school on their own. The loss of the independence of children in public space is attributed to the growth of traffic in this period. In recent years however children mobility patterns are more spread out and resemble those of the adults (Karsten and Vliet 2006b). The scattered geography of children over the city results in an archipelagic spatial activity pattern that requires children to travel under escort to disconnected places. Karsten (2005) has defined this group as the backseat generation. Public spaces have transformed into adult-oriented spaces where children are only tolerated under certain conditions (Valentine and McKendrick 1997). This has resulted in urban public spaces that have become less usable and accessible to children. Bouw and Karsten (2004) name the increased number of personal cars on the street as one of the main reasons for this. Karsten and Vliet (2006b) report that in this regard, large cities in the Netherlands follow the trends observed in other countries (Valentine and McKendrick 1997, Chawla 2002). The increase of cars can be seen as a self-reinforcing process. The presence of more cars encourages more parents to use cars to bring their children to school or other activities. The relation between cars and children has always been problematic and the design of the street has become a central topic in the creation of child friendly cities. The topic has received broad international research and has been translated to specific guidelines by local traffic authorities. The Dutch context has long tradition in this. An early example is the adaptation of the shared space concept 'woonerf' introduced in 1970s. Later specific manuals were developed for a wider application of child friendly traffic design (CROW 2000) and followed up by guidelines as the 'Childstreet2009' concept of the International Institute for the Urban Environment.

SOCIAL DOMAIN

Importance of play and community

The domains of children in cities are in transition, with the move from outside to inside. The time spent indoors has increased and children have become more home centred (Sibley 1995). Activities that used to take place outside now increasingly are done indoors (Karsten 2005). Building huts and playing hide and seek can just as well be done inside as outside. The transition of public space oriented towards more adult spaces has aided to the creation of less autonomous children in the public sphere. Today's children play outside less frequently and have a more restricted home range (Karsten 2005).

A wide body of literature supports the health benefits of outdoor play and this is increasing becoming evident within the planning

literature as well. Outside play improves social skills (Jambor and Gils 2007), motor development (Evans 2006), cognitive development (Collins 1984), and learning performance and concentration. Moreover, outside play makes a considerable contribution to the daily activity needed for a child, contributing to the preventive effect of lowering obesity and chronic diseases (Jiménez-Pavón, Kelly, and Reilly 2010, Aarts et al. 2010). Evidence of various aspects of child development positively correlating to physical and psychological well-being of the child is pushing for better alignments between planning, play, safety and health (Hinkley et al. 2008, Vries and Veenendaal 2012).

Experience and consumption

Children's urban experience potentially varies by axes of difference including age, socio-economic status, location and gender. However, results from the UNESCO program "Growing Up in Cities" from the in 1990s evaluated by Chawla (2007) showed that every child is just as likely to express satisfaction with their neighbourhoods, regardless of their different socio-economic background, ethnicity and or neighbourhood type. Better designed and more affluent neighbourhoods are likely to have more play facilities and services for parents, in deprived neighbourhood's streets can offer an alternative to costly recreational and leisure opportunities. Thus, the neighbourhood becomes the fundamental unit of everyday experience for most children and plays a vital role in their well-being.

Design of neighbourhoods profoundly influences the geographies of everyday life for children at micro levels, while the neighbourhood is also a mere 'backdrop' for many full-time employed and commuting adults (Carroll et al. 2015). Seemingly utilitarian objects provide the physical cues that shape the understanding of the neighbourhood and give the urban environment its sense of place, whether it is designed that way or not. Pieces of infrastructure, barely noticeable as a quick-traveling adult, are micro-landmarks: manholes, storm drains, texture changes in the sidewalk, tree roots or other plants (Valentine and McKendrick 1997).

Though cities are traditionally designed for adults and cars, not children, Zukin (2010) observes a shift in her book 'The Naked City'. She notes that through gentrification cities are experiencing a revaluation of streetscapes with commercial and cultural activities. Especially in neighbourhoods where families settle these patterns of varied consumption and needs are more evident (Karsten 2013). The more intensive consumption of the city reveals new practices of public parenting. Karsten, Bekius, and Dijkers (2011) argue that this transformation goes with the production of a new city. Families as consumers claim their own urban environment with the development of a range of family facilities that can be summarized in three types: child directed facilities, family directed facilities and child and family friendly public spaces. Sidewalks are being transformed into places to play and to socialise. Occupying the outdoors used to be typical working-class behaviour, today it has become part of a new middle-class family style. The rise of this family friendly consumption spaces is in part initiated by the families involved. This ongoing push from research signalizes an increase of family directed consumption spaces.

GOVERNANCE DOMAIN

Planning for child friendly cities is not a new. For 70 years, across 190 countries and territories, UNICEF has been defending the rights of every child and focusing on the critical impact social and economic policy issues have on children. Since its foundation in 1946 to provide emergency food and healthcare to children in countries that had been devastated by World War II, they have grown into an organization through upstream policy work that has generated increasing engagement with, and capacity-building of, civil society, enabling citizens to exercise their rights to participate in public policy decisions. Some highlights of their work include the declaration of the rights of the child (1959), the child survival and development revolution (1982) and the convention on the rights of the child (1989).

In 1992, UNICEF launched the 'Mayors Defenders of Children' initiative in Dakar (SE), creating a framework in which a wave of child-centred activities and programmes took shape and were initiated at local level, placing the role of the government in the fulfilment of children's rights on the global agenda. With the recognition of important trends like the rapid transformation and urbanisation of global societies, the growing responsibilities of municipal and community for their populations in the context of decentralisation, and the increasing importance of cities and towns within national political and economic systems, the Child Friendly Cities initiative (CFC) was launched at Habitat at the second UN Conference on Human Settlements (Habitat II) by UNICEF and UN-Habitat in 1996. The conference declared that the well-being of children is the ultimate indicator of a healthy habitat, a democratic society and good governance (Unicef 2017). The aim of CFC is to guide cities and other systems of local governance in the inclusion of children's rights as a key component of their goals, policies and programmes. As a result, a movement of child friendly municipalities started flourishing in low, middle and high-income countries and an increasing number of cities promoted and implemented initiatives to realise the rights of the child. In 2004, UNICEF published a document "Building Child Friendly Cities - A Framework for Action", providing a framework for defining and developing a Child Friendly City.

Alongside the CFC initiative, other policy related efforts on a global level are working on child friendly cities. The Management of Social Transformations Programme (MOST) of UNESCO launched together with an interdisciplinary team of municipal officials, urban professionals and child advocates the 'Growing Up in Cities' program, which helps to address and respond to issues affecting urban children and youth (Hillman, Adams, and Whitelegg 1990, Karsten 2005). The program was first conceived and initiated by Kevin Lynch, a critical urban studies scholar

known for his work on perceiving the city, who transferred this idea to the perspective of a child (1973, 1979). The other, UN-HABITAT's 'Safer Cities' programme from 1996 embraces a holistic, integrated, multi-level government and multi-sectoral approach to improve the liveability of cities and quality of life for all urban residents, predicated on the confidence that good urban governance, planning and management improves the safety of neighbourhoods (Bell, Montarzino, and Travlou 2007). While the above examples illustrate an awareness of child friendly policy and planning on a global scale, exploring the impact, challenges and limitations of these approaches was beyond the scope of this work.

The development of child friendly environments depends on the capacity of cities to link between local, regional and national scales to identify and share resources needed to facilitate their creation (Riggio 2002). For example, the city of Melbourne (AU) plans to create 215 new childcare places and seeks state government action to ensure adequate provision for schools (Robb 2017). Or the example of Oslo (NO), where, in 2007, the city council mandated that half of all new homes should be designed for three bedrooms and families to accommodate the trend of influx of city families (Toderian 2012). This points towards the importance of city and municipal involvement through the creation of policy mechanism to support the development of child friendly urban environments.

One example of child friendly cities organizing in networks is epitomized by the European Child Friendly Cities Network, that links Swedish, Flemish, Greek, Irish, Spanish, Romanian and Bulgarian grassroots-level organisations with the objective of promoting the rights and interests of children and youth in local communities and involving children and youth in decision-making policies framed by the regional or local authorities. Moreover, it lobbies European Union institutions on child-related issues in urban areas. Creating child friendly communities has gained central importance to building strong and vital neighbourhoods, cities and regions. Although the awareness of child friendly cities is on the rise, there is still much work that needs to be done, especially to learn from earlier undertakings.

2.2. Planning methods child friendly cities

Today, worldwide there is an ongoing debate about how cities can accommodate needs of children, as well as how and if cities can be truly child- and family friendly. To facilitate this, there is a growing body of research into the development of child friendly communities and spaces (Schulze and Moneti 2007, Horelli 2007, Karsten and Vliet 2006a, Boterman and Karsten 2015). Though much of this research focuses on addressing challenges within these neighbourhoods for children from the domains of policy, the role of design and planning tools is gaining traction for improving practices related to child friendly communities. This research uses existing planning and design indicators for creating a process for addressing neighbourhood level challenges for child friendly urban environments.

Use of indicators in child friendly planning

To help address this gap, the report focuses on designing a typology of indicators connected to selected aspects within urban planning and design. Using an environment-focused approach to focus on the physical space occupied and used by children, the method aims to analyse how urban space can be redesigned for better outcomes. This approach considers different types of physical space, which directly or indirectly affects children growing up in them. Though literature offers a wide range of avenues and definitions concerning environmental child friendliness, they are quite broad and difficult to assess (Chatterjee 2006, Broberg, Kyttä, and Fagerholm 2013).

The work of Horelli (2007) for evaluating Environmental Child Friendlyness (ECF), where she aims for a holistic understanding of the term environment informs the basis of the research. The environment means the living environment in its complexity. It does not only refer to the natural environment or the built surroundings, but to the whole physical, psychological, economic, political, and cultural environment. Developing ten normative dimensions including, (1) Housing and dwelling, (2) Basic services (health, education, transport), (3) Participation, (4) Safety and Security, (5) Family, kin, peers and community, (6) Urban and environmental qualities, (7) Resource provision and distribution; poverty reduction, (8) Ecology, (9) Sense of belonging and continuity, (10) Good governance, Horelli (2007) identifies how urban planning can improve and shape a city's child friendliness. Continuing this, work from Bouw and Karsten (2004) highlights that the relationship between community's design and land-use decisions have a significant impact on children's physical, social and mental health. Particularly developing a typology of indicators that can reduce gaps in the urban planning on safety, green space, access, and integration need focus.

The role of children's participation in planning

The promotion of children's participation in both decision making, and planning reflects the importance of their involvement in solutions to community problems and their participation in the formulation of projects. Children provide valuable insight in analysing the problems and in recommending interventions in the form of policies and design (Cities4Kids 2014).

Although there is a growing body of research that shows how and why children should participate in city planning practices they are still mostly excluded (Karsten and Vliet 2006, Chawla 2002). In 1990, the United Nations Convention on the Rights of the Child attracted attention to children's participation in decision making, as means to promote children rights. Following it, the MOST program raises awareness to the need to include young people in local decision making processes in order to both engage them with their environment and improve the

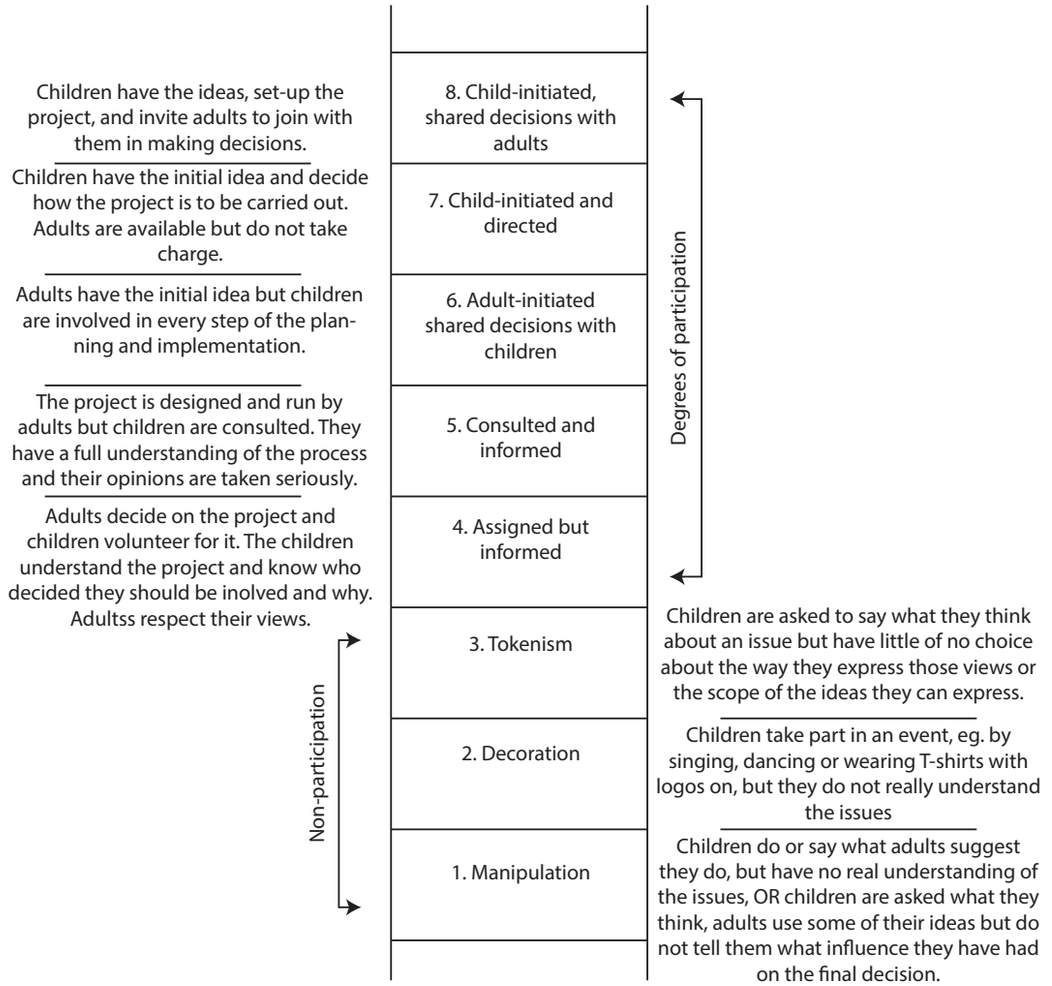
process itself (Driskell 2002, Bell, Vromen, and Collin 2008).

Participation of young people in planning processes faces some of the obstacles common to public participation, yet has its own special difficulties. Hart (1992) was one of the first to adjust the theory of participation to children, adjusting Arnstein's well known ladder, to a ladder of youth participation, examining to what degree an action is initiated and controlled by children. While achieving the top rung of the ladder (shared decision making) is not appropriate for every process, the theoretical division between non-participation (the lower three rungs, up to tokenism) to participation (at least consultation) serve as an accepted quality measure for decision making processes.

One of the main differences between adult and youth participation lies in the methods available for the process. Driskell (2002) describes a variety of participation methods that were used in various lands and locations. Of these, observations, drawings and dramatizing seem most appropriate for young children. Kirby et al. (2003), building on practical experience in the United Kingdom, describes the organization of various types of discussion groups that involve young people in public decision making. While Bell, Vromen, and Collin (2008) stress the importance of time-flexibility and a feeling of ownership to the success of any participation process. However, most literature on participation to date (with the exception of the Reggio-Emilia approach) does not deal specifically with pre-school children, and most methods and recommendations are tailored for the capacities of older age groups.

Riggio (2002) identifies that although child friendly policies vary in focus and context, as a common goal they all focus on the transformation of cities into inclusive communities for children, recognizing that a city friendly to children is one friendly to all other groups. She also identifies the 'golden thread' (pg. 57) through the multiple child friendly models, weaving different experiences into one global goal: child participation. The benefits of including children include the personal and intellectual growth of the involved child, the synergy of ideas created by organizing groups to educate themselves and to propel to turn their ideas into action, and the creation of another arena in which community development can take place.

The other concept being 'Street Reclaiming' from Engwicht (1999), which is based on the principle that residents play an important role in reducing car traffic in the neighbourhood and reclaiming the street as living space. It is an approach focused on mobilizing and coaching residents. It provides tools for reducing car traffic (including the use of one's own car) in less than seven weeks, and design strategies for the design of public space in such a way that motorized traffic 'feels' like a guest in a residential area. In addition, more attention is paid to cooperation with private residents, municipality, police, etc.



Hart (1992) Youth ladder of participation is aimed at an age group that can identify and respond to challenges facing their surroundings. Importantly, participate within decision making at various levels.

2.3. Urban planning and design: examples from different regions

In the following section, international projects are showcased that aim to improve the liveability for children in the city through impetus from urban planning and design. Project examples are taken from different contexts and vary in form and scale levels. Through the analysis we can differentiate two trajectories. One, that focuses on providing an analytical approach that guides policy on planning for child friendly cities, and the other, that are implementation strategies which are part government policy and guide urban design. Besides this, the interventions take place at various scale levels, national, regional, city, or even neighbourhoods.

United States: Playful City initiative

The Playful City initiative is part of the non-profit organisation KaBOOM that is dedicated to bringing balanced and active play into the daily lives of all children, particularly those growing up in poverty in USA (Kaboom 2017). The platform aims to increase the understanding that play can happen anywhere within the community. They do this by creating playgrounds and bringing play into the daily routine of people's lives. The platform collects knowledge, inspires communities to promote and support play. Recently, KaBOOM published a study that pleas for creating "corner store" playscapes closer to home, "just as corner stores within easy reach of home contributes to walkable urbanism, the availability of safe and interesting play spaces - just beyond the front door and embedded in the urban landscape - contribute to a form of playable urbanism".

Part of the platform is the Playful City Initiative USA recognition program that honours cities and towns that ensure that children in their communities, particularly those from low-income families, get the balanced and active play they need (Christensen and O'Brien 2003). The program challenges communities of American cities and their partners to understand the importance of play and encourages their citizens to reimagine cities with children in mind. Communities that apply and get selected can count on logistical support of the foundation and get official recognition of their initiative. One of the many examples is Governing through Citizen Engagement initiative from Ankeny, Iowa. In this public-private collaboration, the Parks and Recreation department reached out to the citizens to realize more sport facilities within the town. The outreach process revealed a pent-up demand for play space and also triggered a cultural shift in governing through co-production (CROW 2000). High levels of citizen participation through community meetings and overall satisfaction rates with the proposed facilities, gave the Parks and Recreation department the political capital and identified financial resources through fund raising to proceed with an ambitious plan for the development of play areas in Ankeny.

India: Child Friendly Smart Cities

Representing almost third of the Indian population (41.2 million) are children under the age of six living in urban areas, however India does not have a prevailing framework of Child Friendly Cities. Recognising this gap over the last years, there has been a growing awareness of initiating discussions on Child Friendly Cities. In 2014 for example, a national consultation on 'Child Friendly Components and Child Impact Indicators' was held in New Delhi to discuss the need for a more child focussed urban development. Over two days children, planning and policy experts, and civil society organisations from Delhi and Odisha came together with the aim to create a common platform for discussion on the inclusion of families and children in urban renewal policies in India. Formation of policies, interventions and implementations were discussed from the perspective of the child. The intended outcome was to devise child impact indicators with regard to their living conditions and develop a framework to advocate child friendly urban policies. The conference was part of the Twelfth Five Year Plan and organized by Humara Bachpan and PRAXIS with support of the Bernard van Leer Foundation. Through various sessions the different aspects of child development were discussed that can grouped into five main themes: (1) Housing and living conditions, (2) Public space (3) Water and sanitation (4) Transport and power (5) Air and soil.

Established in 2015, the Smart Cities Mission is an urban renewal program aimed at developing smart cities around India. Under this impetus, the National Institute of Urban Affairs (NIUA) along with the Bernard van Leer Foundation aims to build Child Friendly Smart Cities (CFSC)[1]. This initiative pushes for better alignment of the needs of children within the urban policy and planning framework of Indian cities by aligning itself with smart city goals. By working with planning indicators focused on, (1) Built Environment (Housing, School, Open Spaces), (2) Services and Facilities (Physical infrastructure, Social infrastructure, Special facilities), (3) Safety and Mobility (Personal safety, Traffic safety, Mobility), (4) Ambient Environment and Disaster Management (Risks and changing environmental conditions), the program promotes advocacy and intervention in urban areas focused on CFC.

Vancouver (CA): Child friendly strategies

Canadian urban (re)development is experiencing an increased policy interest for inclusive design aimed at families. The strategies of 'The Child and Youth Friendly City Strategy of Surrey', adopted in 2010[2], and 'CNV4ME - Connecting Children, Youth and Families' in North Vancouver, adopted in 2015[3], are examples of the vested interest

1 cfsc.niua.org/content/urban-policies-and-programmes
2 City of Surrey (2010) Child and Youth Friendly city strategy. City of Surrey: City Council.
3 City of North Vancouver (2015) CNV4ME Connection children, youth + families in the city of North Vancouver.

of municipalities around Vancouver to create family friendly spaces.

The strategies of the two cities aim to improve the health and wellbeing of children in cities. They do so through similar approaches and have overlapping domains of interventions in their policies. Both strategies for example address the need for community engagement which is about reaching out to the youth and young families to involve them in public decision making and shaping their community. Both strategies also address the need for strengthening community partnerships and improving the access to local youth institutions and programs. The aim of the two cities is to increase the accessibility to local youth-serving agencies and to share knowledge between organizations. Both strategies have a physical environment creation of community spaces, to create places in the city where the residents can easily connect with each other, housing, dwellings that fit the needs of young adults and are affordable for them, youth programming, inclusive and accessible initiatives through recreational and cultural programming.

On the other side of Vancouver, the city of Surrey adopted a child friendly policy in 2010, it focuses on the domains of (1) community engagement, (2) physical environment, (3) civic services, and (4) community partnerships.

Bristol (UK): Playing Out initiative

In the United Kingdom, various cities have developed strategies to include young families in the urban design. This interest can be seen in initiatives both from the government and citizen lead activities. The creation of the 'Child Friendly City Strategy' in mid-size towns like Penrith to 'London Play' in larger cities, and grassroots initiative like Playing Out in Bristol (UK)[4].

Playing Out is an initiative where residents can temporarily close a street to let their children play without the danger or inconvenience of passing traffic. Frustrated at the absence of freedom of outside play for their children due to traffic, two parents started this initiative in 2007-2008 to reclaim the streets for their children through temporary closure of streets. The initiative further developed in 2010 by establishing the platform Playing Out, and through national media coverage was institutionalized within the Bristol city council when the Temporary Street order was established. This pilot program allowed residents to open their streets for play, encouraging children to spend more time outside and increasing their activity levels (Riggio 2002).

Parents apply through the website playingout.net that they intend to close a street down for a few hours once a week, and a manual provides helpful tips on how to successfully launch a Playing Out day. In an evaluation for the city council done by PlayingOut (2012) the organization reported not only an increase of repeated Playing Out days, but also examples of residents feeling more empowered in their local community and an increased familiarity between neighbours. Growing popularity of this initiative has now rooted this citizen lead activity onto the Bristol Child Friendly City project and has gained popularity in streets all over the UK.

4 More information: www.playingout.net

Dublin (IR): Play here, play there, play everywhere

In 1992 Ireland ratified the UN Children's Right convention, and in 2000 issued a National Children's Strategy, following a nationwide consultation process. The provision of play and recreation facilities was diagnosed as a problem in this process, and in 2004 a national play policy document recognized the importance of play and the subsequent need for an array of quality play opportunities. Also following the National Children's strategy, Ireland established in 2002 the 'Comhairle na nÓg', a group of 31 youth councils located in the municipalities of Ireland, aimed to involve young people in services and policies that affect them.

One unique policy making effort in Ireland, discussed here, is the 2012 play plan for Dublin ("Play here, play there, play everywhere")[5]. The plan, initiated by the city council in cooperation with the local youth council, promotes a vision of Dublin as a child friendly, playful city. It examines the infrastructure for play city-wide, and recommends policy arrangements to facilitate play in public spaces and in schools.

5 Dublin City Play Plan 2012-2017, www.dublincity.ie/sites/default/files/content/Community/childrensservicesunit/Documents/DublinCityPlayPlan2012-2017.pdf

Children and parents work together building a wooden pallet hut during ‘Kinderbouwdorpendag’. An activity for children organized in Bergen, Eindhoven (NL). Source: Authors

3. Children in cities: Dutch & Israeli context

3.1. The Dutch context

Cities have always been full of children, and city children have somehow always found outdoor spaces to play in. The rise and decline of play spaces in urban areas can be seen as a metaphor for the changing dynamics of families living in cities. Karsten (2014) describes the historical dynamics of families in cities. At the start of the nineteenth century, streets were the most important space of play for children at the time, but also not the most suitable. Children had to share the streets first with traffic from horses and later by cars and various economic activities taking place on the street. However, this changed dramatically with the growth of private car ownership around 1960 coinciding with the advent of mass suburbanisation. The city was seen as overcrowded, unsafe and unhygienic. Families that could afford it left the city to surrounding districts. The suburbs became the child-rearing district of society (Ward 1977). The Dutch VINEX-policy cemented the wave of families moving to the suburbs.

Following this, extensive urban renewal of Dutch cities resulted in central urban areas becoming increasingly attractive as living spaces. Manufacturing industries, the harbour and other industrial employment in cities are replaced by new forms of clean employment: a service economy, culture and tourism. Cities regained popularity as centres of new employment and possibilities for consumerism and culture (Zukin 1995), and are becoming hubs for young families as well. With a population of more than 17 million people and still growing, the Netherlands is a densely-populated country, positioned as the twenty-second within density rankings (World Bank 2017). The Dutch Environmental Assessment Agency (PBL) also highlights that in the following decades three quarters of the population growth will happen predominantly in urban areas (PBL 2016b). Currently about 75 percent of the population lives in cities. As a consequence of constant growth and transformation, the built environment of the Netherlands has substantially grown in the last decades and is today characterized by a polycentric urban structure, and as a melting pot of urban cores at relatively short distances from each other.

For a long period, families with children were considered to be a non-typical city household. The years of suburbanization of mostly middle-class families led to the almost ‘natural’ idea that families do not belong in the city. Households who stayed within the city were often considered to have weak socio-economic positions (Musterd and Ostendorf 2012). Living in the city has obvious downsides, the lack of affordable and suitable family housing being one main deterrent. Living in the city comes at a high price and it explains the high number of families leaving after the first-born child. Other deterrents are the image of space, quietness and green of suburbia influences many parents’ decision to leave the city for suburbia (Boterman 2012). However, other studies have shown that families deliberately choose to live in the city and the trend of young people moving from cities to

suburbs once they have a family is slowly changing. Research by Karsten (2007) for example analyses why these households disconnect the seemingly traditional relationship between families and the suburbs. Underlying their settlement choice are identified as, (1) Time and geographical reasons: Residential location is a key factor to combine childcare with paid work, which often takes place in the same city. Not only the location of the workplace is a strong determinant of their residential location, also the broad range of urban cultural activities that the city has to offer; (2) Social embeddedness: The diverse composition of the city provides many opportunities to connect with other people. This can have a mutual benefit for both the parents and the children. Children connect families who live in close proximity, these connections can then develop into supportive communities with the mutual benefits for exchange of assistance and advice; (3) Identification as true urbanites: Families living in cities construct an identity of themselves as resolute families that can deal with negative sides of living in the city. They recognize there are serious considerations for living in the city but define themselves as city people who could not live anywhere else. As Karsten (2007) notes, "the choice of residential location is subject to continual reflection and renegotiation".

Especially during the financial crisis (post 2011) when the housing market was sluggish young families stayed in urban areas driven by financial feasibility rather than choice. During this period a larger percentage of people decided to postpone moving to suburban locations. CBS data from 2016, shows that there is an increase of families with children leaving the city again (CBS, 2016). Since 2014 more young families have left the city than five years before. Especially families with children aged 0-4 have exchanged the city for smaller semi-urban or rural municipalities. For example, in Amsterdam most families choose to relocate to Haarlem or Amstelveen. These are adjacent cities that are part of the metropolitan region of Amsterdam. Out of the four big cities in the Netherlands Amsterdam has the highest percentage of young families moving out. Within the first four years of the first born child, 40% of the families move to a different city, compared to 14% in the rest of the Netherlands (excluding the four big cities) (CBS, 2017).

As a response to and recognising that cities within the Netherlands are 'engines of the economy', in 2015 the Dutch Government launched 'Agenda Stad' (Rijksoverheid 2015). A national urban agenda to promote economic growth, improve liveability and stimulate innovation in urban areas. As an addition to this agenda the PBL (2015) published a report titled 'De stad: magneet, roltrap en spons. Bevolkingsontwikkelingen in stad en stadsgewest' (The City as a Magnet, an Escalator and Sponge) where a long-term vision on the population and spatial development is envisioned. This report highlights that there is a renewed interest for living in the city, also among young families. The metaphor of 'the magnet, escalator and sponge' is used to describe the shifting population dynamics in cities and their increasing popularity as places to live and inhabit. Cities also grow as a result of (im)migration, and this cohort belongs to the age group who are just before or in a stage of life where they are looking to have children (CBS 2017). To make urban areas attractive for families with children sustained efforts at the municipal and national level are needed, especially in the four main cities (Amsterdam, Rotterdam, The Hague, Utrecht) of the Netherlands. The creation of more single-family housing and child-friendly neighbourhoods in places like Leidsche Rijn (Utrecht), IJburg (Amsterdam), Stadstuinen (Rotterdam) and Ypenburg (The Hague) can encourage families to stay in urban areas (PBL, 2015).

Questions however still remain on if the increase of families in cities is a structural or a temporary phenomenon. Boterman and Karsten (2015) expect that this trend of urban families in cities will persist for a while. In particular families with strong cultural capital ties. Especially if cities start to tailor urban environements towards lifestyles and preferences of families (Zukin 2010; Karsten 2014).

Child being picked up from school in city center neighborhood Bergen, Eindhoven (NL). Source: Authors

3.2. Examples and initiatives from the Dutch context

Historically the Netherlands has always aimed to use socially just methods to find solutions for child-friendly environments. Examples from pre-war periods from Amsterdam, including the introduction of the Algemeen Uitbreidingsplan (AUP) in 1935, an urban expansion plan for the city of Amsterdam, marked a turning point showing the first consideration of children in the city. The incorporation of recreational facilities for children provided the first step towards play spaces. Appointed architect Aldo van Eyck designed playgrounds to stimulate outdoor play, by creating aluminium, geometric structures around sand pits: allowing children to climb (physical) and excite their fantasy - it is a pirate ship? (intellectual) - at the same time. The seventies marked a water shed shift in Dutch transportation and urban planning policies, as the high number of children traffic casualties triggered a series of popular protests starting in Amsterdam and spreading over the country. While not specifically geared towards creating a child friendly environment, the resulting changes which included the nation-wide bicycle paths network, strict measures for traffic calming and a variety of street design schemes giving preference to pedestrians and cyclists, created de-facto child friendly neighbourhoods and influenced child mobility patterns. Around 1980 for example, more than 700 playgrounds based on the ideas of van Eyk were built in the region of Amsterdam (Lefaivre and Roode 2002). However, with the flight to the suburbs in the sixties, almost all the playgrounds were demolished (or dismantled for not conforming to safety norms). In the last years there has been a concerted effort by various municipalities to create child friendly environments with some success in urban areas. The next section highlights a few examples at efforts being made for CFC at the municipal and local level.

City initiatives Rotterdam: Bouwstenen voor een kindvriendelijk Rotterdam

Within the Netherlands, cities in the Randstad and particularly Rotterdam have been successful in developing and evaluating Child Friendly Cities. The city of Rotterdam adopted ‘child friendliness’ as a valuable urban planning tool to design a liveable, sustainable city between 2007 and 2011. The urban planning method developed by Rotterdam is called ‘Building Blocks for a Child Friendly Rotterdam’ or ‘Kindvriendelijke bouwblokken’ . It helped measure the effects of the city’s specific efforts towards becoming a Child Friendly City. Rotterdam developed an urban planning method and a pedagogical approach to become a Child Friendly City. This was different from the various child-right based approaches and focused on the neighbourhoods and planning process. With this vision Rotterdam aims to reinforce its position as a residential city. The policy contributes to re-establishing a middle class in the city of (young) people that through selective migration previously left the city resulting in an uneven composition of the population. The vision aims to deliver leverage points for housing corporations, property developers, schools, universities and youth work organisations to draw up a coherent strategic vision with four main aims listed below (Engwicht 1999):

1. Enhancing the city as a residential location;
2. Keeping families in the city;
3. Strengthening the economy;
4. Improving the quality of life for children from 0 to 18 years.

The vision presents a basic framework of measures and conditions of urban design interventions that have to be available for a child friendly residential city. The framework consists of four elements or building blocks, (1) child friendly housing a set of criteria designed with local housing developers that deal with housing and designated space for a child, minimum floor space, communal play areas and safe access, (2) public space, is a set of development requirements that included infrastructure suitable for play; optimal exposure to sun, green play areas, luminal spaces and others, (3) facilities, including at least one ‘extended school’ per district, and safe school environment features, and (4) safe traffic routes, child-friendly traffic routes encourage children to explore the city and engage in city life more independently. Every block is operationalized by describing the minimal qualitative and quantitative indicators needed. By stacking these building blocks, urban space is created aimed at parents and children.

In 2014, the policy was reviewed by auditors appointed by the city (Rekenkamer Rotterdam, 2014). Through this evaluation process a number of observations followed, the most important ones being: (1) social amenities for children were not adequately defined within the policy framework. For example, school centres are not supported at the city level, (2) the available instruments and resources to administer the policy were not sufficient and had no priority, (3) The implementation of the policy was mainly focussed on physical measures. Little attention was given to the implementation of social components of a child friendly city. Lastly, the report highlighted that if neighbourhoods had become more child friendly during the period of the policy, it was attributed to efforts at the city-wide level. More so as local municipal boroughs had given little or no attention to the policy. The policy had not likely contributed to the aim of retaining families in the city or to improve conditions for children living in the city.

Summarized from the research the auditors state the following recommendations. (1) The alderman responsible for youth affairs needs to be made responsible for the policy for child-friendly neighbourhoods and to further define departmental responsibilities of the policy. (2) Consider the social components of a child friendly city as much as the physical attributes. (3) When establishing new plans assess the extent to which these contribute to the realization of child-friendliness in a particular district. (4) Bring the realization of family-friendly housing more in line with the neighbourhoods facing these particular challenges. (5) Not only must citizens be involved in planning, but also in the realization of initiatives or projects.

Neighbourhood level initiatives: Neighbourhood child route

A neighbourhood child route is a safe route for children that encourages independent mobility through the neighbourhood, connecting the most important facilities like the school, play areas, the park, etc. through visible markers. One example is the Kindlint, though the concept is named different in different places. The Kindlint is developed by SOAB, a traffic consultancy firm with the idea that by using this route children can safely and independently move across different places in their neighbourhood. It is assumed that play does not only occur at particular destinations (playgrounds, community centers for example) but also on the route to these places. The introduction of the Kindlint is also a response to encourage young children to go to school independently and reduce their dependency on the car. By addressing this relationship, the Kindlint aims to break this negative spiral and increase independence, and the action radius of children.

The project was first realized in the Spaarndammerbuurt in Amsterdam in 2007. The Kindlint consists of blue pavement tiles with images of animals. The animals motifs in the pavement are portrayed through different poses and display where children should wait, where they can walk and where they can run. On the route different play elements, specific measures for traffic safety and adequate lighting are added. The Kindlint in Spaarndammerbuurt was evaluated by Wassenberg & Milder (2008) after a baseline measurement in 2004. The topics considered in this evaluation were the safety and playability of the street and the amount of parental relief related to the increased independence of children. In addition, the children themselves, parents, and a group of experts took part in the evaluation. The outcome shows that the implementation of the Kindlint in the Spaarndammerbuurt though successful had various limitations. Almost all the children knew of, used and liked the Kindlint, but were unclear on the meaning of the different type of tiles and associated activities. Thereby, not fully utilising the Kindlint as it was originally intended. Also, the children did not go out of their way to use the Kindlint, only if it aligned with their destination, more so as not all important neighbourhood activity destinations were part of the Kindlint (for example the largest playground in the neighbourhood is not part of it). Wassenberg and Milder (2008) also found that there were no significant changes in parental relief related to increased independence of their children. Parents still accompanied their children through the neighbourhood, though children spent more time independently of the street. Though the Kindlint can increase the overall child friendliness of the neighbourhood, attention needs to be paid to the type of neighbourhood, resident needs, and existing measures of traffic calming. Other examples of similar concepts can be found at Eindhoven, Eemnes, Delft and Middelburg (NL).

An example of a child friendly route in neighbourhood Woensel-West, Eindhoven (NL). Source: Authors.

3.3. The Israeli context

Israel is a young state, in two respects: the state is less than 70 years old, and many of its cities are less than a century old – many much younger, established either in the 1950s, the 1970s or later. The historical city centre of European cities with its romance, unique urban textures and returning middle class families, simply does not exists in most Israeli cities. Instead, we find in many of them layouts strongly influenced by modernistic planning principles, combining apartment blocks set along wide traffic routes, and green infrastructure. Most Israeli children live in apartments, with family homes and town houses being the deviation from the norm. In another respect, Israel has a young and rapidly population. In 2012, out of 7.6 million inhabitants nearly 2.5 were under the age of 18, and 772,000 of those were under the age of 5. The annual growth rate is 2.4, with fertility rate being 2.9 on average, and much higher in some population groups. Sadly, Israel has also one of the highest inequality and poverty rates among the developed countries, with a GINI coefficient of 35. The meaning of these two data combined is that many children in Israel are poor, and suffer bad housing and restricted life chances. A few population groups in Israel experience a concentration of poverty: some of the minority groups (Palestinians and Bedouin) and the ultra-religious Jewish

population (“Haredi”). Typically, two of these – the Bedouin and the Haredi – also have large families with average fertility rates of 5.5 and 6.5 respectively (fertility rates for the Palestinian population used to be high, but with increasing levels of female education, levels have been dropping in the last years to be closer to the average.

3.4. Examples and initiatives from the Israeli context

Currently there is no national level planning strategy in Israel to promote child friendly cities. While it is partly to UNICEF convention on the rights of children, the state was criticized in 2010 for its failure to adopt a strategy promoting the rights of children, nor has a commission to protect their rights. However, the last decade has seen several initiatives of planners and civil society to promote children participation in public decision making. Spatial planning, in particular, is seen as a domain where children can contribute to better decision making, and through which they can become involved citizens in the future. Thus, planning and place-making programs are sporadically introduced in various school and university curricula. The national planning agency has recently adopted an initiative, called “small scale planners” to establish cooperation between schools and municipalities, coordinating planning studies in the schools and interventions in public spaces planned by the students and sponsored by municipalities.

City and neighbourhood initiatives: examples from Israel

Holon, a suburban city in the centre of the country, has marketed itself as “children city” for the past two decades. The city developed a child-centred urban strategy, promoting a network of “story playgrounds” – each themed after a children book, cultural institutes and activities geared towards children, and prioritizing investment in education. The city repeatedly prepares strategic plans for children and youth, incorporating wide public participation in the planning process.

Founded in 2009, Bat Yam Urban Public Space Evaluation Task Force is a small group of teenagers that prepared small scale plans for improving public spaces, sponsored by the municipality. The yearlong process provided lessons on the value of empowering young adults as involved citizen but had limited influence.

The department of urban conservation in the Tel Aviv municipality has recently led a participatory project in neighbourhood schools. Children were given basic planning knowledge and encouraged to explore the built environment in their neighbourhood, and to plan renovation projects. The project allows the children to understand their environment and their possible influence on it, while allowing municipal planners and architects to understand children’s perception of the environment.

More isolated initiatives appeared in the past decade, over a few municipalities, where groups of children were involved in designing or re-designing public spaces such as the school yard, or public playgrounds in their neighbourhood. While these actions are not coordinated and usually involve a group of professionally knowledgeable parents (thus being limited to well-off communities) – the willingness of municipalities to adopt them seems to signify greater attention to children’s rights and interest in adapting the built environment to the needs of children.

Playground re-designed by children in Jerusalem (IL). Source: Hebrew University of Jerusalem.

Girl drawing a route on the map during the children's workshop. Source: Authors.

4. Research Approach

Urban analysis is essential to improve scientific understanding of children's contemporary problems and needs. Given the dynamicity of cities, social spaces are constantly undergoing transformations, and positioning research and analysis into factors that shape understanding of how complex environments influence the wellbeing of children is essential.

As the research was carried out in Eindhoven (NL) and Jerusalem (IL), the following approach was followed:

Step 1	Surveys and qualitative mapping questions were developed to collect data on basic information of the selected neighbourhoods, street networks and safety, play, and green;
Step 2	Neighbourhoods were selected in both the cities
Step 3	Data collection
	Data was collected in Eindhoven between September-November 2016, followed by two workshops in February 2017; Data was collected in Jerusalem between December 2016-February 2017;
Step 4	Data analysis
	Data was collated from all the four neighbourhoods in Eindhoven, with findings positioned within the context of the city; A similar approach was carried out in Jerusalem though the quality and quantity of data from Jersusalem was not as extensive or thorough;
Step 5	Highlighting underlying common needs and concerns that apply to the upbringing of children in urban environments.

By using the findings, elements for the construction of alternative urban discourses rooted in the daily experiences and challenges can be identified. This report is only a small step in broadening the scope of urban planning discourses in the direction of family friendly cities. Further research is needed to incorporate changing urban lifestyles and family perspectives.

4.1. Methodology and process

Eindhoven

In order to develop insights into the role of planning and design for family friendly cities, the report analyses three important daily living domains – street, green spaces and play spaces through a mixed methods study. Through observations, surveys, mapping, workshops, qualitative interviews in the city of Eindhoven (NL) we identified use, challenges, and requirements for families with children under the age of 12. Divided into two phases, the first phase consisted of semi-structure interviews and surveys with 204 families living in three inner-city and one suburban neighbourhood, representing approximately 407 children under the age of 12. The second phase was in depth research into one of the inner-city neighbourhoods where there has been a slight increase in the number of families with children. Three of the four neighbourhoods are centrally located within walking/cycling distance of the city centre, and the fourth neighbourhood has good public transport connections with the centre.

Jerusalem

The first phase of the Eindhoven research was replicated in Jerusalem, using adapted research tools. Four neighbourhoods were examined, spread geographically over the city and displaying a mixture of different population groups. The data collected was two-fold: structured observations, formatted by a list of indicators, and structured interviews of parents in the neighbourhoods. The total number of families interviewed were 30, representing approximately 55 children which is a much smaller sample size when compared to Eindhoven. As in the Dutch case, the aim was to look into possible relationships between urban design and the behaviour of parents and children in public spaces. The surveys and interviews were constructed to examine the same three dimensions (streets, play spaces and green spaces) that were examined in Eindhoven.

As the research in Jerusalem was carried out by a smaller team with limited resources, it was done only in one phase. While the datasets produced for the four neighbourhoods were comparable to the Eindhoven sets, they were made up of fewer observations. The analysis was qualitative, aiming to relate the observational data (measuring the child friendliness of the physical environment) to the parent's responses (revealing typical use of the environment by children and their families). The data is thus analysed following comparative case-study methodology, which aims to uncover relationships within a set of contexts. The sections focusing on Jerusalem will present, first a juxtaposition of the main findings; will then shortly discuss each data sub-set within the context of the individual neighbourhoods; and will discuss the patterns occurring across all four contexts when the interviews are related to the observational data

Replicating research in two different locations and within different contexts revealed the challenges of comparative research. Adaptation of the structured surveys was necessary (for example, the survey used in Eindhoven used indicators related to bicycle paths, that hardly exist in Jerusalem), and even the semi structured interviews had some fields (such as limiting the number of children per family to three) that had to be adapted. Perhaps the major difference between the two locations was the relative homogeneity among the neighbourhoods in Eindhoven, which enabled the researchers to treat the combined observations as one big data set, and the sharp differences between neighbourhoods in Jerusalem that called for context sensitive methodology in handling the findings.

Students of the TU Eindhoven (NL) present their research results and designs to a panel of experts. Proposals were made improve the child friendliness of one of the neighbourhoods in Eindhoven. Source: Authors.

4.2. Data Collection Methods

Eindhoven

The data collection for the four neighbourhoods was carried out by a group of fifty graduate students over a period of four weeks from the master course on the public domain from the Eindhoven University of Technology. Each neighbourhood had between twelve to thirteen students working together to collect quantitative and qualitative data on play, streets, and green. The surveys and interviews covered, among other topics, housing preferences, play areas, green spaces, daily activities, commute, advantages and disadvantages of having children and living in an urban environment, and mapping activities to point out walking route and locations. The interviews were fully transcribed and the results of the survey collated. The families and parents interviewed used the city and various facilities on a daily basis in various ways, with positive and negative experiences. The interviewees spoke about their daily involvement and experiences, and the transcripts about the city from the perspective of family friendly planning.

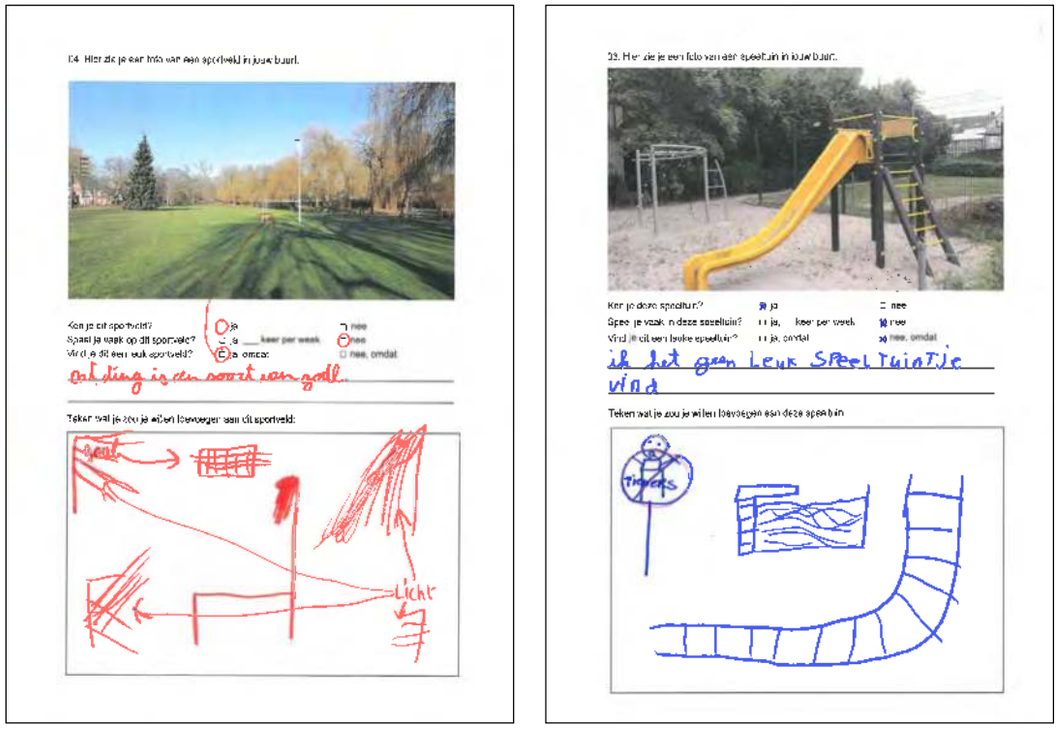
Results from the four neighbourhoods were compared with each other to identify the best possible neighbourhood to carry out the next phase of the research. Phase two of the work was carried out in a gentrifying inner-city neighbourhood that is facing demographic changes, has active participation from parents of the neighbourhood and schools in the area. We held two intensive workshops for children and parents, at the school and a community centre, to verify challenges and identity methods of possible co-creation to address planning for families. Apart from this, neighbourhood coordinators, and policy-makers were interviewed to document current attempts at addressing changing needs and existing initiatives. Finally, we conducted both desk-based studies of literature and policy documents on the initiatives in the city and global responses.

Workshop with school children

Following up on the surveys and spatial analysis done by the student's further investigations were done in the form of a workshop. The aim of the workshop was to investigate the perceptions of the children on their play environment and how to develop these places from their viewpoint. Children are asked to come up with changes to improve the playscapes in their neighbourhood

De Trinoom, a Montessori elementary school, was approached to participate in small workshop with their pupils. Through the school 15 children were approached to participate in the research and they all participated. The selection requirement was that they had to live in Bergen neighbourhood. There was an equal distribution between boys and girls and they were of various age groups, and the median age of the children was 10 years. The workshop held in three subsequent sessions with the

Suggestions how to further improve the school yard. Drawing from the workshop with school children.



Examples of scanned forms from the workshop with school children with results from the questionnaire.

same content and divided into two parts. In the first part the group filled in a questionnaire about the playscapes in the neighbourhood. The selected types of designated and undesignated playscapes for this assignment were based on the outcome of the earlier survey with the parents. Photos were presented of each of the playscapes and children were asked if they knew about this playscape, their frequency of visiting this place and if they could improve something about this playscape what it would be. In the next part of the workshop children were asked to mark their house, playscapes they knew and their favourite playscape on the map with a sticker. Then they were asked to draw the route they took from their house to the their favourite playscape and the route they took to the park.

Workshop with parents

A second workshop was held with parents in the same neighbourhood with the aim to validate the results of the children's workshop, and research the perception of parents on the play environment of their children and how to develop these places from their viewpoint.

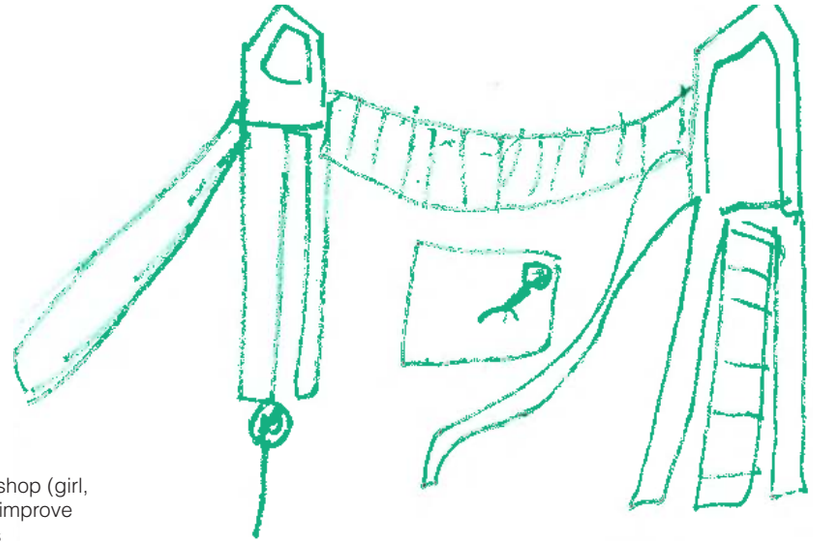
Participants were approached through a letter given to the children who participated in the first workshop and contacts through the neighbourhood association. The requirements to participate were, to be a parent of a child between 0 and 14 and live in Bergen neighbourhood. The workshop existed of four parts. First, a presentation of the results of workshop with children was given followed by a short discussion. Second, participants filled in a questionnaire similar to the one given to the children about the playscapes in the neighbourhood. Third, participants were asked to mark their house and the playscapes of their children on a map, and draw their favourite to the playscapes and park, similar like the children's workshop. Fourth, a group discussion was held pointing out challenges and improvements within the neighbourhood, and knowledge of undesignated play spaces.

Children of elementary school Trinoom taking part in the workshop. Source: Authors.

Jerusalem

During November and December 2016, twelve master planning students from the Hebrew university of Jerusalem who participated in a course on Child Friendly Planning, collected data about the public spaces in four Jerusalem neighbourhoods and their appropriateness for the use of children. Data was collected through four site visits, in four successive weeks. During each visit, the students were asked to observe one aspect of the neighbourhood public space, to fill in a structured evaluation form, using a list of similar indicators, and to conduct three interviews with parents living in the neighbourhood. Where qualitative evaluation of the surrounding was required (for example, when students were asked to assess the quality of playgrounds, or the ease of navigating streets) the students were asked to back their evaluation with visual data.

As stated above, limited resources and student numbers influenced the quality of data collected. Eindhoven's rich quantitative and qualitative data could not be replicated, so the students collected data predominantly by qualitative observations.



Drawing from the workshop (girl, 7 years old) on how to improve one of the playgrounds

4.3. Description of indicators used

For the scope of this work, the key aspects of data collection used environmental indicators focused on the built environment, (1) Basic services (health, education facilities, transport, community activities) within various neighbourhoods, (2) The role of safety and security through the design of street within neighbourhoods, (3) Urban and environmental qualities of the various green and play areas.

BASIC SERVICES WITHIN NEIGHBOURHOODS

The base dataset contains indicators that could be used to create a basic knowledge framework for each of the neighbourhoods. Each of the data points was sourced from municipal data sets, city development plans, and neighbourhood development plans. Some of the data for the indicators were collected through established research and practice methods (counting for example).

Base dataset	Indicator	Source (Eindhoven)	Source (Jerusalem)
Name of Neighbourhood	Text	Development Plan	Municipal website
Total neighbourhood Population	Number	Buurtmonitor	Municipal website
Area of neighbourhood	Number	Buurtmonitor	Development plan (when available)
Density people/ha	Number	Buurtmonitor	--
Density people/km2	Number	Buurtmonitor	Digitised from from municipal data
Addresses w/ kids	Number	Buurtmonitor	Not available
Addresses w/ no kids	Number	Buurtmonitor	Not available
% of homes with kids	Number/ Percent	Buurtmonitor	Not available
Children Density	Number	Buurtmonitor	Digitised from from municipal data
Children per 1000m2	Number	Buurtmonitor	Digitised from from municipal data
Average age of the residents	Number	Buurtmonitor	Municipal website
Income level (per household)	Number	CBS / Buurtmonitor	Municipal website
WOZ-value (home-value)	Number	CBS / Buurtmonitor	Madlan Website, Municipal data
Childcare Facilities	Number	Kinderopvangkaart.nl	Municipal website and observation
Name of various kindergarten facilities	Text	Kinderopvangkaart.nl	Municipal website and observation
Name of various elementary schools	Text	Scholenopdekaart.nl	Municipal website and observation
Number of kids attending	Number	Scholenopdekaart.nl	Municipal data
Names and locations of pre and after school activities	Text	landelijkregisterkin-deropvang.nl	Observation
Origin of schoolkids from own neighbourhood	Number/ Percent	Scholenopdekaart.nl	--
Number of kids attending	Number	landelijkregisterkin-deropvang.nl	Community center
Number of community centers	Number	buurtruimte040.nl	Municipal website
Names community centers	Text	buurtruimte040.nl	Municipal website
Neighbourhood typology	Drawings	Development plan	Observation, devel-opment plan when available
Avg housing occupancy	Number/ Percent	Buurtmonitor	--
% of Social Housing	Number/ Percent	Buurtmonitor	Development plan when avaialble
Ethnicity (numbers)	Number	Buurtmonitor	--
Ethnicity (percentages)	Percent	Buurtmonitor	Municipal website
Age composition	Number	Buurtmonitor	--
Age composition (percentages)	Percent	Buurtmonitor	Municipal website

Table with used indicators and sources for base data neighbourhoods.

STREET DESIGN: SAFETY AND DESIGN

Streets are designed as transportation routes, occupied by pedestrians, bicycles and predominantly cars. Traffic and road capacity are not the inevitable result of growth, they are the product of choices that have been made to shape our communities around the car. Whereas, streets have potential issues as place for children to learn and play. Street corridors are shaped by elements, physical and nonphysical that stimulate children's creativity, knowledge and behaviour (Ekawati 2015). The role that streets play is important for the development of children, as it is the first element they encounter when leaving the protected environment of the house. Streets are places where they learn sense of responsibility, develop their motoric skills and also deal with other children.

Classification of streets

The Dutch 'Sustainable Safety' ('Duurzaam Veilig') is the current policy on the design of the road network in the Netherlands. Launched in 1997 Sustainable Safety aims to reduce dangerous traffic situations to make roads inherently safe. The policy has a user centric system approach on road safety. The most important feature of the system is preventing as far as possible the amount of latent errors. The responsibility for road safety is not solely put on the shoulders of road users but also on those that are responsible for the design of it. In the sustainable safety vision five principles are central: the functionality of roads, homogeneity of masses and/or speed and direction, predictability of road course and road user behaviour by a recognizable road design, forgivingness of the environment and of road users, and state awareness by the road user (Wegman et al. 2008). Sustainable Safety has three different road categories (Wegman and Aarts 2005). Roads highest on the hierarchy are flow roads (1). These are the motorways that are purposed to distribute large traffic flows with high speeds (100-130 km/h). Located outside of the city they are designed for traffic movement and characterized by separated lanes. Much like the first category but lower in hierarchy and a lower average speed (50-70 km/h within the city, 80 km/h outside) distributor roads (2) distribute the traffic flow within the city. Distributor roads connect to the third category of access roads (3). These roads provide access to final destinations to serve the buildings and parcels of people. Traffic speed is low (30 km/h or less) and quality of space is most important in the last category. In practice, there is a large variation in street design of the third category. For this reason, access roads have been further subdivided into different typologies used by the Dutch traffic safety authority (Veilig Verkeer Nederland): 30 km/h streets, woonerf, and car free streets.

Dorstige Smidstraat: an example of an access road in neighbourhood Blixembosch-Oost, Eindhoven (NL).
Source: Authors.

QUALITIES OF THE VARIOUS GREEN AND PLAY AREAS

The importance of green spaces in cities is a reoccurring topic. Swanwick, Dunnett, and Woolley (2003) recognize that to varying degrees since the nineteenth century it provides an escape from widespread urban air pollution and "was a major driver in creating new parks and green spaces" (Swanwick, Dunnett, and Woolley 2003, 94). Access to green spaces has benefits including everything from improved learning and cognitive development to less-aggressive behaviour to enhanced overall happiness and creativity, not the mention a host of other public health and physiological benefits. Green has the ability to contribute positively to some key agendas in urban areas including social inclusion, health, sustainability, and urban renewal (Swanwick, Dunnett, and Woolley 2003). In the book 'The Last Child in the Woods' Louv (2005) describes his concern of the decreasing amount of contact children have with green environments because they are growing up in more urbanized environments. More contact with greenery would result in stronger ties with nature such as an increased responsibility and involvement towards nature (Berg, Koenis, and Berg 2007) and more involvement on a later age towards environmental protection (Chawla 2007). More contact with greenery would also support cognitive and social development (RLG 2008).

One of the indicators of measuring child friendliness within the built environment of a city is through evaluating its urban green spaces. Not only how they are designed, but also by evaluating their ongoing management, including both development and maintenance. Green spaces are crucial for physical, social and cognitive development of young children. Accessibility, both physically and mentally, to visit these places is one of the major aspects of sustainable urban planning (Gupta et al. 2016).

Classification green areas

People relate to green space not as a uniform good with a continuum scale, but as a hierarchy of distinct goods that provide a range of services enabling different recreational activity (Panduro and Veie 2013). Saphores and Li (2012) value the quality of green space based on objective measures such as green space density, size or vegetation concentration; measures of green quality that are possible to validate. However, people's perception of amenity need to be taken within the process as well and the various types of available urban green. Based on the typologies of Panduro and Veie (2013) and (Bell et al. 2007) a classification is made on urban green spaces. Missing elements when mapping the neighbourhoods were later added.

Base	Description	Source (Eindhoven)	Source (Jerusalem)
Amenity green space • Playground • Sportfield • Park • Grassfield • Private backyard	Number/ Text	Direct observations, Google maps	Direct observations, Municipality GIS system
Functional green space • Allotments • Burial ground • Vacant land	Number/ Text	Direct observations, Google maps	Direct observations, Google maps
Natural habitats • Wetland • Woodland	Number/ Text	Direct observations, Google maps	--
Aesthetic green	Number/ Text	Direct observations	Direct observations

Classification of greenscapes. Sources: Panduro and Veie (2013); Bell, Montarzino, and Travlou (2007) with modification of authors

An example of aesthetic green in neighbourhood Lakerlopen, Eindhoven (NL). Source: Authors.

An example of an amenity green space (park) in neighbourhood Woensel-West, Eindhoven (NL). Source: Authors.

Classification of play areas

Two different types of play spaces are differentiated in this research: designated and undesignated play. Designated play spaces are spaces where play is the primary function of the place, such as a playground or sports field. Undesignated play spaces are not marked as a play space by having destined play equipment but are suitable as a play space, such as a courtyard or corridor around the house.

Undesignated outdoor playscapes offer considerable advantages over the traditional playgrounds in providing access for all children. Studies indicate undesignated playscapes tend to encourage more types of social play, greater frequency of social interaction, language development, more dramatic and constructive play, larger variety of play themes, more object transformations (using one object to represent something else), greater duration and continuity of play, and more problem-solving skills than traditional playgrounds or indoor playscapes do (Frost 1992, Burdette and Whitaker 2005). Undesignated and unmanaged, these temporary activity-spaces are owned and imagined by their itinerant users.

The division of playscapes is based on a combination of outcomes from the Dutch Outside Play monitor 2013 carried out by TNS NIPO (Timmermans et al. 2013) and recent literature findings, including the work of Karsten and Felder (2016) on The New Generation of City Children. The latter uses three different types, first, in the private garden or balcony, children can play in the relative safety of the private property and surveillance of the parents. The second type is the sidewalk, street and courtyard, here children can play without the direct surveillance of the parents. The third category, are the further destinations. These destinations can be either designated and undesignated play areas and vary from squares and parks to playgrounds and schoolyards. Play in this category is often done under the guidance of the parents. Because this third category is so broad it has been further subdivided in categories used within the framework of the Dutch Outside Playmonitor. Based both on current literature and policy positions, the following classification was made.

Base	Description	Source (Eindhoven)	Source (Jerusalem)
Designated play area • Playground • Sports Field (basketball, soccer, etc) • Schoolyard • Park	Number/ Text	Direct observations, Google maps	Direct observations, Municipality GIS system
Undesignated playing area • Streets • Parking lot • Garages • Corridor/ Alleyways • Communal court yard • Greenspace	Number/ Text	Direct observations, Qualitative interviews	Direct observations, Qualitative interviews

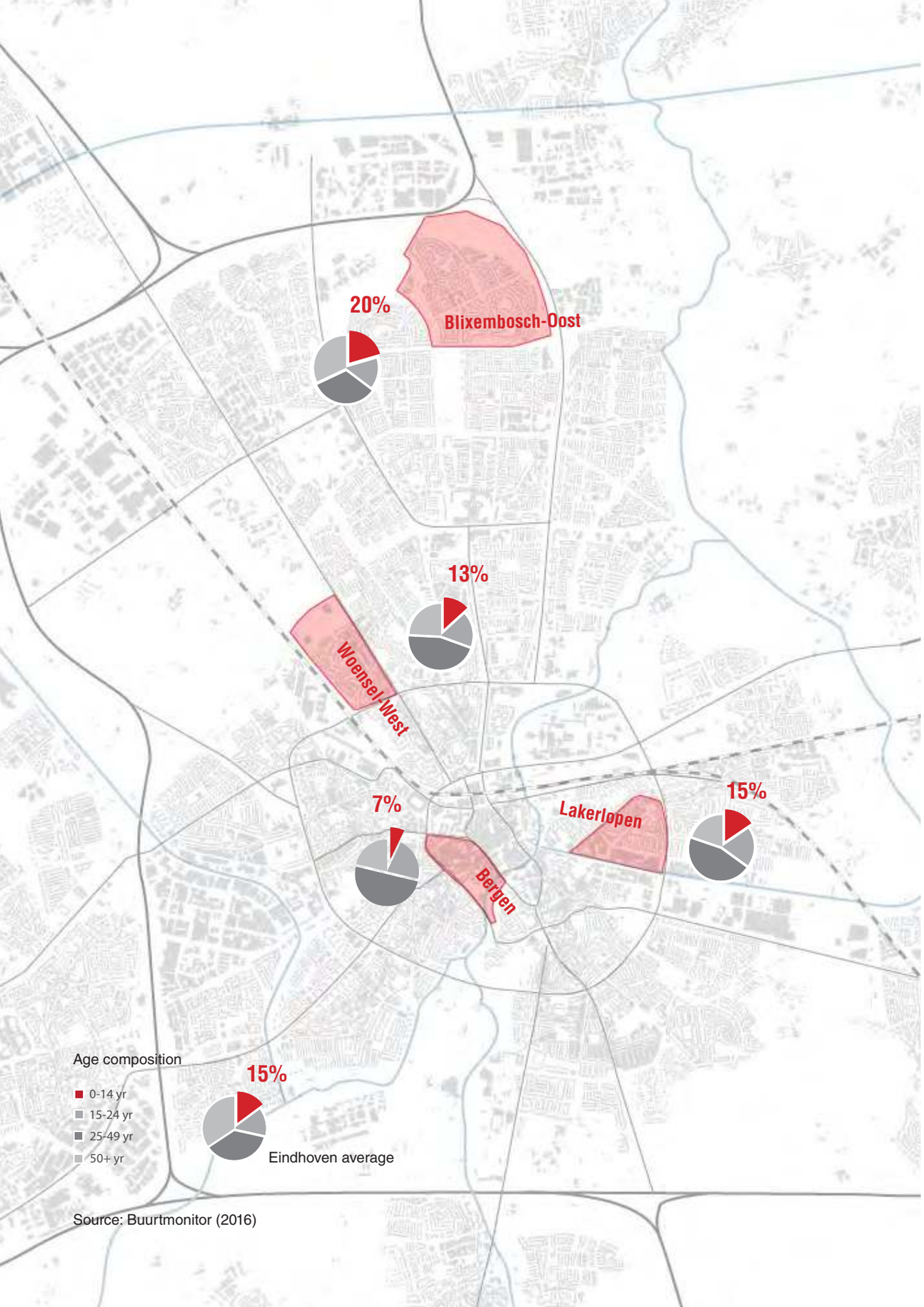
Classification of playscapes. Sources: Karsten and Felder (2016); Timmermans, Meinema, and Snel (2013) with modifications by the authors.

An example of a designated play area (playground) in neighbourhood Blixembosch-Oost, Eindhoven (NL). Source: Authors.

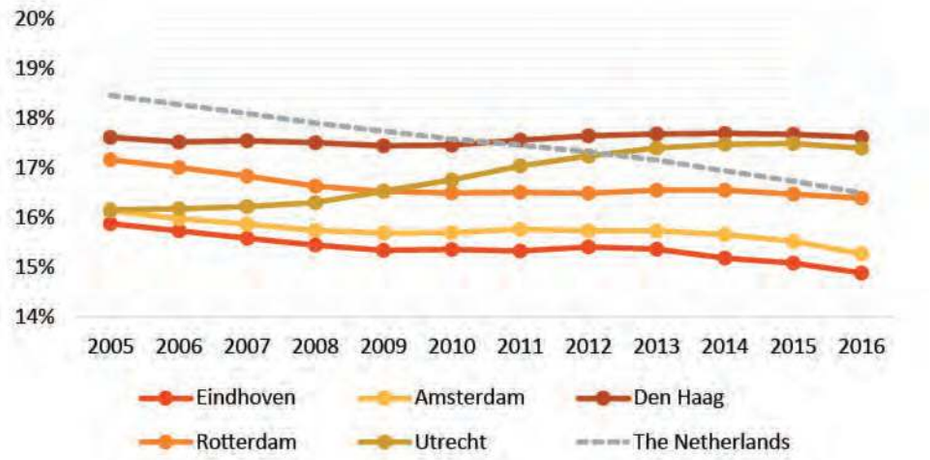
5. Dutch case study: Eindhoven

Eindhoven over the last decade has been increasingly transforming into a city for young adults and families. In 2015, the PBL reported that in the year 2000, the city had an overrepresentation of people in the age groups between 20 to 40 (Jong et al. 2015). The surrounding region in contrast showed an underrepresentation of this age group. In last years, this disparity between the city and the region is becoming starker, while the city is attracting younger people the surrounding region is aging. The reasoning behind this shift according to the PBL is the presence of various higher educational facilities and the city's growing innovative high-tech cluster. However, there appears to be a growing trend where many students are choosing to move to other regions of the Netherlands once they finish their education. Between 2005 to 2016 we can observe a slight decline within the representation of population group between 20 to 40 years from respectively 32,5% to 31,8% as a percentage of the total population[7]. The same pattern is also visible for children of 0 to 14 years from 15.9% to 14.9% on a city average for the same duration (Buurtmonitor data is available only for age groups between 0-14 years of age). Eindhoven in this sense is different from the other four large cities in the Netherlands Amsterdam, The Hague, Rotterdam and Utrecht where children between 0 to 14 make up respectively 15.3%, 17.6%, 16.4% and 17.4% of the population[8].

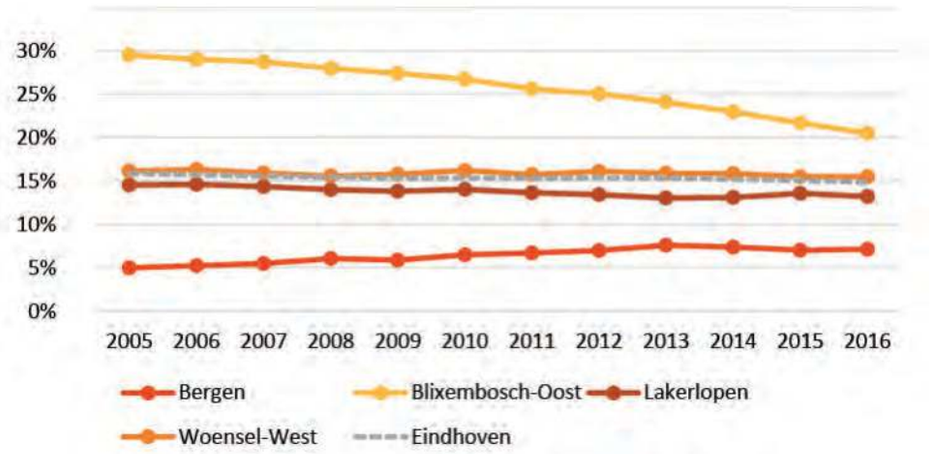
To analyse how the city is responding to the changes in population and need for better child-friendly planning, the research looked at four different neighbourhoods within the city: Bergen, Blixembosch-Oost, Woensel-West and Lakerlopen. With relatively young populations, three of the four neighbourhoods were inner-city, and one was in the suburbs. The cases were selected based on three factors: Firstly, the social economic status and cultural background of the neighbourhood. This was done on the basis of financial indicators such as the average home value (WOZ-waarde) and the average income per household. Ethnic composition of the population was also considered. Second indicator was the location of the neighbourhood within the city. The four neighbourhoods should reflect the growth pattern of Eindhoven's ring like structure. One neighbourhood in the city centre, one neighbourhood within the inner-city ring, one outside of the city ring and one at the edge of the municipal boundaries. Third indicator was the quality of the neighbourhood and measured with the housing composition and urban morphological type.



7 CBS Statline Population and households http://statline.cbs.nl/Statweb/selection/?DM=SLNL&PA=82245NED&VW=T
8 Ibid.



Overview graph of children (aged 0-14) in the five big cities in the Netherlands. Source: CBS Statline.



Overview graph of children (aged 0-14) in Eindhoven in four neighbourhoods. Source: Buurtmonitor.

Mapping during the workshop with the parents from the neighbourhood of Bergen. Source: Authors.

5.1 Descriptions of the neighbourhoods

Bergen

Gentrifying city-centre neighbourhood

Bergen located in the city centre of Eindhoven is the smallest, but also the densest neighbourhood of the neighbourhoods investigated. In total 2,488 inhabitants live in Bergen. Inhabitants are relatively young when compared to Eindhoven's average where little more than a fifth of residents are above 50-years-old[7]. The number of children in the neighbourhood is lowest among the four cases, but has grown from 5% of the population in 2005 to 7,2% in 2016. This figure varies from the other neighbourhoods investigated, where the number of children between 0-14 is stable (Lakerlopen, Woensel-West) or is declining (Blixembosch-Oost). As a rapidly gentrifying neighbourhood with higher than average housing prices (Bergen: € 238.000, Eindhoven: € 206.000) and low percentage of social housing (Bergen: 10%, Eindhoven: 38%), it also has a large share of Western non-natives 20% (Bergen) to 14% (Eindhoven average) and a high share of non-western natives 13% (Bergen) to 9% (Eindhoven average). This can be attributed to the high percentage of non-native workers that live in the neighbourhood.

The housing stock of Bergen consists of mostly multi-family buildings such as apartments (82%). These homes have the lowest occupancy rate of the researched neighbourhoods with two persons on average per home compared to almost three in Blixembosch-Oost. Although adjacent to the city centre Bergen, the neighbourhood differentiates itself with a mix of functions and distinctive historic architecture from the start of the twentieth century. Here residential stock is combined with small scale businesses on the ground floor. Gentrification in this context is characterized by many possible expressions of consumption, among them liveliness, entertainment, relaxation, heterogeneity, culture monumentality, art and unexpected encounters (Metaal 2007). Most notable examples of this are located on the Kleine Berg, a mixed street with shops and restaurants.

The neighbourhood also has a large elementary school that attracts a lot of children (543 attendees) to the neighbourhood but only a fifth of the children from this school come from the central district of the city[8]. Most children come to this school from outside of the neighbourhood which can be problematic at times, especially in relation to traffic.

7 Buurtmonitor, Website Buurt in cijfers: Bergen https://eindhoven.buurtmonitor.nl/Jive?report=brta4ns

8 Scholen op de kaart, Website Scholen op de kaart https://www.scholenopdekaart.nl/Basisscholen/5928/Salto-montessorischool-de-Trinoom/categorie/Algemeen

EINDHOVEN

Blixembosch-Oost

Blixembosch-Oost

Sub-urban family neighbourhood at the edge of Eindhoven

Blixembosch-Oost is a suburban neighbourhood built at edge of the municipal boundaries of Eindhoven in the early 2000's and is an example of the Dutch VINEX planning. The neighbourhood is rich in green and low in density. With 7,051 inhabitants and 166 hectares Blixembosch-Oost is the largest of the neighbourhoods both in size and population investigated in this research. In Blixembosch-Oost, 20.5% of the population falls within the cohort between 0-14, compared to Eindhoven that has an average of 14.9%[7]. Almost six in ten household have children in Blixembosch-Oost, and this is reflected not only in the statistics, but also found in the names of the neighbourhoods and streets. In one part of the neighbourhood street names refer to children's stories like Sprookjesbos (Fairytale forest), Assepoester (Cinderella) and Roodkapje (Little Red Riding Hood). The neighbourhood also has two large elementary schools where most of the children from the neighbourhood attend. Although Blixembosch-Oost is a child rich environment a decline within the number of young children is observable. The last 10 years saw a 7.8% (2005 to 2016) drop in the number of children in between the ages of 0-14, trickling through there is an increasing number of teenagers now in the neighbourhood.

Blixembosch-Oost is the wealthiest neighbourhood of the investigated cases. This is represented in a high-income level per household and high average of housing prices. The average income level in Blixembosch-Oost in 2016 is € 47,900 which is twice as much as in Woensel-West and much higher than € 32,400 average of Eindhoven. The type of housing is almost exclusively family homes with a very small percentage of social housing. The average home value is estimated at € 311,000 compared to the average of € 206,000 in Eindhoven. Blixembosch-Oost has the largest share of native Dutch (77%) inhabitants and is considered a predominantly white native neighbourhood. Also, there are new developments in the neighbourhood, through an expansion project at the north edge (Blixembosch Buiten). The new extension is advertised as a family neighbourhood: child friendly, low traffic intensity and rich greenery[8].

7 Buurtmonitor, Website Buurt in cijfers: Blixembosch-Oost eindhoven.buurtmonitor.nl/Jive?report=brta4ns

8 See: www.nieuwbouw-blixemboschbuiten.nl

EINDHOVEN

Woensel-West

Woensel-West

Redevelopment of an impoverished neighbourhood outside the inner-city ring

Woensel-West, previously also known as Groenewoud Erp, is a neighbourhood under urban renewal just outside of the city ring of Eindhoven, was built in the 1920's as an early Philips working class neighbourhood. Developing a bad reputation because of various complex socio-economic problems, in 2007 the neighbourhood was placed on the national "Van Aandachtswijk naar Krachtwijk" agenda. The national program selected various focus neighbourhoods throughout the country that were in need of structural transformation. Neighbourhoods in the program were characterized by the accumulation of many complex challenges such as, criminality, high numbers of school dropouts, badly maintained housing stock, high unemployment rates, and low emancipation levels. National funding was made available for restructuring and empowering the neighbourhood and its residents, leading to the Woensel-West plan of action in 2008, though the vision 'Omdat Smaken Verschillen' (Because Tastes Differ). This program saw various results, including the relocation of the red-light area, housing stock redevelopment. The neighbourhood has improved greatly since then, and in 2010 a new vision was introduced, 'Visie Woensel-West' to focus on social and physical transformation. The vision has three focal points, on social emancipation, physical fabric improvements, and the aesthetic appeal of the neighbourhood. There is also a push towards creating more family friendly environments. An addition to this environment is the recent completion of the 'Spilcentrum' (spindle centre), a primary school, a kindergarten, a daycare and a clinic that are combined into one building.

Currently one of the housing associations active in the neighbourhood (Sint Trudo) has set up the program 'Zoveel te doen in onze wijk' ('So much to do in our neighbourhood') to increase diversity within the neighbourhood, and this is done through various means. New residents for example are offered a reduced rent in return for some hours of community service per week. These can include giving language lessons, helping aging tenants with assistance in their daily life, tax forms etc. The aim is that these new residents strengthen local socio-economic structure of the neighbourhood and improve its cohesiveness. Woensel-West still falls within the lower spectrum of income and education levels. This is indicated by high number of non-western non-native population (30% Woensel-West compared to 19% Eindhoven's average)[7], and high percentage of social housing (61% in Woensel-West compared to city average of 38%). The average income level is with € 23,500 per year (compared to € 32,400 in Eindhoven) the lowest of the four compared neighbourhoods. The houses in Woensel-West valued at € 144,000 are the lowest of the comparison as well (Eindhoven average: € 206,000).

Woensel-West is the only neighbourhood in the city that has a child friendly route called the 'Spilstraat' (Spindle street) that connects the park to the earlier described Spilcentrum and various play facilities in between, comparable to the earlier described Kindlint. The route is marked with green paint on the pavement and connects old facilities and new facilities such as renewed Playgrounds, a Cruyff institutional football court and the park next to the railway.

7 Buurtmonitor, Website Buurt in cijfers: Woensel-West eindhoven.buurtmonitor.nl/Jive?report=brta4ns

EINDHOVEN

Lakerlopen

Lakerlopen

Transition inner city neighbourhood

Lakerlopen is another neighbourhood undergoing renewal within the inner city of Eindhoven, and in close proximity to the city centre. The neighbourhood can be described as a typical working-class district from the early twentieth century. Faced with physical degradation in the nineties, the neighbourhood was marked as an 'attention area' and has undergone through various periods of interventions. Large tracts of the housing stock were improved as they did not meet technical requirements, public space renewal programs, expansion of commercial activities, were some of the physical improvements made (Grinsven 2011). Though this degradation cause many of the residents to move away, the municipality and housing co-operations have been very active through social programs to bring people back into this neighbourhood. Residents were encouraged to return through various social benefits, rental discount, contribution to the costs of relocation etc. Social initiatives (e.g. support evening's, activities) were introduced and encouraged by the housing corporations as well as the residents, resulting in an improvement of social relations within the neighbourhood. This Lakerlopen transformation project[7] won the Fritz Höger-preis 2011 and was nominated for the Mies van der Rohe Award 2011 and Dirk Roosenburgprijs 2011.

In 2017, Lakerlopen had 3,341 residents, living in almost 1,600 houses of which almost 50% are owned by housing corporations. The neighbourhood is comparable in ethnicity composition to Woensel-West with 30% of non-western non-natives, mostly Turkish and Moroccan. This percentage has been stable through the years, although the number of native residents is increasing. Around 13% of these residents are children between 0 - 14 years. Lakerlopen is the only neighbourhood of the four where there is no elementary school, children attend the Reigerlaan school, one neighbourhood further. Lakerlopen has one kindergarten with 23 children[8].

Lakerlopen's housing stock consists of 48% social housing, which is substantially higher than the city average of 38%. Subsequently, the houses in Lakerlopen are valued lower than Eindhoven average (Lakerlopen: €177.000, Eindhoven € 206.000). Also, the average income level is € 26.300 per year lower than the city average (€ 32.400).

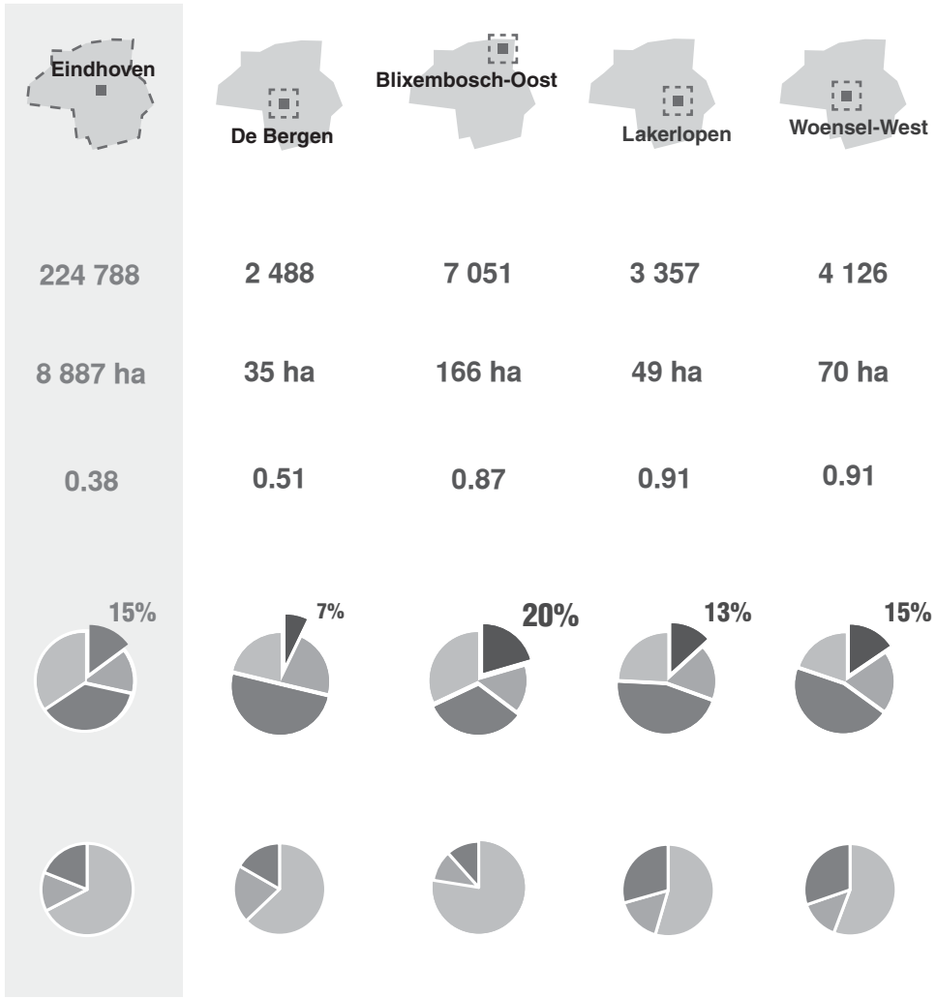
7 Buurtmonitor, Website Buurt in cijfers: Lakerlopen eindhoven.buurtmonitor.nl/Jive?report=brta4ns

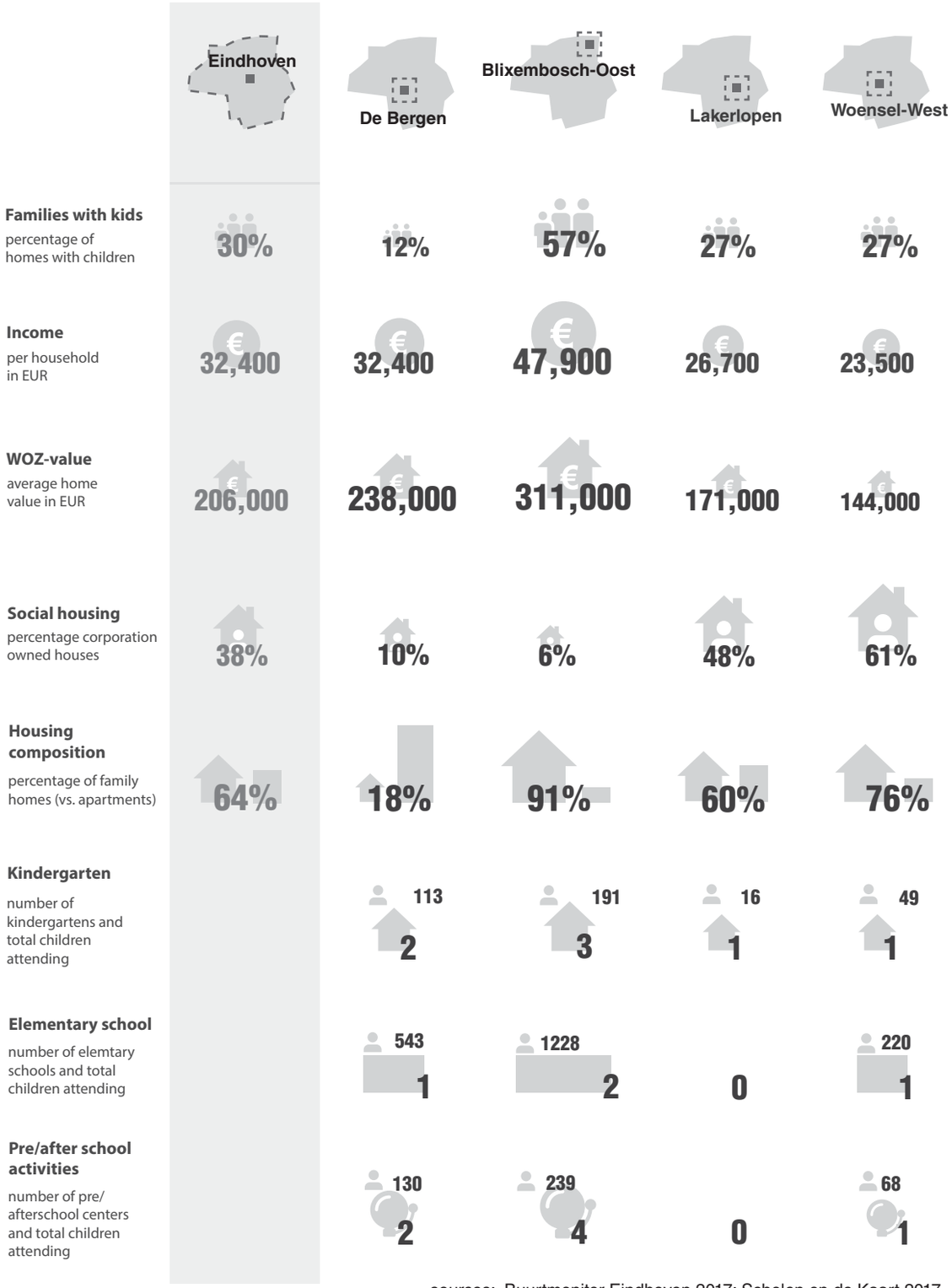
8 Scholen op de kaart, Website Scholen op de kaart www.scholenopdekaart.nl/Basisscholen?school=5260&presentatie=1&sortering=2

5.2 Highlights from the collected data

The following section showcases quantitative and qualitative highlights from the data collected in Eindhoven. Starting with a general overview of the four neighbourhoods, findings on street, green and play are expanded on. The highlights show condensed information with the complete data documented in the appendix.

Quantitative findings





sources: Buurtmonitor Eindhoven 2017; Scholen op de Kaart 2017

Findings on streets

Speeding cars is the most cited reason for unsafe streets in all the four neighbourhoods. Bergen has relatively more distributor roads than the other four neighbourhoods and the least 30 km/h roads. Though most bike paths are designed without protection from vehicular traffic within the neighbourhood, the streets are not considered any more dangerous when compared to the other four neighbourhoods. Interestingly, unsafe streets was attributed to the presence of “shady people” by more than a quarter of respondents from Bergen. Concerns on the lighting of the streets and walkways were considered of less quality than the other four neighbourhood.

The streets of Blixembosch-Oost are considered substantially less dangerous than the streets of the other four neighbourhoods. It was also the neighbourhood that was considered the safest for children to move from private to pubic space. It was also the neighbourhood where measures for traffic calming are considered to be optimum, and the main concern related to street safety in Blixembosch-Oost was speeding vehicles.

Woensel-West is the neighbourhood in the city of Eindhoven that has a visibile neighbourhood childroute or ‘Kindlint’. With most of the roads identified as 30 km/h roads, it also has the most signs protecting youth with regard to street safety and separated walkways. Though the presence of these measure were acknowledged by the respondents, Woensel-West is not considered safe for children to move from private to public space by parents. It was also the neighbourhood considered most unsafe out of the four neighbourhoods. Interviewees in Woensel-West were also least satisfied with their public space as the neighbourhood had the most interviewees who responded negatively on the question whether they liked walking around in their own neighbourhood. Lakerlopen accommodates the most pedestrian only streets, supplemented by the largest percentage of shared space (woonerf). The neighbourhood also had the highest percentage of benches near green- and play spaces and the highest percentage of wide sidewalks without obstacles. Interviewees of Lakerlopen consider walkways are best maintained.

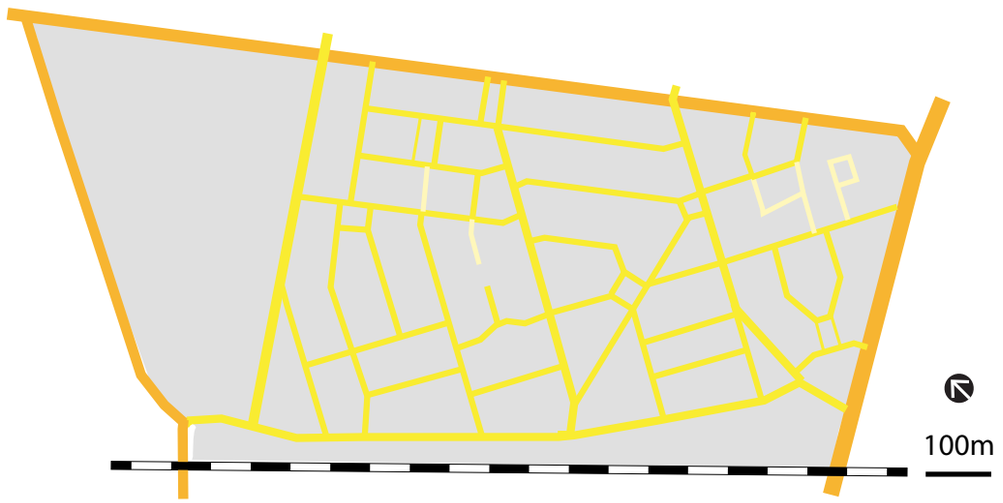
Street crossing in Blixembosch-Oost close to the school. Source: Authors

Neighbourhood		Bergen	Blixembosch-Oost	Woensel-West	Lakerlopen
Various types of the streets	Access 30 km/h	**52%**	**80%**	**88%**	**86%**
	Access woonerf	**9%**	**---**	**---**	**---**
	Access Car free	**9%**	**2%**	**6%**	**10%**
	Distrib-utor	**30%**	**18%**	**6%**	**5%**
Children can easily move from the private to the public space		●●●●○	●●●●●	●●●●○	●●●●○
Measures for traffic calming		●●●○○	●●●●●	●●●○○	●●●○○
Separated bike paths		●●●○○	●●○○○	●●○○○	●○○○○
Separated walkways		●●●●○	●●●●○	●●●●●	●●●●○
Lighting		●●●○○	●●●●●	●●●●○	●●●●●
Presence of shared space		●●○○○	●○○○○	●●○○○	●●●●○
Benches or places to rest along walkways		●●○○○	●●○○○	●●○○○	●●●○○
Kindlint		**No**	**No**	**Yes**	**No**
Based on interviews					
Satisfied with public space		●●●●●	●●●●○	●●●○○	●●●●○
Safety of streets		●●●○○	●●●●○	●●●○○	●●●○○

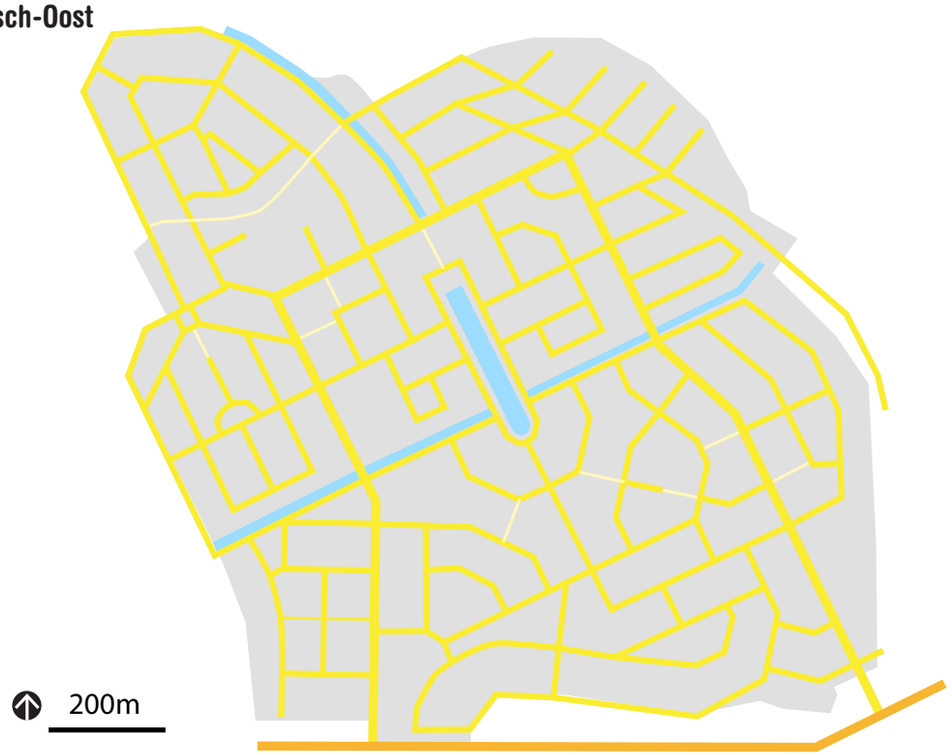
Highlights of the findings on streets for Bergen, Blixembosch-Oost, Woensel-West and Lakerlopen.

Bergen

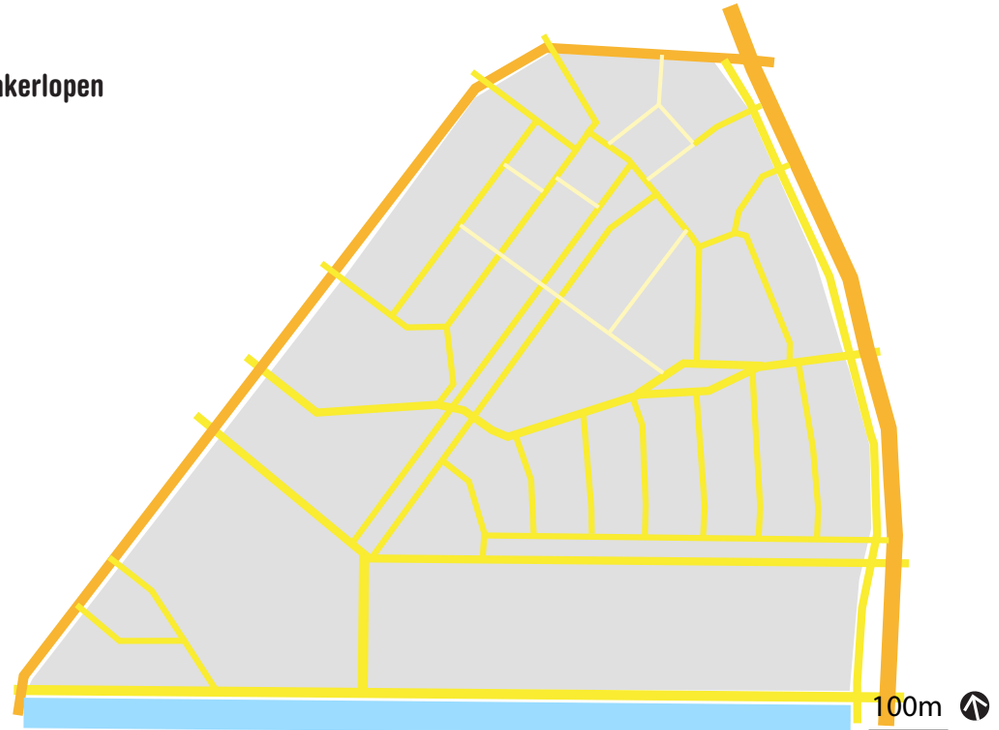
Woensel-West



Blixembosch-Oost

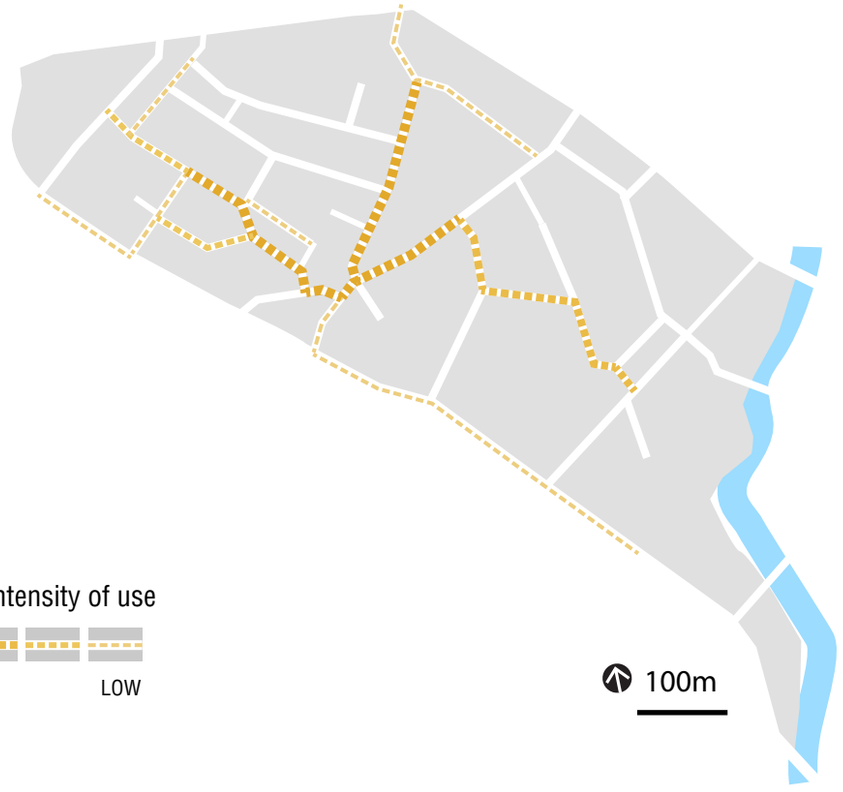


Lakerlopen

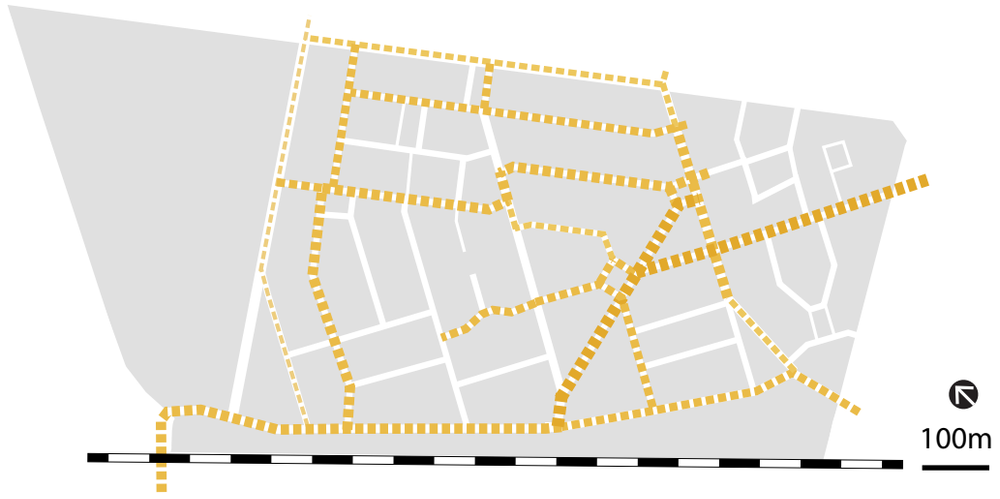


Analytical maps with the road classification of the four neighborhoods based on the Dutch 'Sustainable Safety' ('Duurzaam Veilig') concept

Bergen

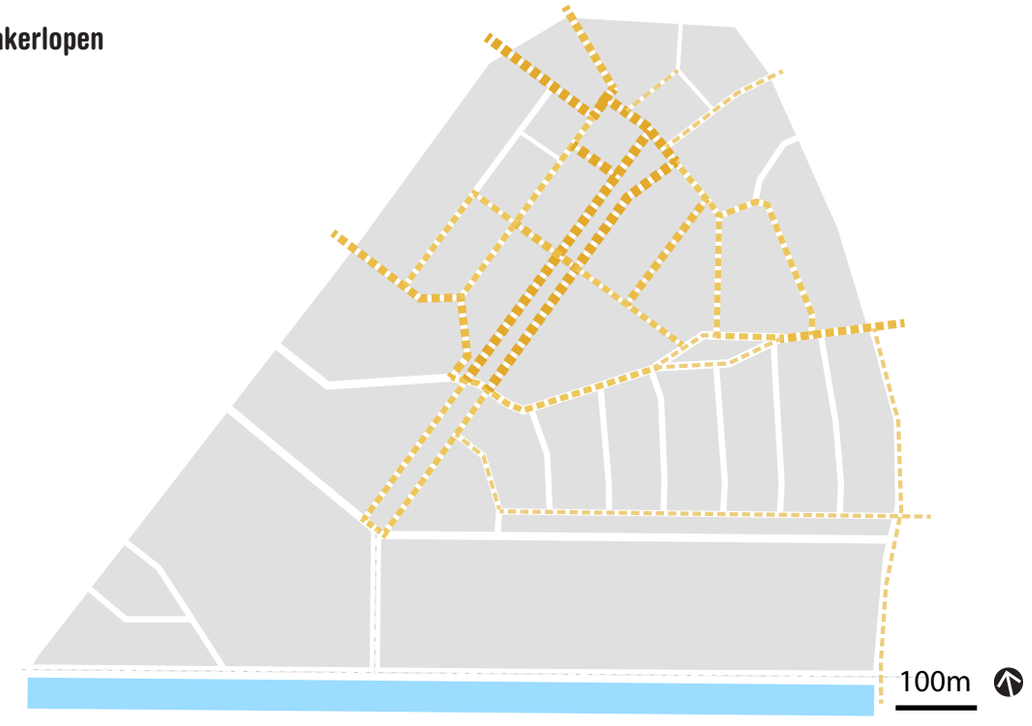


Woensel-West



Blixembosch-Oost

Lakerlopen



Analytical maps of the four neighbourhoods with the reported walking routes in the interviews

Findings on greenscapes

Amenity green (playground, sport field, park, grass field, private backyard) and aesthetic green was available in all four neighbourhoods. Residents of all four neighbourhoods were located within 600 meters from at least one greenscape.

Bergen contains a large a burial ground within its boundaries, which covers about 10 percent of all green in this neighbourhood, that adds a lot to the percentage of functional green. However, the quality and the quantity of greenscapes is not considered optimal of the four neighbourhoods: it has the least play areas for children in green spaces, the least seating, and no food options available next to green spaces.

Most amenity green is found in Blixembosch-Oost, of which most amenity green is formed by grass fields and green playgrounds. The quantity and quality of greenscapes is considered most optimal of the four neighbourhoods. Although the neighbourhood contains the least aesthetic green, it is also the only neighbourhood with a woodland covering about 10 percent of green spaces.

Woensel-West is considered to have the greenest play areas for children, together with the most seating available and the most food options next to these green spaces. There are no natural habitats present in this neighbourhood.

Lastly, Lakerlopen is the only neighbourhood without natural habitats or functional green spaces. It is also not a neighbourhood that excels in the availability of amenity or aesthetic green. Within the category of amenity green there are a few grass fields and sport fields.

Neighbourhood	Bergen	Blixembosch-Oost	Woensel-West	Lakerlopen
Amenity green	**44%**	**80%**	**55%**	**64%**
Functional green	**11%**	**2%**	**9%**	**---**
Natural habitats	**11%**	**13%**	**---**	**---**
Aesthetic green	**33%**	**5%**	**36%**	**36%**
Quality of greenscapes	●●○○○	●●●●●	●●●●○	●●●○○
Quantity of greenscapes	●●○○○	●●●●●	●●●○○	●●○○○

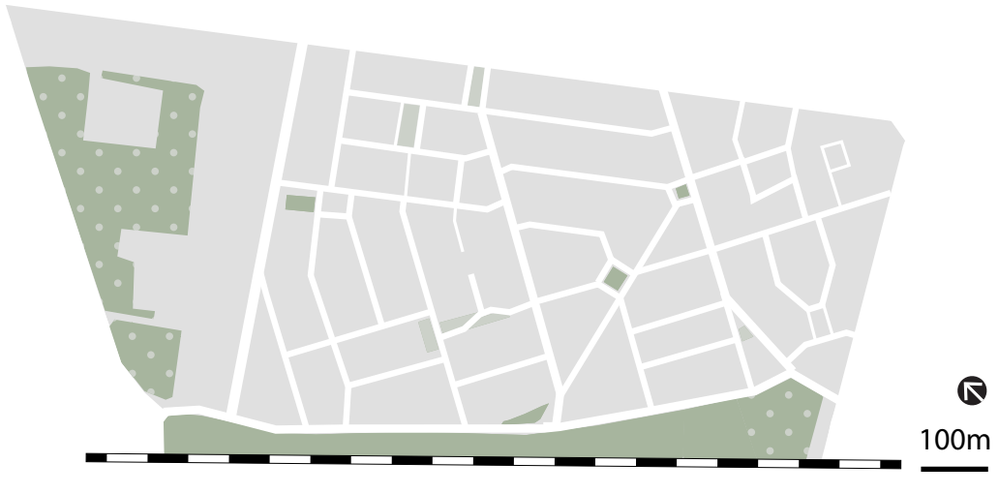
Highlights of the findings on greenscapes for Bergen, Blixembosch-Oost, Woensel-West and Lakerlopen.

Example of amenity green spaces in Lakerlopen. Source: Authors

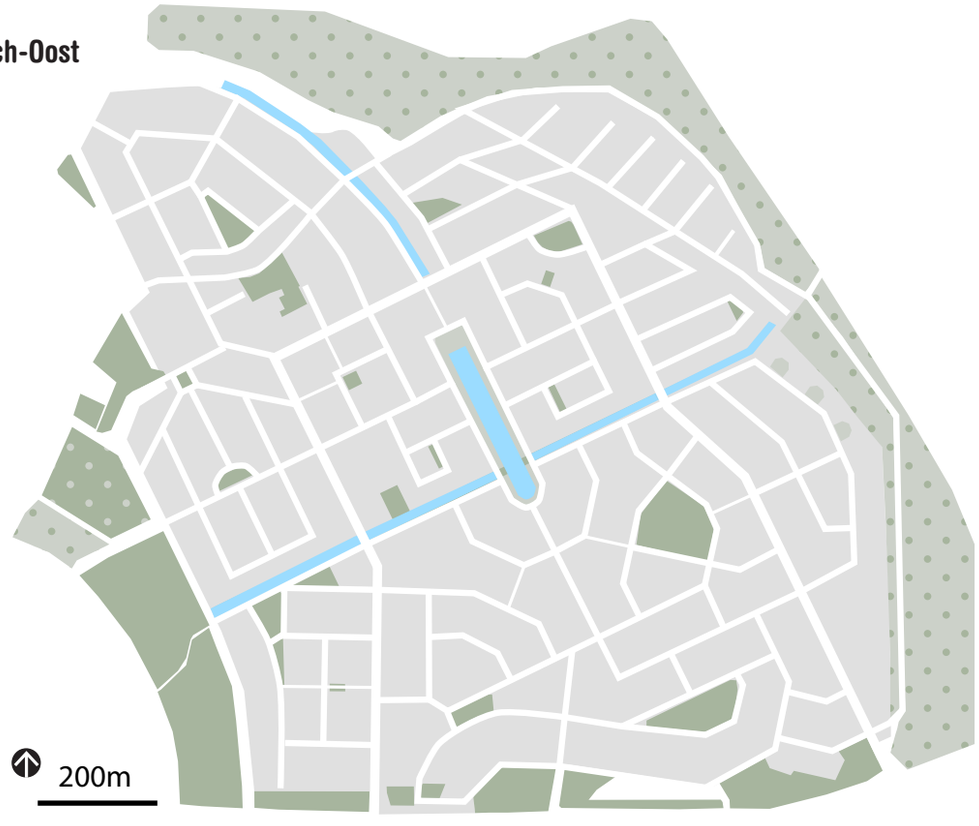
Example of an aesthetic greenscape in neighbourhood Bergen. Source: Authors

Bergen

Woensel-West



Blixembosch-Oost



Lakerlopen

Analytical maps of the four neighbourhoods with the classification of greenscapes based on Panduro and Veie (2013); Bell, Montarzino, and Travlou (2007) with modification of authors

Findings on playscapes

In all four neighbourhoods, more than five designated playing areas are present and at least five undesignated playing areas could be identified, in which more than half of the children of the interviewees play every day. It should be noted here that undesignated play spaces are hard to quantify, and the numbers here are based on observation and comments from children.

The least designated play areas are found in Bergen, of which also the quality of play equipment in playgrounds is considered poor. Almost one-fifth of all play in designated areas in Bergen happens in the park. Although the available play spaces in Bergen are considered to be suitable for various ages, places for parents to sit and observe are missing. The play equipment was also observed to be badly maintained and play areas were not built in line of sight to the housing stock. The most used undesignated play area was the communal courtyard of a gated community, mentions of parking garages and certain streets were also registered by the parents and children.

Children of interviewees in Blixembosch-Oost are considered to play outside the most, of which they play most in designated play areas. More than half of the children that play in designated play areas use playgrounds. This could be aided by the fact that the quality of playscapes in the neighbourhood was considered best out of the four.

Three-quarter of all playing areas in Woensel-West were identified as designated playing areas. These designated play areas are considered best protected from the external environment out of the four neighbourhoods. Interestingly, Woensel-West is the neighbourhood wherein children play the most in undesignated areas, mostly on the streets and grass fields.

With the designated playing areas of all four neighbourhoods Lakerlopen excels in play areas that are built in line of sight, though has the least places for adults to sit and observe their children.

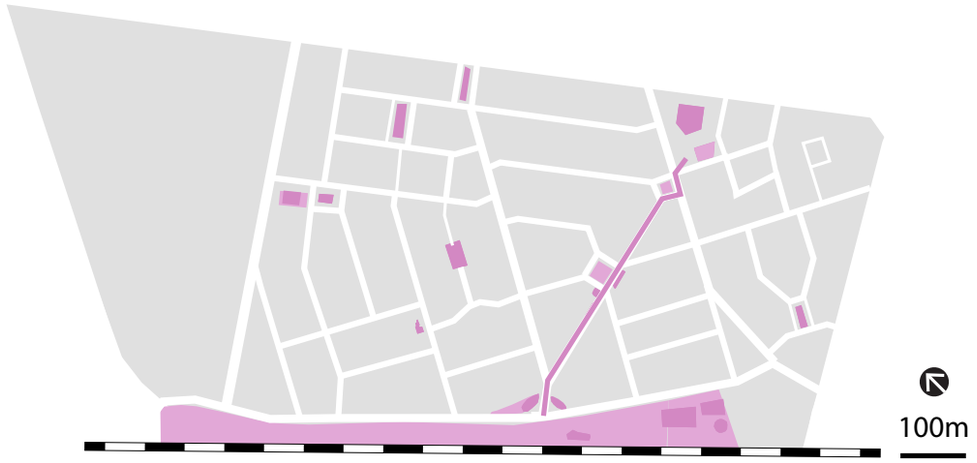
Example of a designated playscape in neighbourhood Blixembosch-Oost. Source: Authors

Neighbourhood		Bergen	Blixembosch-Oost	Woensel-West	Lakerlopen
Designated playing area		**55%**	**68%**	**76%**	**56%**
Undesignated playing area		**45%**	**32%**	**24%**	**44%**
Quality of playscapes		●●○○○	●●●●○	●●●○○	●●●○○
Quantity of playscapes		●○○○○	●●●●○	●●●○○	●●●○○
Based on interviews					
Frequency children play outside	all days	**65%**	**79%**	**68%**	**66%**
	two days	**15%**	**6%**	**16%**	**23%**
	one day	**19%**	**12%**	**9%**	**7%**
	not at all	**---**	**3%**	**7%**	**5%**
Children playing in designaed play areas		**58%**	**63%**	**48%**	**64%**
Children playing in undesignated play areas		**42%**	**37%**	**52%**	**36%**

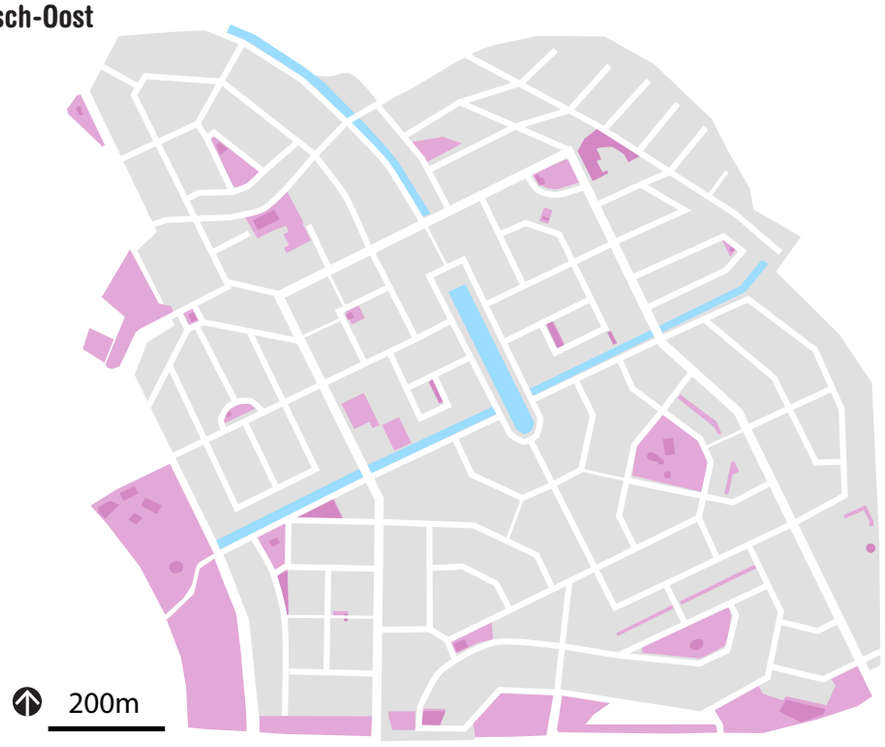
Highlights of the findings on playscapes for Bergen, Blixembosch-Oost, Woensel-West and Lakerlopen.

Bergen

Woensel-West



Blixembosch-Oost



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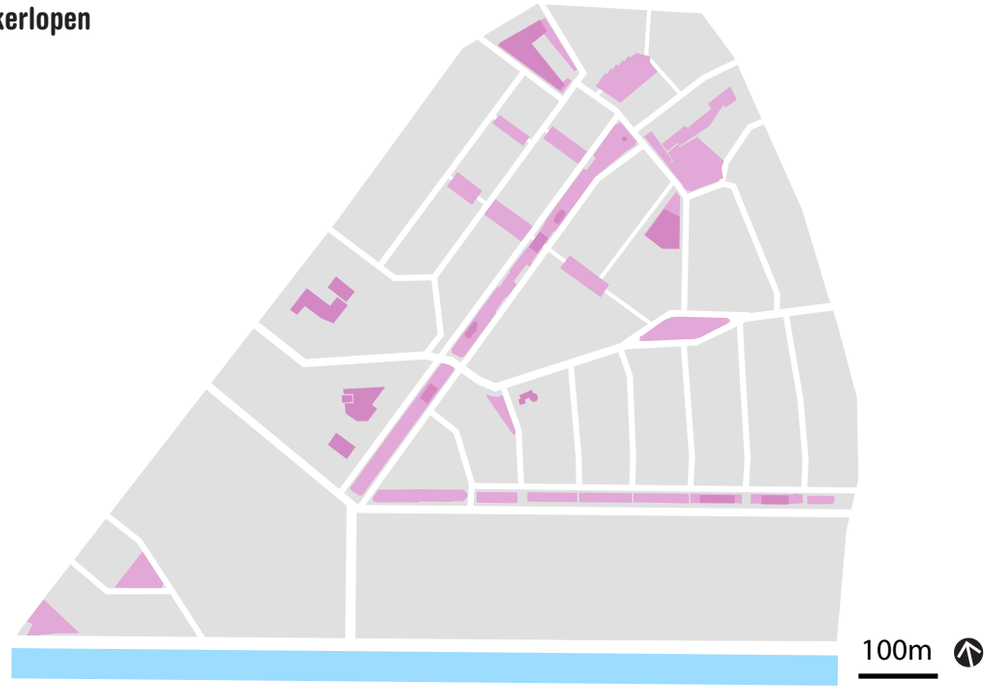


Analytical maps of the four neighbourhoods with the classification of playscapes Karsten and Felder (2016); Timmermans, Meinema, and Snel (2013) with modifications by the authors.

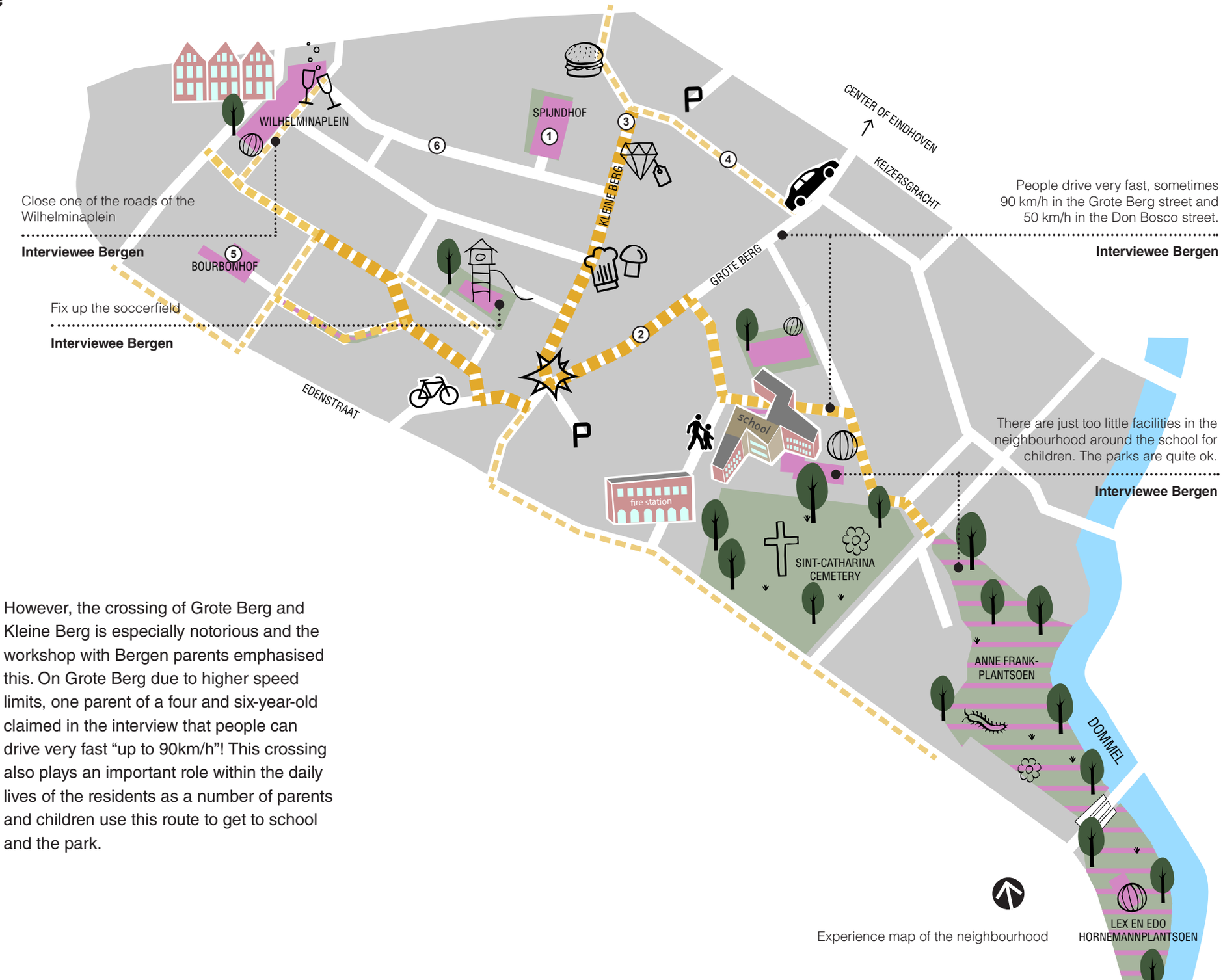
Qualitative findings on walking and experience

Bergen

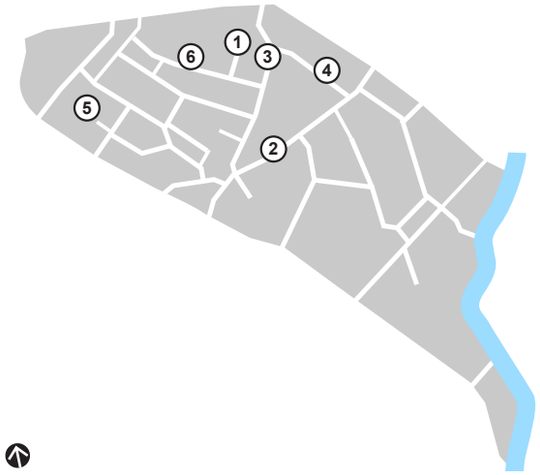
Located between two important access roads to the city, Bergen is a neighbourhood that can be identified by its infrastructural boundaries. The neighbourhood is further dissected by another distributor road, Grote Berg, that divides up the neighbourhood into roughly two sections, and the Kleine Berg intersecting east to west. The Grote Berg is a busy thoroughfare (distributor road) and is observably busier than thoroughfares in the other neighbourhoods (see table in section 5.3), as seen through the qualitative mapping of the neighbourhood. This division created by the Grote Berg, also shapes the distinct characteristics of the northern and the southern parts. The norther half is more historic and has mainly residential and commercial functions. The southern part is part of the city's more recent past, and is also greener with a large park, various office and governmental facilities.

Synonymous with the image of Bergen, Kleine Berg can be considered as the heart of the neighbourhood. A popular and animated street, with a number of local cafes, restaurants, and shops, the street combines residential and commercial activities. Oranjestraat and Sint Catherinastraat are also popular walking streets with destinations to Bourbonhof (a gated community with many young families) and Wilhelminaplein (a popular square for food and drinks).

However, the crossing of Grote Berg and Kleine Berg is especially notorious and the workshop with Bergen parents emphasised this. On Grote Berg due to higher speed limits, one parent of a four and six-year-old claimed in the interview that people can drive very fast "up to 90km/h"! This crossing also plays an important role within the daily lives of the residents as a number of parents and children use this route to get to school and the park.



Experience map of the neighbourhood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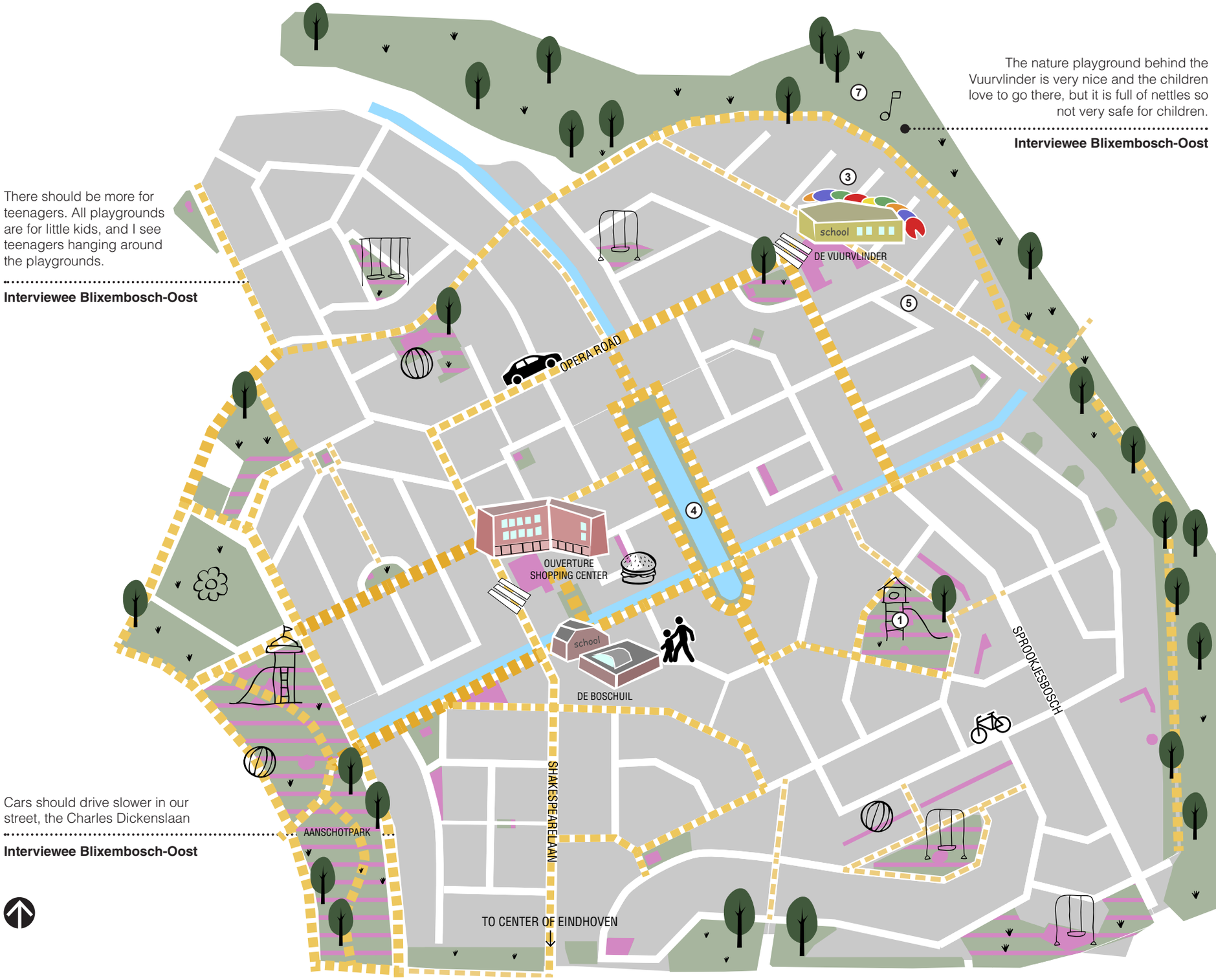
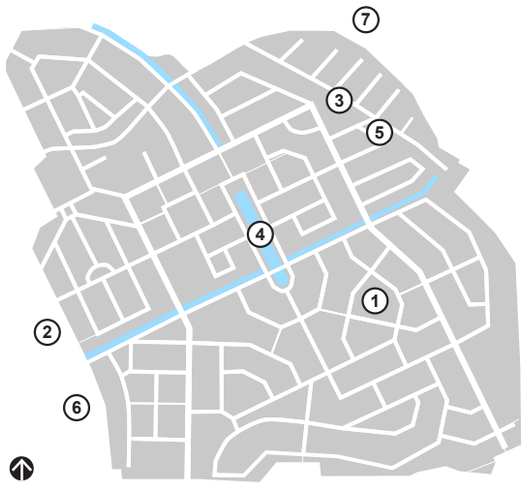
Blixembosch-Oost

The qualitative experience within Blixembosch-Oost shows a neighbourhood that appears relatively balanced in terms of play areas, green, and residence. With small play and green pockets scattered throughout the neighbourhood, and a larger green zone surrounding the residential zone. It is evident that when the neighbourhood was built in the early 2000's, the design of the urban fabric was aimed at enriching the familial use, low density of housing, rich greenery and various options for play. Services like the shopping centre and the elementary school (De Boschuil) are concentrated in the centre, supplemented by another elementary school (De Vuurvlinder) in the northeast. The whole neighbourhood is experienced as a pleasant area to walk around, with 92% of the interviewees responding positively on responses from residents who highlighted that "it is a very peaceful neighbourhood with a lot of possibilities to walk to". Another interviewee added that "the neighbourhood is very diverse which is nice when you walk through it". This diversity in the neighbourhood is endorsed by the various answers the interviewees gave and drawings they made on the question what particular route was their favourite within the neighbourhood. One interviewee praised the larger green pocket in the east because of its calmness: "Nobody walks there and it's quiet", where another interviewee enjoyed walking "through the older part of the neighbourhood".

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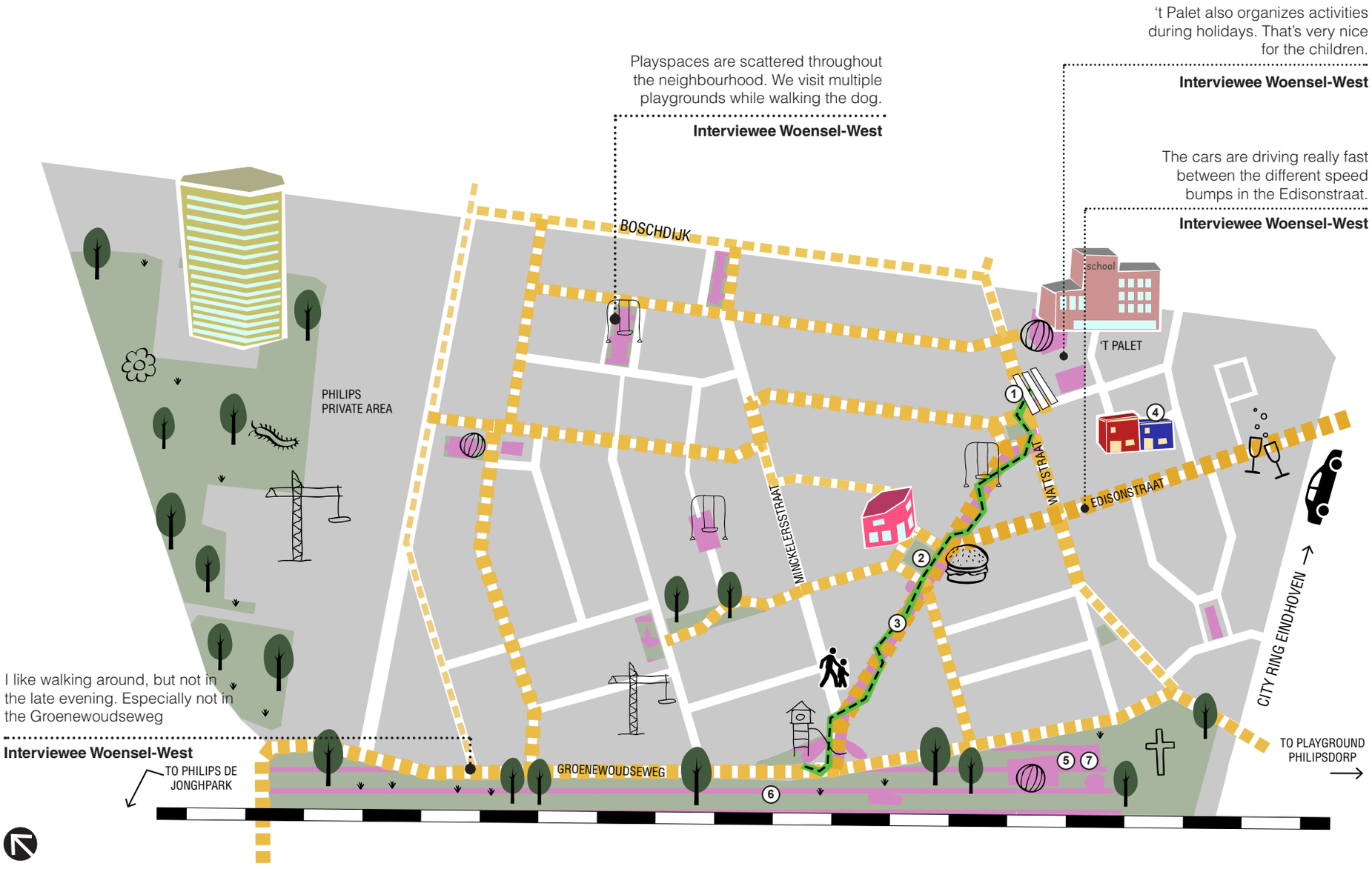
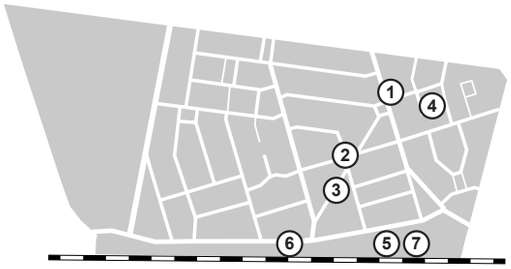
Woensel-West

Among the four neighbourhoods researched, Woensel-West was the least popular neighbourhood to walk in. A little more than third of the respondents answered positively to the question if they like walking around the neighbourhood. It remains a challenge for the residents and the municipality to overcome the problematic history of the neighbourhood. However, people do see that the neighbourhood is improving, “especially in contrast to before. Lots of renovation and new developments improved the neighbourhood”, says one resident, though certain parts of the neighbourhood are more popular than other parts. People highlighted which streets to avoid based on traffic or what they considered as places of undesirable activity like a coffeeshop (where cannabis products are sold). The time of the day also mattered, for example in the evening. “I like walking around, but not in the late evening. Especially not in the Groenewoudseweg”.

Though it is a neighbourhood that has a child friendly route on Edisonstraat and Spilstraat, parents still have concerns that people are driving too fast, “the cars are driving really fast between the different speedbumps in the Edisonstraat”, for example. One parent with a girl of four also responded they do not necessarily stick to the child route, but the kids use it in a playful manner. There were also observations that the child route needs to be made more evident and its use more prevalent.

The route to Philips de Jonghpark and the Playground Philipsdorp are popular destinations for residents in the neighbourhoods to also walk to. They serve functions that are not found in the neighbourhood, a large park and a big playground.

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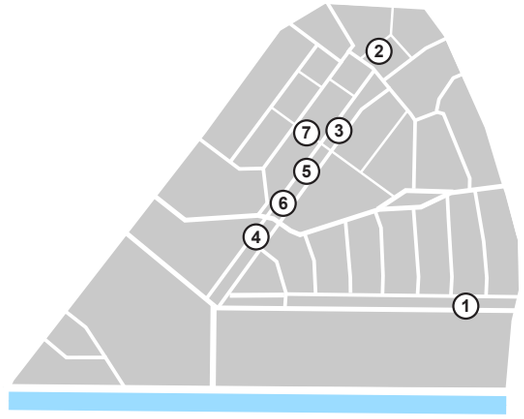
Lakerlopen

Lakerlopen is bordered by two distributor roads, the Tongelresestraat, the City Ring of Eindhoven, and the canal to the south. Although the neighbourhood includes various green- and play spaces, services like a supermarket, restaurant, DIY stores and boutiques, however the elementary school and a park is located in the neighbouring area. Thus, parents and children constantly have to cross the main thoroughfare of the Tongelresestraat to reach the school or the park. Though it is a frequently used walking route, interviewees had many concerns on the threats to safety, for example, “there should be more safe places to cross busy streets like the Tongelresestraat” said one resident.

In general, the popular walking routes were concentrated in the northern part of Lakerlopen. Although the canal in the south seems like an attractive place to walk along, nobody indicated this as an enjoyable walking route. This can be attributed to the fact that the canal zone has an agglomeration of large scale furniture stores, DIY shops, and other logistic companies that act as a buffer zone between the water, green, and the residential areas. People appear to go to this area only for certain needs or if there are specific activities, for example one parent who said, “There was a celebration at the Praxis (DIY store) where they had face-painting for children”.

The most popular walking routes in Lakerlopen connect several play and green areas, and the shopping centre in the north. Interestingly, the intensity of popular routes along the Kempensebaan is the highest. Located in the centre of the neighbourhood, this street became the main pedestrian artery after the transformation project within Lakerlopen. The improvements to the housing stock, public spaces, and a green pedestrian zone, has shaped the movement and preferences across the neighbourhood. An interviewee in Lakerlopen: “I usually take the Kempenbaan because of the pedestrian zone dividing the two sides of the street.” Although there are other streets is designed in a similar way (Ruysdaelbaan for example) interviewees indicated that this part of the neighbourhood was not a pleasant area to walk around: “It is clearly lacking in comparison with the rest of the neighbourhood”.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5.3 Learnings in context

Based on the findings from the quantitative and qualitative data from the four neighbourhoods, we can position specific learnings and challenges of the neighbourhood along certain thematic lines. With the help of indicators based on the urban environment and systematic methods of data collection, cities can assess their levels of addressing child friendly planning and understand the changes over time.

Streets and perceived safety level

Despite the various measures taken for street safety within all the four neighbourhoods, perceived safety (by the parents) in the street is low in all of them. Out of the three investigated the domains with the most challenges and improvements within the neighbourhoods fall under street design and related road safety. In three out of the four neighbourhoods (Bergen, Woensel-West, Lakerlopen) more than half of the parents admit that they do not find the streets safe for their children to play in. A recurring observation was the number of cars on the street and the attitude of the drivers, apart from these, reasons such as speeding cyclists in Bergen to bad visibility in the streets of Blixembosch-Oost deter parents from encouraging their children to play outside. While some parents are able to cope with this and appeal to common sense, like this parent in Lakerlopen, "...don't do stupid things, then it's safe", for most parents this is not the case. Interestingly, in Bergen children were even less satisfied with their safety than their parents. Of the children who participated in the mapping workshop within the neighbourhood only one third of the children found the streets safe to play in, but half of the children said they do regularly play in the street (responses were a mix of personal and parents' choice). The reason streets in the neighbourhood is a popular playspace can be attributed to the low availability of playgrounds in the neighbourhood. However, initiatives such as Playing Out can re-introduce streets as a safe place to play though closures, traffic calming and awareness.

Of all the four neighbourhoods, Blixembosch-Oost was the neighbourhood where parents considered the streets most safe. Blixembosch-Oost, a suburban VINEX neighbourhood, consists mainly of access roads that also have a low intensity of use. Although traffic safety remains a challenge, two third of the parents were satisfied in this neighbourhood with regards to safety. One parent answered, "as a mother I am not satisfied, but in comparison to other neighbourhoods, then yes I am. If I had to give it a grade, it would be a seven (out of 10)". Though levels of perceived safety were quite high, play activities in this neighbourhood do not take place on the street but more within assigned play areas (e.g. playgrounds). The abundance of play facilities around the neighbourhood appears to deter from playing on the streets.

Parents from Bergen on the other hand were concerned about the speed of traffic, and when asked on how improve this situation, all pointed towards traffic calming and more safety: "Make the neighbourhood car-free, make the bike lanes safer and provide less parking spaces." One of the parents mentioned incidents related to speeding cars crashing into people's home. Others stressed on creating better signage's and control. Though it was not only traffic related reasons that contributed to lower perceived safety levels. Social and environmental factors were also associated with a lower perceived neighbourhood safety. In line with earlier research 'stranger danger' appears to be causes of parental anxiety in relation to their children's safety in the neighbourhood (Carver et al, 2008). Findings from this research follow the same pattern. Examples include the presence of homeless people in Bergen and (activities related to) prostitution and drug abuse in Woensel-West. Not only adults contribute to an unsafe feeling where also older peers of the children (teenagers) appear to be a reason to avoid certain places as the workshop in Bergen showed.

The perceived safety levels can also be related to the popularity of walking around the neighbourhood. The findings show that Woensel-West is considerably the least popular neighbourhood to walk in. Respondents say that the situation has improved from previous years though some parents generally do not let their children walk or

Distributor road Grote Berg in Bergen has a high volume of traffic. Source: Authors

play around the neighbourhood unsupervised. Parents generally check up on them after some time or make agreements on how far the kids can go, one example being “the kids walk on the streets by themselves. I let them walk to the playscapes sometimes, but after a few minutes I will check if he is alright”. Bergen and Blixembosch-Oost are considerably more popular neighbourhoods to walk in, with Blixembosch-Oost being praised generally for its traffic safety and social control.

Results from the interviews showed that parents from Lakerlopen are most likely to use their car to drop their kids at the various facilities. This can be explained by the fact that most facilities for kids are located in other neighbourhoods rather than within the neighbourhood. Lakerlopen has for instance no primary/ elementary school and very few after school services. These findings differentiate it from Woensel-West a comparable neighbourhood where most of the facilities are within walking proximity. Interestingly, the use of different transport modes did not affect the perceived road safety level of the neighbourhood. However, it should be said that causal correlations between traffic and perceived safety levels cannot be determined on the basis of this study as the sample size was relatively small.

Literature however shows that road safety is a major concern among the safety perception of children and parents. Carver et al. (2008) describes two British studies, one done by (Lefaivre and Roode 2002) that found that 91% percent of the children considered the main road as ‘scary and dangerous’. Furthermore, more traffic and/ or parked cars in local streets also decreases the likeliness that children perceive their neighbourhood as a favourable place (Mullan 2003). Similarly work by Carver et al (2008) reports on two Australian studies found that parental perceptions of unsafe road environments were negatively associated with walking and cycling among children and parents. Improving traffic conditions can be an important part of increasing children’s local walking and cycling (Timperio et al, 2004). Results from our own study underline the importance of having local facilities for kids within the neighbourhood and safety perceptions. As an example of an unsafe traffic situation was submitted for review during the workshop with the parents from Bergen. They were asked to come up with suggestions to improve the traffic situation around Grote Berg, a main distributor street of the neighbourhood. Reducing the speed from 50km/h road to 30km/h was mentioned by almost every participant. Creating safer road crossings, and increasing their frequency, and changing their design was also mentioned. Narrowing streets so as to reduce traffic speeds, one-way streets, traffic lights, use of a coloured path that mark the route to school, wider sidewalks, lesser parking spaces and allowing less (bus) traffic on the street are other improvements mentioned by participants in this case.

Kleine Berg street in Bergen.
Source: Authors

Traffic countings

			morning		afternoon		evening	
Neighbourhood	**Street name**	**Road type**	**Car**	**Bike**	**Car**	**Bike**	**Car**	**Bike**
Bergen	Sint Catherinastraat	Access	10	13	15	18	36	22
Bergen	Grote Berg	Distributor	113	87	158	202	157	181
Blixembosch-Oost	King Oliver	Access	3	0	7	2	8	2
Blixembosch-Oost	Opera	Distributor	63	12	61	60	75	32
Woensel-West	Lorentzstraat	Acces	41	7	40	17	76	14
Woensel-West	Boschdijk	Distributor	493	25	393	16	493	25
Lakerlopen	Tenierslaan	Access	84	35	97	62	60	35
Lakerlopen	Tongelresestraat	Distributor	130	---	290	---	132	---

Traffic counting is based on half hour observation in the morning, afternoon and evening. The table shows for example, that the inner-city neighbourhood Bergen is the busiest given the main arteries intersecting the neighbourhood. Though experiencing heavy traffic, the neighbourhood has relatively high levels of perceptions of safety.

Designated play versus undesignated play

The importance of outside play has been stressed in the literature ranging from health to children's geography (Hinkley et al. 2008, Aarts et al. 2010, Vries and Veenendaal 2012, Christian et al. 2015). Within our research, we found that the majority of children play outside every day, and that they play mostly in designated play areas i.e. places of organized play (such as the playground, sports field, schoolyard, park) rather than undesignated playing areas (such as streets or sidewalks).

The ample availability of designated play areas in all the four neighbourhoods can be identified as the primary reason for this behaviour. We should note here that though designated areas are easy to identify visually and spatially, undesignated playing areas are more difficult to determine. More so as these spaces cannot be identified through analysis and observation alone and need input from children and/ or parents to point out where else play happens. Between the four neighbourhoods, designated outside play was most evident in Blixembosch-Oost and undesignated play areas were most evident in Bergen.

The number of designated playgrounds in Blixembosch-Oost (almost double when compared to the others) appears to encourage playing outside. Parents of Blixembosch appear to be largely satisfied with the quality and number of available facilities, but the playscapes are mainly aimed at younger children. Though a number of parents complained about the differentiation of playgrounds and that there are not enough spaces suitable for older children. As a parent of two children under the age of ten says, "…we need more for teenagers, all playgrounds are for little children. And I see teenagers hanging around the playgrounds". The absence of flexibility of playscapes means that the various needs of the different age groups are not addressed. Respondents also noted that this results in teenagers loitering around playspaces creating environments of distress for the young children. In February 2017 within the regional news , youth disturbances from Blixembosch and Woensel-West were featured citing problems with noise, litter, alcohol and drugs (Eindhovens Dagblad 2017). More diverse play environments or activities are needed to support the various and changing demographics of neighbourhoods. This can be created combining various activities and space, urban farming, natural playgrounds, sports fields, etc.

In comparison to Blixembosch-Oost, a quarter of outside play in Woensel-West happens on the streets. One of the possible explanations for this is the child friendly route that crosses the neighbourhood from the east to the west called the Spilstraat. This play street connects some of the child facilities within the neighbourhood including the school, playgrounds, and the park. A workshop with elementary school children in the neighbourhood on the route showed that the children are yet to grasp the meaning or knowledge of the various safety elements along the route (e.g. posts for a safe crossing). This problem is not unique and also appeared in the evaluation done of the Kindlint in Amsterdam (Wassenberg and Milder 2008). Interestingly, the children indicated various elements along the route - designated or not - as places for play. Though levels of perceived safety were low, children were still allowed to play on the streets, more so as the number of designated play spaces are limited.

Between all the four neighbourhoods, parents emphasised the need for more centralized and diverse play spaces, and improvements of the playing environment. Like a participant in Woensel-West said: "I want the play areas to be bigger and more together. Not one piece of play-equipment on every street, but a bigger dedicated place where not only children but also parents can gather". A common observation in the interviews and emphasised during the workshop in Bergen was the absence of activities for parents or waiting spaces while the children played in allocated playgrounds. It was also striking that all the answers about improvements were about designated play areas and nothing was mentioned about adapting undesignated play areas. One of the advantages of undesignated play spaces is the accessibility for all children (Wilson 2012). The workshop with children in Bergen revealed children indeed appreciated undesignated play areas because it's close to their home, especially when designated play areas can be more difficult to reach.

Children and parents during straatspeeldag (National playday) in neighbourhood Bergen. Source: Authors.

Literature reflects that proximity to the home is important because much of the learnings of children take place here (Francis 2016); also see (Hart 1978, Carr and Lynch 1981). Moreover, children temporary own and imagine these spaces, encouraging a large variety of play themes: what game can I play here? (Frost 1992). Undesignated playspaces in Bergen include car-garages that are accessed by placing a brick under the garage doors, some appropriation of sidewalks and private courtyards (e.g. Bourbonhof in Bergen) are popular to name a few. As streets are considered unsafe by children in Bergen, a private courtyard of a gated community appears to be a popular alternative both with parents and kids to cope with the capricious city environments. The downside of these closed spaces is that they are only accessible to the children that live there. However, the workshop with children from the Bergen showed other children from the neighbourhood do have interest in playing in these places.

Of the interviewed children in Bergen, there was also a big difference in preference of play spaces between genders. Girls are much more negative about the place and name bad maintenance as a deterrent to play, variety of play equipment and the threat of older teenagers are other nuisances pointed out. Boys would like to see improvements on the maintenance of the soccer field, and additions of more sport facilities. Especially boys, but also girls, name sports like football as a popular activity done outdoors. Literature further reinforces this, Karsten (2003) describes that games boys play more often revolve around physical strength, competition in sports and larger groups. Interestingly they both point out that more attention needs to be paid to diversity of ages within neighbourhood play spaces.

Parents also have specific demands when it comes to redesigning play spaces research results showed. For example, near designated playgrounds more facilities for parents were suggested. During the workshop in Bergen multiple measures were suggested to improve seating within different areas, example include, combining leisure functions with play, like adding a terrace to a playground. For undesignated playspaces more benches are proposed. The combination of leisure and seating could explain the popularity of the Wilhelmina square in Bergen among both parents and kids. This square has a large share of cafes and bars where parents can sit and drink while they watch the kids. Similar suggestions for improvements were found in the interviews with parents in Blixembosch-Oost.

Example of a designated playspace in Woensel-West. Source: Authors

Playground situated on the Spilstraat in Woensel-West. Source: Authors

Example of an undesignated playspace in Blixembosch-Oost. Source: Authors

Urban green spaces

Urban green spaces (UGS) over the past years have become central to a number of research themes, sustainability, physical health, mental health and safety (Barrera, Reyes-Paecke, and Banzhaf 2016). Studies show that accessibility to and the presence of green spaces attracts play, which is important for physical, social and cognitive development of young children (Louv 2005, Amoly et al. 2014). Children's access to local child-friendly environments, including green spaces, contributes to sustainable development in several ways, like diminished car transportation and support for children's healthy development, physically active free play and concern for the environment (Jansson, Sundevall, and Wales 2016).

The issue of accessibility to UGS is one of the crucial aspects of sustainable urban planning and it is linked to the growing concern on the wellbeing of urban population, particularly in children (Gupta et al. 2016). Studies from the perspective of the child on the design of urban green spaces show that children felt that the management of their local environments was not adapted to their preferences (Roe 2006). This appears to be the case for Eindhoven as well in terms of use and accessibility of urban green spaces. While the data was collected independently for play and green, in practice however they are closely related to each other. The embedding of playgrounds in green areas, green spaces often provides opportunities for play (natural playground) or just an informal patch of green in front or back of the house that can be used for any form of undesignated play.

Within the inner-city neighbourhood of Bergen, the park is the most visited greenscape for play according to findings from the children's workshop. This was confirmed by the data from the survey with the parents. Remarkably, this park has no specific play facilities for children. The children invent their own games or make creative use of what is already there, like using an art object as a playset to climb on. The design of the Anne Frankplantsoen (Bergen's city park) and its enclosed character also provides possibilities for informal group play, like hide and go seek for example. During the workshop, an eight-year-old girl described how through their own imagination she created an environment that was the exclusive domain of the children. This description fits in line with the research that shows that play in a natural environment is more varied than play in non-natural play spaces. Play in natural environments is also more sensational, explorative and constructive (Berg, Koenis, and Berg 2007). Natural playgrounds, like the ones that can be found in Blixembosch-Oost, are especially suitable for this.

Blixembosch-Oost is the neighbourhood with the most greenery from the cases researched. Because of its suburban character, it has the highest volume of private gardens, which also contributes to the green quality of the neighbourhood. At the same time Blixembosch-Oost has the least amount of solely aesthetically purposed green. Most greenery in Blixembosch-Oost has a double function as it is a playground as well as a grass field for aesthetic purposes. This doubling of function translates to a high quantity of different play opportunities in this neighbourhood. This quantity and quality of green also appears to contribute to the high rate of outdoor play in designated spaces in Blixembosch-Oost. With the other neighbourhoods researched, quality and access to green was much lower. A number of parents raised this issue including a parent in Lakerlopen: "A larger park would be nice, there are a large number small green patches in the neighbourhood, but still a single large one would be nicer". Parents also gave examples of what they would like in terms of greening streets and addition of play spaces. Findings from the workshop highlighted importance of greening schoolyards, most often these improvements were suggested by the kids for their own schoolyards. Interestingly though grassfields are a desired addition, the use of artificial grass is often mentioned in addition to natural grass by the children! The greenification findings fit in the line with a push towards increasing natural Dutch schoolyards (NOS 2017).

Example of a climbable art object in the Anne Frankplantsoen (Bergen). Source: Authors.

Example of a nature playground Paalspoor in Blixembosch-Oost. Source: Authors.

Impacts and role of the socio-cultural environment

Within a community, the physical (built and natural) environment cannot be detached from social, economic, and political realities of the neighbourhood. While the role of the physical environment is central to the wellbeing of children, from the need for walking and cycling facilities to the preservation of green space, social and cultural features also shape behaviours and permeate into activities. Though contestations exist within research on parental values between high, middle and lower-class families on raising children, the difference between access to activities and amenities was evident through this work. Between the four neighbourhoods studied, it is relatively easy to demarcate lower class and upper-middle class families. Families belonging to the lower-middle classes are neither rich nor poor, though have limited to medium resources (cultural and economic capital). The relatively rich neighbourhood of Blixembosch-Oost appears to have very different forms of activities and capital in comparison to Woensel-West or Lakerlopen. With diverse immigrant status ranging from Turkish, Moroccan, other African and Asian backgrounds, Woensel-West and Lakerlopen typify a very visible generational upward mobility of migrant families. The gentrifying Bergen is a neighbourhood composed of well-educated upper-middle class families where almost all have a native or highly skilled immigrant background. Residents with different socio-economic status also use their neighbourhood differently in terms of employed outdoor activities. Karsten and Felder (2015) found that families with different socio-economic backgrounds also have different activity patterns. In their research on family outings, they found that families with higher socio-economic capital have a higher frequency of activities and enjoy these more than the lower-class families.

Given the diversity in the spatial layouts and demographic composition of these neighbourhoods, it is noteworthy, that the parents were generally satisfied with the wide range of social services in the neighbourhood and the quality of the social environment. Not restricted to social capital of residents, parents with children feel most welcome to local business in Blixembosch-Oost, and value the friendly environment of semi-private and commercial spaces within the neighbourhood. An interesting observation is found in Bergen, where semi-private and commercial spaces are considered least inviting children. Although there are some very positively rated commercial spaces (e.g. those especially aimed towards children), residents identify the conflict of interest between the commercial (restaurants, bars etc.) and the living areas as an issue of future improvement. While commercial activities formerly exclusively belonged to adults, parents note that lines between adult and child-oriented spaces are fading.

As one of the more affluent neighbourhoods in the city, within the four-researched neighbourhoods, Blixembosch-Oost also has the most number of private and commercial activities available for children organised through neighbourhood organisation. Blixemkids, one such example, is a group of volunteers organising activities for children, an interviewee expands: “We celebrate for example Sinterklaas, and on National play day Blixemkids brings waterslides, inflatable bouncers and more”. Although positive, multiple interviewees identified the importance of (and absence of) mixture of people with different backgrounds: “We think the culture of the people in this neighbourhood is ‘too white’. Nowadays we live in a multicultural society and I want my children to grow up knowing this multicultural society”.

In contrast to Lakerlopen, where activities for children are not as common (“there are a few activities, but they’re organised just once a year”, says one parent) and support groups for parents are less known or even wanted. A parent who is aware of such activities highlights “There is a support group for parents at the elementary school, but we don’t go or need that”. Based on the small sample size here it is hard to position the reason behind this. Similarly, low levels of participation can be observed within activities organised by the neighbourhood association, where turnouts are low. One of the interviewee observed that the organization itself, and therefore the activities, might be a bit outdated since there are only seniors

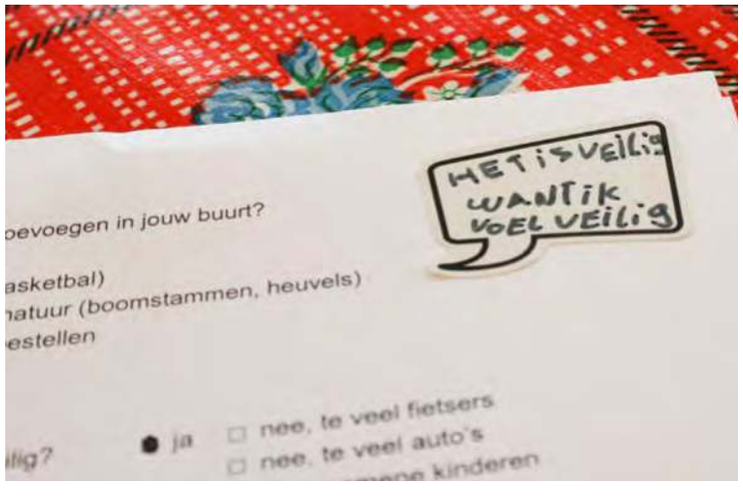
Children and parents from the neighbourhood take part in Woensel-Westival (September 2016): a neighbourhood festival in neighbourhood Woensel-West. Source: Authors

on board. In line with Bell et al (2008), who underpins the importance of a varied group of citizens participating in for example community groups, and the need for feeling of ownership to the success of any participation process.

By far the most diverse neighbourhood within the study, Woensel-West has been successful in banding together to realise the Kindlint and organise various community activities. The diversity of this neighbourhood, also lead parents to comment on the need for more inter-communal activities. "... add more common activities for different groups, promote more mixing of people or children with different backgrounds", says one parent. Some parents raised concerns on the presence of the red-light district close by, and other noted that the differences in socio-economic status implied variance in access to amenities. "While they have the means to access services and special care, not all families have that ability (lower income, lesser social networks). Also, improvement of (mis)communication between people in the neighbourhood through lack of Dutch language comprehension", is a noteworthy example of the differences between the four neighbourhoods.

Interestingly, Bergen, also a neighbourhood in transition attracting skilled and affluent native and non-native workers, has been successful in encouraging various co-creative initiatives for child-friendly environments. Reflecting on the active involvement of its residents and civil society organisations, Stadstuin Bergen located in the heart of Bergen is one such example. The aim of the resident led initiative is to transform a decayed parking space and playground through greening activities into an environment that facilitates interaction between residents, children, and civil organizations such as a home for veterans and social day care facilities for disabled people. The initiative is supported though municipal funding, but also in kind by the various neighbourhood organizations and local entrepreneurs.

Example of improvements of a girl (9) in Bergen taken from the school workshop. The sign in the back says: "no teenagers allowed" because the presence older children are a reason for her to avoid this place.



Picture taken during the workshop with children. The sticker in Dutch reads: "It is safe because I feel safe".

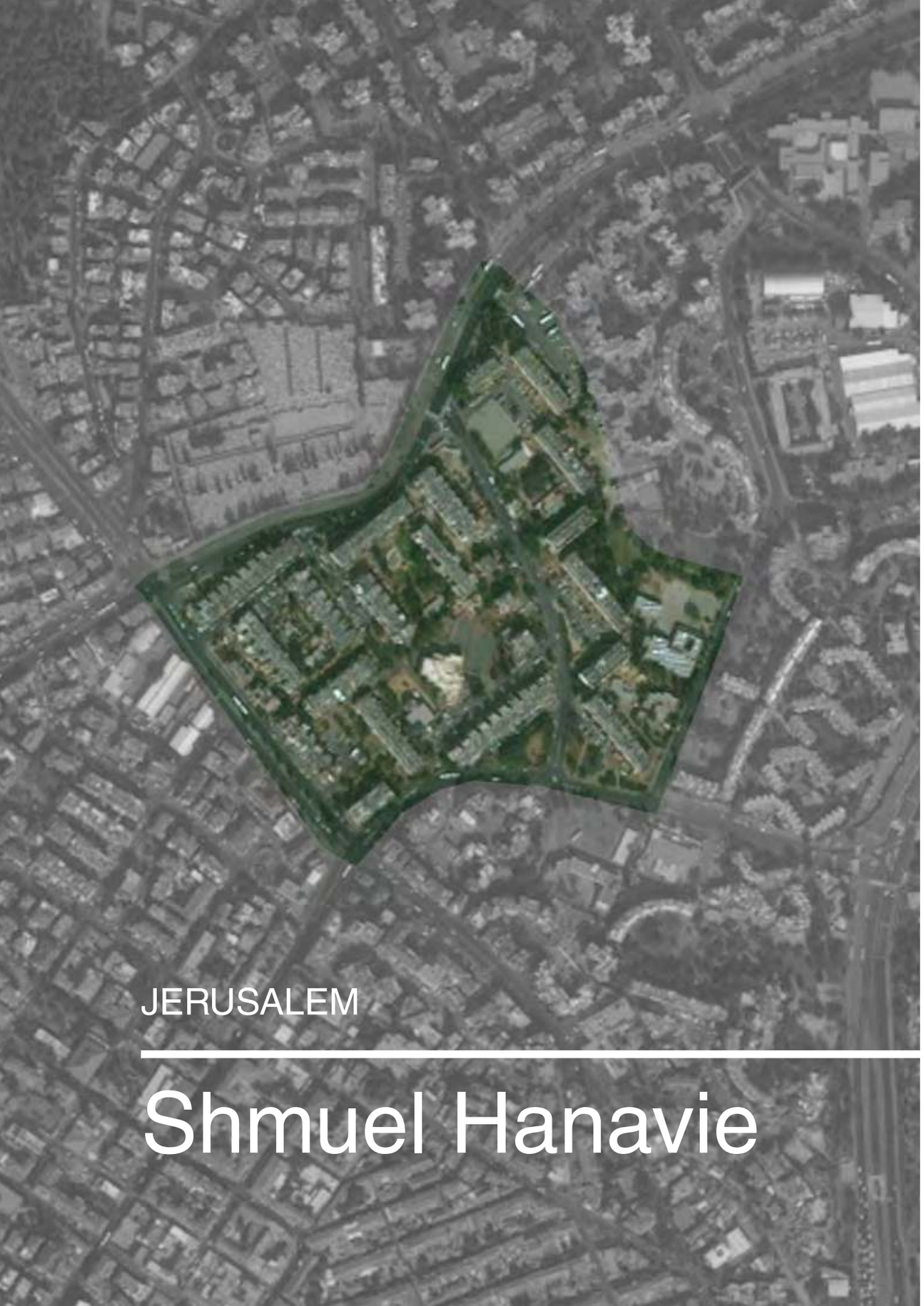
6. Israeli case study: Jerusalem

During November and December 2016, twelve master planning students from the Hebrew university of Jerusalem who participated in a course on Child Friendly Planning collected data about the public spaces in four Jerusalem neighbourhoods and their appropriateness for the use of children. The data was two-fold: structured observations, formatted by a list of indicators given to the students – and structured interviews of parents in the neighbourhoods. Altogether, the students' teams produced comparable datasets for the four neighbourhoods. The aim was to relate the observational data (measuring the child friendliness of the physical environment) to the parent's responses (revealing typical use of the environment by children and their families). The data is thus analysed following comparative case-study methodology, which aims to uncover relationships within a set of contexts. The following sections will present, first a juxtaposition of the main findings; will then shortly discuss each data sub-set within the context of the individual neighbourhoods; and finally, we will discuss the patterns occurring across all four contexts when the interviews are related to the observational data.

The four neighbourhoods chosen for this research span the extent of Jerusalem, from Beit Hanina, in the North of the city to Talpiot estates in its south. The most significant distribution is between the east (Beit Hanina) - which is Palestinian, to the West (all three other neighbourhoods) which is Jewish. While formally belonging to the municipality of Jerusalem, the involvement as well as the intervention capacities of the municipality in the Eastern, Palestinian, neighbourhoods is far more limited than in the west – including its ability to create and maintain public spaces. As we will see, this has grave implications on the living conditions for children in the East of Jerusalem.

All four neighbourhoods are fall in the lower part of the socio-economic spectrum (between 3-5 in a scale of 10). They exhibit a range of population groups: Palestinian, Ultra-religious, second and third generation immigrants and first-generation immigrants, which reflects some of the heterogeneity and spatial segregation of Israeli society. Housing stock is typically for the middle and lower class Israeli environment mostly made up of apartment buildings, with Beit Hanina, which preserves some of its rural heritage, the exception, showing a mixture of buildings and single-family houses.

The neighbourhoods differ in sizes – from Beit Hanina which is a conglomeration of former villages and is estimated at 34,000 residents, Katamonim which is about 6,000 residents, to Talpiot and Shmuel Hanavie which are about 4,000 residents each. The sizes and density of the children population also vary – from 4.3 children per 1,000 square meters in Katamonim, to more than 20 children in child-dense Shmuel Hanavie. Both living conditions and cultural backgrounds in the neighbourhoods, then, show considerable variety.



Shmuel Hanavie

Shmuel Hanavie (“prophet Samuel”) neighbourhood was built in the early sixties on the dividing line between west and east Jerusalem (that is, between the areas of Jewish and pre-67 Jordanian Jerusalem) and was subject to sporadic warfare in its early years. It is composed predominently of three to four floor residential buildings, where each building had multiple entrances that can be considered a prototype for mass social housing in the sixties in Israel. These buildings are relatively small apartments in area but high in residential density. Shmuel Hanavie was part of the 1977 “Neighbourhood Renewal” project which included renovations to the dwelling such as enlarging residential units, and creating new facades to buildings. Improvements were also done to the public domain such as infrastructural upgrades and building community services such as sports facilities.

The neighbourhood was originally inhabited by newly arrived immigrants, and was poverty prone for most of its early decades. Since the mid-eighties there was a spill over from the ultra-orthodox (‘Haredi’) neighbourhoods in the vicinity. Today much of the population is Haredi. It is part of a large conglomerate of Haredi Jewish neighbourhoods in the centre-north of Jerusalem.

In Shmuel Hanavie live 4,300 residents out of which more than a 2,200 (52%) are children, and more than 1,000 (23%) are under the age of 6. These demographic numbers reflect the large families typical of this population group – families in Shmuel Hanavie average 5.9 people. The neighbourhood is made up of 21 low apartment blocks, each housing dozens of families. As the neighbourhood is 107,000 square meter large, the child density stands at 20.5 children for 1000 square meters.

The neighbourhood has one day care centre, six kindergartens and one (girl only) high school. In spite of the high child density, there are no elementary schools in the neighbourhood, and children visit schools in nearby neighbourhoods. One community centre serves also the needs of families with children.

Talpiot Estates

Talpiot Estates, in the south of Jerusalem, was built in the 50's and 60's, as public housing estates intended to relieve the harsh living conditions of Jewish refugees that emigrated to Israel in the early 50's. The neighbourhood lies on a steep and narrow stretch between two main roads, and is mostly made up of apartment buildings of three to four floors.

Currently around 4,000 residents live in Talpiot estate. This population is made up of first and second-generation immigrants from North Africa (the original community) and first-generation immigrants from Ethiopia and the former USSR. This was never a well to do neighbourhood, and today also its residents are at a low socio-economical level.

JERUSALEM

Katamonim 8/9

Katanomin 8/9

Katamonim 8/9 (all in all, there are nine neighbourhoods bearing the name “Katamon” in Jerusalem) lies in the south west of the city, and was built in the late 50’s (Katamonim 8) and early 60’s (Katamonim 9), as social housing. During the 70’s some of the apartments in Katamonim 8 were sold to the residents. In the 90’s the neighbourhood absorbed new immigrants (from the former Soviet Union and from Ethiopia). Currently most immigrants live in Katamonim 9, while Katamonim 8 is populated by the long-standing community of second generation immigrants. Despite public investment in neighbourhood renewal, the population in Katamonim 8 and 9 remained less than well to do: most of the apartments are small (about 55 square meters) – 1 or 2 bedroom apartments – about half of the residents are renters, and almost 5% of the housing stock is social housing (these are very high figures for the Israeli housing market). Average income is about half of the national average.

In 2015 the JLM municipality approved a clearance and renewal plan in the neighbourhood, aspiring to move residents to new buildings, and adding about 5,200 residential units with high-rise buildings. Currently the neighbourhood has about 2,300 residential units.

The neighbourhood has 6,504 residents, out of whom 1,481 are under the age of 18 and 741 under the age of six. Population density stands at 17.8 people for 1,000 square meters, and child density at 4 children per 1,000 square meters. With 2,230 housing units, gross housing density stands at 8.3 units per 1,000 square meters and net housing density at 6.3 housing units per 1,000 square meters – average to high densities.

The housing stock is made out of small single-family houses, dating from the 50’s, at the core of the neighbourhood, surrounded by massive housing estates from the 60’s and an area of 70’s apartment buildings at the north west of the neighbourhood.

JERUSALEM

Beit Hanina

Beit Hanina

Beit Hanina is one of the Palestinian neighbourhoods in East Jerusalem - a disputed area included in the boundaries of the Jerusalem municipality, and effectively forming a distinct urban entity. Situated in the north of the city, the former village has developed since the 80's into a large scale – 34,000 residents – urban sprawl on both sides of the main road to Ramalla. What used to be the old village core is has been cut off by a separation wall, and the neighbourhood today lies in what used to be the agricultural land.

In the past three decades, the neighbourhood became a preferred residential location for both Israeli Palestinians and for East Jerusalemites. As a result of the demand, and of targeted and high-quality housing projects, the population of Beit Hanina is relatively well to do. However, like many other Palestinian settlements in Israel it retains many traditional and rural characteristics which contrast with urban lifestyle (and institutional setting): an organic and unplanned development pattern, retaining of many agricultural functions between residential development, and unclear definition of public spaces and of the relations of private and public spaces. To make things even more complicated, the relationship holding between the residents (in all East Jerusalem) and the JLM municipality is not optimal, showing lack of investment in infrastructure and municipal services supply on the side of the municipality, and an attitude of distrust and hostility on the side of the residents, which strengthen one another. Out of the 30,000 to 40,000 residents of Beit Hanina[16] more than 15,000 are under the age of 18, and about 5,500 under the age of six. This puts population density at 7.8 people for 1,000 square meters, and child density at 2.9 for 1,000 square meters. There are around 3,900 registered residential units[17], and therefore gross residential density stands at 1.4, and net density at 1.9 – low densities, reflecting the high percentage of undeveloped land parcels sprinkled between the housing. Apartments are bigger than the Jerusalem average (96 square meters compared to 81 square meters), reflecting both the relatively high socio-economic level of the residents and the fact that often an extended family will reside in the same house. The unregulated and unplanned development of the neighbourhood resulted not only in a porous residential texture, but also sadly in lack of amenities and infrastructure. Some, such as sub-standard streets and lack of allocation for open public spaces and public services, have direct influence on the affordances for children in the public spaces. Others, such as provision of sewerage, garbage collection and policing may have adverse effect on the life conditions of children. As this neighbourhood is much larger than the other examined, the students focused their analysis on one of its 12 sub-districts.

16 Sources differ – the official number is around 30,000, but estimations of various NGO's put the number at 40,000. The difference stems from Palestinians who reside illegally in the area in order to live west of the separation fence.

17 Municipal data. It is likely that the number is higher, as there are unregulated houses.

6.2 Qualitative data from indicators

The following section showcases highlights from the collected data, quantitative and qualitative, from Jerusalem. Similarly structured to Eindhoven this section starts with a general overview of the four neighbourhoods, findings on street, green and play are then illustrated. The highlights below show condensed information and more data can be found in appendix.

Neighbourhood	Katamonim 8/9	Talpiot Estates	Shmuel Hanavie	Beit Hanina
Streets: Traffic Level (low – high)	●●●○○	●●●●●	●○○○○	●●●●●
Streets: traffic safety measures	More uncommon than common	More uncommon than common	More common than not	Some, near schools
Smooth passage from private to public spaces	**No** (cars blocking pavements)	**No** (low maintenance and stairs)	**Yes**	**Yes**
Quality of sidewalks	●●○○○	●●○○○	●●●●○	○○○○○
Share of pedestrian streets	**24.5%**	**15%**	**33%**	**nearly none**
Number of playgrounds	**7**	**5**	**6**	**1**
Quality of playgrounds	●●●○○	●●●○○	●●●●●	●●●●●
All households are within 600 meters of a play area	**Yes**	**Yes**	**Yes**	**Yes**
Number of other open public spaces	**11**	**0**	**many**	**1**
Ratio of green spaces	**30%**	**20%**	No green spaces besides the playgrounds	No public green spaces
Quality of green spaces	**Fair**	**Fair**	**---**	**---**

Qualitative data collected on various data points on the four neighbourhoods. Source: Univerity of Jerusalem.

6.3 Learnings in context

Based on the collected data this paragraph brings together the quantitiave and qualitative findings of Jeruzalem. Each neighbourhood (Shmuel Hanavie, Talpiot Estates, Katamonim and Beit Hanina) is discussed individually and reviewed through a systematic line of topics. This discussion gives a good overview of the current state of the child friendliness per neighbourhood.

Story playground in Holon (IL). Source: Hebrew University of Jerusalem.

Shmuel Hanavie

Streets

The neighbourhood is framed between two main arteries and two distributor roads. Within the examined area there are three access streets with smaller, dead end, streets leading from them. Inside the neighbourhood, traffic volume was reported at low (counts at afternoon and evening in two different points showed ten and three cars, respectively, in the span of 15 minutes, and a far higher number of pedestrians). Although many cyclists were observed, there are no bicycle paths (which is more the rule than the oddity in mountainous Jerusalem). The high ratio of pedestrian paths – 33% of the entire network – may compensate for this.

However, the neighbourhood layout may play a more significant role in the space allotted to non-motorized traffic. The long building blocks are arranged around large inner courtyards thus creating sheltered large spaces that are connected by pedestrian paths and where most open and green spaces are located. These inner courtyards take up significant share of the neighbourhood's area. They enable children to move easily between their houses to a shared and safe public space.

The streets have wide and well-maintained sidewalks, enabling smooth passage with a stroller. The sidewalks are shadowed, and there are benches along them. This, in addition to the prevalence of pedestrian paths, would seem to create a safe environment for children to move about. In addition, some measures for traffic mitigation (speed bumps and signs) are used in the streets.

However, both on site observations and the data from the interviews proved this not to be the case. While space is allocat-

ed for pedestrians, unclear separation between parking, driving and walking space results in cars parked on pedestrian paths and sidewalks, and in unsafe passage to playgrounds through parking lots.

Consequently, informants reported the streets as unsafe, for example: "..two-way fast traffic, the children are not seen and there aren't speed bumps" or "everybody does whatever he wants, cars entering where it's forbidden, there was a barrier but it was taken". The attitude of the car drivers do not attest to awareness on the child rich density of the neighbourhood.

Example of accessibility challenges within the neighbourhood. Source: Hebrew University of Jerusalem.

Example of types of available public spaces in the neighbourhood. Source: Hebrew University of Jerusalem.

Playscapes and greenscapes

About 10%, or 11,300 square meters, of the neighbourhood is designated as public open space. Most of this space serves as playgrounds – in total, there are seven in Shmuel Hanavie. This makes child density in public open spaces to be about 193 for 1,000 square meters. The number of children per playground is at 314, and the number of young children 143. Combined with the fact that families in the neighbourhood are large (averaging 5.9 people per household, while the families interviewed for this research averaged seven children per household) and apartments are small, playgrounds are intensively used throughout the neighbourhood.

Most playgrounds are clearly separated from traffic, accessible and well maintained though only partly shadowed (a major concern for Jerusalem's warmer climate). Playgrounds are well dispersed across the neighbourhood, with no apartment located more than 100 m away from at least one playground. The problem that was noted in this neighbourhood was not so much the quality and location of playgrounds, as their short supply relative to the size of young children population.

As partial compensation, the buildings layout provides an abundance of green spaces (they were estimated at about 60) that effectively serve as play spaces. However, these – being semi-public and not in the jurisdiction of the municipality – are not well maintained. There is no playground equipment, and little gardening activities. The major advantage reported both by observation and in interviews is the high visibility of these semi-public spaces from the children homes.

Not surprisingly, all respondents reported that their children play outside the house on a daily basis, occasionally more than once a day. Most reported that their children play in a nearby playground, though some mentioned that the children play in the courtyard near their house, in various playgrounds in the neighbourhoods, or meet other children in the street.

Discussion

Parents responses showed some variety in the plays spaces used by their children, hinting at a more significant use – and better acceptance – of public spaces by children. This may be explained both by the neighbourhood layout which creates a network protected semi-public spaces that can be utilized by children, by the severe pressure on use of playgrounds (due to the high number and density of children in this neighbourhood) and possibly by the network of pedestrian paths that enables children to navigate the neighbourhood in relative safety.

However, another contributing factor is probably culture related. This is hinted by the fact that parents perceived the streets to be unsafe, and yet allowed their children to play outside. Haredi society typically treats children as responsible agents at a younger age, and it is not uncommon to see children at elementary school age entrusted with the care of their younger, pre-school, siblings. Furthermore, the large family size coupled with the small apartment size may suggest that parents have little alternative but to allow their children to play out of doors.

More in-depth research needs to take place to verify these initial findings. It will be interesting to compare the response of a population with different cultural background to similar physical layout, in order to isolate its influence on children use of public spaces.

Example of a playscape. Source: Hebrew University of Jerusalem.

Talpiot Estates

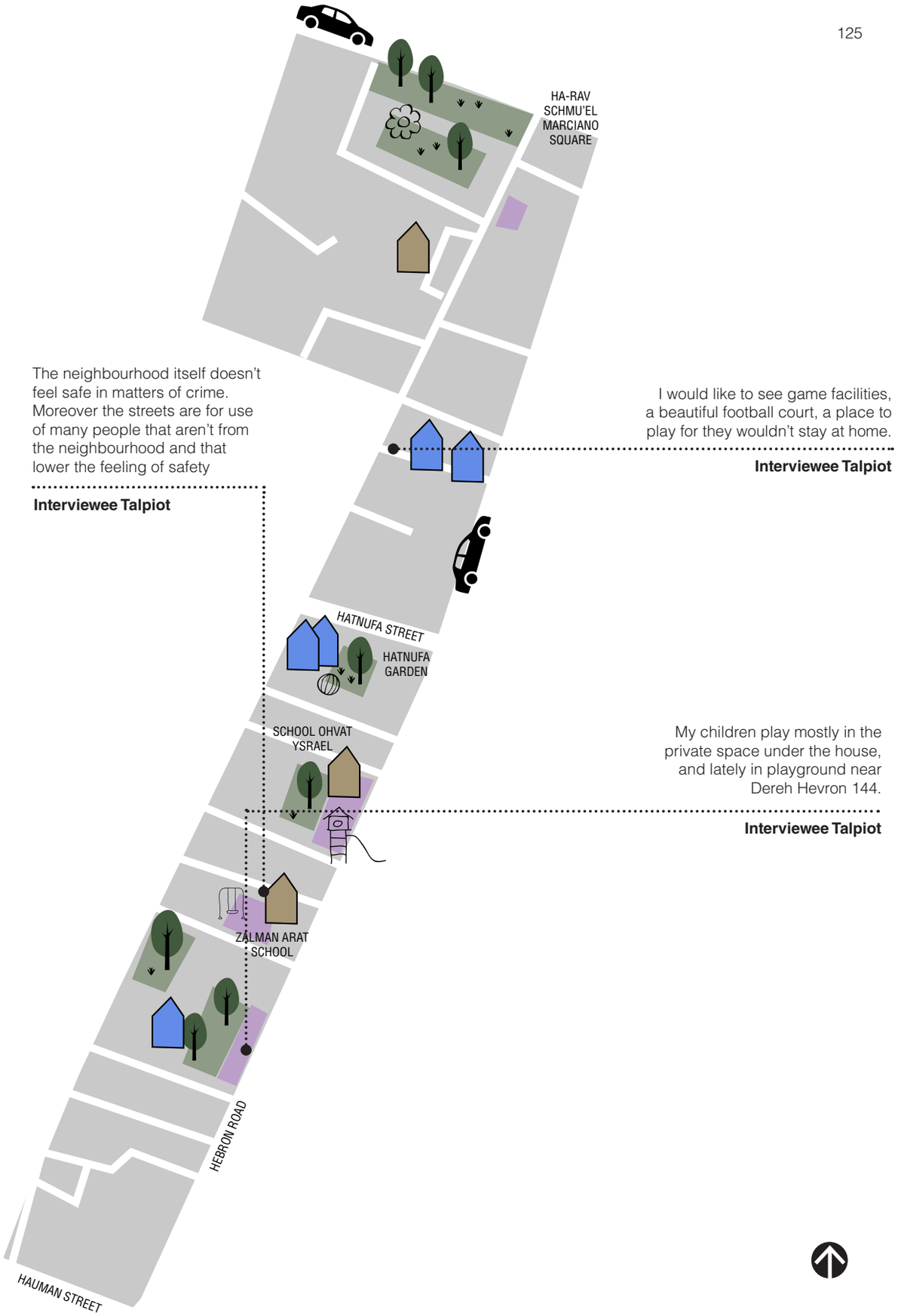
Streets

Talpiot Estates lies in a narrow stretch between two main and busy roads. This creates a restrictive boundary on the available space that can be safely navigated by younger (and even older) children. The safety problem is increased within the neighbourhood by the lack of traffic mitigation measures (a grand total of 3 speed bumps and one sign alerting drivers to the presence of children). While the two bordering main roads have clear separation of pedestrian and motorized traffic (raised sidewalks and separating fences) access roads suffer from lack of separation (and protection) between parking spaces and sidewalks.

Another problem related to safe navigation of the public space is the relatively low share of pedestrian passages. There are virtually no car free streets, only narrow passages between buildings, and these, too, do not form a comprehensive pedestrian network. Added to this is the prevalent problem of unorderly parking on sidewalks. These problems were reflected in the informants replies, which included routes such as “you walk along the street… and through the parking lot and the paths around it” was pointed out by one resident.

The steep topography on which Talpiot has grown also results in limited accessibility. Many of the pedestrian passages, as well as entries to buildings, are stairwells – which are difficult to navigate with strollers. An added factor is low maintenance of sidewalks and stairwells. Interviews also indicated that the residents do not value the experience of walking in the neighbourhood, compounded by the feeling that its streets are unsafe.

Steep topography of the neighbourhood.
Source: Hebrew University of Jerusalem.



Playscapes and greenscapes

Like most Israeli neighbourhoods, the housing stock in Talpiot estates contain only apartment buildings, therefore all available open play areas for children are either public (playgrounds) or semi-public (shared courtyards of apartment blocks).

There are four playgrounds in the neighbourhood, ranging in their maintenance quality. Another open play scape is the school yard (small paved football field) which is available for play outside of school hours.

It was noted that multiple semi-public spaces exist, between the buildings, in the neighbourhood. These are badly maintained and are considered unsafe as play spaces.

However, these semi-public spaces form a thick network of small, highly visible, potential play spaces.

As a result, there is a good distribution of public playgrounds and semi-public play spaces across Talpiot Estates. However, low maintenance of the grounds results in unsafe and unattractive play areas. While residents expressed discontent over the state of playgrounds, their responses indicated that children played outside regularly (most at least once a day).

Hard surfaces across the neighbourhood and quality of public space diminished by parked cars. Source: Hebrew University of Jerusalem.

Example of a small play space. Source: Hebrew University of Jerusalem.

Discussion

A clear drawback of Talpiot estates for children and their parents is traffic. The location of this neighbourhood, between two main and busy roads that also function as connecting paths for the neighbourhood, may adversely influence safety of children moving through it. As is apparent from parent's responses, this problem is aggravated by unchecked parking obstructing sidewalks and pedestrian paths.

The fact that children do play outside, is partly explained by the use made of unofficial play spaces – semi public spaces around, between and near apartment blocks. Observations revealed that the neighbourhood has many visible small spaces that are relatively safe for children to play in. Developing them as play spaces may enhance the child friendliness of Talpiot Estates.

Different playgrounds in the neighbourhood. Source: Hebrew University of Jerusalem.

Example of small play spaces. Source: Hebrew University of Jerusalem.

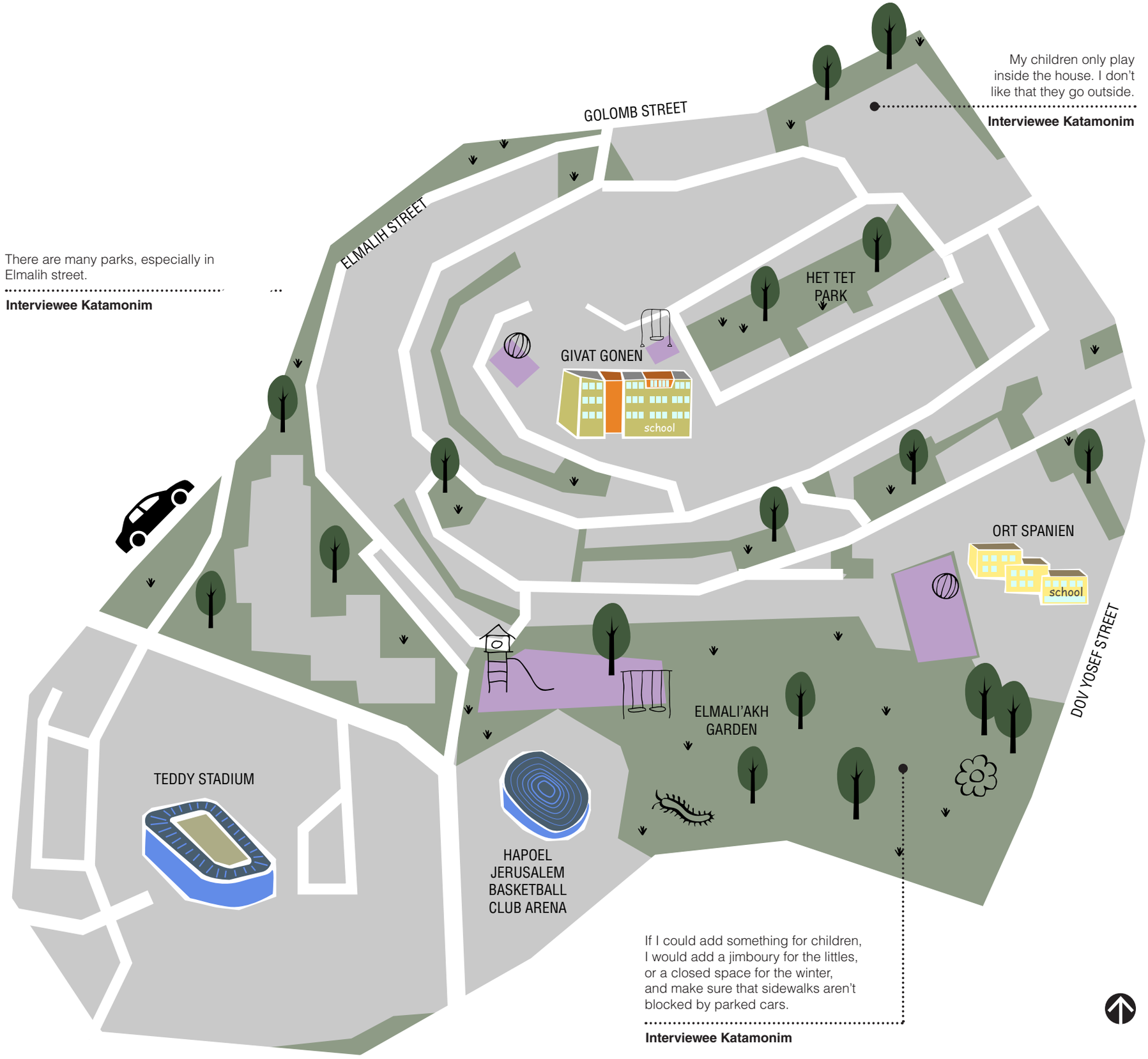
Example of public infrastructure. Source: Hebrew University of Jerusalem.

Katamonim 8/9

Streets

Katamonim is framed by a main road, which cuts it off the natural area Dayr Kirmizan (Deer Valley) at its north, and two main streets from its west and east. It is directly linked to a large sports and green area at the south. Within the neighbourhood the main, semi circular Sint-Martin street runs north to east with five smaller streets running east-west throughout the residential area. There are two concentrations of community and educational institutes – at the center of the neighbourhood, and at its south, near the sports grounds. The majority of roads in the neighbourhood are one way streets, which increase traffic safety.

In addition to the streets, there are many pathways between buildings which serve as pedestrian walkways. Due to the neighbourhood topography, most of these pathways are stairways – in about half of them there are adjacent ramps allowing the passage of strollers. Many are narrow, and the abundance of obstacles, such as trees, prevents smooth passage with a stroller along them.



Traffic within the neighbourhood is moderate. Countings at St. Martin street (main street) showed volumes of 37, 44, and 25 motorized vehicles in a span of 15 minutes during morning, afternoon and evening respectively. At all times, there was a lively pedestrian traffic along the streets.

There are some safety measures for children present in the neighbourhood. For example, the entrance to the neighbourhood has traffic lights, and there are speed bumpers spread around the streets. There are however no speed restricting signs near schools and kindergartens, but there are signs alerting drivers to the presence of children.

All streets have sidewalks, which properly separate pedestrian from motorized traffic. However, cars parking on walkways create a safety hazard in most streets of the neighbourhood. Movement from walkways to roads is made difficult due to the blocking cars, which also limit visibility of children crossing roads.

Sidewalks are wide, well maintained with sufficient street lights and some street furniture. Shadow was noted as a problem – there are not many mature trees, and the buildings are to low to provide much shadow. However, the main problem noted was parked cars and various obstacles obstructing passage. Garbage containers, infrastructure and badly situated street lights and trees create difficulties in walking through some of the streets with young children.

Examples of obstacles blocking easy movement on the sidewalks. Source: Hebrew University of Jerusalem.

Collage of the housing stock in Katamonim 8/9. Source: Hebrew University of Jerusalem.

Playscapes and greenscapes

The neighbourhood has seven designated playgrounds, bringing the number of children per designated playground to a low 106. In addition, 11 undesignated playgrounds were counted, including schoolyards that are open in the afternoon. Observation showed the playgrounds to be suitable also for older children, containing sport facilities and attractions such as tennis tables.

There is good dispersion of the open spaces along the neighbourhood, with no house located more than 200 meters from at least one open space. A large playground is located at the center, adjacent to the elementary school and to the young scout's center.

In addition to the playgrounds, residents in this neighbourhood have access to many green areas – the vast natural grounds at the north of the neighbourhood, and the sport fields (swimming pool, tennis fields, etc.) at its south. The housing estates are enveloped by green areas that could serve as play areas for children.

It was therefore surprising to find that residents do not make use of the abundant supply of playgrounds and sport fields at their disposal. Many informants claimed that their children do not play much outside, some saying they do not allow their children to play outside at all. Worries about personal safety issues – mostly caused by drug related crimes – were mentioned as the main reason for keeping children at home. Poor maintenance of the public open spaces was mentioned as another reason to avoid using them.

Discussion

When juxtaposed to the other three neighbourhood Katamonim seems to offer the best cirumstances for children – relatively relaxed traffic, neighbourhood layout that centers around child facilities and playgrounds, and an abundance of play- and green spaces well distributed across the neighbourhood. However, of all neighbourhoods examined, residents of Katamonim showed the lowest inclination to send their children out of doors. More than half of the children were driven to school, and many of them did not play out side of their homes.

The reasons given by parents to this apparent paradox mentioned a lack of sense of social safety (abundance of drug related crimes). This may prevent children from playing as effectively as lack of playspaces. Another factor is the limited accessibility, observed by the students. While traffic is not busy, the low maintenance of sidewalk, many obstacles limiting walking, and difficult topography may also play a part in the perception of public spaces as unaccessible and therefore "problematic".

Example of public green spaces in the neighbourhood. Source: Hebrew University of Jerusalem.

Another example of public green spaces in the neighbourhood. Source: Hebrew University of Jerusalem.

Beit Hanina

Streets

The area analysed within this study are framed between three commercial and busy streets, and contains a grid made up of one semi-commercial street running north to south (Taha Hussein), and crossing and parallel distributer roads. A third type of road common in the neighbourhood are narrow cul-de-sac's going out of the distributor roads and serving a few houses. These are the result of unplanned housing development on private lands, where arrangements are made ad-hoc between land owners to create access to houses with minimal use of land for streets. Traffic is busy on the main streets (counts of 107 and 210 vehicles per 15 minutes in morning and afternoon). Traffic is also mixed in the distributor roads, and observations revealed not only motorized traffic, but also plenty of pedestrians using the streets.

While the main streets have some traffic calming measures (mostly street bumps) a recurring problem is lack of separation between motorized and non-motorized traffic in most streets (lack of sidewalks). Added to the high traffic volume, and to two-way traffic going through narrow streets, this creates a significant safety hazard in the neighbourhood, which was also expressed in the responses of the informants. The students noted that only in the two main streets, and in some parts of A-Zaituna street. there were there stretches of sidewalks. a As a result, most indictors pertaining to ease of navigation and access in streets in this research were irrelevant in Beit Hanina. The separation of private and public space in this neighbourhood is sharp, with houses often fenced up to the road line, and there are no "buffering" areas such as sidewalks, semi-public open spaces, or front garden that provide a transition between the two. Never the less, streets do serve as an active public space, also for children.

Example of a street in the neighbourhood. Source: University of Jerusalem students.

Playscapes and greenscapes

The area examined contains one playground that serves the entire neighbourhood (30-40,000 residents), bringing the ration of young children using this playground to an unrealistic 5,500. Again, while the indicators given to our students showed that this playground is well designed and well maintained, the fact that most children will naturally not be playing there, rendered them irrelevant for this research.

When looking at children in Beit Hanina it seems more beneficial, than, to observe the alternatives to playgrounds where most children will be playing. The interviews indicated that children play in private gardens, on the street or in open spaces in the neighbourhood. The fact that about 50% of the families live in single family house may mitigate the need for open play spaces. It should be noted, though that unlike other neighbourhoods, residents of Beit Hanina sometimes indicated that their children play outside unregularly (only once a week) or that they do not play outside at all.

School yards can be used by children in the afternoon hours, and some have sport (mostly basketball) fields that can appeal for older children. However, it seems that for safety reasons schoolyards in this neighbourhood are fenced off the streets and are inaccessible for children.

The majority of open spaces in the area are privately owned undeveloped lots, that are sometimes planted, but more often serve as unofficial garbage collection sites. All in all, fifteen were counted. It is not clear to what extent these can serve as play spaces – they are not designed for play, and may be hazardous. In addition, private ownership may deter children that do not belong to the owner's family from playing in their lot.

Open underdeveloped spaces in the neighbourhood. Source: University of Jerusalem students.

Discussion

The problems pertaining to public space in Beit Hanina can be traced down to two main causes: unplanned and unregulated development, and governance problems, namely a problematic relationship between the residents and the municipality. The first cause, lack of planning, results in inadequate supply of land for streets, public open spaces and public amenities. The second results in poor maintenance (garbage is not collected) and lack of infrastructure (sewerage is overflowing in the streets during winter) which diminish the quality of public spaces and aggravate their rarity.

It was not surprising to find that parents expressed discomfort about walking in the streets with their children, and that their interests concentrated on supply of public goods (services and playgrounds) rather than on the quality of the supply. What may be surprising is that even in these circumstances about half of the parents reported that their children play outside more than once a week.

The line dividing Beit Hanina from the other neighbourhoods explored in Jerusalem is not merely an administrative or a political line, but in many senses the line dividing the living environments in first and third world countries. While the residents in Beit Hanina may be better off than those residing in some of the other neighbourhoods, the lack of public services and public goods they experience is typical of developing countries. It is interesting therefore to examine to what extent were the indicators used in this research able to provide us with insights into the appropriateness of the built environment for young children.

Example of play spaces in the neighbourhood. Source: University of Jerusalem students.

The housing stock of Beit Hanina is made of a mixture of single family houses and multifamily housing estates, forming each about 50% of the entire stock. In the past decade, new high-rise buildings have started appearing. Source: University of Jerusalem students.

Examples of streets of Beit Hanina. Source: University of Jerusalem students.

Learnings from the four neighbourhoods

In Jerusalem, out of the four neighbourhoods Katamonim had the largest number of playgrounds as well as proximity to enveloping green spaces. However, its residents indicated the lowest tendency of children to play outside (more than half said their children played outside less than once a week). This was a smaller share than the residents of Beit Hanina, who virtually have no playgrounds at their disposal (one playground serves more than 100,000 residents in East Jerusalem).

At the other extreme, the most informants from Talpiot, which has a quantity and distribution of playgrounds and green spaces said their children played outside regularly – those that avoided sending their children outside mentioned maintenance issues as a reason – but the “winner” was clearly Shmuel Hanavie neighbourhoods, where all parents asked said their children played out of doors daily, and many said they played more than once a day, suggesting that outside play spaces was the “normal” play site, not an interval in indoors play. This finding is more notable when looking not at the number of playgrounds, but at the average number of children per playground: 314 at Shmuel Hanavie, compared to 106 children per playground in Katamonim 8/9. Viewed this way, it is clear that there is a weak correspondence between “playground supply” and “play demand”.

Three factors came up as explanation for this phenomenon: the effect of social safety perception, living conditions at home and possibly the neighbourhood layout. Some parents in Katamonim 8/9 (and to some degree also in Beit Hanina) expressed concern over safety issues (mostly drugs related), hinting that their perception of the environment is not safe. It is interesting to note that parents from this neighbourhood also indicated the highest ratio of driving their children to school. This indicates a reluctance to sending children outside, which playground supply may not be able to mitigate.

Living conditions at home is another issue. With an average apartment size of 77.5 square meters and an average family size of 3.8-6.9 (depending on estimates of the total residents), children in Shmuel Hanavie may have little option than to play out of doors, as long as the living environment is not hostile. If the neighbourhood layout provides alternatives to playgrounds (as may be the cast in Shmuel Hanavie) this will induce children (and their parents) to see out of doors play as the preferred option.

7. Key learnings and recommendations

7.1 Observations & learnings

When juxtaposing findings from the four neighbourhoods in Eindhoven, and the neighbourhoods from Jerusalem, a few interesting patterns can be identified. There was no direct correlation between supply of playgrounds and play spaces in the living environment, and the tendency of children to play out of doors. It leads to questioning the hypothesis that a good supply and distribution of play spaces would ensure children playing, and that a poor supply would mean that children will not tend to do so. Similarly, issues related to the need for play spaces that are suitable for a wide variety of ages was a repeated concern. While in Eindhoven, discussions during the workshop and qualitative data point towards the need for gender-based differences and diversification within playspaces. In Jerusalem the focus was on the creation of more activity centres, particularly indoor activities. In both the cases, emphasis on better maintenance of spaces aimed at children was a repeated concern.

In the Netherlands planning mechanisms are better regulated and enforced, in Jerusalem the complexity of the urban environment manifested itself in very visible ways within public spaces, especially in East Jerusalem. Where the quality and safety of public spaces is diminished by parked cars and is also indicative of absence of regulatory mechanisms. However, in all the neighbourhoods researched traffic safety is a primary concern, speeding cars, parked cars, absence of visual ques to slow down to name a few. Apart from these observations on traffic, the need for safe routes for children to access facilities within the neighbourhood by addressing better pedestrian paths, more localised facilities to avoid the need to drive, playful crossings are some examples.

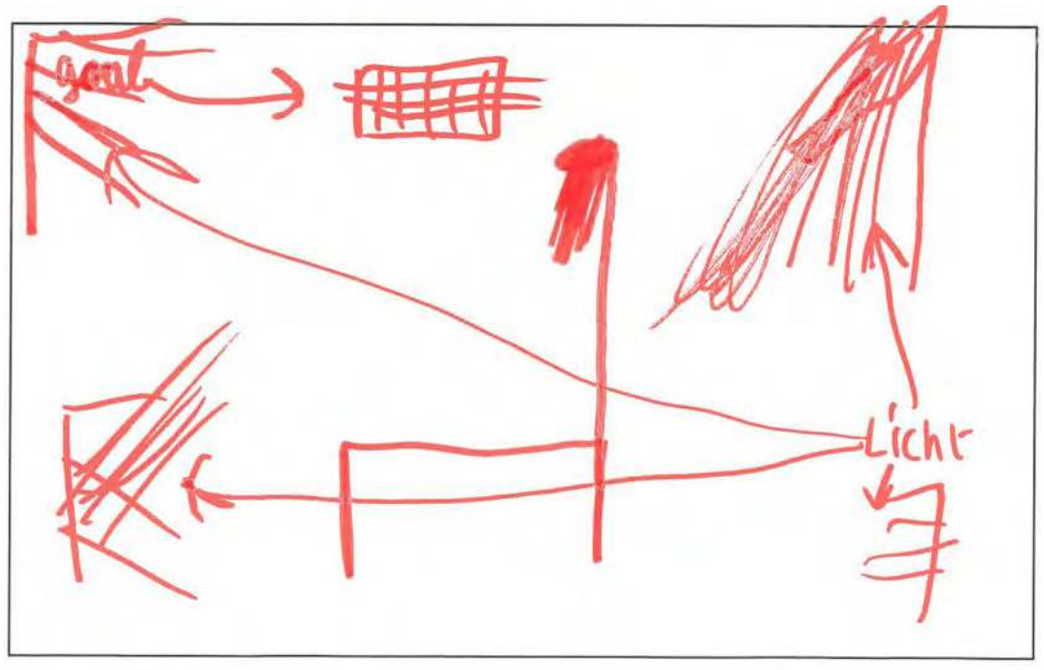
Social environments are also key to creating vibrant and safe environments. Within this study, perception of various neighbourhoods, social safety, ‘stranger danger’, deters play outside, can be addressed through design interventions and community creation mechanisms.

It should be noted here that developing more in-depth methodologies (e.g. ethnographic methods, participatory workshops) can cast light on how space is used by children. Between both the cities, we were able to carry out workshops with children and parents only in Eindhoven in one of the neighbourhoods. This resulted in a rich qualitative layer of information that highlighted concerns, challenges, and existing assets within the neighbourhood. Though this process could not be replicated in Jerusalem given constraints of time and data availability, clearly more in-depth research needs to address this point.

As concerns over the amount of time children play actively outside their homes grows, it is worthwhile to look further into the correlation between playgrounds supply and distribution and the tendency of children to play outside. The recurrent pattern showing that the correlation is weak, may suggest

Example of an informal playspace in Woensel-West (Eindhoven)

that careful consideration should be given to the efforts made in increasing outside play. An increased supply of playgrounds and facilities in an otherwise unsafe environment may not do much, and conversely, child-friendly housing layout creating safe informal play spaces may compensate for inadequate supply.



One of the improvements for the soccerfield proposed during the workshop with children in Bergen

	Eindhoven (NL)	Jerusalem (IL)
Playscapes / Greenscapes	• Gender based differences for playspaces • Challenges to map and identify geography of undesignated play areas. • More playgrounds should be centralized within the neighbourhood • Playgrounds should be designed for multi-age groups and flexible use • Activities for parents • Child friendly routes can increase the number of undesignated play on the street and at the same time provide accessibility to facilities for children within the neighbourhood • Increasing street and neighbourhood green • Softer landscapes in school yards	• Frequency of out of doors play not directly related to supply of playgrounds • Perception of social safety linked to frequency of play. • Challenges to identify geography of undesignated play areas. • Enclosed spaces away from motorized traffic increase probability of play. • Playgrounds suitable for varied age groups a repeated concern
Street networks	• Addressing traffic safety also improves the walkability of the neighbourhood and thereby child-friendliness • Not only traffic contributes to unsafe feelings of the neighbourhood, ‘stranger danger’ also holds back children from certain areas • More local facilities for children within neighbourhood will reduce dependency on car traffic • Creating child-friendly playful crossings • Visual ques for traffic safety • Exploring opportunities for shared space	• Safe routes primary concern of parents • Space taken by parking forms a major hazard, and needs addressing by better planning and enforcement. • Pedestrian routes are not always free of obstacles, which complicates the accessiblity of strollers for example • Pedestrian routes network can increase the amount of out of doors play. • Evaluation of streets as safe dependent on social safety.

Recommendations on greenscapes, playscapes and street networks

7.2 Recommendations

The results of this research from four neighbourhoods in Eindhoven and Jerusalem on child friendly spaces both confirm patterns of consumption and use as reported in literature, but also add new insights for urban planning and design. It is useful here to distinguish between the following, role of urban planning and design can play in highlighting the importance of children's geographies, the levels of possible interventions, bottom up and top-down, and accommodating for changing demographics in cities. The role that urban planning and design can play in highlighting the validity and agency of children's geography in planning processes is vital within the changing profile of cities. This can be seen through the issues raised on repeated concerns regarding safety, awareness, maintenance, and more family friendly spaces, which can be addressed at various scales and levels of interventions as seen below through selected examples.

Intervention themes
- Streets network
- Greenscapes
- Playscapes

Level of recommendation	Concern addressed through possible interventions	
Micro: The smallest level of intervention possible		**Theme**
Playful street furniture	Streets are potential places for children to learn and play. Research identifies that adding urban furniture around the neighbourhood could facilitate observing children at play. Adding a bench between the street and home can have two functions, a buffer between private and public spaces, and increase opportunities to connect with neighbours and others children.	
Sidewalk games	Outside play is not restricted to designated play spaces only but should extend to public space at large. Playing games on the sidewalk encourages more types of social play, introduces a larger variety of play themes, and increases social interaction. Sidewalks also provide access to all children to use it as a play space.	
Street green	Literature shows that the design and management of urban green does not always reflect the needs and preferences of children. Underlining this, neighbourhood resident's plea for small scale greening. The importance of turning hard grey urban spaces to softer, natural aesthetics is vital and can have additional benefits for example to help with direct rainwater drainage, improve aesthetic quality of the neighbourhood, etc.	
Social media community	Various online platforms are available to create virtual and analogous communities - they vary from messaging services like WhatsApp to platforms that facilitate a shared neighbourhood economy like Peerby. Closeby, nanny's living around the area can be found easily, and neighbourhood barbecues can be organized by getting everyone together through WhatsApp or borrowing/ lending a barbecue through Peerby.	
Climbable objects	Any object can become an element to scramble up on: a piece of art in the park, some steel objects on the sidewalk, a tree. For children, climbing on objects is more than just fun. Scaling an object teaches them vital lessons, such as dexterity, risk assessment, focus and planning. They have to decide how high they're comfortable to climb and find the best way to get there.	
Alternating pavements	Traffic safety and awareness levels can be addressed in many ways, one of the easier DIY solutions is creating awareness through design interventions. Informal demarcations are a subtle but clear way to mark different zones of ownership or use of space through alternating tile patterns, using colours within pavements etc.	

Temporary street closure	Streets safety is a repeated concern for families in urban areas. A temporary solution is the closure of a street for a day (once a month for example, see Play Out) to create a play-street. Due to its temporary nature residents can be stimulated to create a festive day to set an example for alternate uses for the streets.	
Natural play areas	Children's access to local green spaces supports healthy development, physically active free play and awareness for the environment. Natural play areas can be suitable for different age groups and offer various types of play-spaces for younger children or meeting spaces for older children. Creating softer alternatives to grey urban landscapes.	
Shared space	A recurring observation in the research is the number of cars on the street and the attitude of the drivers. When streets are not considered safe to play in, less play happens on streets. One way to increase safety levels and at the same time improve the walkability streets is through the introduction of shared space. A multifunctional traffic concept where the quality of public space has the central role and the responsibility of safety is shared.	
Narrowing: visual and physical	The attitude of drivers is an important determinant when trying to improve traffic safety. Physically and visually narrowing the street can help to reduce the speed of drivers.	
Lighting	Adding better street and floor lighting is a solution that can have immediate effect. Through the use of adaptive and LED lighting, neighbourhoods can create special atmospheres, and increase safety. One could also think of creating an illuminated path (with various colours) along the child route, resulting in a pleasant route by day and night.	

Maintenance and awareness	Concerns related to dirty and depreciated play equipment, pet faeces in play spaces, old sidewalks and general neglect of play equipment and play spaces can be deterrents to play. Clean streets, attractive open and green spaces, well maintained signs, buildings, and roads all contribute to high spatial qualities of a neighbourhood while encouraging play.	
Flexible schoolyard	Schoolyards are locations that are only used at certain times of the day and mostly only during weekdays. School yards have a potential to become much more than just a playground during school hours. For example, they can be opened up for brining and dropping children at school, play spaces in the weekend, neighbourhood event spaces etc.	
Living school grounds	Living school grounds are richly layered outdoor environments that aim to strengthen local ecological systems. They are also learning resources for children that foster exploration and adventure and provide a wide range of play opportunities.	
Use of semi-private spaces	Semi-private spaces are transition spaces between private and public spaces. These can include, internal courtyards, lobbies, etc. The use of these spaces in dense urban environments can be intensified by increasing possibilities for recreation and meeting.	
Playful street crossings	Cities today are actively aiming to improve their neighbourhoods through a multitude of interventions. By creating interesting street crossings, neighbourhoods can increase their aesthetic appeal, benefit pedestrians and raise awareness. Streets crossings can be community projects, art installations by famous artists, or children's school projects. The scale and scope depend on its residents.	

Junk yard playground	Originating in the mid-twentieth century in Denmark, junk playgrounds have gained global popularity. Encouraging undirected play and aimed at developing the 4C's, communication, collaboration, critical thinking, and creativity, these spaces are powerful learning environment. Identifying an optimal location and creating a junk playground with minimum investment: junk, tools, physical space, and trained "playworkers" will act as lifeguards. Old doors, lawn chairs, old exercise equipment, boats, wooden planks, sewage pipes, anything unused can become a part of undirected play.	
Street Art	Street art can change a person's perspective of their surrounding environment. Visually streets can merge creativity and culture, express community concerns, wishes, wants, and captures people's imagination. By claiming ownership through the identifcation a piece of property (school walls, playgrounds), the world of urban art can be explored. This can be done by involving children of all ages through class projects, after-class activities etc. These art installations can also be changed periodically. Examples include, street murals, graffiti festivals.	
Community garden	Community gardens are lands that are gardened collectively by a group of people. Generally developed in unused land and space, community gardens aim to raise awareness of food production, health and wellness while also performing educational functions for children and adults. These gardening activities can help to increase social bonds among residents within the neighbourhood.	

Meso: An intermediate level of interventions at the district or neighbourhood level		**Theme**
Multiple use of spaces	Like flexible schoolyards, a variety of spaces can be used and designed for accommodating a variety of functions. For example, parking lots can be used as open play areas during the day and for car parking during the evening, streets designed with play in mind, etc.	
Neighbourhood child route	Cities are now responding to the growing trend of attracting families within their boundaries by actively looking at family friendly developments. Though there is a long way to go to create family friendly cities, incremental shifts can create more awareness. Neighbourhood child routes can be created with the residents of a neighbourhood to connect community and child identified important spaces. By connecting them visually, the route can become a play-route to various destinations or a destination in itself with a number of play elements. This can increase independent mobility for older children, road safety, visual awareness and community building, by putting children at the centre of the expercise.	
Designing for flexible use	Designing playscapes for various abilities rather than age, can include elements for both younger and older children, without being prescriptive on age or who uses what. By being flexible on the design of various elements, settings, context, available facilities, playscapes can cater to multiple ages (young children to young adults).	

Cycle path network	Providing space for cycling creates efficient and attractive places to live, and many cities around the world are capitalizing on the resurgence of the cycle. Offering attractive streetscapes, alternate mobility options, economics of land, inclusiveness, healthy lifestyles, the benefits of cycling are many. Some important factors include, making space for cyclists, identifying user needs and experiences, taming traffic, visibility, becoming a part of the urban street network, separating traffic, technical requirements of the path, signage, and maintenance.	
Pedestrian network	Traffic safety and the relation between children and automobiles is a reoccurring topic of concern. An often-mentioned improvement in this research is to make streets car-free. One way to do this is complete separation of the two by creating zones only designated for slow and specific times for fast traffic. The pedestrian street is an example of such a design intervention.	
Public transportation routes	Development of an adequate and accessible public transportation system is essential for achieving regional sustainability. Family friendly infrastructure needs to include access to amenities within and outside the neighbourhood, and public transportation can play a key role.	

Macro: **The highest and the most complex level of intervention at the city level**		**Theme**
Encouraging child participation	Children are often overlooked when it comes to decision making. Adults decide for children what needs to be done or how it should look like. The rich local knowledge of children and families often remains an untapped source of information.	
Family friendly city strategy	A family friendly strategy starts with various public and private stakeholders; governments, developers, NGO's, residents. Projects from Bristol (UK), Vancouver (CA), Rotterdam (NL) can be successful examples to learn about developing and adopting 'child friendliness' as a valuable urban planning tool to design a liveable, sustainable city.	

Notes

- Different levels of scale: Macro refers to interventions of the city level, meso to interventions of the district or neighbourhood level and micro to the scale of the sidewalk and street.
- Provides interventions in different domains: on spatial, social and government.
- Complexity refers to the amount of government intervention needed. Some elements can be done by residents themselves, some will need help of government officials. Where possible a combination of do-it-yourself and government intervention is considered optimum to achieve desirable outcomes.
- Various themes are used. Entries can be used for multiple themes.

8. Design proposals examples TU/e

Design intervention expo: Designing public space for families with children

As part of a master course on Public Domain from the Eindhoven University of Technology (TU/e), 65 students took part in data collection, analysis, and redesign of public spaces for families with children within the city of Eindhoven. Focusing on the aspects of play, green, and streets, nine groups of 6-8 students attempted to raise awareness through various design interventions.

The course concluded with a design expo, where the groups were invited to present their results to external experts. Each group was given one table and space for three A1 posters, with the one caveat that they be engaging and convince the jury of their idea.

Invited experts

Ardan Kockelkoren (BvL Foundation)
Marloes Groot (Buurtcoördinator Lakerlopen)
Gied Alferink (Buurtcoördinator De Bergen)
Pieter van Wesemael (UUA, TU/e)

Co-ordinated by

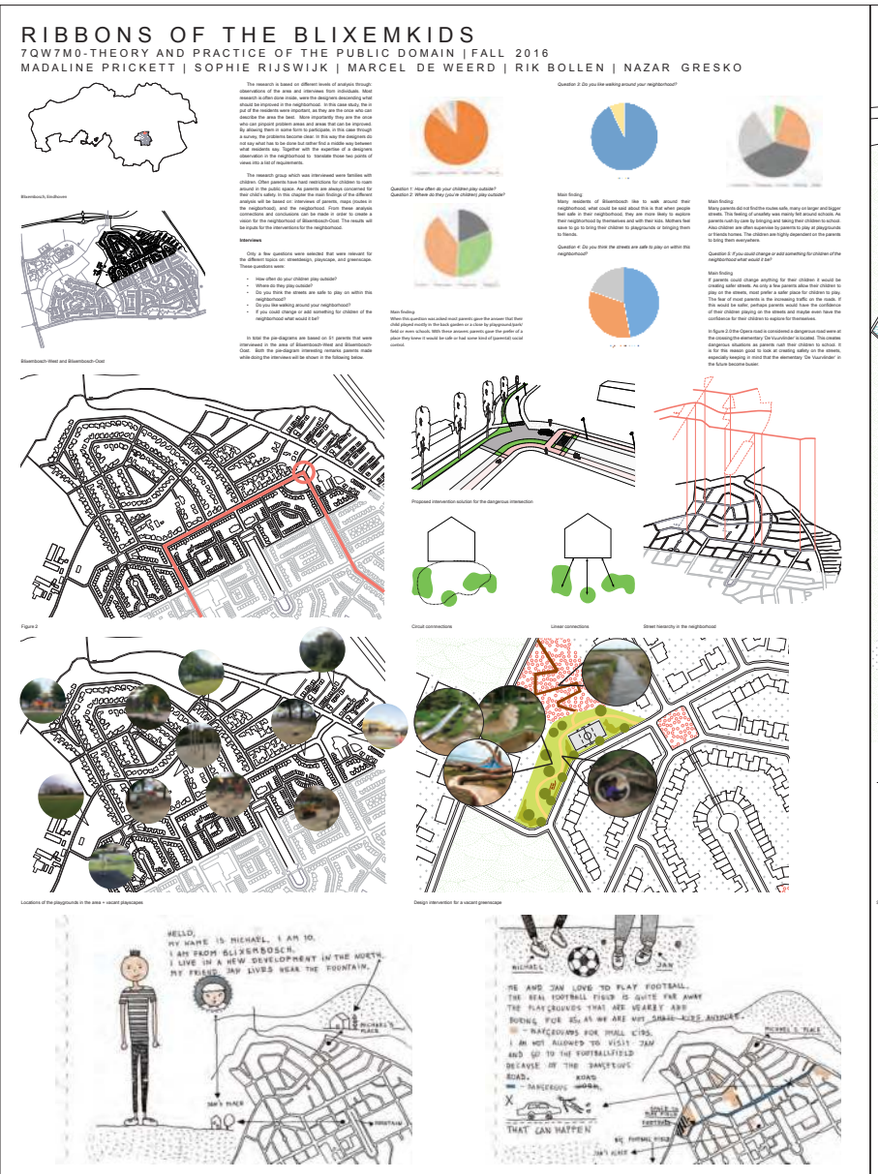
Sukanya Krishnamurthy (UUA, TU/e)
Daniek Reijnders (UUA, TU/e)
Chris Steenhuis (UUA, TU/e)

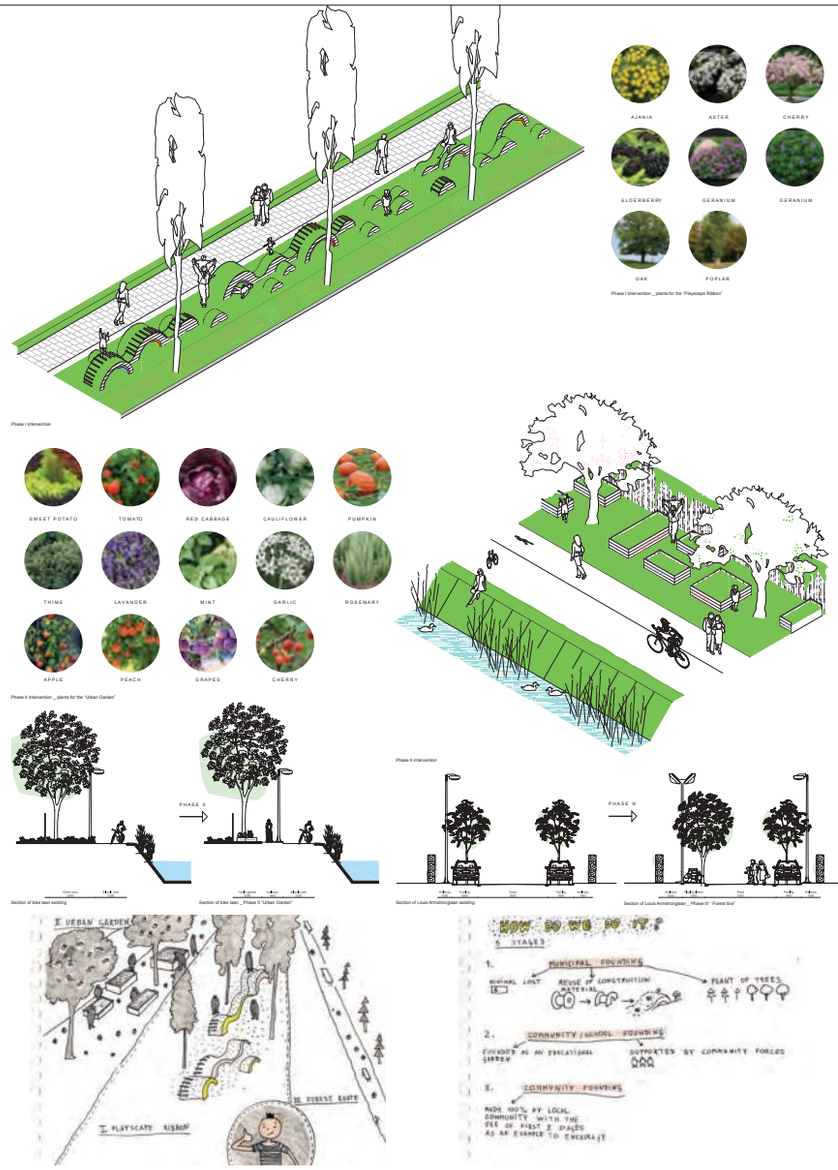
One of the presentations during the expo.
Source: Authors

Urban Green Spaces

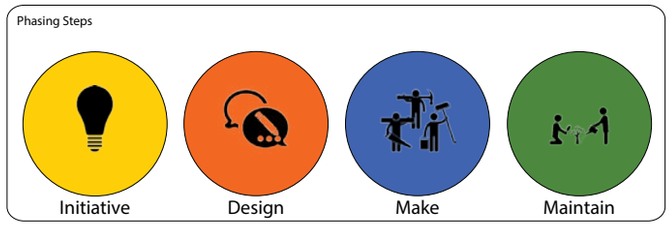
Proposal by:
Rik Bollen
Nazar Gesko
Madeline Prickett
Sophie Rijswijk
Marcel de Weerd
Yuan Zheng

The vision this intervention proposed for the area of Blixembosch was to have a closer look at the locations where children play, and try to link them through a ribbon of various activities. By creating better linkages between playscapes and greenscapes in the neighbouhood, children and parents are offered alternate play opportunities. The concept is based on three strong horizontal access across the research area. By revitalizing vacant and existing spaces, adding new green and play areas, discovery and exploration are encouraged. Each ribbon is conceptualised as having its own identity thereby creating a stronger sense of place orientation for the children.





Proposal by:
M. van Kaam
S. Kromwijk
E. M. A. van der Logt
H. M. Luijk
B. Nuijten
A. Straver



Co-creative placemaking

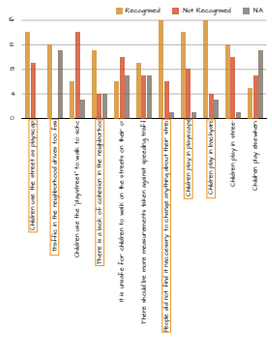
One of the challenges in Woensel West is how the diversity of the neighbourhood (spatial, demographic, and social) can be showcased and built on. The aim of the project is to upgrade a playground in Woensel West and to co-design the space with a diverse group of children. and parents. By offering the neighbourhood a versatile play environment that is safe and open to different ages groups and ethnicity, social cohesion was central. By building into the design process, the involvement of residents and various participatory processes, the project can be considered communal from its very onset, identification of requirements to teh design of the space.

COLORING OUTSIDE THE LINES

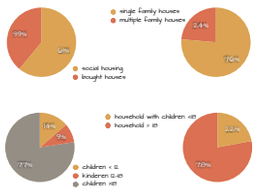
VISION

DESIGN

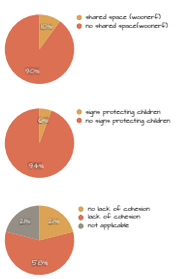
DATA COLLECTION | MAIN FINDINGS



BASIC INFO

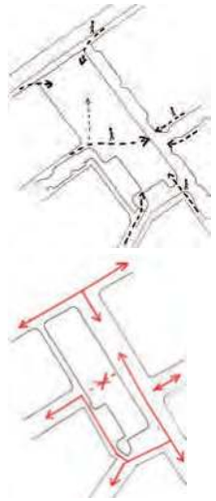


MAIN FINDINGS

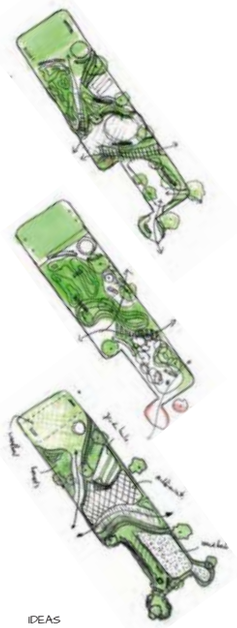


- cars driving too fast
- lack of cohesion
- children play on street AND playscape
- in general people are pretty happy with the neigborhood

GROENEWOUD-ERP MAP



CONCEPTMAPS



IDEAS

BRUGMANSTRAAT

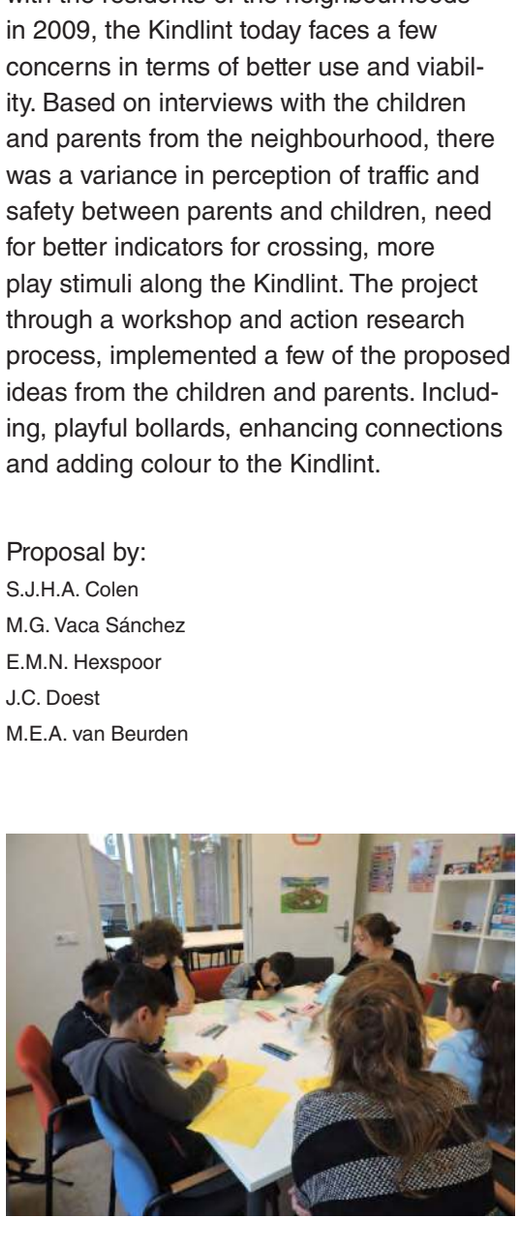
LORENTZSTRAAT

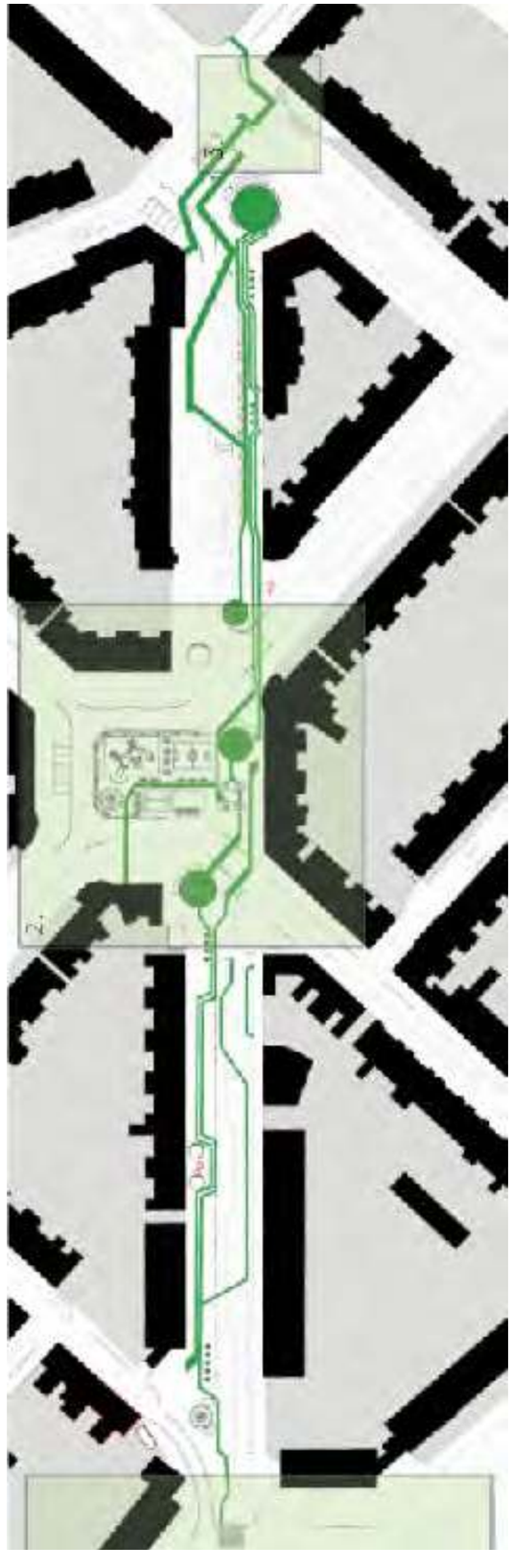
BIRDVIEW NEWTONPLEIN

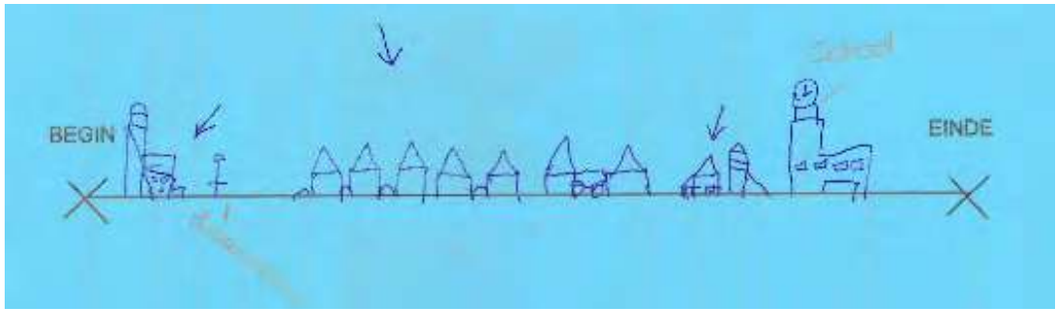
Child route Woensel-West: Process and output

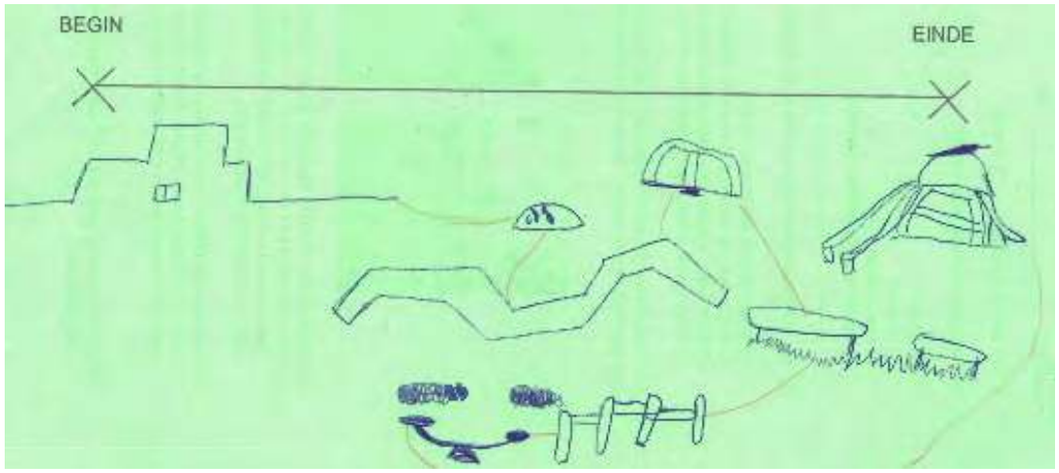
This project looks at how the design of the existing Kindlint in Woensel West can be improved in order to increase use and awareness. Designed in collaboration with the residents of the neighbourhoods in 2009, the Kindlint today faces a few concerns in terms of better use and viability. Based on interviews with the children and parents from the neighbourhood, there was a variance in perception of traffic and safety between parents and children, need for better indicators for crossing, more play stimuli along the Kindlint. The project through a workshop and action research process, implemented a few of the proposed ideas from the children and parents. Including, playful bollards, enhancing connections and adding colour to the Kindlint.

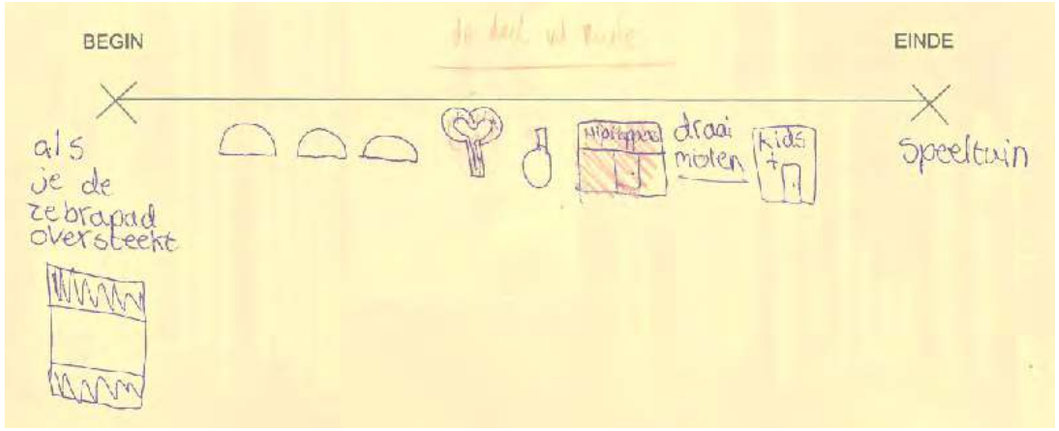
Proposal by:
S.J.H.A. Colen
M.G. Vaca Sánchez
E.M.N. Hexspoor
J.C. Doest
M.E.A. van Beurden











Proposal by:
Evelien Abels
Noor Al-Khayat
Heidi Sairanen

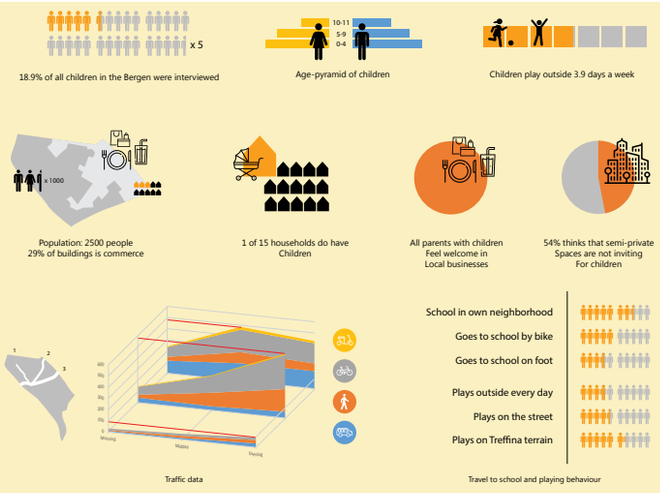
Directed at play

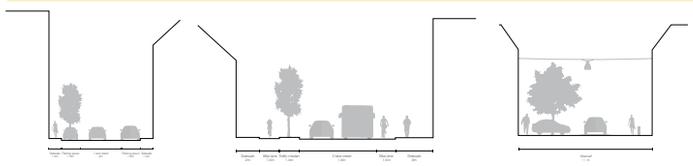
A case study in the Bergen - Eindhoven

Evelien Abels, Noor Al-Khayat, Heidi Sairanen

The Bergen - Centre Eindhoven

The Bergen - Images



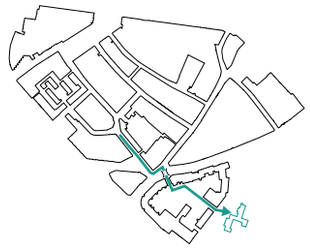


St Catharinastraat | Grote Berg | Kleine Berg

A play directed network

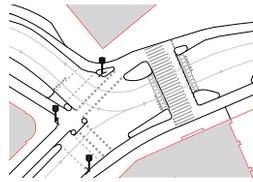
To improve play and safety within Bergen, the proposal was to demark streets for playing and streets as infrastructure. The “streets for playing” are connected to each other, and becomes easier for children to navigate the neighbourhood. With only one designated playground, the Treffinaplein is ‘hidden’ within a building block behind a parking space, making it hard to get to and is perceived as a dangerous place for children especially later in the evening. The proposal also address active redesign of the space to improve the overall quality of the playground and the play street.

Playing zone, traffic zone

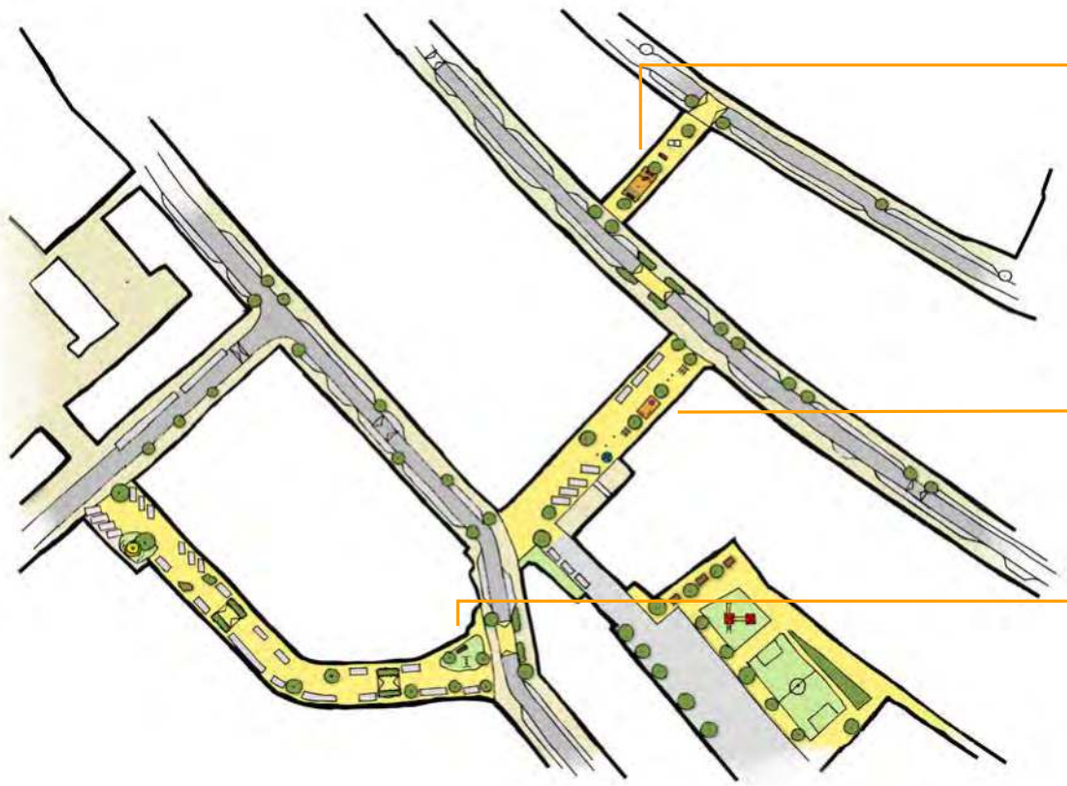


Route to school

Treffina playground



Safe crossing Grote Berg



Play-passage

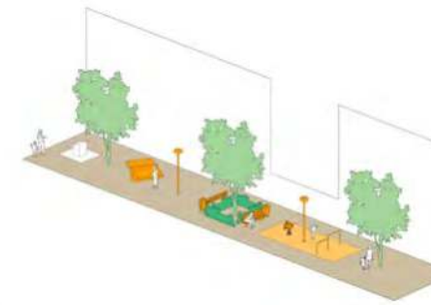
This passage is the only car-free zone in the neighbourhood; supplemented with playing equipment this place becomes both fun and safe.

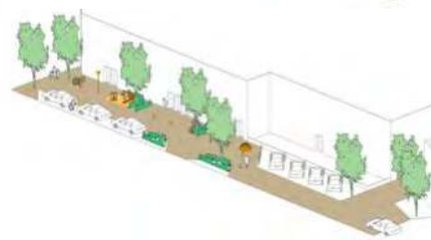
Smitsstraat

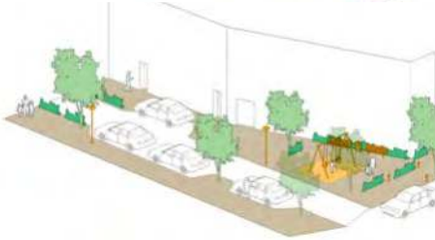
The Smitsstraat forms the connection between the play-passage and the Oranjestraat. It is transformed into a shared space.

Oranjestraat

This street already was a shared space. By adding some playing equipment, this street becomes part of the playing network.







Acknowledgements

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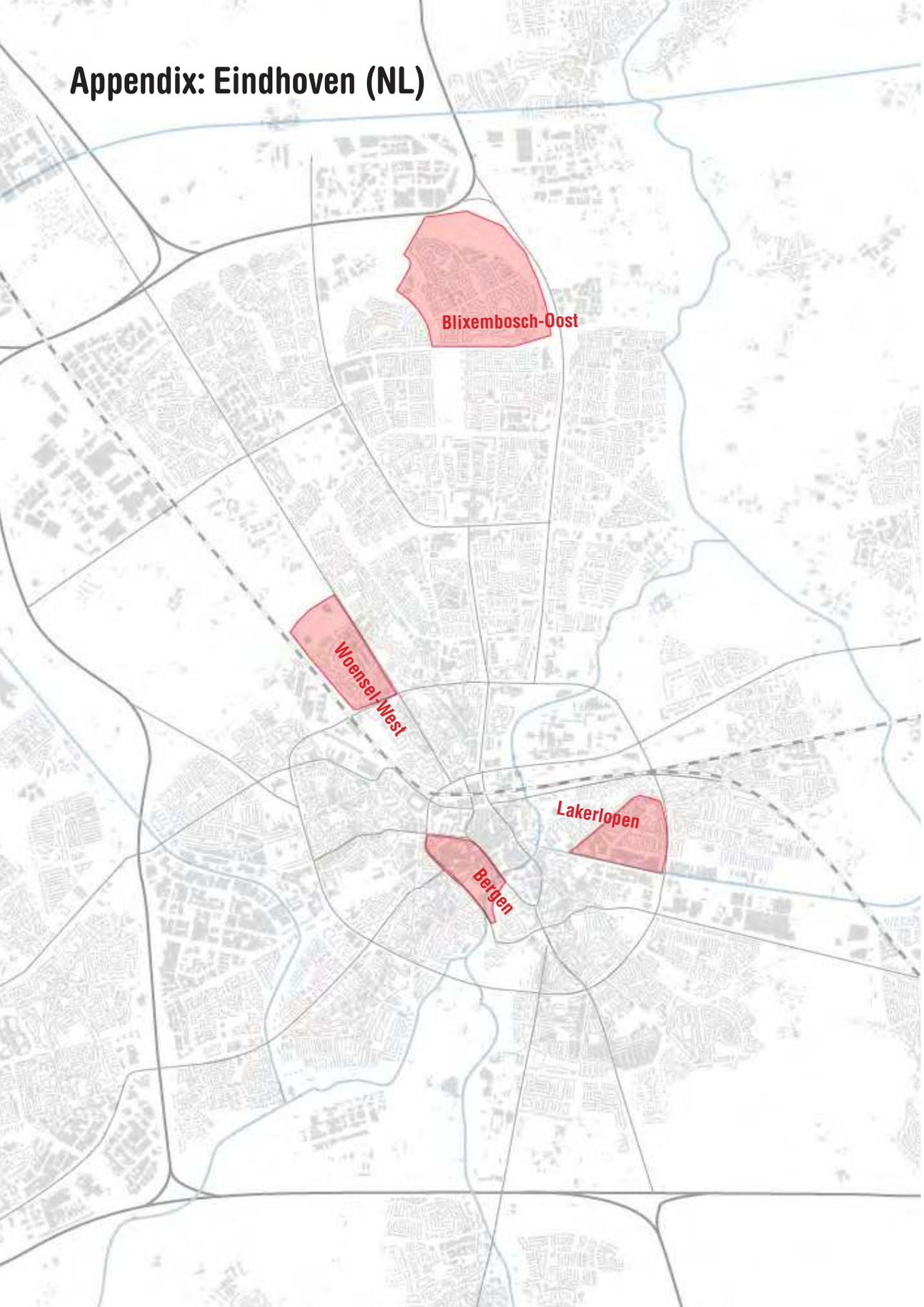
Appendix: Eindhoven (NL)



Appendix 1a: Interviews results

Total number of participants: 204

		Bergen	Blixemb.-Oost	Woensel-West	Lakerlopen
Nationality	Dutch	65%	88%	75%	86%
	Non native western	15%	1%	2%	9%
	Non western non native	19%	11%	24%	5%
Average Age	Parents	38,6	38,0	36,2	39,3
	Children (0-12)	5,5	5,0	3,9	4,7
Age of children	0	10%	38%	28%	24%
	1	8%	46%	18%	28%
	2	5%	48%	25%	23%
	3	21%	35%	18%	26%
	4	7%	43%	24%	26%
	5	21%	38%	29%	13%
	6	16%	40%	20%	24%
	7	25%	42%	21%	13%
	8	18%	43%	18%	23%
	9	19%	38%	14%	29%
	10	14%	48%	19%	19%
	11	10%	52%	5%	33%
	12	7%	64%	14%	14%
	13	18%	45%	9%	27%
	14	0%	50%	42%	8%
	14+	0%	33%	29%	38%
Number of children in total		55	196	94	109
Number of children per family		2.0	2.0	2.3	2.2
Tenure	Owned	73%	86%	55%	48%
	Rented	27%	14%	45%	52%
Employment	yes	77%	94%	98%	73%
	no	23%	6%	2%	27%
Household income in EUR	< 33716	57%	7%	39%	33%
	33716-66421	0%	55%	42%	67%
	>66421	43%	38%	18%	0%
Years living in the neighbourhood		8,2	11,2	12,0	10,4
Frequency children play outside	everyday	65%	79%	68%	66%
	once a week	19%	12%	9%	7%
	twice a week	15%	6%	16%	23%
	not at all	0%	3%	7%	5%

Where children play outside	Designated playing area	playground	18%	41%	12%	12%
		sportfield	8%	3%	2%	1%
		schoolyard	8%	5%	3%	0%
		park	25%	14%	1%	2%
	Undesignated playing area	private backyard	5%	9%	7%	1%
		communal courtyard	10%	1%	1%	1%
		streets	18%	13%	24%	16%
		parking lot	0%	0%	0%	9%
		garages	3%	0%	0%	0%
		corridor/ gangpad	0%	0%	4%	2%
		green space	8%	13%	3%	0%
Safety of streets	yes		48%	68%	43%	46%
	no		52%	32%	57%	54%
Why 'no'	speeding cyclists		25%	0%	0%	0%
	speeding motorised vehicles		50%	80%	69%	71%
	mean children		0%	5%	8%	7%
	shady people		25%	5%	19%	7%
	other		0%	10%	4%	14%
Kindergarten	number	one kid	100%	91%	80%	89%
		two kids	0%	9%	20%	11%
		three kids	0%	0%	0%	0%
	neighbourhood	my own	67%	81%	81%	28%
		next	33%	16%	6%	44%
		other	0%	3%	13%	28%
	how	by walking	50%	44%	67%	21%
		by biking	40%	38%	17%	37%
		by auto	10%	18%	17%	42%
		public transport	0%	0%	0%	0%
Elementary school	number	one kid	57%	64%	53%	70%
		two kids	39%	35%	38%	24%
		three kids	4%	1%	9%	6%
	neighbourhood	my own	74%	82%	68%	0%
		next	4%	11%	21%	82%
		other	22%	7%	12%	18%
	how	by walking	29%	37%	40%	18%
		by biking	46%	44%	43%	38%
		by auto	24%	19%	17%	44%
		public transport	0%	0%	0%	0%

High school	number	one kid	33%	73%	50%	60%
		two kids	67%	18%	50%	20%
		three kids	0%	9%	0%	20%
	neighbourhood	my own	33%	10%	0%	0%
		next	33%	80%	50%	36%
		other	33%	10%	50%	64%
	how	by walking	25%	0%	0%	0%
		by biking	75%	82%	100%	92%
		by auto	0%	0%	0%	8%
		public transport	0%	18%	0%	0%
After school	what	school	50%	9%	25%	0%
		sports	0%	26%	19%	29%
		social/ familial	50%	31%	6%	0%
		after school care	0%	9%	31%	14%
		cultural activities	0%	20%	6%	43%
		other	0%	6%	13%	14%
	neighbourhood	my own	62%	73%	18%	15%
		next	23%	21%	51%	45%
		other	15%	6%	32%	40%
	how	by walking	37%	38%	53%	5%
		by biking	42%	40%	31%	43%
		by auto	21%	19%	16%	52%
		public transport	0%	2%	0%	0%
Social services	yes		96%	97%	77%	81%
	no		4%	3%	23%	19%
Special needs	yes		94%	89%	95%	96%
	no		6%	11%	5%	4%
Semi private and commercial invite children	yes		54%	72%	55%	71%
	no		46%	28%	45%	29%
	if 'no' why:	maintenance	0%	17%	25%	0%
		age	25%	33%	0%	0%
		accessibility	25%	0%	25%	0%
		facilities in stores	50%	50%	50%	0%
		other	0%	0%	0%	100%
	if 'yes' why:	maintenance	0%	25%	0%	25%
		age	0%	17%	20%	13%
		accessibility	100%	17%	0%	13%
		facilities in stores	0%	25%	80%	25%
		other	0%	17%	0%	25%

Special private / commercial activities arranged for children	yes		92%	95%	77%	93%
	no		8%	5%	23%	7%
	association	neighbourhood	100%	82%	50%	100%
		school	0%	18%	50%	0%
	if 'yes' why:	no needs	60%	8%	10%	0%
		festive day	40%	56%	30%	91%
		sport activities	0%	20%	30%	0%
		cultural activities	0%	16%	30%	9%
	if 'no' why:	not aware	50%	---	100%	50%
		other neighbourhood	50%	---	0%	50%
Parents with children feel welcomed to local businesses	yes		92%	95%	77%	93%
	no		8%	5%	23%	7%
	if 'yes' why:	friendly shopkeepers	100%	64%	67%	57%
		attentive shops	0%	21%	0%	0%
		accessibility	0%	0%	33%	29%
		facilities in stores	0%	14%	0%	14%
	if 'no' why:	exclusive shops	0%	---	100%	---
		language barrier	100%	---	0%	---
Activities supporting groups especially arranged for parents	yes		81%	83%	66%	34%
	no		19%	17%	34%	66%
	if 'no' why:	no needs	75%	19%	38%	43%
		neighbourhood association	0%	9%	0%	0%
		social groups	0%	21%	46%	57%
		sport groups	0%	21%	15%	0%
		cultural groups	25%	30%	0%	0%
	if 'no' why:	not aware	---	86%	100%	73%
		language barrier	---	14%	0%	0%
		but wanted	---	0%	0%	27%
Likes walking around the neighbourhood		yes	100%	92%	69%	82%
		no	0%	8%	31%	18%

Results from open interview questions

	Playscapes	BE	BO	WW	LA	Greenscapes	BE	BO	WW	LA
Challenges	Variety in playgrounds		●●●			Variety in greenscapes				
	Availability of playgrounds	●		●●		Availability of greenscapes				
	Accessibility of playgrounds		●	●	●	Accessibility of greenscapes		●		
	Problems with playground					Problems with greenscapes				
	Muddy playground		●			Stinging nettles		●		
	Animal feces		●	●●●						
	Maintenance		●	●	●					
Improvements	Add playscape					Add greenscape		●	●●	●●
	Skate park/ BMX	●	●			Maintenance greenscape		●		●
	Playground/ playsets	●●●	●●	●●	●●	Improve greenscape			●	
	Sport field (different types)		●●●	●	●	Green space		●		●
	Natural playgrounds		●●			Accessibility		●		
	Maintenance playscape	●●	●	●	●	Concentrating greenspaces				●●
	Improve playscape									
	Playground	●	●●●	●	●					
	Accessibility		●		●					
	Concentrating playgrounds			●●	●					
	Differentiation		●●	●	●●					

	Street design	BE	BO	WW	LA	General	BE	BO	WW	LA
Challenges	Traffic safety					Social challenges				
	Speeding (behaviour)	●●●	●●●	●●●	●●●	Few children of same age	●			
	Road design		●		●	Awareness international children	●	●	●	
	Accessibility					Diversity of the neighbourhood			●	
	To school		●●		●	Disturbance of neighbourhood		●	●●●	●●
	To other			●		Maintenance				
	Maintenance		●			Animal feces				●●●
						Loitering general				●●
						Physical challenges		●		●
						Other		●●	●●	●
Improvements	Traffic safety					More (community) activities	●	●	●	●●●
	Traffic calming	●	●●●	●●●	●●●	Facilities for kids				
	Traffic design	●	●●●	●	●	Improve school		●		
	Traffic limitation					More restaurants & shops		●	●●	
	Road closure	●				More recreational activities		●●●	●	●
	Car free streets	●●		●	●	Other physical improvements	●	●	●	●●
	Maintenance		●			Increase surveillance		●		●
						Maintenance				●

Note: Results shown above are from the open question in the survey:"If you could change or add something for children of the neighbourhood what would it be?"

●●● Most mentioned, ●●, Mentioned multiple times, ● Least mentioned

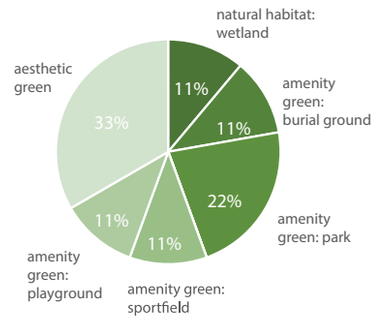
BE = Bergen, BO = Blixembosch-Oost, WW = Woensel-West, LA = Lakerlopen

Appendix 1b: Data from indicators

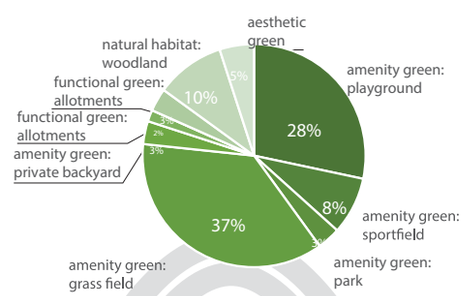
Results from observations on greenscapes

		Bergen	Blixem.-Oost	Woensel-West	Lakerlopen
Type of green					
Amenity green	playground	1	17	5	4
	sportfield	1	5	1	3
	park	2	2	1	0
	grassfield	0	22	4	10
	private backyard	0	2	1	1
Functional green	allotments	0	1	1	0
	burial ground	1	0	0	0
Natural habitats	wetland	1	2	0	0
	woodland	0	6	0	0
Aesthetic green		3	3	8	10
Availability					
Existence of semi private of private green space	Yes	3	7	1	10
	No	2	3	1	11
Quality of greenscapes					
Paved and unpaved walking trails	Yes	5	10	2	14
	No	2	18	10	7
Play areas for children	Yes	1	18	8	9
	No	6	10	4	12
Seating	Yes	4	18	9	13
	No	3	10	3	8
Food options	Yes	0	0	6	2
	No	7	28	6	19
Quantity of greenscapes					
Play areas for children		4	33	15	17
Seating		24	92	---	53
Food options		0	4	2	7
Access					
No residence is located more than 600 meters from at least one green-space	Yes	2	18	1	12
	No	3	1	0	0
No residence is located more than 200 meters from at least one green-space	Yes	0	19	1	11
	No	5	0	0	0

DE BERGEN



BLIXEMBOSCH-OOST



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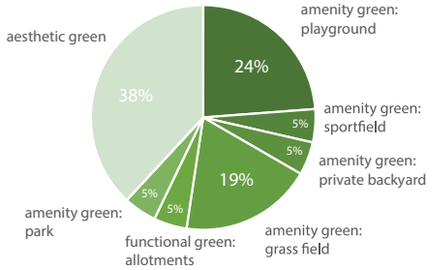
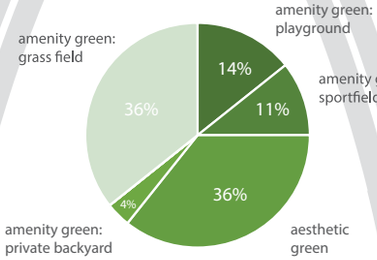


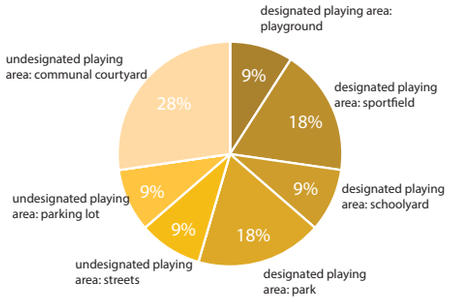
LAKERLOPEN



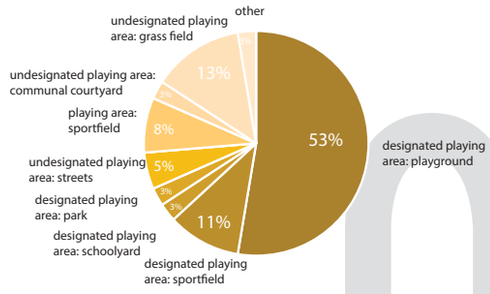
Results from observations on playscapes

		Bergen	Blixemb. -Oost	Woensel-West	Lakerlopen
Type of play					
Designated playing area	playground	1	20	12	9
	sport-field	2	4	3	5
	schoolyard	1	1	1	1
	park	2	1	0	0
Undesignated playing area	private backyard	0	0	0	0
	streets	1	2	2	5
	parking lot	1	0	1	2
	garages	0	3	0	1
	corridor/ gangpad	0	0	0	1
	communal courtyard	3	1	0	2
	grass-field	0	5	2	1
	other	0	1	0	0
Availability					
Number of official playscapes		6	26	15	14
Number of safe playscapes (not per se designated)			38	24	19
Quality of playgrounds					
Play areas are built with the appropriate protection from the external environment	Yes	6	20	17	23
	No	3	18	1	4
Playgrounds with play elements that are suitable for various age	Yes	8	12	8	6
	No	1	26	10	4
Places for adults to sit and observe	Yes	7	22	16	14
	No	2	16	2	13
Shade areas provide protection from sun	Yes	4	10	13	16
	No	5	28	5	11
Play areas built with line of sight in mind	Yes	8	26	14	25
	No	1	12	4	2
Access					
No residence is located more than 600 meters from at least one playspace	Yes		3	2	9
	No		1	0	0
No residence is 200 meters from at least one playspace	Yes		1	1	1
	No		3	1	7
Multi-unit dwellings provide play spaces in common area	Yes		1	0	1
	No		1	2	8
Mini-play destinations					
Designation of public space for the use of children occur also outside playgrounds	Yes		2	2	5
	No		1	0	4
Smaller spaces of safe play on the streets	Yes		1	2	1
	No		1	1	8

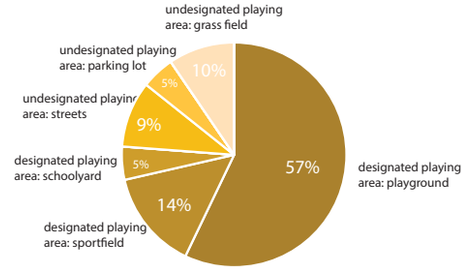
DE BERGEN



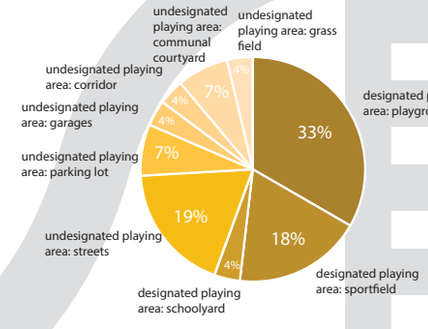
BLIXEMBOSCH-OOST



WOENSEL-WEST



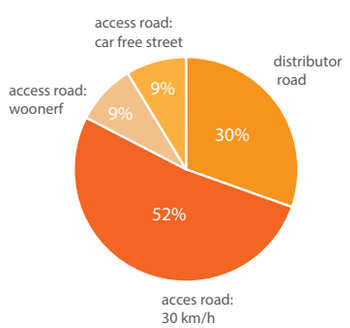
LAKERLOPEN



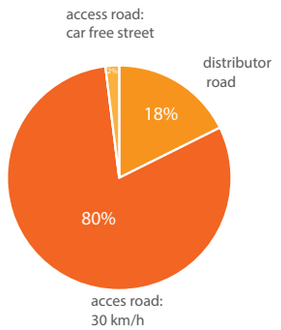
Results from observations on street networks

		Bergen	Blixemb. -Oost	Woensel-West	Lakerlopen
Type of street					
Distributor road		7	9	2	1
Access roads	30 km/h	12	41	28	18
	Woonerf	2	0	0	0
	Car free street	2	1	2	2
Number of streets					
Children can easily move from the private to the public space	Yes	17	55	24	16
	No	7	4	8	7
Measures for traffic calming	Yes	13	44	18	12
	No	11	15	14	11
Separation of walkways	Yes	21	51	30	20
	No	3	8	2	3
Signs protecting youth	Yes	1	5	7	3
	No	23	54	25	20
Traffic structures slow traffic near schools and daycare	Yes	0	8	5	3
	No	24	51	27	20
Separated bike paths	Yes	8	11	4	2
	No	16	48	28	21
Bike path on the road	Yes	9	4	1	5
	No	15	55	30	18
Lighting of the pedestrian routes	Yes	17	57	28	23
	No	7	2	2	0
Presence of pedestrian only streets	Yes	5	6	3	14
	No	19	53	27	9
Presence of shared space (woonerf)	Yes	5	7	6	9
	No	19	52	26	14
Side walks wide enough and free of obstacles	Yes	16	36	23	21
	No	8	13	8	2
	Partial	0	10	1	0
Presence of lowered curbs or ramps	Yes	19	56	26	9
	No	5	3	5	9
	n.a.	0	0	1	0
Side walks are tree shadowed	Yes	13	42	19	11
	No	8	13	13	9
	Partial	3	4	0	3
Benches or places to rest along walkways	Yes	4	12	6	8
	No	20	47	26	15
Walkways are well maintained	Yes	22	48	27	22
	No	2	8	1	1
	Partial	0	0	4	0
Availability of plants or trees along walkways	Yes	20	53	26	21
	No	3	3	4	1
	Partial	1	0	2	1

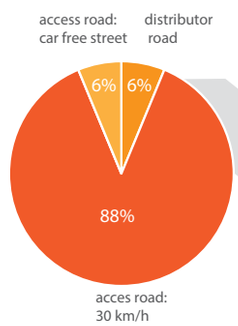
DE BERGEN



BLIXEMBOSCH-OOST



WOENSEL-WEST



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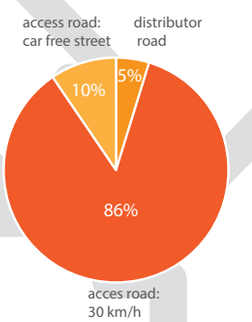


Appendix 1c: Results from workshops Bergen

Results from questionnaire with parents and children

Total number of parents participated: 6
Total number of children participated: 14

			Parents count	Kids count
Frequency outdoor play	Once a week		1	1
	Twice a week		1	0
	Every day		4	13
	Not at all		0	0
Where children play outside	Designated playing area	Playground	4	7
		Sport-field	1	6
		Schoolyard	5	10
		Park	2	6
	Undesignated playing area	Private backyard	4	8
		Communal courtyard	1	2
		Streets	4	4
		Parking lot	3	1
		Garages	2	3
		Corridor	0	2
		Green space	1	0
Treffina terrein (Playground)	Do you know this place?	Yes	8	14
		No	0	0
	Frequency visit?	0 times	3	7
		1 time	1	4
		2-3 times	1	3
		4-5 times	0	0
		6+ times	0	0
	Do you like this place?	Yes	0	7
		No	7	7
	Yes, why?	Soccerfield	0	6
		Close to home	0	1
		Slide	0	2
		General	0	1
	No, why?	Dirty	4	0
		Bad maintenance	3	1
		Dog feces	2	0
		Unsafe feelings	3	0
		Outdated	1	0
		Age variety	1	0
		Nothing to do	0	5
		General	0	1
	Improvements?	Terrace (or coffee place)	2	
		Tidier	2	
		Benches	3	
		Cozier	1	
		Social surveillance	2	
		Adventure	1	
		Skate-bowl		1
		Roller-coaster		1
		Swing		4
		Artificial grass		3
		Catacomb		1
		Nets in the goals		3
		Basketball field		1
		Fence		3
		Scoreboard		2
		Trampoline		2
		No teenagers		4
		Cameras		1
		Lights		2
		Tree house		1
		Pool		2
		Slide		4
Hornemann plantsoen (Sport-field)	Do you know this place?	Yes	8	14
		No	0	0
	Frequency visit?	0 times	2	9
		1 time	1	5
		2-3 times	1	0
		4-5 times	0	0
		6+ times	0	0
	Do you like this place?	Yes	5	8
		No	1	6
	Yes, why?	Tranquility		1
		Soccer goals		5
		Walk the dog		1

		Gymnastics		**1**
		Like the place		**1**
		Gymnastics		**1**
		Hockey		**1**
		Tennis		**1**
	No, why?	Nothing to do		**3**
		Far away		**3**
	Improvements?	Nothing	**2**	
		Barbecue	**1**	
		Building materials	**1**	
		Play equipment different age groups	**1**	
		(another) soccer goal		**8**
		Swing		**3**
		Trampoline		**2**
		Trees		**1**
		Lighting		**1**
		Jacuzzi		**1**
		Television		**1**
		Tree house		**1**
		Food option		**1**
		Swimming pool		**1**
		Playground		**2**
		Slide		**3**
		Basketball field		**1**
Schoolyard	Visit it after school time?	0 times	**7**	**9**
		1 time	**0**	**2**
		2-3 times	**0**	**1**
		4-5 times	**0**	**0**
		6+ times	**0**	**0**
	Do you like this place?	Yes	**3**	**10**
		No	**3**	**4**
	Yes, why?	Lot of play equipment		**2**
		Climbing		**4**
		Soccer		**2**
		Slide		**1**
		Swing		**1**
		Playing tag		**1**

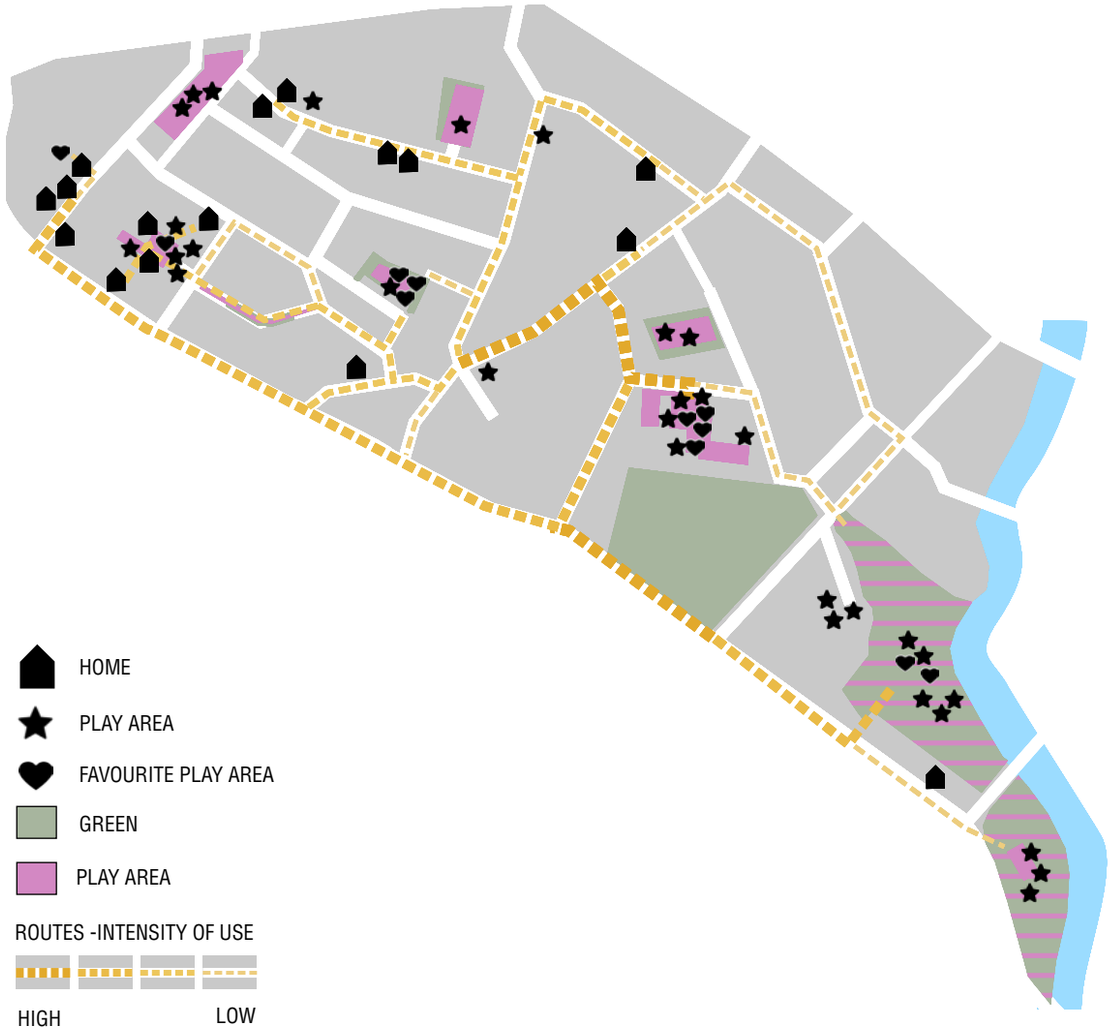
		Hide and seek		**1**
		Attractive	**3**	
		Kids attending here	**1**	
		A place to play alone	**1**	
	No, why?	Old and dirty		**1**
		Too much stone		**1**
		Nothing to do for smaller children		**1**
		Nothing to do		**1**
	Improvements?	Decision for kids	**1**	
		More greenery	**1**	**5**
		Bigger goals		**1**
		Nothing		**3**
		More play-sets		**2**
		Soccer-field		**1**
		Golf course		**1**
		Artificial grass		**2**
		Trampoline		**2**
		Swimming pool		**1**
		Balancing board		**1**
Anne Frankplantsoen (park)	Do you know this place?	Yes	**7**	**14**
		No	**0**	**0**
	Visit it with your kids? Frequency visit?	0 times	**3**	**6**
		1 time	**1**	**7**
		2-3 times	**0**	**1**
		4-5 times	**0**	**0**
		6+ times	**0**	**0**
	Do you like this place?	Yes	**7**	**11**
		No	**0**	**3**
	Yes, why?	Go there with school		**1**
		Play games		**4**
		Climbing		**4**
		Laying in sun		**1**
		Gymnastics		**1**
		Art		**1**
	No, why?	Not many options for games		**1**

		Nothing to do		1
	Improvements?	Extra benches	1	
		Play equipment	1	
		Exercise circuit	1	
		Swing		4
		Slide		1
		Tree-house		4
		Tunnels		1
		Television corner		1
		Swimming pool		1
		Maze		1
		Chill place		1
		Nothing		2
Undefined play-scapes	Do your kids play at	Wilhelmina Square	5	10
		Spijndhof	1	3
		Bourbonhof	1	9
		Luciferplein	1	5
	Do you like these places?	Yes	5	11
		No	2	2
	Why?	Close to home		6
		It is a big space		3
		Nothing to do		2
		Cars		1
		Accessibility		1
		Other		2
	Improvements?	Seats	3	
		Greenery	1	
		Climbing tree	1	
		Nothing		3
		Slides		2
		Swing		2
		Swimming pool		1
		Children's square		1
		Oxboard space		1
		Playground		1
		Covered space		1
		Artificial grass		1
Streets	Are the streets safe	Yes		4
		No		10

	No, why?	Speeding cars		7
		Mean children		3
		Scary people		6
		Other		1
	Do you play on street	Yes		7
		No		7

Results from mapping with parents and children

Results from the children



Participants were asked to mark their house and the playscapes, and draw their favourite to the playscapes and park. The same approach was followed in the two workshops.

See 4. Research approach for more information.

Results from the parents

Appendix: Jerusalem (IL)

Appendix 2a: Interview results*

Total number of participants: 30

			Shmuel Hanavie	Talpiot Estates	Katamonim 8/9	Beit Hanina
Nationality		Israeli	100%	100%	100%	100%
Average Age		Parents	34,8	35,3	50,0	37,5
		Children (0-12)	6,9	5,7	4,9	---
Number of children in total			11	13	20	13
Number of children per family			5.3	2.7	2.2	2.2
Tenure		Owned	100%	86%	44%	50%
		Rented	0%	14%	56%	50%
Employment		yes	17%	100%	67%	50%
		no	83%	0%	33%	50%
No. of years living in the neighbour-hood			8,2	11,2	25,0	10,4
Frequency children play outside		everyday	100%	50%	25%	33%
		once a week	0%	13%	25%	17%
		twice a week	0%	25%	13%	33%
		not at all	0%	13%	38%	17%
Where children play outside	Desig-nated playing area	playground	60%	45%	14%	0%
		sportfield	0%	0%	10%	0%
		schoolyard	0%	0%	0%	0%
		park	0%	27%	14%	0%
	Undes-ignated playing area	private backyard	0%	18%	0%	10%
		communal courtyard	20%	0%	0%	0%
		streets	20%	0%	10%	14%
		parking lot	0%	0%	10%	0%
		garages	0%	0%	0%	0%
		corridor/ gangpad	0%	9%	0%	0%
		green space	0%	13%	0%	43%
Safety of streets	yes		40%	0%	33%	0%
	no		60%	100%	67%	100%
Why, no?	speeding cyclists		0%	0%	0%	---
	speeding motorised vehicles		40%	0%	60%	---
	mean children		0%	0%	0%	---
	shady people		40%	50%	40%	---
	other		20%	50%	0%	---

Kinder-garten	Number	one kid	---	57%	100%	100%
		two kids	---	43%	0%	0%
		three kids	---	0%	0%	0%
	Neigh-bour-hood	my own	---	43%	67%	100%
		next	---	57%	33%	0%
		other	---	0%	0%	0%
	How	by walking	---	50%	67%	50%
		by biking	---	13%	0%	0%
		by auto	---	38%	33%	50%
		public transport	---	0%	0%	0%
Ele-mentary school	Number	one kid	---	50%	60%	100%
		two kids	---	33%	20%	0%
		three kids	---	17%	20%	0%
	Neigh-bour-hood	my own	---	25%	40%	100%
		next	---	63%	0%	0%
		other	---	13%	60%	0%
	How	by walking	---	44%	20%	0%
		by biking	---	22%	0%	33%
		by auto	---	33%	60%	33%
		public transport	---	0%	20%	33%
High school	Number	one kid	---	100%	67%	---
		two kids	---	0%	33%	---
		three kids	---	0%	0%	---
	Neigh-bour-hood	my own	---	0%	67%	---
		next	---	0%	33%	---
		other	---	100%	0%	---
	How	by walking	---	0%	0%	---
		by biking	---	33%	0%	---
		by auto	---	0%	67%	---
		public transport	---	67%	33%	---
After school activities	Where	my own	---	40%	50%	100%
		next	---	50%	0%	0%
		other	---	10%	50%	0%
	How	by walking	---	50%	17%	0%
		by biking	---	0%	0%	0%
		by auto	---	50%	67%	0%
		public transport	---	0%	17%	100%

Social services	yes	0%	60%	25%	0%
	no	100%	40%	75%	100%
Special needs	yes	100%	14%	11%	0%
	no	0%	86%	89%	100%
Semi private and commercial invite children	yes	25%	25%	11%	0%
	no	75%	75%	89%	100%
Special private / commercial activities arranged for children	yes	75%	57%	33%	0%
	no	25%	43%	67%	100%
Parents with children feel welcomed to local businesses	yes	60%	33%	33%	33%
	no	40%	67%	67%	67%
Activities supporting groups especially arranged for parents	yes	50%	22%	22%	0%
	no	50%	78%	78%	100%
Likes walking around in the neighbourhood	yes	100%	14%	100%	83%
	no	0%	86%	0%	17%

* The research in Jerusalem was carried out by a smaller team with limited resources, it was done only in one phase. While the datasets produced for the four neighbourhoods were comparable to the Eindhoven sets, they were made up of fewer observations. The analysis was qualitative, aiming to relate the observational data (measuring the child friendliness of the physical environment) to the parent's responses (revealing typical use of the environment by children and their families).

Appendix 2b: Data from indicators

Results from observations on greenscapes

	Shmuel Hanavie	Talpiot	Katamonim 8/9	Beit Hanina
Availability				
Existence of semi private of private green space	✓	✓	✓	✓
Quality of greenscapes				
Paved and unpaved walking trails	✓	✓	✓	×
Play areas for children	✓	✓	✓	✓
Seating	✓	✓	✓	×
Food options	✓	×	✓	×
Quantity of greenscapes				
Play areas for children	**7**	**9**	**7** (+11 undesignated)	**15** (estimate)
Food options	**1**	**0**	**1**	**0**
Access				
No residence is located more than 600 meters from at least one greenspace	✓	✓	✓	✓
No residence is located more than 200 meters from at least one greenspace	✓	×	✓ (80%)	✓

Results from observations on playscapes

	Shmuel Hanavie	Talpiot	Katamonim 8/9	Beit Hanina
Availability				
Number of designated playscapes	**5**	**5**	**7** (plus schools when open)	**1**
Number of safe playscapes (not per se designated)	**5**	**---**	**11** (plus schools when open)	**1**
Quality of playgrounds				
Play areas are built with the appropriate protection from the external environment	✓	✓	✓	✓
Playgrounds with play elements that are suitable for various age	✓	×	✓	✓
Places for adults to sit and observe	✓	✓	✓	✓
Shade areas provide protection from sun	✓	×	×	×
Play areas built with line of sight in mind	✓	✓	**---**	✓
Access				
No residence is located more than 600 meters from at least one playspace	✓	✓	**---**	×
No residence is 200 meters from at least one playspace	✓	✓	**---**	×
Multi-unit dwellings provide play spaces in common area	✓	✓	**---**	×
Mini-play destinations				
Designation of public space for the use of children occur also outside playgrounds	✓	✓ (private open spaces)	**---**	×
Smaller spaces of safe play on the streets	✓	×	**---**	×

Results from observations on street networks

	Shmuel Hanavie	Talpiot	Katamonim 8/9	Beit Hanina
Children can easily move from the private to the public space	✓	×	×	✓
Measures for traffic calming	× (limited)	× (limited)	✓	× (limited)
Separation of walkways	✓ / × (partially)	✓ / × (partially)	✓	✓ / × (partially)
Signs protecting youth	×	✓	× (limited)	× (limited)
Traffic structures slow traffic near schools and daycare	✓	✓	×	✓
Separated bike paths	×	×	×	×
Bike path on the road	×	×	×	×
Lighting of the pedestrian routes	✓	✓ (some out of order)	✓	✓ / × (partially)
Presence of pedestrian only streets	✓ / × (partially)	✓	✓	×
Side walks wide enough and free of obstacles	✓	✓ (can vary)	×	✓ (can vary)
Presence of lowered curbs or ramps	✓	✓ (in most cases)	✓ (in most cases)	✓
Side walks are tree shadowed	✓ / × (partially)	✓ / × (partially)	×	×
Benches or places to rest along walkways	✓	✓	×	×
Walkways are well maintained	×	✓ (in most cases)	✓	×

Following the current trend of global urbanisation urban environments are becoming principal contexts wherein children grow and thrive. The aim of this report is to explore the role of urban design and its impact on creating child-friendly public spaces. An analysis based on built environments indicators is presented to ascertain the suitability of public spaces for children and their parents. Through empirical work in the cities of Eindhoven (NL) and Jerusalem (IL) underlying concerns and common needs that apply to the upbringing of children in an urban setting is expanded on. The report concludes with a list of design recommendations for better physical and social infra-structure to fit the needs of children and their families.

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