Cities Alive

Designing for urban childhoods

ARUP

This report is a product of collaboration between Arup's Foresight, Research and Innovation and Integrated City Planning teams. We are grateful for the input and advice from a range of internal and external contributors.

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Released December 2017

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“Children are a kind of indicator species. If we can build a successful city for children, we will have a successful city for all people.”

— Enrique Peñalosa, Mayor of Bogotá

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Foreword

Tim Gill

Independent researcher and writer

Urban planning has its roots in creating better places for children and families. The scale of urban poverty and illness in Victorian Britain's cramped, polluted cities ultimately gave rise to Ebenezer Howard's garden city movement. Around the world, the suburb was hailed as the saviour of cities and the answer to families' wishes for clean, safe, green neighbourhoods.

In the postwar decades, Jane Jacobs and Kevin Lynch were offering a more positive take on the prospects for urban children and families. But city leaders arguably ignored their close attention to the texture and fabric of everyday urban life. By the 1970s the writer and town planner Colin Ward gave a gloomy assessment of the state of urban childhood.

More recently, an emerging global child-friendly cities movement shifted the focus onto children's rights and participation. While this movement's values were and are beyond reproach, it has had very little influence on the built form of cities.

Today, history is repeating itself. Environmental degradation and ill health are on the rise in cities the world over and are particularly damaging to children.

Urban population growth has thrust urban planning to the forefront of global challenges. *Cities Alive: Designing for urban childhoods* argues that in responding to these challenges, the needs, experiences and views of children should once more be centre stage.

The central question in these pages is what a sustainable, successful, healthy city looks like. The answer? It looks like a child-friendly city.

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Executive summary

"The choices we make in the built environment can help to ensure children are given respect, fair treatment, a healthy life and the best chances of tackling the challenges of tomorrow. By highlighting children's needs, we will be helping to solve other urban challenges, leading to cities that are better for everyone."

— Jerome Frost, Director, Global Planning and Cities Leader, Arup

Cities Alive: Designing for urban childhoods proposes a child-friendly approach to urban planning, helping us to build successful cities that work for everyone. It sets out the current context and challenges of such an approach; the benefits, best practice and underlying principles; and the actions that can help take us there.

Child-friendly urban planning is an emerging field. It advocates a coherent and systematic approach to planning and designing cities that improves children's development, health and access to opportunities, moving well beyond simply providing playgrounds. It recognises the fundamental importance, not just of independence and play, but of the built environment as a whole in helping to shape a child's development and prospects, and hence their adult lives.

The benefits of a child-friendly city go beyond children to add value to all citizens' lives. The amount of time children spend playing outdoors, their ability to get around independently, and their level of contact with nature are strong indicators of how a city is performing, and not just for children but for all city dwellers. Perhaps uniquely, a child-friendly approach has the potential to unite a range of progressive agendas – including health and wellbeing, sustainability, resilience and safety – and to act as a catalyst for urban innovation.

This report highlights why and how city stakeholders should start to create child-friendly urban environments. It begins by

0-17

definition of children

Based on the United Nations Convention on the Rights of the Child, we define children as people aged 0 to 17 years.[1]

60%

of all urban dwellers

will be under the age of 18 by 2030.[2]

+US$8

return to society

for every US$1 invested in early play-based education, which promotes healthy child development.[3]

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highlighting the changing urban context and sets out the five core challenges of urban childhoods: traffic and pollution; high-rise living and urban sprawl; crime, social fears and risk aversion; isolation and intolerance; and inadequate and unequal access to the city.

It goes on to articulate two fundamental concepts for the development of more child-friendly approaches: 'everyday freedoms' and 'children's infrastructure'. It then explores the benefits that child-friendly practices can bring, illustrated by case studies from around the world.

A coherent vision for child-friendly cities is then set out, followed by a set of key principles and specific recommendations on how to achieve this. It concludes with actions and opportunities for city stakeholders, including policy makers and city leaders, developers and investors, and built environment professionals, and considers how progress might be measured. Case studies and relevant facts throughout the report add detail and context.

Arup aims to shape a better world: creating cities that offer streets, spaces and facilities – for all ages, abilities and backgrounds to enjoy together – can make a vital contribution to our collective wellbeing. With children projected to make up the majority of the world's urban population by 2030, the quality of life experienced in our cities will in many ways determine our global future.[4]

Child-friendly urban planning can help to **achieve city goals** and **tackle urban challenges** by strengthening the links among the built environment, the public realm, and children's wellbeing.

Key messages

The seven key messages that are illustrated in *Designing for urban childhoods* are:

1. The quality of life experienced by urban populations, and particularly by children, will determine **our global future.**

2. Child-friendly urban planning is a vital part of creating **inclusive cities that work better for everyone**.

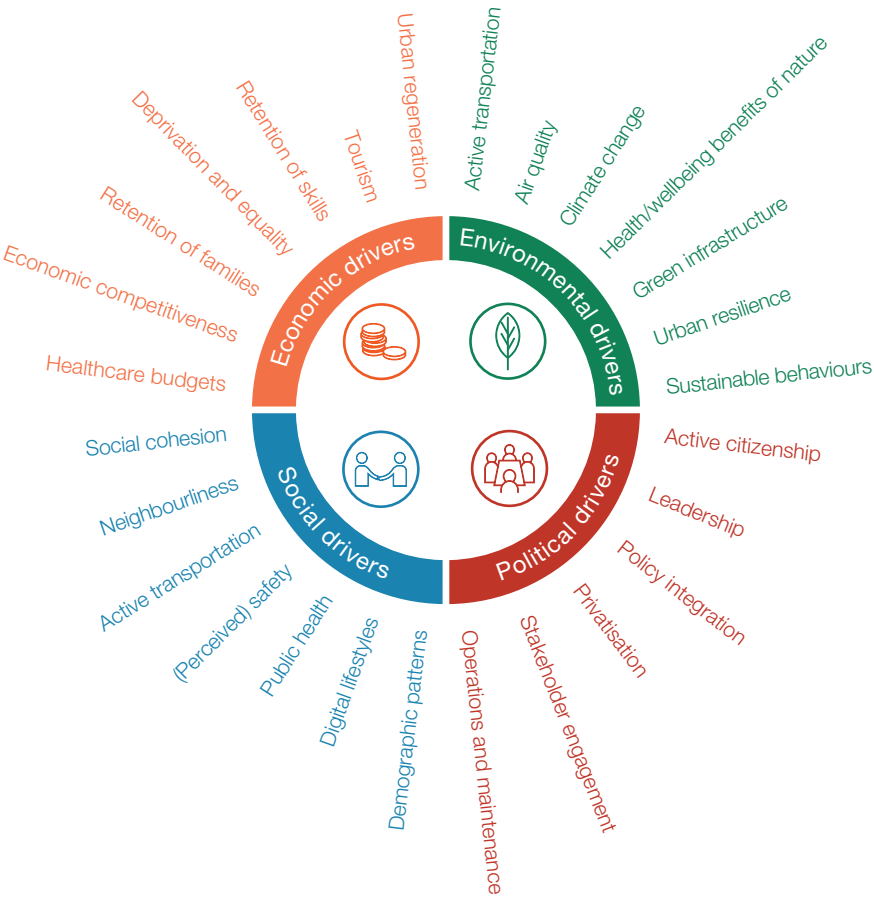
3. Focusing on the needs of children can help act as **a unifying theme** for the promotion of progressive ideas and ambitious actions.

4. Children's infrastructure can help to **enhance the economic value and long-term viability** of the urban environment.

5. Providing multifunctional, playable space - beyond the playground - can enable everyday freedoms and create a **public realm for all ages to enjoy together**.

6. Interventions at the neighbourhood scale offer the greatest potential to create a children's infrastructure network that allows **safe and enjoyable journeys.**

7. Decision makers should be **opportunistic and strategic**, and integrate child-friendly thinking into all aspects of city making.



Drivers of change

This diagram calls out some of the key global factors and trends driving change within the realm of child-friendly cities.

A changing urban context

"We are living in an ever increasingly urban world, with more children growing up in cities than ever before. It is therefore imperative that we design and build cities that meet the needs of children: seeking their input during the design process, providing them with access to play and education, and facilitating their social and cultural interactions."

— Prof. Klaus Schwab, founder and Executive Chairman, World Economic Forum

By 2050 around 70% of the world's population will live in cities.[5] The majority of these urban residents will be under the age of 18.[4] Today that number is already over one billion.[5] The things children want from an urban environment are fundamentally the same as everyone else: safe and clean streets, access to green space, clean air, things to do, the ability to get around, the freedom to see friends, and somewhere to call home.[6]

How children experience cities – and the specific motivations for child-friendly approaches – varies from place to place. Responses to their needs must be tailored to each city's cultural, political, socioeconomic and environmental context.

While the response must be context specific, the underlying challenges are often the same. In some high-income countries, previous gains in life expectancy are beginning to reverse, with children predicted to live shorter and less healthy lives than their parents[7]; while in developing countries, changing lifestyles and societal norms including lower rates of physical activity and an increased consumption of processed food are also contributing to dramatic changes in child health.[8] Globally, the number of overweight children under five is expected to reach 70m by 2025, compared to 41m in 2016.[9] The rate of increase is particularly significant in developing countries, with 30% more children overweight compared to developed countries.[10] Rates of mental health

+60m
urban population
Every year the world's urban population increases by about 60m.[11]

1bn+
children
live in urban settings around the world.[12]

80%
of the world's adolescent population is insufficiently physically active as a result of urbanisation.[13]

problems among children are also on the rise, with the stresses of urban life and declining opportunities for play identified as contributing factors.[14]

The role of the built environment

Many factors shape a child's prospects. Among these, the environment in which they live has to be considered a key determinant of their health, behaviour and development.[15] This affects not just their childhood but the rest of their adult life. Everyday activities such as walking, cycling and play can support a physically active population.[16] In contrast, high-density traffic, poor air quality and a lack of public space can directly discourage people from being physically active.[17]

As such, the dominance of cars in cities is considered one of the biggest barriers to child-friendliness and a key factor in preventing parents from granting children independent mobility.[18] The impact in the developing world is extreme, where environmental pollution and traffic accidents are at their highest.[19] With less independent mobility, children have a reduced ability to navigate and experience the city. This means fewer opportunities for social interaction, chance encounters, playful journeys and discovery.[20]

Arguably, urban planning has historically given insufficient consideration to vulnerable groups, including children. This was recognised at the United Nations 2016 Habitat III conference on sustainable urbanisation, where participants agreed upon the principle that cities should provide equal rights and opportunities for people of all ages.[21]

Children as agents of change

The challenges outlined above can be overcome. The case studies featured in this publication show that children can be powerful agents in the design and implementation of better urban environments. Furthermore, this report argues that taking a child-friendly approach will allow us to tackle issues in a more holistic and integrated manner, leading to benefits and positive outcomes for all. These benefits are explored in more detail in the following chapter.

Early childhood experiences and development are determining factors in adulthood prospects and can lead to increased cost to society.[22]

Child-friendliness in a global context

The actions that should be taken to achieve child-friendly cities vary across the globe. They depend on the specific local contexts, including climate, urban challenges and a city's current level of child-friendliness. While some cities will first need to address basic needs such as sanitation or housing, other cities may focus on traffic safety, environmental pollution or child-engagement in the urban agenda.

Image: © Catalytic Action

The core challenges of urban childhoods

Traffic and pollution

Traffic and pollution are global challenges, affecting children's physical and mental development and hindering independent mobility.[23] Safe roads, crossings and mixed-use neighbourhoods that support cycling and walking can reassure parents, reduce pollution and encourage social interaction.

Children from deprived regions are four times more likely to be hit by a car than those from more developed regions.[19]

High-rise living and urban sprawl

Sprawling cities encourage car-dependency, increased traffic and pollution, and reduce trust.[24] While overly dense high-rise living can lead to isolation and cramped conditions, well-designed developments can enable lively communities and access to outdoor space.[25]

Density, a diverse land-use mix and well connected streets increase physical activity and decrease body mass index.[26]

Crime, social fears and risk aversion

A parent's perception of risk in terms of accidents, crime, strangers and traffic determines a child's independent mobility and their access to space.[27] A balanced approach to safety and risk and natural surveillance can encourage exploration and play.

A **90%** decrease in local anti-social behaviour, from 44 to 4 incidents was achieved through the creation of a play space in Merseyside, UK.[28]

Inadequate and unequal access to the city

Poor quality green spaces, uneven distribution of playable public realm and a lack of safe access can exacerbate social inequality across the city, as can a shortage of free family activities.[29] The public realm can help to equalise social inequality if within reach, accessible to all and evenly distributed across the city.

Adverse early childhood experiences are associated with increased risk of adult disease and dysfunction.[30]

Isolation and intolerance

Children's opportunities for discovery can be restricted by spaces and attitudes that discourage their presence.[23] Teenagers in particular are often perceived negatively and marginalised.[31] Better street and public space design, for example through co-creation, can encourage more interaction and trust.

Over **40%** of Americans believe children up to the age of 12 should be legally required to be supervised when playing in a park.[32]

Case Study

Mayor of Bogotá:

Political motivation that transforms the city

As mayor of Bogotá, Enrique Peñalosa has made bold moves to create a safer, cleaner and more equitable environment for children and adults alike. Political will was critical in the pursuit of a progressive and comprehensive transport strategy, which introduced protected bike lanes, a bus rapid transit system carrying half a million passengers a day and a network of 1,200 new parks and play spaces.[33] This investment underlined the importance of taking the needs of vulnerable citizens such as children seriously and acknowledged rights to access green spaces, sports facilities, transportation and cultural activities. The strategy has supported a healthier environment where people on all income levels are given the freedom to travel by walking, cycling and public transport.

© Bogotá Bike Tours

Two key concepts for child-friendly cities

"This is a crucial and much-neglected topic. If children are not designed into our cities, they are designed out. This means that they are deprived of contact with the material world, with nature, with civic life and with their own capacities."

— George Monbiot, writer

Two concepts are fundamental to understanding and exploring a more child friendly approach to cities: 'everyday freedoms' and 'children's infrastructure'.

Everyday freedoms

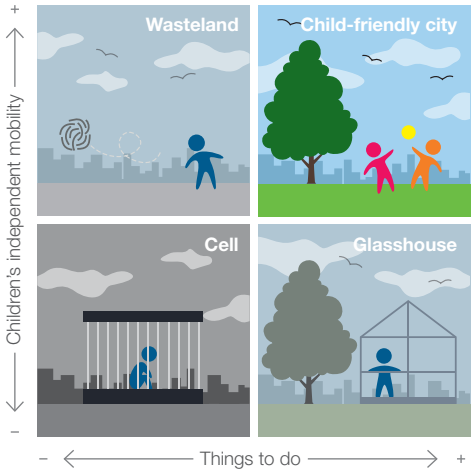
The concept of everyday freedoms combines the ability to play and socialise with high levels of independent mobility. It is through play that children learn to make sense of the world. Play is an instinctive, voluntary and spontaneous human learning impulse, and a basic human right (enshrined in the UN Convention on the Rights of the Child).[34] Unstructured and self directed play is fun, gives satisfaction and a sense of achievement, and is vital to our development.[35] It also impacts our ability to enjoy physical and mental health in old age. The opportunity to establish these healthy patterns of behaviour is key.[36]

Children's independent mobility is the freedom to get around a neighbourhood or part of a city unaccompanied by an adult. Independent mobility is influenced by many elements, including the proximity, choice and availability of things to do, the presence of road crossings, children's age and gender, and perceptions of safety by both children and adults.[37]

8 80 Cities

The 8 80 Cities initiative analyses city safety, necessary mobility and public space improvements by asking whether a senior and a child can walk to the park together.[38]

Image: © 8 80 Cities



Places to go, things to do

This diagram, based on the work of Finnish academic Marketta Kyttä, is a conceptual framework which presents child-friendliness in terms of the relationship between the availability of things to do in an environment and the levels of freedom or independent mobility a child has to explore and enjoy them.

Children in countries such as Finland and Germany are granted comparatively high levels of independent mobility, while overall, children's independent mobility is falling around the world.[37]

Children's perceptions and experiences of their environment change as they grow up.[39] For a city to be child-friendly, it needs to cater to each stage of a child's development. A crucial feature of this process is a change in scale. In early years, children experience life at a small scale, and their domain is largely determined by the need to be close to their parents/caregivers. Later, the focus shifts to playing and getting around more independently in neighbourhood streets, and to socialising, roaming and exploring the wider area. For maximum impact, initiatives to promote everyday freedoms should be close to residential areas. Pavements/sidewalks outside the home can be the first opportunity for unsupervised exploration by younger children, while local parks and public spaces become more accessible as they grow up.

1,200

new parks and play spaces

were created as part of the mayor of Bogotá's urban transformation strategy, to enhance cross-generational and inclusive access to the city.[33]

Playful exploration contributes to children's resourcefulness.[40]

Stead and Kelly (2015)

11

years old

A large proportion of children under 11 across countries globally do not have the freedom to move around their local area.[41]

A children's infrastructure network delivers natural, healthy and attractive environments.

Children's infrastructure

Children's infrastructure is the network of spaces, streets, nature and interventions which make up the key features of a child-friendly city. They are critical to a more inclusive, equitable, healthy and resilient public realm. This network is as important as transport, energy, water, and waste infrastructure; all underpin urban functions and a city's ability to attract and sustain strong, healthy, family-orientated communities. By promoting connected, multifunctional, intergenerational and sustainable public spaces for cities, children's infrastructure can generate a substantial range of benefits for all urban citizens.

A key focus area for children's infrastructure are the streets and the spaces in front of people's homes. On average, these make up at least 25% of a city's space and have the greatest potential to encourage everyday freedoms and social interaction.[42] This means looking beyond just playgrounds and instead focusing on an intergenerational and multifunctional public realm that families and communities can enjoy together. Cities should aim to enhance a child's connection to nature through green and healthy environments. They should also influence and impact a child's everyday journeys, including through routes to and from school or to and from community facilities such as youth centres, parks, leisure and recreation areas.

The likelihood of a child using a destination declines beyond about 800m from their home. This restricts their range and access to amenities to below one kilometer.[43]

Is a child able to safely walk from their home to a store, buy a popsicle and return home before it melts?

The "popsicle test"

10min

car travel

For every 10 minutes spent in a car, time spent participating in community activities falls by 10%.[44]

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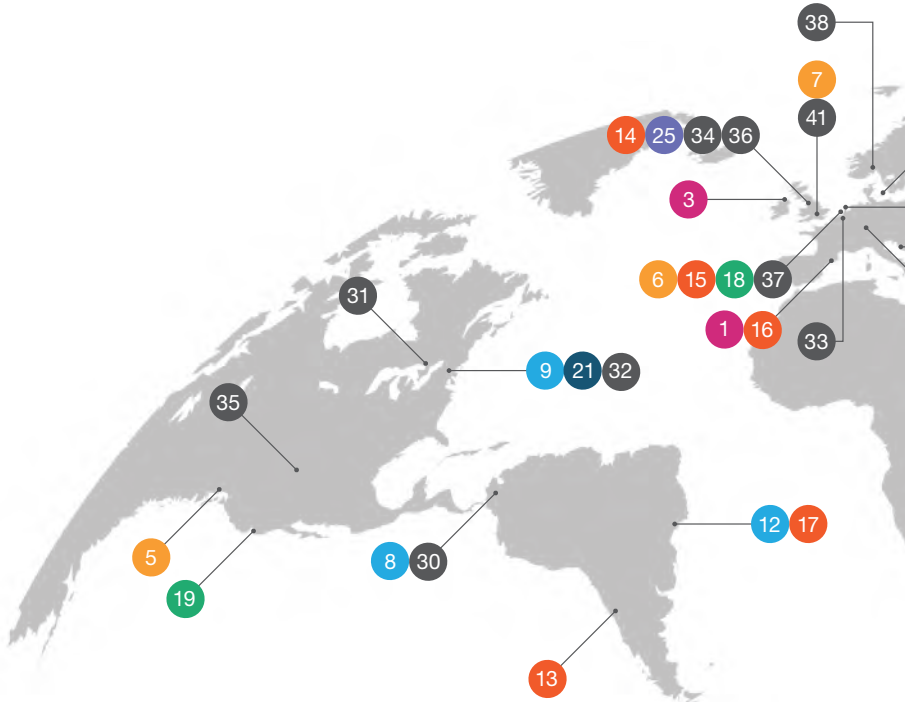
The benefits of child-friendly cities

This section highlights ideas from cities and case studies in different global contexts where steps have been taken to enhance children's experience of the city. It explores what makes a range of interventions child-friendly and their benefits, rationale and potential.

Health and wellbeing	- Physical activity - Mental wellbeing - Accessible activities - Intergenerational activities	- Barcelona Superblocks, Spain - The Livable Cities Project, India - Belfast Healthy City, UK
Local economy	- Retention of families - Vibrant destinations - Attractive developments - Space saving	- Darling Quarter, Sydney, Australia - River District, Vancouver, Canada - Building Blocks for a child-friendly Rotterdam, Netherlands - King's Cross Central, London, UK
Safety	- Road safety - Safe and active streets - Perceived safety - Addressing social fears	- Children's priority zone, Bogotá, Colombia - Global Street Design Guide, New York, USA - Freiburg Green City, Germany - School Zone Improvement Project, South Korea - Criança Fala project, São Paulo, Brazil
Stronger communities	- Generating community - Time spent together - Social interaction - Inclusivity and accessibility	- Bicentennial Children's Park, Santiago, Chile - Housing Design for Community Life, UK - Rotterdam social infrastructure, Netherlands - Banyoles old town, Spain - Cantinho do Céu Complex, São Paulo, Brazil
Nature and sustainability	- Connection to nature - Wilder natural spaces - Risk and adventure - Wellbeing and sanctuary	- Natuurspeeltuin de Speeldernis, Rotterdam, Netherlands - Natividad Creek Park, Salinas, USA - Sanlihe River Ecological Corridor, Qian'an City, China
Resilience	- Resilient citizens - Climate resilience - Response to threats - Multifunctionality	- New York City schoolyards, USA - Copenhagen Cloudburst Plan, Denmark - Disaster resilience parks, Tokyo, Japan - Child-friendly floodable green space, Jakarta, Indonesia
A catalyst for improving cities	- Unifying theme - Citizenship - Overcoming resistance - Resourcefulness	- Leeds pop-up parks, UK - Protest for change, Amsterdam, Netherlands - Car-free experiment, Suwon, South Korea - Tirana's agents for change, Albania - Playground Ideas, Melbourne, Australia



Health and Wellbeing

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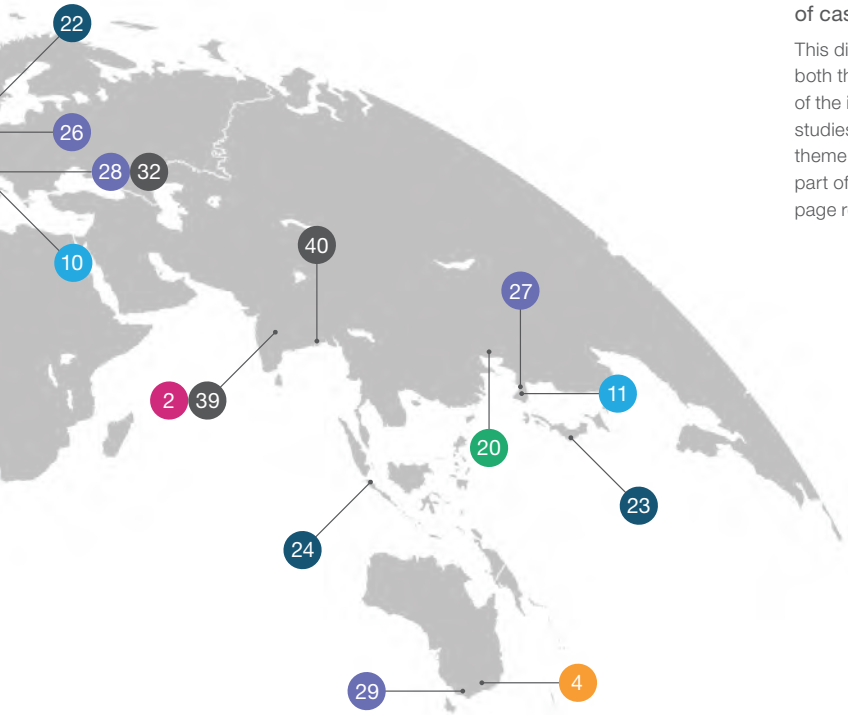

Geographic location of case studies

This diagram gives both the global location of the individual case studies, and the benefit theme which they are part of, along with a page reference.

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Child-friendly urban planning

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Case Study

Barcelona superblocks:
Filling the city with life

Barcelona is piloting a radical new strategy which will restrict traffic to main roads around consolidated 400m-by-400m city blocks. This will turn internal streets into "citizen spaces" with increased safe green space for culture, leisure and community activities. The city's Department of Mobility advocates a series of measures to give pedestrians and cyclists priority, to support an efficient mobility network and to reduce the environmental impact of vehicles. Superblocks are being piloted as an easily applicable and adaptable model that can improve quality of life for children, families and seniors. Assessment of health impacts has shaped the project, which is expected to help to reduce pollution, promote active travel, improve safety and encourage activity and social cohesion without compromising the mobility network.[45]

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Health and wellbeing

"Because of their growing minds and bodies, children are uniquely vulnerable to changes in their environment."

— Dr. Samantha Ahdoot, Virginia Commonwealth University School of Medicine

Positive feelings about a place can be a critical factor in determining whether children's lifestyles are active and healthy.[46] Creating cities that offer children of all ages and backgrounds an opportunity for everyday freedoms, as well as organised activites such as sport, can help to increase fitness, develop stronger immune systems, decrease stress levels and foster greater respect for themselves and others.[47] Children's independent mobility is vital to children's wellbeing and development as it leads to higher levels of physical activity, sociability and improved mental wellbeing.[48] A safe outdoor environment that enables independent mobility will also encourage children's play, with significant longer-term benefits, both for the individual and society.[49] A Policy Studies Institute report made recommendations to improve children's independent mobility including implementing stringent road safety measures, reducing car dependency and the dominance of traffic in the public realm, and putting the needs of children at the heart of spatial planning and urban development.[50]

Encouraging physical activity through everyday freedoms

Walkable neighbourhoods with a mix of destinations close to residential areas support physical activity and feelings of trust in a community.[51] Proximity of things to do and accessible green areas combined with strolling and bicycle infrastructure are particularly important for children, who are not able to travel as far and as easily as adults.[52] Opportunities for everyday freedoms can be enhanced

Belfast Healthy City

Belfast, UK

7,000 children in Belfast were given the opportunity to explore what they did and did not like about their neighbourhoods and what they would change. Their insights helped form "Children's Voices - A Charter for Belfast" and a report which identified that children's priorities were often the same as those of other groups and that child-friendly actions could work for all ages.[53]

© Belfast Healthy City

The Livable Cities Project in India created attractive and safe routes to encourage walking, cycling and play.

through measures such as strengthened pedestrian networks and intersections (as seen in Barcelona's superblocks), as well as wider pavements/sidewalks and prompts to play and explore in the public realm. Design guidelines and initiatives can support child-friendly active mobility infrastructure by including measures such as protected cycle lanes and footbridges.

Accessible and intergenerational activities

Spaces that are free at the point of access and provide a mix of uses, natural elements and activities away from traffic allow children, families and the community to be more active and spend more time together. Supporting play alongside the needs of elderly people will result in tangible health and wellbeing benefits for the whole community.[54]

The Livable Cities Project in India aims to increase the number of children and families walking, cycling and playing in deprived urban areas by creating active and safe routes to school; accessible parks, playgrounds and beaches; and healthy transportation. Programmes in Bangalore, Nagpur, Thrissur and Malappuram reclaim, protect and maintain park space and implement community solutions to improve

8.1m

living in slums

In India, 8.1m children between the ages of zero and six live in slums, with inadequate access to essential basics.[55]

Children's independent mobility leads to higher levels of physical activity, sociability and improved mental wellbeing.[47]

Policy Studies Institute

80-9%

From 1971 to 1990, the number of UK children walking to school unsupervised decreased from 80% to 9%.[47]

Barcelona superblocks create citizen spaces without compromising the mobility network.

walking conditions. Successes include the redesign of 14 parks, giving 1,400 children access to safe park space close to home and bringing 2,000 people to the streets of Bangalore to cycle, walk and socialise through open street events.[56]

Strengthening evidence for healthier urban environments

Engagement and data gathering at the neighbourhood scale can help to build the evidence base for links between the built environment characteristics, healthy behaviours and health outcomes, as well as to identify priorities for public realm improvements. The Belfast Healthy Cities partnership engaged over 7,000 children and families to identify children's place priorities and actions. These included cleaner, calmer, greener streets and more public spaces. The evidence demonstrated a clear link between place, health inequalities and health outcomes.[53]

There are also opportunities to extract value from existing data, for example relating to the safety of children's everyday routes, areas of child poverty and trends in health and development.

70m
overweight children

By 2025, the number of overweight children is expected to reach 70m globally, compared to 42m in 2013.[57]

91%
of Canadian children

do not get the daily recommended amount of physical activity.[58]

1,400
children in India

were given access to safe parks through the Livable Cities Project.[56]

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Local economy

"Public spaces and parts of cities where families with young children choose to visit signal better than any marketing material that an area is clean, safe and fun! Retail, leisure and business occupiers increasingly recognise that this is good for business."

— Roger Madelin, former CEO of Argent Group PLC (developer of King's Cross Central)

Attracting and retaining a skilled workforce is critical to a city's social and economic future. Cities which offer diverse and accessible activities are attractive and appealing to everyone, including children and families. Combining this with vibrant, playful, mixed-use public spaces can also increase footfall and dwell times.

Attractive and vibrant places for families

Recognising their value in making cities more attractive and economically competitive, both public and private interests are incorporating child-friendly interventions in developments. Cities like Rotterdam and Vancouver have taken ambitious steps to make urban environments attractive to families, retaining skilled workers and driving the local economy.[59] Their planning models considered child-friendly housing, proximate public space for play, location of amenities and a network of safe routes. While such initiatives have succeeded in attracting wealthier and more highly educated families, they should also aim to improve the lives of less affluent residents if they are to avoid exacerbating social inequalities.[60]

Through more than a decade of community consultation, Wesgroup Properties worked with the City of Vancouver and community groups to develop a masterplan vision for a new neighbourhood. The city's aim was to engage all ages in the local community through a variety of partnerships, activities

Darling Quarter

Sydney, Australia

Sydney's Darling Quarter has become one of Australia's most visited destinations, revitalised with a retail, commercial and cultural offer; extensive public parks; good pedestrian connections and an innovative 4,000m^2 playground at its centre, activated day and night through lighting.[61]

Image: © Florian Groehn, ASPECT Studios

Rotterdam turned negative perceptions of the city around by implementing a child-friendly plan.

and events. The private sector-led River District development creates a walkable community through mixed destinations including 25 acres of planned parkland, an elementary school, a community centre, day-care facilities and local businesses, with 35% of housing units suitable for families with children.[62]

Rotterdam invested €15m in the Building Blocks for a Child-Friendly Rotterdam Programme after being named the Netherlands' least attractive city to grow up in, in 2006. The Building Blocks assessed neighbourhoods and made improvements to public space, community facilities, housing and safe traffic routes. The programme is now continuing with a focus on nine neighbourhoods to attract a mix of families.[63]

Saving space and supporting mixed activities

A child-friendly approach advocates the multifunctional use of space and the re-use of existing infrastructure such as school grounds, community hubs and parking lots for neighbourhood activities after hours. This can lead to space savings, increased usage, higher density and better access to services and activities.

A once underused and unsafe industrial area around London's largest transport interchange is being regenerated and promises to become a vibrant new quarter by 2020. Ten public squares, three parks, restaurants and retail space

+US$9

rental value per ft²

Pedestrianisation of a street can add US$9 per square foot to annual office rents based on increased footfall and dwell times.[64]

35%

of housing units

in Vancouver's River District development are suitable for families with children.[65]

King's Cross Central supported diverse activities for more cohesive communities.

are activating King's Cross Central for new and existing residents and visitors. Its connectivity and proximity to a prestigious design school has attracted investment from corporations interested in an innovative and connected environment. The area's diverse mix of residents, employees and visitors provides a self-regulating neighbourhood, reducing management costs such as security. A fountain at the heart of the development in Granary Square provides a space for young and old to meet, sparking exchange, interaction and delight.[66]

Stimulating regeneration through playful interaction

Building on the knowledge and understanding that playful encounters activate spaces, cities and developers can use playful interventions as a means of urban regeneration and to create fun and vibrant destinations. Such solutions must be replicable and scalable, and address built environment challenges for children and families.

From its early stages of development, King's Cross Central incorporated arts programming, urban gardens and an temporary open-air swimming pond to generate outdoor activity. Playful encounters can be built into everyday journeys through interventions that look beyond primary function and foster fascination. Examples include playful bus stops, public art projects such as Greyworld's musical railings, and swinging seating at the Porch in Philadelphia.[67]

4,000m^2
playground
activates the mixed-use development in Sydney's Darling Quarter.[68]

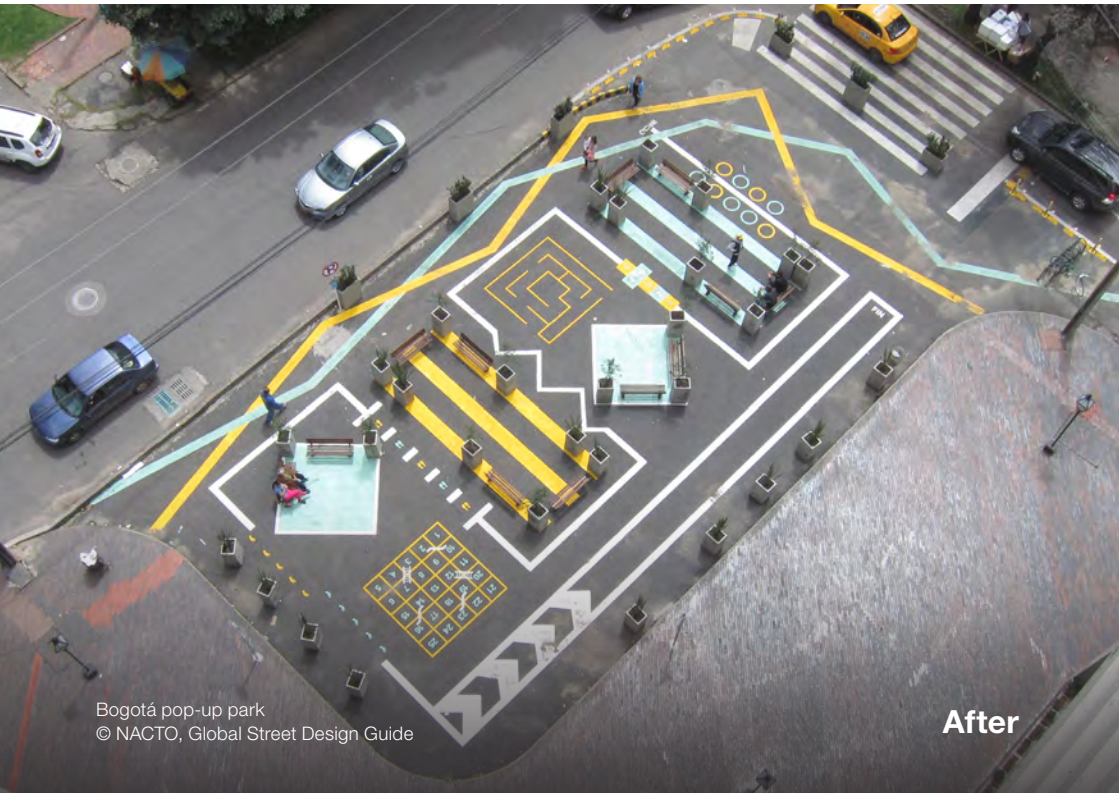
+17%
increase in retail rents
following pedestrianisation, according to a study in Hong Kong.[69]

Case Study

Bogotá children's priority zone

The City of Bogotá is piloting a children's priority zone around a childcare centre in Ciudad Bolívar where interventions will be tested, including traffic calming, wayfinding, play-streets programming, pop-up parks, improved crossings and pavements/sidewalks, enhanced landscaping, social seating and behavioural prompts indicating a child-friendly area. Lessons from the pilot will be integrated into a masterplan with potential to implement interventions around 373 childcare centres in the city and reach a significant percentage of the 0 to 12 population and parents/caregivers.[70]

Before



Bogotá pop-up park
© NACTO, Global Street Design Guide

After

Safety

"The presence of children in public spaces reclaims them for everyone. When public areas are busy with children and families enjoying cultural activities, there is less drug dealing and littering. Public space becomes cleaner and more secure."

— Nayana Brettas, founder of CriaCidade

Traffic, pollution, crime and other hazards are all issues that affect children's everyday freedoms. As children are equal but more vulnerable users of streets, designers have a responsibility to create safe environments for them.[71]

More child-friendly, less car-friendly

Streets free from traffic danger can allow for more active travel, and contribute to a greater sense of community.[72] Questioning and testing the balance and priorities for different user needs encourages a progressive mobility approach to street design, supporting the move from car-friendly to child-friendly. By focusing on quality of life rather than cars, the Global Designing Cities Initiative's "Global Street Design Guide" puts people first. With input from over 42 countries, it aims to set a new international standard by seeing streets as multimodal public spaces rather than movement corridors.[73] Measures can be implemented to increase both actual and perceived safety, for example through traffic calming, active travel networks and multifunctional spaces.

For the last 40 years, the City of Freiburg has undertaken a comprehensive set of long-term land use, transport and engagement strategies aimed at delivering an environmentally sustainable quality of life. To achieve its aims the city has limited cars to walking speed and parking to marked areas by creating shared streets with areas to

Freiburg Green City

Freiburg, Germany

Vauban's streets have been carefully designed to reduce car dominance, allowing residents of all ages to use them for community, nature and play.[74]

Image: © Harry Schiffer

Safe routes between home and school helped reduce traffic fatalities in South Korea.

stay and play. Fully integrated public transport, sustainable drainage systems, and development criteria which favour local residents, older people and families with children have seen Freiburg recognised worldwide as an exemplar green city. The strategy has resulted in reduced car use, increased active mobility and nature-rich space for all ages, prioritising children and the elderly.[74]

Safe and attractive streets for active communities

Enhancements to children's key journeys such as safe routes between home, school and community facilities can reduce traffic accidents and create more pleasantly active journeys. These types of interventions are inherently more accessible and inclusive for a range of users.

Children are more vulnerable to being hit by cars due to their smaller size, their underdeveloped ability to judge speed and their lack of experience and understanding of traffic danger. South Korea's School Zone Improvement Project implemented a series of measures to protect children from traffic accidents by creating safe routes between where children live and their nurseries, schools and other facilities. Between 1988 and 2012, speed limits, clear demarcation of pavements/sidewalks, children's murals to raise awareness and a ban on street parking on the route to school entrances led to traffic fatalities among children falling by 95%.[75]

-95%
child fatalities

South Korea's School Zone Improvement Project reduced children's traffic fatalities by 95% between 1988 and 2012.[75]

No.1
cause of death

In 2015, road traffic injury was the leading cause of death among 10-19yr olds globally.[76]

$100bn
economic cost

The estimated economic cost of road fatalities globally is between US$64.5bn and US$100bn.[77]

The Criança Fala project created cleaner and more secure public spaces with the help of children.

Addressing social fears and raising awareness

Beyond the immediate benefits of improving actual safety, improvements to perceived safety also enable a more enjoyable, welcoming and inviting city. When children are able to freely and safely move around their neighbourhood, parents also have more freedom. This reduces parental stress and time spent on supervision and travel, and gives children the chance to explore and engage with their environment in an unstructured way. Good planning, design and management makes a city act as a family's "backyard", with access to play and recreation spaces, museums and culture, and an extended social infrastructure.

Adults' fears, both for and of young people, can be improved through positive interaction with children, reducing isolation and feelings of distrust. Children benefit from feeling safer in the community and can play a more active role in the places they live.

In a deprived area of São Paulo, many children rarely go out as it is considered too dangerous. The Criança Fala project has transformed public spaces through play and art with the help of children, while encouraging officials to listen to children's concerns. Leaders of municipal departments have received training in child participation, helping to support deeper understanding of the methodology and promoting re-use in other neighbourhoods.[78]

Focus on removing danger from the road environment, not the removal of children from danger.[79]

Policy Studies Institute

The Criança Fala project made **85%** of the children feel they have done something to improve the area, while **74%** of professionals claim to now take children's ideas more seriously.[80]

Instituto para o Desenvolvimento do Investimento Social

Globally, children under 16 are restricted in their independent mobility by their guardians for fear of traffic and strangers.[81]

Case Study

Bicentennial Children's Park, Santiago, Chile

In Santiago, the Bicentennial Children's Park provides a continuous accessible walkway across the city, addressing a deficit of high-quality public space while reconciling the segregation between rich and poor neighbourhoods.[82] Topography was optimised in the design which aimed to balance fun and safe play spaces where children could climb up a long slide or walk to the top of a tree canopy, without being too high from the ground.[82]

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Stronger communities

"Children are the generators of community life."

— Dinah Bornat, architect

Social interaction is essential to health and wellbeing. Where young people have good informal social support networks, they report higher levels of wellbeing.[83] Meaningful positive social contact between community members of all ages helps to build relationships and foster neighbourliness.[84] Whether the public realm feels welcoming, inclusive, accessible and safe influences opportunities for the community to meet and interact. Supporting a sense of ownership, natural surveillance and neighbourhood upkeep in turn contribute to streets and spaces that are safer, cleaner and more inviting.

Where children go, adults follow

The presence of children in the public realm can also positively influence perceptions and motivation to spend time there. Children can help to create sustainable communities by attracting people to a place; adults spend more time outdoors where children are also outdoors, enhancing opportunities for social interaction.[85]

A study of 10 English housing developments found that estates with features like traffic-free pedestrian networks, direct access to public space from dwellings and shared external spaces had the highest levels of observed community activity.[85] Planning and designing for public spaces in new residential areas that are well connected, have good informal surveillance and discourage informal off-street parking and parking on pavements/sidewalks can support this activity.

Housing Design for Community Life

Research study, UK

This research found that external spaces in housing developments in England with the highest levels of outdoor play also had the highest levels of use by adults.[85]

Image: © Hufton + Crow

Public spaces in the Cantinho do Céu Complex, São Paulo have been used to alleviate inequalities.

Interaction between young and old

The creation of sustainable communities can be supported through spaces that facilitate intergenerational interaction, for example, by providing facilities for longer dwell times and a mix of active and contemplative public spaces. Activities that foster exchange, such as community gardening, can also help reduce isolation among the elderly and increase compassion and empathy among the young.

Spending time together for longer

By viewing and assessing neighbourhoods from a child's point of view, the City of Rotterdam reframed how city spaces around social infrastructure were shared, changing schoolyards into neighbourhood squares for the whole community. These parks and squares combine enhanced climate change resilience with opportunities for play, sport, relaxation and gardening. Facilities including places to rest and shelter, toilets, Wi-Fi, water fountains and food outlets encourage the wider community to dwell and enjoy the space. Combining this provision with high-quality playable space and opportunities to socialise close to local shops and services means that children are able to experience everyday urban life as part of the wider community.[86]

People living in walkable, mixed-use neighbourhoods are more trusting than in monofunctional and car-dependent ones.[87]

€15m

investment from the City of Rotterdam in Building Blocks for a Child-Friendly Rotterdam.[88]

Health inequalities in England have been found to decrease with proximity to green areas.[89]

The Trust for Public Land

Banyoles old town public space integrated child-friendly ideas and design sensitive to heritage.

Integrating play into sensitive contexts

Sensitive contexts can still be child-friendly and well used by children and families. The remodelling of public spaces in Banyoles old town in Spain shows how child-friendly interventions can be made while being sensitive to heritage. An award-winning project commissioned by Banyoles City Council saw parked cars removed and utility lines placed underground, making a functional and aesthetically pleasing pedestrianised space.[90] The design opened up the canals for children to enjoy while maintaining the medieval town atmosphere treasured by the community and visitors.[91]

Reconciling urban segregation

Inclusive public space that is free at point of entry is a powerful tool to decrease inequity between different communities. In São Paulo and Santiago, public realm for families and children is a means of reinforcing people's right to the city, reducing economic inequality by integrating deprived areas across the city. The development of the Cantinho do Céu Complex informal settlement was part of São Paulo's Slum Upgrading Programme, which benefited 40,000 families and won the UN-Habitat Scroll of Honour prize in 2012.[92] The project turned a 7km stretch along the banks of the Billings Reservoir into accessible public parks and green networks for residents of all ages to enjoy actively and socially.

Residents of neighbourhoods with common green spaces are more likely to enjoy stronger social ties than those surrounded by concrete.[93]

The Lancet

40,000

number of families

benefitting from São Paulo's Slum Upgrading Programme.[92]

Equality of opportunity in cities can be enhanced by addressing spatial inequality, which determines access to opportunities.[94]

World Economic Forum

© Kongjian Yu, Turenscape

Nature and sustainability

"No one will protect what they don't care about, and no one will care about what they have never experienced."

— Sir David Attenborough, broadcaster and naturalist

Children need nature, nature needs children - cities need both. A connection with the natural world is associated with a range of physical and mental health benefits, including lower rates of obesity, depression, stress and attention disorders.[95] However, the effects of urbanisation, such as deforestation, land take and diminished biodiversity, as well as a tendency for parks to be kept overly tidy, can make it difficult for children to develop and maintain meaningful contact with nature.

Urban green spaces have been shown to particularly benefit the elderly and young, tackling age-related inequality while improving health.[96] Parks and nature can give everyone the sense of being part of a community, and children especially need places they can explore, feel safe and form attachments with both other people and the environment.

Wilder, more creative and flexible spaces

Creating more wild space at local, neighbourhood and city scales allows us to integrate the benefits of natural ecosystems into our everyday lives. The rocks, logs and other materials found in wilder spaces lend themselves to the types of creative and adventurous play essential for developing physical coordination, teamwork and risk assessment skills, while also supporting more reflective and imaginative play. Since these spaces are flexible and adaptable, they have the potential to be enjoyed by everyone: wilder and more natural

Natuurspeeltuin de Speeldernis: Natural and unstructured play

Rotterdam, Netherlands

In a Rotterdam city park, an open space in the forest was transformed into a nature playground, giving inner-city children the chance to make dens, fires and rafts, and to camp out overnight.[97]

© Aardrijk, Sigrun Lobst

Young people learn to care for nature and each other at Natividad Creek Park, Salinas.

spaces close to schools, for example, could be used for outdoor learning, as well as intergenerational activities such as gardening and community events. Planning and design of these spaces should be sensitive to different languages and cultures, encouraging their use by diverse groups.

A sense of belonging for the whole community

Salinas, California, suffers from high crime rates. To help alleviate this, the local community has restored the 64-acre Natividad Creek Park, turning it into a place where young people can go to avoid gangs and violence. While there, children have the opportunity to learn about ecology and take part in intergenerational activities and events, learning to care for both nature and each other.[98]

Time spent in this environment can make children aware of the seasons and natural processes, as well as providing a sanctuary in times of stress. Local green spaces have growing importance for regular contact with nature, and may be more valuable than infrequent visits to natural areas outside of cities.[99] Urban forests and parks are associated with cleaner air and reduced heat stress, while also creating places which are more attractive to live in.[100]

Age- and health-related inequalities have been found to decrease with proximity to green areas.[101]

Design Council Cabe, UK

35k

number of visitors

estimated per year attracted to Natuurspeeltuin de Speeldernis, Rotterdam.[97]

Urban trees and vegetation help decrease stress and aggressive behaviour in cities, and have been linked to crime reduction.[102]

Global Street Design Guide

The Sanlihe River Ecological Corridor in Qian'an City is now a popular gathering place for children.

Connected green infrastructure networks

Nature has become part of children's everyday journeys on the Sanlihe River Ecological Corridor in Qian'an City, China. A heavily polluted 13km stretch of river was transformed into 135 hectares of resilient and ecologically rich landscape for the community. Concrete channels were removed and a system of wetlands created to both clean the water and absorb stormwater. Trees were retained, and native flowers planted. Connecting schools with residential areas via a network of boardwalks, paths and cycle routes, the corridor is now a popular gathering place for children, offering a tranquil environment outside of school hours for both play and study. Engaging artwork, diverse habitats and colourful planting all add to children's experience and their growing connection with nature.[103]

Connected networks of green infrastructure provide an opportunity to create more attractive and natural environments for everyday life.

There is evidence that childhood experiences in nature appear to enhance adult environmentalism.[104]

Wells and Lekies, 2006

Contact with nature has been shown to improve moods and reduce stress, anxiety and levels of attention deficit hyperactivity disorder symptoms in children.[105]

Play in outdoor environments can make a positive contribution to wellbeing across age groups and socioeconomic backgrounds.[105]

The Routledge Handbook of Planning for Health and Well-Being

Hikarigaoka Yosakoi Festival
CC BY 2.0 elmimmo

Resilience

"Cities that meet the needs of children will not only create more resilient children, they will help to create more resilient cities."

— Prof. Claire Freeman and Associate Prof. Paul Tranter

In the face of urbanisation and climate change, we must create environments that cater for positive development and urban experience. These environments are particularly critical in areas of rapid unplanned development and more deprived urban areas where clear connections can be made to residents' health and future opportunities.[106]

Children are uniquely vulnerable to the threats of climate change and urbanisation due to the impact on their development, and those from low-income families are among the most adversely affected.[107] Measures that improve urban resilience can also create opportunities to expand children's everyday freedoms. This in turn can support children who grow up to be more resilient citizens, better able to deal with urban challenges in the future.

Repurposing playable spaces for climate resilience

Cities have shown great initiative in responding to predicted and already apparent climate change by adapting their urban design, for example, through floodable or absorbent public spaces. New York City has shown how utilising and upgrading existing spaces across the city, such as school grounds, helps overcome spatial constraints and unlocks additional community infrastructure. The initiative extends the benefits of ecosystem services to all citizens, including stormwater absorption, reduced air pollution and

Repurposing NYC playgrounds to increase climate resilience

New York, USA

New York is transforming schoolyards into green infrastructure-activated play spaces for the local community that double as stormwater absorbents. These ease pressure on the city's sewer system and protect its waterways from pollution.[108]

© Seth Sherman

Floodable and playful public space planned in Enghaveparken, Copenhagen.

reduced heat island effect. Such interventions can be scaled and applied throughout the city.[108]

In response to severe flooding from heavy rainfall, Copenhagen's city-wide plan seeks to implement 300 adaptive water management projects by 2032. Rather than solely preventing flooding, the plan integrates the excess water and activates urban life. A network of green infrastructure-based surface interventions will transform existing urban areas into multifunctional spaces which store and divert excess water during heavy rainfall. Spaces are designed to function in wet and dry conditions. Cycle paths and sports pitches can, for example, turn into waterways and reservoirs, while bouncy floor panels above underground storage tanks power water pumps to activate nearby water features.[109]

Providing for communities while responding to threats

Ecosystem services and child-friendly design can combine effectively to enhance urban resilience and sustainability. This might include a city's response to threats such as earthquakes and tsunamis. Challenged by earthquakes, Tokyo recognised early on the need for open spaces woven into the urban fabric that provide refuge to its residents in times of disaster. The city's government is building on the tradition of refuge parks with plans to open 185 acres of

+1bn
people globally

By 2060 over one billion people globally will live in cities at risk of catastrophic flooding as a result of climate change.[110]

30–50%
child fatalities

arising from natural events due to greater vulnerability.[111]

In Tokyo, open space has addressed disaster recovery through parks for all citizens.

new disaster-survival parks by 2020. The parks integrate disaster-recovery facilities for large groups of people with urban community hubs and green and public infrastructure. The need for refuge space across the city to accommodate sizeable numbers of people has opened large parts of the city to the public for community interaction, sports and recreation. These places can also help children recover from trauma post-disaster by facilitating play.[112]

In response to flooding, population increase and loss of public realm, Jakarta has committed to a 20% increase in green space by 2030. Through its Green Open Space and Child-Friendly Integrated Public Spaces programme, the city has constructed over 200 parks, with plans to build 3,000 by 2022. The improvements aim to provide access to more attractive, greener environments, with better air quality, libraries, creative studios, and free Wi-Fi, while enabling the city to recover from flooding events in a matter of hours rather than days.[113]

While these initiatives aim to increase city resilience, their design also sensitively integrates with the urban environment and creates opportunities to enrich and expand peoples' experiences and freedoms. A children's infrastructure network offers the opportunity to expand such multifunctional resilience schemes into a city-wide system to benefit both agendas.

43%

of children under five

in low- and middle-income countries are at risk of poor development.[114]

Playful exploration contributes to children's resourcefulness, defined as their ability to navigate to and draw upon physical and emotional resources in times of need.[115]

Play Wales

3,000

child-friendly parks

planned in Jakarta in response to flooding events.[116]

Case Study

Leeds pop-up parks

As part of its drive to improve the public realm and provide more family-friendly space, in 2016 and 2017 Leeds City Council provided temporary pop-up parks in the city centre.[117] In one scheme a road was closed to traffic over the summer and areas were grassed over to create a 900m² park with benches, planters and deck chairs. A survey revealed that 85% of families using the park spent more time in the city centre as a result of the park and 94% said they would be more likely to visit the city centre if there were more, similar spaces.[118]

© Leeds City Council

A catalyst for improving cities

"With their dynamism, energy and new ideas, children demonstrate considerable potential as agents of change."

— Dr. Brian Percy-Smith, Economic and Social Research Council

Cities are complex and ever-changing entities. Highlighting the needs of children - a universal concern - has the potential to act as a unifying theme to navigate challenges and competing priorities, promote progressive ideas and gain support for ambitious actions. Child-friendly urban planning has been an effective catalyst in response to different urban agendas such as road safety, air pollution, sustainable behaviours and supporting an active population.

Reclaiming streets through community action

Around the world, thousands of people are reclaiming residential streets by temporarily closing them to through traffic. "Play streets" provide the space and freedom for communities to interact and show the benefits of streets as places for people not cars. Road closures act as small yet catalytic first steps towards children having the freedom to play outdoors where they live, and they can be scaled throughout the city. In Bristol, London, Adelaide, New York, Toronto and other cities, partnerships between residents, local agencies and municipalities have been formed to take schemes forward.[119] Play streets have also been used to highlight problem areas for neighbourhood road networks and have been endorsed by the United Nations as a solution to the problem of pollution building up outside schools.[120]

Protest for change

Netherlands

400 child road deaths in 1971 triggered extensive protests. The action group Stop de Kindemoord initiated temporary road closures for play, permanent traffic calming and pedestrian and cycle priority over cars.[121] Amsterdam continues to improve walking, cycling, play and sport with design guidelines for the "Moving City."[122]

© Fotocollectie Anefo/Society for the Nationaal Archief

Communities in 143 countries have created playgrounds using free and commonly available materials and tools.

Making use of available resources

Raising awareness, providing guidance and simplifying requirements for bottom-up action can empower the community to implement inexpensive and simple ideas and build social capital. Playground Ideas is a non-profit organisation offering open source playground designs using free, local and commonly available materials and tools. The organisation has supported over 1,885 communities in 143 countries, giving advice on how to build easy, creative and inexpensive play spaces in any context.[123]

Results that overcome resistance

A month-long experiment that converted an inner-city neighbourhood of Suwon, South Korea, into a car-free zone proved successful when residents voted to impose speed restrictions, parking controls and car-free weekends beyond the pilot scheme.[124] The initiative shows how experiments and bottom-up action can turn temporary interventions into permanent solutions and help to overcome resistance to change.

700k

children are estimated to have benefited

from cheap and creative play spaces supported by Playground Ideas.[123]

74%

of professionals

involved in the Criança Fala project claim to now take children's needs more seriously.[125]

Children led the largest political rally ever seen in Tirana, Albania, and opposed adults' resistance to change.[126]

Tirana playground revolution

Children in Tirana, Albania help to shape the city and progress ambitious sustainability goals.

Cities can be both opportunistic and strategic in their approach. Pilots and quick wins are advantageous in gathering political support while effecting change in the longer term, an important factor for elected city leaders. Improving children's infrastructure and policy making is the top priority for the 2015 to 2019 mayoral term in Tirana, Albania. The mayor called on the city's young citizens to instigate behavioural change to progress ambitious sustainable development goals. Children helped to resolve initial resistance from adult residents on initiatives such as car-free days, new parks and play spaces, household recycling and the "clean-up Tirana in a day" initiative. Building on children's sense of ownership and responsibility for their city, Mayor Erion Veliaj introduced a children's council and roles such as official recycling officer for private homes. The children's council ensures that children can take part in decision making and have an active role in shaping their city.[126]

These catalysts support interaction, foster trust and show people from a young age that they have the power and influence to bring about positive change in their community.

If we can create cities in which children are freer to playfully explore their environments, then we are likely to have overcome many of the obstacles to the creation of resilient cities.[127]

Freeman & Tranter

85%

of families

using Leeds pop-up parks spent more time in the city centre.[117]

91%

of respondents

to Playing Out's UK survey agreed that they know more people as a result of play streets.[128]

© SCAPE Landscape Architecture D.P.C. / Ty Cole

A vision for child-friendly cities

"Designing cities for the systems that support the wellbeing and future of children causes us to infuse them with nature; select, educate, house and properly pay superb teachers; build walkable and bikeable neighbourhoods; eliminate environmental toxins; and generate meaningful work for their parents and affordable homes for their families - in short, do everything needed to make a well-tempered city."

— Jonathan F. P. Rose, author of "The Well-Tempered City", founder of Jonathan Rose Companies

In a child-friendly city, children of all ages and abilities are treated with dignity. They are healthy, active, engaged citizens who enjoy freedom to play, explore and socialise in their neighbourhoods. Families can put down roots with room to grow, and parents feel comfortable that children are free to roam outdoors.

Streets and public spaces are welcoming for people of all backgrounds and ages to share and connect through a range of activities and functions. This children's infrastructure network promotes longer dwell times and enables intergenerational activities and positive social contact.

Safe, pleasant and interesting routes between home and key destinations strengthen our connection with nature and promote interactions which nurture trust. This includes an enhanced green infrastructure network, protected bike lanes and walkable pavements/sidewalks.

In this vision, the fabric of the city works with the smaller scale and unhurried pace of children. It provides a mix of uses and destinations, proximate and easily accessed parks and public spaces, and neighbourhoods where children can gradually gain their independence and enjoy what the city has to offer as they grow up.

What one thing would you do to make it easier to walk to see your friends?

"Put their houses closer to mine"

- Child aged 9, San Francisco, USA

Response to Arup survey

If you could change one thing to improve the parks and green spaces near where you live, what would you change?

"I'd like a telescope like we saw in the forest. That would be so good! That way we could see the stars!"

- Child aged 6, Esch sur Alzette, Luxembourg

Response to Arup survey

Recommended interventions

Child-friendly interventions offer an opportunity to improve a city's level of child-friendliness. The ideas presented here include small actions that can add up to high-impact change as part of a children's infrastructure network.

Intergenerational spaces
can become community hubs that increase interaction and exchange between the young and the old.

Traffic measures
such as colourful crossings or shared spaces redefine use and aid driver awareness of pedestrians and street activities.

Pedestrian priority
removes or calms traffic to create a safe environment for everyday street play and socialising.

Community gardens
provide opportunities for intergenerational activities, socialising, skills development and outdoor physical activity.

Neighbourhood mapping
led by children, provides deeper insights into an area's issues and opportunities.

Play streets
temporarily closed to through traffic allow communities to use the space while reducing air pollution and traffic danger.

Playable spaces
look beyond basic design functions, take a balanced approach to risk and provide facilities for families to spend time together for longer.

Multifunctional green infrastructure
caters for multiple purposes, such as stormwater parks that enable play in both flooded and dry conditions.

Sense of ownership
of public space through co-creation and increased activity can help to decrease vandalism and maintenance costs.

Playful encounters
such as public art or creative bus or tram stop designs invite playful interaction as part of everyday journeys and activities.

Cultural and heritage spaces
can become assets for inclusive and playful city life when combined with sensitive conservation.

Wild spaces
are flexible and adaptable areas that reactivate vacant or underused plots and bring nature back into the community.

Construction sites
can become engaging places and educational assets for the local community, e.g. by hoarding design that makes works visible.

Multi-use community spaces
make smart use of space around schools, and other community facilities and enable out of hours use.

Case Study

Child-friendly city advisors

Child-friendly advisors communicate and coordinate across city agencies and programmes, identifying common projects and developing efficiencies to address the needs of children, youth and families. Examples include Tirana's Child Policy Director, who provides technical expertise on child-friendly investments, risk and gaps in provision and projects, and the New York City Children's Cabinet, which draws together 24 city agencies and mayoral offices. The cabinet has developed indicators to identify programme gaps and to better align investment and policies that meet children's needs.[129]

© Owen Myers, Arup

Child-friendly urban planning

"Unfortunately, most cities have not prioritised children in their planning and design. We should move beyond designing our cities for the 30-year-old athletic person and think about the needs of our most vulnerable users: children, older adults and the poor. We can and must provide safe, playful and stimulating everyday experiences for the child in the city."

— Gil Penalosa, founder and chair of the board 8 80 Cities

The various research, ideas and global benchmarks discussed in this report indicate a set of key principles for successful child-friendly urban planning. Firstly, a child-friendly approach should be integrated into the planning, design and management of projects. Embedding the approach consistently in each stage will encourage maximum impact and longevity.

As well as seeking a wide range of partners, disciplines, industries and funding streams, child-friendly planning should also emphasise co-creation: built environment solutions developed through engagement with children, parents/carers and the wider community will be richer, while the process itself will directly benefit those who participate.

Child-friendly planning must also be evidence-based and user-centred. Considering and understanding the context from a child's perspective will generate solutions that are innovative and fit-for-purpose. Lastly, monitoring and evaluation of initiatives – at any scale – are vital to learn lessons and provide the evidence for continued change.

The complex links between city functions and agencies mean that the responsibility for these principles needs to be shared across different actors and disciplines. Strategies should move away from addressing children's needs primarily through playground provision to an integrated approach that can deliver the full range of streets and spaces needed for a successful children's infrastructure network.

A strong child-friendly approach integrates disciplines across environment, planning, transport, public health, culture and sport, and offers mutual benefits.

Harnessing political support

Ghent, Belgium

The City of Ghent's vision and action plan to become a child- and youth-friendly was one of the few policy documents that has been approved by all political parties.[130]

© Visit Gent

Case Study

Risk/benefit assessment:
Promoting a balanced approach to playground safety

Ensuring the safety of public playgrounds has been a concern since they were first built over 100 years ago. However, a preoccupation with safety - often driven by worries about liability and litigation - has in many cases led to unexciting playgrounds and poor use of public money. In the UK children's play organisations, designers and others have worked with safety and public health agencies to develop a more balanced approach to playground safety: risk/benefit assessment. As a result, British playgrounds have become notably more challenging and adventurous - and risk/benefit assessment is spreading to Australia and Canada, amongst other countries.[131]

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The role of co-creation

Child-friendly urban planning should engage children, parents/caregivers and the wider community in co-creation early in the process and on their own terms. Engagement must be age appropriate, creative and fun. Co-creation processes should make the most of existing community activities and outcomes from engagement already undertaken.

Children's outcomes that build support

The rationales, approaches and outcomes for co-creation will differ according to context and stage of the development process. The Growing Up Boulder initiative in Colorado works in partnership with local government, community and businesses to reflect children's rights in local policy, laws, programmes and budgets. The longevity of the project - eight years - has helped child-friendly principles to become embedded in the city's planning: four city departments now contribute funding and staff time to the initiative. Outcomes are also becoming more visible in the city and most new projects implement participants' suggestions, for example, the inclusion of children's ideas in the city's transport masterplan.[132]

Involvement in all project phases

Construction phases can provide benefits for children such as skills development, teamwork and opportunities to design and build. For example, a construction project to transform a former eco-classroom into a new play structure and performance space, dubbed "The Whaler" at Somerford Grove Adventure Playground, involved 30 children and young people over school holidays. It benefited local children in a deprived area of London, who collectively achieved something they never imagined they could do, while learning vocational and life skills in the process.[133]

200+
children and youth
contributed to the redesign of Boulder's Civic Area as part of Growing Up Boulder.[132]

4
city departments
contribute funding and staff time to Growing Up Boulder.[132]

6,700
square metres
of unused space between highways were transformed to create Westblaak Skatepark.[134]

Growing Up Boulder engages children of all ages and abilities in the local issues they care about.

Public spaces that are respected, well used and clean are important to a sense of ownership. Co-creation can also support operation and ownership of public spaces and build social capital for their maintenance, helping to ease management duties. Involving skaters throughout the planning and design process of Rotterdam's Westblaak Skatepark, and in its maintenance and management after completion, has established a joint sense of responsibility amongst users that underpins its function.[134]

Innovative ways of understanding children's needs

Mapping and monitoring the things that matter to children as part of their everyday journeys has highlighted issues and prioritised improvements to street environments, helping to make them more accessible and liveable.

Creative use of technology can improve understanding of children's concerns and perspectives. In Oslo, the Traffic Agent app gamifies the collection of real-time road safety data, helping improve the city's walking infrastructure and provide reassurance to children and families on their walk to school.[135] The City of Oslo invested €347,000 in the development of the child-friendly app, which casts its primary school-age users in the role of secret agents, encouraging them to report on concerns like heavy traffic, a difficult pedestrian crossing or problems seeing road signs.

5,790
reports

and 2,402 trackings logged by children since the launch of the Traffic Agent app in 2015.[136]

85m
slum dwellers in India

potentially benefiting from perspectives from the child-led mapping project.[137]

Planning

Rationale: Understanding challenges and opportunities, supporting constructive debate
Approach: Active, child-led walking tours; photography; study trips
Outcomes: Strengthened evidence base, shared vision, informed policies, raised aspirations

Design

Rationale: Idea generation, early buy-in, improved designs
Approach: Creative, hands-on, drawing, making, play-based activities
Outcomes: Sense of identity, attracting users, community ownership

Construction

Rationale: Impact mitigation, skills development, improved relations
Approach: Educational, informative and interactive, embracing challenge
Outcomes: Social interaction, learning and development, decision-making

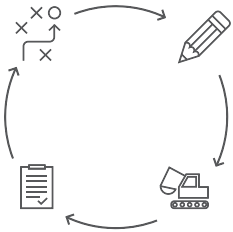
Management

Rationale: Encourage use, social interaction, ownership of a space, attract people
Approach: Social, active, play-based, tactical urbanism
Outcomes: Self-regulating space, social capital, monitoring and reporting, activity generation

The app has already led to several interventions, including rebuilt crossings and improved pavements/sidewalks.[136]

Low-cost and accessible co-creation

A child-led mapping and improvement initiative uses children's hand-drawn maps of their local communities to highlight problems in India's slums, providing new perspectives and helping to improve the lives of India's 85m slum dwellers.[138] In contrast to other technology-led mapping programmes, the use of hand-drawn maps makes the process accessible to all, and its focus on children gives a voice to a group that would otherwise be overlooked. The maps highlight issues of safety, sanitation and access in routes, spaces and areas that they use. Anecdotal evidence suggests that the maps, and the problems they illustrate, are being taken seriously by local officials.[137]



The table above gives suggestions for what the different reasons, methods and results might be when working with children at each stage of development.

Actions and opportunities

The actions set out on the following pages invite actors to be both opportunistic and strategic to improve existing and new urban environments. Big change is possible through small, coordinated interventions, scaled-up and adapted to different contexts.

Actions should be underpinned by engaging and empowering stakeholders to better understand and align with children's needs and perspectives. Insights and impacts from successful child-friendly interventions should be explored, shared and incentivised, for example through networks, knowledge-sharing platforms, study tours and awards.

As an emerging field, child-friendly urban planning has the potential to test and trial innovations. These can act as catalysts or demonstrator projects, particularly for innovative or resisted projects, to address any emerging trade-offs and influence policy reform. When implementing actions, actors should respond and adapt to local development constraints, pressing agendas and policy priorities for a city.

Differentiator for urban agendas

Bhubaneswar, India

The child-friendly element of Bhubaneswar's smart-city bid for support was the deciding factor for India's Smart Cities Mission and put it first in the rankings.[139]

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City leaders and policy makers

Cities ultimately aim to provide a good quality of life for people of all ages. The actions for city leaders and policy makers aim to aid understanding of how child-friendly a city is and to build links with urban policy priorities.

City leaders and policy makers should engage the community in constructive debates about children's wellbeing and freedoms in the city, building a shared vision and harnessing the potential of community action to monitor and report problem areas.

Developers and investors

Developers and investors aim to create sustainable communities and vibrant destinations with a recognisable identity that can attract and support greater use, footfall and spend. These actions can help to make developments more attractive, adapt to changing needs and facilitate flexible use and efficient management.

Developers and investors should explore co-creation opportunities to tap into and build local knowledge, mobilise social capital, create a sense of identity and ownership, and ease management and maintenance.

Built environment professionals

Built environment professionals often need to mediate between different interests when developing integrated and multifunctional solutions. Actions involve taking a child's-eye view of planning, design and management which can help to find creative responses to city and development challenges.

Built environment professionals should engage communities to develop more creative and informed ideas, to support community action and intervention in problem areas and to raise aspirations and demand for child-friendly cities.

Actions and opportunities

The diagram above sets out a palette of actions that can be adapted to the progress, resources and aspirations of cities. These include **first steps** to kick-start change, simple and effective **quick wins** that can help to gain support, actions to **scale up** projects to the city level, and suggested **review** procedures.

First steps

Quick wins

Scaling up

Review

City leaders and policy makers

1 **Appoint a child-friendly champion** to advise civic leaders and facilitate action across departments and disciplines. For example, select a voluntary ambassador or integrate child-friendly responsibilities into existing roles.

2 **Simplify requirements and regulations** to support existing and facilitate new community and tactical initiatives.

3 **Integrate child-friendly criteria into procurement processes** so that child-friendly value is integrated across projects and considered from the outset.

4 **Implement a children's infrastructure policy** including projects and programmes serving needs at the neighbourhood scale and improving children's key journeys, for example space standards, road-user hierarchies and enhanced green infrastructure networks.

5 **Map, monitor and measure everyday freedoms** and children's contexts at the neighbourhood level with robust baseline data and child-friendly indicators that reflect local context, and make performance publicly available.

Developers and investors

6 **Adopt inclusive and flexible management strategies** that serve playful and spontaneous behaviours and interaction, including programming and activity planning.

7 **Explore funding** and delivering child-friendly interventions through **corporate social responsibility (CSR) requirements.**

8 **Enhance construction phases of development**, for example by encouraging interaction with adjacent streets and creating opportunities for children's skills development.

9 **Look beyond the development boundary** to consider improvements to children's infrastructure networks to and from mixed-use development destinations.

10 **Incorporate temporary events** as part of programming and activity planning and support existing community activities in the public realm.

Built environment professionals

11 **Look beyond the basic design function** for the child-value of every intervention, increasing opportunities to build playful behaviours and freedom to explore into everyday life.

12 **Explore innovative and creative approaches to design and management of playable spaces**, and support a balanced approach to risk and wildness, for example through risk/benefit assessment.

13 **Transform outdoor institutional settings** into multi-use neighbourhood spaces for the community, for example around schools, sport/recreation and health facilities.

14 **Design walkable and green environments** that facilitate longer dwell times, increase actual or perceived safety and cater for the different scales, roaming ranges and activities of different age groups in an integrated way. For example through traffic calming, seating and toilets, and a mix of active and contemplative spaces.

15 **Recommend evidence-based policies, guidelines and indicators** that integrate child-friendly considerations across planning, design and management.

Economic

Possible priorities

Retention of families
Placemaking
Equity and reduced deprivation

Suggested indicators

- City migration by age band
- Net migration of children and families
- Presence of children in the public realm
- Land and property values
- Availability and accessibility of activities and services
- (Child) health inequalities
- Deprivation indicators
- Intergenerational activities

Social

Possible priorities

Preventive healthcare
Safety and reduced crime
Road safety and active travel

Suggested indicators

- Levels of reported anti-social behaviour
- Reported crime
- Road traffic accidents
- (Child) pedestrian casualties
- Active travel mode levels
- Children's use of public transport
- Physical activity levels
- Prevalence of health conditions
- Levels of environmental pollution

Environmental

Possible priorities

Ecosystem services
Climate and disaster resilience
Liveability

Suggested indicators

- Congestion
- Levels of footfall
- Use of space
- Air quality
- Flood soakaways
- Area available for disaster relief
- Value of green infrastructure
- Mental health
- Commute times

Political

Possible priorities

Active citizenship
Sustainable behaviours
Building consensus

Suggested indicators

- Number of community groups and initiatives
- Votes and referendum results
- Leadership popularity polls
- Child engagement in decision making
- Co-created spaces
- Cross-party-political sign up
- Number of volunteers
- Funding across city functions and agencies
- Dwell times and spend

Indicators

Potential indicators to evaluate the impact of child-friendly urban planning

Measuring success

Successful cities are cities where children of all ages are active and visible in the public realm. The amount of time children spend playing outdoors, their ability to get around independently and their level of contact with nature are strong indicators of how successfully a city is performing, not just for children but for everyone.

Measuring and evaluating child-friendliness can help to show a city's quality of life and can help to prioritise investment in children's infrastructure. These assessments can contribute to a growing evidence base of the built environment interventions that support healthy and child-friendly cities, helping to make links between healthy behaviours and health outcomes.

Interdisciplinary metrics and indicators help to make links with a city's urban policy priorities. The table opposite suggests potential indicators that could be adapted to evaluate the impact of child-friendly urban planning.

Child-friendly urban planning holds the potential to integrate objectives and coordinate work across departments and policy areas. Building capacity within existing teams and funding streams can support progress in child-friendly interventions even at times of fiscal austerity.

Healthy Streets for London

United Kingdom

Transport for London has adopted a healthy streets approach to encourage Londoners to use cars less and walk, cycle and use public transport more. Ten indicators measure what makes streets attractive, enabling local government to implement interventions in their own way to suit their local context.[140]

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Leading the way

"At its most fundamental level the debate is about the quality of the environments we wish to bring up our children in and how we enable them to flourish."

— Policy Studies Institute, "Children's Independent Mobility"

Seeing a city from children's perspective shines a light on how the urban environment could be improved, both now and for future generations.

The ideas and insights presented in this report highlight opportunities to create healthier and more inclusive, resilient and competitive cities for people to live, work and grow up in.

Child-friendly urban planning is an emerging idea, and our understanding of what works for children and for everyone is still developing. We can be both opportunistic and strategic in improving existing and new urban environments through all lenses of city making. Harnessing political will, testing interventions through pilots and demonstrators, and being creative in approaches to make use of the evidence, resources and capabilities available to us will help us make better choices for child-friendly environments.

We are at a critical moment in the evolution of cities. How we treat our children today is how we will be remembered in the future. The questions that we ask, the choices that we make and the leadership that we show to create better neighbourhoods and cities for children now will shape the lives of urban citizens for many generations to come.

"If I could change one thing to improve the streets near where I live, I would ban cars so children could play outside on the street."

- Child aged 9, London

Response to Arup survey

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Acknowledgements

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Samuel Williams
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Felicitas zu Dohna

Expert advisor
Tim Gill

Arup contributors
Tom Armour
Tessa Colclough
Matt Dillon
Jerome Frost
Finola Glynn
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Josef Hargrave
Paul Jansen
Tim Jarvis
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Aude Matard
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Andrew Tempany
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Project Manager
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Graphic design and illustration
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Clare Lavelle
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Copy Editor
Tom Butler
Jesse Vernon

Thank you to everyone who took part in the Arup workshops, surveys, events and forums, and who provided insights on child-friendly case studies around the world.

External contributors
Ben Addy - *Sustrans*
Jens Aerts - *Unicef*
Kars Alfrink - *Hubbub*
David Altabev - *Nesta*
Phillippa Banister - *Sustrans*
Corinne Bass - *A New Direction*
Dinah Bornat - *ZCD Architects*
Nicola Butler - *Play England*
Michael Chang - *TCPA*
Pia Christensen - *University of Leeds*
Riccardo Luca Conti - *Catalytic Action*
Christopher Cook - *Boston Parks and Recreation Department*
Rebecca Cox - *Living Streets*
Joana Dabaj - *Catalytic Action*
Amica Dall - *Assemble*
Rosie Dalton-Lucas - *Public Health Southwark*
Paul de Zylva - *Friends of the Earth*
Michael Delfs - *British Land*
Victoria Derr - *California State University*
Skye Duncan - *NACTO*
Houssam Elokda - *Happy City*
Alice Ferguson - *Playing Out*
Marta Fernandez - *RMIT Europe*
Sue Finch
Helen Forman
Mathew Frith - *London Wildlife Trust*
Natalie Ganpatsingh - *Intelligent Health*
Jan Gehl
Dr Elizabeth Grant - *RIBA*
Marcus Grant - *Cities & Health*
Mike Greenaway - *Play Wales*
Jay Griffiths - *Author*
Helen Griffiths - *Fields in Trust*
Kate Halahan - *Trees for Cities*
Darell Hammond - *Founder of KaBOOM!*
Phin Harper - *Architecture Foundation*
Hennie Haworth
Dominic Higgins - *Wildlife Trust*
Paul Hocker - *London Play*
Dr Jussi Holopainen - *RMIT*
Jane Houghton - *Natural England*
John Howie - *NHS Scotland*
Marguerite Hunter-Blair - *Play Scotland*
Mary Jackson - *Learning through Landscapes*
Margaret Kernan - *ICDI*
Liz Kessler - *Rethinking Cities*
Richard Lambert - *Living Streets*
Sigrun Lobst - *AARDRIJK*
Roger Madelin - *British Land*
Marion McFadden - *Enterprise Community*
Andrew McMullen - *Lego Group*
Bruce McVean - *Transport for London*
George Monbiot - *Writer*
Charles Montgomery - *Happy City*
Nicola Murphy-Evans - *Greater London Authority*
Amanda O' Rourke - *8 80 Cities*
Jacqueline O'Loughlin - *Playboard Northern Ireland*
Dolly Oladini - *Greater London Authority*
David Pallash - *Lego Group*
Itai Palti
Tom Platt - *Living Streets*
Cath Prisk - *Project Dirt*
Caspar Rodgers - *alma-nac*
Lucy Saunders - *Transport for London*
Prof. Klaus Schwab - *World Economic Forum*
Leni Schwendinger - *NightSeeing*
Mark Sears - *The Wild Network*
Giselle Sebag - *Center for Active Design*
Ben Shaw - *Policy Studies Institute*
Kate Sheldon - *Trees for Cities*
Robin Sutcliffe
Geoff Thompson *MBE FRSA DL*
Julia Thrift - *TCPA*
Paul Tranter - *UNSW Canberra*
Susanne Tutsch - *Erect Architects*
Marcus Veerman - *Playground Ideas*
Adrian Voce - *European Network for Child Friendly Cities*
Patrin Watanatada - *Bernard van Leer Foundation*
Holly Weir
Adam White - *DaviesWhite*
Helen Woolley - *University of Sheffield*

For Theo & Ivy

"Children need the opportunity to explore their neighbourhoods, to dream up their next adventure, to build dens, to feel free in nature, to overcome physical and emotional challenges. It's vital that the cities we build give children a chance to do these things, or else we all lose out."

— Tim Jarvis AM, Arup consultant, adventurer, environmental scientist

"I believe a city that is designed for people of all ages and abilities, including children, will truly be an inclusive city that will meet the needs of all its citizens and make it more liveable."

— Prof. Klaus Schwab, founder and Executive Chairman, World Economic Forum

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