

# Children's 20-minute Neighbourhoods

A review of available literature



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# Executive summary

Twenty-minute neighbourhoods are recognised globally as a good way to improve liveability and reduce car travel by having most of what you need close by. Currently policy and guidance rarely consider the needs of children in these neighbourhoods beyond provision of playparks and schools. So what would a child-friendly 20-minute neighbourhood look like? We reviewed the research relating to children's needs in terms of urban environments, outdoor spaces, streets and local travel to build an evidence-based answer to that question.

The review highlighted the importance of **listening to children and including their needs in the planning process**. Children are diverse and it is vital to consider all ages and stages, from new-borns and their carers to teenagers.

**It's not just destinations that are important, but the streets and spaces in between.**

Education and opportunities for play are well recognised child-specific needs, however, provision of good quality schools and well-designed playparks are not the only ways to meet these needs. Opportunities for play and learning can be incorporated into streets and public spaces, enhancing everyday journeys.

It is clear from the review that **twenty-minute neighbourhoods have the potential to play an important role in reversing the decline in children's independent mobility** (travel and play without adult supervision). This decline is a concern as independent mobility is linked to healthy child development and increased physical activity.

The evidence shows that **proximity and safety are key** to supporting independent mobility. Simply put, things need to be closer to home and access routes designed from a child's point of view to ensure they are safe. For teenagers, close proximity to affordable public transport is key to supporting their independence and access to opportunities and experiences further afield.

The latest guidance shows that **by considering the needs of children, we end up with urban spaces and streets that tend to work better for other vulnerable users** (including the elderly and those with disabilities that affect mobility) as well the rest of society.

# Introduction

The needs of children are invariably left out of traditional urban planning policy. By considering explicitly the needs and desires of children, this report explores how good urban design can be more inclusive.

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## Twenty-minute neighbourhoods

A 20-minute neighbourhood is one where most of what you need – schools, shops, health services and more – is located so you can walk there and back from your house in 20 minutes. The aim is to reduce the need for car travel and improve liveability by having what you need close by. It is predominantly an urban phenomenon, where amenities and housing tend to be more concentrated. Walkable neighbourhoods are being adopted by cities all over the world, from 20-minute neighbourhoods in Portland, Oregon, USA and Melbourne, Australia, to Paris' 15-minute city and Barcelona's "superblocks" (O'Sullivan, 2020). The Scottish Government's 2020 Programme for Government also supports the idea of 20-minute neighbourhoods, "where people can meet their needs within a 20 minute walk from their house - enabling people to live better, healthier lives and supporting our net zero ambitions".

What constitutes a neighbourhood and the spatial definition of such a neighbourhood are varied (Macklon, 2020). This review uses the definition of a 20-minute neighbourhood provided by Sustrans (2020a); "one that allows residents to meet most of their needs within a 20 minute round trip by foot." Based on the typical walking speed of three miles per hour, this translates to 1 mile or 1.6km for a return journey, meaning that the neighbourhood is a 800m diameter circle (Sustrans, 2020a).

In addition to the services available, the ability to navigate a neighbourhood by walking or cycling is also of importance. Building and street network density, as well as street layout and any severance such as major roads or rivers should also be considered (Macklon, 2020). Krishnamurthy (2019) also points to consideration of the social, economic and political realities of the neighbourhood. While the requirements of the physical environment (in the form of shelter, greenspace and so on) are more obvious, social and cultural factors can also influence behaviours and available activities (Krishnamurthy, 2019).

The key destinations to be included within a 20-minute neighbourhood – food retail, education, health services (pharmacy, GP, dentist), financial services (post office, bank), open space, employment, entertainment, affordable housing, and public and active travel<sup>1</sup> infrastructure – are key to the lives of both adults and children (Sustrans, 2020a). However, the needs of children, beyond those shared by people of all ages, such as food and shelter, have rarely been explored (Stafford & Baldwin, 2018).

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## Children and urban planning policy

It is important that we don't ignore children in our urban planning. The UN estimates that by 2050 around 70% of the world's population will live in cities, and the majority of those urban residents will be under 18 years old (UNICEF, 2012). Children under 14 made up more than 18% of the UK's urban population in 2014, meaning nearly a fifth of our population is routinely not being considered in urban planning (ONS, 2021). Not only can building with children in mind create a safer, more pleasant place for young people to thrive, but it also strengthens the economy by keeping families in the city (Colophon, 2010).

*“The state of children is a very sensitive barometer to the effects of social environmental, economic and other changes.” (UNICEF, 2004, p5)*

Urban planning policy in the UK shows little focus on children and children's needs, but recent developments show a move in the right direction. Welsh towns have a duty to ensure sufficient play opportunities (Gill, 2017), and the Mayor of London released Making London Child-Friendly in late 2019.

*“...it is important to avoid the huge costs to society of not attending to children: governments know from research beyond doubt that what happens to children in the early years, within the family, within other forms of care, and even before birth in the womb, significantly determines their positive, or negative, growth and development. This, in turn, determines their cost or contribution to society spread over the rest of their lives.” (UNICEF, 2004, p5)*

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<sup>1</sup> Active travel generally includes walking, wheeling and cycling. Wheeling is defined as using a wheelchair or mobility scooter. Scooting and skating may also be included.



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## Places for children are places for all

*“Children are a kind of indicator species. If we build a successful city for children, we will have a successful city for all people.”* Enrique Penalosa, former mayor of Bogotá

One argument for designing our neighbourhoods to meet the needs of children is that in doing so, we meet the needs of all people. By creating spaces which work for children, cities can improve mental and physical health, build stronger communities, increase social interaction, stimulate the local economy by retaining families, address road and social safety, and improve individual and climate resilience (ARUP, 2017).

*“Streets that are designed with the needs of children and caregivers in mind better serve everyone using them, from older adults to people with disabilities to able-bodied people”* (NACTO, 2020).

Projects such as 8 80 Cities<sup>2</sup> are driven by the principle that if a place works for our youngest and oldest (arguably amongst the most vulnerable in society), then it works for everyone. In comparison to adults, young children move more slowly and require more rests, so places to stop and rest are important, in the same way they are for older adults (NACTO, 2020). The wide, smooth pavements required for buggies and skateboarding also work for wheelchairs (Mintzer, 2018). The needs and preferences of older adults in terms of cycling are the same as for children and parents; that is to say, safe, segregated, wide, even-surfaced, and well connected cycle paths, with safety being the main concern (Van Cauwenberg et al., 2018). Teenagers and children desire better and more affordable transport to maintain their independence when they cannot access cars, a desire shared by the elderly who can no longer drive but wish to live independently (Mintzer, 2018).

The Urban 95 initiative, which asked what urban designers would change if they could experience a city from 95cm, the average height of a three year old, maintains that if somewhere is safe, clean and interesting enough for babies, toddlers and their caregivers then it's likely to work for everyone (Urban95, n.d.).

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<sup>2</sup> <https://www.880cities.org/>

# Literature review

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## About this review

The aim of this review was to collate and summarise what has currently been written on 20-minute neighbourhoods for children with a focus on identifying how the needs of children differ from those of adults. The review was a web-based literature search and included both academic and 'grey' literature. Given the lack of specific research on 20-minute neighbourhoods for children, this review has focused on children's needs with reference to urban environments, outdoor spaces, streets and local travel. This included following relevant references from those found via searching. Approximately 12 days were spent finding and reviewing the literature and writing this report.

The sections below were chosen iteratively after engaging with the available literature. First, the diversity of ages and stages encompassed by the term 'children' is set out, before looking at what they require from a neighbourhood: housing, opportunities for physical activity, play space, nature, social interaction, safety and education. Current evidence of what children ask for from their neighbourhood is summarised before moving on to how children might access these facilities by considering the importance of travel and independent mobility. Finally, the available guidance on child-friendly urban design and the importance of consultation with children is considered.

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## Children – definition, age and stage

Children are a diverse group, from new-borns to 18 year olds, encompassing a huge array of development stages, all with different needs (United Nations, 1990). When considering what children require in a 20-minute neighbourhood, it is important to consider their age and developmental stage. The following breakdown is based on NACTO's (2020) Designing Streets for Kids guidance.

Infants (aged 0-1 years) are fully dependent on their parents to move around the neighbourhood. Infants are often pushed in wheeled vehicles (pushchairs, prams) so smooth, even surfaces are key.

Toddlers, or pre-schoolers, (aged 1-3 years) are still dependent on parents or guardians but like to walk short distances and are curious about their surroundings. Frequent places to rest



and objects to stimulate young children's brains – colours, patterns and textures – are useful here.

Nursery-age children (3-5 years) can scoot, cycle and run, and often insist on independent movement but tire quickly. Good public transport networks help with longer journeys, and smooth surfaces can minimize trips and falls.

Primary school children (age 5-13) have increasing independence as they age. The journey to school, whether with caregivers, with peers, or alone, is a key journey. Towards the end of this age bracket, children can walk or cycle independently in low-traffic areas or segregated cycle tracks, and can cross streets. This group has the most variance in independent mobility but the allowance of freedoms is dependent on culture, the local area, parents' views, and the children themselves, making it difficult to say when each stage will be met.

Adolescents, or secondary school children (13-18 years), tend to travel alone or in peer groups, rather than with parents or guardians. They require safe pedestrian, cycle and public transport networks and gathering spaces independent from the playgrounds usually reserved for younger children.

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## Needs of Children

During the literature review a number of essential neighbourhood requirements for healthy childhood development were identified. The needs of the child included in this section are those most often highlighted and discussed in the literature on urban childhood.

### Housing

Shelter is a fundamental need for everyone. Checklists for 20-minute neighbourhoods generally include a range of affordable housing options to suit different needs and income brackets (Badland et al., 2019; Macklon, 2020). In the building blocks for a child-friendly Rotterdam, they go further by stipulating a number of requirements for apartments to be suitable for children, and stating that houses with gardens are best (Colophon, 2010). These requirements include: a minimum floor area (85m<sup>2</sup>), a room for each child, street access, a lift, private and communal outdoor areas, and communal playgrounds in larger apartment blocks (Colophon, 2010).

In Boulder, Colorado, USA children were invited to give their recommendations for child-friendly city housing as part of the Growing Up Boulder project. Recommendations ranged from colourful buildings and gardens to community centres and flood mitigation (Derr & Kovács, 2017). Table 1 shows some of the recommendations given by the children, split by

school stage (Derr & Kovács, 2017). What these children are telling us is they want a safe, walkable or cycle-able neighbourhood with most of what they need – in essence, a 20-minute neighbourhood.

**Table 1: Student recommendations for dense, affordable housing (adapted from Derr & Kovács, 2017)**

Elements	Primary school	Both	Secondary school
<b>Natural</b>	Animals, hills, fruit trees	Gardens, diverse and abundant vegetation	More wild spaces
<b>Play and recreation</b>	Water plays	Play equipment, picnic and gathering areas, nature play, indoor and outdoor recreation facilities	Hang-out spaces
<b>Sustainability</b>	Play, recycling centre, roof garden, solar panels, water efficiency	Flood mitigation, cycle and walking paths, alternative transport options	
<b>Mixed use</b>	Pet care	Coffee shops, community centres, ice cream shops	Affordable teen hangout spaces with food
<b>Housing</b>	Apartments, co-housing, single family homes, townhouses	Colourful buildings	Two-to-four stories, front and back yards, underground parking
<b>Safety and health</b>	No smoking, safety from cars, opportunities for exercise	Clear separation of bikes and cars, personal safety	

## Opportunities for physical activity

Physical activity is necessary for physical health and reducing obesity. Children are twice as active away from home than they are at home (Mackett et al., 2005). As James Sallis tells us, “the best predictor of preschool children’s physical activity is simply being outdoors... [and] an indoor, sedentary childhood is linked to mental health problems” (Louv, 2010). A study by Mitchell et al. (2016) found that park space and the availability of multi-use paths influenced children’s non-school physical activity. Additionally, children are more physically active in unstructured activity than structured activity (by roughly 50%), and are more active when they have walked to an activity (Mitchell et al., 2016). In short, children’s physical activity can be increased simply by ensuring there are safe, accessible places to play and move.

## Play

Outdoor play is important for growth and physical activity in children, providing developmental opportunities and benefits in short supply elsewhere (Kemple et al., 2016). Outdoor play has also been linked to improved self-control and focus as well as social and cognitive development (Kemple et al., 2016). Well-designed and accessible playgrounds are an important neighbourhood resource often offering a safe environment and play equipment not found elsewhere, as well as opportunities for both children and carers to interact (Smoyer-Tomic et al., 2004). Given the importance of risky play (Brussoni et al., 2015), ARUP (2017) recommend a balanced approach to playground safety, using risk/benefit assessment to enable challenging and adventurous playgrounds. However, play doesn't have to be confined to a playground – opportunities for play can arise anywhere within a city, from vacant lots to bus stops (ARUP, 2017).

*“We need to provide invitations to play at every opportunity, using the spaces children pass through, topography and nature, moving the focus beyond ‘play equipment surrounded by a fence’” (Gill & Russell, 2020).*

Stutzin (2015) contrasts the playgrounds of Dutch Aldo van Eyck and his contemporary, American Robert Moses, both creators of hundreds of playgrounds in the mid-1900s. Where Moses produced the large, prescriptive, fenced playgrounds of New York, van Eyck gave Amsterdam public spaces, each uniquely designed for the space it inhabited, with abstract playscapes unbound by rules and encouraging creativity. Van Eyck's initial project, a single play space in Bertelmanplein, was so successful that residents began to demand similar interventions in derelict spaces in their own neighbourhoods. Through the use of simple elements such as sand pits and climbing apparatus, arranged to reduce the need for additional security or fences, van Eyck created multi-use spaces to stir the imagination. The integration of van Eyck's playgrounds into the public landscape reintroduced children as an essential part of the city, turning them into spaces for the entire community.

Older children and teenagers also need space to play. As part of the Growing Up Boulder Initiative, teens commented on what they wanted out of parks, with answers including Wi-Fi, interactive lighting, art and water features, movie nights and music events, and play space for both children and adults (Derr, 2015). Examples of the latter include large swings requiring co-operation, fields for playing soccer (football) or ping-pong tables, zip lines and parkour courses that facilitate risk-taking (Derr, 2015).

## Nature

Seeing and interacting with nature and green spaces can reduce stress, prevent depression, and improve calmness, attention, memory, and overall wellbeing (Kemple et al., 2016). A 2013 study by MacKerron & Mourato found that people were “significantly and substantially happier” and reported greater wellbeing outdoors in natural areas than in urban settings.

Louv (2010) collates headlines from a number of studies showing the benefits of nature for physical, emotional and mental health in adults and children alike, and the potential benefit in tackling obesity and inactivity.

As Louv (2010) discusses, children now are far less likely to play outdoors, and in wild and natural spaces, than previous generations. He goes on to tell how nature contributes to the healthy development of the senses, fosters creativity and increases emotional resilience (Louv, 2010). Being in nature has also been shown to reduce the symptoms of Attention deficit hyperactivity disorder (ADHD) (Kuo & Faber Taylor, 2004).

Moss (2012) states, “nature doesn’t come with an instruction manual, or a set range of possible outcomes; instead it holds infinite possibilities”. It is precisely this quality of nature that encourages the kind of creative, adventurous play needed to develop co-ordination and risk assessment skills (ARUP, 2017). Providing access to open green or blue spaces or wilder settings can reduce obesity and improve wellbeing among urban dwellers, as well as promoting activity and leaning in children (Kemple et al., 2016; Louv, 2010; Moss, 2012).

## Social interaction

The *Designing Streets for Kids* guide highlights social interaction as one of eight key children’s needs from streets (NACTO, 2020). Social contact is a vital component of healthy child development (Smith et al., 2015). How we design our neighbourhoods and streets can help foster opportunities for meeting, spending time with, and travelling with others to get the social interactions children need (Raman, 2010).

*“The built environment should support both caregivers and the act of caregiving by providing space, privacy, and opportunities to socialize for both children and their caregivers.” (NACTO, 2016, p6).*

Children’s social interaction needs change as they grow. For babies and young children interaction with caregivers is key. For adolescents, opportunities to socialise with peers and the informal social support this brings is particularly important for their wellbeing (McGrath et al., 2009; Smith et al., 2015). Young people more likely to be lonely than older age groups (Coughlan, 2018).

Teenagers are often excluded from public spaces either due to lack of suitable facilities or low tolerance of their presence (Day & Wagner, 2010; Derr, 2015; NACTO, 2020). Isolating teens from the rest of society can lead to increased teen alienation, dysfunction and antagonism in adolescents (Derr, 2015). Research shows that, contrary to common perception, teenagers do not want to be separated from the rest of society – they want to be integrated into public spaces and want to see public spaces designed for everyone (Bourke, 2014). Spaces that work for all are important in encouraging social interaction between age groups, which can benefit both young and old. For example, community gardening can help

reduce isolation among the elderly and increase compassion and empathy among the young (ARUP, 2017).

The Growing Up Boulder project asked teens what features they would like to see in city parks and their top ten asks included a number of features suitable for liveable neighbourhoods such as hang-out spaces (some with Wi-Fi and some in nature), opportunities for play and risk taking/thrill seeking (such as climbing walls and splash zones) and food trucks and cafes (Derr, 2015; Mintzer, 2017).

Research has shown that children refer to important places in their neighbourhood by the people they meet at these places, rather than the physical features of a place, which highlights the social importance of their local environment (De Visscher & Bouverne-De Bie, 2008). A recent study of 7-13 year olds in Auckland, New Zealand found that neighbourhood parks with a variety of options for socialisation were of high importance to children (Egli et al., 2020).

Compact, walkable neighbourhoods are associated with increased opportunities to meet others (Van den Berg et al., 2017). Formal social spaces such as parks, sports facilities and community spaces, where clubs and activities can take place, are all important for social interaction, as are streets with places to play, rest and travel side by side (NACTO, 2020).

Social interactions within a neighbourhood can also help to build trust between residents and help to create social networks, which can lead to greater sense of safety within a locality. (Williams, 2005). A sense of safety is important for children to be allowed to play and travel independently. This is explored further in the [Safety – social](#) and [Independent mobility](#) sections.

## Safety - traffic

Like all people, children have the need to feel and be safe in their environment. Fears over traffic safety are one of the main reasons children are not allowed out to explore their local neighbourhood independently (ARUP, 2017; Hillman et al., 1990; Krishnamurthy, 2019; Shaw et al., 2015). Given their smaller, more fragile bodies, children are at higher risk of death from road traffic collisions (NACTO, 2020). Road traffic injuries are the leading cause of death for people ages 5 to 29 (WHO, 2018b).

The Urban 95 initiative challenges urban designers to imagine the world from 95cm, the average height of a three year old. This reminds us that children are less visible to traffic and less able to see when in traffic, so measures such as removing car parking near junctions and cutting back vegetation to avoid reduced sightlines are important (Danenberget al., 2018; Ghekiere et al., 2014).

*“[I]t is normal for children to carry out activities in the road environment – such as cycling, walking, running, playing and other common group activities. It is also important for their healthy development that children, from an early age, undertake such activities. For this reason, it is important for the road environment to be safe so that these activities can be undertaken without the child’s safety being put at risk.”*  
(WHO & UNICEF, 2008)

When designing traffic safe environments for children the focus should be on “removing danger from the road environment, not the removal of children from danger” (Shaw et al., 2015, p68).

There are a number of initiatives in the UK that have encouraged children and families to walk and cycle locally, primarily through reducing or eliminating traffic from the roads. These include:

- Low Traffic Neighbourhoods (LTNs): reduce motorised traffic in residential streets using interventions such as modal filters and one way streets (Sustrans, 2020e)
- School Streets: restrict motor traffic around schools at drop off and pick up (Sustrans, 2019)
- Play Streets: short, regular road closures, often organised by neighbours on their own streets to create safe place for children to play (Playing Out, n.d.).

## Safety – social

Stranger danger and fear of crime and of being bullied can also prevent children from exploring their local neighbourhoods (Marzi & Reimers, 2018).

Neighbourhood design may help foster feelings of social safety through design which encourages ‘natural surveillance’, where spaces for children are close to places where they can be seen by others, such as near their homes or multi-use public spaces. There is evidence to show that walkable neighbourhoods, that encourage people onto the streets, are ones where residents feel safer, and can be associated with a reduction in street crime (Foster et al., 2010; Goodman & Aldred, 2020; Sohn, 2016).

A sense of community in the neighbourhood and the presence of friends and siblings to explore and travel with are important factors in encouraging children to venture out independently and their parents to let them (Marzi & Reimers, 2018). The presence of ‘good’ local shops was positively correlated with walking to school in Scotland. The researchers felt this was because the shops contributed to a positive sense of place and a feeling that there was a community looking out for children (Waygood & Susilo, 2015).



Providing facilities and places for older children can help prevent crime in this age group. In Halton, Merseyside, a play space for teens led to a 90% decrease in local anti-social behaviour (Gill, 2014).

The Growing up Boulder initiative found that teens, particularly girls, requested lighting and emergency call boxes in parks for safety. These features would extend the amount of time teens could use the park and allow them and others to walk through it at dusk or in the dark rather than having to walk around it (Mintzer, 2017).

## Good air quality

Alongside social and traffic safety, children need clean air and opportunities for exercise in clean, safe environments. In 2016, ambient air pollution was responsible for the deaths of almost 300,000 children under the age of five, and has been linked to numerous medical issues including asthma and cancer (WHO, 2018a). Children are more vulnerable to the effects of air pollution; they breathe faster than adults, live closer to the ground where pollutants are concentrated, and their organs are still maturing (WHO, 2018a). Burning of fossil fuels for energy production and transport are two of the main sources of urban air pollution (WHO, 2018a). Switching to cleaner energy sources can reduce some of this risk, but limiting levels of traffic near where children roam can help not only physical safety but also pollution levels. The Melbourne Urban Liveability Checklist includes a restriction on traffic volumes near schools (Badland et al., 2019). Sustrans expands that to include restrictions on traffic volumes across the whole neighbourhood (Macklon, 2020).

## Education and learning

### Schools

Local schools are invariably included in a plans for 20-minute neighbourhoods, such as those for Melbourne (Victoria State Government, 2017) and Paris (Willsher, 2020). Sustrans describes schools, at least early years and primary, as an essential part of a 20-minute neighbourhood (Sustrans, 2020a). However, for England at least, schools do not typically lie within a 10-minute walk (20-minute round trip). The average school run is 1.8 miles for primary and 3.5 miles for secondary schools (Department for Transport, 2020).

School is a key destination for children and getting there makes up a substantial proportion of the journeys made by any child over the age of four. It is a twice daily, essential journey for the vast majority of children and can have a significant impact on the quality of life of those making it as well as the wider community. High quality schools that are close to home and accessible independently by children as they grow is therefore an important part of a child-friendly neighbourhood. Travel to school is a much studied and important journey for children and is considered further in the [School run section](#).

Another benefit of neighbourhood schools is that playgrounds and sports areas associated with them can become useable by the whole community after hours.

*“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.” (ARUP, 2017)*

### Environments for learning

Access to education is not just about access to schools. Children learn through play. Young children need interesting, stimulating environments that are safe to explore close to home (Gill, 2019). “Play and learning should be incorporated into streets wherever possible, enhancing everyday journeys and augmenting what children learn in formal settings” (NACTO, 2020, p120). This includes spaces where children can interact with nature and engage their senses. Examples include artwork on walls, ground-surface paving patterns and games, and landscaping with plants children can grow and touch and climb.

Older children need opportunities to learn outside schools hours too. The Growing up in Boulder initiative in the USA found that teenagers wanted spaces in parks to hang out in groups and complete school work together, such as sheltered picnic tables with Wi-Fi access (Derr, 2015).

### What not to include

In creating safe, healthy places for children, it is also important to consider what to exclude from neighbourhoods. Availability of poor quality food in the vicinity of schools, for example, has been associated with unhealthy eating habits and obesity in high school children (Davis & Carpenter, 2009). In London, 400m ‘School Superzones’ are being piloted around schools, which will include, among other measures, restricting the advertising and sale of unhealthy foods (Doyle, 2019).

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## What do children want from their neighbourhood?

Conversations with children about their ideas for their urban environments are still the exception rather than the norm, but there are examples across all age groups. Children are asking for the same things that we have identified are needed, and this is true across all age groups. Playgrounds are mentioned by every group, even older children, but other themes recur across several of the examples below. Nature, in some form, is mentioned by all the groups; for aesthetic reasons, but also to interact with and use in both imaginative and active play. Other destinations include (food) shops, playing fields, friends’ houses, cleanliness (in

respect of litter), opportunities for risk-taking, and safety features such as lighting and low or no traffic (Derr, 2015; Derr & Kovács, 2017; Egli et al., 2020; Ergler, 2021; Rasmussen & Smith, 2002).

Twenty-seven 2-5 year olds in Dunedin, New Zealand were given the opportunity to map their ideal city (Ergler, 2021). The children picked places and features not only for themselves but also those that they had observed their family using, such as a coffee shop for grandma and grandad. Features chosen by over half of the children included playgrounds, beaches, supermarkets and other shops, hospitals, fast food, kindergarten and school and a library. Alongside these features, the children included safety infrastructure: lampposts, pedestrian crossings, traffic lights, and police cars, to protect them from burglars, drunks and speeding cars. The children were also taken on neighbourhood walks and asked to point out features they liked and disliked, revealing an affinity for the environment. The children liked colourful flowers and seeds for imaginative play but disliked broken glass and other rubbish that could harm the environment (Ergler, 2021).

In Denmark, 88 5-12 year olds were asked to photograph the places and activities that were meaningful and important to them, followed up by interviews with the children about the photographs (Rasmussen & Smith, 2002). This revealed a multitude of places, people and things. To focus on the places, the photographs showed playgrounds, earth mounds (for digging) and hills (for sledding), dens of all kinds, goals and playing fields, but also houses, gardens, streets, water towers, building sites, shops, sports centres and parking lots. In addition to the places, there were also photos of animals and nature, the stories relating to which showed “a consumer-type relationship with nature”: picking flowers, climbing trees, and playing in fields (Rasmussen & Smith, 2002). One particular example shows “the mounds”, a steep hill used for sliding, the interview revealing “that it is the excitement factor and the imaginative factor of the place that are important” (Rasmussen & Smith, 2002). Another shows the use of a wooden pavilion as goalposts in a game of football, showing that children can and will make use of objects outside their intended purpose.

Egli et al. (2020) asked 1,102 7-13 year olds from Auckland, New Zealand to mark places they visited on a map, and what they liked or disliked about those places. Figure 1 shows the framework of destinations; most commonly parks, playgrounds, fields, sports courts and shops, particularly food shops, but also friends’ and relatives’ houses. Also shown are qualities (positive or negative) of the places and activities undertaken there. The children liked ‘big’ spaces, with a variety of things to do, as long as they weren’t too crowded. Facilities were also important – toilets, drinking fountains, and goalposts – as well as safety, with concerns ranging from other people (including teenagers) and traffic to dogs and personal injury.

Figure 1: Kids Perceptions of Neighbourhood Destinations framework (Egli et al., 2020)



As part of its Growing Up Boulder project, the City of Boulder asked children of all ages to contribute to the city planning process (Derr & Kovács, 2017). When asked what makes a child-friendly community, primary school students ages 8-9 responded with physical spaces such as parks, playgrounds, pools, and play equipment, but also with safety, freedom from cars, opportunities for play, and nature (each mentioned by at least 20% of 45 children). As part of the same project, teenagers gave similar responses but with increased focus on food and study space.

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## Accessing local facilities/travel

Having all the facilities and features children need close by is redundant if they cannot comfortably and safely reach them. This section summarises the challenges and needs of children when travelling about their local neighbourhood and accessing their local facilities.

*“Interventions at the neighbourhood scale offer the greatest potential to create a children’s infrastructure network that allows safe and enjoyable journeys.” (ARUP, 2017, p9)*

Encouraging active travel is a key driver behind the design of 20-minute neighbourhoods. However, much of the design guidance for walking, cycling and wheeling does not explicitly consider the needs of children (Brown et al., 2019; Stafford & Baldwin, 2018). NACTO has published some exceptions including a guide to cycling facilities for all ages and abilities (NACTO, 2017) and *Designing Streets for Kids* (2020), which has brought together best practice from around the world and created universal design principles for streets that work for children. Key elements from this guide are summarised in the [Children specific design](#) section.

## Dependence and proximity

Reflecting the key findings from the literature review, this section discusses the importance of proximity to facilities, independent mobility and the school run.

One key feature of children’s mobility is their dependence on caregivers, which is not the case for most adults. The youngest children are entirely dependent and therefore the needs of both child and caregiver must be considered together. As well as practical access, the mental and physical wellbeing of the carer is key and making a neighbourhood supportive of parents and other primary care givers is important in supporting children (Brown et al., 2019).

Child-friendly neighbourhood design needs to consider access for buggies and the space required for carer and child to be side by side when walking and cycling (NACTO, 2020). There must be opportunities for caregivers to interact while travelling places with young children. This could include providing privacy for breastfeeding and frequent places to sit, rest and play with children too small to walk long distances (NACTO, 2020). Toilets and baby changing are also important for young children, who need to use these facilities more often than adults (ARUP, 2017).

Facilities also need to be closer for children than adults if they are to easily reach them. A 10-minute walk for a child, particularly a younger child, is not the same distance as for an adult. Young children are either pushed in buggies or walk slowly, not reaching the same

pace as adults until around 12 years old (Cavagna GA, Franzetti P, 1983). Tim Gill found in his research on child-friendly cities in Europe and Canada that, “for children, what is most important is what is nearby” (Gill, 2017, p18).

### How close do things need to be?

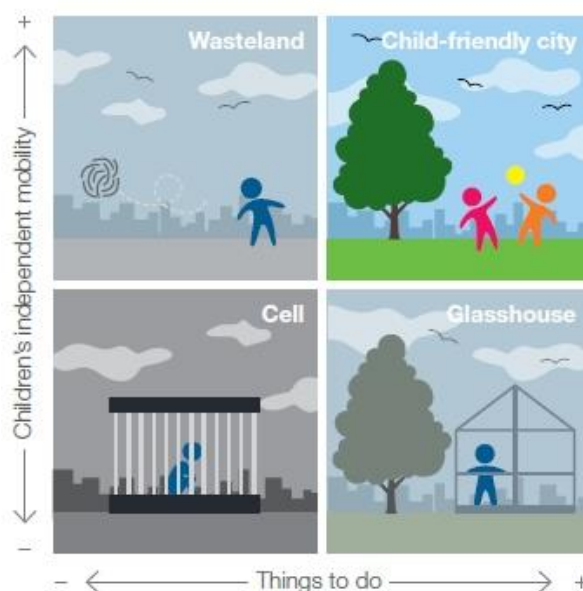
There is a paucity of research on how close to home facilities need to be for them to be independently accessible to children. There are many variables that would influence the distance a child is willing and able to travel, such as age, quality of the facility and perceived safety of the local environment (Vlaar et al., 2019). A recent study of 10-13 year old Canadians found that half the children went no further than 800m from where they lived, but ranged from not going anywhere to a maximum of 32km (Vlaar et al., 2019). It is worth noting that the average distance roamed may be lower for girls than for boys; in a study by Mitchell et al. (2016), the correlation between park space and physical activity in children varied between two buffer ranges, at 800m for boys but only 500m for girls.

As children grow, it is not just getting places, but getting there by themselves that becomes increasingly important too.

### Independent mobility

Environmental psychologist, Marketta Kyttä’s Boulby model (Figure 2) shows a child-friendly environment as one where there are both a high number of potential experiences on offer and the ability for a child to access those experiences without an adult (Kyttä, 2005).

**Figure 2: A model of child-friendly places (adapted from Kyttä)**





For a neighbourhood to support a child's healthy development, it is crucial that it is seen as safe for children to explore independently as they grow. 'Independent mobility' is a term used in the literature to describe the freedom children have to get around and play unaccompanied by adults (Shaw et al., 2015). It provides opportunities for healthy social and physical development, freedom to access the natural environment, and prepares children for life as independent adults (NACTO, 2020; ARUP, 2017; Shaw et al, 2013). It is seen by many to be fundamental to child-friendly neighbourhood design (NACTO, 2020).

Twenty-minute neighbourhoods that support children to roam and travel independently also have potential benefits for the wider community, although there is a lack of research in this area. Parents and carers of independently mobile children would not have the burden of providing constant surveillance or a taxi service. This could reduce the number of car journeys made, alleviating congestion and improving the local environment for all.

### Reasons for decline

There has been a decline in children's independent mobility in recent decades, which is well documented in developed countries and is of concern in terms of children's health and wellbeing (Marzi & Reimers, 2018; Shaw et al., 2015; Wales et al., 2020). A reduction in independent mobility can lead to adverse impacts such as loss of autonomy and access to environments outside the home resulting in lower quality of life, decline in physical activity and consequent health implications (Shaw et al., 2015).

Children's independent mobility is a complex phenomenon; the freedom they are allowed is determined by a combination of factors including children's capabilities and desires and both the physical and social environment they live in (Mikkelsen & Christensen, 2009; Shaw et al., 2013; Wales et al., 2020). However, much of the decrease in independent mobility is thought to be linked to parental safety concerns, which include perceived risk from accidents, crime, strangers, and in particular, traffic (ARUP, 2017; Hillman et al., 1990; Krishnamurthy, 2019; Shaw et al., 2015). A study looking at independent mobility in 16 countries globally found that traffic was the strongest factor in determining the freedom children were granted – the number of cars on the street, speed of vehicles and poor visibility were all concerns (Shaw et al., 2015). Parents' concerns about safety have been found to be a primary reason children are not allowed to cycle to get places (Ghekiere et al., 2014).

Children's own safety concerns may also have contributed to the decline in independence; children typically report a wider range of safety concerns than adults, including traffic, but also being attacked or bullied by older children, darkness, and animals (Marzi & Reimers, 2018).

Along with safety fears, the walkability and distance from school and leisure activities and busy family schedules have also been found to be factors in contributing to the likelihood of children travelling independently (Marzi & Reimers, 2018). One study in Perth, Australia

found that, among 10-12 year olds, high neighbourhood walkability predicted girls' independent mobility (Villanueva et al., 2014). However, the more walkable neighbourhoods were also generally perceived as safer, so it is difficult to determine the influence of walkability independently from other factors (Villanueva et al., 2014). Research on the determinants of independent mobility is not only challenging due to the interactions between the potential determinants but also due to a lack of consistent measurement (Marzi & Reimers, 2018). Furthermore, most studies to date have looked at the determinants of independent mobility in terms of travel to school rather than for leisure trips and it is unclear how generalisable the findings are (Fyhri et al., 2011).

## Teenagers

Teenagers desire better and more affordable transport to maintain their independence when they cannot access cars (Mintzer, 2018). Evidence suggests that young people aged 12 to 24 are making fewer trips on average than 20 years ago, and cost is cited as a major barrier. Despite this, an increase in walking amongst 17 to 20 year olds in the last 15 years suggests travel and transport are still vitally important to young people (Chatterjee et al. 2019). With appropriate interventions, this trend could be built upon, and improved cycling infrastructure could enable young people to travel longer distances to access suitable opportunities. Access to public transport is also important for independent mobility for older children so accessible transit stops are crucial within their 20-minute neighbourhood.

## The school run

Children's active travel to school has declined in recent years in the UK and more children than ever are being driven to school (Sustrans, 2020d). Between 1971 and 2010 the number of children of primary school age allowed to walk to school by themselves fell from 86 per cent to 25 per cent (Shaw et al. 2015). The majority of children in England are accompanied to school by an adult: 96% of 5-10 year olds and 57% of 11-16 year olds (NTS, 2020). Distance from home, along with ensuring child safety, is a key influence on whether children travel actively to school (Smith et al., 2020). A recent Scottish study found that both distance and walkability were associated with active travel to school among 10-11 year olds (Macdonald et al., 2019). Given that in England schools are on average further than 800m from home, their inclusion within a 20-minute neighbourhood is challenging.

Having schools within walking distance is the ideal, but if that's not possible, then public transport links within a short walk with direct links to school or safe, comfortable cycle paths are essential to help minimise the use of private motorised transport for the school run. There is little consensus around what constitutes a reasonable walking distance to school for children of different ages. The statutory maximum walking distances to school<sup>3</sup> in the UK are two miles (3.2km) for 5-7 year olds and three miles (4.8km) for 8-16 year olds (Department

<sup>3</sup> This is the distance set out in UK law that is considered safe and reasonable for children to walk to school. Local Authorities have a duty to provide free transport to school for children who have to travel further than the statutory walking distance to their closest school.

for Education, 2014), but these distances are arguably further than is culturally acceptable within the UK. A few studies that have attempted to identify a 'culturally reasonable' distance for walking to school seem to broadly agree with up to a kilometre as a walking range for 9-11 year olds (Morency et al., 2014; Waygood & Susilo, 2015). In Scotland, the distance is 0.78km for 10-11 year olds (Waygood & Susilo, 2015) and in Montreal 0.88km (9-10 year olds) and 1.09km (11-12 year olds) (Morency et al., 2014). However, there are cultural variations, with one study finding that 10-11 year old children in Osaka, Japan walked to school regardless of distance, although schools were likely to be under 3km away, as the maximum walking time was 40 minutes (Waygood & Susilo, 2015).

An active journey to school is known to have benefits for children's health and wellbeing through increased physical activity (Southward et al., 2012). A longer school run, if made actively, could even be encouraged as a way for children to meet the current guidelines of 60 minutes of daily physical activity which currently, in England, fewer than half of children do (Sport England, 2019).

Proximity is not the whole story. Ensuring every child has a school close by is not enough, as children do not necessarily attend their closest school and living close to school does not guarantee that children travel there actively.

Having schools easily accessible is vital, but in addition, policies need to be in place to ensure that the majority of parents can and do choose to send their children to their nearest school, which currently is not always the case. In the UK, a child's catchment school (where they are given priority to attend) is not always the closest school. A recent study found that over 60% of parents do not opt to send their children to the closest secondary school, instead going for the one in the area with highest attainment (Burgess et al., 2019). A strong argument can therefore be made for a children's 20-minute neighbourhood to contain not only a school, but a school of high quality.

Even when children are travelling to their closest school, concerns over traffic safety mean that many parents choose to drive rather than let their children walk, even when they'd prefer not to. A recent survey carried out by Sustrans found that although a third (34.1%) of parents did drive their children to school only 16% wanted to (Sustrans, 2020b). Alongside improved traffic safety, more and better quality active travel infrastructure is key to encouraging more parents and children to travel to school actively (Sustrans, 2020c).

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## Designing a children's 20-minute neighbourhood

Good examples of child-friendly urban design are becoming increasingly frequent. Examples include the cities of Rotterdam in the Netherlands and Boulder in Colorado, USA, Bogotá's

children's priority zones, Chile's Bicentennial Children's Park and Barcelona's "superblocks" (ARUP, 2017). Design guidance is now available, from NACTO's *Designing for All Ages and Abilities* (2017) and *Designing Streets for Kids* (2020) to ARUP's *Cities Alive: Designing for Urban Childhoods* (2017) and Rotterdam's *How to Build a Child Friendly City* (Colophon, 2010). ARUP (2017) recommends 14 interventions to improve child-friendliness, including intergenerational, multi-use, playable spaces, pedestrian priority, traffic measures, wild spaces, and neighbourhood mapping led by children.

As an example of a child-friendly city, we look at Rotterdam in the Netherlands as discussed by Tim Gill (2018). Rotterdam's child-friendly city initiative began in 2006 when it was labelled the worst Dutch city to bring up a child. This first phase invested €20 million in the Oude Noorden neighbourhood between 2006 and 2010, aiming to make public spaces greener, more playful and more sociable, increase available family housing, and improve active travel networks. The second phase (2014-2018) also tackled education and events, covering an additional nine neighbourhoods. They used GIS mapping data of street width, traffic speed and play areas to plan improvements, including a shift away from car dominance, with active travel budgets outstripping those for car infrastructure. Phase two asked inhabitants and neighbourhood children to participate in the design of their streets. Playgrounds are being re-imagined in a more naturalistic style with a focus on free play, the influence of non-profit adventure playground organisation Speeldernis. The changes have worked, with economic, environmental and cultural benefits, and an increase in the number of families in the city, exceeding Rotterdam's own target.

While the city's planners are unashamed of the potential 'gentrifying' effects inherent in these policies, the schemes have received some concern from some grassroots movements (Doucet et al., 2016). The apparent aim of these policies is to encourage middle-class families to move in, for example by combining apartments to increase floor space, in turn causing some poorer families to be pushed out (Gill, 2013). However, thanks to strong tenant rights and welfare systems, very few families are actually displaced (Mecking, 2018). A study by Weltevrede et al. (2018) showed how the nine neighbourhoods involved in Rotterdam's initiative experienced an increase in population and economic growth, and residents did not feel displaced (Mecking, 2018). Moreover, both old and new residents saw the changes as positive, providing a greener, richer, more pleasant city, with the only negative being the lack of communication between the two groups (Mecking, 2018).

## Children specific street design

NACTO's (2020) *Designing Streets for Kids* is a recent guide highlighting the importance of designing streets for children and their caregivers. It provides design recommendations that aim to foster accessibility and independent mobility, emphasising that streets are not just about getting from A to B, but are also places to pause and play, "Children are best served when they are able to fully use their urban streets, not just parks and playgrounds" (NACTO, 2020).

At the neighbourhood level it stresses that de-prioritising cars is key: “it is important to develop designs that ensure walking, cycling, and transit facilities are prioritized over direct paths for private vehicles. Identify areas or streets that can be closed to private vehicles or where vehicular access can be limited, and open them to people.” (NACTO,2020 p22)

It summarises what children need from streets:

- Reliable mobility choices (active travel integrated into public transport networks)
- More space (for buggies, travel side by side, wheelchairs and play)
- Places to pause and stay (recognising children are less mobile and need to play)
- Social interaction (streets that encourage everyday interactions between people)
- Visibility (the average 3 year old is 95cm tall and so less able to see or be seen in traffic)
- Play and learning (streets provide opportunities to bring play and learning into everyday lives)
- Security (caregivers and children need to feel safe – well-maintained, low or no traffic, active, but not crowded streets)
- Safe environment (children’s bodies and brains are less developed and are more vulnerable to risks such as air pollution and excessive noise)

Chapter 5 of the NACTO guide sets out key street design elements for children (Table 2) and advises consideration of how each element encourages play, learning and social interactions. Another essential consideration is the height of a young child and how that affects how the element will be viewed and interacted with. Finally, considering design from a child’s perspective involves acknowledging that they will use elements in unconventional ways (eg climbing over and hiding under benches); as a natural part of their development, this should be encouraged (NACTO, 2020).

**Table 2: Key street design elements for children (from NACTO’s Designing Streets for Kids, 2020)**

Design element	Details/examples
<b>Pedestrian crossings</b>	Short, frequent, at-grade, legible crossing points. Compact intersections and traffic calming measures and priority signals for slower road users. Good visibility of and for children.
<b>Sidewalks</b>	See pavements as public places as well as throughways – as well as extra space on paths, a minimum 0.5 m frontage zone and buffer zones to separate from traffic. Active facades for visual interest at

	both adult and child eye-level and engaging pavement surfaces for play and interaction.
<b>Pause and play spaces</b>	Near schools and other facilities for kids, or where kids visit with caregivers, can be informal or formal. Include elements to encourage fun, play and social interaction.
<b>Seating</b>	Appropriately sized, including space for wheelchairs or buggies. Ideally every 50-100m along a street. Consider both fixed and flexible seats.
<b>Play and learning</b>	Consider all the ways children learn (eg visually, logically, socially, solitary etc.) Opportunities exist in the design of surfaces, landscaping, transit stops, water features and lighting.
<b>Nature and landscaping</b>	Great for buffering from traffic. Consider children's height. Allow children to engage with nature. Add trees.
<b>Transit stops</b>	Seating, shelter, accessibility and co-locating other features such as toilets, rubbish bins etc. Think of opportunities for play.
<b>Cycle infrastructure and facilities</b>	Cycle lanes protected from traffic, safe intersections and complete networks.
<b>Additional elements</b>	Public toilets, drinking fountains, Wi-Fi, wayfinding, rubbish bins, lighting, where applicable at heights accessible by younger children.

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## Listening to Children

The United Nation Convention on the Rights of the Child (1990) Article 12 states that a “child who is capable of forming his or her own views [has] the right to express those views freely in all matters affecting [them]”. Beyond the child’s legal right to register their opinion in matters which affect them, Stevenson (2007) summarises several reasons why it is important to include children in the consultation process, from differing needs and the impact of the built environment on development, to new perspectives and the potential for increased use of the outputs.

The Growing Up Boulder initiative engaged children of all ages in the design and planning process for renovations of the city. They used a variety of techniques with children depending on their ages, with drawing and model-making for primary school children and field trips, presentations, dialogue, research and writing with both primary and secondary school children (Derr & Kovács, 2017). During the field trips children used the ‘photovoice method’, taking picture of details framed green or red, depending on whether they liked or disliked the subject of the image.



A 2020 article by Grant speaks on a London project by architect Dinah Bornat that is asking 17- and 18-year olds in classroom settings their thoughts on the space around them to influence neighbourhood design by using the Voice Opportunity Power toolkit<sup>4</sup>.

Even pre-literate children can engage with city planning. The Dunedin preschooler study used picture cards, conversation and neighbourhood walks, combining the research with play, to allow the children to point out important features and facilities, and things they like and dislike (Ergler, 2021). Through their responses, the children showed care and understanding for the needs of people of all ages and the wider environment.

However, a pair of articles by Gutteridge & Legg (2019a, 2019b) discuss the difference between asking a child what they want and observing them at play or involving them in activities. The authors argue that while designing good play spaces requires good knowledge of children and children's play, consultation in its usual guise can be detrimental to the process, by allowing playground equipment manufacturers to take the place of play experts (2019a). Consultation involving asking children what they 'like' and 'don't like' inevitably places greater focus on 'things' than experiences. As we saw in the [Nature](#) section, the most imaginative and educational play occurs not with swings and slides, but with rocks, trees and other natural objects (ARUP, 2017). However, it is easy to miss this nuance when simply asking a child what they like instead of watching them at play (Gutteridge & Legg, 2019a).

*“An illuminating example came after observing a 7 year old boy playing with the sand and water offer on one site. His play had lasted for nearly two hours and had involved a myriad of experiments and creations as well as complex social interactions. Then just before leaving he had a couple of rides on the aerial cableway. “What did you enjoy at the play area?” we asked. “The flying fox” (cableway) came the reply. Are we wrong to make our own judgment about the most engaging play that day? Was his answer not just easier or perhaps what he thought was expected?” (Gutteridge & Legg, 2019b)*

A greater judgement on what children want, and need, from their neighbourhood can be better achieved through a combination of observation, informal conversations with children, and remembering one's own experiences as a child (Gutteridge & Legg, 2019b). This combination helps to highlight when objects are used in unexpected ways – excavation material as a fort, or a climbing frame 'film set', for example (Gutteridge & Legg, 2019b).

Through these examples we can see the importance of tailoring the consultation approach to the age of the child one is consulting with, and of observing of children at play. We cannot ask the same questions of a seven year old that we would of an adult. Whatever the approach used, considering a child's perspective on urban planning can enhance design and ensure an area is used by its intended market.

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<sup>4</sup> <https://voiceopportunitypower.com/>

# Conclusion

A 20-minute neighbourhood for children will invariably provide the necessary features for all ages and can be a good starting point for urban design.

*“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” (ARUP, 2017, p11).*

Children want the same things from their neighbourhood that everyone else does; the key differences are in how those needs are met, how close to home they are and how accessible they are. Activities that children can engage in differ from those an adult might enjoy. With the exception of teenagers, children generally don't have disposable income available to enjoy paid facilities, but they are also more likely to find diversion in a playpark or a patch of wilderness. Children, particularly younger children, often have a smaller travelling range than their older counterparts, meaning that facilities for children need to be closer to home. In addition to a shorter distance the route to these facilities must be safe and accessible by non-motorised means, or by public transport for very young children and teenagers. For children, it is particularly important that their neighbourhood be safe from traffic and social fears, as concerns in these areas (from both child and their carers) can severely limit a child's ability to get around independently.

It is important to include children and young people in the urban planning process to understand their needs. When designing a 20-minute neighbourhood, starting with children in mind is a logical first step, given that meeting their needs also meets the needs of other less mobile and vulnerable people in society such as some elderly and disabled. However, it is important not to overstate the often-made claim that cities that work for children work for all, given that there is a lack of rigorous research in this area. This review has highlighted the requirements of children, which often dovetail with those of others with limited mobility in society, but do not reflect the needs of all; for example those of people who are deaf or blind (Abouebeid, 2019).

Perhaps when designing our neighbourhoods the needs of diverse ages and abilities should be considered together, rather than looking at what each groups needs in isolation, as has traditionally been the case (Stafford & Baldwin, 2018). While child-friendly design covers a wide range of needs and abilities, it is important to consider the needs of all users in order to create a city that works for everyone.

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