

20-minute neighbourhoods: The vital role of transport in creating inclusive communities in Dundee

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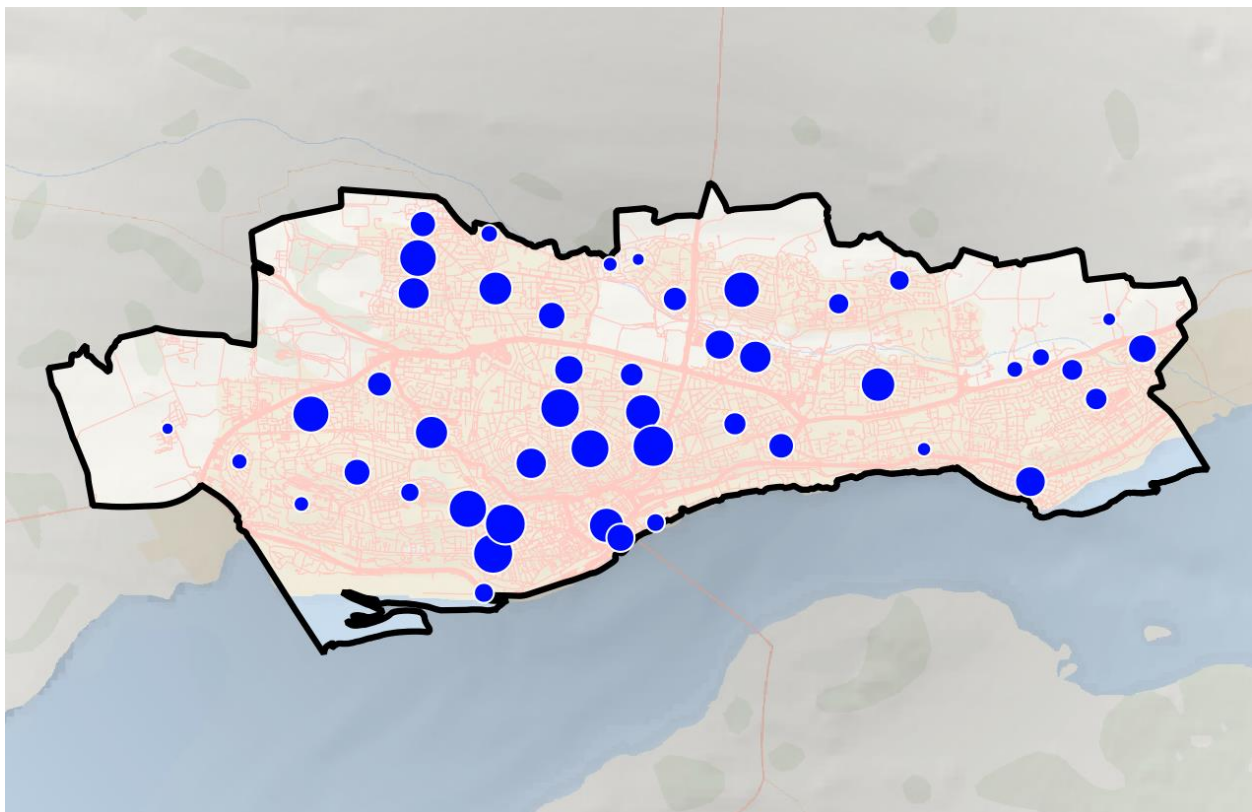
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'Investigate a transport intervention that has been shown to reduce environmental damage. How did it interact with poverty/social exclusion? How transferrable is that solution for other places/problems?'



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1. Introduction

1.1. Introduction

Transport plays a vital role in our daily lives, enabling access to employment and education opportunities, essential services, and leisure. However, our current transport system has substantial negative impacts on our environment; transport accounted for approximately 36% of Scotland's greenhouse gas emissions in 2019, the majority of which came from road transport (66%)¹.

There are also many people who face major obstacles when using our transport system, such as high costs, unreliability, and inadequate infrastructure. These inequalities in our transport system can lead to poor accessibility, particularly for those dependent on public transport and active travel, contributing to poverty, social exclusion, and poor health and wellbeing. Over a quarter of people living in towns and cities cannot easily reach places they need to visit without driving².

The COVID-19 pandemic exposed how a significant proportion of people became reliant on a car to access their day-to-day needs³, and has demonstrated the importance of having key services nearby to promote sustainable travel and facilitate access for those without a car. A potential transport intervention to address these issues is the '20-minute neighbourhood'.

1.2. Purpose of this study

Current research on 20-minute neighbourhoods has been focused on districts in larger cities, but given that only 23% of the UK's population lives in its core cities, there is a need for more practical research in towns and smaller cities⁴. This paper will therefore explore 20-minute neighbourhoods in the context of a small city: Dundee. This study will:

1. Provide a summary of the environmental and inclusion benefits of 20-minute neighbourhoods by reviewing relevant literature and policies;
2. Undertake walking accessibility analysis to establish a baseline for Dundee and identify which areas should be prioritised for investment in 20-minute neighbourhoods;
3. Engage with organisations and residents to better understand the barriers faced when accessing local services by active modes in Dundee and the challenges and opportunities of delivering 20-minute neighbourhoods.

2. Literature Review

2.1. 20-minute neighbourhoods

The concept of 20-minute neighbourhoods has been gaining momentum in recent years, particularly following the COVID-19 pandemic, and they are already being implemented in several cities such as Melbourne, Paris, and Portland.

20-minute neighbourhoods are designed so that residents can meet most of their daily needs, such as visiting supermarkets, schools, and healthcare, within a short walk, wheel, or cycle of their home. In addition to enabling local access, 20-minute neighbourhoods would also include public realm and greenspace improvements, as well as improved active travel and public transport links to other areas that facilitate sustainable journeys beyond a neighbourhood².

However, it should be noted that 20-minute neighbourhoods are not an entirely new concept, building on earlier ideas such as 'liveable neighbourhoods' and 'walkable neighbourhoods', and the exact definition can vary, particularly with regards to what facilities constitute a 20-minute neighbourhood⁵.

Lockdowns during the pandemic highlighted the importance of local living, with people spending more time in their local area, working from home if possible, and making use of public green space, as well as walking

and cycling more⁶. Governments across the globe have expressed an interest in creating a post-COVID future that addresses inequalities in access to local facilities and is more resilient to health and economic crises⁵.

Research has shown that people are generally willing to walk for 20 minutes (10 minutes in each direction) to access their daily needs⁷. However, many existing and new neighbourhoods are currently either built too far away from facilities for people to walk, wheel, or cycle to them, or they are built at too low a density for facilities to be financially viable⁸. There is a need for better integration between transport and land use planning to move away from car-centric design and prioritise active travel when considering access to facilities⁹. A 20-minute neighbourhood approach would help to better disperse investment, jobs, and services across towns and cities².

2.2. Scottish policy context

The Scottish Government's commitment to implement 20-minute neighbourhoods is set out in Policy 15 of the fourth National Planning Framework¹⁰ (NPF4), with the intent to "*create connected and compact neighbourhoods where people can meet the majority of their daily needs within a reasonable distance of their home, preferably by walking, wheeling or cycling or using sustainable transport options.*" The 'Local living and 20-minute neighbourhoods'⁷ draft planning guidance to support the implementation of Policy 15 has also been published for consultation.

Creating 20-minute neighbourhoods across Scotland would deliver significant environmental benefits and contribute towards the Scottish Government's targets of achieving net-zero by 2045 and reducing car vehicle kilometres by 20% by 2030¹¹. Delivering the transport components of 20-minute neighbourhoods was also a key recommendation from the recently completed second Strategic Transport Projects Review (STPR2), which will inform transport investment in Scotland from 2022 to 2042¹². 20-minute neighbourhoods also closely align with other Scottish Government policies, such as the Town Centre Action Plan Review¹³ and the Place Principle¹⁴.

2.3. The benefits of 20-minute neighbourhoods

20-minute neighbourhoods can deliver several benefits, including:

- Tackling the climate crisis by reducing car use and increasing active travel for everyday journeys;
- Better health and wellbeing through increased physical activity;
- Creating more inclusive communities by improving access to local services and facilities;
- Boosting local economies and providing local employment opportunities;
- Supporting a sense of community and improving safety perceptions and social interaction¹⁵.

Similar schemes introduced in Waltham Forest ('Low Traffic Neighbourhoods') found that air pollution has reduced¹⁶ and traffic levels have decreased by as much as 76% in some neighbourhoods¹⁷. There have also been significant increases in active travel; 28% of residents in Walthamstow Village now walk as their primary mode of transport for regular journeys¹⁸ and cycling has increased by up to 172%¹⁷ in some neighbourhoods. Those living in low traffic neighbourhoods are also less likely to own a car¹⁷.

There are several existing local centres across Scotland with the potential to become 20-minute neighbourhoods, but poor-quality infrastructure can act as a barrier. Fears around road safety is the most significant barrier to the uptake of active travel, with 63% of people in Scotland agreeing that their local roads are too busy¹⁹. Delivering safe infrastructure and reducing vehicle traffic in local areas is essential to promote active travel for everyday journeys and make 20-minute neighbourhoods a reality.

Transport interventions to support 20-minute neighbourhoods would include measures such as segregated cycle lanes, wider footways, improved crossing points, lower speed limits, modal filters, and cycle parking. Delivering such measures would particularly benefit those most at risk of transport exclusion, such as children, young people, those on low incomes, women, older people, and those with mobility or sensory impairments:

- Many **children** want to walk, scoot, or cycle more, but the parental influence over children's travel decisions is strong, particularly in relation to safety, as well as time and distance²⁰. Unsafe conditions are one of the main reasons why children are prevented from travelling independently²¹. Many parents believe that children are safer when they are driven due to high traffic volumes and speeds, dangerous parking, and inadequate crossings²². 20-minute neighbourhoods would improve safety and enable more children to travel actively and independently. Addressing parents' safety fears can increase active commuting to school by up to 60%²³.
- Car use is reducing amongst **young people** nationally²⁴. Many 16-24 year-olds are unable to pursue opportunities, such as work, education, and socialising, due to a lack of public transport and active travel options²⁵. There is an urgent need to provide alternative services and infrastructure to ensure that young people are not economically or socially excluded. 20-minute neighbourhoods could achieve this by improving active travel and public transport options, as well as providing local education and job opportunities.
- **Low-income households** have lower levels of car ownership, with 40% of the lowest income households having no car access²⁶. Low-income communities are more likely to be exposed to the negative impacts of transport, including higher risk of being killed or injured on roads and higher levels of air pollution²⁷. 20-minute neighbourhoods have the potential to address these issues by improving road safety, reducing pollution, and enabling free/low-cost transport options for accessing local services. The inclusion of affordable housing options within 20-minute neighbourhoods is also a key part of the NPF4¹⁰, to ensure they are accessible for everyone regardless of income.
- **Active travel rates can vary between genders**, with men three times more likely to cycle than women²⁸. Fears around personal safety (such as walking alone and poor lighting) and the need to balance work, leisure, and domestic responsibilities are major barriers to women travelling actively as part of their daily routine²⁸. 20-minute neighbourhoods could benefit women by providing local services within walking distance. The delivery of high-quality, better-connected active travel networks would allow trip-chaining and enable women to walk and cycle with children. An increase in the number of people walking and cycling would also increase natural surveillance and improve safety perceptions.
- **Physical activity declines with age**; across Scotland, only 55% of those aged 65-74 years and 35% of those aged 75 and over meet the recommended levels of physical activity²⁹. Older adults are more likely to use active modes for shopping, errands, and recreational and social activities³⁰. However, they can face several barriers when travelling actively, such as roads being too busy, poor infrastructure, and unattractive environments³⁰. 20-minute neighbourhoods would reduce these barriers and provide local facilities within a short walking distance. They could also deliver health benefits through increased physical activity, which has been shown to improve cognition, reduce morbidity and mortality, and increase mental wellbeing³¹.
- **The mobility impaired take 38% fewer trips across all modes of transport than those without impairment**³². People with mobility or sensory impairments can face significant barriers when travelling due to issues with accessibility, such as pavement obstructions, a lack of controlled crossing points and dropped kerbs, poorly maintained surfaces, steps, and poor lighting³², which can prevent them from accessing key services. 20-minute neighbourhoods would address some of these issues and create more inclusive environments. However, it should be noted that some people with mobility impairments may be unable to walk far, and it is important to provide rest facilities along routes (such as benches), access to adapted cycles, and disabled parking spaces at suitable locations for those reliant on a car for transport. Providing accessible housing options within 20-minute neighbourhoods is also a key part of the NPF4¹⁰, to ensure the mobility impaired are not excluded.

The above benefits could be realised by 20-minute neighbourhoods. Given the health, deprivation, and environmental challenges that Dundee faces, 20-minute neighbourhoods present an opportunity to tackle these issues and deliver transformational change. By prioritising active travel, reducing car use, and improving placemaking, they would help to create a clean, attractive city and deliver a sustainable transport system that is accessible and inclusive for all.

3. Study Area and Context

Dundee is located in the north-east of Scotland and is its fourth largest city, with a population of 147,720³³. The Dundee City boundary and its localities are shown in Figure 1 (larger versions of the figures presented in this paper can be found in Appendix A).

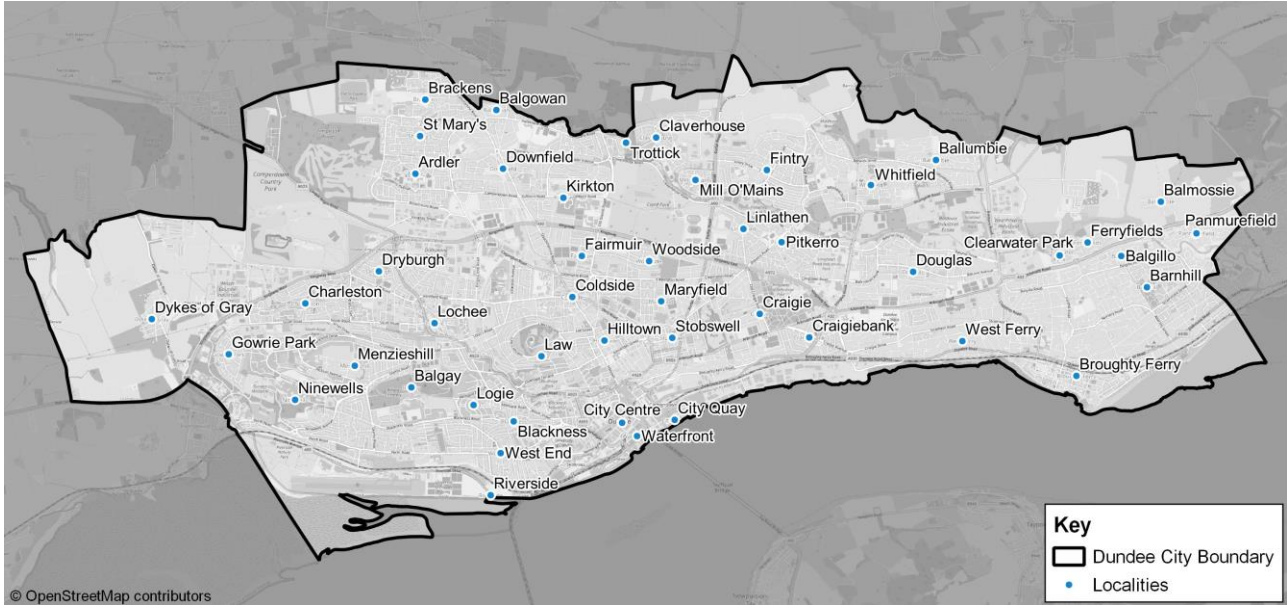


Figure 1: Dundee City boundary and localities

Dundee is a good example of a walkable and cyclable city where 20-minute neighbourhoods could be implemented. The density of its housing and services means that many people already live within a modest distance of shops and key services²¹, and over half of trips made in the city are less than 2km long³⁴. Active travel is also already a popular choice in Dundee; 54% of residents walk at least five days a week and 13% cycle at least once a week³⁵.

Despite car ownership in Dundee being low, with 42% of residents not having access to a car³⁶, over a third of all trips are undertaken by car³⁴. The whole Dundee City area was declared an Air Quality Management Area in 2006³⁷. There are also many areas in the city that are within the most deprived 20% of Scotland (shown in Figure 2), as measured by the Scottish Index of Multiple Deprivation (SIMD)³⁸, and 21% of residents identify as having a long-term health problem or disability³⁶. The creation of 20-minute neighbourhoods and supporting infrastructure could therefore deliver significant environmental and inclusion benefits for Dundee.

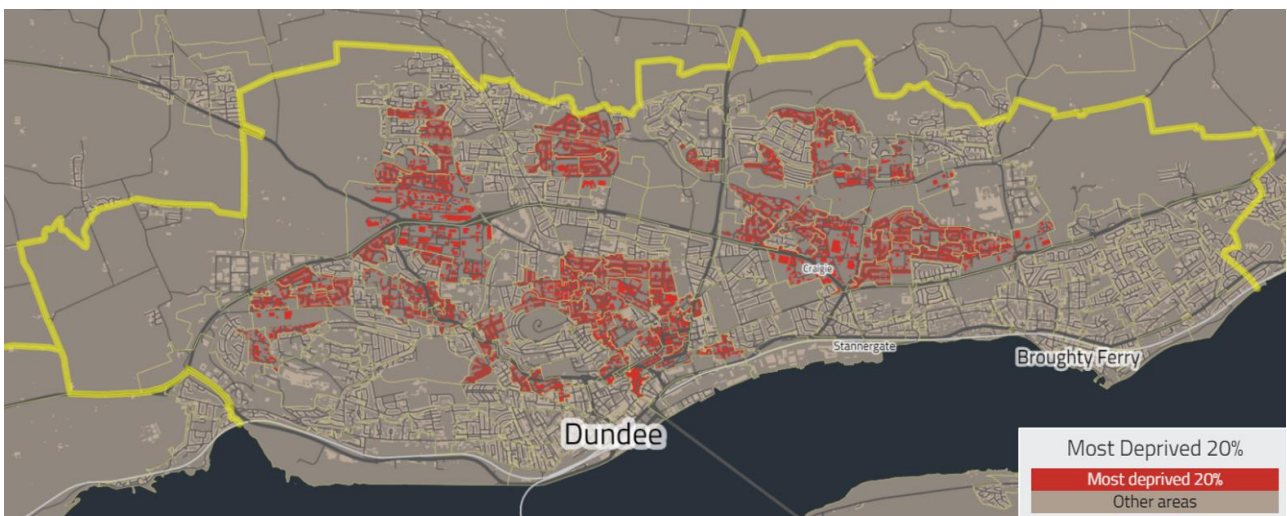


Figure 2: Areas in Dundee within the most deprived 20% of Scotland³⁸

There is growing support amongst residents to improve active travel provision and enhance local communities. The Dundee Walking and Cycling Index³⁵ found that:

- 65% support building more segregated cycle lanes, even if this means less space for road traffic;
- 72% support wider pavements;
- 74% support more frequent road crossings;
- 70% support low traffic neighbourhoods;
- 67% agree that increasing space for socialising, walking, and cycling on their local high street would improve their local area.

Existing walking and cycling provision in Dundee is shown in Figure 3. It can be seen that there are several existing active travel routes, such as the Green Circular, a 26-mile walking and cycling route through parklands³⁹, and the Broughty Ferry Esplanade, a transformational scheme that has delivered a fully segregated, inclusive walking and cycling route with public realm enhancements⁴⁰. Furthermore, the Dundee Cycle Hub opened in 2021, providing information on bike hire, lessons, and servicing⁴¹. However, there is still a significant number of missing links in the active travel network, which can deter users and prevent local access by foot or bike.

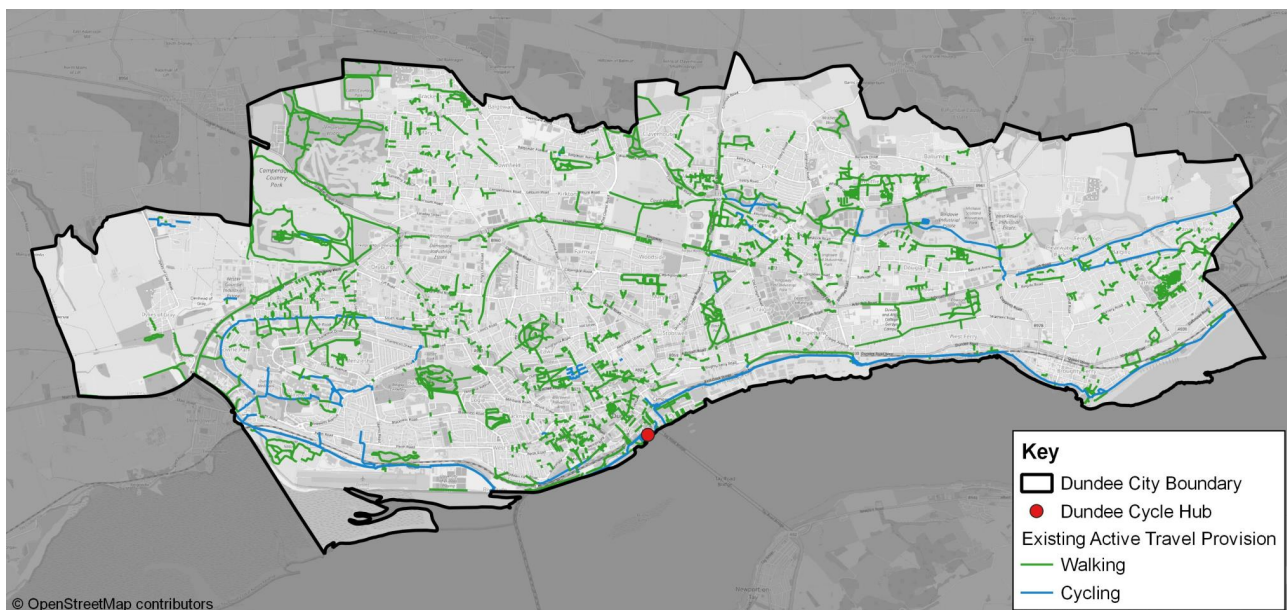


Figure 3: Existing active travel provision

Regeneration work has been undertaken in recent years in several local communities across Dundee, such as Lochee, Mill O'Mains, Whitfield, Hilltown and Dundee Waterfront⁴², and Dundee City Council has set out their ambition for 20-minute neighbourhoods in their Council Plan 2022-27⁴³.

Dundee City Council's Sustainable Transport Delivery Plan⁴⁴ aims to *"improve transport for communities in all areas of the city for accessing employment, education, leisure and recreational amenities"* and sets out plans to deliver a comprehensive active travel network over the next 10 years with primary, secondary, and long-distance routes, as well as improved cycle parking and road safety, 20mph zones, and school streets. Proposals for these primary routes are already in development through the ongoing 'Active Freeways' studies. These will create six high-quality, segregated active travel routes along Dundee's main transport corridors: Lochee Road, Perth Road, Harefield Road, Pitkerro Road, Arbroath Road and Strathmartine Road⁴⁵. The Active Freeway concept was a recommendation in STPR2¹², and Dundee is currently leading the way in their development. A continuous, inclusive network would provide a lot of the infrastructure required to support the delivery and development of 20-minute neighbourhoods.

4. Accessibility Analysis

4.1. Methodology

To inform future decision making in where investment in 20-minute neighbourhoods should be made, it is important to first establish a baseline to quantitatively analyse how residents in Dundee can access their daily needs. To do this, the travel-time analysis software TRACC was used to assess how many key destinations can be reached within a 10-minute walk from each data zone population weighted centroid. Only walking accessibility has been considered in this analysis and a walking time threshold of 10 minutes was selected, as much of the literature on 20-minute neighbourhoods suggests that most daily needs should be provided within a 10-minute journey each way. In line with Sustrans' definition of a 20-minute neighbourhood⁴⁶, the following facilities were used as key destinations:

- Food retailers and supermarkets;
- Education – early years, primary, and secondary;
- Health services – pharmacies, GPs, and dentists;
- Financial services – post offices and banks;
- Employment;
- Public open space – parks and recreation grounds;
- Entertainment – leisure, culture, and entertainment facilities;
- Transport provision – bus and rail stops.

Each data zone was given a walking accessibility rank based upon the total number of accessible destination points that are located within the maximum walking time threshold of 10 minutes (as identified by TRACC). Further analysis was then undertaken (using TRACC) and localities were ranked in order of priority for delivering 20-minute neighbourhoods by considering the total population within a 10-minute walk of each locality, car accessibility, health/disability, risk of deprivation, and existing facilities (by using the walking accessibility rank of the data zone the locality is located within). A full description of the methodology used for the analysis, list of the data sources, and TRACC parameters used are provided in Appendix B.

4.2. Walking accessibility and data zone ranks

Each data zone was ranked from 1 (good access to key services within a 10-minute walk) to 188 (poor access). A map showing the walking accessibility rank for each data zone is provided in Figure 4.

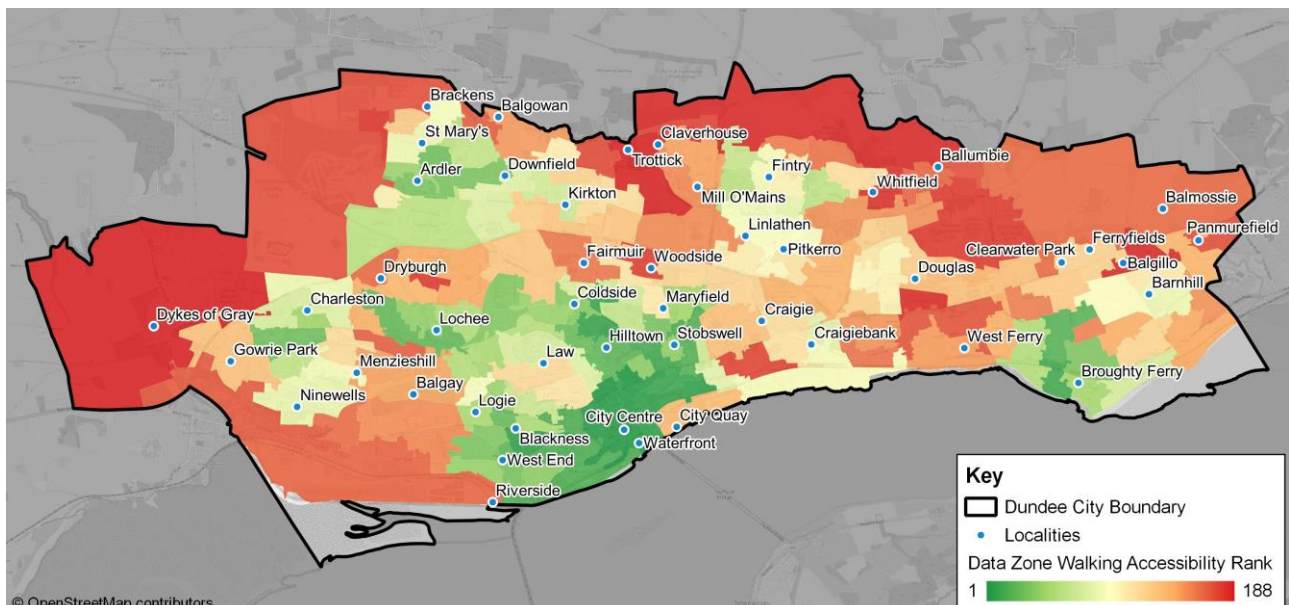


Figure 4: Data zone walking accessibility ranks

Walking accessibility to key destinations is generally better in the north-west, south, and south-east of the city. Areas near the City Centre, Hilltown, West End, Broughty Ferry, and Stobswell had the highest accessibility ranks and are good examples of existing local centres which already have several facilities in place. Areas in the north, north-east, and west of the city, such as Dykes of Gray, Claverhouse, Balgillo, Whitfield, and Woodside, had the lowest accessibility ranks and should therefore be considered for future investment for facilities and infrastructure improvements. New housing developments have been built in some of these areas in recent years, and their low accessibility ranks are likely due to a lack of facilities and supporting infrastructure. There are also severance issues caused by the A90 Kingsway and A92 trunk roads near these areas.

It should be noted that the accessibility ranks presented in this section do not take the quality of transport infrastructure or services into consideration. The ranking presented in this section should act as a guide for directing investment in areas which are most lacking facilities. Areas with existing services should still be considered for infrastructure and placemaking improvements to become effective 20-minute neighbourhoods, however.

4.3. Walking catchments and locality ranks

A map showing the walking catchments for each locality is provided in Figure 5.

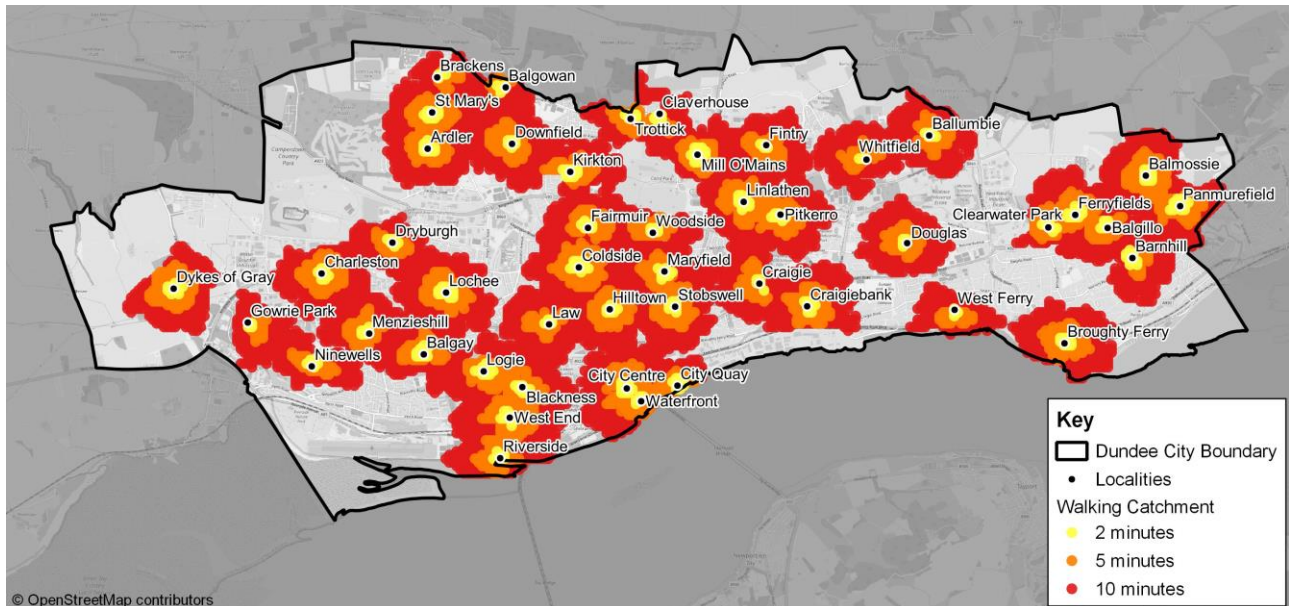


Figure 5: Locality walking catchments

The analysis found that in total, 99,065 people in Dundee (approximately 67% of the city's total population) would benefit if 20-minute neighbourhoods were delivered in every single locality. Each locality was ranked from 1 (highest priority for intervention) to 47 (lowest priority). The top five ranked localities are shown in Table 1 and the full ranking of localities can be found in Appendix C.

Table 1: Top five ranked localities

Locality	Total population catchment ³³	% with no car access ³⁶	% with long-term health problem/disability ³⁶	Data zone SIMD quintile ³⁸	Data zone walking accessibility rank	Locality rank
Maryfield	4,103	60%	24%	1 (most deprived)	105	1
Dryburgh	1,932	47%	29%	1 (most deprived)	165	2
Douglas	3,756	47%	25%	1 (most deprived)	135	2
Coldsides	6,339	58%	28%	1 (most deprived)	36	4
Linlathen	3,100	48%	26%	1 (most deprived)	103	5

Given that large proportions of the population in these areas have no car access, have a long-term health problem or disability, are at risk of deprivation, and/or have limited access to key services, 20-minute neighbourhoods have the potential to deliver significant inclusion benefits for these populations, and these five localities should therefore be considered priority areas for investment.

5. Engagement

5.1. Approach

To better understand the barriers faced when accessing local services by active modes in Dundee and the challenges and opportunities of delivering 20-minute neighbourhoods, semi-structured interviews were carried out with local authorities, a local equality group, and local communities/residents. The interview questions are provided in Appendix D and a list of the organisations and communities engaged with is shown in Table 2.

Table 2: Organisations and communities engaged with

Organisations
Dundee City Council, Sustainable Transport Team (2 representatives)
Dundee City Council, Environment Team (1 representative)
City of Edinburgh Council, Neighbourhoods Team (1 representative)
Dundee Access Group (1 representative)
Communities / local residents
Dykes of Gray (2 residents and 2 members of the Western Gateway Community Group committee)
Lochee (2 residents)
West End (1 resident)
Charleston (2 residents)
Hilltown (1 resident)
Douglas (1 resident)
Broughty Ferry (1 resident)
Whitefield (1 resident)

5.2. Key engagement findings

Discussions with council officers found that there is a need for **clear definitions and accurate messaging of 20-minute neighbourhoods and the benefits they would deliver**, as there are concerns amongst some members of the public that 20-minute neighbourhoods could make accessing other parts of the city more difficult.

It also is important to express that 20-minute neighbourhoods are about **improving access to local services, improving the quality of these, and enabling sustainable travel for everyday journeys for residents**; they would still allow people to access the rest of the city using public transport or car if necessary. Developing 20-minute neighbourhoods is about continuous improvement and identifying which services and infrastructure communities do or do not have. Effective communication will be important in getting local communities to buy in to the concept of 20-minute neighbourhoods.

Council officers also highlighted that **engagement with residents, businesses and communities** should be a key part of 20-minute neighbourhood strategies. It is good to engage with communities at an early stage and ensure that schemes and strategies meet their needs, although it was noted that engagement at an early stage can be challenging if there is no vision. 20-minute neighbourhoods can feel unachievable for

communities with limited infrastructure or local services, particularly given public service closures, centralisation of services, and budget cuts in recent years. There are also challenges with social norms, as many people see owning a car as more aspirational than walking and cycling.

Several of the residents interviewed said they visit their local centre on a weekly or monthly basis for a variety of purposes (such as accessing post offices, pharmacies, food stores, bus stops, libraries, places of worship, and restaurants), but some claimed they are more likely to visit their city centre rather than their local centre, due to the city centre having a wider variety of amenities. The equalities group and many residents claimed that issues such as too much traffic, poorly maintained infrastructure, safety concerns, and a lack of wide or good quality paths, crossing points and street lighting affect their ability to walk, wheel, or cycle in their local area. However, **all residents agreed that 20-minute neighbourhoods would benefit them** and liked the idea of having most amenities within a short walking distance. Suggestions on the types of improvements residents would like to see in their local area included:

- Better maintained streets and pavements;
- High-quality walking and cycling infrastructure;
- More public transport options that are reliable and affordable;
- More local amenities, rest stops, and greenery;
- Increased sense of community with more local events, community spaces, and support for local businesses.

Council officers highlighted that there are severance issues caused by several trunk roads running through Dundee, particularly the Kingsway, which effectively splits the city in two. Walking is already a popular choice for many residents, but cycling mode share is low due to a lack of safe infrastructure. Much of the existing active travel infrastructure is focused on the Waterfront rather than the rest of the city, and infrastructure is particularly lacking in areas with high levels of deprivation. However, **there are ambitions to deliver active travel infrastructure improvements in Dundee**, as demonstrated by the Council's ongoing Active Freeway studies and Sustainable Transport Delivery Plan.

Delivering effective behaviour change measures is also important. There is growing support amongst politicians, the public, council officers, and local press to invest in active travel. It was mentioned that previous engagement in Dundee has found that businesses can sometimes have concerns around loss of parking, but there are generally ways to accommodate this.

Council officers conveyed that **there is ample space in Dundee to accommodate active travel infrastructure**, with only occasional pinch points in the network, although it should be noted that there are topographical challenges in the city due to its many hills. To promote active travel for everyday journeys, it is essential that infrastructure is well maintained, affordable and accessible; this can be achieved by engaging with as many people with protected characteristics as possible and the groups that represent them.

Council officers highlighted that there are examples of desirable local centres south of the Kingsway, such as the West End, Broughty Ferry, and Lochee, which have the required services to function as 20-minute neighbourhoods. However, north of the Kingsway, local centres have suffered from economic decline and are less attractive. It is therefore important to **consider placemaking improvements in 20-minute neighbourhoods** to create pleasant environments that residents will want to spend time in.

6. Conclusions

6.1. Recommendations

20-minute neighbourhoods comprise several elements that include transport, planning, economics and architecture based elements. There is a need for collaborative working and consensus across these disciplines to embed 20-minute neighbourhood principles into decision making in local authorities, particularly with regards to directing funding and public investment.

The research presented and summarised in this paper illustrates that there are opportunities for 20-minute neighbourhoods to contribute towards improving transport accessibility, social mobility, improved air quality, and better levels of social inclusion. There are already many existing local centres with significant potential to be transformed into 20-minute neighbourhoods by improving active travel and public transport infrastructure, providing more amenities, and enhancing placemaking.

Within Dundee, there are several residential areas that currently lack local services and have limited access to key destinations. The analytical process detailed in this paper proposes a methodology for ranking populations in Dundee that could realise the greatest level of benefit from the delivery of 20-minute neighbourhoods. The process primarily targets populations without a car, with a long-term health problem or disability, and/or are at risk of suffering from deprivation. By targeting these populations, the level of benefits realised by the introduction of 20-minute neighbourhoods could be maximised, returning a higher level of value than investing in other locations.

The engagement process found that there was strong support for 20-minute neighbourhoods from the local residents and stakeholders interviewed. Ongoing transport projects and changing attitudes in the city present an opportunity to prioritise active travel, reduce car use and promote local living. However, it was recognised that there are several challenges to overcome, particularly the current economic climate and misconceptions amongst the general public about the impact of 20-minute neighbourhoods on wider accessibility. Effective engagement and clear messaging is therefore crucial to improve the public's understanding of the concept and the benefits they would deliver, as well as ensuring that proposals meet communities' needs.

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Appendix A. Figures

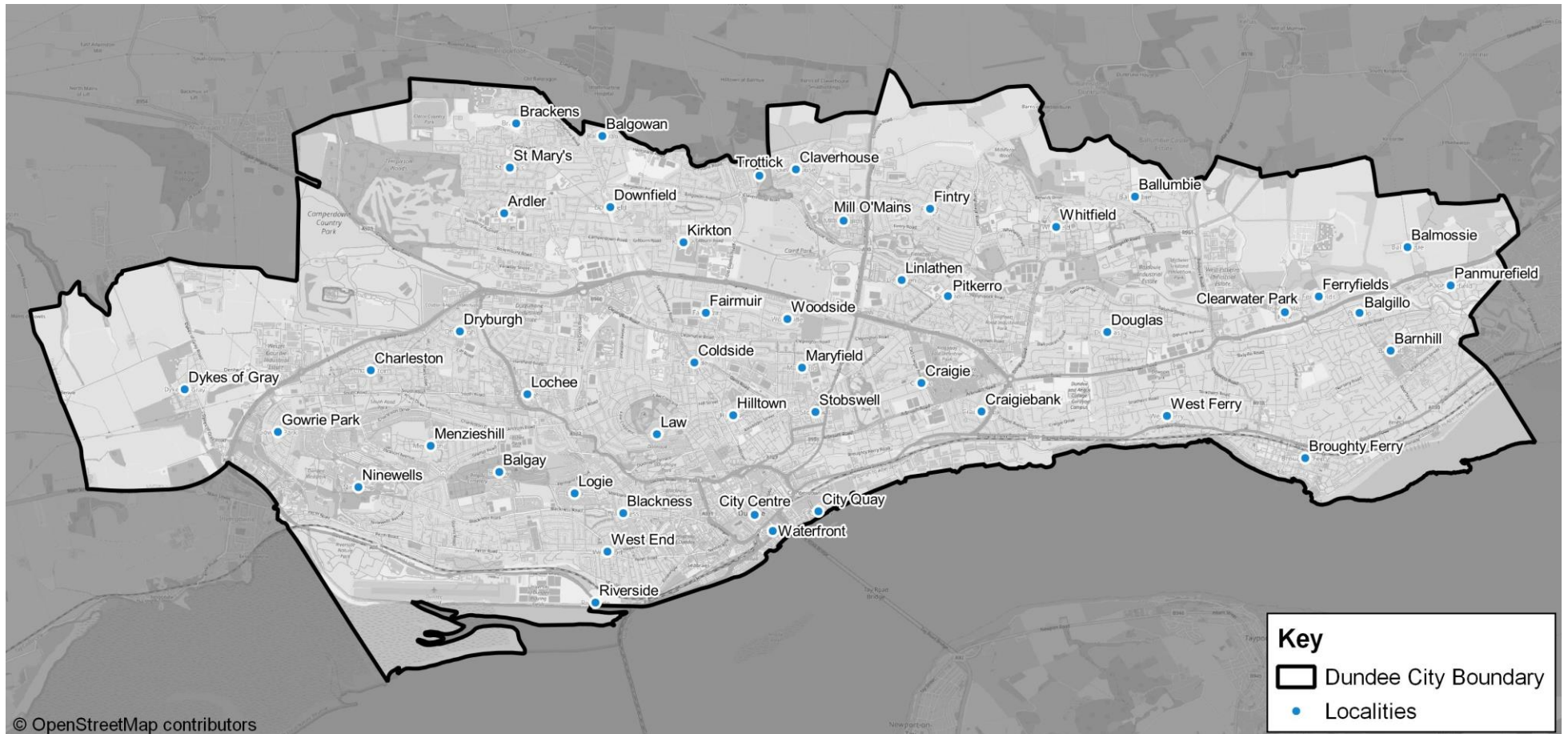


Figure A1: Dundee City boundary and localities

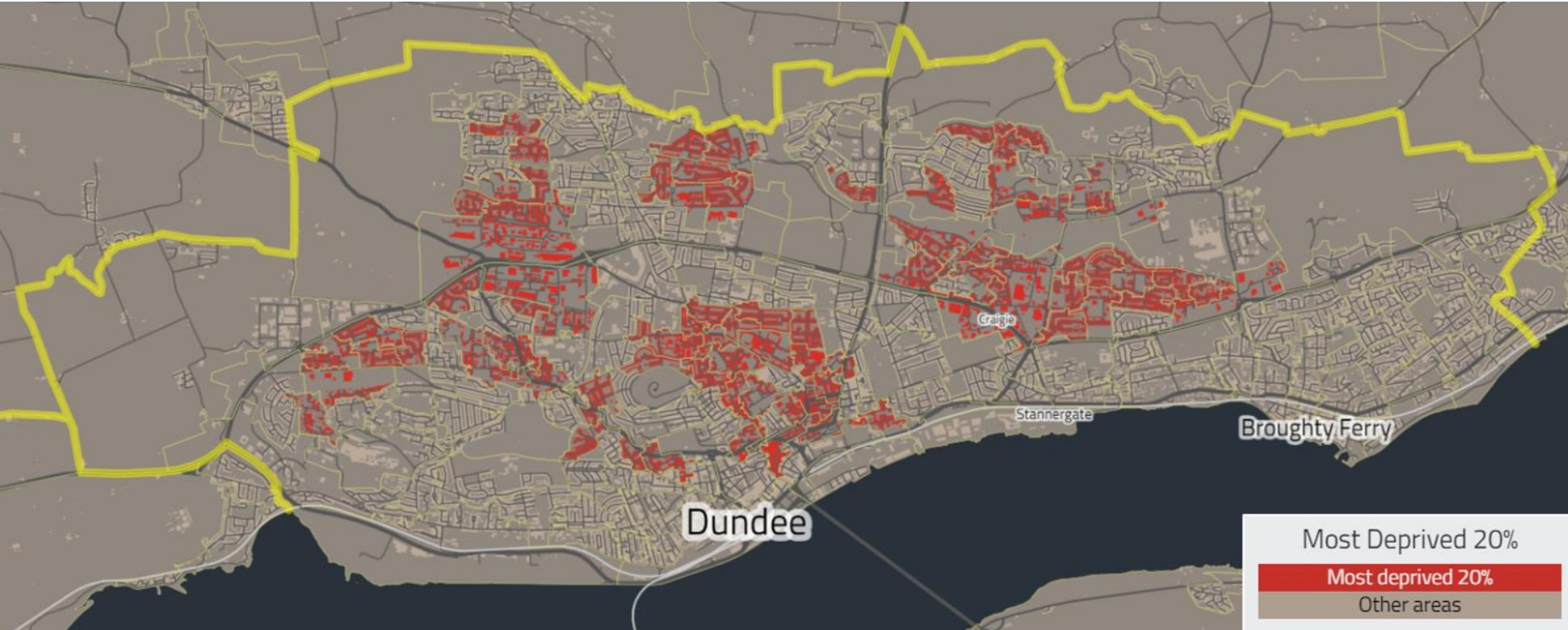


Figure A2: Areas in Dundee within the most deprived 20% of Scotland

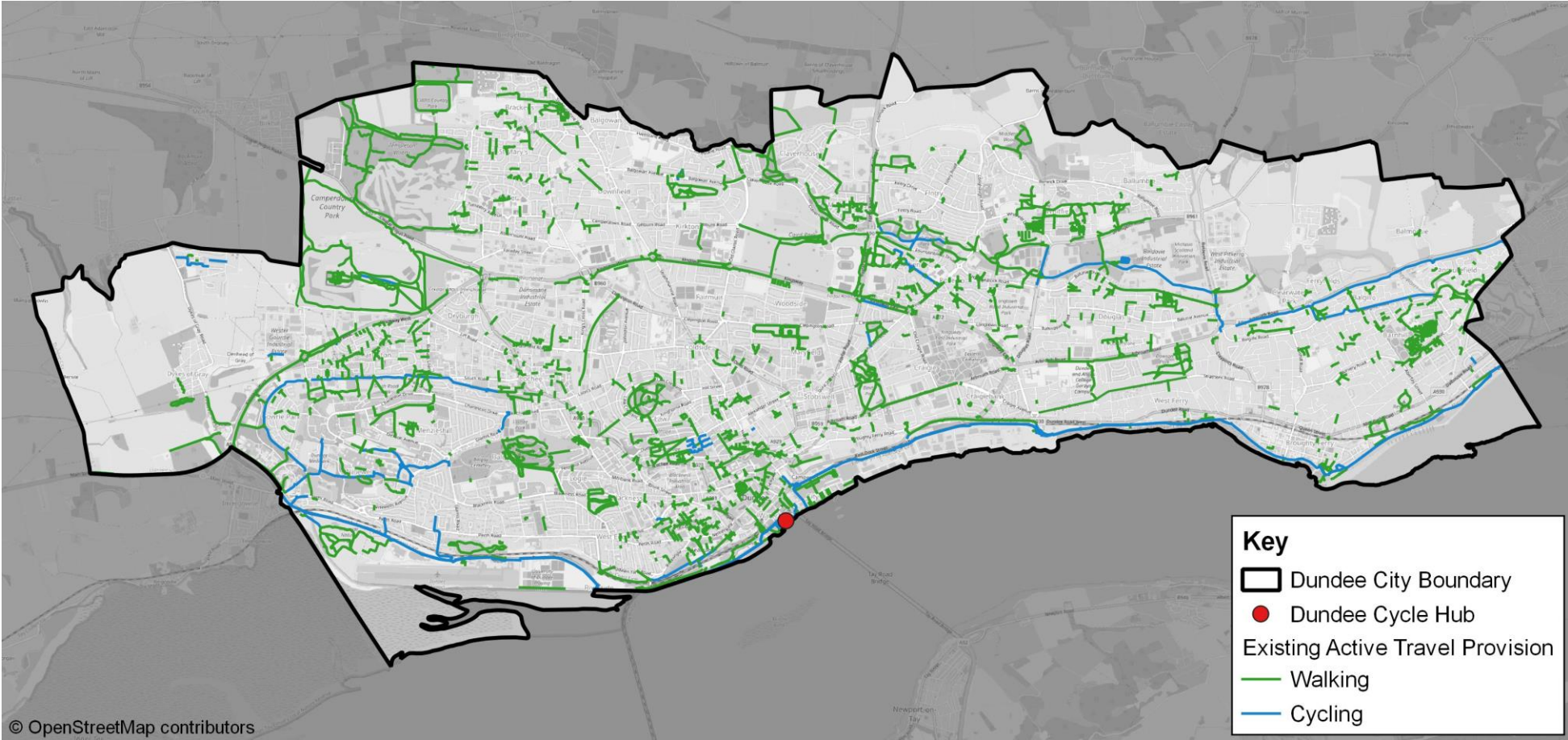


Figure A3: Existing active travel provision

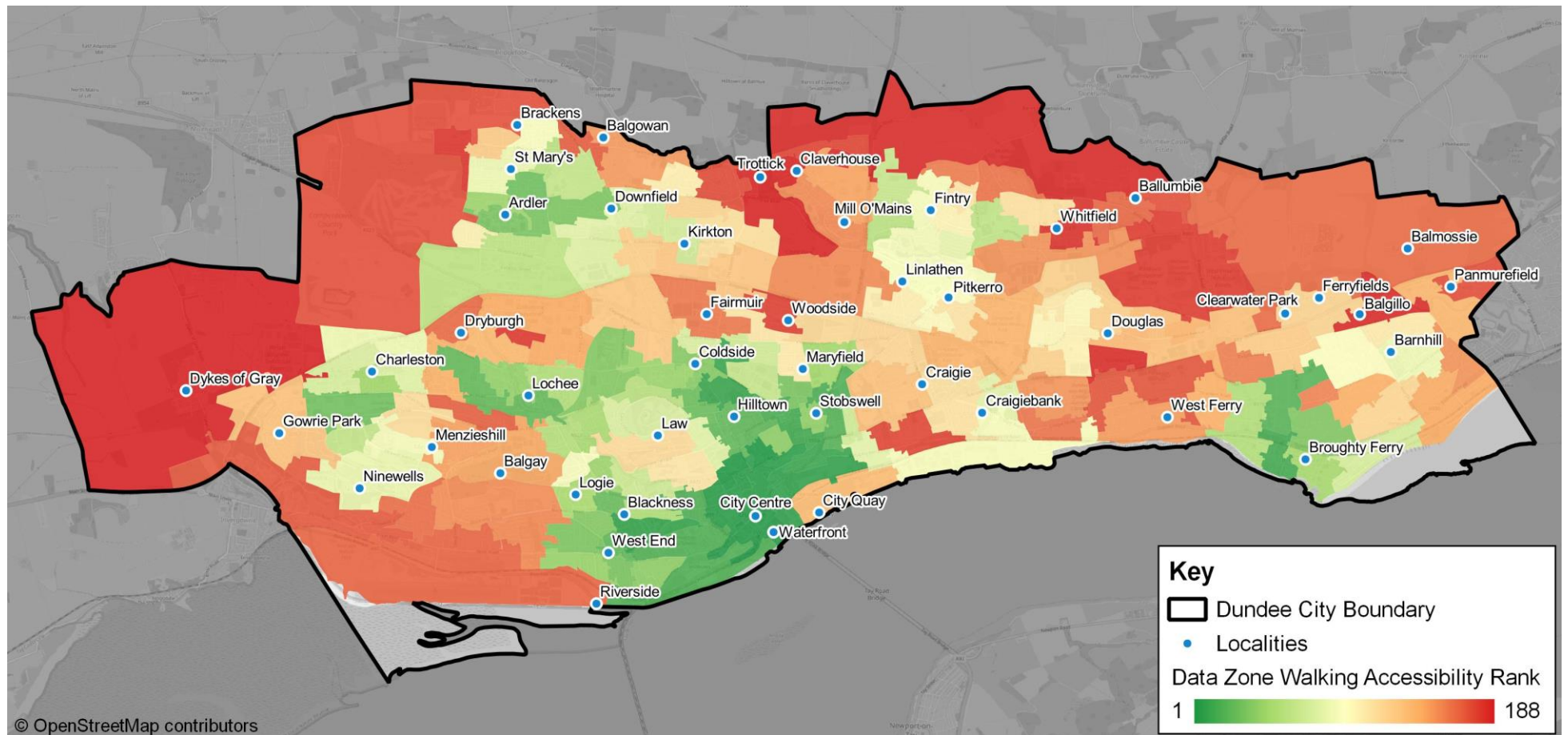


Figure A4: Data zone walking accessibility ranks

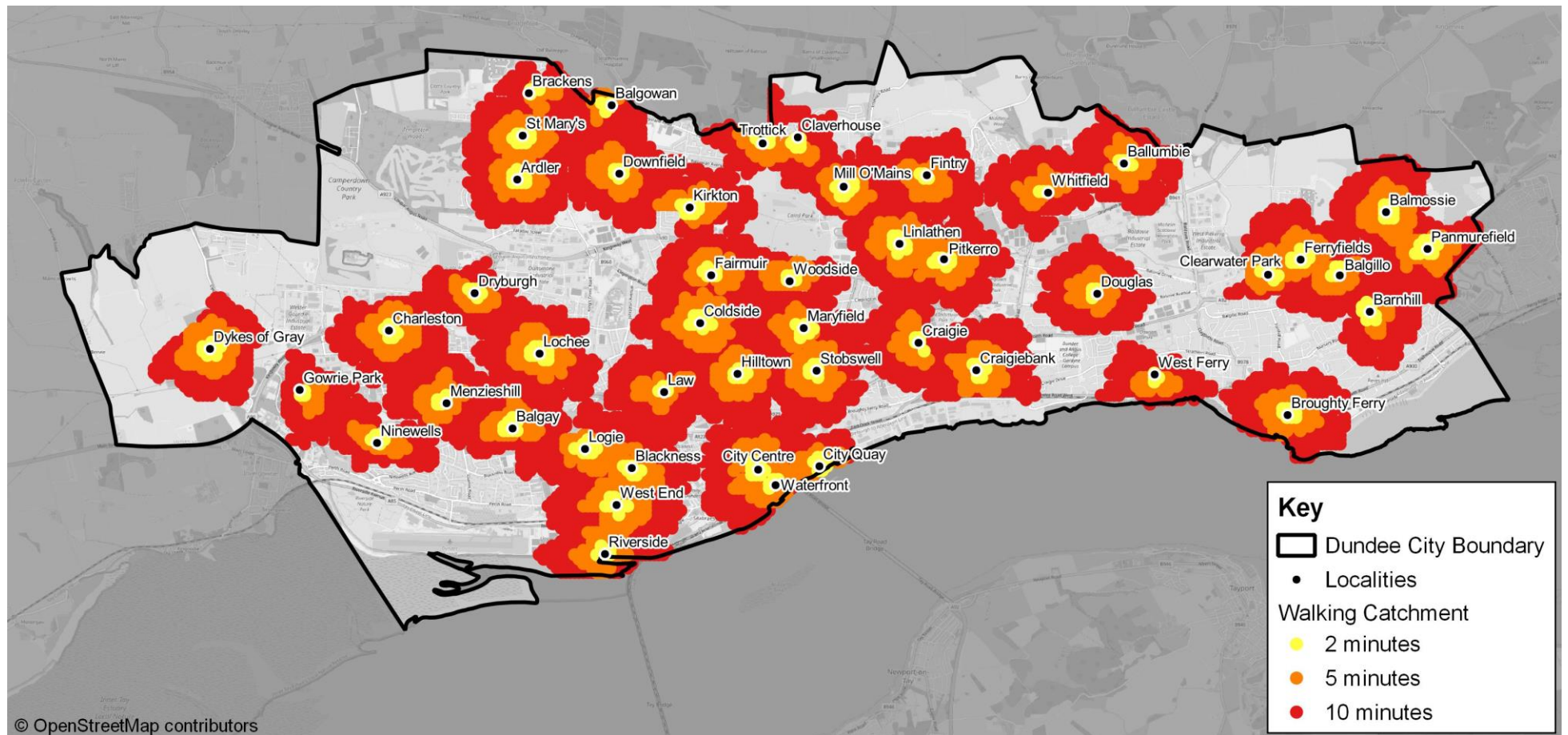


Figure A5: Locality walking catchments

Appendix B. Methodology for Accessibility Analysis

Data Zone Walking Accessibility Ranking:

1. Data zone population weighted centroids were used for the origin points;
2. The following facilities were used for the destination points;
 - Food retailers and supermarkets;
 - Education – early years, primary, and secondary;
 - Health services – pharmacy, GP, and dentist;
 - Financial services – post office and bank;
 - Employment;
 - Public open space – parks and recreation grounds;
 - Entertainment – leisure, culture, and entertainment facilities;
 - Transport provision – bus and rail stops.
3. TRACC was used to calculate walking accessibility from each data zone to each destination point using a walking time threshold of 10 minutes.
4. The number of destination points that can be accessed from each data zone were counted for each type of destination.
5. For each type of destination, data zones were ranked based upon the number of accessible destination points when compared to all other data zones; the rankings across all types of destinations were then averaged for each data zone.
6. Each data zone was ranked based on its average rank value from step 5 when compared to all other data zones; this is the overall walking accessibility rank for the data zone. Rank 1 represents the data zone with the best accessibility to key services within a 10-minute walk and 188 represents the data zone with the poorest accessibility.
7. Data zones were then mapped and categorised based on their walking accessibility rank.

Walking Catchments and Locality Ranking:

1. A grid of origin points spaced 50 metres apart was generated in TRACC for Dundee.
2. TRACC was used to calculate walking accessibility from the origin grid points to each locality in Dundee using a walking time threshold of 10 minutes.
3. The walking catchments (origin grid points) for each locality were mapped and categorised using walking time thresholds of 2 minutes, 5 minutes, and 10 minutes.
4. Population and socio-economic data (car access and long-term health problem or disability) was imported into TRACC (at a data zone level) and distributed across the origin grid points.
5. Each locality was ranked based upon the total population that can access it within a 10-minute walk, the percentage with no car access, the percentage with a long-term health problem or disability, the SIMD (quintile) score for the data zone containing the locality, and the walking accessibility rank (as described above) for the data zone containing the locality; the rankings across all these indicators were then averaged for each locality.
6. Each locality was ranked based on its average rank value from step 5 when compared to all other localities; this is the overall priority rank for the locality. Rank 1 represents the locality that is considered the highest priority for investment and 47 represents the locality that is the lowest priority. The full ranking of localities is provided in Appendix C.

Data sources:**Table B1: Data sources used for accessibility analysis and GIS mapping**

Origin, Boundary, Population, and Socio-Economic Data		
Data	Sources	
Mid-2021 population estimates	Mid-2021 Population Estimates Scotland, National Records of Scotland, July 2022, https://www.nrscotland.gov.uk/	
2020 SIMD	Scottish Index of Multiple Deprivation 2020, Scottish Government, https://simd.scot/	
Data zone boundaries 2011	Data Zone Boundaries 2011, Scottish Government, November 2014, https://spatialdata.gov.scot/	
Data zone population weighted centroids 2011	Data Zone Centroids 2011, Scottish Government, November 2014, https://spatialdata.gov.scot/	
Long-term health problem or disability 2011	Long-term health problem or disability, Census 2011, Scottish Government, https://www.scotlandscensus.gov.uk/	
Local authority boundaries	Local Authority boundaries – Scotland, Scottish Government, April 2019, https://spatialdata.gov.scot/	
Car or van availability 2011	Car or van availability, Census 2011, Scottish Government, https://www.scotlandscensus.gov.uk/	
Localities	OSM points of interest; key = place; value = suburb, village; OpenStreetMap; https://www.openstreetmap.org/	
Destination Data		
Category	Sub-category	Sources
Food retailers	Food stores and supermarkets	Retail Points, Geolytix, August 2023, https://geolytix.com/blog/supermarket-retail-points/
Education	Early years	List of Dundee City Council Nurseries, Dundee City Council, https://www.dundee.gov.uk/service-area/children-and-families-service/education/early-education-and-childcare/publications
	Primary	Scottish School Roll and Locations, Scottish Government, April 2023, https://spatialdata.gov.scot/
	Secondary	Scottish School Roll and Locations, Scottish Government, April 2023, https://spatialdata.gov.scot/
Health services	Pharmacy	Pharmacies – Scotland, Scottish Government, September 2020, https://spatialdata.gov.scot/
	GP	GP Practices – Scotland, Scottish Government, September 2020, https://spatialdata.gov.scot/
	Dentist	Dental Practices and Patient Registrations, Open Data Scotland, September 2023, https://opendata.scot/datasets/public+health+scotland-dental+practices+and+patient+registrations/
Financial services	Post offices	OS Address Base, Ordnance Survey, https://www.ordnancesurvey.co.uk/products/addressbase Branch Finder, Post Office, https://www.postoffice.co.uk/branch-finder
	Banks	OSM points of interest; key = amenity; value = bank; OpenStreetMap; https://www.openstreetmap.org/
Employment	Key employment centres	Business Register and Employment Survey, Nomis, 2022, https://www.nomisweb.co.uk/datasets/newbres6pub (the largest employment sites in each data zone containing more than 1% of total jobs in Dundee were selected)
Public open spaces	Parks	Parks and Environment, Dundee City Council, https://www.dundee.gov.uk/service-area/neighbourhood-services/environment/parks-and-environment

	Recreation grounds	OSM points of interest; key = leisure; value = park, playground; OpenStreetMap; https://www.openstreetmap.org/
Entertainment	Leisure facilities	Leisure and Sport Facilities, Leisure and Culture Dundee, https://www.leisureandculturedundee.com/leisure-sport#facilities
	Culture facilities	Find a Library, Leisure and Culture Dundee, https://www.leisureandculturedundee.com/library/find-library Culture, Leisure and Culture Dundee, https://www.leisureandculturedundee.com/culture
	Entertainment venues (arts centre, cinema, tenpin bowling, theatre, water park)	OSM points of interest; key = amenity, leisure; value = arts_centre, cinema, theatre, water_park; OpenStreetMap; https://www.openstreetmap.org/
Public transport stops	Bus stops	NaPTAN, Datacutter, Basemap, https://basemap.co.uk/datacutter
	Rail stations	OSM points of interest; key = public_transport; value = station; OpenStreetMap; https://www.openstreetmap.org/
Road and Active Travel Networks		
Data		Source
OpenStreetMap road network		OpenStreetMap data, Geofabrik, 2018, https://download.geofabrik.de/europe/great-britain.html
National cycle network		National Cycle Network (Public), Sustrans' Open Data Portal, Sustrans, https://data-sustrans-uk.opendata.arcgis.com/

TRACC Parameters:

Table B2: Parameters used for TRACC calculations

Calculation:	Origin-Destination
Mode:	Walk
Choose direction:	Outbound
Choose calculation type:	Fastest path
Walk speed (when not on network):	4.8 km/hr
Walk variance (when not on network):	1.2
Maximum origin/destination distance (crow flies):	100 kilometres
Time catchment:	10 minutes
Return accessible result only:	Yes
Limit number of destinations per origin:	No
Maximum origin/destination connector length:	800 metres
Road network buffer:	No
Normalise road network:	No

Appendix C. Locality Ranks

Table C1: Locality ranks

Locality	Total population catchment	% with no car access	% with long-term health problem/disability	Data zone SIMD quintile	Data zone walking accessibility rank	Locality rank
Maryfield	4,103	60%	24%	1	105	1
Dryburgh	1,932	47%	29%	1	165	2
Douglas	3,756	47%	25%	1	135	2
Coldside	6,339	58%	28%	1	36	4
Linlathen	3,100	48%	26%	1	103	5
Hilltown	6,132	58%	24%	1	21	6
Lochee	3,458	52%	27%	1	41	7
Pitkerro	3,299	46%	24%	1	94	8
Charleston	4,328	55%	23%	1	46	9
Woodside	1,692	40%	27%	2	179	10
Fairmuir	2,467	48%	26%	4	160	11
Stobswell	7,960	55%	18%	1	40	12
Mill O'Mains	1,842	45%	22%	1	155	13
Fintry	4,192	44%	23%	2	89	14
Whitfield	1,597	40%	19%	1	183	15
St Mary's	4,871	38%	21%	1	83	16
Blackness	7,823	56%	16%	2	51	17
Craigiebank	1,960	43%	27%	2	89	17
Law	3,196	45%	23%	4	116	19
Ardler	3,241	41%	22%	1	29	20
Logie	5,928	53%	18%	3	50	21
Kirkton	2,254	37%	23%	1	68	22
City Centre	3,978	66%	12%	2	4	23
Menzieshill	2,209	39%	21%	2	88	24
Barnhill	1,669	30%	24%	2	86	25
Downfield	3,568	27%	23%	3	78	26
Ninewells	910	42%	23%	2	82	27
Broughty Ferry	3,102	31%	23%	4	48	28
West End	6,964	47%	14%	4	20	29
Brackens	1,972	34%	20%	5	173	30
Balgay	1,398	23%	22%	3	145	31
West Ferry	844	17%	24%	4	148	32
City Quay	1,382	48%	9%	4	134	33
Craigie	1,687	26%	21%	4	130	34

Riverside	1,472	39%	10%	4	168	35
Trottick	874	29%	17%	4	187	36
Waterfront	2,257	61%	10%	4	3	36
Claverhouse	513	29%	17%	4	187	38
Dykes of Gray	265	8%	21%	4	188	39
Balgowan	1,175	18%	20%	4	149	40
Ballumbie	1,543	14%	14%	4	173	40
Panmurefield	2,302	8%	14%	5	175	42
Balmossie	521	7%	15%	3	165	43
Gowrie Park	1,060	38%	18%	5	130	44
Balgillo	1,616	10%	13%	5	120	45
Clearwater Park	1,096	6%	8%	5	120	46
Ferryfields	1,248	5%	7%	5	120	46

Table C2: Overall Dundee access to localities

Total Dundee population within 10-minute walk of a locality	99,065
% with no car access	45%
% with long-term health problem or disability	21%

Appendix D. Interview Questions

Local authorities:

1. What are the key issues in promoting active travel for everyday journeys?
2. What are the main challenges of delivering high-quality active travel infrastructure in local communities?
3. How do we overcome these challenges to deliver the infrastructure required for 20-minute neighbourhoods?
4. What are the opportunities of 20-minute neighbourhoods?
5. How do we ensure that our transport system delivers greater social value and improves inclusion?
6. How do we get local communities to buy-in to the concept of 20-minute neighbourhoods?
7. What can key stakeholders do to support the delivery of 20-minute neighbourhoods?

Communities / local residents:

1. Do you visit your local centre? If so, how often and what are your main reasons for visiting your local centre? If not, why not?
2. What is your main mode of transport when accessing local facilities?
3. The 20-minute neighbourhoods concept aims to provide access to most daily needs within a 20-minute walk, wheel or cycle. What are your initial thoughts on 20-minute neighbourhoods? Do you think there are benefits or disadvantages?
4. What five facilities do you consider to be essential in a 20-minute neighbourhood?
Prompts: supermarket, school/pre-school, GP, dentist, pharmacy, post office, park/spaces for play, place of worship, library, café, pub
5. Think about everything within 20-minutes of your home. Are there any factors that affect your ability to walk, wheel or cycle in your local area?
Prompts: speed of traffic, amount of traffic, poor quality paths, lack of crossing points, poor lighting, pollution, personal safety concerns
6. What would improve your experience of spending time in your local centre and getting around on foot or by bike?
Prompts: better maintenance, better walking/cycling infrastructure, more public transport options, more local amenities, more greenery, less traffic, more rest facilities, if more people were doing it
7. What other kinds of opportunities or facilities would you like to see more of in your local area?
Prompts: sense of community, more outdoor and recreation space, better support for local businesses and charities, more cultural and entertainment events, more night life

Equalities groups:

1. What are the main barriers your members face when walking, wheeling, or cycling for everyday journeys?
2. The 20-minute neighbourhoods concept aims to provide access to most daily needs within a 20-minute walk, wheel, or cycle. What are your initial thoughts on 20-minute neighbourhoods?
3. Would 20-minute neighbourhoods have any benefits or disadvantages for your members?
4. Do you feel that more 20-minute neighbourhoods would improve transport inclusion in Dundee?
5. What would improve the experience of spending time in local centres and getting around on foot or by bike for your members?

Prompts: better maintenance, better walking and cycling provision, better public transport, more local amenities, more greenery, less traffic, more rest facilities

6. What five facilities do you consider to be essential in a 20-minute neighbourhood?

Prompts: supermarket, school, GP, dentist, pharmacy, post office, park, place of worship, library, café, pub

7. What other kinds of local opportunities or facilities would benefit your members?

Prompts: sense of community, more outdoor and recreation space, better support for local businesses and charities, more cultural and entertainment events, more night life