

GLASGOW OPEN SPACE STRATEGY

CONSULTATIVE DRAFT

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1. Executive Summary

The City of Glasgow has a long tradition in the pursuit of a high quality built environment and public realm, continuing to the present day. This strategy represents the next steps in this tradition by setting out how open space should be planned, created, enhanced and managed in order to meet the priorities for Glasgow for the 21st century. This is not just an open space strategy. It is a cross-cutting vision for delivering a high quality environment that supports economic vitality, improves the health of Glasgow's residents, provides opportunities for low carbon movement, builds resilience to climate change, supports ecological networks and encourages community cohesion. This is because, when planned well, open space can provide multiple functions that deliver numerous social, economic and environmental benefits.

Realising these benefits should be undertaken in a way that is tailored to the needs of the City. As such, this strategy examines the priorities Glasgow has set out and identifies six cross-cutting strategic priority themes for how open space can contribute to meeting them. It should be noted that the themes are not mutually exclusive and, given the potential multifunctional nature of open space, should be delivered in conjunction with one another. The strategic priority themes are:

- 1 Place setting for improved economic and community vitality;
- 2 Health benefits and well-being;
- 3 Creating connections;
- 4 Improving ecological quality;
- 5 Enhancing natural processes and generating resources; and
- 6 Managing the micro-climate.

Following a review of the existing open space context, this strategy sets out how open space can contribute to meeting these strategic priority themes, providing the evidence and analysis of the relationship between open space and the key issues for Glasgow. It then sets out strategic objectives for each theme. These objectives are used to structure an action plan for delivering multifunctional open space. Also included in the action plan is a discussion of delivery mechanisms.

What is the current open space resource?

Planning Advice Note 65, 'Planning and Open Space' (PAN65) provides a typology framework to categorise the different types of open space within Scottish settlements.

Mapping the open space resource illustrates the spatial distribution of the different open space types and a quality assessment of 200 representative sites has been undertaken to help understand whether the sites are fit for purpose. Analysing these reviews of Glasgow's current open space resource showed that:

- Glasgow has a significant open space resource but the distribution, type and quality varies considerable across the city;
- There is a core of very high quality parks and gardens, although there is opportunity to improve less high profile spaces and the role of smaller pocket parks;
- There are significant tracts of poor quality amenity space that present great potential for improving the quality of place;
- Areas of natural and semi natural green space are concentrated on the urban fringe. They offer important connectors to the countryside but could extend further into the city to support ecological networks;
- There is limited space for allotments; and
- Although there is significant open space associated with sports provision, this is dominated by golf clubs and there might be opportunities to diversify the sports space offering.

Place setting for improved economic and social vitality

A high quality environment is central to improving economic performance and fostering high quality sustainable neighbourhoods. It helps to support economic growth and attract investment, enhance land and property values, improve productivity, attract tourists, define communities and raise neighbourhood satisfaction. On the flip side, there is a strong association between poor quality green space and deprivation. The visual impact of un-maintained green and open space can contribute to a feeling of neglect that heightens the fear of crime; poorly designed and managed places can actively attract anti-social behaviour.

Glasgow's open space should therefore further support regeneration and the creation of a high quality environment that maintains the City's appeal to investors, tourists and commercial activities and starts to improve the image of some of the more deprived areas. The focus for open space in achieving this will be on:

- Improving the quality of civic space and the public realm – investment in Glasgow City Centre civic space and public realm has already delivered award winning space. These activities should be continued and extended to other centres;
- Reducing vehicle dominance and improving pedestrian experience – vehicle dominance in the City Centre has a negative impact on the pedestrian experience. Evidence from around the world shows a strong correlation between pedestrian experience and the vitality of city centres. Furthermore, vehicle dominance also reduces opportunities for other activities such as al fresco dining and cafe culture;
- Animating stalled spaces – there is a significant area of under-utilised land across Glasgow. Some areas are derelict and contaminated, whereas some are part of longer term regeneration plans. This not only detracts from the quality of place, but also represents a wasted resource for other interim uses; and
- Improving the quality of amenity space – the quality of amenity space is generally quite low. There is also a higher proportion of amenity space in more deprived areas compared to other open space types.

The strategic objectives for place setting are therefore to:

- Develop design guidelines and co-ordinate a coherent approach to civic space improvements; areas of focus could include the banks of the Clyde in conjunction with the identified key regeneration projects, George Square and Pollok Town Centre as well as other neighbourhood community spaces;
- Explore opportunities to reduce vehicular dominance within the city centre, potentially through multifunctional street sharing and / or limiting access;
- Activate stalled sites through the creation of temporary spaces, including recreation activities and pocket parks; and
- Focus on supporting the provision of high quality residential and business amenity space, particularly those areas identified as Strategic Economic Investment Locations and areas identified in the Glasgow City Council report, Industrial and Business Areas for Improvement (2008).

Health and wellbeing

Effectively designed open space is vital to improving residents' quality of life, especially in urban areas. Some health benefits of open space provision, such as providing opportunities for an active lifestyles and relaxation, are well known. Others, such as its ability to improve mental health and contribute to social cohesion are less obvious. The Scottish Index of Multiple Deprivation (SIMD) suggests that there is a large disparity in Glasgow's health. While some areas are the least deprived in the country, there are areas where two-thirds of the population are classified as falling within the 15% most deprived areas in Scotland. Overall, a third of Greater Glasgow is covered by the SIMD's most deprived areas for health. Although from the survey of open space it appears that Glasgow has a significant supply of space for formal and informal recreation, the provision and quality of this space is poorer in the more deprived areas, where health problems are most acute.

As such, the strategic objectives for open space to help improve the health of Glasgow's residents are:

- Improving the access and quality of recreational open space, including parks and gardens, sports facilities and amenity space, particularly focusing action towards the more deprived areas of the city;
- Providing high quality natural play equipment in areas of deficiency;
- Integrating opportunities to exercise into the outdoor environment; and
- Maintaining support for the Equally Well project and promoting 'Healthy Urban Planning' by delivering more walkable places through attractive public realm, an appropriate mix of services and improved connectivity for pedestrians and cyclists.

Creating connections

Open space assets are not just destinations in their own right. The routes that connect these spaces, people's homes, places of work and leisure activities also have an important public realm and open space role. They provide an opportunity for the multifunctional benefits of open space to permeate throughout the City.

Perhaps the greatest opportunity for open space is in creating cycling and walking routes that support green corridors. Attractive green networks, shaded by trees, can encourage greater use of cycling and walking routes: so long as routes are safe and directly link communities to

the services and employment that they need in order to provide alternatives to driving cars or taking public transport. The dominance of vehicular routes and their interchanges present barriers to movement and often result in redundant space. Opportunities to overcome the barriers and to improve the quality of underutilised space will help improve movement and the quality of place.

Drawing from this, the strategic objectives for creating open space connections are:

- Reinforcing the cycle and pedestrian routes along the main waterways and through green corridors;
- Ensuring that new development proposals and regeneration plans contribute to the creation of the cycle and pedestrian network; and
- Improving the environment and character of key transport interchanges by improving the quality of the underutilised space through planning, lighting and art installations.

Ecological quality

Biodiversity underpins the health of the environment and its ability to generate natural resources such as food, maintain ecosystem services or natural processes such as improving air and water quality and in building climate resilience. Biodiversity is the foundation for all ecosystems services, on which we all depend, but has been eroded as civilisation has grown, with an acceleration in the decline during the last 100 years, a period when oil has become the main source of energy for agriculture and industry.

Citiescapes also present significant physical barriers for wildlife, restricting its distribution. Furthermore, the ecosystem services that are associated with environmental infrastructure are provided in a more efficient way when habitats and open space are interconnected. As such, creating a more permeable urban environment, through the creation of ecological networks, is a more robust way of planning for biodiversity and the ecosystem service benefits it supports

A number of sites have been designated specifically for their ecological quality. Sites of Special Scientific Interest (SSSIs) are national designations identified by Scottish Natural Heritage and as such are afforded high levels of protection as they represent some of the most important ecological sites in the country. Local Nature Reserves are statutorily designated by local authorities and are protected by national legislation. Other environmental designations are locally defined and protected through the City Plan. As might be expected, these sites tend to be on the outskirts of the city where there is more space, closer connection with the wider countryside and potentially less human

intrusion. There are also a number of other open spaces that have not been formally designated but when surveyed as part of the quality assessment score highly for biodiversity value, displaying characteristics of high ecological quality. In comparison, more local open spaces, when assessed, tend to perform poorly. Amenity space (12%) in particular is rarely considered to be fit for biodiversity purposes. As these spaces are distributed widely across the city, they offer great potential to help reinforce the ecological network.

The strategic objectives for Glasgow to become more permeable to wildlife by creating an ecological network and improving the ecological quality of its assets, are:

- Improving the biodiversity value of amenity and civic space. The creation of meadows in residential amenity space and the greening of civic space, e.g. through raingardens, as proposed in the Place Setting and Enhancing natural processes sections should be undertaken, considering Biodiversity Action Plan (BAP) priority species;
- Continuing to manage parks and natural / semi-natural areas within the urban area for their biodiversity value; and
- Improving ecological connection along core corridors including the road, rail and river network.

Enhancing natural processes and generating resources

Green infrastructure delivered through open space provides ecosystem goods and services that are essential for the management of air, land and water resources. Natural systems are often able to manage resources very efficiently, providing treatment and safeguarding local cycles/systems and resources. Open space could be employed to provide ecosystem goods and services in relation to:

- *Resource production* – including food and biomass fuels to support local low carbon energy generation schemes;
- *Improvement of air quality* - vegetation can improve local air quality by filtering out pollutants which in turn can help improve the health of the population. Airborne particulates and ground level ozone are helping induce climate change. Green space can help to reduce their impact;
- *Remediation of contaminated land* – Plants can be used to reduce contamination on a site through a process known as phytoremediation. Microbial activity in the growing vegetation draws up the contaminant and locks it within the plant matter. It can then be removed and disposed of safely; and

- *Management, storage and treatment of water* - Natural processes can also be used to remove pollutants and sediments from stormwater or wastewater, providing local sources of clean water and ensuring local waterway quality is protected. Natural treatment systems can be designed in as part of Sustainable Drainage Systems (SUDS) to manage and cleanse stormwater runoff. Natural infiltration systems can also be used to filter water before letting it naturally percolate into groundwater systems, replenishing local supplies.

Glasgow recognises the important functions and resource potential offered through open space and urban greening. By enhancing natural processes and resource generation potential in parks, open space and green networks, these places can become increasingly multifunctional, for example offering water treatment alongside amenity improvements that encourage recreation and support biodiversity.

As such, the strategic objectives for enhancing natural processes and generating resources are to:

- Utilise green infrastructure to help improve air quality and manage surface water flow and quality;
- Make efficient use of vacant land for resource production by using stalled spaces to supporting the GCVGNP SAGE project and growing short rotation coppice (SRC) or short-term forestry to reinforce the wood fuel supply chain; and
- Pilot phytoremediation principles to help remediate contaminated land.

Micro-climate control

Due to recent and historic emissions to the atmosphere, changes to our climate are now inevitable. In the west of Scotland it is predicted that these changes will cause longer, hotter summers; warmer, wetter winters with more storm events and higher wind speeds. In addition to activities to reduce further climate change by reducing emissions, it is therefore increasingly apparent that we will need to introduce measures to help adapt to the changing climate. Some people and infrastructure are particularly vulnerable to changes in the climate. For instance low lying areas are more exposed to flood risk and older people and young children are particularly vulnerable to heat waves. Buildings and road surfaces may become weakened, ground conditions can become unstable and public transport and electrical supplies can overheat and breakdown. Furthermore, rises in temperature are felt more acutely in urban areas as the city fabric absorbs and retains more of the sun's heat. This is known as the urban heat island effect.

Open space and, in particular, green infrastructure offer important potential for adapting to inevitable climate change through managing water, maintaining a comfortable temperature and sheltering from wind.

In addition to the objectives for surface water management discussed under *Enhancing natural processes and generating resources*, the strategic objectives for micro-climate control are to utilise green infrastructure to:

- moderate the temperature of the city through urban greening and increased permeability of civic space, amenity space and transport infrastructure; and
- project against high wind speeds where practicable.

Moving towards delivery

To make the most of Glasgow's significant open space resources this strategy has looked at the City's identified priorities, highlighted how open and green space can be used to meet these priorities and, with consideration of the quantity and quality of existing space, identified opportunities for enhancement. Through the strategic objectives, the focus is to deliver high quality, multifunctional space.

Delivering these objectives in this period of economic restraint and working within the reformed planning system poses many challenges. However, adversity breeds innovation and although this strategy will need to be delivered in a time of financial constraint and new planning structure, there is considerable scope for finding new delivery mechanisms and funding arrangements. This time of flux will require greater emphasis on collaborative working and investigation of new approaches that may challenge traditional attitudes towards open space delivery and management.

Taking into consideration the challenges and opportunities for delivering the strategic objectives set out above, there are nine headline actions for Glasgow City Council (GCC)

Ensuring good leadership and co-ordinated delivery

1. GCC will build a consistent approach to open space provision by undertaking a critical review of the services it provides to ensure that they are aligned with the strategic objectives, and identifying specific activities that need to be implemented.

2. GCC will work with the Glasgow and Clyde Valley Green Network Partnership (GCVGNP) to establish a register of stalled sites and set out proposals for underutilised spaces (including vacant and derelict land, as well as amenity space around road interchanges), such as temporary pocket parks and bike parks, art exhibitions, green gyms, Sow and Grow Everywhere and biomass.
3. GCC will work with landowners and other GCVGNP partners to pilot phytoremediation of contaminated land. Candidate sites could include the chemical works at St Rollox, steel works at Blochairn and the gas works site at Provanmill

Controlling the spatial development framework

4. GCC will take a City wide approach to public realm design guidance, including a detailed review of existing conditions within the public domain, to set the standard for future development.
5. GCC will continue to develop a strategic network of green pedestrian and cycle routes across the City, ensuring that these are adequately included in development proposals, support ecological networks and are not severed by other infrastructure improvements.
6. GCC will require surface water management plans that utilise green infrastructure where appropriate for all key regeneration areas and sites.
7. GCC will require developers to demonstrate how schemes contribute to the creation of ecological networks.

Funding, implementation and ownership

8. GCC will help facilitate the development of social enterprises and business improvement districts that clearly articulate an approach to delivering and maintaining open space that achieves the strategic objectives
9. GCC will review the management of amenity space, particularly the underutilised land associated with residential areas, and develop initiatives for cost efficient ways of improving the aesthetic quality and function of spaces, including pictorial meadows, pocket parks and green gyms. Priority actions will be developed for the more deprived areas of the City, where benefits will be most acutely felt.

With the business-as-usual case becoming more challenging, failure to act in moving towards delivery of multifunctional open space will result in a continued decline in the quality and relevance of open space in meeting Glasgow's needs. Not only will Glasgow miss the multiple economic, social and environmental benefits, but the opportunity to work collaboratively across service sectors and delivery partners to

maximise gain through efficient use of resources and shared knowledge for mutual benefit will be lost. This will result in a degraded environment and disengaged communities that undermine economic potential; stressed infrastructure and disconnected habitats that are at greater risk from climate changes and reduced opportunities to celebrate, enjoy and play outside.

Early action, starting with effective planning and engaging a range of stakeholders in the design, delivery and management of open space can deliver the objectives of this strategy and much more.

2. Glasgu: The Dear Green Place

Glasgow Open Space Vision: “To ensure Glasgow continues to be a “dear green place” for both residents and visitors alike by integrating open space into all aspects of the city’s activities in ways that promote sustainability, equality and enhance quality of life.”

2.1. Introduction

From the verdant surroundings of early settlement around Saint Mungo known as the Dear Green Place, through the design concepts of Charles Rennie Mackintosh and ‘The Glasgow Four’, to the Academy of Urbanism ‘Great Street Award’ 2008 for Buchanan Street, the pursuit of a high quality environment has been a recurring theme through Glasgow’s development. This strategy represents the next steps in the progression by setting out how open space should be planned, created, enhanced and managed in order to meet Glasgow’s priorities.

This is however not just an open space strategy. It is a cross-cutting vision for delivering a high quality environment that supports economic vitality; improves the health of Glasgow’s residents; provides opportunities for low carbon movement; builds resilience to climate change; supports ecological networks and encourages community cohesion. This is because when planned well open space can provide multiple functions that can deliver numerous social, economic and environmental benefits.

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2.2. Guide to this Strategy

The Glasgow Open Space Strategy is the output of a period of study over a number of months, considering the current open space assets within the city, how they are performing, and how they might perform in the future. The following sections present a discussion of the strategic priorities for the City, the evidence for changing the way we view open space and the conclusions on the way forward for a future with high quality, high performing open space.

Section 3 of the strategy sets out the benefits open space can offer, drawing from recognised research and examples of best practice. The overall strategic priorities for Glasgow to which open space can make a contribution are discussed and opportunities for change are identified, where concerted action would offer the greatest benefits. Section 3 concludes with a statement of a series of priority themes for the Glasgow Open Space Strategy.

Section 4 reflects on the current open space resource, both quantitatively and qualitatively, identifying where focussed intervention could bring substantial cross-cutting improvement to the city environment.

Sections 5 to 10 then take each of the strategic priority themes and present a discussion of strengths and weaknesses and opportunities for action.

Finally, **Section 11** considers the strategic objectives and proposed actions and sets out a plan for the delivery of a Better Place in Glasgow.

3. What should open space be used for?

greenspace scotland: Making it Happen highlights the need to agree what greenspace and open space should be used for. This section provides an introduction to the variety of functions open space can contribute towards meeting Glasgow's wider priorities in order to establish overarching open space objectives.

3.1. The benefits of open space

As can be demonstrated by Glasgow's current resources (see Section 4), open space is designated for a variety of *primary* functions. However, well planned and designed open space provides a much wider range of benefits.

Our understanding of the benefits of open space, and particularly green space, are becoming increasingly better defined and documented. *greenspace scotland's Making the Links* (2009) highlights the role that green infrastructure can play in developing:

- **healthier communities** – by providing opportunities for increasing physical activity levels and bringing us in touch with our natural environment, which helps strengthen mental health;
- **safer and stronger communities** – by enhancing the sense of place which gives a community identity. Unmanaged spaces become barriers to people, sapping local morale, feeding fear of crime and fear of others;
- **wealthier and fairer communities** – by making attractive places for investment;
- **smarter communities** – by developing a creative, stimulating learning environment; and
- **greener communities** – by supporting biodiversity, reducing the impacts of climate change and providing opportunities for more sustainable production and consumption.

The Scottish Government National Planning Framework 2 (NPF2) recognises that these benefits of a high quality green environment will contribute to supporting national aspirations. As such, the NPF2 action programme sets out the development of the Central Scotland Green Network (CSGN) as one of only 14 National Developments considered by Ministers to be essential elements of the strategy for Scotland's long term development.

Recognising the wider economic and social benefits green infrastructure can provide, the CSGN will provide the framework for developing the green infrastructure network across the 10,000km² of Central Scotland. Led jointly by Forestry Commission Scotland and Scottish Natural Heritage, the CSGN is supported by an interim steering group of related organisation and in consultation with a wider partnership of local authorities, NGOs, public agencies and land managers. The CSGN therefore plays an important role in co-ordinating activities, developing baseline information, monitoring change and administering the CSGN Development Fund for supporting projects.

These broader social, economic and environmental benefits are also reiterated by the Glasgow and Clyde Valley Green Network Partnership (GCVGNP) in their four overarching themes of: Stronger Safer Communities, Health Improvements, Enhancements for Biodiversity and the Environment, and Enterprise Development. GCVGNP is the organisation tasked with promoting Green Networks across the Glasgow Metropolitan Region. They advocate strongly the role of a joined up approach to environmental management which delivers multiple benefits.

Within the overarching themes highlighted above, numerous benefits can be derived from open space, some of these are summarised in the table below and discussed in more detail in the relevant themed sections throughout this report. Although categorising benefits is a useful way to highlight the breadth of opportunities open and green space can provide it should be recognised that benefits are not mutually exclusive and as such, emphasis should be placed on delivering space that maximises opportunities for achieving **multiple benefits**.

Table 3.1: Summary of potential open space benefits

Environmental benefits:	Economic benefits:	Social benefits:
Protection and enhancement of landscapes, biodiversity and geodiversity.	Provides an inspiring setting for attracting investment.	Provides opportunities to improve health and well-being
Micro climate control	Increases quality of place helps to increase property and land values	Provides recreation and leisure opportunities.
Water quality and flood water management	Proximity to attractive environments helps increase labour productivity and reduced absenteeism	Provides learning and education opportunities, including lifelong learning for adults.
Carbon sequestration	Boost tourism attracting capital and supporting employment	Facilitates community cohesion by providing opportunities to reinforce feelings of local belonging and sense of ownership.
Efficient use of land	New opportunities and boosting local economies.	

Environmental benefits:	Economic benefits:	Social benefits:
Reduction of flood risk	Helping to attract and retain people ensuring stable populations and labour supply.	Protection and enhancement of cultural heritage
Noise pollution abatement	Generating resources with economic value, such as food and biomass	Provision of sustainable transport routes for walking and cycling
Food pollination		
and air quality improvements		

3.2. Glasgow’s priorities

Although open space can deliver a wide range of benefits, investment in developing, enhancing and managing open space should be directed to where it can maximise these benefits and contribute to delivering against the City’s priorities. Targeted investment in open space is particularly important in economically challenging times when resources are limited; open space improvements provide one of the most cost effective methods of delivering against several of the City’s priorities with multiple socio-economic and environmental benefits.

The *Glasgow and the Clyde Valley Strategic Development Plan: Main Issues Report (MIR)* (2010) sets out the long-term vision for the Strategic Development Planning Authority. As such, it sets out the strategic development priorities in order to establish the long-term framework for action within the Glasgow and Clyde city-region. It offers a commitment to the overarching vision of:

“...the Glasgow city-region to be one of the most dynamic, economically competitive and socially cohesive city-regions in Europe. A city-region which prospers and through effective public and private sector partnership working at all levels, includes all of its people in its success. A place of quality where people choose to live”

It also highlights, based on a detailed analysis of the evidence, five key components to achieving this vision to 2035. These can be summarised as:

- **Economy** – with Glasgow city centre at the core and key locations in the city region driving a low carbon economy; all accessible by a network of sustainable transport;

- **Urban Fabric** – Renewing the urban fabric, enhancing the genius-loci of strategic centres, regenerating run down communities and making good use of vacant and derelict land resources;
- **Infrastructure** – Upgrades to water and drainage networks and investment into sustainable travel and movement;
- **Environment** – Specific reference is given to enhancing the green infrastructure network, including open space, within the urban environment to improve economic competitiveness, energy developments for climate mitigation, enhancing biodiversity and providing opportunities for healthier lifestyles; and
- **Energy** – Developing a more decentralised power distribution, based on alternative technologies and exploiting opportunities to develop biomass, combined heat and power and other forms of renewable energy.

In addition to breaking down the distance to economic markets, supporting a sustainable economy, promoting sustainable locations for development and tackling risk, the MIR also specifically highlights promotion of environmental action as a key issue and ‘*an economic necessity*’ for the city region. As such, the MIR emphasises the role the environment, and potentially open space resources, can play in:

- **Economic competitiveness** – through place setting and supporting tourism/day-trippers;
- **Recreation and Health** – by providing a ‘green lung’ and ‘green gym’;
- **Infrastructure** – by proving flood protection, water retention and cleansing opportunities as well as acting as a carbon sink;
- **Energy** – providing an alternative source of energy, such as biomass. The MIR explicitly highlights the opportunity to develop an alternative wood fuel market utilising urban derelict land;
- **Nature** – as a reservoir for biodiversity; and
- **Resource development** – Reiterating opportunities for energy crops, but also timber and other crops.

City Plan 2, adopted in December 2009, is the current incarnation of the development plan for Glasgow. As such, it sets out the priorities specifically for the city. Several of the key issues highlighted at the city-region scale are concentrated within the city itself. In addition to the infrastructure, environment and economic (jobs) priorities in line with those outlined above, the City Plan places considerable emphasis on the needs of the people, with particular reference to the creation of quality residential neighbourhoods. The Vision of City Plan 2 also focuses on improving the quality of life for Glasgow’s residents.

“That the design, location, scale and nature of new development in Glasgow will help to create a City of successful, sustainable places and will result in an improved quality of life for those living, investing, working in and visiting the City.”

The Vision is underpinned by three Guiding Principles;

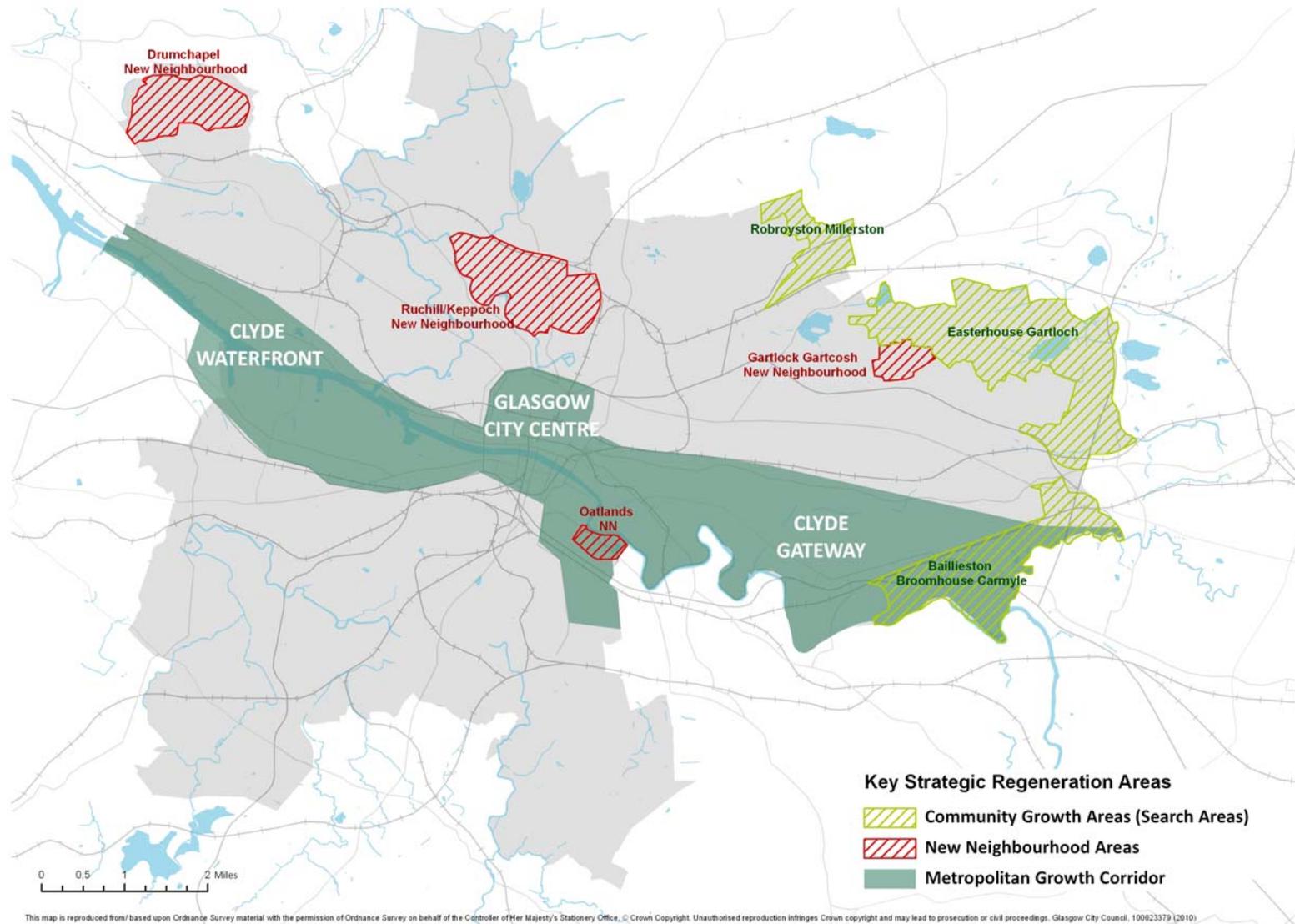
- **Promoting social renewal and equality** – City Plan 2 promotes inclusive and accessible design in new development; it highlights the need to improve the image of the City, thereby helping attract inward investment, through securing the highest possible quality of design in new development;
- **Delivering sustainable development** – City Plan 2 seeks to promote social renewal and fairness, encourage sustainable economic development, protect and enhance the physical and natural environment and ensure the efficient use of energy and resources; and
- **Improving the health of the city and its residents.** – Glasgow residents, particularly men, have some of the lowest life expectancy rates of any UK town or city and the mortality gap compared with other cities appears to have widened since the early 1970s. Coronary and respiratory ailments are significant contributors to this problem. City Plan 2 recognises the importance of accessibility to health services, cultural and sporting facilities and local recreation and greenspace in facilitating more active and healthy lifestyles amongst the city’s residents, creating attractive, accessible environments and seeks to promote sustainable places in which to live and work.

Another cross cutting issue that will potentially have significant impacts on the City over the period of the plan will be **climate change**. This is both in terms of mitigation – taking carbon out of the atmosphere, and adaptation – building resilience to the inevitable changes that are likely to occur as a consequence of climate change. The role of open space and green infrastructure in responding to this challenge is highlighted in Glasgow’s *Climate Change Strategy* (2010), and the Glasgow Open Space Strategy will build on this role.

3.3. The focus of change – the regeneration context

The Strategic Development Plan sets out the key regeneration areas, and more detail will be provided within the emerging Local Development Strategy. These regeneration areas represent the areas of greatest future change and as such present perhaps the greatest opportunity to deliver significant open space enhancement with associated multiple benefits. They are therefore an important overarching consideration for this strategy. These are illustrated spatially in Figure 3.1.

Figure 3.1: Key Strategic Regeneration Areas in Glasgow:



In addition to the overarching open space objectives outlined in this strategy, the emerging MIR for *the new Local Development Plan* reiterates a number of key spatial green network priorities which will form the basis of concerted action, as they are considered to be able to effectively deliver multiple benefits. These include;

- Clyde Waterfront, focusing on Scotstoun/Knightswood and Govan/Ibrox;
- City Centre, focusing on Cowcaddens and Laurieston;
- Clyde Gateway, focusing on Bridgeton/Dalmarnock and Toryglen;
- North Glasgow, including Milton, Springburn, Cowlares and Germiston;
- Castlemilk;
- Greater Easterhouse, including Ruchazie, Easterhouse, Springboig and Barlanark;
- The Broomhouse/Baillieston/Carmyle Community Growth Area;
- The Easterhouse/Gartloch Community Growth Area; and
- The Robroyston/Millerston Community Growth Area;

3.4. Strategic Open Space Priorities

Glasgow City Parks and Open Spaces Best Value Review (2005)

In 2005 the Council set out to bring about real and measurable improvements in its performance in providing accessible, higher quality, and cost effective services for the people of the city through a commitment to best value, continuous improvement, local government modernisation and the community planning agenda in relation to Glasgow's open space and its management and success. The 2020 Vision sets out the Council's long-term approach to delivering this in association with four broad themes:

- Social Inclusion, Safety and Well Being;
- Sustainable Environment;
- Urban Regeneration and Economic Development; and
- Best Value and Service Integration.

Through an analysis of services, and employee and public consultation, the review made recommendations towards a clearer commitment to the overall success of parks and open spaces in line with the Council Key Objectives. The process established 138 Key Actions, and defined an Implementation Plan outlining 66 proposals with accompanying tasks and targets to ensure that success was delivered across the board and at various scales, through diverse approaches to the management of open space and support services. An internal evaluation of the progress of the Best Value Review undertaken in 2008 indicated that although many of the proposals set out in 2005 had been completed and/or were ongoing; several proposals had not been fully delivered (in 2008) and remain as ongoing priorities. Those that offer specific relevance for the open space strategy include:

- Promoting the active and healthy lifestyles agenda of the City Council through the development of initiatives such as healthy walking and cycling routes in parks and open spaces (Key Actions 50, 101 & 131);
- Ensuring the parks service promotes recycling, composting and waste minimisation and investigates the potential funding sources for implementing improvements (Key Action 133);
- Forming benchmarking links with a core cities group comprising major UK cities (Key Action 84); and
- Introducing more qualitative performance measures that can be benchmarked with other authorities (ILAM & Green Flag models) (Key Actions 33, 37,38, 76, 85, & 88).

3.5. Priorities for this Strategy

Glasgow's open space has a significant role to play in working towards achieving all of the high level priorities highlighted above. These can be consolidated into strategic priorities for Glasgow's Open Space.

Open space in Glasgow should be for:

- 1 Place setting for improved economic and community vitality;
- 2 Health benefits and well being;
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- 5 Enhancing natural processes and generating resources; and
- 6 Managing the micro-climate.

Multifunctional open space and green infrastructure can help to deliver against all of these strategic priorities and, although separated thematically for explanation and discussion, should not be seen in isolation. For example, using urban greening to improve the public realm can help with place setting whilst providing a safe connecting route in a way that supports biodiversity, cleanses and stores surface water, cleans the air, provides walking opportunities to aid health and helps manage the urban heat island effect. As such, the objectives, actions and priorities outlined under each of the themes below should work in conjunction with one another. Glasgow City Council and its partners are already working proactively to deliver multifunctional open space across the City. One of the most significant opportunities being explored is around Gartcosh / Gartloch. The Seven Lochs Wetland Park proposals demonstrate the potential to deliver a significant new open space asset, capable of integrating community growth with water drainage management to create high quality green space, habitat creation, improved access networks and opportunities for recreation and healthier lifestyles. This area of national, and potentially international importance, has focused heavily on understanding the hydrological conditions and the potential utilisation of Sustainable Drainage Systems (SuDS) and wetlands to store, cleanse and manage water to spatially define opportunities for settlement growth, the creation of ecological networks and new access and recreation.

The following section provides an overview of the existing open space resource in Glasgow and some of the current strengths and weaknesses. Subsequently, taking the priorities set out above, a series of themed sections (Sections 5 to 10) provide more detail as to the evidence behind the role of open space in achieving these priorities and the key issues for Glasgow, providing more specific open space objectives and overarching design/management guidelines.

4. What is the current open space resource?

Glasgow already has a significant open space resource that will provide the foundation for future creation, enhancement and management that will help to meet Glasgow's strategic priorities.

4.1. Quantity

Planning Advice Note 65, 'Planning and Open Space' (PAN65), published in May 2008, sets out the need for open space strategies to be underpinned by a comprehensive understanding of existing open space. It also provides a typology framework to categorise the different types of open space within Scottish settlements. Table 4.1 below highlights the total area of different types of open space within Glasgow and Figure 4.1 shows how this is distributed across the City.

Geography plays an important part in the distribution of and access to open space in the city. In Glasgow, the distribution of space across the city is fairly typical of what you might expect in an urban area: a range of larger natural open spaces towards the periphery with smaller more formal areas nearer the centre. This is reflected in the most widespread open space types being natural/ semi-natural open spaces and green corridors making up approximately 40% of the total open space resource, with public parks and gardens responsible for a further 20%. Sports areas are also a significant open space resource within the city representing 15% of the total, but this is perhaps skewed by golf course provision within the city at 9%.

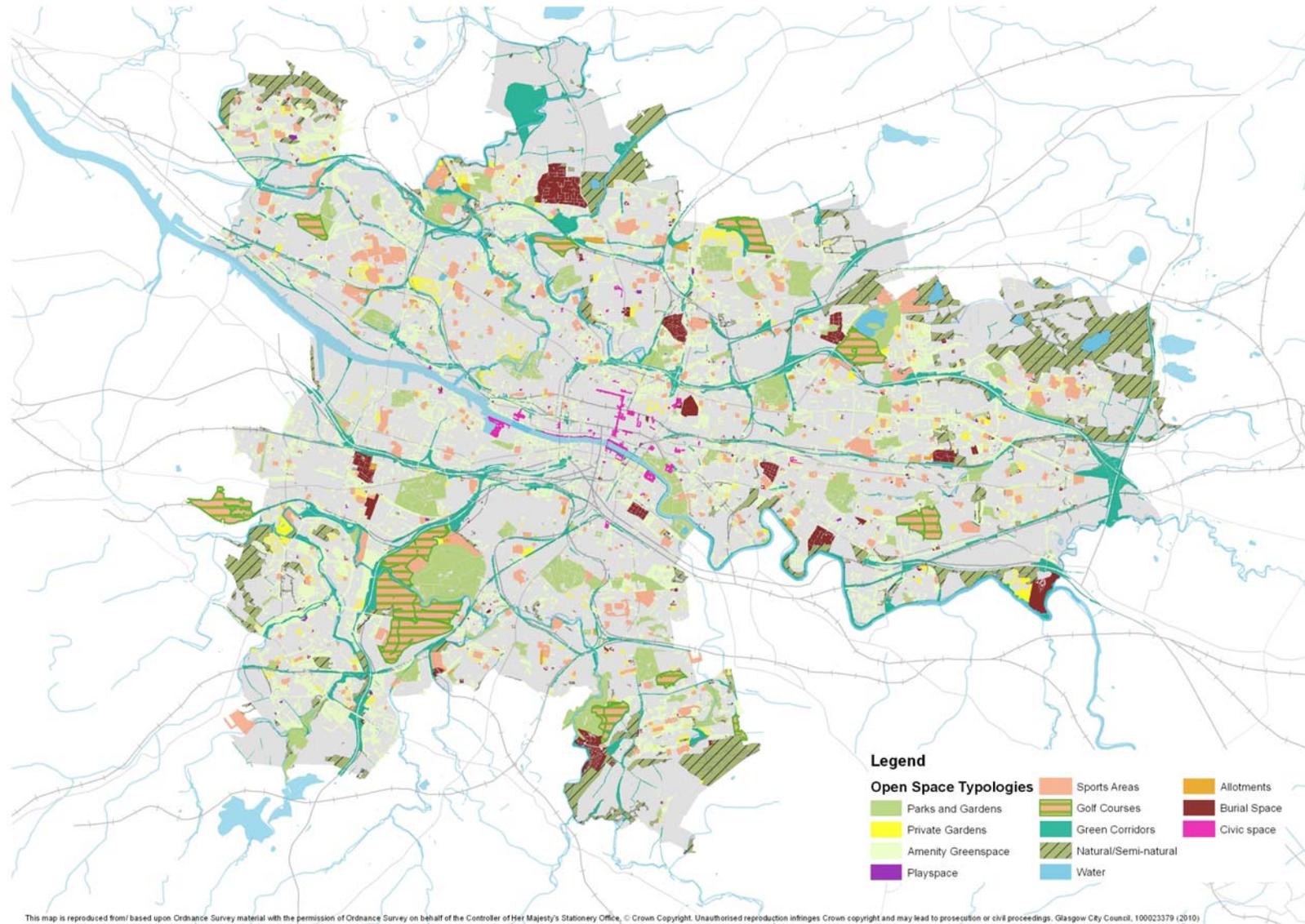
Although Green Corridors play a vital role in the provision of open space in the city, a large proportion of these are not accessible to people (e.g. the landscaped areas of the M8 and M77 motorways). Physical barriers, both natural and man-made, such as the motorways, can present formidable obstacles to access to a city-wide network of open space.

Table 4.1: PAN 65 Open space definitions and areas within Glasgow

Open Space Types	PAN 65 Definition	Total Area (ha)
Public parks and gardens	Areas of land normally enclosed, designed, constructed, managed and maintained as a public park or garden. These may be owned or managed by community groups	1,006
Private gardens or grounds	Areas of land normally enclosed and associated with a house or institution and reserved for private use (note: only included here are those private areas that are for communal use as per the definition in City Plan 2)	324
Amenity greenspace	Landscaped areas providing visual amenity or separating different buildings or land uses for environmental, visual or safety reasons and used for a variety of informal or social activities such as sunbathing, picnics or kickabouts.	884
Playspace for children and teenagers	Areas providing safe and accessible opportunities for children's play, usually linked to housing areas.	17
Sports areas	Large and generally flat areas of grassland or specially designed surfaces, used primarily for designated sports (including playing fields, golf courses, tennis courts and bowling greens) and which are generally bookable.	852 (458ha of which are golf courses)
Green corridors	Routes including canals, river corridors and old railway lines, linking different areas within a town or city as part of a designated and managed network and used for walking, cycling or horse riding, or linking towns and cities to their surrounding countryside or country parks. These may link green spaces together.	742
Natural/semi-natural greenspaces	Areas of undeveloped or previously developed land with residual natural habitats or which have been planted or colonised by vegetation and wildlife, including woodland and wetland areas.	1075 (247 ha of which is water)
Allotments and community growing spaces	Areas of land for growing fruit, vegetables and other plants, either in individual allotments or as a community activity.	28
Burial grounds	Includes churchyards and cemeteries.	251
Other Functional Greenspace	May be one or more types as required by local circumstances or priorities.	5
Civic space	Squares, streets and waterfront promenades, predominantly of hard landscaping that provide a focus for pedestrian activity and can make connections for people and for wildlife.	22
Total		5,205 (not including water)

(Note: each classification can be broken down further into sub-categories. This has been done throughout the themed sections to provide a finer grain of analysis)

Figure 4.1: Distribution of open space in Glasgow



Fields in Trust (formally the National Playing Fields Association) proposes a recommendation of 2.4ha of recreation space per 1000 population. This recommendation covers both formal and informal accessible recreation areas as well as sports and play areas. In the absence of other standards this provides a useful benchmark for the level of open space provision. Figures 4.2 and 4.3 below illustrate that the distribution of open space is not uniform across Glasgow. Figure 4.2 highlights areas where there is less than 2.4ha of open space per 1000 population. This is based on data zones, which are areas with roughly equal population and as such they are larger in less densely populated parts of the city. It should be noted that this does not take into consideration any over-provision in neighbouring areas. Nor does it recognise where such space is not fit for purpose (for instance where accessibility is limited). However, it does highlight that there are significant pockets across the city where the provision of open space is limited. This correlates with Figure 4.3 which shows the percentage coverage of open space in each data zone. As might be expected, it shows that the provision of open space becomes less prominent moving from the urban edge towards the city centre. It also highlights that there is less open space in the West around Govan & Ibrox (including the area of Southern General Hospital), from the City Centre through to the Southside, in particular Pollokshields and Govanhill and in the East End around Carntyne.

Figure 4.2: Distribution of open space by area per person

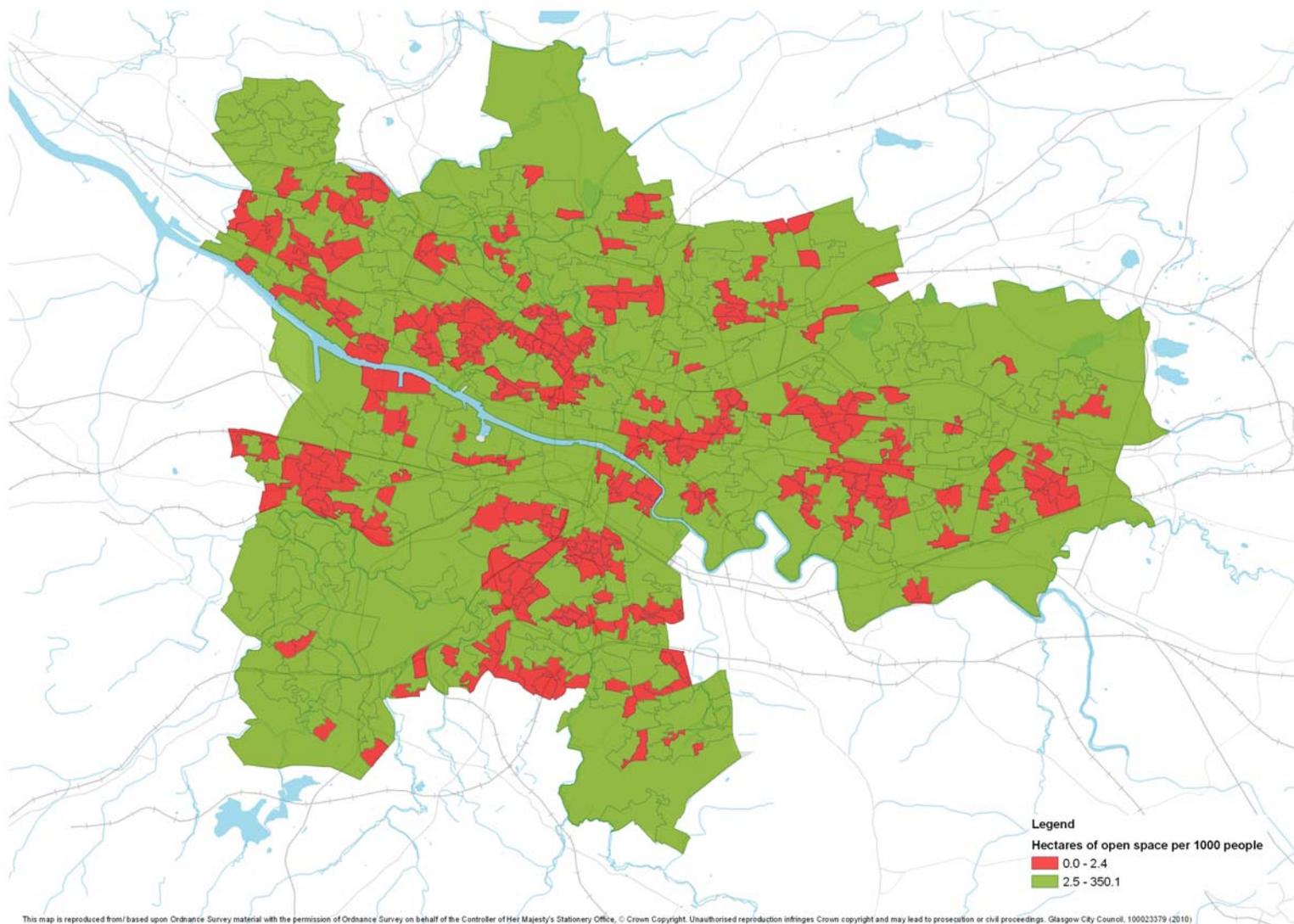
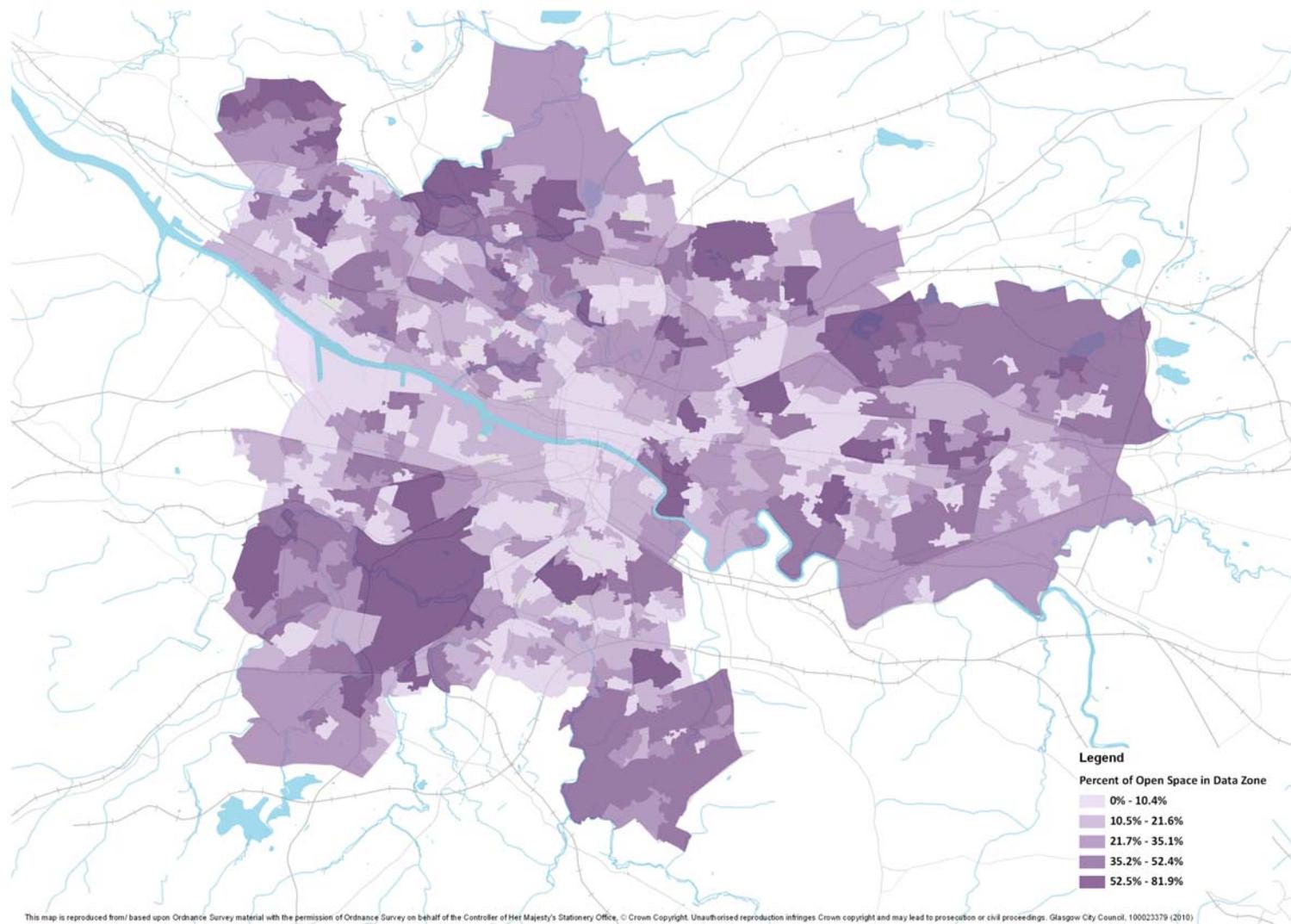


Figure 4.3: Percentage of area that is open space



The distribution of different types of space, and the different experience they offer also varies across the city. The detail of this distribution and the relationship this has with specific issues is analysed in more detail at appropriate points throughout this strategy document. However there are some high level observations. Glasgow has a high proportion of parks and gardens. These are significant in scale, and are distributed fairly regularly across the city. There are large swathes of natural and semi-natural green space, however these are generally on the edge of the city. There are also significant swathes of amenity space distributed across the City and with concentrations in the south west and north east. There is a very limited supply of allotments. The large proportion of sports space provision is dominated by golf clubs, which may limit participation as they are not flexible in their use. Finally, as might be expected, civic space is concentrated in the urban core. There are however other centres across the City that might have potential for additional civic space.

4.2. Quality

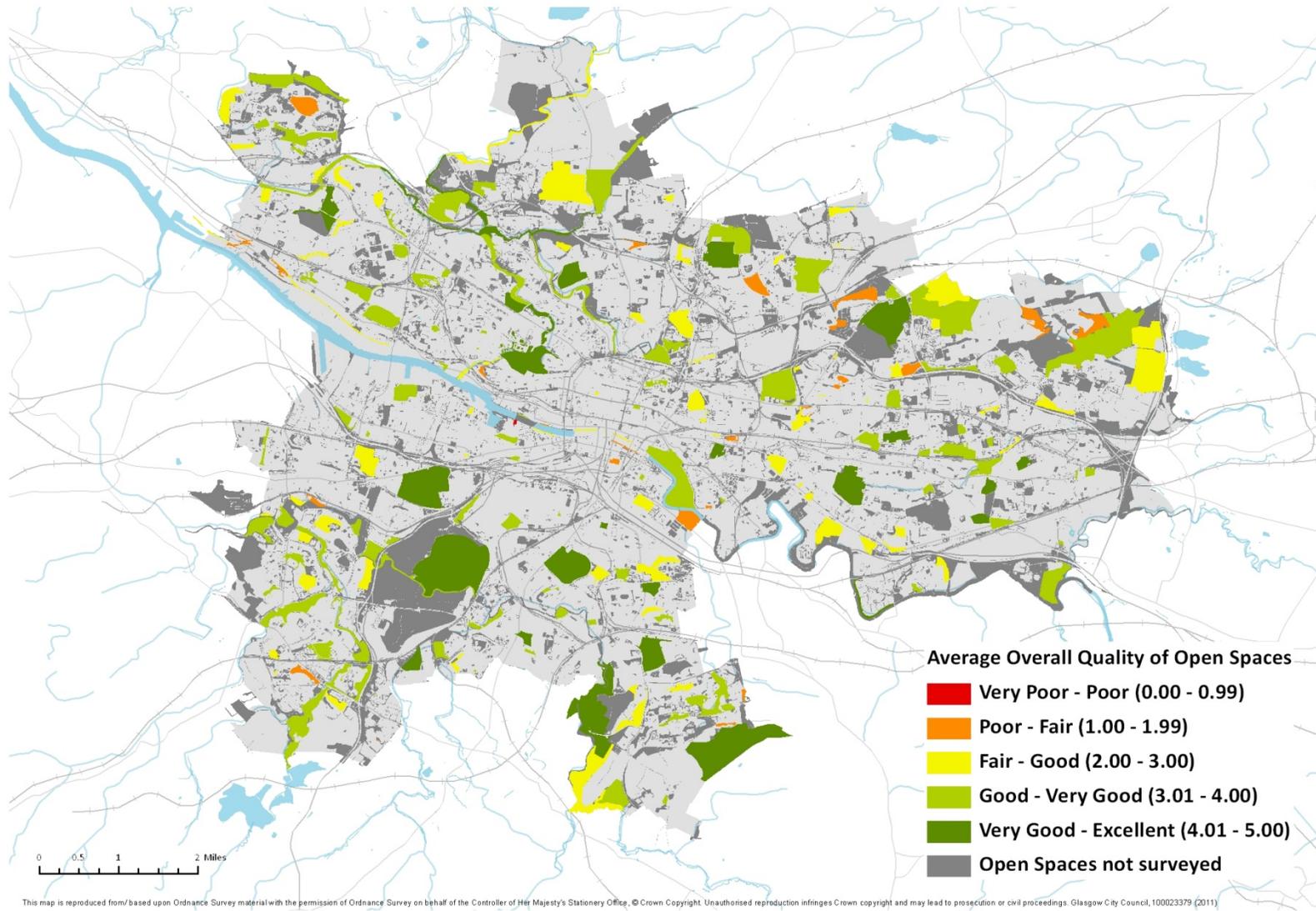
The quality of open space is also an important factor in being fit for purpose. In addition to the quantitative analysis of Glasgow's open space, and to help inform this strategy, a quality assessment was undertaken in the autumn of 2009 for 200 of Glasgow's open spaces. These sites were chosen to help reflect the overall characteristics of open space across the city, covering an area of 2,805ha (54% of the total area) and encompassing all of the PAN 65 open space types represented in Glasgow including:

- 61 Amenity Spaces ;
- 56 Public Parks;
- 28 Natural/ Semi-natural Spaces;
- 19 Green Corridors;
- 17 Sports Areas; and
- 19 Other (Civic, Other functional space etc.).

This quality assessment was undertaken in line with the methodology advocated in the Greenspace Quality Toolkit, developed by greenspace scotland and the Glasgow and Clyde Valley Green Network Partnership. Each of the sites were scored between 1 and 5 against five key criteria: accessibility, attractiveness, biodiversity, promotion of health and well being and community support. The scores from each of these criteria can be used to determine how well the open space is performing that particular function, as has been done at various points through this study, or they can be combined to give an overall quality score. As such, the overall quality of the representative spaces surveyed varied

considerably across the city, ranging from poor to excellent. Overall, around 55% were considered to be fit for purpose; however a considerable proportion, 45%, were considered to be less than fit for purpose. These are highlighted in Figure 4.4.

Figure 4.4: Quality scoring of surveyed sites



Public parks generally score very well, with 80% of sites being assessed as good or better, perhaps reflecting the relatively high investment in maintenance and management of these sites. Green Corridors also scored highly with 84% of these being assessed as good or better. Key routes like the Kelvin Walkway in the North, National Cycle Route 75 along the Clyde and the White Cart Water in Pollok Park all score in the highest category, very good to excellent.

Conversely, amenity open spaces perform poorly with only 39% of sites being assessed as good or better. This is of particular concern as amenity space is a one of the most prominent open space types and a key contributing factor in determining the overall environmental quality of an area. This can have significant connotations for a range of issues including economic vitality and participation in informal recreation, with associated health issues. More detailed analysis of the criteria, the open space performance and key issue is included where relevant throughout each of the themes in the following sections of this strategy.

The open space outlined in the Table 4.1 and the associated maps in Figures 4.1 and 4.4 provide a baseline open space position. Policy Env 1 of the current City Plan 2 (2009), sets out a presumption in favour of the retention of all public and private green/open space, hence protecting most of the open space highlighted above.

The PAN 65 Audit and Greenspace Quality Toolkit assessment highlight the diversity of primary function, distribution, scale and quality of Glasgow's open space and have been used throughout this strategy to both describe types of open space and as an indication of quality. Traditional approaches to developing open space strategies focus on assessment of needs for each of the open space types in turn. However, it is becoming increasingly clear that open space can play numerous, multi-functional roles and strategic assessment and direction should focus on how open space is contributing to meeting Glasgow's wider needs. As such this strategy is thematic, drawing on wider perspective and experience and focuses on how open space can contribute to meeting the priorities for Glasgow as set out in the previous section.

4.3. Focusing attention

The city parks, such as Bellahouston, Kelvingrove, Hogganfield, Glasgow Green and Pollok Country Park, are generally excellent in quality; providing a strong foundation to the overall open space resource. These assets share common characteristics in that they are all of significant scale, with mature, attractive landscape setting, diversity in character/resource and a specific destination attractor. As such, they are deservedly high profile and attract appropriate investment; which should be maintained.

However there are a number of intermediate scale sites surveyed that are failing to perform well. These include Kinfauns Drive, Richmond Park and Leggatston Drive, as well as several sites in the more deprived areas to the north east of the city including, Millerston, Broomhill Playing Fields, Whitehill Playing Fields, Lochwood Plantation and Gartloch Pool. These sites failed to perform on a high number of key assessment criteria and, as such, require significant investment and improvements to management regimes to bring them up to a desired standard.

Furthermore, it is the smaller, incremental spaces which help to define the overall quality of place within towns and cities. At present in Glasgow these 'in between spaces' are lacking in coherence, integration and function. Substantial areas of amenity space are underutilised, there are significant areas of vacant land across the city and transport infrastructure dominates in some areas generating redundant spaces, such as the Clyde Waterfront area beneath Kingston Bridge.

Appendix 1 includes a summary of all the sites surveyed including scoring and recommendations.

In summary, the key characteristics of current open space provision in Glasgow are:

- Glasgow has a significant open space resource;
- There is a core of very high quality parks and gardens, although there is opportunity to improve those less high profile spaces and the role of smaller pocket parks;
- There are significant tracts of poor quality amenity space that present great potential for improving the quality of place;
- Areas of natural and semi natural green space are concentrated on the urban fringe. They offer important connectors to the countryside but could extend further into the city to support ecological networks;
- There is limited space for allotments; and
- Although there is significant open space associated with sports provision, this is dominated by golf clubs and there might be opportunities to diversify the sport space offer.

5. Place Setting for improved economic and community vitality

“Clever councillors will invest in great green space” CABE (2010)

5.1. Relationship between open space and place setting

A high quality environment is central to improving economic performance and fostering high quality sustainable neighbourhoods in a number of ways:

- *Economic growth and investment* – contributing to Gross Value Added (GVA) by helping to maintain and attract high value industries;
- *Land and property values* – the Commission for Architecture and the Built Environment (CABE) developed evidence to suggest that property values increase with proximity and views of greenspace by about 18%;
- *Labour productivity* – Natural Economy Northwest has shown that productivity increases and sickness absenteeism is reduced when employees work in greener and more attractive environments. Furthermore, staff retention is improved reducing recruitment costs;
- *Tourism* – Environmental infrastructure can support tourism directly through drawing visitors to natural attractions and more generally by building a reputation for high quality sense of place;
- *Community creation and cohesion* – Attracting visitors, new residents and rooting existing residents to an area. The Urban Green Spaces Taskforce (2002) also suggests that a decline in greenspace weakens community cohesion. Conversely, effective management can help create and reinforce sense of place and reduce crime; and
- *Neighbourhood satisfaction* – The Scottish Social Attitude Survey (2009)¹ showed that there was a strong correlation between the quality of local green space and life satisfaction and in particular better self-assessed health, greater social trust and a higher sense of community cohesion. A recent CABE study also found that there is a high correlation between neighbourhood satisfaction and the provision of quality green space. Appreciation of these spaces is also increasing: in 2007, 91% of people thought it was very or fairly important to have green spaces near to where they live, and by 2009 this had risen to 95%. The CABE study also demonstrates that urban green space attracts more users than any of the other public services tracked – there is, therefore, a strong relationship between the quality of green space and the public perception of council performance.

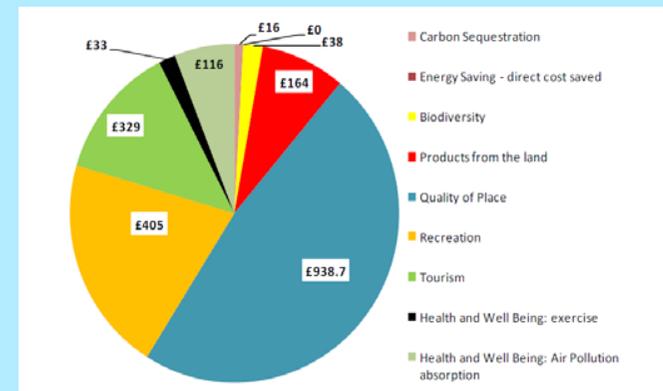
¹ <http://www.scotland.gov.uk/Resource/Doc/317297/0101048.pdf>

On the flip side, there is a strong association between poor quality green space and deprivation. The visual impact of unmaintained green and open space can contribute to a feeling of neglect that heightens the fear of crime; poorly designed and managed places can actively attract anti-social behaviour. However, evidence suggests that the provision of quality green space is significantly less in areas of deprivation. CABE found that the quality of space in more deprived areas is generally lower than in more affluent areas. Within the most affluent areas less than 0.5% of the population experience more than three least favourable environmental conditions; in the most deprived areas it is 22%. The lower provision and poorer quality standards in more deprived areas leads to less frequent use – with 51 visits to green space per year, compared with 62 in the most affluent wards. This has broader socio-economic issues as, for example, there is also a correlation between poor health and deprivation, which can also be improved by delivering effective environmental infrastructure.

There are also a number of additional economic benefits that can be derived from well managed open space. For example, utilising green infrastructure to manage the micro-climate can reduce heating and cooling bills; open space can help reduce the risk and costs associated with flooding; and improved opportunities for physical activity and movement will improve health, reducing health care costs.

CASE STUDY: Calculating economic benefit – Mersey Forest

Demonstrating the economic benefit of open and green space is complicated, but important in articulating the importance of open space in relation to other services. The Mersey Forest, the largest of England’s 12 community forests conducted an economic study to evaluate the investment of £7 million in tree planting, land reclamation, habitat management and access improvements and support for forestry enterprise. The study found the investment yielded annual returns of £5.5 million and a net present value of £71 million (2009/2010 prices). Sources of benefit include: carbon sequestration, energy savings, biodiversity, products from the land, views, recreation, tourism, health and wellbeing, and air pollution absorption. 60% of people living in The Mersey Forest use their local woodlands – with nearly 20% visiting at least once a week.



5.2. Issues and priorities for Glasgow

Glasgow is a city of disparities; on one hand it is one of the UK's most important economic centres, yet it also has some of the most deprived areas in Europe.

Economic growth in Glasgow has occurred against a backdrop of significant industrial re-structuring. The city has undergone major change over the past two decades as the reliance on traditional industries such as shipbuilding and heavy engineering has been replaced by a modern mixed economy, driven by financial and business services, communications, biosciences, creative industries, healthcare, higher education, retail and tourism. Fewer than one in ten jobs are now in manufacturing or utilities. The largest sectors in the city by job number are now healthcare and social work activities (15.7% of all employees); real estate, renting and business activities (15.2%); and wholesale and retail trade, and vehicle repair (15.1%), which together represent almost half of all jobs in the city.

The growth in financial and business services has seen Glasgow become Europe's sixteenth largest financial centre² and a growing number of blue chip financial sector companies have established key operations or headquarters in the city.³ Dominant export industries are food and drink (£4.6bn); chemicals (£2.2bn); and wholesale, retail and accommodation, and business services both at £1.9bn per annum each. The retail sector located in the heart of the city is also particularly strong. The city centre retail focus of Argyle Street, Buchanan Street and Sauchiehall Street provides a world class retail offer, with the retail sector in Glasgow being the largest in the UK outside that of London's West End. The strength of the tourism sector for Glasgow's economy is also a significant wealth generator for the city.⁴

Scotland has a long-standing tradition and history of innovation and enterprise. Entrepreneurship is illustrated by the high rates of VAT registered businesses in Glasgow City in 2007 (estimated at 12.7%) - higher than Scottish and GB averages. Deregistration rates were higher too (9.3%), giving net year growth of 3.4%⁵. Universities including Glasgow, Strathclyde, Caledonian and University of the West of Scotland as well as many key institutes of further education underpin the City's wealth generation and economic creativity. A key challenge Glasgow faces, however, is to move up the 'value chain' of goods and services production - that is to become more specialised, innovative and productive.

² The Global Financial Centres Index (City of London, Sept 2008)

³ Financial services jobs for Glasgow (The Scottish Government, 2008)

⁴ In 2005, tourism generated £0.8bn for Glasgow, approximately 20% of all tourism revenue generated in Scotland (Glasgow's Tourism Strategy to 2016, p.28)

⁵ Though deregistration rates are comparatively large, higher churn rates are considered beneficial to the economy, with growing regions characterised by lower survival rates and higher job losses but also by higher rates of business start-up and superior job creation. A plausible interpretation is that this process is shifting resources from declining activities to new activities.

In terms of new jobs created, many jobs have been created in large workplaces. This illustrates the city's attractiveness to external investment. However, the actual number of businesses and employment in the workplaces with ten or less employees has declined. Employment growth has also been in lower-skilled jobs and too few have been created in higher value sectors, which are seen as being vital to future competitiveness of the city.

In contrast, levels of deprivations, as measured by the Scottish Index of Multiple Deprivation (SIMD) are significant across the city. Glasgow has approximately 11% of the Scottish population, but accounts for almost 31% of all deprived areas in Scotland. East Glasgow is among the worst affected areas of the city with some of the most extensive areas of need, including Tollcross, Shettleston and Easterhouse. The reasons behind deprivation are linked to many interrelated variables such as worklessness, community safety, low-educational attainment, poor housing and ill-health but it is clear that open space can have an important role to play in helping to improve the prospects for residents across a number of these agendas.

Between 2004 and 2009, Glasgow has seen a gradual improvement in its SIMD rankings with a concentration of its most deprived areas shifting towards the less deprived end of the scale. Although improvements have occurred in pockets scattered across the city (e.g. parts of Penilee, part of Summerston, an area in North Kelvin, parts of Govanhill), some of the most significant improvements have been in areas that have experienced major regeneration programmes (e.g. Sighthill, Shawbridge).

The open space strategy should therefore further support regeneration and the creation of a high quality environment that maintains the City's appeal to investors, tourists and commercial activities and starts to improve the image of some of the more deprived areas. The focus for open space in achieving this will be on:

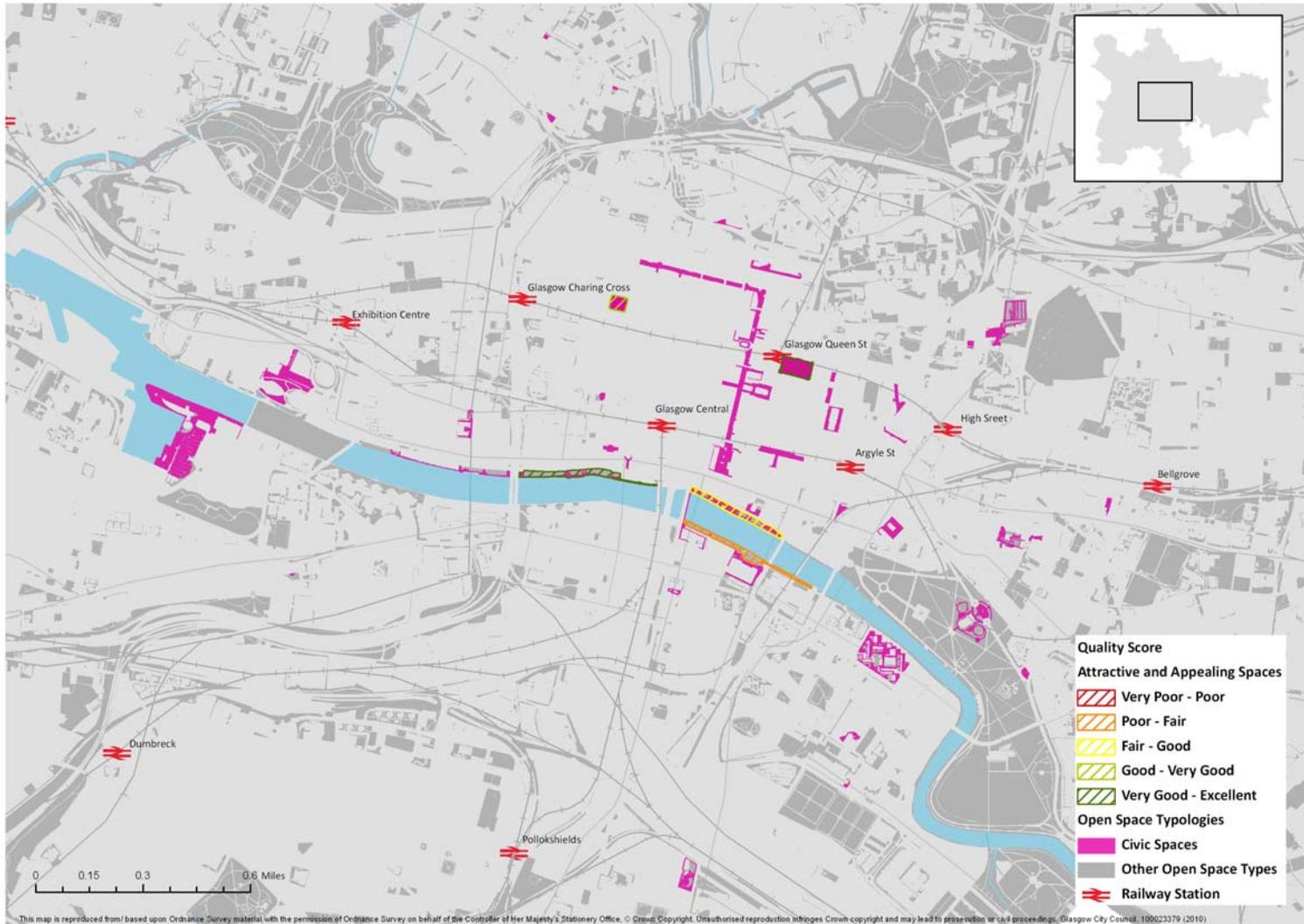
- Improving the quality of civic space and the public realm;
- Reducing vehicle dominance and improving pedestrian experience;
- Animating stalled spaces; and
- Improving the quality of amenity space.

5.3. Improving the quality of civic space

As the economic heart of the city, Glasgow city centre is a key destination for employment, tourism and retail. There has been significant investment in improving the public realm, with the creation of a pedestrian-orientated environment around the award winning Buchanan Street. There have also recently been public realm improvements along Broomielaw waterfront. Figure 5.1 shows the civic space in central Glasgow, highlighting the overall quality score, where assessments have been undertaken.

Although work to date has delivered considerable improvements, there remains significant opportunity to build on this to further improve the city centre environment. In conjunction with the proposals set out in the Green Network Strategies for Clyde Waterfront and Clyde Gateway, opportunities should be sought through development of the key regeneration priorities to continue to upgrade the public realm along the length of the Clyde. This should act as a key cycle and pedestrian route. This public realm is however currently disconnected from the main city centre. Focus should also be given to improving the north/south routes, connecting the city centre with the key regeneration activity. This should be undertaken with a cohesive design language that promotes legibility across the area.

Figure 5.1: City Centre Civic Spaces and Quality Scores where available



5.4. Vehicle dominance and pedestrian experience

Glasgow's central area is defined by major road infrastructure and, apart from where recent pedestrianisation has been achieved along Sauchiehall Street and Buchanan Street; vehicular movements dominate the urban environment. This is particularly acute along the A814, which segregates the Clyde from the city centre, and within the city centre itself. This has an impact on the pedestrian experience. There is however an increasing body of evidence from Portland, Seoul, Copenhagen, Melbourne, New York and many other cities, that inviting greater pedestrian movement is economically advantageous; particularly for retail. This is because people-orientated city centres generally retain visitors for longer with supporting activities, such as street cafes and performers animating the environment. This helps to make the city centre a destination in itself; people visit to be in the centre not just because it is a place to shop or work, but because it is a pleasing experience.

Opportunities should be explored to further reduce vehicular domination, for example, although George Square is considered to be of high quality, the user experience (particularly arrival from Queen Street Station) is poor. This reduces the potential use and animation of this significant space. Reducing the road dominance would allow for greater animation of the square by promoting outdoor eating and street side vending as is popular in Royal Exchange Square and Nelson Mandela Place. These opportunities in particular will be considered through the forthcoming review of George Square Traffic Management Proposals, however other solutions, such as multifunctional shared surfaces, limited access and pedestrianisation may also be suitable across the City Centre. As a by-product, creating high quality, walkable environments is also likely to encourage movement and help improve the health of residents



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CASE STUDY: Cities for people – Times Square, New York

For many years, traffic in midtown Manhattan caused major problems. Tourists and locals risked serious injuries competing for space with traffic congestion. Following the city's release of the 2007 planning document *PlaNYC: A Greener, Greater New York*, the New York City Department of Transportation (NYC DOT) commissioned a study to understand how they could improve the city's sidewalks and streets. Among the conclusions was the result that only 11 percent of Time Square was designed as resting and walking space while 89 percent of the area was used to accommodate cars.

In the summer of 2008, NYC DOT converted much of the streets along Broadway for pedestrian use. Between 35th and 42nd streets, Broadway was converted into pedestrian living rooms furnished with planters, lawn chairs, and other street furniture. New bicycle lanes were also included, narrowing the road for traffic from four lanes to two.

The results indicate that the program has been a success. There has been a 35 percent decrease in pedestrian injuries and general improvements to traffic flow. Economically, 42 percent of residents surveyed stated they have shopped in the neighbourhood more since the changes were implemented.

Construction cost were relatively low, as redesignation was done simply through coloured makings and three business improvement districts have partnered with the city and agreed to maintain the new plazas.

5.5. Animating Stalled Spaces

There is a significant number of vacant and derelict sites in Glasgow as shown in Figure 5.2. With the recent economic downturn, these sites are at risk of becoming stalled spaces, which remain under utilised for some time. As with empty shop fronts and derelict buildings, space which is not used can quickly reduce the quality of the areas. Overgrown, run down sites reinforce the feeling of neglect, and increase fear of crime. Making use of these spaces, whether creating a low maintenance landscape or establishing a more formal use, such as temporary Playspace/skate/cycle parks, to generate resources such as biomass or cleansing through phytoremediation (discussed under Enhancing natural processes and generating resources, Section 9, in more detail) these spaces remain active and cared for. In turn this reduces their potentially negative impact on their surrounding areas.

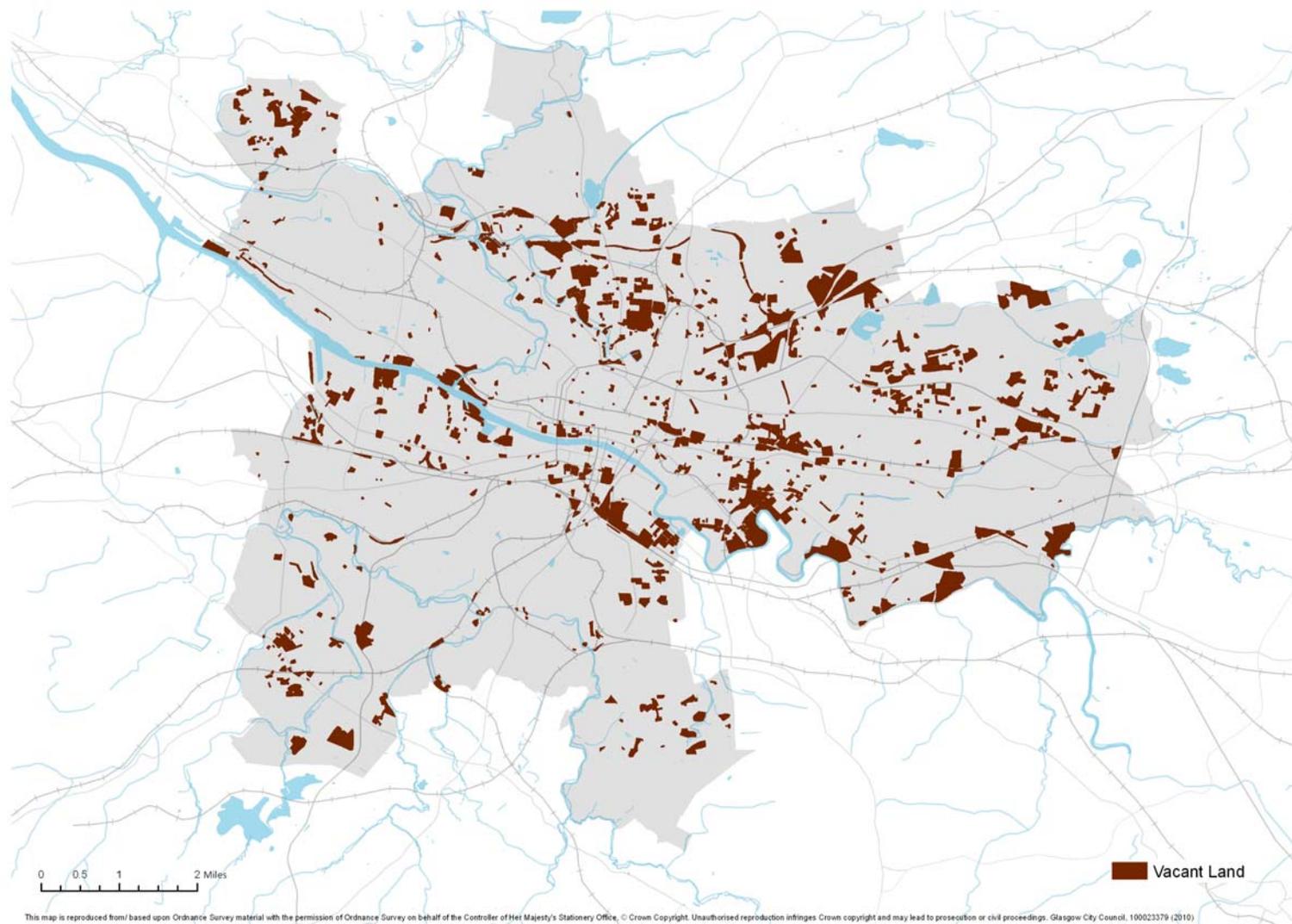
Although it can be challenging, providing a flexible approach to using underutilised space is a progressive way of providing additional services and facilities. It is particularly useful in times of austerity and where there is considerable transformational change required that leaves long periods before land is fully utilised. GCC has been progressive in understanding that evolving cities need to be prepared to take this kind of flexible approach, having established the Community Support for Stalled Spaces programme.

CASE STUDY: Animating underutilised spaces – Rottenrow Gardens, Glasgow

Glasgow has already set and exemplary precedent for making good use of stalled sites. After Strathclyde University acquired and demolished the Glasgow Royal Maternity Hospital in 2001 there was a danger that the site would remain undevelopable for a lengthy period of time. In the meantime, Rottenrow Garden's was created as a temporary space using relatively low cost planting and materials that could be easily removed. This centrally located site is now a natural meeting place, has improved connectivity and is popular venue for outdoor social events at the university. Rottenrow Gardens are a prime example of transforming a centrally located site from disused to community treasure.



Figure 5.2: Vacant land



The Community Support for Stalled Spaces initiative provides assistance to community and voluntary organisations to implement environmental improvements on land earmarked for development which has stalled, and has become vacant and/or derelict. It is also an aim of the programme to engage and involve local people in making a difference in their area. Hence the programme is community driven, recognising that the people of the local community are best placed to identify areas for improvement. To date, 21 applications for funding have been approved.

GCC will also consider supporting land owners and developers with proposed temporary, pop-up use of their site which would be of benefit to all. More information can be found at:

http://www.glasgow.gov.uk/en/Business/Environment/Clyde_KelvinGreenspace/Stalled+Spaces+++Temporary+Landscapes.htm

Pop-up uses offer a cost efficient way of animating space during the interim period whilst awaiting development or until a more formal use is established. Although pop-up uses should not replace needed facilities or services, they do offer an important resource for intervening periods.

5.6. Improving the quality of amenity Space

Amenity space is on the whole, most people's most frequent experience of open space. As such, the general quality of amenity space can have an enormous impact on the perception of place. In employment areas, this can have an impact on the attractiveness of the area to potential investors and in residential areas it is likely to have an impact on quality of life. In both, it is likely to have an impact on the land and property values. The open space survey carried out in the development of this strategy highlighted that amenity space generally was of poor quality and that the worst performing areas in this category are frequently distributed within the most deprived areas of the city. Figure 5.3 below highlights the areas of residential amenity space (a sub-set of PAN 6.2 Amenity Space specific to residential areas) in relation to the most deprived parts of the city. It highlights that there is significant amenity space resource in deprived areas across the city, for example, around Gartloch / Gartcosh New Neighbourhood area. In areas such as these, focus should be given to improving the quality and interest of amenity space. The Gartcosh/Gartloch Site Selection and Development Guidance highlighted the importance of balancing the often complex relationship between environmental, ecological, and physical considerations to maximise the potential of the area and its green network.

Similarly, Figure 5.4 shows the spatial relationship between amenity space and house price. There is a high correlation between the amount of amenity space and lower value properties. As lower value properties generally have less private outdoor space, the quality of amenity space becomes increasingly valuable to local residents. Improvements can even save money.

Opportunities for improving residential amenity space could include:

- Pictorial meadows - Mowing amenity space is considerably expensive, typically involving 24 cuts annually. Careful consideration of meadow seeding, as in Sheffield for example (see below), reduces the intensity of management regimes with often only bi-annual cuts (2 cuts) required, therefore reducing maintenance costs. GCC is currently considering the opportunities from alternative mowing regimes.
- Pocket Parks – introducing small parks into residential development can be an effective way of providing a relatively low cost focal point. For example, the Bourne Estate play space & community garden in Camden, London turned an unused lawn in a high density housing estate into a natural play area and community space for £46,000.
- Sport, recreation and play equipment – As there are significant health issues in Glasgow (see Health and wellbeing, Section 6), introducing informal recreation and play facilities into residential areas could help encourage more activity. For example, the AdiZone project, which combined public funding with private sponsorship to maximise legacy benefits from the 2012 London Olympic and Paralympic Games has delivered 40 family fitness zones for the equivalent cost of a public swimming pool.

CASE STUDY: Sheffield's Green Estate

Like many inner city areas, Sheffield was experiencing social, economic, and environmental poverty. With the view to use underutilised land, engaged citizens decided to improve their community by bringing life back to the derelict land and degraded amenity space by making it more attractive and biologically productive. In partnership with a number of local organisations, the community led "Green Estate" set out to address the poor quality of open space, build community cohesion, and improve its future sustainability. A plan was developed to regenerate green spaces to capitalise on their potential to deliver improvements to the area. One of the major successes has been the creation of 'pictorial' meadows. Using durable and succession flowering species mixes, large swathes of amenity space were transformed by colour, helping to improve the appeal of the area and reducing the maintenance requirements for a large area of previously mown land in council ownership.

With the realisation that funding would cease to sustain the Green Estate, the community led organisation began to undertake commercial activities that would support the ongoing neighbourhood improvement. These services include green roof services, green waste composting, and demolished sites regeneration among many others.

The Green Estate is an exemplar of a community social enterprise leading the regeneration of their area, improving the sustainability of their neighbourhood in the process.



Figure 5.3: Housing related amenity space and housing deprivation rank

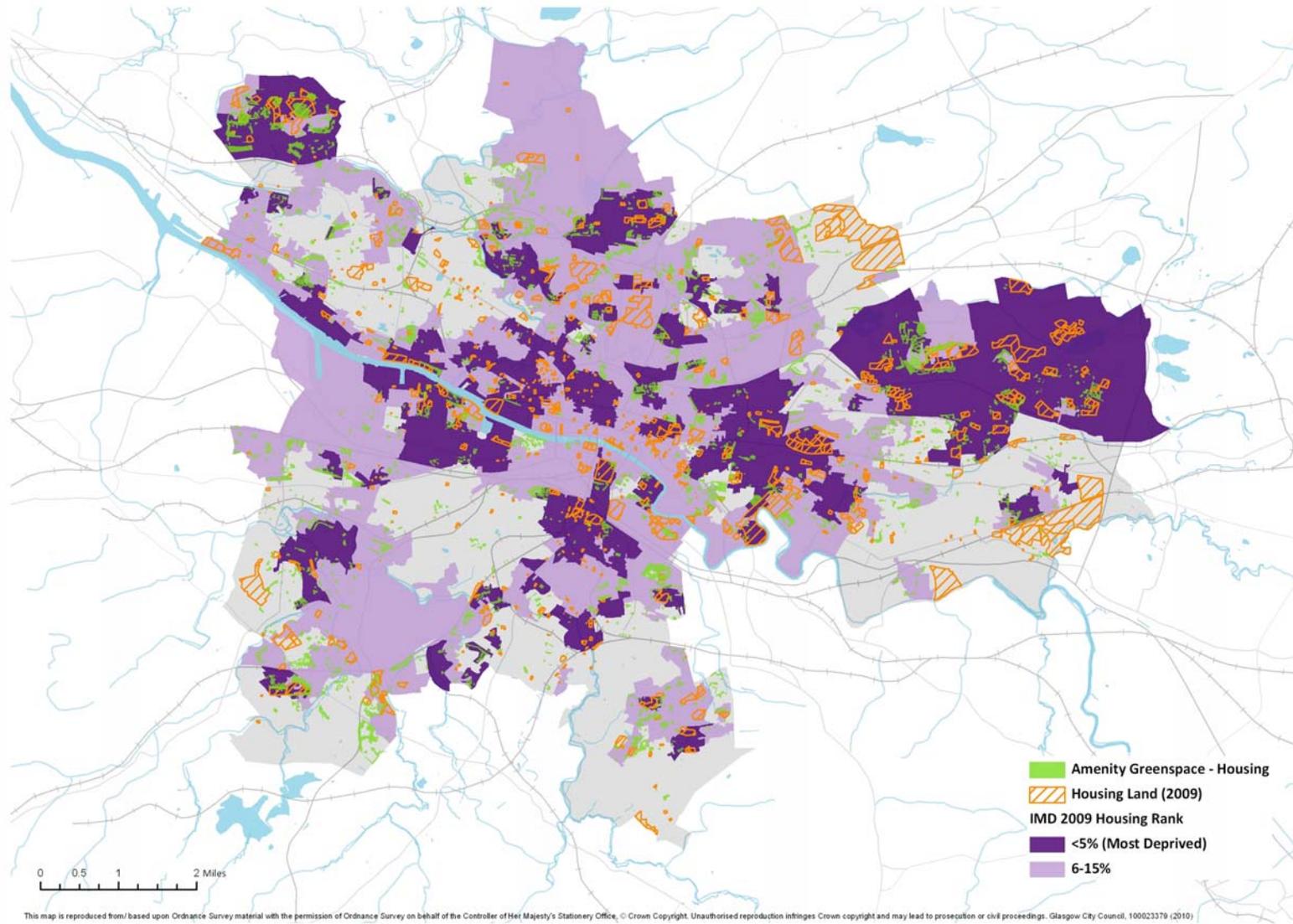
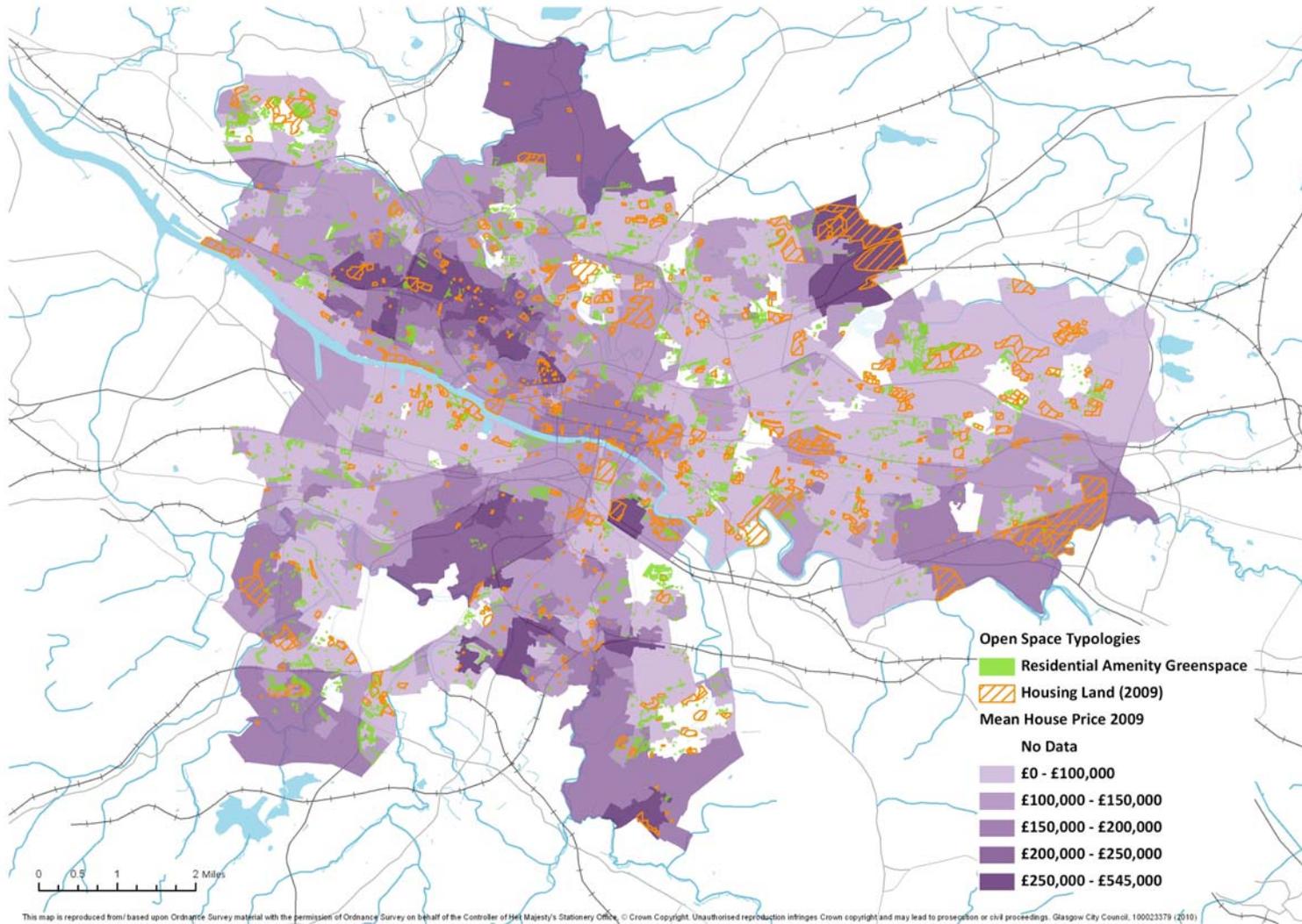


Figure 5.4: Housing related amenity space and house price



Maximising community benefits – Delivering green space improvement through social enterprise

A social enterprise is a business with primarily social objectives whose surpluses are principally reinvested for that purpose in the business or in the community, rather than being driven by need to maximise profit for shareholders and owners. The Sheffield Green Estate is an excellent example of where a social enterprise has been the vehicle for delivering green space improvement as well as community capacity building. Although starting life as the Environment and Heritage programme, a partnership between Manor and Castle Development Trust (MCDT), Sheffield Wildlife Trust (SWT), Sheffield City Council (SCC) and many other organisations and funded through the Single Regeneration Budget, a loss of funding but commitment to the communities prompted a move to becoming a social enterprise. Instead of receiving core funding to support ongoing green space management they developed core commercial activities to support them and their activities. These include green space management consulting as well as training and education. The same organisation principle has also been applied effectively to a range of other open space management operations, including allotments, community farming/orchards and land sharing.

There are a number of ways of establishing a social enterprise:

Charitable Status - A charity is an organisation established for charitable purposes and registered under the Charity Acts, the most recent and far-reaching being the Charities and Trustee Investment (Scotland) Act 2005, which came into effect in April 2006. Constitution as a charity may be necessary to seek grant aid or donations, or if the proposal is to hold land in trust for the benefit of a community. Some funding organisations will only donate to registered charities. A group must have a written constitution in order to register as a charity.

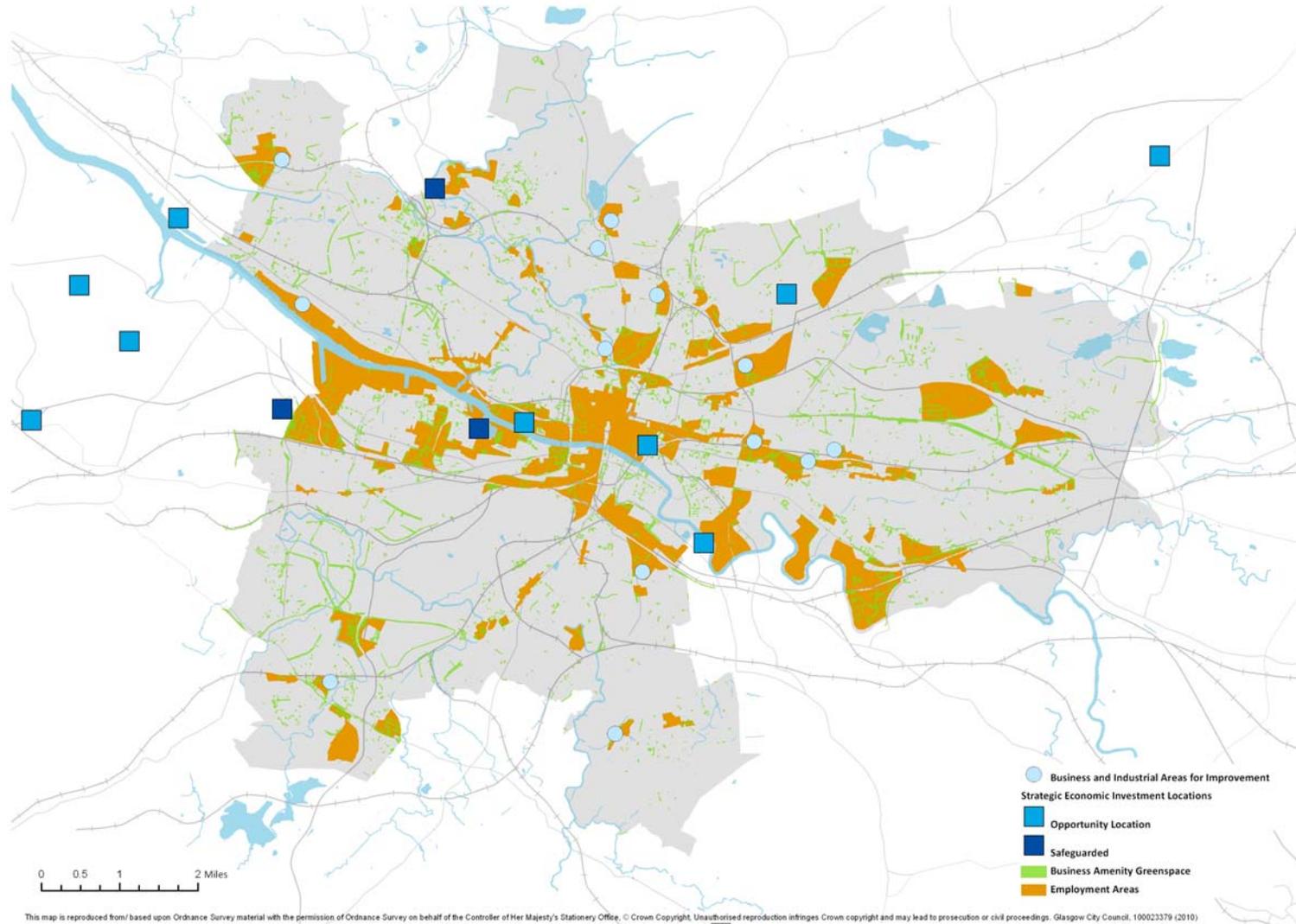
Companies - Some organisations choose, in addition to charitable status, to become a registered, not-for-profit company limited by guarantee. This is often relevant where there is a large capital development or trading involved. The Charities and Trustee Investment (Scotland) Act 2005 introduced a new legal structure called a Scottish Charitable Incorporated Organisation (SCIO). This type of organisation takes on a legal identity of its own without having to register as a company. A new social company is also available, termed the Community Interest Company.

As with residential amenity space, improving the quality of amenity space associated with business areas will help to create a strong identity. The improvement of the public realm and delivering of multifunctional open space will help to attract and retain businesses. The GCV MIR highlights a number of Strategic Economic Investment Locations. These areas have been identified for their role and function in the city-region economy and will support important highly skilled and valuable businesses. As such, these areas are likely to require a high quality public realm and present an opportunity for investment to be better directed at delivering *multifunctional* open space, i.e. considering water management, biodiversity and ecological networks etc. as well as amenity value in their design. In these areas, there may also be opportunities for the businesses to take a more active role in funding, designing and maintaining their public realm by recognising the mutual benefits that it can bring through the formulation of Business Improvement Districts.

In addition to the more high profile Strategic Economic Improvement Locations, there are a number of business and industrial locations that are in need of improvement. The Industrial and Business Areas for Improvement Summary Report (2008) provides details of survey work undertaken looking at the quality of the public realm across 72 industrial and business areas. It concludes that there are 43 areas that would benefit from improvements, 13 of which have been identified for further discussion and possible inclusion in a programme of public realm improvements. Again, these public realm improvements should consider opportunities for providing multifunctional benefits, including water management, biodiversity and recreation.

Figure 5.5 below shows the relationship between business amenity space and key employment areas, highlighting the Strategic Economic Investment Locations and Industrial and Business Improvement Areas that could provide the catalyst for improvement.

Figure 5.5: Key employment areas and amenity space



CASE STUDY: Clean and Green, Victoria Business Improvement District

The businesses in Victoria, London recognise the importance of environmental quality to the success of their businesses. As such they have joined together to form the Victoria Business Improvement District. Depending on their size and turnover, businesses pay an additional levy to raise funds for environmental improvement. Activities have included improving communal greenspace, reducing signage clutter and promoting a cleaner, more efficient and accessible street layout.

There are now 107 Business Improvement Districts across the UK undertaking activities to collectively improve their business environment. They come in a variety of forms, but are mostly set up by interested businesses as companies limited by guarantee for 5 year terms. Participating businesses are balloted after this time to see if they want to continue. To date there has been a 100% renewal rate. This suggests the financial benefits to businesses are clear; for every £1 invested in the local area an additional £0.7 is levered into the area. Not to mention the increases in land value, footfall and productivity from the more attractive environment.

CASE STUDY: Sandvik, Coventry

Sandvik, an engineering company with a manufacturing centre in Coventry was experiencing extensive drainage problems; surface water run-off was causing drainage systems to overflow, causing flooding both externally and internally, and disrupting output. After engaging architect Adrian Allen, Sandvik was encouraged to take a pioneering approach to managing the solution. Moving away from traditional utilities which would have required expensive excavation and upgrade, the firm invested in rain gardens (explored in more detail in the resource management section). In addition to managing the surface water in a cheaper way, the company experienced some unexpected benefits. The resulting planting improved the quality of the factory surroundings considerably, giving employees a place to socialise during breaks. This has helped to improve moral, productivity and is used on a lot of Sandvik's promotional material.



Before



After

5.7. Open space objectives for place setting for economic and community vitality

Following the research and analysis undertaken to develop this Strategy and building on the experience from leading edge practice, conclusions can be drawn on the priorities for achieving the vision for open space in the city. Glasgow's objectives for open space to aid place setting that bolsters economic and community vitality will be to:

- Develop design guidelines and co-ordinate a coherent approach to civic space improvements; areas of focus should include the Clyde Waterfront, in conjunction with the identified regeneration priorities, high profile and high impact city centre spaces such as George Square and key neighbourhood community spaces, e.g. Pollok town centre;
- Explore opportunities to reduce vehicular dominance within the city centre, potentially through multifunctional street sharing and / or limiting access;
- Activate stalled sites through the creation of temporary spaces, including recreation activities and pocket parks; and
- Focus on supporting the provision of high quality residential and business amenity space, with particular emphasis on those areas identified as Strategic Economic Investment Locations and areas identified in the Glasgow City Council report, Industrial and Business Areas for Improvement (2008).

6. Health and wellbeing

6.1. Relationship between open space and health and wellbeing

Effectively designed open space is vital to improving residents' quality of life, especially in urban areas. Some health benefits of open space provision, such as providing opportunities for active lifestyles and relaxation, are well known. Others, such as its ability to improve mental health and contribute to social cohesion are less obvious. There has been much research in the area that has provided evidence for a number of these benefits. These include:

- *Improving mental health and stress relief* – The Forestry Commission Scotland's *Branching Out* initiative has shown the strong connection between open space and mental wellbeing. Small groups of citizens engaged in environmental stewardship activities, wilderness skills learning, and participated in relaxation and exercise. The results showed that participants were able to improve their mental and physical health, improve their time management skills, acquire new skills, and establish a greater social network. The results of this programme and other similar ones suggest that open space can be used to improve many areas of health for a given population;
- *Physical activity* – Well designed open space and access to it in high density neighbourhoods shows it is necessary to increase physical activity⁶. Increasing physical activity has a considerable impact on improving overall health but particularly in relation to coronary and respiratory diseases which are particularly acute in Glasgow. Recent research by the NHS and Natural England has shown that where people have good perceived and/or actual access to green space they are 24% more like to be physically active. If everyone was afforded equitable good access to green space it is estimated that the cost-averted saving to the health service could be in the order of £2.1 billion per annum;
- *Illness prevention* – Prisoners in Michigan whose cells overlooked greenspace and trees had 24% fewer medical visits⁷; and

⁶ L.E. Jackson (2003) The relationship of urban design to human health and condition *Landscape and Urban Planning* 64

⁷ (E.O. Moore, 1981)

- *Social cohesion* - There is a clear benefit of social interaction to human health, and public spaces provide the opportunity to engage a community socially. The improvement of public open spaces has been shown to be an important resource for community organising efforts in inner city neighbourhoods⁸.

This evidence provides a robust support for well designed open space; however, there are many other indirect health benefits to which urban greening can contribute. The growth of vegetation naturally improves the surrounding air quality and helps to regulate the surrounding micro-climate. Presence of greenery in the workplace can also help prevent employee sick leave, maintaining a healthy and productive work force. Plants in urban areas, such as allotments or vegetable gardens, also provide the opportunity for residents to grow their own healthy food and connect with nature in the process. Furthermore, ensuring neighbourhoods are designed to be pedestrian friendly is one simple, but effective way to increase activity levels. Taking advantage of urban design elements, such as human scale streetscapes with active frontages can work towards facilitating walking in vibrant public spaces. This also links well with increasing community vitality, as discussed above.

greenspace scotland, NHS Health Scotland and Scottish Natural Heritage have developed the Greenspace and Health Outcomes Framework to reflect this range of health benefits supported by quality greenspace. The Outcome Framework is designed to help guide the delivery of greenspace (spaces and networks) for health benefits by providing tools for linking activities with outcomes. The framework is made up of a suite of 'generic' models (that can be locally tailored) which aim to capture the links between activities relating to the creation, management and use of greenspaces and green networks and a series of long-term health outcomes derived from the National Performance Framework and from the 2009 Single Outcome Agreements. More information can be found at <http://www.greenspacescotland.org.uk/default.asp?page=481>

⁸ Kuo, Sullivan, Coley, Brunson (1998) Fertile Ground for Community: Inner City Neighbourhood Common Spaces. *American Journal of Community Psychology* 26:6.

Issues and priorities for Glasgow

The Scottish Index of Multiple Deprivation (SIMD) suggests that there is a large disparity in Glasgow's health. While some areas are the least deprived in the country, there are areas where two-thirds of the population are among the 15% most deprived areas in Scotland. Overall, a third of Greater Glasgow ranks in SIMD's most deprived areas for health⁹. While deprivation is a problem in other European cities, such as Manchester and Liverpool, premature deaths in Glasgow are exceptionally high – 30% higher than either Manchester or Liverpool¹⁰. In fact, Glasgow has among the lowest life expectancy in the UK¹¹. This has led to what is colloquially known as *The Glasgow Effect*. The Scottish Social Attitudes survey show that there is a strong correlation between use of green space and deprivation, highlighting that over 3 times as many people in the most deprived areas of Scotland never visit their local greenspace compared with people in the least deprived areas; 29% compared with 8%. Furthermore, those with no qualifications, people who live in flats, and social renters were also less likely to ever visit their local greenspace.

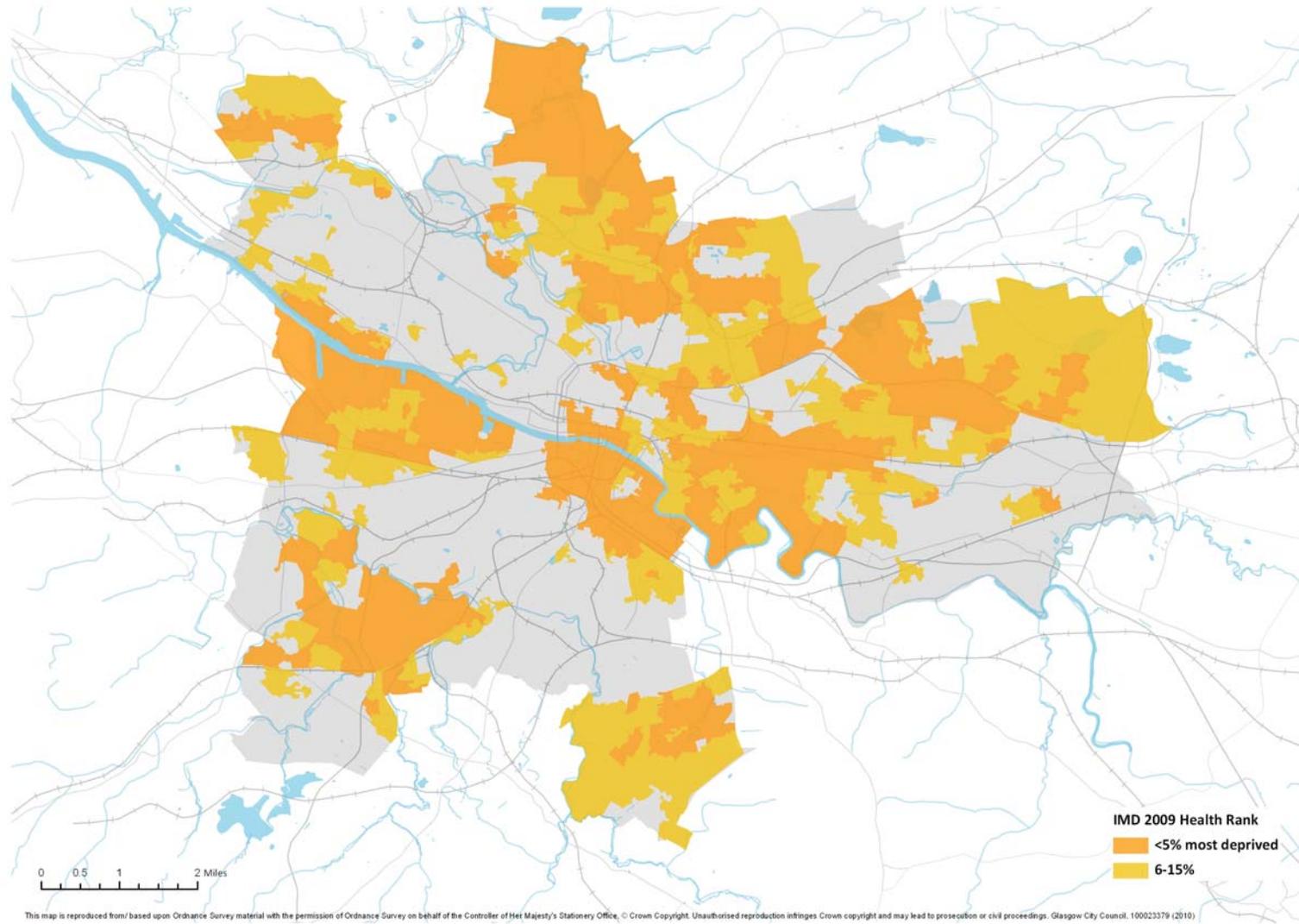
The first step in determining the opportunity for open space to play a role in improving Glasgow's health is to map health deprivation for the city. This can be seen in Figure 6.1.

⁹ <http://www.scotland.gov.uk/Publications/2009/10/28104046/6>

¹⁰ Walsh D, et al. (2010) Investing a Glasgow Effect. *Glasgow Centre for Population Health*

¹¹ www.statistics.gov.uk/downloads/theme_population/LE_UK_2008.xls

Figure 6.1: Scottish Index of Multiple Deprivation, 2009



Social housing represents areas where deprivation is concentrated. For this reason, providing opportunities for residents to be active and providing areas for respite are priorities for these areas. The Glasgow Clyde Valley Green Network has already begun projects which look to provide access to open space and its multiple benefits to areas of social housing, such as in Milton, located on the northern periphery of Glasgow¹². Not only will open space in this area provide opportunities for residents to engage in healthy, active lifestyles, but can also contribute quiet places for people to relax and recharge. How open space is planned, developed, and designed is crucial to its success. One of the important conclusions from the work in Milton is that engaging and consulting with the community is critical to the success of the project.

Whilst the quantity of sports facilities is important, their quality is an important factor in projecting their use. Given the significant health problems affecting the major parts of the city the opportunity for sites to actively support health and well being is one that needs to be exploited. The quality assessment undertaken as part of this study (Section 4) showed that the many sites (38%) scored poorly against health and wellbeing criteria and were not encouraging people to be active.

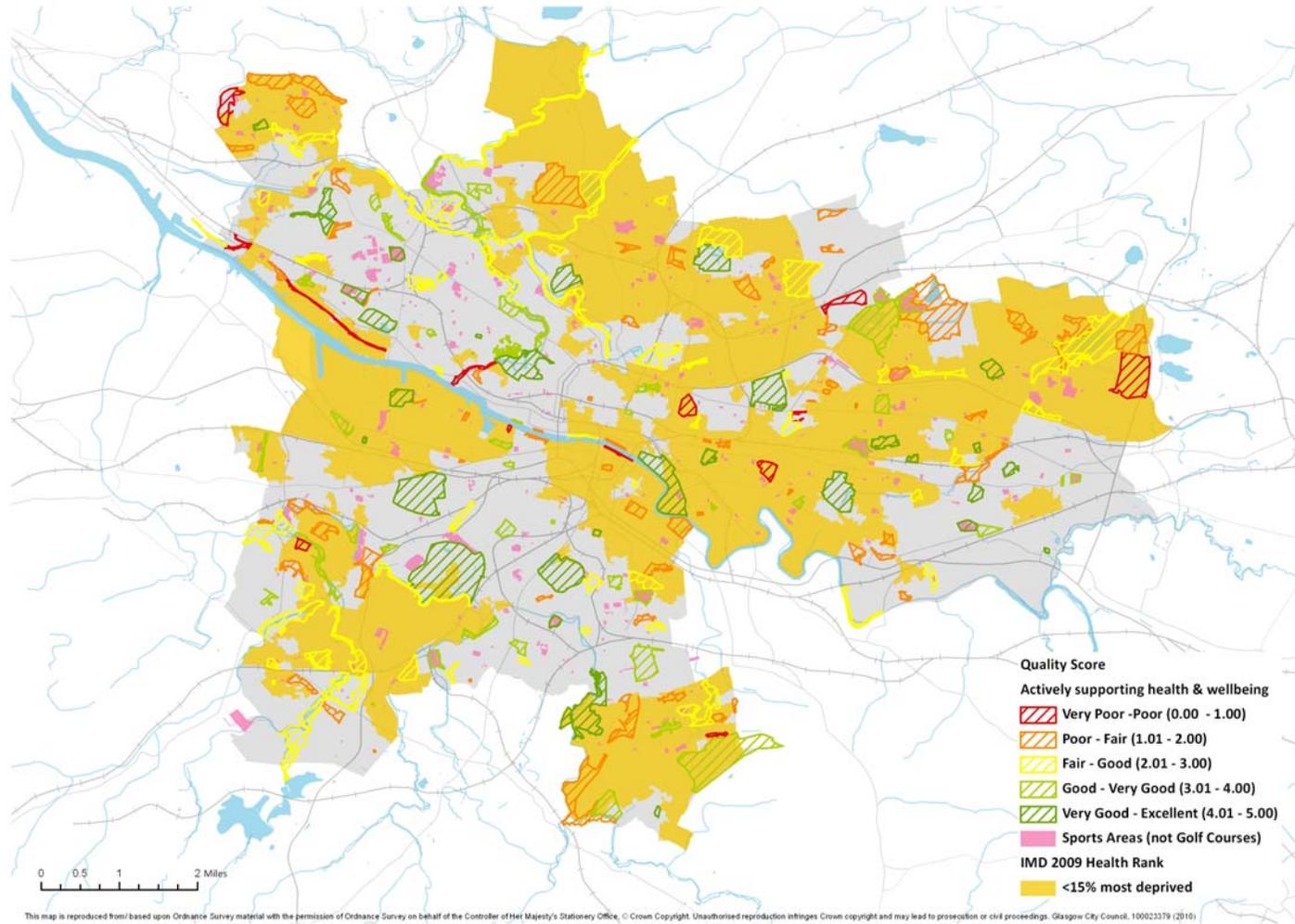
Sports Areas (75%), as expected, fared the best in the quality assessment, but even then, a quarter of sites were deemed not fit for purpose. This represents a significant number of sites that are not fulfilling their main function. Public parks (61%) in general performed relatively well.

Types of space that perform less well in the quality assessment are Green Corridors (32%), Natural/Semi-natural Space (25%) and Amenity Space (22%). The poor performance of green corridors in particular is a concern as activity and active travel should be a major function of this type of open space. Local amenity spaces are also not providing enough local opportunities for physical exercise.

The most pressing issue, however, can be seen from Figure 6.2. When considering the quality of open space, both formal and informal, it appears the majority of high quality space is outside of the most deprived areas. The corollary here is that the places that are in greatest need of high quality recreational space have limited access to it.

¹² Glasgow and Clyde Valley Green Network Partnership (2010) Milton Social Housing and Regeneration Project

Figure 6.2: Quality of open space in actively supporting health and wellbeing



Recreation and physical activity

Perhaps the most immediate health issue where open space provision can deliver direct benefits is in obesity reduction. The link between obesity and the recreation opportunities from open space are well understood, and improving activity levels in Glasgow will be important to increasing long-term health and life expectancy. High quality open space is key to getting people more active, this may be through the provision of dedicated spaces for sport and recreation; through more informal inclusion of equipment in the form of outside gyms and natural features to make better use of amenity space or passively through urban design initiatives that encourage movement. Some creative approaches have been undertaken in other parts of the UK, such as the Activmobs project in Kent.

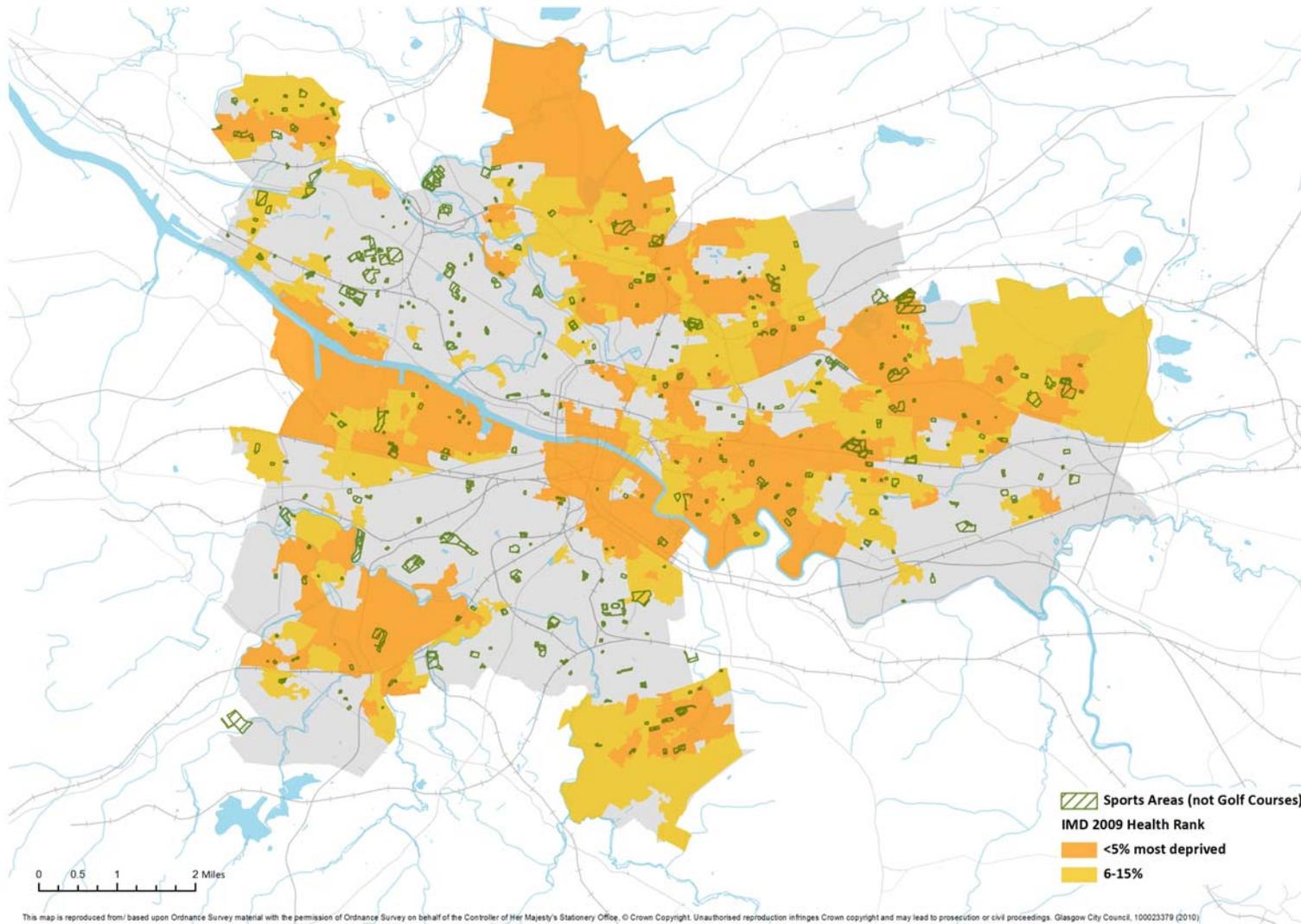
With 394ha (excluding golf courses) of open space designated for sports and recreation purposes distributed across the city, it would suggest that Glaswegians have widespread opportunities to engage in active lifestyles. However, overlaying sports facilities provision on the map of health deprivation, as in figure 6.3, suggests that many opportunities for health-improving recreational activities exist outwith the deprived areas of the city.

The map shows that high quality sport and recreation opportunities are sparser within the areas of deprivation; initiatives to improve this are required in Glasgow. In order to make the biggest impact, recreation space initiatives need to be targeted to priority issues for Glasgow. These priorities have been determined to include: improving provision of social housing recreation space, improving community access to open space, and engaging children early in healthy lifestyles.



Outdoor gym

Figure 6.3: Sports areas in relation to health deprivation



CASE STUDY: Activmobs

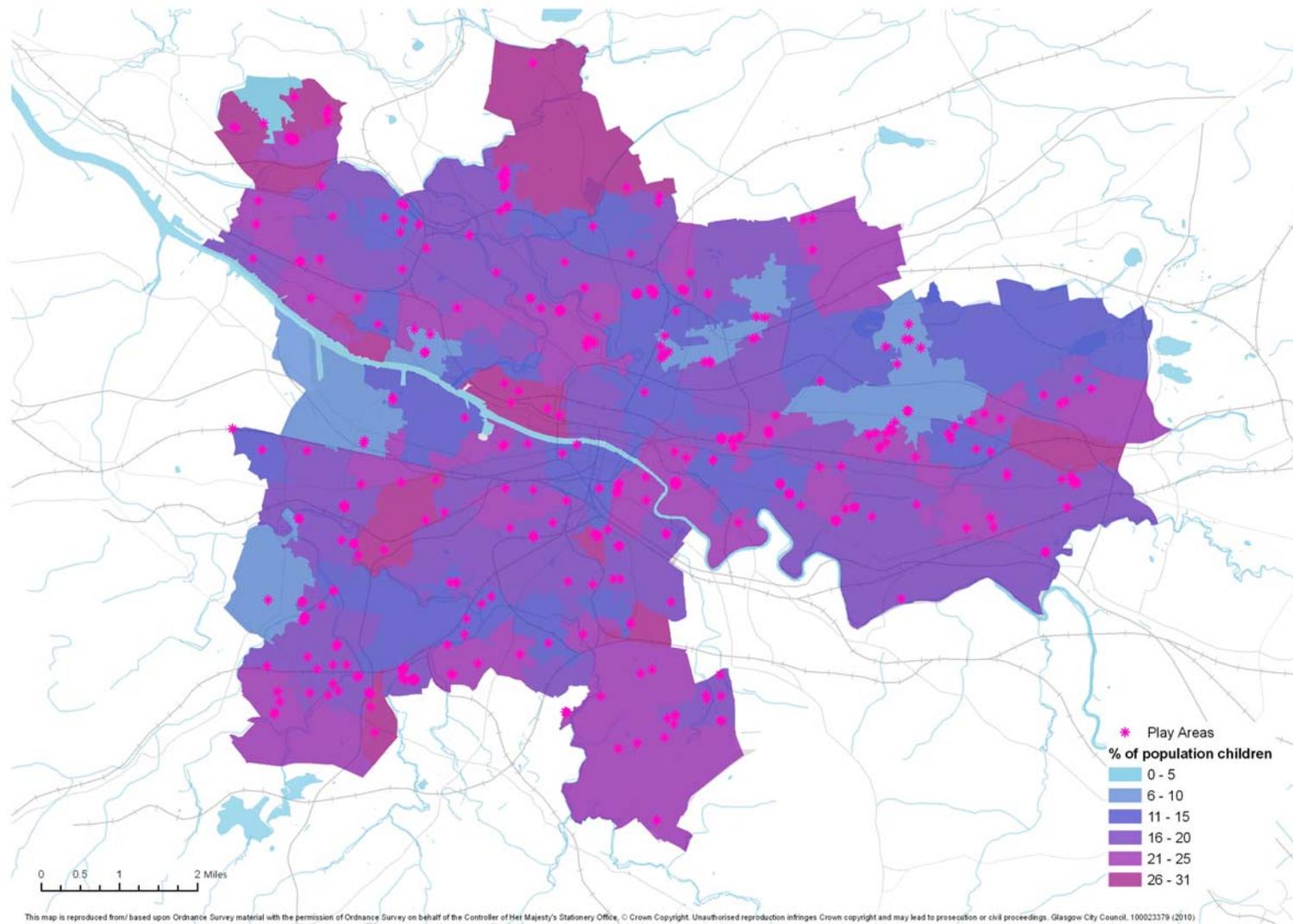
Activmobs programme provides support – financial and otherwise – for community members to start groups that engage in any form of activity¹³. The concept eschews the notion that exercise needs to be done in gyms or through more formal activities that people might not associate with having fun. Rather, Activmobs look to build on anything active that people are already doing, or would like to do, getting together in an informal manner with colleagues, friends, or other community members to have fun, while improving their fitness. Appropriate open space provision is key to the effective delivery of this programme as it provide “free” space for community members to host many of their groups.

Play space

While engaging the adult population is important, the best way to reduce obesity rates is through prevention. For this reason, ensuring that play spaces are available for children is key to ensuring that facilities exist to foster activity. The following figure maps the concentration of children against the number of play spaces in Glasgow City. Access to play spaces for children does not appear to be correlated to the concentration of children in a particular area. In fact, some areas to the north with a high percentage of children appear to have fewer play spaces than other areas.

¹³ http://www.activmob.com/about_activmob

Figure 6.4: Play areas relative to concentration of children



CASE STUDY: P.I.N.E. Project, Toronto, Canada

Engaging children in an active lifestyle is the best way to ensure they pursue healthy activities throughout their life; this is even better when it can be done in a way that establishes a connection with the natural environment. The Primitive Integrated Native Education (PINE) Project is an outdoor and environmental education non-profit organisation. It was founded in Toronto in 2008 to provide an opportunity for children, youths and families to discover nature in their local urban environments, and be active in the process. Their classroom is any urban green space, and their goal is to inspire healthy, lifelong connections between people and nature through outdoor learning and play. By uncovering nature in the city, their programs foster an understanding of the interconnection between communities and ecologies; encourage environmental stewardship and community leadership; and inspire active lifestyles.

The programme uses direct experience, observation, problem solving, creative thinking and interaction to guide all their lessons. Their “classes” require no technology, no special texts and no particular setting – just a patch of grass or a tree, and the senses and imaginations of participants and instructors. Some of the classes include the tracking and nature club, homeschool programming, after school programs, and summer camps. Each of these programs blends active lifestyles, creative arts, natural history, science, indigenous skills, and stewardship to bring participants a unique outdoor experience right in their own backyards.

Although the programs are varied, the thread that joins them all is community building around a connection to, and stewardship of, the natural environment. Many of the programmes are offered by donation or pay-as-you-are-able, to ensure the broadest variety of participation and to provide opportunities for those participants who are financially unable or otherwise unlikely to pursue outdoor activities outside the city.

PINE operates with the belief that the health of the natural environment determines the health of the community in many ways, and by uniting them through education, recreation, and stewardship, PINE seeks to create healthier and happier ecological and social systems.

Passive improvements

Equally Well is the Scottish Government's action plan for tackling health inequalities. Equally Well asked community planning partners across Scotland to propose 'test sites' for taking new approaches to the challenge of tackling health inequalities. Glasgow submitted two successful bids for test site status in the summer of 2008. The first is in Govanhill in south east Glasgow, looking at street level community regeneration, building on local residents' vision of what is needed and multi-agency service delivery. The second is a City-wide initiative focusing on integrating health into city planning. It sets out seven proposed projects to evaluate and develop further the innovative engagement and planning processes undertaken in the creation of regeneration plans in the East End Local Development Strategy. This spatial strategy document called 'Changing Places, Changing Lives' sought to combine excellence in placemaking with socio-economic policy objectives, particularly those related to health and wellbeing. It particularly focused on utilising innovative techniques and concepts related to public consultation, based on quality of life and health issues, a focus on health in the delivery of urban infrastructure and developing new models for integrating health into policy making. The equally well project will now to extend these activities into other areas.

Open space can also play an important role in patient recovery from illness. The new South Glasgow Hospitals Campus includes provision for improved open and green space which will present an attractive place to recover and visit. Other opportunities to link healthcare institutions and open space could be explored throughout the city.



The new South Glasgow Hospital will include new open space and green roofs.

6.2. Open space objectives health and wellbeing

The health of Glasgow's residents will be enhanced by:

- Improving the access and quality of recreational open space, including parks and gardens, sports facilities and amenity space, particularly focusing action towards the more deprived areas of the city;
- Providing high quality natural play features and equipment in areas of deficiency;
- Integrating opportunities to exercise into the outdoor environment; and
- Maintaining support for the Equally Well project and promoting 'Healthy Urban Planning' by delivering more walkable places through attractive public realm, an appropriate mix of services and improved connectivity for pedestrians and cyclists.

7. Creating connections

7.1. Relationship between open space and creating connections

Open space assets are not only destinations in their own right. The routes that connect these spaces, our home, places of work and leisure activities also have an important public realm and open space role. They provide an opportunity for the multifunctional benefits of open space to permeate throughout the City.

Perhaps the greatest opportunity for open space is in creating cycling and walking routes that support green corridors. Attractive green networks, shaded by trees, can encourage greater use of cycling and walking routes, so long as routes are safe and directly link communities to the services and employment that they need in order to provide alternatives to driving cars or taking public transport.

Access to more sustainable transport options not only help to reduce CO₂ emission and air pollution, but can also play an important role in promoting healthy lifestyles. Green links and corridors are also important in developing functional ecological networks, which make the landscape more permeable for wildlife.

Designed well, these routes can also reduce some of the negative impacts of vehicular and rail routes, providing screening, safety barriers and noise filtration, as well as improving air quality.

7.2. Issues and priorities for Glasgow

Improving connectivity

Although natural features, such as the rivers and canals can present barriers to communities, they also offer excellent opportunities for improving links. Running through the heart of the city, the River Clyde is a key contributor to Glasgow's open space network. The river crosses a diverse range of character zones and variety of built form, natural and manmade landscapes and different habitats and environments along its route. The parklands and vegetated soft water edge at Glasgow Green to the east offers a contrasting character to the civic space, quayside promenade and various architectural landmarks along the waterfront in the central area, with the numerous bridges and iconic industrial

heritage such as the Finnieston Crane. To the west the sense of place changes dramatically again through the regeneration of Glasgow Harbour, the impressive ship yards and active dock areas past the Renfrew Ferry Terminal, where the hard river edge becomes natural once more and the Clyde widens as it passes under the Erskine Bridge and out towards the Firth. Connectivity along the length of the Clyde is intermittent in provision and quality; however, the development associated with the regeneration of the Clyde Waterfront, City Centre and Clyde Gateway growth corridors offers considerable opportunity to provide a continuous link along the river.

Two of the Clyde's major tributaries also run through the City, offering opportunities for improved connectivity for both people and wildlife. The River Kelvin winds its way to Partick and Glasgow Harbour on the Clyde from the Campsie Fells north of the city, and the White Cart flows through the plateau farmland of South Lanarkshire and into the urban greenspace and southern communities of the urban area.

The canal system is also an invaluable asset in the northern part of the city; offering numerous environmental, economic and recreational opportunities, coupled with regeneration benefits (Glasgow Canal Regeneration Project) and the opportunity for becoming a focus of communities rather than something that locals are unaware of (visually or physically) due to lack of connection and physical barriers.

The opportunity presented by the waterways to create better connections is reflected in Glasgow's Draft Core Paths Plan, which proposes new and improved routes along the Clyde, Kelvin, Forth and Clyde Canal and White Cart. Figure 7.1 shows the Core Path network. It also shows where new aspirational links are proposed to improve the network, as well as key cycle routes. It illustrates particular connectivity issues to the south of the city centre, in the northwest and in some of the most deprived areas to the northeast of the city. Creating and reinforcing the cycle and pedestrian network is also important for areas where there is particularly low car ownership, which is a prevalent feature in Glasgow, and providing alternative opportunities for travelling to work/school. Currently cycling accounts for only 2% of the modal share of adults travelling to work. However, many journeys within Glasgow could be undertaken by bike and are often quicker than by any other mode. Through the development of Glasgow's cycle route infrastructure, adaptation of the road network to a safer environment and the promotion of active and sustainable travel, cycling is increasingly seen as a realistic form of transport by the citizens of Glasgow.

Furthermore the Scottish Household Survey showed that in 2006, only 3% of adults said that they cycle as a means of transport. Similarly, the number of children in Glasgow that cycle to primary school is under 2% and less than 0.5% for secondary school students. Well over half of Glasgow's pupils do however walk to school, although a significant proportion, about a third, use private cars. As a by-product, creating high quality, walkable environments is also likely to encourage movement and help improve the health of residents.

A partnership of organisations, including GCC and Glasgow Life are currently developing a Strategic Plan for Cycling for Glasgow. Its ambitious aim to make cycling the biggest participation activity in Glasgow by 2020 is to be underpinned by improvements to the cycling network and support for community cycling hubs as well as activities to encourage behavioural change in the short-term.

Design principles for connectivity

Safe - Where feasible routes should be dedicated for cycle and pedestrian use to avoid contact with other road users. Where this is not possible, opportunities should be sought to protect cyclists and walkers such as in this example from Copenhagen which uses parked cars to create a protective barrier that segregates the cyclists from the main highway. They should also be well lit and appropriately surfaced.

Integrated - Cycle and pedestrian routes should be fully integrated into the movement hierarchy rather than being an extension of the road network.

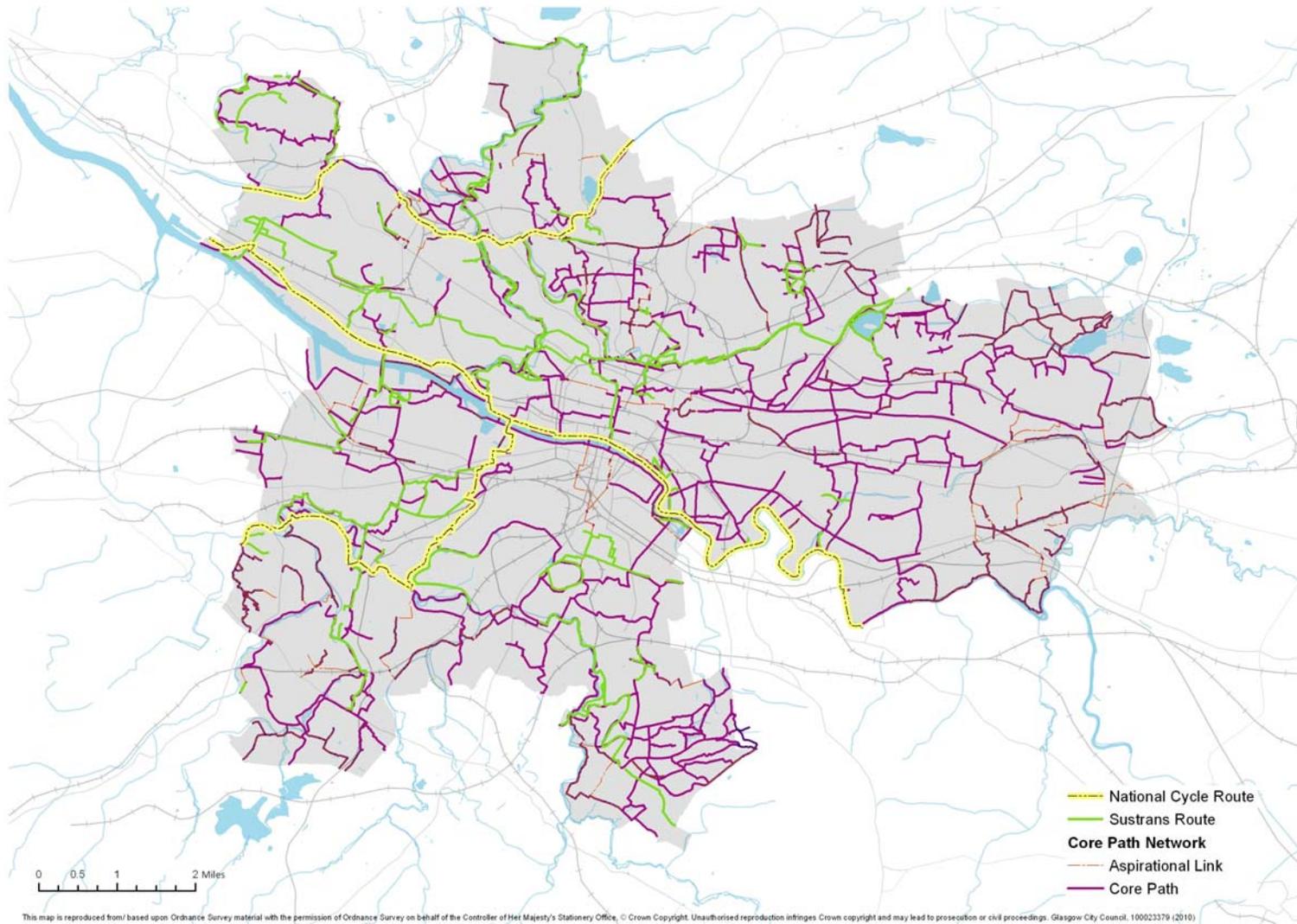
Link into wider network – It is important that new development does not impede the development of cycle and pedestrian routes. These should be considered and incorporated into development at the master planning stage.

Signage – Routes should be clearly identified and not convoluted.

Green links – Green corridors offer excellent opportunities for combining connectivity with creating a more functional ecological network.



Figure 7.1: Cycling and pedestrian network in Glasgow



CASE STUDY: The Green Chain, South East London

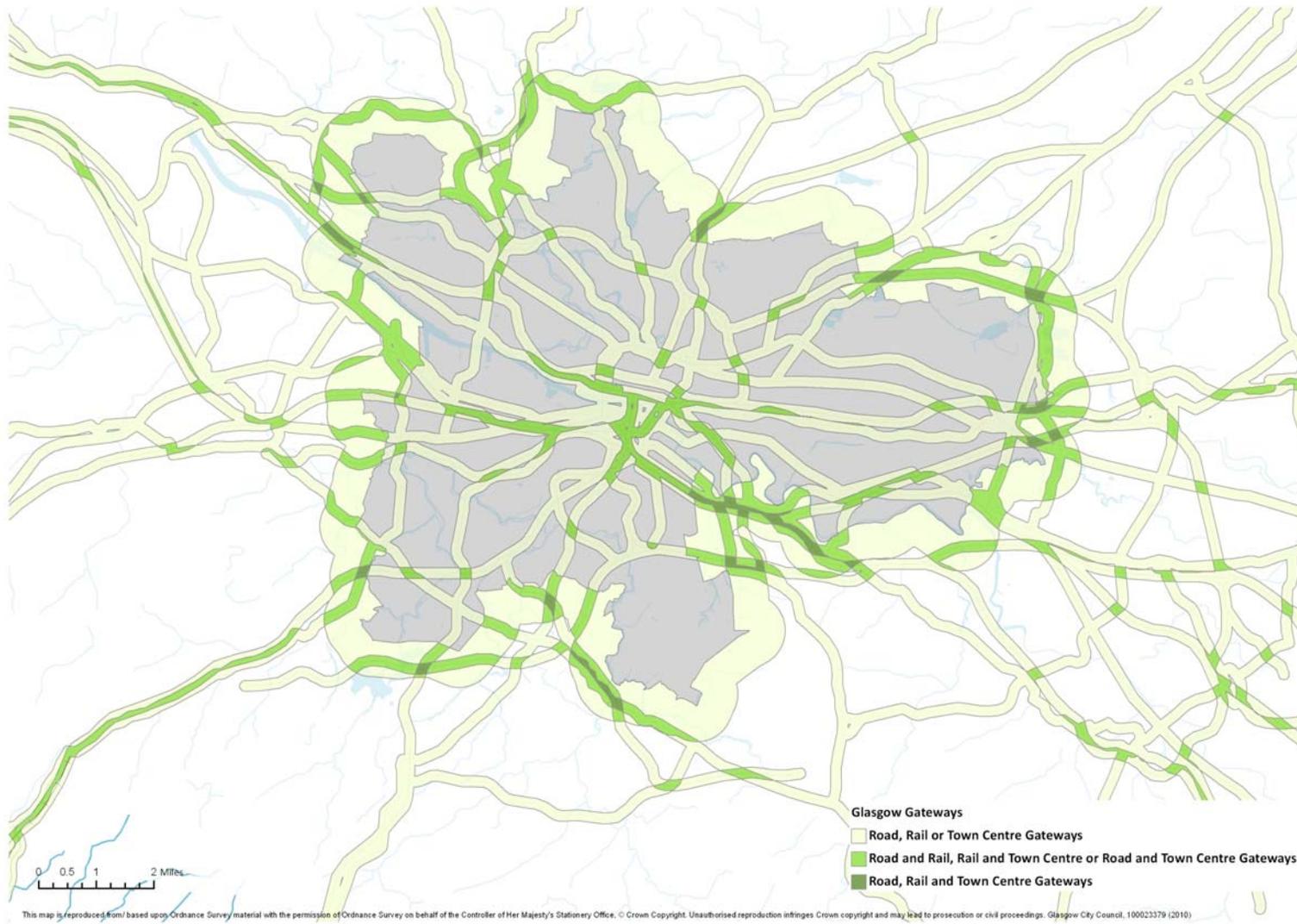
In 1977 four London Boroughs – Bexley, Bromley, Lewisham and Greenwich – in partnership with the Greater London Council linked some 300 open spaces between the River Thames and Crystal Palace Park. The aim of the project was to protect these green spaces from building activity. The Green Chain is made up of 10 sections covering 65 kilometres.

The Green Chain provides a number of benefits. The preservation of the landscape since the 1970s has protected the area's rich biodiversity, including areas of ancient woodlands dating from the Ice Age. Meadows, formal gardens, and playing space provide a diverse range of recreational activities amongst the wildlife, landscapes, streams, and lakes. The Green Chain has also become an opportunity for outdoor education, providing children the opportunity to connect with the natural world around them.

*Highways infrastructure*

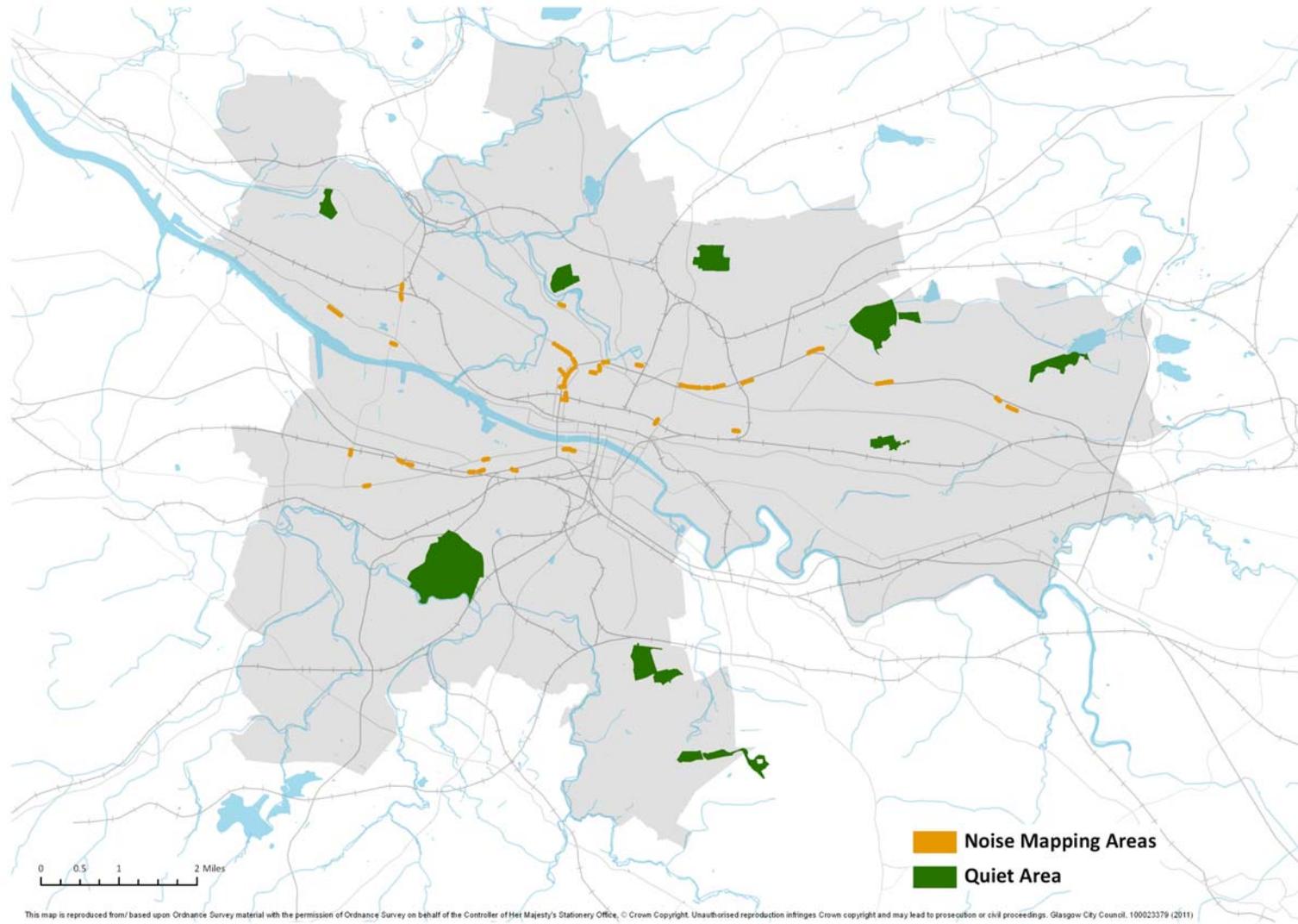
The highway infrastructure of major roads (M8, M80, M74 and M77) forms a significant factor in the built environment of the city, particularly around the north and western periphery of the city centre and in its elevated form where flyovers and underpasses dominate large areas of the urban landscape. Numerous significant interchanges are present where highways split and converge, leaving beneath many incongruous and unappealing spaces that are a major hindrance to pedestrian movement and contribute in a negative manner to the public domain. Making the underutilised areas around transport infrastructure interchanges more attractive by using planting, lighting and art features not only helps to create interest, but also provides excellent opportunities to demarcate gateways into the city, reinforcing the sense of place. As such, Figure 7.2 highlights where major transport infrastructure comes together.

Figure 7.2: Transport infrastructure gateways



The physical nature of transport infrastructure also creates major areas of severance by isolating neighbourhoods from each other and preventing aspirations for north-south connectivity with the Clyde. Specific areas of severance exist between Pollokshields and Tradeston, Port Dundas and the City Centre, North Cardonald and Shieldhall. Noise can also be a critical factor in undermining environmental quality. As is shown in figure 7.8 mapping of noise has highlighted that transport corridors are responsible for most of the noisiest areas. Acting as a buffer, green infrastructure can play an important role in reducing the effects of noise.

Figure 7.8: Noisy / quiet areas



7.3. Open space objectives for creating connections

Following the research and analysis undertaken to develop this Strategy and building on the experience from leading edge practice, conclusions can be drawn on the priorities for achieving the vision for open space in the city. Glasgow will seek opportunities to improve the provision and quality of open space connectivity by:

- Reinforcing the cycle and pedestrian routes along the main waterways and through green corridors; to maximise benefit these should take into consideration opportunities for enhancing ecological networks;
- Ensuring that new development proposals and regeneration plans contribute to the creation of the cycle and pedestrian network; and
- Improving the environment and character of key transport interchanges by improving the quality of underutilised space through planning, lighting and art installations.

8. Ecological Quality

8.1. Relationship between open space and ecological quality

Biodiversity underpins the health of the environment, its ability to generate natural resources such as food, maintain ecosystem services or natural processes such as improving air and water quality and in building climate resilience. Biodiversity is a term used to describe the diversity of all life on earth, from individual genes through to entire ecosystems. Biodiversity is the foundation for all ecosystem services, on which we all depend, but has been eroded as civilisation has grown, with an acceleration in the decline during the last 100 years, a period when oil has become the main source of energy for agriculture and industry. Ecosystem services are better and more stable when biodiversity is high. With the establishment of the International Convention on Biodiversity (ICB) in 1992, the international community recognised that efforts to halt the decline in biodiversity were urgently required. A UK response to the ICB was the establishment of a national biodiversity action plan (BAP) in 1994. The overall aim of the UK BAP is to conserve and enhance biodiversity by:

- Conserving and where possible enhancing the population and natural ranges of native species, natural and semi-natural wildlife habitats; ecosystems that are characteristic of local areas;
- Increasing public awareness of the importance of environmental quality and involvement in conserving biodiversity; and
- Contributing to the conservation of biodiversity on a European and global scale.

The appropriate response to the requirement to conserve biodiversity in urban areas, and the maintenance of the ecosystem services which are associated with it, is to provide biodiverse environmental infrastructure. Currently the conservation of biodiversity is achieved primarily through the designation of sites for nature conservation or geological interest, and the establishment of nature reserves.

Cityscapes present significant physical barriers for wildlife, restricting distribution. Furthermore the ecosystem services that are associated with environmental infrastructure are provided in a more efficient way when habitats and open space are interconnected. As such, creating a more permeable urban environment, through the creation of ecological networks, is a more robust way of planning for biodiversity and the ecosystem service benefits it supports.

It is therefore becoming increasingly clear that managers of all open space, whether it is managed primarily for recreation, transportation, drainage or any other purpose, need to take account of the potential to enhance their site for biodiversity in order to create more expansive ecological networks. Furthermore, although ecological networks are primarily about the conservation of biodiversity they also moderate climate, reduce flood risk and bring respite from poor air quality.

8.2. Issues and priorities for Glasgow

Designated Sites

Figure 8.1 show the sites that have been designated specifically for their ecological quality. Sites of Special Scientific Interest (SSSIs) are national designations identified by Scottish Natural Heritage (SNH) and as such are afforded high levels of protection as they represent some of the most important ecological sites in the country. Local Nature Reserves (LNRs) are statutorily designated by local authorities and are protected by national legislation. Other environmental designations are locally defined and protected through the City Plan. As might be expected, these sites tend to be on the outskirts of the city, where there is more space, closer connection with the wider countryside and potentially less human intrusion. As can be seen from Figure 8.2, these sites generally scored well in the assessment of biodiversity quality in the 2009 survey (Section 4).

Figure 8.2 also shows that there are a number of sites across the city that have not been formally designated but, when surveyed as part of the quality assessment, score highly for biodiversity value, displaying characteristics of high ecological quality. As might have been expected, Green Corridors (95%) and Natural/ semi-natural (86%) spaces perform best with most sites scoring very well. Public parks also score relatively well, with 48% considered fit for this purpose, although there is potential for these sites to be further enhanced.

In comparison, more local spaces, when assessed, tend to perform poorly. Amenity space (12%) in particular is rarely considered to be fit for biodiversity purposes. As these spaces are distributed widely across the city, they offer great potential to help reinforce the ecological network.

Brownfield biodiversity is also an important consideration. Sites left for a long time can quickly become colonised, becoming ecologically important. Regeneration activities should, where possible, recognise this contribution and where possible accommodate or transpose these habitats.

Figure 8.1: Ecological designations

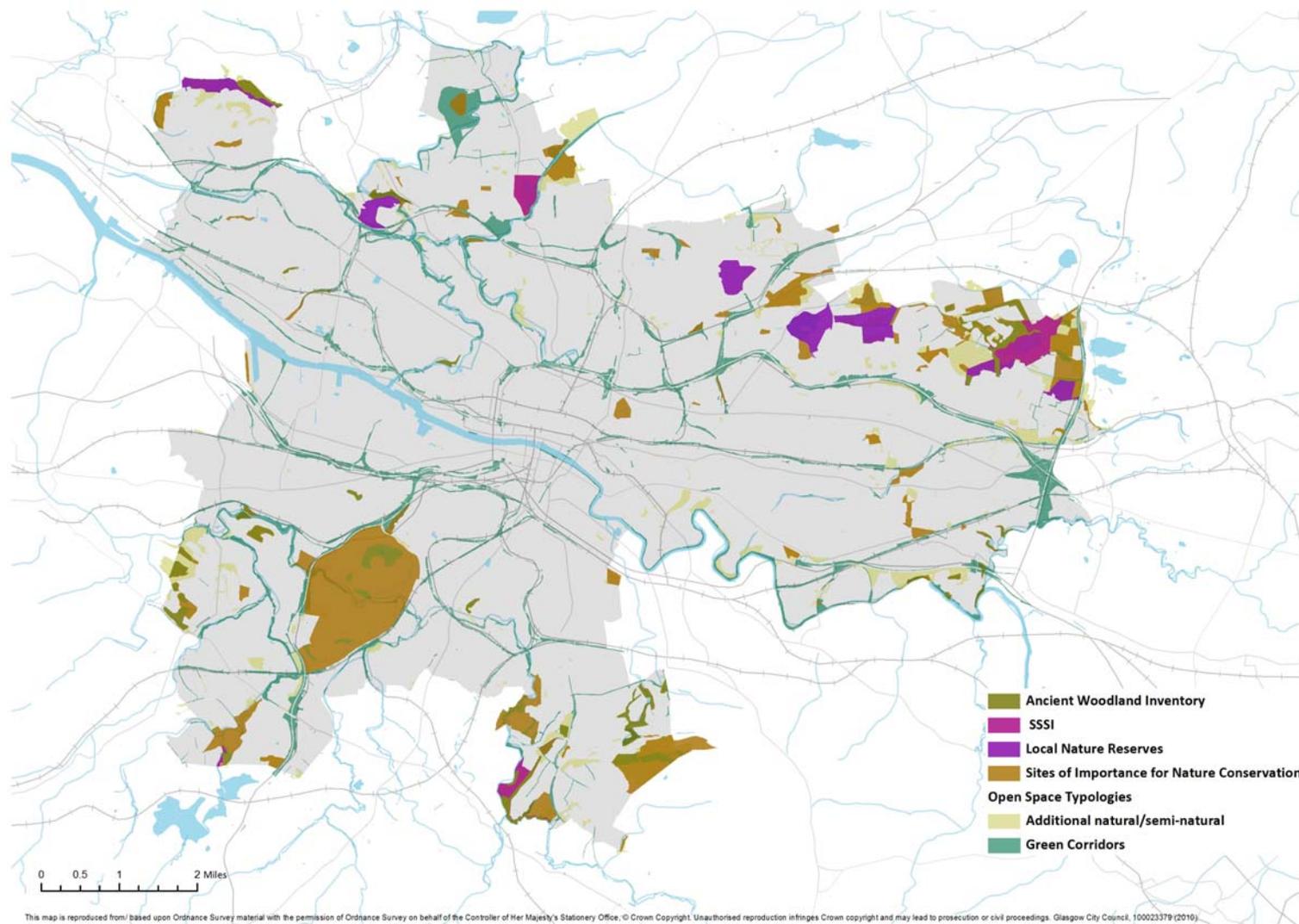
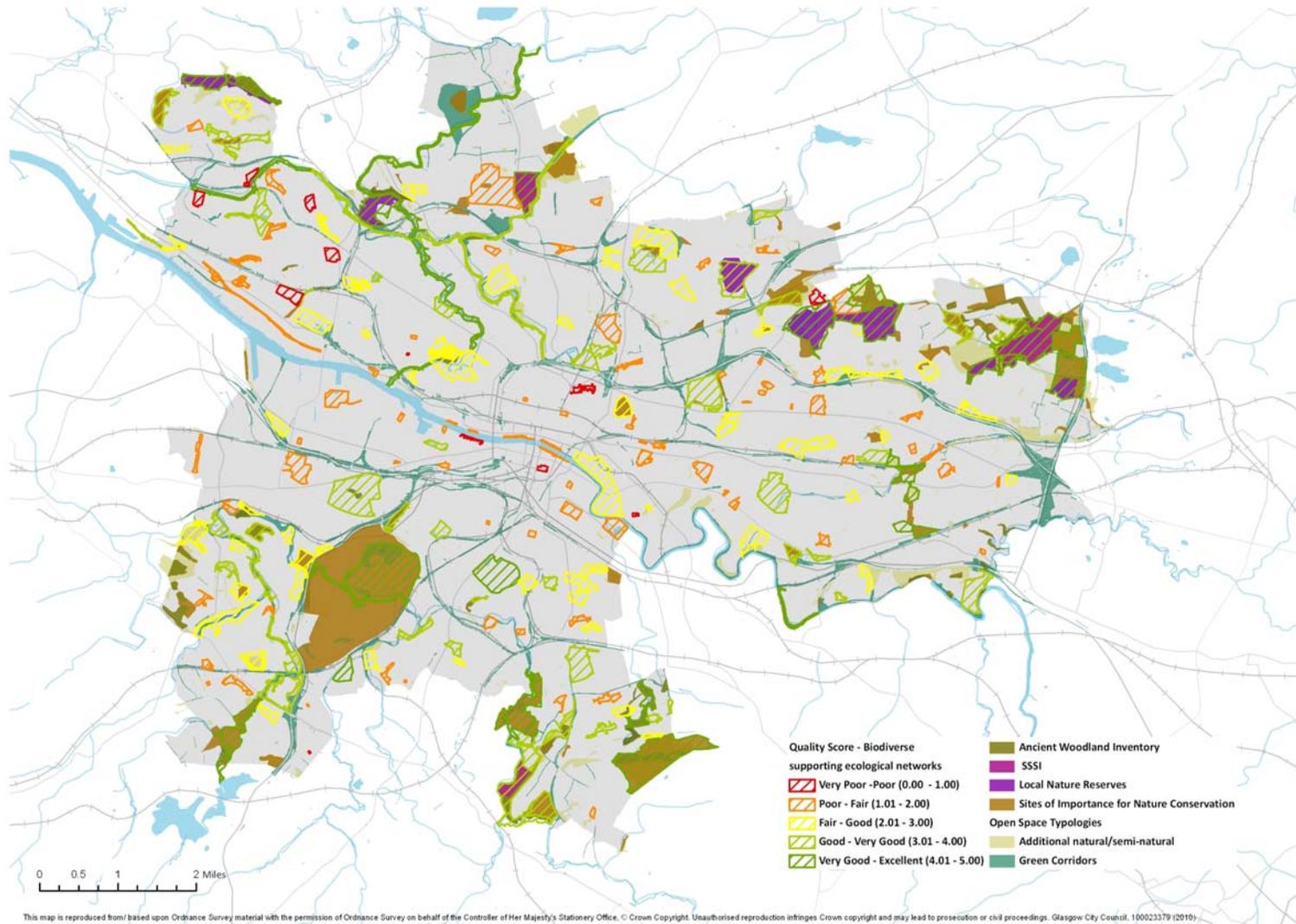


Figure 8.2: Ecological designations and biodiversity quality score



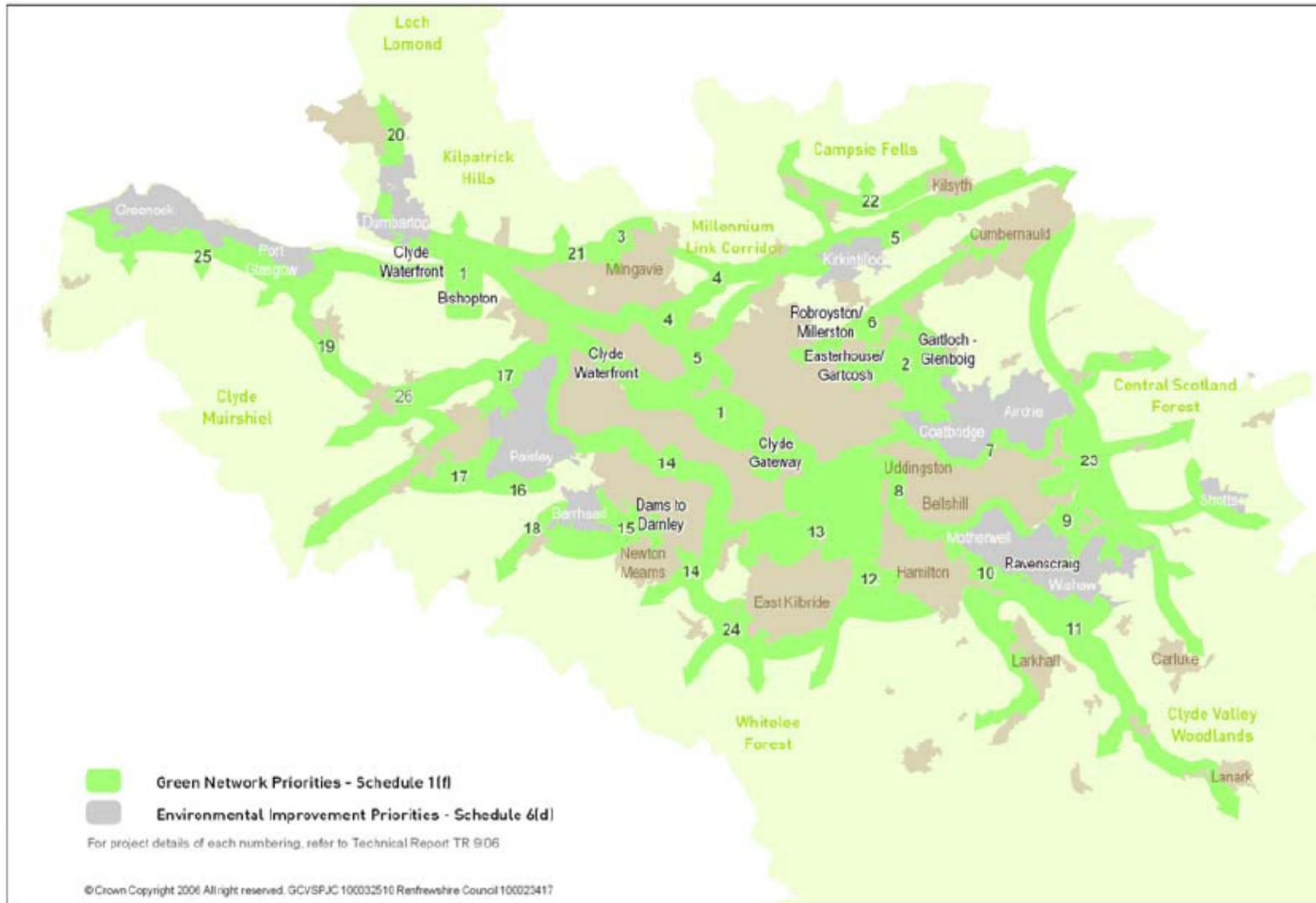
Developing a network

Developing ecological networks through the City increases the permeability for wildlife. This in turn allows the areas to support greater biodiversity with greater resilience. Integrated Habitat Network (IHN) modelling has recently been carried out for the whole of the Central Scotland Green Network area. The IHN examines the functional connectivity of existing habitat, based on three categories (woodland, wetland and grassland), to analyse to what extent representative species can move through the landscape and to help identify prioritise enhancement areas. Within these areas, biodiversity enhancement activities should particularly guide design and management of less obvious spaces such as playing fields.

Furthermore, the GCVGN Integrating Green Infrastructure Initiative identified a green network priority plan (Figure 8.3). From this, and supported in the GCVSDP MIR, a number of strategic locations for improvement have been identified, mainly focusing on the key areas of change with the city. These include:

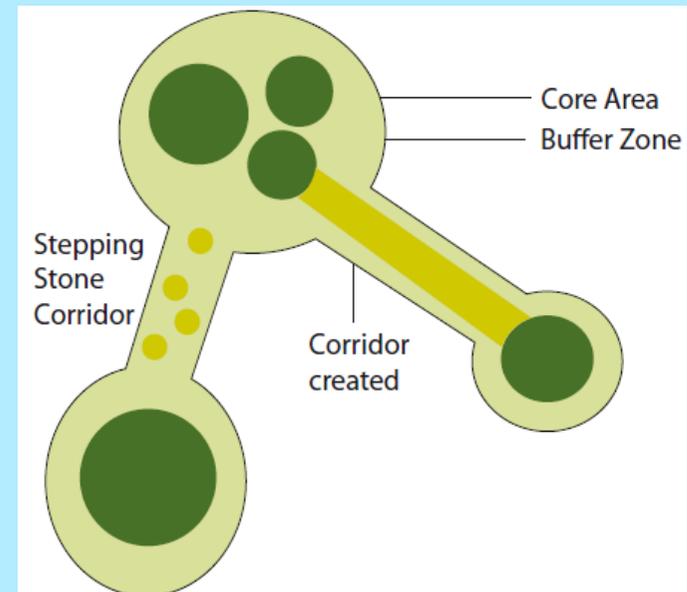
- Clyde Waterfront, focusing on:
 - Renfrew,
 - Clydebank,
 - Scotstoun/Knightswood, and
 - Govan / Ibrox;
- Glasgow City Centre, focusing on:
 - Laurieston, and
 - Cowcaddens;
- Clyde Gateway URC, focusing on:
 - Bridgeton / Dalmarnock, and
 - Toryglen / Rutherglen;
- North Glasgow, focusing on:
 - Greater Easterhouse, and
 - Castlemilk.

Figure 8.3: Green Network Priorities (GCVGNP 2006)



Design Considerations for creating ecological networks

- **Designated sites** - Ecological networks begin with designated sites, which become the core areas of the network. Core areas should then be surrounded by buffer zones where it is feasible to create or restore habitat. In urban areas these buffer zones could be existing green space or vacant sites.
- **Linear connections** - Green connections, often in the form of linear sites associated with road, rail or waterway network or perimeter strips around sites can then be improved and linked in order to complete the network.
- **Stepping stones** - Where it is not possible to create a continuous link, stepping stones of smaller sites within close proximity to one another can be a suitable alternative.
- **Regeneration** - Where large scale regeneration is proposed, planners should examine the options for buffering core sites, restoring biodiversity to open space and making the connections in the wider network, by creating multi-functional environmental infrastructure corridors that include cycle paths, footpaths and SuDS as well as ecological connections.
- **Priority areas** – The Integrated Habitats Network and GCVGNP Integrating Green Infrastructure Initiative (see below) have mapped priority areas for reinforcing the network.



Rivers, water and drainage

With the rivers and network of canals in Glasgow, waterways are also an important component in developing ecological networks. Development along these routes should not only consider the opportunities for improving connectivity for movement of people, but should also take into consideration the potential for enhancing ecological corridors.

Development can also have a detrimental impact on water quality. Opportunities for incorporating water sensitive urban design that captures, stores and cleanses surface water run-off, is a more ecologically friendly way of managing water. These processes, sometimes called Sustainable Drainage Systems (SuDS), include swales and rain gardens that can be incorporated into development with a diverse range of species and help to create a high quality environment when considered early in the design process. The next section explores this in more detail.

Green roofs

Opportunities to strengthen ecological networks and improve permeability are not always available on the ground in cities. Green roofs are increasingly offering an important alternative as technology improves and inclusion becomes more viable. There are two types of green roof – extensive and intensive or semi-intensive roofs. Extensive green roofs are cheaper and thinner, generally a form of sedum matting. Although they require less management, their biodiversity benefits are limited. Intensive green roofs are, on the other hand, ecologically much more advantageous. Using a minimum substrate of 80mm, they can support a wider range of species. There are also storm water and micro-climate management benefits from intensive green roofs. They do generally require more management (although maintaining most habitats will need management), however the costs associated with building intensive green roofs do not necessarily represent a significant increase as long as they are considered early in the design process.

Species selection

In supporting ecological quality, it is generally preferential to prioritise local native species. The Glasgow City Biodiversity Action Plan also sets out a range of habitats and species that have been identified as locally important. There are also a wide variety of other species that are beneficial. Some of these, such as bats, are protected by legislation and their presence is an important indicator of environmental quality.

There are however a wide variety of other species that might be important; it is critical to have a measured approach to balancing the wider benefits from habitat and ecological network creation with the needs of individual species.

Glasgow Biodiversity Action Plan priorities					
HABITATS	SPECIES				
Broadleaved and Mixed Woodland	<i>Plants</i>	Bog-rosemary	<i>Birds</i>	Swift	
Wet Woodland		Purple Ramping-fumitory		Skylark	
Neutral Grassland		Bluebell		Reed Bunting	
Acid Grassland		Sheep's-bit		Jack Snipe	
Dwarf Shrub Heath		Toothwort		Tree Sparrow	
Fens		Tufted Loosestrife		<i>Mammals</i>	Water Vole
Marsh		Wood Crane's-bill			Otter
Swamp		Burnet-saxifrage			Badger
Reedbeds		Bog-mosses			
Raised Bog					
Standing Open Water	<i>Insects</i>	Dragonflies and Damselflies			
Rivers and Streams	<i>Fish</i>	Small Pearl-bordered Fritillary			
Boundary Features		Atlantic Salmon			
Built Up Areas and Gardens		Amphibians			
		Common Toad			
		Common Frog			
		Palmate Newt			

8.3. Open space objectives for ecological quality

Glasgow will become more permeable to wildlife by creating an ecological network and improving the ecological quality of its assets, by:

- Improving the biodiversity value of amenity and civic space. The creation of meadows in residential amenity space and the greening of civic space i.e. through rain gardens, as proposed in the Place Setting and Resource Management sections should be undertaken, considering BAP priority species;
- Continuing to manage parks and natural / semi-natural areas within the urban area for their biodiversity value; and
- Improving ecological connection along core corridors including the road, rail and river network.

9. Enhancing natural processes and generating resources

9.1. Relationship between open space and natural processes and generating resources

Green infrastructure delivered through open space provides ecosystem goods and services that are essential for the management of air, land and water resources. Natural systems are often able to manage resources very efficiently, providing treatment and safeguarding local cycles and systems. Within this section we will consider the ecosystem goods and services that open space could be employed to provide in relation to:

- **Resource production** – including food and biomass fuels to support local low carbon energy generation schemes;
- **Improvement of air quality** - vegetation can improve local air quality by filtering out pollutants which in turn can help improve the health of the population. Airborne particulates and ground level ozone are helping induce climate change. Green space can assist in reducing their impact;
- **Remediate contaminated land** – Plants can be used to reduce contamination on a site through a process known as phytoremediation. Microbial activity in the growing vegetation draws up the contaminant and locks it within the plant matter. It can then be removed and disposed of safely; and
- **Manage, store and treat water** - Natural processes can also be used to remove pollutants and sediments from stormwater or wastewater, providing local sources of clean water and ensuring local waterway quality is protected. Natural treatment systems can be designed in as part of Sustainable Drainage Systems (SUDS) to manage and cleanse stormwater runoff. Natural infiltration systems can also be used to filter water before letting it naturally percolate into groundwater systems, replenishing local supplies.

9.2. Issues and priorities for Glasgow

Resource Production

Food

The report 'Community Growing in Scotland' from greenspace scotland highlights that localised food production has been a growing agenda recently. It cites a number of reasons for this including climate change impacts of food distribution and the rising cost of food production. Although not all food resources can be grown within an urban environment, urban farming, allotments and community growing schemes can help support traditional food production. There is also a wide variety of broader societal benefits derived from a closer connection between food growing and consumption. With significant health problems in Glasgow (See health and wellbeing section for more details), a better understanding of where and how food is generated can help to communicate the relationship between the health of the environment, healthy food and healthy bodies. Community schemes have also been shown to help bolster community cohesion, provide a focal point for communal activities and could offer the potential for social enterprises that provide training and education opportunities.

Figure 9.1 shows the designated allotment areas in Glasgow. They comprise an area of just 28 ha on 25 sites with 1,320 individual plots. This is the equivalent of less than half a square meter of growing space per person in the city. The GCVGNP and partner organisations including the Glasgow Centre for Population Health amongst others have developed the '*Sow and Grow Everywhere (SAGE)*' (2010) initiative which has undertaken research into the demand and opportunities for growing food across the sub-region. They found that there was considerable demand for growing opportunities, with over 650 people in Glasgow currently on waiting lists for allotments and numerous community groups expressing interest in developing growing schemes. Within Glasgow, SAGE recognises the potential of underutilised open space and stalled spaces in providing opportunities for growing, setting out four spatial strategy strands (see Figure 9.2):

- strategy strand 1: bring vacant & derelict land in densely populated urban areas into use for growing as an interim landuse;
- strategy strand 2: bring underused land (amenity space) in peripheral estates & social housing areas into use at scales up to market garden growing;
- strategy strand 3: bring underused private garden space in suburban or outlying areas into use for growing; and
- strategy strand 4: bring underused public land into active use for growing (focused on school sites throughout the area).

Figure 9.1: Glasgow's allotments

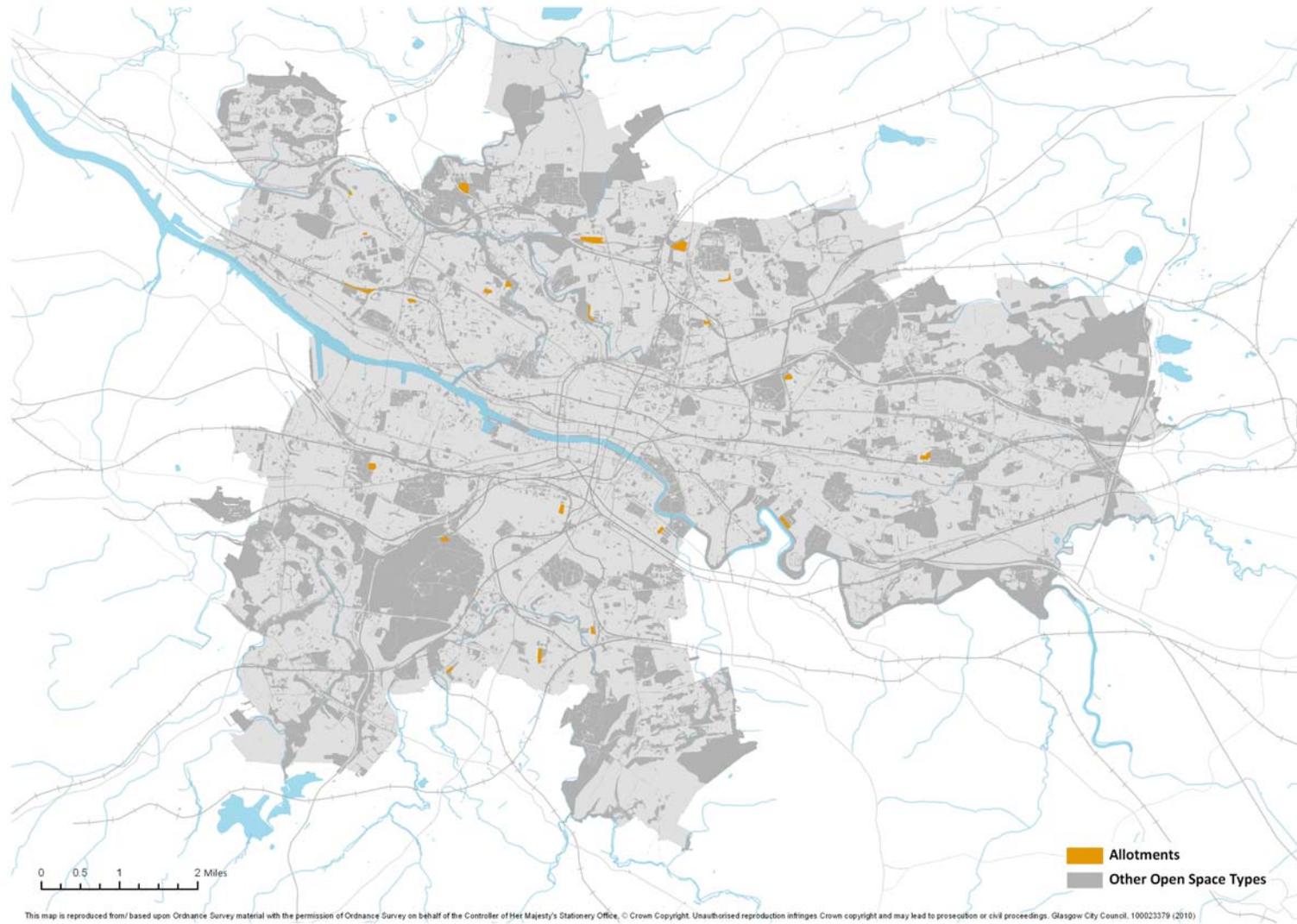
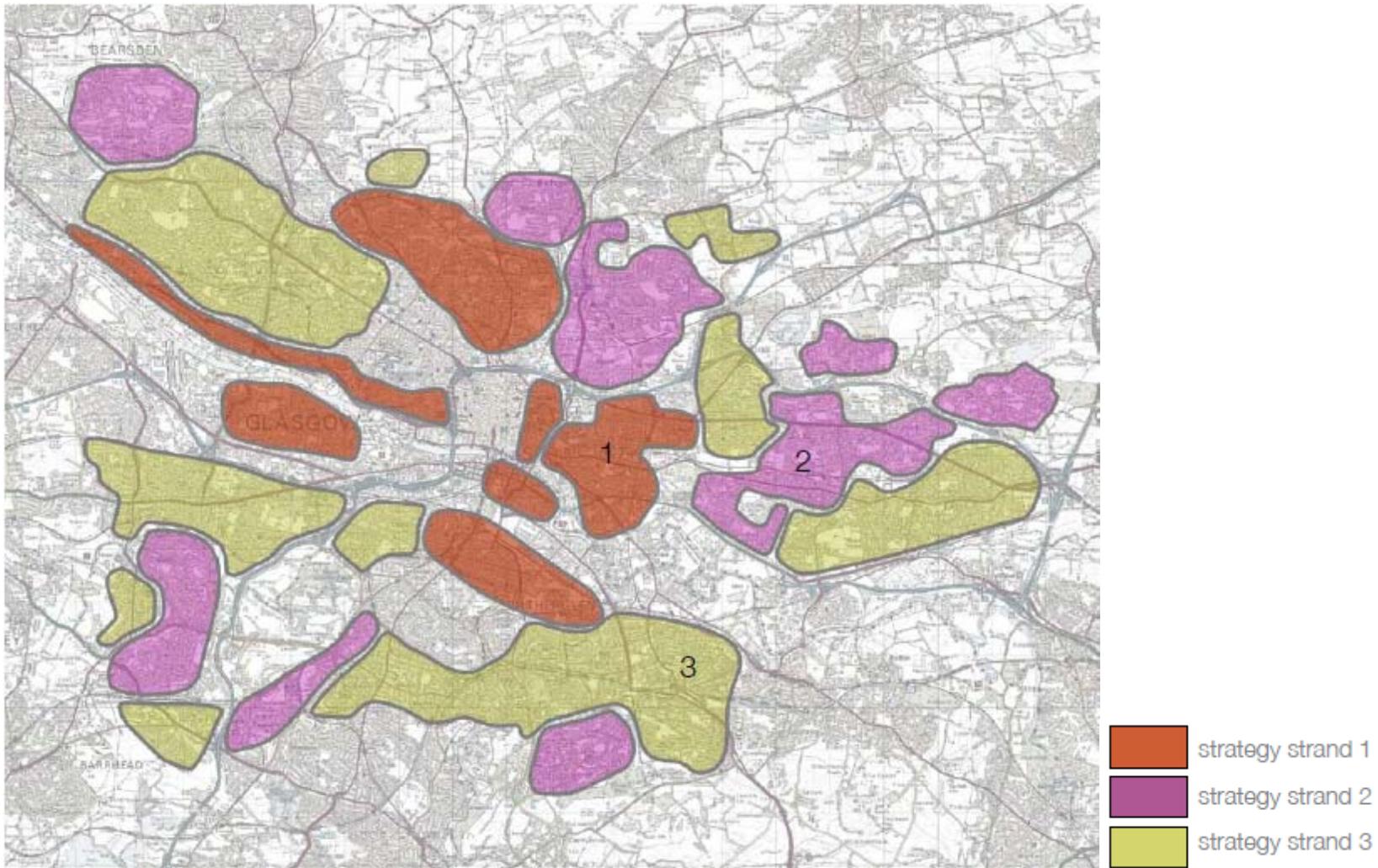


Figure 9.2: SAGE strategy strand areas (GCVGNP, 2010)



(Source: GCVGNP: Sow and Grow Everywhere, 2010)



CASE STUDY: Temporary allotments, London

As SAGE notes, there is significant potential to utilise vacant land for growing opportunities. These sites, however, may only be temporary, waiting for future development that has stalled or programmed to come forward in the future. Additionally, derelict space may also have contamination issues that would be unsuitable for growing food. A series of innovative growing projects commissioned as part of the London Festival of Architecture demonstrated the potential of developing ‘grow bag’ allotments. These initiatives used three underutilised spaces across the city to provide temporary growing spaces

When it is time to move on, the allotment grow bags could be relatively easily transported to a new site.

(Source: WhatIF projects)



CASE STUDY: Urban farming, Middlesbrough

Middlesbrough is similar to many modern towns and cities suffering from a struggling economy, with much vacant land. A coalition of designers, community organisations, local authorities, and volunteers teamed up to investigate how to use Middlesbrough's vacant land to grow fruits and vegetables. After consulting the community more than 1,000 people showed interest in cultivating their own crops in allotments in the city.

The project's success can be partially attributed to wider community support provided. To ensure the project was effective, allotment holders received free training from local experts such as horticulturalists and farmers. Local chefs were also engaged to create events where people cooked and ate meals using ingredients from their allotments. In 2007, the first crop was harvested and Middlesbrough held a banquet in the town square with participants creating the menu using their own produce. The event was attended by 8,500 residents.

The project's success continued to foster support and interest. Helping Middlesbrough council understand the potential for urban agriculture in town, local designers created a map identifying hundreds of sites with potential to host more allotments.

Since then, the Council has obtained £150,000 in funding for the project and grown the waiting list for allotment space to 150 people. Involvement in the project has also grown to include more nearly two-thirds of Middlesbrough schools, and 4,000 people.

The project has had many other indirect benefits. Community food co-ops have been established, and could supply food for a proposed community restaurant. A course offering experience in urban agriculture is also being discussed with a local college.

The Middlesbrough urban farming project is an example of how partnerships within the community – from residents and volunteers to public and private organisations and local authorities – can help foster successful and meaningful change.



Biomass production

Biomass is considered a carbon neutral energy source and would help work towards climate change emission reduction targets. When the wood fuel is burnt, carbon dioxide is released into the atmosphere. The growing of biomass, however acts as a carbon sink, sequestering the climate change causing gas carbon dioxide from the air.

Scotland's *Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets* sets out the challenge and priorities for decarbonising energy supply to help mitigate climate impacts. It recognises that decentralising heat production will be key to lowering carbon emissions and that biomass will play a significant role as an energy fuel. It highlights however that currently biomass fuel markets are not sufficiently established to facilitate the step change required to make biomass fuelled heating networks and combined heat and power viable.

The Glasgow and Clyde Valley Strategic Development Plan sets out a specific priority to explore opportunities to help develop the local biomass wood fuel market. The *Indicative Forestry Strategy and Woodland Framework* (2005), which is currently being updated, highlights the potential of woodland management and biomass production on vacant sites as key sources of wood. The *Assessment of Wood Energy Opportunities within the Glasgow and Clyde Valley Area* (2007) provides an indication of the scale of potential resource from woodland management and highlights some of the challenges. The research found that the sourcing of wood for fuel through thinning, cleaning and management would be sufficient to fuel the seven wood boilers within Glasgow at that time. However, the report acknowledges that supply using these techniques is likely to be intermittent. Furthermore, more reliable wood fuel sources are likely to come from overseas and as such have a high cost and carbon footprint. There is a need therefore to create a more consistent local source of wood fuel. The Sustainable Glasgow Initiative, a pioneering partnership between the University of Strathclyde; Glasgow City Council; Scottish Power; Scottish and Southern Energy; and Scottish Enterprise as well as other utilities and social infrastructure stakeholders, is focused on reducing carbon emissions across the city. They also recognise the need to utilise other fuel sources such as biomass and wood fuel.

Vacant land could be used in providing a more consistent wood fuel supply and help create the chain necessary to accelerate the uptake of biomass as a fuel source in developments. Within Glasgow there are around 1,070 ha of vacant plots over 1 ha in size (see Figure 5.2). As an indication, if all of this was used to grow biomass, through short-rotation coppice (SRC) or short-term forestry, it could produce enough wood

fuel to heat around 15,000 homes¹⁴. Although it is unlikely to be feasible to establish all sites this way, it does highlight the scale of potential that vacant land presents. One of the biggest challenges to achieving this would be the initial co-ordination of sites and as such there would be a need to work with landowners to identify suitable sites that are not likely to come forward for development until later in regeneration plans. As discussed above, there are numerous benefits from keeping sites active.

Design considerations for biomass production

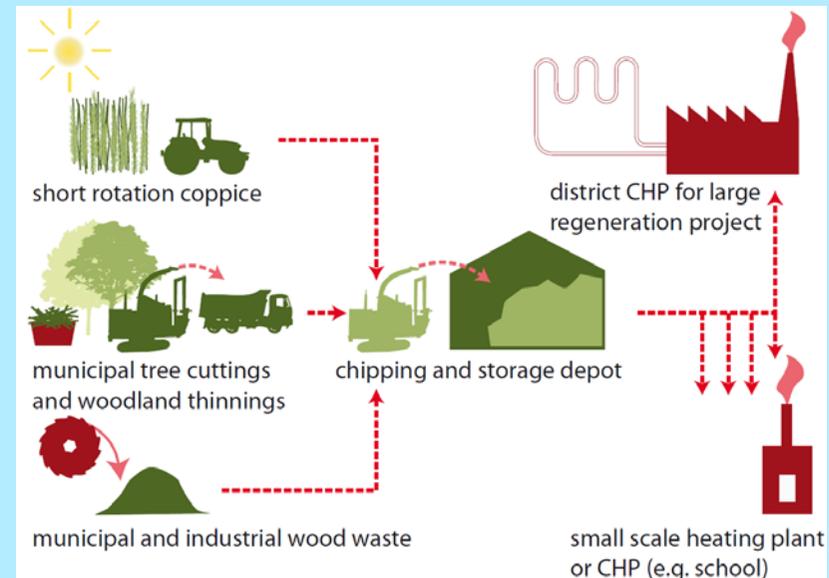
Management of system - The illustration shows a flow diagram of energy production from biomass sources, including SRC or short-term forestry that could be grown on derelict and vacant land. To make effective use of available sites to grow biomass, it is recommended that a consortium of local authorities (such as through the GCVGNP) establishes a partnership body with landowners and other companies active in this sector in order to develop a supply chain that co-ordinates cropping and processing with demand from an energy plant. The location of the processing areas and identification of an appropriate site for an energy plant would also be needed.

Management of sites - Sites will also need some coordinated management in terms of planting, maintaining and cropping (and with woodland, thinning).

Species - Willow and poplar are two popular SRC species that would be suitable to grow in Glasgow.

Phasing - It takes 2-3 years for each rotation.

Access - Sites will need to be accessible to cropping machinery and transportation (agricultural tractors and trailers)



¹⁴ Based on AECOM Green Energy Model calculations

CASE STUDY: Royal Cornwall Hospital

Royal Cornwall Hospital's biomass heating installation is regarded as a renewable energy exemplar project. The establishment of a biomass supply chain was the result of the hospital's desire to reduce energy costs and carbon footprint, as well as increase the reliability and security of its energy supply.

The biomass boiler exists alongside the hospital's gas boilers, which only supply heat in the winter months when demand exceeds the biomass boiler capacity. The biomass boiler has been designed and constructed to facilitate efficient fuel supply delivery to minimise risks.

The boiler uses wood chips, which are sourced locally to reduce road miles travelled. To reduce dependence on one source, the hospital purchases wood chips via a wood fuel broker. The longer-term vision is to secure a multi-year supply agreement.

The challenge facing biomass boilers is their difficulty in operation and maintenance relative to gas boilers. Royal Cornwall Hospital has found that it can be difficult to identify and agree to appropriate human resources that can help manage the system. Setting up the appropriate management is key to the effective operation of the biomass supply chain.

The hospital has estimated that the cost of an installed biomass boiler ranges between £500 and £1,000 per kW of capacity. This range is dependent on the complexity of fuel delivery system.

Land asset management – Community Land Trusts

Finding and using space, whether temporarily or permanently for alternative uses can be difficult. Land trusts are non-profit organisation that actively work to conserve and enhance land by undertaken responsibility for land assets. This usually involved asset transfer. At its simplest level, asset transfer is a shift in management and / or ownership of land or buildings, from public bodies, (most commonly local authorities), to communities, (community and voluntary sector groups, community enterprises, social enterprises, etc). There are a number of ownership models:

Freehold - 'absolute' ownership, which gives a right to use the asset as the owner sees fit (subject to planning consent, and the restrictions and other matters registered on the building or land with the land registry, for example any right of way or outstanding mortgage).

Grant of a long lease or 'virtual freehold' - a long lease for e.g. 125-999 years. This type of purchase will usually require the payment of a premium or purchase price, as would be the case if a freehold were being acquired. It may also include a requirement to pay ground rent and a service charge to the Freeholder (this is sometimes a nominal sum).

Assignment of an existing long lease - This is the acquisition of an existing leasehold interest from the previous tenant (known as an assignment). Where a lease is being taken by assignment, there is often less scope to alter the original lease terms.

Licence - This is a short term agreement often between 6 months and 2 years. A licence is most often used when an occupier does not have exclusive access to the space. The terms of this type of agreement are generally 'easy in, easy out' requiring relatively short notice to terminate by either landlord or occupier (often a month).

There are a number of land trusts actively working for environmental benefits that provide a model for managing land assets:

The Land Trust (National) – Perhaps the best known trust, the Land Trust. They provide cost effective management solution for all open spaces, restoring derelict, neglected or under-used land and maintaining it for people and nature in the form of publicly accessible green spaces. By providing long-term management and funding, they aim to help to create quality, sustainable public spaces that enhance the economic, social and health prospects of communities. The development and management of Trust sites is funded through a variety of

methods, but in particular endowments, where a sum of money is given to the Trust along with the ownership of the land.

Parks Trust (Milton Keynes) - The Trust is a Company Limited by Guarantee and a registered Charity. Its primary objective is to provide, maintain and equip parks, gardens, landscaped areas, woodlands, open spaces, playing fields, playgrounds and recreational amenity spaces within the Borough of Milton Keynes and the environs, for the benefit of the inhabitants and visitors to the area. The trust has taken responsibility for parkland, floodplain, ancient woodland, scheduled monuments as well as transport corridors. It also keeps income-earning assets, such as freehold of property, as an important revenue stream.

There is also growing support and informaton for community organisations wishing to take on more responsibility

The **Scottish Community Land Network** is for anyone interested in the development of community-based land activities. The aim is to make the network active in supporting groups and individuals by providing up to date news, opportunities to discuss ideas and ask questions. The network is funded through the Community Land Unit of Highlands and Islands Enterprise

Locality (previously Development Trust Association) supports community enterprise. Community enterprise is a significant sub-sector within the wider social enterprise sector. It shares the same definition of an organisation trading for social purpose with profits reinvested rather than going to shareholders, but it is more specific in that it is based in, and provides benefits to a particular local neighbourhood or community of identity. A community enterprise will also be owned and managed by members of that community, so that it is an organisation run *by* a community as well as for a community

Air quality

The principal air quality legislation within Scotland is the Air Quality Standards (Scotland) Regulations 2010 which consolidates previous air quality regulations and revises some air quality targets. The Environment Act 1995 requires the Government to produce a national Air Quality Strategy (AQS) containing standards, objectives, and measures for improving ambient air quality. It also requires that Local Authorities undertake an appraisal of air quality within their area to establish compliance or non-compliance with the targets established in the AQS and the current Air Quality Standards (Scotland) Regulations. Where the objectives are likely to be exceeded, the Authority must designate an Air Quality Management Area (AQMA) and establish an Action Plan, which outlines measures to achieve the objectives.

Within Glasgow it has been shown that there are several locations where particulate levels have exceeded standards required. In addition, nitrogen dioxide levels, associated with vehicular emissions, are exceeding objectives in the Finnieston Street area and around Bridge Street/ Norfolk Street. Although monitoring at nearby residential streets gives results within the National Air Quality objectives, the presence of suitable receptors around this junction gives cause for concern. Furthermore, the Council has designated three AQMAs where there are persistent air quality hot spots:

- AQMA Byres Road and Dumbarton Road
- AQMA City Centre
- AQMA Parkhead Cross

Figures 9.3 and 9.4 below show the distribution and concentration of nitrogen dioxide and particulates across Glasgow. Although there are a number of contributing factors, such as the proximity to the city centre and land use activities, there is also a strong correlation between air quality and green open space – where levels of pollution are higher, there are fewer green open spaces. There is well established understanding of the air quality improvement benefits that green space / urban greening can offer. As such, creating more green space within areas of poor air quality, by greening civic space for example, could help to address air quality issues.

Figure 9.3: Nitrogen dioxide and open space

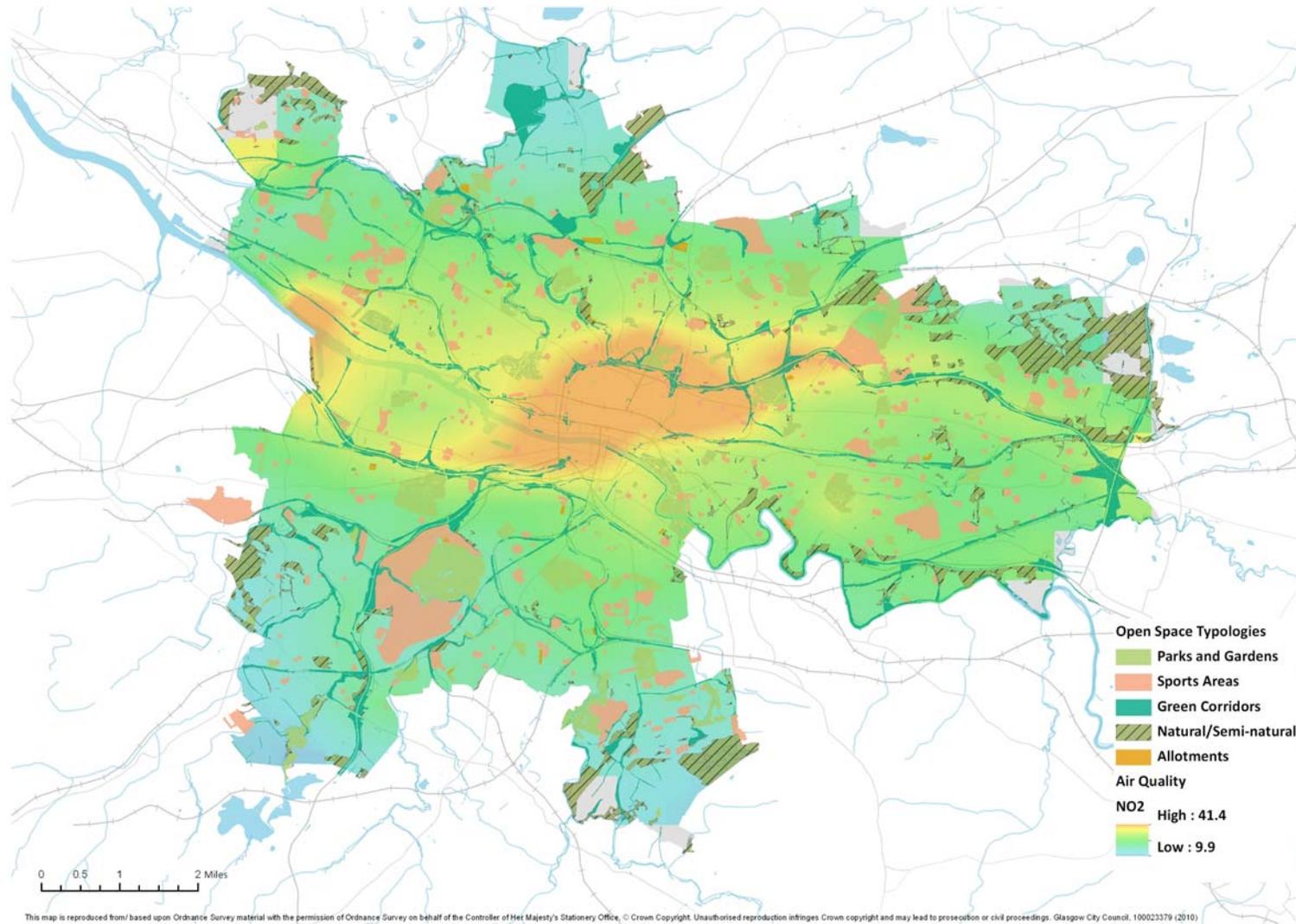
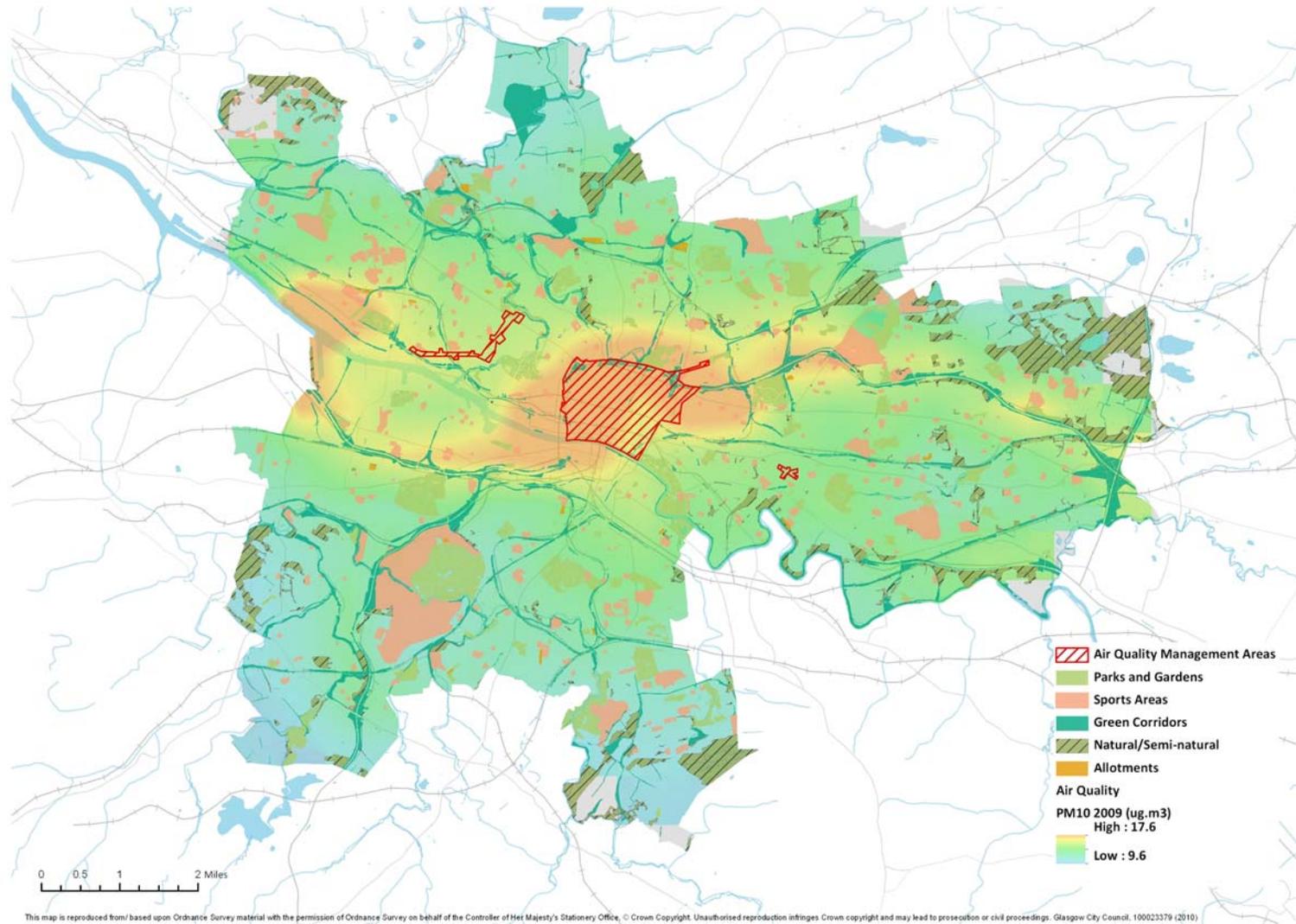


Figure 9.4: Airborne particulates and open space



Remediate contaminated land

Given Glasgow's industrial and manufacturing heritage, numerous sites across the city are likely to be blighted by some levels of contamination. Remediation costs can prevent site redevelopment from being viable, causing the redevelopment of the site to stall. The growth of bio-crops on derelict land may have dual benefits. Certain crops can also naturally remediate contaminated sites through the process of phytoremediation.¹⁵ Traditional remediation is possible by chemical means, soil washing, or by burial of the contaminated area, however there are some sites where phytoremediation techniques may be appropriate. Contaminated land can blight the development potential of a locality, discouraging inward investment and economic redevelopment of regions of industrial decline. Field trials show short-rotation coppice (SRC) provides effective risk management and remediation solutions to hotspots of residual metal contamination of brownfield land. A number of plant species grown as biomass fuel crops have been found to take up heavy metals, frequently in unusually high concentrations. Application of phytoremediation through the growth of bio-crops could be an interim strategy for derelict sites prior to development, to provide initial land remediation in a multi-functional and cost-effective manner.

¹⁵ Christopher J. French, Nicholas M. Dickinson and Philip D. Putwain (2005) Woody biomass phytoremediation of contaminated brownfield land. University of Liverpool.

CASE STUDY: Phytoremediation Karlstad, Sweden

The site in Karlstad had been used for oil storage, resulting in contamination of the soil. Digging up the contaminated soil and transporting it to be treated was an option, however, it is a costly process – both financially and environmentally. As an alternative, the depot grew short-rotation willow coppice (*Salix viminalis*) on-site as a means of using plants to clean the soil naturally. This process, known as phytoremediation, proved to be less expensive and more environmentally beneficial.

The small site (0.5ha) makes cultivating the willow for biofuel uneconomical. Instead, the harvest is left to decompose and increase the organic content on-site. If the site was larger, and had customers nearby, the cuttings could potentially be sold as biomass for energy.



Manage, store and treat water

Traditional drainage systems channel runoff from impermeable surfaces into underground pipework, which then conveys the water to a discharge point. This method means that water is quickly conveyed to a single discharge point, often distant from the point of origin, where it is mixed with other run-off and discharged in large quantities to water bodies. This method of management has had considerable adverse effects, including:

- Increased flood risk as large amounts of water are concentrated in certain areas;
- A marked increase in pollution of waterways as run-off is discharged rapidly without treatment and pollutes receiving water with nutrients, sediment, petrol and oil, while also causing erosion and adversely affecting ecology;
- Depletion of local groundwater and surface water resources due to a decrease in the amount of water re-entering the local ecosystems; and
- Considerable pressure on infrastructure to manage large loads of water. Where sewage and stormwater drainage infrastructure are combined, high rainfall can lead to combination of flows where sewage is then directly discharged to water bodies. Mechanical stormwater systems can be costly and use large amounts of energy and resources.

With a history of culverting waterways and a combined sewerage and drainage system exacerbating the situation, Glasgow’s drainage systems are at capacity. This puts a large area of Glasgow at a heightened risk from surface water flooding. The City has experienced firsthand the cost and disruption this can cause, with significant flooding in 2002.



Furthermore, the pollution in this water is affecting the health of the waterways, and as a result Scotland is not currently meeting its commitments to water quality under the EU *Water Framework Directive*.

A more effective approach to water management is to renew infiltration through more permeable uses, to utilise dedicated attenuation areas to slow and store storm water and in extreme events direct water to areas where the impact of flooding will be least felt as highlighted in Figure 9.5.

The constraints in Glasgow’s drainage capacity has initiated a new multi-agency approach to planning for drainage, with development of the Metropolitan Glasgow Strategic Drainage Partnership (MGSDP)

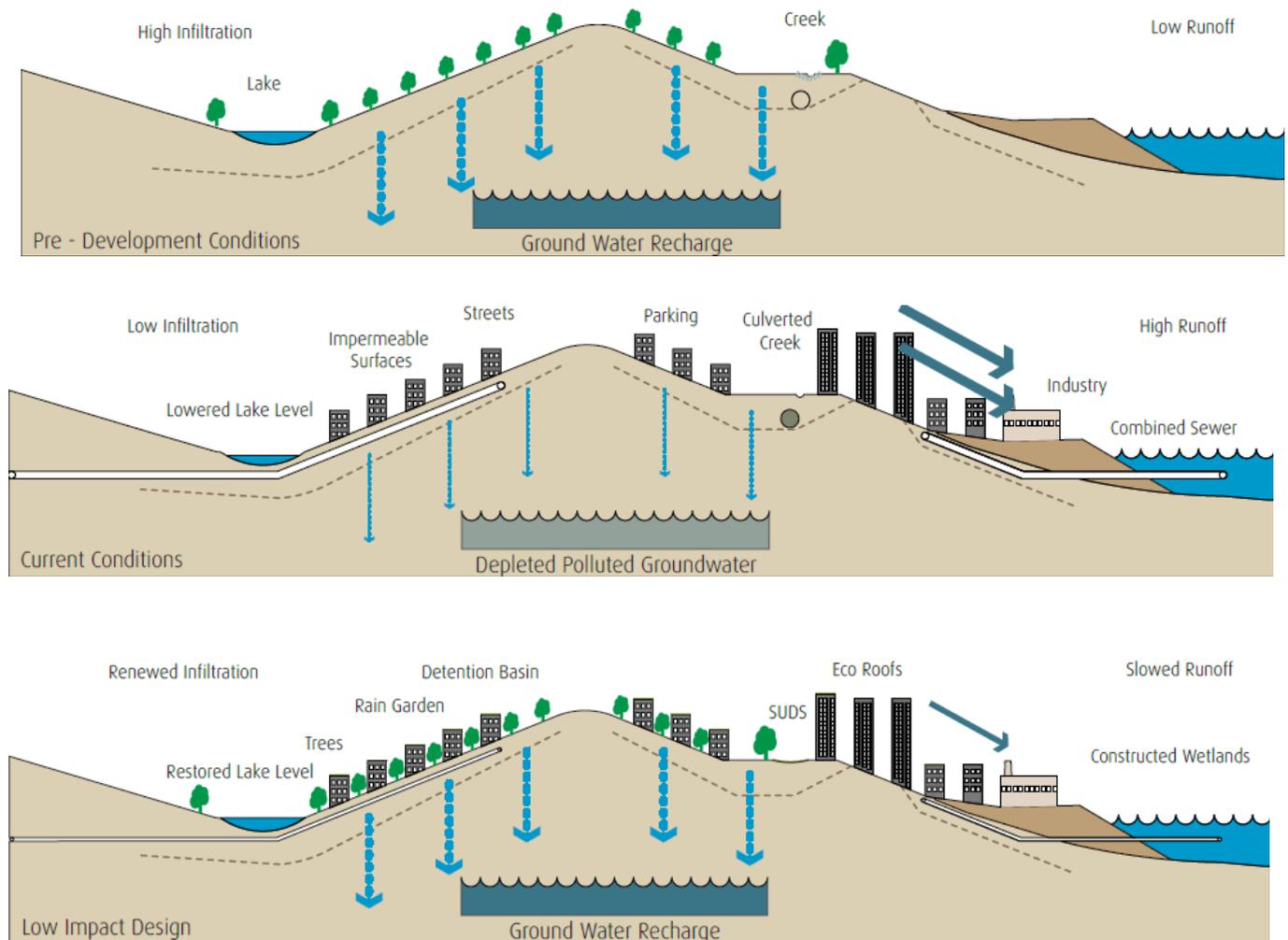


Figure 9.5 Comparative impact of development on the water cycle

The MGSDP recognises that effective planning for low impact water management, referred to as ‘water sensitive urban design’ to reflect the need for landscape design consideration for surface features, starts with catchment and area-wide drainage planning. This will help to identify key opportunities and constraints to providing large scale regional water controls. Large water storage areas and drainage paths should be identified on a regional level and used to inform the placing of development. This will allow land to be allocated efficiently and placed correctly to achieve the best results.

As such, the MGSDP is currently in the process of evidence gathering and testing to develop a Strategic Drainage Plan and Implementation Strategy. Part of this process is to identify ‘High Priority Drainage Communities’ which will form the focus of strategic activities. Specific details of these are not published at time of writing this strategy. What is clear, however, is that open space will play a strategic role in delivering increased water management capacity. Glasgow has already undertaken significant installation and planning for of Sustainable Drainage Systems (SuDS), which act to mimic natural water management systems and return clean water to the local environment. SuDS have been developed to increase the water retention capacity in Ruchill Park in order to support the development of a new school. A series of ponds have been build at a cost of £600k to store water.

The masterplanning and layout of new development is a crucial stage in sustainable drainage design. All aspects of built form, including roofs and pavements, hinder water flow which should naturally infiltrate the soil and nourish plants. The masterplanning stage of development will determine both the quantity of runoff that is created and the methods available at the detailed design stage to manage that runoff. The GCVGN Integrating Green Infrastructure Design Studies is a series of studies exploring the benefits of adopting an integrated green infrastructure approach. These studies, for Johnstone South West, the Burgh of Pollokshaws, Cowlairs Urban Village and Jackton and the Gill Burn Valley, demonstrate how sustainable drainage can be incorporated into design guidelines to maximise benefits. The incorporation of strategic SuDS, utilising attenuation ponds in this way has also been incorporated in the Green Network Strategy for Clyde Gateway.

Good masterplanning should follow the following process:

- Examine site topography, identifying key natural drainage paths, existing water bodies and potential infiltration areas. Layouts should aim to minimise effects on these natural systems, maintaining drainage paths and using road layout to direct water to mimic the natural drainage layout;

- Minimise impermeable surfaces. The major sources of run-off are roofs, roads and paved surfaces. Where possible, paved surfaces should be minimised, then methods to reduce runoff from impermeable surfaces through source control should be employed. Runoff from roofs can be managed at source through the use of green roofs, rainwater harvesting or down-pipe soakage areas adjoining a building. Runoff from roads and paved surfaces can be stored and reduced using adjoining infiltration areas and permeable paving;
- Cluster land uses to manage pollution. The site layout should consider the affect of land use on the quality of runoff. Industrial areas where runoff could be more polluted should be isolated so that runoff can be managed separately. Consideration should be given to dividing the site into stormwater management areas according to drainage catchments and land use; and
- Allocate sufficient space for SuDS. The types of SuDS that are suitable for the management of water on the site should be thought through before layout is finalised. It is important to allocate sufficient space for storage and treatment of water. These spaces can be alongside roadways or integrated with public realm or open space areas. Sufficient space should be allocated in each of the stormwater management areas mentioned above. As a rough rule of thumb, at least 5-10% of the site should be allocated for SuDS. If road-side swales are likely to be used, the design should ensure that there is sufficient width for road corridors.

Good SuDS design requires a merging of expertise between planning, urban design, engineering, landscape architecture and ecology and is most effectively undertaken during masterplanning when solutions can be planned at the outset. It is also important to note that drainage patterns do not respect ownership boundaries; as such co-ordination between land ownership parcels is critical.

Small scale SuDS can however be retrofitted, and consideration should be given to incorporating SuDS into hard spaces, such as civic space, car parks, industrial areas and along the highways network. Solutions do not have to be complicated; for example the use of rain gardens can be a simple design solution. The images below highlight small scale surface water management solutions that build to have a significant positive impact on the overall water attenuation and water quality. In some cases, water can be recycled into surrounding properties as a non-potable water source.



Defensive space here has been turned into a rain garden by allowing run-off from the housing to irrigate planting rather than going directly into the drainage infrastructure.



The hard surfacing of car parks are often problem areas with surface water becoming polluted. Planting can be used to help improve the quality of the water before it enters the drainage systems

This urban micro-wetland filters the run-off from the surrounding civic space, storing it for reuse as a non-potable water supply in the surrounding buildings.



Even small scale SuDS features, such as these that have been incorporated into a public seating areas, can contribute to significant improvements in surface water management and pollution control.



CASE STUDY: Positive Traffic Calming – Raingardens, Portland Oregon

The salmon industry has traditionally been an important economic sector in Portland Oregon. However, through the 1980s and 1990s there was a considerable decline in the Salmon population. Being sensitive to water quality, the salmon numbers were reducing due to increased pollution of the watercourses. One of the main contributing factors was identified as coming from the chemicals in the run-off from the road network. Initially starting as a community campaign, and resulting in a change of approach to roadside management by the City's highway's authorities, a series of street raingardens were established in sub-urban streets where traffic calming was identified as a priority. These systems cleanse the water as it is attenuated simply by using the plants and filtration layers before water enters the drainage system. Not only did the salmon return with the falling pollution levels and traffic accidents reduced, the streets were considered to be more attractive with increased property values. Soon the city was being lobbied by community groups interested in having these positive traffic calming measures introduced to their street.

The City also established the Clean Rivers Reward program, which encourage property owners to disconnect downspouts from the city's combined sewer system and create rain gardens by reducing waste water charges. This has led to widespread urban greening with numerous additional climate control, biodiversity and amenity benefits.



Before



After

CASE STUDY – Melbourne School of Arts

With the understanding that stormwater is the most critical component to improving the health of Melbourne's water ecosystems, Melbourne Water partnered with local stakeholders to undertake initiatives to improve the quality of the Yarra River. The Victorian College of the Arts (VCA) was one of these projects. Water is collected from rooftops and nearby streets, and used to water raingardens. In this process, soils act as a filter, preventing pollutants from entering into the water supply. Water is then collected in a perforated pipe and channelled into a stormwater drain and eventually back to the Yarra River.

With the inclusion of signage to increase public awareness of how the process works, it has helped to educate students of the importance of stormwater management, and move stormwater treatment into the forefront of awareness. The high quality design of the project proves that improving water quality can be done in a way that also improves public open space.



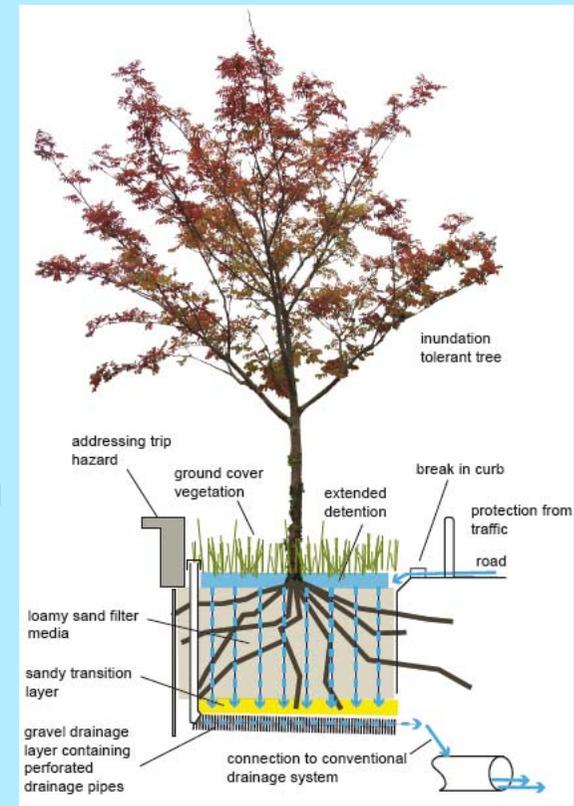
Design considerations for water sensitive spaces

Design and Sizing – Urban wetlands (including rain gardens) should be sized to provide adequate storage of water after a rainfall event, but also to allow for a high level of natural water treatment to take place. As a rule of thumb, depending on the depth of the feature and rate of infiltration, urban wetlands should be between 2-10% of the impermeable area drained (the area of roofs and paved space it will receive run-off water from). In the case where a limited area is available, its size can be used to determine which buildings/what scale of area it could capture runoff from for treatment. Even if an area is smaller than ideal, it can still reduce flows into conventional drains and improve water quality, so will be worth the effort. Urban wetlands should be designed by a multi-disciplinary design team, including a drainage engineer, a landscape architect and an ecologist to ensure the features have multiple benefits.

Streetscape Integration – Rain gardens should be integrated into appropriate spaces within a streetscape. Verges can be used on either side of a street, or for more efficient construction, one central garden can be used in a central reservation. Traffic islands and roundabouts can also be converted to rain gardens to create an attractive yet functional landscape. Rain gardens should be carefully sited in relation to other underground utilities.

Inclusion of Street Trees – Street trees can be incorporated into a rain garden and runoff can therefore be used to passively irrigate the tree. A tree pit can also be designed as a small rain garden, gathering runoff and passing it through vertical filter layers.

Water Treatment – The wetland should be vegetated with plants that can cope with both wet and dry conditions, which assist in water treatment, which are native, and which contribute to amenity. The soil layers beneath the rain garden should be specifically designed to allow rapid draining (with a highly permeable layer on top), but also to aid treatment (with sand filtration layers). A gravel storage area with a perforated pipe should be included as the bottom layer to capture water and direct it to another rain garden or the wider surface drainage network



Soil Contamination – Where land is contaminated, raingardens should be lined with a suitable geotextile to ensure water does not contact contaminated soil and subsequently infiltrate groundwater supplies.

Plant Species – The urban wetland or rain garden should be vegetated with plants that can cope with both wet and dry conditions, which assist in water treatment, which are native, and which contribute to a wetland habitat community. The types and placement of species in the wetland should be carefully selected.

Exemplars case studies – The GCVGNP Design Studies show how sustainable drainage can be effectively incorporated into masterplanning http://www.gcvgreennetwork.gov.uk/component/option,com_docman/Itemid,53/gid,185/task,cat_view/

9.3. Open space objectives for natural processes and generating resource

Glasgow recognises the important functions and resource potential offered through open space and urban greening. By enhancing natural processes and resource generation potential in parks, open space and green networks, these places can become increasingly multifunctional, for example offering water treatment alongside amenity improvements that encourage recreation and support biodiversity.

As such, the city will seek to:

- Utilise green infrastructure to help improve air quality and manage surface water flow and quality;
- Make efficient use of vacant land for resource production by using stalled spaces to supporting the GCVGNP SAGE project and growing short-rotation coppice (SRC) or short-term forestry to reinforce the wood fuel supply chain; and
- Pilot phytoremediation principles to help remediate contaminated land.

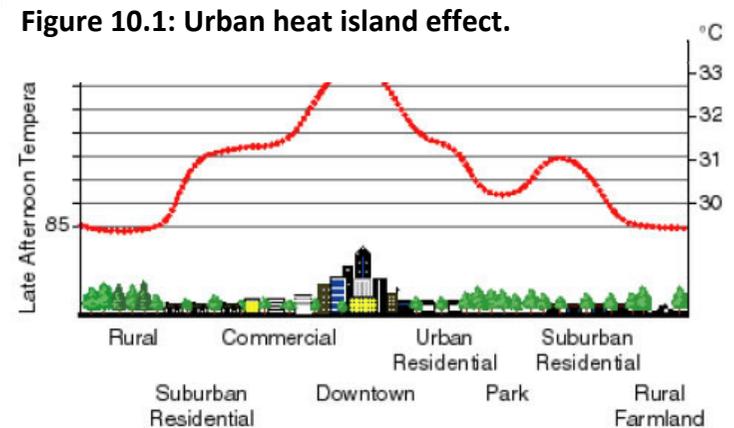
10. Micro-Climate Control

10.1. Relationship between open space and micro-climate control

Due to recent and historic emissions to the atmosphere, changes to our climate are now inevitable. In the west of Scotland it is predicted that these changes will cause longer, hotter summers and warmer, wetter winters with more storm events and higher wind speeds. As such, in addition to activities to address further climate change by reducing emissions, it is increasingly apparent that we will need to introduce measures to help adapt to the already changing climate. Certain people and infrastructure are particularly vulnerable to changes in the climate. For instance low lying areas are more exposed to flood risk and older people and young children are particularly vulnerable to heat waves. Critical infrastructure can also be affected by extreme heat. Buildings and road surfaces may become weakened, ground conditions can become unstable and public transport and electrical supplies can overheat and breakdown. Furthermore, rises in temperature are felt more acutely in urban areas as the city fabric absorbs and retains more of the sun’s heat. This is known as the urban heat island effect. City centre temperatures can be as much as 4°C more than in rural areas, as highlighted in Figure 1

Open space and, in particular green infrastructure, offers important potential for adapting to inevitable climate change: managing water, maintaining a comfortable temperature and providing shelter from wind. The section on Enhancing natural processes and generating resources (Section 9) has already discussed the benefits of urban greening for water management through SuDS, however urban greening and water bodies can also help to control the temperature, for instance:

- Shade trees can reduce building cooling demand by 30%;
- Green spaces which are greater than 1 ha develop their own distinguishable microclimate. Figure 10.2 shows a thermal image of a dense city centre. It highlights that green and open space remain significantly cooler (blue areas);



- An additional 10% green cover in high density urban areas could moderate temperatures by 4 °C, sufficient to entirely counteract currently predicted warming due to climate change until 2050; and
- Trees and vegetation can be used in shelter belts to defuse wind speeds, as in Figure 10.3

Figure 10.2: Thermal image of dense urban area showing that green space has a cooling effect

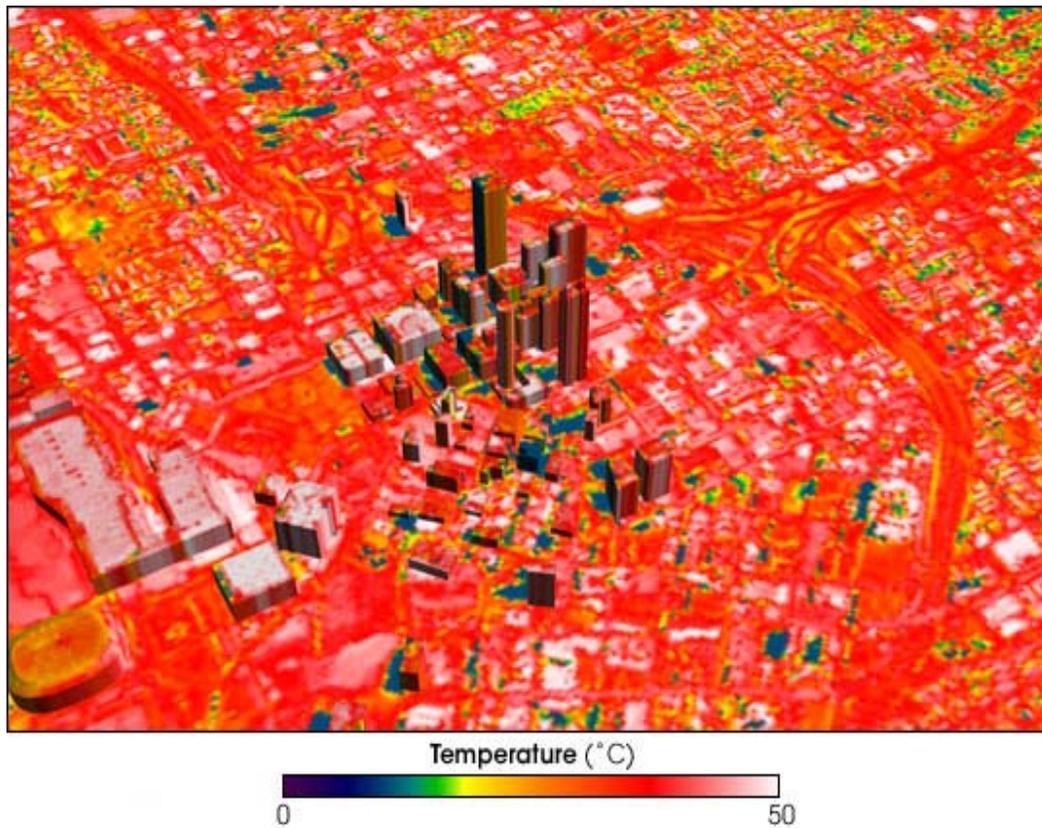
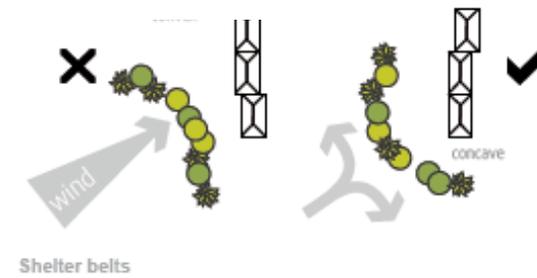


Figure 10.3: Shelter belt design



10.2. Issues and priorities for Glasgow

The UK Climate Projections 2009 provide the most comprehensive assessment of the potential changes to the climate. Assuming moderate emissions to 2080:

- The mean winter temperature is likely to increase by 2.6 °C and the mean summer temperature by 3.5 °C. Peak summer temperatures are likely to be even higher;
- Precipitation is like to increase in the winter by 21% and decrease in the summer by 16%; and
- Some areas across the city experience high wind speeds. These may become excessive and more persistent with climate change.

As highlighted above, the urban heat island effect is likely to exacerbate temperatures within the city. This will be particularly acute around the major road infrastructure and within denser parts of the city, such as the city centre. Wind speeds through the city could also cause a problem. Green infrastructure, such as shelter belts, can offer effective protection from high winds.

The *Glasgow Climate Change Strategy and Action Plan* (2010) recognises that open space also has a role to play in helping to adapt to climate change. There are also a number of parallels in multifunctional aspects in providing and supporting low carbon energy and improving health between this strategy and the Climate Change Strategy. As such, they are mutually supportive.

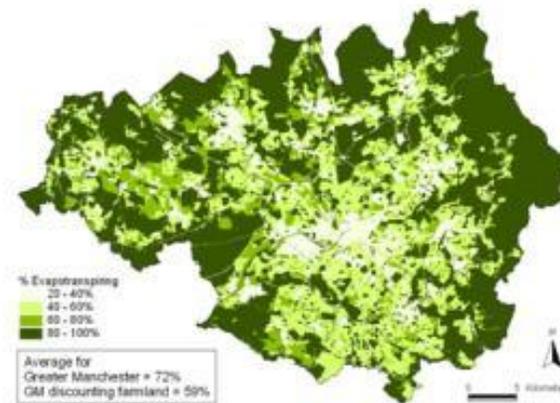
10.3. Open space objectives for micro-climate control

Glasgow will seek to utilise green infrastructure to :

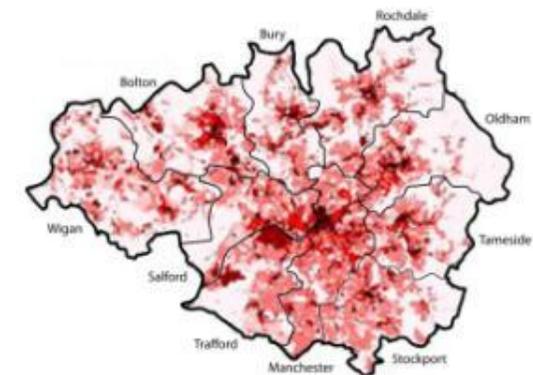
- moderate the temperature of the city through urban greening and increased permeability of civic space, amenity space and transport infrastructure; and
- protect against high wind speeds where practicable.

CASE STUDY: Manchester City Green Roofs Retrofit for Microclimate

A green roof strategy was developed for Greater Manchester authorities, which highlighted the benefits that green roofs could bring in terms of climate change adaptation. A concurrent project, SCORCHIO, which was being taken forward by Manchester University produced an Urban Heat Island map which showed the areas of the city that are likely to suffer from elevated temperatures that will only be exacerbated by climate change. The most affected areas were in the centre of the city where, due to underground utilities and space constraints, street trees and other natural microclimate interventions were not suitable. Accordingly, an intensification in the use of green roofs was proposed as a local microclimatic control. Public buildings have been identified as pilot projects, and green roofs are currently being retrofitted to those roofs. Bee habitats were identified as a biodiversity priority which would simultaneously be productive and require low maintenance.



Green space



Urban heat island

11. Moving towards delivery

11.1. The vision

In times of competing demands on limited budgets new, more efficient ways of delivering our objectives must be found. Open space can play an important part in this with the potential to deliver multiple outcomes and support the achievement of Glasgow's ambitions.

“The vision for Glasgow's open space is to ensure the city continues to be a “dear green place” for both residents and visitors alike by integrating open space into all aspects of the city's activities in ways that promote sustainability, equality and enhance quality of life.”

11.2. The strategic action themes

To make the most of Glasgow's significant open space resources this strategy has looked at the City's identified priorities, highlighted how open and green space can be used to meet these priorities and, with consideration of the quantity and quality of existing space identified opportunities for enhancement. The focus is to deliver high quality, multifunctional space. In this regard, the strategy identifies a series of ***cross cutting strategic objectives***. Set out under six priority themes, these strategic objectives should where possible be delivered concurrently to deliver truly multifunctional open space:

Place setting for economic and community vitality

Following the research and analysis undertaken to develop this Strategy and building on the experience from leading edge practice, conclusions can be drawn on the priorities for achieving the vision for open space in the city. Glasgow's objectives for open space to aid place setting that bolsters economic and community vitality will be to:

- Develop design guidelines and co-ordinate a coherent approach to civic space improvements; areas of focus should include the Clyde Waterfront, in conjunction with the identified regeneration priorities, high profile and high impact city centre spaces such as George Square and key neighbourhood community spaces, e.g. Pollok town centre;

- Explore opportunities to reduce vehicular dominance within the city centre, potentially through multifunctional street sharing and / or limiting access;
- Activate stalled sites through the creation of temporary spaces, including recreation activities and pocket parks; and
- Focus on supporting the provision of high quality residential and business amenity space, with particular emphasis on those areas identified as Strategic Economic Investment Locations and areas identified in the Glasgow City Council report, Industrial and Business Areas for Improvement (2008).

Health and wellbeing

The health of Glasgow's residents will be enhanced by:

- Improving the access and quality of recreational open space, including parks and gardens, sports facilities and amenity space, particularly focusing action towards the more deprived areas of the city;
- Providing high quality natural play features and equipment in areas of deficiency;
- Integrating opportunities to exercise into the outdoor environment; and
- Maintaining support for the Equally Well project and promoting 'Healthy Urban Planning' by delivering more walkable places through attractive public realm, an appropriate mix of services and improved connectivity for pedestrians and cyclists.

Creating connections

Glasgow will seek opportunities to improve the provision and quality of open space connectivity by:

- Reinforcing the cycle and pedestrian routes along the main waterways and through green corridors; to maximise benefit these should take into consideration opportunities for enhancing ecological networks;
- Ensuring that new development proposals and regeneration plans contribute to the creation of the cycle and pedestrian network; and
- Improving the environment and character of key transport interchanges by improving the quality of the underutilised space through planning, lighting and art installations.

Ecological quality

Glasgow will become more permeable to wildlife by creating an ecological network and improving the ecological quality of its assets, by:

- Improving the biodiversity value of amenity and civic space. The creation of meadows in residential amenity space and the greening of civic space, e.g. through raingardens, as proposed in the Place Setting and Enhancing natural processes sections should be undertaken, considering BAP priority species;
- Continuing to manage parks and natural / semi-natural areas within the urban area for their biodiversity value; and
- Improving ecological connection along core corridors including the road, rail and river network.

Enhancing natural processes and generating resource

Glasgow recognises the important functions and resource potential offered through open space and urban greening. By enhancing natural processes and resource generation potential in parks, open and green networks, these places can become increasingly multifunctional, for example offering water treatment alongside amenity improvements that encourage recreation and support biodiversity.

In recognition of this, the city will seek to:

- Utilise green infrastructure to help improve air quality and manage surface water flow and quality;
- Make efficient use of vacant land for resource production by using stalled spaces to supporting the GCVGNP SAGE project and growing short rotation coppice or to reinforce the wood fuel supply chain;
- Pilot phytoremediation principles to help remediate contaminated land.

Micro-climate control

Glasgow will seek to utilise green infrastructure to:

- moderate the temperature of the city through urban greening and increased permeability of civic space, amenity space and transport infrastructure; and

- protect against high wind speeds where practicable.

11.3. Challenges and opportunities

Delivering these objectives in a period of economic restraint poses many challenges. However, adversity breeds innovation and although this strategy will need to recognise financial limits, there is considerable scope for finding new delivery mechanisms and funding arrangements. Recent reforms to the planning system call for a greater focus on action and delivery and advocates stronger partnership working. This time of flux will require greater emphasis on collaborative working and investigation of new approaches that will challenge traditional attitudes towards open space delivery and management. Recent guidance on *Delivering Better Places in Scotland* provides a summary of key lessons about the process of delivering better places, a number of which are pertinent to delivering this open space strategy:

- *Ensuring good leadership and co-ordinated delivery* – As demonstrated by the breadth of information covered in this strategy, one of the major emergent opportunities from focusing on delivering multifunctional open space is that it offers tangible benefits to a wide variety of interested parties. Open space highlights the interdependency of a wide range of services, covering numerous council departments, partner public bodies and private organisations with ownership and / or management responsibilities for land assets. Demonstrating and promoting the cross-cutting benefits of open space through multi-agency working therefore opens up the potential of utilising a wider range of delivery and funding opportunities. However, co-ordinating and capitalising on this breadth of participation is challenging, particularly in balancing the priorities of single interest groups. Good leadership is therefore critical in both co-ordinating action across services providers and presenting a clear and consistent message; open space renewal needs to be aligned with the objectives of this strategy in a way that engages all interested groups.

Place promoters could be responsible for improvements across the city or within a particular locality; and could come from a public body, a private organisation or the wider community itself. However, political leadership is key to communicating the benefits of open space and articulating the rationale for investment in economically challenging times. These messages should be clear and consistent over time and political stability is critical to improving the quality of open space.

Co-ordination is also critical in land assembly. Creating ecological and movement networks across the city will need to connect across site boundaries. Similarly, natural processes and eco-systems services such as water management do not respect notional ownership

and organisational boundaries. As such, to harness the real benefits that multifunctional open space brings there needs to be a strategic approach to designing open space that encourages greater collaboration and joint working between neighbouring land owners and managers.

- *Controlling the spatial development framework* – Planning in Glasgow is evolving. This strategy has been developed in the context of, and with the ambition of influencing the spatial development framework for Glasgow. The priorities that this strategy sets out reflect the broader ambitions for open and green space as articulated through the NPF2 and the CSGN, as well as the Glasgow and the Clyde Valley Strategic Development Plan and current City Plan 2. In turn, the analysis and recommendations set out within this strategy will help structure the development of the next iteration of the City Plan.
- *Funding, implementation and ownership* – With increased scrutiny on public spending and tighter margins for developers, options for financing open space are becoming restricted. The first obstacle to overcome in attracting funding for open space enhancement and creation initiatives is to provide robust justification for implementation. This strategy goes some way to do this, but these benefits need to be widely and consistently articulated.

Demonstration projects have already signalled the start of this journey but further effort needs to build on this foundation to demonstrate the economic, social and environmental benefits of integrated action. The Gartloch / Gartcosh Seven Lochs project offers excellent potential to showcase best practice in design and development. As it comes to fruition, opportunities to monitor and learn from this ambitious plan should be taken to act as a catalyst for delivering multifunctional open space elsewhere.

Regeneration and developer contributions have for a long time been an important way of financing and delivering open space improvements. Developers are likely to continue to play a major role in delivering high quality space, although the financial performance of the current development market places added pressure on a number of other important issues including provision of affordable housing. Developer responsibilities should be clearly defined to avoid uncertainty and risk, utilising the design guidelines highlighted throughout this strategy. Monies could be used directly in relation to the site, however to lever wider community benefits, consolidating contributions into a central funding pot may be more efficient. This would require new financing models. One such model, Tax Increment Financing (TIF), which uses predicted future gains in revenue to finance current improvements is currently being explored.

Opportunities for financing through public and charitable funding sources are also changing. Competition for finance is increasing and there is generally less availability of monies for traditional approaches to open space renewal. Although this restricts activities on one hand, it should on the other drive more considered, well designed schemes with multiple benefits through increased scrutiny. It will also prompt investigation and experimentation with alternative forms of delivery, particularly in regard to increased community ownership – business and residential. As highlighted throughout this strategy, there are a number of case studies and a plethora of organisational models that can help in rising to this challenge. Social enterprises formed as charities or companies can help co-ordinate community action and Business Improvement Districts could stimulate activities for mutual benefits on business and industrial estates.

11.4. Taking the next steps

Taking into consideration the challenges and opportunities for delivering the strategic objectives set out above, there are nine headline actions for Glasgow City Council (GCC) and its partners.

Ensuring good leadership and co-ordinated delivery

1. GCC will build a consistent approach to open space provision by undertaking a critical review of the services it provides to ensure that they are aligned with the strategic objectives, and identifying specific activities that need to be implemented.
2. GCC will work in partnership through the GCVGNP to create a register of stalled sites and set proposals for underutilised spaces (including vacant and derelict land, as well as amenity space around road interchanges), such as temporary pocket parks and bike parks, art exhibitions, green gyms, Sow and Grow Everywhere and biomass.
3. GCC will work with landowners and other GCVGNP partners to pilot phytoremediation of contaminated land. Candidate sites could include the chemical works at St Rollox, steel works at Blochairn and the gas works site at Provanmill.

Controlling the spatial development framework

4. GCC will take a City wide approach to public realm design guidance, including a detailed review of existing conditions within the public domain, to set the standard for future development.

5. GCC will continue to develop a strategic network of green pedestrian and cycle routes across the City, ensuring that these are adequately included in development proposals, support ecological networks and are not severed by other infrastructure improvements.
6. GCC will require surface water management plans that utilise green infrastructure where appropriate for all key regeneration areas and sites.
7. GCC will require developers to demonstrate how schemes contribute to the creation of ecological networks.

Funding, implementation and ownership

8. GCC will help facilitate the development of social enterprises and business improvement districts that clearly articulate an approach to delivering and maintaining open space that achieves the strategic objectives
9. GCC will review the management of amenity space, particularly the underutilised sites associated with residential areas, and develop initiatives for cost efficient ways of improving the aesthetic quality and function of spaces, including pictorial meadows, pocket parks and green gyms. Priority actions will be developed for the more deprived areas of the City, where benefits will be most acutely felt.

With the business as usual case becoming more challenging, failure to act in moving towards delivery of multifunctional open space will result in a continued decline in the quality and relevance of open space in meeting Glasgow's needs. Not only will we miss the multiple economic, social and environmental benefits, but the opportunity to work collaboratively across service sectors and delivery partners to maximise gain through efficient use of resources and shared knowledge for mutual benefit will be lost. This will result in a degraded environment and disengaged communities that undermine economic potential; stressed infrastructure and disconnected habitats that are at greater risk from climate changes and reduced opportunities to celebrate, enjoy and play outside.

Early action, starting with effective planning and engaging a range of stakeholders in the design, delivery and management of open space can deliver the objectives of this strategy and much more.

**GLASGOW OPEN SPACE STRATEGY - CONSULTATIVE DRAFT
AND STRATEGIC ENVIRONMENTAL ASSESSMENT
INTERIM ENVIRONMENT REPORT**

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1. CONTEXT: GLASGOW OPEN SPACE STRATEGY, RELATIONSHIP TO OTHER PLANS

Relationship with other Qualifying Plans and Programmes

- 1.1 Scottish Planning Policy (SPP) contains a requirement that local authorities undertake an open space audit and on the basis of it, prepare an open space strategy for their area. The Council as part of its review of the City Plan initiated an open space audit and subsequently used this to inform the production of a consultative draft open space strategy. The intention is that once the open space strategy is adopted by the Council it will inform the process of producing the relevant environmental policies and guidance in the new Local Development Plan.
- 1.2 The Glasgow and the Clyde Valley Structure Plan 2006 and the Glasgow City Plan 2009 together currently constitute Glasgow's Development Plan. However, under the new Scottish planning regime the Glasgow and the Clyde Valley Strategic Development Plan (SDP) and the Glasgow Local Development Plan (LDP) are in the process of replacing them. The SDP is currently at the Proposed Plan Stage. It is anticipated it will go to Examination in the summer of 2012. The LDP must follow on behind the SDP taking account of the strategic context it provides. It is anticipated that its proposed plan will be issued for consultation towards the end of 2012. For more information on the Development Plan and the LDP's relationship to other plans and programmes refer to the LDP Main Issues Report (MIR) SEA paragraphs 1.6 to 1.9 (page 10).

Glasgow's Consultative Draft Open Space Strategy

- 1.3 Following the six week period of consultation for the Consultative Draft Open Space Strategy the Council will consider the representations received and may use them to refine the document. This will then become the final version which will be submitted to the Council for adoption as Glasgow's Open Space Strategy (GOSS). As the process of producing the LDP unfolds GOSS may remain as a document used to inform policy development in its own right or parts of it may be incorporated into supplementary planning guidance.
- 1.3 A summary of the key facts relating to Glasgow's Consultative Draft Open Space Strategy are set out below:

Name of Local Authority:	Glasgow City Council
Title of the Strategy:	Glasgow's Consultative Draft Open Space Strategy
Legislative Requirement	Scottish Planning Policy requires all local authorities to prepare an open space strategy for their area.
Subject of the Strategy	Glasgow's Consultative Draft Open Space Strategy examines how a multifunctional approach to open space can contribute to the Council's wider strategic objectives while maximising potential benefits to communities and other stakeholders. It takes account of the Glasgow and Clyde Valley Strategic Development Plan, the City Plan, the emerging LDP, and other key strategies, policies and advice as prescribed by Regulation.

Strategy Period	The Open Space Strategy will be adopted in 2012. Its strategic themes are intended to meet Glasgow's needs until 2027	
Frequency of Update	The Open Space Strategy will be updated in conjunction with the reviewing of the LDP.	
Strategy Coverage	Glasgow City Council local authority area (68 square miles)	
Strategy Objectives	The Draft Open Space Strategy proposes six mutually supportive strategic themes designed to frame the Council's future approach to the functions, management and delivery of open space on a city wide basis. Each strategic theme is supported by objectives aimed at supporting and extending a network of open spaces that are; of a high quality, offer a diverse range of recreation and lifestyle experiences, address health inequalities, enhance biodiversity, and promote environmental sustainability and economic competitiveness.	
Contact Point	Development Plan Development and Regeneration Services Glasgow City Council 229 George Street G1 1QU	Telephone: 0141 287 8608 Email: developmentplan@glasgow.gov.uk

Scoping Report and the Consultation Authorities Response

- 1.5 A Scoping Report for the GOSS was submitted to the Consultation Authorities via the SEA Gateway in June 2010.
- 1.6 The three Consultation Authorities (Historic Scotland, Scottish Natural Heritage and the Scottish Environmental Protection Agency) agreed that a 6 week consultation period was appropriate for the GOSS Environmental Report. The responses of the Consultation Authorities to the Scoping Report were received in July 2010. They were supportive of the approach being taken and offered advice clarifying points of detail in the scoping report and methods for assessing the environmental effects of the strategy and its associated action plans.
- 1.7 In the intervening period the actual nature of the Consultative Draft GOSS produced by the consultants for the Council has changed. It has become a purely strategic document and no longer contains an action plan setting out proposals for specific open space based projects and potential funding sources to deliver them. In addition it does not examine the need to reaffirm or amend the open space standards contained in the City Plan. This was a requirement arising from the City Plan Public Local Inquiry. It will now be addressed as part of this consultation and subsequently as part of the LDP process.
- 1.8 As part of the baseline information required for the scoping process the Council is required to identify the plans, programmes, strategies and environmental objectives to be analysed in the environmental report for their relationship with the contents of the open space strategy. A table summarising these and including changes recommended by the Consultation Authorities is set out in **Appendix 1**.

Environmental Report

- 1.9 The Environmental Report (ER) constitutes the strategic environmental assessment of the Consultative Draft GOSS. The purpose of the ER is to identify, describe and evaluate the likely significant effects on the environment of its implementation. It should be noted that the strategic themes it proposes by their very nature are unlikely to have any significant negative effects on the environment and therefore require little need for mitigation. It is in this context that the consultants in producing the final form of the Consultative Draft GOSS did not propose alternative strategic options.
- 1.10 The Scottish Government have advised that in terms of any new plans, programmes and strategies no additional assessment of significant environmental effects is required if the topics under consideration have already been examined in other SEA's which cover most of the same issues. The ER for the LDP MIR is so current that its' consultation period parallels that for the Consultative Draft GOSS ending on 12 December 2011 (see paragraphs 5.1 and 5.8). The ER is the key consultation document in the environmental assessment process.
- 1.11 The Consultation Authorities and all other interested parties are invited to comment on the assessment and on the Consultative Draft GOSS to which it relates. This is an Interim ER which aims to set out sufficient information, under the terms of the Regulations, to provide a context for assessing those elements of the environment that may be affected by the six strategic themes proposed by the Consultative Draft GOSS. In addition they have also been assessed against the SEA prepared for City Plan 2 which until replaced by the LDP provides the policy context within which the strategic themes can begin to be realised. The detailed assessment of potential significant environmental effects is set out in Tables 1 to 6 (pages 7 to 12).

The Importance of Public Consultation

- 1.12 The Council sees' public consultation as an important opportunity to comment on, add to and refine the GOSS and its SEA. The consultation process seeks to initiate as wide a dialogue as possible using a mixture of web based, postal, visual media and face to face presentations, briefings and workshops. This should result in the production of a document with a broad and committed endorsement for final adoption by the Council. (see Part 5, page 5)

2. BASELINE: CURRENT STATE OF THE ENVIRONMENT

- 2.1 As pointed above (paragraph 1.10) the baseline information relating to the current state of the environment for the GOSS is the same as that relating to the LDP MIR. (See the LDP MIR SEA, Part 2, pages 17 to 31). It can be accessed via the web link at; www.glasgow.gov.uk/developmentplan

3. STRATEGIC ENVIRONMENTAL ASSESSMENT, ALTERNATIVES AND MITIGATION

- 3.1 The Environmental Assessment (Scotland) Act 2005 ('the Act') came into force on 20 February 2006 and is the implementing legislation for EC Directive 2001/42/EC, known as the "SEA" Directive. Schedule 3 of the Act sets out the information that the ER should address, including likely significant environmental effects over the; short, medium, or long term or that are permanent, temporary, secondary, cumulative or synergistic.
- 3.2 GOSS does not consider an alternative strategic approach. It represents the consultant's recommendation of the best way forward given Glasgow's particular circumstances and its ambitions for the future. As confirmed below by the tables setting out the assessment of environmental effects they are all mainly positive and sometimes neutral. The lack of significant negative environmental effects or issues means that there is no specific need to mitigate for them.
- 3.2 In undertaking the assessment of the environmental effects of the strategy the consultants have identified specific objectives which they consider are the best way to take each of the themes forward into the LDP and any other high level initiatives relating to the Glasgow's open space. The six strategic themes are;
- 1 Place setting for improved economic and community vitality;
 - 2 Health benefits and well-being;
 - 3 Creating connections;
 - 4 Improving ecological quality;
 - 5 Enhancing natural processes and generating resources; and
 - 6 Managing the micro-climate.
- 3.3 The significant environmental effects of the GOSS strategic themes are set out in the following six tables which list the objectives identified as necessary for their realisation. Against each of them are rows listing the City Plan Policies considered capable, in the widest sense, of contributing towards that objective. The next three columns summarise the findings of the City Plan 2 SEA with regard to the environmental effect of each of these policies i.e. positive, neutral or negative. The detailed information upon which this element of the summary tables is based can be found in the SEA Appendices contained in the City Plans Supporting Documents page 49 and thereafter. The SEA can be found at www.glasgow.gov.uk/en/Business/CityPlan/ A similar process was used to represent the SEA outcomes for those LDP MIR issues considered relevant to the realisation of the GOSS strategic themes. A column identifies the MIR reference number and the next three the assessment of its significant environmental effect. This information is derived from the environmental assessment tables contained in the MIR SEA pages 35 to 40 and can be found at www.glasgow.gov.uk/developmentplan

Table 1 - Place setting for improved economic and social vitality

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
Improving the quality of civic space and the public realm – investment in Glasgow City Centre civic space and public realm has already delivered award winning space. These activities should be continued and extended to other centres;	DES 1	✓	✓		MIR 6.1	✓	✓	
	DES 6	✓	✓			✓	✓	
Reducing vehicle dominance and improving pedestrian experience – vehicle dominance in the City Centre has a negative impact on the pedestrian experience. Evidence from around the world shows a strong correlation between pedestrian experience and the vitality of city centres. Furthermore, vehicle dominance also reduces opportunities for other activities such as al fresco dining and cafe culture;	TRANS 2	✓	✓		Not mentioned			
	TRANS 3	✓	✓					
	TRANS 5	✓	✓					
Animating stalled spaces – there is a significant area of under-utilised land across Glasgow. Some areas are derelict and contaminated; whereas some are part of longer term regeneration plans. This not only detracts from the quality of place, but also represents a wasted resource for other interim uses;	Not mentioned				MIR 1.5	✓	✓	
Improving the quality of amenity space – the quality of amenity space is generally quite low. There is also a higher proportion of amenity space in more deprived areas compared to other open space types.	DEV 11	✓	✓		MIR 5.3	✓		
	DES 4	✓	✓		MIR 6.1	✓	✓	
	ENV 1	✓	✓		MIR 6.5	✓	✓	
	ENV 2	✓	✓					
	ENV 6	✓	✓					
	ENV 7	✓	✓					
	ENV 8	✓	✓					

Table 2 - Health and wellbeing

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
Improving the access and quality of recreational open space , including parks and gardens, sports facilities and amenity space, particularly focusing action towards the more deprived areas of the city;	DEV 11	✓	✓		MIR 3.2		✓	
	DES 1	✓	✓		MIR 5.3	✓		
	DES 4	✓	✓		MIR 6.1	✓	✓	
	ENV 1	✓	✓		MIR 6.5	✓	✓	
	ENV 2	✓	✓					
	ENV 7	✓	✓					
	ENV 8	✓	✓					
	TRANS 5	✓	✓					
Providing high quality natural play equipment in areas of deficiency;	DES 1	✓	✓		MIR 3.1	✓	✓	
	DES 2	✓	✓		MIR 3.2		✓	
	ENV 1	✓	✓		MIR 6.1	✓	✓	
	ENV 2	✓	✓		MIR 6.5	✓	✓	
Integrating opportunities to exercise into the outdoor environment;	DES 1	✓	✓		MIR 3.1	✓	✓	
	DES 4	✓	✓		MIR 3.2		✓	
	ENV 1	✓	✓		MIR 6.1	✓	✓	
	ENV 2	✓	✓		MIR 6.5	✓	✓	
	TRANS 5	✓	✓					
Maintaining support for the Equally Well project and promoting 'Healthy Urban Planning' by delivering more walkable places through attractive public realm, an appropriate mix of services and improved connectivity for pedestrians and cyclists.	DES 1	✓	✓		MIR 3.1	✓	✓	
	DES 4	✓	✓		MIR 3.2		✓	
	ENV 1	✓	✓		MIR 6.1	✓	✓	
	ENV 2	✓	✓		MIR 6.5	✓	✓	
	TRANS 5	✓	✓					
	TRANS 8	✓	✓					

Table 3 - Creating Connections

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
Reinforcing the cycle and pedestrian routes along the main waterways and through green corridors; to maximise benefit these should take into consideration opportunities for enhancing ecological networks;	DES 1	✓	✓		MIR 4.6	✓	✓	
	DES 5	✓	✓		MIR 6.1	✓	✓	
	ENV 7	✓	✓					
	TRANS 5	✓	✓					
Ensuring that new development proposals and regeneration plans contribute to the creation of the cycle and pedestrian network;	TRANS 2	✓	✓		MIR 5.1	✓	✓	
	TRANS 3	✓	✓		MIR 5.3	✓		
	TRANS 5	✓	✓					
	ENV 4	✓	✓					
Improving the environment and character of key transport interchanges by improving the quality of underutilised space through planning, lighting and art installations.	DES 1	✓	✓		MIR 1.6	✓	✓	
	DES 2	✓	✓		MIR 6.1	✓	✓	
	DES 5	✓	✓		MIR 6.5	✓	✓	
	DES 6	✓	✓					
	TRANS 2	✓	✓					
	TRANS 3	✓	✓					
	TRANS 5	✓	✓					

Table 4 - Improving Ecological Quality

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
Improving the biodiversity value of amenity and civic space. The creation of meadows in residential amenity space and the greening of civic space i.e. through rain gardens, as proposed in the Place Setting and Resource Management sections should be undertaken, considering BAP priority species;	DES 4	✓	✓		MIR 3.1	✓		
	ENV 1	✓	✓		MIR 5.3	✓		
	ENV 2	✓	✓		MIR 5.4	✓		
	ENV 6	✓	✓		MIR 6.1	✓	✓	
Continuing to manage parks and natural / semi-natural areas within the urban area for their biodiversity value;	DES 4	✓	✓		MIR 5.1	✓	✓	
	ENV 1	✓	✓		MIR 5.4	✓		
	ENV 2	✓	✓					
	ENV 6	✓	✓					
Improving ecological connection along core corridors including the road, rail and river network.	DES 4	✓	✓		MIR 4.6	✓	✓	
	DES 5	✓	✓		MIR 4.7	✓	✓	
	ENV 1	✓	✓		MIR 5.3	✓		
	ENV 2	✓	✓		MIR 5.5	✓		
	ENV 6	✓	✓					
	ENV 10	✓	✓					

Table 5 - Enhancing natural processes and generating resources

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
Utilise green infrastructure to help improve air quality and manage surface water flow and quality;	DEV 11	✓	✓		MIR 5.2	✓		
	DES 1	✓	✓		MIR 5.3	✓		
	DES 5	✓	✓		MIR 5.4	✓		
	ENV 1	✓	✓					
	ENV 4	✓	✓					
	ENV 7	✓	✓					
Make efficient use of vacant land for resource production by using stalled spaces to supporting the GCVGNP SAGE project and growing short-rotation coppice (SRC) or short-term forestry to reinforce the wood fuel supply chain;	ENV 12	✓	✓		MIR 1.5	✓	✓	
Pilot phytoremediation principles to help remediate contaminated land.	ENV 12	✓	✓		Not mentioned			

Table 6 - Micro-Climate Control

Strategic Objectives	City Plan 2	Environmental Assessment			LDP MIR	Environmental Assessment		
		positive	neutral	negative		potential benefits	potential issues	Issues identified
moderate the temperature of the city through urban greening and increased permeability of civic space, amenity space and transport infrastructure; and	DEV 11	✓	✓		MIR 1.2	✓	✓	
	DES 1	✓	✓		MIR 1.3	✓	✓	
	DES 4	✓	✓		MIR 5.2	✓		
	TRANS 3	✓	✓		MIR 5.3	✓		
	TRANS 5	✓	✓		MIR 5.4	✓		
	ENV 1	✓	✓					
	ENV 2	✓	✓					
	ENV 7	✓	✓					
	ENV 8	✓	✓					
protect against high wind speeds where practicable.	DES 1	✓	✓		Not mentioned			
	DES 2	✓	✓					

4. MONITORING

Monitoring of the significant environmental effects of implementing the new Glasgow Open Space Strategy will be done as part of the process of monitoring the policies and guidance that emerge to form the new LDP.

5. PUBLIC CONSULTATION

5.1 This SEA was prepared by the Development Plan team within Glasgow City Council. It will be submitted to the Consultation Authorities (Scottish Natural Heritage, Historic Scotland and Scottish Environmental Protection Agency) via the SEA Gateway, and opened for public consultation. The consultation period for the GOSS and its SEA will last for 6 weeks running from 31 October to 12 December 2011. The consultation period for the MIR and its SEA began on 3 October and also ends on 12 December 2011.

5.2 GOSS and its SEA will be available to view online at www.glasgow.gov.uk/glasgowopenspacestrategy. Alternatively, the documents will be available to view at all of Glasgow's Public Libraries, as well as the Council's offices at;

Development and Regeneration Services
 229 George Street
 Glasgow
 G1 1QU

5.3 Comments and feedback are invited generally on the GOSS and this document. To do so, go to the following web link www.glasgow.gov.uk/glasgowopenspacestrategy

5.4 To comment on the MIR and its SEA go to www.glasgow.gov.uk/developmentplan

6. ADDITIONAL INFORMATION

6.1 The Glasgow Open space map showing the Cities protected open spaces can be accessed at; www.glasgow.gov.uk/en/Business/CityPlan/

6.2 Scotland's Greenspace Map can be accessed at; www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/greenspace-and-outdoor-access/open-space-audits-and-strategies/dataset/

APPENDIX

Listing the Plans, programmes, strategies (PPS) and environmental objectives to be analysed in the Environmental Report for their relationship with the Open Space Strategy

Name of PPS/ environmental protection objective	Relevance of Document	Originator
National		
National Planning Framework	Planning Framework 2 which guides spatial development of Scotland to 2030. It is a material consideration in framing planning policy. Published 2009. The framework identifies key issues and drivers for change, and strategic investment priorities and opportunities for different parts of Scotland, including Glasgow.	Scottish Government
Scottish Planning Policy (SPP)	The Scottish Planning Policy sets out the aims of the planning system and national policies on development topics.	Scottish Government
Planning Advice Note (PAN) series	Provide good practice advice on various topics. PAN65 Planning and Open Space and PAN60 Planning for Natural Heritage being particularly relevant	Scottish Government
Circulars	Interpret planning legislation	Scottish Government
Water Environment and Water Services (Scotland) Act 2003	Protection of the water environment Production of river basin management plans	Scottish Government
Flood Risk Management (Scotland) Act 2009	Requires a more integrated and sustainable approach to flood risk management and requires LA's to look to reduce overall flood risk	Scottish Government
River Basin Management Plan for Scotland River Basin District & the Clyde Management Plan	Sets out individual water body environmental objectives and a programme to achieve them	SEPA
Scottish Biodiversity Strategy (2004)	Provides guidance on Scotland's biodiversity, issues and opportunities and an agenda for action	Scottish Government
Wildlife and Countryside Act 1981 (as amended)	Gives protection to listed species from disturbance, injury, intentional destruction or sale.	UK Parliament
The Conservation (Natural Habitats, &c) Regulations 1994	Transpose the EC Habitats Directive into national law and provide for the designation and protection of European sites, European protected species	UK Parliament

Name of PPS/ environmental protection objective	Relevance of Document	Originator
SHEP - Scotland's Historic Environment Policy (2009)	Provides a framework for more detailed strategic policies and operational policies that inform the day to day work of a range of organisations that have a role and interest in managing the historic environment	Scottish Government
Regional		
Glasgow and the Clyde Valley Structure Plan 2005	Sets out a strategic vision for Glasgow and the Clyde Valley	Glasgow and the Clyde Valley Joint Structure Plan Committee
Glasgow and the Clyde Valley Green Network Partnership publications	Reports and strategies aimed at using green environment to improve development opportunities over a 20 year period	Glasgow and the Clyde Valley Green Network
Local		
Glasgow City Plan and SEA (Adopted 2009)	Sets out the City Council's broad development strategy for the next 20 years together with physical development proposals and supporting policies	GCC
Local Biodiversity Action Plan	Contains a programme of actions to protect and enhance and promote local biodiversity throughout the City.	GCC
Strategic Review of Parks and Open spaces (2004)	Sets out a vision and objectives for open space with the aim of co-ordinating Council plans and strategies that affect open space.	GCC
Glasgow Playing Pitch Strategy (2007)	Identifies strategic goals and actions for improving the provision and development of outdoor sports pitches, including a network of quality pitches.	GCC
Allotments Strategy (2009)	Sets out recommendations for upgrading existing allotments, site management, identifying opportunities for funding and new allotments.	GCC
Glasgow Cultural Strategy (2006)	Sets out a vision for delivering the city's social and economic objectives through culture and sport.	GCC
Tourism Strategy (2007 to 2016)	The Strategy focuses on image/brand, people, place and product.	GCC/others
Environment Strategy and Action Plan 2006 - 2010	Overview of GCC activities and actions addressing local and global environmental challenges.	GCC
Glasgow Draft Climate Change Strategy	Overview of GCC activities and actions addressing local and global climate change challenges.	GCC

