



City and County of Swansea

Notice of Meeting

You are invited to attend a Meeting of the

Economy, Environment & Infrastructure Policy Development Committee

At: Remotely via Microsoft Teams

On: Thursday, 17 December 2020

Time: 2.00 pm

Chair: Councillor Cyril Anderson

Membership:

Councillors: J E Burtonshaw, P Downing, P R Hood-Williams, P K Jones, M A Langstone, W G Lewis, P Lloyd, P M Matthews and T M White

Watch Online: <https://bit.ly/36C7qmD>

Agenda

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3 Minutes. To approve and sign the Minutes of the previous meeting(s) as a correct record.	1 - 3
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Next Meeting: Thursday, 21 January 2021 at 2.00 pm

A handwritten signature in black ink that reads 'Huw Evans'.

Huw Evans
Head of Democratic Services
Thursday, 10 December 2020

Contact: Democratic Services - Tel: (01792) 636923

Agenda Item 3



City and County of Swansea

Minutes of the **Economy & Infrastructure Policy Development Committee**

Remotely via Microsoft Teams

Thursday, 19 November 2020 at 2.00 pm

Present: Councillor C Anderson (Chair) Presided

Councillor(s)

J E Burtonshaw
W G Lewis
T M White

Councillor(s)

P Downing
P Lloyd

Councillor(s)

P R Hood-Williams
P M Matthews

Officer(s)

Scott Dummett
Phil Holmes
Martin Nicholls
Paul Relf
Samantha Woon

Senior Lawyer
Head of Planning & City Regeneration
Director of Place
Economic Development & External Funding Manager
Democratic Services Officer

Also present:

Leader of the Council
Cabinet Member for Investment, Regeneration and Tourism
Cabinet Member for Homes, Energy and Service Improvement
Cabinet Member for Environment Enhancement and Infrastructure Management

Apologies for Absence

Councillor(s): P K Jones

9 Disclosures of Personal & Prejudicial Interests.

In accordance with the Code of Conduct adopted by the City and County of Swansea, no following interests were declared.

10 Minutes.

Resolved that the Minutes of the Economy and Infrastructure Policy Development Committee held on 22 October, 2020, be approved as a correct record.

11 Consultation Response from Local Toilet Strategy.

The Director of Place introduced the consultation response in respect of the Local Toilet Strategy.

Members' noted the background, public consultation, recent and upcoming developments and next steps.

Members' asked questions of the Officer who responded accordingly.

The Cabinet Member for Investment, Regeneration and Tourism referred to the development of top end of High Street. The development would include student accommodation and would generate opportunities for local businesses. It was noted that Transport for Wales were considering the citing of public conveniences in front of the train station.

The Cabinet Member for Homes, Energy and Service Improvement detailed the successful outcomes as a result of work undertaken by the Council and Third Sector organisations in making positive impacts in relation to the number of homeless individuals within the City Centre.

The Cabinet Member for Environment Enhancement and Infrastructure Management referred to the efforts made by the Council in securing the successful DIY SOS Project in Caswell which had served to enhance the reputation of the Council and Swansea as a whole.

The Chair congratulated Officers for their input in regeneration, homelessness and the DIY SOS Project.

The Chair thanked the Director of Place for his informative report.

Resolved that the report be noted.

12 Economic Recovery Action Plan.

The Head of Planning and City Regeneration, assisted by the Economic Development and External Funding Manager, provided a comprehensive summary of the Economic Recovery Action Plan.

Members' noted the key issues within the Action Plan and the positive work that had been undertaken in securing grant streams and providing alternative range of support to support individuals and businesses.

The Cabinet Members for Investment, Regeneration and Tourism and Environment Enhancement and Infrastructure Management praised Officers for joint working and securing positive outcomes during the COVID 19 Pandemic.

The Chair and Members' expressed their gratitude to Officers for their efforts and successes.

Resolved that aspects of the Action Plan be an on-going item to be considered by the Committee.

13 Outline Work Plan 2020 - 2022.

The Chair referred to the outline Work Plan for 2020 – 2022.

The Director of Place advised that the Terms of Reference for the Economy and Infrastructure PDC would be amended at Council in December to encompass Environmental issues. It was suggested that the Work Plan items be determined in relation timescales once the amendment had been made.

Members' discussed the Consultation on the Toilet Strategy and determined that they had no further comments to make and thanked Officers for their comprehensive report.

The Economic Recovery Action Plan would need to be considered by the PDC at periodic times as the situation evolved.

Resolved that:

1. the Green Infrastructure Strategy would be considered at the meeting on 17 December 2020.
2. The Chair and Vice Chair meet with the Director of Place regarding the outline work plan for 2020-2022 and determine a timescale for the consideration of items.

The meeting ended at 2.49 pm

Chair

Agenda Item 4



Report of the Director of Place

Economy, Environment and Infrastructure PDC – 17 December 2020

Green Infrastructure Strategy

Purpose:	The Strategy will be reported to Cabinet on the 13 th February 2021 seeking adoption. The PDC's views are invited.
Policy Framework:	The Strategy is designed to support the Local Development Plan (LDP) Policy ER 2 Strategic Green Infrastructure Network and emerging Supplementary Planning Guidance on Green Infrastructure. The strategy contributes to the Council's duties under the Well-being of Future Generations (Wales) Act 2015, Environment (Wales) Act 2016 and will support the application of the Statutory SuDS Standard 2019. It also delivers one of the steps in the Council's well-being objective: Maintaining and enhancing Swansea's natural resources and biodiversity and, the Swansea Public Service Board's Working with Nature Objective.
Consultation:	The process to produce the Strategy included engagement with relevant Council stakeholders from the public, private and 3 rd sector and residents, visitors and users of the Swansea Central Area during the development of the draft strategy followed by a 5 week consultation on the draft strategy.
Recommendation(s):	It is recommended that: 1) The Strategy is approved for adoption.
Report Author:	Penny Gruffydd
Finance Officer:	Ben Smith
Legal Officer:	Debbie Smith

1. Introduction

- 1.1 We know from the Landmark report by the UN Intergovernmental Panel on Climate Change (IPCC), that by 2050 the Swansea Central Area will have periods of intense heavy rainfall, droughts, and rising temperatures. Failure to adapt to and mitigate for climate change is no longer an option if we are to provide an economically prosperous hub for the Swansea Bay City Region. Environmental sustainability is the basis for a resilient and prosperous Swansea. The benefits and cost-effectiveness of green infrastructure (GI) are now well documented. The regeneration currently underway in the Swansea Central Area provides a perfect opportunity to design in multi-beneficial GI improvements to help ensure we have a city centre fit for the future.
- 1.2 During 2019 the Council's Natural Environment Section worked in collaboration with Natural Resources Wales (NRW) and Green Infrastructure Consultancy (a leading expert with a proven track record in the green infrastructure industry) to develop a draft Swansea Central Area Green Infrastructure Strategy; *Swansea Central Area – Regenerating our City for Wellbeing and Wildlife* (Appendix A), including a Green Space Factor tool. The Strategy is designed to realise the green infrastructure aims of the Swansea Central Area Regeneration Framework and ensure the city centre benefits from strategically planned green infrastructure enhancements in both the planning of new development and the refurbishment of existing buildings and public spaces.
- 1.3 The strategy sets out the benefits and cost-effectiveness of green infrastructure i.e. reduced flood risk, summer cooling, cleaner air and water, reductions in noise, better mental and physical health, gains in biodiversity, reduced CO₂ emissions and energy costs and a strengthened economy. It will enable the Council and stakeholders to take an informed and joined up approach to maximising these benefits and will create investor confidence in green infrastructure in the city centre.

2. Strategy Development

- 2.1 To ensure and enhance the quality and variety of GI in development across Swansea Central Area the strategy provides a strategic approach by:
- demonstrating the environmental, social, economic and cultural benefits of improving and enhancing GI,
 - identifying opportunity areas and technologies/techniques for enhancing GI in new and existing development,
 - influencing strategic investment in GI based on its multiple benefits,
 - providing guidance and a tool to enable simple and reliable assessments of GI in new and existing development.

- 2.2 The Strategy is designed to provide an evidenced and clear overall strategy for multifunctional GI which performs individually and collectively, physically and visually, ensuring the Council maximise the city centre's potential and its environmental resilience. It sets out a vision for the central area of Swansea to be much greener, creating green spaces which deliver resilience, prosperity, health, well-being and happiness. The intention is to double the amount of green infrastructure (with the exception of open water) within 10 years, to create a distinctive destination city with a high quality environment which is more liveable, better adapted to climate change and better for people and wildlife.
- 2.3 The strategy includes a Swansea Central Area Green Space Factor (GSF) tool, designed to measure the permeability of the different types of surfaces when planning a new development / refurbishment. The tool scores surface cover types for their permeability and quality in terms of multiple benefits. Similar GSF tools have been widely used since the 1990's, including in Greater London, the North West Region and Southampton.
- 2.4 Whilst use of the tool is not mandatory the Strategy states that NRW and the Council intends to apply the tool to their development proposals and expects and encourages all developers within the central area to use the tool to inform and improve their schemes as part of the pre-application process.

- 2.5 The strategy's vision:

A city with high quality multi-functional green infrastructure delivers resilience, prosperity, nature, health, well-being and happiness to the citizens and visitors of Swansea.

was developed following significant stakeholder engagement, including workshops for colleagues from the private, public and 3rd sector (including PSB partners), along with internal sessions with officers and members including the Economy and Infrastructure Policy Development Committee. 634 face to face conversations were held with members of the public across 10 locations in the Swansea Central Area. Sessions with the 4 primary schools within the catchment were held along with stakeholder meetings with 6 local groups including residents and local interest groups, and social media engagement using #citynature / #naturynyddinas.

- 2.6 These conversations demonstrated an overwhelming desire for more nature in the city, with stakeholders talking about the contribution nature makes to their personal, mental and physical wellbeing and to their desire to live, work and visit the city centre. Swansea workers, residents and visitors wanted a greener, healthier city with less hard surfaces. A city which provides space for wildlife bringing people joy, and an

improved visitor and trading experience. A destination and liveable city which can adapt to and mitigate for climate change.

- 2.7 The draft strategy went out to public consultation between 22nd November 2019 and the 31st December 2019. The consultation process included an online survey and consultation events held at the 4 primary schools within the catchment area and in Swansea Central Library. 45 survey and one email response were received, along with comments from consultation sessions held with the 4 primary schools in the catchment area and members of the public in Swansea Central library. Professional stakeholders were consulted via the survey, and the draft was circulated internally to relevant Heads of Service for comment and a corporate workshop held on the 16th December 2019.
- 2.8 Overall the strategy was very well received. Over three quarters (79%) of survey respondents agreed with the strategy's vision, and over three quarters of survey respondents supported the strategic objectives. The comments and actions from the public surveys, email and school and Library session are all summarised in Appendix B.
- 2.9 The Strategy reflects the comments and suggestions from the consultation. In light of these comments the strategic objectives have been reviewed and revised to include SMART objectives which clearly reflect each component of the vision. The targets from the draft strategy have been reworked to form a suite of Performance Indicators supported by two targets: increasing canopy cover to 20 - 25% by 2044 and doubling terrestrial GI from 13% to 26% by 2030. These figures were based on latest available research and recommendations and considered to be appropriately ambitious given the physical constraints of a highly urbanised area.
- 2.10 A number of comments from the surveys referred to GI improvements at locations outside the Swansea Central Area. These will be addressed during the development of the County Wide GI Strategy, the engagement stage of which will recommence once covid restrictions have been lifted enabling face to face public engagement.

3. Using the Strategy Corporately

- 3.1. Swansea Council has a strong commitment to reducing and adapting to the effects of climate change. As demonstrated in its Climate Change Declaration, the corporate objective: Maintaining and enhancing Swansea's natural resources and biodiversity and, the Swansea Public Service Board's Working with Nature Objective. The inclusion of GI is an effective way for the Council to deliver against these commitments whilst also complying with the requirements of national and local drainage, planning and environmental legislation.
- 3.2 The scoping and development of the Strategy has been overseen by a cross cutting disciplinary steering group including Strategic Planning,

Nature Conservation, Regeneration, Landscape and Development Management teams within the Planning and City Regeneration Service, and colleagues from Drainage and Parks Services within the Place Directorate.

- 3.3 For corporate asset development, implementation of the strategy will have short and long term implications. The shift to the inclusion of GI in Council projects has the potential to have a short term effect on the costs of ongoing projects if not properly designed in. However, for future, longer term projects evidence shows that costs can be mitigated against by considering existing GI assets and interventions from the outset of a project. For example, recent Welsh Government analysis of the evidence for sustainable urban drainage (SuDS) concludes that the overall costs of well-designed good quality landscaped SuDS solutions are always less than those of conventional solutions, and in most cases the overall operational costs and maintenance costs are also lower. When piloting the GI Strategy and GSF Tool on 71/ 72 the Kingsway the design has been able to incorporate significant GI technologies within the design process.
- 3.4 There are numerous long term benefits of upfront investment in GI. For example the iTrees study of Swansea River Tawe catchment area (2015) concluded that trees in the catchment intercept an estimated 252 million tonnes of water (equivalent to an estimated £333,900 in sewage charges avoided), removed an estimated 136 tonnes of airborne pollutants (worth more than £715, 500 in damage costs), and an estimated 3,000 tonnes of carbon (estimated to be worth £671,000) from the atmosphere per year, worth and stored an estimated 102,000 tonnes of carbon (estimated to be worth £23.1 million). Other benefits include reducing surface water run off and localised flooding, creating habitats for wildlife, improving mental and physical health and wellbeing and child development, saving energy costs, increasing property values and inward investment, and protecting that investment from the impacts of climate change. Covid 19 has highlighted the importance of access to high quality greenspace for people's mental and physical health.
- 3.5 The Regeneration Team plan to use the Strategy to advise current and future phases of the Swansea Central Area regeneration programme. The Strategy has been aligned to the Swansea Central Area Regeneration Framework (SCARF) to reflect this. Regeneration and Development Management will also be encouraging partners and developers to use the strategy and tool as a simple and effective means of demonstrating compliance with legislation.
- 3.6 The issues of future maintenance and the need for training in the use of the GSF tool and implementing new GI infrastructure are fully recognised and reflected in the strategic objectives in the Strategy and will be addressed through bespoke training for teams on specific issues as required, and more widely through local professional

development events, working with communities to identify innovative ways to maintain GI, promoting and sharing good practice.

- 3.7 Corporate and partner cross-disciplinary collaboration will be key to delivering quality multi-beneficial GI which will tackle the causes and effects of biodiversity loss and climate change. The progress and success of the strategy will be monitored as part of the Council's Section 6 Duty under the Environment Act, the Council's Wellbeing objective: Maintaining and enhancing Swansea's natural resources and biodiversity and through the Swansea Public Service Board Local Wellbeing Plan and the Climate Change Programme Board where GI has been identified as one of the 8 themes for the achievement of zero carbon and the climate emergency response.
- 3.8 The collaborative stakeholder approach taken through the development of the strategy has meant that whilst in development the objectives and principles are already influencing developments locally and nationally. For example, successful engagement and partnership working with Welsh Government catalysed the development and delivery of a £5 million GI grant fund delivering capital GI schemes in the current financial year in urban centres across Wales, 4 of which are in the Swansea Central Area. The Strategy has also created local and national radio, television and broadsheet interest and media coverage.

4. Wellbeing of Future Generations Act

- 4.1 The sustainable development principle and the ways of working have been central to the development of this strategy from its conception, as outlined in Appendix C.

5. Equality and Engagement Implications

- 5.1 The Council is subject to the Public Sector Equality Duty (Wales) and must, in the exercise of their functions, have due regard to the need to:

- Eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act.
- Advance equality of opportunity between people who share a protected characteristic and those who do not.
- Foster good relations between people who share a protected characteristic and those who do not.

Our Equality Impact Assessment process ensures that we have paid due regard to the above.

- 5.2 The Strategy is part of the delivery of the Council's Corporate Plan and the Swansea Local Well-being Plan both of which have undergone full EIA's. As a strategy focusing on the natural environment it will not directly impact on any of the relevant protected groups. However by enhancing and improving the natural environment the strategy will

contribute to all the Wellbeing of Future Generation Act's 7 well-being goals and therefore indirectly contribute to the overall improvement of wellbeing for all Swansea residents including the relevant protected groups, by contributing to improving social, environmental, economic and cultural well-being.

6. Financial Implications

- 6.1 Acceptance of this strategy will further embed and reinforce the wider GI obligations and requirements on the authority as set out in the LDP and WBFGA. In the short term there would be potential for additional costs to current projects that have not had GI adequately designed in from the outset, however this would be offset in the longer term by the savings that better use of GI would bring to future projects.

Acceptance of the report does not mean that additional resources will be made available and it should be assumed that future spending needs will need to be contained within existing budget provision and furthermore also have full and due regard to the likely heavily constrained resources available to the authority in future.

7. Legal Implications

- 7.1 The Council must comply with the statutory obligations for biodiversity and natural resource management contained in the Well Being of Future Generations Act 2015 and the Environment (Wales) Act 2016 as detailed in this report.

Appendices: These will be included within the report.

Appendix A Swansea Central Area: Regenerating Our City for Wellbeing and Wildlife

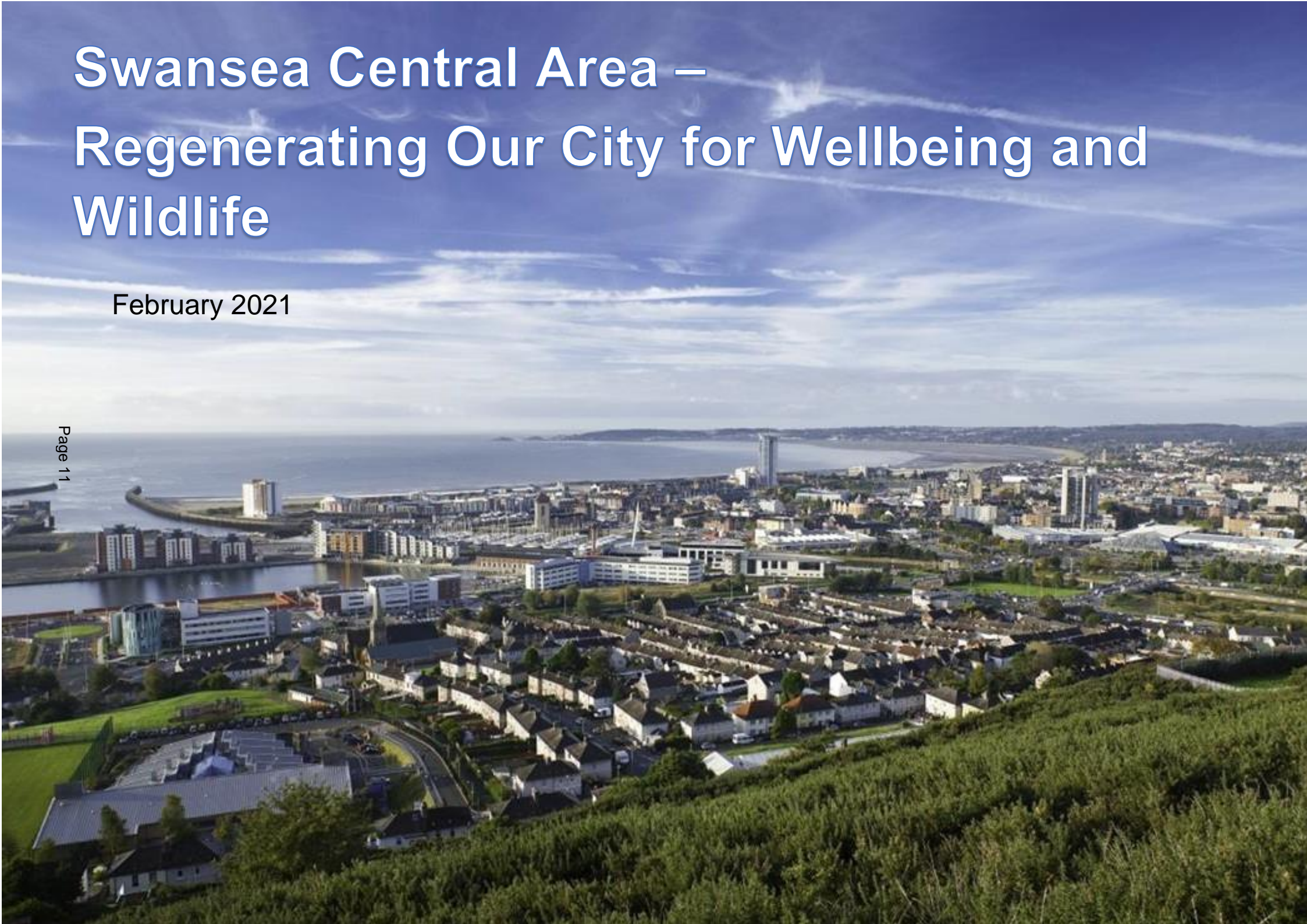
Appendix B Consultation Report

Appendix C Assessment of the Strategy's contribution to the Well-being of Future Generations Act's wellbeing goals and application of the ways of working.

Appendix D EIA Screening Form

Swansea Central Area – Regenerating Our City for Wellbeing and Wildlife

February 2021





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SUMMARY

This strategy sets out the Swansea Council's and Natural Resources Wales's vision for:

“A city with high quality multi-functional green infrastructure delivering resilience, prosperity, nature, health, well-being and happiness to the citizens and visitors of Swansea.”

The landmark report by the UN Intergovernmental Panel on Climate Change (IPCC)¹ advises that by 2050 the Swansea Central Area will have periods of intense heavy rainfall, droughts and rising temperatures. In this strategy Swansea Council and Natural Resources Wales send a powerful message that failure to adapt to and mitigate for such a climate change scenario is no longer an option, if we are to maintain an economically prosperous hub for the Swansea Bay City Region. Environmental sustainability is the basis for a resilient and prosperous Swansea. It requires current generations to choose how they meet their needs without compromising the ability of future generations to be able to do the same.

The benefits and cost-effectiveness of green infrastructure are now well studied and include reduced flood risk, summer cooling, cleaner air and water, reductions in noise, better mental and physical health, gains in biodiversity and a strengthened economy. The economic benefits of green infrastructure are increasingly being recognised, for example, in terms of savings compared to drainage infrastructure, reduced heating and cooling costs of buildings, increased property values and creation of green job opportunities.

Wales has legislation; the Well-being of Future Generations (Wales) Act 2015 and Environment (Wales) Act 2016, which requires that people work together to protect and enhance nature for the long-term benefit of all. Wales also has the requirements of the Flood and Water Management Act 2010 and Statutory Standards for Sustainable Drainage Systems 2018 which requires a new approach the sustainable management of surface water. The provision of green infrastructure will enable us to meet these requirements, and this Strategy aims to create investor confidence in green infrastructure by describing how it will be applied in the Swansea Central Area.

¹ IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate

change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)

“A City that is green is a City where I want to be seen.
A City that is bare is a City that does not care”

Anonymous member of the public, Swansea

The development of this strategy involved over 634 face to face conversations with members of the public, including residents and visitors to the Swansea Central Area, about what nature in the city means to them. Workshops were also held with businesses, developers, architects, landscape architects, public sector staff and Swansea Councillors. The overwhelming message from this engagement was that #citynature is very important to people and will increase their enjoyment and therefore their dwell time in the city centre.

Swansea Central Area is located in an attractive setting, with Swansea beach and bay, the river Tawe, and surrounding hills and woods all within sight. However within the urban area, with the exception of churchyards, the marina and a few locations where there are street trees, sealed surfaces dominate. There are plans however to increase the amount of green infrastructure in new schemes outlined in the Swansea

Central Regeneration Framework (SCARF), which will make the area more vibrant and attractive.

This strategy considers how green infrastructure can be increased in extent and quality in the central area of Swansea in order to make it better adapted to climate change and a better place for people and wildlife. Green infrastructure is a term used to describe all the greenspace, soil, vegetation and water (ranging from parks to roof gardens) that provide the ecosystem services that make our places more liveable.

“Taking kids shopping is a headache. 30 minutes
break for free play is a life line. Children don’t have
that chance today.”

Anonymous shopper, Swansea Quadrant

This strategy sets out a vision for the central area of Swansea to be much greener and more biodiverse, creating green spaces and using a combination of street-level features such as street trees and rain gardens as well as vegetation on buildings, including green roofs and green walls. The intention is to double the amount of green infrastructure (with the exception of open water) within 10 years. The focus will be to create a green infrastructure network, centred on a Green Artery that will connect Swansea Station in the north, with the beach and marina in the south and the wider area, via existing, improved greenspaces including churchyards and Castle Square. Green infrastructure will be planned and designed to be multi-functional and will involve a partnership approach, using innovative solutions, including Supplementary Planning Guidance for green infrastructure and a Green Space Factor tool (GSF tool). Swansea Council is committed to using the GSF tool, designed for the Swansea Central Area, as a measure for the quantity and functionality of green space in its developments. The GSF tool is described in Appendix 3.

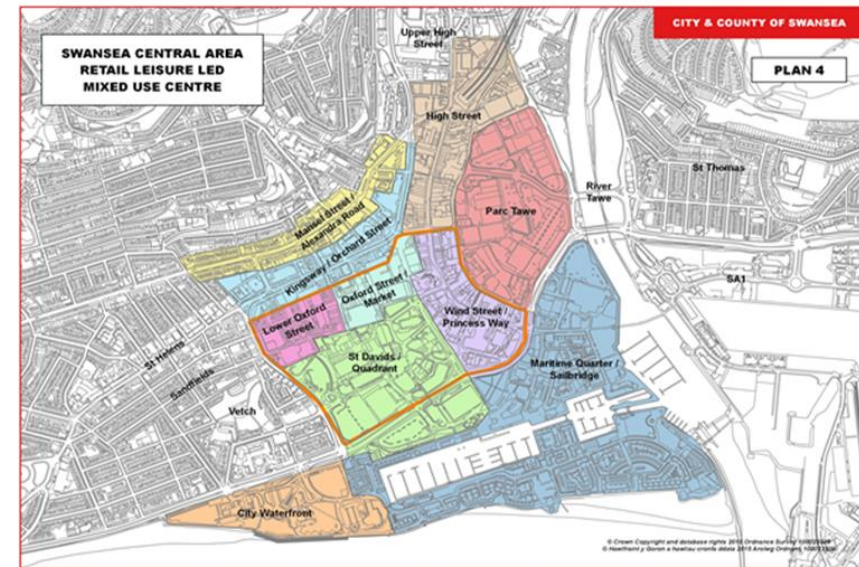


Figure 1: Swansea Central area as identified in the Swansea Central Area Regeneration Framework (SCARF)

1 INTRODUCTION

The Challenge

- 1.1 Swansea Central Area is dominated by sealed surfaces and buildings with GI making up only 13% of the area. There is clear evidence from the UN Intergovernmental Panel on Climate Change (IPCC) that by 2050 the Swansea Central Area will have periods of intense heavy rainfall, droughts and rising temperatures. Failure to adapt to and mitigate for climate change is no longer an option. The benefits and cost-effectiveness of green infrastructure (GI) are well documented. Environmental sustainability is the basis for a resilient and economically prosperous Swansea.

The Solution

- 1.2 Increasing GI and adaptation to / mitigation for climate change as part of the regeneration of the Swansea Central Area, is an important key driver for economic prosperity in the Swansea Bay City Region.
- 1.3 This strategy is designed to provide a focused approach to enhancing and developing urban GI. Whilst this strategy is for the Swansea Central Area, it will

eventually form part of a Green Infrastructure Strategy to be developed for the whole of the County of Swansea. Implementation requires a cross-disciplinary approach across services in Swansea Council, Natural Resources Wales and partners. This strategy demonstrates how the provision of more multifunctional GI will enable us to meet the requirements of relevant Welsh legislation and policy including the Well-being of Future Generations (Wales) Act 2015, Environment (Wales) Act 2016 and Schedule 3 of the Flood and Water Management Act 2010. The strategy is intended to be used by all stakeholders involved in the redevelopment and refurbishment of the Swansea Central Area.

- 1.4 The purpose of the strategy is to outline how GI can restore nature and contribute to improving the economy, culture and health & wellbeing in the Swansea Central Area. It describes existing GI assets and sets out a vision for future provision of GI. Climatologists predict that by 2050, the Swansea Central Area will have periods of intense heavy rainfall, droughts, and rising temperatures.² In this strategy Swansea Council and Natural Resources Wales send a powerful message that

² IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate

change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)

failure to adapt to climate change is no longer an option, adaptation will be essential if Swansea is to continue to be an economically prosperous hub for the city-region. Maintaining existing and creating new high-quality GI is an important part of the work that Swansea Council and Natural Resources Wales will be undertaking to adapt to climate change and halt and reverse biodiversity losses. GI is essential for the health and well-being of Swansea's visitors and residents and to the vibrancy and viability of the city centre as the economic driver and key leisure destination of the Swansea Bay Region.

- 1.5 The intention is to bring about a cultural change so that a collaborative, cross-disciplinary, multifunctional approach to the planning, design, construction and maintenance of GI is adopted. The strategy sets out guiding principles and a framework for implementation. The implementation of the strategy is supported by the use of the Swansea Green Space Factor (GSF) tool, designed to increase the quantity and functionality of GI schemes (Appendix 3). The strategy is also supported by a catalogue of green infrastructure interventions (Appendix 2). Swansea Council, together with Natural Resources Wales is committed to promoting these schemes and interventions, and encourages others to use them, particularly when considering the design of proposals and associated GI schemes.

- 1.6 The GSF tool will help translate policy objectives into practice. It will not replace policies, strategies, plans or codes, but will help planners, and those involved in the development process to better understand how GI can be designed into schemes.
- 1.7 In those cities where they have been applied, GSF schemes have been shown to increase the amount of green space within developments, as well as increasing functionality, particularly with respect to surface water drainage. GSF schemes are supported by a wealth of evidence and experience, benefits include:
- a) A reported increase in the use of multifunctional green infrastructure features.
 - b) Urban greening on restricted sites in densely developed areas.
 - c) A simple mechanism, easily understood by non-specialists.
 - d) Facilitation of conversations between developers and planners.
 - e) Empowerment of local planning authorities to demonstrate the case for more greening.
 - f) Greater flexibility with scores and targets able to be adjusted to reflect local priorities.



Figure 2. Green roofs for example provide many benefits which enable developers to reach GSF targets

What is Green Infrastructure?

1.8 Green infrastructure (GI) is defined by the UK government as a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities. As a network it includes natural habitats ranging from grasslands, wetlands and

woodland to parks, open spaces, playing fields, street trees, rain gardens, allotments and private gardens. It can also include rivers, streams, canals, docks, beaches and other water bodies and features such as green roofs (Figure 2) walls.³ It is the urban elements of GI which are of particular relevance to this strategy.

1.9 Green infrastructure (GI) is a catch-all term used to describe all the features of the natural environment between and within our towns and cities. By providing GI we are able to enjoy the many “ecosystem services” that these features provide as part of a sustainable approach to the management of natural resources where multi-functionality becomes a key objective of good design. Ecosystem services are the benefits that people derive from nature.⁴

1.10 GI can be accessible or inaccessible, publicly or privately owned, managed or unmanaged, designated as open space or for nature conservation or not. GI includes all soil, vegetation and water. It does not include paved or sealed surfaces or buildings, but it does include features on buildings such as green roofs and green walls.

³ Landscape Institute on GI <https://www.landscapeinstitute.org/policy/green-infrastructure/>

⁴ Ecosystem Services <https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/ecosystem-services>

1.11 Nature-based Solutions (NbS) is a term used by the International Union for Conservation of Nature (IUCN) to describe actions that protect or restore nature for human wellbeing or biodiversity. NbS features are part of the GI network. Green infrastructure can be defined as the “network of green (soil and vegetation) and blue (water) spaces that provide ecosystem services.”⁵

1.12 Between 2009 and 2011 the UK National Ecosystems Assessment (UK NEA) analysed the natural environment in terms of the benefits it provides for society. It was found that our economy, health and wellbeing depend on the range of services provided by ecosystems and their components.

1.13 These include:

- Supporting services – those necessary for all others, including nutrient cycling and photosynthesis.
- Provisioning services – food, fibre and fuel.
- Regulating services – including clean water, clean air and climate.
- Cultural services – recreational, wellbeing, beauty and sense of place.

Multi-functionality is linked to spaces that provide the broadest range of ecosystem services.

1.14 The GI, ecosystem services, approach to land use planning, design, creation and maintenance enables us to gain more from the built environment, by conserving and restoring natural features and thinking about the widest range of functions, thereby ensuring benefits can be maximised. Sections 4 and 5 set out how that can be brought about. Good quality multifunctional GI requires an integrated approach that embraces many disciplines and all stakeholders. It must be considered at every level of the planning, design and management / maintenance process across all departments and disciplines, and is relevant at every scale of development, from major regeneration projects to individual buildings to site specific features such as tree pits. A positive and proactive approach will enable an area to make best use of its air, land and water, providing a better return on investment and happier and healthier residents and visitors.

1.15 There is a considerable, and rapidly growing, body of evidence that GI is essential for human health and wellbeing, provides habitat for wildlife and will help us to adapt to climate change. For a full review of the benefits

⁵ Nature-based Solutions <https://www.iucn.org/commissions/commission-ecosystem-management/our-work/nature-based-solutions>

of GI and key references and sources of information, see the Ecosystems Knowledge Network website.⁶

1.16 Given the range of benefits provided, the protection, creation, enhancement and maintenance of GI, should be a key consideration in all land use plans and projects.

1.17 GI is multi-functional and operates at different spatial scales, which means that its importance is often underestimated. The provision and maintenance of GI is the responsibility of many different authorities and landowners, which means that coordination, cooperation and collaboration is essential. There is also a wide spectrum of GI types, many of which are not included in conventional classifications of greenspace or nature conservation sites, which can lead to confusion about what should be prioritised. GI is rising up the political, legislative, social and environmental agenda, due to the burgeoning body of evidence for its benefits (see Chapter 2 for more detail on policy).

1.18 It is important that GI provides the widest range of benefits (ecosystem services). This means that

ecosystems must be protected and restored along with the microbes, plants and animals (biodiversity) that make ecosystems work. Biodiversity loss is now a major concern for civilization.⁷ The European Commission and the UK government is committed to halting overall biodiversity loss and are seeking biodiversity net gain/benefit in development.⁸ GI forms part of national

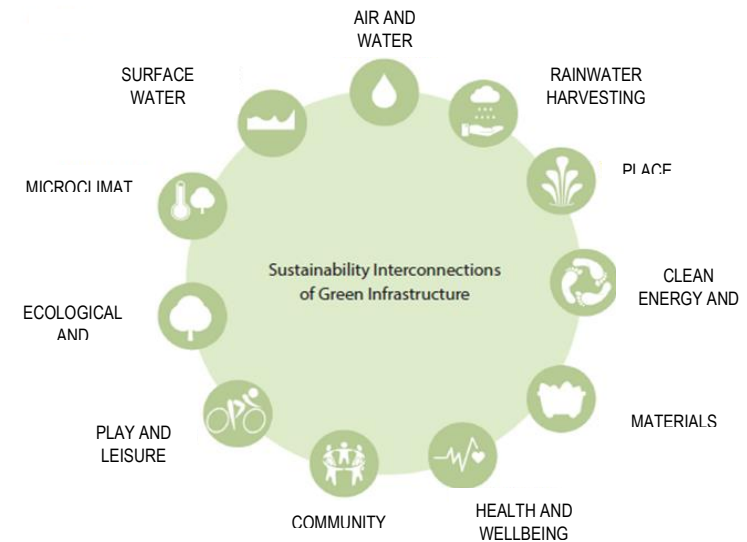


Figure 3. Interconnections of GI

⁶ Ecosystems Knowledge Network
<https://ecosystemsknowledge.net/resources/tools-guidelines/green-infrastructure>

⁷ Stockholm Resilience Institute on biodiversity loss
<https://www.stockholmresilience.org/research/research-news/2018-10-30-natures-steep-decline.html>

⁸ UK Government consultation on biodiversity net gain
<https://consult.defra.gov.uk/land-use/net-gain/>

policy as set out in Planning Policy Wales: Edition 10 and Welsh Government's Natural Resources Policy where it is regarded as a key mechanism for delivering the aspirations for ecological networks and creating natural and distinctive places. Figure 3 illustrates the range GI benefits.

1.19 Investment in GI benefits communities and provides a financial return. The prioritisation of green spaces in regeneration schemes may seem at odds with delivery of housing and growth targets, yet renewal and development can be an opportunity to “create places with more nature afterwards than before.”⁹



Street tree



Biodiverse extensive green roof



Green wall



Rain garden



Roof terrace



Allotment



Woodland



Beach

Figure 4. Various types of green infrastructure

⁹ Berkeley Group on biodiversity net gain
https://www.berkeleygroup.co.uk/media/pdf/0/k/The_Nine_Concepts_-_Making_space_for_nature_and_beauty.pdf

Across Swansea, in recent years we have increasingly seen the proponents of new developments viewing GI as a valuable, multi-functional asset, supporting the delivery of quality homes and neighbourhoods. It is important that this is continued and expanded upon with developers taking greater responsibility to use the full palette of GI options, as illustrated in Figure 4 , to demonstrate how they are addressing this issue as part of demonstrating net biodiversity benefit.

Benefits of Green Infrastructure

1.20 The components of GI have traditionally been valued for the amenity that they bring to the urban environment, that is, the way that they make peoples' surroundings more pleasant and their living and working environments more attractive. However, there is now a considerable, and growing, body of evidence of the wide range of benefits GI brings:

1.21 Environmental benefits:

- Adaption and mitigation to climate change i.e. cooling and shading and flood mitigation and creating micro-climate i.e. wind breaks.
- Creating habitat for wildlife, enhancing connectivity and supporting natural processes e.g. nutrient cycles.

- Reducing air and water pollution.
- Providing food.

1.22 Social and cultural benefits:

- Improving mental and physical health and wellbeing i.e. promoting physical exercise, dampening noise and lowering stress i.e. calming and inspiring.
- Facilitating social interaction i.e. multigenerational cohesion and creative play.
- Improving child development.
- Improving air quality by filtering particulates and absorbing gases.

1.23 Economic benefits:

- Saving in energy costs.
- Reduction on insurance claims e.g. from flooding
- Increased productivity.
- Increased property values.
- Increased footfall for businesses.
- Increased inward investment.
- Reduced pressure on infrastructure i.e. removal of carbon from the atmosphere, airborne particulates, interception of water run off.

1.24 More in-depth detail on the benefits of GI are provided in Appendix 1.

2 STRATEGIC CONTEXT

National GI Drivers

2.1 There is legislation, policy and guidance which supports the creation and maintenance of GI at both

national and local levels. The benefits of GI (as described in the previous section) and their relationship to national guidance and legislation are outlined in Table 1 below.

Wellbeing of Future Generations (Wales) Act 2015	Environmental (Wales) Act 2016	Schedule 3 Flood & Water Management Act 2010 Statutory Standards	Active Travel (Wales) Act 2013 Manual for Streets	Planning Wales Act 2015 Planning Policy Wales 2019
<ul style="list-style-type: none"> Places a legal duty on all public bodies to improve wellbeing. GI contributes to all wellbeing goals: <ul style="list-style-type: none"> o Prosperous o Reliant o Healthier o Cohesive communities o Vibrant culture o Globally responsible Healthy environment as a key principle of GI. 	<ul style="list-style-type: none"> Places a legal duty on the Council to protect and enhance biodiversity and maintain resilient ecosystems (the Section 6 Duty). Ecosystems services approach must be used in the consideration of all development. Resilience of ecosystem services considered against principles of diversity, condition, extent and connectivity of ecosystems and their adaptation to climate change. 	<ul style="list-style-type: none"> Gives duties to approve, adopt and maintain Sustainable Drainage Systems (SuDS) on the SuDS Approving Body (SAB). Developers of sites of 1 or more dwellings of 100m² or more are required to implement sustainable urban drainage solutions in line with 6 statutory standards which promote SuDS design which deliver benefits of multifunctional GI. 	<ul style="list-style-type: none"> Duty on the Council to promote provision for walkers / cyclists and sustainable development. Promotes multifunctional streets which achieve carbon reduction, health / air quality improvements, community pride / sense of ownership. Promotes well-designed streets in sustainable communities where people want to live and work now and in the future' 	<ul style="list-style-type: none"> Planning Wales Act links land management to sustainable management of natural resources. PPW guidance recognises GI as key to delivery of Placemaking and sustainable development. "GI is fundamental to shaping places, creating wellbeing and quality of spaces to live, work and play. It enhances the built environment when integrated appropriately and creatively." (PPW 6.2.4) "Development of GI is an important way for Local Authorities to deliver their Section 6 duty" (PPW6.2.2)

Table 1: National Legislation, Policy and Guidance

2.2 In addition to complying with the legislation described in the table, improving the quantity, quality and variety of GI in the city will contribute to compliance with other legislation which addresses air and water quality, climate change, surface water run-off, resilience planning, biodiversity, health and wellbeing (including mental and physical health) and social exclusion.

GI Drivers in Swansea

2.3 Swansea Council and Natural Resources Wales Corporate Plans both recognise that our city faces a number of challenges in the years ahead, one of which is climate change (with more heatwaves and surface-water flooding, air quality problems and biodiversity losses predicted). Locally appropriate, good quality GI will help to mitigate these challenges and reduce future costs. The national legislation shown in Table 1 is supported by local strategy, policy and guidance, as outlined in Table 2 below.

Swansea PSB Local Wellbeing Plan	Swansea Council Corporate Plan	Swansea Local Development (LDP) Plan and SPG	Swansea Council Strategies	Swansea Designations and Evidence
<ul style="list-style-type: none"> The Public Service Board (PSB) has embedded the Section 6 duty of the Environmental (Wales) Act 2016 into the Local Wellbeing Plan 2018. 'Working with Nature' is one of the plan's Wellbeing objectives. 	<ul style="list-style-type: none"> The Council has embedded the Section 6 duty into the Corporate Plan 2018 – 2022. Improving GI is one of the steps of the resilience objective. 	<ul style="list-style-type: none"> LDP supported by SPG promotes sustainable development and placemaking. Policy ER 3 – Strategic Green Infrastructure Network – requires development to explore all opportunities to maintain and enhance GI network at all scales. 	<ul style="list-style-type: none"> Biodiversity Action Plan / Nature Recovery Plan. Swansea Flood Risk Management Plan 2015. Air Quality Management Area Action Plan (2004) 	<ul style="list-style-type: none"> Quiet Area (designated under Noise Action Plan for Wales). Open Space Assessments (Fields in Trust and Accessible Natural Greenspace provision) and emerging Open Space Strategy. Air Quality Management Areas Natural Resources Wales South West Wales Area Statement.

Table 2: Local Legislation, Policy and Guidance

3 VISION, STRATEGIC OBJECTIVES & PRINCIPLES

Vision

- 3.1 **A city with high quality multi-functional green infrastructure delivers resilience, prosperity, nature, health, well-being and happiness to the citizens and visitors of Swansea.**

Strategic Objectives

- 3.2 Each strategic objective contributes **directly** to any elements of the vision and **indirectly** to all the elements of the vision.
- Provide a high quality nature rich environment.
 - Create a distinctive destination city.
 - Ensure the city is resilient to the impacts of climate change.
 - Ensure stakeholder and community involvement in the design and maintenance of GI.
 - Create a skilled and knowledgeable local economy to deliver and maintain GI.
- 3.3 The vision and strategic objectives were developed following significant engagement with stakeholders from the local community, Councillors, local businesses, visitors, the public, private and third sectors. These conversations established an overwhelming desire for more nature in the city, with stakeholders talking about

the contribution nature makes to their personal mental and physical wellbeing and to their desire to live, work and visit the Swansea Central Area.

- 3.4 The engagement process recognised a need:
- to build local knowledge and skills around the opportunities and benefits of GI.
 - to provide training for all involved in the design development and maintenance of GI.
 - for robust local policy and guidance on GI supported by cross sector leadership.
 - for partnership working to implement GI projects and share learning.
 - for community involvement in the good design of GI schemes.
- 3.5 The strategy's strategic objectives have been designed to address these needs. Performance indicators and targets have been set to ensure the vision is achieved and monitor progress.
- 3.6 Applying the five principles of GI to the design process (see paragraph 3.10) will ensure the social, economic and environmental benefits of GI are maximised and the strategy's goals are achieved.
- 3.7 Table 3 below sets out the steps and actions that will need to be taken to achieve each strategic objective

along with performance indicators and targets which have been set to evaluate and measure progress.

3.8 Research findings indicate that a target of 20% to 25% canopy cover within the Swansea Central Area by 2044 is ambitious yet realistic.¹⁰ An increase of terrestrial GI to 26% by 2030 requires Swansea Council, Natural Resources Wales and their partners to double the amount of GI in 10 years which is again ambitious but realistic.

3.9 The intention is to increase resilience, prosperity, health, wellbeing and happiness for citizens and visitors and to ensure that the GI network complements and improves the existing natural and built environment. This vision and strategic objectives will contribute to delivering the Swansea’s Local Well-being Plan, Local Development Plan (LDP) and Swansea Central Area Regeneration Framework.

Strategic Objective	Steps and Actions	Performance Indicator	Target
Provide a high quality nature rich environment	<ul style="list-style-type: none"> Review opportunity for increasing canopy cover across the Swansea Central Area and map potential to reach 25%. Review opportunity for increasing biodiversity across the Swansea Central Area and map potential. Ensure GI is built into schemes from the outset. Become a Trees in the Townscapes champion by officially endorsing the 12 Trees in the Townscape principles¹¹ in Swansea Central Area. 	<ul style="list-style-type: none"> Increase terrestrial GI Increase canopy cover. Increase biodiversity. GI to achieve the strategy’s five GI principles by being multifunctional, biodiverse, adapted for climate change, healthy and smart and sustainable. 	<ul style="list-style-type: none"> Increase terrestrial GI to 26% by 2030. Increase canopy cover to 20 - 25% by 2044.

¹⁰ Doick, K.J, Davies, H. J, Moss, J., Coventry, R., Handley, P., Vaz Monterio, m., Rogers, K., Simkin, P.: *The Canopy Cover of England’s towns and Cities: baselining and setting targets to improve human health*

and wellbeing Conference Proceedings of TPBEIII. Urban Trees Research Conference 5-6th April 2017 Institute of Chartered Foresters, Edinburgh

¹¹ <http://www.tdag.org.uk/trees-in-the-townscape.html>

Strategic Objective	Steps and Actions	Performance Indicator	Target
	<ul style="list-style-type: none"> Encourage partners to apply the 12 Trees in the Townscape principles to all developments 	<ul style="list-style-type: none"> Number of green roofs installed to GRO code requirements.¹² 	
Create a distinctive destination city	<ul style="list-style-type: none"> Build GI into Swansea Central Area improvement programmes and grants. Ensure the Green Space Factor tool (GSF tool) is used on Council led developments. Encourage developers and land managers to improve GI. Encourage the use of GSF tool by partners and on non Council led developments. Investigate and attain wildlife and well-being friendly city schemes such as; Biophilic City¹³, National Park City¹⁴, UNESCO Biosphere Reserve¹⁵. Report and monitor improvements to economic, social and environmental welling in the Swansea Central Area. 	<ul style="list-style-type: none"> Number of GI projects enabled by the Target Regeneration Investment (TRI) programme or similar. Monitor using mapping data. 	<ul style="list-style-type: none"> Increase terrestrial GI to 26% by 2030. Increase canopy cover to 20 - 25% by 2044.
Ensure the city is resilient to the impacts of climate change	<ul style="list-style-type: none"> Design and implement GI solutions. Develop Swansea as a sponge city¹⁶ through implementation of good multifunctional SuDs. 	<ul style="list-style-type: none"> GI solutions to achieve the strategy's five GI principles by being multifunctional, biodiverse, adapted for climate change, 	<ul style="list-style-type: none"> Increase terrestrial GI to 26% by 2030. Increase canopy cover to 20 - 25% by 2044.

¹² GRO Green Roof Code 2014 <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

¹³ <https://www.biophiliccities.org/>

¹⁴ <https://www.nationalparkcity.org/>

¹⁵ <https://en.unesco.org/biosphere>

¹⁶ <https://www.worldfuturecouncil.org/sponge-cities-what-is-it-all-about/>

Strategic Objective	Steps and Actions	Performance Indicator	Target
	<ul style="list-style-type: none"> • Monitor the success of GI solutions and adapt design to maximise resilience where necessary. • Create Baselines for measuring the success of GI solutions 	<p>healthy and smart and sustainable.</p> <ul style="list-style-type: none"> • Working with partners to assess all available data for monitoring. 	
Ensure stakeholder and community involvement in the design and maintenance of GI	<ul style="list-style-type: none"> • Involve communities in the design and development of GI • Work in partnership with community groups to identify sites and plant trees to increase canopy cover. • Work with community groups to identify innovative ways to maintain GI. 	<ul style="list-style-type: none"> • Number of GI projects incepted / co-produced and/or maintained by stakeholders. 	
Create a skilled and knowledgeable local economy to deliver and maintain GI	<ul style="list-style-type: none"> • Work with industry experts to build local knowledge base. • Develop interactive webpages for Strategy. • Develop a plan for communicating GI development and successes. • Work with partners to design, develop and provide training. • Design and deliver events / contunited professional development to build GI skills and raise awareness. • Promote best practices through local case studies and pilots. 	<ul style="list-style-type: none"> • Number of events to raise awareness of green infrastructure for businesses / organisations to build the local green infrastructure sector. • Number of SME's specialising in delivery and maintenance of GI. 	

Table 3: Actions and Targets for achieving the Strategic Objectives

Principles of GI

3.10 The five principles (Figure 5) should be considered by all who plan, design, build, vegetate and maintain green infrastructure. By following these principles, interventions maximise the number and intensity of benefits for people and wildlife. Applying these principles will successfully achieve the strategy’s vision.

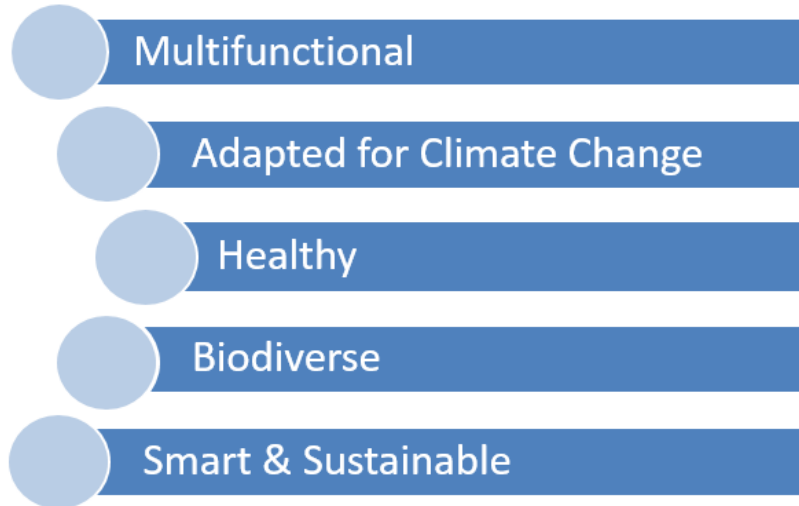


Figure 5. Principles of GI

Multi-functional

3.11 Nature itself is multi-functional. A natural area simultaneously provides a full range of ecosystem services. Humans tend to modify land use for limited purposes – for example, an arable field produces food, or a car park stores cars. The conventional approach is for specialist individuals or organisations or departments to provide a facility that does one thing well. However it is important, given the scale of the difficulties facing urban areas, which are likely to be exacerbated by climate change and biodiversity loss that every effort is made not to miss opportunities to make features multi-functional. Although there can be trade-offs, more often than not, extra provision of GI elements does not interfere with the primary purpose and the return on any extra investment is positive as illustrated in Figure 6.

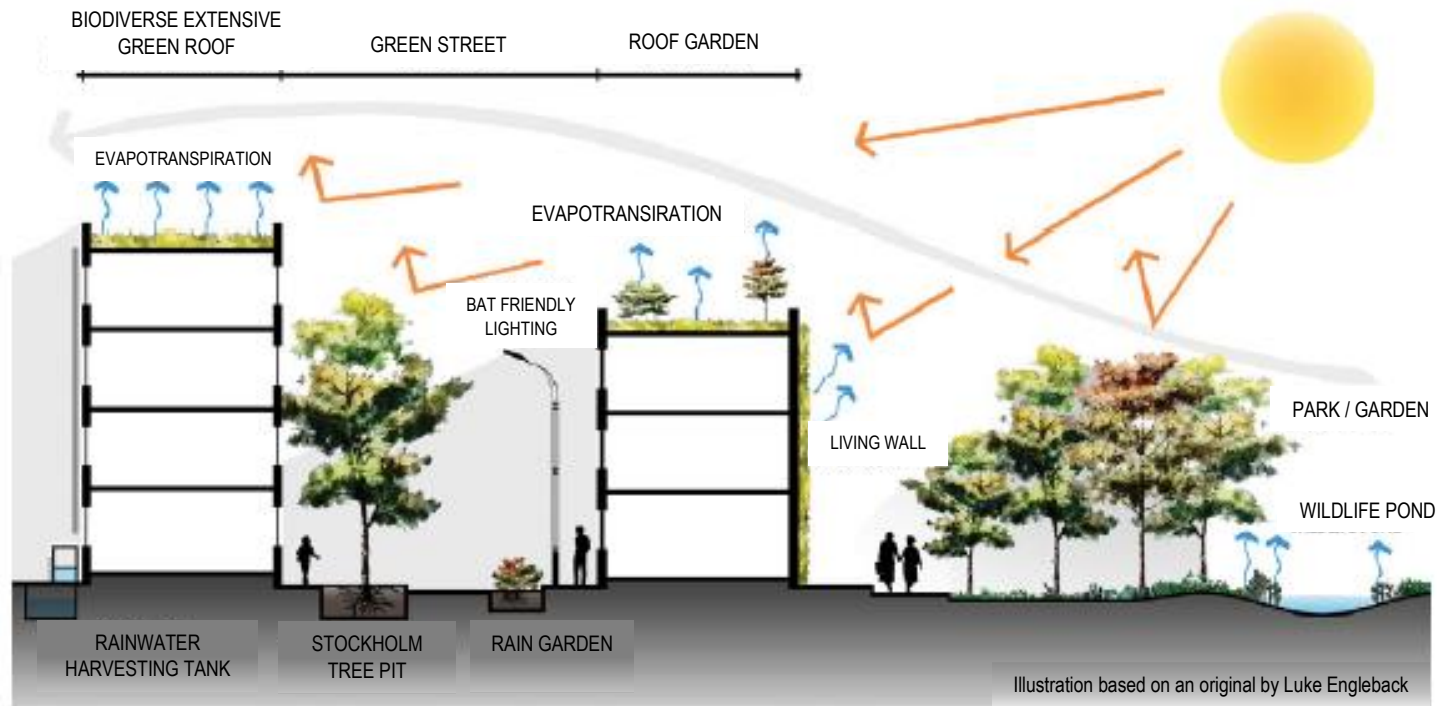


Figure 6. Green infrastructure improves microclimate

3.12 A cycle path can be an ecological as well as a transportation corridor. Extra tree planting in a car park can improve amenity, provide summer shade, sustainable drainage and biodiversity. Sometimes there are synergistic effects. An example is a biosolar roof (photovoltaics combined with a green roof) where a cooler microclimate increases the output of the photovoltaics.

3.13 Multi-functionality is also illustrated in Appendix 2 in the petal diagrams, designed to demonstrate the contribution of various ecosystem services in GI typologies. The more balanced and bigger the petals the more multi-functional the GI type.

Adapted for Climate Change

3.14 According to the Met Office Hadley Centre Climate Programme, climate change is predicted to lead to sea level rises, warmer and wetter winters and hotter and drier summers.¹⁷ Summer heatwaves are likely to be more frequent and more intense. Heavier downpours, even in summer, are likely to lead to flash flooding. Even if greenhouse gas emissions and associated global

warming can be limited, some increases in heatwaves and surface water flooding will occur. For example Figure 7 illustrates the benefits of sustainable urban drainage systems as part of GI solutions to mitigate for and adapt to the impacts of climate change.

3.15 In general, an increase in GI will be a cost-effective way of adapting to these changes. More specifically, features that provide shade and evaporative cooling in summer (Figure 8 and 9), close to where people live and work and features that intercept and filter rainwater and surface water run-off, should be incorporated into schemes.

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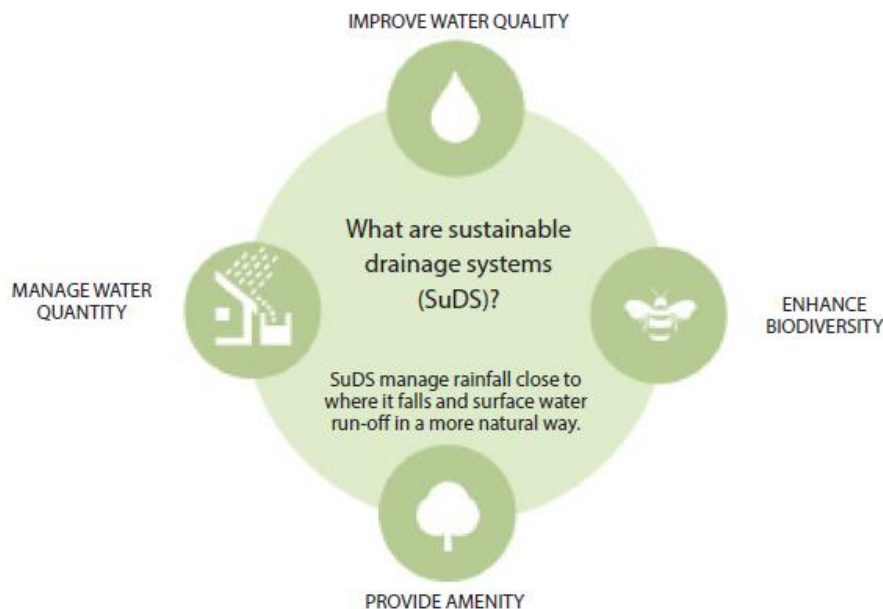


Figure 7. What are SuDS?

¹⁷ <https://www.metoffice.gov.uk/research/collaboration/ukcp/derived-projections>



Figure 8. Infra-red image of masonry wall (left) and green wall (right)

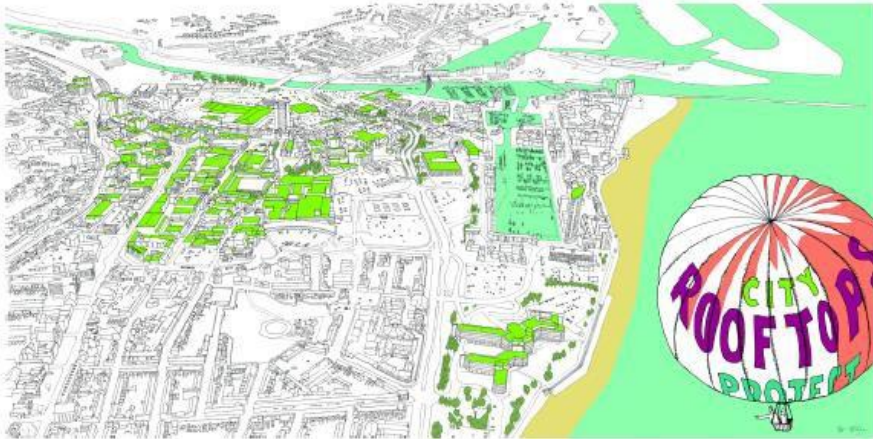


Figure 9. Potential for green roofs across Swansea city centre produced by Andrew Nixon/Powell Dobson Architects for the CIVIC 2014 Exhibition at the Mission Gallery

Healthy

3.16 For good health and a sense of wellbeing, people need clean air, clean water, food, exercise, contact with nature and places to socialise, play and learn. GI can provide these benefits. Conventional, readily accessible greenspace is important, however other GI features, even if simply overlooked like green walls, can be important for mental health. Unseen features, like extensive green roofs for example, may be providing relief in a heatwave, filtering water, or absorbing air pollution. The precise location and specific design of

green infrastructure can be an important factor with respect to providing health benefits (Figure 10).



Figure 10. Cycle path as a green corridor

Biodiverse

3.17 Biodiversity is the whole range of living things and systems on earth, it includes ecosystems, animals, plants, microbes and the genetic variation between them. All life depends on biodiversity and ecosystems function better when high biodiversity is maintained. In responses to continuing losses, Natural Resources Wales has recently set out a fresh approach to

conserving biodiversity, named 'Vital Nature'¹⁸ sets out priorities for protecting and restoring Wales' biodiversity, the variety of habitats and species and the ecosystems they depend on. Central to the report is the principle that everyone's wellbeing depends on a healthy environment, which in turn depends on healthy biodiversity

3.18 Swansea has a Local Biodiversity Action Plan (LBAP).¹⁹ There is a strong emphasis on partnership, engagement and learning in the LBAP. Urban wildlife referred to includes bats, song thrush, bumble bees, mason bees, butterflies and stag beetle, amongst others.

3.19 Wherever GI occurs in Swansea, consideration should be given to how biodiversity can be maintained and enhanced. Planting schemes, native species or species with a documented value for wildlife, where justified, should be used, along with appropriate habitat features such as decaying logs, nesting and roosting boxes for birds and bats and refugia for invertebrates (bug hotels) and wildflowers.



Figure 11. Mason bees using bee

Smart & Sustainable

3.20 A transition in the economy, away from fossil fuels, in order to avoid the worst effects of climate change, is essential and the Welsh Government has published a decarbonisation programme.²⁰ In addition, reductions in pollution and waste, with more recycling and waste increasingly used as a raw material (for example, the circular economy) is sought.²¹

¹⁸ <https://naturalresources.wales/about-us/news-and-events/news/nrw-sets-out-a-fresh-approach-to-wildlife-in-wales/?lang=en>

¹⁹ Swansea LBAP <https://www.swansea.gov.uk/article/10113/Swansea-Local-Biodiversity-Action-Plan>

²⁰

<https://gov.wales/topics/environmentcountryside/climatechange/emissions/?lang=en>

²¹ Circular economy <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

- 3.21 The provision and maintenance of urban GI should support these efforts, helping to save energy, working alongside efforts to provide energy from renewable sources (for example solar and biogas from green waste) and using recycled materials and recycled green waste for growing media.
- 3.22 Vehicles and equipment used to build and maintain GI should wherever possible run on renewable energy. GI should be, wherever possible, low maintenance. Also wherever possible, GI should not rely on artificial irrigation and where irrigation is required, consideration should be given to using harvested rainwater. Smart technologies should be used to monitor and share data with practitioners, the community and education institutions. This information might include energy and water consumption and biodiversity records. Staff working on the maintenance of GI should receive appropriate training and support.

Cross-Disciplinary Working

- 3.23 Tackling the causes and effects of issues such as biodiversity loss and climate change requires a radical step change in approach across all sectors, and this step change must occur in the short term. The conversations required to deliver quality GI provide a well-timed opportunity to increase the skills and knowledge capacity needed to achieve this. Culture change will be required across organisations and our partners to work together in an innovative and collaborative way to ensure that development is resilient and adaptable to climate change. Achieving cross-sector agreement to the principles in this green infrastructure strategy is key to the delivery of the joint vision for Swansea Central Area (Figure 12).



Figure 12. Cross-disciplinary and partnership working required to deliver the vision for quality GI.

The Principles and the Green Space Factor tool

3.24 The GSF tool (Appendix 3) provides a useful and simple way to explore the function and benefits of GI and ensure that these principles are embedded into the early

stages of the development and design process. It provides a simple and clear way to navigate the many overlapping and interrelated issues.

4 SWANSEA'S GREEN INFRASTRUCTURE

Setting

4.1 The Swansea Central Area lies in an attractive coastal location. It is bordered by three wildlife corridors which provide oases of nature and tranquillity close to the heart of the city; the Swansea Bay Wildlife Corridor, the River Tawe Wildlife Corridor and the Hillside Wildlife Corridor. One of the aims of this Strategy is to create connections, both for people and wildlife, from green spaces within the central area to these surrounding wildlife corridors.

4.2 The **Swansea Bay Wildlife Corridor** (Figure 13) is located to the immediate south of the City and sweeps for 8 kilometres to the west. Its bounded by a promenade which is accessible to pedestrians and cyclists, who enjoy splendid views and fresh air. The whole bay is a Site of Importance for Nature Conservation (SINC)²² and the western half of the bay is a Site of Special Scientific Interest (SSSI), an important intertidal habitat for migratory birds.

4.3 The eastern boundary of the Swansea Central Area is bordered by the **River Tawe Wildlife Corridor** (Figure 14), which has had a barrage at the river mouth since 1992. The Tawe Wildlife Corridor supports a surprising

diversity of wildlife including otters, herons and kingfishers. It has good access for walkers and cyclists along its whole length, linking to the Swansea Vale Nature Reserve south of the M4, and to the Brecon Beacons beyond. Across the Tawe to the immediate south east is the SA1 Swansea Waterfront district. Along the northern edge of the docks, on the opposite side of the river, are new commercial and education facilities.



Figure 13. Swansea Bay Wildlife Corridor

4.4 North of Fabian Way, which is the main highway access to the east of the city, is primarily a residential area. To the north of that is Kilvey Hill, which provides good views of the city centre. Kilvey Hill is covered with plantation

²² Swansea Bay SINC <https://www.swansea.gov.uk/swanseabay>

woodland, grassland, heathland and wetlands. Part of it is managed as Community Woodland. To the immediate east of Kilvey Hill, is Crymlyn Bog National Nature Reserve, another SSSI.²³



Figure 14. River Tawe Wildlife Corridor

- 4.5 The **Hillside Wildlife Corridor** to the north of the city centre provides a linear strip of woodland, heathland, grassland and wetland habitat stretching from the Tawe River Corridor in the east to Cockett Valley and the open countryside in the west. It offers spectacular views over the City Centre, Swansea Bay and on a clear day across the channel to Devon. The corridor connects Bryn-y-Don Park²⁴ with the Rosehill Quarry Community Park²⁵ and

the Mayhill Washing Lake and Community Food Garden. Beyond the corridor to the north west of the central area are residential suburbs, including Townhill and Mayhill.

- 4.6 To the west and south-west of the central area is Sandfields a residential area of predominantly terraced properties which includes the Vetch Veg allotments and open space sited on the former Swansea City FC ground.²⁶

Existing Assets

- 4.7 Swansea Central Area was badly damaged by bombing in 1941. The 1950s and 1960s saw a period of significant post-war reconstruction (Figure 15), which has left a legacy of spaces dominated by sealed surfaces, including many large car parks. This makes the area vulnerable to surface water flooding and the urban heat island effect. There are street trees, with large trees in selected locations (church yards and Castle Square) however tree canopy cover is patchy. There is very little semi-natural vegetation, with ground cover, where it occurs, usually dominated by amenity grassland and

²³ Crymlyn Bog <https://sac.jncc.gov.uk/site/UK0012885>

²⁴ Bryn Y Don Park <https://www.swansea.gov.uk/brynydon>

²⁵ Rosehill Quarry <https://www.opengreenmap.org/greenmap/swansea-green-map/rosehill-quarry-1288>

²⁶ Veg Vetch <http://www.sustainableswansea.net/vetch-veg.html>



Figure 15. Swansea at dusk

non-native shrubberies. There is however semi-natural vegetation around the dunes along the beach front and scrub and other rough vegetation along the River Tawe. The southern part of the central area is very different in character, with the large area of open water of the former dock in the Maritime Quarter and the lawn and trees surrounding the Council's Civic Centre. Figure 16 and 17 illustrate existing GI assets in in and around the central area and Table 4 shows cover of various categories of GI in Swansea Central area. Overall terrestrial GI cover in Swansea Central Area is 13%.

Category of GI	Area (hectares)	%
Amenity greenspace	9.8	7
Cemeteries & Churchyards	0.4	<1
Civic greenspace	3.3	2
Semi-natural	4.2	3
Total terrestrial GI (total of areas above)	17.7	13
Water (marina)	7	5
Total GI (including water)	24.7	18
Total Swansea Central Area	133.4	100

Table 4: GI in Swansea Central Area by category, based on Ordnance Survey map data, Jan 2019, updated via ground survey October 2020

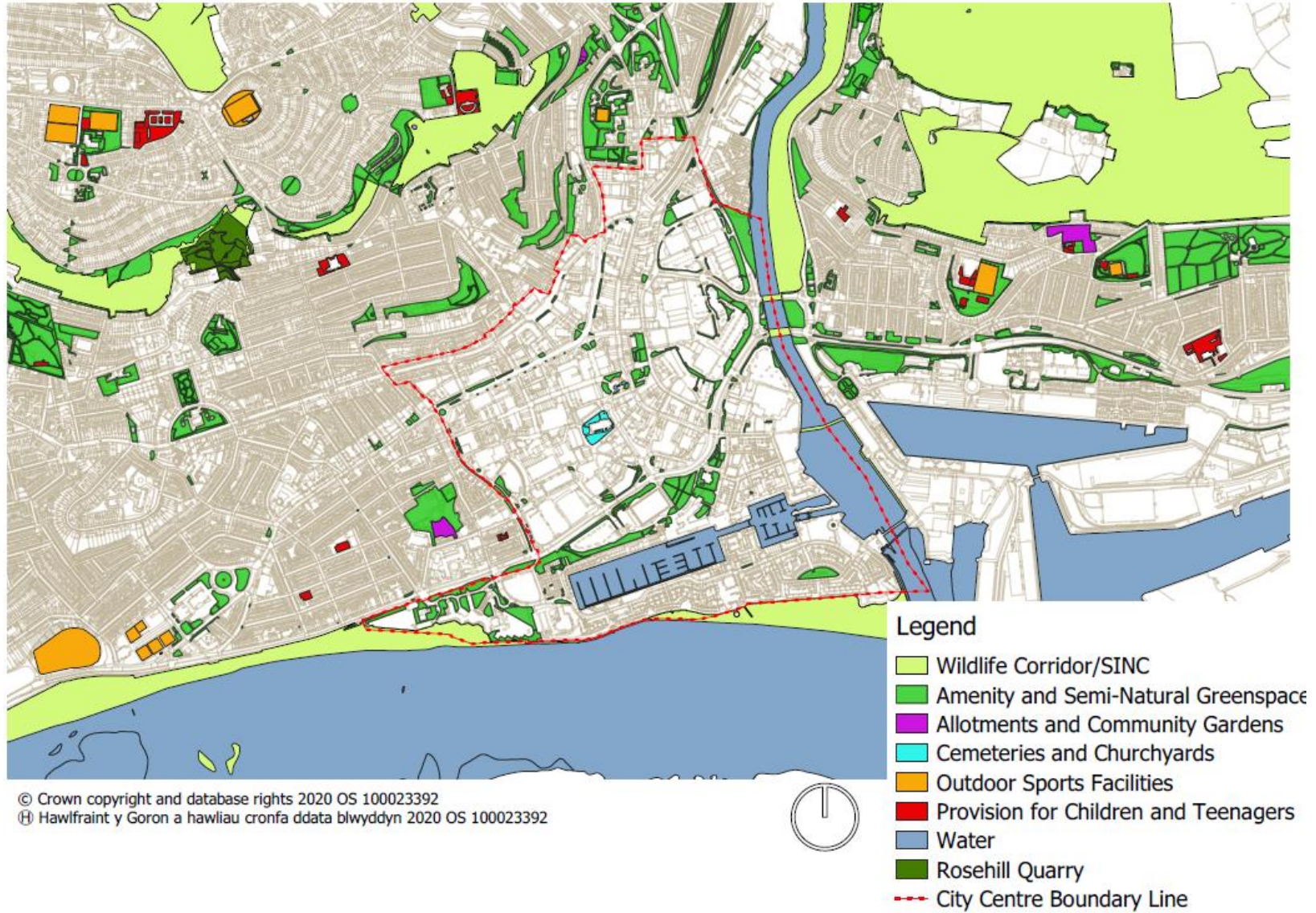
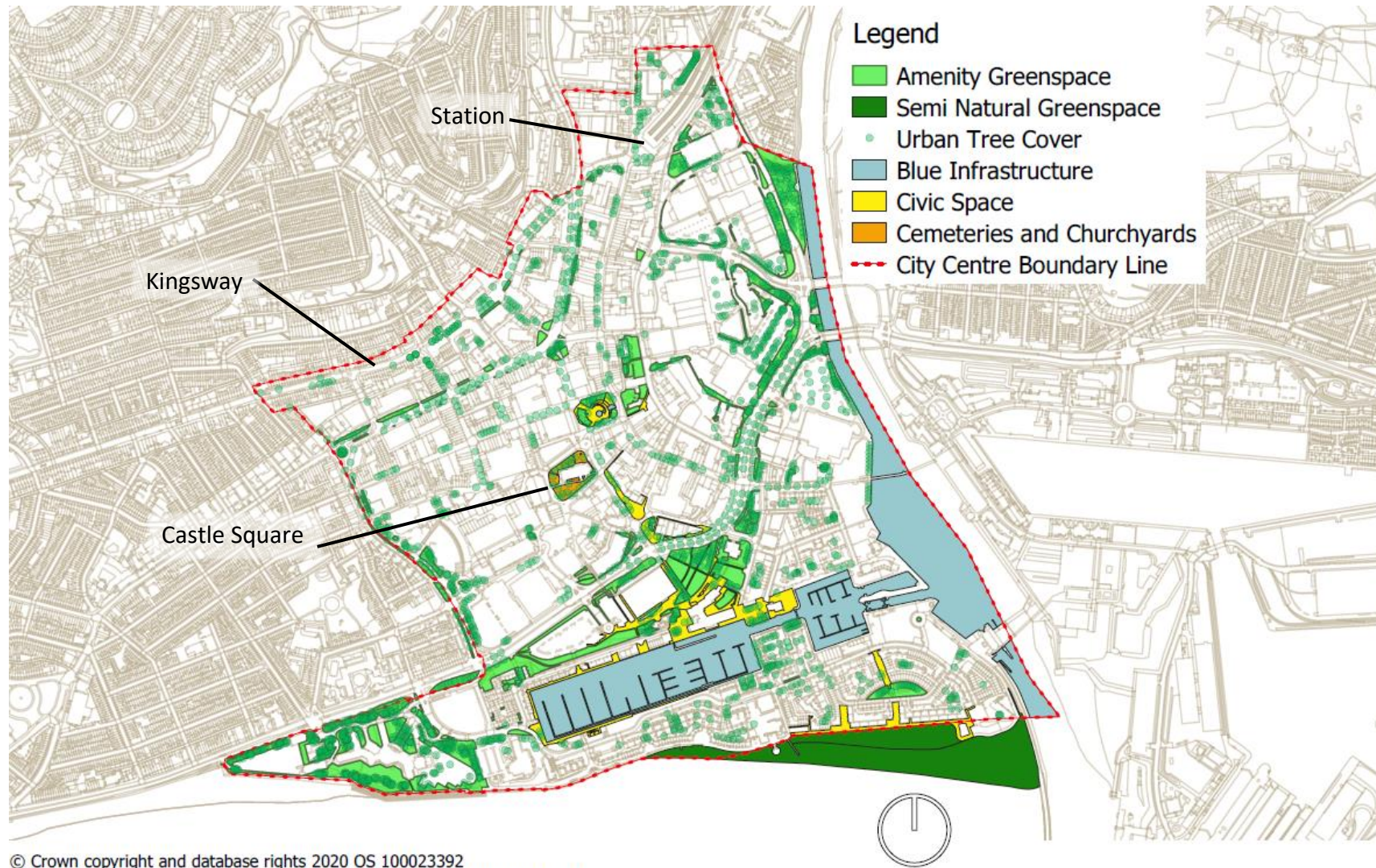
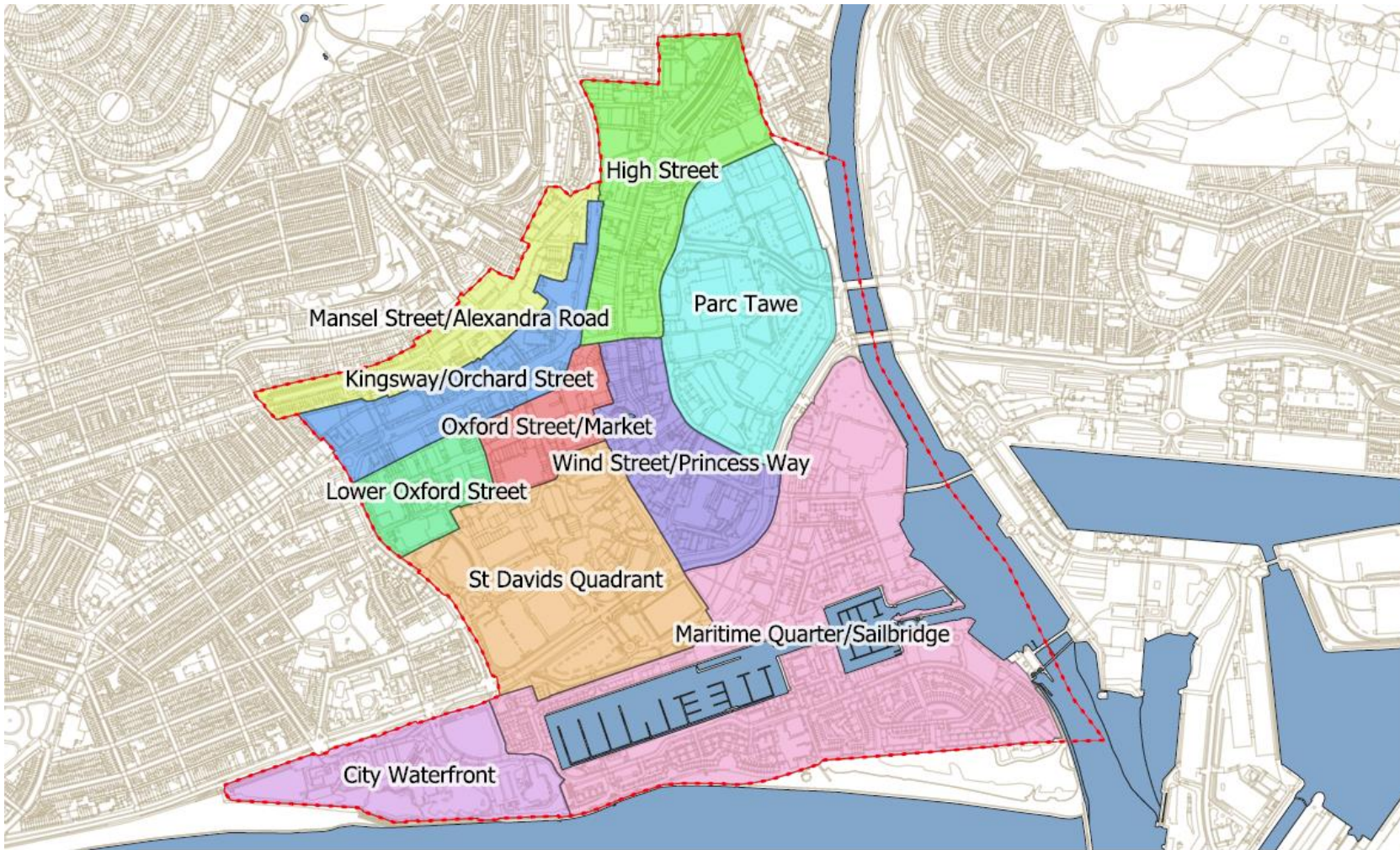


Figure 16. Existing Assets



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Hawlfraint y Goron a hawliau cronfa ddata blwyddyn 2020 OS 100023392

Figure 17. Existing Green Infrastructure in Swansea's Central Area



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Hawlfraint y Goron a hawliau cronfa ddata blwyddyn 2020 OS 100023392



Figure 18. The 10 Swansea Districts

- 4.8 The Swansea Central Area Regeneration Framework divides the central area into 10 districts, as shown in Figure 18. The districts are described in the following paragraphs.
- 4.9 The High Street area is the key route from the railway station south towards Kingsway to the west and Wind Street to the south east. Its importance as a retail street has declined over the years following the establishment of the Quadrant Shopping Centre. There are improvements underway associated with the Urban Village scheme,²⁷ whilst a new high rise student accommodation block is being constructed on the former Mariner Street surface car park site. The High Street area is heavily built-up - there are a few pockets of vegetation, including 'wasteland' vegetation of self-established trees and shrubs at the rear of the Grand Hotel. There are street trees along some sections of High Street and occasional ornamental planters and amenity tree plantings elsewhere, including a grassed areas here. The Strand runs past the multi-storey car park and grassed area and trees outside of Alexandra House.
- 4.10 Wind Street and Princess Way continue south from High Street. This is a densely developed commercial and

²⁷ Urban Village <https://www.coastalha.co.uk/Pages/Next-phase-of-Urban-Village-development-given-green-light.aspx>

residential area with bars, clubs and restaurants. Wind Street itself has an almost continuous avenue of London plane trees, planted on the eastern side of the street. At the northern end of this area is Castle Square and Swansea Castle. Castle Square (Figure 19) is mainly paved and includes a large water feature, and mature trees around the perimeter of the square, including Norway maple, birch and cherry with amenity grassland and shrubberies beneath. Swansea Castle has amenity grassland within its curtilage. There are hanging baskets and ivy is growing on the castle walls in a few places.



Figure 19. Castle Square

- 4.11 Parc Tawe is a retail park located on a former dockland area to the south-east of High Street. It is dominated by large retail warehouse type buildings served by surface level car parks. The car parks have shrubberies planted with non-native ornamental species and there are lines of trees, mainly maples, with some lime and whitebeam. Where Parc Tawe meets the River Tawe, there are two highway crossings and the river bank is urbanised as a walkway. However semi-natural vegetation occurs on the river banks extending northwards.
- 4.12 To the south of Parc Tawe on the opposite side of Oystermouth Road, is the Maritime Quarter. This is the largest district within the central area, consisting of residential and commercial development around the Tawe Basin, formerly part of the Swansea Docks and now used as a marina. There are shrubberies and trees (including pines) around the Sainsbury's supermarket car park. Travelling west there is an open area of amenity grassland in front of Museum Green leading on to the district's largest green space within the curtilage of National Waterfront Museum. Both green spaces consist of amenity grassland, birch trees and shrubberies planted with ornamental species. In addition, there are tree plantings along Oystermouth Road and amenity grassland and ornamental plantings by Fisherman's Way. Just outside the Maritime Quarter, to the south and close to the river mouth, is a small area of sand dunes managed as a nature reserve.
- 4.13 West of the Maritime Quarter, is the City Waterfront. This consists of the Civic Centre, library, hotel and associated car parks. The landscape around the Civic Centre is amenity grassland, mature stone pines, and maples with shrubberies alongside.
- 4.14 Just beyond the Civic Centre, on the beach, is an artificial dune project,²⁸ designed to create habitat and to reduce the amount of sand blowing onto the promenade.
- 4.15 St Davids and the Quadrant is a commercial area to the north of Oystermouth Road and the Maritime Quarter. It is dominated by car parks and commercial / residential buildings. During 2020 the area immediately south and north of Oystermouth Road forms part of the construction site for regeneration proposals at Swansea Central. To the north of the Tesco supermarket and around the edges of the Tesco car park are lines of trees. Other greenspaces in this area are the lawns and trees around St David's Priory Church and St Mary's

²⁸ Sand dune project, Swansea Bay
<https://www.coastalha.co.uk/Pages/Next-phase-of-Urban-Village-development-given-green-light.aspx>

Churchyard, which includes a number of fine mature trees, including London plane, and amenity grassland. The churchyard pre-dates the commercial development that surrounds it.

4.16 To the north of St David's Church is the Oxford Street and Market area which is also one of the city's main commercial and retail areas. GI is limited to street trees (mostly London plane). The Lower Oxford Street area is a continuation of the commercial and residential development associated with Oxford Street. There are street trees, including Norway maple and London Plane in a few locations, although canopy cover is fragmented.

4.17 Kingsway (Figure 20) and Orchard Street is another mixed commercial area to the north of Oxford Street. Prior to 2019 there were street trees in a few locations, and canopy cover was patchy with mature trees confined to pockets such as that at Mount Pleasant Baptist Church. However during 2019 the Council commenced the construction of the Kingsway Urban Park project which included a more pedestrian friendly environment, with wider footways and significant street tree planting.

4.18 Mansel Street (Figure 21) and Alexandra Road are located to the north of Kingsway and Orchard Street. This is a mixed commercial / residential area with retail and professional services fronting the streets. Although

most rear gardens are covered with extensions, there are some that retain vegetation. There are street trees, including lime and whitebeam, however canopy cover is intermittent.

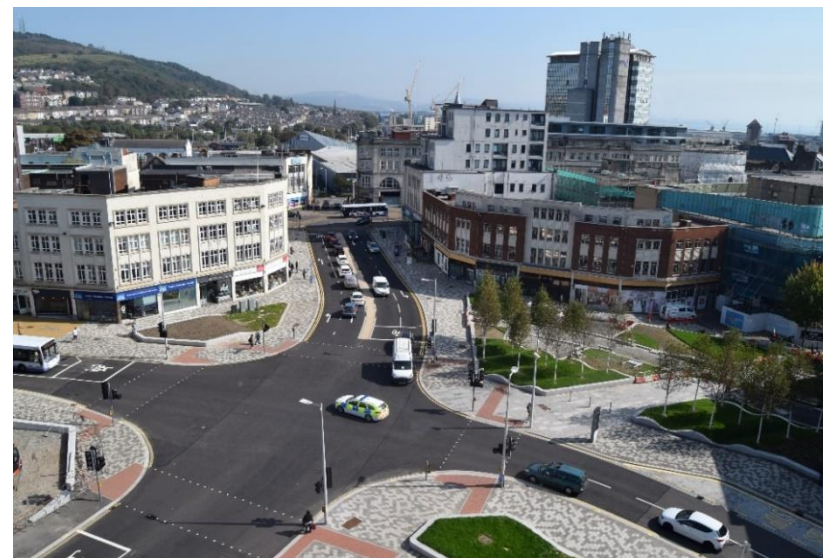


Figure 20. Recent redevelopment of Kingsway

4.19 Swansea as a whole has historically experienced losses in greenspace through redevelopment and regeneration projects and a decline in biodiversity as a consequence. Increased traffic has resulted in a deterioration in air quality and poor water quality in the Lower Tawe and Swansea Bay adjoining the central area. People living



Figure 21. Green suburbs to the north of Kingsway

next to major highways suffer from noise pollution²⁹ whilst those living in the central area north of Oystermouth Road do not live within easy reach of a substantial accessible greenspace as defined by Fields In Trust³⁰. Countryside Council for Wales (now part of Natural Resources Wales), recommended that no person should live more than 300m from their nearest natural greenspace³¹. This is roughly the equivalent of a six-minute walk. The proposals outlined in this strategy

²⁹ Environmental challenges in Swansea <https://www.swansea.gov.uk/article/30953/The-natural-environment-is-healthy-and-resilient>

³⁰ Fields in Trust <http://www.fieldsintrust.org/>

will help reduce inequalities in access to greenspace. Swansea Central Area's resident population of approximately 10,000 (swollen daily by workers and visitors), includes some of the most deprived and vulnerable people in Wales.³²

Proposals and Redevelopment Initiatives

- 4.20 The Swansea Central Area Regeneration Framework (2016) and the Swansea Local Development Plan (2019) include proposals and redevelopment initiatives which have the potential to include GI. These are described in brief here and shown in Figure 22.
- 4.21 A number of the locations for these proposals and initiatives are essential elements of the proposed Green Artery and wider GI network. Potential GI enhancements should be considered from the outset in any redevelopment and refurbishment schemes and it is important that every opportunity is taken at the initial design stage to maximise the area of soil, water and vegetation created both at ground level, but also on buildings.

³¹ <http://www.teebweb.org/wp-content/uploads/2013/01/Natural-Spaces-and-Health-Mapping-Accessible-Natural-Greenspace-in-Wales-UK.pdf>

³² PPW Technical Advice Note 16 Sport Recreation and Open Space <https://gov.wales/sites/default/files/publications/2018-09/tan16-sport-recreation-open-space.pdf>

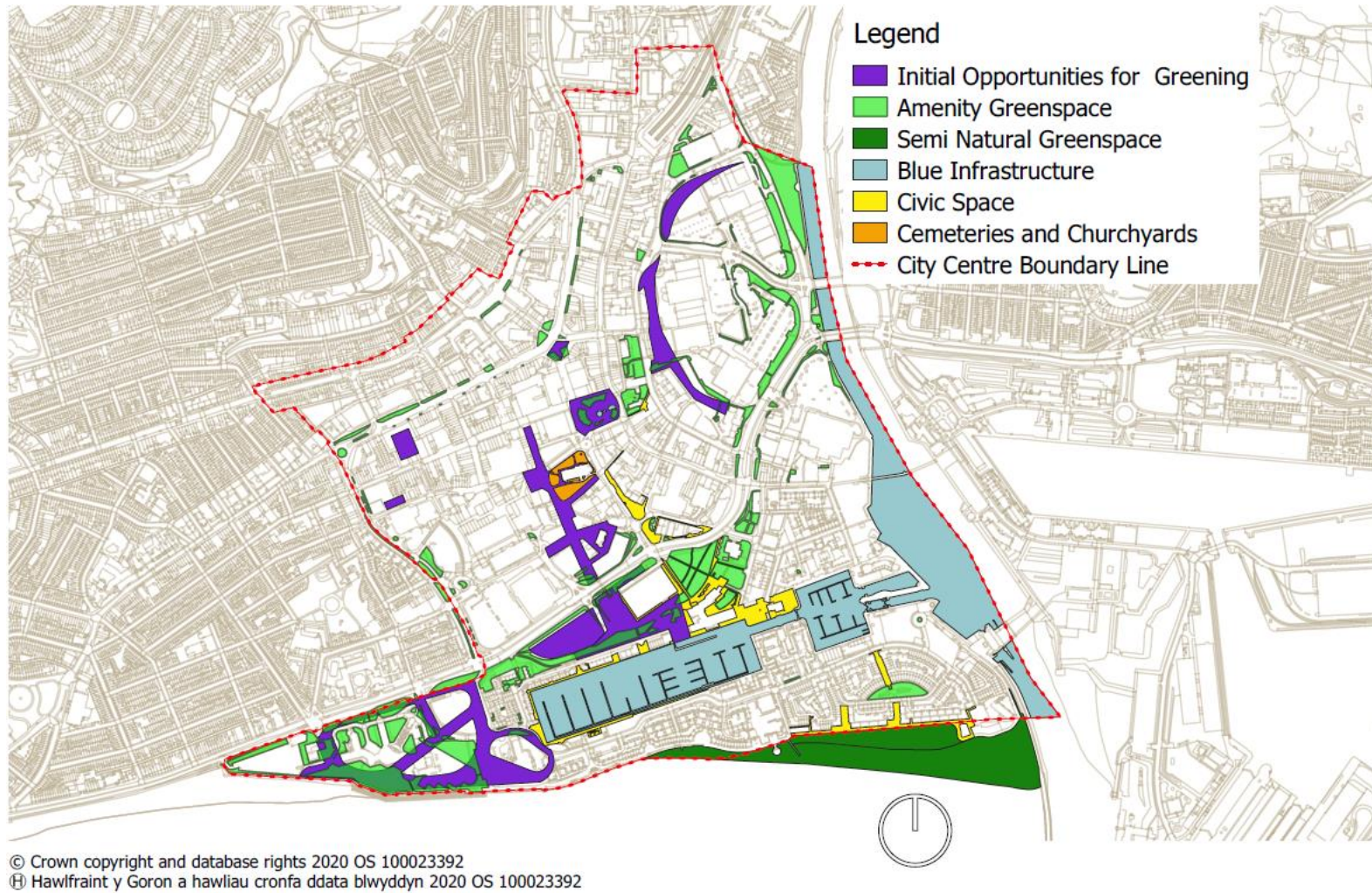


Figure 22. Opportunities for greening

4.22 At the heart of the Swansea Central Area's GI network will be the Green Artery (see Figure 25). The proposal is set out in the Swansea Central Area Regeneration Framework (2016).³³ The Green Artery will be a GI corridor connecting Swansea Station in the north to the Maritime Quarter in the south, making the centre of Swansea more permeable to both people and wildlife. Within the Green Artery, pedestrians and cyclists will have priority. From the community engagement there was a strong mandate for nature in the city, the prominence of which is illustrated in Figure 23.

4.23 Interventions along High Street will connect the station with Castle Square, where there will be an overall reduction in sealed surfaces. Heading south from Castle Square, connections will be made with St Mary's Church, St David's Church and across Oystermouth Road via a new landmark bridge to the new Coastal Park. From the Coastal Park it will be a short walk to other destinations in the Maritime Quarter, the beach and Waterfront. The Green Artery will be a primary focus, however green links will be made with Oxford Street and Kingsway to the west and Parc Tawe and the River Tawe to the east, with other arms of the GI network extending to the natural environment on the outskirts of the city, including,

the Tawe Riverside, Hillside and Swansea Bay wildlife corridors

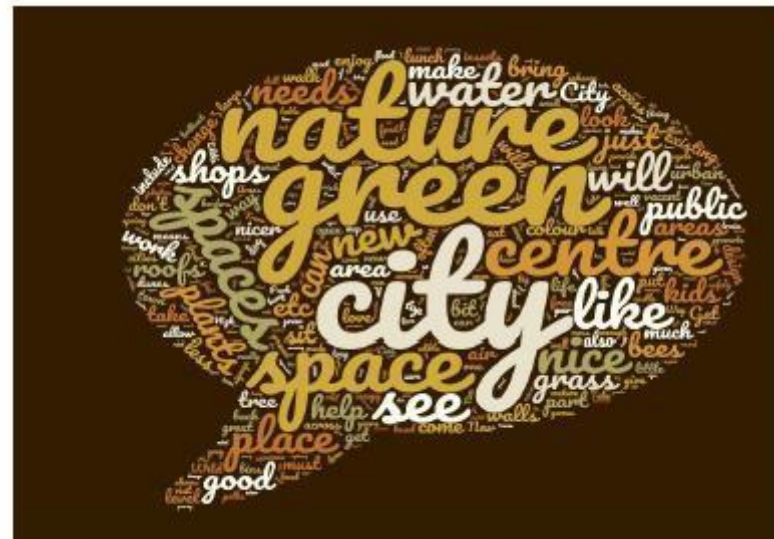


Figure 23. Opportunities theme 'word cloud' from the community engagement

4.24 As well as the Green Artery itself, GI interventions can be made anywhere in the city, as opportunities arise through redevelopment and also through routine repair and maintenance or by retrofitting features. There may also be locations, identified through future GI audits or ecosystem services analyses, where small interventions can be identified that can have a disproportionately large

³³ Swansea Central Area Regeneration Framework 2016
<https://swansea.gov.uk/citycentreframework>

impact, including, for example, tree and wildflower planting, rain gardens, green roofs and green walls.

4.25 The Swansea Central Phase 1 and 2 schemes will make a substantial contribution towards GI. Swansea Central Phase 1 includes the construction of a new arena, adjacent car park with a rooftop coastline park and green walls. A bridge will connect to the north side Oystermouth Road and Swansea Central Phase 2. Phase 2 will incorporate mixed use development to complement the St Mary's and St David's Church and to connect to Whitewalls and Castle Square (via Caer Street).

4.26 In Oxford Street there will be opportunities for urban greening on the Oxford Street School site. There will also be new public spaces, and pockets of public realm in the surrounding streets with opportunities for greening.



Figure 24. Oxford Street

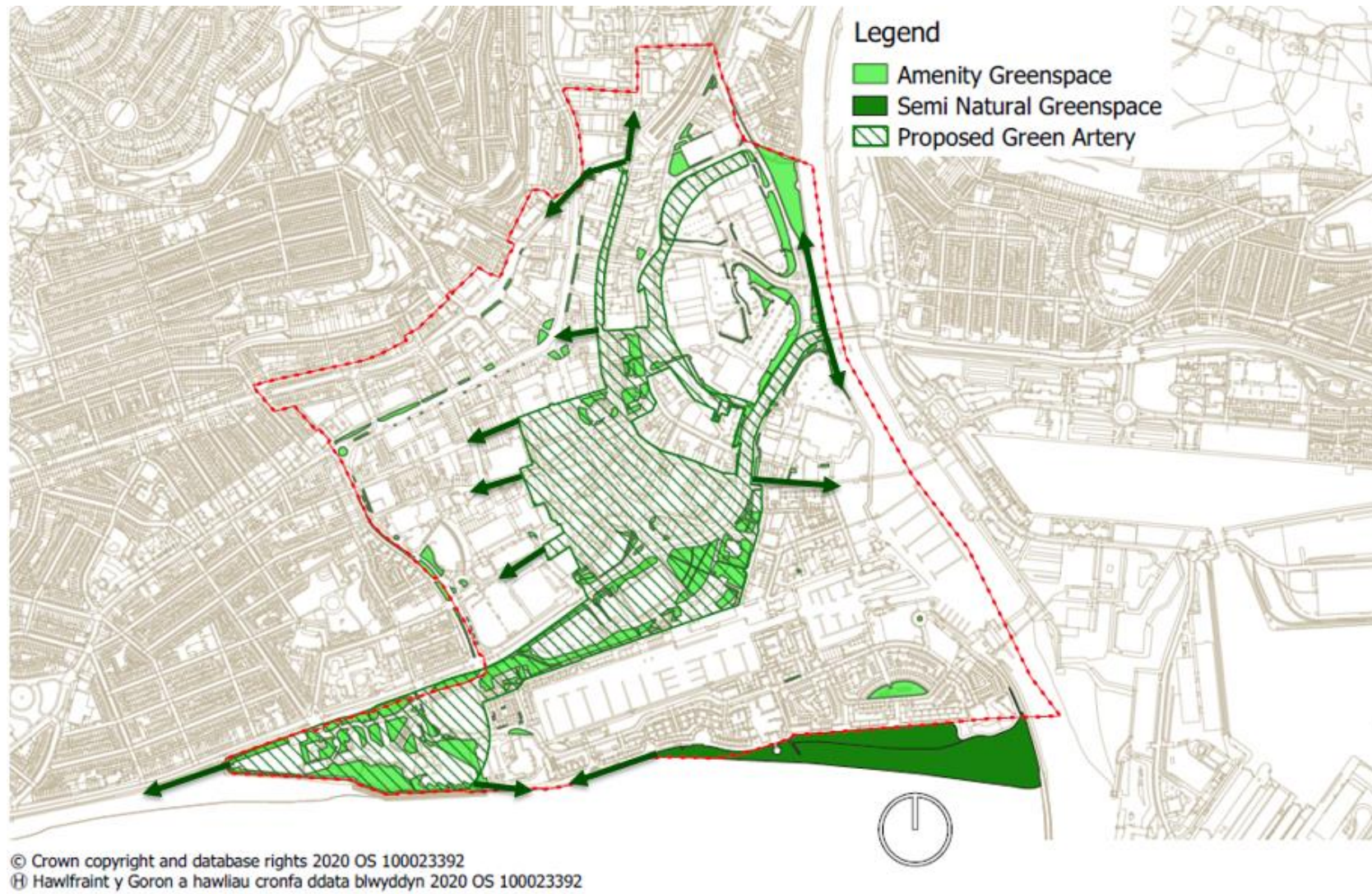


Figure 25. Proposed Green Artery

4.27 Castle Square will be a key central multi-functional green space within the Green Artery and was the most frequently mentioned public space referred to in the community engagement. The redevelopment of Castle Square will include an enhanced public realm. One of the key objectives is that it should adopt an overall principle of retaining and enhancing public access and contributing to a greener Central Area with no loss of useable greenspace. The enhancement of the Square will play an important role in connecting greenspace around the historic Castle, to St Mary's Church and contributing towards the extension of the green artery.

4.28 The key objective for Wind Street is to realise the full potential as a focus for the city's dining and entertainment economy, including proposals to pedestrianise the street, introduce informal seating and enhance GI with additional trees species and new planting.

4.29 Along Alexandra Road and Mansel Street, there may be opportunities for the planting of street trees and private owners and tenants could be involved in greening through the establishment of rain gardens and wildlife gardens.

4.30 Along Kingsway and Orchard Street, the recent re-planting of street trees and the creation of new planters

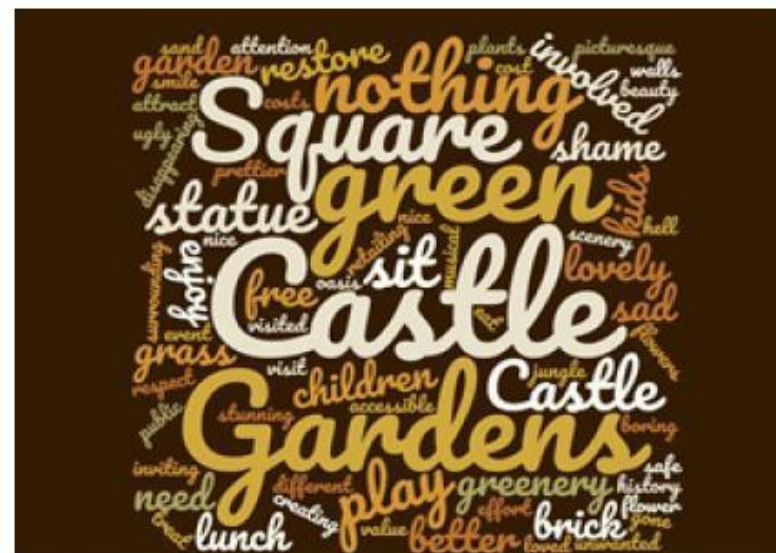


Figure 26. Castle Square theme 'word cloud' from the community engagement

and grassed amenity areas, including rain gardens, will be complemented by pockets parks in courtyards and rooftop gardens and green roofs on new developments such as 71/72 The Kingsway. The southern aspect of the 71/72 The Kingsway will include significant new GI. Including multifunctional green public space within the surrounding area.

4.31 Along High Street, there are developments such as Coastal's Urban Village including roof top gardens and courtyards. On street parking and relatively narrow pavements means that space is generally limited,

however there are opportunities to enhance existing urban greening to increase multi-functionality and more biodiverse vegetation. Additional connecting linkages may come forward between High Street and the Strand and Parc Tawe.

4.32 In Parc Tawe, the edge of centre retail park may offer opportunities to green car parks through de-paving and when buildings are re-developed green roofs and green walls can be included in the plans. In the longer term the site could accommodate extensive GI forming part of strategic connections to adjacent areas, and blue (water space) which symbolise the former pre industrial river alignment along the Strand.

4.33 The Civic Centre and City Centre Waterfront sits within a swathe of existing greenspace. In the medium to long term, redevelopment of this area is envisaged with mixed leisure and residential uses set within a layout with a key north/south route which is part of the Green Artery, and which encourages walking and cycling between the central area and the Swansea Bay seafront. Public spaces and thoroughfares in the scheme would provide the opportunity to incorporate rain gardens and street trees offering shade and shelter, and buildings would have the potential to incorporate green walls and roofs.

4.34 In the adjacent Maritime Quarter and its conservation area, there are pockets of street trees, and limited formal landscaped areas within the largely hard-surfaced areas focused around the former South Dock. The Swansea Point dunes are an area of natural habitat and a significant area of GI on the seaward frontage of the Maritime Quarter. There are also several development sites where targeted urban greening can be brought forward as part of future new development, including vacant development sites adjacent to Swansea Point, and the Sailbridge site adjacent to the River Tawe.



Figure 27. Maritime Quarter

5 IMPLEMENTATION

Working Together

- 5.1 GI benefits everybody. Whilst national and local government can coordinate and set direction by producing policies, strategies and guidance, it is important that organisations and individuals who are not traditionally involved with soil, water and vegetation etc. are aware of opportunities for them to contribute. A communication network needs to be developed that promotes partnership working and shares information and experiences through social media, training and events. Time should be taken to acknowledge and celebrate progress (Figure 28).



Figure 28. Planting a rain garden

Feasibility

- 5.2 All of the urban GI typologies described in this strategy (see Appendix 2) are proven, even though some of the techniques are relatively new in the UK. At ground level, the planting of trees and the provision of ornamental planters is already standard practice in the public realm and private gardens are popular. With proposals submitted for planning permission, applicants would normally expect to be required to include some GI, in line with LDP Policy ER03 and forthcoming Green Infrastructure SPG.
- 5.3 The challenges are to maximise the area of green infrastructure provided, to ensure that as many ecosystem services as possible are provided and to ensure a net gain in biodiversity. Figure 29 illustrates the process required to enable high quality multifunctional GI.

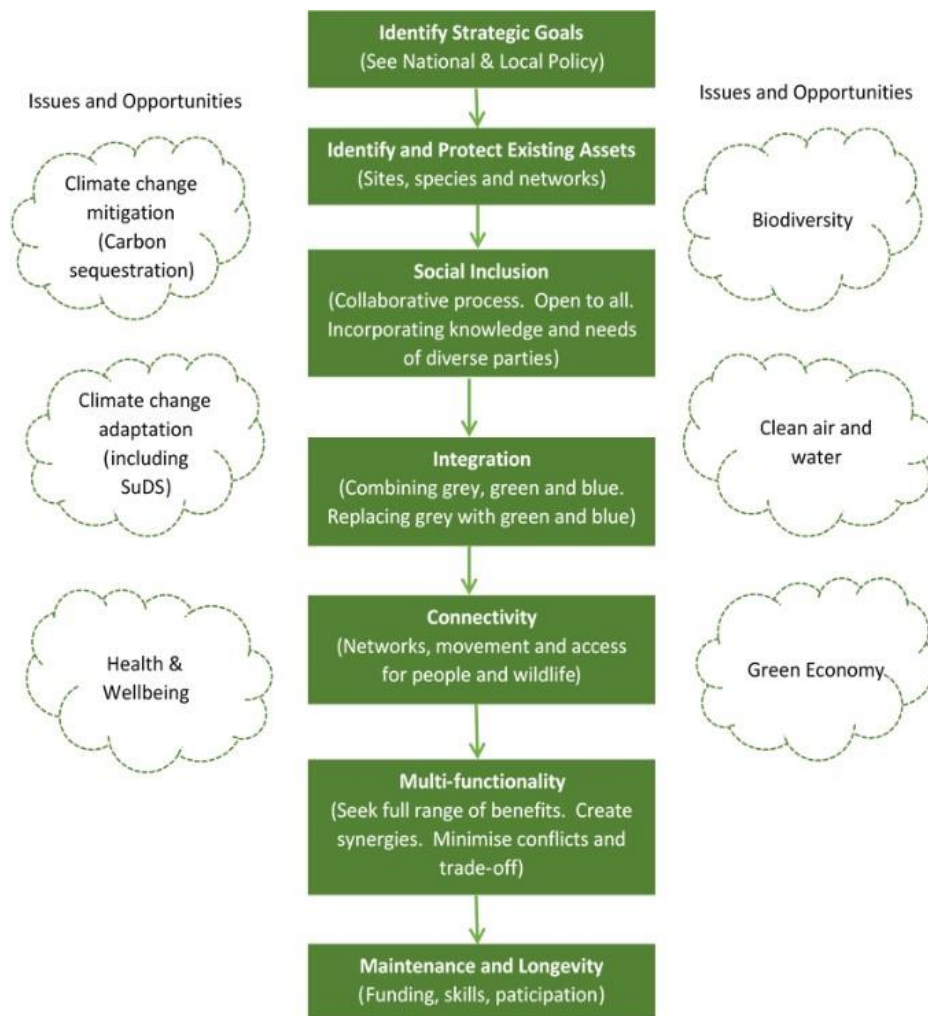


Figure 29. Planning and implementing green infrastructure

³⁴ Environment Systems (2018) Green Infrastructure Opportunity Mapping and Multi-Scale Delivery. Swansea Castle Ward Case Study

Impact

- 5.4 GI can play a useful role wherever it is located, however it is often helpful to prioritise particular locations for the most appropriate interventions. The report on Green Infrastructure Opportunity Mapping and Multi-Scale Delivery Swansea Castle Ward Case Study (2018) shows locations where there are demands for reduction in air pollution, standing water and pluvial (surface water) flooding, improvements in water quality and where there is an absence of accessible green space.³⁴
- 5.5 This strategy will be strengthened by more a detailed GI audit, to identify issues and opportunities at a smaller scale and include specific proposals which can be taken forward for detailed design and delivery.
- 5.6 Swansea Council will apply the Green Space Factor Tool (GSF tool) in consideration of all development in the Swansea Central Area (see Appendix 3). This is a simple method for measuring the extent and likely effectiveness (in providing various ecosystem services) for various interventions included in project proposals. The Council will use this tool to assess the quantity and quality of GI and may choose to set minimum targets in

the central area where redevelopment is proposed. Complimentary to this, software that can model microclimates and identify priority areas for the location of GI (including for example Greenpass³⁵) can be used by planners and designers of large-scale developments to ensure development maximise their contribution to the strategic objectives.

- 5.7 The GSF tool is considered the effective measure for assessing how much permeable green space is needed across a development. Natural Resources Wales and Swansea Council see the GSF tool as best practice for planning the enhancement of GI in the central area, delivering the green artery as set out in the Swansea Central Area Regeneration Framework and meeting obligations under Schedule 3 to the Flood and Water Management Act 2010. Natural Resources Wales and Swansea Council expect and encourages developers to use the tool as part of the design and application process.

- 5.8 The challenge of linking the provision of infrastructure to specific economic benefits is not unique to GI. Like all other infrastructure needed to support development, effective GI is essential to support a healthy and economically successful city. GI makes a very important contribution to the attractiveness of the city and neighbourhoods for investors, residents and visitors. This contribution is well described and understood by planners and many developers and increasingly supported through good practice.³⁶

- 5.9 The evidence shows that increasing the attractiveness of an area through investment in high quality multifunctional GI increases inward investment and property values, visitor dwell time and spend, and can reduce the long-term cost burden on public services. Development costs can also be reduced as traditional equivalent grey infrastructure, is often more expensive to design and install. For example the Welsh Government Analysis of the Evidence for SuDS, concludes:³⁷

Value

³⁵ Greenpass - modelling urban green infrastructure for climate change adaptation. See greenpass.at

³⁶ DEFRA & Natural England 2013. Green Infrastructure's contribution to economic growth: A Review

http://sciencesearch.defra.gov.uk/Document.aspx?Document=11406_GI_Economic_Catalyst_Final_Report_July2013.pdf

³⁷ Welsh Government 2017. Sustainable Drainage Systems on new developments. Analysis of evidence including costs and benefits of SuDS construction and adoption Final Report.

- The overall capital costs of well-designed, good quality landscaped SuDS solutions are always less than those for conventional solutions. In most cases, overall operational and maintenance costs are also lower.
- SuDS are not just an alternative to conventional drainage solutions. They can provide significant and multiple benefits (Figure 30) and have particular potential to help Wales meet well-being and wider sustainability goals. Although the arrangements for the way in which water and surface water systems are managed in Wales has evolved in the last decade and there are still many players with diverse responsibilities, all key stakeholders support the role that SuDS can play in achieving these aims.
- Across the 110,000 new homes planned for Wales by 2021, analysis suggests that the use of landscaped SuDS on new developments that are compliant with required standards could save Wales nearly £1 billion in capital construction costs and generate benefits of over £20 million per year.

5.10 Budgetary constraints and competing cost demands on development schemes mean that greening is often an element that is considered at the end of the design

process and is often scaled back and compromised. Given the proven positive returns on investment from GI, a more positive forward-thinking approach should be applied to GI.

5.11 Now that SuDS are mandatory for new development in Wales, more money will be spent on GI, however it is important that water quality, biodiversity and amenity are fully considered in such schemes, as well as the volume of water being stored or attenuated. Sustainable drainage, the use of the GSF tool and the planning process will require GI to be provided to meet local planning authority requirements. In turn budgets for construction projects should include an allowance so that these new expectations can be met.

5.12 GI is typically a very small proportion of the total cost of construction, and good planning, with the principles set out in this strategy, embedded in schemes at an early stage in the design process, will ensure that GI is given due consideration in any assessment of viability.

“Much has been discussed and documented about the bottom-line benefits of green infrastructure but planting trees, building rain gardens or using porous paving alone are not enough to create sustainable real estate*. To be truly sustainable, green infrastructure must add value, enhance the occupier experience and be flexible enough to adapt and respond to changing social, economic and technological conditions.”

Professor Yolanda Barnes of the Bartlett, UCL

* Real estate is defined here as physical land, structures and the resources attached to it, whether man made or natural i.e. built and green / blue (water) infrastructure.

5.9 With place making high on the public and political agendas there is an increasing expectation that real estate / assets contribute to our social, economic and environmental and cultural wellbeing. With rising costs of energy and maintenance eroding capital returns, resilient and sustainable buildings with lower maintenance costs result in a better long-term option for owner occupiers and investors. Therefore increasingly the success of built infrastructure will depend on its interaction with GI investment, the local economy, culture and popular appeal. Placemaking

requires an understanding of the whole-place and a focus on interventions which are not prescriptive, but which encourage innovation and holistic solutions.



Figure 30. SuDS should be multifunctional (Credit: Robert Bray Associates)

Maintenance

5.10 Greenspace, trees, sustainable drainage features, green roofs and green walls all require regular maintenance. Whenever GI is proposed, a maintenance plan (which identifies responsibilities, purpose, regular upkeep and contingency for remedial measures and budget), should be prepared. As well as the requirement to follow conventional best practice, there should be consideration

of how ecosystem services can continue to be provided and how biodiversity can be maintained over the long term. There is a need to become more innovative and less conventional in approaches to maintaining GI. For example, the engagement in developing this strategy highlighted a clear and strong desire from local communities to be involved in future maintenance

Monitoring

5.11 Outside of academic research, relatively little information is available on how GI continues to function after installation and how it continues to support habitats and species. Effective monitoring is therefore vital to assessing the effectiveness of the strategy and its implementation. Monitoring will be carried out as part of the Council's Section 6 Duty under the Environment (Wales) Act 2016 every three years and through the Council Wellbeing Objective and Swansea Public Service Board Local Wellbeing Plan. Ideally this will include GI mapping by remote sensing at periodic intervals, with appropriate ground-truthing. The monitoring and evaluation process will be set out in the Strategy's Action Plan.

APPENDIX 1 – BENEFITS OF GREEN INFRASTRUCTURE



Figure A1.1 Benefits of Green Infrastructure

A1.1 There is a wealth of evidence on the benefits of high quality multifunctional GI to environmental, social, economic and cultural wellbeing as summarised in Figure A1.1. The following paragraphs focus on

some of the benefits more relevant to the Swansea Central Area.

A1.2 Climate change is predicted to increase the frequency and intensity of both heatwaves and heavy downpours³⁸. Heavy rain can cause surface water flooding. GI has been shown to reduce the severity of these problems by providing **summer cooling** and by **absorbing rainwater** that might otherwise exacerbate surface water flooding.

A1.3 The Urban Heat Island (UHI) effect occurs when summer sunshine beats down upon the dense materials (including asphalt, concrete, masonry and brick) that make up the built environment. Energy is absorbed into dense materials and is re-radiated at night, which is the main cause of the UHI effect, which can make the centre of a city up to 10 degrees centigrade warmer than its rural hinterland in the middle of a summer day.³⁹ The UHI effect exacerbates heatwaves and leads to an increase in energy consumption, through the increased intensity

³⁸ Met Office climate change projections <https://www.metoffice.gov.uk/research/collaboration/ukcp/derived-projections>

³⁹ EPA on UHI <https://www.epa.gov/heat-islands>

of use of air conditioning. The UHI also exacerbates air pollution and risks to health.

A1.4 The soil, vegetation and water in GI prevents heat islands from developing by **reflecting sunlight** and **providing shade**. Water evaporating from soil and water bodies and transpiring from leaves provides **evaporative cooling**. On hot summer days, the ambient temperature of vegetated areas can be up to 4 degrees centigrade cooler than those areas of the city where there is no vegetation. The difference in surface temperature between conventional roofs and green roofs on hot summer days is even more marked, with the temperature difference often exceeding 20 degrees centigrade.⁴⁰

A1.5 The soil in GI is important as a store of water, which can provide **evaporative cooling**, however soil (whether in the guise of green roofs, tree pits, rain gardens or other planted features) is also important as a **sponge for rainwater** (Figure A1.5), which would otherwise go straight into downpipes and drains, which may be overwhelmed during extreme rainfall events, causing surface water flooding.

⁴⁰ GI and the urban heat island
<http://www.vcccar.org.au/sites/default/files/publications/VCCCAR%20Urban%20Heat%20Island%20-WEB.pdf>

Extensive green roofs, for example, have been shown to absorb the first 5mm of rain that falls upon them. Approximately half of the rain that falls on a typical extensive green roof over the course of a year is retained within the substrate (soil) and subsequently lost through evapo-transpiration.⁴¹ Rain gardens and tree pits at street level can be designed to intercept and **store large volumes of stormwater**.⁴²



Figure A1.2. Roof gardens are an effective source control element in sustainable drainage systems

⁴¹ Green roofs rain Livingroofs.org on green roofs and stormwater
<https://livingroofs.org/storm-water-run-off/>

⁴² Rain Garden Guide <https://raingardens.info/wp-content/uploads/2012/07/UKRainGarden-Guide.pdf>

- A1.6 The **economic and monetary valuation** of GI is subject to various methods of assessment (necessary because of the wider spectrum of benefits) and the process can be difficult and controversial (because it is argued that some attributes of nature cannot, meaningfully, have a value assigned to them), however some work has been undertaken to place monetary values on GI assets in London. London's public parks have a gross asset value in excess of £91 billion and the GLA estimates that for every £1 invested in parks, Londoners reap £27 in benefits.⁴³
- A1.7 Another example of the monetary valuation of GI is the iTrees method. This was used to estimate the value of trees in Swansea's River Tawe Catchment (2015), which includes the Swansea Central Area.⁴⁴ The study concludes that the trees in the catchment:
- **Intercept** an estimated 252 million litres of water every year, equivalent to an estimated £333,900 in sewerage charges avoided.

- **Remove** an estimated 136 tonnes of **airborne pollutants** each year, worth more than £715,500 in damage costs.
- **Remove** an estimated 3,000 tonnes of carbon from the atmosphere each year, this amount of carbon is estimated to be worth £671,000.
- **Store** an estimated 102,000 tonnes of carbon, estimated to be worth £23.1 million.

- A1.8 In addition to these various indirect economic benefits, the planning, design, installation and maintenance of GI is an economic activity in itself. For example, the UK annual expenditure for extensive green roofs, which is centred on London, exceeded £26m for 2017.⁴⁵
- A1.9 GI is associated with improved health and wellbeing and the mechanisms for this include:
- **Access** to greenspace whereby people maintain good health through **exercise**.

⁴³ London Natural Capital Accounts <http://www.vivideconomics.com/wp-content/uploads/2017/11/Natural-Capital-Accounts-Report-GLA-NT-HLF.pdf>

⁴⁴ iTrees <https://naturalresources.wales/media/680678/revised-english-wales-urban-canopy.pdf>

⁴⁵ London Living Roofs and Walls 2019 https://www.london.gov.uk/sites/default/files/2019_london_living_roofs_walls_report.pdf

- **Exposure** to vegetation and natural features facilitates social interaction, are **calming and inspiring**, lowers stress and improves mental health and wellbeing.
- **Reduction** in pollutants that can cause disease.

A1.10 The evidence for these effects is considered in turn and summarised in the paragraphs that follow.

A1.11 Epidemiological studies have shown that access to nearby greenspace encourages increased physical activity, lowers rates of obesity and lowers morbidity.⁴⁶ The reasons for this are complex, however an important factor is that a greener environment increases the prevalence of walking and other physical activity. The importance of exercise in preventative medicine is now being emphasised by health professionals, who recognise that easy, local access to GI is essential if prescriptions for exercise are to be effective.⁴⁷

A1.12 The sight of vegetation, outside as well as inside, lowers stress and blood pressure and helps concentration.⁴⁸ **Cognitive development** in children and the recuperation of patients are also reported to be improved when vegetation is visible. Productivity is increased and the symptoms of conditions including Alzheimer's disease, dementia, depression and ADHD (Attention Deficit Hyperactivity Disorder) may be alleviated.⁴⁹ This was reflected in the engagement findings for this strategy; with emotional benefits of green spaces in the city centre a clear theme for residents and visitors of all ages (see Figure A1.3 and A1.4). GI can be very important in child development. Research in Barcelona, using brain imaging techniques, which compared children growing up in areas without vegetation with children in areas with vegetation, found that children in the areas with vegetation had beneficial structural changes in their brains, which were permanent.⁵⁰

⁴⁶ Links between natural environment and health
<http://eprints.gla.ac.uk/4767/1/4767.pdf>

⁴⁷ Walking for Health <https://www.walkingforhealth.org.uk/>

⁴⁸ Chang, C.Y., and P.K. Chen. 2005. Human Response to Window Views and Indoor Plants in the Workplace. *Hortscience* 40, 5: 1354-59

⁴⁹ Nature and mental health

https://depts.washington.edu/hhwb/Thm_Mental.html

⁵⁰ <https://www.childinthecity.org/2018/03/28/childhood-exposure-to-green-space-may-help-brain-development/?gclid=...>

A1.15 Health is impacted by poor air quality. Air pollutants of particular concern in cities are particulates and nitrogen dioxide. In Wales, more specifically, for the latest year for which data are available (2017), the long-term mortality burden attributable to air pollution (fine particulate matter and nitrogen dioxide combined) is an estimated effect equivalent to 996 to 1,417 deaths.⁵³ The vegetation that makes up GI has been shown to improve air quality by filtering particulates and absorbing gases. Studies have shown that planting on buildings in street-canyons reduces street-level concentrations by as much as 40% for nitrogen dioxide and 60% for particulate matter.⁵⁴

A1.16 The various benefits provided by GI combine to provide economic benefits in terms of energy savings, fewer insurance claims (for example, after flooding), fewer working days lost, preventative health measures, reductions in crime, increased productivity, increased property values, increased footfall for businesses and increased inward

investment. The health benefits of urban GI, in terms of reductions in provision by the health service are estimated at £2.1 billion in the UK.⁵⁵

A1.17 Opportunities for **local food production**, in allotments, community gardens and orchards or even through temporary projects, increases access to healthy, locally sourced and distinctive food and provides education and training opportunities. It also contributes to **food security** and reconnects communities with their local environment. One example is 'Vetch Veg'⁵⁶, located at Swansea City's former football ground (Figure A1.5). This green oasis in the middle of an urban area has enhanced the community spirit, has people sharing experiences, swapping recipes and tasting and sampling new dishes. This reflects the diverse cultures of Swansea.

A1.18 Another example is the Swansea Community Green Spaces project to create green spaces for social interaction and cohesion including the site at Seaview Green Space, Mount Pleasant. This is a

⁵³ Public Health Wales on air pollution https://public.tableau.com/views/Nationallong-termannualairpollutionconcentrationsanthropogenicandmortalityburdenranges/Dashboard1?:embed=y&:displaycount=yes&:publish=yes&:origin=viz_share_link

⁵⁴ GI and air quality in street canyons <https://pubs.acs.org/doi/abs/10.1021/es300826w>

⁵⁵ Health and GI: Evidence of benefits <http://nhsforest.org/evidence-benefits>

⁵⁶ Veg Vetch, Swansea <http://www.vetchveg.co.uk/>

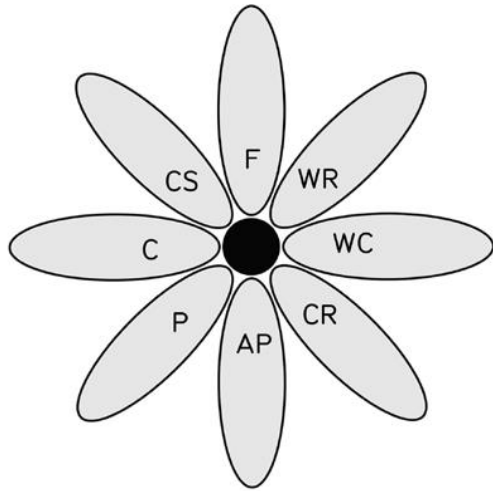
food growing project working with asylum seekers and refugees, in collaboration with the African Community Centre. It has encouraged local residents to become involved by actively engaging with people passing by. As a result, the community have formed their own successful growing project and have leased the site from the Council. This project has contributed to bringing the community together and has improved the physical and mental wellbeing of individuals.



Figure A1.5. Vetch Veg (Credit: Kathryn Campbell Dodd)


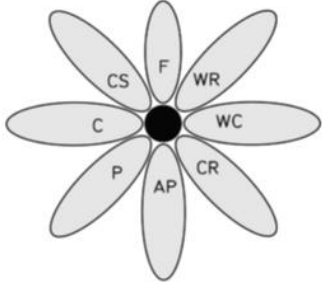

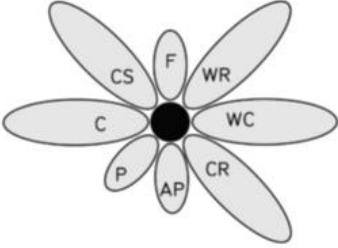
APPENDIX 2 – URBAN GREEN INFRASTRUCTURE TYPOLOGIES


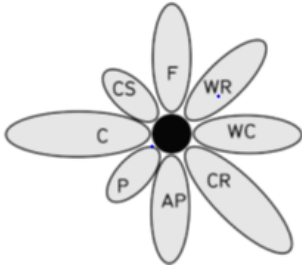

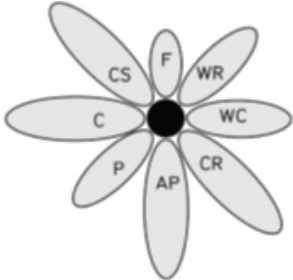
A2.1 This Appendix describes the range of urban GI types referred to in the Green Space Factor tool and to consider the ecosystem services (benefits) that are likely to be provided. It is not intended to be encyclopaedic (other types and features are available) and does not consider the biodiverse sub-types included in the Swansea Green Space Factor scoring system.



Petal Diagram Key	
F	Food
WR	Water Regulating
WC	Water Cleansing
CR	Climate Regulation
AP	Air Pollution Abatement
P	Pollination
C	Culture
CS	Carbon Sequestration

A2.2 Each petal represents a different category ecosystem service provided by the GI type. The size of the petal gives an approximate measure of the relative strength of that ecosystem service.


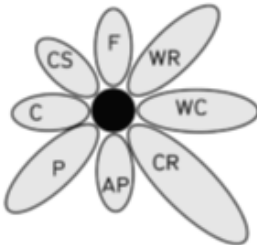

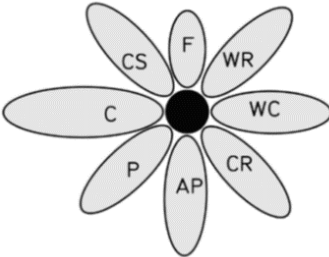
Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Semi-natural vegetation (e.g. woodland flower-rich grassland)	Although unusual to have semi-natural vegetation with native species in urban areas, this can occur and is desirable in terms of biodiversity and the range and ecosystem services provided. An example is the sand dune habitat close to the river mouth as well as woodland associated with the Tawe River corridor.			High	1
Wetland and open water created on site	Usually limited opportunities in open areas, however extremely valuable where it does occur			High	1

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Intensive green roof or vegetation over structure. Vegetated sections only. Substrate minimum settled depth of 150mm. See livingroofs.org.uk for descriptions ⁵⁷	Extremely variable, important amenity space in locations where greenspace may be limited. Biodiversity can be boosted by following wildlife gardening advice. ⁵⁸			Low - Moderate	0.8
Standard trees planted in natural soils or in connected tree pits with a minimum soil volume equivalent to at least two-thirds of the projected canopy area of the mature tree - see Trees in Hard Landscapes for overview. ⁵⁹	Important that tree pits are designed to receive surface water run-off by using soil cells or Stockholm tree pits. Biodiversity value will depend on species selection.			Low - High	0.8

⁵⁷ <https://livingroofs.org/intensive-green-roofs/>


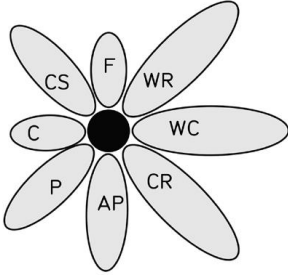

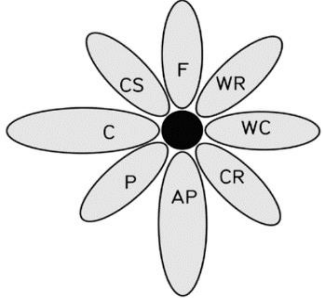
⁵⁸ <https://www.wildlifetrusts.org/gardening> and <https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/>

⁵⁹ <http://www.tdag.org.uk/trees-in-hard-landscapes.html>

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Extensive green roof with substrate of minimum settled depth 80mm (or 60mm beneath vegetation blanket) – meets the requirements of GRO Code 2014. ⁶⁰	Essential that adequate substrate depth is provided to absorb rainfall and store water for subsequent evapo-transpiration. Biodiversity value will depend on species selection.			Moderate - High	0.7
Flower-rich perennial planting – see Centre for Designed Ecology. ⁶¹	Can include species to attract pollinating insects.			Moderate	0.7


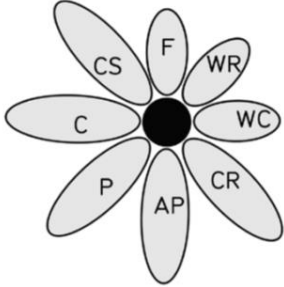

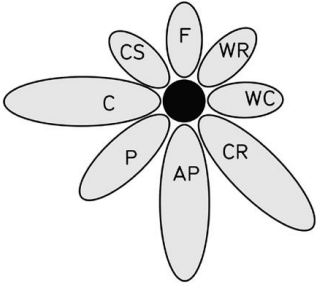
⁶⁰ <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

⁶¹ <https://cfde.co.uk/front-page/about/case-studies/>


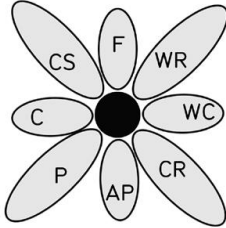

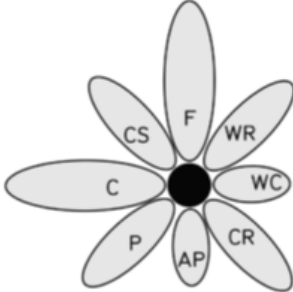
Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
<p>Rain gardens and other vegetated sustainable drainage elements – See CIRIA for case studies.⁶²</p>	<p>Careful design required to ensure levels are correct, that soil has been amended to be free-draining and water-absorbent and that overflow route is created in event that capacity of rain garden is exceeded. Biodiversity value will depend on size and planting palette.</p>			<p>Moderate - High</p>	<p>0.7</p>
<p>Hedges (line of mature shrubs one or two shrubs wide) – see RHS for guidance⁶³</p>	<p>Hedge should be large enough (width and height) to provide cover for nesting birds. Value for larvae food plants will be increased if native species are used.</p>			<p>Moderate - High</p>	<p>0.6</p>

⁶² <http://www.susdrain.org/>


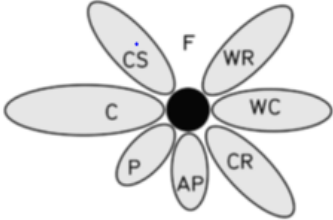

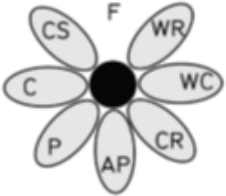
⁶³ <https://www.rhs.org.uk/advice/profile?pid=351>

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
<p>Standard trees planted in pits with soil volumes less than two thirds less than the projected canopy area of the mature tree.</p>	<p>Ideally larger tree pits will be used, however sometimes available space is limited. Biodiversity value depends on species selection.</p>			<p>Low - Moderate</p>	<p>0.6</p>
<p>Green wall – modular system or climbers rooted in soil – see NBS Guide to Façade Greening for overview.⁶⁴</p>	<p>Wide range of systems and planting methods. Wherever possible should use climbers rooted in soil. Where irrigation is required harvested rainwater should be used if feasible. Biodiversity value will depend on plant species selection.</p>			<p>Moderate - High</p>	<p>0.6</p>


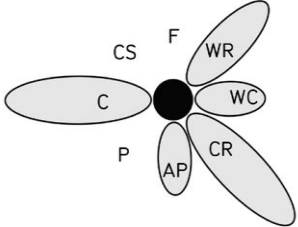

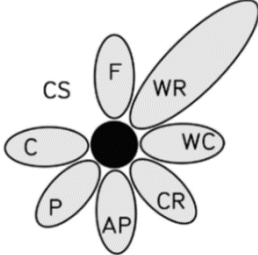
⁶⁴ <https://www.thenbs.com/knowledge/the-nbs-guide-to-facade-greening-part-two>


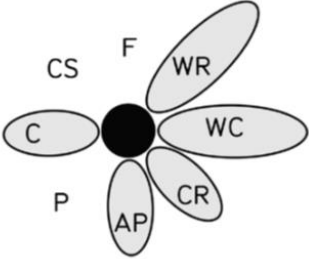


Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Groundcover planting – see RHS Groundcover Plants for overview ⁶⁵	Wherever feasible, planter beds should be designed to receive surface-water run (see rain garden). Planting should be native or of documented value for wildlife in order to maximise biodiversity value.			Low - Moderate	0.5
Allotments or raised beds for food growing	Although growing food is the main focus, consideration should be given to providing flowers for pollinating insects and avoiding the use of biocides that harm wildlife			Low – Moderate	0.5

⁶⁵ <https://www.rhs.org.uk/advice/profile?PID=818>

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Amenity grassland (species-poor, regularly mown lawns)	This is the default vegetation type with urban greening (often combined with tree planting). Unless there is a specific requirement for a lawn for amenity or recreational purposes, this should be avoided. Where possible, lawns should be planted with a range of low-growing wild flowers (e.g. birds foot trefoil) to attract pollinating insects.			Low - Moderate	0.4
Extensive green roof of sedum mat or other lightweight systems that do not meet GRO Code 2014. ⁶⁶	To be avoided			Low	0.3

⁶⁶ <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Open water (chlorinated)	Although this feature may form part of an amenity landscape, it receives a low GSF score because of its low biodiversity value. Most important ecosystem services are cultural (aesthetic, recreational) and evaporative cooling			Low	0.2
Unplanted detention basins	Although this feature may form part of a sustainable drainage system, it receives a low GSF score because of its low biodiversity value.				

Urban Green Infrastructure type	Comments	Image	Ecosystem Services	Biodiversity Value	GSF Score
Permeable paving - see CIRIA for overview ⁶⁷	Although this feature may form part of a sustainable drainage system, it receives a low GSF score because of its low naturalness/biodiversity value.			Low	0.1
Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone)	Sealed surface should be avoided unless there is a requirement for hard wearing surfaces or smooth surfaces for cycles, wheelchairs etc.			Negligible	0
Bird boxes, bat boxes, bug hotels etc	Although these are not landscape typologies, applicants will be encouraged to include these features in their plans.			High	N/A

⁶⁷ <http://www.susdrain.org>

SWANSEA CENTRAL AREA GREEN SPACE FACTOR TOOL

A3.1 INTRODUCTION

- A3.1.1 Green Space Factor (GSF) tools are used by planners, designers and planning authorities to make an assessment of the quantity and functionality of green infrastructure included in planning applications.
- A3.1.2 Planting types within a site are measured and scored, and an overall score for a site (between 0 and 1) is calculated. A minimum target for a scheme to meet can be set. (See section 2 for more details of how the measurements are undertaken).
- A3.1.3 GSF schemes have been applied in a number of cities around the world, beginning with Berlin in the 1990s. Similar schemes spread to other German cities (including Hamburg) and then overseas, including Sweden (Malmö), the United States (including Seattle and Washington DC) and Canada (Toronto). The City of Southampton was the first UK planning authority to develop a GSF scheme. A partnership led by the Red Rose Forest developed a GI Toolkit based on a GSF approach for England's North-West region in 2008. More recently the Greater London Authority has proposed the use of a GSF scheme as part of its urban greening policy in the draft New London Plan⁶⁸. The City of London was the first local planning authority in London to promote the approach.⁶⁹
- A3.1.4 Swansea Central Area is undergoing significant re-development and there is growing awareness of, and an associated body of evidence for, the multiple benefits of GI, including measurable net positive impacts on physical health and mental wellbeing. Swansea Council and Natural Resources Wales are committed to realising these benefits. It is also the case that GI will have a critical role in improving the City's capacity to adapt to climate change.
- A3.1.5 Natural Resources Wales, Swansea Council and Green Infrastructure Consultancy have developed a GSF tool. It assists developers and planners to determine the appropriate level of urban greening required for development in the Swansea Central Area, in order to achieve the vision set out in the Swansea Central Area Regeneration Framework (SCARF) and the Swansea Central Area Regenerating Our City for Wellbeing and Wildlife Strategy. Multifunctionality is illustrated in the Appendix 2 petal diagrams, designed to demonstrate

⁶⁸ <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/chapter-8-green-infrastructure-and-natural-environment/policy-g5>

⁶⁹ <https://www.architectsjournal.co.uk/news/all-schemes-in-square-mile-to-include-urban-greening-under-new-20-year-plan/10036754.article>

the contribution of GI typologies. The more balanced and larger the petals the more effective and multifunctional the GI type is.

A3.1.6 Natural Resources Wales and Swansea Council are committed to using this GSF tool as a way of increasing the quantity and quality of green infrastructure in the Swansea Central Area with a special emphasis on schemes that contribute to the establishment of a 'Green Artery'. There are numerous opportunities to add greenery to new buildings and refurbished buildings, and where options to add more vegetation to certain buildings (e.g. Listed Buildings) may be limited, the tool can still be used to ensure all opportunities are explored.

A3.1.7 The GSF will be used as a planning tool and to facilitate pre-application discussion. It is to be used in combination with the Council's Local Development Plan (LDP) and the suite of Supplementary Planning Guidance (SPG) documents relating to amenity, GI and biodiversity. The tool will also help developers to demonstrate how they are integrating Sustainable Urban Drainage (SuDS) into their schemes. SuDS is now required by legislation.

A3.1.8 Whilst it will not be compulsory for the GSF tool to be applied to all proposals within the Swansea Central

Area, applicants are expected to submit a GSF calculation in support of their plans. Where a GSF calculation is not provided applicants will need to provide extensive evidence demonstrating how the application meets the vision of the Green Infrastructure Strategy and supporting legislation. GSF scores may be calculated for application sites, buildings, buildings and their ground-level curtilage or street-level public realm for new building and refurbishment.

A3.1.9 The benefits of the GSF tool include:

- Increase in the use of multifunctional green infrastructure features.
- Urban greening on restricted sites.
- A simple calculation mechanism, easily understood by non-specialists.
- Facilitation of conversations between developers and planners.
- Flexibility: scores and targets can be adjusted to reflect specific priorities.

A3.1.10 GSF schemes are part of a response to the problems associated with the increasing density of cities. They are usually applied in locations that tend to be dominated by high density zones or districts like Swansea Central Area. Areas where large-scale

urban renewal is planned, where rapid development is expected, or where there are particular problems including, for example, biodiversity losses, surface water flooding exacerbated by inappropriate development. Achieving a satisfactory GSF score in developments with limited or no ground level greenspace (where a building covers most or all of a site) will normally require green roofs and green walls to be included.

A3.1.11 Conventional GI planning is characterised by ground-level mapping that usually overlooks the potential to green the roofs, terraces and facades of buildings. With high-rise developments with green roofs and walls located on multiple levels and aspects it will be increasingly important that not only GSF schemes, but all policies related to GI, biodiversity and climate change adaptation, take account of the challenges and opportunities associated with denser developments and taller buildings.

A3.1.12 Depending on how they are embraced, GSF schemes encourage developers to obtain more specialist advice (usually from landscape architects) in order to ensure that their plans meet the local community and the planning authority's expectations for GI improvements. With most GSF schemes, the

purpose is easily explained and understood and the calculation of the overall score using the tool is a relatively straightforward and inexpensive process. Schemes allow flexibility with respect to plot layout and landscape design and are not prescriptive. Scores for particularly desirable features can be increased in order to encourage use.

A3.1.13 GSF schemes may be perceived as an unnecessary additional administrative burden. This is more likely to be the case in cities, like those in the United States for example, where the attainment of a particular score is a pre-requisite of the permitting process. It will consequently be considered unacceptable for fragile landscape features (like intensive green walls for example) to be included in plans for the purpose of meeting a target, without appropriate controls to prevent those features subsequently failing if not properly installed or maintained. It should be noted that artificially engineered features tend to require more maintenance and are more vulnerable to failure than retained existing features or more traditional planting in natural soils.

A3.1.14 Although scoring schemes are relatively simple, the score assigned to any particular surface cover may vary from city to city and the assignment of a

particular score to a particular landscape treatment can be subject to debate. There is the potential for low quality features (for example green roofs with inadequate substrate depth) to be used to formulate unsatisfactory schemes that meet the target score. These difficulties can be overcome by providing good definitions and accurate descriptions of the various types of surface cover. If necessary, scoring schemes can be reviewed to address persistent shortcomings.

A3.1.15 GSF schemes have been confused with certification or benchmarking methods designed to measure the sustainability or environmental performance of developments. BREEAM, for example, which assesses the sustainability of building and infrastructure projects, includes five assessment categories included under the themes of landscape and ecology.⁷⁰ These categories are: site selection; ecological value of sites and protection of ecological features; mitigating ecological impact; enhancing site ecology and long-term impact on ecology. In contrast with the GSF calculation process, these BREEAM assessments require detailed baseline surveys, calculations and reports, which must be undertaken by suitably qualified persons. BREEAM schemes

may also incur substantial costs. Although BREEAM is a valuable way of measuring environmental performance and encouraging designers to strive for excellence, it has not been devised as a tool for planners and could not be readily applied to the task of improving GI provision across entire planning zones or neighbourhoods.

A3.1.16 Potential issues (depending on how a GSF scheme is implemented) can include the following:

- given that a GSF calculation determines only the quantum of broadly described categories, the design quality of each treatment cannot be assessed in detail.
- there is a possibility of the GSF scheme being too rigidly interpreted, with proposals meeting, but not exceeding, targets.
- Not promoting green roof and green walls could result in insufficient GI being created in schemes with tall buildings and a small ground-level curtilage.

A3.1.17 In light of these issues, it will be essential to be clear and precise about how a GSF scheme relates to the full suite of policies that influence greenspace planning and design. The GSF tool is the

⁷⁰ <http://www.breeam.com/>

assessment tool promoted by Swansea Council and Natural Resources Wales. However, it will not be the sole method of assessing GI proposed as part of a development scheme and cannot be a replacement for good design. The GSF tool should be seen to complement and help deliver policies and standards on, urban greening, wellbeing, biodiversity and climate change adaptation, including summer cooling and sustainable drainage.

A3.2 SWANSEA CENTRAL AREA GREEN SPACE FACTOR TOOL

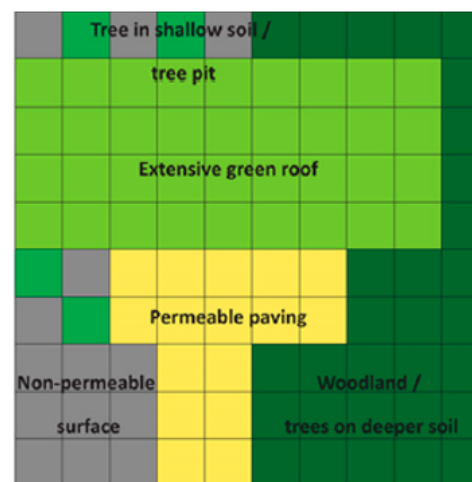
A3.2.1 The Swansea Green Space Factor (GSF) tool is aimed primarily at new developments and refurbishments. It can be used to establish a baseline for retrofit projects and used to measure the associated improvements. Minimum target scores will be an expectation and will be as follows:

- 0.3 for predominantly commercial developments, and
- 0.4 for predominantly residential developments.

A3.2.2 These scores are based on experience of successful GSF schemes and will drive up standards. The scores can be increased in the future where there is the potential for further gains, as well as an appetite, to extend the scheme. GSF scores may be calculated for application sites, buildings, buildings and their ground-level curtilage or street-level public realm. Designs for taller buildings can easily meet the 0.3/0.4 target scores by including green roofs and green walls or by vegetating balconies and other features on upper floors.

A3.2.3 The tool should be used from the conception, setting the tone of the scheme. For example, for schemes going through the RIBA stages, the tool should be used from RIBA Stage 0 and be revised and amended throughout the process.

A3.2.4 In calculating an overall GSF score for any given proposed development it is necessary to measure the overall area of the site and then to map and measure the coverage of various surface cover types within the site (see Figure A3.1). Surface covers include sealed surfaces, permeable paving, amenity grassland, trees and shrubs, extensive green roofs, roof gardens and green walls.



$$(0.7 \times 36) + (0 \times 14) + (0.2 \times 16) + (1 \times 30) + (0.7 \times 4)$$

$$\frac{100}{100} = 0.61$$

Score = 0.61
Target = 0.5






Site 100 m ²		Factor	Area (m ²)
	Extensive green roof	0.7	36
	Non permeable surface	0.0	14
	Permeable Paving	0.2	16
	Woodland / trees on deeper soil	1.0	30
	Trees on shallow soil / tree pit	0.7	0
			100

Figure A3.1. Diagram of simplified theoretical development site to demonstrate how the GSF works (modified from Southampton City Councils Guidance notes)

A3.2.5 Once the various parcels have been measured and categorised, then the total coverage of each surface

cover can be quantified. Scores are then assigned to each surface cover. Then the calculation of the overall green space factor can begin. The score for each surface cover within a site is multiplied by its area. This generates a series of figures which are then added together. This new total is then divided by the site area to give an overall GSF score (as set out in Figure A3.2).

A3.2.6 Figure A3.1 and A3.2 show a theoretical square development site of 100 square metres, explaining how the site has been analysed in terms of surface cover and areas of each type.

$$\frac{(\text{Score A} \times \text{Area}) + (\text{Score B} \times \text{Area}) + (\text{Score C} \times \text{Area}) + (\text{Score D} \times \text{Area}) \text{ etc.}}{\text{Total Site Area}}$$

Figure A3.2 Calculation for GSF score

A3.2.7 A completed GSF tool score spreadsheet should be submitted in support of an application (such as SuDS or planning applications).

A3.2.8 Scores are assigned according to the rate of infiltration of rainwater for each landscape element in a development.⁷¹ This basis in infiltrations highlights that the GSF tool is useful in demonstrating compliance with the Welsh Government statutory SuDS Standard 2019.

A3.2.9 In effect, scores are a simplified measure of the various benefits (ecosystem services) provided by soils, vegetation and water and are usually assigned on the basis of potential for rainwater infiltration. This is because the water-holding capacity of surface cover and associated soil is a good proxy for their ability to provide the range of benefits associated with natural systems.

A3.2.10 Ecosystem services provided by urban landscapes include supporting services, provisioning and cultural services (particular therapeutic benefits), however there is a special interest in regulating services (notably climate regulation and the cleaning of water and air). Scores between 0 and 1 (in increments of 0.1) are allocated to each surface cover type, with impermeable surfaces such as concrete and asphalt

⁷¹

http://www.stadtentwicklung.berlin.de/umwelt/landschaftsplanung/bff/index_en.shtml

assigned a score of 0 and the most natural surface cover such as open water/trees or woodland on deeper soils, awarded a score of 1. (See Table A3.1) listing all types between 1 and 0) The scoring system takes into account existing land cover, encourages retention of existing natural features and requires an overall increase in score compared with the existing condition. The performance requirements for surface cover types are not prescribed

A3.2.11 Table A3.1 lists the surface cover type and their corresponding scores for the Swansea Central Area and should be used to achieve the overall score. It covers most eventualities, however, if a surface cover type is encountered which is not listed, it should be assigned the same score as the category in the figure that is most functionally similar. An increase in scoring is specified for biodiverse versions of landscape typologies, in order to encourage efforts to ensure net gain/ benefit in biodiversity value.

A3.3 REVIEW OF GREEN SPACE FACTOR SCHEMES

Surface Cover Type	Score
Semi-natural vegetation (e.g. woodland, flower-rich grassland) created on site	1
Wetland or open water (semi-natural; not chlorinated) created on site	1
Biodiverse intensive green roof or vegetation over structure. Vegetated sections only. Substrate minimum settled depth of 150mm – See livingroofs.org for descriptions. ⁷² Planting to be with native species and/or species with documented value for biodiversity.	0.9
Intensive green roof or vegetation over structure. Vegetated sections only. Substrate minimum settled depth of 150mm – See livingroofs.org for descriptions. ⁷³	0.8
Standard trees planted in natural soils or in connected tree pits with a minimum soil volume equivalent to at least two-thirds of the projected canopy area of the mature tree -see Trees in Hard Landscapes for overview. ⁷⁴	0.8
Biodiverse extensive green roof with substrate of minimum settled depth 80mm (or 60mm beneath vegetation blanket) – meets the requirements of GRO Code 2014. ⁷⁵ For advice on attracting invertebrates to extensive green roofs see BugLife. ⁷⁶	0.8
Biodiverse rain gardens and other vegetated sustainable drainage elements – See CIRIA for case studies. ⁷⁷ Planting to be with native species and/or species with documented value for biodiversity.	0.8
Extensive green roof with substrate of minimum settled depth 80mm (or 60mm beneath vegetation blanket) – meets the requirements of GRO Code 2014. ⁷⁸	0.7
Flower-rich perennial planting – see Centre for Designed Ecology. ⁷⁹	0.7
Rain gardens and other vegetated sustainable drainage elements – See CIRIA for case studies. ⁸⁰	0.7
Biodiverse green wall – modular system or climbers rooted in soil – see NBS Guide to Façade Greening for overview. ⁸¹	0.7
Native hedges (line of mature native shrubs one or two shrubs wide)	0.7
Hedges (line of mature shrubs one or two shrubs wide) – see RHS for guidance ⁸²	0.6

⁷² <https://livingroofs.org/intensive-green-roofs/>

⁷³ <https://livingroofs.org/intensive-green-roofs/>

⁷⁴ <http://www.tdag.org.uk/trees-in-hard-landscapes.html>

⁷⁵ <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

⁷⁶ https://www.buglife.org.uk/sites/default/files/Creating%20Green%20Roofs%20for%20Invertebrates_Best%20practice%20guidance.pdf

⁷⁷ <http://www.susdrain.org/>

⁷⁸ <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

⁷⁹ <https://cfde.co.uk/front-page/about/case-studies/>

⁸⁰ <http://www.susdrain.org/>

⁸¹ <https://www.thenbs.com/knowledge/the-nbs-guide-to-facade-greening-part-two>

⁸² <https://www.rhs.org.uk/advice/profile?pid=351>

Surface Cover Type	Score
Standard trees planted in pits with soil volumes less than two thirds less than the projected canopy area of the mature tree.	0.6
Green wall – modular system or climbers rooted in soil – see NBS Guide to Façade Greening for overview. ⁸³ 0.6 Native groundcover planting	0.6
Groundcover planting – see RHS Groundcover Plants for overview ⁸⁴	0.5
Species-rich lawns (species-rich – with at least 5 species of low-growing wildflowers - regularly mown lawns)	0.5
Allotments or raided beds for food growing (exclude paved areas)	0.5
Amenity grassland (species-poor, regularly mown lawns)	0.4
Extensive green roof of sedum mat or other lightweight systems that do not meet GRO Code 2014. ⁸⁵	0.3
Open water (chlorinated)	0.2
Unplanted detention basins 0.2 Permeable paving - see CIRIA for overview ⁸⁶	0.1
Sealed surfaces (e.g. concrete, asphalt, waterproofing, stone)	0

Table A3.1. Swansea Central Area GSF

A3.3.1 GSF schemes are well established - they have been used in various countries and cities in Europe and North America for more than 20 years. The following examples show the history, range, type and success of GSF schemes.

A3.3.2 City of Berlin - has operated the Biotop Flächenfaktor or Biotope Area Factor (BAF) since 1994. The BAF is applied, in combination with Landscape Plans, in a number of Berlin's inner-city neighbourhoods. Landscape Plans address spatial

issues and opportunities and the BAF ensures that adequate green space is provided within each development parcel. BAF targets are adjusted according to land use, with sites with educational use, for example, requiring the highest scores. Minimum scores for sites within neighbourhoods covered by the scheme vary between 0.3 and 0.6. Problems with surface water flooding and an overall lack of green space were the catalysts for the BAF initiative, and surface cover types are assigned scores (between 0 for impermeable surfaces and 1 for vegetated surfaces completed connected with the

⁸³ <https://www.thenbs.com/knowledge/the-nbs-guide-to-facade-greening-part-two>

⁸⁴ <https://www.rhs.org.uk/advice/profile?PID=818>

⁸⁵ <https://livingroofs.org/wp-content/uploads/2016/03/grocode2014.pdf>

⁸⁶ <http://www.susdrain.org>

soil below) based on their ability to infiltrate, store and evaporate water. The BAF is viewed positively by city planners, architects and developers, who have praised its simplicity and flexibility, however, it is recognised that it cannot be used to assess the environmental impact of a scheme.

A3.3.3 Malmö, Sweden - A complex GSF scheme was trialled in 2001 in a new residential development in the post-industrial Western Harbour area of Malmö. The original purpose was to ensure that adequate green space was provided on every plot and that sealed surfaces were minimised. A minimum score of 0.5 was set. The quality of some development did not match the planning authority's expectations so the scheme was subsequently revised to include a Green Points System. The system was designed to improve the quality of landscape design and to encourage the inclusion of features that increase biodiversity. The scheme is now being applied to a wider area within Malmö as well as the neighbouring town of Lund.⁸⁷

A3.3.4 Seattle, USA – Seattle, in the State of Washington, adopted a GSF scheme in 2006 and expanded it in 2009. It was modelled on the Berlin BAF. The three priorities of

Seattle's scheme were: live-ability; ecosystem services; and climate change adaptation. As with other schemes, Seattle's has a catalogue of landscape elements, each with its own score, and a requirement for project proposals to meet a minimum overall score. Minimum scores vary according to zones, with residential zones requiring the highest scores and commercial and industrial areas, lower scores. To qualify for certain scores, landscape features must comply with detailed standards set by the city. For example, bio-retention facilities must include adequate soil volumes.⁸⁸ Increased diversity of planting is also encouraged. The scheme includes a provision for bonus credits for drought tolerance, irrigation with harvested rainwater, landscape features visible to passers-by and food cultivation. For a scheme to be awarded a score, it must be submitted with a landscape plan and landscape management plan and submitted by a licensed landscape professional. A landscape professional must also verify that the landscape scheme has been installed in conformance with the approved plan. Since the scheme was adopted, Seattle's Department of Planning and Development has noted higher quality and better-integrated landscape design, with increased use of permeable paving, green roofs, and green walls.

⁸⁷ Annika Kruuse (2011) GRaBS Expert Paper 6 the green space factor and the green points system

⁸⁸ City of Seattle (2015) Director's Rule 30-2015: Standards for Landscaping, including Green Factor

A3.3.5 Washington DC, USA – Washington DC has the Green Area Ratio (GAR).⁸⁹ It was introduced in 2013 and revised in 2016 and is very similar to the Seattle scheme. It has been established by regulation and applies to all applications for building permits for new buildings and major renovations (with a few exemptions). The satisfactory implementation of a landscape scheme, that has met the minimum GAR score, must be demonstrated by a Certified Landscape Expert, before a certificate of occupation may be granted. The scheme gives high scores for trees (measured by canopy size), intensive green roofs and the conservation of existing soil. Target scores vary according to planning zones, with differentiation between residential, mixed use and downtown (city-centre) areas.

A3.3.6 Helsinki, Finland - Helsinki considered a GSF scheme as part of its Climate-Proof City – Tools for Planning (ILKKA) project (2012-2014).⁹⁰ The approach was to test the operation of a tool and to use the tool to assess design options in two new development sites (Kuninkaantammi and

Jätkäsaari). A unique scoring system was developed by a panel of local experts. Issues considered were ecology, functionality, amenity and maintenance, with the ecological and functional goals prioritised over amenity and maintenance. Minimum scores were set for various land use classes, including residential (0.5), office (0.4), commercial (0.3) and industrial/logistics (0.2), with an expectation that higher targets would be met. These targets reflect the typical differences in the extent of greenspace provided within these development types in Helsinki.

A3.3.7 Singapore – Singapore, which has promoted the ‘City in a Garden’ vision, has explored a Green Plot Ratio (GnPR), which measures overall leaf area and compares this with site area. Typical leaf area indices for trees, palms, shrubs and grasses are used in the calculations and it is hoped that the intention is for the GnPR approach to assist in evaluating green infrastructure on tall buildings.⁹¹ Singapore has also been at the forefront of promoting green roofs and green walls on tall buildings through its Skyrise Greenery scheme of

⁸⁹ Washington DC zoning codes <http://handbook.dcoz.dc.gov/> and map <http://maps.dcoz.dc.gov/zr16/map.html#!=14&x=8565251.499999998&y=4709970.999999999&mms=18!26!21!24!22!19!4!8!1!2&dcb=0>

⁹⁰ http://ilmastotyokalut.fi/files/2014/11/Developing_Helsinki_Green_Factor_Summary_13032014.pdf

⁹¹ <http://global.ctbuh.org/resources/papers/download/286-greening-the-urban-habitat-singapore.pdf>

incentives and awards.⁹² Singapore is also noted for promoting high-rise bridges and gardens, which provide opportunities to exercise and relax without descending to the ground (e.g. the Pinnacle@Duxton skybridge).⁹³

A3.3.8 London - The Greater London Authority (GLA) included the Urban Greenspace Factor (UGF) tool as part of its Urban Greening policy in the draft New London Plan.⁹⁴ The UGF tool follows the approach first developed in Berlin, with some uplift of scores to encourage good quality green roofs and larger tree pits. Following on from the approach advocated by the GLA, the City of London's planning department has endorsed the use of a GSF tool as part of its approach to urban greening. Urban greening is now part of its draft City Plan 2036.⁹⁵

A3.3.9 Southampton - Using a GSF tool is a requirement for applications within Southampton's City Centre Action Plan (AP 12), which in 2015, required 'all developments (and especially key sites) to assess the potential of the site for appropriate GI

improvements by using the Council's Green Space Factor tool, and to improve the score for the site.'⁹⁶ For other sites not within the City Centre, the council encourages, but does not require, use of the tool. Scores are assigned according to the rate of infiltration of rainwater for each landscape element.⁹⁷ The scoring system takes into account existing land cover, encourages retention of existing features and requires an overall increase in score compared with the existing condition. Performance requirements for surface cover types are not prescribed (as they are in the US for example). A completed spreadsheet is submitted as part of an application; however, there is no requirement for a suitably qualified professional to do this and no mechanism for verifying that a scheme has been implemented satisfactorily.

A3.3.10 All schemes allocate scores to various categories of surface cover included in planning proposals. Depending on how a scheme is operated by an authority, failure to meet the target can result in rejection of a planning application, or an indication that a proposal needs to be amended, to include a

⁹² <https://www.nparks.gov.sg/skyrisegreenery>

⁹³ <https://www.timeout.com/singapore/things-to-do/the-pinnacle-duxton-skybridge>

⁹⁴ <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/chapter-8-green-infrastructure-and-natural-environment/policy-g5>

⁹⁵ <https://www.cityoflondon.gov.uk/services/environment-and-planning/planning/planning-policy/Pages/Local-Plan-Review.aspx>

⁹⁶ Southampton City Centre City Centre Action Plan, Adopted Version 18 March 2015

⁹⁷ <https://www.southampton.gov.uk/policies/Green-Space-Factor-tool.xls>

larger area of GI overall, or elements with higher functionality. Cities usually set a minimum score that must be met and some have targets to encourage developers to be more ambitious and innovative, or they may have requirements which relate to the delivery of a specific function or outcome (e.g. stormwater management).

Swansea Central Area: Regenerating out City for Wellbeing and Wildlife

Consultation Report

INTRODUCTION

There is clear evidence from the UN Intergovernmental Panel on Climate Change (IPCC) that by 2050 the Swansea Central Area will have periods of intense heavy rainfall, droughts and rising temperatures. The benefits and cost-effectiveness of green infrastructure (GI) in adapting to and mitigating for climate change are well documented, along with a wide range of other social, environmental and economic benefits. The regeneration currently underway in the Swansea Central Area provides a perfect opportunity to design in multi-beneficial GI improvements.

Swansea Council's Strategic Planning and Natural Environment Section and Natural Resources Wales (NRW) employed Green Infrastructure Consultancy (a world leading expert in the GI industry) to develop a GI strategy using the ideas and issues raised from stakeholder engagement. This was conducted through a series of workshops, meetings, training days and presentations with colleagues from Swansea's Public Service Board (PSB) partnership, private, public and third sector in February 2019. 634 face to face conversations were held with members of the public in 10 locations across the Swansea Central Area. Sessions with the 4 primary schools within the catchment were held along with stakeholder meetings with 6 residents' and local interest groups, together with social media engagement using #citynature / #naturynyddinas. These conversations demonstrated an overwhelming desire for more nature in the city, with stakeholders talking about the contribution nature makes to their personal mental and physical wellbeing and to their desire to live, work and visit the city centre. Swansea workers, residents and visitors wanted a greener city with less hard surfaces. A city which provides space for wildlife bringing people joy, and an improved visitor and trading experience. A destination and liveable city which can adapt to and mitigate for climate change.

The strategy's vision and strategic objectives reflect the opinions, words and ideas from the engagement process. In response to stakeholder conversations it explores the benefits and cost-effectiveness of GI, such as: reduced flood risk; summer cooling; cleaner air and water; reductions in noise; shelter from the wind; better mental and physical health; gains in biodiversity; reduced CO2 emissions and energy costs; and a strengthened economy. It sets out an intention to double the amount of GI in the city centre over 10 years, and details existing assets and the opportunities for creating a GI network by using 5 core principles of: multifunctional; biodiverse; adapted for climate change; healthy; smart and sustainable. The strategy includes a Green Space Factor Tool - designed to measure the quantity and functionality of green space. The strategy is designed to support the Local Development Plan (LDP), Policy ER 2 Strategic Green Infrastructure Network and emerging Supplementary Planning Guidance (SPG) on GI. It contributes to NRW and Swansea Council's duties under the Well-being of Future Generations (Wales) Act 2015 and, Environment (Wales) Act 2016, and will support the application of the Statutory SuDS Standard 2019 and the Swansea PSB's Working with Nature Objective.

DRAFT STRATEGY CONSUTATION

The draft strategy went out to public consultation between 22nd November 2019 and the 31st December 2019. The consultation process included an online survey and consultation events were held at the 4 primary schools within the catchment area and in Swansea Central Library.

CONSUTLATION RESPONSES

45 survey responses were received. One email response was also received, and comments from the school and library sessions were also recorded.

Completed survey responses are reported in the tables and charts below. Charts present the findings from multiple choice questions, whilst written comments are listed in a table under each question. The comments received from the school and library sessions are also listed in tables below.

The Council's GI Steering Group considered each comment and allocated an appropriate response / action from those defined below.

A = **Amend Strategy**

AP = to be addressed in the strategy **Action Plan**

OS = comment **out of scope** of the Strategy / not applicable

N/A = comment noted but **no action** required

SUMMARY OF RESPONSES

Overall the strategy was very well received. Over three quarters (79%) of survey respondents agreed with the strategy's vision (Question 1). Over three quarters of respondents also either agreed or strongly agreed with the strategic objectives, but some questioned the relationship between the strategic objects and targets particularly around the implementation of quantitative targets (Questions 2 and 3). As a result the GI Steering Group reviewed and revised the strategic objectives in order to provide SMART objectives which reflected each component of the vision. Elements of the original objectives were also considered to be more appropriately expressed as performance indicators. Specific comments are included in the tables below and in Appendix 1 which sets out the amended strategic objectives and related performance indicators.

A number of comments (Question 4) referred to GI improvements at locations outside the geographic area defined by the strategy so were identified as being out of scope. However, the Council has begun work on a County Wide GI Strategy which will address many of the currently out of scope issues raised. There were a number of comments which focused on the need to raise knowledge and skills, provide training, engage with stakeholders and the community, and around the issue of maintenance (Questions 5, 8 and 9). These points are reflected in the revised strategic objectives and performance indicators (see Appendix 1), will be implemented through the Action Plan and success monitored via a monitor and evaluation process.

The targets (now performance indicators) to increase canopy cover to 20% - 25% by 2044 and double terrestrial GI from 13% to 26% by 2030 received a number of comments (Questions 3 and 12) both in terms of what baseline data was available and whether the target was too ambitious or ambitious enough. The terrestrial GI figures in Table 3 of the Strategy were based on Ordnance Survey mapping¹ and confirmed by a ground truthing survey (walking the site to add new or remove no longer existing GI) in October 2020. Latest canopy cover studies² date back to 2013 and place the canopy cover at around 7%, but this data is historical and unlikely to reflect accurately the current cover in the Swansea Central Area. Recent studies³ recommend setting an average tree canopy cover of 20% (15% for coastal cities) as a minimum for most UK towns and cities. As such these performance indicators are considered to be appropriately ambitious given the physical constraints of a highly urbanised area. Both the GI percentage and canopy cover percentage will be periodically surveyed as part of the strategy monitoring process.

The respondent data demonstrated that more men (62%) than woman (38%) responded to the survey. Of the survey respondents 60% (31 respondents) live within the County (SA1 – SA6).

The session in Swansea Central Library and those held in the catchment primary schools focused on the vision and strategic objectives. Consultees were supportive of the vision and objectives. In particular the school sessions focused on simplifying the language of the vision and strategy.

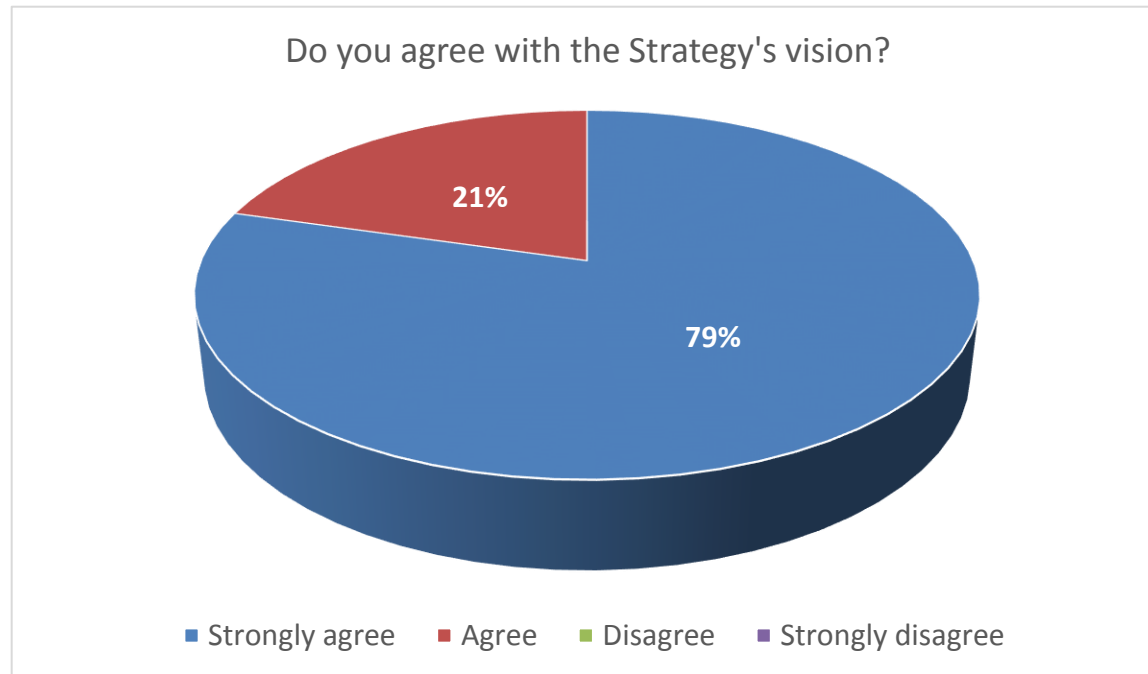
¹ 13% overall terrestrial GI cover was estimated in March 2019 based on Ordnance Survey map data, Jan 2019 and confirmed in October 2020 following a ground truthing survey

² Canopy cover – there are two recent publications which have looked to measure canopy cover; *Valuing Urban Trees in the Tawe Catchment, (2016) Kieron Doick, Angiolina Albertini, Phil Handley, Vicki Lawrence, Kenton Rogers and Heather Rumble*, which states that the Tawe catchment in 2014 had a 16% urban tree cover, equal to an area of 1,119 ha. The trees were primarily found in parks, on residential land and on vacant land, and *Town Tree Cover in the City and County of Swansea: understanding canopy cover to better plan to manage urban trees (2016) Natural Resources Wales*, which states that canopy cover in the Swansea Central area was 6% to 7% (measurements were broken down by Lower Social Output Areas / Welsh Index of Multiple Deprivation Custer Areas). The assessment was undertaken by iTree in 2013.

³ Doick, K.J, Davies, H. J, Moss, J., Coventry, R., Handley, P., Vaz Monterio, m., Rogers, K., Simkin, P: *The Canopy Cover of England's towns and Cities: baselining and setting targets to improve human health and wellbeing* Conference Proceedings of TPBEIII. Urban Trees Research Conference 5-6th April 2017 Institute of Chartered Foresters, Edinburgh.

CONSULTATION RESULTS

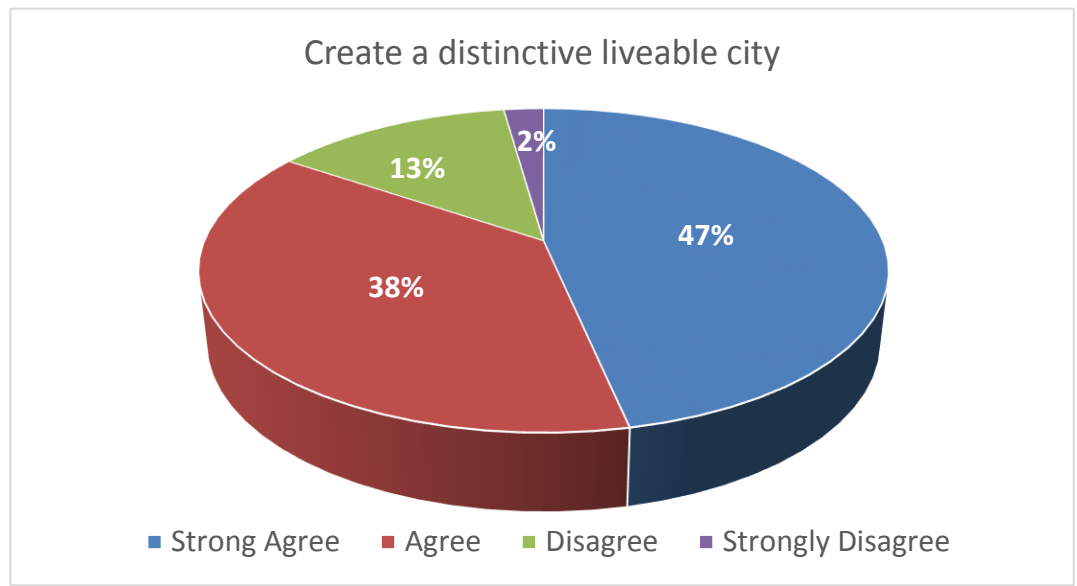
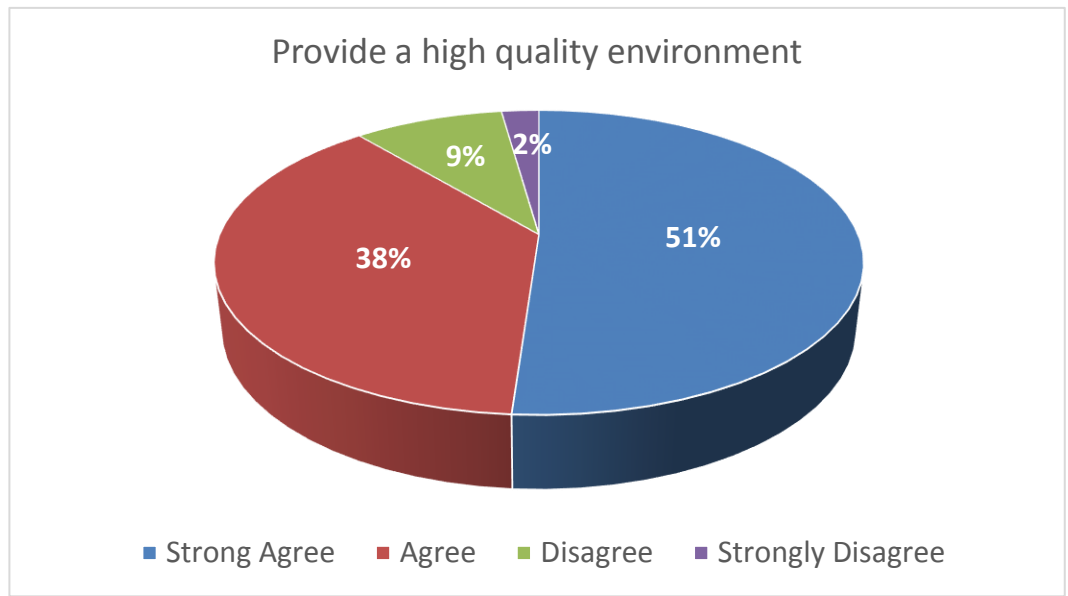
Question 1: The Strategy's vision is for 'A City of high quality multifunctional green infrastructure delivering resilience, prosperity, nature, health, wellbeing and happiness to the citizens and visitors of Swansea'. Do you agree with this?

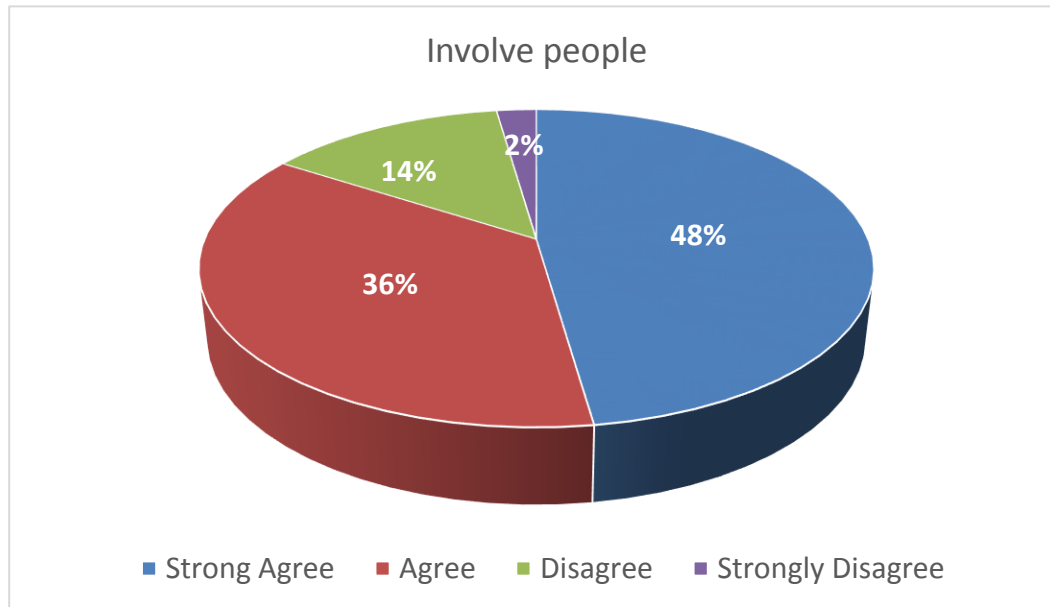
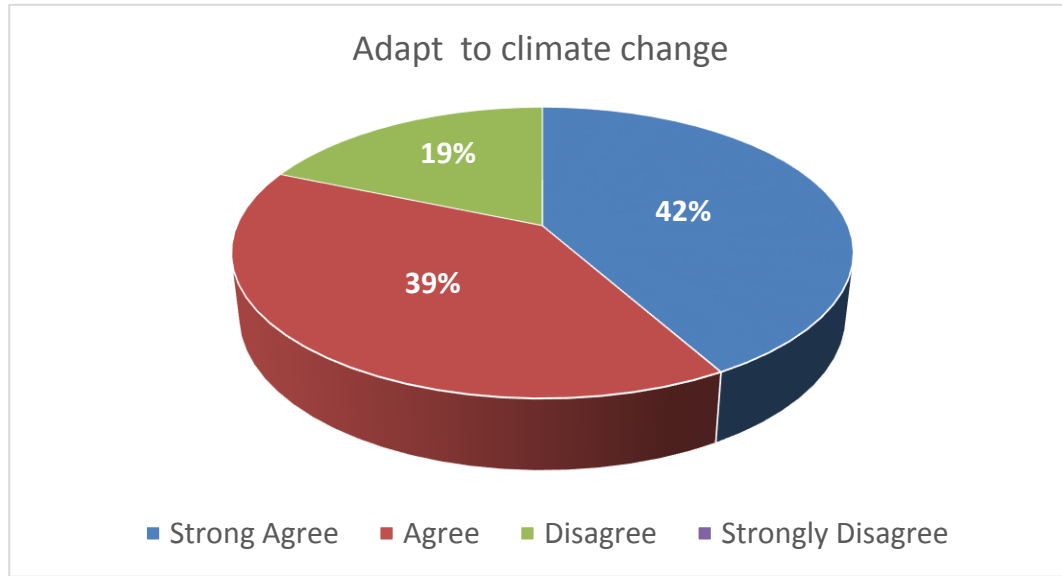


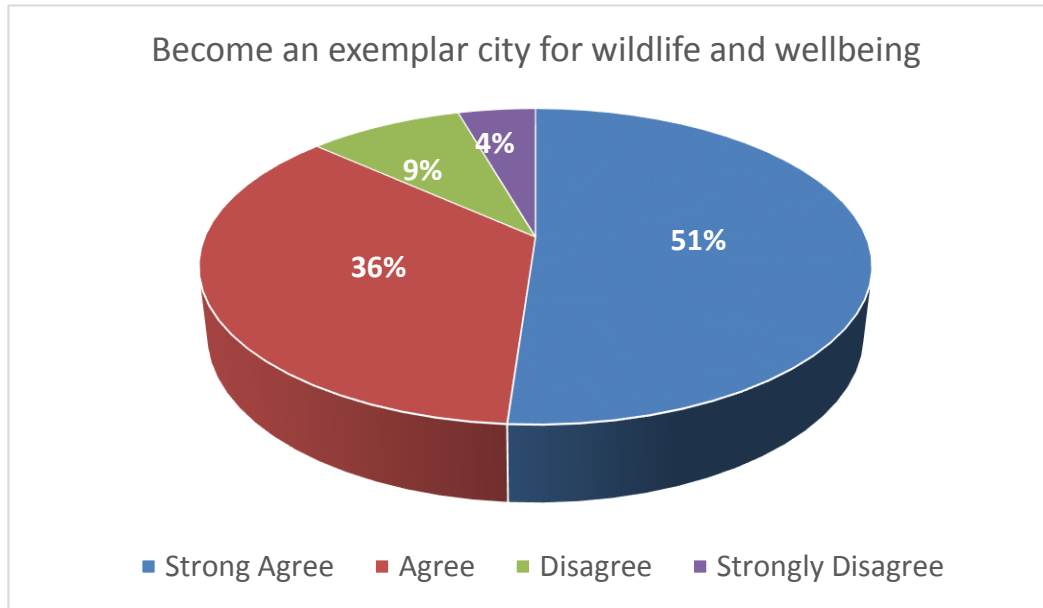
Comment	Action				Response
	A	AP	OS	NA	
Absolutely agree, but all departments within the Local Authority have to accept this step change and fully embrace this different, yet much needed approach. I am thinking rainwater run-off solutions, and also configuration and specification of highways. Provide proper training for relevant officers.		X			Training addressed though the strategic objectives.
Excellent idea but I'm concerned that it won't be implemented fully. I've seen the Kingsway development not going far enough in terms of green space and vegetation especially trees and flowers. There is way too much pavement and those grass sections are very feeble attempts at green space.				X	Implementation via the strategic objectives, steps and actions, performance indicators and targets, all of which will be tracked through the evaluation / monitoring process (see Appendix1).
I strongly agree that GI, as described in the strategy, will contribute to delivering the benefits you describe. I fear you may be setting expectations too high by suggesting that GI can be as transformative as suggested. There are many factors which influence health and happiness, for example, other than urban GI, over which this strategy has no control.				X	
I think that the main focus should be on providing green spaces for nature within the city to improve biodiversity. These can then be accessible to the public to improve health and well-being.				X	
It is what the Americans call a "Motherhood and Apple Pie" question but so far so good.				X	
It would be a mistake to measure prosperity in purely financial terms, well-being is an important element of prosperity, and well-being depends on a variety of environmental factors including traffic free areas for leisure and walking within the city environs. It is difficult to see how the proposed digital arena will enhance the well-being or environment of the city for residents or visitors.				X	Arena development includes significant GI improvements in the proposed coastal park, which provides an outdoor amenity area for residents and visitors and environmental improvements.
Living walls, green top bus stops, greener Castle Square garden, a greater push for greener forms of transport. Frequent boat trips up the river to the stadium. Improve parks such as Singleton. Create a new attraction like daffodil hill in California. Which if you look it up, was a successful attraction.			X	X	Comments on transport to be shared with relevant service areas. County wide strategy will cover the adjoining districts and links.
More greenery is needed whether it's grass, trees or living walls. Castle Square garden is in desperate need of this. Singleton Park			X	X	Singleton Park lies outside the area covered by the City Centre Strategy, and

is also in need of some urgent action. One of the ornamental gardens looks neglected. Also instead of building houses at the farm build a community centre and link it up with the hospital. Be great for cancer patients or for patients with mental health issues to get out and get some fresh air. Could even been used as a physiotherapy unit if a small farm with some horses were introduced.					is therefore out of scope for this document. However the emerging Countywide GI Strategy will address this issue. Castle Square is part of the green artery.
Personally I would specify "high quality, accessible, multifunctional GI"				X	Accessibility is covered under the GI principle of multifunctional.
This should be one of the top				X	
Would love to see that this plan goes further than a vision. How can these 'resilience, prosperity, nature, health, well-being and happiness' be measured? It would be good to talk to businesses and people who commute to the city regularly to get a genuine picture of how the city has responded to the new strategy and planners can quickly adapt where these indicators fall short. I feel it's not all about the city centre but the way of life around Swansea that should be included in assessing our health, wealth & happiness. A large part of this would be to improving transport links so people can get to places via public transport cheaply, independently and reliably. I'm concerned as a resident of Swansea for 15 years there's been no reliable change to our public transport system despite all the developments in this sector regards other modes of transport. It's very sad to see no strategy in place for dealing with large spikes in use for events like Air Show and Christmas lights, where taxis will not pick up the phone and not drop off. I feel these are the periods that show a lack of vision in terms of improving on this indicators and people's impression of Swansea.				X	The emerging Countywide GI strategy will consider the issue of Active Travel links. The strategic objectives and targets have been reviewed to ensure they reflect each element of the vision clearly and have associated PIs which will be measured and monitored (see Appendix1).
Yes a good effort towards these important goals, thanks!				X	

Question 2: The Strategy's strategic objectives are set out below. Do you think the strategic objectives will enable this vision to be achieved?







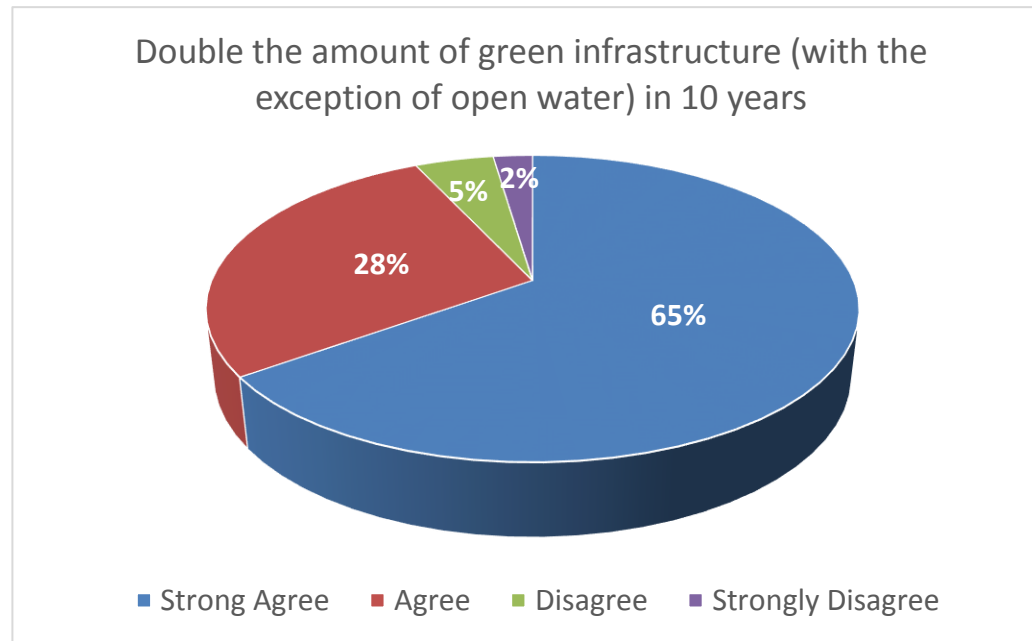
Comment	Action				Response
	A	AP	OS	NA	
I think this is an excellent vision				X	
I think the objectives are great. What isn't clear is the quantitative element - how much GI is required in a particular situation to deliver a particular objective. It's not clear whether your targets for GI and green cover are entirely pragmatic or whether they relate to an evidence base.	X	X			<p>Targets are to become Performance Indicators (PI's). Targets for GI increase were developed with Green Infrastructure Consultancy and the canopy cover targets are taken from the recommendations made by Doick, K.J <i>et al</i> (see reference in footnote 3).</p> <p>Use of the GSF tool will help to determine the quantitative element for a particular application.</p>

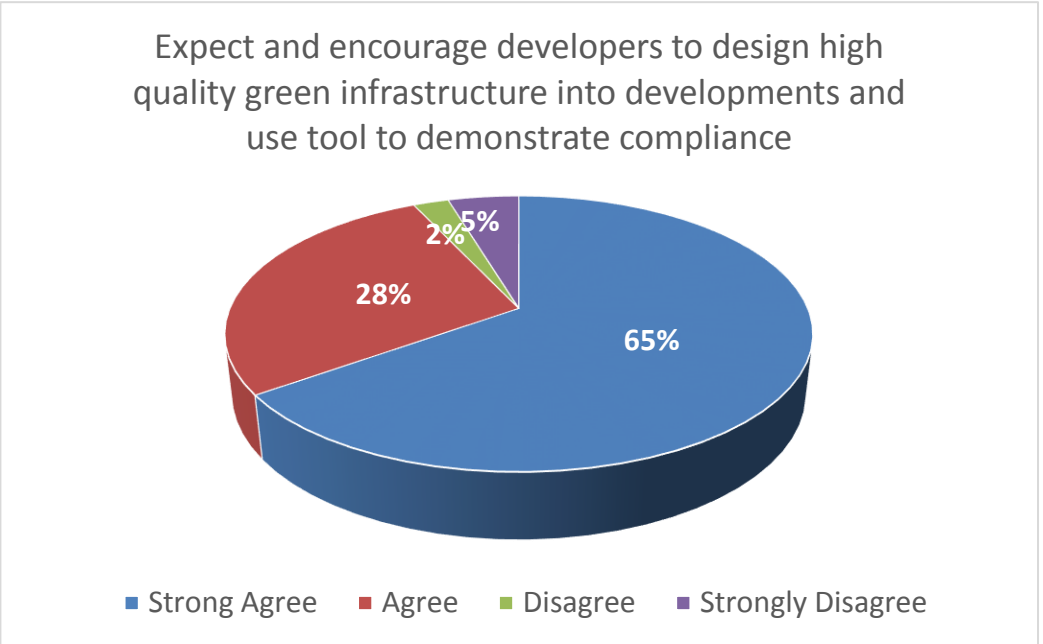
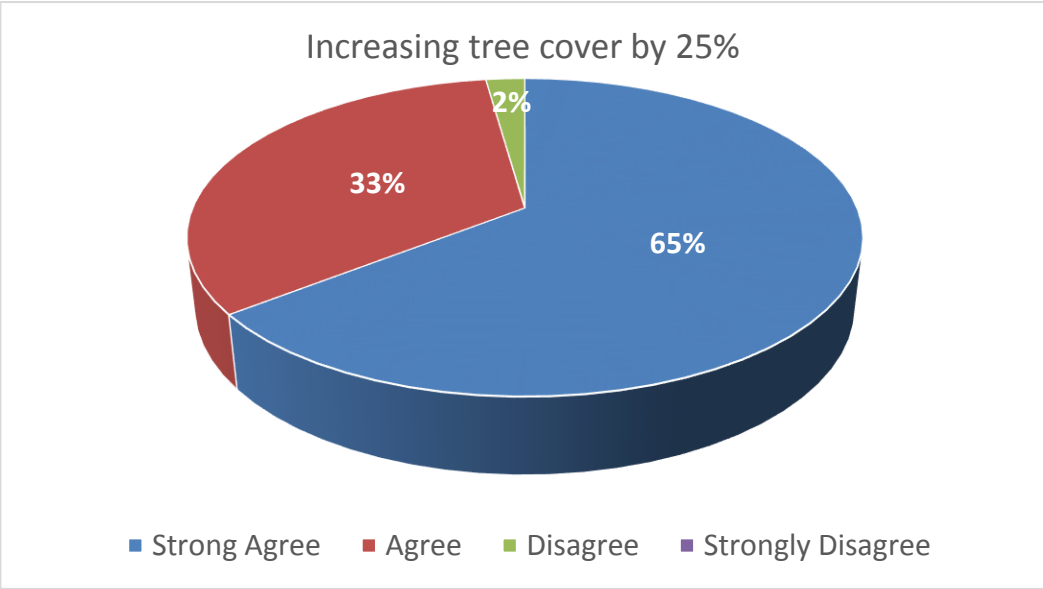
<p>Difficult to answer honestly as the definition of each objective is not fully understood from the list above - what does each objective mean? Overall i do agree they would enable the vision to be achieved</p>	X			<p>The strategic objectives have been reworded to make them clearer and a set of PI's has been added.</p>
<p>This is a new idea and a lot will need to be worked out on the fly (especially now the city has committed to the greening plans for the City Centre). Perhaps ideas could be developed as the new trees and grassed areas come to require maintenance.</p>		X		<p>The strategic objectives and the monitoring and review process ensure learning and continuous improvement.</p>
<p>I agree. I think more could be done and I think it could be more ambitious - currently this is slated for impact by 2030 and 2044. Why can't it be done quicker? Why can't you also affect how new buildings are put up? Say they'll only get planning permission if they have green roofs and walls.</p>			X	<p>The reference to canopy cover targets has been removed from the strategic objectives and a specific PI created.</p> <p>The timescales stated in the PI are considered realistic for the types of improvements to be measured i.e. canopy cover from mature trees. However the impacts of GI will evolve from 2020 forward.</p> <p>Introducing 'green' planning conditions is outside the scope of this strategy. However, all new developments will be considered against the requirements of national planning policy and adopted LDP Policy which require that development maximises opportunities to maintain and enhance GI. SPG on GI will also be prepared to provide further guidance on the implementation of planning policy.</p>
<p>It's difficult to identify the actual strategic objectives from this consultation document-the draft strategy, which undoubtedly was expensive to commission contains much information and many tables which have been lifted from other documents. The particular maps are not particularly informative for most people and would confuse rather than clarify for most of the population. I suggest an easy read document is produced with specific and</p>	X			<p>The strategic objectives have been reworded to make them clearer and PIs added.</p> <p>The Action Plan will further inform actions and a plain English / strategy on a page version is planned.</p>

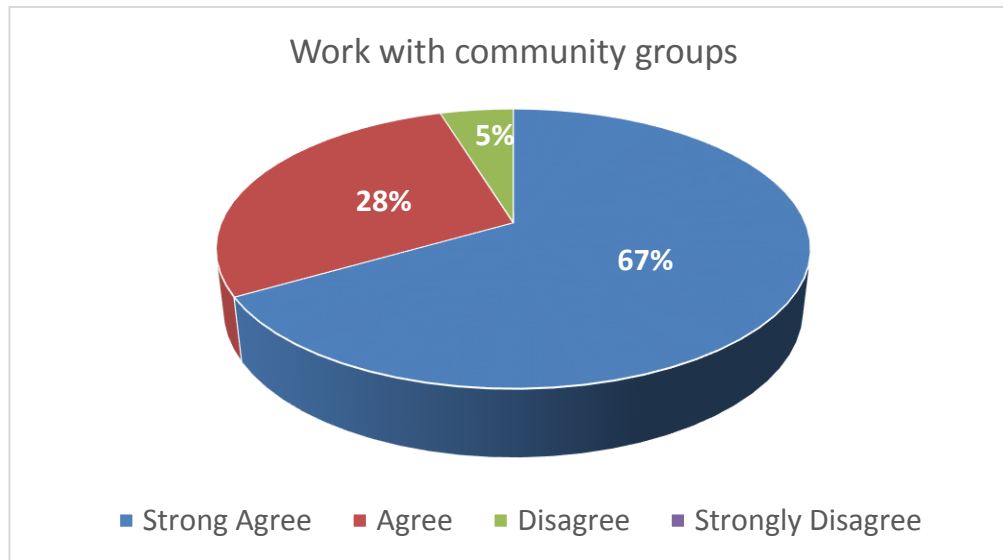
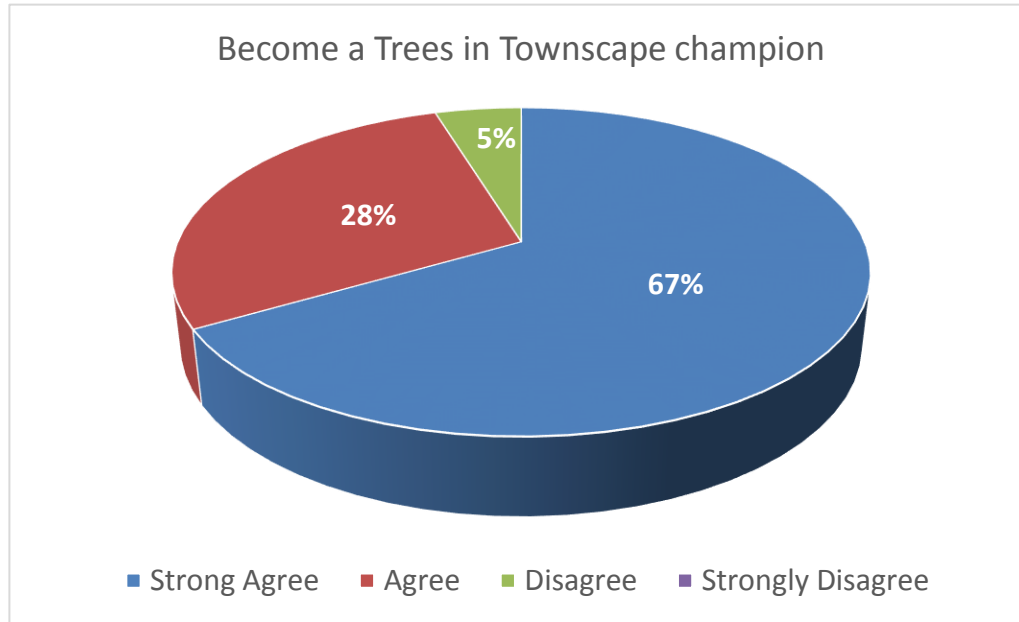
clear area proposals. For example: the existing 'community forest' which was planted some decades ago, will now be refreshed and maintained and linked with the central city green areas in order to facilitate 'green corridors' to support wildlife and enable residents to walk across the city in a healthy and pleasant environment following paths through existing woodland where possible.					
Swansea has the potential for providing all this which is encouraging; it's the sectors where funding is lacking that will end up failing without intervention and some form of linking i.e. we can't involve people by creating an event where there's little thought toward the climate or natural habitats, there should be a clear strategy that makes people think about how they get there and ways they can help the clean-up. But there should also be an event after the event that mitigate its impacts.				X	Comments on event mitigation measures to be shared with relevant service areas.
Should be accessible to everyone	X				An easy read / strategy on a page version is to be developed.
The city has no hope!				X	
Create small attractive looking tuck shops/stalls for small start-up businesses to use/rent. Dot them around the city. One by Castle Square, Kingsway, St David's and along the Bay. The one by Castle Square could rent out or offer deckchairs for people to use in the summer months. Castle Square needs a much higher quality environment. Give the people their park/garden back.				X	This is being picked up by the feasibility study for Castle Square.
But would like to see all Kingsway buildings either demolished or revamped, because they make the city centre look like warzone and one of the main causes of the sadness look of the city				X	
The two variables in here are around siting and design. For these objectives to be achieved and the vision delivered, design quality must be high, and location of GI must be appropriate, where it's environmental impact can be maximised and where it can be accessed and the social benefits enjoyed by a wide range of communities.				X	
The areas for people, within the town centre, should be turned inward and not looking at the road, there should be some areas				X	There are a number of ways of creating boundaries to a play space, and play

fenced for children. There must be things to do (tea shop) and look at (water features).					spaces should be appropriate to the context of the proposals and the wider area. The seats within the City Centre are not all orientated facing the road. They allow multiple aspects of the area with additional features to be introduced as part of the GI proposals
Improving air quality should be a major goal.	X				Air pollution is addressed under benefits of green infrastructure Chapter 1 and is one of the ecosystem services depicted in the GI typologies (Appendix 1 of the Strategy), and through the strategic objectives to provide a high quality nature rich environment and a city resilient to the impacts of climate change. Figure 1 (now Figure 3) amended to include air quality.
I hope this is implemented to its full potential but I have my doubts based on previous efforts and current plans. Lots of trees, plants and green spaces to sit and relax		X			Implementation to be tracked through the delivery of the strategic objectives, steps and actions, performance indicators and targets.

Question 3: To enable us to achieve our strategic objectives we will aim to achieve the following. Do you consider these aims appropriate and deliverable?







Comment	Action				Response
	A	AP	OS	NA	
Again, I agree in principle. I think you should include something in the strategy around what performance indicators you will monitor to establish to what extent the vision and strategic objectives have been realised.	X				Agree. A set of performance indicators have been added to the final version of the strategy.
Is it increasing tree cover by 25% from what there is now, or from what it was prior to the trees all being cut down? Unless you can force developers to install green infrastructure they will not due to cost.				X	<p>The performance indicator seeks to increase canopy cover to 20% / 25%, rather than by 20% / 25% i.e. to increase canopy cover to 25% of the Swansea Central Area.</p> <p>This is considered to be an appropriately ambitious aim and is based upon research and evidence contained in <i>Town Tree Cover in the City and County of Swansea: understanding canopy cover to better plan to manage urban trees</i>, NRW 2016, which references the most recent canopy cover measurements undertaken by iTree in 2013 which report that the average canopy cover for the Swansea Central Area was between 6% and 7%.</p>
Not sure of the amount of green infrastructure in place currently				X	The strategy is based upon a baseline figure of 13%. This is based on a data survey completed in March 2019 of terrestrial GI (i.e. excluding the marina), which has been confirmed by a 'ground truthing' survey completed in October 2020.
That 25% tree cover increase by 2044 seems little to me				X	The aims in the strategy are considered to be appropriately ambitious and are based on research which recommends setting an average tree canopy cover of 20% as a minimum for most UK towns and cities, with a lower target of 15% for coastal towns. The aspiration of 25% is therefore considered very ambitious for Swansea (see footnote 3 for research reference).
These objectives should be aimed for a LOT sooner than stated here. These deadlines are too late.				X	<p>Strategy targets include:</p> <ol style="list-style-type: none"> 1. Increase terrestrial green infrastructure to 26% by 2030.

					<p>2. Increase canopy cover to 20% - 25% by 2044.</p> <p>These deadlines are considered to be reasonable and realistic targets over these periods to achieve the improvements in quantity and quality of GI which the strategy is seeking to achieve.</p>
There's no point going about this half-heartedly. Let's do this properly and aim for all the top level goals, even if we fail to achieve them.				X	See above response.
I think you need to push harder to achieve this more quickly.				X	See above response.
Maximising the green resources which already exist is an important element in achieving these objectives. Please revisit and revive the 'community forest' which was planted some decades ago and is in need of maintenance and sustenance.				X	<p>The strategy looks to both improve and enhance existing GI and create new GI.</p> <p>The community forest areas: Tawe Corridor, Kilvey Hill and Northhill Wildlife Corridor are outside the Swansea Central Area and therefore outside the scope of the strategy.</p>

<p>Green infrastructure should be mandatory for any future development in the Swansea Central Area. I'm largely encouraged by Swansea Councils response to the climate crisis and positive vision on its greenspaces... I recently asked whether I could plant a tree on my street... I wasn't able to but was recommended to look to a local park... Having seen some trees being planted in a park only to be snapped and removed soon after I hope developers are encouraged to look for innovative responses to creating Green infrastructure such as vertical greening, technological responses that are built into their projects and are an integral part of their upkeep. Planting improving native biodiverse habitats for flora and fauna is also an education and carbon sink often overlooked by new builds that prefer to concrete and garden rather than improve an areas biodiversity, flood resistance etc... and here is where the latest understanding and innovations would be helpfully introduced at planning stage so we're not only looking to them but they look to the council for support and knowledge</p>			X	<p>Introducing planning restrictions is outside the scope of this strategy. However, all new developments will be considered against the requirements of national planning policy and adopted LDP Policy, which require that development maximises opportunities to maintain and enhance GI. SPG on GI will also be prepared to provide further guidance on the implementation of planning policy.</p>
<p>If developers don't have the do these things by law and are only expected or encouraged to are they going to do it or just give the bare minimum?</p>			X	<p>See response above.</p>
<p>Castle Square garden is in need of more greenery. One of the new plans I've seen floating about online looks set to fail already. By introducing levels with a unit... which looked more grey than green.</p>		X		<p>Regeneration projects will be influenced by the requirements of the strategy.</p>
<p>I think that it is very important to engage both developers and the community with improving</p>			X	

and increasing green spaces as this will help the goals to be achieved.					
Yes...but we need deep understanding and commitment from all officers...not just lip service and tick boxes!		X			The strategic objective to <i>create a skilled and knowledgeable local economy to deliver and maintain GI</i> includes steps / actions for building the local knowledge and skills around GI through events, training and sharing best practice. Implementation will be monitored through PI's (see Appendix1).
There are a number of partners that would support and work with the Council to help achieve these aims. We would be happy to support at Young-Dragons.co.uk and 2Benterprising.co.uk		X			Working in collaboration with partners is important and will be addressed through the delivery of the strategic objectives, steps and actions, performance indicators and targets (see Appendix1).
Who will clear leaves from trees when drains are blocked!!!				X	This will be addressed as part of the maintenance plan as with all public realm cleansing and maintenance. Leaf fall will be one of the considerations when selecting the types of trees to be planted
All of the above, but they need to be serious about implementation, and understand the implications of adopting these aims.		X			Implementation will be addressed through the Action Plan and monitoring PI's
I am the President for the Swansea University Tree Society and I would absolutely love to be a part of this project! I believe by involving the local students and residents we will help to further cement the lost connection between us and nature, which is a crucial element for overall mental and physical well-being.		X			Working in partnership is important and will be addressed through the delivery of the strategic objectives, steps and actions, performance indicators and targets. The Nature Conservation Team have good links with the University to explore wider GI and Biodiversity improvement opportunities.
All very good intentions.				X	
The plans for the Woolworths building look great! We need more like this! However My only concern is with it being social housing. Will they maintain and look after it? I've also noticed the plans involve a second public area which is great! However this too will also need to be maintained and looked after. After seeing what happened in Penlan with the trees it				X	

doesn't fill me with confidence. Something needs to be done to the building behind Argos.					
Reiterate earlier comments around design quality and siting of GI in order to maximise the benefits of these enhancements, rather than pursuing large-scale schemes which could deliver area-based or percentage targets while compromising the net gain in infrastructure. Initiatives such as Tiny Forests for example, could deliver concentrated improvements in GI in highly constrained spaces, so qualitative as well as quantitative targets will be important. Also an idea of the regulatory/legislative frameworks through which developers will be stimulated and supported to deliver high quality GI in a highly competitive and pressured construction sector.				X	Policy context for developers outlined above. The strategy is about improving quality as well as quantity
We can achieve this and more. This is a massive opportunity and I really hope this is not another half arsed attempt that doesn't satisfy expectations.				X	

Question 4: The Strategy focuses on enhancing green infrastructure in the Swansea Central Area from the train station to the Maritime Quarter. This includes High Street, Castle Square, St Mary's Church, St David's Church, across Oystermouth Road to the new Coastal Park. Green links will also be made with Oxford Street and the Kingsway to the west and the River Tawe to the east. Are there any other areas in the central area where you would like to see enhanced green infrastructure?

Comment	Action				Response
	A	AP	OS	NA	
Hafod up to Morrision			X		Area will be covered in County wide Strategy
St Helens Road			X		Area will be covered in County wide Strategy
There is scope to install GI on open top-level multi-storey car parks, such as close to the train station.				X	

Upper High Street to Dyfatty Lights, Dyfatty Street, Orchard Street.			X		Area will be covered in County wide Strategy
green areas in the city centre shopping area would be great				X	
Carmarthen Road approach, more park and rides.			X		Area will be covered in County wide Strategy
Roofs are perhaps a wasted opportunity but I appreciate that costs may be prohibitive. I would also like to see more trees and green areas leading out to the Uplands along Walter Road but doing this might perhaps be better achieved by encouraging the residential blocks and businesses in the old terraces on Walter Road to take up the concrete in their front garden areas and replace them with more permeable, greener surfaces. Too many of these elevated garden areas are just concreted over.			X		Area will be covered in County wide Strategy
The area around the maritime museum which forms a pleasant green should be maintained and extended. It is really important that the addition of a digital arena is not allowed to make this part of the city a no-go area for most of its residents and that the increased traffic which such an addition can be expected to generate is not able to make its impact on access to the city for residents and visitors who do not wish to attend events there which are most likely to attract occasional short term visitors with no investment in consideration of sustaining the city as a pleasant environment for residents and many visitors.				X	
Princess Way, especially the pedestrianised area leading towards the Kingsway.				X	
Villages and the outer areas of Swansea need to be thought of as well, not just central Swansea. There should be pathways and green areas accessible wherever we live.			X		Area will be covered in County wide Strategy
Why only central, this should include the whole sweep of Swansea Bay.			X		Area will be covered in County wide Strategy
I'm not one for looking up at roofs for fear of being crapped on by a pigeon or seagull but there are large				X	

roof spaces that are underutilised, I'm not even sure if I've seen a solar panel in the city centre.. However the improvements to rent/rates begs the question why haven't their owners considered installing these... Also Green Roofs and vertical walls are still a futuristic vision... it's a shame that cladding that's a danger to human life near Castle Gardens wasn't a moss and fern installation... Let's not jump on the plant tree bandwagon and think more strategically on how to achieve these goals					
The sa1			X		Area will be covered in County wide Strategy
North of the High Street all the way to Dyfatty lights and include Dyfatty Street all the way down to Alexandra Road too.			X		Area will be covered in County wide Strategy
Port Tennant Area			X		Area will be covered in County wide Strategy
Mayhill North			X		Area will be covered in County wide Strategy
Although this is focusing on the city centre it could in some way include ALL areas of Swansea. Just because visitors and the public are more likely to see the city centre, it doesn't mean the other area of Swansea should be ignored both residential and industrial. Everyone should be involved and given the chance to be.			X		County wide Strategy currently in development will cover all areas across the county.
Castle Gardens need to be green it should never have gone all concrete who's brilliant idea was that!!!				X	
These things don't happen overnight, but this is a good start. However, the Council needs to be serious. The station car park for example could provide a fantastic opportunity for greening the infrastructure right outside the railway station. We need to visible evidence that the strategy is delivering.				X	Performance Indicators have been added (see Appendix1). Implementation will be addressed through the Action Plan and monitoring / reporting on PI's. The station car park has been redeveloped.
If this was up to me, I'd utilise all of the space within Swansea to be covered in as much green infrastructure as possible! Wherever there is a space, I'd fill it with nature as we are at a point in time where we must put environmental solutions at the forefront of all that we do				X	

in order to secure a prosperous and liveable future for all.					
There is no "residency" in the city centre that would utilise this. Populous has been driven out of the city centre, there is no reason for people to visit, stay or use the facilities. The restrictive parking imposed across the city centre drives people away after 1 or 2 hour parking restrictions. Why pay to park when there are out of town free parking facilities available.				X	
The area around and including the old Albert Hall badly needs attention. That building is a real eyesore.				X	
This kind of exercise will need to take place throughout the city overtime, but the area identified is a good and logical starting point. In future it would be good to seek to build around and away from this area.				X	
The road that runs behind Argos. The building opposite the homeless shelter needs to be removed or replace. In that area there seems to be quite a bit of Japanese knotweed that needs to be removed.				X	Comments shared with relevant service areas.
SA1 area.			X		Area will be covered in County wide Strategy
Wind Street. The 'cafe quarter' we were promised years ago.				X	
The whole SA1 marina area is covered in pavement, during the summer it's unbearable to walk around in the heat and glare. The same goes for the bay campus, why is there so much concrete? Why restrict it to just these areas, why not apply it to the whole city centre. Also make Fabian Way have more green space, this could be a great entry to the city, where have the natural flowers gone? Also our terrible European boulevard needs to have grass and plants, again why is there so much pavement, its dull and dire looking.				X	A County wide GI strategy is also being prepared which will take into account these areas.

Question 5: To achieve and monitor the strategy's aspirations and to manage and maintain green infrastructure, Natural Resources Wales and Swansea Council are looking to work with local businesses, community groups, residents and other public organisations. This is only one approach, do you have any further suggestions on how we might monitor and manage green infrastructure.

Comment	Action				Response
	A	AP	OS	NA	
Annual update reports		X			A monitoring and reporting process will be developed as part of the Action Plan for implementation
Include the future generation in schools				X	Engaged with all 4 primary schools in the city centre catchment: Terrace Road, St Helens, Christchurch and Brynymor at the start of the preparation of the strategy. They were revisited during the draft strategy consultation stage. A 'strategy on a page' version is planned and will be shared with the schools.
I agree with your approach - the more benefit that people see, in particular local communities and businesses, the more keen they will probably be to ensure that their local bit of GI is well preserved. Those individuals will need to be encouraged to do this, to be "given permission" to intervene (such as the watering of street trees that's happening) and to see the feedback and monitoring that SC and NRW will do.				X	
Go to the source of some of the problem - traffic standing still				X	
The key will just be to ensure that all of those organisations work together and not at cross-purposes.				X	
Through planning permission, highways agency				X	Introducing planning restrictions is outside the scope of this strategy. However, all new developments will be considered against the requirements of national planning policy and adopted LDP Policy, which require that development maximises opportunities to maintain and enhance GI. SPG on GI will also be

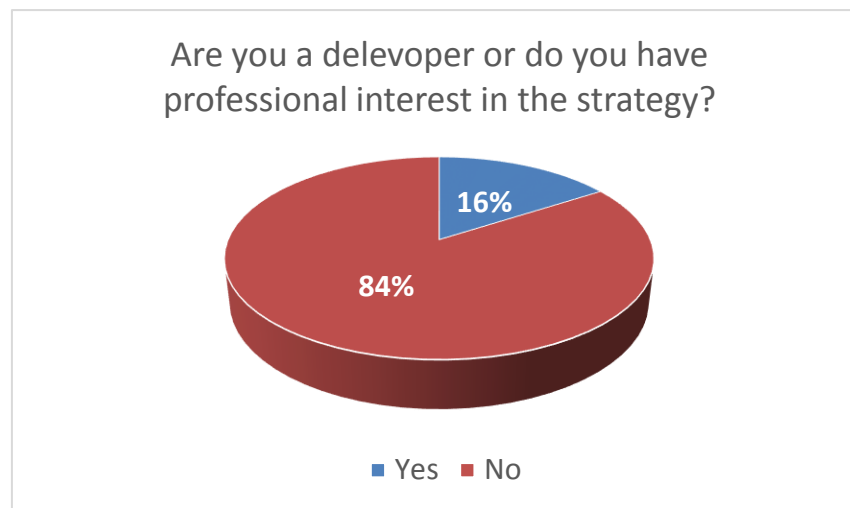
					prepared to provide further guidance on the implementation of planning policy.
Employ your own direct labour force specifically for this work.		X			Training and developing skills was one of the themes which came out of the engagement process and will therefore be part of the implementation process addressed through the Action Plan. For example; Parks Services – training and upskilling for new GI technologies.
Have more car parks for people to park			X		Comment passed on to relevant service area.
Have an active input to planning applications that are being made, by businesses in particular, that can have massive effects on our health and wellbeing e.g. Biffa (proposed incinerator in Swansea). Please check this planning application. Having the Steel Works on our doorstep is bad enough.				X	See above response on policy requirements.
Annual Green Awards with specific categories for new builds, community involvement and individuals. Use of Green 'Ambassadors' from schools or community groups		X			One of the strategic objectives is to ensure stakeholder and community engagement in the development, design and maintenance of GI. This will be achieved through the Action Plan.
All groups should be involved not only Council nominated groups.		X			During the development of the strategy the Council endeavoured to engage with as many stakeholders as possible including spending time in 10 locations across the city centre where 634 face to face conversations with members of the public were held, also the strategy was publicised via social media and through community groups and local residents associations. The Council will be looking to continue the conversation via these methods and increase involvement as the strategy is implemented to assess its progress and success.
It would be a testing time if we are the first UK city to have a green Infrastructure strategy, I think we need to look to centres of excellence and try and try again if something doesn't work. Wealth is a funny thing and seeing new infrastructure fail is almost chucking money				X	

in the bin... once you have one example of where it works (solar panels, green roofs, vertical walls, it should be recommended almost like how we suddenly have 20 plus barbershops in town still surviving					
School involvement				X	Engaged with all 4 primary schools in the city centre catchment: Terrace Road, St Helens, Christchurch and Brynymor at the start of the preparation of the strategy. They were revisited during the draft strategy consultation stage. A 'strategy on a page' version is planned and will be shared with the schools.
By getting schools, colleges and universities involved. Give the public some pride in their city. If people know that their kids or someone else's kids helped plant flowers, design the garden, build insect boxes, bird boxes.... People will want to look after it and protect it. Would also help with getting people on board with the idea. Also use the new display screens dotted around the city to show this work off. I've said many times before how these screens could be used to showcase poetry from schools, colleges, and universities.... All ties people into the city. Yes advertise shops and restaurants but the screens should also be used for many other things.				X	See engagement with stakeholders response above
Employing a sustainability officer to oversee the plans.				X	The Council's Nature Conservation Team Sustainable Policy Officer and NRW's Sustainable Places Officer are jointly leading on the development and implementation of the strategy.
Do with the people not too the people if possible.		X			NRW and the Council were keen to put stakeholders at the centre right from the start. The project started with an engagement programme designed to speak to as many people as possible about what nature in the city meant to them. The final version of the strategy has been amended to provide a clear objective relating to stakeholder and community involvement

					accompanied by a specific performance indicator to measure the success of this objective.
National companies (who have plenty of financial resources) that have a presence in our city. The football and rugby teams, local news / media and celebrities.				X	
Get sensible people!!				X	
Engage communities on a wider scale. Provide opportunities to partake in events, join organisations like the Woodland Trust. This is a long term issue, and not just about a political cycle. Mother Nature does not negotiate nor does she respect political cycles,				X	See engagement with stakeholders response above
I implore you to consider working closely with the University Tree society as we are all extremely passionate about protecting and preserving our environment as much as possible. We would all be extremely happy to help with as much of this project as possible, so I hope to hear from you soon!				X	See engagement with stakeholders response above
Yes, pay the correct salary for professionally qualified staff in the Council to retain and encourage people to want to gain employment and work for the citizens of Swansea. We have now been left with unqualified, inexperienced people on our workforce, led by senior managers who are chasing salaries and not the betterment of Swansea.				X	An amended Strategic Objective focuses on building skills and experience within the Council and partner organisations (see Appendix 1). The Action Plan will also create a training programme to build capacity
Many young people are inspired by the current impetus for countering climate change; involve younger people through school discussion groups and forums.				X	See engagement with stakeholders response above
Create a city application. Encourage people to download it. In the areas such as castle square, Kingsway, High Street, the new public area by the oceans site, market, bus station, shopping centre. Install QR readers. Whenever bins need emptying, rubbish picked up, floors cleaned, maintenance to flowerbeds, grass cut. People can scan and select the issue. The Application can also be used to promote events, competitions like the best city picture, offers like the Swansea discount cards, public notices...			X		Comments to be shared with relevant service areas.

Earthwatch Europe is not local to Swansea, but we do provide a number of citizen science tools which can both connect people with the environment and contribute to monitoring the impact of GI improvements, which we would be keen to offer to Swansea alongside this strategy.			X	The strategy includes a revised strategic objective to ' <i>Ensure stakeholder and community involvement in the design and maintenance of GI</i> '. This is supported by a specific Performance Indicator (see Appendix1).
Work with local schools to develop green champions who can monitor for you whilst gaining an understanding of biodiversity and nature generally. Develop local environmental coordinators.		X		The strategy includes a revised strategic objective to ' <i>Ensure stakeholder and community involvement in the design and maintenance of GI</i> '. This is supported by a specific Performance Indicator (see Appendix1). The Action Plan will also contain actions to deliver this objective.
No doubt that you know this but I thought I'd say that Paris has a good way of achieving more green space by allowing people to apply for permits to look after green areas. I've always thought that local businesses be made to do more outside their business of work. For example walking along St. Helen's Road and you despair at the lack any natural beauty, it's looking very tired and it's deteriorating.		X		See comment above. The Action Plan will look at innovative ways of maintaining GI.
Involve schools. Teach in schools to value what we have and what this plan is trying to do			X	The 4 primary schools in the city centre catchment, Terrace Road, St Helens, Christchurch and Brynymor were engaged during the development of the strategy. Both NRW and the Council support schools / provide resources / sessions in environmental education.
Regular publicity and updates e.g. in Evening Post and Swansea Leader			X	

Question 6: Are you a developer or do you have a professional interest in the draft strategy? If you answer YES you will proceed to questions about the Green Space Factor Tool, green infrastructure typologies and other more specific questions. If you answer NO you will proceed to the end of the survey.



Question 7: The strategic objectives include aspirations for Swansea to become a Sponge City, Biophilic City, National Park City, UNESCO Biosphere Reserve or Woodland City (from page 17 of the strategy). Have you had any experience delivering any of these options? If so please share you experience in particular any opportunities and/or barriers you foresee?

Comment	Action				Response
	A	AP	OS	NA	
No				X	
No.				X	
No				X	
We are considering a green roof/wall project at the moment on our offices along High Street at Coastal Housing Group. Funding could be key to this.				X	

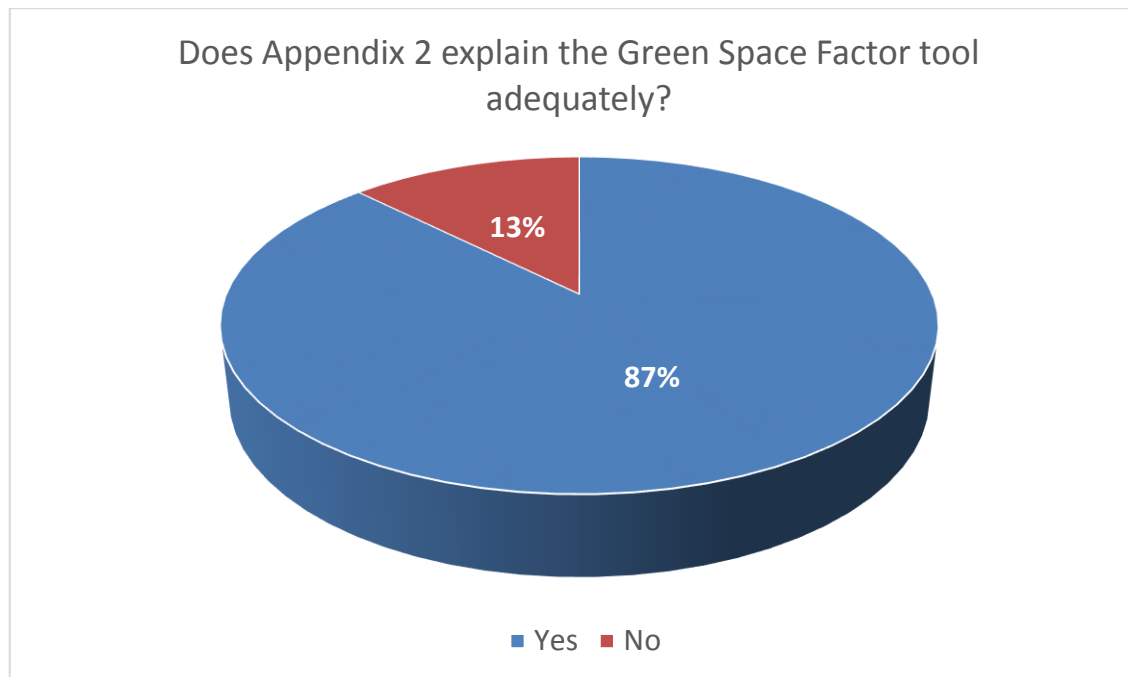
<p>One of Earthwatch Europe's core focus areas is "creating thriving places to live and work". Within this we operate two key programmes - Climate Proof Cities, which works with localities to improve resilience within the urban fabric, and Naturehood, which connects communities with the biodiversity on their doorsteps. Both of these initiatives have a strong core of citizen science, empowering local people both to take environmental action, and to monitor and disseminate the impact that their actions are having. https://earthwatch.org.uk/working-with-business/climate-proof-cities https://naturehood.uk/get-involved/naturespace-actions In particular, our Tiny Forests project is specifically relevant. Designed to maximise GI value in highly constrained spaces, Tiny Forests can both directly deliver ecosystem services and also act as a focus for community engagement. This is a concept licensed to Earthwatch by IVN, who have been delivering this initiative successfully in the Netherlands in recent years. Key concept across all areas is a strong and ongoing process of community involvement. Without local ownership by the communities which they support and in which they are located, these GI improvements will not achieve sustained benefit.</p>				X	
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Question 8: In the chapter titled Implementation (starting on page 35) we set out several areas relating to working together; feasibility, impact, value, maintenance and monitoring. Do you have any ideas that are not included in this chapter which would help enable green infrastructure in the Swansea Central Area?

Comment	Action				Response
	A	AP	OS	NA	
No				X	
<p>It is important to realise that the council does not control all of the land which could be included to accommodate green infrastructure. You should involve private owners to encourage them to take up hard landscaped areas such as I mentioned above on Walters Road. Walters Road has become subject to a lot of flooding but a lot of the private businesses and residences have simply concreted over their front garden areas.</p>			X	X	Walters Road is outside the Swansea Central Area.
Speed up the Traffic lights in the city centre if possible			X		

Using local community groups/primary schools/interested groups to maintain our city.	X	X			The strategy includes a revised strategic objective to <i>'Ensure stakeholder and community involvement in the design and maintenance of GI'</i> . The Action Plan will look at innovative ways of maintaining GI (see Appendix1).
Perhaps review business rate model to see if any funding can be drawn to improve the green environment within the Swansea Central Area. With all the development planned for the centre of Swansea in the next few years, larger companies will be providing lots of new buildings, and redeveloped facilities. Surely an opportunity to obtain planning gain in terms of delivering on this strategy.				X	There are opportunities though the Swansea Business Improvement District (BID) partnership and Targeted Regeneration Investment (TRI) Programme which can support the delivery of the strategy and wider GI agenda.
Earthwatch Europe would advocate the inclusion of citizen science in this section. As well as dramatically increasing sample size for monitoring, citizen science connects people with their environments and promotes stewardship through creating a network of engaged local champions. Earthwatch has been delivering citizen science activities linked to environmental issues for nearly 50 years, including Freshwater Watch, Naturehood, and our climate proof cities programme.		X			This will form part of the Action Plan.

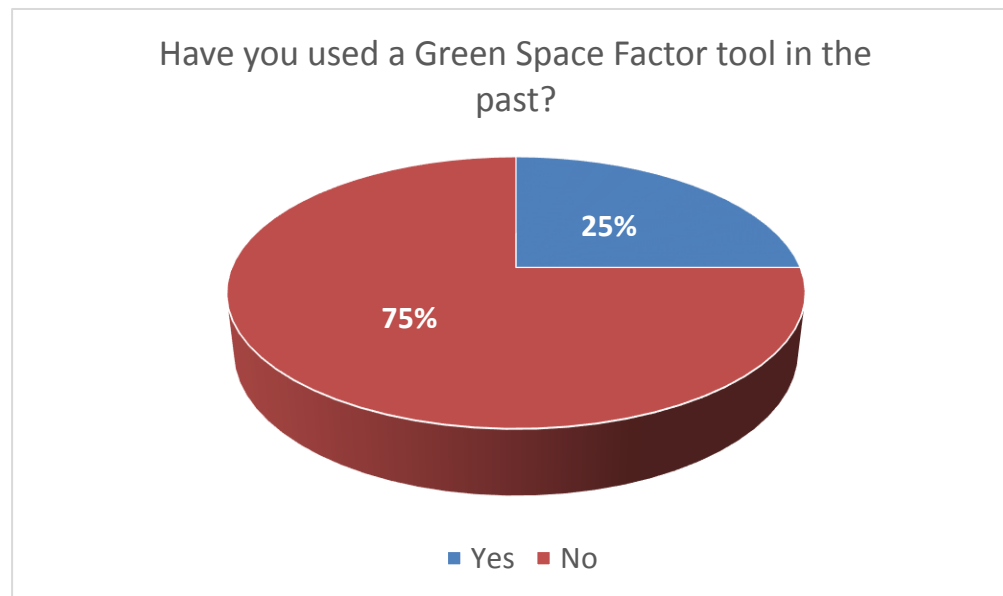
Question 9: The Green Space Factor (GSF) tool (Appendix 2 in the draft Strategy) is designed to assist planners, developers and designers in determining the appropriate level of urban greening. The Council and Natural Resources Wales are committed to using this tool and expect applicants to submit a GSF calculation in support of their plans. Does the Appendix explain the tool in enough detail?



Comment	Action				Response
	A	AP	OS	NA	
Could well be a reason why developers (especially large house builders) don't come to Swansea citing more costs. Their business model has to be challenged.				X	The Green Space Factor Tool is not mandatory. It is designed to help maximise compliance with the Welsh Government's statutory SUDs Standards 2019 and to help deliver place making as defined in Planning Policy Wales 10.
This should become the national standard for wales				X	

<p>The GSF tool is a useful reckoner at the design stage but takes no account of aftercare or management. Without effective management in place, backed up by monitoring, a number of the putative benefits within the tool will not be achieved, e.g. failed trees or planting will only deliver the outcome of permeable paving in real life, in spite of achieving a high score at the design stage. Whole-life planning and costing, and effective monitoring using citizen science tools, can help to mitigate this risk.</p>		X		<p>Maintenance was one of the themes from the engagement work and through the development of the strategy. To reflect the need identified the strategy now has two strategic objectives designed to build skills around GI maintenance and identifying innovative maintenance solutions: <i>‘Ensure stakeholder and community involvement in the design and maintenance of GI’</i> and <i>‘Create a skilled and knowledgeable local economy to deliver and maintain GI’</i> (see Appendix1). The Action Plan will detail how the objectives will be met, and PI’s will measure success.</p>
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Question 10: Have you used a Green Space Factor tool in the past?



Comment	Action				Response
	A	AP	OS	NA	
Hard to put a figure to assets value - subjective				X	The Tool has had track record of over 20 years of use around the world. The value allocated in the tool is based on this experience coupled with the priorities and needs highlighted by stakeholders during the development of the strategy and current Welsh legislation.
We haven't used the tool directly but have done significant work around its framework.				X	

Question 11: The quality and multi-functionality of green infrastructure are essential. The Urban Green Infrastructure typologies (Appendix 1 in the draft strategy) sets out the ecosystem services that each typology provides. Does Appendix 1 adequately demonstrate the quality and multi-functionality of green infrastructure? If not how could it be improved?

Comment	Action				Response
	A	AP	OS	NA	
Yes. examples of work done in annual update reports				X	
Yes. In fact perhaps more summaries/succinctness would be useful.				X	The steering group concluded that Appendix 1 (now Appendix 2) of the Strategy could not be summarised any further without the risk of losing valuable detail.
Yes, but I am no expert.				X	
Yes.				X	
This typology is quite public realm-facing, and does not have an element addressing connectivity of GI types. Particularly for wildlife and biodiversity, people's private spaces, and how they connect with each other and the public realm, are an incredibly important aspect of urban GI, and these metrics could potentially lead to development being approved with strong public spaces, but where the equally valuable private spaces are left with comparatively low-impact GI. Our Naturehood programme is already speaking with developers as to		X			Increases in GI, canopy cover and biodiversity will be performance indicators for the strategy. Connectivity will be measured through the monitoring process and will be addressed in the Action Plan.

how positive ecological value can be incorporated into the design of new housing spaces, as well as retrofitted to existing housing stock.					
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Question 12: Do you have any other comments on the draft Strategy Swansea Central Area: Regenerating Our City for Wellbeing and Wildlife?

Comment	Action				Response
	A	AP	OS	NA	
Interested to see how it will link to wider GI strategy				X	
Bird feeders located around the city centre in the winter months				X	Natural food supply from planting is the preferred option. This will be addressed via the Action Plan.
The Urban Heat Island effect (p11) is potentially damaging to health, as you indicate, though this is understating it - the UHI effect is a real threat to life, particularly for the elderly living in high rise accommodation. <i>Ref: Environ Health Perspect. 2012 Feb; 120(2): 254-259. Published online 2011 Sep 1. doi: 10.1289/ehp.1103532</i> Swansea LBAP (p23) needs updating. You're right to emphasise the crucial importance of a culture change (p24) in terms of cross sectoral working in relation to the climate and diversity crises we face. This culture change has to extend to the entire population and your work on GI and how you have framed it will contribute to that change.				X	
Yes - whilst i agree with the majority of what is being put forward, the strategy fails to address one of the main problems - traffic pollution. Currently, all the traffic is funnelled to certain target points, (car parks). This causes delays, and sitting traffic. If street parking was opened up by 50% from all the residents' only parking in the Sandfields, streets by the YMCA and St Thomas, people would look to park in different areas spreading the traffic flow around. A lot of the time the resident's			X		Transport is out of scope of the GI strategy, however comments on transport to be shared with relevant service areas.

only spaces are not being used and it would make it easier for people to enjoy the city centre.					
About time! Well done and thank you.				X	
No.				X	
The environmental impact of the digital arena has not been appropriately considered in relation to sustainability, creating a pleasant and healthy environment for residents and older and longer staying visitors, it is likely to discourage enjoyment of the area around the marina, museums etc for many.				X	The Arena was designed taking into consideration the sustainable development principle and the wellbeing goals of the Wellbeing of Future Generations Act and a Sustainability Statement developed for the Phase 1 of the city centre regeneration.
more benches				X	
Green areas need to be drastically increased across the whole of Swansea, not just central. More Trees. Monitor planning applications such as Biffa. Look at how we can encourage electric car usage to clean up our air. Encourage and Introduce Zero Waste shops across Swansea. Make recycling difficult items more accessible, perhaps even from the kerb side, e.g. crisp packets, wrappers etc...			X	X	The Swansea Central Area and wider GI Strategies seek to assist in achieving this. Waste comments will be shared with the relevant service area.
Perhaps make more of specific areas of wildlife e.g. the Swansea peregrines on the BT building? Similar to Chichester where there is a webcam, public display (run by the RSPB) - people travel to Chichester just to see them		X			The Action Plan will promote the use of swift bricks and boxes etc.
Why only central Swansea, surely it should involve all of Swansea.				X	The emerging Countywide Strategy will cover all areas across the County.
Like I say we need to provide guidance, funding options, and knowledge of what will work and the vision as a baseline for developers and new business then add to our guidance, funding options, and knowledge pool with their ideas to enhance our city in the areas outlined. We've seen where a strategy has not worked, lessons need to be learned...		X			To be addressed in the Action Plan.
Looking forward to having a greener city				X	
Make better use of singleton park as mentioned. Scrap the idea of introducing levels to castle square along with the unit. Levels will bring unwanted attention				X	Comments to be shared with relevant service areas.

<p>to hide within. No need for a unit when there are plenty of units surrounding castle square. Everyone just wants a garden. Maybe fence it off like the garden in Neath, Victoria garden? I think it's called. To protect it from damage. The garden could then be used Christmas time as an actual winter wonderland. Summer time you could create a nice green sitting area with the option to hire out deckchairs. Easter time an actual Easter egg hunt. Also off the topic but maybe add a statue or two prompting things in Swansea. Like the cockle women which in turn will promote the market and fish industry within Swansea and South Wales. Also promote our poetry more within the city. New buildings should also incorporate stained glass designed by the university. The university is known for it yet there's nothing on show within the city.</p>				
<p>I think bee friendly spaces need to be made an increased priority and discouraging general felling of trees in residential gardens throughout the city should be discouraged with some sort of more formal legislation. The amount of trees and greenery disappearing from gardens in favour of decking and concrete in recent years is shocking</p>			X	
<p>In a number of places there are references to "pedestrians and cyclists". Whilst that mixture might work for leisure activities, please don't use that provision to forget what is a key target for climate change - to get people out of their cars for their normal journeys, particularly to and from work. Commuting cyclists and pedestrians do not mix! Pedestrians want to be able to wander along, often in groups, without thinking about other traffic and they regularly complain about "speeding cyclists" i.e. ones going at typical cycling speeds of 12-20 mph. Cyclists just want to get to work or home as quickly as possible (like any other commuter) and if they have to slow down, ring their bell and wait to get past every couple of minutes they are</p>			X	<p>Comments on transport to be shared with relevant service areas.</p>

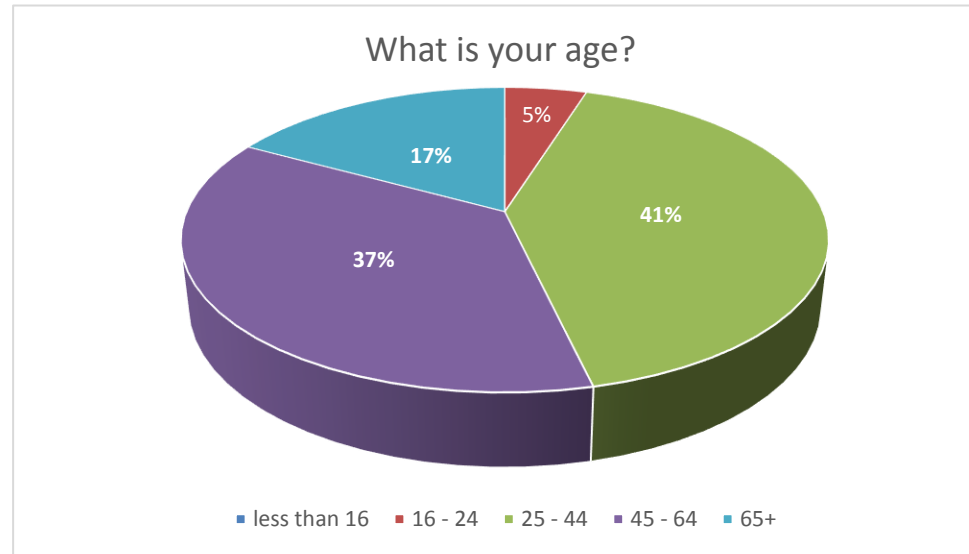
going to get fed up and return to the car. Probably the most used commuter route is east/west where the road infrastructure is practically suicidal on a bike and in any case riding on the road results in annoyed drivers and abuse. Either the roads need to be accepted and safe as a place for "A to B" cyclists (as was normal 40 years ago) or there needs to be working segregation of shared use paths, e.g. using a kerb to split "road" from "pavement" as is done in some countries. Clearly this can't be magically produced immediately, but a long term greening project should be looking to a genuine cycling future not just families on Sunday afternoons.					
Please can we have it happen and get strong links with developing the plan with a strong 'placemaking' ethos - age friendly, child friendly, people friendly...futureproof friendly :)				X	
In many cities of America, when a developer wants to build something - whether it is a house or a housing estate, a drive-thru or a retail complex, they are expected to calculate the total cost and then 10% of that cost - the figure is then locked in to local government using for parks, recreation, and wildlife.				X	Introducing planning restrictions is outside the scope of this strategy.
Discouraging motor vehicles from entering the city centre (aside from public transport) and promoting sustainable and alternative transport i.e. cycling, walking etc.				X	Comments on transport to be shared with relevant service areas.
As a company working with young people we see this as a fantastic opportunity to make Swansea the city of choice for our youngsters to stay, live, work and play.				X	
Although the central area of Swansea is a focus of this I would like to see the council planting more trees/vegetation on the numerous grass areas, verges and roundabouts around the city. Also the plastic partitions that are placed/and being placed around the roundabouts of Swansea (to slow motorists as they approach) could also be planted with ivy's...etc to produce small green walls in these areas and be much				X	The Countywide Strategy currently in development will cover all areas across the County.

more pleasant to look at than the current plastic screens that are in place.					
Make sure there are flowers as well				X	
No				X	
As previously mentioned, I personally hope that the Council would consider utilising as much space as possible to enhance our overall green coverage. Nature should always be at the forefront of every decision as we desperately need to preserve, protect and grow our existing green network. I feel confident that Swansea could very well be the model image for other cities to follow suit and I would love to be a part of this. Please get in touch with me on treesociety@swansea-societies.co.uk to discuss our potential partnership further. THANK YOU!				X	
The aims are praiseworthy and supported; the key is achievability and a careful business plan that recognises costs and benefits.				X	
This is a great strategy which should be expanded to all Welsh towns and cities.				X	
Turn castle square back into a garden with Grass, flowers, trees, deckchair hire during the summer, daffodil garden for St David's, Easter egg hunt for Easter, an actual winter wonderland for Christmas. To prevent damage install a stone wall with fencing. Provide a strange for performers and entertainers.				X	Comments to be shared with relevant service areas.
Would like to see green facade buildings replacing the concrete sad buildings in Kingsway.				X	
Thank you for the opportunity to comment.				X	
Develop better canal infrastructure that will support local wildlife.			X		County wide Strategy currently in development will cover all areas across the County.
Have less traffic in the centre. More pedestrianised roads. Or trams				X	Comments on transport to be shared with relevant service areas.
I think it's vital to consider closing a section of High St to car traffic. I strongly suggest making the section from High St Station to Argos restricted to buses, taxis, bikes and pedestrians -- to make this a much more				X	Comments on transport to be shared with relevant service areas.

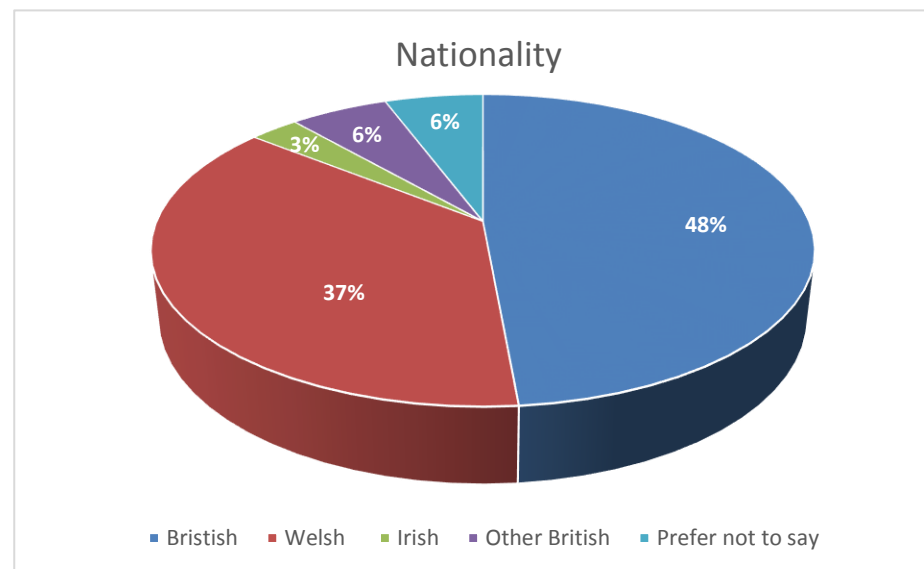
attractive space. E.g. see what Cardiff has done with St Mary`s Street,					
Please change the current plans to include more green space, it's too much pavement. And please can we have more green space on Kingsway, some of it is well done but some of it looks like an afterthought. The green space on the main road outside the bus station is a good example of how it should be done.				X	
<p>We note the emphasis that the paper places on creating a green artery with 'High St being the key route from the Rail Station South, towards Kingsway to the West and Wind St to the South East' (p30) Earlier in the document it states that 'within the green artery pedestrians and cyclists will have priority' (p18) and supports this by saying that ' a cycle path can be an ecological as well as a transportation corridor' (p21)</p> <p>It is therefore disappointing that that there are no proposals at all with regard to cycling or walking. The document itself refers to High St as being 'heavily-built up, there are few pockets of vegetation'. Indeed for both cyclists and pedestrians, High St. is a thoroughly unpleasant experience with no provision at all for cycling and having lorries and cars in close proximity to shoppers and office workers.</p> <p>If High St is to be the start of a green artery, then the road area needs to be redesigned to accommodate cycling, walking and a greener landscape. We would therefore recommend that the report consider the following possible options.</p> <p>1. Declare an Ultra-Low emission zone in the centre of the city meaning that Electric vehicles would predominate.</p>			X		<p>Changes to transport infrastructure is out of scope of this strategy. However there is potential to link GI with Active Travel routes to both enhance routes and optimise multi - benefits i.e. green corridors.</p> <p>The comments will be shared with Regeneration and Transportation and other relevant service areas to highlight opportunities to integrate GI.</p>

<p>2. Make High St. and Castle St. Caer St and Princess way E-bus and E-taxi only bus lanes that cyclists could use.</p> <p>3. Make High and Castle St. one way to motor traffic thereby increasing the area available to accommodate green vegetation and a 2 way cycling provision.</p> <p>4. Make High St and Castle St a pedestrian and cycling only zone, massively increasing the area available for greening</p> <p>In addition, attention needs to be paid to the extension of the green artery to Wind St and lower Princessway. We would recommend.</p> <p>5. That one of the 2 South East bound lanes on Wind St. should be turned into a cycle lane for 2 way cycling which would allow additional space for extra greenery.</p> <p>6. That St Mary's St and St Mary's Square should offer be closed to traffic completely and turned into a cycleway, pavements and green area.</p>					
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Question 15: What is your age?

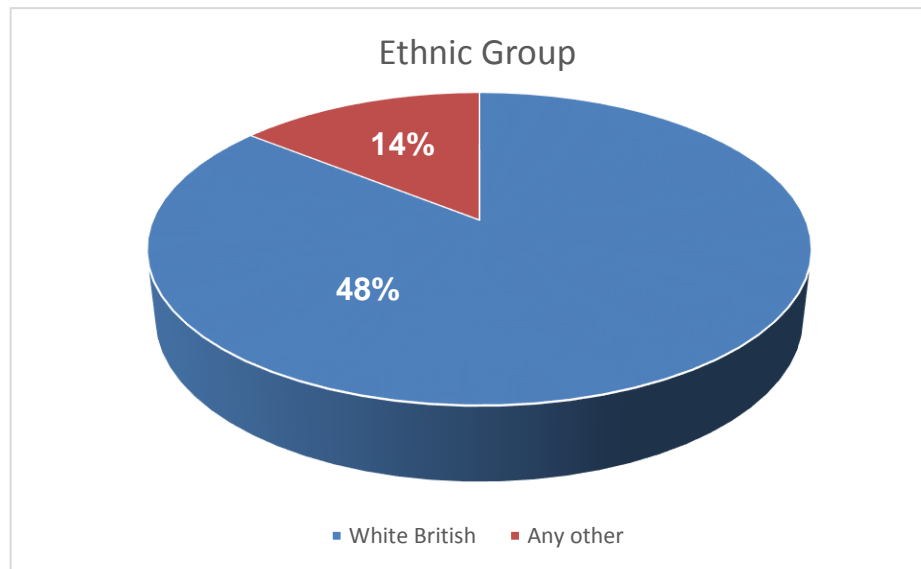


Question 16: Nationality - would you describe yourself as?



Comments on selection:
Irish by birth but living and working in Swansea for 30 years.
This has no relevance
European
British
Born in Swansea and with ancestors all born and lived in Swansea as far back (so far researched) as 1577 and probably before. I care about Swansea
Jewish British

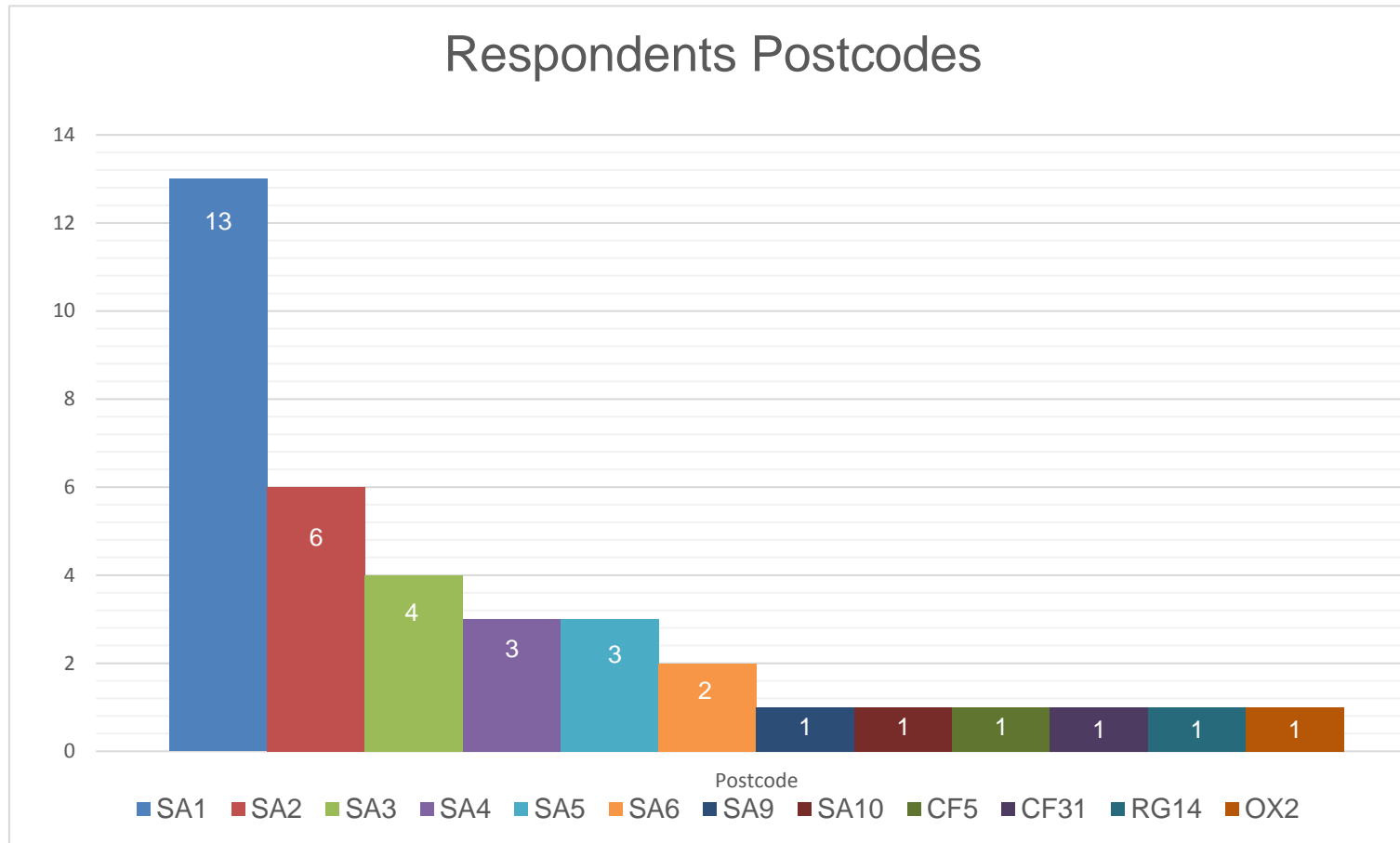
Question 17: What is your ethnic group?



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Comments
White European. There is no such thing as a White British ethnicity.
This has no relevance
N/A
Human
African-Arab
Jewish

Question 18: What is your postcode?



Consultation Workshops

The following workshops were held:

- A. Consultation with local primary schools within the Swansea Central Area catchment
- B. Swansea Central Library Consultation

A. Consultation with Local Primary Schools within the Central Area catchment

4 sessions with the 4 primary schools (St Helens, Terrace Road, Christchurch and Brynymor) were held focusing on the vision and the objectives. Comments from the discussion are listed below. The Steering Group concluded that the response would provide valuable content for the proposed Strategy on a Page/Easy Read Version.

Comment	Action				Response
	A	AP	OS	NA	
Nature – greenery, wildlife Resilience – strong, positive Wellbeing – exercise, strong Healthy – free, explore Multifunctional – smart, science, busy, skills, very helpful Happiness – Joy, fun, excited, kindness, responsibility	X				Excellent words for the strategy on a page
Nature – greenery, wildlife Resilience – strong, positive Wellbeing – exercise, strong Healthy – free, explore Multifunctional – smart, science, busy, skills, very helpful Happiness – Joy, fun, excited, kindness, responsibility	X				Excellent words for the strategy on a page
Nature – green areas, wildlife, flowers, insects, trees, animals Resilience – trying hard, not giving up, positive Wellbeing / healthy - fruit, exercise, trees, bees, water, free to explore Multifunctional - buildings, cooking, experience, science, busy, skilled, rain garden, bug hotel Happiness – joyful, fun, enjoy, kindness	X				Excellent words for the strategy on a page

Multifunctional – science, busy, skills, rain garden, building Happiness – Joy, kindness Nature – greenery, wildlife, trees Resilience – positive trying harder Wellbeing – free to explore, exercise, sports water	X				Excellent words for the strategy on a page
Prosperity Wellbeing – exercise, fruit, healthy Multifunctional – busy, skilled, solar panels, nectar, buildings, experienced Happiness – joyful, enjoy, fun, kindness Resilience – working hard, independence, positive Nature – wildlife, greenery, flowers Free to explore	X				Excellent words for the strategy on a page
Healthy wildlife, greenery, grass, positive, wealth, exercise, fruit, milk, reses, happy, free to explore, building, smart, experienced, busy, skilful, saving bees, joyful, fun, relaxed.					
Green, flowers, bushes, positive, resilience, wellbeing, potatoes, water, fruit and veg, fresh air, fit, joy, fun, happy, free parks, sometime, milk, yoghurt	X				Excellent words for the strategy on a page
Greenery, strong, milk, fit, trees, busy, skills, boy, rain garden, trees, flowers, positive, healthy – milk apples, happiness – explore, buildings, hard, exercise, cooker, skilled, animals,	X				Excellent words for the strategy on a page
Trees, exercise, cooker, beautiful, bees, milk, plants	X				Excellent words for the strategy on a page
Joy, fun, kindness, excellent, solar roof, smart, busy, skills, workshop, greenery, flowers, grass, trying hard, wellbeing, fruit, love the greenery, wealth, positive, trees	X				Excellent words for the strategy on a page
Schools can plant more trees, and don't destroy nature that is there already only make it better, Healthy – plant more veg, Have gardens as people don't always have them.				X	
It is nicer				X	
Peaceful spaces for people and nature, make nature even better than it is now, tell us where they put the nature first, before building stuff, nature must be part of it.				X	
More bees more grass				X	
More bees and more grass				X	

More parks on top of buildings because to get outside is healthier and it is fun and it will make you happy.				X	
High quality incorporation of greenery throughout the city centre, increases the variety of happiness within the population of the area. It's also encourages people to the healthier and spend money in Swansea. It also benefits the environment by bringing wildlife and assisting the atmosphere.				X	
Adding solar panels, mitigating the heat island effect – if we put more flowers around the city it will keep us cool and it will help wildlife. Trees – if we plant more trees birds can eat, animals will be happy and so will people. Save water – if we put more pipes around.				X	
Sponge city – I feel the sponge city is a great idea for our planet, because it will make our city more green rather than just blowing on concrete floor. My ideas – green walls, berry trees, flower beds, fountain with flowers, green roof.				X	
Provide a high quality environment – wooden bug hotels, hanging flower baskets, trees with bird feeders, trees with berries and tree houses.				X	
Do not give up, we need wealth – attract more visitors, we need more green in Swansea.				X	
Do not give up we need wealth, attract more visitors we need more green in Swansea.				X	
Do not give up, buildings good and happy wildlife				X	
We need sponge city, because its sucks water instead of putting it down the drain.				X	
Sponge – act like a sponge, GI green space, green environment, surrounded by nature. Multifunctional GI – multi-tasking Resilience – space to bounce back Prosperity – healthier happier lifestyle, positive place Citizens – Community / residents Health – create peaceful place and help people get along. Wellbeing – Comfortable, happy, healthy, valued, no rules for nature – ‘let nature go free’	X				Excellent words for the strategy on a page
A garden with grass and benches and when you are in there be quite and have flowers in there.				X	

When nature is strong it helps other animals	X				Excellent words for the strategy on a page
Not just grass we need flowers, insects and trees				X	
There is a lot of grass everywhere but not many trees				X	
Castel square looks all broken and mouldy				X	
Water and space for frogs				X	
Important words – all of them, citizens , nature	X				Excellent words for the strategy on a page
More bins and people need to put stuff in the bins / signs for the bins				X	Share comments with relevant service.
Multifunctional = busy nature	X				Excellent words for the strategy on a page

B. Swansea Central Library session

A consultation event was held in Swansea central library focusing on the vision and objectives. Consultees were supportive of the vision and objectives and made the following comments.

Comment	Action				Notes
	A	AP	OS	NA	
Ban chewing gum in town, Swansea is dirty				X	
Too much ugly space, more nature looks better, nice to be there				X	
Castel square needs shade to sit under				X	
Like the wavy bit in Princess Way – greenspaces need to be maintained so they look good.				X	
I agree with nature in the city centre.				X	
Prom a major asset, need to use this more, encourage people to walk and meet each other. Link to the city too.				X	
Greenery is an asset to the city centre, all for more greenery but it needs maintenance.				X	
Good to have greenery in the city centre					
Need for jargon free strategy on a page	X				Strategy on a page to be jargon free.

APPENDIX 1
Revised Strategic Objectives and Performance Indicators

The consultation process raised a number of questions about the relationship between the strategic objects, targets and the implementation of quantitative targets. As a result the GI Steering Group reviewed the Strategic Objectives and the need to provide SMART objectives, which reflected each component of the vision.

The original Strategic Objectives have been replaced with new Strategic Objectives and a set of SMART Performance Indicators (PIs) developed. The PI's include elements of the original objectives and targets. Other elements of the original targets are more appropriate as part of the Action Plan which will be published separately and after the Strategy.

Strategic Objectives:-

- Provide a high quality nature rich environment.
- Create a distinctive destination city.
- Ensure the city is resilient to the impacts of climate change.
- Ensure stakeholder and community involvement in the design and maintenance of GI.
- Create a skilled and knowledgeable local economy to deliver and maintain GI.

The strategic objectives are designed to contribute **directly** to as many elements of the vision as possible as outlined in the table below. Each strategic objective will contribute **indirectly** to all the elements of the vision.

Objective	Contribution to the vision					
	Nature	Health	Prosperity	Wellbeing	Resilience	Happiness
Provide a high quality nature rich environment	✓	✓		✓	✓	✓
Create a distinctive destination city	✓		✓	✓		✓
Ensure the city is resilient to the impacts of climate change	✓	✓		✓	✓	✓
Build opportunities for stakeholder and community involvement into the design and maintenance of GI.			✓	✓	✓	✓
Create a skilled and knowledgeable local economy to deliver and maintain GI.			✓	✓	✓	

The following performance indicators have been set:

1. Increase terrestrial green infrastructure.
2. Increase canopy cover.
3. Increase biodiversity.
4. Green Infrastructure to achieve the strategy's five principles by being multifunctional, biodiverse, adapted for climate change, healthy, and smart and sustainable.
5. Number of green roofs installed to GRO code requirements.
6. Number of GI projects enabled by the Target Regeneration Investment (TRI) programme or similar.
7. Monitor using mapping data.
8. Working with partners to assess available data for monitoring.
9. Number of GI projects incepted / co-produced and/or maintained by stakeholders.
10. Number of events to raise awareness of green infrastructure for businesses / organisations to build the local green infrastructure sector.
11. Number of SME's specialising in delivery and maintenance of GI.

The following targets have been set:

1. Increase terrestrial GI to 26% by 2030
2. Increase canopy cover to 20 – 25% by 2044

Appendix C: Assessment of the Strategy’s contribution to the Well-being of Future Generations Act’s wellbeing goals and application of the ways of working.

Wellbeing Goal	Evidence of contribution
A prosperous Wales	<ul style="list-style-type: none"> • Strategy designed to address adaptation to and mitigation for climate change. • GI typographies which facilitate high performing efficient buildings and public realm and support a low carbon society. • Strategy outcome to increase local knowledge and skills on the benefits of GI techniques and technologies. • Strategy outcome to increase understanding and knowledge of how GI will improve environmental, social, economic and cultural wellbeing.
A resilient Wales	<ul style="list-style-type: none"> • Aim of the strategy is to create and maintain multifunctional GI which supports ecosystem resilience and addresses climate change. • Biodiversity is one of the five principles of the strategy with a focus on native species or those with a documented value for wildlife. • Strategy focuses on connectivity via the development of green artery across the Swansea Central Area and out to the Swansea Bay, Tawe Riverside and Hillside wildlife corridors. • Strategy outcomes to provide practical evidence on how the Council is meeting it duties under the Environment Act. • Development of the Strategy is one of the steps of the Councils Corporate Priority – to maintain and enhance Swansea’s natural resources and biodiversity.
A healthier Wales	<ul style="list-style-type: none"> • Strategy will enable access to nature and vegetation which has numerous physical and mental health benefits. • Installation of the correct type of GI can help reduce / manage air and water pollution, and the impacts of extreme weather events.
A more equal Wales	<ul style="list-style-type: none"> • Swansea Central Area is in Castle ward which includes some of the most deprived and vulnerable people in Wales. Castle 2 (North) is the 2nd most deprived Lower Super Output Area (LSOA) in Swansea. • GI is low (13%) in the Swansea Central Area in comparison to other areas of the county and the national average. The Strategy’s aim is to double this to 26% by 2030.

A Wales of cohesive communities	<ul style="list-style-type: none"> • In enhancing and increasing good quality GI the Strategy is helping create attractive places in the Swansea Central Area for residents and the wider community to enjoy / use. • The focus on multi-functionality to build resilience and adaptation to and mitigation for climate change contributes to community safety.
A Wales of vibrant culture and thriving Welsh Language	<ul style="list-style-type: none"> • Development of a green artery will improve connectivity across the city centre extending out to the Swansea Bay, Riverside and Hillside wildlife corridors / recreational spaces.
A globally responsible Wales	<ul style="list-style-type: none"> • The Strategy's contribution to improving ecosystem reliance, adaption to and mitigating for climate change and enhancing natural resources are part of local and global environmental improvements. • The Strategy is part of the Council's delivery of its duty to the Environment Act (Wales)
Way of Working	Evidence of contribution
Looking at the Long term	<ul style="list-style-type: none"> • Strategy aims to make immediate enhancements which will help future proof the Swansea Central Area against existing and future challenges including; <ul style="list-style-type: none"> ○ Improving residents facilities, health and well-being, ○ Improving visitors experience and dwell time, ○ Future proofing for climate change, flooding, warmer hotter summers, more extreme weather events, ○ Reducing energy costs and consumption. • Strategy focus is on building environmental / ecosystem reliance. • Strategic objectives will be achieved through short, medium and long term actions.
Taking in integrated approach	<ul style="list-style-type: none"> • The GI Strategy will have a positive impact and contribute to all of the well-being goals. • The contribution will be monitored to avoid any unintended negative impacts. • The Strategy contributes to the Swansea PSB's working with Nature Well-being Objective and the corporate objectives of the Council and NRW.
Involving people	<ul style="list-style-type: none"> • Early engagement process to inform the vision for the strategy included: <ul style="list-style-type: none"> ○ 634 face to face conversations with members of the public in 10 locations around the Swansea Central Area.

	<ul style="list-style-type: none"> ○ Sessions with the 4 primary schools covering the Swansea Central Area (3 English medium 1 Welsh medium). ○ Social media campaign on twitter. ○ Stakeholder meeting with 6 local groups including residents groups and local interest groups and local universities. ○ Two half day stakeholder workshops with partners across the public, private and third sector. ○ Internal corporate session with officers and members and the Economy and Infrastructure Policy Development Committee. ● Draft strategy went out for external consultation via online surveys, face to face sessions with the 4 primary schools covering the Swansea Central Area (3 English medium 1 Welsh medium) and members of the public in Swansea Library. ● Internal consultation via email and a workshop.
Collaboration with others	<ul style="list-style-type: none"> ● Joint project between Swansea Council and Natural Resources Wales. ● Development of Strategy is a step in the Public Service Board's Working with Nature Objective.
Prevention	<ul style="list-style-type: none"> ● Strategy's aim for multi-functional GI will help address existing, and build resilience to prevent or reduce the impact of future environmental, social, economic and cultural problems in the Swansea Central Area.

Equality Impact Assessment Screening Form – 2017/8

Please ensure that you refer to the Screening Form Guidance while completing this form. If you would like further guidance please contact the Access to Services team (see guidance for details).

Section 1

Which service area and directorate are you from?

Service Area: Strategic Planning and Nature Environment

Directorate: Place

Q1(a) WHAT ARE YOU SCREENING FOR RELEVANCE?

Service/ Function	Policy/ Procedure	Project	Strategy	Plan	Proposal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(b) Please name and describe here:

Production of the Swansea Central Area Green Infrastructure Strategy, designed to increase and enhance green infrastructure in the regeneration of the Swansea Central Area in line with the Swansea Central Area Regeneration Framework, the Council's well-being objectives and duties under the Planning, Environment and Well-being of Future Generations Acts.

Q2(a) WHAT DOES Q1a RELATE TO?

Direct front line service delivery	Indirect front line service delivery	Indirect back room service delivery
<input type="checkbox"/> (H)	<input type="checkbox"/> (M)	<input checked="" type="checkbox"/> (L)

(b) DO YOUR CUSTOMERS/CLIENTS ACCESS THIS...?

Because they need to	Because they want to	Because it is automatically provided to everyone in Swansea	On an internal basis i.e. Staff
<input checked="" type="checkbox"/> (H)	<input checked="" type="checkbox"/> (M)	<input type="checkbox"/> (M)	<input type="checkbox"/> (L)

Q3 WHAT IS THE POTENTIAL IMPACT ON THE FOLLOWING...

	High Impact (H)	Medium Impact (M)	Low Impact (L)	Don't know (H)
Children/young people (0-18)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Older people (50+)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Any other age group	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disability	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Race (including refugees)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Asylum seekers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gypsies & travellers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Religion or (non-)belief	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sex	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sexual Orientation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gender reassignment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Welsh Language	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Poverty/social exclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Carers (inc. young carers)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Community cohesion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Marriage & civil partnership	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pregnancy and maternity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Q4 WHAT ENGAGEMENT / CONSULTATION / CO-PRODUCTIVE APPROACHES WILL YOU UNDERTAKE?

Equality Impact Assessment Screening Form – 2017/8

Please provide details below – either of your planned activities or your reasons for not undertaking engagement

The Strategy is a joint strategy developed by the Council and Natural Resources Wales. The project team undertook engagement work at the start of the development of the strategy with a wide range of stakeholders including the public, private and 3rd sectors, local residents, visitors, primary schools in Castle ward and members of the public. The engagement process focused on the theme *what does nature in the city mean to you* #citynature / #naturynyddinas

The stakeholder events included workshops, meetings and seminars between February and April, with:

- Public organisations including Swansea University, ABMU, Welsh Government, Public Health Wales, Fire Service, NRW and Swansea Council.
- Local and regional private business including developers, architects, engineers, SME's, social housing.
- Terrace, St Helens Christchurch and YGG Brynymor primary schools.

Over three weeks face to face conversations were held with over 630 members of the public in a number of locations around the city centre including the Swansea Market, Oxford Street, Swansea point (on the prom), Swansea Central Library, the Quadrant and the Glyn Vivian. Conversations will also held with a number of local groups including the Maritime Quarter Residents Association, Swansea Save our Trees, GRAFT (community growing project ion the National Waterfront Museum). There we also a number of conversations on social media via Twitter.

The findings from the engagement procuress were used the set the draft strategies vision and strategic objectives.

The draft strategy went out to public consultation between 22nd November 2019 and the 31st December 2019. The consultation process included an online survey and consultation events, held at the 4 primary schools within the catchment area and in Swansea Central Library. 45 survey responses and one email response were received, along with and comments from consultation sessions held with the 4 primary schools in the catchment area and members of the public in Swansea Central library.

Professional stakeholders were consulted via the survey, and the draft was circulated internally to relevant Heads of Service for comment and a corporate workshop held on the 16th December 2019.

Overall the strategy was very well received. Over three quarters (79%) of survey respondents agreed with the strategies vision and over three quarters of survey respondents supported the strategic objectives.

There were a number of comments which focused on the need to raise knowledge and skills, provide training, engage with stake holders and the community, and around the issue of maintenance, and comments on the GI and canopy cover targets. The strategic objectives were revised to address these comments and performance indicators added.

A number of comments referred to GI improvements at locations outside the geographic area defined by the strategy. These will be addressed in the emerging County wide GI Strategy which will support of the Swansea Central strategy and emerging Biodiversity and GI Supplementary Planning Guidance.

Q5(a) HOW VISIBLE IS THIS INITIATIVE TO THE GENERAL PUBLIC?

High visibility <input type="checkbox"/> (H)	Medium visibility X (M)	Low visibility <input type="checkbox"/> (L)
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(b) WHAT IS THE POTENTIAL RISK TO THE COUNCIL'S REPUTATION?
(Consider the following impacts – legal, financial, political, media, public perception etc...)

High risk <input type="checkbox"/> (H)	Medium risk X (M)	Low risk <input type="checkbox"/> (L)
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Q6 Will this initiative have an impact (however minor) on any other Council service?

X Yes No **If yes, please provide details below**

The Strategy will require some services to work a bit differently i.e. in how they use and enhance green infrastructure in the services we provide and how we design, develop and maintaining their assets and how they work in partnership with other public sector organisations. However the strategy is meant to act as a critical friend to help the Council meet its duties to the Environment, Planning and Well-being of Future Generations Act and the 2019 SuDS Standards.

Q7 HOW DID YOU SCORE?
Please tick the relevant box

MOSTLY H and/or M → HIGH PRIORITY → **EIA to be completed**
Please go to Section 2

MOSTLY L → LOW PRIORITY / NOT RELEVANT → **Do not complete EIA**
Please go to Q8 followed by Section 2

Q8 If you determine that this initiative is not relevant for an EIA report, you must provide a full explanation here. Please ensure that you cover all of the relevant protected groups.

The strategy is part of the delivery of the Councils Corporate Objectives and Corporate Plan and Swansea Local Well-being Plan both of which will have undergone full EIA's. As a strategy focusing on the natural environment it will not directly impact on any of the relevant protected groups. However by enhancing and improving the natural environment the strategy will contribute to all the Well-being of Future Generation Act's 7 well-being goals and therefore indirectly contribute to the overall improvement of well-being for all Swansea residents including the relevant protected groups, by contributing to social, environmental, economic and cultural well-being.

Section 2

NB: Please email this completed form to the Access to Services Team for agreement before obtaining approval from your Head of Service. Head of Service

Equality Impact Assessment Screening Form – 2017/8

approval is only required via email – no electronic signatures or paper copies are needed.

Screening completed by:
Name:
Job title:
Date:
Approval by Head of Service:
Name:
Position:
Date:

Please return the completed form to accesstoservices@swansea.gov.uk

Economy, Environment & Infrastructure PDC – Work Plan 2020-2022

Meeting Date	Topic	Description	Task	Output	Designated Officer
21/01/2021	Climate Change post COVID 19 Recovery (Highways & Transport)	How can the Council's policies be amended and improved to support the delivery of the Council's aim to be net zero carbon by 2030 within the services and operations of the Council?	To identify good practice and improve or develop policies that supports the Council's aim of becoming net zero carbon by 2030	To develop policies that contribute to encourage improvements in tackling climate change across the Council.	
18/02/2021	Local and Regional Economy & Recovery response	How is regeneration, economic development and inward investment progressed and encouraged?	To identify good practice from across the UK and build into policies to support the Swansea Approach	To develop policies which build on existing provision and improve economic development and inward investment opportunities.	
18/02/2021	What can the Council do to encourage more shops and support High Street Regeneration?	Consider how the Council can work towards encouraging greater take up of shop units and support the regeneration of the high street.	To seek out and identify models of good practice and identify where authorities have been successful in attracting the use of shop units and	To develop policies that support the council in its high street regeneration and encouraging the take up of shop units.	

Economy, Environment & Infrastructure PDC – Work Plan 2020-2022

			creative and innovate ways of regenerating high streets.		
18/03/2021	More Homes Housing and Decarbonisation Strategy	How is the council providing more affordable and energy efficient homes as part of its Housing Revenue Account	To identify good practice and develop policies to improve the numbers of homes and energy efficiency of the existing stock.	To develop and amend Council Policies in line with the overarching strategy and welsh Governments Decarbonisation Agenda and City Region Homes as Power stations.	
18/03/2021	Management and maintenance of open space. (Biodiversity & Tree Policy)	To identify how the Council could manage its green space differently e.g. grass cutting in parks, green spaces and grass verges to maximise biodiversity, while ensuring the City remains visually attractive.	To identify good practice from other authorities and understand how these could be applied in Swansea to improve biodiversity.	To develop policies that helps maximise biodiversity with no increase in cost.	
22/04/2021	Future City Wide Workforce	We will consider what has changed and what the future plans are for the city and	To identify ways the Council can support the links and develop	To develop policies that support and improve a city wide workforce that meets the need of the	

Economy, Environment & Infrastructure PDC – Work Plan 2020-2022

		identify good practice and examples of how training and skills can be connected through universities and colleges with business and manufacturing.	policies that encourage greater partnerships between further and higher education and business and develop policies that will support a better prepared workforce for the future.	future development of the city.	
Post May 2021	Speed Humps, do they cause damage to: existing road Surfaces, and do they add to air pollution?	To identify how speed humps affect the community, road surfaces and affect air pollution	Understand where and how best to use speed humps and the positive and negative effects of their introduction.	To develop a Policy that can guide and improve the way speed humps are used.	

Meeting Dates:

21 January 2021
18 February 2021
18 March 2021
22 April 2021