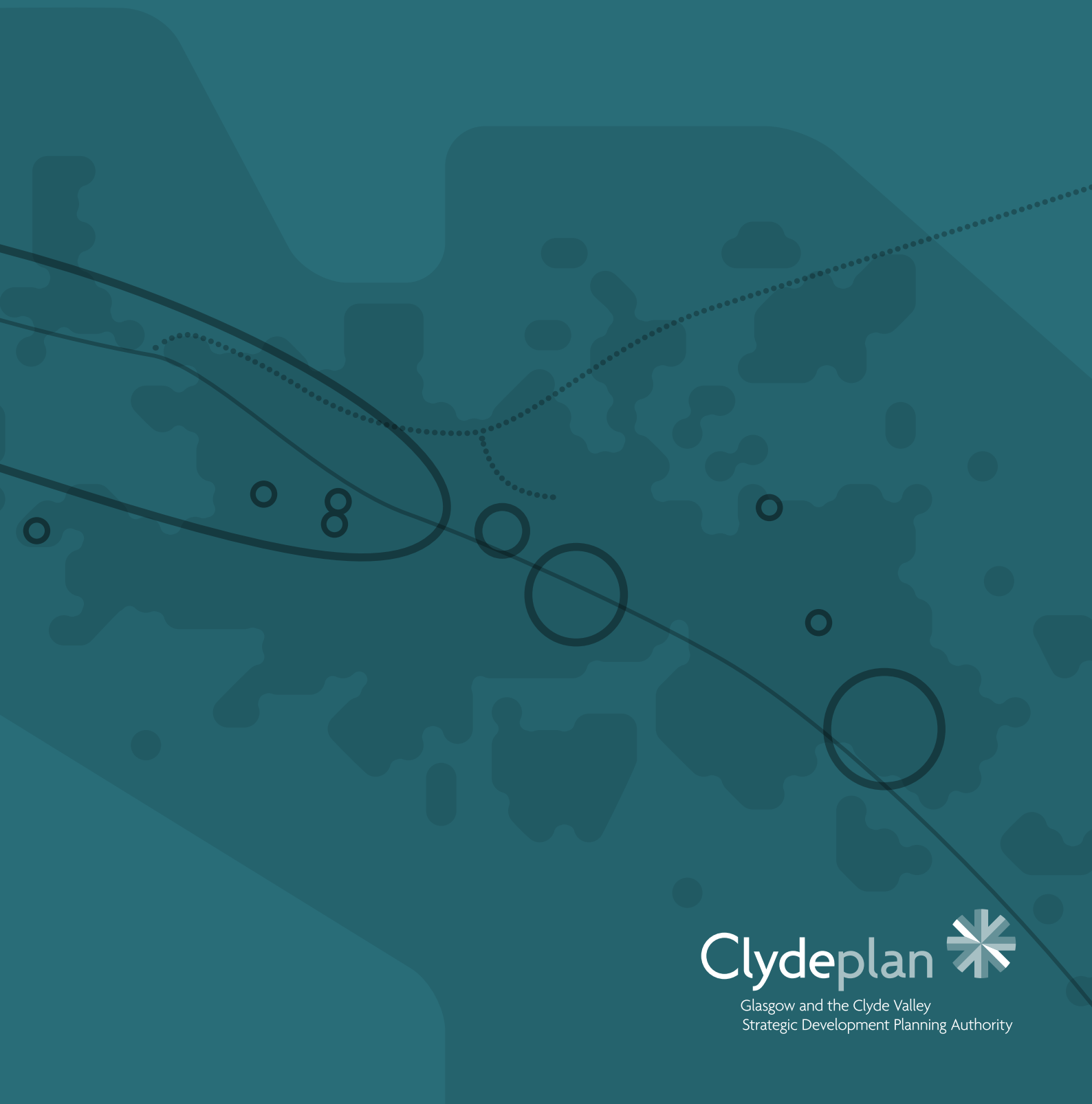
Strategic Development Plan

Proposed Plan

January 2016

Strategic Environmental Assessment:
Environmental Report



Clydeplan

Glasgow and the Clyde Valley
Strategic Development Planning Authority

Clydeplan

Glasgow and the Clyde Valley
Strategic Development Planning Authority

STRATEGIC DEVELOPMENT PLAN

MAIN ISSUES REPORT

STRATEGIC ENVIRONMENTAL ASSESSMENT

UPDATED ENVIRONMENTAL REPORT

January 2016

East Dunbartonshire Council · East Renfrewshire · Glasgow · Inverclyde · North Lanarkshire Council · Renfrewshire Council · South Lanarkshire · West Dunbartonshire Council

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NON TECHNICAL SUMMARY

What is Strategic Environmental Assessment?

Clydeplan Strategic Development Planning Authority (SDPA) has prepared a Second Strategic Development Plan (SDP). Once adopted, the SDP will guide development throughout Glasgow and the Clyde Valley city region.

This SEA of this SDP is a statutory requirement, arising from Directive 2001/42/EC and the Environmental Assessment (Scotland) Act 2005.

This Supplementary Environmental Report forms part of the Strategic Environmental Assessment (SEA) of the SDP. Changes and additions made to the report following the Main Issues Report (MIR) stage have been added in green.

SEA identifies the likely environmental impacts of plans and policies, and alternatives to them. It ensures that decision making is informed by relevant environmental information by taking place at an early stage in the process. SEA provides opportunity for the public, including those who might be affected by the proposals, to consider this information and use it to inform their views on the draft plan or policy.

Responses should be made no later than **Friday 29th February 2016** and sent

- by e-mail to info@clydeplan-sdpa.gov.uk
  or
- in writing to Stuart Tait, Manager, Clydeplan, Lower Ground Floor, 125 West Regent Street, Glasgow, G2 2SA

For any further information, please go to www.clydeplan-sdpa.gov.uk/proposedplan2016 call 0141 229 7730 or email info@clydeplan-sdpa.gov.uk.

What is SDP Proposed Plan?

The SDP sets the context for development planning in the Glasgow and the Clyde Valley city region. It provides a vision, strategic development strategy and spatial frameworks for development across the whole city region focussing on key land use and development issues that cross the planning authority boundaries.

It contains the National Developments identified in the third National Planning Framework (NPF3). It also sets out a spatial development strategy alongside a number of spatial frameworks for specific development types.

It is expected that the final SDP will be approved by Scottish Ministers in the Spring of 2017, replacing the first SDP (approved May 2012).

The first stage in the SDP process was a setting out the key areas for change since SDP1 was approved and identifies a 'preferred strategy'. The consultation process for the Main Issues Report confirmed this strategy, whilst the four planning outcomes of NPF3 ensure that the city region becomes:

- **a low carbon place:** focuses on growing and supporting a local carbon economy;
- **a natural, resilient place:** focuses on enhancing the natural and cultural heritage assets;
- **a successful sustainable place:** focuses on creating high quality, diverse and sustainable places that promote well being and attract investment;
- **a connected place:** this section focuses on connectivity both in terms of transport and digital links.

The Proposed Plan includes a re-articulated the Vision for the city region in the context of NPF3 and strategic placemaking principles. Clydeplan has a key role in leading and facilitating delivery of the Glasgow and Clyde Valley City Deal proposals. The Spatial Development Strategy is a mechanism for drawing together the 'compact city' model and the spatial priorities set out in the Plan.

How is a Strategic Environmental Assessment undertaken?
This is a strategic level assessment of city region level planning policies. As a result, it broadly assesses the expected effects of the proposed policies, and alternatives to them.

A series of key questions ('environmental objectives') is used to structure the assessment. Information about the existing environment has been used to inform the assessment and define these objectives. Individual and collective effects of the policies on natural and cultural heritage, landscape, climate, air, soil, water and material assets (environmental infrastructure), are identified. Where relevant, more detailed environmental baseline information has also been used to help identify more localised impacts.

The assessment identifies positive and negative environmental effects, considers whether they would be temporary or permanent, and notes where they would arise in the short, medium or long term. It also identifies effects arising directly from the policies, and 'secondary' effects, which would indirectly impact on the environment. 'Cumulative' effects are also identified: including where there will be several impacts in particular locations, or on specific environmental features. The assessment has been systematic, and the findings are recorded in a series of tables. The significant impacts are described in the Environmental Report.

Which reasonable alternatives have been assessed?

The assessment considers the effects of policy proposals, and reasonable alternatives to them. Those alternatives must be realistic and the effects of the options which were considered are assessed.

Which existing environmental protection objectives are relevant?

There are many established environmental protection objectives embodied within the context of this assessment and international and national climate change objectives are expressed in targets for reducing greenhouse gas emissions, as well as supporting adaptation to changing weather patterns.

What are the likely significant effects emerging from the next SDP?

Taking this into account, the assessment of the Clydeplan Proposed Plan identifies the following key effects. This is reflected in Diagram A: Compatibility Matrix comparing SDP2 with SEA objectives.

The *City Region as a Successful, Sustainable Place* supports development and investment to facilitate economic recovery with an emphasis on sustainable settlement patterns and placemaking. Overall, this strategy is expected to have potential for positive environmental impacts. Reducing development on greenfield land will benefit soil, water, and landscape, whilst improvements to the quality of built fabric could generally support conservation and enhancement of historic townscapes. Linking development with public transport networks, walking and cycling routes will help to reduce climate change emissions from transport. Positive effects for the environment as a whole, and particularly people and health, are expected from the MIR's support for green infrastructure and green network.

SDP2 Proposed Plan allows for a generous supply of land for housing which could have environmental impacts, but these can be minimised by the emphasis on placemaking.

Ultimately, the environmental effects of housing development will depend largely on decisions taken at a more local level and mitigation measure for local planning authorities are identified in this report.

Ravenscraig is identified as a national development and will benefit the environment by restoring a significant area of vacant land and creating a high quality living and working environment.

In relation to the *City Region as a Low Carbon* Place, the overall strategy raises a number of potential environmental effects and many of these will be at a local scale where development requires careful planning to avoid adverse impacts on biodiversity, soil, water, landscape and cultural heritage. Overall, SDP2 is expected to make a significant contribution to meeting targets for reducing greenhouse gas emissions. There is some potential for air quality to be affected by increased biomass for heat. Further mitigation measures will safeguard important landscapes from large scale wind farms,

The section *City Region as a Natural, Resilient Place* is expected to provide environmental benefits. Continuing environmental protection will benefit biodiversity, landscapes, as well as water and air. Proposals for enhancing tourism and recreation, including completion of a national cycle and walking network, will benefit people and health, and provide opportunities for enjoying the environment. Careful visitor management may be required where recreation is being encouraged in more sensitive areas, to avoid disturbance of species and habitats, and reduce the impacts of paths and tracks on soil and wider landscapes. An emphasis on sustainable transport options for visitors will help to offset the greenhouse gas emissions arising from increased international travel.

City Region as a Connected Place will help to reduce greenhouse gas emissions and improve air quality, by minimising travel distance. Positive effects on material assets will be achieved by making best use of existing infrastructure. Improving links between cities could have localised impacts on population, air, soil, water, landscape and cultural heritage, but these would be largely confined to the construction phase and will be addressed through future transport and development planning.

The NPF3 proposal for High Speed Rail links to London, and between Edinburgh and Glasgow may generate a range of environmental effects. Impacts on communities and wider environmental resources including biodiversity, air, soil, water, cultural heritage and landscape, will need to be taken into account in future SEA of the development.

The proposed Glasgow airport enhancements could have environmental impacts, but these will be largely localised including disturbance to local communities, and impacts on the water environment from run-off although impacts on nearby European protected sites may require further consideration. Airport enhancements could increase greenhouse gas emissions, should they facilitate increased passenger travel.

What are the likely combined / synergistic / cumulative effects of the next SDP?

The combined effects of the policies on biodiversity are expected to be mixed. Whilst they aim to protect natural heritage, they also facilitate development and this in turn could have impacts such as habitat damage or loss, and disturbance to species. As a result, the Environmental Report for the MIR and the Proposed Plan highlights where there may be particular concentrations of development, and explores whether there will be a need for a strategic approach to address impacts collectively.

Cumulative effects on population and health are expected to be positive. Whilst some types of development will require careful planning and consenting to avoid adverse effects. Many parts of SDP2 aim to create new opportunities for communities throughout the city region, thereby strengthening their resilience, and will reinforce local distinctiveness and improve environmental quality.

There may be more mixed combined effects on air quality, water and soil from the combined polices and proposals. Construction, and some operational activities, can impact on all of these topics, but this will be managed through the planning process. Generally positive cumulative effects on soil are expected from the SDP, including from the prioritisation of the reuse of brownfield land.

Cultural heritage and landscape may be impacted by a number of proposals set. However, the SDP will include policies supporting their protection.

The cross-cutting commitment to placemaking will help to ensure that planning continues to manage development design and location, ensuring that these qualities are respected and enhanced. As the SDP aims to make best use of existing infrastructure this will help to improve material assets.

Figure A: Compatibility Matrix comparing SDP2 with SEA objectives

Key

++	the proposed objectives are compatible
+	the proposed objectives are mostly compatible
?	the proposed objectives have an uncertain relationship
0	there is no clear relationship between the objectives
-	the proposed objectives are mostly incompatible
--	the proposed objectives are incompatible

	SEA Objectives																											
	Air			**Biodiversity**			**Climatic Factors**			**Cultural Heritage**				**Landscape**			**Material Assets**		**Population and health**			**Soil**			**Water, coastal, Marine**			
	Avoid adverse effects on AQMA	Improve air quality	Avoid adverse effects on air quality	Avoid adverse effects on protected habitats and species	Enhance biodiv.	Avoid adverse effects on all habitats & species	Avoid increasing GHG	Support actions to reduce GHG	Support adaption to climate change & future proofing	Avoid adverse impacts on protected historic env & setting	Enhance the historic env.	Avoid adverse effects on historic environment	Improve quality of wider built env.	Avoid adverse impacts on protected landscape, wild land & geodiversity	Avoid adverse effects on all landscapes	Enhance landscape quality	Avoid adverse impact on material assets (infrta etc.)	Enhance material assets	Avoid adverse impacts on helath inequalities & quality of life	Improve health & living env.	Address inequalities (SIMD)	Avoid adverse impacts on soil	Advoid adv. Impacts on valuable soil	Reduce VDL	Avoid adv. Impact on ecol. status of water bodies	Reduce flood risk	Avoid adv. Impacts on sensitive coastal & marine areas	Improve water env.
SDP2 Vision	+	+	+	0	+	0	++	++	++	++	++	++	++	++	+	++	++	++	++	++	++	?	+	++	+	++	+	++
Policy 1: Placemaking incl Table 1: Placemaking Principle (see para. 3.17)	0	0	0	0	+	0	0	+		+	++	+	++	+	+	++	+	+	+	0	+	0	0	+	0	+	0	0
Policy 2: Leadership and Delivery (see para. 3.18)	General policy statement. Does not require assessment.																											
Policy 3: Glasgow and Clyde Valley City Deal (see para 3.19-3.21 and Appendix A)	The policy is a general statement of support for the Lead Authorities of the City Deal Programme and related projects and therefore very general in its terms. Assessment of City Deal Projects must be dealt with at the local development plan or project level. However, the following general impacts apply. See Appendix A for strategic assessment of the current project list.																											
	-?	-?	-?	?	0	?	?	+-	++	0?	?	?	+?	?	-?	?	++	++	+	0	++	-?	-?	++	0	+	?	0
	City Region as a Successful and Sustainable Place																											
Policy 4: Network of Strategic Centres See Appendix A for strategic assessment of strategic centres	+	0	+	0	0	0	+	0	?	+	+	+	+	+	0	0	++	++	+	++	+	+?	+?	+?	0	0	0	0
Policy 5: Strategic Economic Investment Locations See Appendix A for strategic assessment of SEILs	0	0	0	-?	-?	-?	+	+	+	+?	+?	+	+?	+?	+?	+?	+	+	+?	+?	+	+?	+?	++	+	?	?	?
Policy 6: Strategic Freight Transport Hubs See Appendix A for strategic assessment of Freight Hubs	+	+	+	0	+	+	+	+	+	0	0	0	0	-+	-+	-+	++	++	0	0	+	0	?	++	?	?	?	?

	SEA Objectives																											
	Air			**Biodiversity**			**Climatic Factors**			**Cultural Heritage**				**Landscape**			**Material Assets**		**Population and health**			**Soil**			**Water, coastal, Marine**			
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Policy 7: Joint Action Towards the Delivery of New Homes **Policy 8: Housing Land Requirement** **Policy 9: Housing – Affordable and Specialist Provision**	These policies are general policy statements of support for joint action between housing delivery stakeholders to work collaboratively, for local authorities to provide a supply of land for housing at LDP level and to take steps to develop affordable and specialist provision.																											
	City Region as a Low Carbon Place																											
Policy 10: Delivering Heat and Electricity	-	-?	-?	?	0	?	+	+	++	0	0	0	+	?	+?	-?	++	++	+	++	+?	?	+	+	0	0	0	0
Policy 11: Planning for Zero Waste	0	0	-?	0	0	0	-?	+	+	0	0	0	+?	0	0	0	0	0	-?	-?	0	0	0	+?	+	+	0	0
	City Region as a Natural, Resilient Place																											
Policy 12: Green Network and Green Infrastructure	The policy is a general statement of support for Green Network and Green Infrastructure. See XXX for strategic assessment of the GN Strategic Delivery Areas.																											
	+	+	+	++	++	++	+	+	++	0	0	0	++	0	++	++	0	0	++	++	0	0	+	+	+	+	0	0
Policy 13: Forestry and Woodland	The GCV FWS is the subject of its own SEA and HRA.																											
Policy 14: Green Belt	0?	+?	+	+	+	+	+	+	+	?	0	0	++	0	++	+?	+	++	++	++	0	+	?	+	?	+	0	0
Policy 15: Natural Resource Planning	0	--	--	-+	0	-?	-+	-+	?	+-	+?	-?	-+	0?	--	-	0	+	--	--	0	-	-?	0	-+	0	0	?
Policy 16: Improving the Water quality and Managing Flood Risk	0	0	0	0	0	0	+	+	+	0	0	+-	+-	0	0	0	+	+	?	?	0	0	0	0	+	+	+	+
	City Region as a Connected Place																											
Policy 17: Promoting Sustainable Transport	+-	+-	+	0	0	?	+	+	?	0	0	+-	0	0	?	0	+	+	?	?	?	+-	0	0	+-	0	0	0
Policy 18: Strategic Walking and Cycling Network	++	+	++	+-	+	+?	++	++	++	?	0	?	+	+	+	+	++	++	++	++	+?	+	+	+	+	+	+	+

	SEA Objectives																									
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Policy 19: Glasgow Airport and Sustainable Transport Access	?	+-	-	-	-	?	+-	+-	+-	?	0	?	+	0	0	0	++	++	+?	?	0	?	-?	+	+	+	+	+
Policy 20: High Speed Rail	The policy is a general statement of support for High Speed Rail and related projects and therefore very general in its terms.																									
	?	+?	+?	-?	-?	?	+?	+	+?	?	?	?	?	-	?	?	++	++	-?	?	0	-	-?	?	-?	0	0	0

How can these effects be reduced, avoided or monitored?

The planning system has a crucial role to play in managing the impacts of development. City region level SEA is the second stage in the environmental assessment process following on from the first stage of the SEA of NPF3 and SPP. Subsequent SEA of more specific local development plans and project level Environmental Impact Assessment (EIA) provide important opportunities to carry forward the recommendations where appropriate.

The SEA identifies a number of high-level mitigation measures that aim to maximise the benefits of SDP2 for the environment. Some aspects of the SDP are very broad at this stage, and so the SEA identifies subsequent plans, including other sectoral policies and projects, and strategic and local development plans, where issues can be more effectively addressed. SDP2 balances policies which mitigate the potential impacts of proposals and the effects of housing, business, renewable energy and development more generally.

What happens next?

Clydeplan will take into account views raised in response to the consultation on the Proposed Plan Issues and this Supplementary Environmental Report. Following a six-week consultation on the Proposed Plan and associated Supplementary Environmental Report, Schedule 4 responses will be drawn up and these will be submitted to DPEA in May 2016. It is expected that the next SDP will be adopted in summer 2017.

A post-adoption SEA Statement will be published in 2017 following adoption of the second SDP. This will explain how issues raised in the environmental assessment, and associated views in response to the consultation, have been addressed.

How do I get involved in the Strategic Environmental Assessment?

The Environmental Report is the key output from the SEA, and the main stage for the public and stakeholders to get involved in the process accords with the procedures set out in the 2005 Act.

1. INTRODUCTION

Purpose of this report

1.1 Clydeplan, as the Strategic Development Planning Authority (SDPA) for the Glasgow and the Clyde Valley city region, has prepared a Proposed Plan as part of the development of its second Strategic Development Plan (SDP). As part of this process, Clydeplan has undertaken a Supplementary Environmental Report.

1.2 This Supplementary Environmental Report is required under Section 5(3) of the Environmental Assessment (Scotland) Act 2005 (the 2005 Act). Clydeplan SDPA is the 'Responsible Authority' for the SEA. Schedule 3 of the 2005 Act outlines the required content of an Environmental Report. It includes information about the current and future state of the environment which could be affected by the plan, a description of its likely significant effects, and mitigation and monitoring proposals.

Structure of this Report

1.3 This report includes the following information:

- **Section 2**: provides the environmental context, including environmental protection objectives;
- **Section 3:** describes the significant environmental effects expected from the SDP2 Proposed Plan;
- **Section 4:** brings together the findings, to explain the expected cumulative effects arising from the SDP2;
- **Section 5:** outlines proposals for mitigation and monitoring;
- **Section 6:** sets out the next steps in the policy development and environmental assessment, process;
- **Appendix A:** sets out the assessment of the proposed strategy for the second SDP; and
- **Appendix B:** sets out Mapped Assessments of key development proposals
- **Appendix C:** is the Strategic Flood Risk Assessment for Clydeplan.

1.4 Public participation is an important part of the SEA process. Views on the findings of the assessment, and other information set out in the Updated Environmental Report are now welcome.

1.5 Comments can be made via info@clydeplan-sdpa.gov.uk, or by writing to Clydeplan, Lower Ground Floor, 125 West Regent Street, G2 2SA.

Key Facts

1.6 Figure 2 sets out the key facts about the Strategic Development Plan.

Figure 2: Key Facts

Responsible Authority	Clydeplan (Glasgow and the Clyde Valley Strategic Development Planning Authority)
Title	Glasgow and the Clyde Valley Strategic Development Plan: Proposed Plan
Subject	Planning
Period covered	The Second Strategic Development Plan is a long term strategy, covering approximately 20 years into the future.
Frequency of updates	Strategic Development Plans are updated every five years.
Area covered by the policy	The Strategic Development Plan area comprises the administrative boundaries of the eight Clydeplan local authorities: East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Lanarkshire, Renfrewshire, South Lanarkshire and West Dunbartonshire. It excludes that part of West Dunbartonshire that lies within the Loch Lomond and Trossachs National Park.
What prompted the preparation of the policy?	The role of the SDP is to consider the land use implications of the new planning policy context set by NPF3 and the revised SPP particularly in the context of economic growth, climate change, green networks, housebuilding and infrastructure.
Purpose and/or objectives of the policy	The role of the SDP is to consider the land use implications of the new planning policy context particularly in the context of sustainable economic growth, the transition to a low carbon economy, climate change, green networks, housebuilding and infrastructure.
Contact	info@clydeplan-sdpa.gov.uk

Approach to the environmental assessment

1.7 This is a strategic level environment assessment of a high level policy framework. The approach to the assessment reflects the broad and strategic nature of SDP2 allowing for cumulative effects of the revised policy framework to be explored, and reducing the potential for duplication between assessments.

1.8 This SEA is undertaken in a systematic and transparent way. Scottish Government guidance also emphasises the importance of proportionality, to ensure that SEA does not lead to unnecessarily detailed reporting. To help achieve this, the assessment has used a range of methods to identify potential significant environmental effects. This assessment has been undertaken by the Clydeplan team to fully integrate the assessment within the drafting of the documents and maximize its effectiveness in the decision making process.

Stage 1 - Strategic Level Assessment

1.9 Firstly, key policy and strategy proposals within the SDP were evaluated against a range of environmental assessment objectives. As proposed at the scoping stage, a matrix was established, using SEA objectives and a standard assessment summary marking system. For ease of comparison, the assessment objectives were applied to both the Main Issues Report and the Proposed Plan.

Stage 2 - Strategic Developments Assessment

1.10 The assessment of the main components of the Proposed Plan then focused on each of the proposed strategic developments, using constraints mapping to explore key effects arising from each of those identified as part of the Spatial Development Strategy. The findings are included in the main text of this Supplementary Environmental Report.

Stage 3 - Cumulative Effects Assessment

1.11 In addition, the assessment has considered whether, at a local level, significant cumulative effects are likely to arise. This brings together the findings from both the strategic level and development specific assessments and assesses effects against a more specific environmental baseline. These findings were then reviewed and conclusions emerged on the performance of the next SDP in relation to the environmental topics.

Methodological Considerations

1.12 Schedule 3 of the 2005 Act states that Responsible Authorities should identify any difficulties encountered during the assessment process. Whilst no issues have hindered the assessment process, it is important to recognise that this is a strategic level assessment of a high level policy framework and so the findings are necessarily broad brushed.

1.13 The SEA has made best use of available information on the proposals, but it is possible that as they are taken forward into more specific plans or projects, they could evolve and change. Many of the specific environmental effects arising from policies in particular will depend on their local interpretation, as well as the context within which they are applied. Development plans will be subject to SEA, at which stage these effects can be more fully established. This is a natural feature of a strategic level assessment, and does not undermine the benefits of undertaking SEA at this level. Any uncertainties or likely dependencies have been identified and taken into account throughout the assessment process.

1.14 The SDP is heavily influenced by many other SEAs of its plans, programmes and strategies, including SDP1, the third National Planning Framework and some components of the Scottish Planning Policy. Many other recent policies have benefitted from being assessed, with their environmental effects having already been reported and consulted upon. For the next SDP this wider policy and assessment framework is an important reference point and previous findings have been taken into account where relevant. Similarly, environmental context and baseline data, which have informed other recent environmental assessments, have been used to inform the development of the environmental context for this SEA.

Significance

1.15 Directive 2001/42/EC and the 2005 Act both state that the Environmental Report should set out significant environmental effects expected from the plan. To help achieve a consistent approach, the following criteria have been used as a broad guide to evaluate the significance of both positive and negative effects:

- effects on nationally or internationally protected environmental features;
- effects of greater than local scale;
- effects that could impact on delivery of regional policies, targets or commitments;
- effects that exacerbate or address an existing, regional environmental problem or issue, as identified in the baseline analysis.

1.16 The report notes more minor effects arising from the MIR but aims to focus particularly on effects that are considered to be significant when considered in relation to these criteria.

Alternatives

1.17 The SEA Directive requires the Environmental Report to identify "an outline of the reasons for selecting the alternatives dealt with." At the scoping stage, consideration was given to the type of alternatives that might emerge during development of the SDP and its associated Background Reports. Since then, the assessment has shadowed the policy development process and the alternatives considered during the drafting process have been assessed.

1.18 The SDP2 aims to bring together existing strategies to provide a coherent and consistent interpretation within a planning and development context. It also builds on the existing SDP, and so consideration of alternatives has focused on a defined range of policy options. This includes choices about how prescriptive the policies should be at a regional level, and options for delivering on the established policy objectives (shown as 'strategic alternatives'). These high level alternatives, and their environmental effects, are explained and compared in the main text of the report (shown as 'strategic alternatives' in boxes within the relevant sections) with assessment summary tables provided in Appendix A.

1.19 For the next SDP, the key options alternatives, where considered reasonable, have been set out as questions in the MIR consultation document. In addition, some key choices for the next SDP also arise from the selection of the most appropriate strategic developments to deliver on the wider aims of the spatial strategy. As a result, strategic development proposals have been assessed, with the findings summarised in the main text of the Environmental Report (for those which are preferred at this stage). Ordered in relation to the relevant themes within the Main Issues Report, these projects constitute alternative delivery options. Levels of detail in the assessment of projects vary, reflecting the strategic nature of some of the proposals and the project information which is available at this stage. Views on their suitability and their relative environmental effects are invited. Other options are not considered 'reasonable' at this stage and have not therefore been assessed. A guide to key options is provided in the relevant section of the Environmental Report.

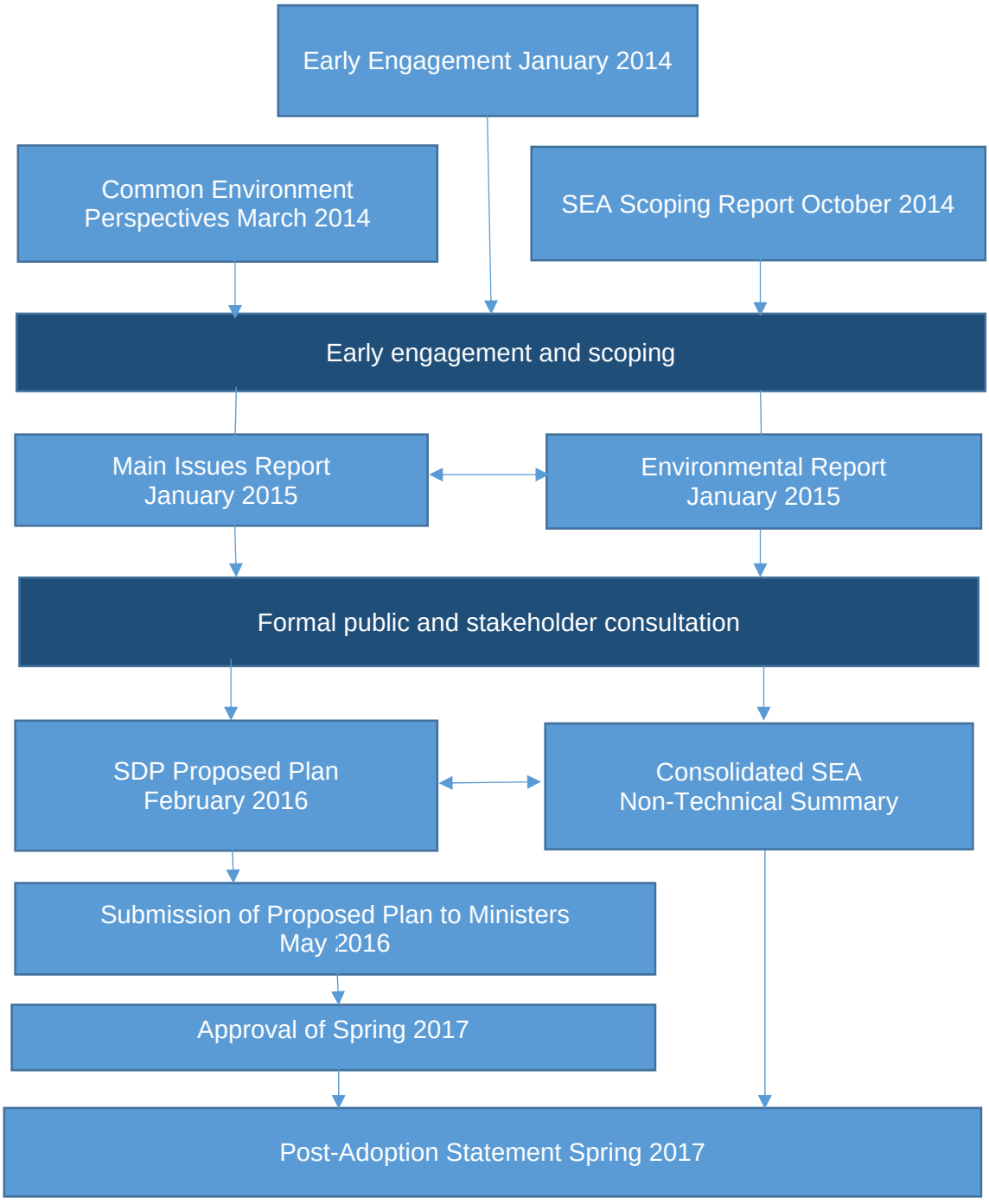
Links to the Habitats Regulations Appraisal

1.20 The SEA is undertaken alongside a Habitats Regulations Appraisal (HRA). At this stage, the HRA has focused on identifying which of the proposed National Developments could raise issues for the conservation objectives of European protected sites. In the interests of transparency, this early work has been summarised in an initial report, published alongside the Environmental Report. Natura issues have also been identified as an integral part of the SEA.

Outline of the Policy and Assessment Process

1.21 Figure 3 shows the policy preparation process and the links between the preparation of the next SDP and its environmental assessment. In addition to these key steps, it may be necessary to update this Environmental Report and undertake an additional, focused public consultation on it. Should substantive changes be made, which generate significant environmental effects that have not previously been reported upon, this additional stage will be built into the programme. It is expected that SDP2 will be approved in Spring 2017.

Figure 3: SDP and SEA Timelines



Elements that remain unchanged from the approved SDP1

1.23 The current approved SDP (May 2012) acknowledges the legacy of development and infrastructure as being fundamental to the long-term future of the city-region and that maximising the benefit of those resources is central to the sustainable approach of the SDP. The SDP sets out a Spatial Development Strategy based upon a number of key components and reflecting the terms of NPF3 these remain unchanged:

- a **Development Corridor** runs west to east through the city region paralleling the River Clyde and the M8 corridor to Edinburgh. Contained within the Corridor area a series of regeneration and transformational projects, the Flagship Initiatives, designed around sustainability principles to regenerate and restructure its urban communities;

- the **City Centre** as the core of the city region and its principal economic and cultural global asset. It sits between two Flagship Initiatives Clyde Waterfront and Clyde Gateway;

- **Clyde Waterfront** as a major long-term regeneration project designed to revitalise the River Clyde section of the Development corridor and to reconnect its communities with the river;

- **Clyde Gateway** as a large scale community regeneration and restructuring development opportunity focused on the east end of Glasgow and the western edge of South Lanarkshire. Some elements are already complete including the M74 completion and East End Regeneration Route. It also incorporates the 2014 Commonwealth Games facilities as well as being an initial focus for the delivery of the Metropolitan Glasgow Strategic Drainage Plan (NPF3 National Development);

- **Ravenscraig** (NPF3 National Development) aims to deliver long term regeneration in the southern area of North Lanarkshire by recycling a large area of derelict land;

- **Glasgow and the Clyde Valley Green Network** addresses the need for green infrastructure linking urban and rural communities. It is an integral part of the national development Central Scotland Green Network (NPF3 National Development); and

- **Community Growth Areas** aim to manage an identified need for long term housing growth as additional development land outwith the regeneration and flagship initiatives accommodating over 19,000 new housing units.

2. Environmental Context

Purpose of this section

2.1 Schedule 3 of the Environmental Assessment (Scotland) Act 2005 requires Responsible Authorities to identify:

- relevant aspects of the current state of the environment and its likely evolution without the plan or programme;
- environmental characteristics of areas likely to be affected;
- relevant existing environmental problems;
- relevant environmental protection objectives at the international, European or national level.

2.2 There are many objectives for environmental protection and improvement within existing legislation, policies, strategies, and plans, forming the context for this SEA. Appendix A includes fuller analysis of relevant environmental objectives. For each key environmental topic, a summary of these existing environmental protection objectives has been provided below.

2.3 The environmental baseline is formed along similar lines as NPF3 and SPP whose focus is particularly on Scotland. Whilst a general overview has been taken of the Clydeplan city region comprising eight constituent local authorities, key constraints and issues have been factored into the report using maps and tables which will assist with coordinating action and informing development proposals. The initial Environmental Report which accompanied the MIR sets out the Environmental Baseline.

Environmental objectives

2.4 There are many objectives for environmental protection and improvement within existing legislation, policies, strategies, and plans that form a complex context for this SEA. The table below includes a table setting out analysis of relevant environmental objectives to date. The following paragraphs summarise the key objectives for each topic area:

Environmental Objectives
Air quality objectives focus on reducing emissions which are potentially harmful to health and the environment. There are also requirements for monitoring, with a particular focus on areas where air pollution is concentrated. Air quality objectives seek to improve air quality of five of the local authorities within the Glasgow and the Clyde Valley city region. Within these five local authorities and as shown in Map 1, Air Quality Management Areas (AQMA) exist with the aim, of reducing emissions concentrations that have adverse effects on public health and the environment.

Environmental Objectives
Implications It is anticipated that the trend in the improvement of air quality will continue until 2020. Policies that assist sustainable development, transport and the green network will benefit urban areas where higher emissions give greatest cause for concern for health and the environment. Continuing migration to carbon-free renewable energy will assist with meeting targets at a national level. It is recognised that private power generation companies and the international community are major stakeholders in this part of the process and that government can only be influencers rather than drivers towards achieving these targets. The SEA assesses the extent to which the next SDP could help to reduce, or even increase emissions of pollutants to air at a city region level. The assessment includes a focus on areas where pollution is already concentrated i.e. Air Quality Management Areas.
Legislation and policies relating to **biodiversity, flora and fauna** aim to protect habitats and species from damage and disturbance, by identifying areas of particular value. These policies define a hierarchy of protection, from the international to local level. The Natura2000 network protects natural wealth associated with the Habitats and Birds Directive. European Protected Species and the Scottish Biodiversity Strategy also delineate conservation priorities. It is recognised that beyond European and national designations there is a requirement for preservation of biodiversity at a local scale. Ecological networks need to be maintained and as well as addressing issues of mechanical and climatic threat to biodiversity, broader impacts require to be understood and safeguarded against.
Implications Sound planning should influence development and limit damaging activity in order to safeguard biodiversity throughout the city region. This should address the mechanical impact of development as well as the impact of climate change. The second SDP should provide a context for sustainable planning that seeks not just to protect but enhance biodiversity through programmes such as woodland expansion, bog management, agricultural monitoring, flood management, green networks, settlement level planning and infrastructure projects. The SEA assesses the extent to which the next SDP will contribute to the core aims or protection and enhancement of biodiversity. There will be a need to establish and mitigate impacts on designated sites and species from the international to local level.

Environmental Objectives
The SEA encourages the next SDP take positive action to reflect the Scottish Biodiversity Strategy.
Climate change has been accelerating at an unprecedented rate over the last 50 years. Scottish Government and SDP1 have sought to develop policy and strategy that will decelerate climate change triggered by human promulgated greenhouse gasses reported by the IPCC. A growing adaptation framework is developing based around new policies conceived through the Climate Change (Scotland) Act 2009. Since 1990, there has been a gradual yet steady decline in greenhouse gas emissions suggesting that strategy and policy is having a positive effect towards achieving this target. However the system is estimated to operate under a 50 year feedback cycle and current emissions will still be contributing to the cycle in the 2060s. Recent plans and policies have emerged since SDP1 was published, that seek to reduce the rate of climate change and facilitate adaptation to its impacts. These include legislation and targets and key policies that aim to reduce greenhouse gas emissions from sectors including energy and transport.
Implications As climatic factors remain a concern to the future of GCV heritage, investment and biodiversity for a further 100 years, the next SDP will need to be robust supporting a long term view of the future. Reduction in the use of fossil fuels and low energy transportation can be supported by climate friendly initiatives. Carbon free energy generation e.g wind and initiatives like the heat-mapping project could make a huge impact on emissions reduction as local community and development demands and resourcing are addressed individually, rather than through generic traditional solutions. Whilst these established and developing strategies engage with the energy, industrial, business and domestic sectors, public transport could be further developed to reduce its contribution and green network - provide low carbon alternatives. The SEA should assess the extent to which the next SDP delivers on both climate change mitigation and adaptation. For mitigation, the assessment should highlight progress made by the next SDP in helping to achieve objectives for renewable energy generation, heat and sustainable transport. The assessment of the contribution to adaptation should take into account the role of planning in addressing issues such as changing vulnerability of the natural environment, the need for land use change, and requirements for long term resilience.

Environmental Objectives

Cultural heritage objectives focus on protecting sites, townscapes (places, buildings and open spaces), buildings and landscapes which have been recognised and internationally, nationally or locally designated for protection. Objectives relate to these sites, and their wider setting, as part of their character and value. Policy also emphasises the importance of recognising and avoiding negative impacts on the wider setting of recognised sites, and enhancement where appropriate.

Sites of recognised cultural heritage require designation and protection at international, national and local levels. Townscapes, buildings, battlefields, marine wrecks, landscapes and archaeological sites, known and unknown, need to be protected or enhanced, in keeping with policy that emphasises their cultural importance and significance. The quality of our built and rural environment is enhanced by the presence of cultural heritage and policy aims to improve the nature of these localities by safeguarding and improving traditional sites and fabric. The Royal Commission for Ancient and Historic Monuments in Scotland (RCAHMS) and Historic Scotland (HS) are the two main established bodies tasked with managing and protecting Scottish cultural heritage.

Clydeplan covers 4.2% of the nation's land area but 33% of the nation's population. Reflecting upon the significance of the city region culturally, materially and historically the above average distribution of assets in the area reinforces the importance of developing conservation policies that protect culture, community, national identity and revenue.

Implications
The SEA considers the impacts of the next SDP on cultural heritage from a city region perspective.

Good planning promotes and protects conservation of cultural assets through consideration of appropriate location and design. The SEA considers whether the next SDP could give rise to cumulative effects on a number of sites across the city region, for example, landscape scale change over the long term could have impacts on the setting of important or valued historic resources, as well as more direct impacts from specific developments.

The SEA considers whether the policy direction and proposals for the next SDP emphasis the role of the historic environment in supporting sustainable economic growth.

Good planning can address issues of climate change adaptation to protect cultural heritage. Reuse and enhancement of existing fabric is promoted. Where unknown heritage exists, development should be approached from a perspective that incorporates pre-project survey as part of the planning process.

Environmental Objectives
Landscape objectives, including the overarching European Landscape Convention, recognise and protect special landscapes but also aim to improve degraded landscapes and recognise the importance of all landscapes. National Scenic Areas and protected geological sites (some of these falling within Sites of Special Scientific Interest - SSSIs) are recognised as underpinning important local, regional and national landscape character. Scottish Natural Heritage (SNH) and the Scottish Government (SG) lead on managing this environmental objective.
Implications The SEA assesses the effects on landscape quality and diversity. The assessment will go beyond protected areas to consider less formally recognized areas such as landscapes that contribute to a sense of place or which would benefit from enhancement. The assessment recognises the importance and potential of landscapes close to where people live and where enhancement and regeneration could be achieved. The next SDP needs to consider how to balance economic growth, support the renewables industry and encourage tourism whilst being careful not to undermine the landscape that tourism benefits from and supplies significant revenue to local communities and the Scottish economy. In order to enhance degraded urban fringes and transport corridors, good planning will be required that improves the landscape character of degraded margins. High quality development and landscape design has a role to play in achieving this objective and should aim to incorporate sensitive perceptions of community and tourist.
Material assets is a broad topic area, potentially encompassing a range of environmental objectives relating to minerals and aggregates, transport, water, energy, social (housing, community facilities etc.) tourism, waste, telecommunications / digital and environmental infrastructure. Policies relating to these assets are wide-ranging, but aim to contribute to core planning objectives of sustainable development. Within the context of pursuing sustainable development and promoting a low carbon economy, material assets associated with agriculture, forestry, transport and waste have been identified as contributing most significantly.
Implications Many aims around material assets focus on improving infrastructure with underpinning themes seeking to reduce emissions from activities such as transport and waste. These can have a strong economic focus but are also linked with opportunities for making the best use of resources.

Environmental Objectives
The SEA should explore the extent to which the next SDP is contributing to wider environmental aims and objectives. Policy should aim to encourage economic development in rural areas whilst providing support for other activities including agricultural change thus minimising adverse impact on landscape character or local economy. Sustainable forestry is essential in supporting climate change adaptation and mitigation objectives. Biodiversity must be protected whilst understanding the role that biomass production plays albeit carbon generating, in reducing reliance on fossil fuels. Provision of woodland for health, well-being and recreation should also be sustained. The new SDP needs to address issues of transportation where activity centred around the car and road haulage has been increasing significantly. A renewed vision for reduction in landfill and increase in recycling needs to be found if reductions in waste disposal are to be maintained.
Much of **population and health** objectives centre on environmental quality associated with provision of greenspace, pollution control and sustainable transport. It is assumed that the index of deprivation associated with poor health would be improved with access to outdoors and quality amenities promoting physical and mental wellbeing in “clean” environments and serviceable facilities. Wider policy addressing child poverty, reducing inequalities, including health inequalities, and improving health form an important context for the SDP and its environmental assessment. Fifty percent of Scotland’s most deprived datazones were found in Glasgow City in 2004 but this reduced to 35.8% in 2012. Other areas have seen increases in deprivation including North Lanarkshire and Renfrewshire where significant shares of their datazones are amongst the 15% most deprived in Scotland. Between SIMD 2009 and SIMD 2012, Glasgow City and South Lanarkshire have seen a decrease in the number of datazones contributing to the 15% most deprived areas in Scotland. For Clydeplan, these changes need to be monitored and understood in order to inform the next SDP.
Implications Planning for population change should be assisted by identifying new sustainable development locations that are less susceptible to flooding, promote services and embed good transport links. Environmental quality can be improved through SDP. High quality air, greenspace, public transport and remediation of vacant and derelict land will be key to achieving this including the provision of good access to community walking/leisure and cycling links. As pressure on the city region’s population and its health increases under expanding development and climatic uncertainties, resilient vision and design needs to be established that will safeguard population and infrastructure.

Environmental Objectives
There are a number of ongoing commitments to improving mental and physical health and well-being. Planning has a role in helping achieve this through placemaking, improving communities, providing access to facilities, promoting active travel and recreation and creating healthier and safer environments. The SEA explores the extent to which these are being met. Equality and addressing poverty through improving communities and access to employment are key objectives in planning. Housing issues continue to raise objectives for planning through ensuring an effective supply of land for housing and working to link the needs of communities and households with available stock. Whilst this is directly relevant to wider policy issues, it is also relevant to the impacts of the next SDP on population and health.
Soil objectives include European level recognition of the importance of soil resources, and national commitments to sustainable soil management seek to protect valued soils including prime quality agricultural land and those with a high carbon content, such as peat. Guidance on the development of wind farms on peat, commitments to remediation of contaminated land and the prevention of soil pollution are also applicable, or will be when the MIR is published in January 2015.
Implications Policy is required that assesses windfarm development on peat soils and in the central belt there needs to be remediation from the effects of sealing and contamination associated with development. Under Clydeplan, the latter is significant as is the requirement to protect the remaining agriculturally productive land from pollution and development. Potential pressures for soils include those arising from construction activity, such as soil sealing and loss of biodiversity. Soil has an important role in the context of climate change. Safeguarding carbon rich soils, including peatland has become a priority. There is a need to bring vacant and derelict land back into productive use and protecting soils that support primary activities. The SEA should consider the extent to which the next SDP reflects the importance of different types of soils and avoid negatively impacting on its functionality. Planning will have a direct effect on local, national, European and global issues associated with soil. Soil loss can be minimised through good planning in anticipation of climate change. Agriculture needs to be supported to protect the little high quality land that exists in Glasgow

Environmental Objectives
and the Clyde Valley whilst taking care not to compact soils or contaminate water networks. Regeneration and urban planning will directly affect potential for flooding if issues of sealing, compaction or SUDS are not addressed. Careful windfarm planning needs to be ensured to minimise loss of peaty carbon rich soils. Woodland clearance on windfarm sites potentially destabilises soils which needs to be carefully considered as part of the whole carbon sequestration, flood reduction and woodland expansion programme.
Water policies of relevance to the next SDP include the Clyde River Basin Management Plan which aims to improve the overall condition of water bodies inland and on the coast, and marine policies including the emerging framework provided by the National Marine Plan. Policies relating to managing inland flood risk are also relevant to national planning policy.
Implications Policies relating to the water environment aim to improve the condition of water bodies through appropriate management of activities that could lead to a range of pressures, including pollution, modification through engineering works, and abstraction. Planning policies have a role in ensuring the targets set by River Basin Management Plans are met. Policy on flood risk management seeks to promote sustainable solutions that reflect and address the impact of climate change on the water environment over the long term. There are a number of existing environmental protection objectives for the marine and coastal area, including those that protect their valued natural and cultural heritage objectives. The next SDP should seek to integrate emerging marine planning with terrestrial planning. Future SDPs should ensure that new development does not coincide with high flood risk areas or increase the risk of flooding. As well as seeking to minimise risk Clydeplan should also ensure that development does not affect water quality or threaten existing objectives. Water infrastructure and networks should also be enhanced to reduce leakage and meet anticipated demands including contingency for drought.

2.5 SDP2 will work within this framework of environmental regulation and policy, avoiding adverse impacts on valued resources, dealing with existing problems and where possible delivering environmental improvements. The SEA assesses the extent to which the options within the Proposed Plan achieve these broader objectives. The proposed assessment framework, which will build on the environmental objectives set out here, is explained in more detail in Section 3.

3. Proposed Plan - Significant Environmental Effects

Introduction

3.1 SDP1 set out a vision for the spatial development of Clydeplan to 2035, based upon a 'compact city model' aimed at minimising carbon and development footprints by focusing on a development corridor. SDP1 also provided a framework for planning focusing on housing, town centres, business and industry, transport, green networks, energy, waste, water and communications technology infrastructure.

3.2 The MIR highlighted key changes that influenced the content of SDP2. SDP2 sets the context for development planning in the city region and sets out regional planning policies for the development and use of land and for interpretation in relevant local developments plans as well as in relation to development management decisions.

3.3 Considerations for the SDP2 include a demographic framework, housing land, industrial business and vacant and derelict land supply well as the current economic climate and its effect on employment and delivery.

3.4 The key elements of the next SDP are set out below whilst Diagram A summarises the outline effects of each section of SDP2. The Proposed Plan sets out a Spatial Development Strategy to ensure the city region becomes:

1. a successful, sustainable place - focuses primarily on future distribution, scales and patterns of built development including supporting sustainable economic growth and regeneration and the creation of well-designed spaces. To deliver the strategy,

    a. three new Strategic Economic Investment Locations (SEILs) have been identified, to support key sectors in city region economy; and
    b. two additional Strategic Freight Transport Hubs have been identified in support of the modal shift and the transportation demand of the key sectors;

2. a low carbon place - focuses on low and zero carbon generating technologies development including wind energy, reducing carbon emissions and adapting to climate change. To deliver the strategy a wind energy spatial framework is presented, identifying areas that are likely to be the most appropriate for onshore wind farm development;

3. a natural, resilient place - focuses on helping to protect and enhance the natural and cultural assets and facilitating their sustainable use. To deliver the strategy the Green Network Priorities has been revised and

refined and introduces a new spatial framework identifying Green Network Strategic Delivery Areas using new and extended data sources; and

4. a connected place - focuses on supporting better transport and digital connectivity. The Spatial Development Strategy is key to delivering these aims.

Outline of key components of Clydeplan Strategic Development Plan

3.5 The city region contains almost half the Scottish population, and is centred on the Glasgow conurbation and the River Clyde. This is an urbanised and industrial area with much of the Glasgow conurbation and the Clyde Estuary being developed. The industrial legacy in the region has left significant areas of contaminated, derelict or vacant land.

3.6 The River Clyde and its tributaries are distinctive features of the geographically diverse area. Beyond the urban townscapes of Glasgow and other settlements, the region is predominantly lowland, extending to undulating moorland that contains many areas and networks or semi-natural habitats. As the Clyde Estuary opens out to the west, there are extensive mudflats, sands and shingles and areas of saltmarsh and coastal grassland that add to the landscape value of the region, some of which is recognised as being of national importance. Further inland, there are areas of native woodlands and agricultural land.

3.7 Several country, regional and national parks are distributed across or around the region, including Pollok Country Park, Cathkin Braes Country Park, Clyde Muirshiel Regional Park, and Loch Lomond and The Trossachs National Park lying just outwith the Clydeplan boundary to the north. Though less formally recognised as biodiversity sites, many urban green spaces are havens and feeding areas for wildlife, including some rare species.

3.8 In recent years, significant water quality improvements have helped to improve the environmental value of the region, particularly in the Inner Clyde. The river supports several fish species of international importance (i.e. Atlantic salmon, Lamprey and Powen) and complements a number of discrete SSSIs. The Inner Clyde SPA and RAMSAR site extends from Glasgow to Port Glasgow and is designated for Redshank birds. This area is also a SSSI with littoral sediment coast, and supports numerous bird species. A SPA and SSSI (Black Cart), near Glasgow Airport, has been designated for the Whooper Swan.

3.9 Cultural heritage assets are found throughout the region, including numerous listed buildings and several gardens and designed landscapes. The region is a key transport hub with key links to western and northern Scotland, and the south, and is served by Glasgow Airport, located to the south-west of the city. Several local air quality management areas (AQMA) have been declared in the region, due largely to vehicle emissions.

3.10 The following key developments within Clydeplan are recognised National Developments, identified in NPF3:

- Strategic Enhancements at Glasgow Airport as a National Development;
- Creative Clyde Enterprise Area
- the potential National Renewables Infrastructure Plan site at Inverclyde supported within the wider strategy and City Deal;
- Central Scotland Green Network remains a National Development, with a focus on active travel and derelict and vacant land restoration;
- Metropolitan Glasgow Strategic Drainage Plan is retained as a National Development;
- redevelopment of the Ravenscraig site is supported as a National Development, and other key developments, such as the Clyde Waterfront and Clyde Gateway, are also recognised as regional priorities.

3.11 SDP2 as a whole will have mixed effects on the environment. The following paragraphs set out the effect of each of the main strategy components and their respective development frameworks and / or proposals followed by a consideration of cumulative effects arising from the Proposed Plan. The assessment findings are set out in detail in Appendix A, Appendix B contains assessment mapping for the spatial proposals and the environmental objectives and Appendix C sets out the Strategic Flood Risk Assessment for the city region.

SDP2 Vision

3.12 The SDP2 Vision SDP1's Spatial Development Strategy was set out as the land use expression of the Clyde Valley Community Planning Partnership's Vision contained in its Economic Strategy 2011 - 2016. The Vision for SDP2 has been re-articulated to reflect key themes emerging from NPF3 and seeks to reflect a high level aspiration for the city region for both its people and its environment. It is intended to ensure it maximises its potential on all fronts. The detailed actions and decisions by others will ultimately determine if the Vision is achieved.

3.13 The SDP2 sets out a new Vision which reflects the new planning policy agenda set out in NPF3 and SPP. The Vision states:

'Glasgow and the Clyde Valley will be a resilient, sustainable compact city region attracting and retaining investment and reducing inequalities through the creation of a place which maximises its economic, social and environmental assets ensuring it fulfils its potential as Scotland's foremost city region.'

3.14 In relation to population and health, generally positive effects on physical and mental health are expected through a focus on improving the quality of life for people. This will have a particular focus on disadvantaged communities

resulting from measures such as derelict land reclamation, the creation of the green network, promotion of active travel and secondary effects from the emphasis on skills, training and employment.

3.15 In relation to soil, the vision is based upon a compact city model that seeks to reduce the development footprint of the city region and focus on the reuse of vacant and derelict land for both development and the creation of the green network.

3.16 In addition, the vision is intended to support the Scottish Government's outcomes for planning by attracting and retaining investment and improving the quality of life for people through the creation of a place which maximises its economic, social and environmental assets ensuring it fulfils its potential as Scotland's foremost city region.

Policy 1: Placemaking Principle

3.17 Clydeplan seeks to embed the creation of high quality places firmly as part of its Vision and Spatial Strategy. SDP2 requires that new development proposals are based upon a design-led and participative process and should seek to deliver on the six qualities of place (distinctive, safe and pleasant, welcoming, adaptable, resource efficient and easy to move around and beyond). Assessment identifies mostly positive effects on all SEA objectives with the exception of waste, where any direct effect is negligible (refer Diagram A, Non-Technical Summary).

***Policy 2:* Leadership in the delivery of the Vision and Spatial Strategy**

3.18 Delivery of SDP2 is multi-sector and Clydeplan aims to provide proactive and positive corporate leadership based around partnership working, including working with development industry and Community Planning. Collaboration and co-ordinated action is required to secure high quality development in the right place at the right time, particularly in relation to housing. Clydeplan, local authorities, Community Planning Partnerships and the development industry should work together to reduce risk and ensure development and service delivery are closely aligned. Policy 2 states the intention of Clydeplan to encourage joint working, a continuing multi-agency approach aligned to corporate leadership and decision-making. This role as collaborative working facilitator does not require to be assessed.

Policy 3: Glasgow and the Clyde Valley City Deal

3.19 The impact of recession has affected public and private investment programmes and as a direct response to this the Clydeplan Local Authorities and the Scottish and UK Government announced the creation of a Glasgow and Clyde Valley City Deal in August 2014. This, along with employment schemes across the city region, established an infrastructure fund which will be used over the next 20 years. Clydeplan SDPA supports the Lead Authorities in the

development of a number of projects aimed at delivering key strategic priorities and the Clydeplan local authorities are currently assessing the detailed delivery programme for each of the projects. Below, an overall assessment of the City Deal projects is given. Refer to Appendix A for an assessment of individual project, as defined at the time of publication of SDP2.

3.20 In relation to material assets the City Deal Fund projects are likely to create new infrastructure which will both complement existing infrastructure assets and improve strategic accessibility across the city region. There are also likely to be positive effects in relation to population and health since the investment programme aims to ensure that deprived areas benefit from this investment. It is anticipated that significantly enhanced access to employment opportunities across the city region will improve quality of life.

3.21 The physical delivery of the various components of the SDP's Spatial Development Strategy is key to delivering its Vision. The City Deal infrastructure investment programme is an important mechanism in achieving that. The detailed assessments of each project will be undertaken by the respective Local Authority. The detailed actions/decisions by others will ultimately determine if the City Deal infrastructure investment programme is delivered and the proposed benefits across the city region in particular to those in deprived areas are achieved.

Spatial Development Strategy

3.22 The preferred Spatial Development Strategy was confirmed as a result of consultation at MIR stage and remains unchanged. Individual elements of the Strategy are detailed in paragraph 1.23.

City Region as a successful and sustainable place	Detailed assessment findings are set out in Appendix A.
Preferred strategy	***Reason for selection***
Promote long term sustainable and economic growth locations through a strategic network of Strategic Economic and Investment Locations (SEILs). In addition to those identified in SDP1, incorporate three SEILs to support key sectors in city region economy at these locations: South Glasgow University Hospital, Glasgow (Life Sciences sector); Creative Clyde Enterprise Area, Pacific Quay, Glasgow (Creative and Digital sector); Biocity Scotland, Newhouse, North Lanarkshire (Life Sciences sector).	Aims to support sustainable economic growth reflecting the SEILs role and function in support of Scottish Government identified key economic sectors. Also promotes sustainable travel and placemaking.

Promote a network of strategic freight transport hubs. In addition to those freight hub identified in SDP1, incorporate two additional hubs at: • King George V Dock, Govan; and • Burnbrae, Linwood.	Aims to support the sustainable transport of goods and promote the modal shift between road, rail and marine shipping.
Recognise the role of the city region's natural and cultural heritage. In addition strategic assets including Glasgow City, New Lanark World Heritage Site. Clyde Muirsheil Regional Park, Dams to Darnley Country Park, the Campsie Fells, the Antonine Wall and adjoining Loch Lomond and Trossacahs National Park; recognise the Forth and Clyde Canal; and the River Clyde.	Aims to support the city region's significant contribution to Scotland's visitor economy.
Town centres have experienced significant change particularly in relation to retail shopping patterns.	To continue to support 'town centre' first principle for significant footfall generators to support role and function.
Provide a flexible approach to housing development.	Support housing development whilst maintaining flexibility in response to the needs of the sector.

3.23 This section of the Proposed Plan sets out where development should take place and how planning can best support the wider aims of economic recovery in a way that is consistent with climate change objectives. Proposals are based on placemaking, low carbon options in relation to settlement patterns, development locations and public transport connections. The importance of development and reinvigoration of town centres is re-emphasised as well as the carbon benefit of co-locating complementary uses, higher densities and stronger links with low carbon transport opportunities.

3.24 The overall approach will have generally positive effects on population and health and climatic factors by facilitating public transport use, heat networks, reduced travel and digital connections. Impacts on soil are likely to be reduced from using existing industry and business locations and encouraging higher densities and continuing the drive to

reuse vacant and derelict land. Material assets are likely to be supported by the emphasis on making best use of existing infrastructure capacity.

3.25 With regards to less favorable environmental effects, there may be a need to reconcile increased density of development within towns and the city centre with the need to manage cumulative impacts on air quality (arising from congestion) and flood risk, through to development planning, site selection and development management. Impacts on biodiversity networks from more concentrated development patterns could arise, but at the same time will benefit from the integration of green networks.

3.26 The integration of green infrastructure including green networks is an integral part of sustainable development strategies. This will generate significant positive effects across all of the environmental topics but particularly significant for population and health and soils given the emphasis on active travel and derelict land reclamation. In relation to derelict and reclamation, significant positive effects on landscape objectives can also be expected.

3.27 Secondary effects may arise from measures to support climatic factors such as active travel and better infrastructure.

3.28 With regards to housing, mixed effects are expected in relation to biodiversity, water, soil, cultural heritage and landscapes. This is due to the emphasis on generosity in relation to housing land provision. Much depends on the housing sites identified at Local Development Plan and development management stages. High level mitigation can be offered in the SDP by emphasizing the need for sustainable approaches to spatial planning of development and promoting placemaking across all sectors.

A low carbon place: supporting a low carbon economy	Detailed assessment findings are set out in Appendix A.
Preferred strategy	***Reason for selection***
Planning can help deliver renewable heat.	Supporting national energy policy to help achieve renewable heat generation target.
Support for onshore wind energy development through a spatial framework, recognising the city region wide strategic landscape capacity study.	To continue to provide support for achieving renewable energy targets that avoids adversely impacting on landscapes and ensures a consistent approach across the city region.

3.29 This section of the Proposed Plan focuses on energy and the transition to a low carbon economy and this is likely to raise a variety of environmental issues. Where community energy and local ownership is concerned this is likely to have generally positive effects particularly in relation to climatic factors. However, given the range of technologies involved in renewable and low carbon energy a range of effects are likely but depend on how they are planned at the development plan and in relation to siting and design within the development management process.

3.30 In relation to renewable heat, a range of potential environmental effects can be anticipated. Regarding increasing use of biomass and increased planting level of plant stocks issues are likely to include potentially negative impacts on air quality, particularly in areas where pollution is already concentrated. Less significant effects are predicted for biodiversity, soil, water, cultural heritage and landscape although this will depend on appropriate land use planning policies and development planning actions where more detailed elements will be given due consideration.

3.31 The proposed strategy for onshore wind could also provide mixed effects. Impacts on landscape could be significant and local authorities intend to make use of the Strategic Landscape Capacity Study for Wind Turbine Development (LUC, 2014) to guide siting and design issues in relation to planning and development management. Individual and cumulative impacts of development on biodiversity, soil, water, cultural heritage and landscape have been considered in this Strategic study and more monitoring of this situation is required. However, given the availability of mitigation at the plan and project level, impacts are not expected to be significant.

A natural resilient place: supporting positive environmental action	Detailed assessment findings are set out in Appendix A.
Preferred strategy	***Reason for selection***
Emphasis on the importance of green infrastructure.	Promotes the role of the natural environment as an integral part of resilient placemaking.
Recognising the value of green networks as an integral part of development.	Aims to provide significant environmental benefits through enhancement, active travel and derelict land reclamation.
Green network priorities	Update of existing green network spatial priorities. This will continue to provide significant environmental and health benefits.

3.32 The overall approach to green infrastructure will generate significant positive effects across all environmental topics particularly population and health and soils due to the proposed emphasis on active travel and derelict land reclamation. Significant positive effects on landscape objectives can also be expected in relation to enhancement and wider (non-designated) landscapes.

3.33 Green network priorities focus on environmental improvements including provision of a large scale network of multi-functional greenspace, habitat improvements, water environment management, landscape improvements, restoration of vacant and derelict land, active travel and recreational routes. This is expected to generate long term positive effects on biodiversity, improving green infrastructure and promote habitat links as an integral part of a multifunctional green network. The Main Issues Report identifies sixteen priority areas for access, climate change, habitats and health.

3.34 Significant positive effect on population, physical and mental health are expected since the priorities are specifically linked to current and long established problems with social health disadvantage in Glasgow and the Clyde Valley.

3.35 Active travel measures should help reduce greenhouse gas emissions and improve air quality over time through reduced car usage. Planting and increased woodland cover could provide further benefits through absorption of certain pollutants. Adaptation to climate change should be facilitated by biodiversity networks providing opportunities for species movement.

3.36 Opportunities for improvements to the water environment are likely due to the improved networks of wetlands and watercourses being recognised as part of ‘blue’ green networks. Positive effects on soils are expected from the proposed emphasis on derelict land reclamation, potential decontamination of polluted soils and broader environmental improvements.

3.37 Green network is expected to take into account and work positively with the historic environment. Potential adverse effects on known and unknown archaeological remains from activities such as planting will be taken into account and addressed by established good practice standards.

3.38 Significant positive benefits on landscape across Glasgow and the Clyde Valley due to green networks role in restoring degraded landscapes. Care will be required at project level to ensure projects are consistent with landscape character.

A connected place: supporting sustainable travel	Detailed assessment findings are set out in Appendix A
Preferred strategy	***Reason for selection***
Support low carbon transport options and aims to reduce the need to travel.	Aims to reduce greenhouse gas emissions from the transport sector and improve quality of life.
Aims to improve international connections.	Ensures Glasgow and the Clyde Valley can access key markets and support investment in the economy.
Strategic airport enhancements – Glasgow International airport.	Supports national development with the aim of maintaining and improving international connectivity.

3.39 The emphasis of this section of the Proposed Plan is the need to reduce emissions from the transport sector, minimising the need to travel and distance travelled. This is expected to generate positive effects on climate change objectives by helping to reduce emissions from transport over time. Positive effects on material assets are also expected from the emphasis on making best use of existing infrastructure. Air quality benefits will arise from the emphasis on reducing travel and promoting active and public transport choices with secondary effects on health.

3.40 Positive effects on population are expected from better connections, as well as further direct positive impacts on health from better connections as well as further direct positive impacts on health from use of improved walking and cycling networks for everyday travel.

Overall Effects of SDP2 Proposed Plan

3.41 The Proposed Plan aims to prioritise connections to support economic investment. Mixed environmental effects are expected with potential impacts on biodiversity, water, soils, cultural heritage and landscape. As with previous components, these effects should be effectively resolved at the planning and consenting stages. Impacts on climatic factors could be negative suggesting there would be benefit in prioritizing investment in strategic rail routes in preference to road options where possible and appropriate.

3.42 Links to the rest of the UK and other parts of the world raises issues for climatic factors, as further long distance travel, particularly by air, will increase greenhouse gas emissions. Long term commitment to high speed rail could provide some benefit for climate change, particularly by reducing the share of short haul flights to other parts of the UK. Mixed effects on population and health may arise, given the potential for large scale infrastructure

enhancements on residential amenity during both construction and operation. Potentially positive or negative localized effects on biodiversity, air, water, soil, cultural heritage and landscape may arise, but these are not expected to be regionally significant, given that development will take place at generally established transport hubs, plan and project mitigations will be brought forward at the appropriate stage in the process.

3.43 The need for careful management is demonstrated by the small but important number of designated natural heritage sites located within this relatively developed region. Given the scattered nature of these sites, the potential for significant environmental impacts will largely depend on development locations and will be site and operation specific. The assessment of the Glasgow Airport suggests that further consideration of impacts on the Black Cart Water may be required.

3.44 Many of the proposed developments considered in SDP2 have important environmental components, aiming to improve the quality of the built or natural environments. Several proposals specifically aim to improve the natural environment, including the Central Scotland Green Network. Others, such as those involving the redevelopment of industrial sites and using existing infrastructure where possible, such as Ravenscraig, could collectively provide significant environmental benefits by improving land, and more local positive impacts on water, townscape and landscape, and human health. There is potential for ecological benefits for biodiversity, water quality and reducing flood risk, particularly for the Inner Clyde, from the Metropolitan Glasgow Strategic Drainage Plan.

3.45 Cumulative construction impacts may raise issues for surrounding areas and habitats. While this is already a relatively urbanised area, temporary impacts in disturbance and soil, water and air quality may occur from undertaking some construction activities. However, many impacts are expected to be managed at the design stage or through the adoption of appropriate controls during the construction works (i.e. management planning, staging of land disturbances, sediment and erosion controls, dust suppression).

3.46 In operational terms, increased activity at developed sites is likely, particularly in the regeneration of long-disused sites. This, and any associated transport infrastructure works may create local air quality issues (i.e. vehicle emissions). In contrast, decarbonisation initiatives such as the cycle and walking networks and emphasis on active travel in the Central Scotland Green Network, may create opportunities for everyday use, reducing transport emissions and improving human health by encouraging active lifestyle. It is anticipated that many of these issues will be considered in greater detail at the project-level in the environmental assessment of specific developments (i.e. HRA / EIA processes).

3.47 In conclusion, the key issues requiring regional or local mitigation (refer to section 6 for further detail) are:

- appropriate design of developments to mitigate potential adverse impacts;
- management of construction impacts from site development works.;
- assessment of, and mitigation where necessary, of potential impacts to sensitive receptors (i.e. Inner Clyde Firth and Black Cart SPAs); and
- consideration of potential cumulative air quality impacts associated with specific developments (i.e. increase in localised vehicle emissions).

4. Strategic Cumulative Effects

Introduction

4.1 This section brings together the assessment of the MIR, the Proposed Plan and associated Background Reports to explain the potential cumulative effects arising from the changes in planning policy context. It considers each of the SEA topics and identified key issues arising for each.

Air

4.2 The assessment of the Proposed Plan and the associated Background Reports highlights some interesting issues with regard to air quality. The low carbon agenda suggests a need for higher density development, to reduce transport use and facilitate new infrastructure such as decentralised heat, waste and digital networks. However, this will need careful planning to avoid increasing congestion, and associated concentrations of air pollutions, particularly within existing urban areas and on key transport corridors. Mitigation is recommended, including ensuring that locational guidance that emphasises development in and around existing settlements is strongly linked with public and active transport infrastructure provision. Issues around heat and biomass are also raised in the assessment.

4.3 Most other components of the Proposed Plan are expected to have positive impacts on air quality. However, construction activity will require appropriate planning and mitigation at the project level to minimise any temporary effects.

Biodiversity, flora and fauna

4.2 The overall effect of the Proposed Plan and its associated Background Reports is expected to be mixed. SDP2 aims to realise opportunities for economic development, not least by making use of its natural resources. In some cases environmental protection is integral to development and business aspirations. In others there will be challenges including the potential for renewable energy and associated infrastructure to impact on habitats and species and there may also be impacts where transport links are upgraded. As a result mitigation is suggested at a strategic level, including a focus on addressing particular concentration of development and essential infrastructure around the development corridor.

4.3 SDP2 will continue to protect key sites and species, especially those recognised at national and international level but also where they are of regional significance. With the overall emphasis on facilitating sustainable economic growth, local development plans will continue to manage local level individual and cumulative impacts on a range of environmental resources, particularly non-designated areas which have natural heritage value and sensitivity.

Climatic factors

4.4 The Proposed Plan and the associated Background Reports reflect the objectives set out in climate change policy, including RPP2. SDP2 emphasises the transition to a low carbon economy, and aims to link this with wider economic growth. It is expected to result in positive effects on reducing emissions from key sectors, including energy and transport. The SDP will also contribute positively to our targets for climate change emissions reduction.

4.5 The assessment suggests there may be scope to improve the focus on the role of planning in facilitating adaptation to climate change. SDP2 in particular is a long-term document, and so resilience and flexibility, key principles for achieving adaptation, are implicitly covered within the strategy. SDP2 also provides examples to adaptation, but there may be scope to strengthen these further during in the finalised version.

Cultural Heritage

4.6 Significant positive cumulative effects on cultural heritage are expected, given the emphasis within SDP2 on protecting, and enhancing where appropriate, the historic built environment. SDP2 notes its importance in relation to regional heritage, identity and local distinctiveness and aims to protect key assets.

4.7 As with other receptors, there is potential for some types of development to result in cumulative impacts on the historic environment. The SDP SEA in particular highlights potential for relatively minor effects arising from some of the proposals, and the broader support for renewable energy generation. The assessment suggests some potential for negative cumulative effects, particularly on buildings and sites that are not formally designated for protection. These will require an appropriate approach to planning and development management.

Landscape

4.8 SDP2 recognises the importance of nationally designated landscapes particularly with regard to avoiding significant adverse impacts from commercial scale wind energy development. Initiatives such as the Glasgow and Clyde Valley Green Network, national walking and cycling routes also provide opportunities to increase experience and enjoyment of the landscape. Whilst these parts of the strategy are expected to generate regionally significant positive effects on landscapes, some SDP2 proposals may result in more adverse effects and will require careful management, including infrastructure projects.

4.9 These potential issues are balanced by the Background Report 10 Low and Zero Carbon Generating Technologies, which strengthens its recognition of the need to safeguard key features as further key considerations within spatial frameworks. The assessment acknowledges that some types of development could potentially result in adverse impacts, individually and cumulatively. It also notes likely benefits from the provision of clearer guidance on spatial frameworks for onshore wind.

Material assets

4.10 Cumulative effects on material assets will be generally positive. In particular, the SDP's focus on a 'connected place' and 'movement' emphasises the need to make best use of existing infrastructure. The SDP recognises the importance of other infrastructure, such as for sewerage and drainage, and coastal defences and safeguard other material assets, such as natural resources, whilst promoting their sustainable use.

Population and health

4.11 Effects on population and health from the Proposed Plan and the associated Background Reports are expected to be positive. Whilst some types of development require careful planning and management to avoid local level impacts on communities, the policies recognise and reflect this, emphasising the role of development management in addressing these issues. The Spatial Development Strategy overall raises no significant issues for population and health, but notes potential challenges around some types of energy developments, as well as transport infrastructure improvements. In addition, the strategy seeks to address long standing issues of social disadvantage, derelict land and reclamation and promotes environmental enhancement in areas which are densely populated, thereby providing opportunities for cumulatively positive impacts on population and health over time.

4.12 The assessment findings for this topic are expected to be largely positive, reflecting the role of planning and SDP2 in achieving an appropriate balance in development and protection of communities and their environment. Some localised issues could arise where some types of development, such as minerals extraction and renewable energy development take place.

Soil

4.13 SDP2 should provide benefits for soil, not least because it recognises the importance of high quality agricultural land and peatland. Positive cumulative effects are expected from the emphasis on reuse of derelict and vacant land, within their broader approaches to spatial development and placemaking. More localised negative impacts on soil arising from some types of development are identified, but are not expected to be cumulatively significant. The broad direction of travel within the Proposed Plan and in particular within the suite of Background Reports will help to minimise these effects, for example by indicating a preference for more compact city region with denser settlement patterns, and the town centre first approach.

Water, Coastal and Marine

4.14 Cumulative effects on coastal biodiversity are noted above, and some aspects of SDP2 could impact upon other environmental assets in these areas. Some developments will be in areas with flood risk issues, and so further work

will be required as these projects progress towards delivery to reach sustainable solution. Cumulative effects on the water environment more generally are expected to be positive. Some issues were identified from development activities which will require mitigation at the project level.

4.15 Balancing this, policies on coastal locations, flooding and the water environment would help to minimise any effects, when applied in combination with other development specific approaches.

5. Mitigation and Monitoring

Introduction

5.1 The assessment of the Proposed Plan identifies a number of opportunities for mitigating environmental effects of the policy. In addition, the assessment explores scope for further enhancing already positive effects. This section of the Supplementary Environmental Report brings together the proposed mitigation measures that have emerged from the assessment. Consultee views on these proposals are invited.

5.2 A number of environmental issues are identified in the assessment of the Proposed Plan that should be addressed through appropriate mitigation. These range from issues arising from the broad components of the strategy, to more local issues. In addition, specific mitigation measures are identified for the proposed developments. These are intended to be indicative at this stage, as they will depend on the detailed plans and projects that subsequently emerge in the process. However, they can be used as a starting point or checklist for consideration as the Spatial Development Strategy, proposals and policies progress through the planning process.

Mitigation undertaken since MIR

5.3 Many of the effects arising from the MIR have considered as the Proposed Plan was being finalised:

- in several sections of the MIR, the assessment suggested that there may be opportunities to build in climate change adaptation measures in response to predicted changes in weather patterns. As a result narrative and policies relating to housing, the historic environment, and infrastructure make more reference to resilience;

- where spatial planning identified development locations, more explicit reference to the importance of cultural and architectural heritage, historic townscapes, listed buildings and conservation areas has been made particularly when focusing on town centres;

- within the Proposed Plan green infrastructure development now benefits from broader recognition of all types of open spaces within green networks and ecosystems. In addition, the emphasis within Background Report 11 Green Network Priorities on the existing strategic network and the aim to improve network connectivity is beneficial;

- On flooding, the MIR assessment suggested there would be benefits from further strengthening the role of Strategic Flood Risk Assessments within development planning and decision making. Appendix 3 contains the Strategic Flood Risk Assessment for Clydeplan.

Strategic level mitigation measures

5.4 The assessment of the overall strategy components identifies a number of potential effects on the environment that can be avoided or minimised through strategic mitigation measures. The following schedule sets out these effects, the proposed mitigation and comments on how these measures can be implemented.

Issue	**Mitigation / Monitoring recommendation**
A successful and sustainable place: supporting economic recovery	
Potential impacts on air quality arising from increased density of development, redevelopment of brownfield land and an emphasis on town centres and compact settlements.	Local Development plans should continue to emphasise the importance of ensuring that site allocations are closely linked with public transport networks and access points. This is reflected in the Background Reports.
Potential impacts of housing development on biodiversity, soil, water, flooding, landscape and cultural heritage.	Development plans should aim to identify sites that minimise the potential for environmental effects. This will be explored further in the SEA of local development plans. Mitigation will be required as project proposals progress to the consenting stage.
Potential impacts on climate change emissions arising from further tourism travel.	The Main Issues Report recognises the importance of low carbon transport options for visitors and the opportunities for projects such as scenic corridors to be multimodal.
A low carbon place: supporting a low carbon economy	
Potential for effects on air quality arising from increased biomass for heat.	Continuing monitoring of air quality impacts of biomass. This should particularly focus on areas where there are existing concentrations of air pollution, specifically AQMAs.

Issue	Mitigation / Monitoring recommendation
Potential landscape, visual and community impacts arising from onshore wind deployment.	Further consideration of landscape impacts (cumulative and individual) will be required within local spatial frameworks for wind energy development and their associated SEA, following the SPP framework. Monitoring of development should also continue.
Potential impacts on communities arising from development of waste infrastructure.	These effects remain uncertain at this stage and require fuller consideration and mitigation as project proposals progress to the consenting stage. SDP1 and SPP provide an appropriate framework for achieving this.
A successful and sustainable place: supporting economic recovery	
Potential impacts on air quality arising from increased density of development, redevelopment of brownfield land and an emphasis on town centres and compact settlements.	Local Development plans should continue to emphasise the importance of ensuring that site allocations are closely linked with public transport networks and access points. This is reflected in the Background Reports.
Potential impacts of housing development on biodiversity, soil, water, flooding, landscape and cultural heritage.	Development plans should aim to identify sites that minimise the potential for environmental effects. This will be explored further in the SEA of local development plans. Mitigation will be required as project proposals progress to the consenting stage.
Potential impacts on climate change emissions arising from further tourism travel.	The Proposed Plan recognises the importance of low carbon transport options for visitors and the opportunities for projects such as scenic corridors to be multimodal.
A connected place: supporting sustainable travel	
Potential effects from future improvements to transport infrastructure to support the cities network, economic development, including	These effects remain uncertain at this stage and require fuller consideration. This will be explored further in the SEA of local development plans as well as transport plans. Mitigation will be

Issue	Mitigation / Monitoring recommendation
links to key investment sites and scenic tourism routes.	required as project proposals progress to the consenting stage.
Impacts arising from improved international connections, including on climatic factors, water and the coastal environment.	Consider focusing on improving surface transport access to airports in the proposed Framework, rather than expansion of facilities to facilitate additional passenger numbers.

Local Development Plan Mitigation

SDP2 - General

5.5 Overall, development proposals in the city region have the potential for spatial cumulative effects arising from the combination of developments in city region. Potential mitigation includes:

- appropriate siting, design and construction of developments;
- assessment and mitigation of impacts on designated sites including the Inner Firth of Clyde and Black Cart SPAs;
- continued wider promotion of health benefits such as outdoor access and sustainable transport options;
- integration of development with opportunities for environmental enhancement identified within the Central Scotland Green Network and The GCV Green Network Partnership.

Placemaking

Landscape

5.6 When considering development layout and design, local development plan and project level design frameworks should highlight opportunities for landscape enhancement, this applies particularly to design guidance to assist with improvements to settlement edges.

Network of Strategic Centres

Climate change

5.7 Any additional development in the strategic centres would mitigate potential climate change impacts through master planning solutions. Local development plans should ensure these allocations are connected with public transport interconnections, good walking and cycling connections etc.

Water

5.8 Any appropriate mitigation should be developed as part of master planning brief for new/additional development using SUDS which offers the opportunity for green infrastructure and reinforce the green network.

Cultural Heritage

5.9 Where local development plans identifies development locations, more explicit reference to the importance of cultural and architectural heritage, historic townscapes, listed buildings and conservation areas should be included, particularly when focusing on town centres. Further mitigation includes noting the important and defining character and functionality of town centres. In this way local planning authorities can balance reuse of buildings and new development to reinvigorate town centres with the ongoing need to protect and enhance the existing historic environment;

Strategic Economic Investment Locations (SEILs)

Air

5.10 With regard to air quality issues, mitigation measures should be fully identified at local development plan stage. In order to increase capacity of the local environment to accommodate development at these established locations possible mitigation measures could include the use of planting and the creation of green network assets.

Biodiversity

5.11 There are two SEILs in close proximity to SSSIs/SPA – Gartcosh (Woodend and Bishop Loch, SSSI) and Glasgow Airport (Black Cart, SSSI and SPA). Any potential negative impacts will have to be mitigated through local development plan and/or master planning solutions.

Climatic Factors

5.12 Any potential for increased CO2 emissions resulting from increased traffic as a result of SEIL designation, will be required mitigation measures should be further considered at local development plan level.

Landscape

5.13 The network of SEILs aims to deliver better places for people and economic activity and this includes the quality of the landscape. Opportunities for further positive effects include creating strong landscape frameworks for each location. Local development plans should how this could be delivered.

Water

5.14 Flooding may be an issue in some locations, this is identified in Appendix C: Strategic Flood Risk Assessment and appropriate mitigation should be developed as part of local development plan considerations. This could include use of SUDS adding to green infrastructure and reinforcing the green network.

Strategic Freight Transport Hubs

Biodiversity
The strategic freight transport hub at Glasgow International Airport is in close proximity to Black Cart SPA. Local development plans and/or masterplans should appraise any potential negative impacts and identify mitigation.

Landscape
The potential negative effect of any new freight development will be felt at a local or project level. Local development plans and masterplans should identify mitigation measures with regard to landscape issues. This may include the use of planting and green network to increase the capacity of the local environment to accommodate development at these established locations.

Soils
The specific location of new development within the strategic freight transport hub is unknown. Local development plans and/or masterplans should avoid building on valuable soil resources e.g. prime agricultural land, carbon rich soils.

Water
There are potential flooding issues King George V Dock and Greenock Ocean Terminal. Local development plans should identify measures to protect against or manage flood risk and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.

Low and Zero Carbon Generating Technologies

This section of the Proposed Plan relates mainly to renewable energy development, or low and zero carbon generating technologies, and encouraging waste management facilities to appropriate locations. Assessment was found to be generally positive in environmental terms. Whilst there is benefit in prioritising protection for designated sites, it is worthwhile emphasising the need for careful planning to mitigate impacts on the wider environment, including water and soil resources. This will happen as a matter of course at the local level within development planning and supplementary guidance, and through project level EIA where appropriate;

Green Network

Report 11 Green Network Priorities identifies existing strategic network and aims to improve network connectivity. There will be opportunities to maximise benefits by targeting health improvement measures, active transport, and restoration of previously damaged environments. Mitigation of potential localised issues is expected to be achieved as a matter of course through project level planning and good environmental management. Local development plans should be aware of potential negative effects where this could facilitate the spread of invasive species, and should seek further advice as appropriate.

Strategic Walking and Cycling Network

Biodiversity

There are potential for mixed effects on biodiversity. Improved access could result in disturbance, particularly for sensitive protected sites and species, such as the Inner Clyde SPA. Consideration of this should be given at the local development plan level. Measures could include appropriate design and construction methods alongside visitor management measures.

Climatic Factors

Local development plans should consider the viability of coastal pathways over the long term alongside the need to anticipate or adapt to this in light of climate change impacts.

Cultural Heritage

At local development plan or project level, consideration should be given to whether construction of paths or routes could have visual impacts or negative effects on sites and their settings. Any potential adverse effects on archaeological remains should be avoided or minimised through appropriate design, routing and construction.

Landscape

Localised mitigation may be required in sensitive locations to avoid negative effects from new tracks or associated infrastructure such as signage.

Soil

No significant effects on soil are expected, although route design may need to take into account local characteristics and sensitivities and good practice in the handling of soil should be followed at the project level.

Monitoring

5.7 The assessment has highlighted a number of issues that could form a focus for monitoring the environmental effects. Scottish Government is currently working on producing indicators for national spatial planning. This includes identification of a focused set of key indicators, which relate to the *existing Scotland Performs* information and other ongoing data collection. There is potential to use the findings from this project, together with emerging work on indicators being taken forward by the Strategic Development Planning Authorities to embed the SEA monitoring into a wider monitoring framework.

5.8 The post-adoption SEA Statement will set out a schedule for monitoring, focusing on significant effects once the policies have been finalised. This will be used to inform the monitoring of the SDP2.

6. Next Steps

Programme for finalising SDP2

6.1 Following closure of the consultation period, the responses received will be collated, analysed and reported to Clydeplan Joint Committee and Steering Group. Following its consideration, Schedule 4 responses will be drafted and submitted to Scottish Government.

6.2 The timetable is set out in Clydeplan's Development Plan Scheme 2015/16 and the timeline is as follows:

- Consultation on Proposed Plan: 18 January – 29 February 2016;
- Submission of Proposed Plan to Scottish Ministers May 2016.

More information can be found at: www.clydeplan-sdpa.gov.uk/proposedplan2016

6.3 At the end of the process, following finalisation of the second Strategic Development Plan, a post adoption SEA Statement will be published and advertised. This will set out the assessment findings, views made in response to the consultation on the Environmental Report, and Clydeplan's response to them.

APPENDIX A: ASSESSMENT MATRICES

Appendix A: ASSESSMENT MATRICES

Glasgow and Clyde Valley City Deal
The Infrastructure Fund is underpinned by a robust governance process, a rigorous assurance framework and programme management arrangements designed to deliver the agreed outcomes and aims to deliver key strategic priorities.

Key objective:
The SDP supports the Lead Authorities in the development of the City Deal Programme and related projects.

The following sites have been previously assessed at local development plan level:

M77 Strategic Corridor, East Renfrewshire Council, Local Development Plan Environmental Report, March 2015 (Mallesheugh / Maidenhill Netwon Mearns, Table 3; para. 3.3.27 - 3.4.36)

Canal and North Gateway, Glasgow City Council, City Development Plan Revised Environmental Report (Port Dundas, p. 108). Particular attention would need to be given to the design of any new development given the proximity to the Forth and Clyde Canal. Major efforts would also be required to deliver improved public transport accessibility. An Archaeological Survey may be required. Potentially contaminated land and the potential for flooding would require further investigation.

City Centre Public Realm Programme, Glasgow City Council, City Development Plan Environment Report, DES6 Public Realm and Lighting. Assessment finds positive or neutral effects. The policy aims to ensure that high standards of urban design are met through new development. New development should respect existing local character, townscape and built form while protecting aspects of the natural environment.

Clyde Waterfront, Glasgow City Council, City Development Plan Environment Report, p. 74. Assessment provides a broad assessment of mainly positive effects from regeneration along the Clyde Waterfront.

Metropolitan Glasgow Strategic Drainage Plan (MGSDP), Glasgow City Council, previously assessed in NPF3 Environmental Report. Potential negative effects on cultural heritage should be avoided through appropriate design and construction or installation methods.

Inchgreen, Inverclyde Council, Local Development Plan Environmental Report, p. 127, Policy ECN1: Business and Industrial Areas. Assessment identifies a range of mitigation measures relating to biodiversity and water.

Inverkip, Inverclyde Council, Local Development Plan Environmental Report, p.131, c), Inverkip Power Station. Assessment identifies the need to ensure potential biodiversity impacts are mitigated.

Greenock Ocean Terminal, Inverclyde Council, Local Development Plan Environmental Report, p. 128, (a) Ocean Terminal. Assessment identifies the need to ensure potential water measures are mitigated.

Glasgow Airport Investment Zone, Renfrewshire Council Local Development Plan Environmental Report, p.99, Policy E2. Assessment identifies mitigation in relation to air, biodiversity, water, climatic factors, landscape, population and health and soil.

Cathkin Relief Road, South Lanarkshire Local Transport Strategy (LTS), 2011. The Environmental Report concluded that a number of the LTS policies and actions were predicted to have potential temporary negative effects on the environment as a result of construction activities; however, the majority of these effects are temporary in nature and can be avoided or reduced through mitigation.

A number of operational negative effects (landscape, biodiversity, noise and water quality/flood risk) have been identified as a result of the assessment of the LTS. The majority of these relate to proposed large scale infrastructure developments, such as Cathkin Relief Road. The assessment concluded that provided that the recommended mitigation measures are implemented and additional assessments are undertaken where required, there should be no significant adverse residual effects on the environment

Community Growth Areas (East Kilbride, Newton, Hamilton and Larkhall). South Lanarkshire. The proposal includes improvement to strategic connectivity for CGAs. High level assessment recognises the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets, soil and water. Route selection, project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Greenhills Rd / A726 Dual Carriageway, South Lanarkshire. The proposal includes improvement to strategic connectivity for a SEIL. High level assessment recognises the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets, soil and water. Route selection, project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Stewartfield Way Transport Capacity Enhancements, South Lanarkshire. The proposal includes improvement to strategic connectivity for a SEIL. High level assessment recognises the need to ensure Environmental Impact Assessment identifies

impacts at planning application stage. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets, soil and water. Route selection, project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Exxon Site Development, West Dunbartonshire Local Development Plan Environmental Report March 2014, p.23. Assessment identifies significant effects and some mitigation measures in relation to air, biodiversity, climatic factors, water, landscape and soil.

City Deal Sites: Not fully assessed:

Collegelands: Calton / Barras, Glasgow City Council, City Development Plan Environment Report, High level strategic assessment is mainly positive effects from regeneration in this area, particularly for population and health. New development should respect existing local character, townscape and built form while protecting aspects of the natural environment.

A8/M8 Corridor Access Improvements, North Lanarkshire Local Plan environmental report, p. 36, p.41. Assessment identifies the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. Planning conditions can potentially mitigate identified impacts.

Pan Lanarkshire Orbital Transport Corridor, North Lanarkshire Council, EDI2B Transport Development: Improvement to A73. The proposal includes improvement to strategic connectivity for Ravenscraig, SEIL and Motherwell Strategic Centre. High level assessment recognises the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets and water. Project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Gartcosh / Glenboig CGA, North Lanarkshire Council, Partial assessment includes Cardowan Link Road Study: EDI2B. Proposal to improve strategic connectivity for CGA, Strategic Economic Investment Locations and Strategic Freight Transport Hub. High level assessment recognises the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets, soil and water. Project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Clyde Waterfront and Renfrew Riverside, Renfrewshire Council. High level assessment recognises the need to ensure local development plan environmental report, masterplan or project assessment identifies potential impacts. The significant issues are likely to be air, biodiversity, climatic factors, landscape, material assets, soil and water.

Glasgow Airport Access, Renfrewshire Council. Proposal to improve strategic connectivity to airport, SEIL and Strategic Freight Hub. High level assessment recognises the need to ensure Environmental Impact Assessment identifies impacts at planning application stage. The significant issues are likely to be biodiversity, landscape and water. Route selection and project design and, if necessary, planning conditions can potentially mitigate any identified impacts.

Network of Strategic Centres:
Strategic centres support a diverse range of economic and social roles and functions. The traditional role of the strategic centre is usually characterised by its retail and civic functions. However, the roles and functions of many centres are changing and evolving, as retail market demand and trends in society change. Centres are now multi-dimensional in nature and almost all offer common services and functions. The balance between these multiple roles differs and results in each individual centre possessing a range of different dominant roles.

Key objective:
The SDP, with its focus on minimising carbon and development footprints through sustainability principles, requires a focus on the city-region existing communities and their regeneration and renewal. Fundamental to such an approach are the future of the strategic centres. These are at the heart of how the city-region functions, as the core of communities and which are generally more sustainably accessible by public transport.

The following centres are included in this high level assessment: Glasgow City Centre, Airdrie, Barrhead, Braehead, Clydebank, Coatbridge, Cumbernauld, Dumbarton, Easterhouse, East Kilbride, Greenock, Hamilton, Kirkintilloch, Lanark, Motherwell, Newton Mearns, Paisley, Parkhead, Partick / Byres Road, Pollock, Ravenscraig, Shawlands, Wishaw.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	+	The network of strategic centres is at the heart of the city-region functions and at the core of communities. These locations are generally more sustainably accessible by public transport.
	Improve air quality	0	
	Avoid adverse effects on air quality	+	
Biodiversity	Avoid adverse effects on protected habitats and species	0	There are limited implications for the impacts of biodiversity on the strategic centres. Any potential negative impacts will have to be mitigated through master planning solutions
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	0	
Climatic factors	Avoid increasing greenhouse gas emissions	+	The aspiration for sustainable transport/active travel is seen as key to the success of the network of strategic centres so there is a clear link between the

	Support actions contribute to targets for reducing greenhouse gas emissions	0	locations and sustainable transport options. Any additional measures at the site level will be required to mitigate the potential for increased CO2 emissions resulting from increased traffic. Any additional development in the strategic centres would be mitigated through master planning solutions.
	Support adaptation to climate change, and future proofing of new development	?	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	+	Given the focus of development within the strategic centres as part of the wider place making agenda. This would benefit the historic environment with the promotion of such environments and the re-reuse/refurbishment of existing building for new uses.
	Enhance, where appropriate, the historic environment	+	
	Avoid adverse effects on the historic environment	+	
	Improve the quality of the wider built environment	+	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	+	The network of strategic centres is urban focussed is likely to avoid adverse impact on protected landscapes, wild land or geodiversity. The network of strategic centres is based on design and delivery of better places for communities and regeneration activity. This includes the quality of the landscape and is therefore likely to have an overall positive impact.
	Avoid adverse effects on all landscapes	0	
	Enhance landscape quality	0	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	The strategic centres are likely to positively impact on the material assets
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	+	The Strategic Centres aim to have a direct positive impact on peoples quality of life and to increase social capital, communities, economic and regeneration activity across the city region The Strategic Centres are a key part of the placemaking agenda and as such their delivery will improve peoples' living environment and promote active travel
	Improve the health and living environment of people and communities	++	

	Address inequalities by improve access to employment (SIMD most deprived areas)	+	options The Strategic Centres are likely to impact positively on local employment / volunteer opportunities
Soil	Avoid adverse impacts on soil	+?	There is a potential positive impact on soil as it reinforces both the reduction of vacant and derelict land, regeneration and the placemaking agenda.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultultural land, carbon rich soils	+?	
	Reduce vacant and derelict land	+?	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	0	Any appropriate mitigation should be developed as part of mater planning brief for new/additional development using SUDS which offers the opportunity for green infrastructure and re-in force the green network and promote active travel options. Where built development is permitted, local development plans should identify measures to protect against or manage flood risk and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.
	Avoid and reduce flood risk	0	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	0	

Key Findings:

The aim of the Strategic Centres is to support a diverse range of economic and social roles and functions whilst minimising carbon and development footprints through sustainability principles

Targeting strategic activity in these locations is likely to result in a positive impact with the potential to deliver multiple benefits and reduce negative impact.

Overall, therefore, the Network of Strategic Centres is unlikely to have any negative impacts and many positive impacts where mitigation measures are applied in a positive manner at the appropriate level.

For further details on recommended mitigation, refer to Section 5.

Strategic Economic Investment Locations

Strategic Economic Investment Locations Overall:

The SEILs have been selected to support the Scottish Government's key sectors, Scottish Enterprise locational priorities and the growth in rebalancing economic sectors. As strategic priorities, they best reflect the need for sustainable locations to address long-term drivers of change.

Key objective:

In terms of supporting a rebalanced low carbon economy for the city-region with its focus on key existing and new economic sectors, the SEILs are a priority set of locations based upon their ability to offer specific roles and functions within the new rebalanced economy.

The following SEILs are included in this high level assessment: Glasgow City Centre, Creative Clyde Enterprise Area, International Financial Service District, International Technology and Renewable energy Zone, Biocity Scotland Proposed Enterprise Area, Queen Elizabeth University Hospital Glasgow, Glasgow Airport Investment Area, Bishopton, Clyde Gateway, Clydebank Riverside, Eurocentral, Gartcosh, Hamilton International Technology Park, Hillington / Renfrew North, Inverclyde Waterfront, Lomondgate, Peel Park North, Poniel, Ravenscraig, Robroyston, Scottish Enterprise Technology Park.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	0	The SEILS network focuses development within existing strategic locations. The effect of any individual SEIL allocation will be felt at a local or project level. With regard to air quality issues in the following locations, mitigation measures should be fully identified at local development plan stage. See Appendix B: Mapped Assessment: SEILs. Possible mitigation measure could include the use of planting and green network to increase capacity of the local environment to accommodate development at these established locations.
	Improve air quality	0	
	Avoid adverse effects on air quality	0	

Biodiversity	Avoid adverse effects on protected habitats and species	-?	There are two SEILs in close proximity to SSSIs/SPA – Gartcosh (Woodend and Bishop Loch, SSSI) and Glasgow Airport (Black Cart, SSSI and SPA). Any potential negative impacts will have to be mitigated through local development plan and/or master planning solutions.
	Enhance biodiversity	-?	
	Avoid adverse effects on all habitats and species	-?	
Climatic factors	Avoid increasing greenhouse gas emissions	+	The aspiration for sustainable transport is seen as key to the success of the SEILs agenda so there is a clear link between the locations and sustainable transport options. Any additional measures at the site level will be required to mitigate the potential for increased CO2 emissions resulting from increased traffic.
	Support actions to reduce greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	+?	There is a potential positive impact on cultural heritage as part of the SEILs agenda as it does reinforce both the place making agenda and the re-use of the built environment.
	Enhance, where appropriate, the historic environment	+	
	Avoid adverse effects on the historic environment	+?	
	Improve the quality of the wider built environment	+	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	+?	The SEILs network is largely urban focussed and is unlikely to impact positively or negatively on protected landscapes, wild land or geodiversity. The network of SEILs aims to deliver better places for people and economic activity and this includes the quality of the landscape. Opportunities for further positive effects include creating strong landscape frameworks for each location.
	Avoid adverse effects on all landscapes	+?	
	Enhance landscape quality	+?	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	+	The SEILs are likely to positively impact on the material assets
	Enhance material assets	+	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	+?	The network of SEILs is unlikely to have an direct impact on quality of life. The network of SEILs is a key part of the placemaking agenda. Opportunities

	Improve the health and living environment of people and communities	+?	for further positive effects include creating strong landscape frameworks within the green network for each location. The SEILs are likely to impact positively on employment.
	Address inequalities by improve access to employment (SIMD most deprived areas)	+	
Soil	Avoid adverse impacts on soil	+?	There is a potential positive impact on soil as the network of SEILs reinforces the reduction of vacant and derelict land and the placemaking principle.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultultural land, carbon rich soils	+?	
	Reduce vacant and derelict land	++	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+	Flooding may be an issue in some locations (refer to Appendix C: SFRA) and appropriate mitigation should be developed as part of local development plan considerations. This could include use of SUDS adding to green infrastructure and reinforcing the green network. Where built development is permitted, local development plans should identify measures to protect against or manage flood risk and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.
	Avoid and reduce flood risk	?	
	Avoid adverse impacts on sensitive coastal areas and marine environment	?	
	Improve water environment	?	
Key Findings: Delivery of the network of SEILs aims is to support a rebalanced low carbon economy for the city-region focussing on key existing and new economic sectors. The aim is to increase employment opportunities for the population across the city region. Targeting strategic economic activity in these areas encourages positive effects and provides opportunity for multiple benefits, reducing potential negative impacts. Overall, the network of SEILs is likely to have positive effects on population and health and climatic factors through the facilitation of public transport use, reduced travel and digital connections. Positive effects on soil and landscape can be increased through project level implementation of high quality landscape planting.			

Strategic Freight Transport Hubs

Freight Hubs Overall: Strategic Freight Hubs
These locations comprise the strategic response to long-term sustainable freight movements into and within the city region.

Key objective:
The movement of raw materials, both imports and exports is essential to the long-term city region economy. The SDP requires that this be achieved as sustainably as possible. Modal shift between road, rail and marine shipping is a key component of this so there is therefore an imperative to invest in freight hubs as key locations to enable modal shift to occur.

City Deal specific projects are assessed elsewhere in this document.

The following centres are included in this high level assessment: Burnbrae, Deanside, Eurocentral / Mossend, Gartsherrie, Glasgow International Airport, King George V Dock and Greenock Ocean Terminal.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	+	The AQMAs are mapped in Appendix B
	Improve air quality	+	The shift from road to more sustainable freight along with connecting CO2 heavy freight options i.e. air to more sustainable options should reduce greenhouse gas emissions.
	Avoid adverse effects on air quality	+	
Biodiversity	Avoid adverse effects on protected habitats and species	0	Overall all the locations should not have any significant effect on biodiversity.
	Enhance biodiversity	+	There are two freight hubs that have a close proximity to SPA (Black Cart).

	Avoid adverse effects on all habitats and species	+	Glasgow International Airport. Local development plans / masterplans should appraise any potential negative impacts and identify mitigation.
Climatic factors	Avoid increasing greenhouse gas emissions	+	The shift from road to more sustainable freight along with connecting CO2 heavy freight options i.e. air to more sustainable options should reduce greenhouse gas emissions.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	Positive benefits could arise from the re-use of vacant and derelict land and the use of historic buildings as part of the wider placemaking agenda. Overall there is little interaction between the strategic freight transport hubs and cultural heritage.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	0	
	Improve the quality of the wider built environment	0	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	-+	The potential negative effect of any new freight development will be felt at a local or project level and mitigation measures should be fully identified with regard to landscape issues. This may include the use of planting and green network to increase the capacity of the local environment to accommodate development at these established locations.
	Avoid adverse effects on all landscapes	-+	
	Enhance landscape quality	-+	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	The strategic freight transport hubs are likely to positively impact on the material assets.
	Enhance material assets	++	

Population and Health	Avoid adverse effects on health, health inequalities and quality of life	0	The strategic freight transport hubs will not have a significant direct impact on quality of life.
	Improve the health and living environment of people and communities	0	
	Address inequalities by improve access to employment (SIMD most deprived areas)	+	The freight hubs are likely to impact positively on employment
Soil	Avoid adverse impacts on soil	0	The freight hubs will not have a significant impact on soil.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultultural land, carbon rich soils	?	The specific location of new development within the freight hubs is unknown. Local development plans and/or masterplans should avoid building on valuable soil resources e.g. prime agricultural land, carbon rich soils. Use of VDL will have a positive impact on its reduction.
	Reduce vacant and derelict land	++	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	?	The potential negative effect of any new freight development will be felt at a local or project level and mitigation measures should be fully identified with regard to water/flooding issues. There are potential flooding issues King George V Dock and Greenock Ocean Terminal. Local development plans should identify measures to protect against or manage flood risk and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.
	Avoid and reduce flood risk	?	
	Avoid adverse impacts on sensitive coastal areas and marine environment	?	
	Improve water environment	?	

Key Findings:

Delivery of the freight hubs is planned and designed to enhance the movement of freight and help reduce CO2 emissions. There are potential flooding issues King George V Dock and Greenock Ocean Terminal. Local development plans should identify measures to protect against or manage flood risk and any loss of flood storage capacity mitigated to achieve a neutral or better outcome.

Overall, therefore, the strategic freight transport hubs could to have an impact on flooding. Further consideration of potential mitigation is best considered at the local plan level.

Enabling New Homes

Policy 7: Joint Action Towards the Delivery of New Homes; Policy 8: Housing Land Requirement; and Policy 9: Housing – Affordable and Specialist Provision. These policies are general policy statements of support for joint action between housing delivery stakeholders to work collaboratively, for local authorities to provide a supply of land for housing at LDP level and to take steps to develop affordable and specialist provision.

Policy 10: Delivering Heat and Electricity
Delivery of a regional component of wind energy spatial framework for Glasgow and the Clyde Valley.

Key objective: To guide wind turbine development to strategic locations based on guidance in SPP and to outline a strategic approach to strategic landscape capacity issues. Background Report 9: Wind Energy Development in GCV.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	-	The introduction of more biomass planting and greater deployment of biomass as a fuel source has the potential to negatively impact air quality particularly where pollution is already clustered.
	Improve air quality	-?	
	Avoid adverse effects on air quality	-?	
Biodiversity	Avoid adverse effects on protected habitats and species	?	With careful siting and design any potential for negative impacts can be minimised or mitigated.
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	?	
Climatic factors	Avoid increasing greenhouse gas emissions	+	Promoting more sustainable energy and heat combined with careful siting and design will reduce greenhouse gas emissions and enable increased resilience to climate change impacts.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	++	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	The interaction between the historic environment and the low carbon energy can be minimised and where it does happen it is unlikely have a significant positive or negative impact. The introduction of the low carbon energy into urban areas is likely to enhance the quality of the existing built environment and future development enabling a more sustainable medium to long term usage.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	0	

	Improve the quality of the wider built environment	+	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	?	There is potential for negative impacts on the landscape however, mitigation is available through the use of region-wide landscape capacity studies and siting and design guidance these impacts can be avoided and/or mitigated.
	Avoid adverse effects on all landscapes	+?	
	Enhance landscape quality	-?	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	Renewable energy and associated infrastructure is likely to impact positively on material assets.
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	+	Community energy projects are likely to have positive effects on local communities, providing a sustainable, affordable and efficient form of heat and power. This ultimately will have beneficial effects on health and, where linked to affordable housing provision, to inequalities.
	Improve the health and living environment of people and communities	++	
	Address inequalities by improve access to employment (SIMD most deprived areas)	+?	
Soil	Avoid adverse impacts on soil	?	Low carbon energy could impact on soils but is dependent on the technology, siting and location. This requires consideration at development planning and application stage.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	+	
	Reduce vacant and derelict land	+	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	0	Proposals for renewable heat from waste water could impact on water but will depend on issues that would only be considered within project planning and application stage. Further it is likely that adequate mitigation could be implemented. There is less correlation with coastal and marine environments and therefore there is unlikely to be a positive or negative impact.
	Avoid and reduce flood risk	0	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	0	

Key Findings: The proposals relating to low carbon heat and electricity and community / local ownership are expected to be generally positive, particularly in relation to climatic factors. Some technologies could have a range of potential environmental effects depending on how they are planned for and consented at project stage. These effects are not considered to be significant but will require further consideration within development planning and management

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Policy 11: Planning for Zero Waste

Delivery of the regional component of the Scottish Government's Zero Waste Plan..

Key objective: To facilitate the transition to zero waste by guiding development proposals for waste management facilities to certain location types such as land designated for industrial, employment or storage and distribution uses; degraded, contaminated or derelict land etc.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	0	No significant effects on air quality are expected from this policy. Issues with odour could arise in the vicinity of some waste facilities, requiring appropriate mitigation.
	Improve air quality	0	
	Avoid adverse effects on air quality	-?	
Biodiversity	Avoid adverse effects on protected habitats and species	0	No significant effects are expected from sustainable waste management.
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	0	
Climatic factors	Avoid increasing greenhouse gas emissions	-?	These facilities have the potential for local level individual and cumulative effects on communities (e.g. dust, odour, noise, concern about the presence of facilities and their impacts). These effects will require mitigation at the consenting or development plan level.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	No significant effects on cultural heritage are expected from this policy. Whilst waste management could result in changes to the built environment, project level assessment and mitigation would ensure any significant effects on townscapes and the historic built fabric are avoided.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	0	

	Improve the quality of the wider built environment	+?	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	No significant effects on landscape are expected from this policy.
	Avoid adverse effects on all landscapes	0	
	Enhance landscape quality	0	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	0	The policy supports a modernised network of waste services, reducing resource use and making best use of existing assets.
	Enhance material assets	0	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	-?	These facilities have the potential for local level individual and cumulative effects on communities (e.g. dust, odour, noise, concern about the presence of facilities and their impacts). These effects will require mitigation at the consenting or development plan level.
	Improve the health and living environment of people and communities	-?	
	Address inequalities by improve access to employment (SIMD most deprived areas)	0	
Soil	Avoid adverse impacts on soil	0	No significant effects on soil are expected from the preferred approach. There are likely to be benefits from reducing waste going to landfill sites, through diversification of facilities. Effects of alternative facilities may require mitigation at the project level.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	0	
	Reduce vacant and derelict land	+?	

Policy 12: Green Network and Green Infrastructure
Delivery of a regional component of the Central Scotland Green Network, a National Development in NPF3.

Diagram 7:Green Network Strategic Delivery Areas

Key objective: To champion and facilitate the delivery of a high quality, multi-functional Green Network which provides social, health, environmental and economic benefit to the city region.

GN SDAS: Upper Greenock, East Greenock, Port Glasgow, Dumbarton, Bowling, Clydebank, Erskine, Johnstone / Black Cart Corridor, Renfrew, Yoker / Whitecrook, Glasgow West End, Govan / Ibrox, Toryglen, Clyde Gateway, Gartloch / Gartcosh, Ravenscraig.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	+	The introduction of more vegetation in urban areas through the delivery of Green Infrastructure has the potential to improve air quality through the removal of PM10 and the absorption of NO2
	Improve air quality	+	
	Avoid adverse effects on air quality	+	
Biodiversity	Avoid adverse effects on protected habitats and species	++	A key component of the Green Network is the reversal of habitat fragmentation. Targeted habitat creation using the Integrated Habitat Network model to inform interventions will enhance biodiversity and ecological connectivity
	Enhance biodiversity	++	
	Avoid adverse effects on all habitats and species	++	
Climatic factors	Avoid increasing greenhouse gas emissions	+	The protection and expansion of the Green Network and the targeting of Green Infrastructure in existing urban areas and in new development will provide adaptive capacity for the city region. Promoting more sustainable modes of travel and increasing habitat which can capture and store carbon will reduce greenhouse gas emissions
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	++	

Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	The interaction between the historic environment and the Green Network is likely to be limited and where it does happen it is unlikely have a significant positive or negative impact. The introduction of the Green Network and Green Infrastructure into urban areas is likely to enhance the quality of the existing built environment and future development.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	0	
	Improve the quality of the wider built environment	++	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	The Green Network is largely urban focussed and is unlikely to impact positively or negatively on protected landscapes, wild land or geodiversity. The premise on which the Green Network is based on the design and deliver of better places for people and wildlife which includes the quality of the landscape. It is likely therefore to have a positive impact.
	Avoid adverse effects on all landscapes	++	
	Enhance landscape quality	++	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	0	The Green Network is unlikely to impact positively or negatively on material assets
	Enhance material assets	0	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	++	The Green Network will provide free, local opportunities for people to engage in healthier lifestyles. The Green Network is key part of the placemaking agenda and as such its delivery will improve peoples' quality of life The Green Network is unlikely to impact positively or negatively on employment.
	Improve the health and living environment of people and communities	++	
	Address inequalities by improve access to employment (SIMD most deprived areas)	0	
Soil	Avoid adverse impacts on soil	0	The Green Network is generally unlikely to impact positively or negatively on soil. The protection and enhancement of valuable carbon rich habitats such as peatland will have a positive impact. Use of VDL is a stated priority in NPF3 for the CSGN and therefore its delivery will have a positive impact on its reduction.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	+	
	Reduce vacant and derelict land	+	

Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+	There is an overlap between delivery of the Green Network and River Basin Management Planning and Natural Flood Management. Both are considered in planning for the Green Network and therefore there is likely to be a positive impact on ecological status of water bodies (particularly their associated terrestrial habitats) and flood risk. There much less correlation with coastal and marine environments and therefore there is unlikely to be a positive or negative impact.
	Avoid and reduce flood risk	+	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	0	
Key Findings: Delivery of the Green Network is planned and designed to enhance or replicate degraded natural systems and to improve the quality of urban areas for people and the movement of species. Through use of the Opportunities Mapping approach to target of effort and resources in areas where there is likely to be the greatest positive impact gives the potential to deliver multiple benefits and reduce negative impact. Overall, therefore, the Green Network is unlikely to have any negative impacts and many positive impacts.			

Policy 13: Forestry and Woodland
Delivery of a regional component of the Scottish Forestry Strategy (FWS).

Diagram 8: Indicative Potential for Woodland Expansion

Key objective: To address tensions between the multiple roles of forestry and woodland, promoting appropriate woodland creation and ensure an eco-systems approach is taken when considering competing land uses.

Given the wide range of potentially sensitive issues in relation to forestry and woodland planting arising from the Indicative Potential for Woodland Expansion, the Clydeplan FWS has its own SEA and HRA.

Key Findings: Delivery of the FWS is planned and designed to protect and enhance existing resources and to improve the quality of urban woodland for people and the movement of species.

Through use of the FWS Spatial Framework approach to target of effort and resources in areas where there is likely to be the greatest positive impact gives the potential to deliver multiple benefits and reduce negative impact.

Overall, therefore, the FWS is unlikely to have any negative impacts and many positive impacts.

Policy 14: Green Belt
LDPs required to designate inner and outer boundaries of green belt.

Key objective: To direct development to the most appropriate locations, protect and enhance quality, character, landscape setting and identify of settlements.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	0?	The green belt can cause longer travel to work distances, however, appropriate uses are generally acceptable in the green belt and is expected to provide adequate mitigation. Additionally, the protection of green belt from inappropriate uses has the potential to improve air quality
	Improve air quality	+?	
	Avoid adverse effects on air quality	+	
Biodiversity	Avoid adverse effects on protected habitats and species	+	Green network is an important component of green belt policy Targeted habitat creation using the Integrated Habitat Network model to inform interventions will enhance biodiversity and ecological connectivity.
	Enhance biodiversity	+	
	Avoid adverse effects on all habitats and species	+	
Climatic factors	Avoid increasing greenhouse gas emissions	+	The protection of green belt from inappropriate uses, alongside permitted appropriate uses, can provide adaptive capacity for the city region.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	?	The interaction between the historic environment and forestry is likely to be limited
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	0	

	Improve the quality of the wider built environment	++	The introduction of urban woodland is likely to enhance the quality of the existing built environment and future development.
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	Green belt designation can have a positive effects and encourage protect and enhance landscape setting and quality.
	Avoid adverse effects on all landscapes	++	
	Enhance landscape quality	+?	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	+	The use of greenbelt can impact positively on material assets as it safeguards sustainable access to and opportunities for countryside recreation. In addition, maintaining the natural role of the environment in terms of floodplain capacity, carbon sequestration or biodiversity can have positive effects.
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	++	The use of greenbelt can impact positively on population and health as it safeguards sustainable access to and opportunities for countryside recreation. It can also provide free, local opportunities for people to engage in healthier lifestyles. Green belt can play a key part of the placemaking agenda and as such its delivery will improve peoples' quality of life. Forestry and Woodland creation is likely to have a positive effect on employment.
	Improve the health and living environment of people and communities	++	
	Address inequalities by improve access to employment (SIMD most deprived areas)	0	
Soil	Avoid adverse impacts on soil	+	Green belt designation can impact positively on soil. The protection and enhancement of valuable carbon rich habitats such as peatland will have a positive impact. Use of VDL is a stated priority in NPF3 for the CSGN and therefore, green belt designation can have a positive impact on its reduction.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	?	
	Reduce vacant and derelict land	+	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	?	There is potential for an overlap between green belt designation, the Green Network and River Basin Management Planning and Natural Flood Management. There is likely to be a positive impact on ecological status of water bodies (particularly their associated terrestrial habitats) and flood risk. There much less correlation with coastal and marine environments and therefore there is unlikely to be a positive or negative impact.
	Avoid and reduce flood risk	+	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	

	Improve water environment	0	
Key Findings: Designation of green belt is planned and designed to protect and enhance existing resources and to improve the quality of life for people and the movement of species. Overall, therefore, green belt designation is unlikely to have any negative impacts and many positive impacts.			

Policy 15: Natural Resources Planning
Ensures an adequate and steady supply of minerals and maintain a land bank for construction aggregates equivalent to 10 years.

Key objective: To address tensions between the responsible extraction of resources and protecting the environment and local communities.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	0	It is unlikely that mineral extraction would coincide with existing AQMAs.
	Improve air quality	--	Potential for adverse effects on air quality arising from minerals extraction requires mitigation at planning consent stage, Further mitigation is offered via the regulatory process required for mineral extraction.
	Avoid adverse effects on air quality	--	
Biodiversity	Avoid adverse effects on protected habitats and species	-+	This policy could lead to higher levels of extraction and, in turn, could impact on biodiversity. The policy notes the importance of managing impacts on environment and mitigation would be available at project level.
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	-?	
Climatic factors	Avoid increasing greenhouse gas emissions	-+	This policy could have mixed effects on climate change objectives. Extraction of materials aid transition to a low carbon economy, including renewable energy generation. However, the extraction process and related activities including transportation of products and their end use can generate emissions.
	Support actions contribute to targets for reducing greenhouse gas emissions	-+	
	Support adaptation to climate change, and future proofing of new development	?	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	+-	Minerals extraction can adversely impact on cultural heritage, including the setting of the historic built environment or cause damage to archaeological remains. Effects will require mitigation at the project level and commitments to restorations provide longer term benefits for the historic environment.
	Enhance, where appropriate, the historic environment	+?	
	Avoid adverse effects on the historic environment	-?	
	Improve the quality of the wider built environment	-+	

Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0?	Certain landscape designations will preclude mineral extraction activity. There are likely significant negative impacts on landscape in the short to medium term. Commitments to restorations provide longer term benefit. This can include restoration conditions with any planning consents should mitigate any short-medium term negative effects.
	Avoid adverse effects on all landscapes	--	
	Enhance landscape quality	-	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	0	This policy encourage best use of material assets overall and protection of the resources is a key aim. Regulations are in place to manage wastes arising from this process, including the importance of recycling and minimising waste.
	Enhance material assets	+	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	--	Minerals extraction can result in adverse effects on people, health and living environments. Overall the policy could lead to higher levels of minerals extraction, but it also emphasises the need to protect communities. Effects are not expected to be significant as the policy states that mitigation will be required to address any issues.
	Improve the health and living environment of people and communities	-	
	Address inequalities by improve access to employment (SIMD most deprived areas)	0	
Soil	Avoid adverse impacts on soil	-	Minerals extraction has the potential to impact on soil in terms of direct loss, pollution via the water environment and impacts on stability. These effects will require mitigation at the project stage. It is not expected that prime quality land would be particularly affected by extraction. Protection of peatland is noted, and is extended to include peatland with restoration potential, thereby providing benefits.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	-?	
	Reduce vacant and derelict land	0	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	-+	Minerals extraction can impact on the water environment, including groundwater and surface water bodies. Mitigation will be required through the project consenting process.
	Avoid and reduce flood risk	0	

	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	?	

Policy 16: Improving the Water Quality Environment and Managing Flood Risk and Drainage
Ensures protection and enhancement the water environment including support of MGSDP.

Key objective: To adopt a precautionary approach to reducing flood risk; address tensions between the responsible extraction of resources and protecting the environment and local communities.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	0	No significant effects on air quality are expected.
	Improve air quality	0	
	Avoid adverse effects on air quality	0	
Biodiversity	Avoid adverse effects on protected habitats and species	0	No significant effects are expected from sustainable water management. Improvements to water quality will generally result in secondary positive effects on biodiversity, although changes will require management at the site level.
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	0	
Climatic factors	Avoid increasing greenhouse gas emissions	+	This policy could have mixed effects on climate change objectives. Extraction of materials aid transition to a low carbon economy, including renewable energy generation. However, the extraction process and related activities including transportation of products and their end use can generate emissions.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	No significant effects on cultural heritage are expected.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	+-	

	Improve the quality of the wider built environment	+-	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	No significant effects on landscape are expected.
	Avoid adverse effects on all landscapes	0	
	Enhance landscape quality	0	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	+	This policy supports a modernised network of water resources and making best use of existing resources.
	Enhance material assets	+	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	?	This policy would result in improved infrastructure, supporting regeneration and provision of more robust services in the long term.
	Improve the health and living environment of people and communities	?	
	Address inequalities by improve access to employment (SIMD most deprived areas)	0	
Soil	Avoid adverse impacts on soil	0	No significant effects on soils are expected.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	0	
	Reduce vacant and derelict land	0	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+	Generally positive effects on the water environment are expected, in particular from support for sustainable water management. Improved infrastructure could reduce the risk of pollution from discharges or leakage into the water environment. More resilient infrastructure will help to reduc**e** flood risk from surface water run-off.
	Avoid and reduce flood risk	+	
	Avoid adverse impacts on sensitive coastal areas and marine environment	+	
	Improve water environment	+	

Policy 17: Promoting Sustainable Transport
Ensures collaborative working to ensure delivery of planned and programmed investment in the city region's transport network.

Key objective: prioritise work to identify future land-use and transport integration solutions.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	+-	Generally positive impacts on air quality are expected from targeted interventions Aimed at reducing congestion. However, any proposals for further road capacity expansion could ultimate lead to negative impacts on air quality, suggesting that there would be particular benefit in focusing on public transport provision in the first instance.
	Improve air quality	+-	
	Avoid adverse effects on air quality	+	
Biodiversity	Avoid adverse effects on protected habitats and species	0	No significant or direct effects are expected from this policy. Localised impacts could arise from specific transport projects, including habitat fragmentation, but it is expected these would be addressed at route selection or project level through further assessment and consenting.
	Enhance biodiversity	0	
	Avoid adverse effects on all habitats and species	?	
Climatic factors	Avoid increasing greenhouse gas emissions	+	This policy is supportive of climate change objectives, as it seeks to reduce congestion and target interventions in areas where there is most significant need. This could also increase the overall volume of traffic as it makes road transport more viable. Interventions could also help to build long term resilience of the transport network to climate change impacts.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	?	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	0	No significant or direct effects are expected from this part of the emerging strategy. Localised impacts could arise from specific transport projects, but it is expected that these would be addressed at the route or project level through further assessment and consenting.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	+-	
	Improve the quality of the wider built environment	0	

Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	No significant or direct effects are expected from this policy. Localised impacts could arise from specific transport projects, but it is expected that these would be addressed at the route or project level through further assessment and consenting.
	Avoid adverse effects on all landscapes	?	
	Enhance landscape quality	0	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	+	Generally positive effects are expected from an emphasis on making best use of existing infrastructure and prioritising investment in parts of the infrastructure network where pressure is greatest.
	Enhance material assets	+	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	?	This policy prioritises investment in areas where people already live. Generally positive impacts are expected. Direct negative impacts would be largely confined to construction and therefore temporary and these would be addressed at the route selection of project level through further assessment and consenting.
	Improve the health and living environment of people and communities	?	
Soil	Avoid adverse impacts on soil	+-	No significant or direct effects are expected from this policy. Localised impacts could arise from specific transport projects, but these would be addressed at the route selection or project level through further assessment and consenting.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	0	
	Reduce vacant and derelict land	0	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+-	No significant or direct effects are expected from this policy. Localised impacts could arise from specific transport projects, but it is expected that these would be addressed at the route selection or project level through further assessment and consenting.
	Avoid and reduce flood risk	0	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	0	

Policy 18: Strategic Walking and Cycling Network
Identifies an indicative strategic walking and cycling network with the city region and sets out policy objectives.

Key objectives: prioritise investment in a walking and cycling network; encourage local development plans to identify and safeguard existing walking and cycling networks; and promote opportunities for the enhancement of this network.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	++	Generally positive (secondary) effects on air quality are expected, as a result of reduced pollution from transport. This could be particularly beneficial in areas where pollution is concentrated (Local AQMAs).
	Improve air quality	+	
	Avoid adverse effects on air quality	++	
Biodiversity	Avoid adverse effects on protected habitats and species	+-	Potential for mixed effects on biodiversity. Improved access could result in disturbance, particularly for sensitive protected sites and species. This will require appropriate design and visitor management measures and also facilitate movement of invasive species, requiring appropriate management at site level. Wider benefits, including biodiversity enhancement and improved understanding of natural heritage are also expected.
	Enhance biodiversity	+	
	Avoid adverse effects on all habitats and species	+?	

Climatic factors	Avoid increasing greenhouse gas emissions	++	Positive effects on climatic factors are expected, particularly where use of routes is functional and replaces other, more polluting forms of transport. The viability of coastal pathways over the long term, and the need to anticipate or adapt to this, should be considered in light of climate change impacts.
	Support actions contribute to targets for reducing greenhouse gas emissions	++	
	Support adaptation to climate change, and future proofing of new development	++	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	?	The development has a role to play in raising awareness and understanding of the enjoyment of the cultural heritage. At the project level, consideration should be given to whether construction of paths or routes could have visual impacts or negative effects on sites and their settings. Any potential adverse effects on known and unknown archaeological remains should be avoided or minimised through appropriate design, routing and construction.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	?	
	Improve the quality of the wider built environment	+	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	+	The development has a role to play in raising awareness and enjoyment of landscapes. No adverse effects are expected at a landscape scale although localised mitigation may be required in sensitive locations to avoid negative effects from new tracks or associated infrastructure such as signage.
	Avoid adverse effects on all landscapes	+	
	Enhance landscape quality	+	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	Connecting walking and cycling networks to form a complete CSGN-wide or Clydeplan network.
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	++	Positive effects on population and health are expected from increased opportunities for active travel and physical activity. This will be particularly beneficial if routes are used by local communities on an everyday basis.
	Improve the health and living environment of people and communities	++	

	Address inequalities by improve access to employment (SIMD most deprived areas)	+?	
Soil	Avoid adverse impacts on soil	+	No significant effects on soil are expected, although route design may need to take into account local characteristics and sensitivities and good practice in the handling of soil should be followed at the project level.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	+	
	Reduce vacant and derelict land	+	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+	No significant effects on water are expected, although route design may need to take into account local characteristics and sensitivities.
	Avoid and reduce flood risk	+	
	Avoid adverse impacts on sensitive coastal areas and marine environment	+	

Policy 19: Glasgow Airport and Sustainable Transport Access
Support joint working to identify a sustainable transport solution for Glasgow Airport.

Key objectives: to ensure early commitment to resolve capacity problems on the M8 adjacent to the airport in recognition that a sustainable transport solution will not be implemented in the short term.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	?	Mixed effects on air quality are expected, with improved public transport reducing air pollution from traffic, whilst an overall increase in travel to the airport and air travel. There are three AQMAs within Glasgow City, which have been declared for NO_2 (with one also designated for particulate matter), but they are some distance from the airport and therefore unlikely to be directly affected
	Improve air quality	+-	
	Avoid adverse effects on air quality	-	
Biodiversity	Avoid adverse effects on protected habitats and species	-	The development has potential for loss of habitats, including greenfield land from proposed developments, and short term disturbance during construction. Black Cart SPA/SSSI, which is designated for Whooper Swans, is located close to the airport, and ongoing consideration of bird movements, risk of bird strike and habitat management will be required. Further sites include a Local Nature Reserve, Paisley Moss, adjacent to the south western end of the main runway and owned by the airport, and Walkinshaw Brickworks, a Site of Importance for Conservation.
	Enhance biodiversity	-	
	Avoid adverse effects on all habitats and species	?	
Climatic factors	Avoid increasing greenhouse gas emissions	+-	Effects on climatic factors will be mixed as improved access may contribute to increased flight activity. Improved public transport links could provide benefits in terms of reducing greenhouse gas emissions, but increasing travel to the airport and air travel will increase emissions over the long term.
	Support actions contribute to targets for reducing greenhouse gas emissions	+-	

	Support adaptation to climate change, and future proofing of new development	+-	
Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	?	There is potential loss or damage to cultural heritage resources, and impact on setting of cultural heritage resources including listed buildings and scheduled monuments. Scheduled Monuments located within a five kilometre radius of the airport are not expected to be directly affected by further development in this location.
	Enhance, where appropriate, the historic environment	0	
	Avoid adverse effects on the historic environment	?	
	Improve the quality of the wider built environment	+	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	0	No significant or direct effects are expected from this policy. Localised impacts could arise from specific proposals, but it is expected that these would be addressed at the route selection or project level through further assessment and consenting.
	Avoid adverse effects on all landscapes	0	
	Enhance landscape quality	0	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	Generally positive effects are expected from an emphasis on making best use of existing infrastructure and prioritising investment in parts of the infrastructure network where pressure is greatest. The development will enhance transport infrastructure, thereby benefiting material assets.
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	+?	Transport improvements will have a positive effect on population by increasing accessibility. However, air pollution and noise disturbance may increase and this could impact on human health in the long term. Short term effects for communities may also arise during construction.
	Improve the health and living environment of people and communities	?	
	Address inequalities by improve access to employment (SIMD most deprived areas	0	
Soil	Avoid adverse impacts on soil	?	Some effects on soil are expected, although route design may need to take into

	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	-?	account local characteristics and sensitivities and good practice in the handling of soil should be followed at the project level. Access improvements could result in soil sealing with permanent negative effects on soil, and loss of agricultural land.
	Reduce vacant and derelict land	+	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	+	There is potential for short term impacts on water quality from construction activities and long term impacts from operational activities. Glasgow Airport discharges surface water run-off into the adjacent Black and White Cart Waters with potential flood risk.
	Avoid and reduce flood risk	+	
	Avoid adverse impacts on sensitive coastal areas and marine environment	+	
	Improve water environment	+	

Policy 20: High Speed Rail

Support joint working to secure and safeguard related development land, options for sustainable transport connections and the route and development land options located within local authorities.

	Objectives	Effect	Comments / Supporting Evidence
Air	Avoid adverse effects of air quality where air quality is a known issue through AQMA	?	The location of the stations and lines is unknown and therefore it is not possible to quantify impacts on AQMA. If an electrified service replaces diesel, emissions in the immediate vicinity of the rail line and stations would reduce.
	Improve air quality	+?	
	Avoid adverse effects on air quality	+?	
Biodiversity	Avoid adverse effects on protected habitats and species	-?	Potential impacts on biodiversity from new linear infrastructure. This could include direct impacts from land take to accommodate new or improved rail, such as habitat loss or damage, and disturbance during both construction and operation
	Enhance biodiversity	-?	
	Avoid adverse effects on all habitats and species	?	
Climatic factors	Avoid increasing greenhouse gas emissions	+?	Reduced greenhouse gas emissions can be expected where rail use replaces other more polluting modes of transport. Emissions from operation of electric trains will depend on the generation source, and the construction of the rail line may raise embedded carbon issues. Overall it is anticipated that the HSR link would reduce greenhouse gas emissions, but further detailed study would be required to confirm the likely balance.
	Support actions contribute to targets for reducing greenhouse gas emissions	+	
	Support adaptation to climate change, and future proofing of new development	+?	

Cultural Heritage	Avoid adverse impacts on the protected historic environment and its setting.	?	There is potential for permanent negative effects on cultural heritage where new track is constructed, including loss of known and unknown archaeological resources, impacts on historic buildings where established railway infrastructure is modified, and effects on the setting of some historic sites.
	Enhance, where appropriate, the historic environment	?	
	Avoid adverse effects on the historic environment	?	
	Improve the quality of the wider built environment	?	
Landscape	Avoid adverse impacts on protected landscapes, wild land and geodiversity	-	The development has the potential for short and long term, potentially significant negative effects on landscape, although this will depend on the extent to which new track is required and whether or not additional infrastructure will be located within landscapes where transport corridors are already an established features.
	Avoid adverse effects on all landscapes	?	
	Enhance landscape quality	?	
Material Assets	Avoid adversely impacting on material assets (infrastructure etc.)	++	The development would improve the transport infrastructure and rail network in the long term, thereby benefiting material assets. Impacts on natural assets such as forestry, minerals and farmland will require further consideration.
	Enhance material assets	++	
Population and Health	Avoid adverse effects on health, health inequalities and quality of life	-?	Impacts on population and health may arise from construction and operation of the route in the long term. Potential issues include noise and vibration, with secondary impacts on health. Positive impacts on air quality could also benefit health.
	Improve the health and living environment of people and communities	?	
	Address inequalities by improved access to employment (SIMD most deprived areas	0	
Soil	Avoid adverse impacts on soil	-	The construction of the new rail stations and high speed line could result in permanent soil sealing where greenfield land is developed. The locations of stations and route are not known therefore negative impacts on valuable soil resources are unknown. There is potential for construction of stations to use areas of brownfield land, but this remains uncertain at this stage.
	Avoid adverse impacts on valuable soil resources e.g. prime agricultural land, carbon rich soils	-?	

	Reduce vacant and derelict land	?	
Water, Coastal, Marine	Avoid adverse impacts on the ecological status of waterbodies	-?	Construction of the rail line and new stations could impact on waterbodies. This could include physical changes and water pollution. The degree of impact depends on the route chosen and mitigation to avoid or minimise impacts would be required at the site level. Effects may be significant given the scale of development, but remain uncertain at this stage.
	Avoid and reduce flood risk	0	
	Avoid adverse impacts on sensitive coastal areas and marine environment	0	
	Improve water environment	0	

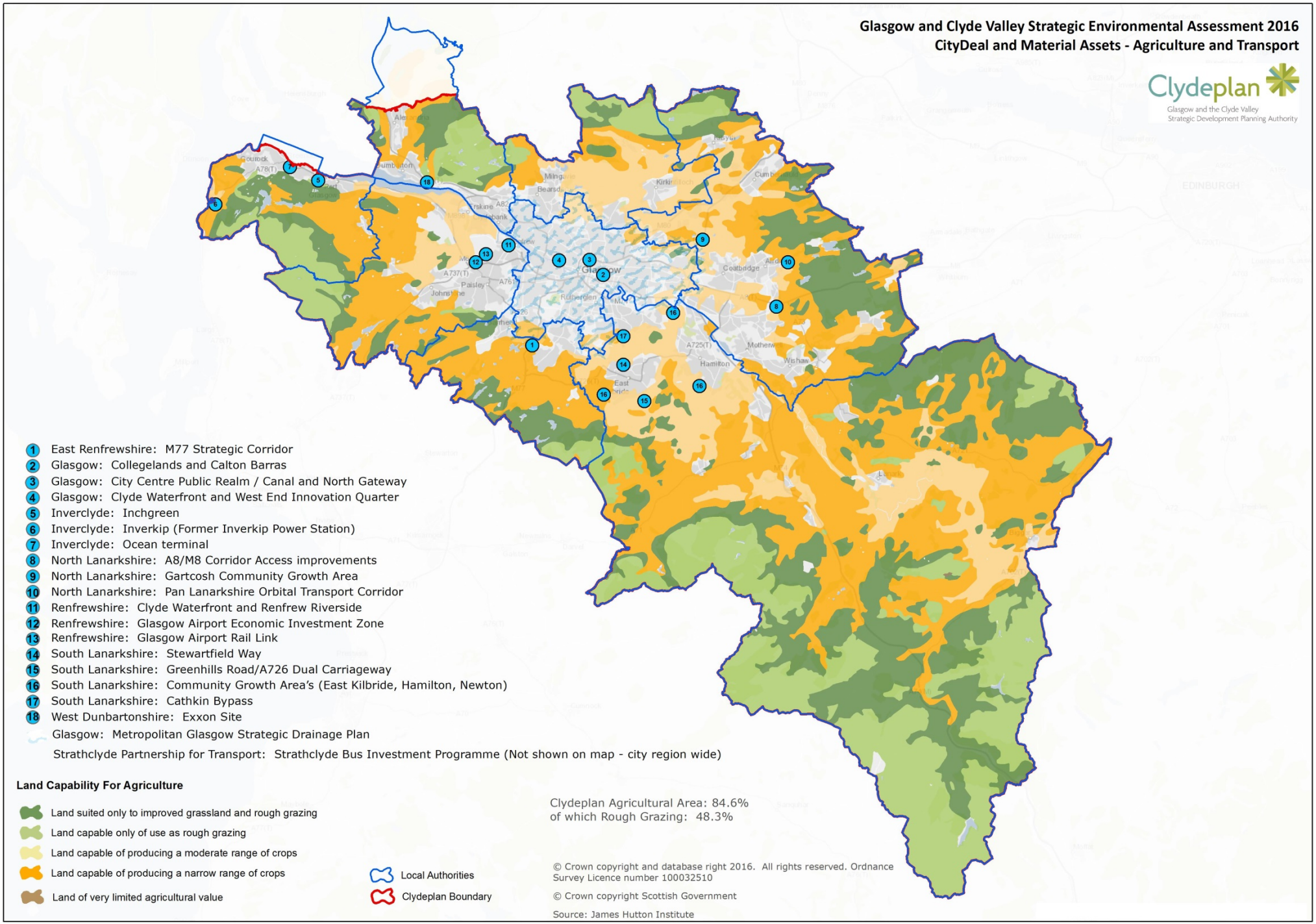
Appendix B: Mapped Assessments

Appendix B: Mapped Assessments

City Deal	Pg 82-94
Strategic Economic Investment Locations and Freight Hubs	Pg 95-108
Strategic Centres	Pg 109-121
Wind Farm Development Areas	Pg 122-134
Green Network Opportunities	Pg 135-147

Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Material Assets - Agriculture and Transport

Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority



1. East Renfrewshire: M77 Strategic Corridor
2. Glasgow: Collegelands and Calton Barras
3. Glasgow: City Centre Public Realm / Canal and North Gateway
4. Glasgow: Clyde Waterfront and West End Innovation Quarter
5. Inverclyde: Inchgreen
6. Inverclyde: Inverkip (Former Inverkip Power Station)
7. Inverclyde: Ocean terminal
8. North Lanarkshire: A8/M8 Corridor Access improvements
9. North Lanarkshire: Gartcosh Community Growth Area
10. North Lanarkshire: Pan Lanarkshire Orbital Transport Corridor
11. Renfrewshire: Clyde Waterfront and Renfrew Riverside
12. Renfrewshire: Glasgow Airport Economic Investment Zone
13. Renfrewshire: Glasgow Airport Rail Link
14. South Lanarkshire: Stewartfield Way
15. South Lanarkshire: Greenhills Road/A726 Dual Carriageway
16. South Lanarkshire: Community Growth Area's (East Kilbride, Hamilton, Newton)
17. South Lanarkshire: Cathkin Bypass
18. West Dunbartonshire: Exxon Site

Glasgow: Metropolitan Glasgow Strategic Drainage Plan

Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)

Land Capability For Agriculture

- Land suited only to improved grassland and rough grazing
- Land capable only of use as rough grazing
- Land capable of producing a moderate range of crops
- Land capable of producing a narrow range of crops
- Land of very limited agricultural value

Local Authorities

Clydeplan Boundary

Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%

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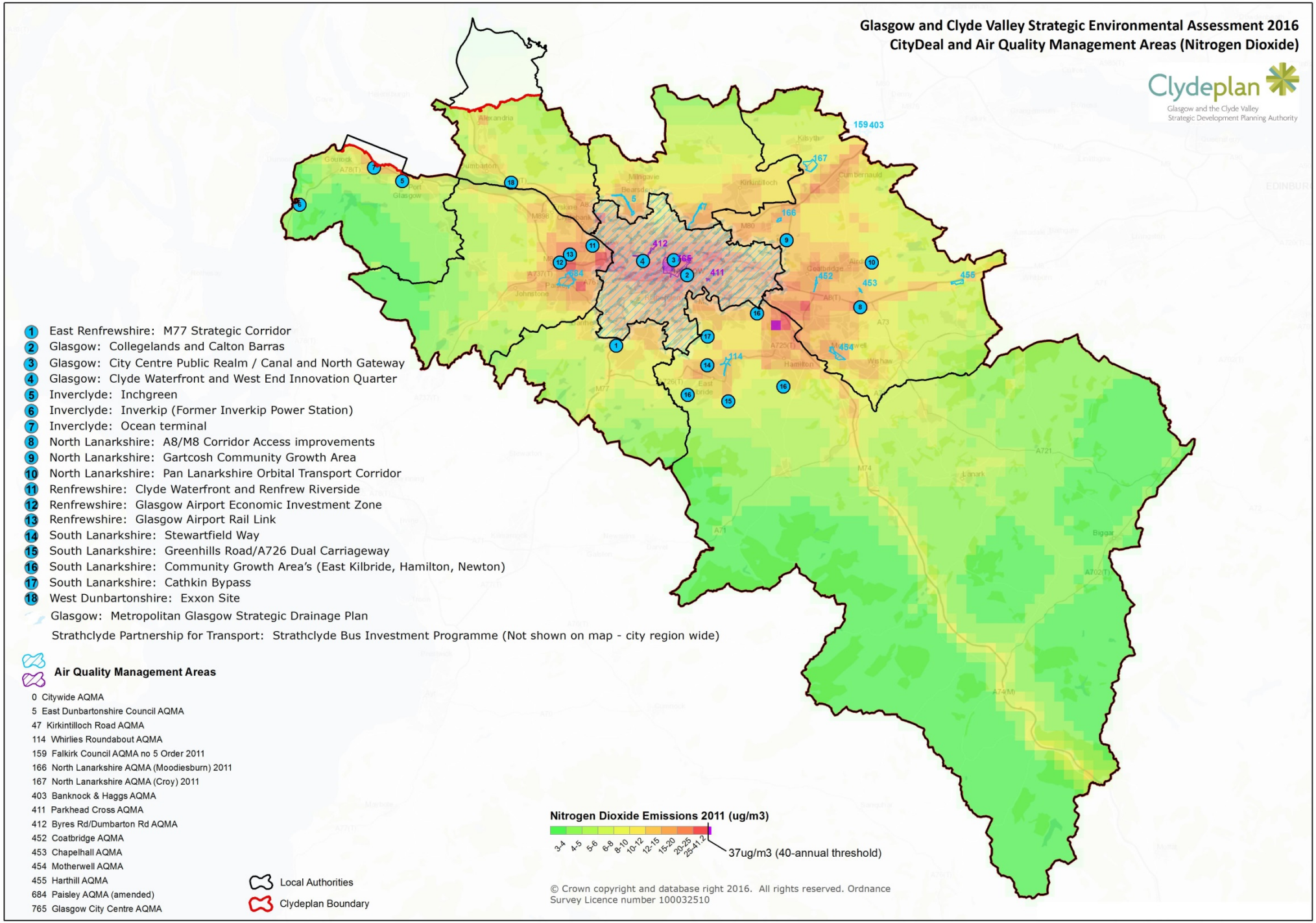
Source: James Hutton Institute


Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Air Quality Management Areas (Nitrogen Dioxide)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
1 East Renfrewshire: M77 Strategic Corridor
2 Glasgow: Collegelands and Calton Barras
3 Glasgow: City Centre Public Realm / Canal and North Gateway
4 Glasgow: Clyde Waterfront and West End Innovation Quarter
5 Inverclyde: Inchgreen
6 Inverclyde: Inverkip (Former Inverkip Power Station)
7 Inverclyde: Ocean terminal
8 North Lanarkshire: A8/M8 Corridor Access improvements
9 North Lanarkshire: Gartcosh Community Growth Area
10 North Lanarkshire: Pan Lanarkshire Orbital Transport Corridor
11 Renfrewshire: Clyde Waterfront and Renfrew Riverside
12 Renfrewshire: Glasgow Airport Economic Investment Zone
13 Renfrewshire: Glasgow Airport Rail Link
14 South Lanarkshire: Stewartfield Way
15 South Lanarkshire: Greenhills Road/A726 Dual Carriageway
16 South Lanarkshire: Community Growth Area's (East Kilbride, Hamilton, Newton)
17 South Lanarkshire: Cathkin Bypass
18 West Dunbartonshire: Exxon Site
Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Nitrogen Dioxide Emissions 2011 (ug/m3)
3-4 4-5 5-6 6-8 8-10 10-12 12-15 15-20 20-25 25-41.2
37ug/m3 (40-annual threshold)
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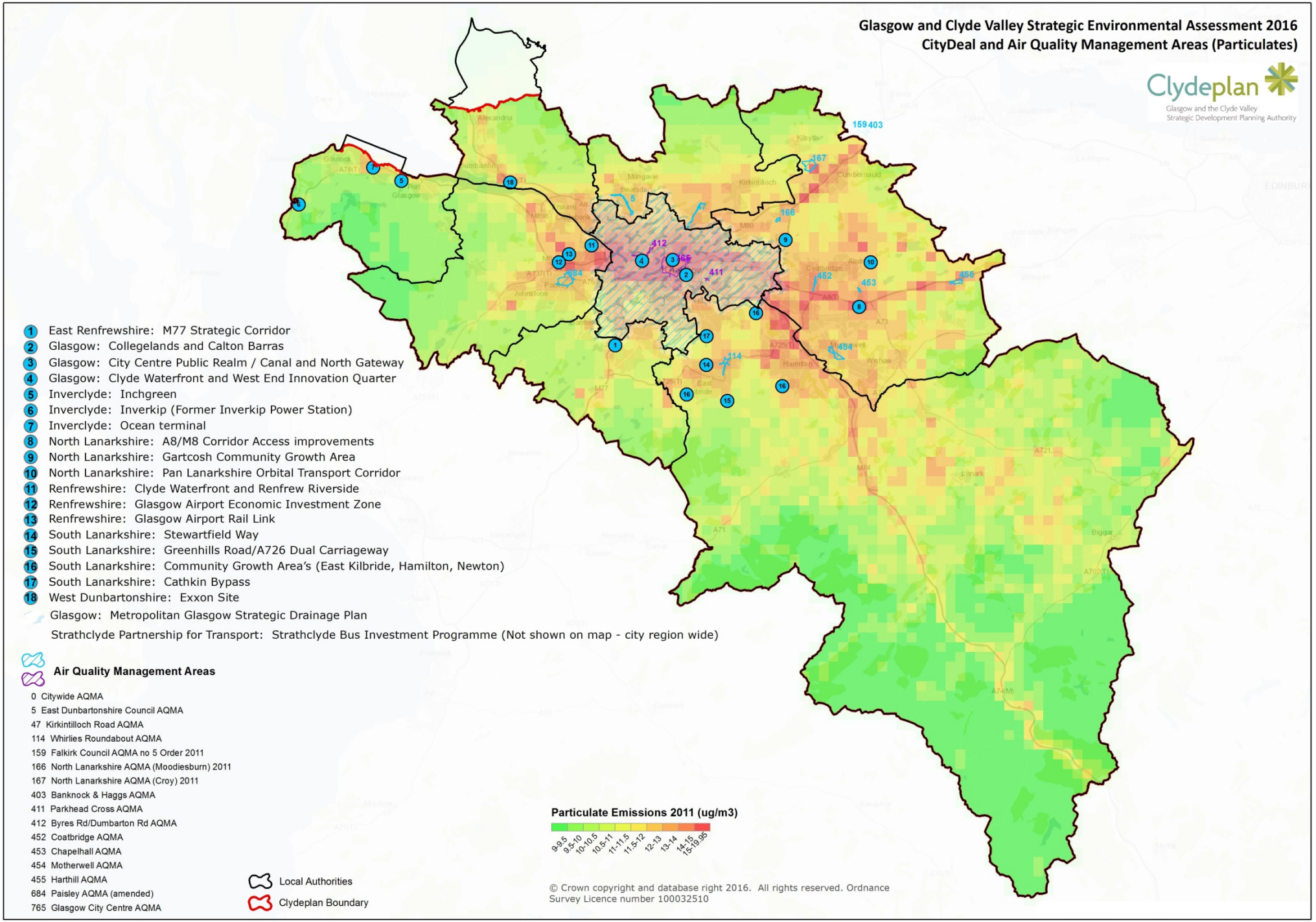
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Air Quality Management Areas (Particulates)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
1 East Renfrewshire: M77 Strategic Corridor
2 Glasgow: Collegelands and Calton Barras
3 Glasgow: City Centre Public Realm / Canal and North Gateway
4 Glasgow: Clyde Waterfront and West End Innovation Quarter
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6 Inverclyde: Inverkip (Former Inverkip Power Station)
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11 Renfrewshire: Clyde Waterfront and Renfrew Riverside
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15 South Lanarkshire: Greenhills Road/A726 Dual Carriageway
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17 South Lanarkshire: Cathkin Bypass
18 West Dunbartonshire: Exxon Site
Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.95
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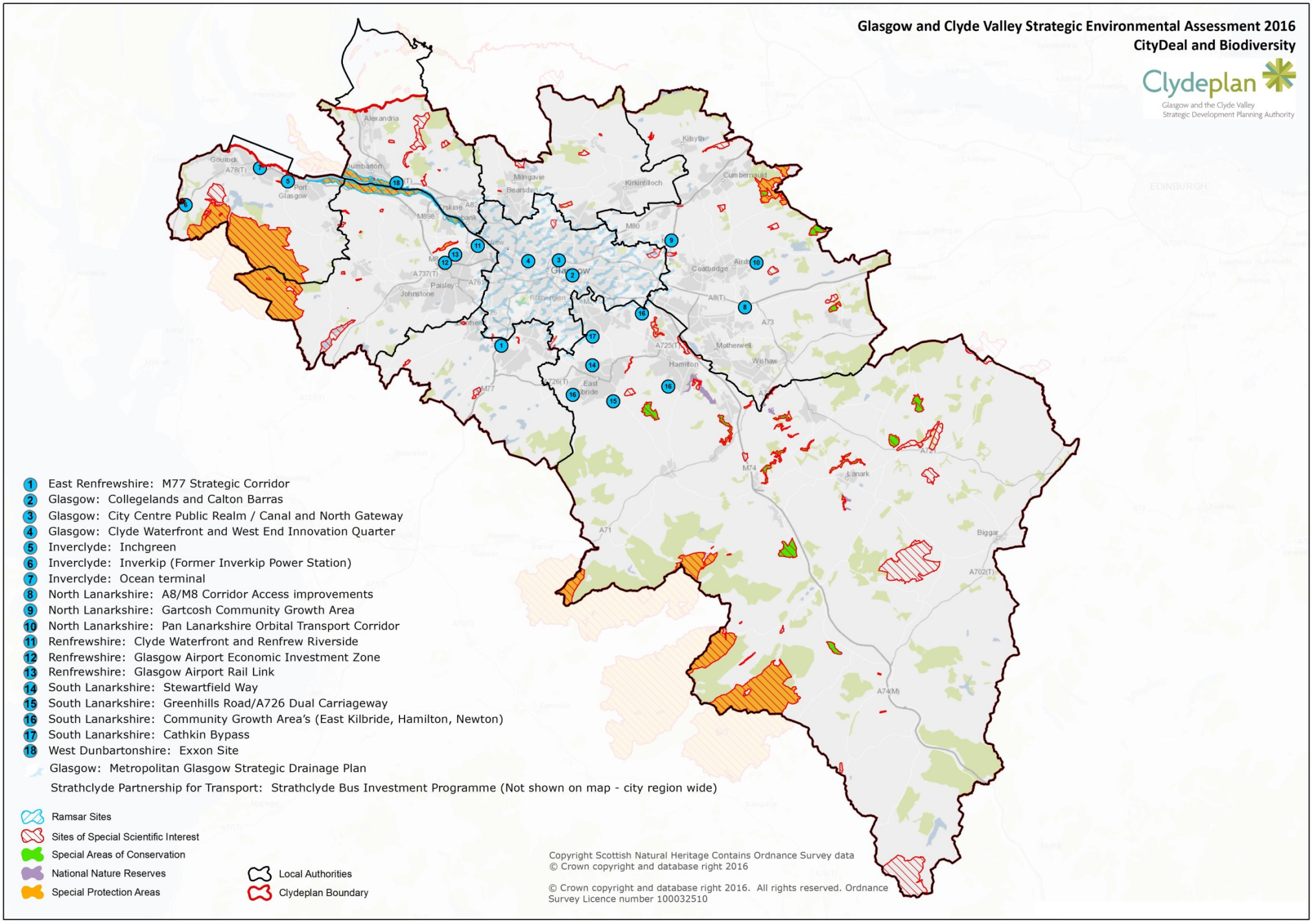
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Biodiversity
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
1 East Renfrewshire: M77 Strategic Corridor
2 Glasgow: Collegelands and Calton Barras
3 Glasgow: City Centre Public Realm / Canal and North Gateway
4 Glasgow: Clyde Waterfront and West End Innovation Quarter
5 Inverclyde: Inchgreen
6 Inverclyde: Inverkip (Former Inverkip Power Station)
7 Inverclyde: Ocean terminal
8 North Lanarkshire: A8/M8 Corridor Access improvements
9 North Lanarkshire: Gartcosh Community Growth Area
10 North Lanarkshire: Pan Lanarkshire Orbital Transport Corridor
11 Renfrewshire: Clyde Waterfront and Renfrew Riverside
12 Renfrewshire: Glasgow Airport Economic Investment Zone
13 Renfrewshire: Glasgow Airport Rail Link
14 South Lanarkshire: Stewartfield Way
15 South Lanarkshire: Greenhills Road/A726 Dual Carriageway
16 South Lanarkshire: Community Growth Area's (East Kilbride, Hamilton, Newton)
17 South Lanarkshire: Cathkin Bypass
18 West Dunbartonshire: Exxon Site
Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Ramsar Sites
Sites of Special Scientific Interest
Special Areas of Conservation
National Nature Reserves
Special Protection Areas
Local Authorities
Clydeplan Boundary
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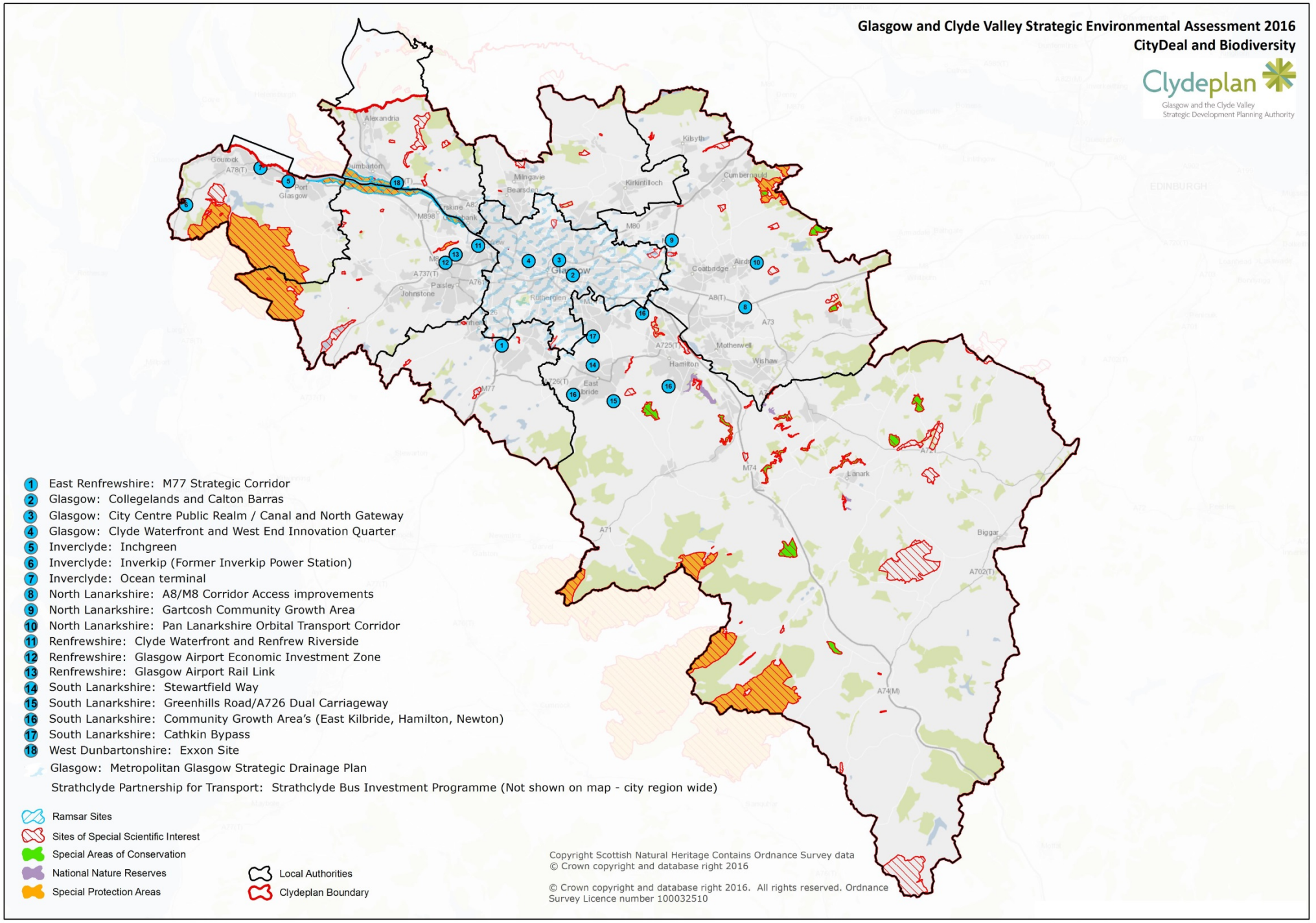
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Biodiversity
Clydeplan
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National Nature Reserves
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Local Authorities
Clydeplan Boundary
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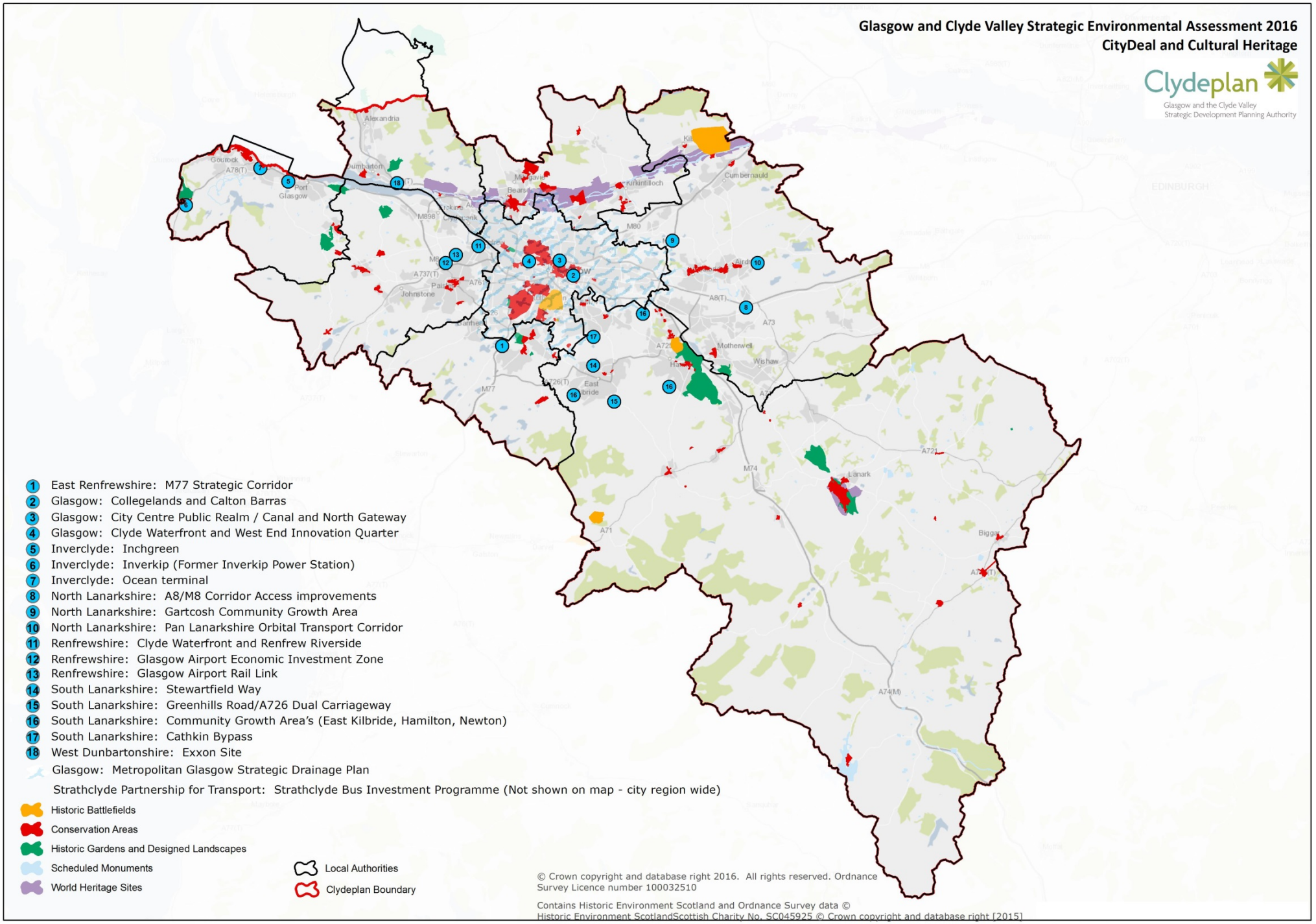
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Cultural Heritage

Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority



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18. West Dunbartonshire: Exxon Site

Glasgow: Metropolitan Glasgow Strategic Drainage Plan

Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)

- Historic Battlefields
- Conservation Areas
- Historic Gardens and Designed Landscapes
- Scheduled Monuments
- World Heritage Sites
- Local Authorities
- Clydeplan Boundary

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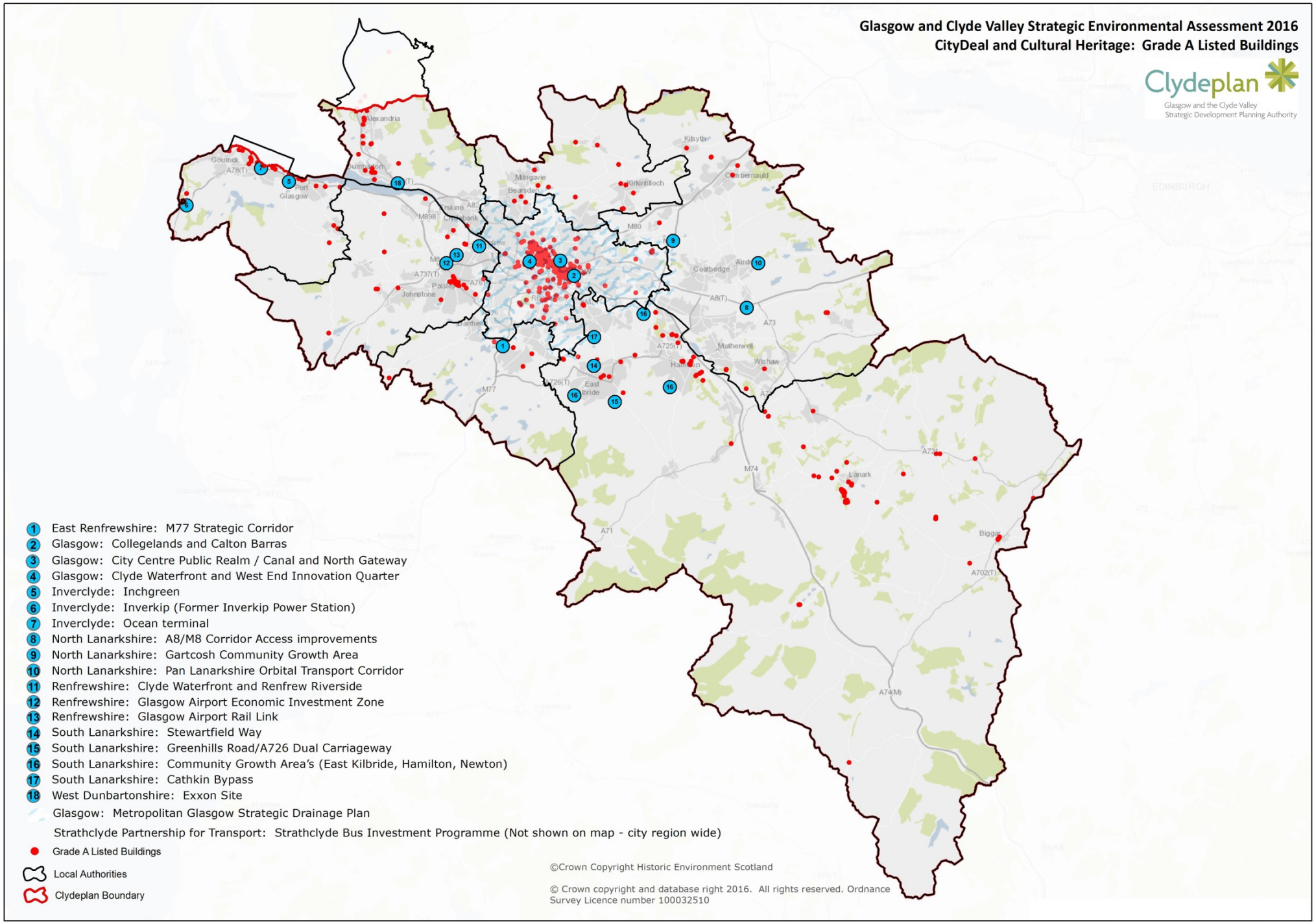
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Cultural Heritage: Grade A Listed Buildings
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
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Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Grade A Listed Buildings
Local Authorities
Clydeplan Boundary
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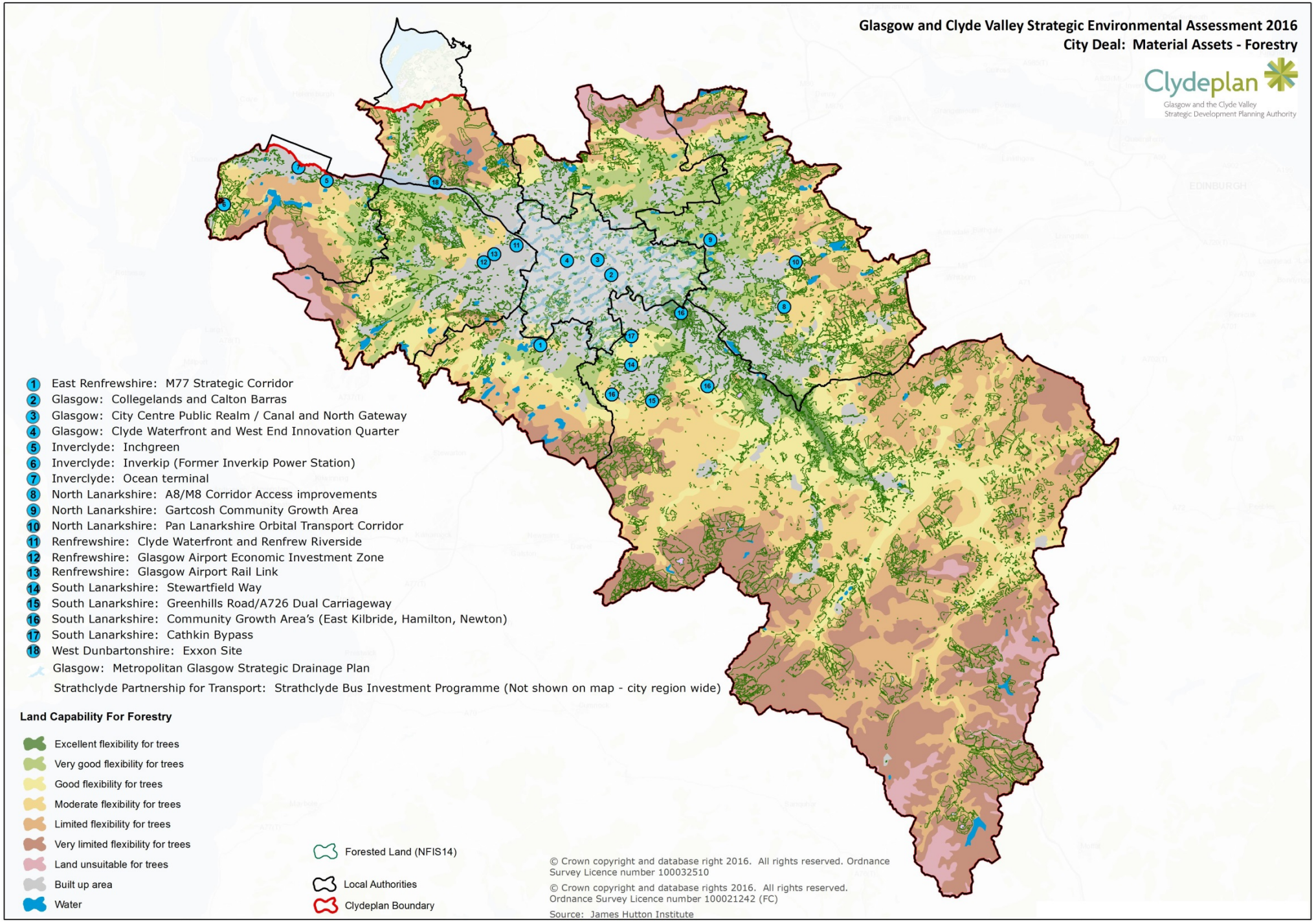
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
City Deal: Material Assets - Forestry
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
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18 West Dunbartonshire: Exxon Site
Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Land Capability For Forestry
Excellent flexibility for trees
Very good flexibility for trees
Good flexibility for trees
Moderate flexibility for trees
Limited flexibility for trees
Very limited flexibility for trees
Land unsuitable for trees
Built up area
Water
Forested Land (NFIS14)
Local Authorities
Clydeplan Boundary
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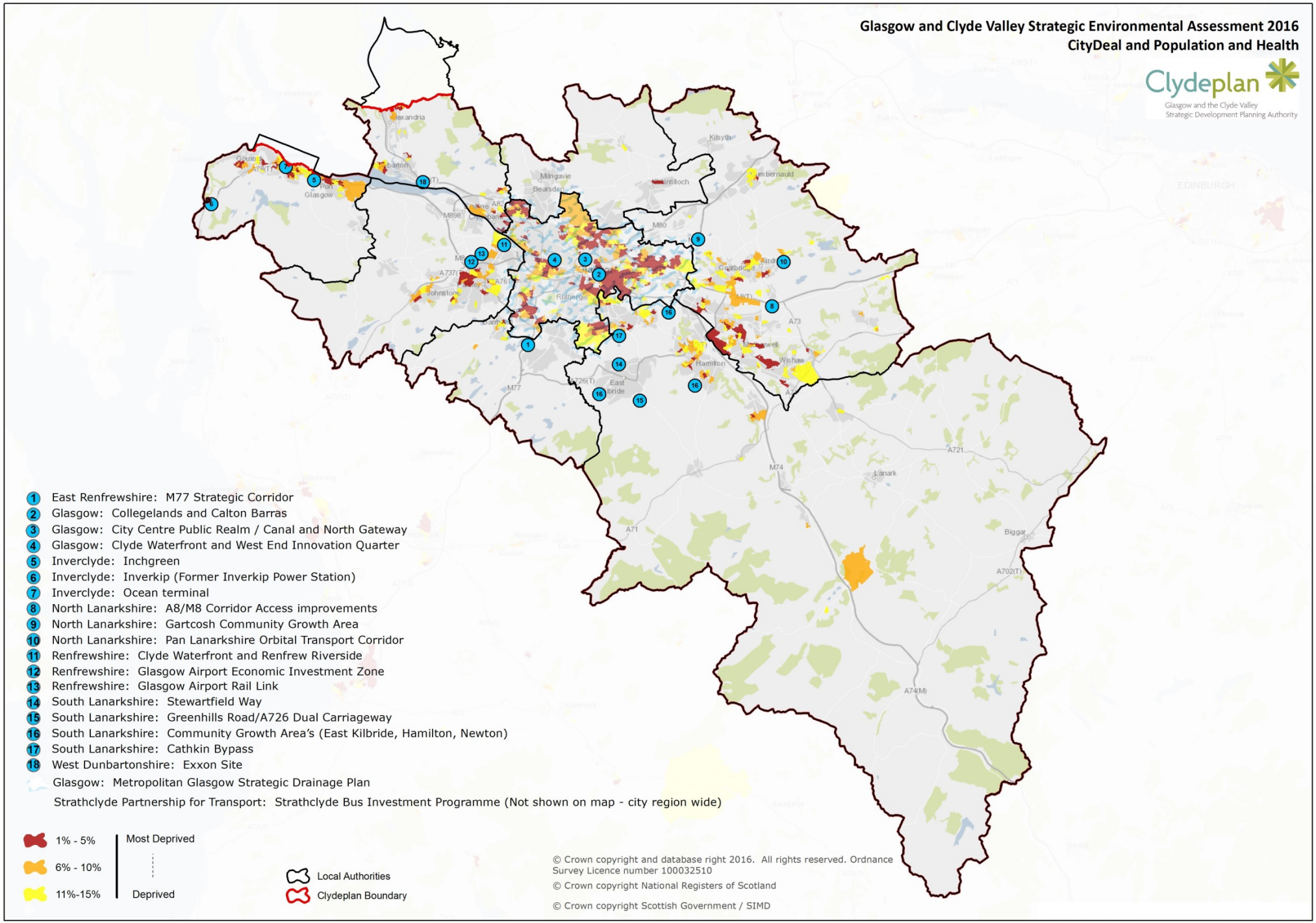
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Population and Health
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
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Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
1% - 5%
6% - 10%
11%-15%
Most Deprived
Deprived
Local Authorities
Clydeplan Boundary
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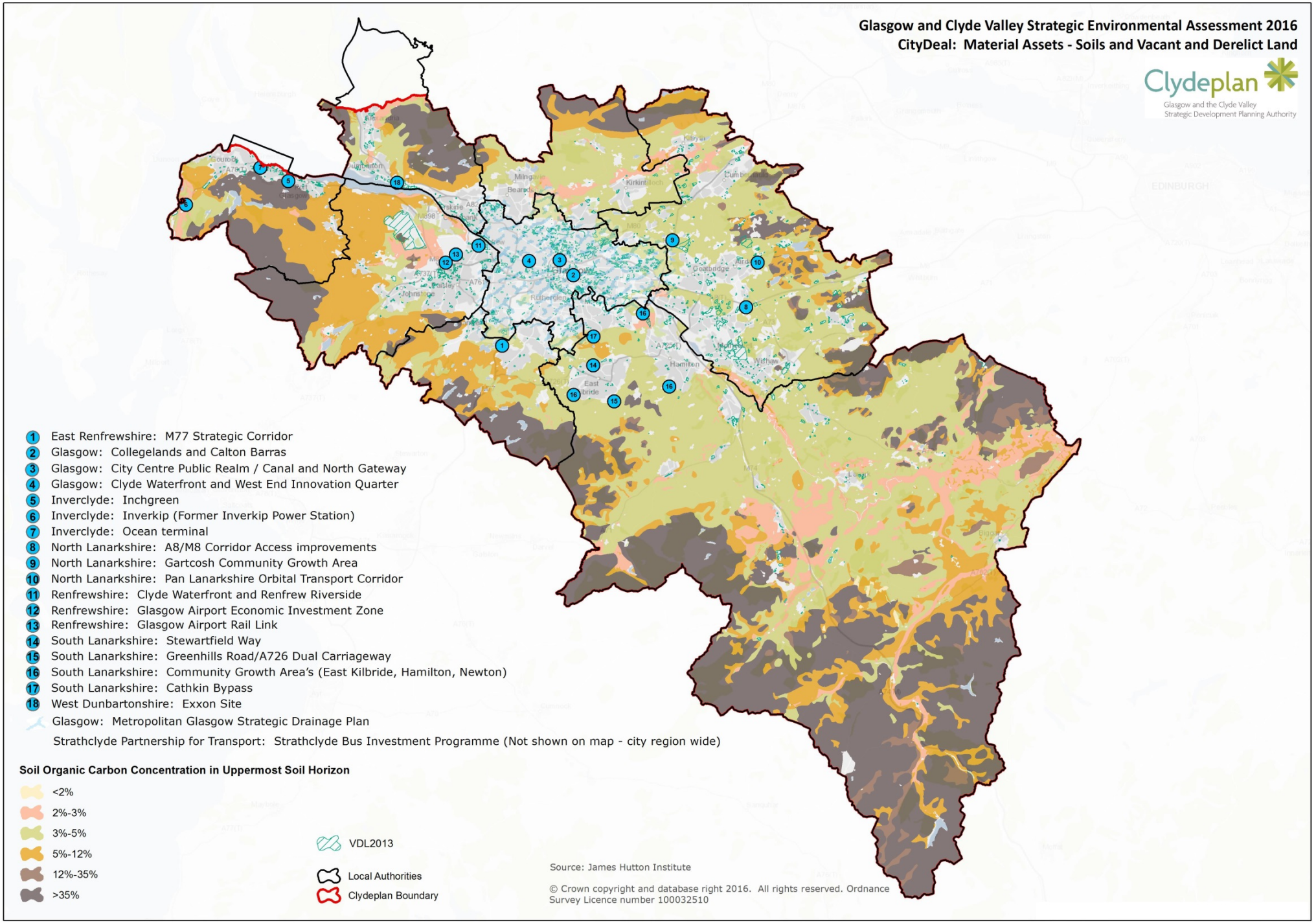
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal: Material Assets - Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
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Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
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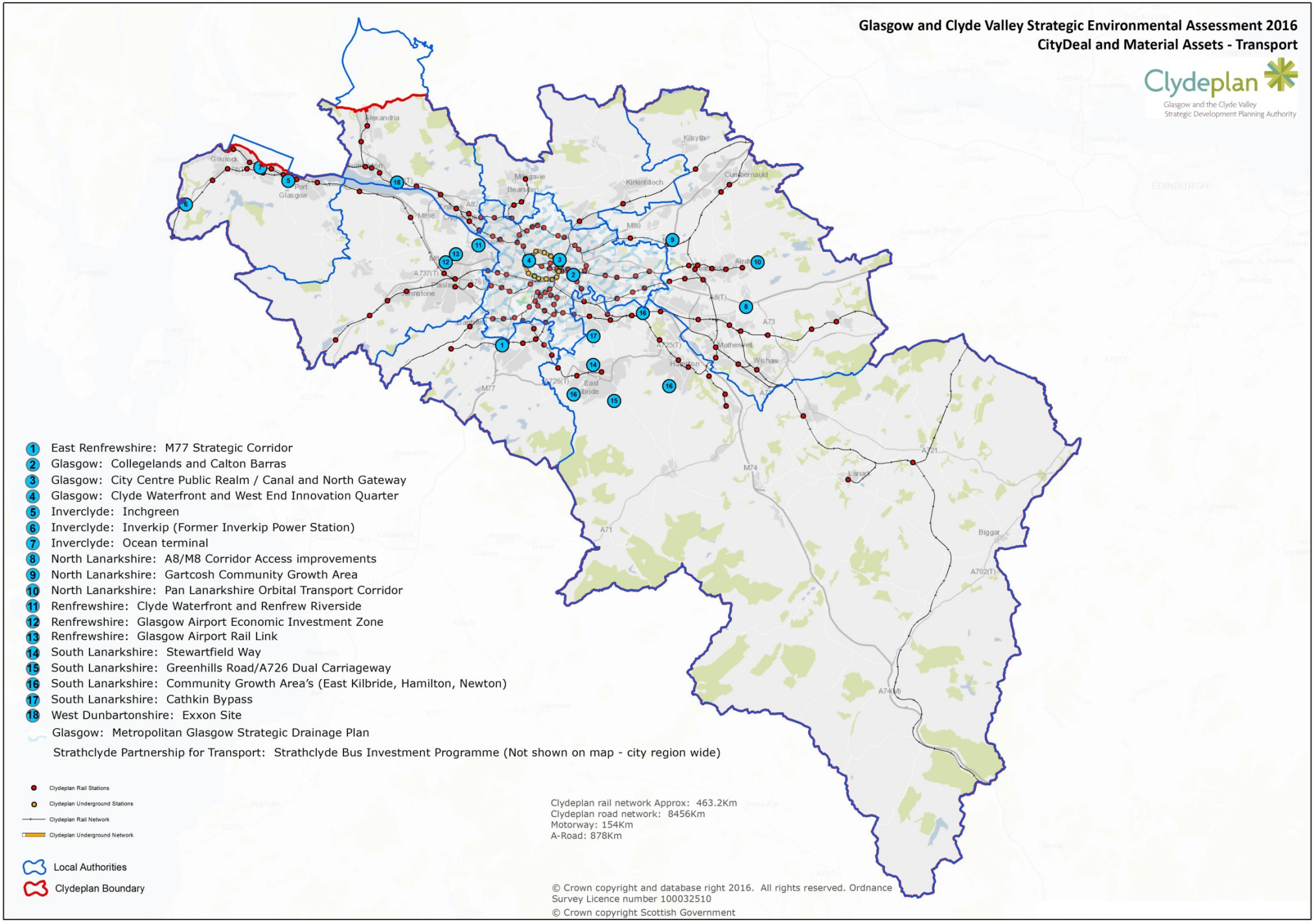
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Material Assets - Transport

Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority



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Glasgow: Metropolitan Glasgow Strategic Drainage Plan

Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)

Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network

Local Authorities
Clydeplan Boundary

Clydeplan rail network Approx: 463.2Km
Clydeplan road network: 8456Km
Motorway: 154Km
A-Road: 878Km

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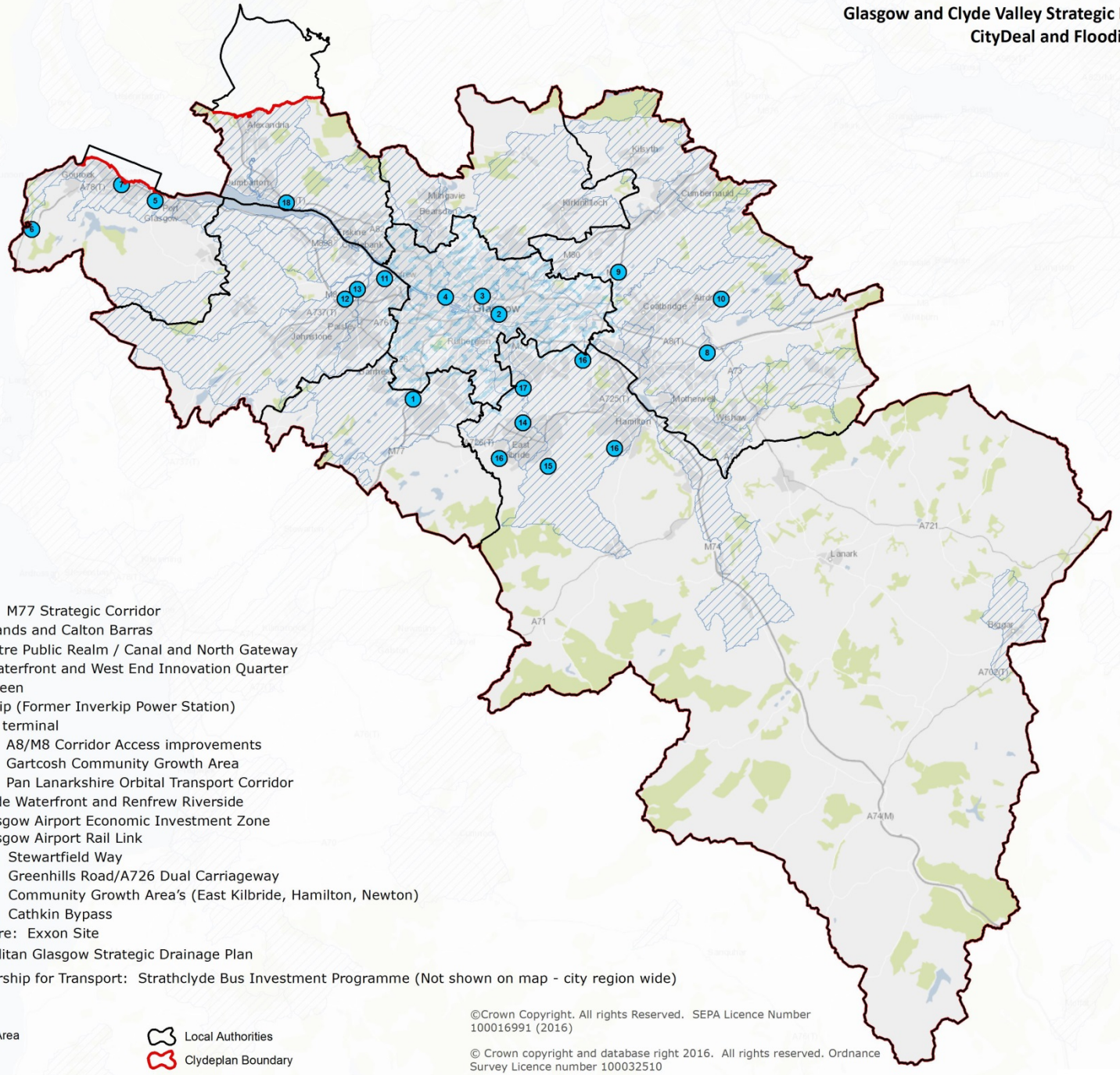
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Flooding: Potentially Vulnerable Areas

Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority



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Glasgow: Metropolitan Glasgow Strategic Drainage Plan

Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)

Potentially Vulnerable Area

Local Authorities

Clydeplan Boundary

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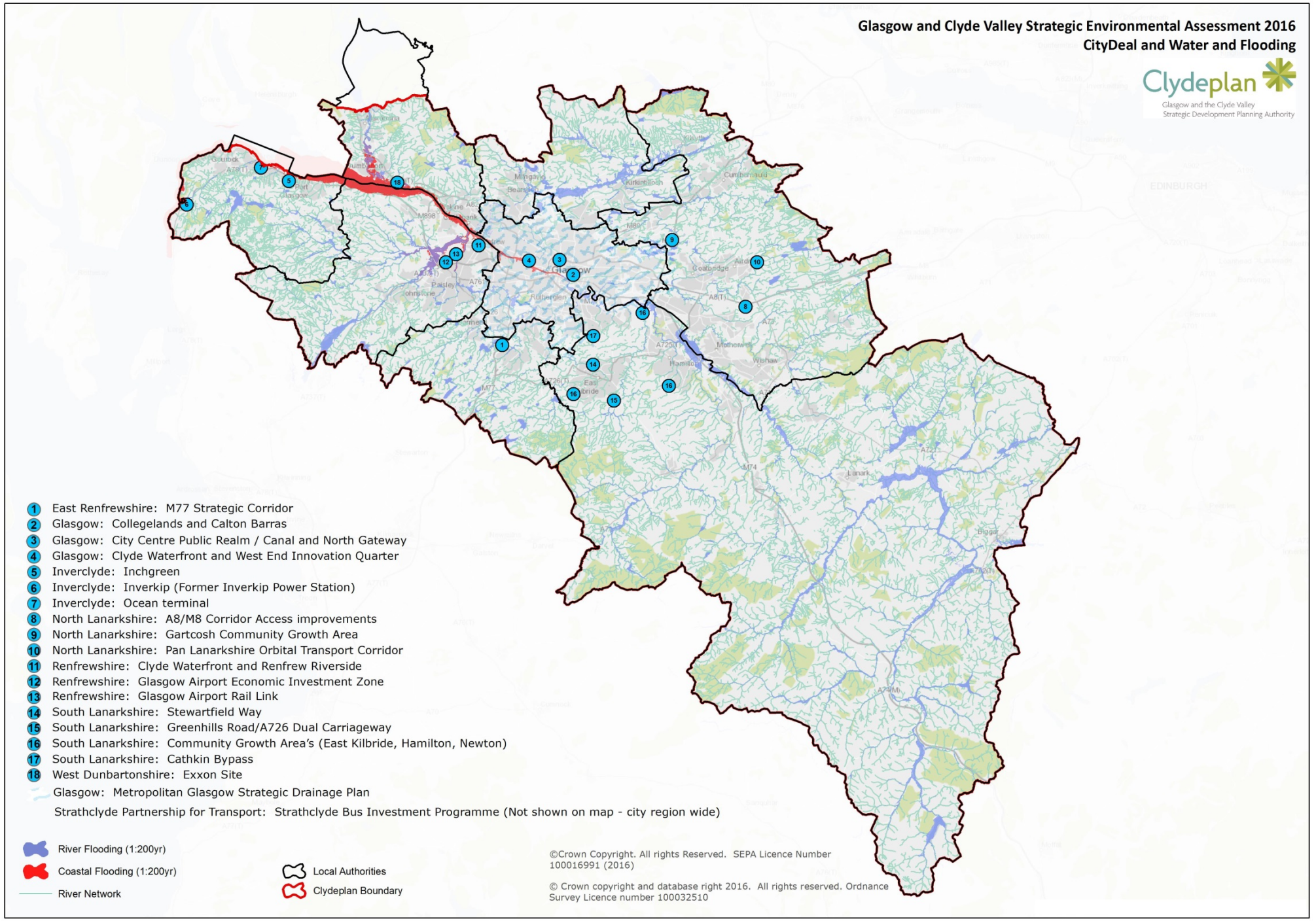
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
CityDeal and Water and Flooding
Clydeplan
Glasgow and the Clyde Valley
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Glasgow: Metropolitan Glasgow Strategic Drainage Plan
Strathclyde Partnership for Transport: Strathclyde Bus Investment Programme (Not shown on map - city region wide)
River Flooding (1:200yr)
Coastal Flooding (1:200yr)
River Network
Local Authorities
Clydeplan Boundary
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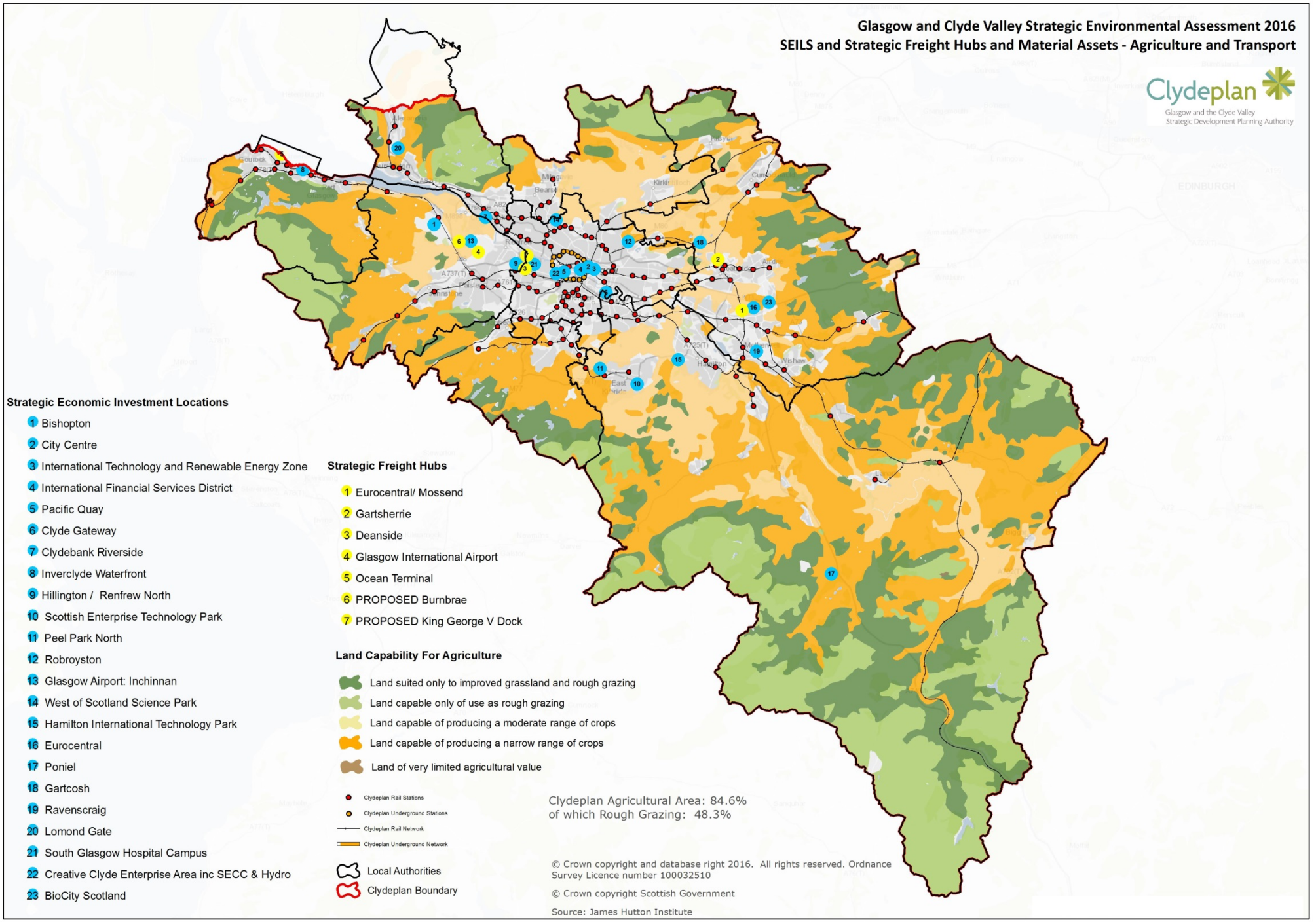
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Material Assets - Agriculture and Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
6 Clyde Gateway
7 Clydebank Riverside
8 Inverclyde Waterfront
9 Hillington / Renfrew North
10 Scottish Enterprise Technology Park
11 Peel Park North
12 Robroyston
13 Glasgow Airport: Inchinnan
14 West of Scotland Science Park
15 Hamilton International Technology Park
16 Eurocentral
17 Poniel
18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
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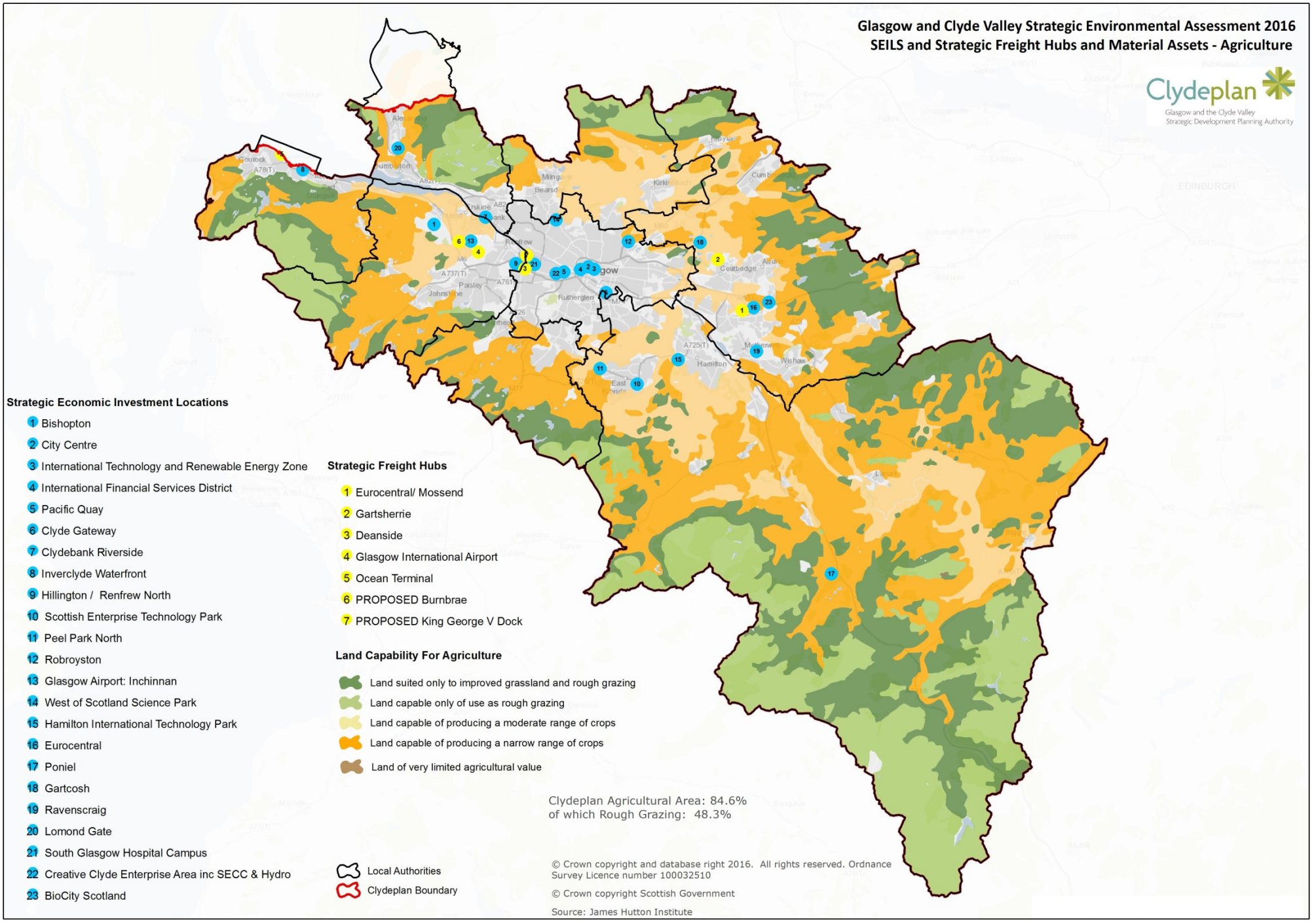
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Material Assets - Agriculture
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Glasgow and the Clyde Valley
Strategic Development Planning Authority
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18 Gartcosh
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21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
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4 Glasgow International Airport
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6 PROPOSED Burnbrae
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Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
Local Authorities
Clydeplan Boundary
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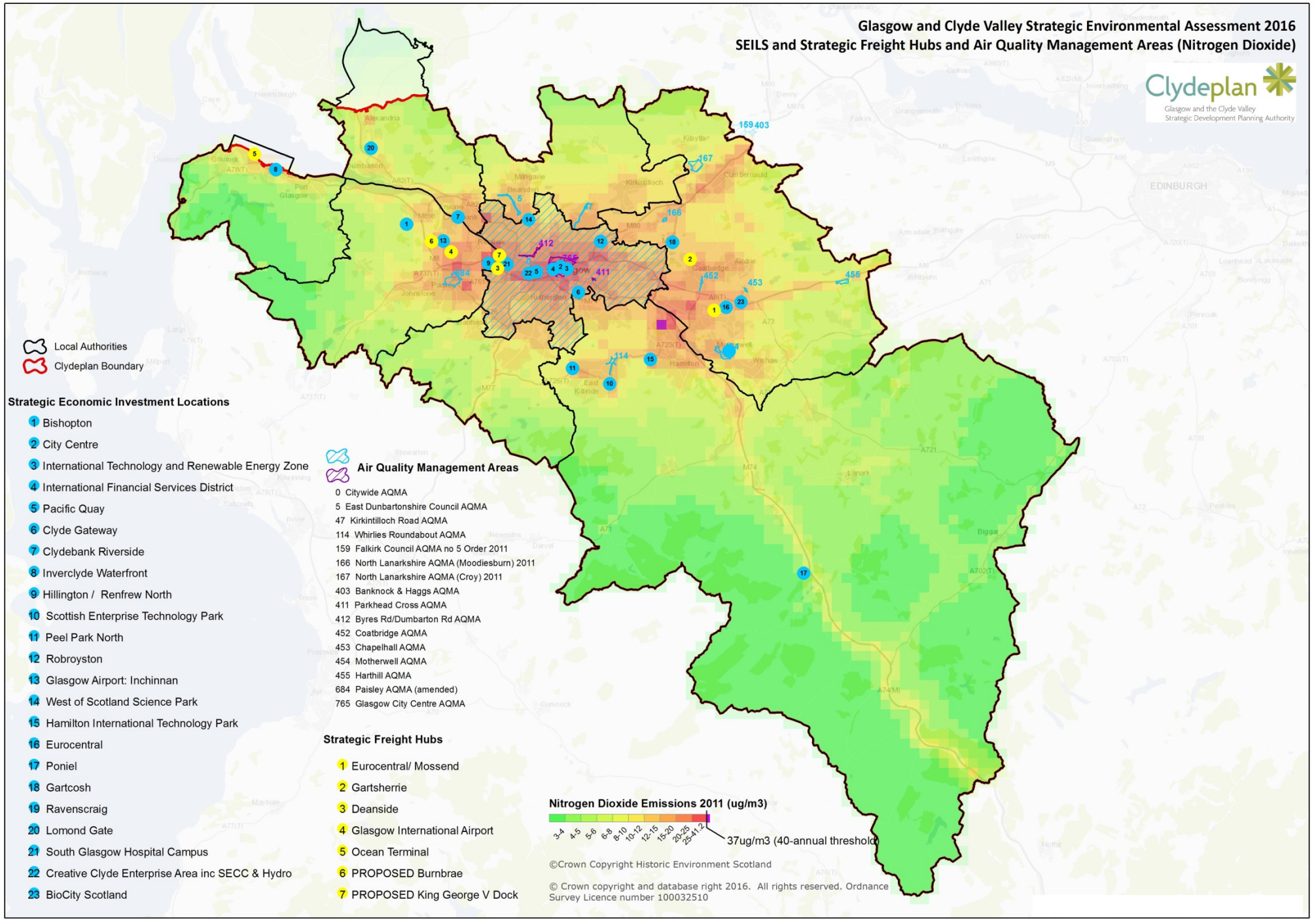
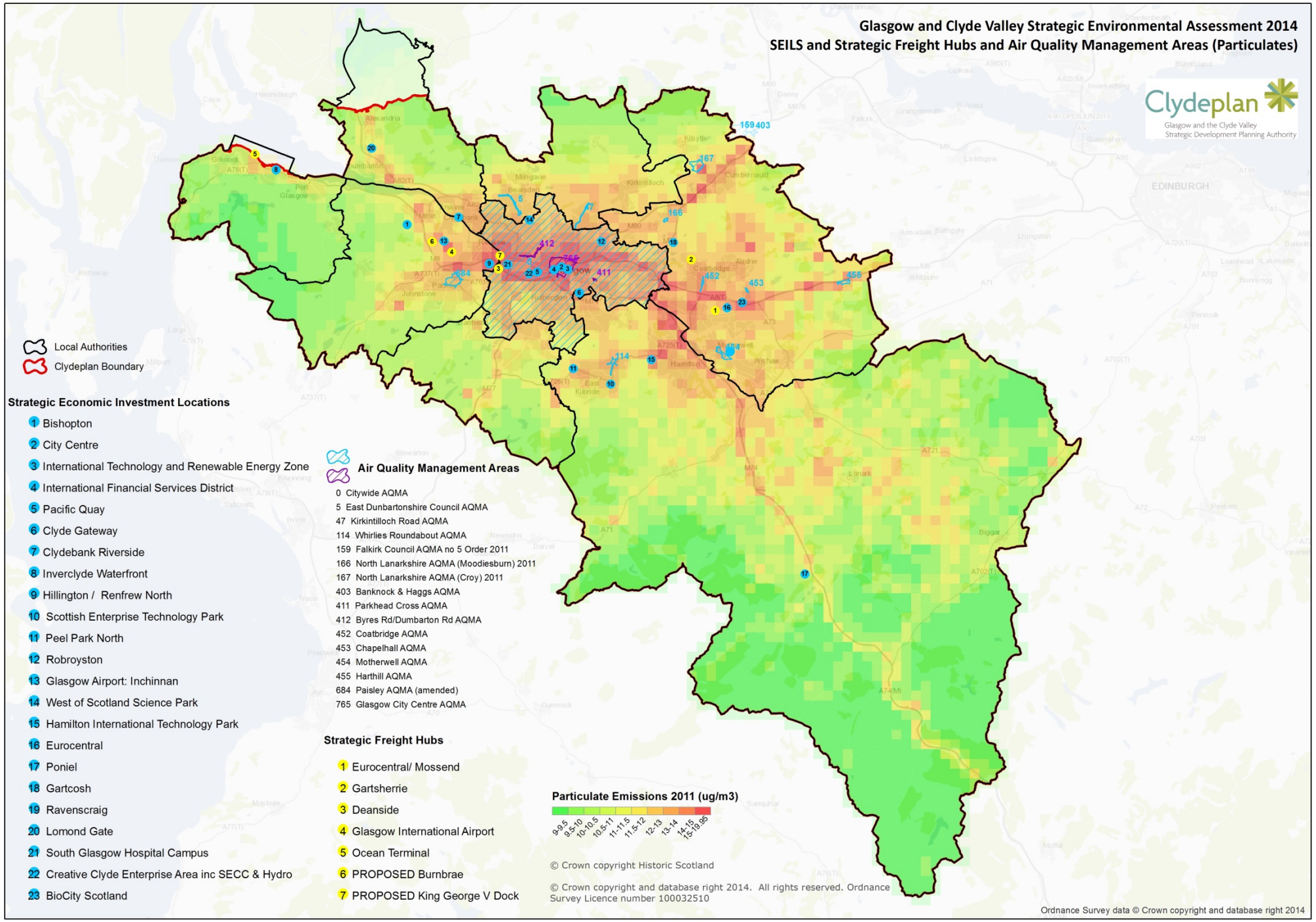
Source: James Hutton Institute

Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Air Quality Management Areas (Nitrogen Dioxide)

Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority




Glasgow and Clyde Valley Strategic Environmental Assessment 2014
SEILS and Strategic Freight Hubs and Air Quality Management Areas (Particulates)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Local Authorities
Clydeplan Boundary
Strategic Economic Investment Locations
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2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
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8 Inverclyde Waterfront
9 Hillington / Renfrew North
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16 Eurocentral
17 Poniel
18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.95
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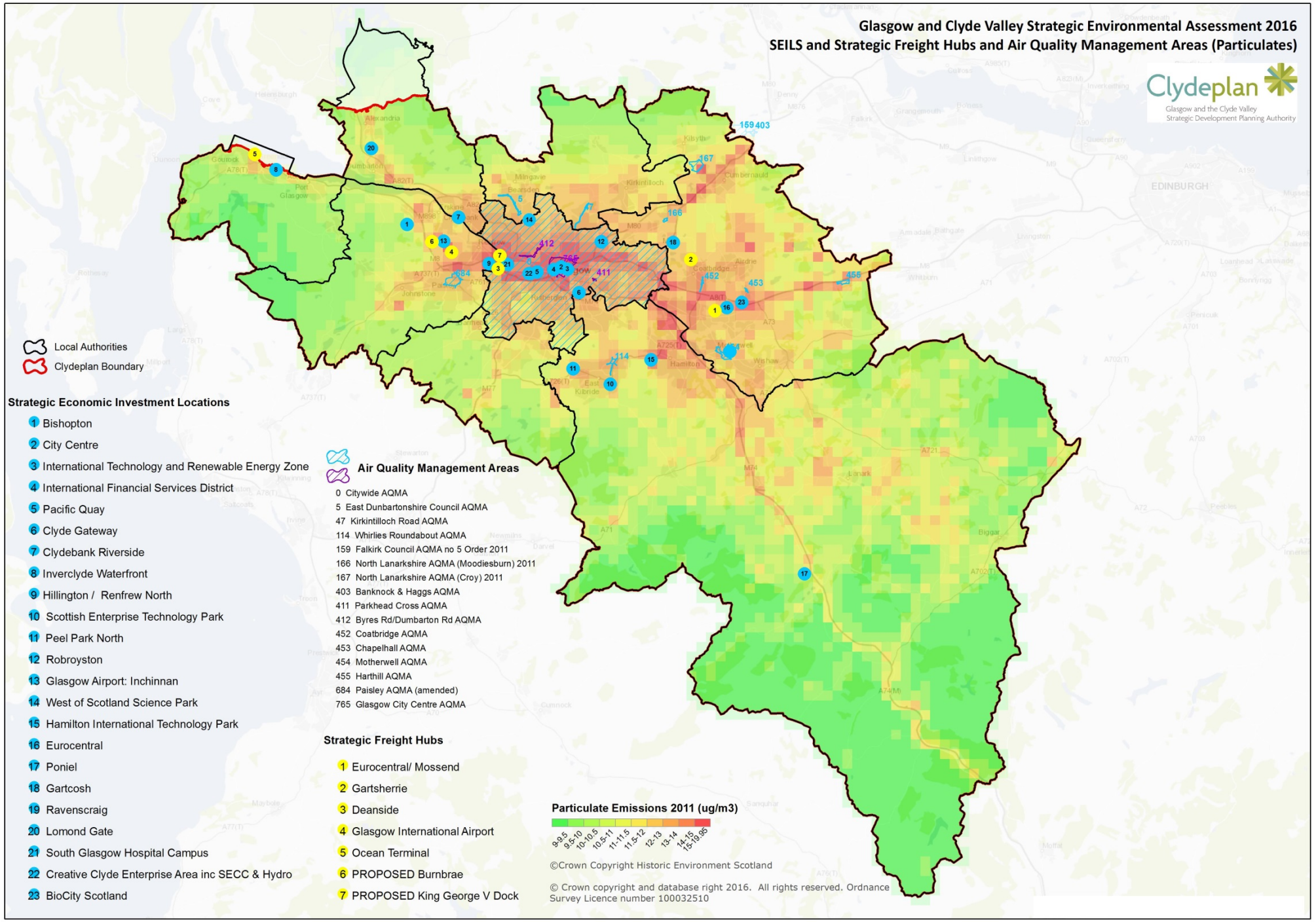
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Air Quality Management Areas (Particulates)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Local Authorities
Clydeplan Boundary
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
6 Clyde Gateway
7 Clydebank Riverside
8 Inverclyde Waterfront
9 Hillington / Renfrew North
10 Scottish Enterprise Technology Park
11 Peel Park North
12 Robroyston
13 Glasgow Airport: Inchinnan
14 West of Scotland Science Park
15 Hamilton International Technology Park
16 Eurocentral
17 Poniel
18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.96
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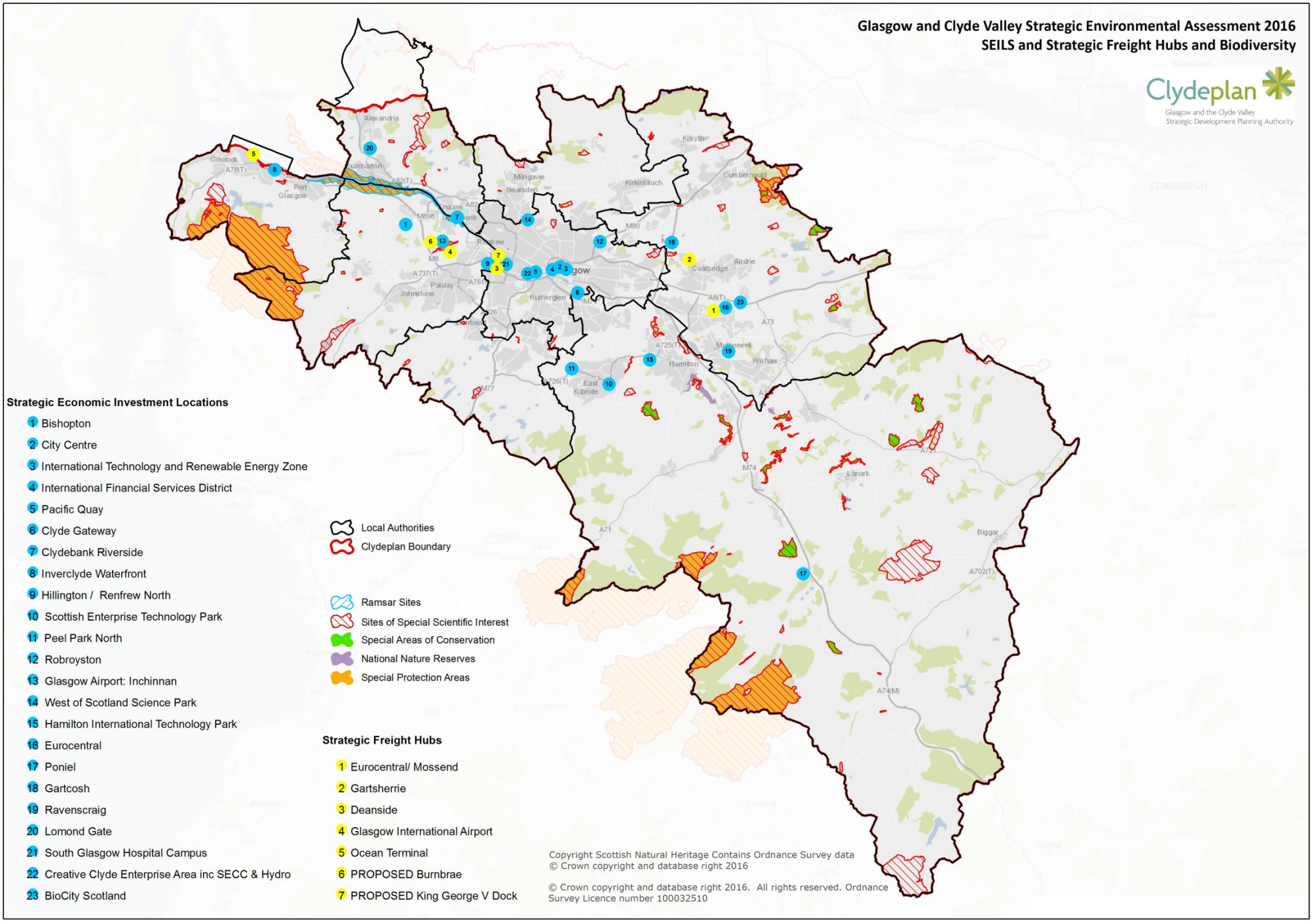
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Biodiversity
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
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18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Local Authorities
Clydeplan Boundary
Ramsar Sites
Sites of Special Scientific Interest
Special Areas of Conservation
National Nature Reserves
Special Protection Areas
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
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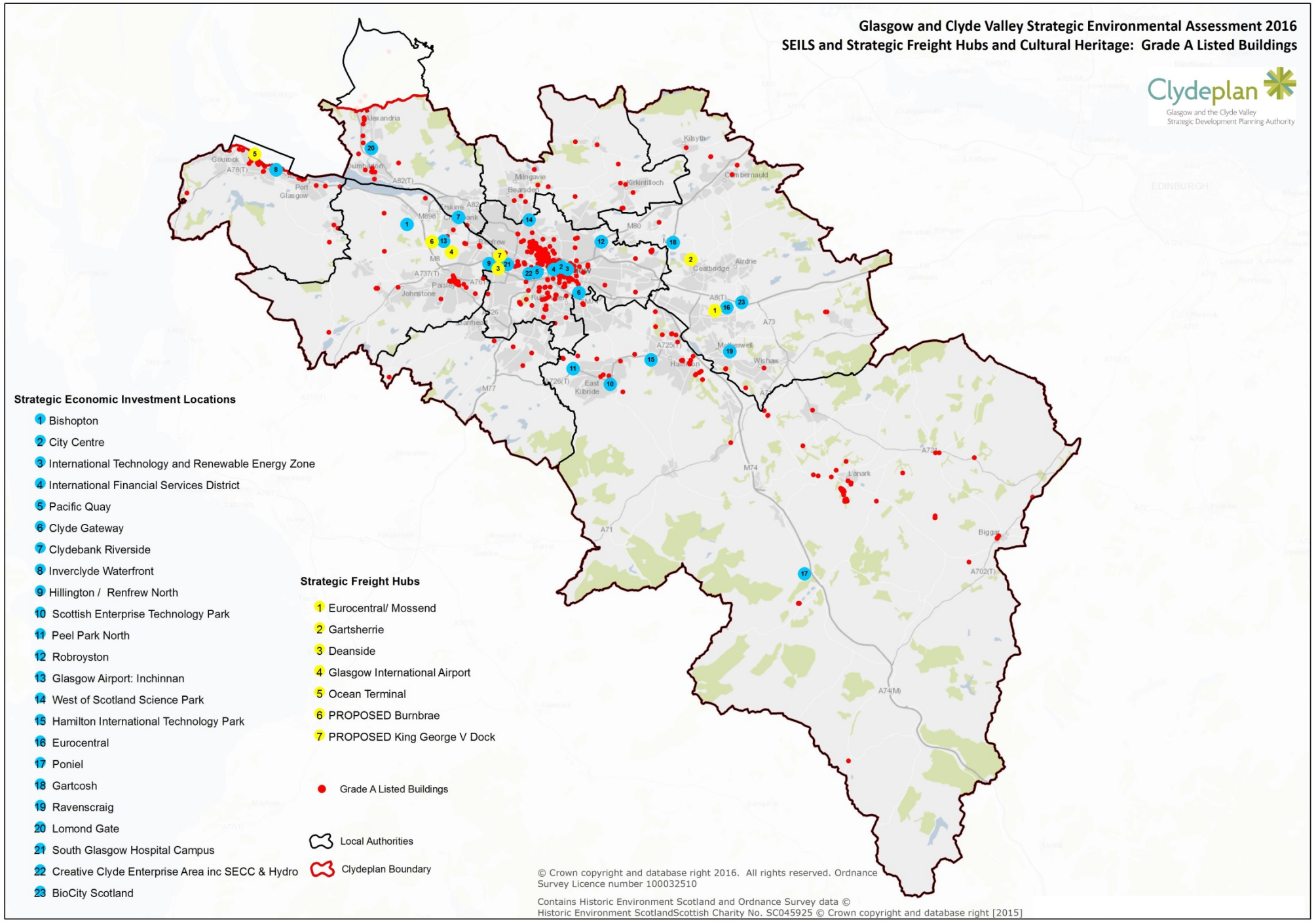
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Cultural Heritage: Grade A Listed Buildings
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
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4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Grade A Listed Buildings
Local Authorities
Clydeplan Boundary
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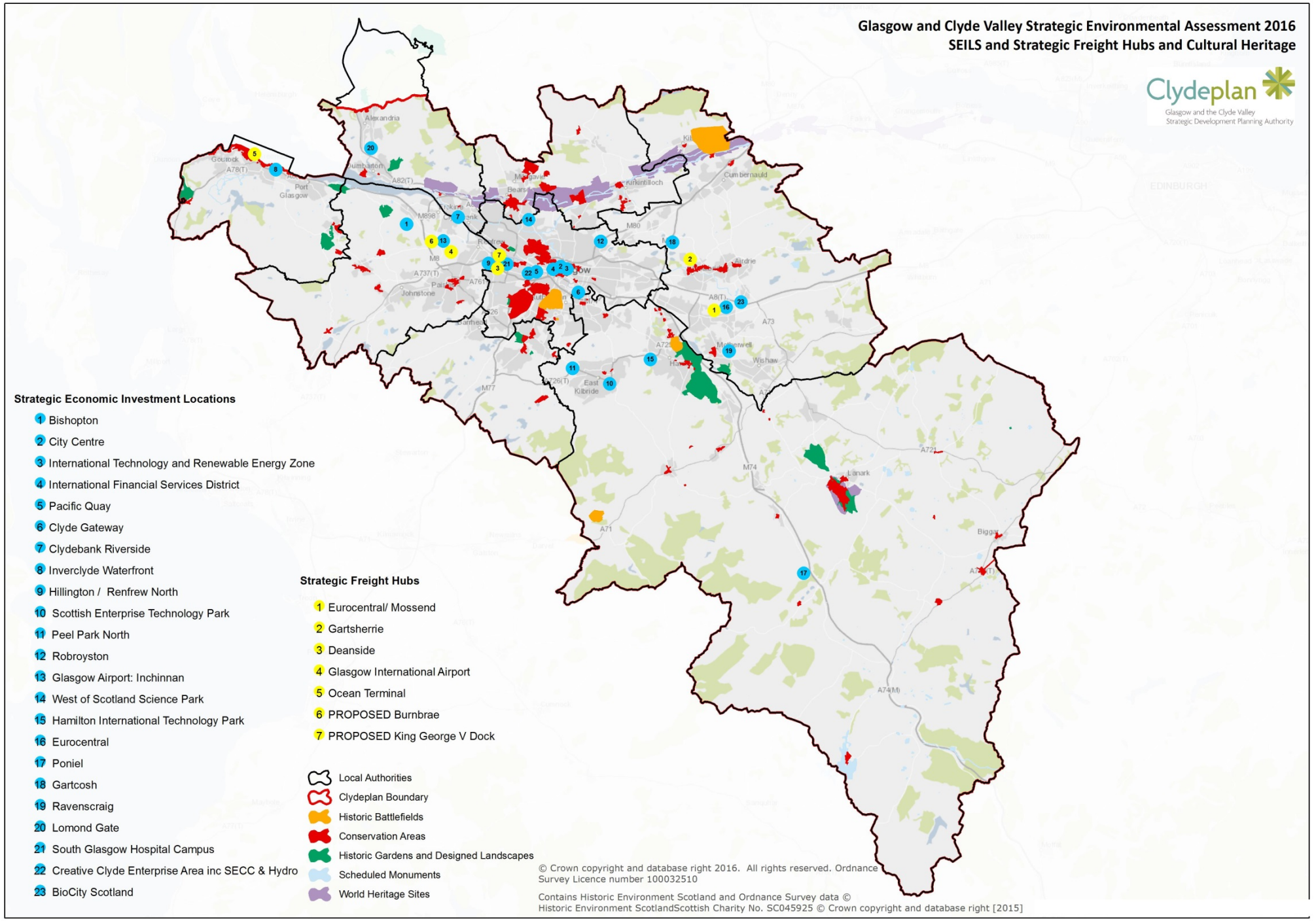
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Cultural Heritage

Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority



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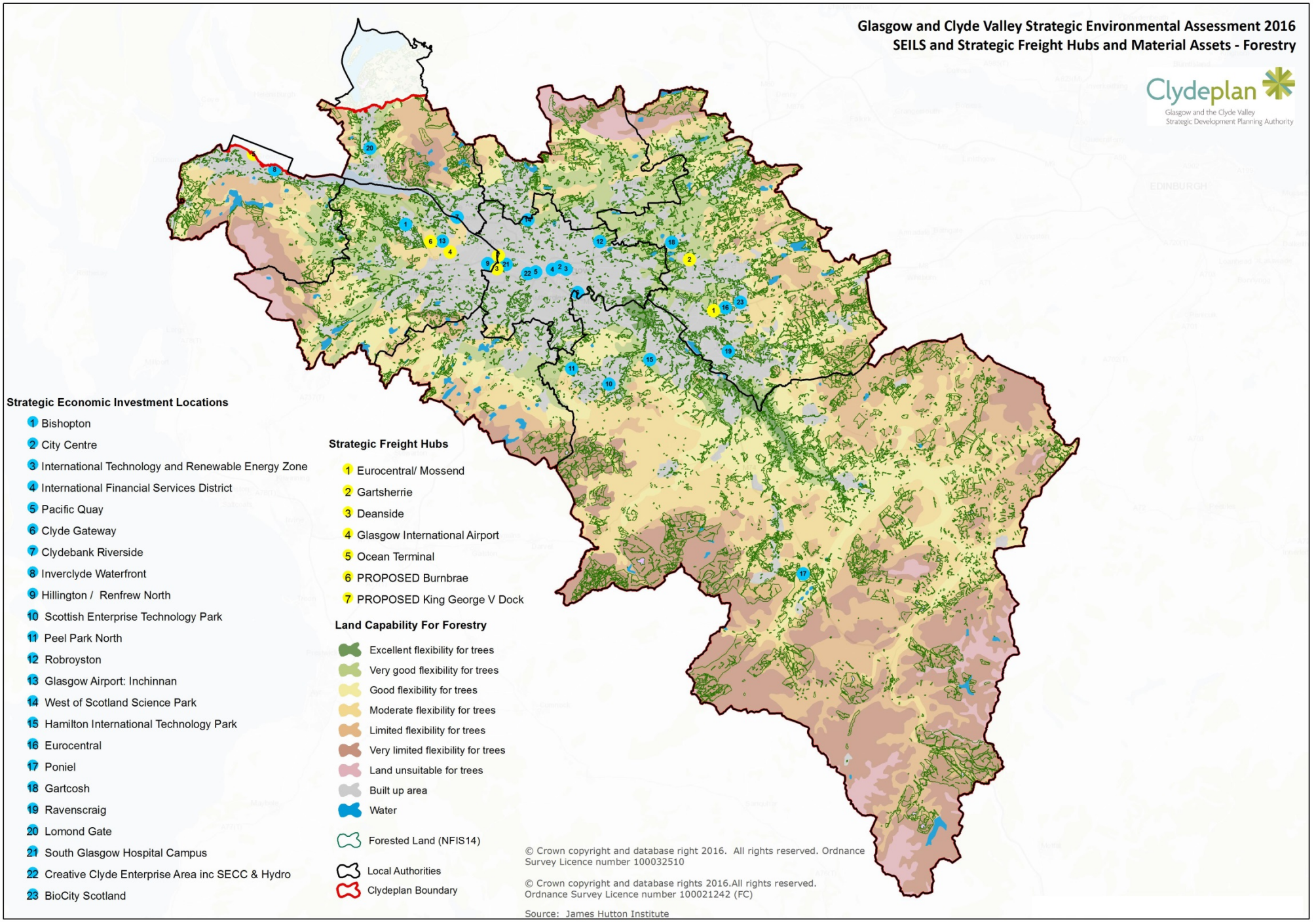
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Material Assets - Forestry
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
6 Clyde Gateway
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19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Land Capability For Forestry
Excellent flexibility for trees
Very good flexibility for trees
Good flexibility for trees
Moderate flexibility for trees
Limited flexibility for trees
Very limited flexibility for trees
Land unsuitable for trees
Built up area
Water
Forested Land (NFIS14)
Local Authorities
Clydeplan Boundary
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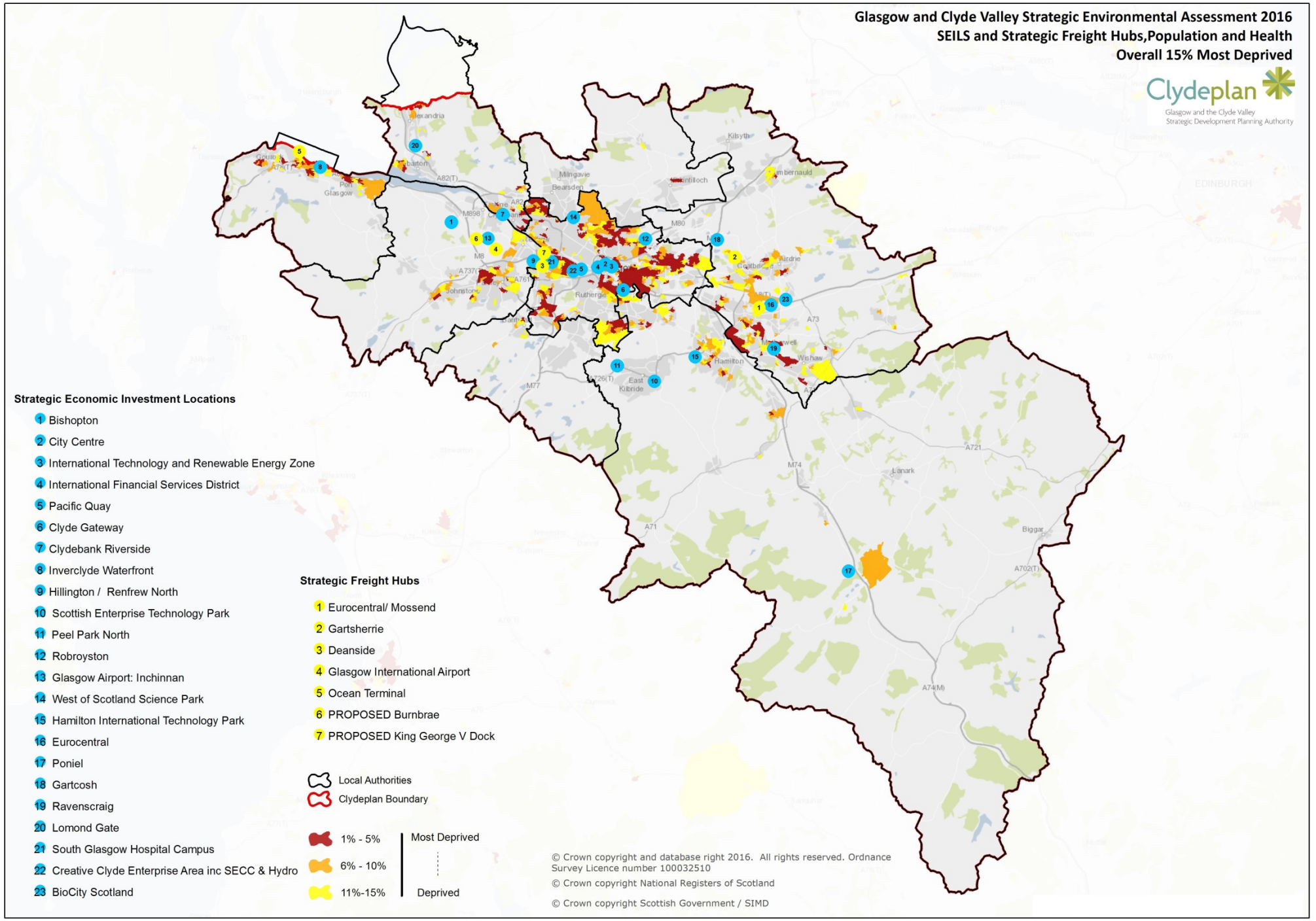
Source: James Hutton Institute


Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs,Population and Health
Overall 15% Most Deprived
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
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1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Local Authorities
Clydeplan Boundary
1% - 5%
6% - 10%
11%-15%
Most Deprived
Deprived
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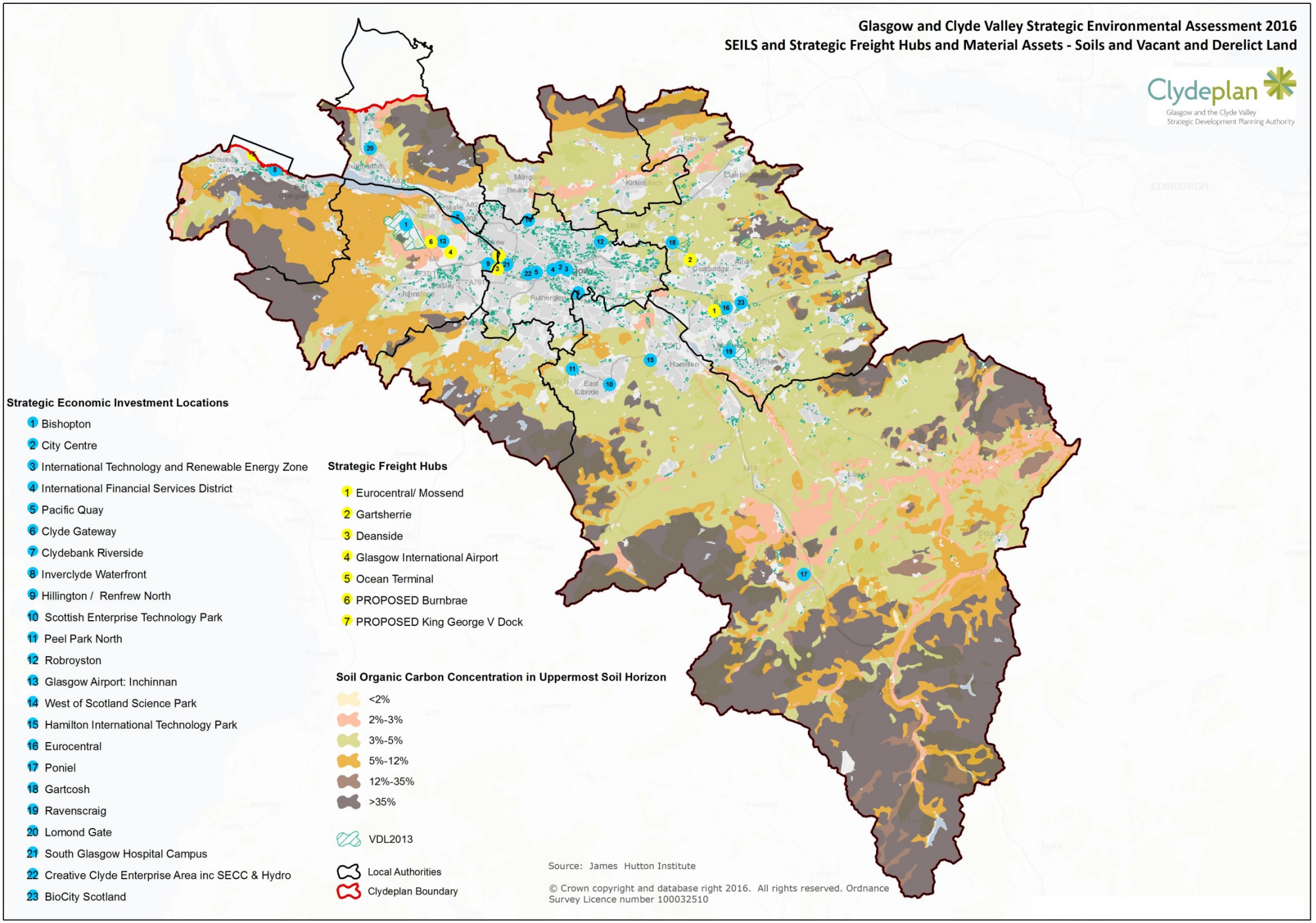
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Material Assets - Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
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6 Clyde Gateway
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16 Eurocentral
17 Poniel
18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
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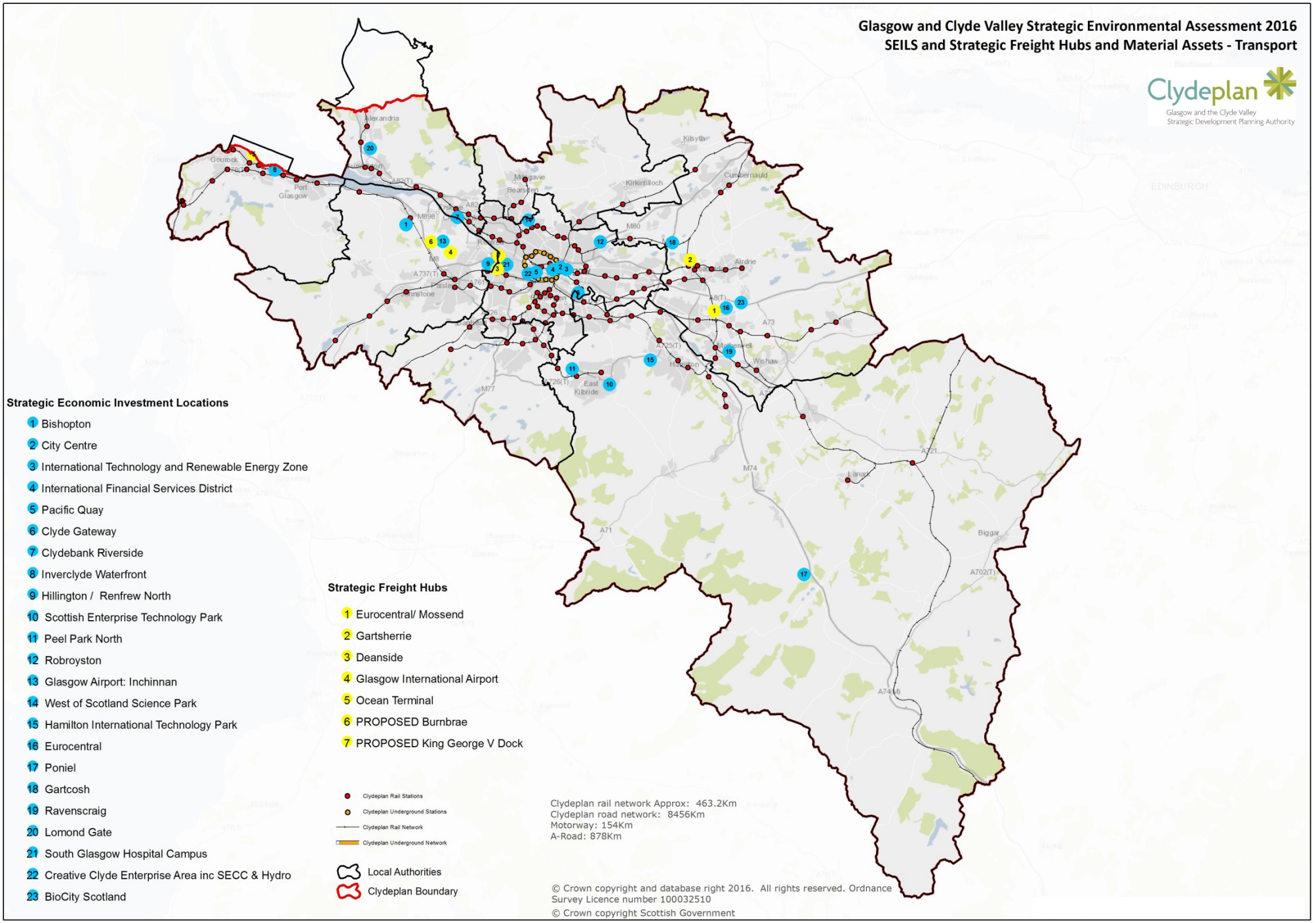
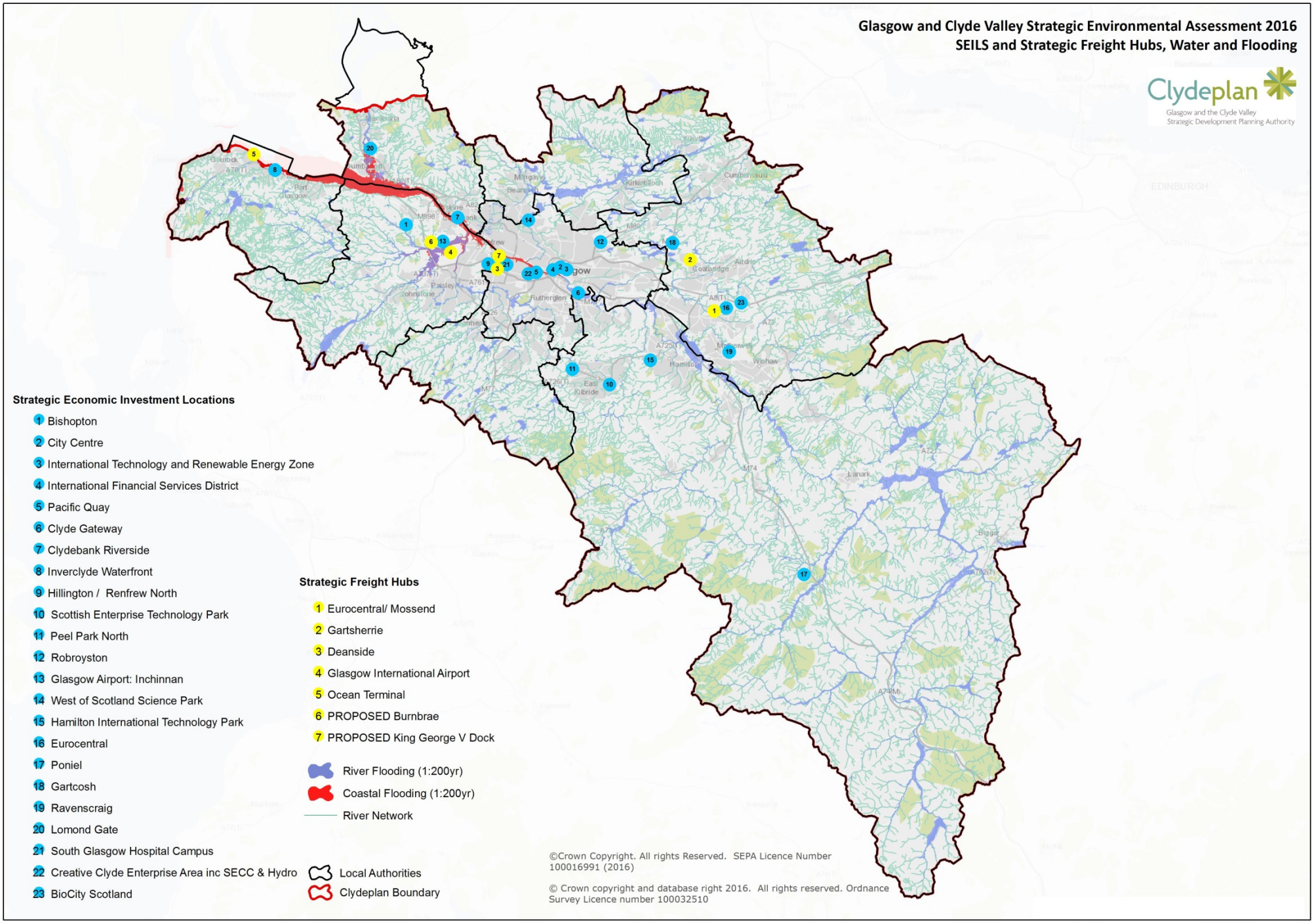
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs and Material Assets - Transport

Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority




Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs, Water and Flooding
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
6 Clyde Gateway
7 Clydebank Riverside
8 Inverclyde Waterfront
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13 Glasgow Airport: Inchinnan
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16 Eurocentral
17 Poniel
18 Gartcosh
19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
River Flooding (1:200yr)
Coastal Flooding (1:200yr)
River Network
Local Authorities
Clydeplan Boundary
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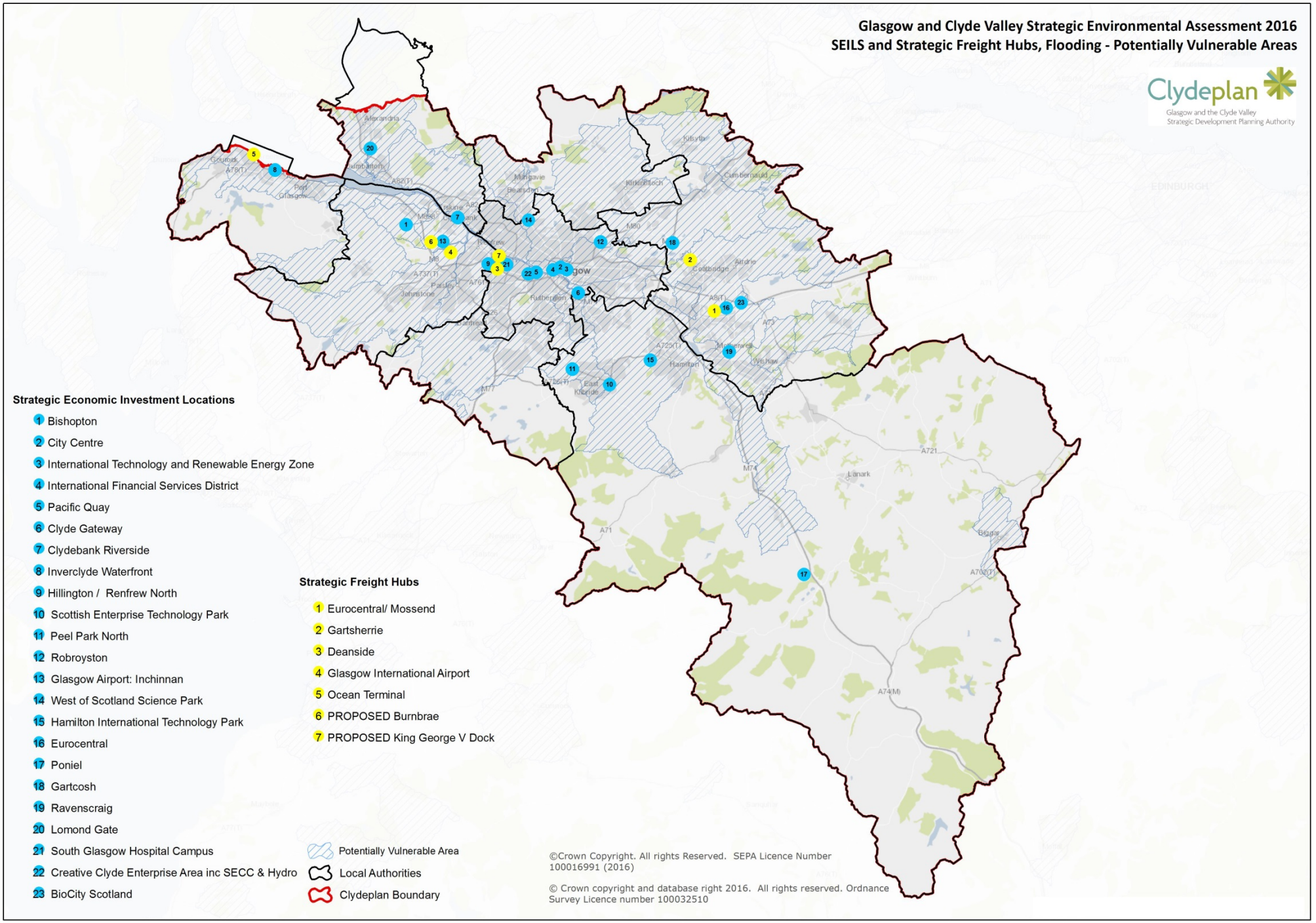
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
SEILS and Strategic Freight Hubs, Flooding - Potentially Vulnerable Areas
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Economic Investment Locations
1 Bishopton
2 City Centre
3 International Technology and Renewable Energy Zone
4 International Financial Services District
5 Pacific Quay
6 Clyde Gateway
7 Clydebank Riverside
8 Inverclyde Waterfront
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19 Ravenscraig
20 Lomond Gate
21 South Glasgow Hospital Campus
22 Creative Clyde Enterprise Area inc SECC & Hydro
23 BioCity Scotland
Strategic Freight Hubs
1 Eurocentral/ Mossend
2 Gartsherrie
3 Deanside
4 Glasgow International Airport
5 Ocean Terminal
6 PROPOSED Burnbrae
7 PROPOSED King George V Dock
Potentially Vulnerable Area
Local Authorities
Clydeplan Boundary
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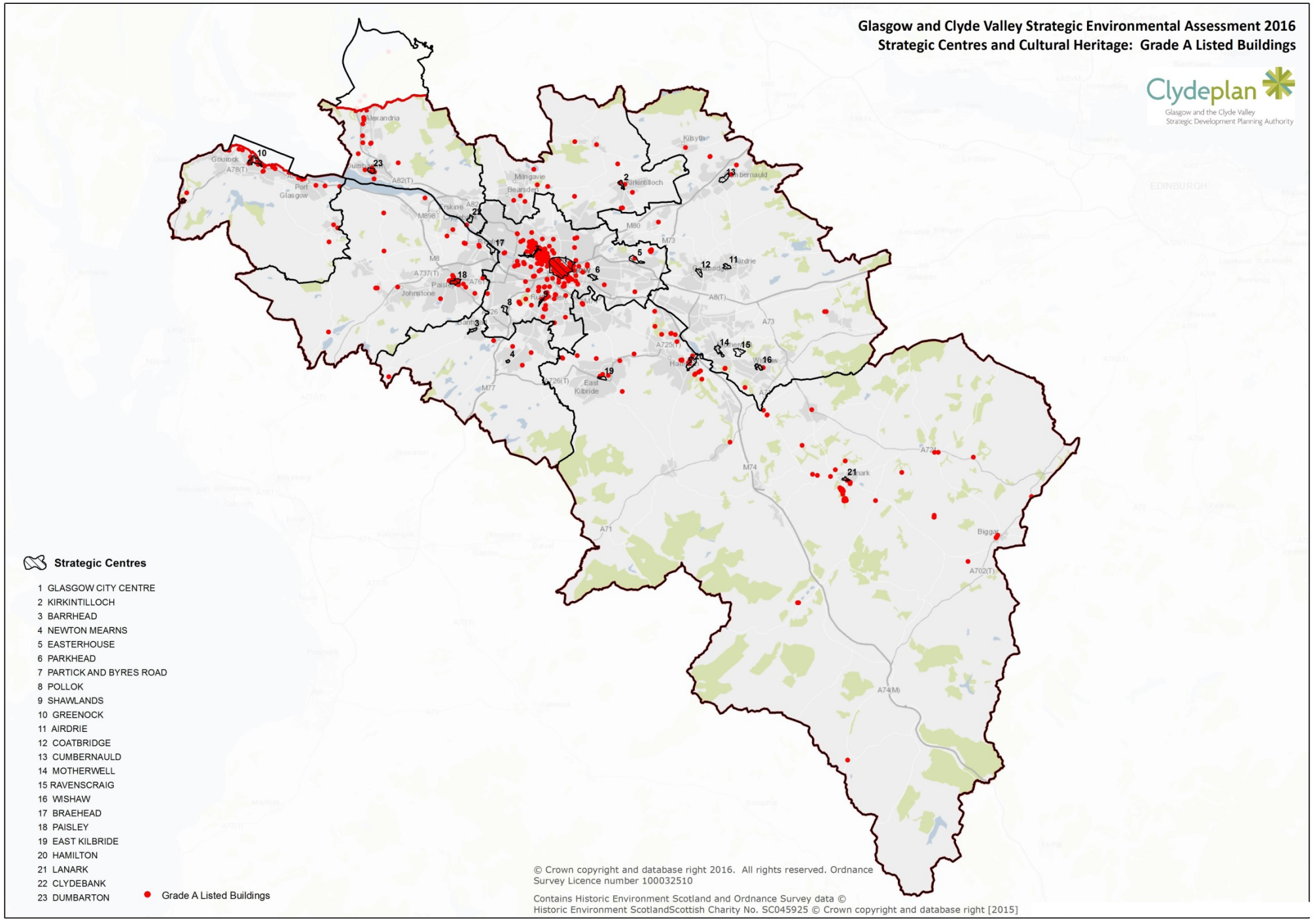
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Cultural Heritage: Grade A Listed Buildings
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
5 EASTERHOUSE
6 PARKHEAD
7 PARTICK AND BYRES ROAD
8 POLLOK
9 SHAWLANDS
10 GREENOCK
11 AIRDRIE
12 COATBRIDGE
13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Grade A Listed Buildings
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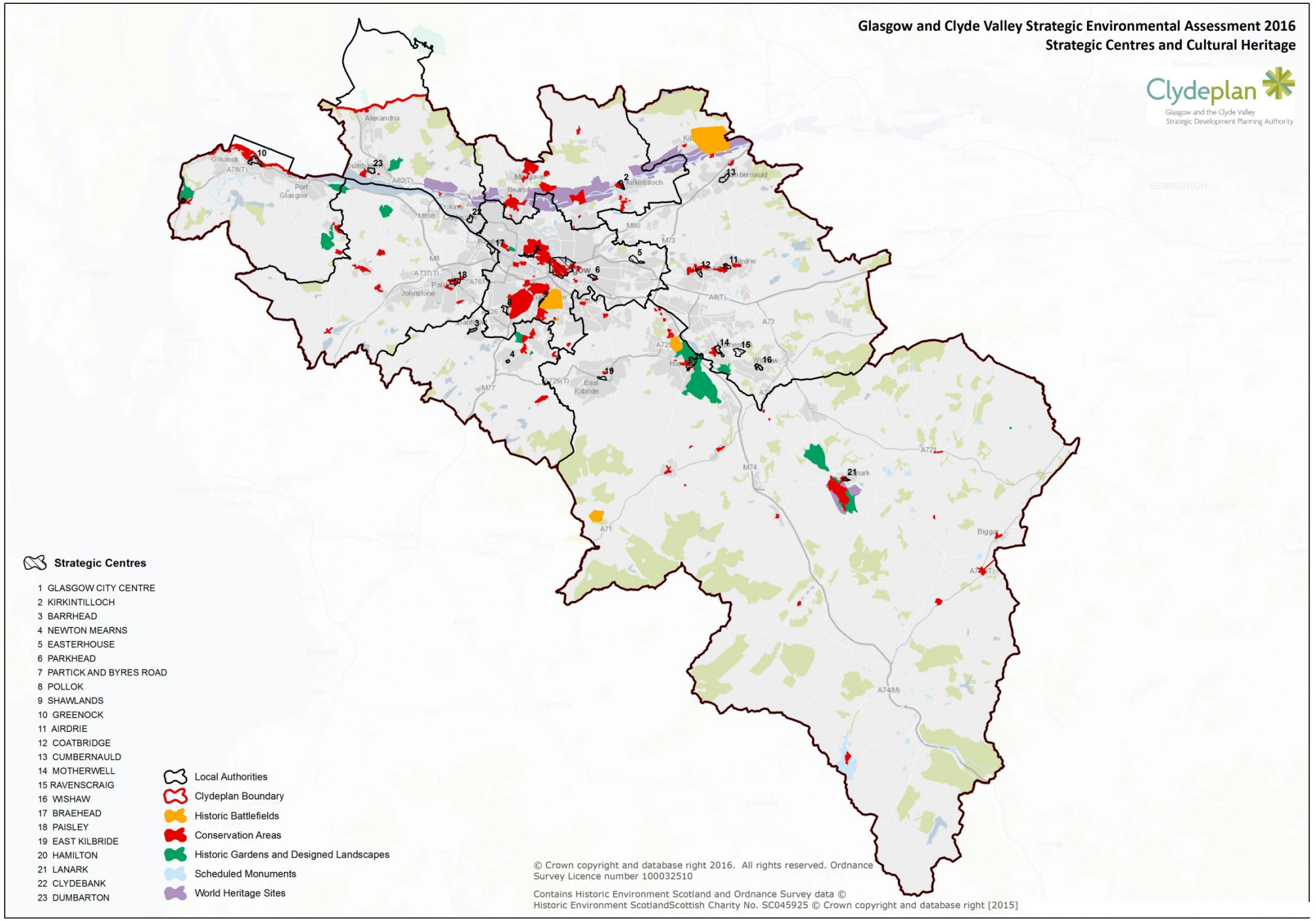
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Cultural Heritage
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
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13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Local Authorities
Clydeplan Boundary
Historic Battlefields
Conservation Areas
Historic Gardens and Designed Landscapes
Scheduled Monuments
World Heritage Sites
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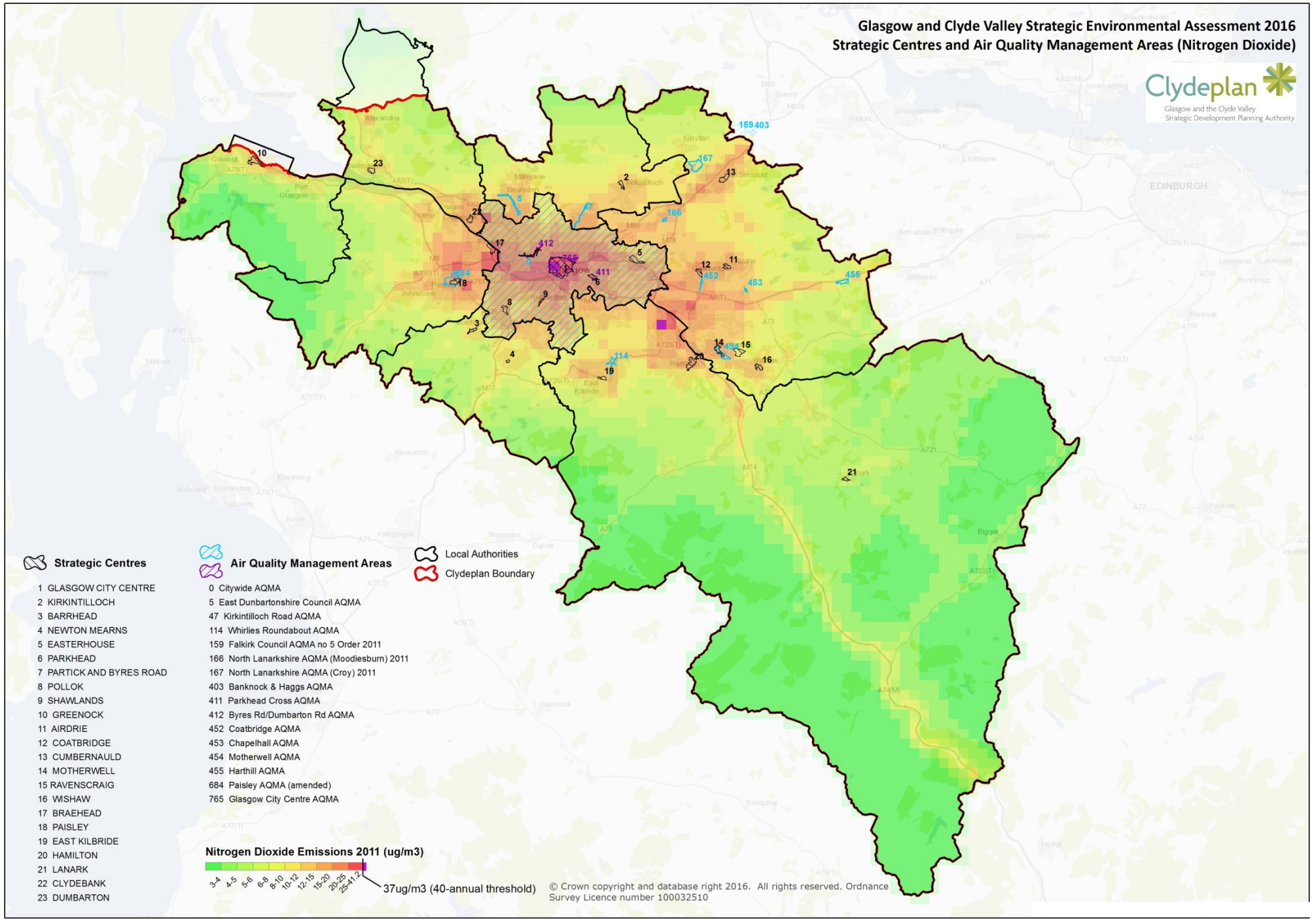
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Air Quality Management Areas (Nitrogen Dioxide)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
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20 HAMILTON
21 LANARK
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23 DUMBARTON
Air Quality Management Areas
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412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Nitrogen Dioxide Emissions 2011 (ug/m3)
3-4 4-5 5-6 6-8 8-10 10-12 12-15 15-20 20-25 25-41.2
37ug/m3 (40-annual threshold)
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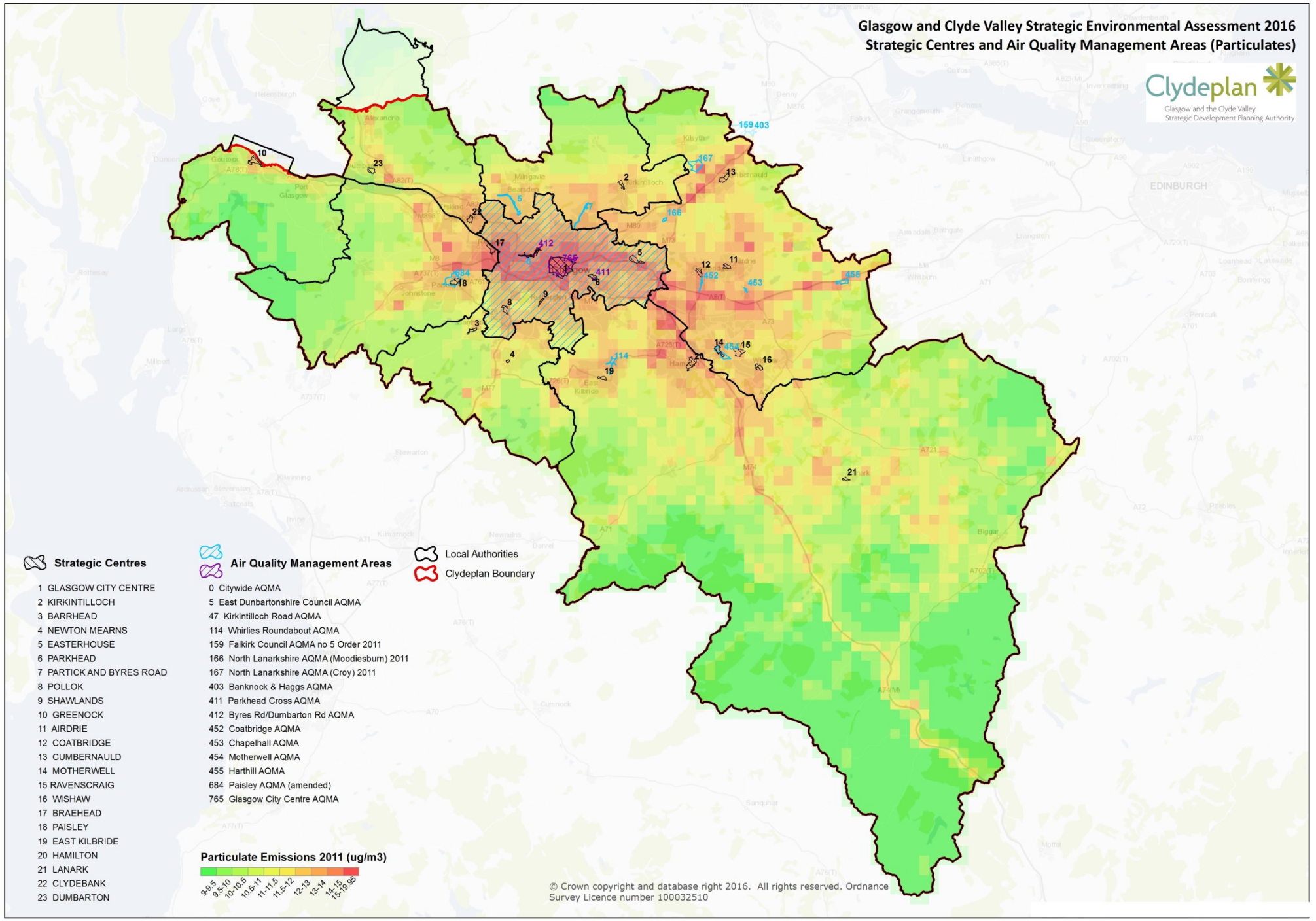
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
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454 Motherwell AQMA
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765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.95
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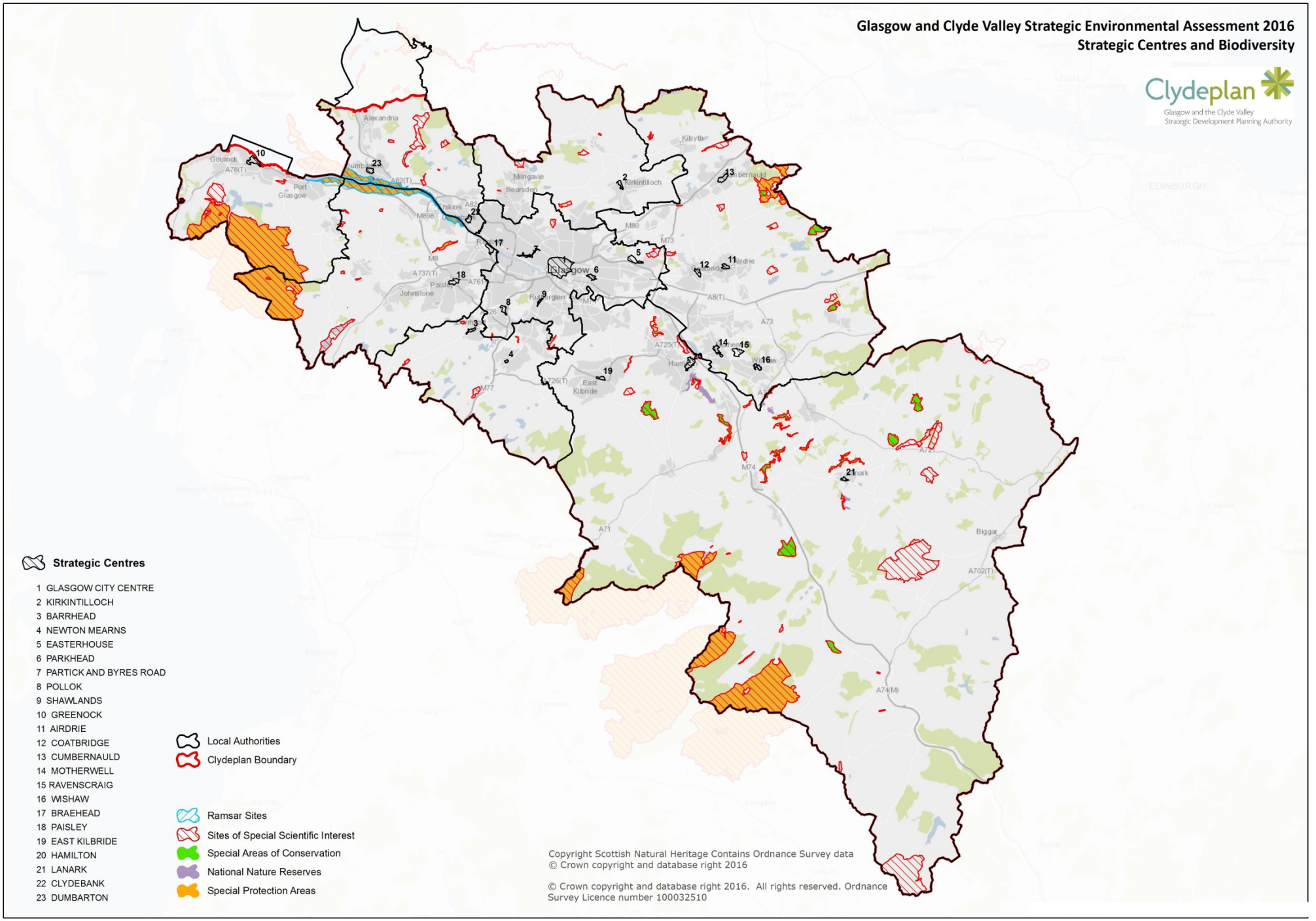
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Biodiversity

Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority



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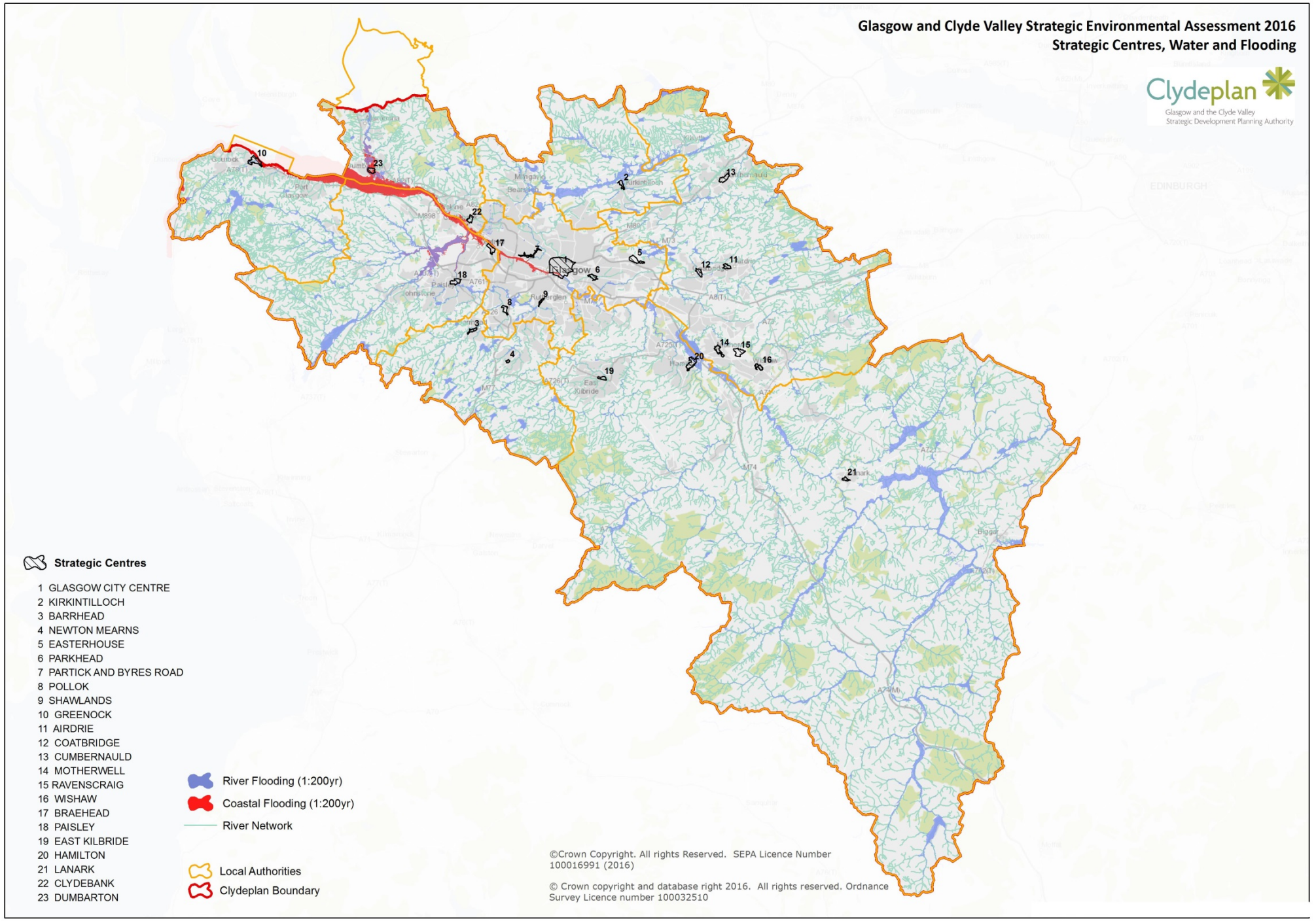
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres, Water and Flooding
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
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13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
River Flooding (1:200yr)
Coastal Flooding (1:200yr)
River Network
Local Authorities
Clydeplan Boundary
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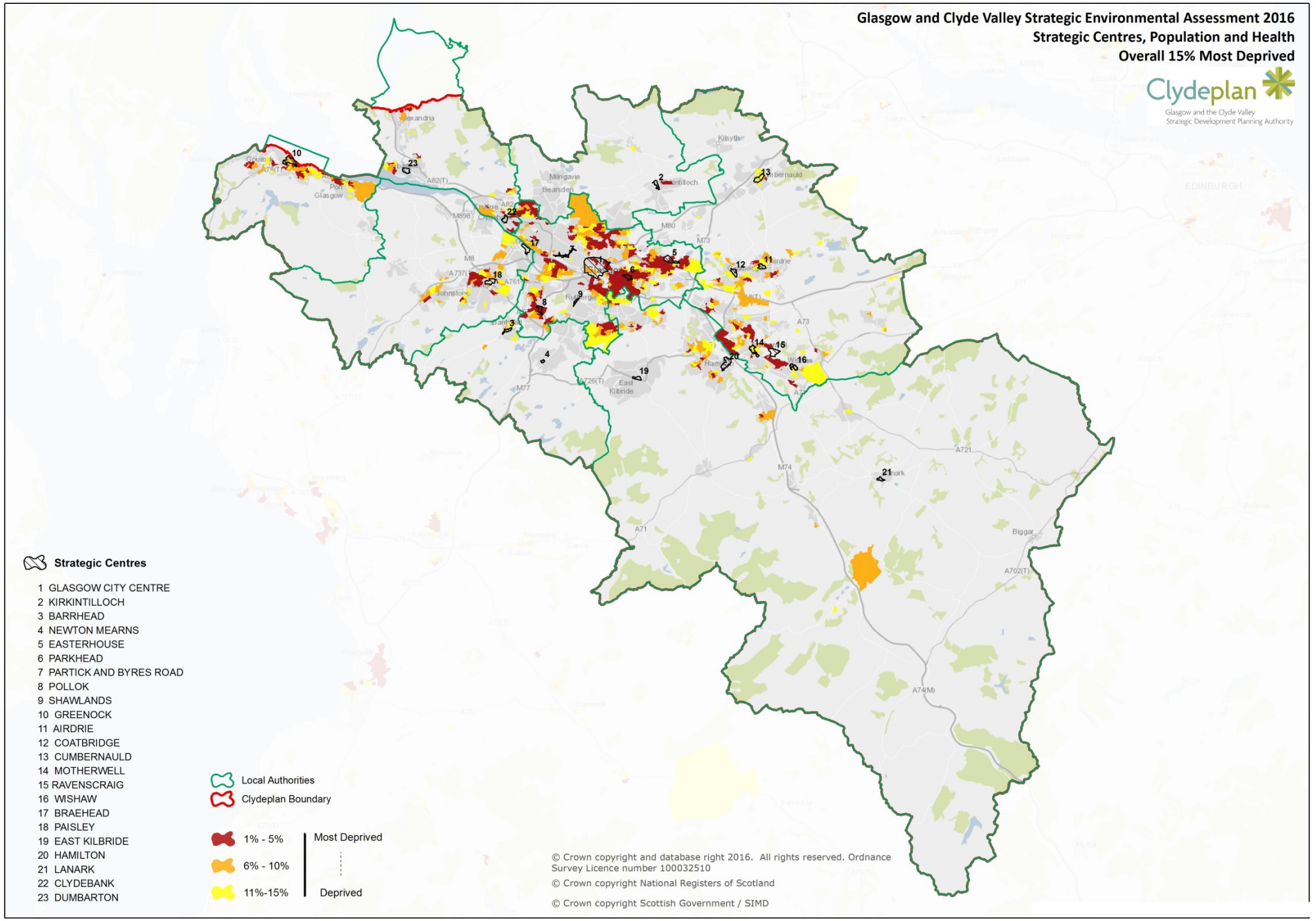
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres, Population and Health
Overall 15% Most Deprived
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
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9 SHAWLANDS
10 GREENOCK
11 AIRDRIE
12 COATBRIDGE
13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Local Authorities
Clydeplan Boundary
1% - 5%
6% - 10%
11%-15%
Most Deprived
Deprived
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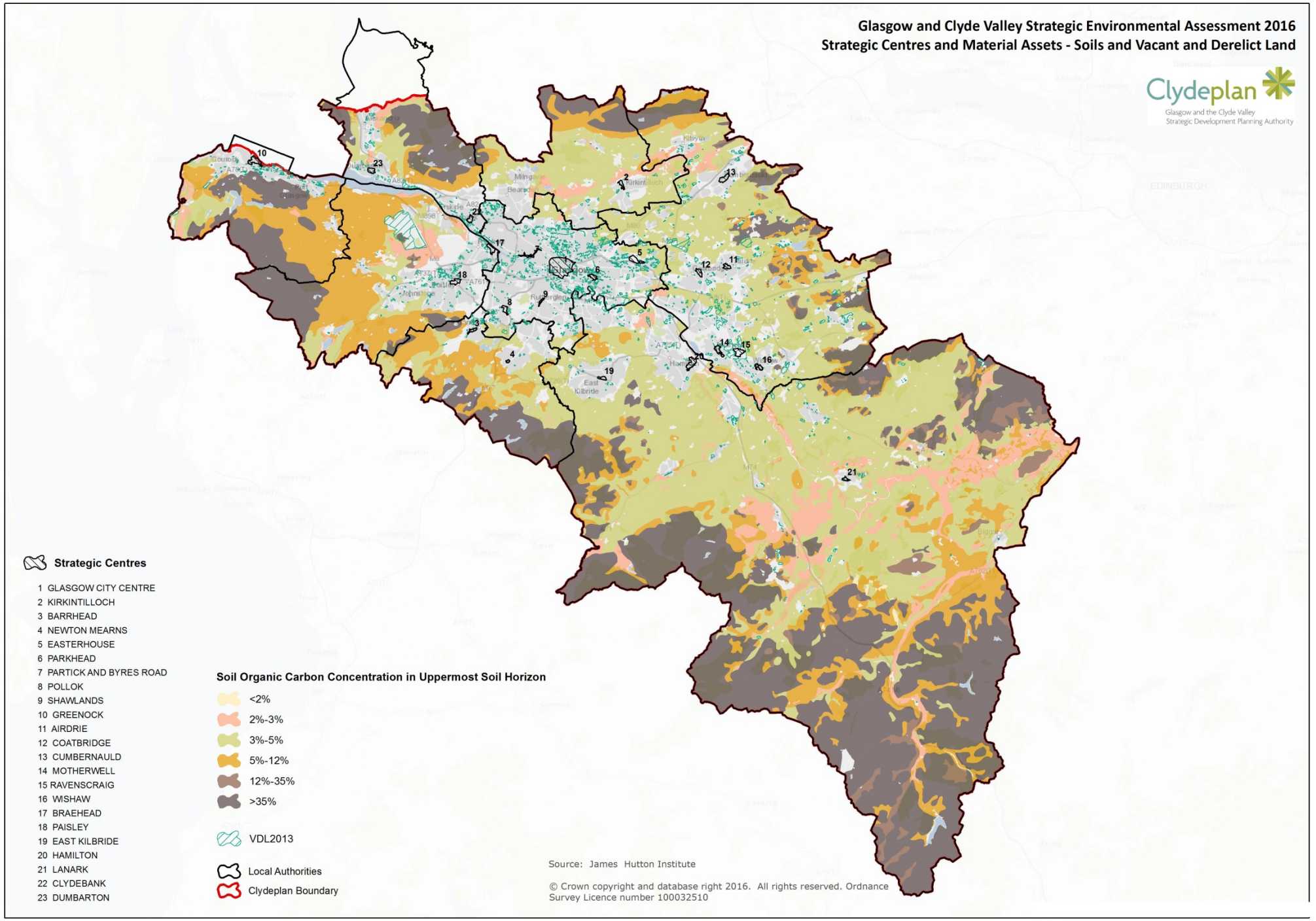
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets - Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
5 EASTERHOUSE
6 PARKHEAD
7 PARTICK AND BYRES ROAD
8 POLLOK
9 SHAWLANDS
10 GREENOCK
11 AIRDRIE
12 COATBRIDGE
13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
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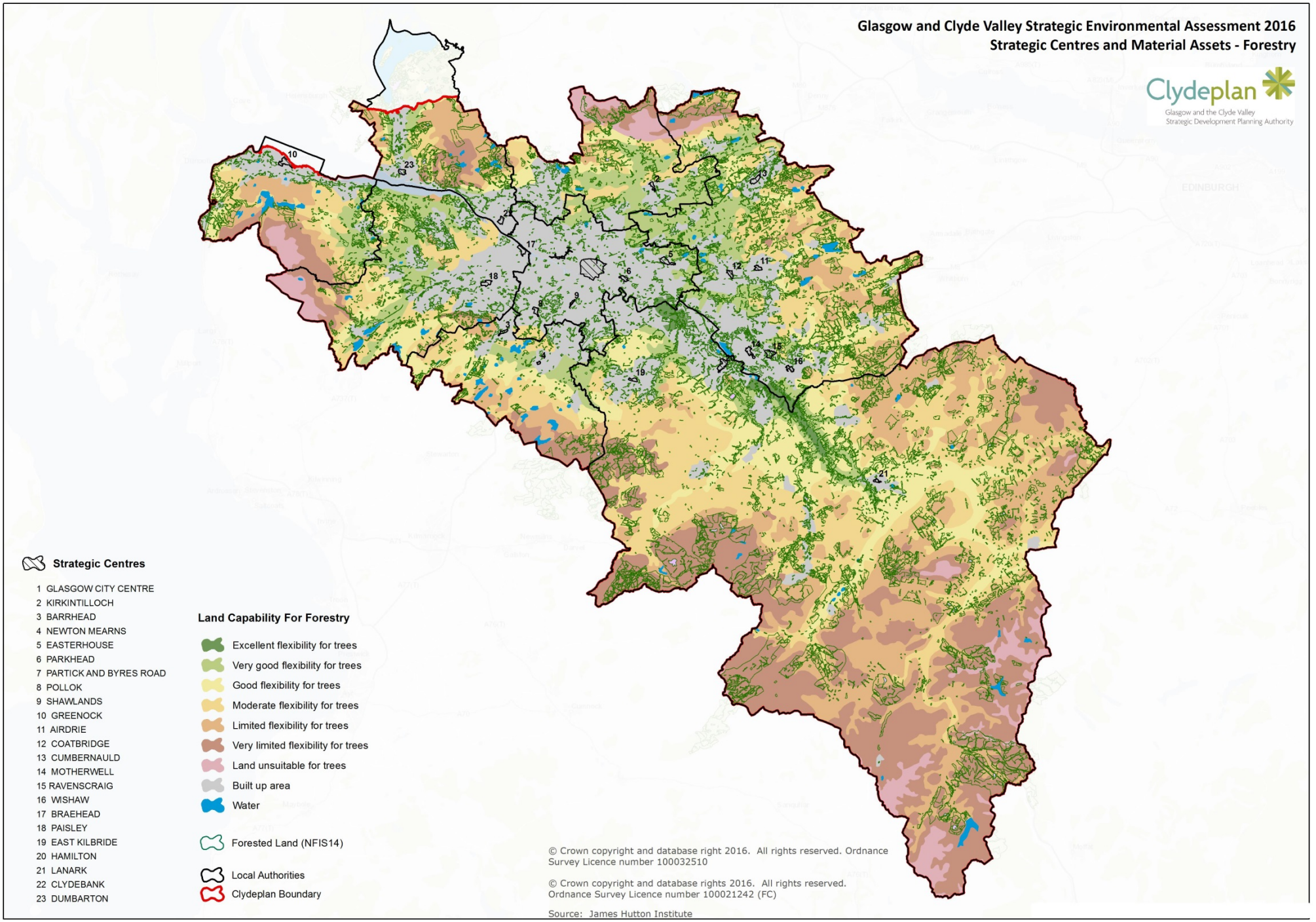
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets - Forestry
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
5 EASTERHOUSE
6 PARKHEAD
7 PARTICK AND BYRES ROAD
8 POLLOK
9 SHAWLANDS
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12 COATBRIDGE
13 CUMBERNAULD
14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Land Capability For Forestry
Excellent flexibility for trees
Very good flexibility for trees
Good flexibility for trees
Moderate flexibility for trees
Limited flexibility for trees
Very limited flexibility for trees
Land unsuitable for trees
Built up area
Water
Forested Land (NFIS14)
Local Authorities
Clydeplan Boundary
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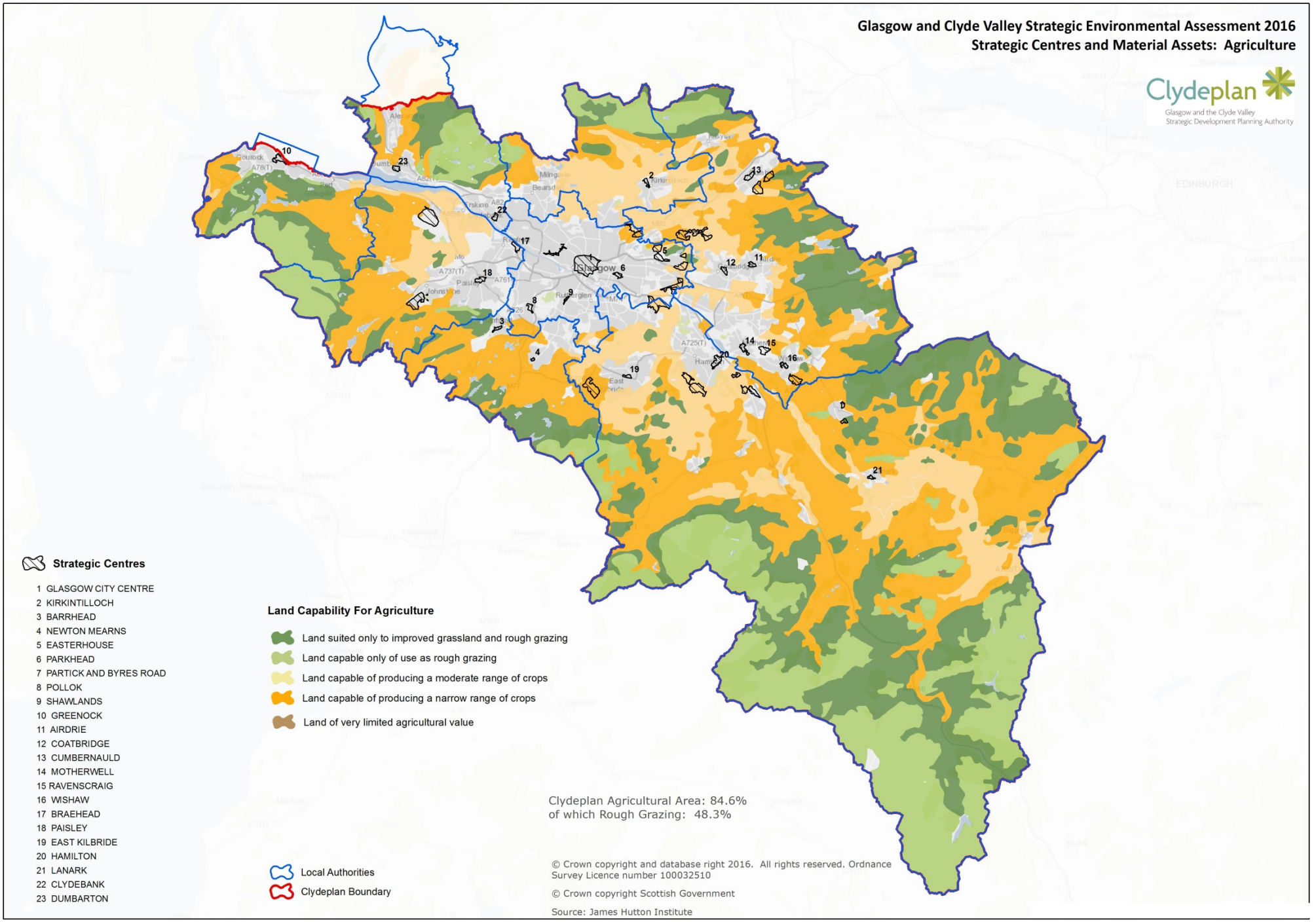
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets: Agriculture
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
5 EASTERHOUSE
6 PARKHEAD
7 PARTICK AND BYRES ROAD
8 POLLOK
9 SHAWLANDS
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15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
Local Authorities
Clydeplan Boundary
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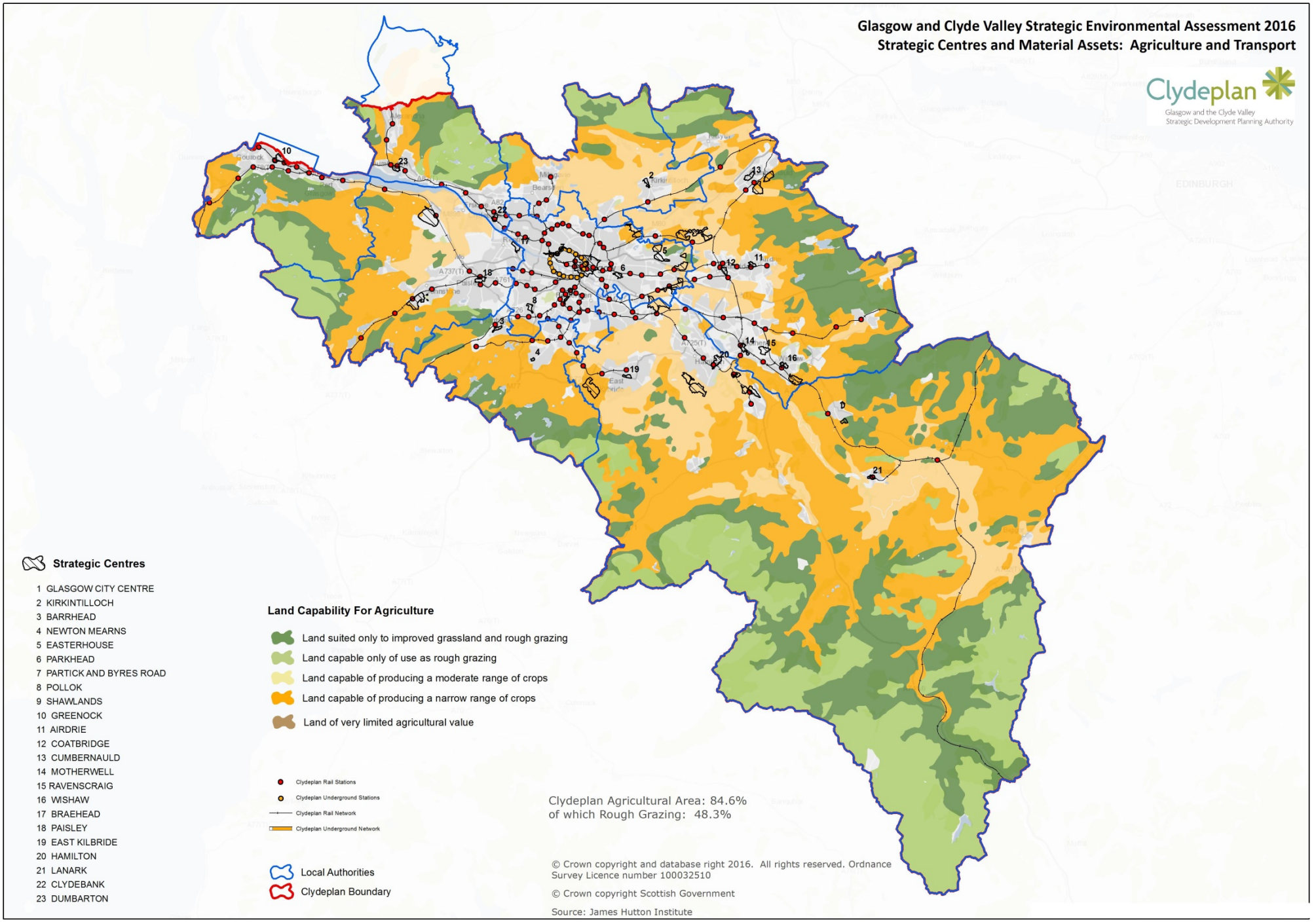
Source: James Hutton Institute


Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets: Agriculture and Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
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4 NEWTON MEARNS
5 EASTERHOUSE
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16 WISHAW
17 BRAEHEAD
18 PAISLEY
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20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan Agricultural Area: 84.6%
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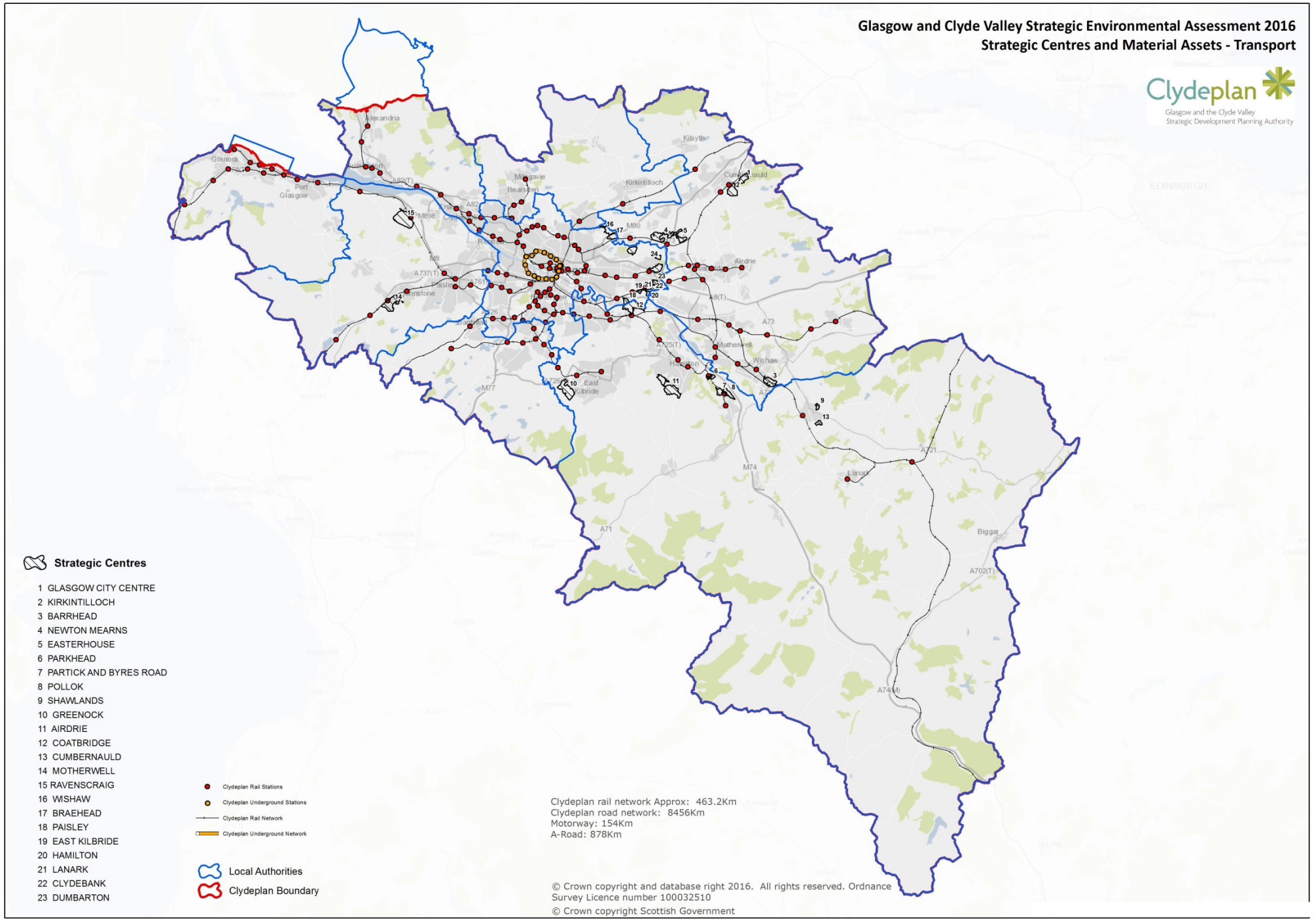
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets - Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
1 GLASGOW CITY CENTRE
2 KIRKINTILLOCH
3 BARRHEAD
4 NEWTON MEARNS
5 EASTERHOUSE
6 PARKHEAD
7 PARTICK AND BYRES ROAD
8 POLLOK
9 SHAWLANDS
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11 AIRDRIE
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14 MOTHERWELL
15 RAVENSCRAIG
16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan rail network Approx: 463.2Km
Clydeplan road network: 8456Km
Motorway: 154Km
A-Road: 878Km
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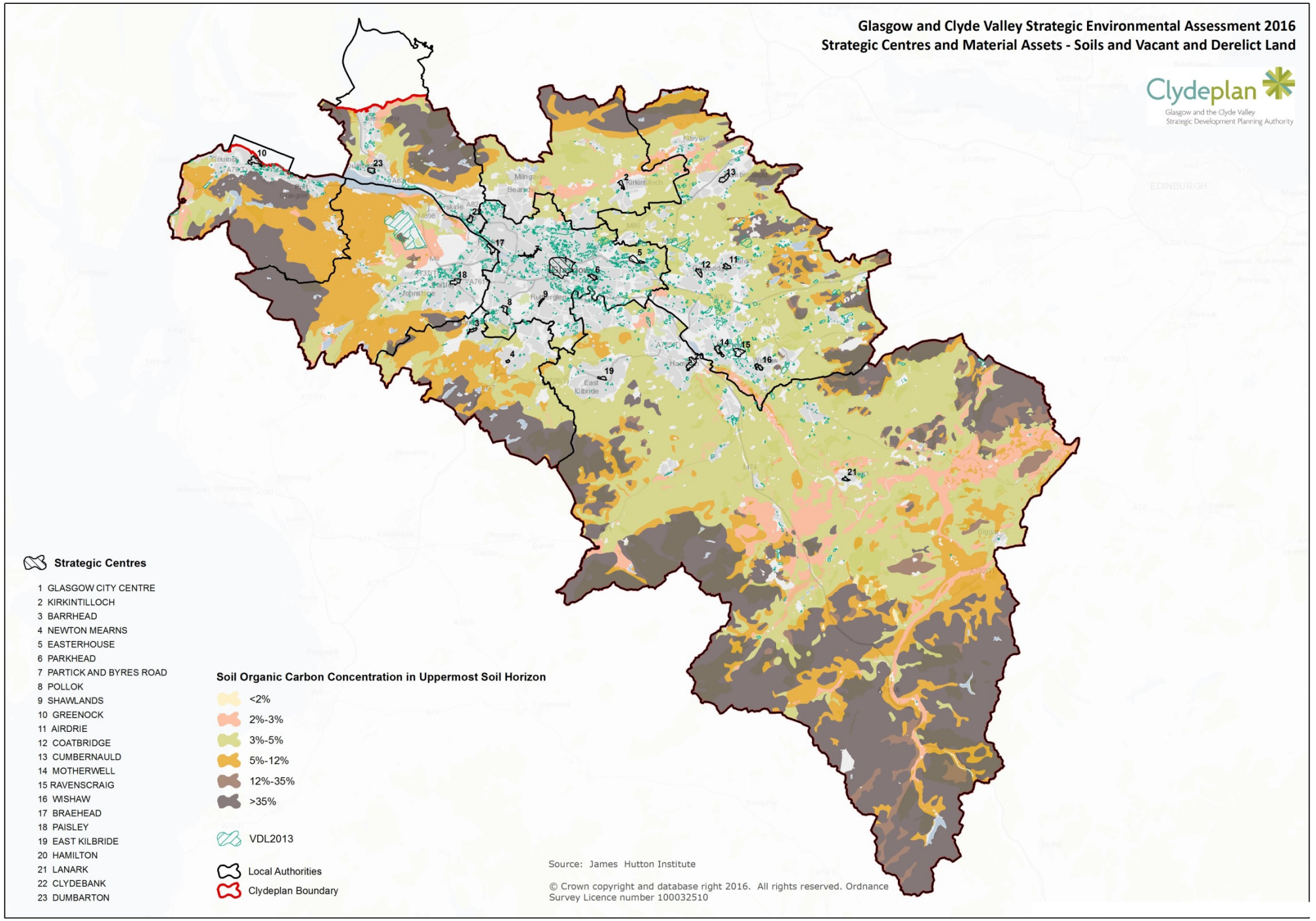
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Strategic Centres and Material Assets - Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Strategic Centres
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16 WISHAW
17 BRAEHEAD
18 PAISLEY
19 EAST KILBRIDE
20 HAMILTON
21 LANARK
22 CLYDEBANK
23 DUMBARTON
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
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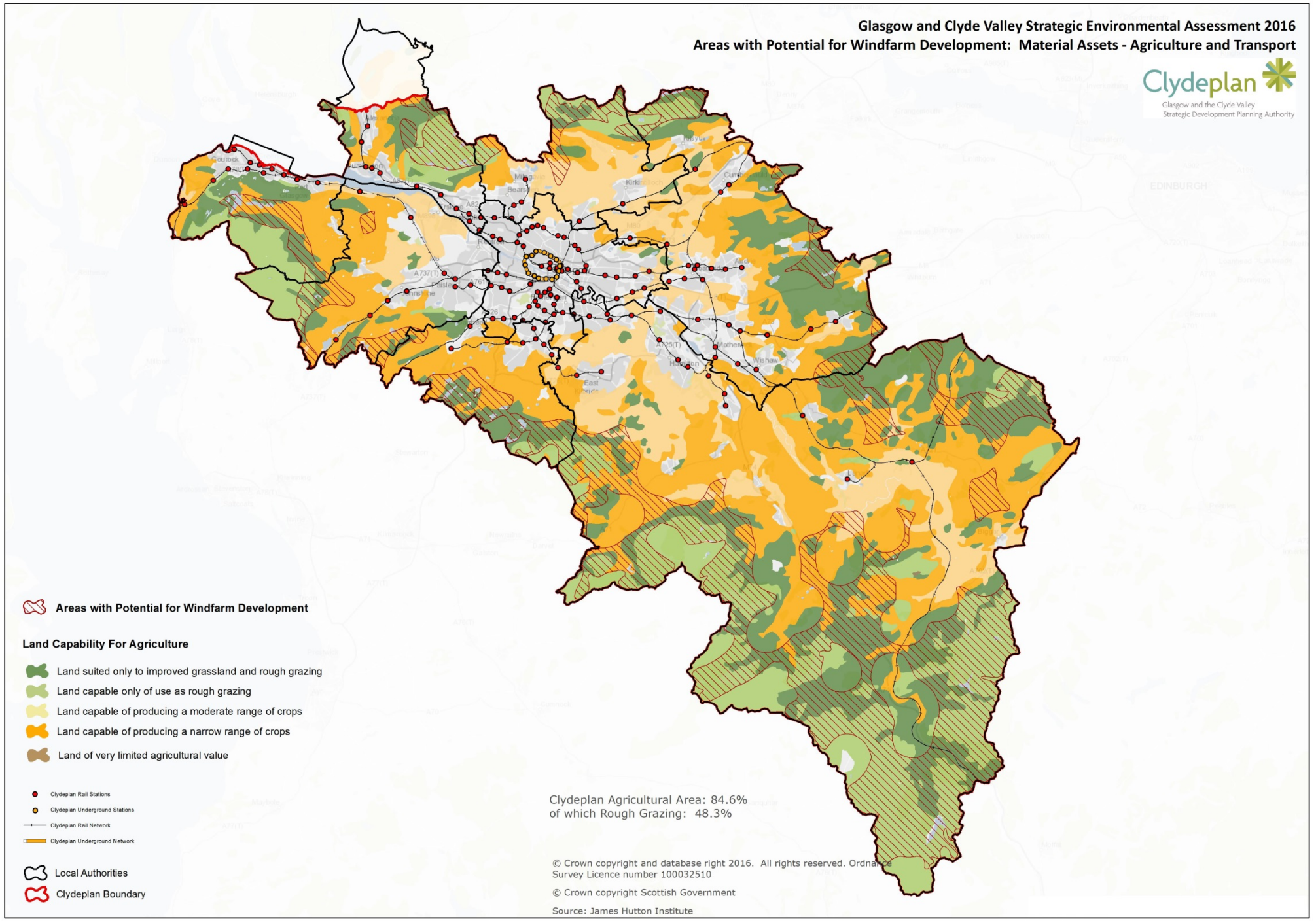
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development: Material Assets - Agriculture and Transport
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
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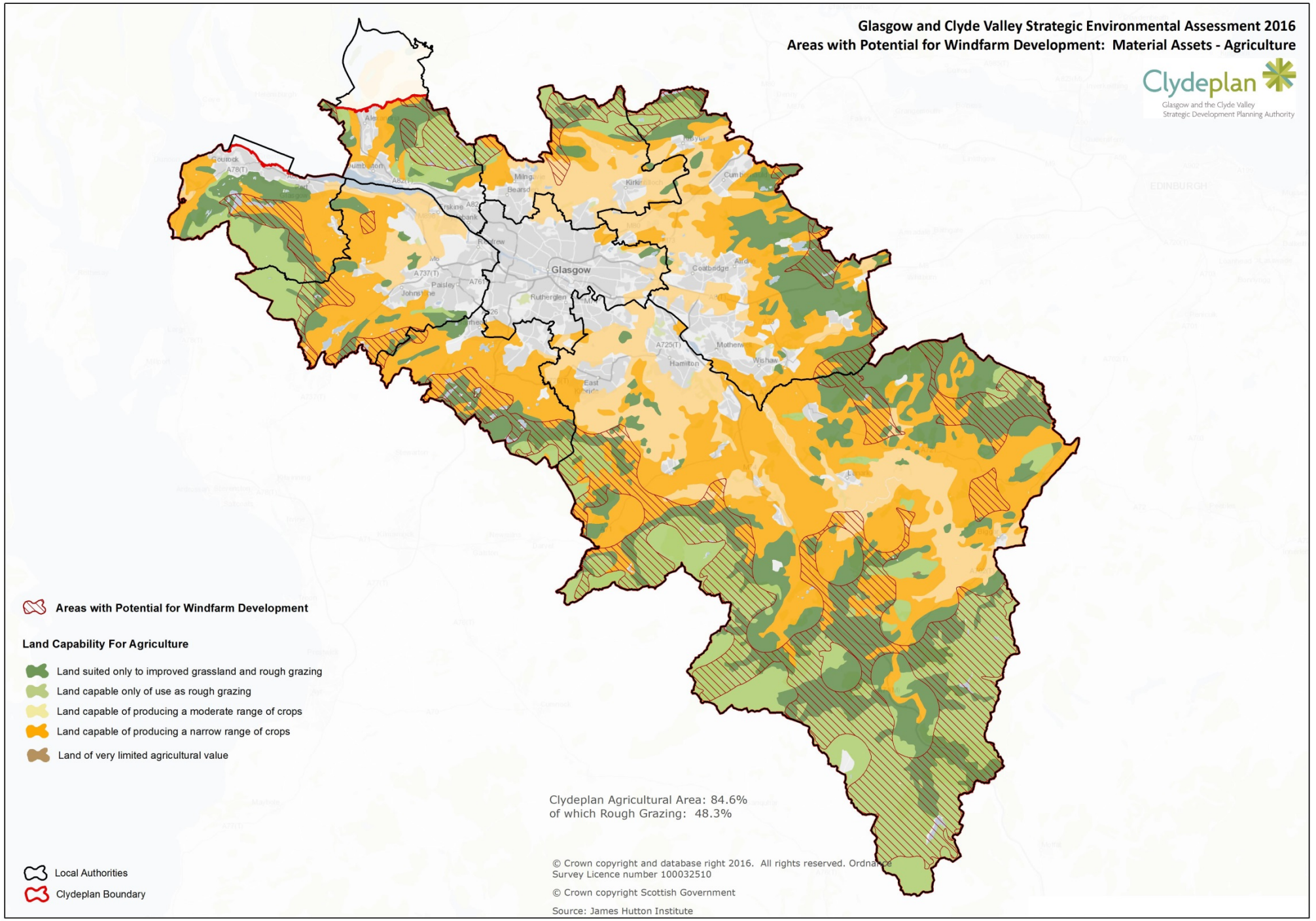
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development: Material Assets - Agriculture
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
Local Authorities
Clydeplan Boundary
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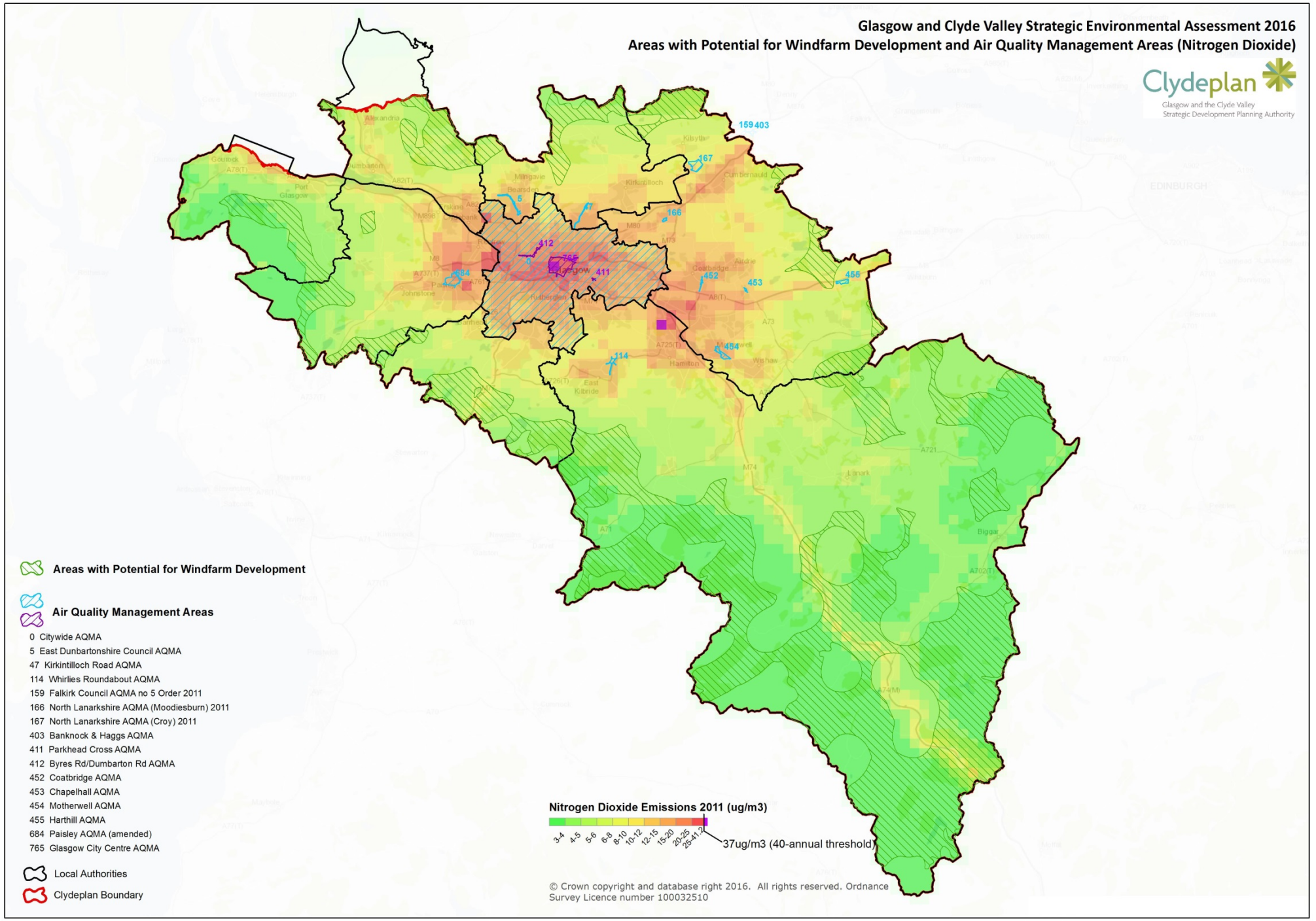
Source: James Hutton Institute
Glasgow
Paisley
Coatbridge
Hamilton
Motherwell
Wishaw
Rutherglen
EDINBURGH


Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Air Quality Management Areas (Nitrogen Dioxide)
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
159
403
167
166
412
765
411
684
452
453
456
454
114
5
47
Areas with Potential for Windfarm Development
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Nitrogen Dioxide Emissions 2011 (ug/m3)
3-4 4-5 5-6 6-8 8-10 10-12 12-15 15-20 20-25 25-41.2
37ug/m3 (40-annual threshold)
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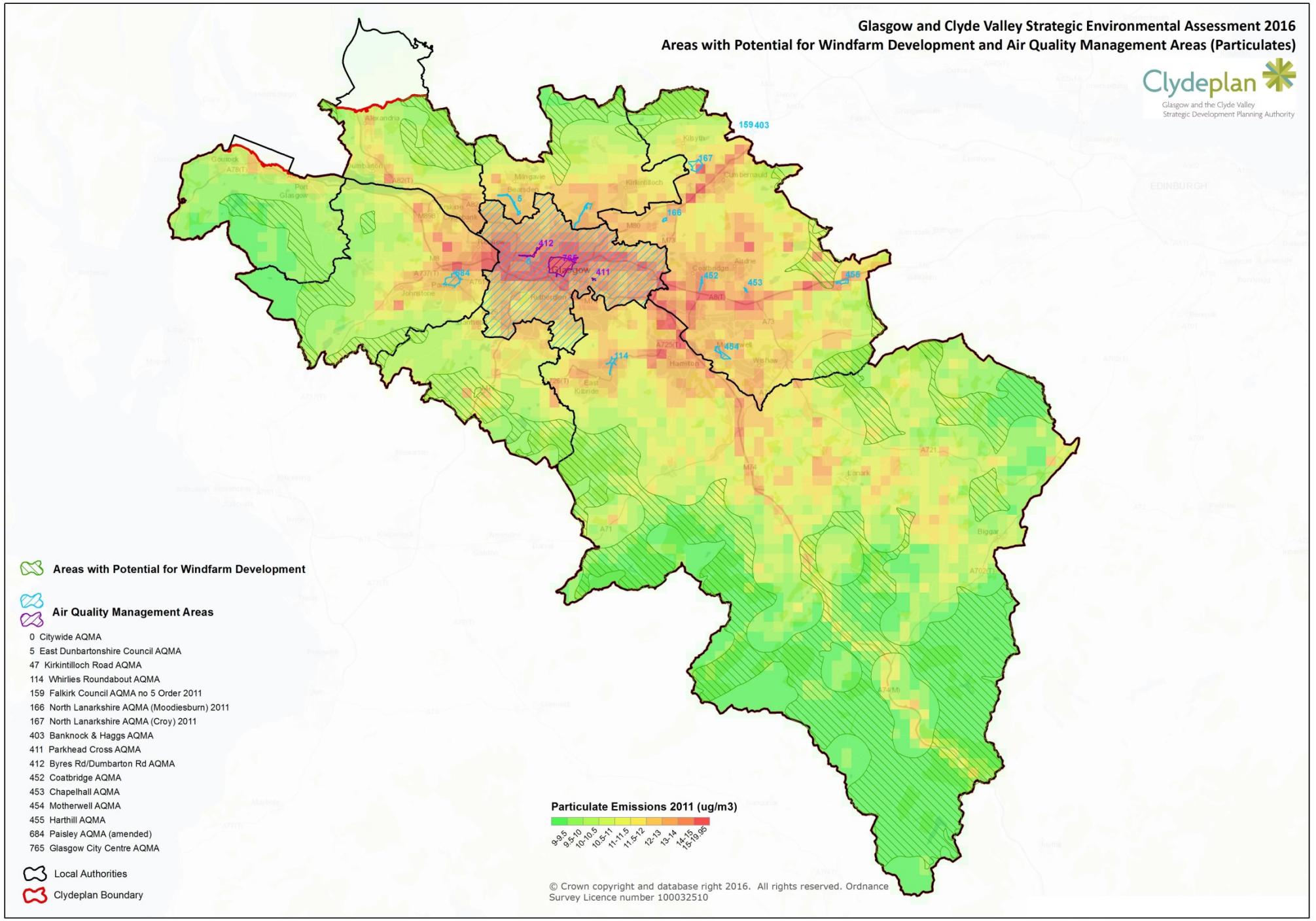
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Air Quality Management Areas (Particulates)
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.95
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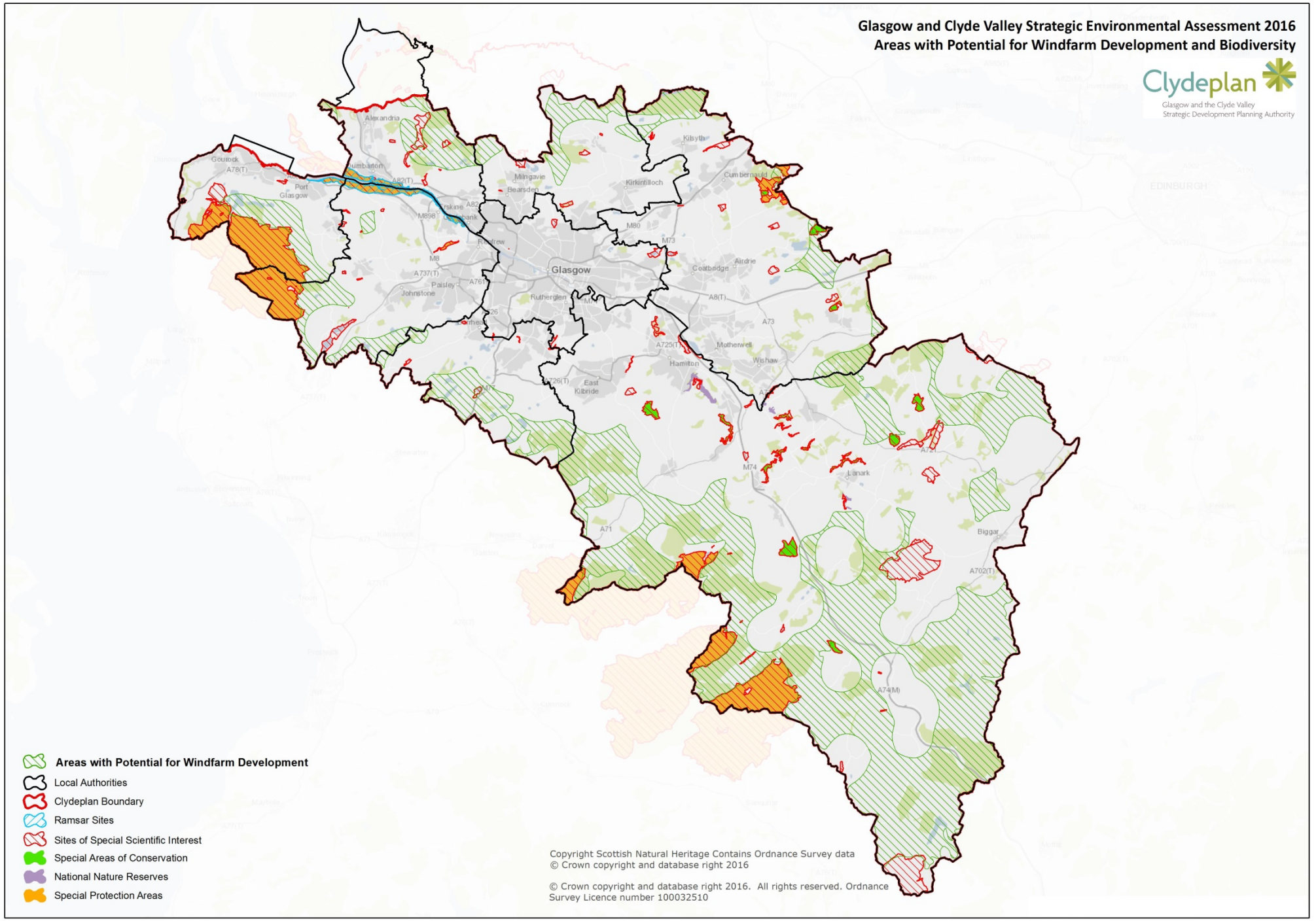
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Biodiversity
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Local Authorities
Clydeplan Boundary
Ramsar Sites
Sites of Special Scientific Interest
Special Areas of Conservation
National Nature Reserves
Special Protection Areas
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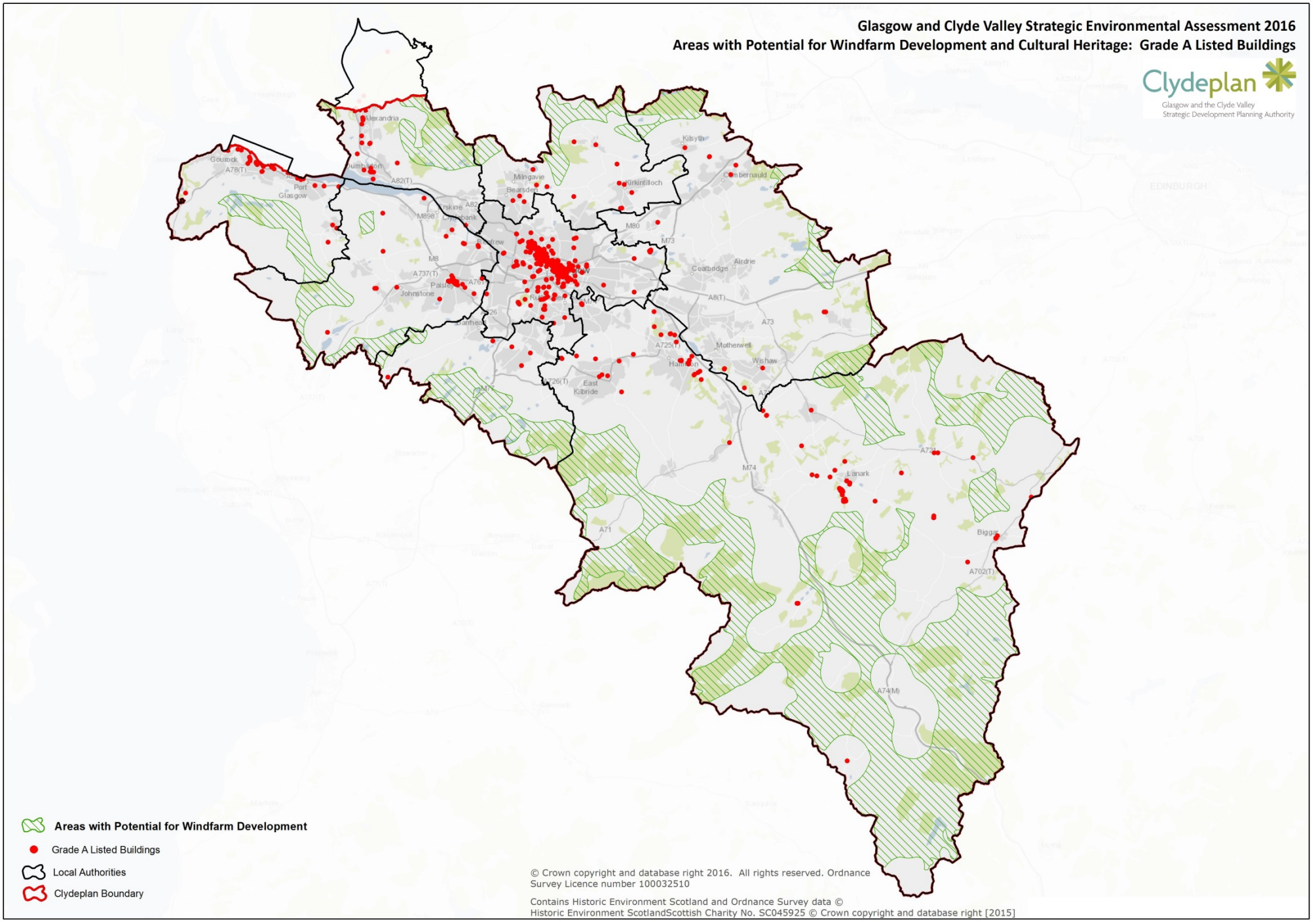
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Cultural Heritage: Grade A Listed Buildings
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Grade A Listed Buildings
Local Authorities
Clydeplan Boundary
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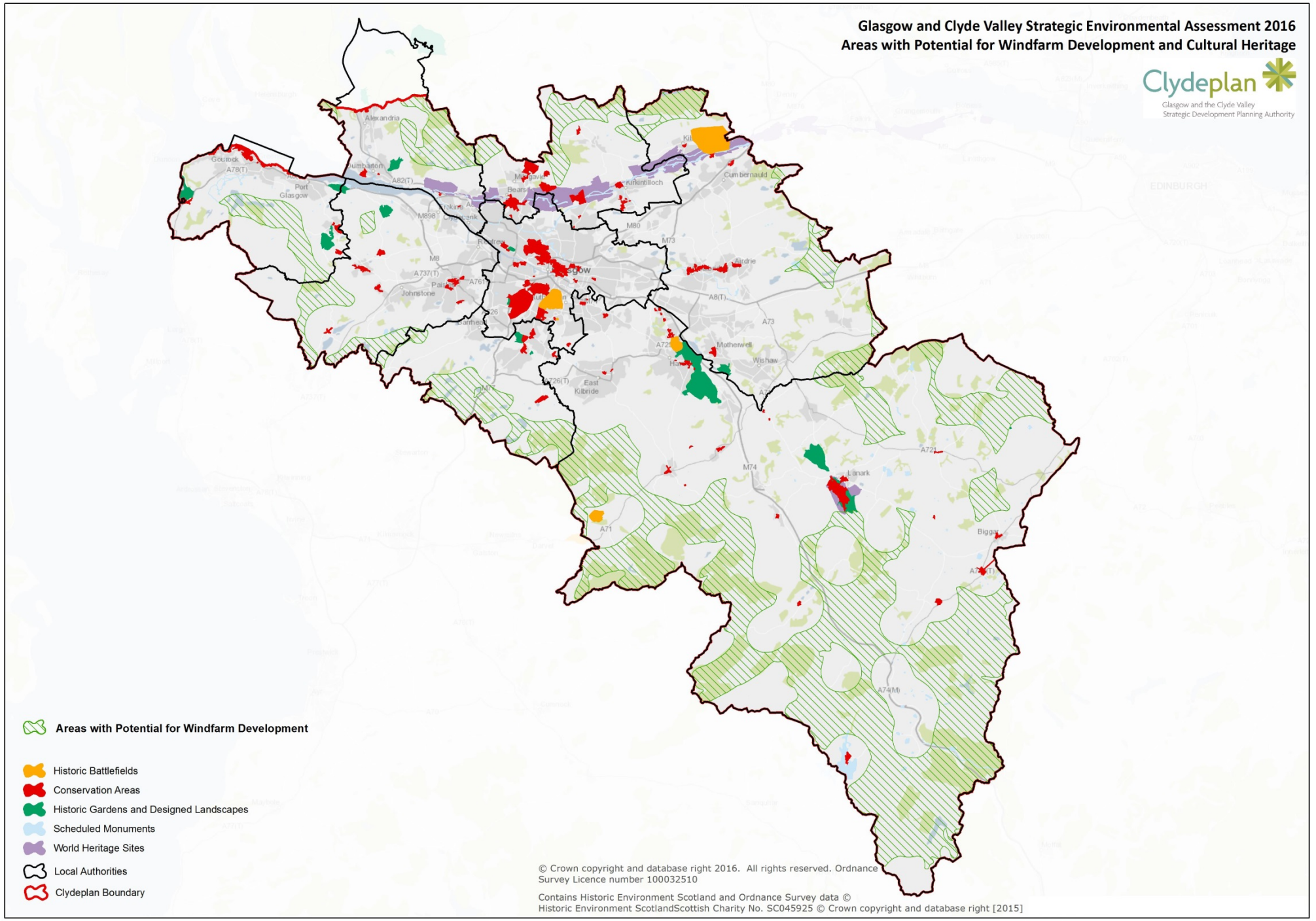
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Cultural Heritage
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Historic Battlefields
Conservation Areas
Historic Gardens and Designed Landscapes
Scheduled Monuments
World Heritage Sites
Local Authorities
Clydeplan Boundary
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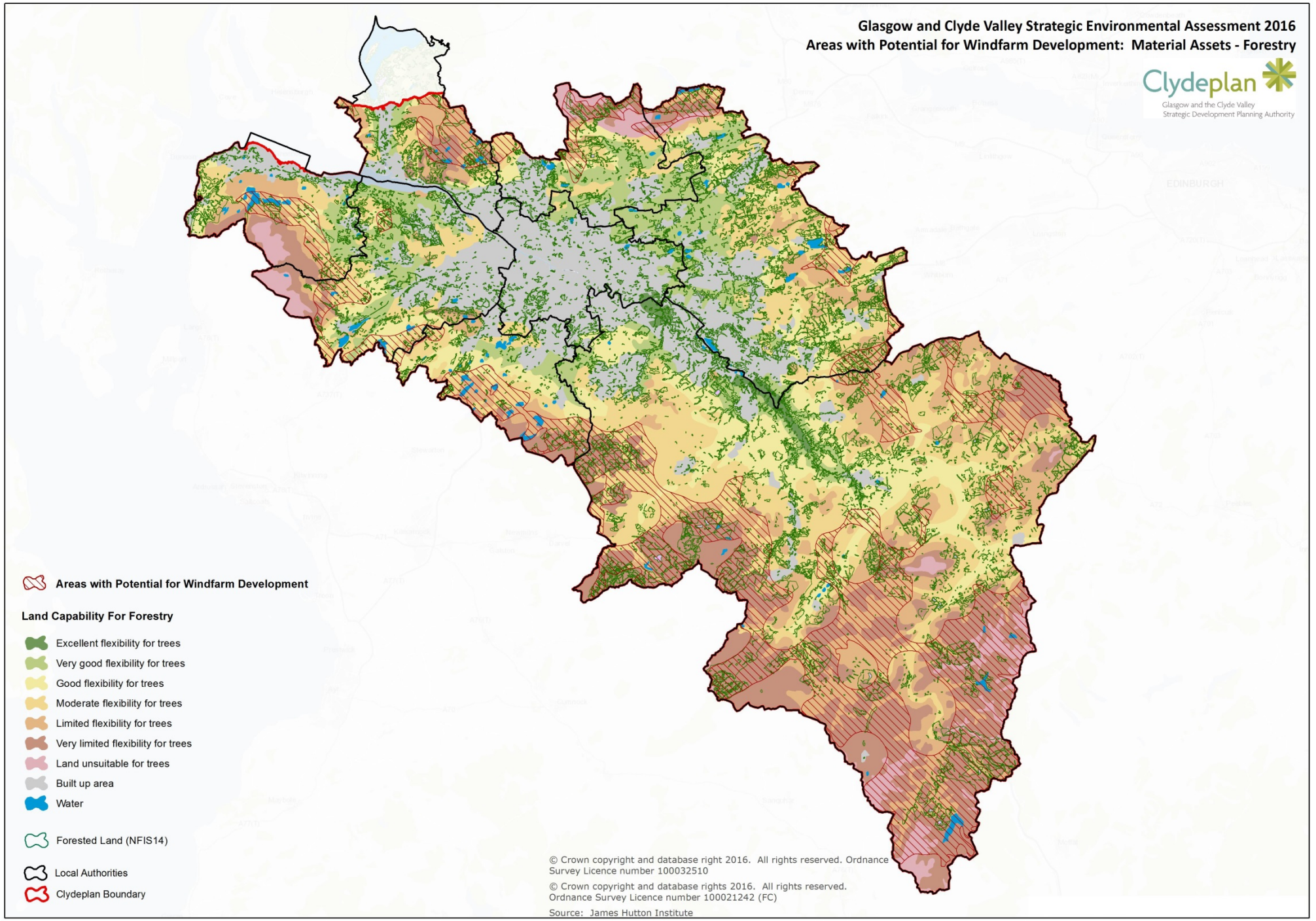
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development: Material Assets - Forestry
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
EDINBURGH
Areas with Potential for Windfarm Development
Land Capability For Forestry
Excellent flexibility for trees
Very good flexibility for trees
Good flexibility for trees
Moderate flexibility for trees
Limited flexibility for trees
Very limited flexibility for trees
Land unsuitable for trees
Built up area
Water
Forested Land (NFIS14)
Local Authorities
Clydeplan Boundary
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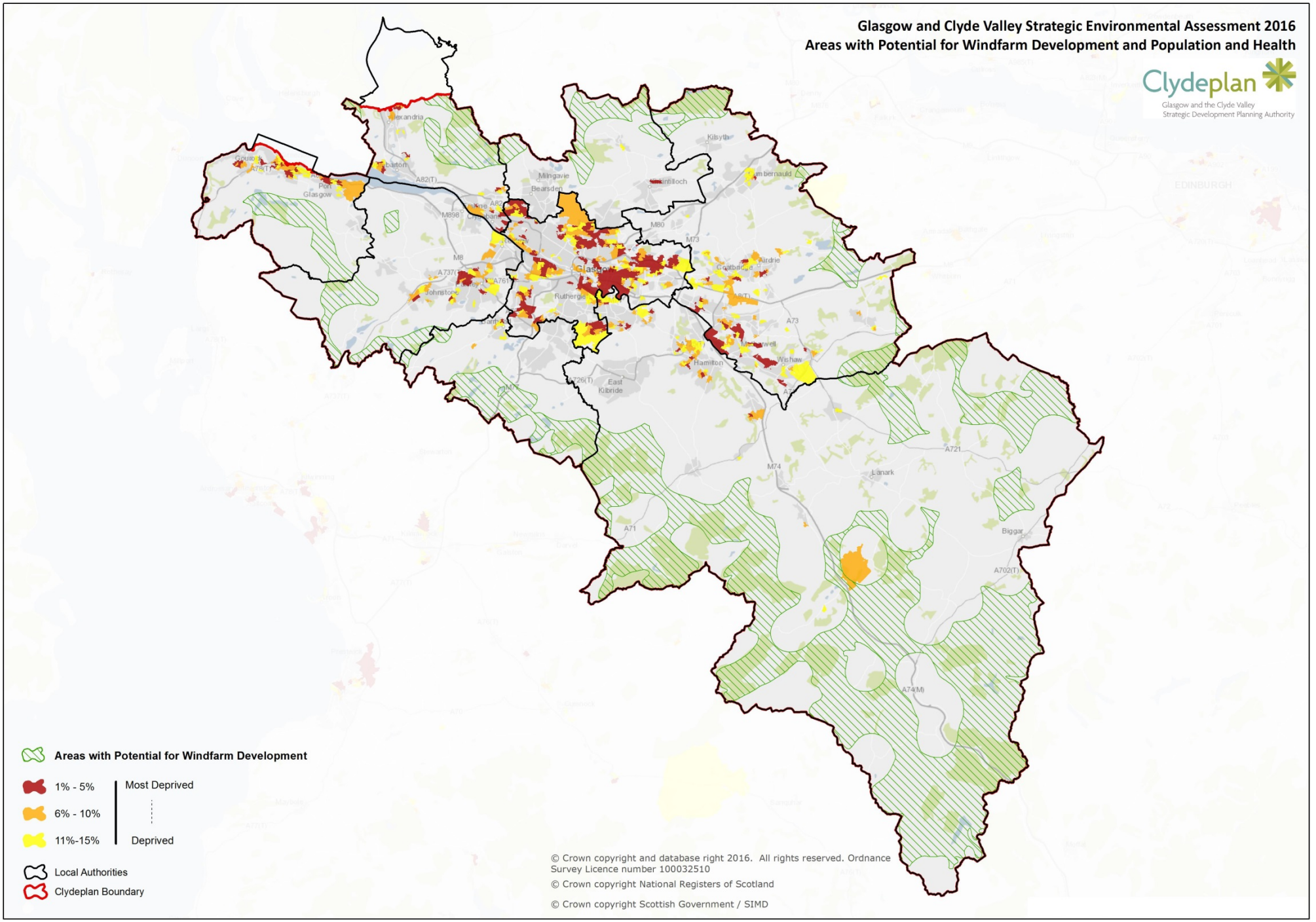
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Population and Health
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Areas with Potential for Windfarm Development
1% - 5%
6% - 10%
11%-15%
Most Deprived
Deprived
Local Authorities
Clydeplan Boundary
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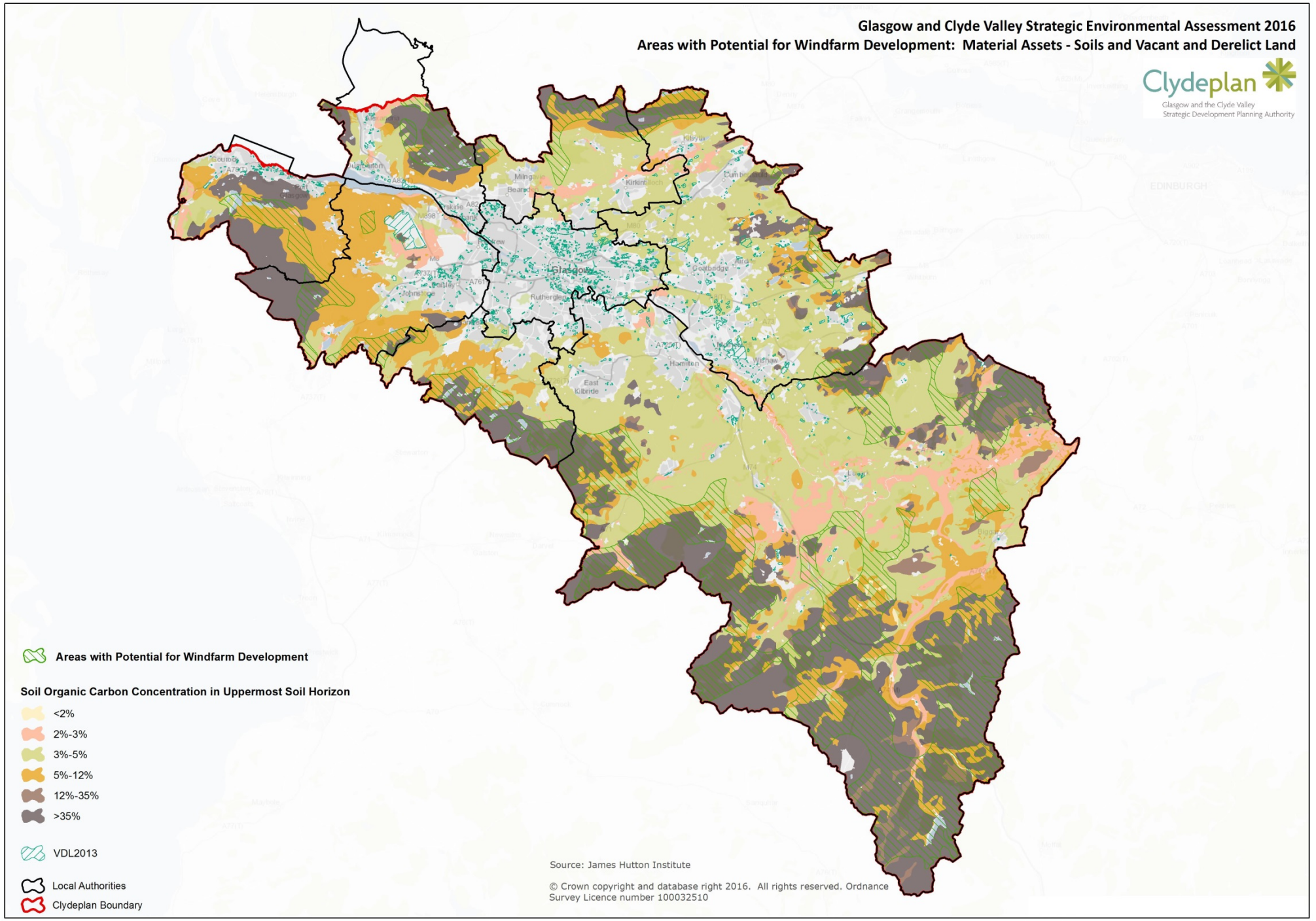
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development: Material Assets - Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
Source: James Hutton Institute
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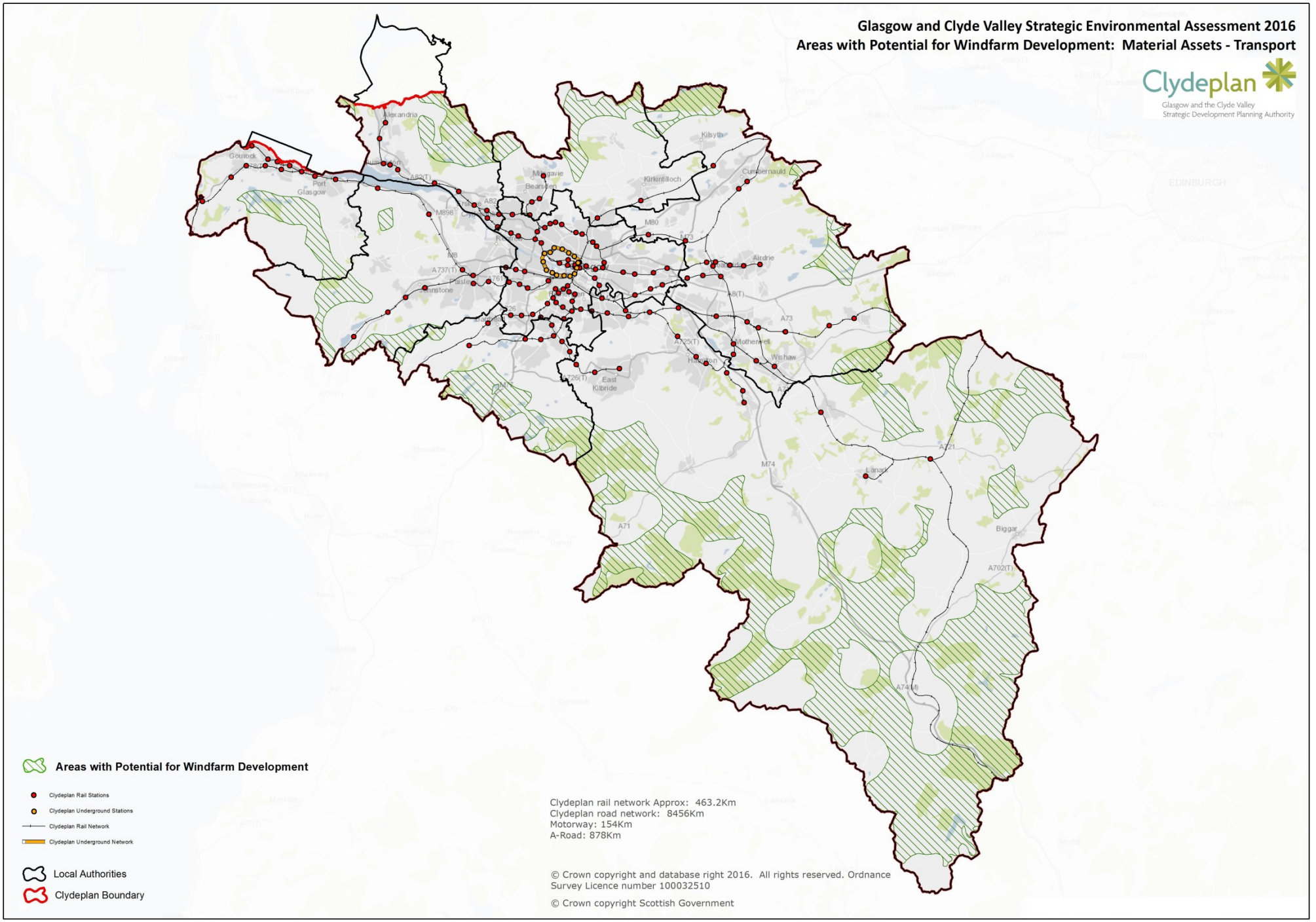
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development: Material Assets - Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Areas with Potential for Windfarm Development
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan rail network Approx: 463.2Km
Clydeplan road network: 8456Km
Motorway: 154Km
A-Road: 878Km
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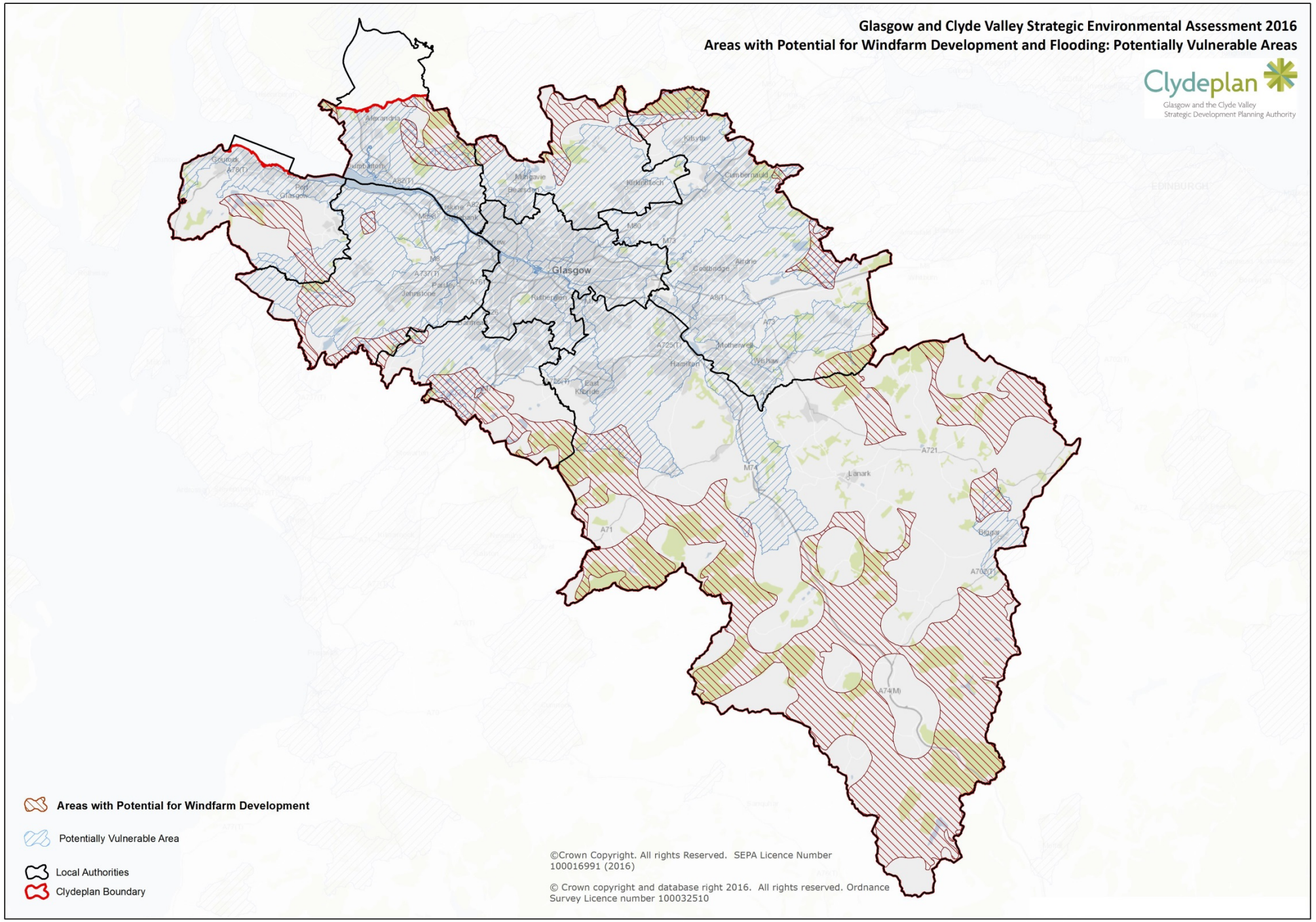
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Flooding: Potentially Vulnerable Areas
Clydeplan
Glasgow and the Clyde Valley Strategic Development Planning Authority
Glasgow
Areas with Potential for Windfarm Development
Potentially Vulnerable Area
Local Authorities
Clydeplan Boundary
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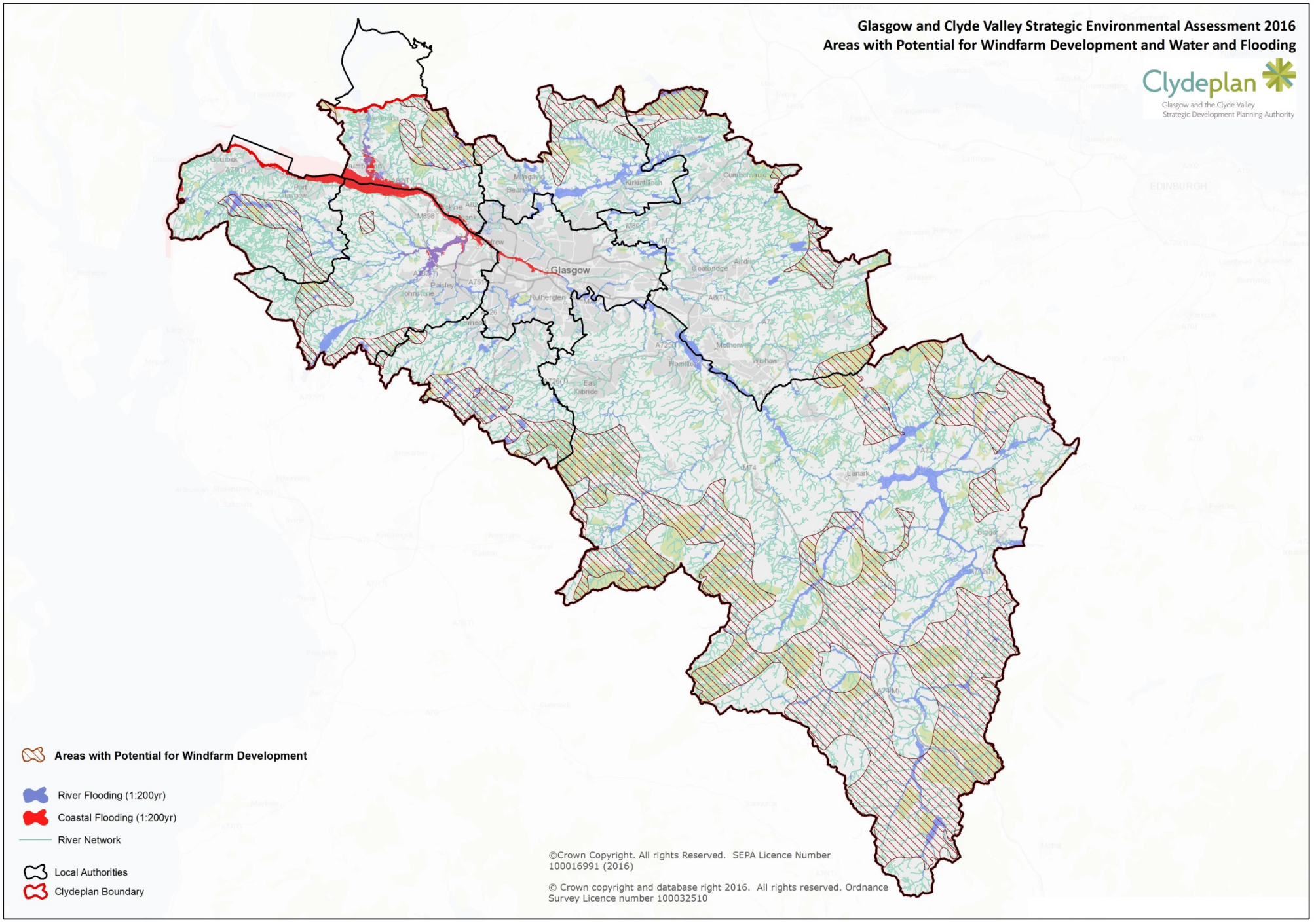
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Areas with Potential for Windfarm Development and Water and Flooding
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Glasgow
EDINBURGH
Areas with Potential for Windfarm Development
River Flooding (1:200yr)
Coastal Flooding (1:200yr)
River Network
Local Authorities
Clydeplan Boundary
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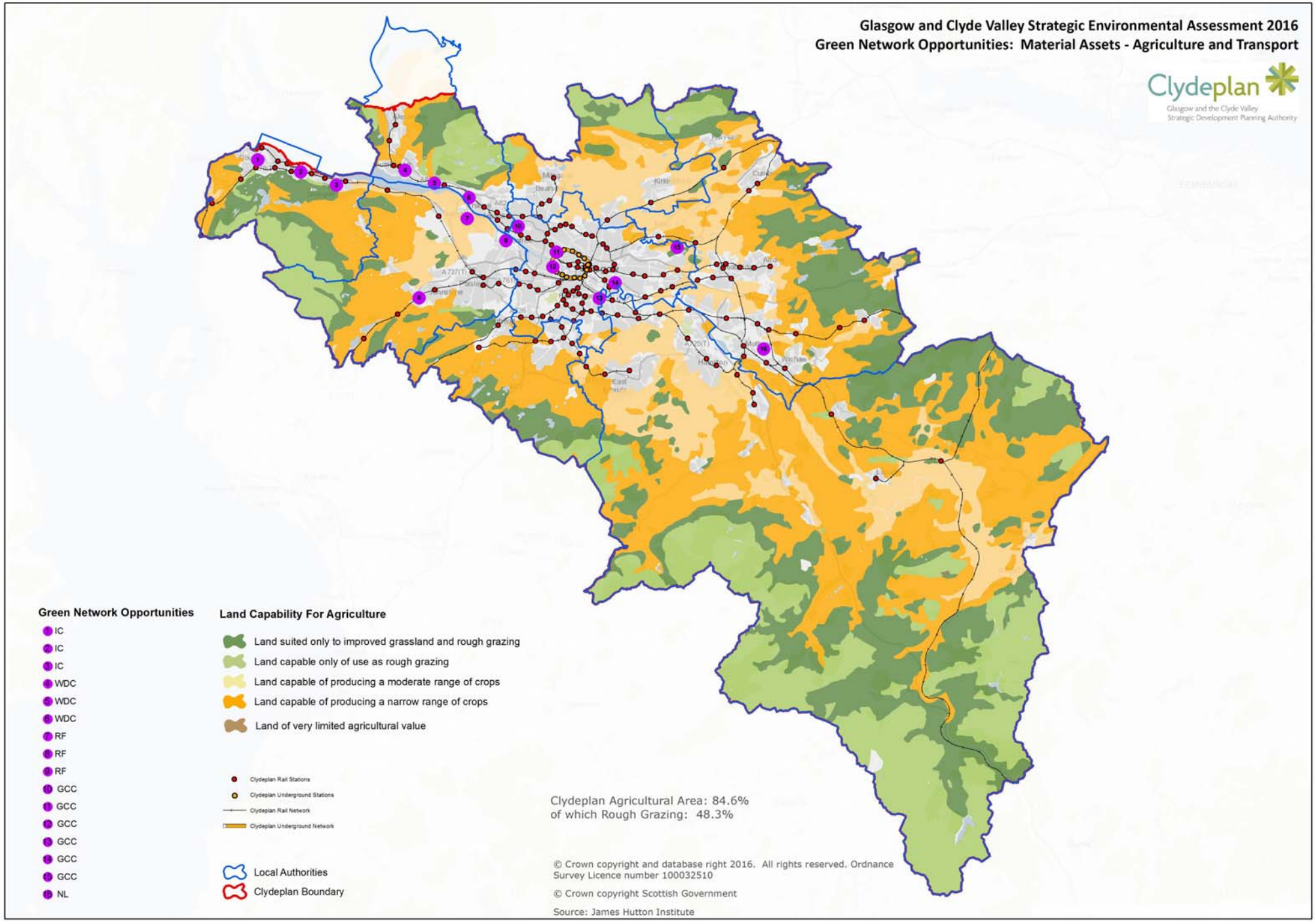
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Material Assets - Agriculture and Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
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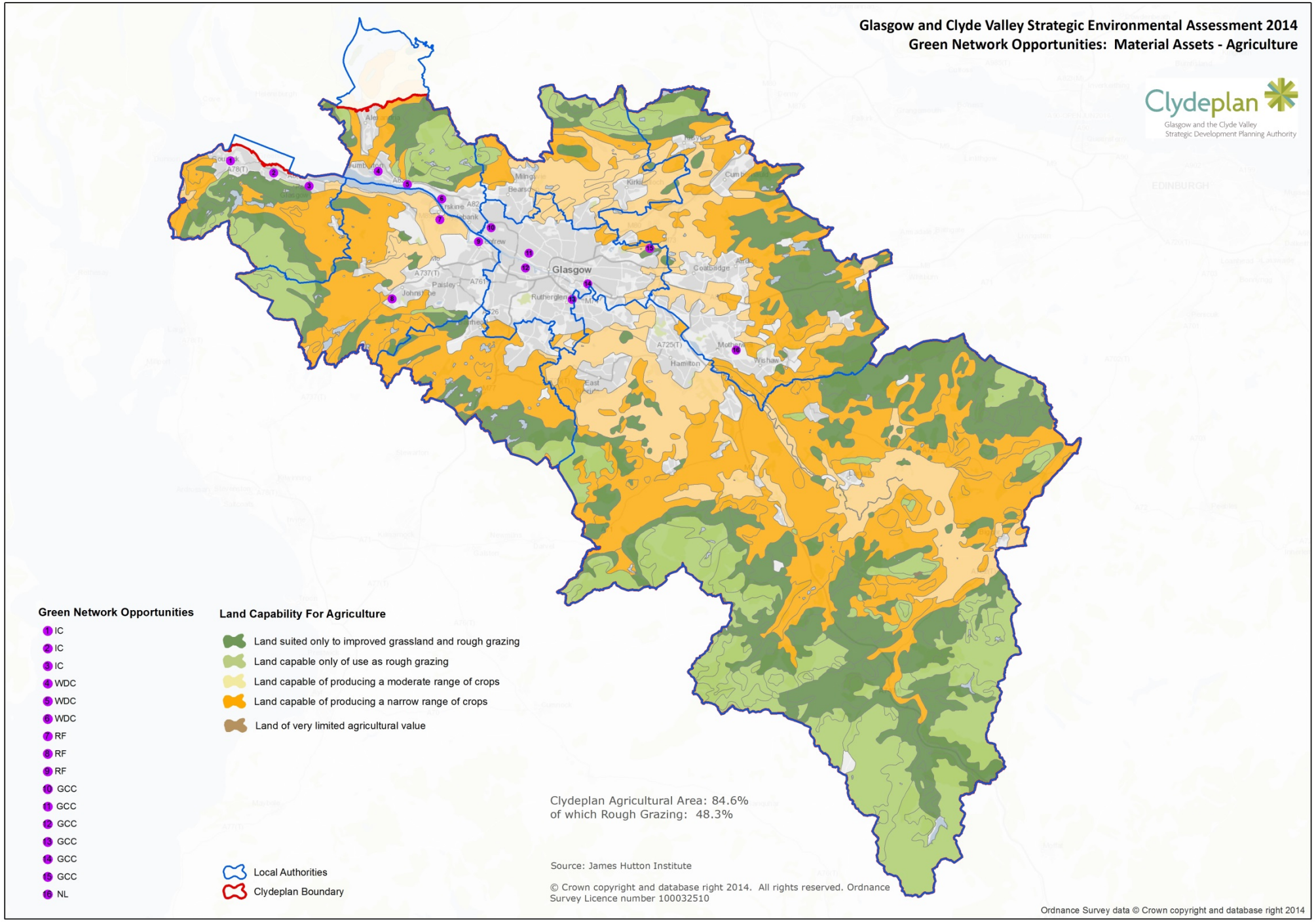
Glasgow and Clyde Valley Strategic Environmental Assessment 2014
Green Network Opportunities: Material Assets - Agriculture
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Glasgow
Paisley
Coatbridge
Hamilton
Rutherglen
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Land Capability For Agriculture
Land suited only to improved grassland and rough grazing
Land capable only of use as rough grazing
Land capable of producing a moderate range of crops
Land capable of producing a narrow range of crops
Land of very limited agricultural value
Local Authorities
Clydeplan Boundary
Clydeplan Agricultural Area: 84.6%
of which Rough Grazing: 48.3%
Source: James Hutton Institute
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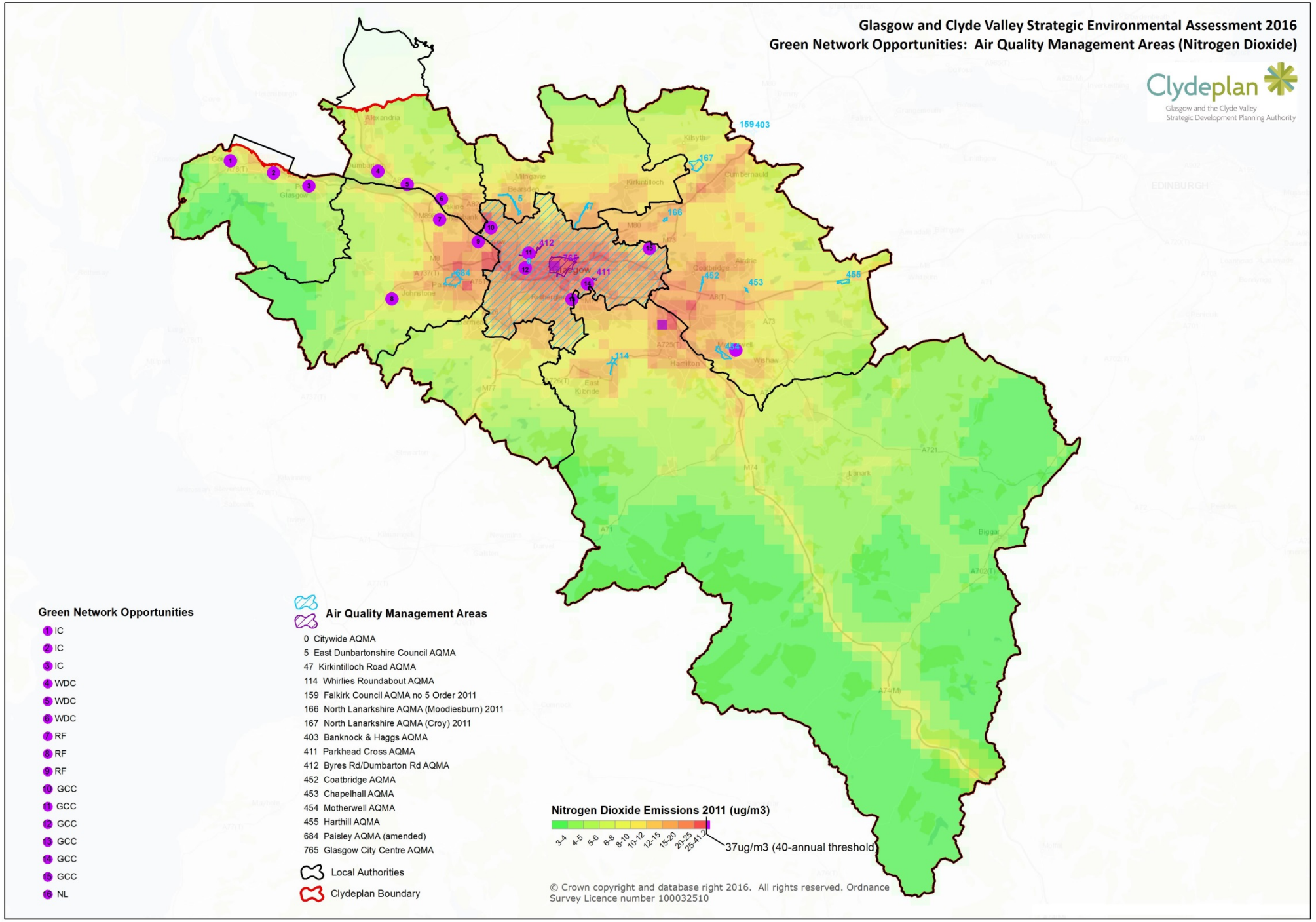
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Air Quality Management Areas (Nitrogen Dioxide)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Nitrogen Dioxide Emissions 2011 (ug/m3)
3-4 4-5 5-6 6-8 8-10 10-12 12-15 15-20 20-25 25-41.2
37ug/m3 (40-annual threshold)
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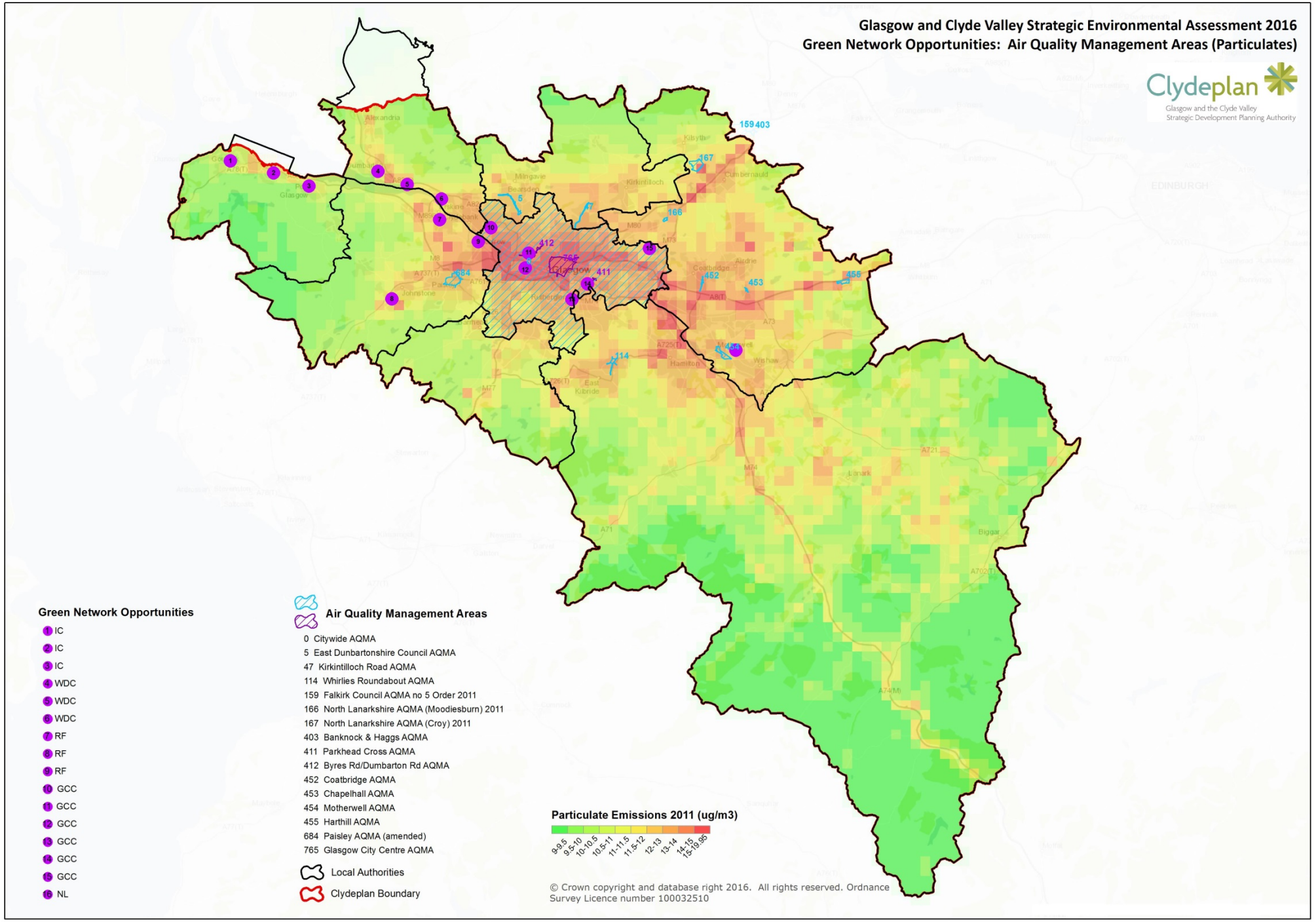
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Air Quality Management Areas (Particulates)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Air Quality Management Areas
0 Citywide AQMA
5 East Dunbartonshire Council AQMA
47 Kirkintilloch Road AQMA
114 Whirlies Roundabout AQMA
159 Falkirk Council AQMA no 5 Order 2011
166 North Lanarkshire AQMA (Moodiesburn) 2011
167 North Lanarkshire AQMA (Croy) 2011
403 Banknock & Haggs AQMA
411 Parkhead Cross AQMA
412 Byres Rd/Dumbarton Rd AQMA
452 Coatbridge AQMA
453 Chapelhall AQMA
454 Motherwell AQMA
455 Harthill AQMA
684 Paisley AQMA (amended)
765 Glasgow City Centre AQMA
Local Authorities
Clydeplan Boundary
Particulate Emissions 2011 (ug/m3)
9-9.5
9.5-10
10-10.5
10.5-11
11-11.5
11.5-12
12-13
13-14
14-15
15-19.96
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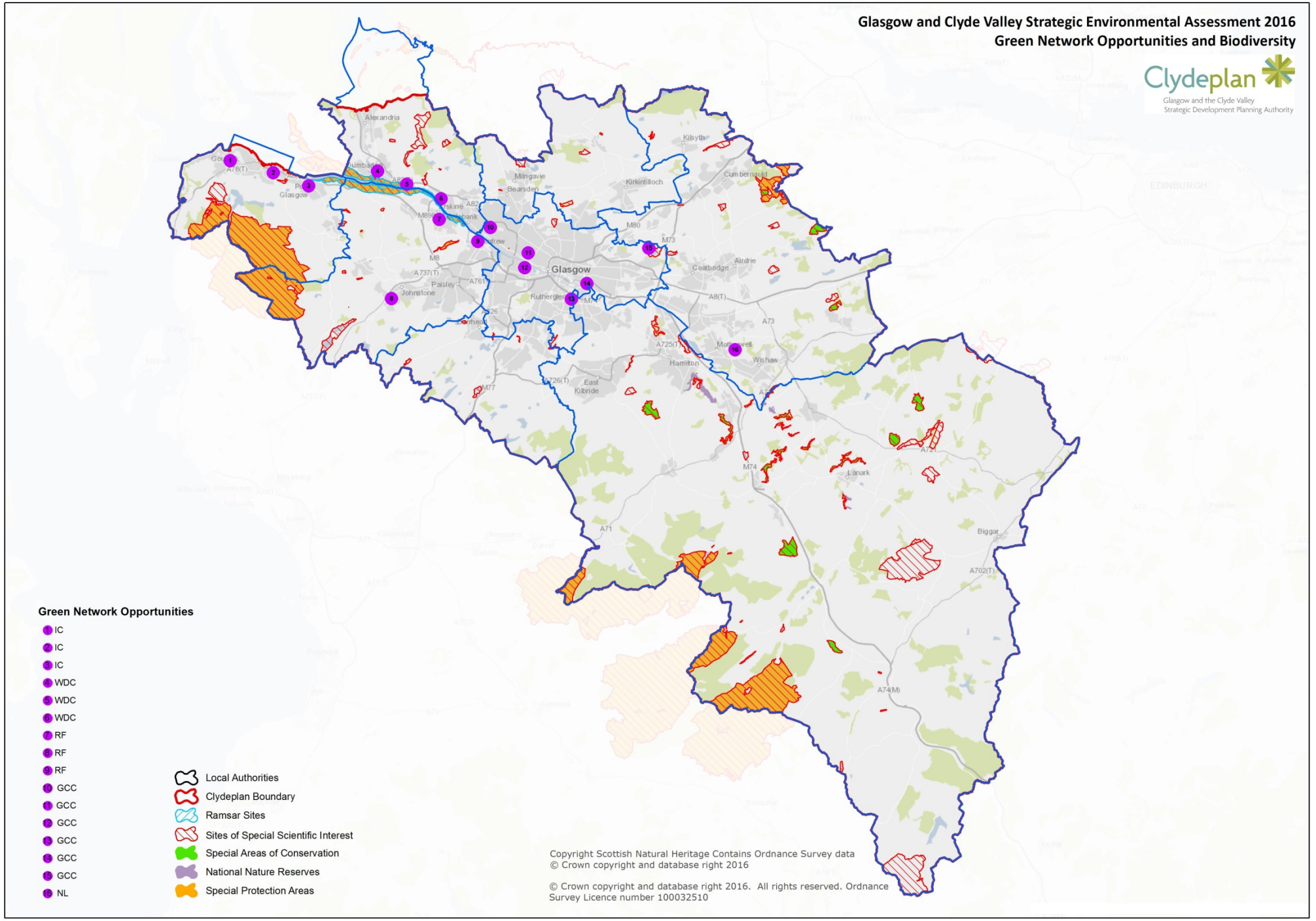
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities and Biodiversity
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Local Authorities
Clydeplan Boundary
Ramsar Sites
Sites of Special Scientific Interest
Special Areas of Conservation
National Nature Reserves
Special Protection Areas
Glasgow
Alexandria
Kilsyth
Kirkintilloch
Cumbernauld
Milngavie
Bearsden
Coatbridge
Airdrie
Paisley
Johnstone
Hamilton
Motherwell
Wishaw
East Kilbride
Lanark
Biggar
EDINBURGH
M8
M80
M73
M74
M77
A8(T)
A73
A71
A702(T)
A74(M)
A737(T)
A761
A726(T)
A725(T)
A78(T)
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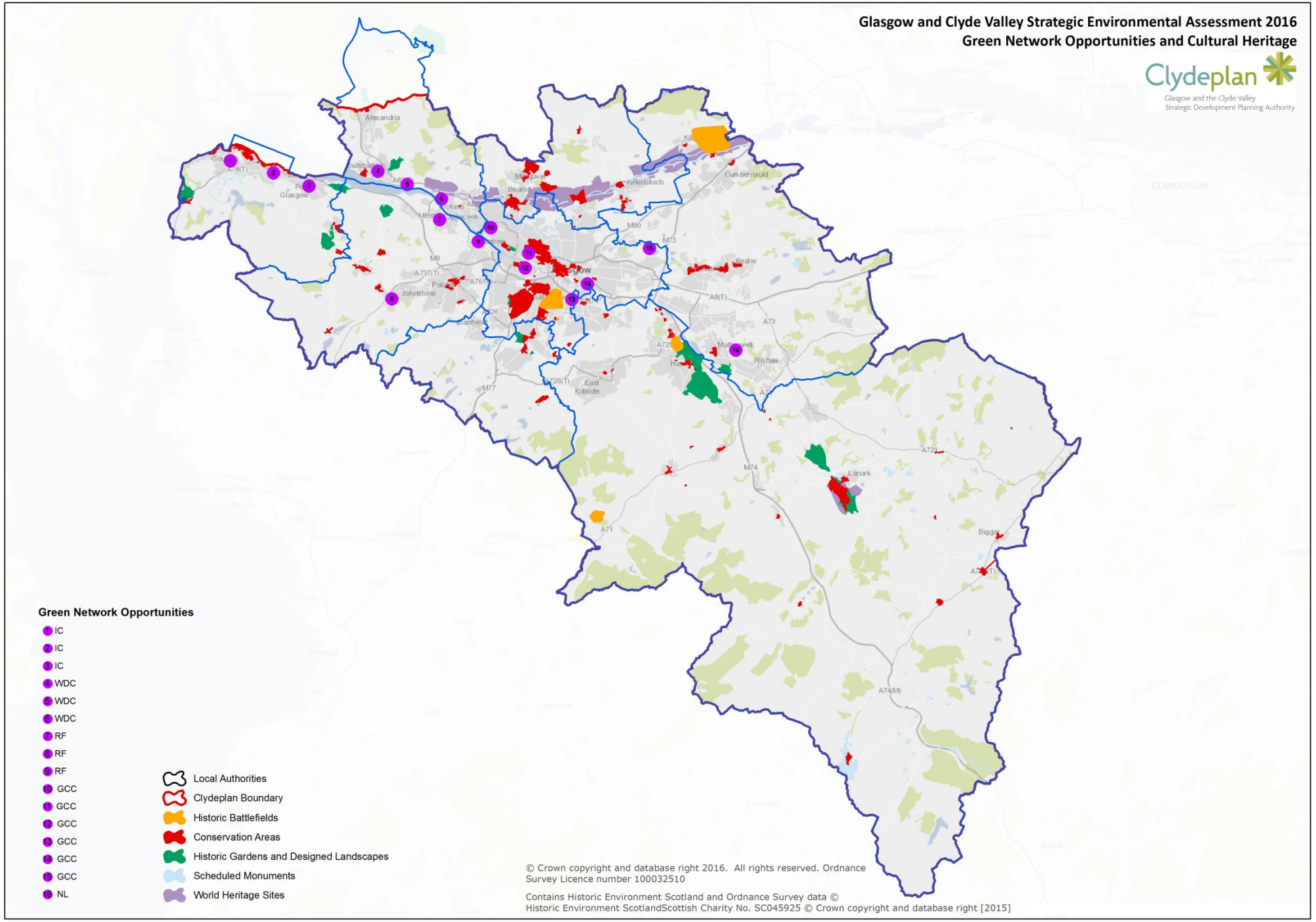
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities and Cultural Heritage
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Local Authorities
Clydeplan Boundary
Historic Battlefields
Conservation Areas
Historic Gardens and Designed Landscapes
Scheduled Monuments
World Heritage Sites
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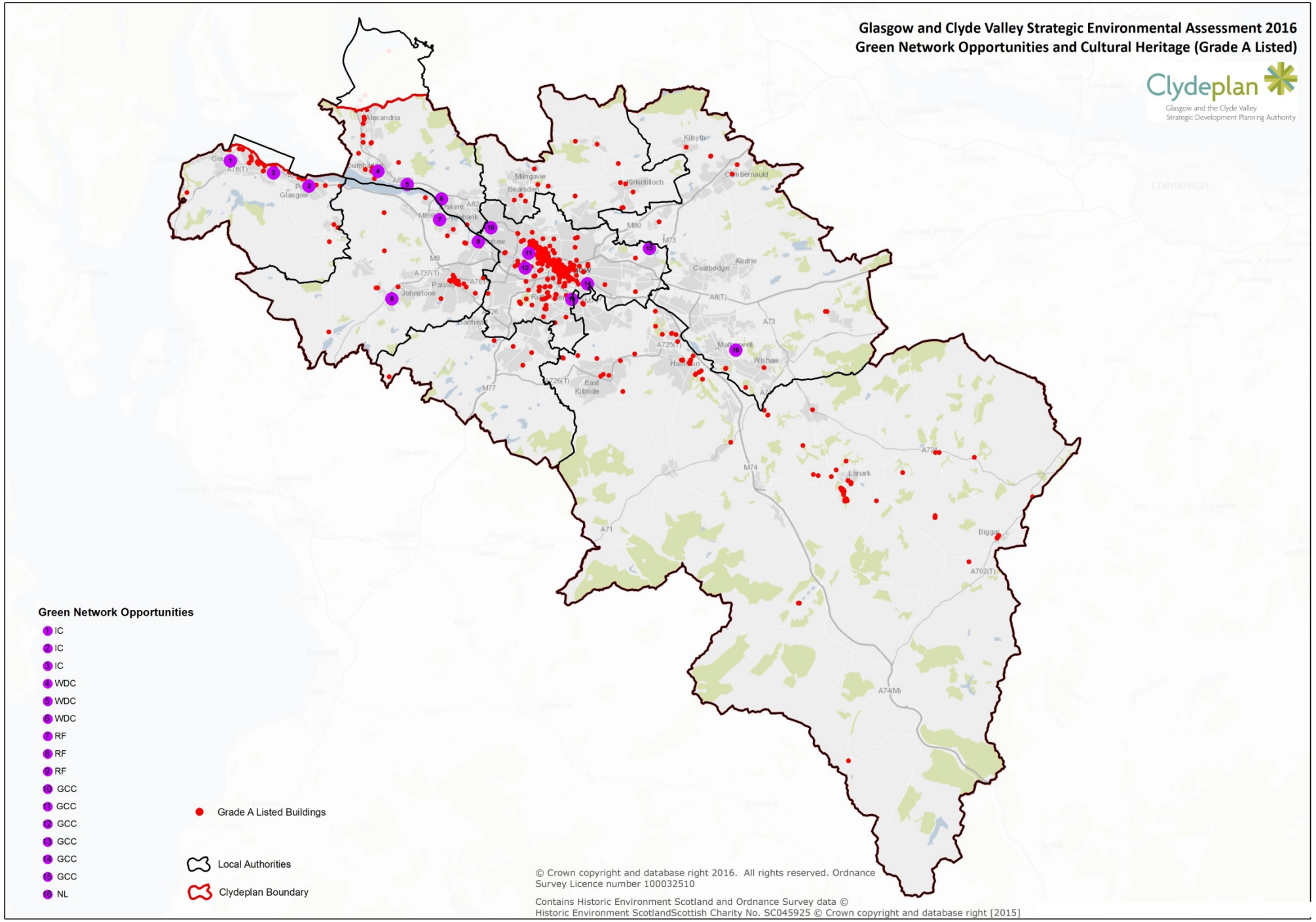
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities and Cultural Heritage (Grade A Listed)
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Grade A Listed Buildings
Local Authorities
Clydeplan Boundary
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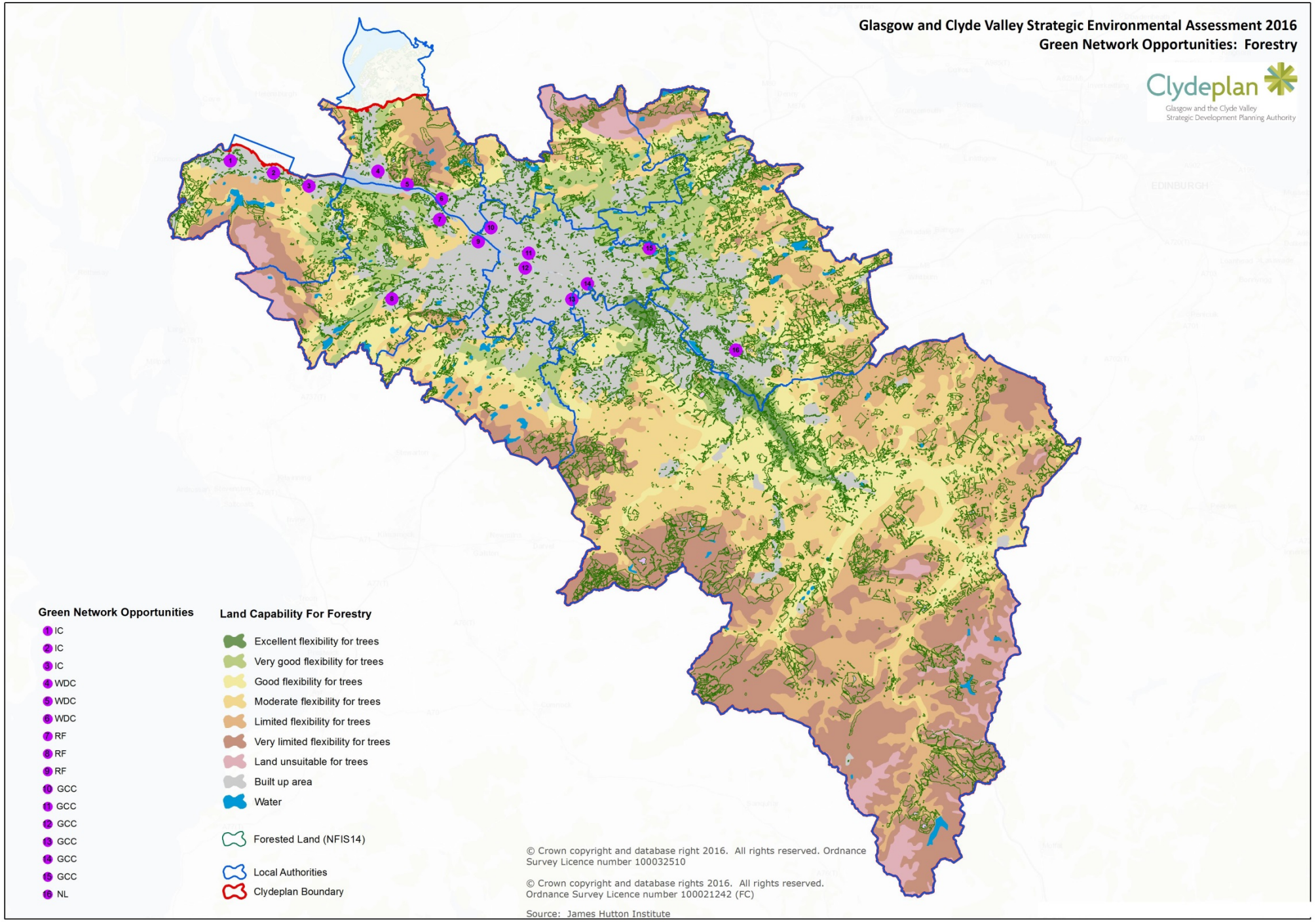
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Forestry
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Land Capability For Forestry
Excellent flexibility for trees
Very good flexibility for trees
Good flexibility for trees
Moderate flexibility for trees
Limited flexibility for trees
Very limited flexibility for trees
Land unsuitable for trees
Built up area
Water
Forested Land (NFIS14)
Local Authorities
Clydeplan Boundary
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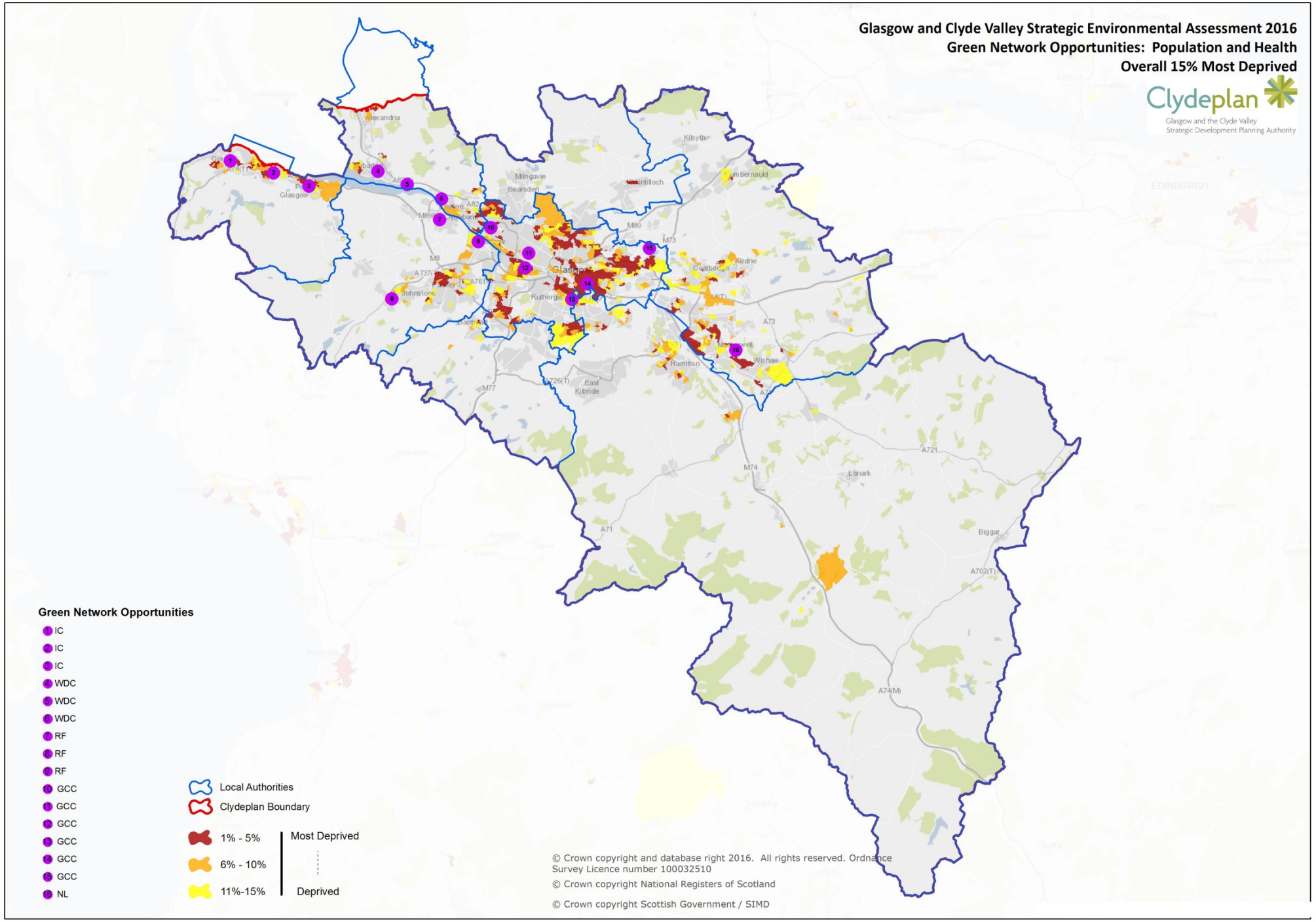
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Population and Health
Overall 15% Most Deprived
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Local Authorities
Clydeplan Boundary
1% - 5%
6% - 10%
11%-15%
Most Deprived
Deprived
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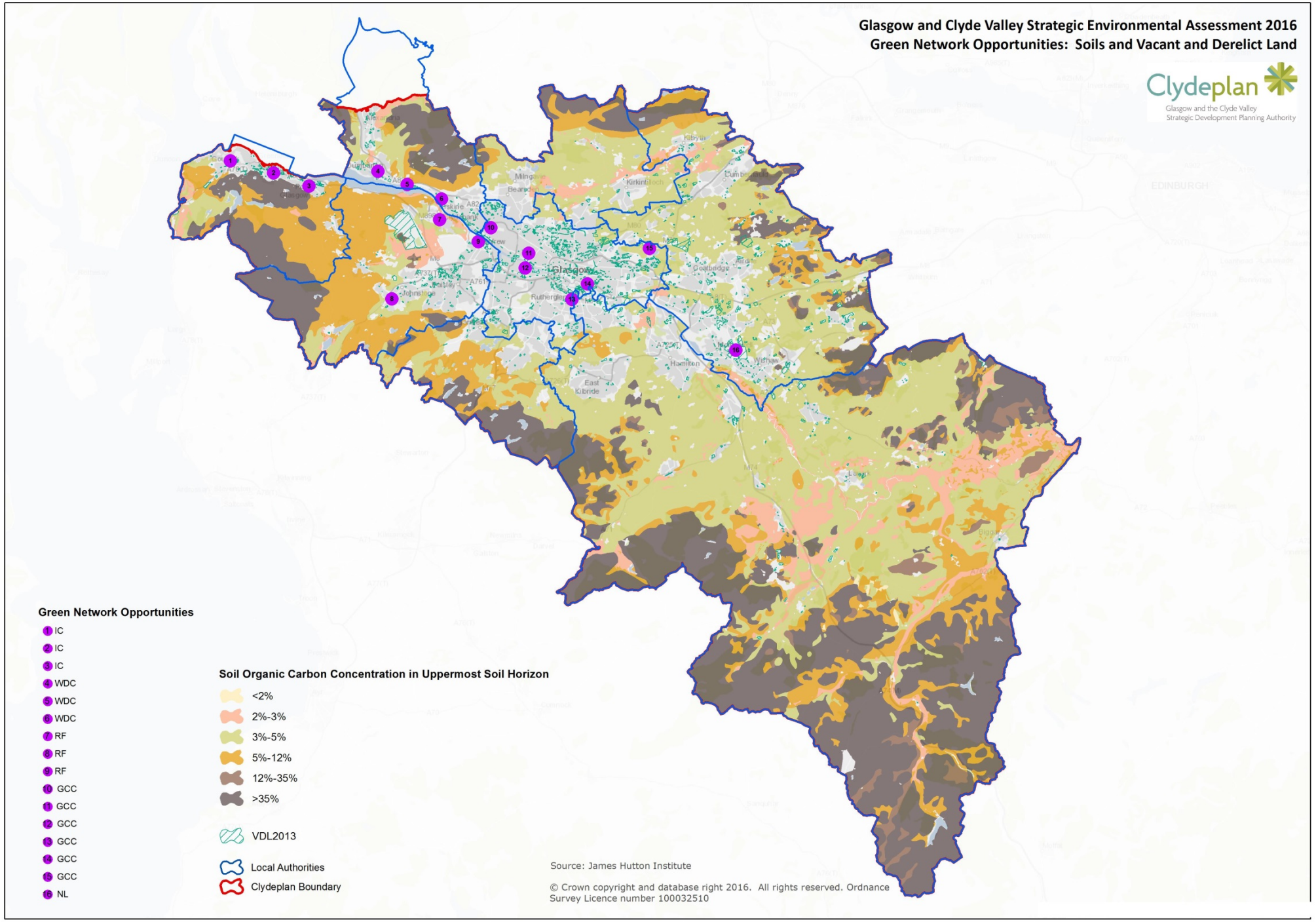
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Soils and Vacant and Derelict Land
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Soil Organic Carbon Concentration in Uppermost Soil Horizon
<2%
2%-3%
3%-5%
5%-12%
12%-35%
>35%
VDL2013
Local Authorities
Clydeplan Boundary
Source: James Hutton Institute
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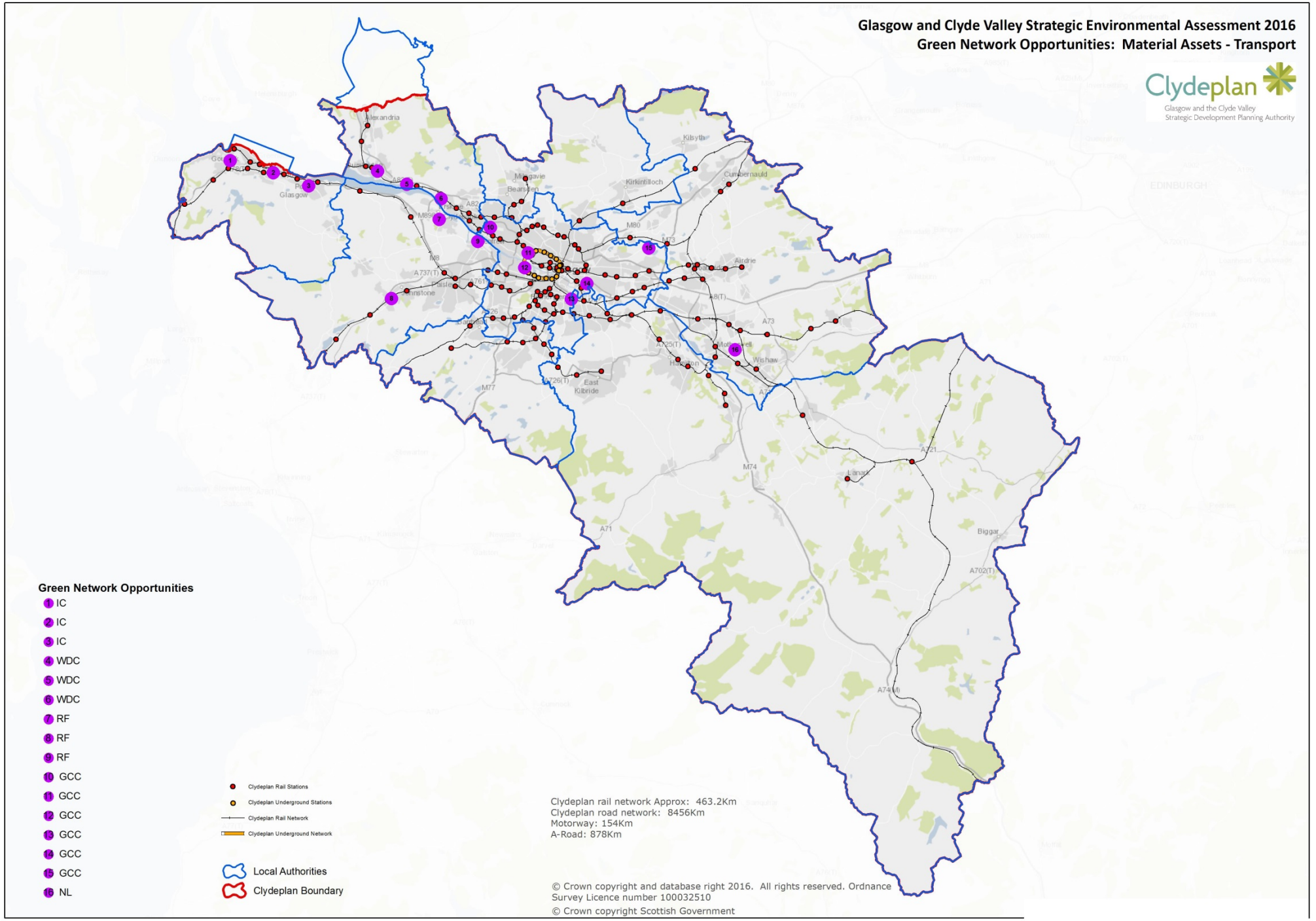
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Material Assets - Transport
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Clydeplan Rail Stations
Clydeplan Underground Stations
Clydeplan Rail Network
Clydeplan Underground Network
Local Authorities
Clydeplan Boundary
Clydeplan rail network Approx: 463.2Km
Clydeplan road network: 8456Km
Motorway: 154Km
A-Road: 878Km
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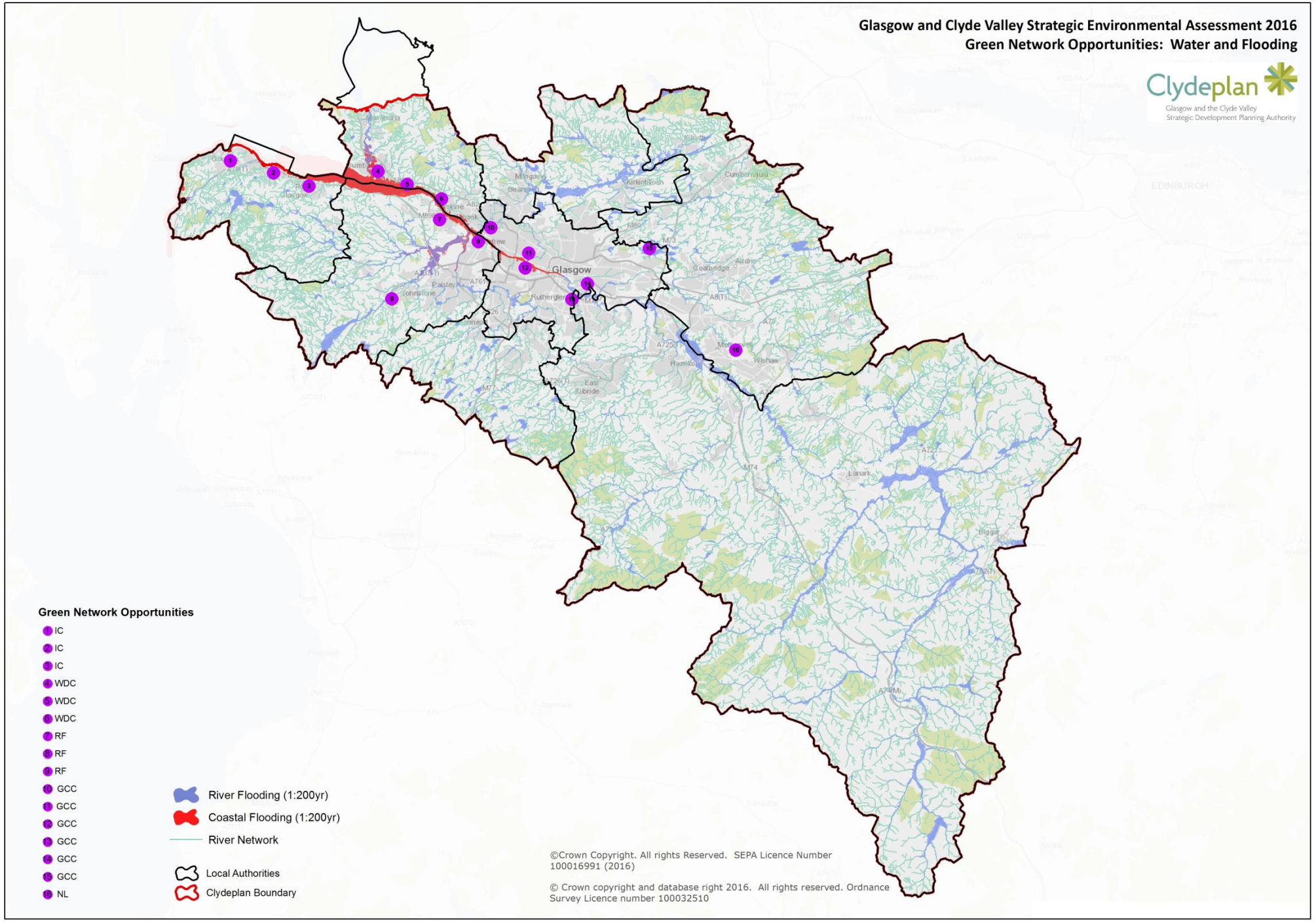
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Water and Flooding
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Glasgow
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
River Flooding (1:200yr)
Coastal Flooding (1:200yr)
River Network
Local Authorities
Clydeplan Boundary
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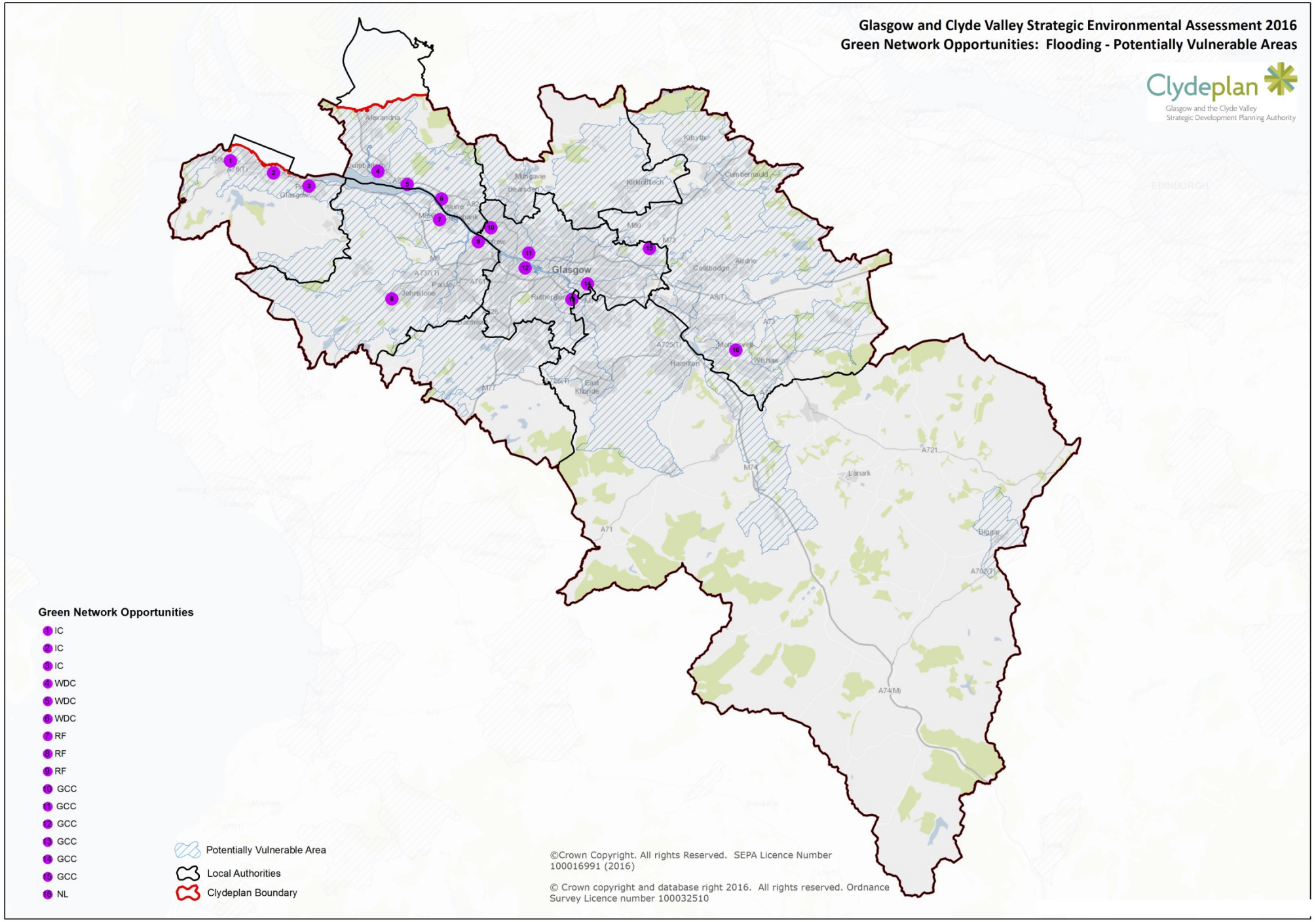
Glasgow and Clyde Valley Strategic Environmental Assessment 2016
Green Network Opportunities: Flooding - Potentially Vulnerable Areas
Clydeplan
Glasgow and the Clyde Valley
Strategic Development Planning Authority
Glasgow
Green Network Opportunities
1 IC
2 IC
3 IC
4 WDC
5 WDC
6 WDC
7 RF
8 RF
9 RF
10 GCC
11 GCC
12 GCC
13 GCC
14 GCC
15 GCC
16 NL
Potentially Vulnerable Area
Local Authorities
Clydeplan Boundary
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Appendix C: Clydeplan Strategic Flood Risk Assessment

Appendix C: Clydeplan Strategic Flood Risk Assessment

Introduction

1.1 This Strategic Flood Risk Assessment (SFRA) has been produced to accompany the Strategic Development Plan (SDP) Proposed Plan for Glasgow and the Clyde Valley.

1.2 This section consists of the first part of the SFRA and provides a compendium of readily accessible information on flood risk that should allow for a broad scale assessment of flood risk for the city region, the second section details the risk based site options appraisal to assist transparency. The Clydeplan catchment is extensive comprising approximately 9000 features. These features are too numerous to include here and are available on request to the Clydeplan Local Authorities and SEPA.

1.3 The level of detail and information collected and analysed has been proportionate to the issues in Clydeplan and has principally involved a desk based study making use of existing information which has been developed by the Scottish Environmental Protection Agency (SEPA) through Flood Risk Management Maps and the National Flood Risk Assessment tool.

1.4 Planning authorities are expected to prepare an SFRA at a more detailed level to inform their Local Development Plans (LDPs).

What is a Strategic Flood Risk Assessment?

1.5 A Strategic Flood Risk Assessment is designed for the purposes of informing the development plan process, primarily, to avoid increasing overall flood risk by avoiding areas of flood hazard.

1.6 It constitutes a strategic overview of flood risk to the development plan area and involves the collection, analysis and presentation of all existing, available and readily derivable information on flood risk from all sources.

Aim

1.7 The aim of this SFRA is to inform the Clydeplan SDP by providing an overview of flood risk in the city region and offer analysis and a simplified presentation of the available information on flood risk from all sources. The findings have been used to inform the strategic environmental assessment (SEA) element of the assessment of significant affects for flooding in the Environmental Report.

1.8 The assessment should be proportionate to the strategic scale of the SDP and allow further, more detailed assessment and consideration, at the Local Development Plan level to be undertaken.

1.9 There is always uncertainty in the estimation of flood risk, including the potential effects of climate change. It is acknowledged that the quality of data collected and produced for this SFRA will vary and less reliable information (and assumptions drawn from it) requires a precautionary approach to be taken. The SFRA should be considered a ‘live’ document to be updated on a regular basis as new information becomes available to the organisations involved.

Background and Policy Context

1.10 The National Planning Framework (NPF3) supports a catchment-scale approach to sustainable flood risk management. It aims to build the resilience of Scotland's cities and towns, encourage sustainable land management in rural areas, and to address the long-term vulnerability of parts of the coasts and islands.

1.11 Scottish Planning Policy (SPP) requires the planning system to control development which would have a significant probability of being affected by flooding or would increase the probability of flooding elsewhere. Planning Authorities should take the probability of flooding from all sources and associated risks involved into account when preparing development plans. It states that Strategic Flood Risk Assessments should be used to inform choices about the location of development and policies for flood risk management. Strategic Development Plans should address any significant cross boundary flooding issues.

1.12 In response to the need to manage flood risk and drainage, as well as other water quality and management issues, the Clydeplan Strategic Development Plan Proposed Plan states that:

Policy 16

Improving the Water Quality Environment and Managing Flood Risk and Drainage

To support the Vision and Spatial Development Strategy and to achieve the objectives set out in paragraph 8.28 [to secure improvements to water and drainage capacity, and water quality, and to reduce flood risk, address the implications of sea level rises in the Firth of Clyde etc] Local Development Plans and development proposals should protect and enhance the water environment by

- *adopting a precautionary approach to the reduction of flood risk;*
- *supporting the delivery of the Metropolitan Glasgow Strategic Drainage Plan;*
- *supporting the delivery of the Glasgow and the Clyde Valley Green Network; and*
- *safeguarding the storage capacity of the functional floodplain and higher lying areas of attenuation.*

Scope of SFRA

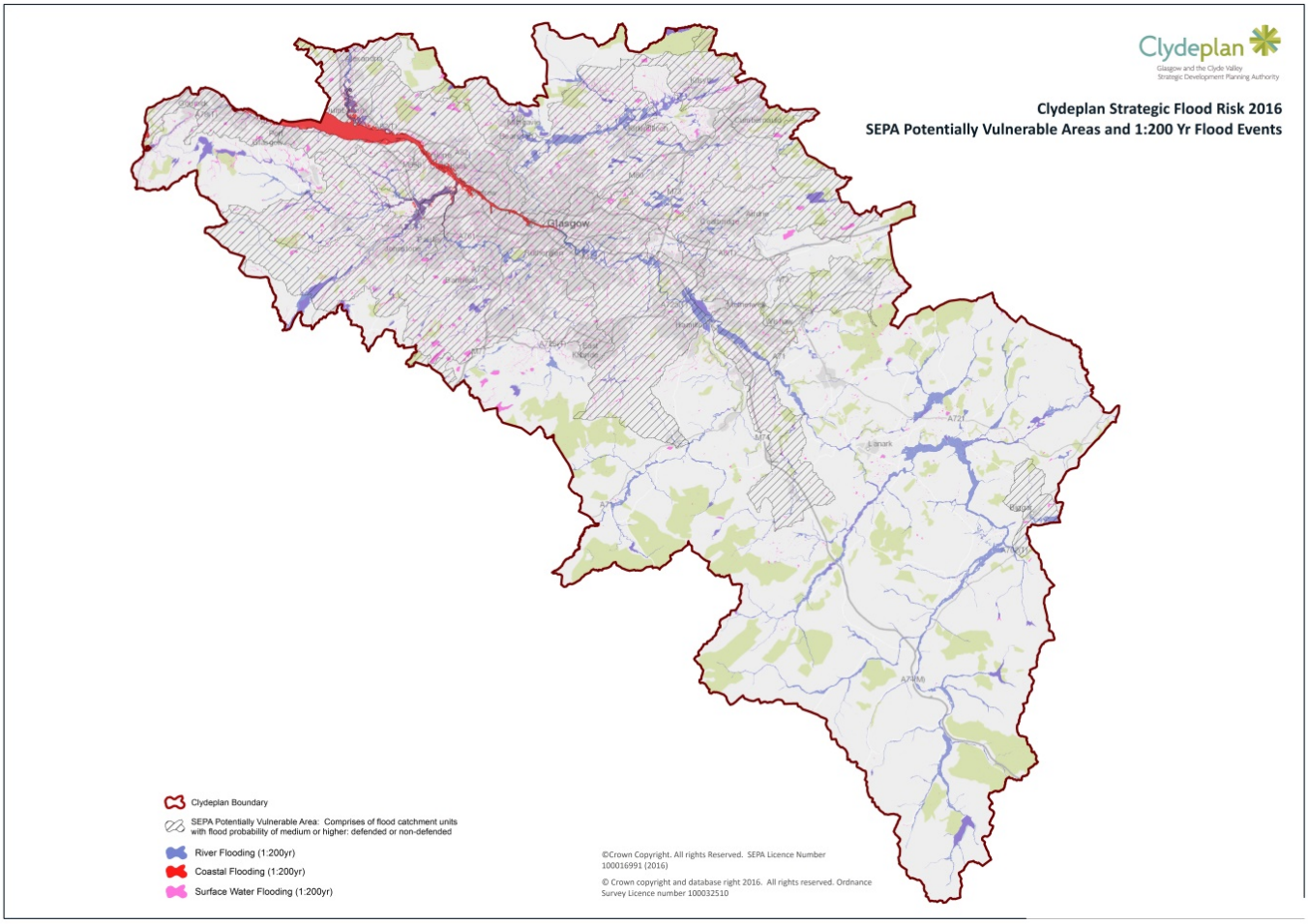
1.13 SEPA state in their 'Strategic Flood Risk Assessment: SEPA technical guidance to support development planning" that the key information that should be covered in this report includes:

- Current
    - flood hazard for all potential sources of flooding
    - flood risk for all potential sources of flooding
- Potential
    - flood hazard and risk due to climate change
- Existing
    - flood protection schemes and other flood risk management infrastructure

- Identification of
    - functional flood plain locations (including built up areas and undeveloped/sparsely developed areas)
    - relevant drainage issues
    - sites or areas constrained by flood risk; and

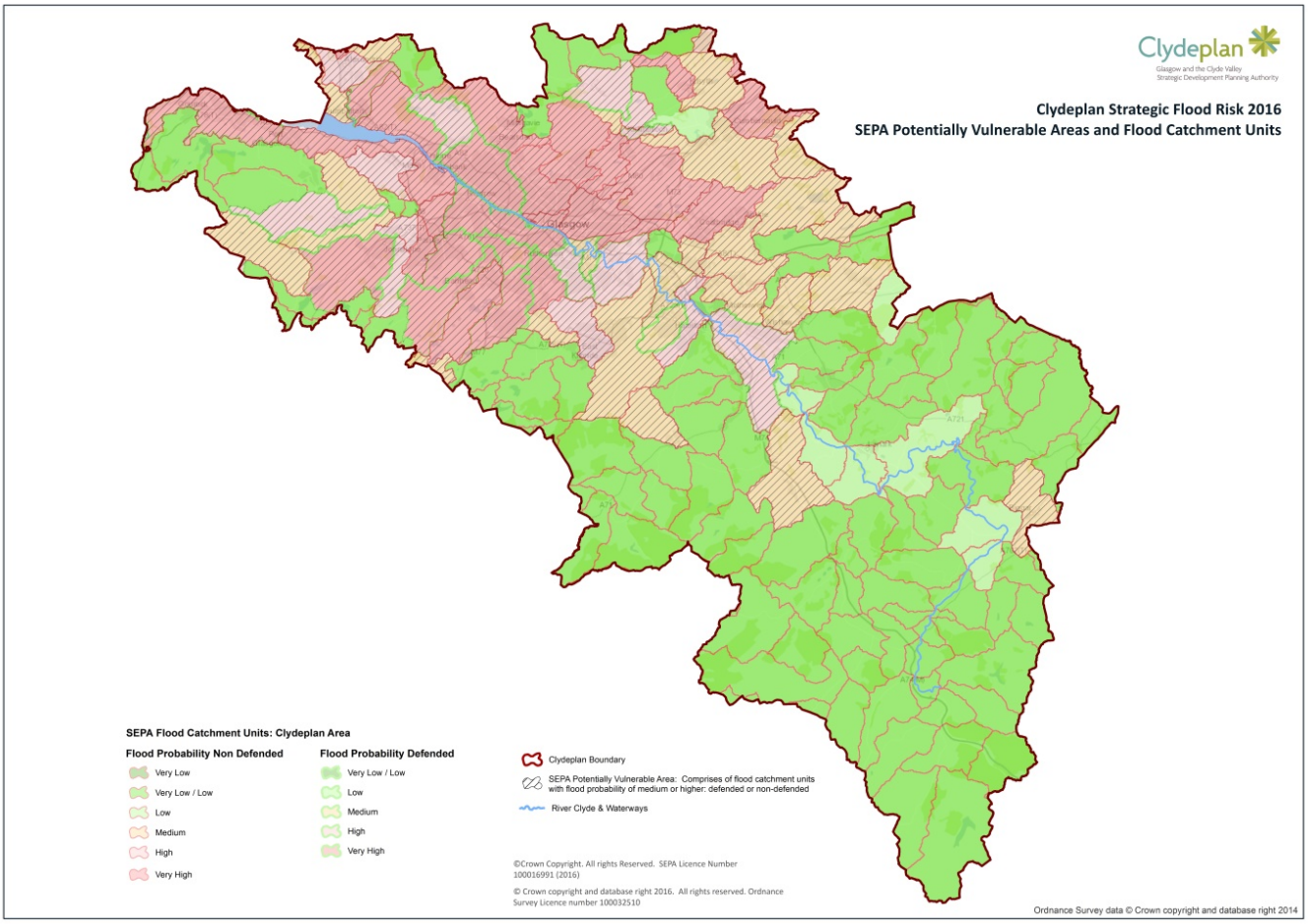
- Information on
    - Growth pressures in the area

1.14 Map 1 details the functional floodplains for the Clydeplan area by identifying medium 1:200 year flood risk for fluvial (in pink), pluvial (in blue) and coastal (in red) flood types which contribute to SEPA's determination of Potentially Vulnerable Areas (PVAs).



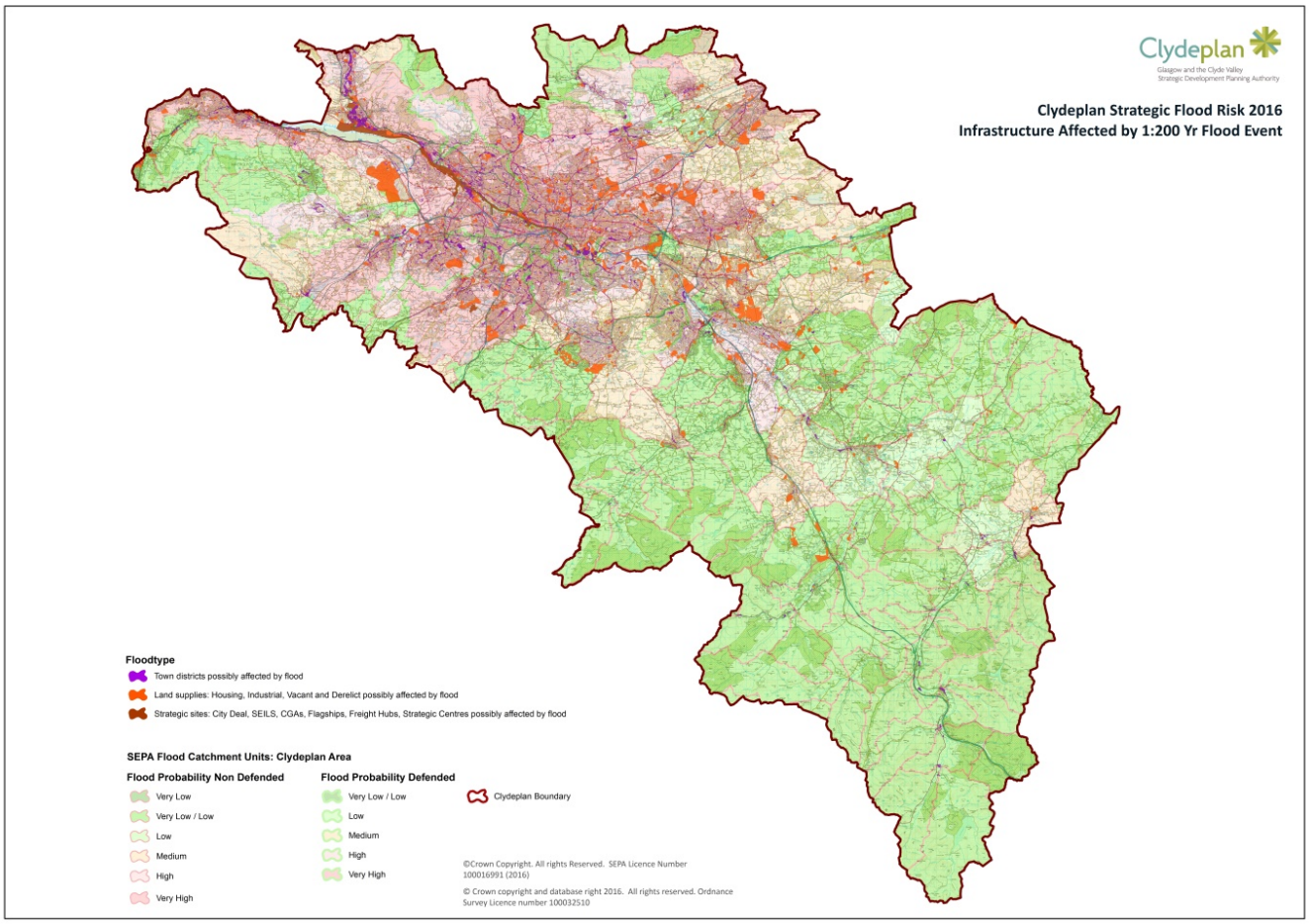
Map1: Functional Floodplains and Potentially Vulnerable Areas

1.15 Map 2 quantifies the extent of the flooding risk by highlighting the affected areas by their likelihood of flood probability from very low (green with orange outline) to very high (red with orange outline) for non-defended areas and from very low/low (green with green outline) to very high (red with green outline) for defended areas. The hatching identifies which areas are identified as Potentially Vulnerable Areas by SEPA.



Map 2: Flood Risk for all potential sources of flooding

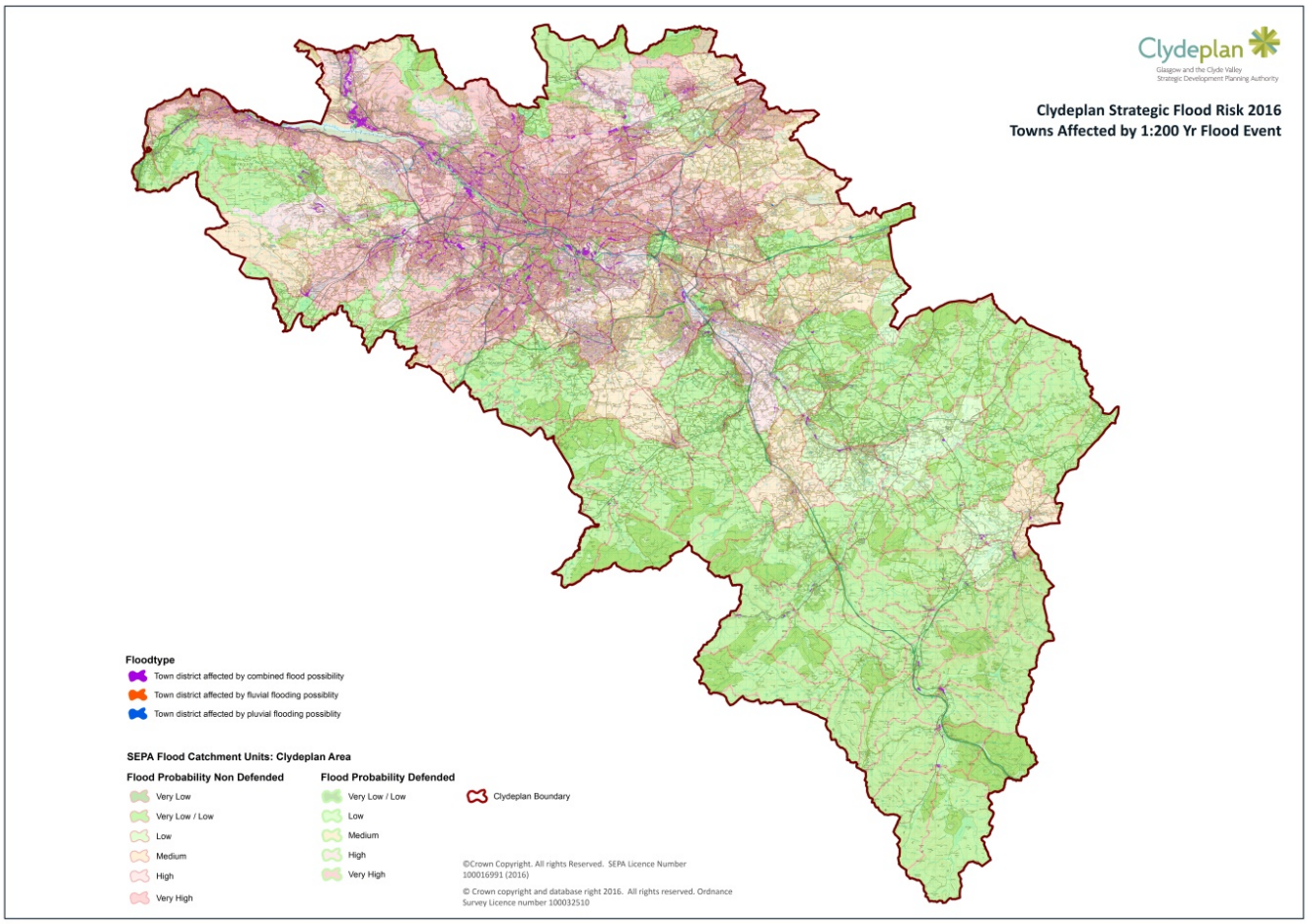
1.16 Map 3 shows the affected infrastructure in terms of the flooding hazard for all potential sources of flooding in terms of impact on towns (purple), land supply sites (orange) and strategic sites (including Strategic Network of Centres locations, Strategic Economic Investment Locations, Strategic Freight Transport Hubs, Community Growth Areas and City Deal locations – in brown).



Map 3: Flood Hazard for all potential sources of flooding

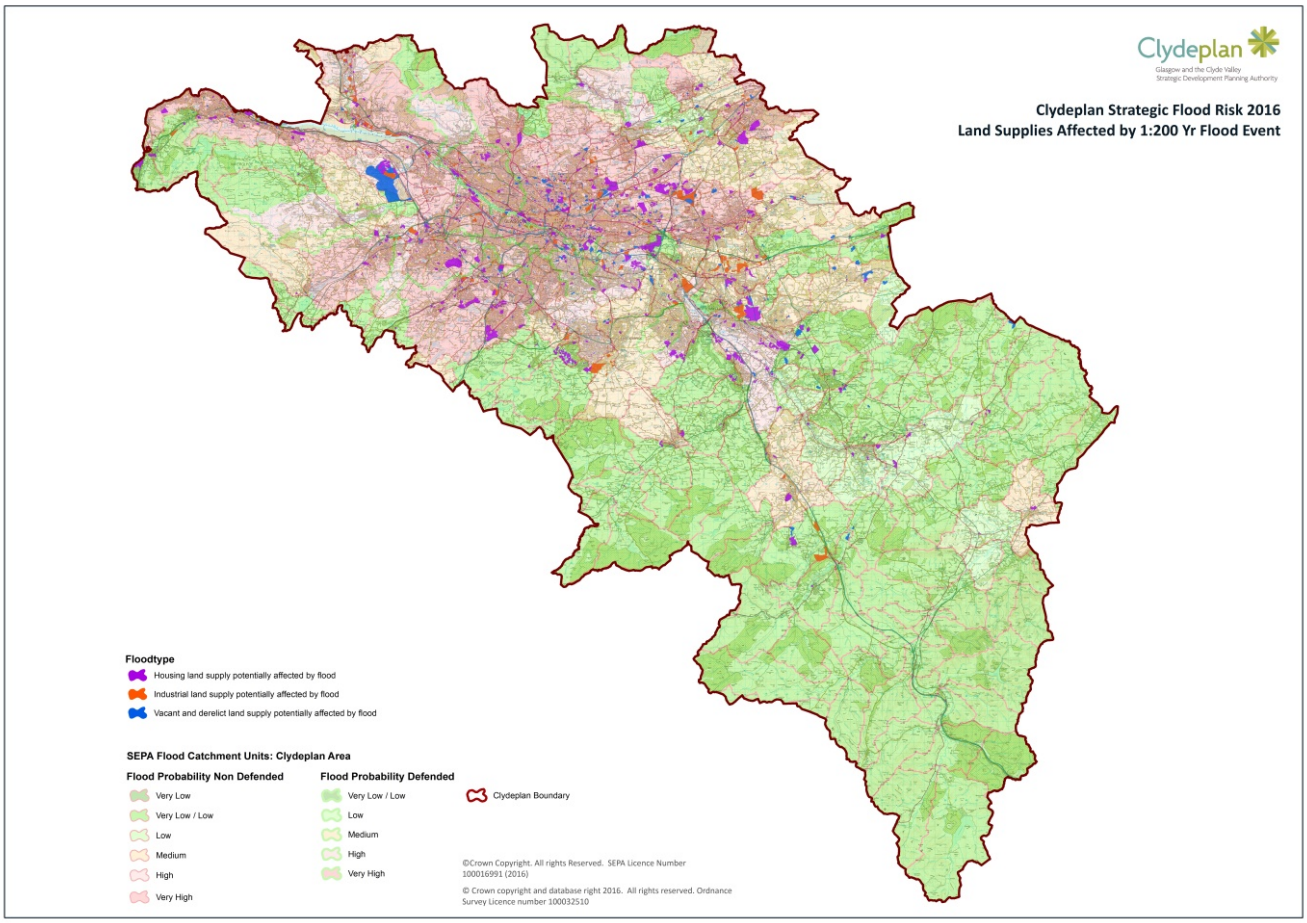
1.17 Map 3 has been further broken down in to the component elements which are covered in Maps 4-6.

1.18 Map 4 shows the flooding hazards to towns by flooding type i.e. fluvial (orange), pluvial (blue) or combined (purple).



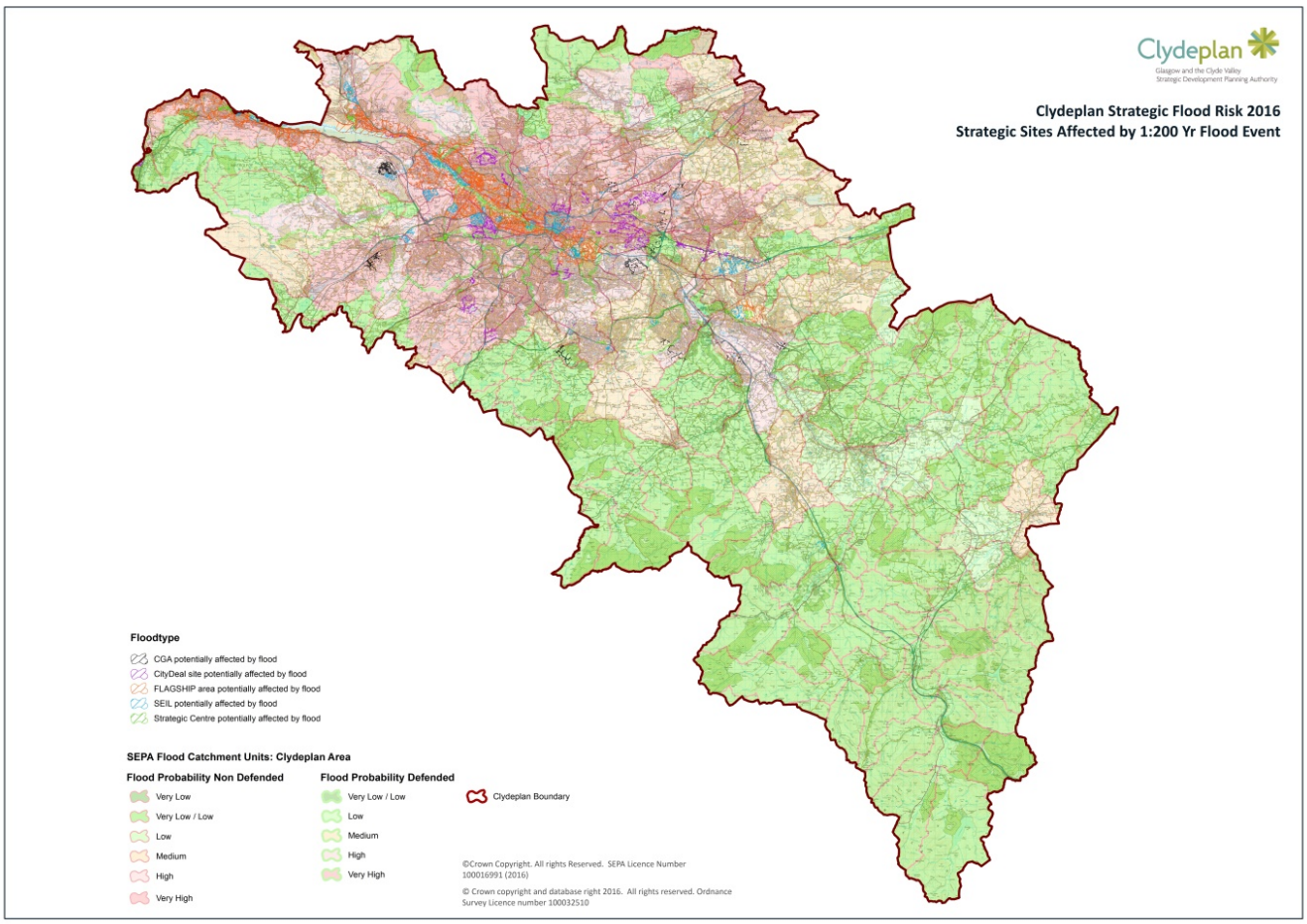
Map 4: Flooding Hazard for towns by all potential sources of flooding

1.19 Map 5 shows the flooding hazards by land supplies type i.e. industrial (orange), vacant and derelict land (blue) or housing (purple).



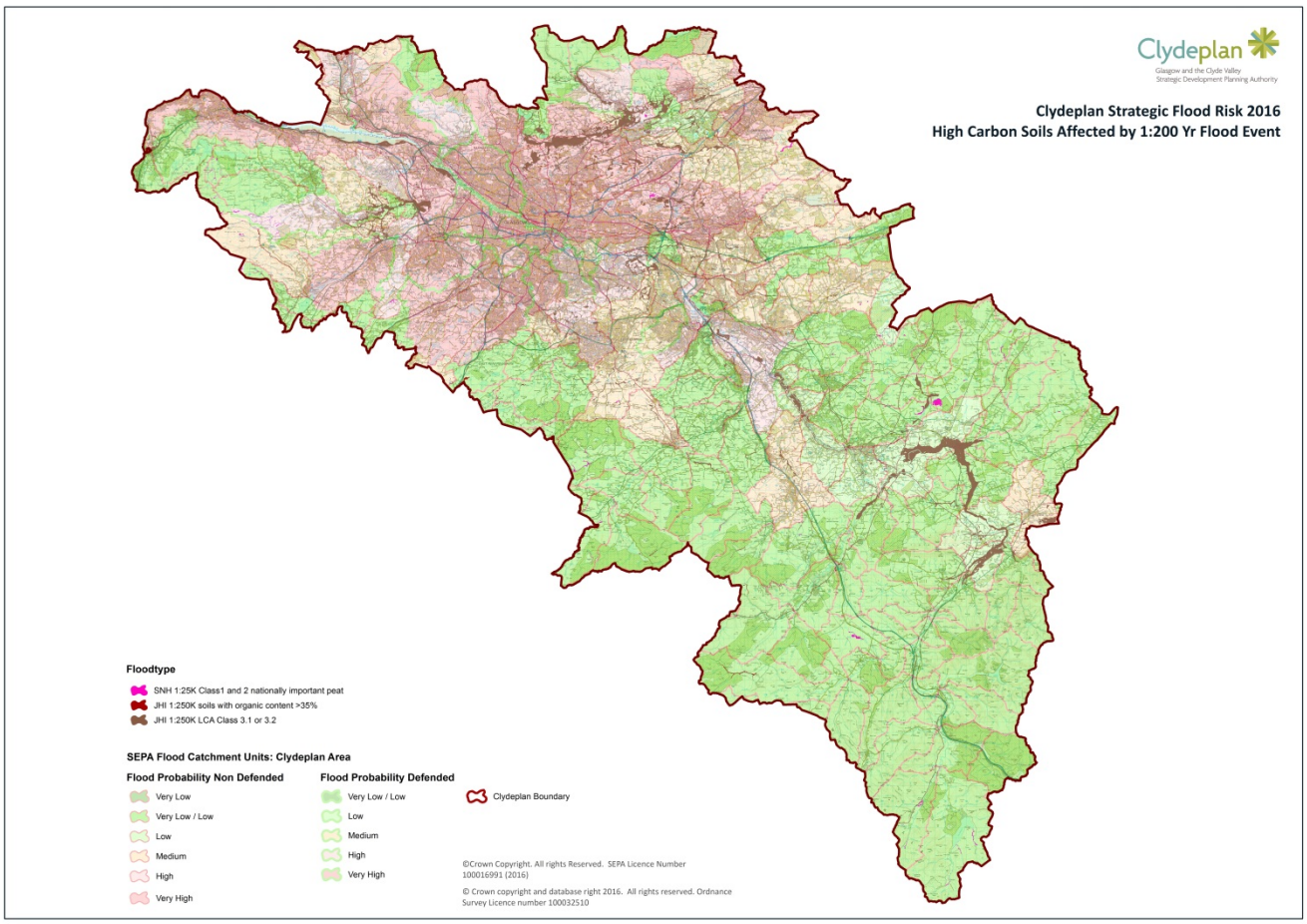
Map 5: Flooding Hazard for land supplies by all potential sources of flooding

1.20 Map 6 details the flooding hazards by strategic development sites i.e. some of those sites identified in the SDP. Specifically Map 6 includes details of Community Growth Areas (black hatching), City Deal locations (purple hatching), Flagship areas – known as the 'Development Corridor' in the SDP (orange hatching), Strategic Economic Investment Locations (blue hatching) and the Strategic Network of Centres (green hatching).



Map 6: Flooding Hazard for strategic sites by all potential sources of flooding

1.21 Map 7 adds a new element not displayed in Map 3 – soil types. It identifies soils with a high carbon value (i.e. peat) and soils with an agricultural value i.e. soils of 3.1 or 3.2 agricultural land use category, which may be considered a flooding hazard due to the potential impact of erosion, disturbance etc. of these sensitive areas.



Map 7: Flooding Hazard for sensitive soil type by all potential sources of flooding

1.22 The map above details the flooding hazards to nationally important areas of peat (pink), soils with organic content over 35% (red), and Land Capability for Agriculture class 3.1 and 3.2 soils (brown).

1.23 Overall, the maps above provide a response to the key elements of section 1 of the SFRA in terms of identification of the functional floodplain and growth pressures (by examining land supplies and strategic sites) and identification of current flood hazard and flood risk to the city region.

1.24 At the strategic scale it would be disproportionate to detail potential flood hazards due to climate change beyond the identification of current coastal and other flooding hazards. Detail at the Local Development Plan level would be expected to identify and address these issues in more detail.

1.25 It is also considered inappropriate to detail relevant drainage issues in this SFRA due to the scale of the area being addressed. The SDP supports the delivery of the Metropolitan Glasgow Strategic Drainage Plan, a co-ordinated approach to drainage for the city region which has overseen several completed and ongoing projects to address flooding and drainage issues in the city region. Local Development Plans would be expected to identify and address local drainage issues in more detail.

1.26 With regards to the remaining key elements of the SFRA, Section 2 includes details of sites or areas constrained by flood risk as well as other detailed tabular information used to construct the maps. These features are too numerous to include here and are available on request to the Clydeplan Local Authorities and SEPA.

1.27 The following information sources were used:

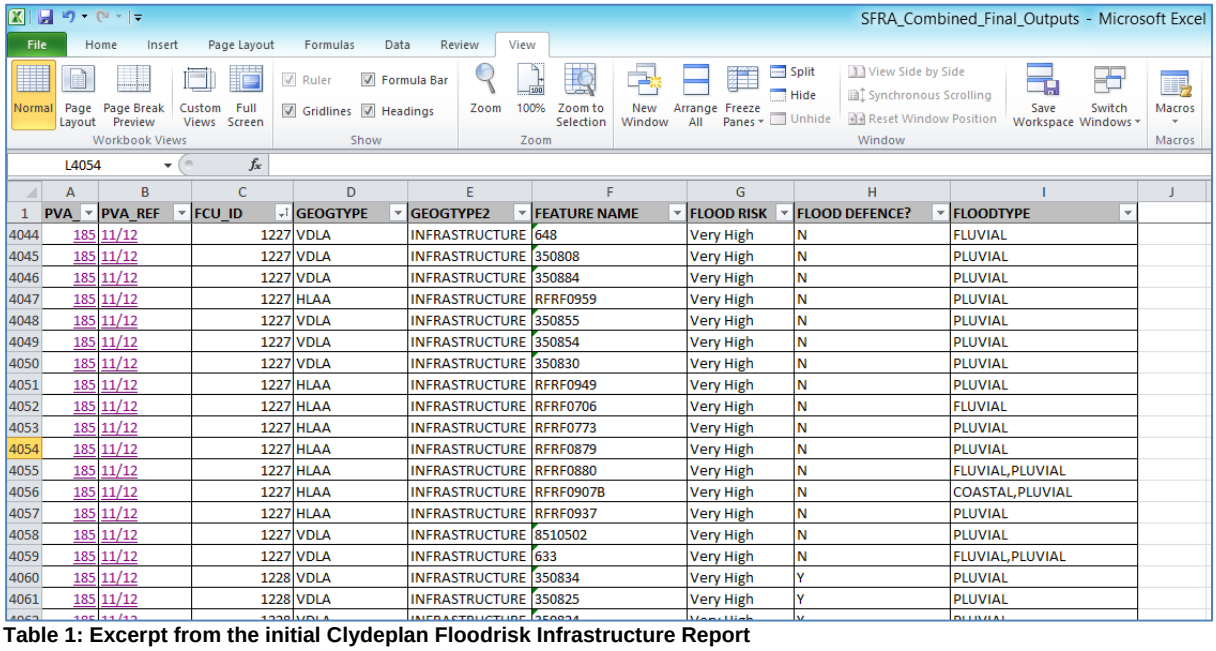
- SEPA flooding datasets
  - Pluvial (1:200 + climate change)
  - Fluvial (1:200)
  - Coastal (1:200)
  - Potentially Vulnerable Areas
  - Flood Catchment Units

- Clydeplan data
  - Housing Land Supply
  - Industrial Land Supply
  - Vacant and Derelict Land Supply
  - Flagship Areas (Development Corridor)
  - City Deal sites
  - Community Growth Areas
  - Strategic Economic Investment Locations (SEILS)
  - Strategic Network of Centres

- James Hutton Institute
  - Sensitive Carbon Soils
  - Soils of High Agricultural Value

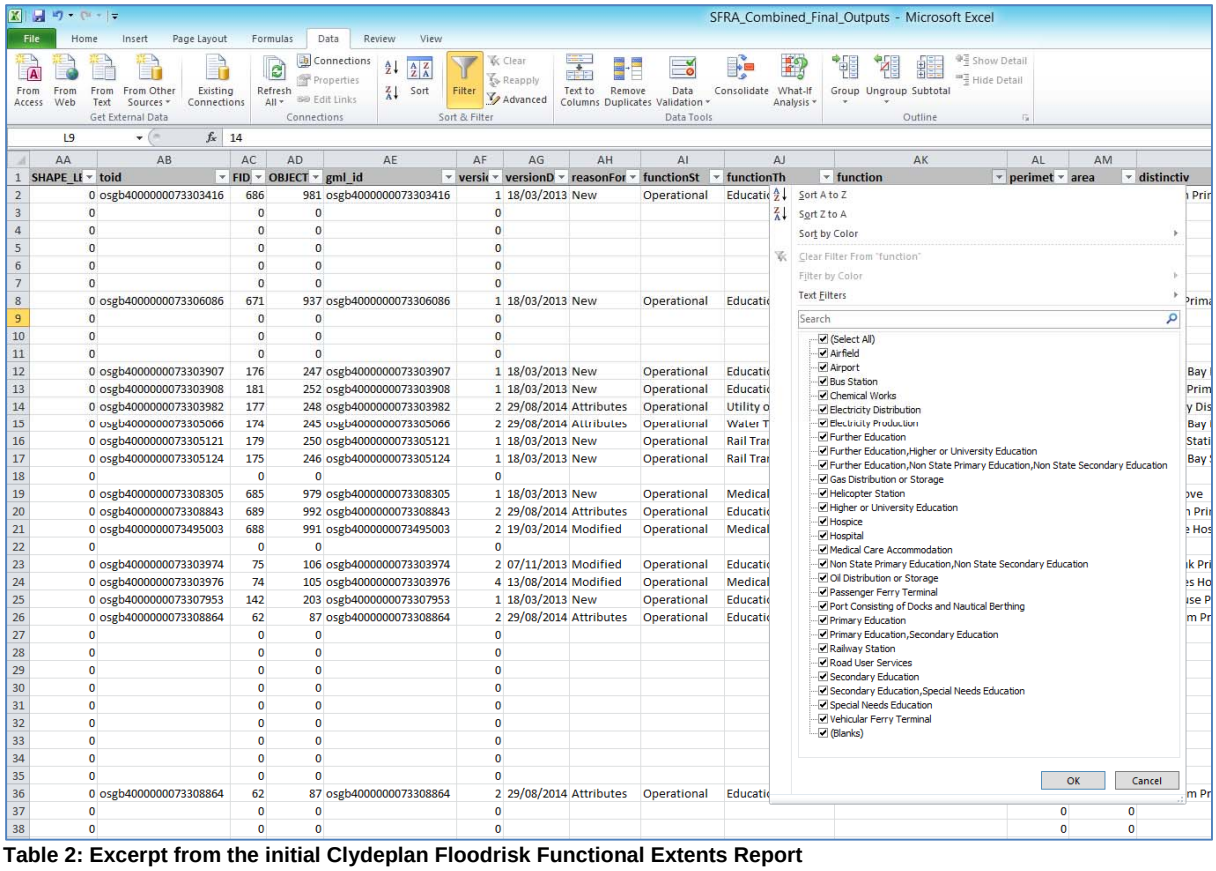
- Ordnance Survey data
  - Settlement locations
  - Functional extents (education, hospitals, utilities etc

2.1 The Clydeplan catchment is extensive and in consideration of the functional floodplain extents of map 1 and PVAs shown in Map 2, approximately 9000 features have been identified for further appraisal. These features are too numerous to include in this section of the SFRA but are available on request to the Clydeplan Local Authorities and SEPA. Two excerpts from these reports are available below which are cross referenced to GIS mapping and SEPA's online NFRA reports.



	A	B	C	D	E	F	G	H	I	J
1	PVA_	PVA_REF	FCU_ID	GEOGTYPE	GEOGTYPE2	FEATURE NAME	FLOOD RISK	FLOOD DEFENCE?	FLOODTYPE	
4044	185	11/12	1227	VDLA	INFRASTRUCTURE	648	Very High	N	FLUVIAL	
4045	185	11/12	1227	VDLA	INFRASTRUCTURE	350808	Very High	N	PLUVIAL	
4046	185	11/12	1227	VDLA	INFRASTRUCTURE	350884	Very High	N	PLUVIAL	
4047	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0959	Very High	N	PLUVIAL	
4048	185	11/12	1227	VDLA	INFRASTRUCTURE	350855	Very High	N	PLUVIAL	
4049	185	11/12	1227	VDLA	INFRASTRUCTURE	350854	Very High	N	PLUVIAL	
4050	185	11/12	1227	VDLA	INFRASTRUCTURE	350830	Very High	N	PLUVIAL	
4051	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0949	Very High	N	PLUVIAL	
4052	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0706	Very High	N	FLUVIAL	
4053	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0773	Very High	N	PLUVIAL	
4054	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0879	Very High	N	PLUVIAL	
4055	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0880	Very High	N	FLUVIAL,PLUVIAL	
4056	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0907B	Very High	N	COASTAL,PLUVIAL	
4057	185	11/12	1227	HLAA	INFRASTRUCTURE	RFRF0937	Very High	N	PLUVIAL	
4058	185	11/12	1227	VDLA	INFRASTRUCTURE	8510502	Very High	N	PLUVIAL	
4059	185	11/12	1227	VDLA	INFRASTRUCTURE	633	Very High	N	FLUVIAL,PLUVIAL	
4060	185	11/12	1228	VDLA	INFRASTRUCTURE	350834	Very High	Y	PLUVIAL	
4061	185	11/12	1228	VDLA	INFRASTRUCTURE	350825	Very High	Y	PLUVIAL	

Table 1: Excerpt from the initial Clydeplan Floodrisk Infrastructure Report



	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1	SHAPE_LE	toid	FID	OBJECT	gml_id	versi	versionD	reasonFor	functionSt	functionTh	function	perimet	area	distinctiv
2	0	osgb4000000073303416	686	981	osgb4000000073303416	1	18/03/2013	New	Operational	Educatio				
3	0		0	0		0								
4	0		0	0		0								
5	0		0	0		0								
6	0		0	0		0								
7	0		0	0		0								
8	0	osgb4000000073306086	671	937	osgb4000000073306086	1	18/03/2013	New	Operational	Educatio				
9	0		0	0		0								
10	0		0	0		0								
11	0		0	0		0								
12	0	osgb4000000073303907	176	247	osgb4000000073303907	1	18/03/2013	New	Operational	Educatio				
13	0	osgb4000000073303908	181	252	osgb4000000073303908	1	18/03/2013	New	Operational	Educatio				
14	0	osgb4000000073303982	177	248	osgb4000000073303982	2	29/08/2014	Attributes	Operational	Utility o				
15	0	osgb4000000073305066	174	245	osgb4000000073305066	2	29/08/2014	Attributes	Operational	Water T				
16	0	osgb4000000073305121	179	250	osgb4000000073305121	1	18/03/2013	New	Operational	Rail Trar				
17	0	osgb4000000073305124	175	246	osgb4000000073305124	1	18/03/2013	New	Operational	Rail Trar				
18	0		0	0		0								
19	0	osgb4000000073308305	685	979	osgb4000000073308305	1	18/03/2013	New	Operational	Medical				
20	0	osgb4000000073308843	689	992	osgb4000000073308843	2	29/08/2014	Attributes	Operational	Educatio				
21	0	osgb4000000073495003	688	991	osgb4000000073495003	2	19/03/2014	Modified	Operational	Medical				
22	0		0	0		0								
23	0	osgb4000000073303974	75	106	osgb4000000073303974	2	07/11/2013	Modified	Operational	Educatio				
24	0	osgb4000000073303976	74	105	osgb4000000073303976	4	13/08/2014	Modified	Operational	Medical				
25	0	osgb4000000073307953	142	203	osgb4000000073307953	1	18/03/2013	New	Operational	Educatio				
26	0	osgb4000000073308864	62	87	osgb4000000073308864	2	29/08/2014	Attributes	Operational	Educatio				
27	0		0	0		0								
28	0		0	0		0								
29	0		0	0		0								
30	0		0	0		0								
31	0		0	0		0								
32	0		0	0		0								
33	0		0	0		0								
34	0		0	0		0								
35	0		0	0		0								
36	0	osgb4000000073308864	62	87	osgb4000000073308864	2	29/08/2014	Attributes	Operational	Educatio				
37	0		0	0		0						0	0	
38	0		0	0		0						0	0	

Table 2: Excerpt from the initial Clydeplan Floodrisk Functional Extents Report

APPPENDIX D: UPDATED ENVIRONMENTAL BASELINE

APPPENDIX D: UPDATED ENVIRONMENTAL BASELINE

Environmental Context

1. Under schedule 3 of the Environmental Assessment (Scotland) Act 2005, responsible authorities are required to identify:

- the current state of the environment and how it will be affected if excluded from the planning process;
- how the character of specific environments will be affected;
- existing environmental problems
- International, European and national protection objectives.

2. Many objectives exist for environmental protection and improvement. These are based upon legislation, policies, strategies and plans alluded to in the following sections and which provide the context for the baseline Strategic Environmental Assessment (SEA) and which are highlighted more fully in Appendix A at the end of this document?

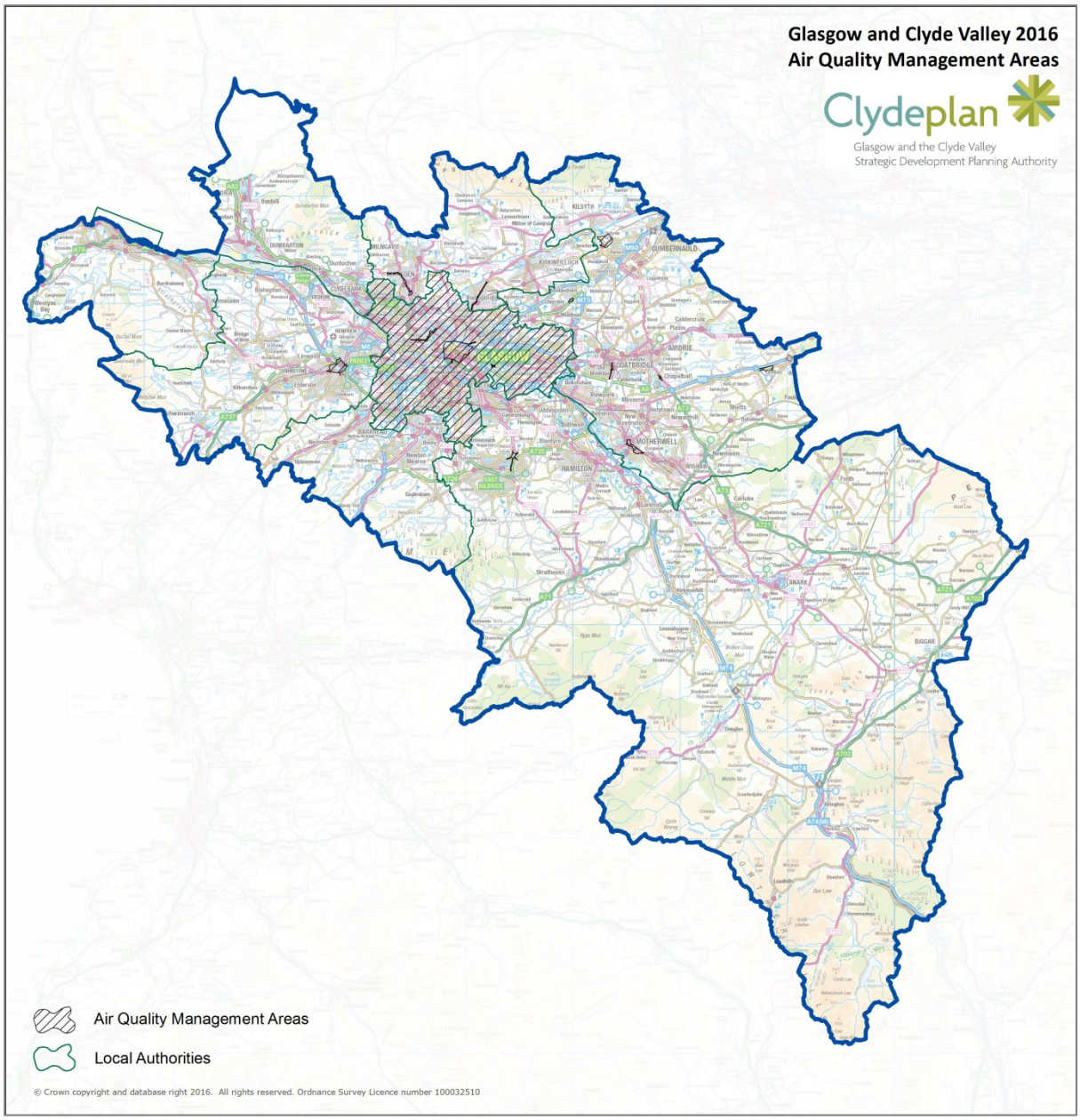
3. The environmental baseline is based on NPF3 and SPP whose focus is particularly on Scotland. Whilst a general overview has been taken of the Clydeplan city region comprising 8 constituent local authorities, key constraints and issues have been factored into the report using maps and tables which will assist with coordinating action and informing development proposals.

Air Quality

Overview

4 Air quality objectives seek to improve air quality of five of the local authorities within the Clydeplan city region. Within these five local authorities and as shown in Map 1, Air Quality Management Areas (AQMA) exist with the aim, of reducing emissions concentrations that have adverse effects on public health and the environment.

Map1: Air Quality Management Areas



Background

5 Poor air quality affects human health, flora and fauna, water and material infrastructure. Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), ground level ozone and particulates have the most significant impact on human health and the environment and CO_2 on Climate.

6 Oil and coal-fired power stations, domestic solid fuel burning and an increase in diesel car usage are responsible for the majority of SO_2 and NO_2 acidic emissions in Scotland. As well as causing acidification of water and soils and damage to vegetation both locally and internationally, these emissions cause damage to the respiratory system and the eyes. Accelerated erosion of buildings is of concern.[1]

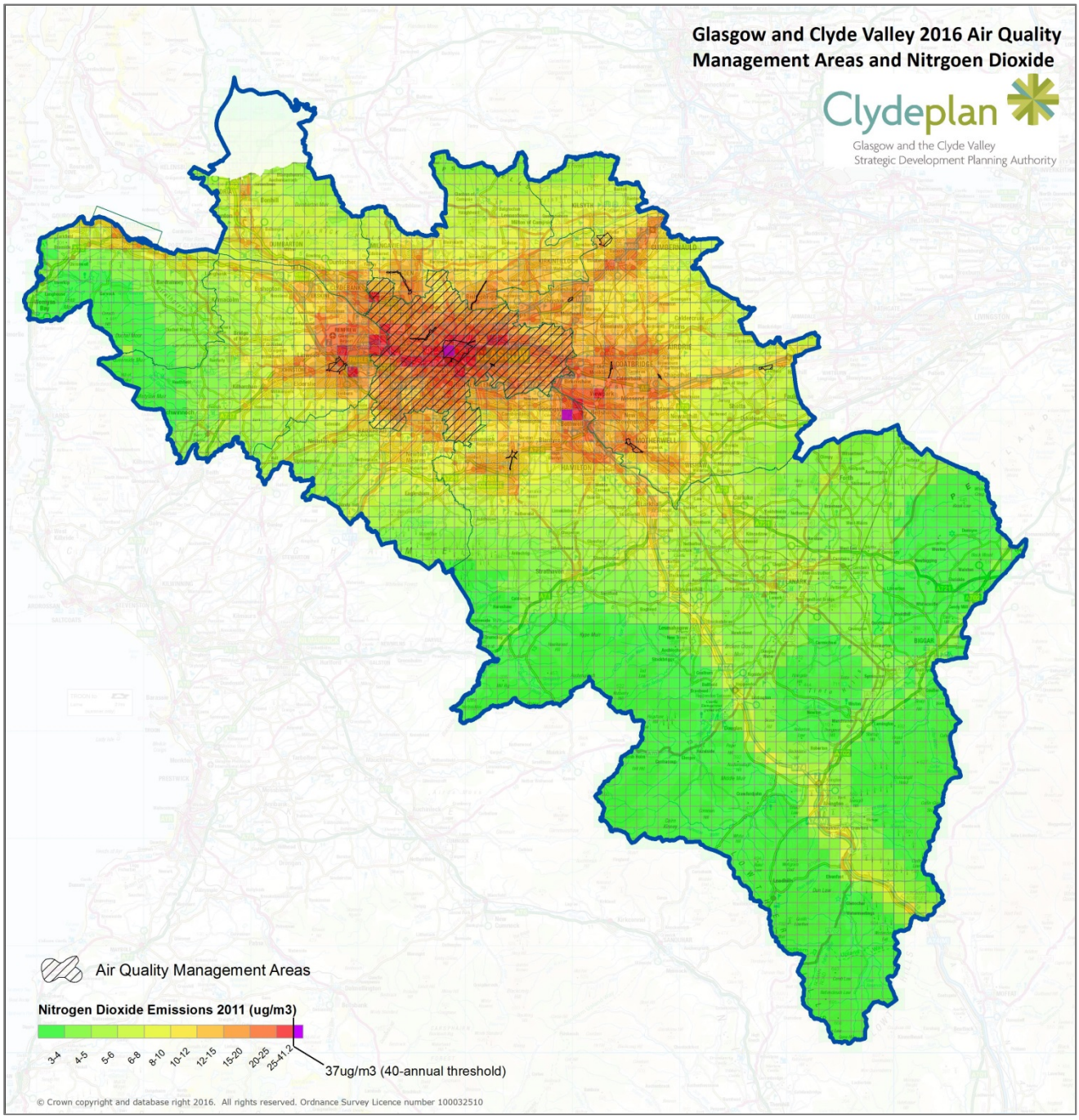
7 Emissions associated with heavy fuel and biomass burning release particulates into the atmosphere causing respiratory problems, toxification of soils and vegetation. Chemical reactions in the atmosphere reduce visibility, and encourage condensation: fog and cloud formation.

8 High ozone concentrations in the lower atmosphere are created through the combination of Volatile Organic Compounds (VOCs) and NO_2 found in fuel burning reacting with sunlight in an oxidation process. Ozone affects those with existing breathing difficulties, is toxic to plants and has an adverse effect on crop yields.

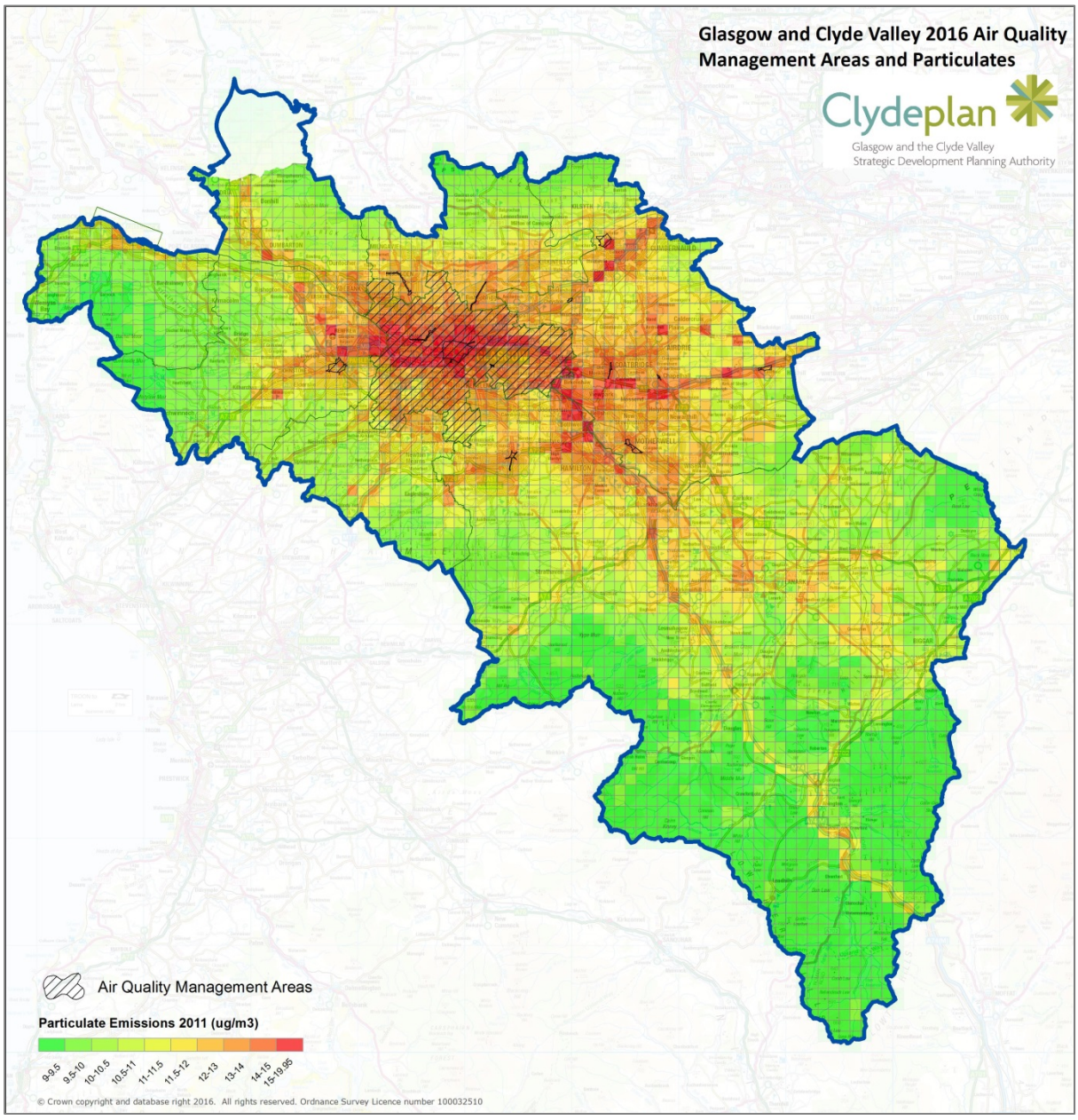
9 Map 2 highlights NO_2 concentration and distribution over the Clydeplan city region whilst map 3 reveals the pattern for particulates. The data for these maps was acquired from the DEFRA Local Air Quality Mapping (LAQM) download site. Concentration of pollutants is at its highest within urban regions and along the transport network - a picture which is reinforced in the maps at the end of this section*. As discussed in the Climate SEA baseline report, point source emissions from power stations are difficult to display cartographically, but their contribution is substantial and requires quantification by other methods.

[1] Scotland's Environment (undated)
http://www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx

Map 2: Air Quality Management Areas and Nitrogen Dioxide



Map 3: Air Quality Management Areas and Particulates



Trend Prediction Risk

10 Scotland has not enjoyed better air quality since before the industrial revolution.[2] Transport emissions pose the most serious threat to continued improvements in air quality[1] with the increase in volume of diesel cars, diesel trains and road haulage being responsible.

11 Five local authorities in Clydeplan city region have introduced AQMAs to maintain the improvements in air quality recorded between 1990 and 2010[3]. Figures published by UK

[2]Scotland's Environment (undated) Air and climate [online] Available at: http://www.environment.scotland.gov.uk/our_environment/air_and_climate.aspx

[3]Air Quality in Scotland (undated) Local air quality management [online] Available at: http://www.scottishairquality.co.uk/laqm.php?a=l&la_id=i

National Atmospheric Emissions inventory show that since 1990 NO_2 emissions have decreased by 61%, particulates by 57% and SO_2 by 73%.[4] If the trend continues, a further reduction in the level of these gasses, 45%, 19% and 64% respectively, is expected from the period 2002 – 2020.[3]

12 Continued improvement in air quality remains uncertain. Whilst it has been identified that the fuel type used in transport remains a problem, a potential issue in the energy generation sector is the growing use of biomass with the associated increase in particulates emissions. Overall emissions figures should remain in decline as carbon-free renewable power generation is consolidated.

Trend Graphs

(*Concentrations of roadside and urban background emissions from 1987-2010)*

Nitrogen Dioxide

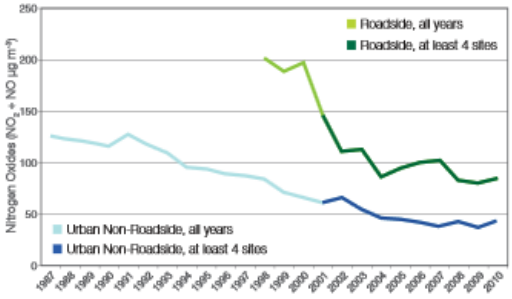


Figure 5.1

Trends in annual mean NO_x concentration at urban background and roadside sites in Scotland: 1987 - 2010.

Nitrogen Dioxide (mean)

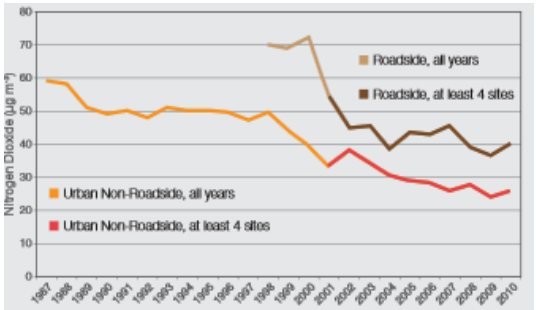


Figure 5.2

Trends in annual mean NO_2 concentration means at urban background and roadside sites in Scotland: 1987 - 2010

Ozone

Figure 5.3

Trends in annual mean ground-level ozone concentration at sites in Scotland: 1987 - 2010

Particulates

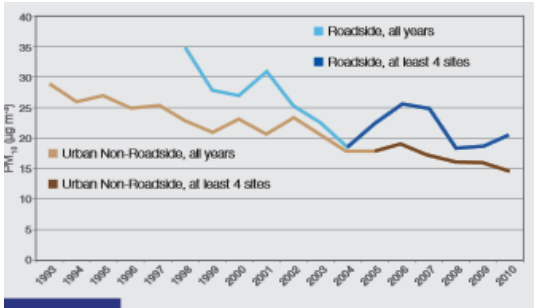


Figure 5.4

Trends in annual mean concentration of PM_{10} particulate matter at urban background and roadside sites in Scotland: 1993 - 2010.

Key Issues

13 It is anticipated that the trend in the improvement of air quality will continue until 2020. Policy that assists sustainable development, transport and the green network will benefit urban areas where higher emissions give greatest cause for concern for health and

[4]Scottish Environment Statistics Online, Air Quality, Air Pollutant Emissions
http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment/trendairpollutants

the environment. Continuing migration to carbon-free renewable energy will assist with meeting targets at a national level. It is recognised that private power generation companies and the international community are major stakeholders in this part of the process and that government can only be influencers rather than drivers towards achieving these targets.[5] The maps below highlight concentrations of air pollutants over Scotland and the central belt revealing the higher levels associated with the urban environment and the transport network.[6]

Air Quality: Emissions Associated with Transport and Agriculture Distribution

Nitrogen Dioxide Concentrations

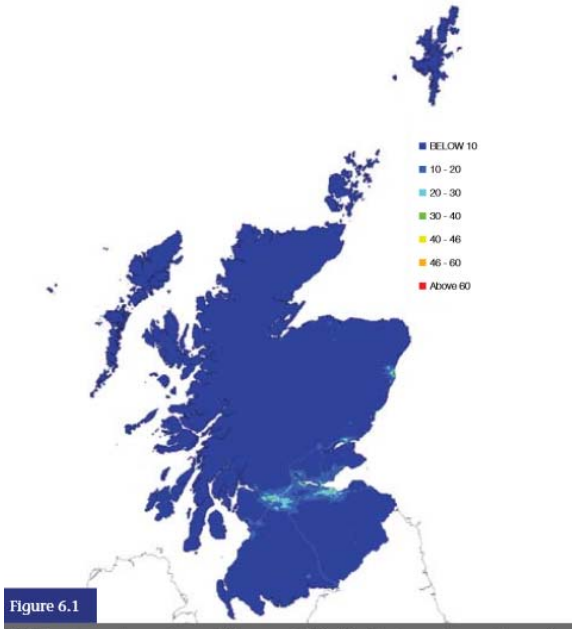


Figure 6.1
2009 background annual mean NO_2 concentration (Scotland-specific model, µg m^{-3}).

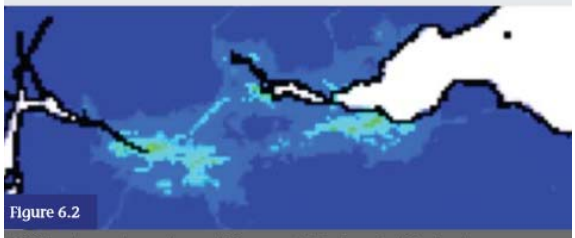


Figure 6.2
2009 background annual mean NO_2 concentration in central Scotland (Scotland-specific model, µg m^{-3}).

Particulates Concentrations

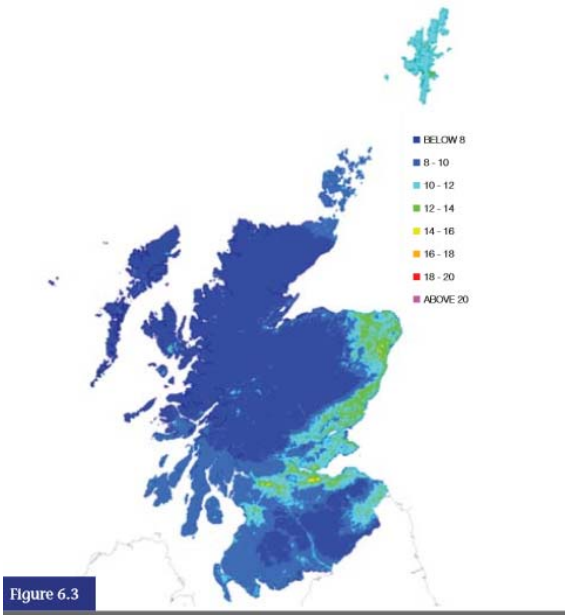


Figure 6.3
2009 background annual mean PM_{10} concentration in Scotland (Scotland-specific model, µg m^{-3}).

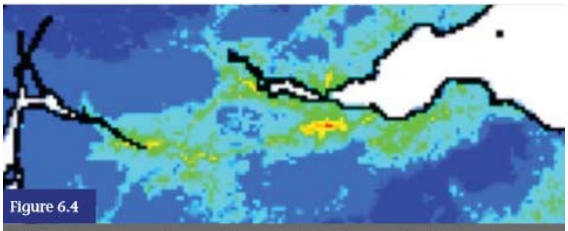


Figure 6.4
2009 background annual mean PM_{10} concentration in central Scotland (Scotland-specific model, µg m^{-3}).

[5] Air Quality in Scotland: Trends Summary
http://www.scottishairquality.co.uk/trends.php
[6] from paragraph 9

Biodiversity

Overview

14 Policies exist that define a hierarchy of protection for biodiversity, flora and fauna from a European to a local level. The Natura2000 network protects natural wealth associated with the Habitats and Birds Directive. European Protected Species and the Scottish Biodiversity Strategy also delineate conservation priorities. It is recognised that beyond European and national designations there is a requirement for preservation of biodiversity at a local scale. Ecological networks need to be maintained and as well as addressing issues of mechanical and climatic threat to biodiversity, broader impacts require to be understood and safeguarded against.

Background

15 Biodiversity is crucial to the sound functioning of ecosystems and their supporting role of sustaining life. Services such as nutrient and chemical cycling, pollination, carbon cycling and environmental cleansing can only be sustained through bio-diverse environments.[7,8] Mechanical attrition and climate change are greatly affecting global biodiversity.[9]

16 Fully functioning ecosystems sustain life. If an ecosystem is undermined, health and economy are undermined. Poor health exacerbated by a damaged ecosystem affects individual and community well-being, stresses the nation's health service and burdens the tax payer. In their current condition, ecosystem services provide revenue to the nation of around £22billion p/a.[10]

17 In Map 4, it becomes apparent that there is richness of biodiversity in Scotland and to a lesser extent Glasgow and the Clyde valley: a comparison highlighted in table 1. Scotland is home to 50,000 terrestrial and fresh water species and 39,000 species in the surrounding environments. Of the 89,000 species, 50% are thought to be single-celled organisms, 25% plant and fungi and the remaining 25%: arthropods and invertebrates. Scotland has 31 endemic species including 4 insects and 1 bird: The Scottish Crossbill.[7] Scotland also hosts majority populations or high concentrations of other global species.

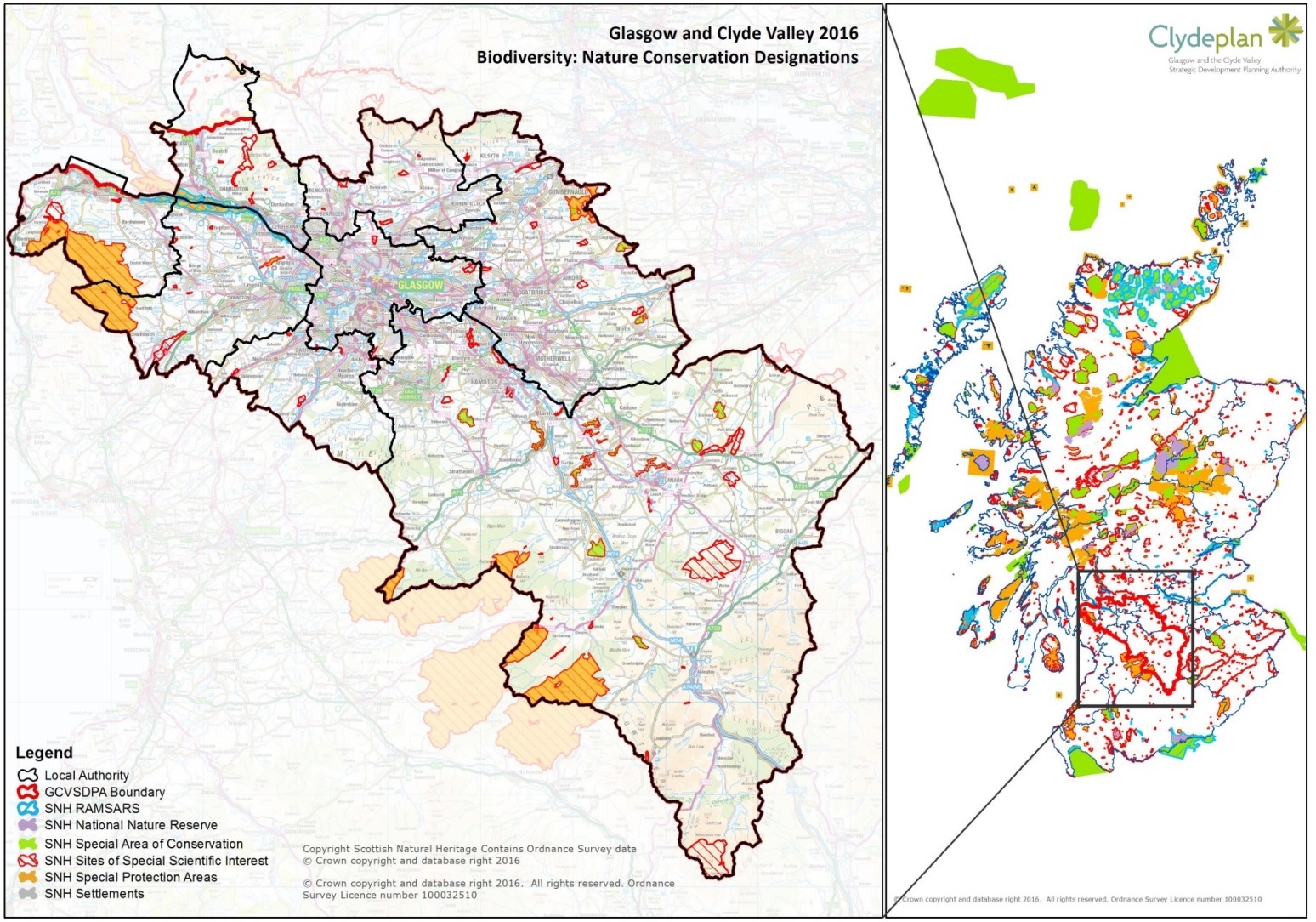
[7]SNH (2012) Safeguarding Biodiversity [online] Available at: http://www.snh.gov.uk/protecting-scotlandsnature/safeguarding-biodiversity/

[8]Mackey E.C. and Mudge G.P. (2010) Scotland's Wildlife: An assessment of biodiversity in 2010, Scottish Natural Heritage, Inverness [online] Available at: http://www.snh.gov.uk/docs/B811968.pdf

[9]Convention on Biological Diversity (undated) Climate Change and Biodiversity – Introduction [online] Available at: http://www.cbd.int/climate/intro.shtml

[10]Scotland's Environment (2012) Benefits from Nature [online] Available at: http://www.environment.scotland.gov.uk/our_environment/society/benefits_from_nature.aspx

Map 4: Designated Biodiversity Sites of Clydeplan and Scotland



18 From the Scottish Natural Heritage (SNH) International Designation Report of 2011[11], land with protected designation has been extracted for the Clydeplan city region in table 1 below. Marine Protection Areas (MPAs) are currently being collated in order to protect marine habitats, species and landscapes. The qualifying protected habitats of the Clydeplan designated sites and responsible authorities are listed in tables 2,3 and 4

Table 1: Designated Sites of Biodiversity: Scotland / Clydeplan (Extracted from 2011 report[10])

Designation	Scotland	Clydeplan City Region
SAC	239	10
SPA	153	5
RAMSAR	51	1
NNR	47	1
SSSI	1442 (12% of Scottish Land)	93

Table 2: SAC sites in Clydeplan

SAC Site Name	Qualifying Habitat	Responsible Local Authority
Black Loch Moss	Active and degraded raised bog	NL plus Within 5K
Braehead Moss	Active and degraded raised bog	SL
Cranley Moss	Active and degraded raised bog	SL
Clyde Valley Woods	Mixed woodland on base-rich soils associated with rocky slopes	SL
Coalburn Moss	Active and degraded raised bog	SL
North Shotts Moss	Active and degraded raised bog	NL
Red Moss	Active raised bog	SL
West Fannyside Moss	Blanket raised bog	NL
Waukenwae Moss	Active and degraded raised bog	SL
Loch Lomond Woods	Western acid oak woodland and otter	WD, A&B, Stirling
Airds Moss	Blanket raised bog	EA, within 5K
Bankhead Moss, Beith	Active raised bog	NA, within 5K
Blawhorn Moss	Active and degraded raised bog	WL, within 5K
Craigengar	Dry heath; species-rich grassland with mat-grass in upland areas; marsh saxifrage, saxifrage hirculus	WL, within 5K
Endrick Water	Atlantic salmon, brook lamprey, river lamprey	Stirling, within 5K
River Tweed	River lamphrey, brook lamphrey and sea lamphrey, Atlantic salmon, otter, rivers with floating vegetation often dominated by water-crowfoot	SB, within 5K

[11] SNH (2011) International Designations [online] Available at: http://www.snh.gov.uk/protecting-scotlandsnature/protected-areas/international-designations/

Table 3: SPA sites in Clydeplan

SPA Site Name	Qualifying Habitat	Responsible Local Authority
Muirkirk and North Lowther Uplands	Golden plover, *Pluvialis apricaria*; breeding; hen harrier, *Circus cyaneus; breeding;* merlin, *Falco columbarius*; breeding; peregrine, *Falco peregrine*s; breeding; short-eared owl, *sio flammeus; breeding;* ; hen harrier, *Circus cyaneus; non-breeding*	SL plus Within 5K
Inner Clyde	Redshank, *Tringa tetanus; non-breeding*	WD, RF, IC plus Within 5K
Slamannan Plateau	Taiga bean goose, *Anser fabalis fabalis; non-breeding*	NL plus within 5K
Renfrewshire Heights	Hen harrier, *Circus cyaneus; breeding*	RF, IC plus Within 5K
Black Cart	Whooper swan, *Cygnus cygnus; non-breeding*	RF
Loch Lomond	Capercaillie, *Tetrao urogallus* and Greenland white-fronted goose, *Anser albifrons flavirostris*	Within 5K
Westwater	Pink-footed goose, *Anser brachyrhynchus*; non-breeding and a waterfowl assemblage; non –breeding	within 5K

Table 4 Ramsar sites in GCVSDPA

Ramsar Site Name	Qualifying Habitat	Responsible Local Authority
Inner Clyde	Redshank, *Tringa tetanus*; non-breeding	WD, RF, IC plus within 5K
Loch Lomond	Greenland white-fronted goose , *Anser albifrons flavirostris;* non-breeding	Within 5K
Westwater	Pink-footed goose, *Anser brachyrhynchus*; non-breeding and a waterfowl assemblage; non-breeding	Within 5K

19 SNH is responsible for monitoring Scotland's priority habitats and species under the former UK Biodiversity Action Plan. From October 2010 to March 2011, SNH reported a 1% increase in vulnerable sites, reducing favourable conditions from 78% to 77%. 43% of habitats and 38% of species were stable or improving, 33% of habitats and 22% of species were in decline with the remainder showing no clear trend.[12] Of the 2370 habitats and 601 geological features being monitored in 2010, tables 5 and 6 below, depict the condition and trending of these environments.

[12]Scottish Government (2011) Scotland Performs – National Indicator – Protected nature sites, available at: http://www.scotland.gov.uk/About/scotPerforms/indicators/natureSites

Table 5: Performance and health of habitats, 2011-2011

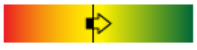
Topic	Summary
Estuaries and seas Scottish marine and coastal biodiversity is rich, diverse and fragile. Sustainable management will improve the health of our seas and the dependent Scottish communities.	Scotland's marine and coastal biodiversity is a major asset. Our marine and coastal ecosystems consist of a wide range of habitats, from open seas to sheltered sea-lochs, and from underwater cliffs and gorges to wide expanses of sand and mud. These provide niches for thousands of species. It is essential to recognise our relationship with this ecosystem and to sustainably manage the resource.
Farmland and lowland Scotland's farmland hosts a diverse range of plants and animals – some of which are in decline, but others are faring well.	Arable and grassland fields, crofting land, horticultural areas and lowland heaths and unimproved grasslands all make up the farmland and lowland ecosystem. The biodiversity of this ecosystem is highly influenced by land use change and land management practices, with very recent losses of set-aside land and applications of herbicides and pesticides affecting some areas. By October 2010, around two-thirds of habitats and species assessed by SNH were found to be in a favourable or recovering condition.
Mountains and uplands Scotland's uplands are uniquely wild and distinctive, and have some of our most highly rated wildlife and habitats	Scotland's uplands have some of our most distinctive and important wildlife and habitats – embracing mountains, moorlands, blanket bog and rough grasslands. Birds such as the golden eagle, golden plover and red grouse epitomise the uplands, and heather and bog mosses help define the landscape and support much of its nature. Much of the uplands have been damaged by grazing, drainage, afforestation and atmospheric deposition to the extent that near-natural habitats are rare. A range of monitoring studies reveals that many of the upland habitats and associated wildlife are declining in extent or condition.
Rivers and lochs Despite good and improving water quality, nutrient enrichment, water use, habitat change, invasive species and climate change still threaten freshwater wildlife	Freshwater wildlife is largely in good condition, reflecting long-term quality improvements. Some habitats and species remain adversely affected by physical modifications and water abstraction, although the overall ecological condition of Scottish rivers and lochs is generally good. Despite improvements over several decades, some problems remain. For example, water voles and freshwater pearl mussels continue to decline, and nutrient enrichment threatens vulnerable populations of plants such as river jelly lichen and slender naiad. Climate change and invasive non-native species have introduced new challenges to be addressed.
Wetlands Scotland's wetlands, including peatlands, are home to a special range of plants and animals, and contribute uniquely to storing carbon as well as to sustaining clean water	Scotland's wetlands are special habitats in their own right and provide a living space for a wide variety of plants, such as orchids and animals. Found from the sea shore to mountain tops, most wetlands within protected sites are in favourable condition, with the exception of lowland raised bogs. Peatland (a type of wetland) stores and accumulates significant quantities of carbon, with around 1600 million tonnes stored in Scottish peat soils. Further down the catchment, wetlands can help reduce flooding, and provide valuable grazing.
Woodlands and forests  Scotland's woodlands are diverse and support a variety of species. Our woodlands are in a good state and are improving	Woodlands support a high proportion of Scotland's terrestrial wildlife. Rare and threatened species are more often associated with semi-natural woodlands, but many have also colonised planted forests. Woodland ecosystems of all types supply a wide range of social, environmental and economic services to society. There are many potential threats to woodland biodiversity; however much is being done to address these threats and take advantage of opportunities to enhance biodiversity.

Table 6: Habitat extent changes, 1998 – 2007

Table 10.1 Broad habitat extent in 1990, 1998 and 2007
Source: Countryside Survey 2007

	1990	1998	2007		1998 - 2007		
	000 ha	000 ha	000 ha	% Scotland	change (000 ha)	% change	significant change 1998 - 2007
Fresh water & wetland							
Standing Open Waters	75	88	89	1.1	1	1	-
Rivers & Streams	21	20.7	21.3	0.3	0.6	2.9	↑
Lowland and farmland ecosystem							
Arable & Horticulture	593	618	534	6.6	-84	-13.6	↓
Improved Grassland	815	831	907	11.2	76	9.1	↑
Neutral Grassland	429	430	461	5.8	31	7.2	-
Linear Features ('000 km)	143	103	95	1.2	-8	-7.8	↓
Built-up Areas & Gardens	150	153	153	1.9	0	0.1	-
Other land	48	77	74	0.9	n/a	n/a	-
Unsurveyed urban land	38	38	38	0.5	n/a	n/a	-
Woodland ecosystem							
Broadleaved, Mixed & Yew Woodland	284	229	251	3.1	22	9.5	↑
Coniferous Woodland	913	1,030	956	11.9	-74	-7.1	↓
Upland ecosystem							
Montane	n/a	38	38	0.5	1	1.9	-
Inland Rock	53	91	84	1	-7	-7.8	-
Bracken	107	121	132	1.6	10	8.4	-
Fen, Marsh & Swamp	289	261	239	3	-22	-8.6	-
Calcareous Grassland	36	28	26	0.3	-2	-5.5	-
Dwarf Shrub Heath	1,007	912	894	11.1	-18	-2	-
Acid Grassland	1,095	911	983	12.3	72	7.9	↑
Bog	1,922	2,039	2,044	25.6	5	0.2	-
Total	8,019	8,019	8,019	100			

Trend Prediction Risk

20 Biodiversity loss owing to land use pressure, nutrient deposition and land/air/water pollution, invading species and climate change is well documented.[13] European indicator

[13]Scotland's Environment (2012) Wildlife [online] Available at: http://www.environment.scotland.gov.uk/our_environment/wildlife.aspx

based assessments like Natura 2000 network reveal that decline in biodiversity has been halted under the implementation of new policies.

21 Through climate change and the proliferation of invasive species, habitat and species loss or change in breeding or migration and increase in disease is possible. Across Scotland, 14% of the 867 non-native species have shown increase giving rise to concern over food availability and habitat loss especially for seabirds and the marine environment.[4,14] Additionally, whilst some species may need dispersal time in order to survive under climate change, there is suggestion that warming may improve opportunities for harvesting of some species in an "improved" niche environment.[15,16]

Marine and River

22 Scotland has a large coastal and marine territory and seabed ecosystems are as complex as terrestrial soils. Areas have been designated for preserving seaweeds, plants, reef and mudflats protecting, fish, shellfish and seabirds. Acidification, diffuse pollution and material deposition in areas such as the Clyde, especially from climate change storm events (coastal and river) puts significant pressure on transitional areas such as coastline, estuary and mudflat (See map 5).

23 In addition to climate change, the mechanical impact of for example, energy generation, flood prevention, infrastructure projects, forestry and agricultural expansion can have a negative impact on aquatic habitats, species and biodiversity. The Inner Clyde Ramsar site on Map 4 falls within the city region but there are no Marine Protection Areas within the boundary, the closest being Upper Loch Fyne and Loch Goil MPA approximately 15 miles from the boundary.

Upland

24 Scotland's blanket bogs are globally renowned accounting for 1.1 million hectares (17%) of Scotland's upland area. A further 21%-31% of upland area is peaty heathland. Bog and heathland losses result from a complex range of issues including climate factors, pollution and changes in land management particularly afforestation and windfarm installation the latter of which are all relevant to the city region.[17] The SEA soils baseline report covers distribution of high peat soils in Glasgow and the Clyde valley and table 2 lists the designated bog sites of the area.

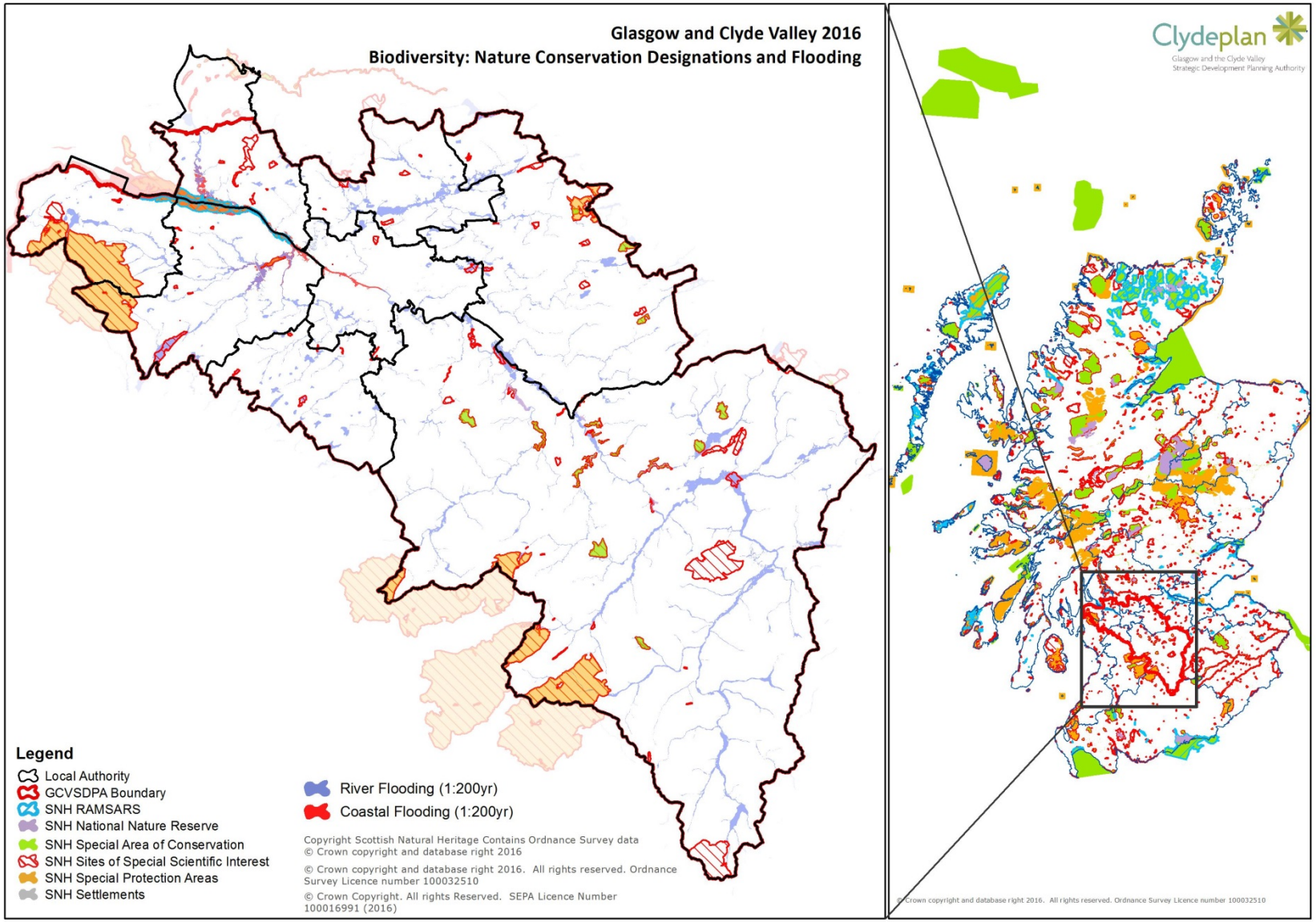
[14]Baxter J.M., Boyd I.L., Cox M., Donald A.E., Malcolm S.J., Miles H., Miller B., Moffat C.F. (Editors) (2011) Scotland's Marine Atlas: Information for the National Marine Plan, Marine Scotland, Edinburgh, pg. 189 [online] Available at: http://www.scotland.gov.uk/Publications/2011/03/16182005/0

[15]ibid

[16]SNH and The Marine Biological Association(undated) Impacts of climate change on seabed wildlife in Scotland[online] Available at: www.marlin.ac.uk/PDF/Climate_change_brochure.pdf

[17]Scottish Government (undated) Scotland's environment, pressures affecting upland wildlife [online]Available at: http://www.environment.scotland.gov.uk/our_environment/wildlife/mountains__uplands/pressures.aspx

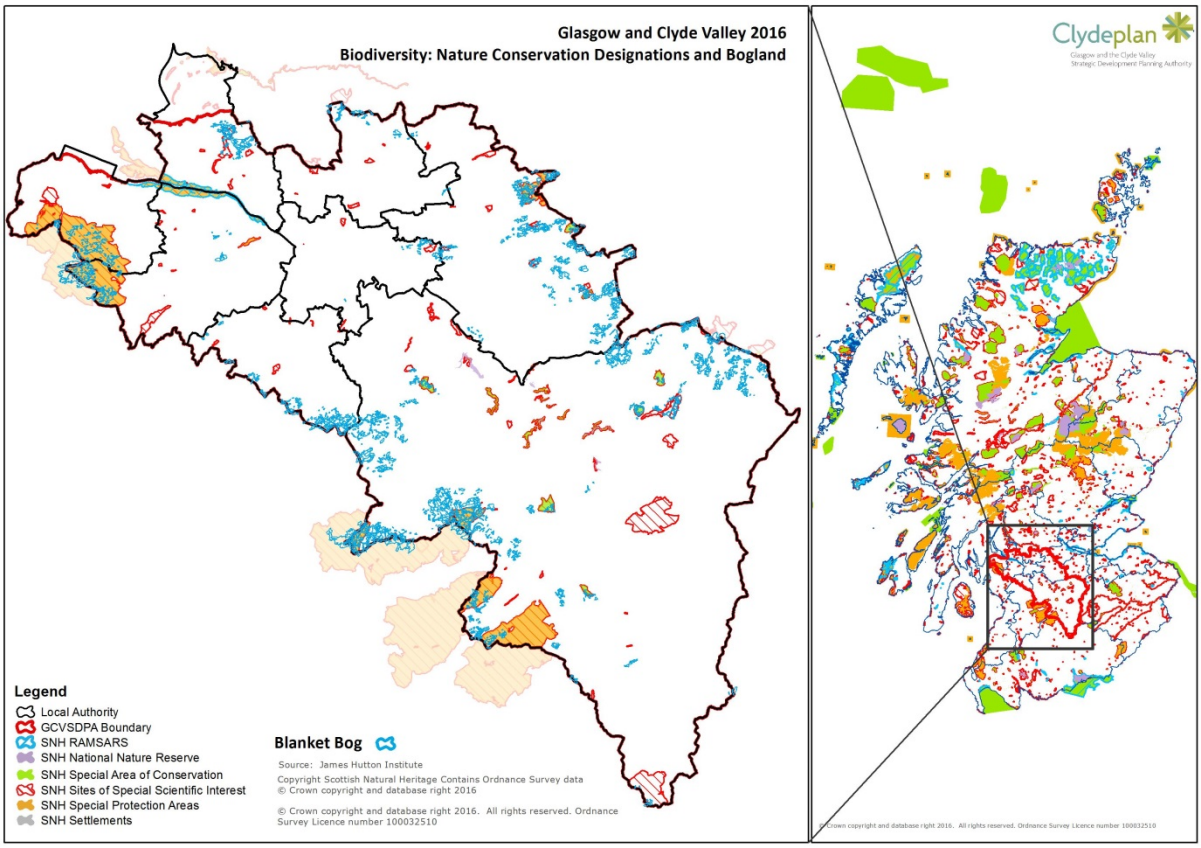
Map 5: Flood Risk Areas of Clydeplan



Wetlands

25 Most protected bog sites are in a favourable condition and they house a range of plants and animals including waterfowl and waders. Peatland contribute significantly to wetland habitat. Lowland raised bogs are not in favourable condition at a national scale and there is potential for restoration.[18] Glasgow and the Clyde Valley is home to several SAC raised bog sites that are shown on Map 4 and listed in table 2. Map 6 shows the general distribution of bog over the city region.

Map 6: Bog Sites with Biodiversity in Clydeplan



Forestry/Woodland

26 Woodland cover in Clydeplan runs at around 18% - similar to the national average. Woodland supports a disproportionate amount of biodiversity where there has been a 30% increase in the number of birds found in woodland nationally over the decade 1994-2004. Native, ancient and semi natural woodlands have the highest levels of biodiversity with 8000Ha of new woodland being created in the UK between 2010-2011. Reforestation targets for Scotland were set at 1,000HA p/a and between 2001 and 2005 but the rate is closer to 100Ha/pa as reported in http://www.heraldscotland.com/news/environment/targets-to-increase-woodlands-missed.24474511.

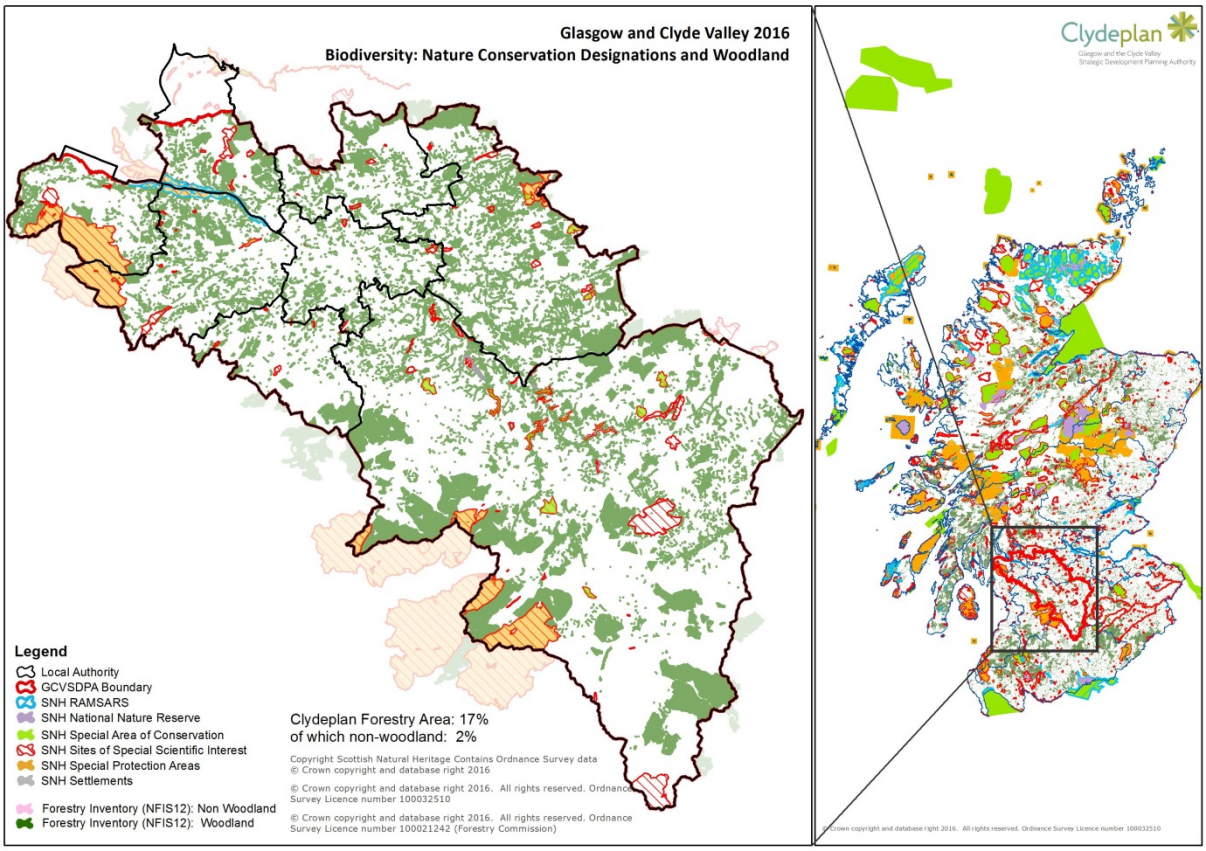
27 Woodland categorised as favourable or improving has also increased 10% from 59% to 69% since 2005 due to improved management of the national and private forest estate. However there has been a decline in woodland cover within Clydeplan from the construction

[18] Scottish Government (undated) Scotland's environment, wetlands [online] Available at: http://www.environment.scotland.gov.uk/our_environment/wildlife/wetlands.aspx

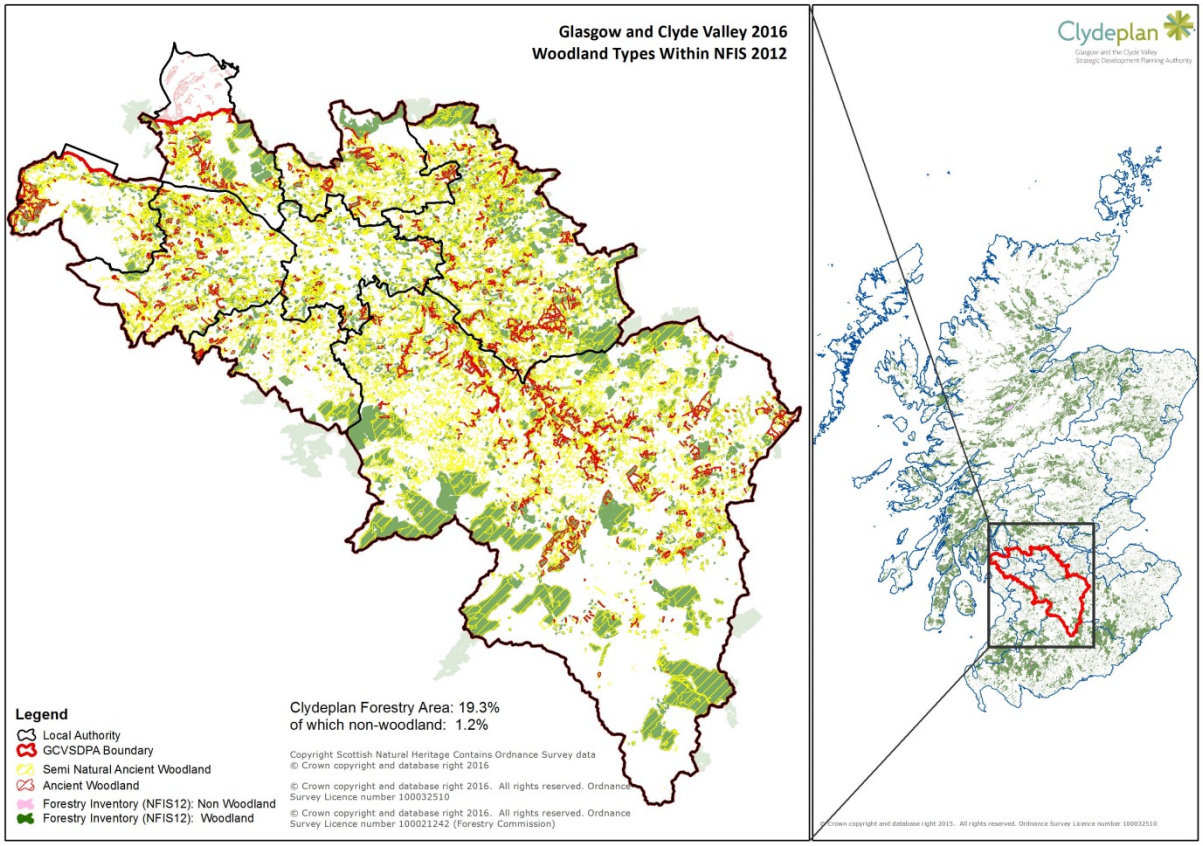
of new wind farms. The distribution of woodland comparing Scotland to the Clydeplan city region can be viewed in Map7. It is perhaps surprising that despite high biodiversity in woodland, there is little protection for them except for the minor SSSI sites found specifically in South Lanarkshire Clyde Valley where the sites are protected for their biological components.

28 Whilst map 7 shows the distribution of woodland from the 2012 National Forest Inventory Survey (NFIS12), upon closer inspection, map 8 reveals that much of this woodland in not necessarily commercial but falls into an Ancient or Semi Natural Ancient Woodland category (AWI and SNAWI). SNH can provide guidance to local authorities on how to protect this valuable resource.

Map 7: Woodland Distribution and Biodiversity in Clydeplan



Map 8: Woodland breakdown (NIFS12) within Clydeplan



Agriculture

29 75% of the land area of Scotland is given over to agriculture, equating to around 5.6million Ha. 55% is rough grazing, 24% grass, 10% for direct cultivation or fallow crops, 8% to woodland (woodland on agricultural land) and 2% supporting agricultural management. Woodland within agricultural boundaries has increased by 110% since 2001 with the concession being largely at the expense of rough grazing. [19] Bog and heathland are also subsumed within these figures.

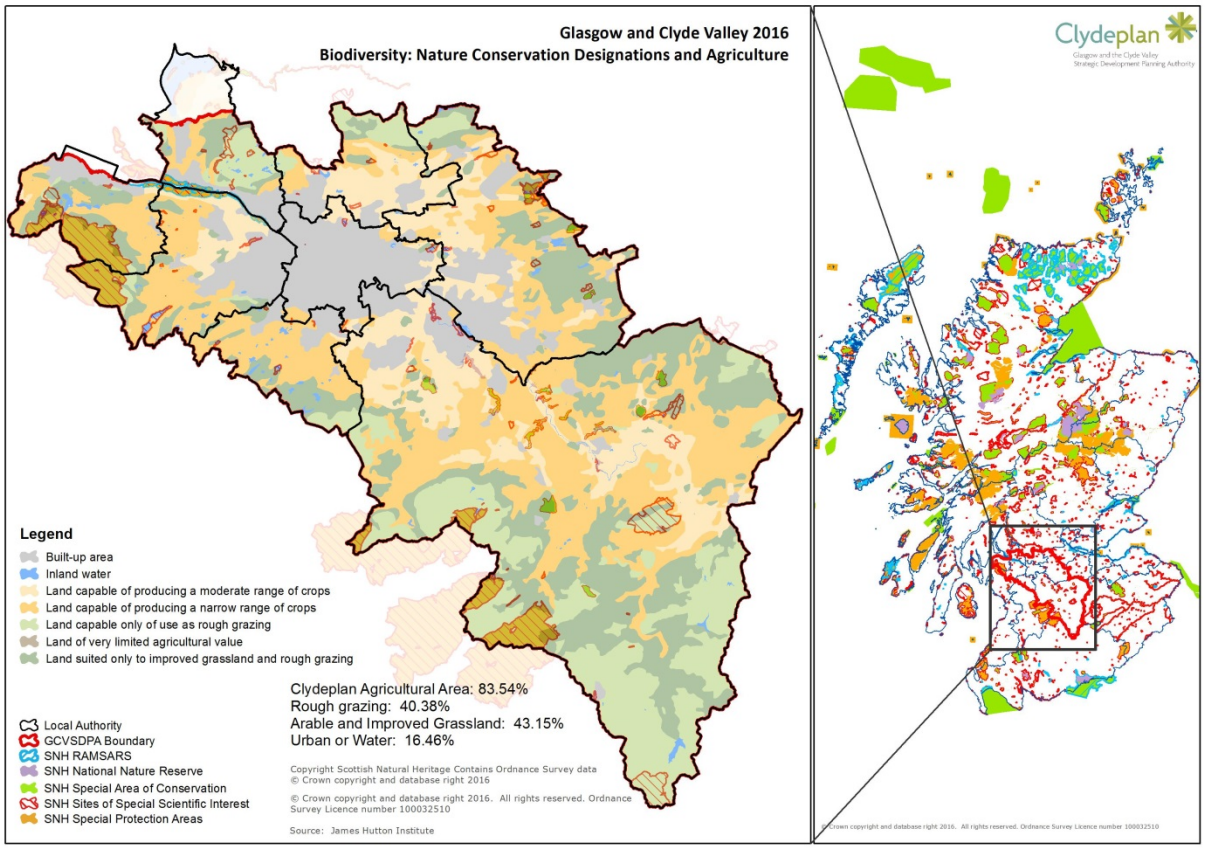
30 In Glasgow and the Clyde Valley, around 85% of the land has agricultural value with around 40% of that being classified as rough grazing and 43% as arable or improved grassland (Map 9). Most designated sites fall within a range of agricultural types but the Inner Clyde RAMSAR is out-with agricultural land classification.

31 Agricultural intensification has increased in recent years as mixed farming has given way to intensive arable systems. The removal of field boundaries in support of arable farming has led to a 7% loss of managed hedgerows and trees which has a subsequent effect on biodiversity. Small mammals, birds and invertebrates have been lost along with the hedgerows including predatory species that assist with pest control.[20]

[19]Scottish Government (2011) Final results from June Agricultural census [online] Available at: http://www.scotland.gov.uk/Publications/2011/09/27083355/3

[20]Scottish Government (undated) Scotland's Environment, description of farmland and lowland wildlife. [online] Available at: http://www.environment.scotland.gov.uk/our_environment/wildlife/farmland__lowland/description.aspx

Map 9: Agriculture with Biodiversity in Clydeplan



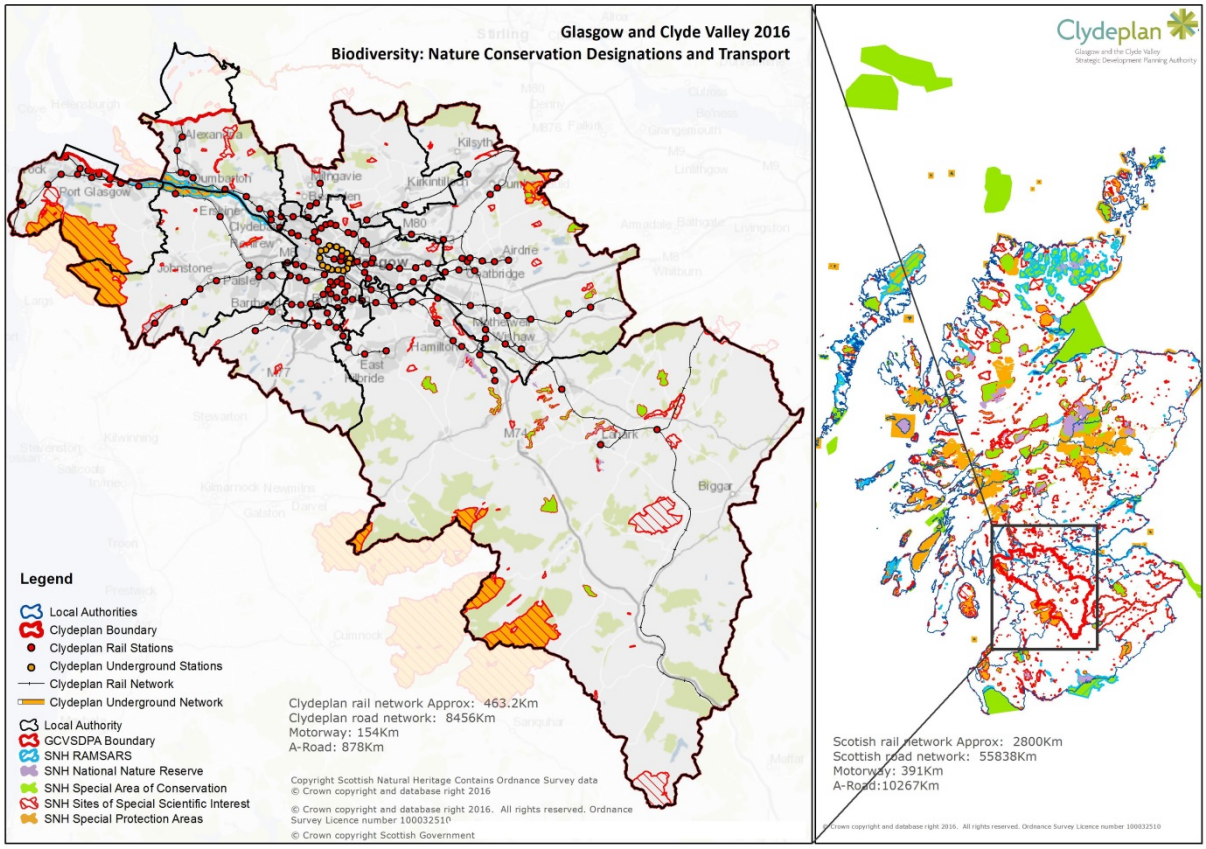
32 Diffuse pollution from agriculture continues to pose a risk to water courses including rivers, lochs, transitional and coastal waters. Chemical and waste contamination, and land disturbance have the potential to affect water quality, air quality and biodiversity.[21] These relationships have an additional, more convoluted effect on sites of designated biodiversity that will require an inclusive approach that considers such complexity.

Infrastructure/Urban

33 Infrastructure projects including transportation have the potential to adversely affect biodiversity. The relationship between transport infrastructure and designated sites can be seen in map10. If sensitively planned and managed, impact on habitat and biodiversity can be limited and concessionary measures implemented such as crossing areas, corridors and sensitive tree and hedge planting that can redistribute wildlife movement in a safeguarding capacity.

[21]SEPA (2012) About Diffuse Pollution [online] Available at: http://www.sepa.org.uk/water/diffuse_pollution/about_diffuse_pollution.aspx

Map10: Transport with Biodiversity in Clydeplan



Key Issues

34 Sound planning should influence development and limit damaging activity in order to safeguard biodiversity throughout the city region. This should address the mechanical impact of development as well as the impact of climate change. NPF3 and SPP should provide a context for sustainable planning that seeks not just to protect but enhance biodiversity through programmes such as woodland expansion, bog management, agricultural monitoring, flood management, green networks, settlement level planning and infrastructure projects.

Climate

Overview

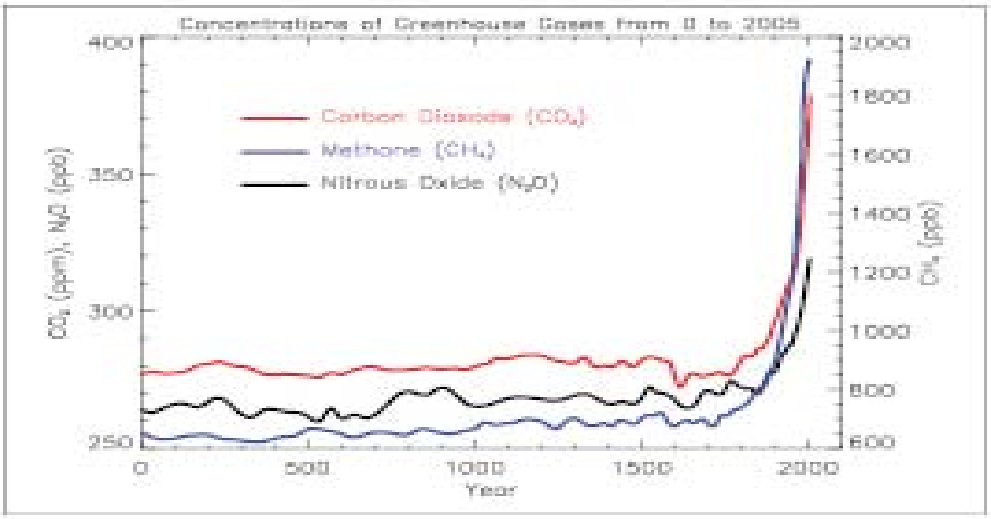
35 Climate change has been accelerating at an unprecedented rate over the last 50 years. Scottish Government and SDP1 have sought to develop policy and strategy that will decelerate climate change triggered by human promulgated greenhouse gasses reported by the IPCC.[22] A growing adaptation framework is developing based around new policies conceived through the Climate Change (Scotland) Act 2009.

Background

36 Four main identifiable human derived greenhouse gasses need to be controlled[23]: Carbon Dioxide, Methane, Nitrous Oxide and Halocarbons like the ozone depleting CFCs largely eliminated in the 1980s. They are the main contributors to climate change and in human terms are produced through energy generation and transportation and also activity associated with domestic, industrial, business and agricultural processes.

37 Ambitious targets have been set to reduce greenhouse gas emissions by 42% by 2020 and 80% by 2050.[24] If successful, emissions will be reduced to pre 21st century and pre-industrial revolution levels in less than 40 years. Whilst the energy sector has been identified as the one of the largest contributors to carbon emissions in Scotland, all sectors will require policy development that will assist greenhouse gas mitigation. Despite reductions in emissions, if policy and implementation is successful, atmospheric concentrations will remain high but will be stabilised (See Figure 1).

Figure 1: Concentrations of Greenhouse Gases from 0 - 2005



38 Since 1990, there has been a gradual yet steady decline in greenhouse gas emissions suggesting that strategy and policy is having a positive effect towards achieving this target (See figure 2a).[25] However the system is estimated to operate under a 50 year feedback cycle and current emisisions will still be contributing to the cycle in the 2060s.

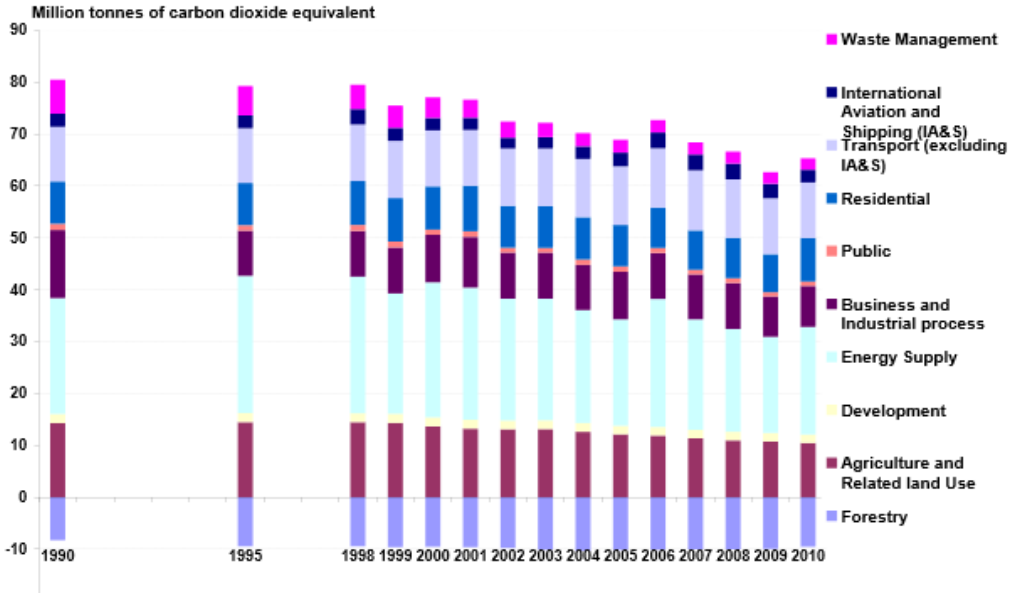
[22]Intergovernmental Panel on Climate Change FAQ 2.1 How do human activities contribute to climate change and how do they compare with natural influences? http://www.ipcc.ch/publications_and_data/ar4/wg1/en/faq-2-1.html

[23]Scotland's Environment (undated) climate change [online] Available at: http://www.environment.scotland.gov.uk/our_environment/air_and_climate/climate_change.aspx

[24]Scotland's environment web Air and Climate Response by Society http://www.environment.scotland.gov.uk/our_environment/air_and_climate/climate_change/response.aspx

[25]Scottish Greenhouse Gas Emissions 2010 http://www.scotland.gov.uk/Publications/2012/07/9583/downloads#res-1

Figure 2a: Greenhouse gas emissions by source: 1990, 1995, 1998 – 2010



39 Decarbonisation within the energy supply sector will continue to rise but other sectors should also look to reduce their emissions. There is concern over forestry policy as a counter to carbon production. Forest planting is falling short of targets by around 20% p/a[26] and felling has increased as swaths of forest have been removed for wind-farm construction. A balanced, cohesive, encompassing strategy should be embraced that will see all sectors of society contribute to carbon reductions.

40 Tables 7 and 8 reveal the percentage contribution of greenhouse gas emissions and volume per sector. Those highlighted with the greatest potential for emissions reductions are already being effectively focussed on: energy generation and domestic. Agriculture, business, industry, and transport need work. The maps in the Air Quality section of this report confirm emissions issues associated with the transport network and urban environment are substantial highlighting the need for mitigation and effective policy.

[26] (June 2014 woodland trust press release)

Table 7: Scottish greenhouse gas emissions by source: 2010 share, 2010 comparisons with 1990 and 2009[27]

National Communication Sectors	% share of 2010	%change from 1990	%change from 2009
Energy Supply	37%	-7%	12%
Transport (excluding IA&S)	19%	2%	-1%
International Aviation and Shipping (IA&S)	4%	-1%	-12%
International Aviation	*2%*	*118%*	*-6%*
International Shipping	*3%*	*-29%*	*-16%*
Business and Industrial Process	14%	-40%	2%
Business	*13%*	*-33%*	*2%*
Industrial Process	*1%*	*-79%*	*-4%*
Residential	15%	3%	15%
Public	2%	-29%	3%
Waste Management	4%	-67%	-3%
Development	3%	-9%	-1%
Agriculture and Related Land Use	19%	-27%	-3%
Forestry	-17%	15%	-4%
Total greenhouse gas emissions	**100%**	**-23%**	**6%**

Table 8: Scottish greenhouse gas emissions by gas and government sector, 2012 (values in Mt CO_2e) [28]

	TOTAL	Carbon dioxide	Methane	Nitrous oxide	Fluorinated gases
TOTAL	**52.9**	**39.8**	**6.8**	**5.1**	**1.2**
Energy Supply	17.1	16.5	0.4	0.1	0.0
Agriculture and related land use	11.2	3.0	3.6	4.6	0.0
Transport (excluding international aviation and shipping)	10.5	10.4	0.0	0.1	0.0
Business and Industrial process	8.5	7.4	0.0	0.1	1.1
Business	8.1	6.9	0.0	0.1	1.1
Industrial Process	0.4	0.4	0.0	0.0	0.0
Residential	7.3	7.0	0.1	0.0	0.2
Waste Management	2.8	0.0	2.7	0.1	0.0
International Aviation and Shipping	2.4	2.3	0.0	0.0	0.0
International aviation	1.1	1.0	0.0	0.0	0.0
International Shipping	1.3	1.3	0.0	0.0	0.0
Development	1.7	1.7	0.0	0.0	0.0
Public	1.4	1.4	0.0	0.0	0.0
Forestry	-9.9	-10.0	0.0	0.0	0.0

Trend Prediction Risk

41 Extremes of weather will be more common, a fact underlined by the background trend of warming[29] (table 9): wetter winters with heavier and more prolonged rainfall, drier summers, snow loss and an increase in the duration of the growing season[30] with much of

[27] http://www.scotland.gov.uk/Resource/0039/00397478.pdf
[28] http://www.scotland.gov.uk/Publications/2014/06/5527/3
[29] Ibid
[26] Ibid

this being experienced in the north west.[31] In terms of temperature and precipitation changes, table 9 below highlights the changes expected by 2050 under a medium emissions scenario. Under a high emissions scenario as shown on maps 11 and 12, the UK Climate Projections 2009 (UKCP2009) show that by 2080, west coast and central Scotland could be 3.1°C warmer in winter and 4.3°C in summer, again with drier summers and wetter winters.

42 Sea level rises are also anticipated and although Scotland is still rising from post glacial rebound, this rate of rebound will not counter sea-level rises. Low lying areas around the Clyde and exposed coastal areas will be vulnerable. Through modelling, it is projected that sea levels could rise between 10.5cm – 18cm by 2050 and 23.4cm to 39.2 cm by 2095 although the worst affected areas would be along the East Coast of Scotland, Orkney and Shetland. The Inner Clyde and sea-lochs of Argyll afford a degree of "protection"[32] because of their orientation to damaging weather systems. Constriction at the mouth of sea lochs also abate the full force of storms and reduce tidal range. Map series 13 highlights the areas, heritage and infrastructure that might be affected under climate change.

Table 9: Scotland's climate projections by the 2050s under medium emissions

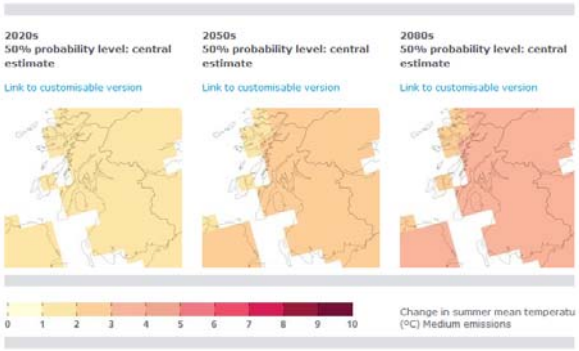
2050s MEDIUM EMISSIONS	EASTERN SCOTLAND	NORTHERN SCOTLAND	WESTERN SCOTLAND
Summer average Temperature	+2.3°C (+1.1°C to +3.9°C)	+2.0°C (+0.9°C to +3.4°C)	+2.4°C (+1.1°C to +3.8°C)
Winter average temperature	+1.7°C (+0.7°C to +2.9°C)	+1.7°C (+0.6°C to +2.8°C)	+1.9°C (+1.0°C to +3.0°C)
Summer average precipitation	-12% (-27% to +1%)	-10% (-24% to +2%)	-12% (-27% to +1%)
Winter average precipitation	+10% (+1% to +20%)	+13% (+3% to +24%)	+15% (+5% to +29%)

[31] DEFRA et al, (2009) UK Climate Projections [online] Available at: http://ukclimateprojections.defra.gov.uk/
[32] Ibid

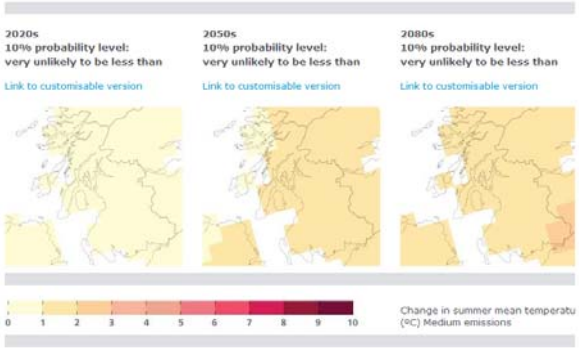
Map 11: Temperature Outcomes from http://ukclimateprojections.metoffice.gov.uk/22275

Medium Emissions

Central Estimate

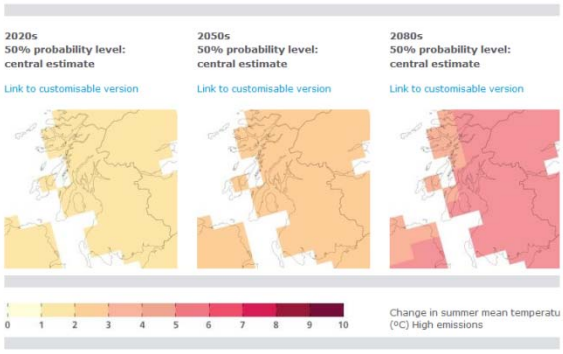


Low Probability: Unlikely to be less than…

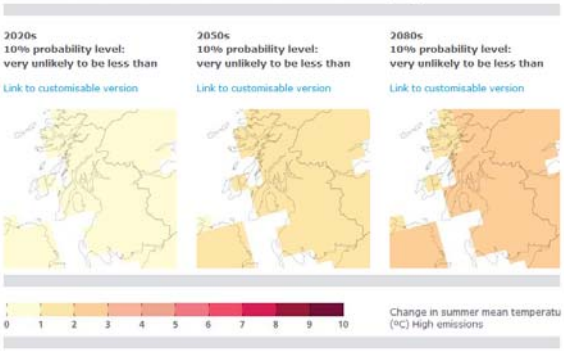


High Emissions

Central Estimate



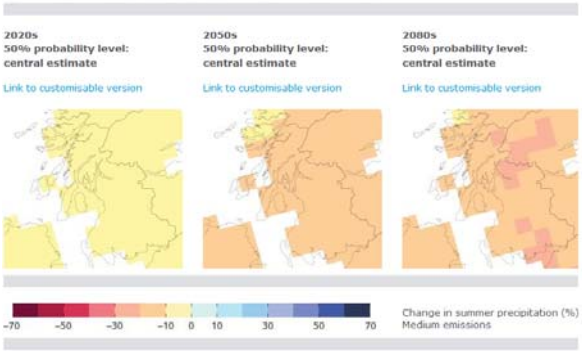
Low Probability: Unlikely to be less than…



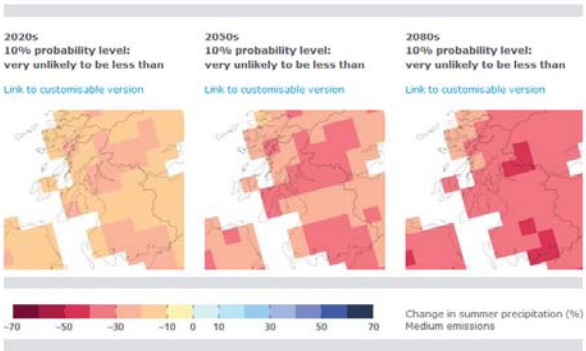
Map 12: Precipitation Outcomes from http://ukclimateprojections.metoffice.gov.uk/22275

Medium Emissions

Central Estimate

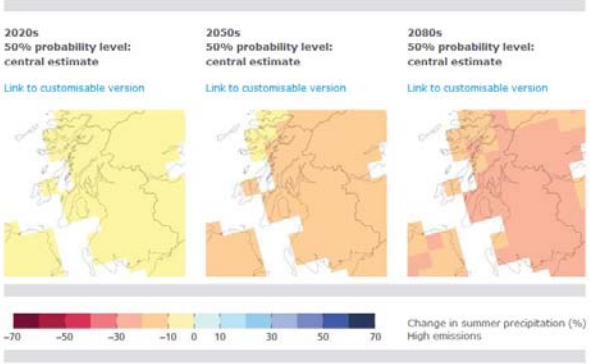


Low Probablity: Unlikely to be less than…

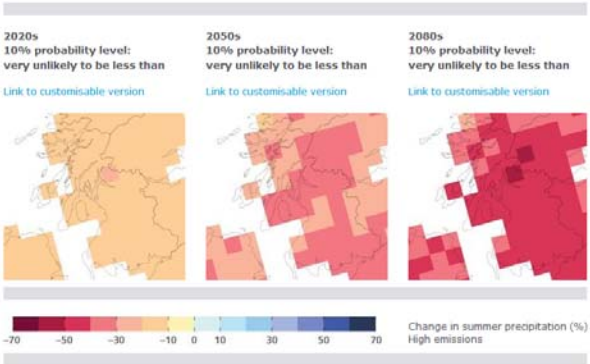


High Emissions

Central Estimate

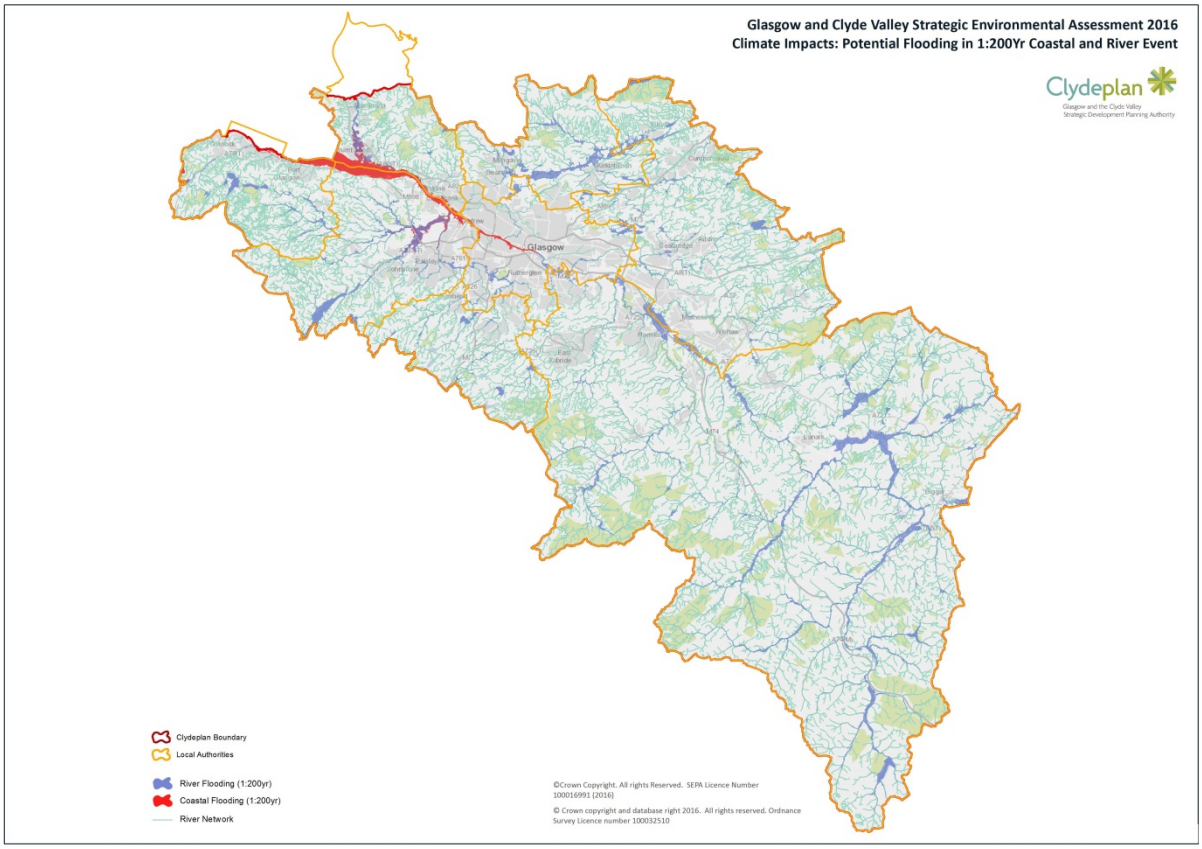


Low Probability: Unlikely to be less than

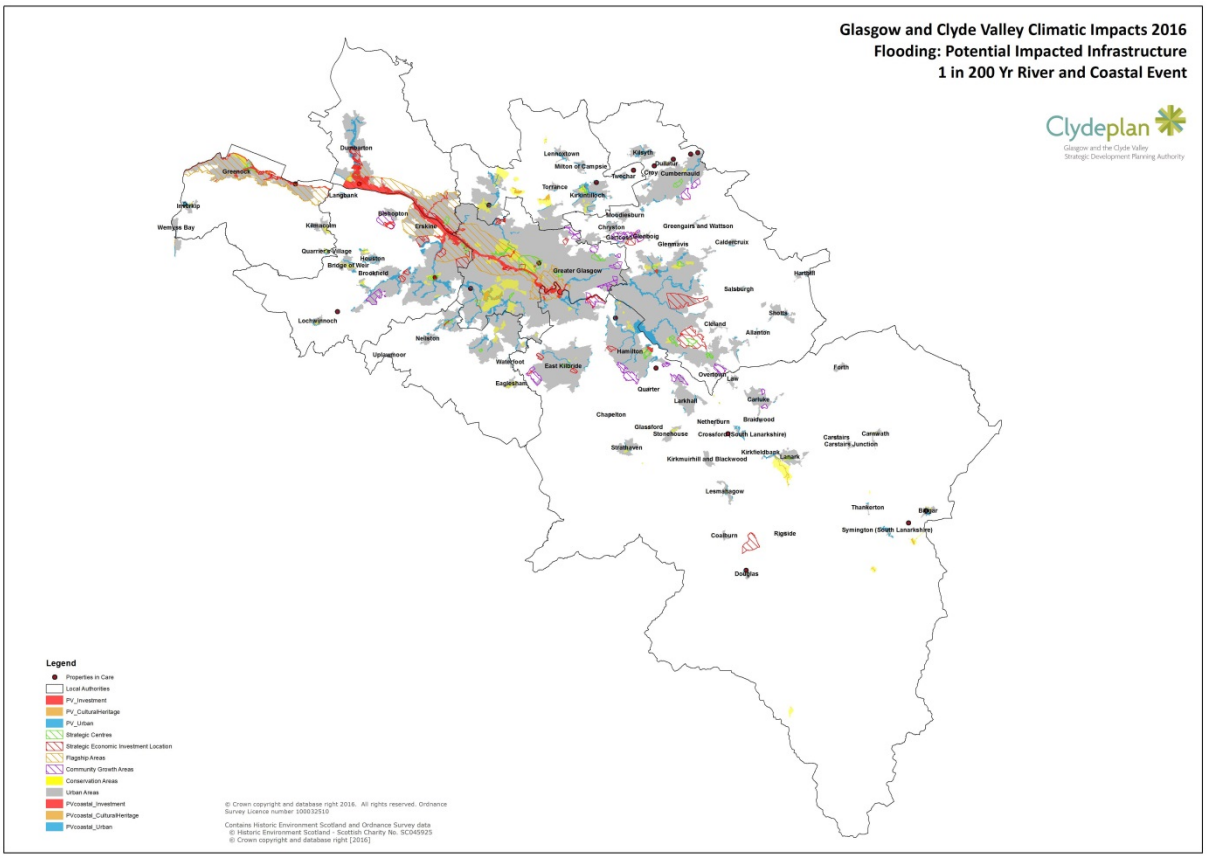


Map Series 13

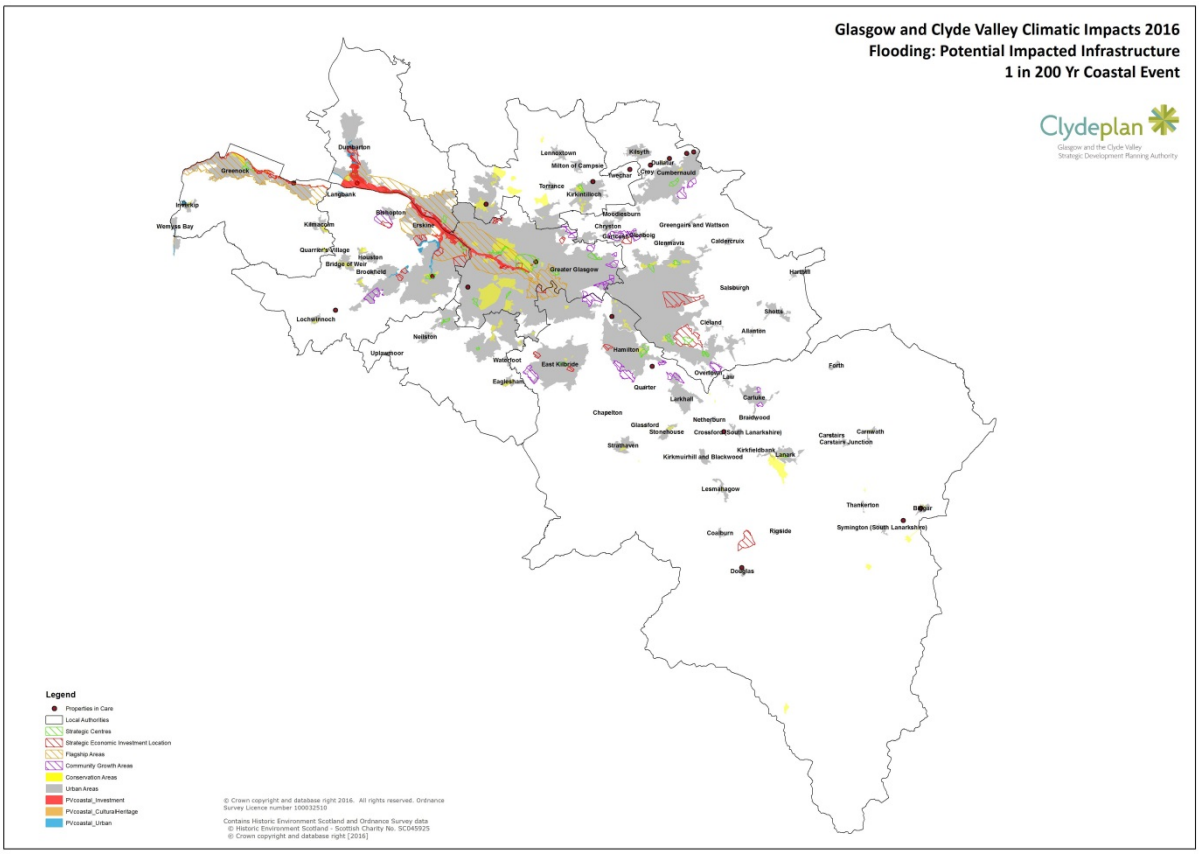
Map13a – Clydeplan River network and flood model for 1 in 200 year event



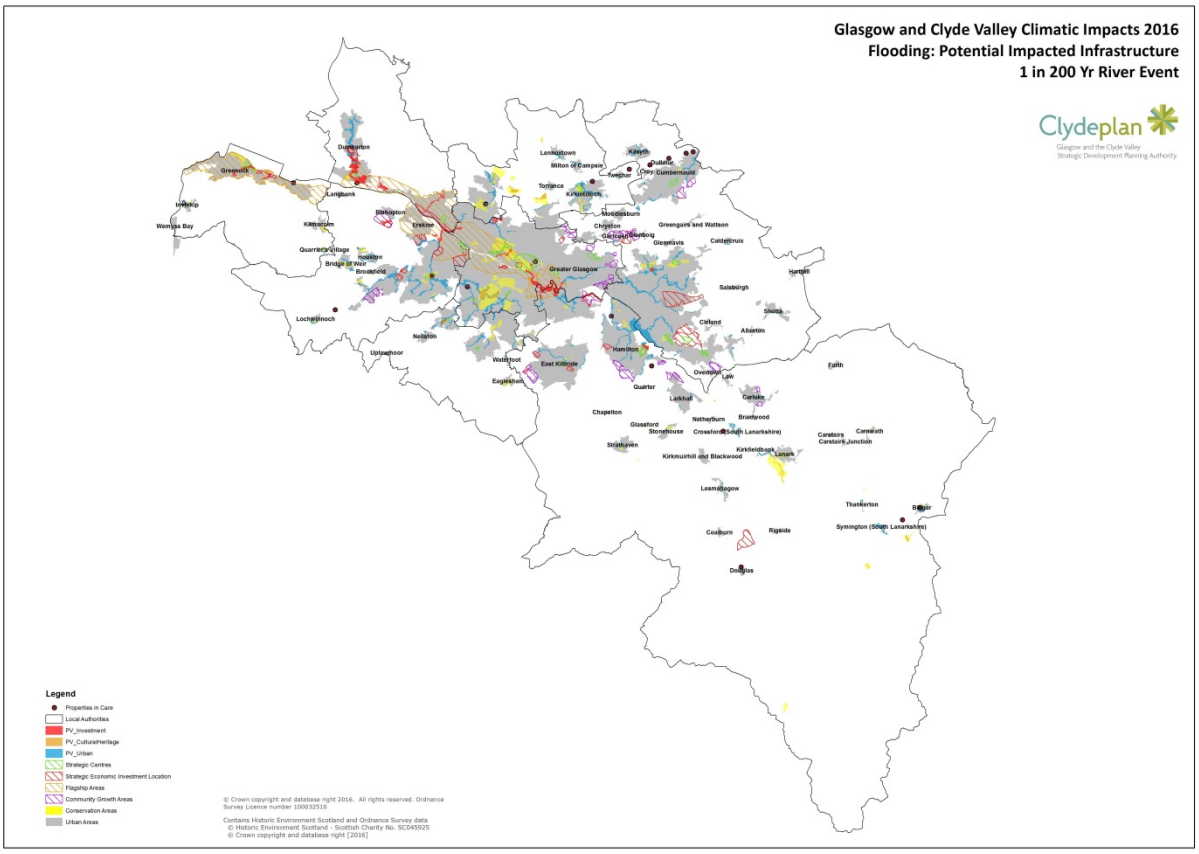
Map13b – Clydeplan 1:200Yr Flood Tidal and River flooding impacts



Map13c – Clydeplan 1:200Yr Flood Tidal impacts



Map13d – Clydeplan 1:200Yr Flood River Impacts



Key Issues

43 As climatic factors remain a concern to the future of GCV heritage, investment and biodiversity for a further 100 years, the next SDP will need to be robust supporting a long term view of the future. Reduction in the use of fossil fuels and low energy transportation can be supported by climate friendly initiatives. Carbon free energy generation e.g wind and initiatives like the heat-mapping project could make a huge impact on emissions reduction as local community and development demands and resourcing are addressed individually, rather than through generic traditional solutions. Whilst these established and developing strategies engage with the energy, industrial, business and domestic sectors, public transport could be further developed to reduce it's contribution and green network – provide low carbon alternatives.

Cultural Heritage

Overview

44 Sites of recognised cultural heritage require designation and protection at international, national and local levels. Townscapes, buildings, battlefields, marine wrecks, landscapes and archaeological sites, known and unknown, need to be protected or enhanced, in keeping with policy that emphasises their cultural importance and significance. The quality of our built and rural environment is enhanced by the presence of cultural heritage and policy aims to improve the nature of these localities by safeguarding and improving traditional sites and fabric. The Royal Commission for Ancient and Historic Monuments in Scotland (RCAHMS) and Historic Scotland (HS) are the two main established bodies tasked with managing and protecting Scottish cultural heritage.

Background

45 Eighty three percent of visitors to Scotland visit historic sites. As these assets are irreplaceable, it is important to conserve them for future generations and to sustain national revenue supported by millions of visitors.[33] Historic buildings and artefacts shape communities but cultural heritage extends beyond fabric in more obscure ways such as the arts: language, music and festivals.

46 Of the 5 designated world heritage sites in Scotland, Clydeplan hosts two: The Antonine Wall and New Lanark. There are numerous other conservation areas, Gardens and Designed Landscapes. National Scenic Areas, Historic Battlefileds, scheduled monuments and listed buildings all contribute to the character of Glasgow and the Clyde Valley and Scotland. Whilst there are currently 33 battlefields in the inventory, a further 22 are being researched.[34] Although there is no national park within the area, Loch Lomond and the Trossachs National Park borders West Dunbartonshire within the North Western extent of the strategic area. The distribution of Scotland's and Clydeplan cultural heritage assets is displayed in map 14 below with The Antonine Wall and New Lanark World Heritage sites in purple.

47 Cultural heritage assets are well distributed over Scotland with a tendency for aggregation around settlements and coastal areas. Between RCAHMS and HS there are around 290565 known sites or assets. Of the assets being monitored including all categories of listed building, there are around 77829 in Scotland with 8746 of these found in GCVSDPA: approximately 11%.

48 Clydeplan is responsible for 4.2% of the nation's land area but for 33% of the nation's population. Table 10 compares the number of recorded sites between Scotland and Clydeplan. Reflecting upon the significance of the city region culturally, materially and historically the above average distribution of assets in the area reinforces the importance of developing conservation policies that protect culture, community, national identity and revenue. With many sites in Glasgow and the Clyde Valley being accessible to the majority of the country's population, their preservation and promotion yields many benefits.

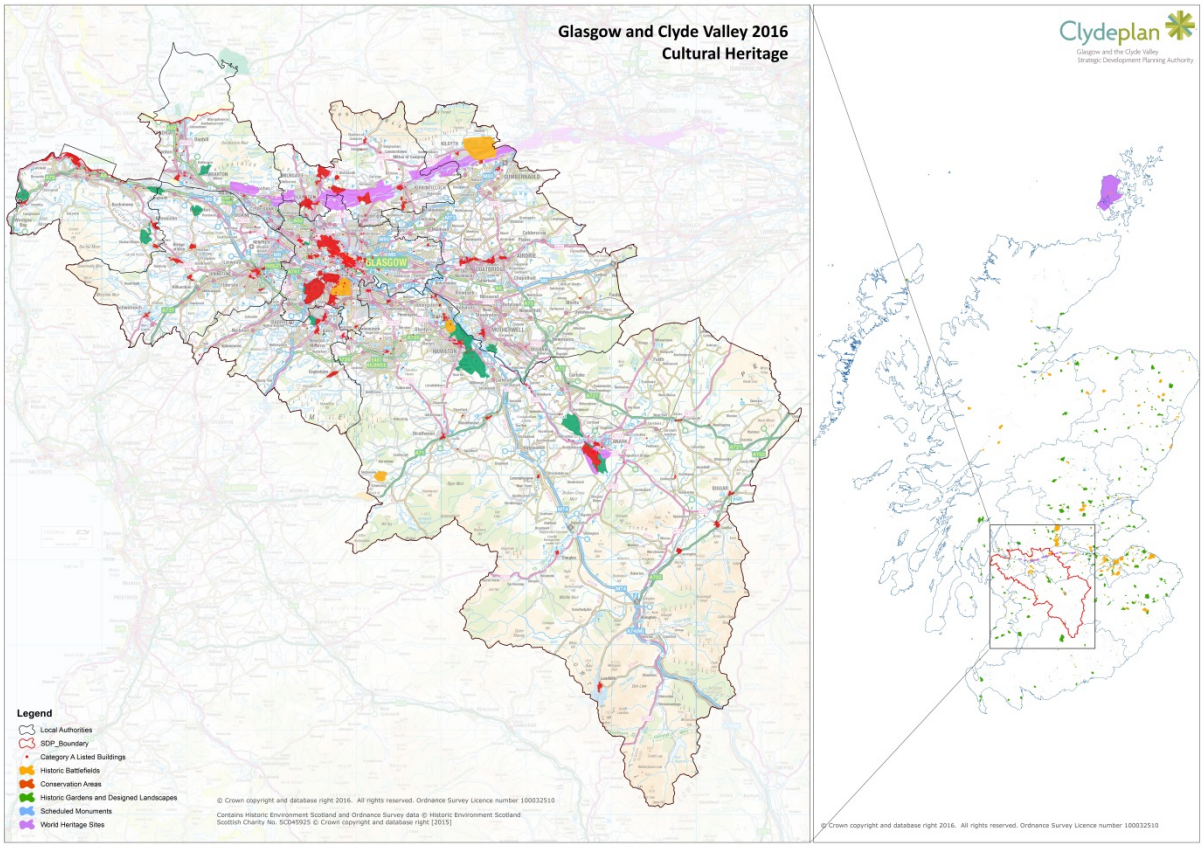
[33] Historic Scotland (2012) Why is the Historic Environment Important? [online] Available at: http://www.historicscotland.gov.uk/index/heritage/valuingourheritage/why-is-the-historic-environment-important.htm

[34] Historic Scotland (2012) Inventory Battlefields [online] Available at: http://www.historicscotland.gov.uk/index/heritage/battlefields/battlefieldsunderconsideration.htm

Table 10: Distribution and comparison of Clydeplan and national cultural heritage

Asset Type	Scottish Volume	GCVSDPA Volume	GCVSDPA Percentage
Historic Battlefields	39	5	12.8%
Conservation Areas	659	96	14.6%
Scheduled Ancient Monuments	8182	365	4.5%
Properties in Care	325	19	5.8%
Historic Marine Protected Areas	8	0	0%
World Heritage Sites	10	2	0.2%
Gardens Designed Landscapes	391	21	5.4%
Category A Listed Buildings	6668	1061	15.9%

Map14: Distribution of Cultural Heritage over Glasgow and the Clyde Valley



49 The importance of cultural heritage, nationally and internationally, is increasingly being recognised and since 2008 has led to expansion in the number of buildings categorised as listed. According to local, national or international significance a building receives a categorisation level (listing) of A, B or C. These listings often reflect period and style. Buildings of particular significance are placed on the Buildings at Risk Register (BARR). This register has been developed since 1990 and incorporates vulnerable buildings under threat through lack of maintenance. Scottish buildings at risk have declined in volume by 0.5% since 2009 to around 8.2% and in 2010 85% of scheduled monuments were considered to be in optimal or satisfactory condition, similar to the 2007 record. Thirteen percent were deemed to be in unsatisfactory condition and 2% had significant problems.

50 RCAHMS holds around 135,000 land and 19,170 maritime site records.[35] There are many buildings in Scotland that are not designated for protection that face similar conservation issues. Around 25% of these have no protection from Scottish ministers but may come under the care of individual owners or guardians.[36] It is estimated that around 434,000 buildings 19% of dwellings in Scotland were built prior to 1919. Historic Scotland also protects 345 buildings including Edinburgh Castle and the Calanais Standing stones.

Trend Prediction Risk

51 Natural and manmade impacts affect the historic environment. Although 85% of the historic environment is in optimal or satisfactory condition, 2% are in immediate risk, 9% in high risk and a further 25% at medium risk. Risk level against failure period is listed in the table 11 below. 36% of historic cultural fabric could be lost to decay within 5 years if left protected.

Table 11: Risk Level against expected time until failure

Risk Level	Volume Affected	Failure period
Immediate	2%	Imminent
High	9%	Within 1 Year
Medium	25%	Within 5 Years

52 Threats and vulnerability tend to be site and environmentally specific.[31] As with many aspects of SEA, climate change will create significant pressure on cultural fabric and landscapes. Storm events, flooding, rising sea-levels and coastal damage will adversely affect our heritage with exposed sites being at greatest risk.[37] As well as increased physical erosion associated with weather extremes (heat, humidity, aridity, cold) biological and chemical undermining, through for example, algal, fungal and corrosive impacts, need to be considered. Invasive plant species associated with climate change could also adversely impact the resilience of our cultural heritage.

53 Development is a key pressure for the urban environment with the changing demands on city-scape and function placing an ever increasing pressure on traditional cultural landscape. As discussed in paragraph 48 a high ratio of cultural heritage/land area/population is identified under Clydeplan. If as reported, 8% of planning applications in Scotland involve listed buildings or areas of conservation a significant number of these will fall in the Glasgow and Clyde Valley area. Key concerns in poorly administered policy relates to loss of viable use, change in population and neglect.[38] Changes in land use can also impact undeveloped areas resulting in pressure on cultural heritage.

Key Issues

54 Good planning promotes and protects conservation of cultural assets through consideration of appropriate location and design. Good planning can address issues of climate change adaptation to protect cultural heritage. Reuse and enhancement of existing fabric should be promoted. Where unknown heritage exists, development should be approached from a perspective that incorporates pre-project survey as part of the planning process.

[35]SHEA (2011) Historic environment Audit [online] Available at: http://www.heritageaudit.org.uk/ (accessed 6/12/12)
[36]ibid
[37]Historic Scotland (2012) The Effect on the Historic Environment [online] Available at: http://www.historicscotland.gov.uk/index/heritage/climatechange/effectonenvironment.htm
[38]ibid

Landscape and Geodiversity

Overview

55 The European Landscape Convention and other objectives exist with a view to recognising and protecting special national landscapes and improving degraded landscapes. National Scenic Areas and protected geological sites (some of these falling within Sites of Special Scientific Interest - SSSIs) are recognised as underpinning important local, regional and national landscape character. Scottish Natural Heritage (SNH) and the Scottish Government (SG) lead on managing this environmental objective.

Background

56 The diverse and distinctive landscapes of Scotland have been recognised for their contribution to natural and cultural heritage as well as to the social and economic well-being of the nation. The European Landscape Convention aims to protect all landscapes, not just protected areas and it is recognised that underlying geology is crucial to realising this objective.

57 Attractive accessible landscapes support good health whilst providing enjoyment and recreation.[39] Scotland's economy benefits from a £4.2billion tourist industry where landscape contributes to local tourism and contributes to the cultural and natural heritage those visitors come to enjoy. With 9% of the Scottish workforce employed within tourism and by recognising that landscape quality is important to visitors, restoration of degraded landscapes will help ensure revenue and employment associated with tourism is maintained whilst supporting health and well-being. The majority of National Scenic Areas and geologically significant sites lie out with GCV, however Loch Lomond and the Trossachs National Park and the Dark Skies Park lie on the periphery of the Clydeplan boundary to the north and south respectively and are easily accessible as are the scenic and picturesque landscapes of Arran and Perthshire. There are no local biosphere reserves however the footprint of Biospheres are fuzzy and incorporate a buffer zone and broad transitional area that create a wider geographical constraint.[40] There are several Geological Review Sites within the GCV boundary and these are listed in table 12. However there are no UNESCO Geoparks. Some geological sites nest within the SSSI boundaries. The distribution of these sites of conservation can be understood from Map 15.

58 As with many of the sites associated with landscape and geodiversity, wild land as categorised by Scottish Natural Heritage is predominantly found in the North West of Scotland. These are areas of perceived ruggedness, remoteness, natural vegetation and with minimal infrastructure associated with human activity.[41] Muirshiel Country Park within Renfrewshire Authority is the only wild land found within Clydeplan's boundary.

[39] The Scottish Landscape Forum's Report to Scottish Ministers (2007) Scotland's Living Landscapes http://www.snh.gov.uk/docs/B173495.pdf

[40] Galloway and Southern Ayrshire Biosphere http://www.gallowayandsouthernayrshirebiosphere.org.uk/

[41] Scottish Natural Heritage (2002) Natural Heritage Zones: A National Assessment of Scotland's Landscapes http://www.snh.gov.uk/docs/A337653.pdf

Map15 – Distribution of Geodiverse landscapes over Glasgow and the Clyde Valley

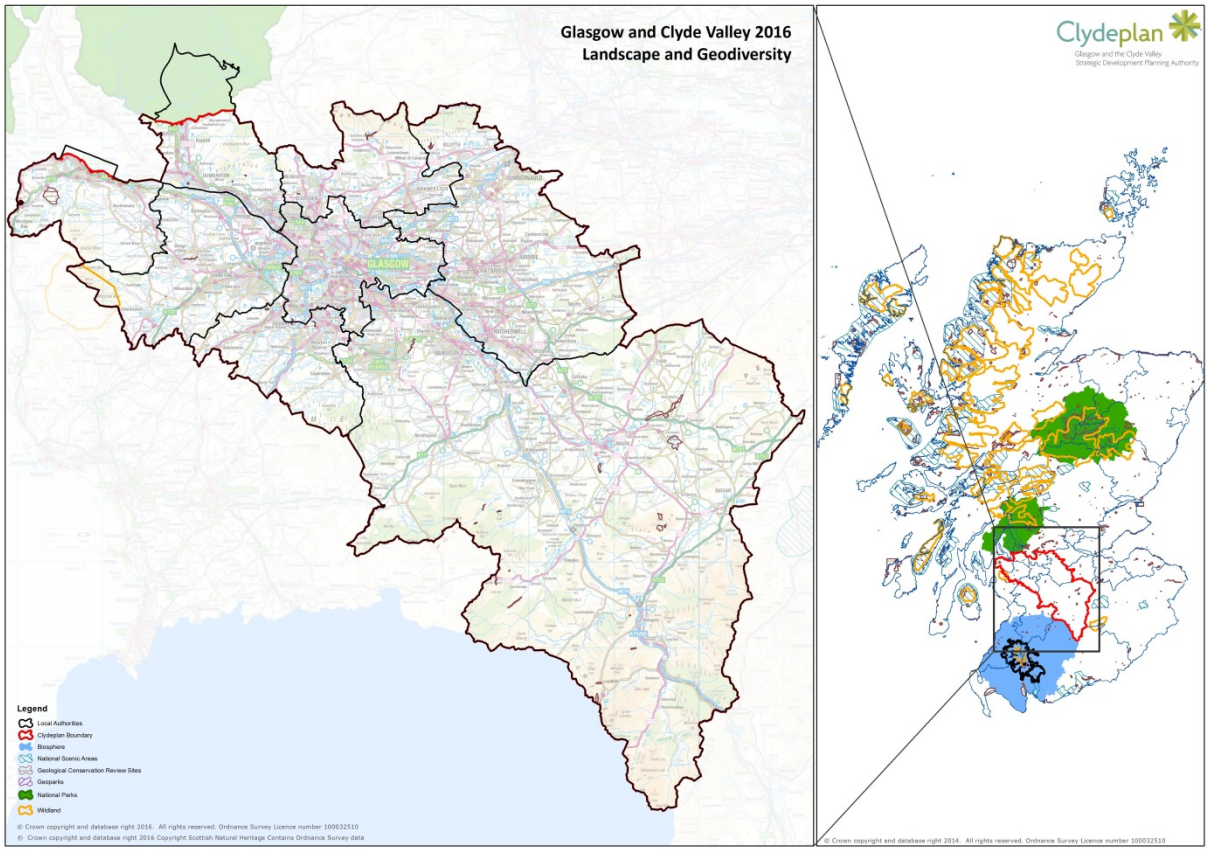


Table 12: SNH GCR sites falling within Clydeplan boundary.

Bearsden	Clochodrick Stone	Falls of Clyde	Ree Burn - Glenbuck Loch
Birk Knowes	Corrie Burn	Glenarbuck	River Calder
Birkenhead Burn	Craighead Hill Quarry	Kennox Water	River Clyde Meanders
Boylestone Quarry	Dippal Burn	Leadhills - Wanlockhead	Rouken Glen
Bridge of Weir	Dumbarton Rock	Loch Humphrey Burn	Shiel Burn
Campsie Fells	Dunrod Hill	Mollinsburn Cuttings	Tinto Hills
Carstairs Kames	Dunside	Raven Gill	Victoria Park
			Waulkmill Glen

Trend Prediction Risk

59 Landscape character is affected by incremental development not necessarily based upon material expansion or exploitation of resources (renewables and extraction) but also based on land use changes associated with agriculture and forestry. Human perception around factors such as ease of access, journey times, visitor experience and access rates also affect, sometimes subjectively, how land and character is perceived.

60 In the current period, some of these considerations have come to the fore as landscapes are being considerably altered by the energy sector and renewables industry. Some areas are cleared of woodland with turbines erected in their place. Under the European Landscape Convention, caution needs to be applied under this fuzzier legislation that affords “non-protected” landscapes some degree of consideration in the planning process. Whilst climate change is perceived as a threat to most other aspects of SEA, when considering climate change mitigation measures, renewables and the energy sector paradoxically pose the most significant threat to the landscape and geodiversity component of SEA.

Key Issues

61 The new SDP needs to consider how to balance economic growth, support the renewables industry and encourage tourism whilst being careful not to undermine the landscape that tourism benefits from and supplies significant revenue to local communities and the Scottish economy. In order to enhance degraded urban fringes and transport corridors, good planning will be required that improves the landscape character of degraded margins. High quality development and landscape design has a role to play in achieving this objective and should aim to incorporate sensitive perceptions of community and tourist.

Material Assets

Overview

62 Within the context of pursuing sustainable development and promoting a low carbon economy, material assets associated with agriculture, forestry, transport and waste have been identified as contributing most significantly.

Background

63 Material assets of Clydeplan are wide ranging and relate to infrastructure, resources and production. These areas of business are important in supporting the economy and affect environmental quality.

Agriculture

64 In terms of sheer coverage, agriculture is the most significant asset within the Scottish economy and planning system, accounting for 80% of Scotland's land area with 85% of this classified as Less Favoured Area Rough Grazing. For the Clydeplan Area (See Map 16), 84.6% is agricultural with nearly half of this being Less Favoured Area Rough Grazing. Cattle and sheep farming make up the majority of rough grazing income with deer, pigs and chickens a lesser amount. Wheat, Barley, potatoes and oil seed rape make up the vast majority of arable production with fruit and vegetable production restricted to the more fertile soils of Tayside and Angus. (See table 13)

Table 13: Agricultural productivity: Livestock and Arable

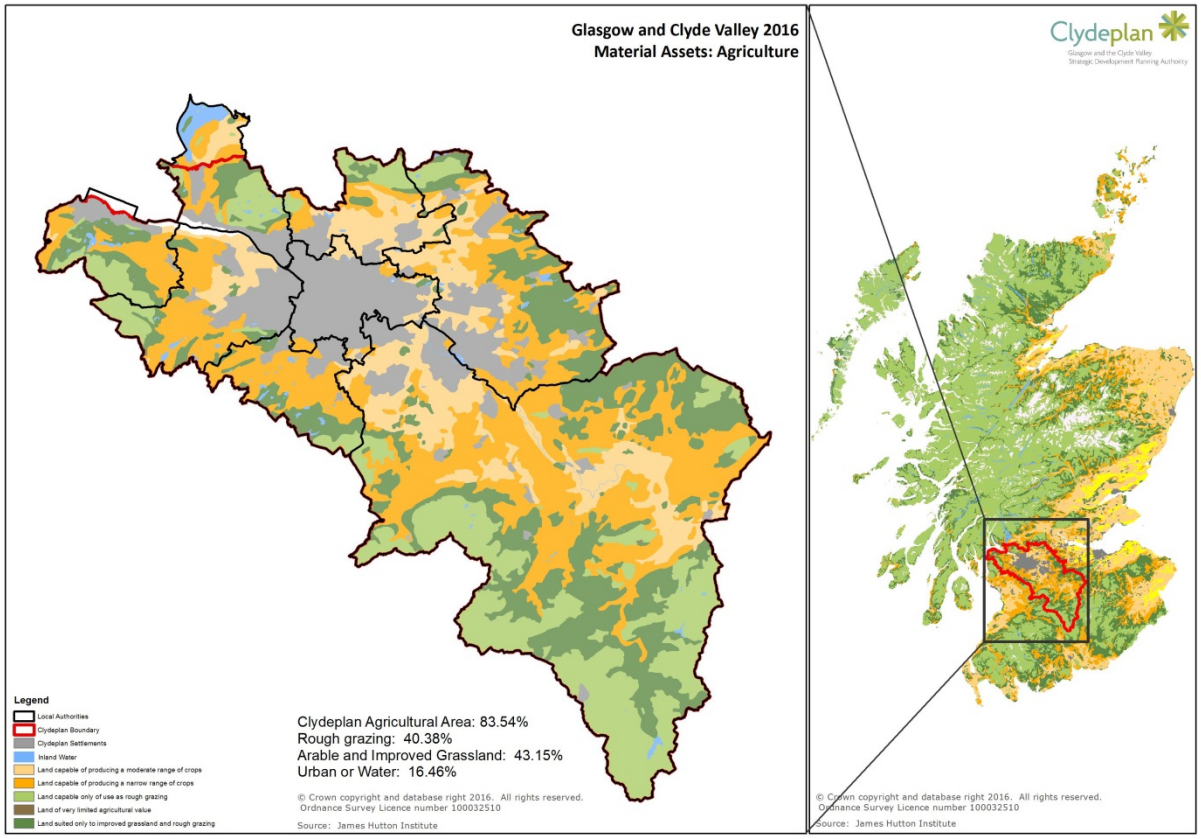
Livestock's contribution to Agricultural Output in Scotland

	2005	2006	2007	2008
	% of output			
milk	14.02	12.92	12.40	13.13
cattle	26.80	25.55	22.38	23.72
sheep	9.15	8.21	7.40	7.27
Total cereals	10.15	11.22	15.81	16.79

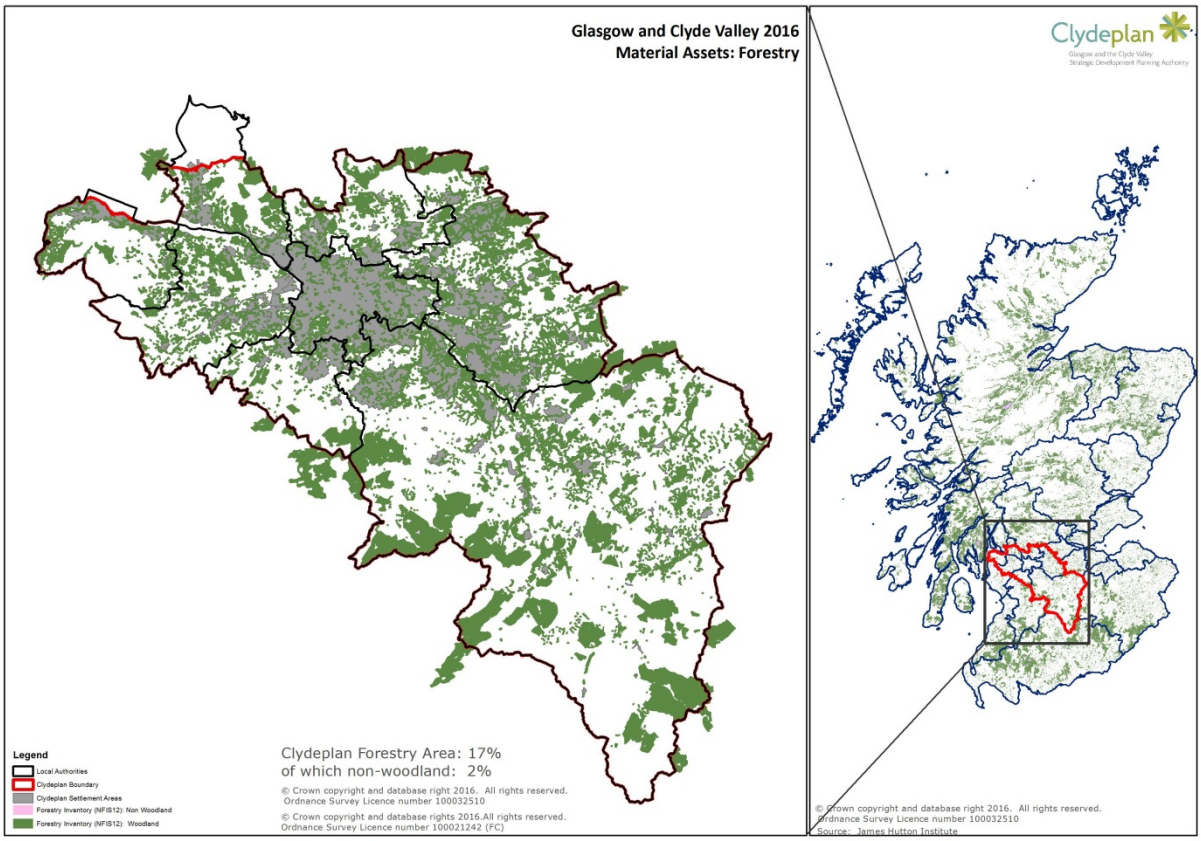
Ruminant agricultures contribution to agricultural production

	Cattle			Sheep		
	2005	2006	2007	2005	2006	2007
	Per cent of agricultural production					
Scotland	26.8	25.5	22.4	9.2	8.2	7.4
UK	14.2	15.6	15	6	6	5.3
Ireland	32.6	27.2	25.1	3.6	3.5	3
France	13.9	13.6	12.3	1.4	1.3	1.2
Spain	6.3	6.7	5.9	4.5	4.7	3.4
Greece	2.4	2.7	2.3	8	8.1	7.6
EU - 25	9.5	9.5	8.7	1.9	1.9	1.5

Map16 – Agricultural distribution and type over GCV



Map 17 – Distribution of woodland over Glasgow and the Clyde Valley



Woodland

65 Woodland occupies 18.1% of the Clydeplan area comparing favourably with the national total of 18.1%. The vast majority of Clydeplan woodland falls within land classified as rough grazing. Scotland's forests are highly productive creating 45% or £700 million of the UK total revenue[42] and yields are expected to rise.[43] Within the Clydeplan area woodland is desirable for leisure and amenity, promoting health and wellbeing and if suitably managed (woodland is a carbon sink and net gain should be pursued after harvest) could be used to support biomass energy projects. From map 17, woodland within Glasgow and the Clyde Valley is evenly distributed with slightly less than average found in East Renfrewshire, Inverclyde and Glasgow City.

Travel

66 Traffic volume on the 55,838 kilometres of Scottish Roads has increased by 15% since 1996 and doubled on trunk roads since 1983.[44] Trunk roads make up 6.3% of the network but carry 37% of all traffic and 63% of all cargo with many of these roads being found in the Clydeplan catchment area.[45] The 2800Km rail network carries 77million passengers per annum and a slightly increasing amount of freight year on year.[46] Ninety six million tonnes of Cargo pass through Scottish ports every year and 9.5 million passengers, with Greenock in the Clydeplan region being one of the 4 gateway ports in Scotland[41]. Although Edinburgh Airport is now Scotland's busiest airport, Glasgow retains its lead for accommodating transatlantic heavy aircraft.

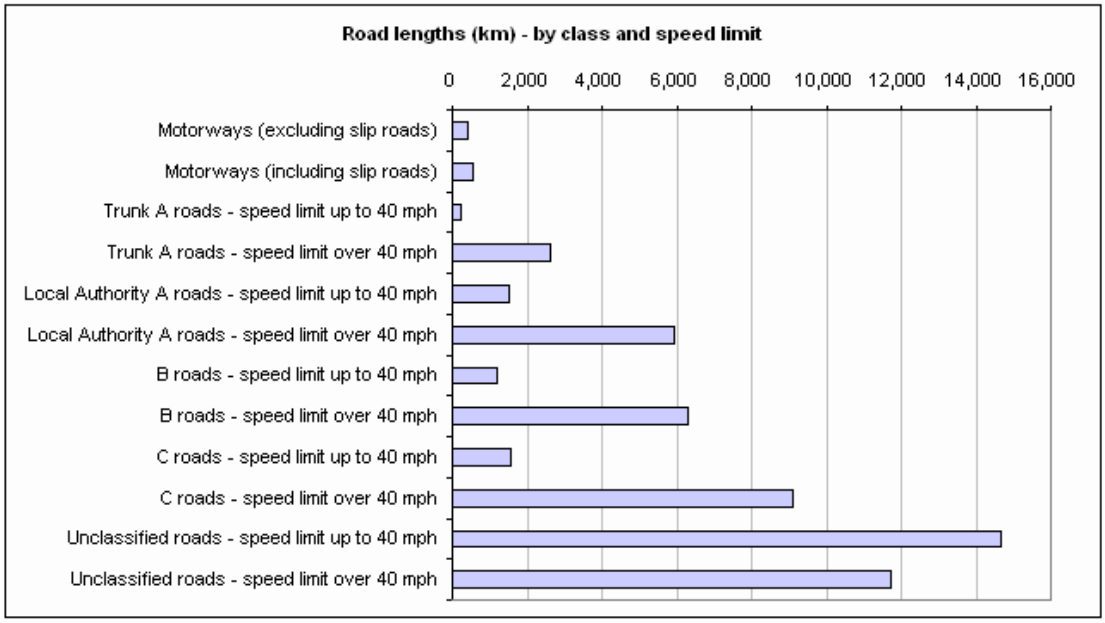
67 For a region that occupies 4.2% of the Scottish land mass, Clydeplan not surprisingly hosts a higher than average percentage of the transport infrastructure with table 14 below quantifying the region's approximate share. Table 15 provide further breakdown of the Scottish road network. Map 18 highlights the extent of the transport network.

Table 14: Comparison of Clydeplan and Scottish transport network

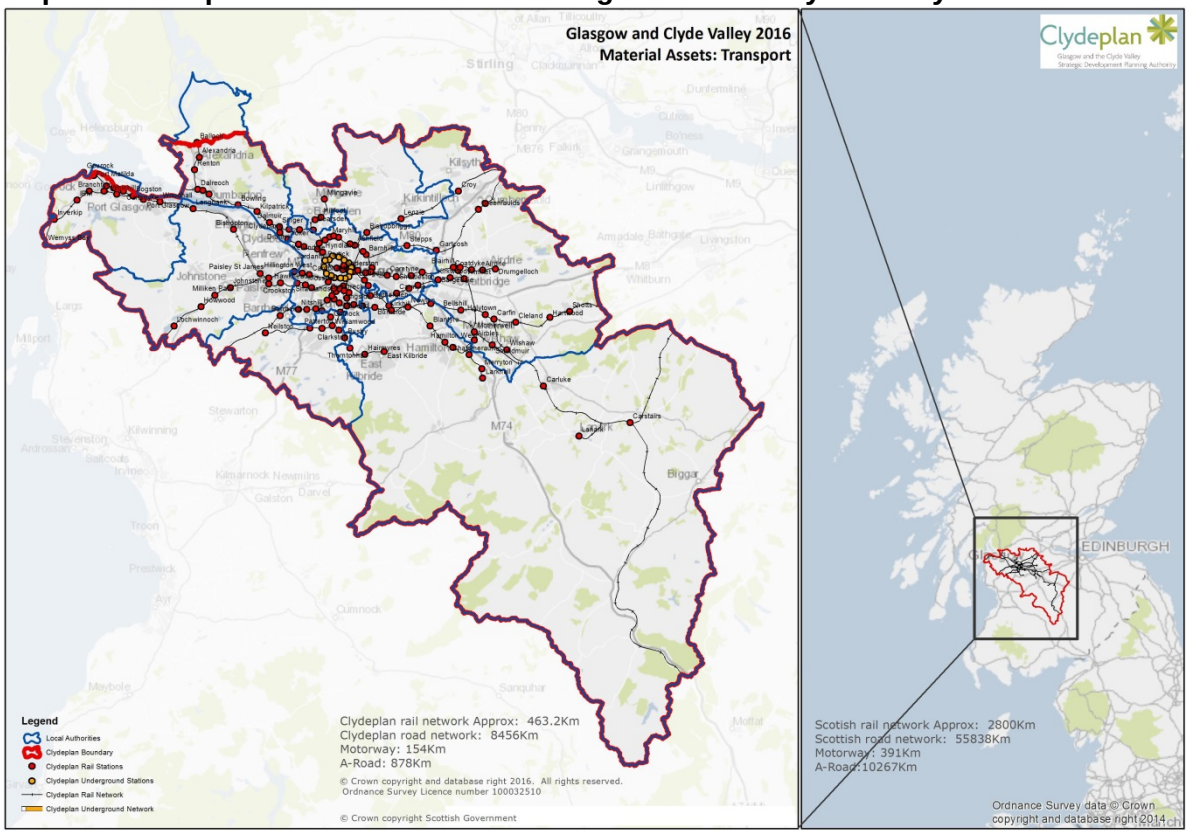
Transport	Scotland (Km)	Clydeplan (Km)	Clydeplan Share (%)
Rail	2800	463	16.5
Total Road Network	55838	8456	15.1
Motorway	391	154	39.4
A-Road	10267	878	8.6

[42]HR Wallingford, AMEC Environment & Infrastructure UK Ltd, The Met Office, Collingwood Environmental
Planning, Alexander Ballard Ltd, Paul Watkiss Associates, Metroeconomica (2012) A Climate Change Risk
Assessment for Scotland, DEFRA
[43]The Scottish Government (2011) Statistics, Agriculture fisheries and rural [online] Available at: http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/TrendTimberHarvested
[44]Scottish Government (2009) Private Transport – Road Network Statistics, [online] Available at: http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendRoadNetwork
[45]Scottish Government (2011) Adaptation framework transport sector action plan [online] Available at: http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlandsaction/adaptation/AdaptationFramework/SAP/Transport/TheChallenge
[46]ibid

Table 15: Scottish road network breakdown – by length, type and speed limit



Map18 – Transport distribution within Glasgow and the Clyde Valley



Waste

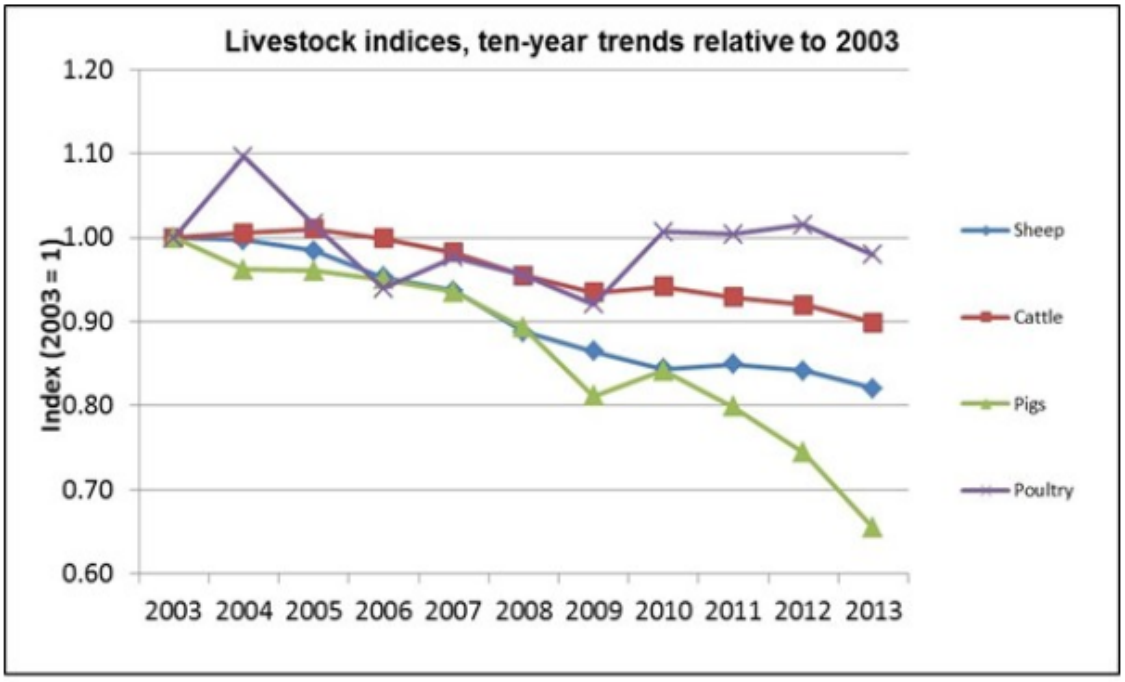
68 7.4 million tonnes of waste was landfilled in Scotland in 2007. Biodegradable Municipal Waste (BMW) accounted for 1.4 million tonnes (14%) of this waste. Although landfill has decreased by 34% and BMW by 28% since 2000, protection against soil and water course pollution needs to be maintained. Material reclamation and recycling needs to be further enhanced to reduce the 1.26 million tonnes being disposed of annually. These materials decompose and release greenhouse gasses such as CO_2 and methane.[47]

Trend Prediction Risk

Agriculture

69 Within Arable and livestock farming, the trend reveals a decrease in productivity over the period 2002-2012. The graphs below (fig3,4) reveal these trends in both sectors with livestock farming showing steep decline, perhaps since foot and mouth disease. Decrease in arable productivity is less discernible.[48,49] In terms of food security and carbon offset and to support the business of rural, agricultural communities, it would be beneficial to develop policy that addresses decline in the farming industry.

Figure 3: Livestock indices, 10 year trend

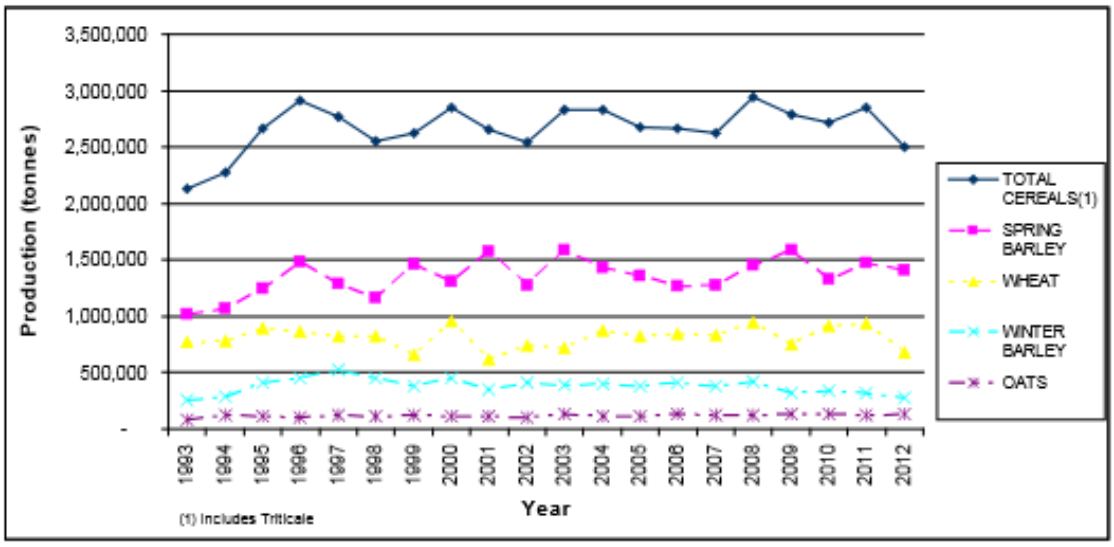


[47]Scottish Government Key Waste Statistics http://www.scotland.gov.uk/Topics/Environment/waste-andpollution/Waste-1/wastestrategy/key-facts

[48]Scottish Government High level Summary of Statistics Trend Last Update September 2012 Livestock Trends
http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/TrendLivestock

[49]Scottish Government (2012) Statistical Publication, Agriculture Series, First estimate of the cereal and oilseed
rape harvest 2012. http://www.scotland.gov.uk/Resource/0040/00404539.pdf

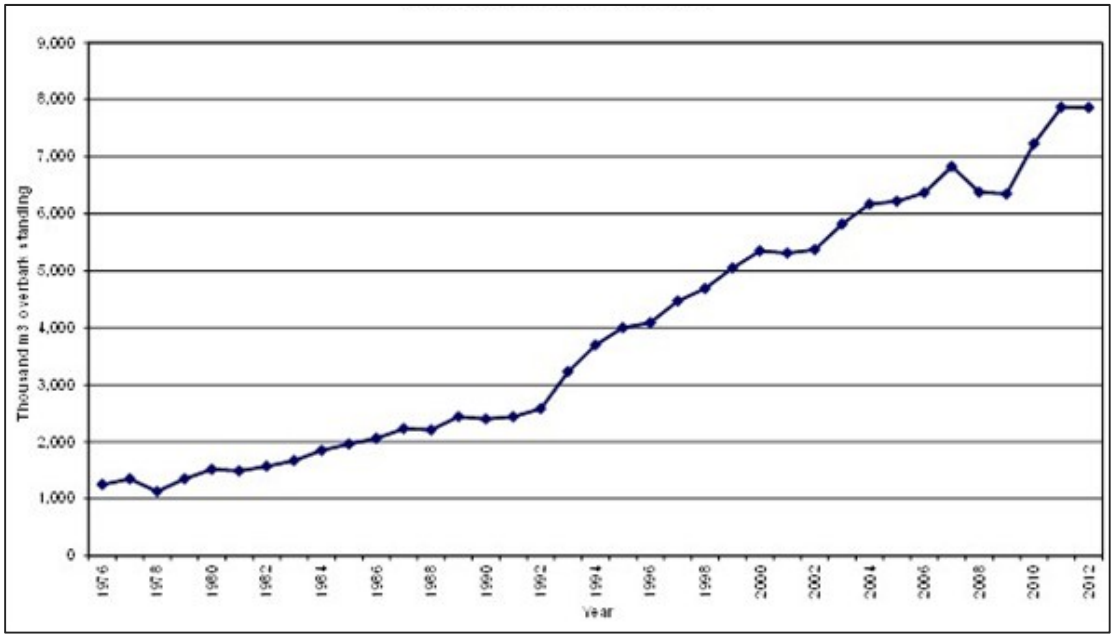
Figure 4: Cereal prosuction trends, 1993 to 2012



Forestry

70 The Forest and Woodland Strategy aims to increase woodland cover to 25% from 18% as stated in the NIFS survey of 2011.[50] Under climate change it is anticipated that yield will increase particularly with Scandinavian species like Sitka Spruce which grow faster, yet softer and weaker in warmer environments. Scots Pine and Lodgepole Pine growth rates are also expected to rise in warmer conditions. Timber harvest is currently 6 times greater than in the late 1970s as shown in the graph below.

Figure 5: Timber harvested in Scotland 1976 to 2012



[50]Scottish Executive (2006), The Scottish Forestry Strategy [online] Available at: http://www.forestry.gov.uk/sfs

Travel

71 Climate change is expected to affect transport of freight and people over Scotland. Road and rail would be the most seriously affected through flooding and landslides with air and shipping less affected. However climate change remains a real threat to all communities, resources and infrastructure.[38]

72 There has been a large increase in distance travelled by car since 1985, the mode of transport still favoured by 75% of Scotland's inhabitants. On average each individual travels around 7000 miles per annum. Figures from the 2001 census reveal that commuting by car increased by 21%-68% between 1966 and 2001 whilst the use of the bus has decreased from 43%-12% and walkers from 24%-12%.[51] Census data from 2011 has not yet been collated in order to identify the trend for the last decade 2001-2011. These figures are significant to Clydeplan where the majority of trunk roads service the working centre. Commuting by train or bike remained relatively stable over this period at 4% and 2% respectively.

73 Rail haulage of commodities showed signs of declining over 1996-2006 but recovered in 2007, with coal and minerals being the main commodity transported.[52]

Waste

74 Waste recycling rates have grown over the 5 year period from 2006-2011 although the rate of growth has slowed.[53] 37% less waste was landfilled at the end of the 5 year period but with 4.56 million tonnes still being disposed of. As of 2010/11, recycling and compost rates were running at 38.2% over the Scottish Local Authorities.[54]

75 Carbon flows associated with waste were studied by DEFRA in 2006 and recommendations for improved disposal and carbon reductions focus on:

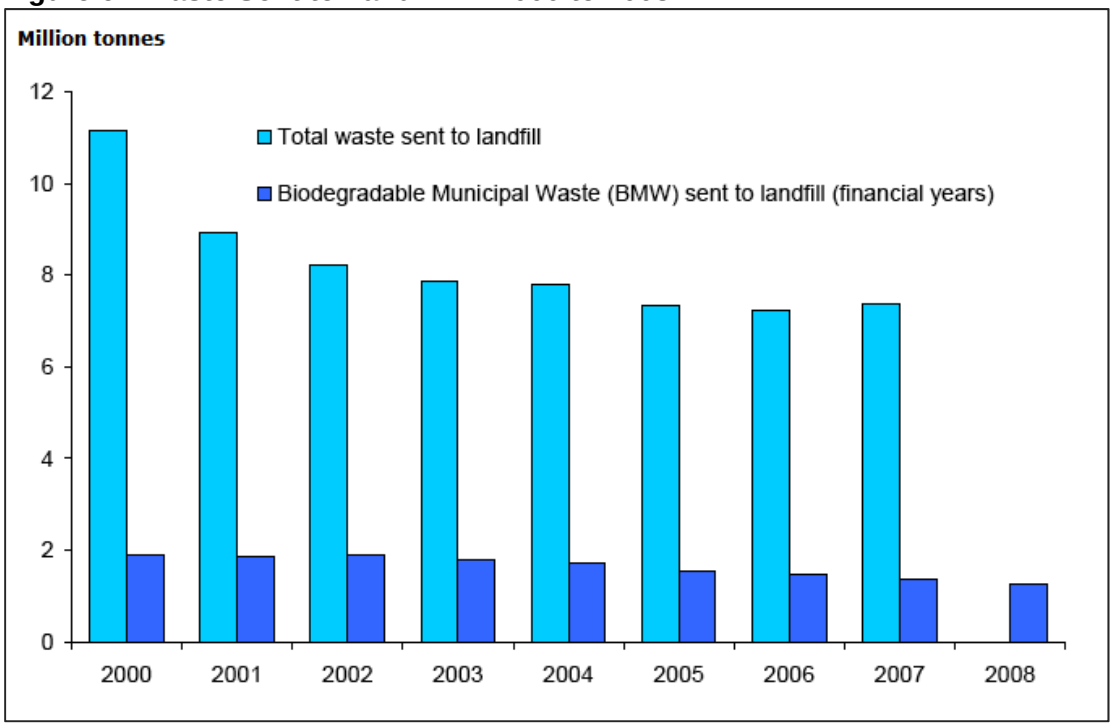
Recycling:	Waste Paper and Card Recycling of non-ferrous metals
Energy Recovery:	Anaerobic digestion of agricultural manures and slurries Recovery via combustion of waste wood Combustion of waste paper and card

76 Should waste projects be supported, the environmental impacts of waste disposal such as soil and water contamination, greenhouse gas leakage and odour should be reduced. Further research on the environmental and health implications of waste disposal and management is recommended.[55] The graph below (Figure 6) depicts Scottish Government targets and the slowing trend of curbing landfill. This highlights the need to reenergise support for waste reduction if the trend is to be

[51]Scottish Government High level Summary of Statistics Trend 2011, Travel to work http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendTraveltoWork
[52]Scottish Government (2009) preparing for Tomorrow, Delivering Today, Freight in Scotland http://www.scotland.gov.uk/Publications/2009/08/03104646/0
[53]SEPA (2012) Waste Data Digest 12: Key Facts and Trends http://www.sepa.org.uk/waste/waste_data/waste_data_digest.aspx
[54]DEFRA (2006) Carbon Balances and Energy Impacts of the Management of UK Wastes Defra R&D Project WRT 237
[55]DEFRA (2004) Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes http://www.defra.gov.uk/publications/files/pb9052a-health-report-040325.pdf

improved. It is hoped that recycling and composting will increase from the 2010 rate of 40% to 70% by 2025.

Figure 6: Waste Sent to Landfill R: 2000 to 2008



Key Issues

77 Policy should aim to encourage economic development in rural areas whilst providing support for other activities including agricultural change thus minimising adverse impact on landscape character or local economy.

78 Sustainable forestry is essential in supporting climate change adaptation and mitigation objectives. Biodiversity must be protected whilst understanding the role that biomass production plays albeit carbon generating, in reducing reliance on fossil fuels. Provision of woodland for health, well-being and recreation should also be sustained.

79 The new SDP needs to address issues of transportation where activity centred around the car and road haulage has been increasing significantly. A renewed vision for reduction in landfill and increase in recycling needs to be found if reductions in waste disposal are to be maintained.

Population and Human Health

Overview

80 Much of population and health objectives centre on environmental quality associated with provision of greenspace, pollution control and sustainable transport. It is assumed that the index of deprivation associated with poor health would be improved with access to outdoors and quality amenities promoting physical and mental wellbeing in "clean" environments and serviceable facilities. Reducing inequalities in child poverty, preventing loss of residential infrastructure and improving health also figure highly in NPF3 and SPP.

Background

81 Optimal human health is supported by numerous factors: health and education, employment, safety, outdoor recreation, and a healthy environment underpinned with good air, water and soil. Climate change can have a significant impact on the quality of housing stock and leisure facilities in terms of fabric and disease. It can also affect opportunities for travel and recreation.

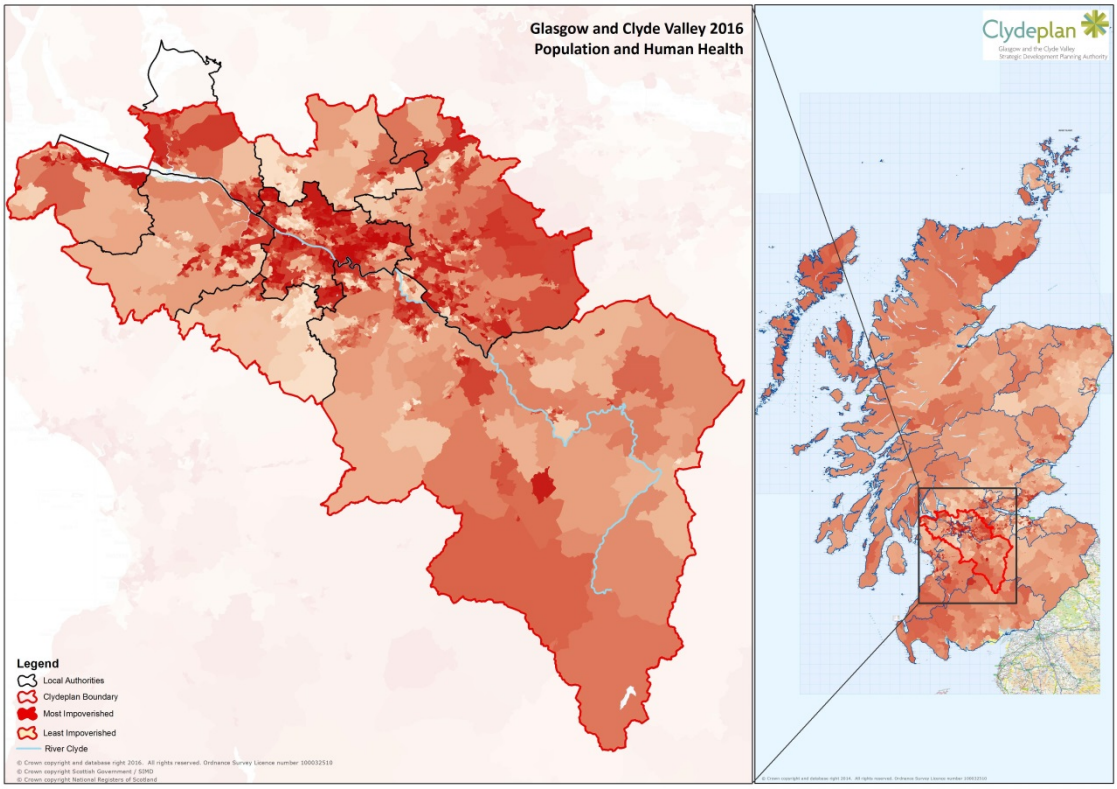
82 In 2011, a record five and a quarter million people were resident in Scotland with the majority living in the central belt[56] and 1.7million in GCV. Scotland's population is expected to rise to around 5.76 million by 2035 – an increase of 10%. Within the GCV, West Dunbartonshire, East Dunbartonshire, Renfrewshire and Inverclyde have experienced population decline between 2000 and 2010.

83 Deprivation in Scotland is monitored using the Scottish Index of Multiple Deprivation (SIMD) which monitors key areas: Income, Employment, Health, Education, Geographic Access, Housing and Crime. These are aggregated into an index of multiple deprivation revealing that deprivation in the city region has become less concentrated over the period 2004-2012: highlighted in the SIMD 2012 revision.[57] Map 19 shows the deprivation index for Clydeplan and Scotland and map 20 the top 15% most deprived areas in Glasgow and the Clyde Valley. Fifty percent of Scotland's most deprived datazones were found in Glasgow City in 2004 but this reduced to 35.8% in 2012. Other areas have seen increases in deprivation including North Lanarkshire and Renfrewshire where significant shares of their datazones are amongst the 15% most deprived in Scotland. Between SIMD 2009 and SIMD 2012, Glasgow City and South Lanarkshire have seen a decrease in the number of datazones contributing to the 15% most deprived areas in Scotland. For Clydeplan, these changes need to be monitored and understood in order to inform the SDP.

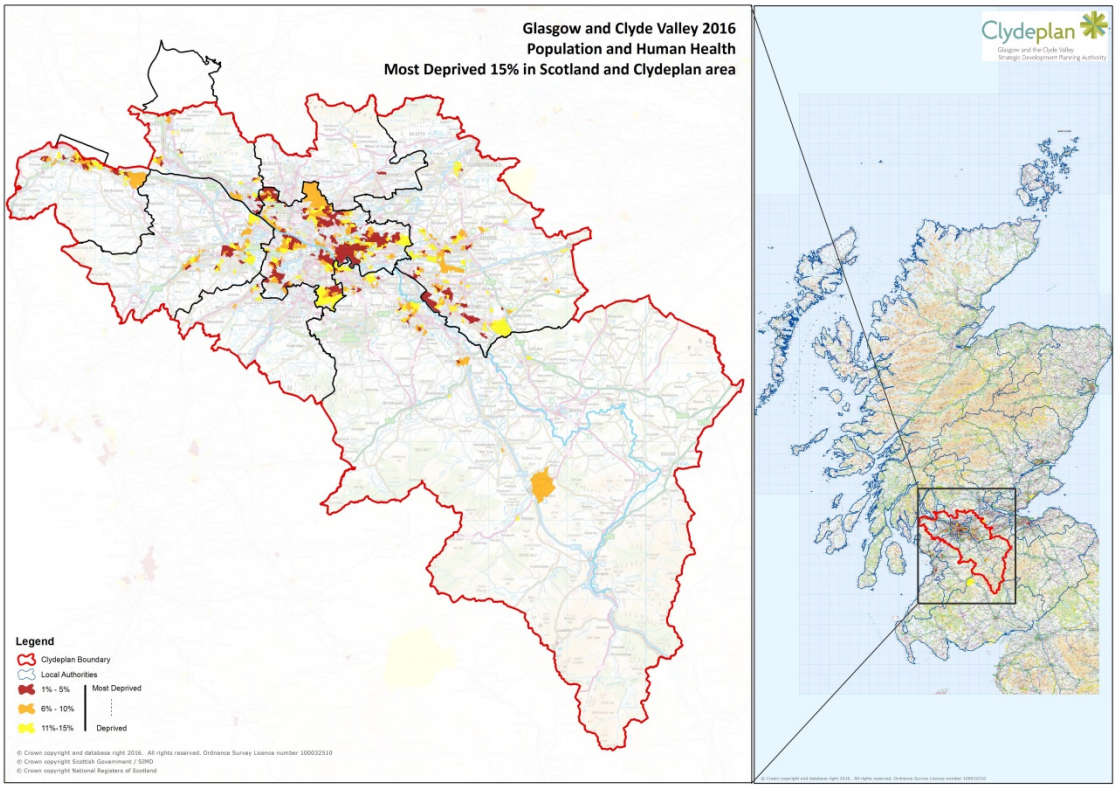
84 Between 1996 and 2010 an average of 23,600 homes a year were built in Scotland with the peak being around 2007. Glasgow City saw the highest growth rate in Scotland in 2010 with 1828 completions.

[56]General Register Scotland High level summary of statistics: Population and Migration, http://www.groscotlandgov.uk/files2/stats/high-level-summary/j11198/j1119801.htm
[57]SIMD 2012 Results http://simd.scotland.gov.uk/publication-2012/simd-2012-results/overall-simd-results/keyfindings/

Map 19 – Deprivation index for Clydeplan and Scotland



Map 20 – Most deprived 15% of datazones in Clydeplan and Scotland



85 A third of Scottish households currently suffer from fuel poverty.[58] Climate change is creating fluctuating extremes of winter weather that makes fuel poverty difficult to assess and legislate for. However the main drivers for fuel poverty are fuel price and stagnant salaries. Cool, damp, inefficient houses have significant effects on health, particularly in children.[59] Respiratory conditions, aches and pains and nervous disorders are more common in these dwelling conditions. It is estimated that 430,000 properties in Scotland might be affected.[60] The moulds and algae found in these properties are identified as key triggers for poor health.

86 Outdoor access supports physical and mental well-being including combatting stress and obesity. Between 2005 and 2008, 78% of the adult Scottish population took part in an outdoor recreational visit. Parks and open spaces were favoured by 37% of people taking exercise. An average of 50% of the Scottish population has access to greenspace but for poorer areas this is closer to 39% partly because direct access to the natural environment is more difficult but no less beneficial.[61]

Trend Prediction Risk

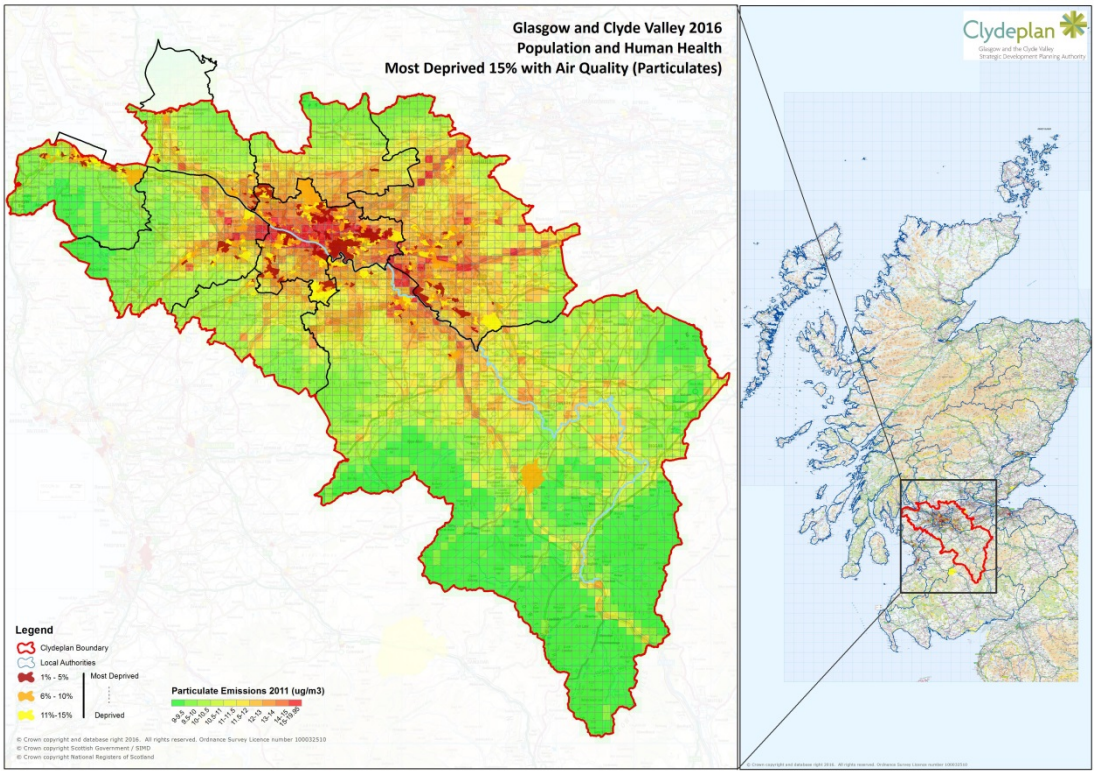
87 Life expectancy has improved over recent surveys as has healthy life expectancy (HLE) albeit it at a slower rate. In 2009, HLE for men was 60 and 62.2 for women. The lowest HLE for GCV is highlighted in the 15% most deprived datazones: 57.5 for men and 61.9 for women.

88 The elderly and those with asthmatic conditions are more susceptible to poor air quality where long term exposure can have adverse effects on the heart and lungs, increasing mortality rates. In recent decades air quality has improved and the incidence of premature deaths has fallen.[56] Short duration high pollution events can however trigger increases in hospital admissions.[62]

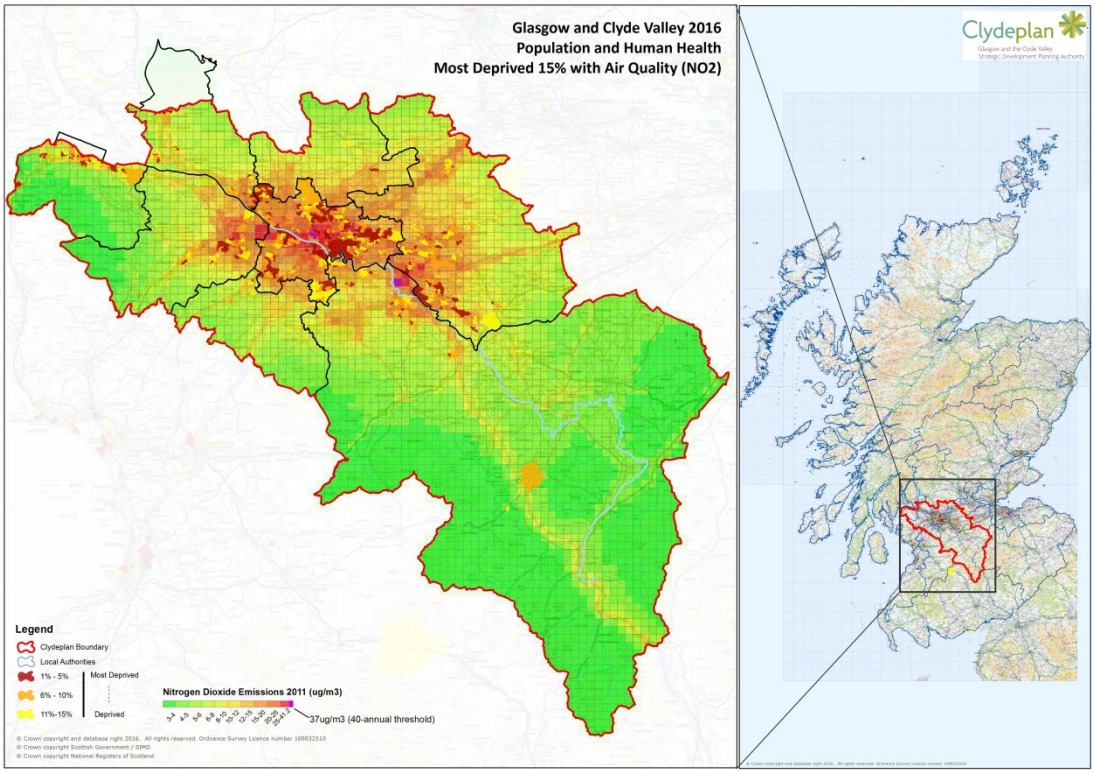
89 Ozone is a pollutant on the increase. Under climate change, a 5^{o}C rise in temperature could see a 4% increase in health burden (500 premature deaths) compared to the baseline.[63] High levels of particulates are found around urban centres and congested traffic routes as is nitrogen Dioxide (NO_2). Maps 21 and 22 show the distribution of particulates and nitrogen dioxide in Glasgow and the Clyde Valley in relation to SIMD.

[58]National Performance Framework
http://www.scotland.gov.uk/About/Performance/scotPerforms/purposes/population
[59]ibid
[60]HR Wallingford, AMEC Environment & Infrastructure UK Ltd, The Met Office, Collingwood Environmental Planning, Alexander Ballard Ltd, Paul Watkiss Associates, Metroeconomica (2012) A Climate Change Risk Assessment for Scotland, DEFRA
[61]Greenspace Scotland (2011) Greenspace Use and Attitude Survey 2011 [online] Available At: http://www.greenspacescotland.org.uk/1greenspace-survey-2011.aspx
[62]Scottish Government Statistics Health of Scotland's population
http://www.scotland.gov.uk/Topics/Statistics/Browse/Health/TrendLifeExpectancy
[63]Vardoulakis, S. and Heaviside, C. (Editors) (2012) Health Effects of Climate Change in the UK 2012 Current evidence, recommendations and research gaps, Health Protection Agency

Map 21: Most deprived 15% of datazones in Clydeplan with particulates level

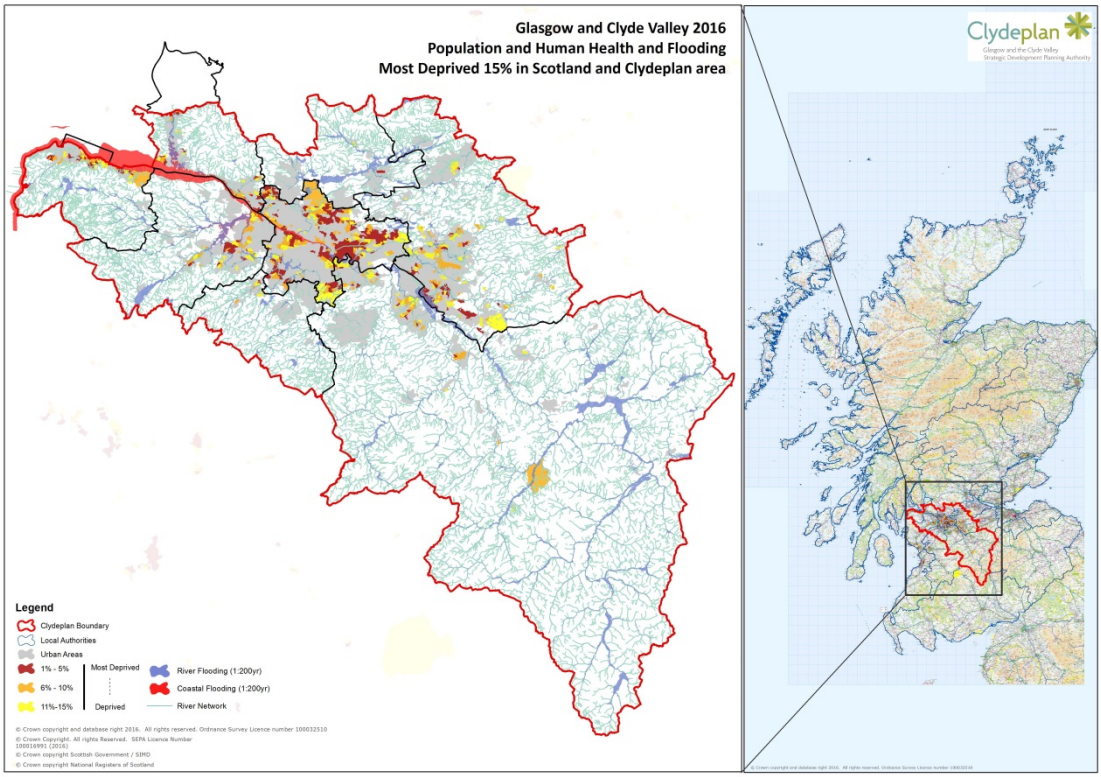


Map22: Most deprived 15% of datazones in Clydeplan with NO_2 level



90 The SEPA National and Strategic Flood Risk Assessments identify flood risk and flood impact to people, economy and environment. Map 23 highlights the areas and infrastructure potentially affected by flooding. For further detail refer to the climate section. It is estimated that 1 in 22 residential and 1 in 13 non-residential properties in Scotland may be affected by river flooding, heavy rainfall or coastal damage. 10% of fire stations, 4% of schools, 5% of residential care homes and 5% of hospital and health centres are at risk.[64] Within the Clydeplan Catchment, The Clyde Estuary, White Cart Water, the River Clyde at Motherwell, sections of the River Kelvin, Wemyss Bay, Dumbarton and Loch Lomond/Vale of Leven areas are susceptible.[60]

Map 23 Most deprived 15% of datazones in GCV with 1 in 200yr flood scenario



91 The effects of flood and excess heat on population and human health will not be evenly spread. Remote wild areas will be susceptible as will densely urbanised areas.[65] Rural areas may suffer from transport disruption and storm damage. Deprived areas and the elderly will be less able to respond or recover in either locality. Through health issues and fuel poverty, vulnerable groups will become more exposed to risk. With an ageing population, the elderly are of greater future concern.[61] Extremes of heat and cold have a greater effect on the elderly the very young and the vulnerable.[66] If climate change contributes to warming weather,

[64]SEPA National Flood Risk Assessment
http://www.sepa.org.uk/flooding/flood_risk_management/national_flood_risk_assessment.aspx
[65]ibid
[66]HR Wallingford, AMEC Environment & Infrastructure UK Ltd, The Met Office, Collingwood Environmental Planning, Alexander Ballard Ltd, Paul Watkiss Associates, Metroeconomica (2012) A Climate Change Risk Assessment for Scotland, DEFRA

increased demand in services, food, water, energy, education, healthcare and transport are all anticipated[67].

Key Issues

92 Planning for population change should be assisted by identifying new sustainable development locations that are less susceptible to flooding, promote services and embed good transport links. Environmental quality can be improved through SDP. High quality air, greenspace, public transport and remediation of vacant and derelict land will be key to achieving this including the provision of good access to community walking/leisure and cycling links. As pressure on the Scottish population and its health increases under expanding development and climatic uncertainties, resilient vision and design needs to be established that will safeguard population and infrastructure.

[67] ibid

Soil

Overview

93 The importance of soil as a resource and national commitment to its sustainable management has been recognised at a European level. High quality agricultural land and high carbon soils like peat need preserving. Policy is required that assesses windfarm development on peat soils and in the central belt there needs to be remediation from the effects of sealing and contamination associated with development. Under Clydeplan, the latter is significant as is the requirement to protect the remaining agriculturally productive land from pollution and development.

Background

94 Soil and soil quality are environmentally, socially and economically important to Scotland. The Scottish Soil Framework (2009) defines soil quality and how it supports the following functions[68]:

- food, forestry and biomass production;
- regulating environmental function like water flow and quality;
- storing carbon preventing atmospheric release;
- promoting habitat and biodiversity; and
- providing raw material and providing a platform for buildings and roads.

95 The geology and climate of Scotland render soils relatively infertile and poorly drained. They are high in organic matter in the peat of the highland northwest and they are well leached compared to Europe. 25% of Scottish soils including improved grassland are cultivated for agriculture with another 45% being used for rough grazing. 17% of Scottish soils are forested.[69] In Glasgow and the Clyde Valley and as indicated in map, 43% of soils are used as improved grassland and 40% for rough grazing although not all are used under their specific classification. For example, within these soil classifications, 18% of the soils are forested.

96 Peat covers around 11% of Scotland's land but holds 70% of the 3,000 million tonnes of "locked-in" carbon (Map 25). This also represents 50% of the UKs soil carbon stocks.[70] These soils that host semi-natural vegetation like heather moorland, native woodland and blanket bog are rare in a UK, European and global context and should be afforded protection.[71]

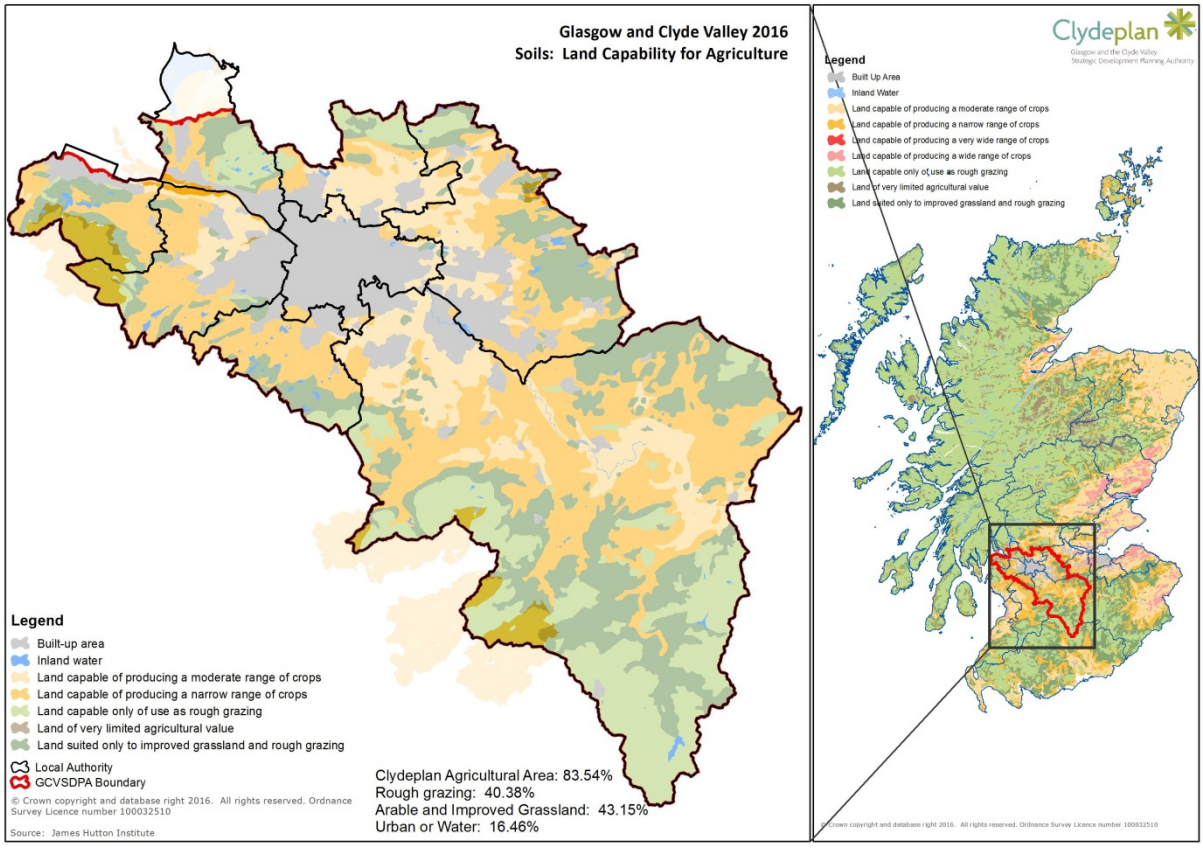
[68]Scottish Government (2009) Scottish Soil Framework http://www.scotland.gov.uk/Publications/2009/05/20145602/0

[69]98The State of Scotland's Soil, 2011, Dobbie, K.E, Burneau, P.M.C, Towers, W. [online] Available at: http://www.sepa.org.uk/land/soil.aspx

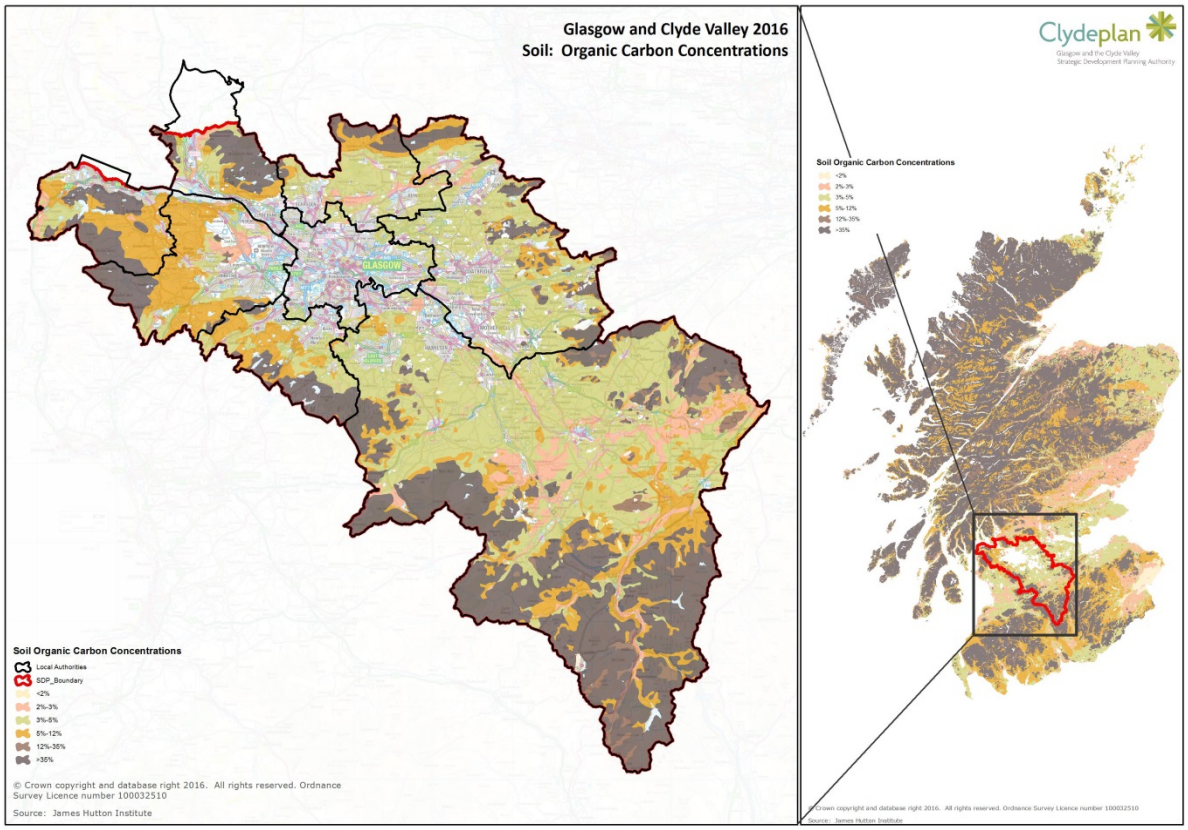
[70]Dobbie, K.E, Bruneau, P.M.C and Towers, W. (eds) (2011) The State of Scotland's Soil, Natural Scotland, www.sepa.org.uk/land/land_publications.aspx

[71]The Scottish Government (2009) Scottish Soil Framework. [online] Available at: http://scotland.gov.uk/Publications/2009/05/20145602/4

Map 24 – GCV Soil Classification 1: Land Capability for Agriculture



Map 25 – Clydeplan Soil Classification 2: Organic Carbon Concentrations

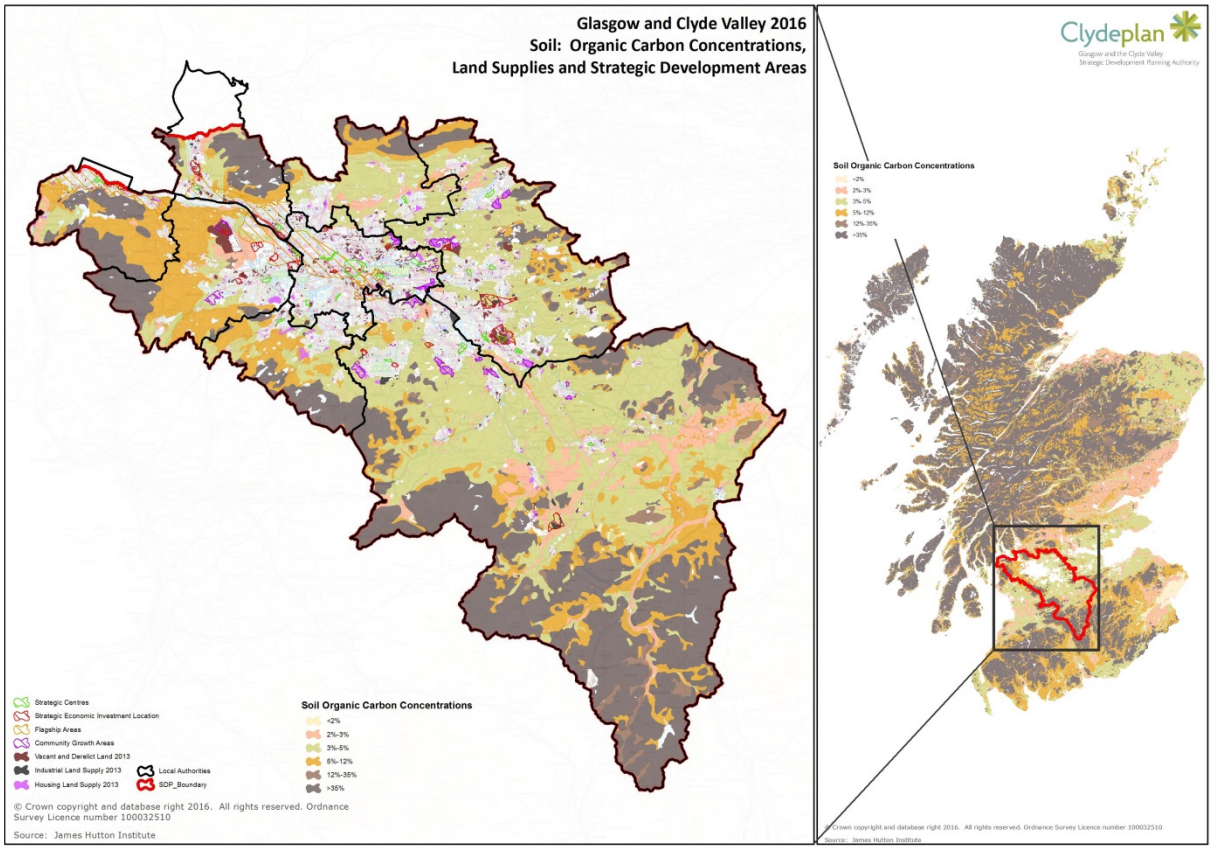


Trend Prediction Risk

97 There is little trend data to indicate whether Scottish soils, generally considered to be in good condition, are improving in quality or degrading. Climate change and organic loss are considered the main national threats to soil and are thought to be difficult to redress. Loss of carbon to the atmosphere has a global impact.

98 The significant impacts to GCV are associated with soils sealing, decrease in biodiversity, acidification and eutrophication through pollution. Leaching is also a problem as GCV is exposed to wetter than average conditions. In the agricultural sector and as highlighted in water framework, cultivation can lead to erosion, contamination, structure loss and compaction which has significant implications to health, rural and built environment. In Scotland, soil sealing is thought to run at around 1000 hectares p/a and the majority of this is focussed on GCV and the central belt. Additionally, debris flow and landslides have increased over the last 200-500 years and the increase is anticipated to continue as the effects of climate change magnify. Map 26 shows development opportunities in Clydeplan and their relationship to carbon rich soils in the area.

Map 26 Clydeplan Soil Classification 2: Organic Carbon Concentrations



99 Soil contamination is also associated with the central belt and GCV. Vacant and derelict land figures (as shown in Map 26) are at their highest levels in this region and in 2011, North Lanarkshire and Glasgow City accounted for 13% and 12%

of the Scottish total respectively. Redevelopment requires appropriate planning in order to address soil and ground water contamination. On average, 488 hectares of vacant and derelict land are brought back into use in Scotland every year.[72] 179 hectares were brought back into use in Clydeplan in 2013.

100 Whilst the majority of high carbon peat-lands are found in the north west, the Scottish Borders, Lothians, Ayrshire and the northeast corridor and Moray contain the best agricultural land. Between Maps 24 and 25, the distribution higher quality agricultural soil and higher carbon content soils is displayed.

Key Issues

101 Planning will have a direct effect on local, national, European and global issues associated with soil. Soil loss can be minimised through good planning in anticipation of climate change. Agriculture needs to be supported to protect the little high quality land that exists in GCV whilst taking care not to compact soils or contaminate water networks. Regeneration and urban planning will directly affect potential for flooding if issues of sealing, compaction or SUDS are not addressed. Careful windfarm planning needs to be ensured to minimise loss of peaty carbon rich soils. Woodland clearance on windfarm sites potentially destabilises soils which needs to be carefully considered as part of the whole carbon sequestration, flood reduction and woodland expansion programme.

[72]The Scottish Government (2012) Statistical Bulletin Scottish Vacant and Derelict Land Survey 2011 http://www.scotland.gov.uk/Resource/0038/00386399.pdf

Water

Overview

102 Scotland currently has two river basin management plans (RBMP) for the Tweed and Solway river catchments. The improvement of water body condition and the protection of coastal and inland waters are key objectives. Many of these areas are relatively undeveloped. In addition to this, there is an emerging National Marine Plan and awareness that coastal and inland flood risk management needs to be strengthened.

Background

103 Scotland's water provides a variety of uses from underpinning, health, industry and prosperity, to energy generation and leisure. Water also supports biological and ecological diversity recognised as requiring protection under European Legislation covered by SNH Natura2000 designation. Over the last 20 years Scotland's water environment and water quality has improved.

104 Eighty two percent of water for our consumption comes from reservoirs and a further 10% directly from rivers. River abstraction has decreased by 13% in the period 2003 – 2010. The remainder of consumed water comes evenly from loch or groundwater. Thirty three percent of water intended for delivery is lost in distribution. Although drought is rare in Scotland and in the city region, leakage should be eliminated to reduce hardship during these periods.

105 Flooding has a significant impact on residential, cultural, environmental, agricultural and business sectors. Financially, annual damages to the business and domestic sectors amount to around £1.5 billion: a significant stress to the Scottish economy.

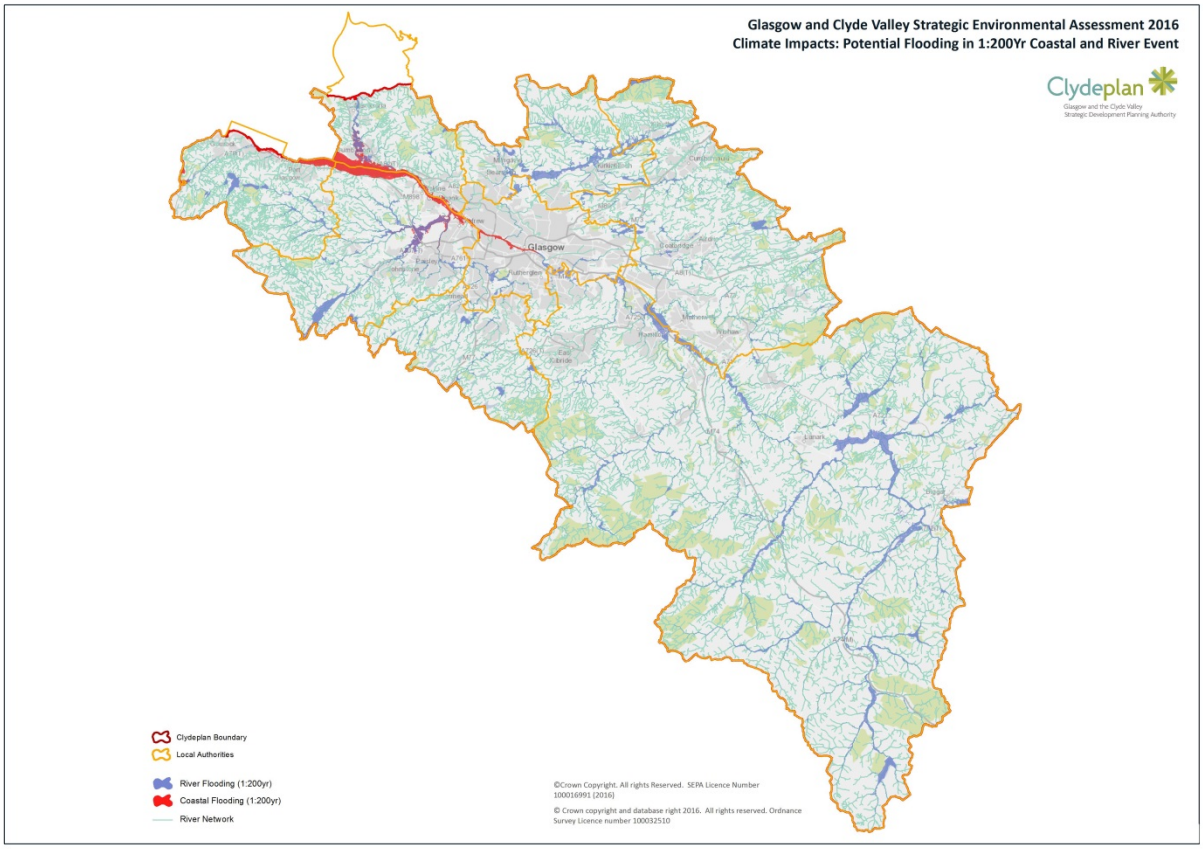
106 Fluvial river flooding is responsible for almost half of all flood damage (45%). Pluvial surface water flooding is a more recent issue and is on the increase, being associated with climate change. Pluvial flooding overwhelms drains and drainage rates of soils. Non-saturated surfaces and soils cannot cope with deluge conditions responsible for 38% of Scotland's flood damage.[73] The Sustainable Urban Drainage System (SUDS) is being developed to counter this rising phenomenon. River catchments areas are being developed to slow the passage of water as well as creating new amenity. New urban developments are required to pass grey water through a SUDs scheme.[74]

107 The maps below are included in the climate section of this report and demonstrate the pressure that will be exerted on Glasgow and the Clyde Valley in times of coastal and inland flood. Map 27 shows the impact of coastal and inland river flooding in a 1 in 200 year event. Map 28 highlights areas that would be threatened or potentially inundated with flood water and this has led to the development of the potentially vulnerable areas classification by SEPA as shown in Map 29.

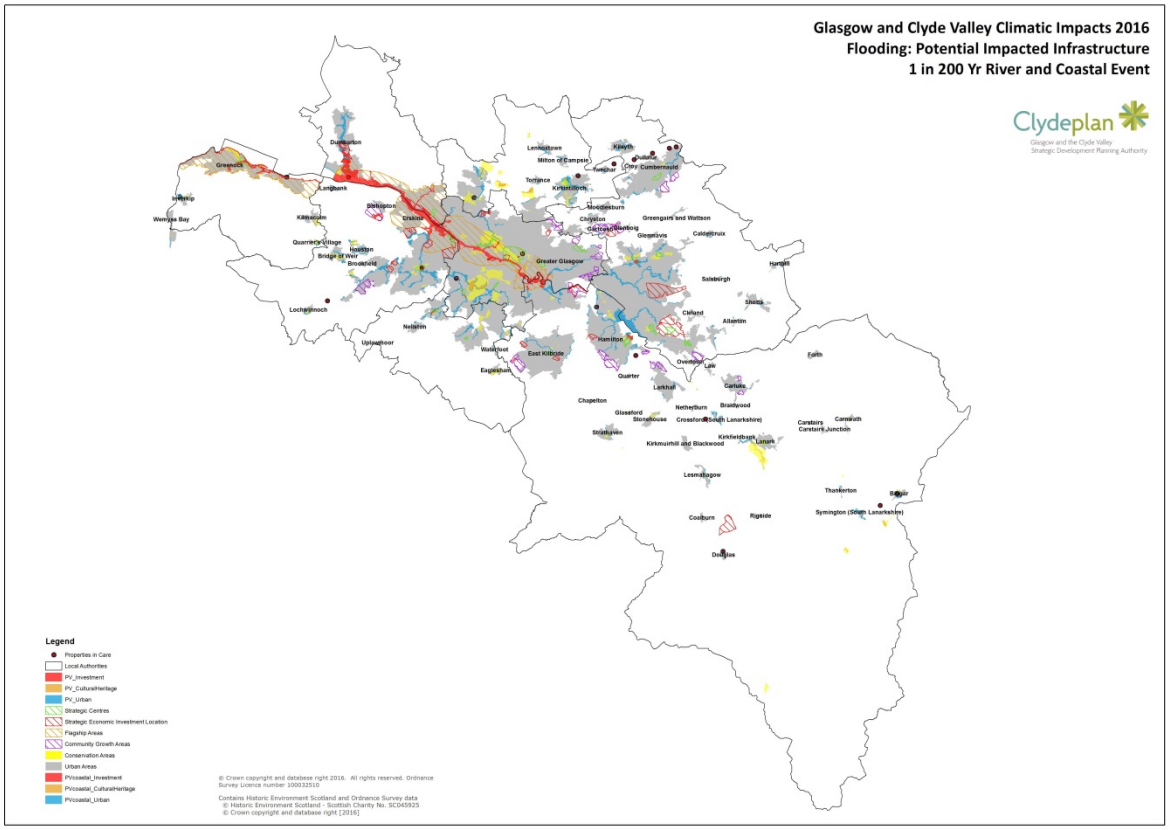
108 Coastal and estuary environments are also suffering under climate change as demonstrated in Map 27. Low pressure, high winds, high rainfall and storm surge contribute to coastal flooding and accounts for 17% of Scotland's flood damage. As discussed under the population and health and climate sections of this report, the sheltered aspect of much of the Clydeplan area protects it against human and material coast.

[73] SEPA (2011) National Flood Risk Assessment
http://www.sepa.org.uk/flooding/flood_risk_management/national_flood_risk_assessment.aspx
[74] SEPA website Sustainable Urban Drainage Systems
http://www.sepa.org.uk/water/water_regulation/regimes/pollution_control/suds.aspx

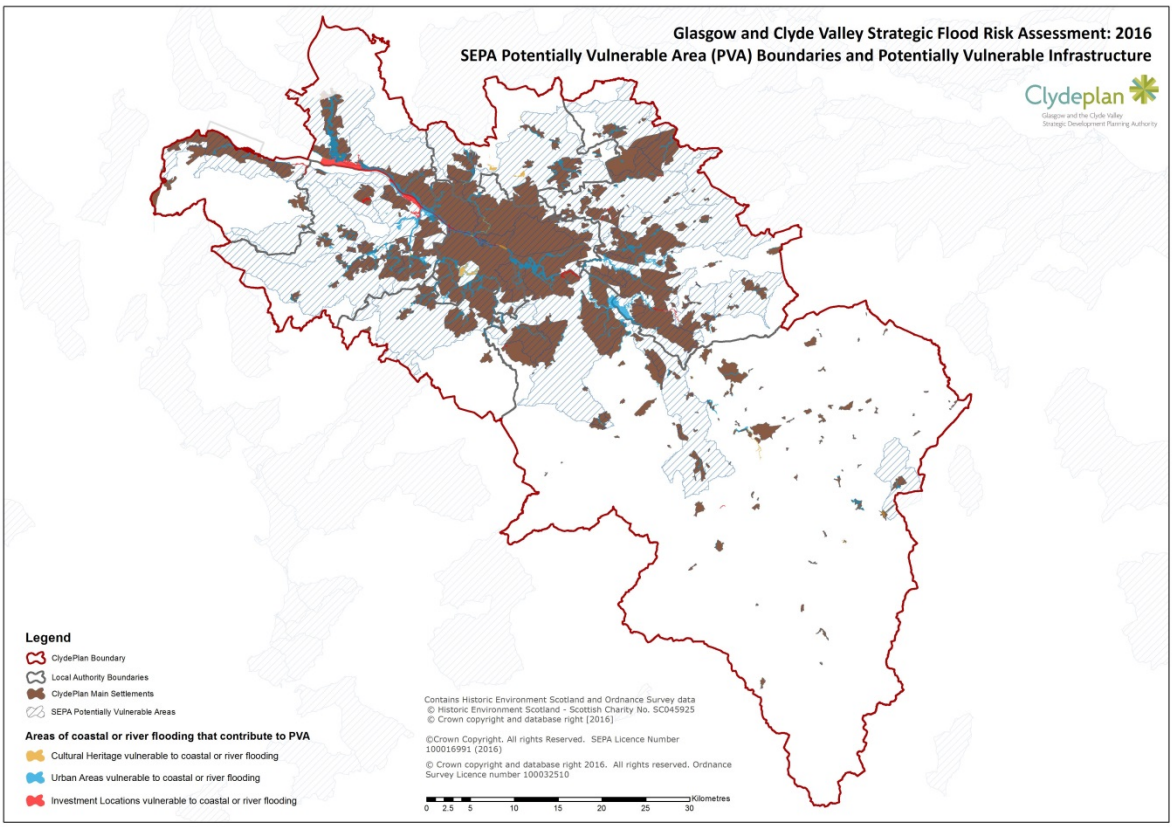
Map27 – River network estuary and coastal flood model for 1 in 200 year event



Map 28 – 1:200Yr Flood Tidal and River flooding impacts



Map 29 – 1:200Yr Flood Tidal and River flooding extents and SEPA Potentially Vulnerable Area Classification

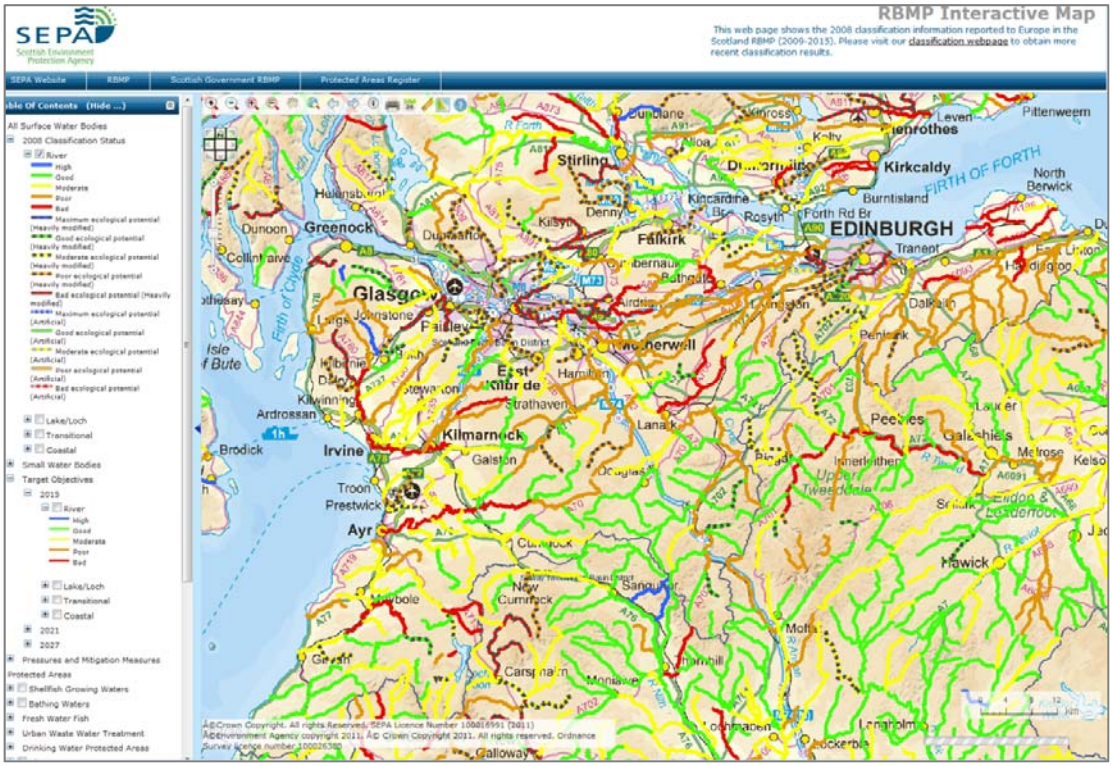


Trend Prediction Risk

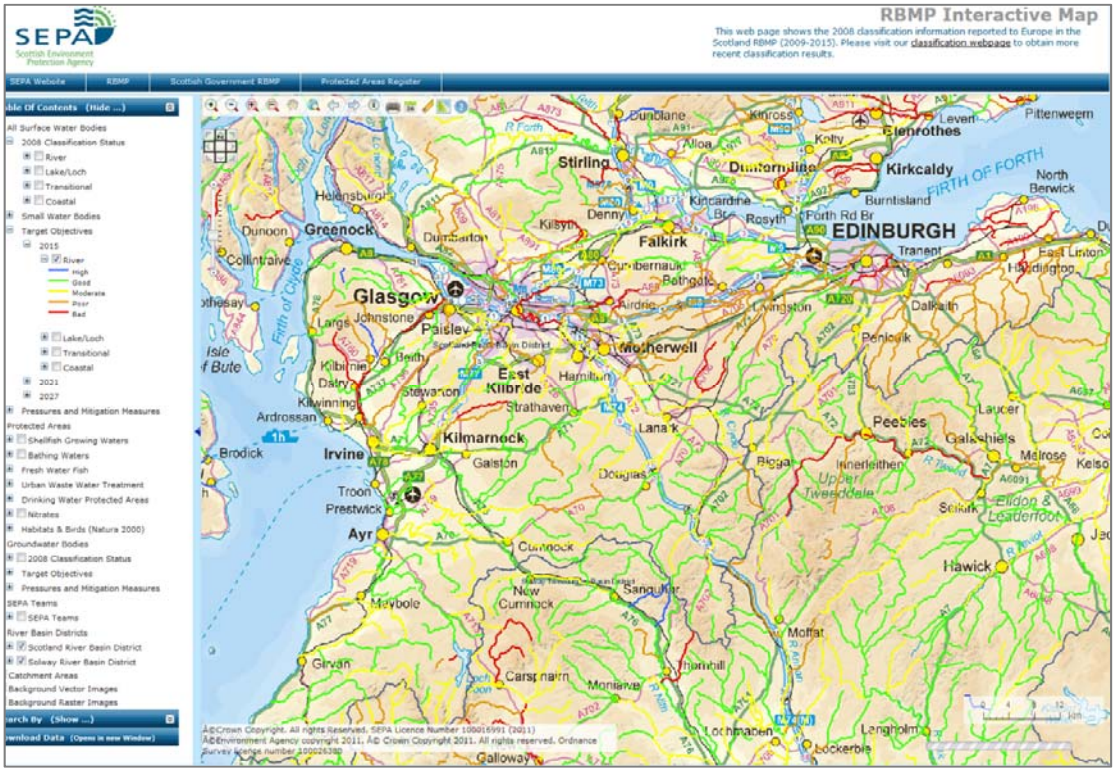
109 Although a large proportion of the Scottish River Basin is high quality, 35% of the waters are in poor condition being under significant pressure from human activity. Maps 30a and 30b taken from SEPAs River Basin Management Plan (RBMP) website highlight current river quality in the city region and the 2015 objective respectively. Figure 7 from the Scottish Government SEA portal shows the positive trends within the 5 monitoring sectors. Agriculture, manufacturing, abstraction, sewerage and alteration through urban development and flood protection are all having an impact on water condition. Past engineering and forestry activities also have an impact.[75] Many water bodies are now designated for protection in an effort to restore then to their former purpose or function. 98% of all protected water bodies are to be in good condition by 2027 although a small proportion will not achieve this status as contamination continues from legacy mining and industrial activity. 100% should be operating in their function by 2020[71]. Coastal and estuary waters tend to be in better condition than inland water courses and lochs. The Clyde Estuary and Firth of Clyde are in moderate or good condition.

[75]SEPA (2009) Summary The river basin management plan for the Scotland river basin district 2009–2015 http://www.sepa.org.uk/water/river_basin_planning.aspx

Map30a: River quality classification (2008) from SEPA RBMP interactive map website (http://map.sepa.org.uk/rbmp/)



Map30b: River quality Objectives (2015) from SEPA RBMP interactive map website (http://map.sepa.org.uk/rbmp/)



110 Climate change presents unique challenges to achieving 2027 objectives. Higher summer temperatures, decrease in rainfall and irrigation creates seasonal concentration and eutrophication. Increases in winter precipitation increases load transport and run off from the transport network, urban and industrial contaminants. Agriculturally, soil run off and increased chemical, nutrient and faecal material loading bring

issues.[76] For any flood scenario, contamination of the areas in Clydeplan highlighted in maps 27, 28 and 29 needs to be considered. The worst highlighted areas are The Clyde Estuary, White Cart Water, the River Clyde at Motherwell, sections of the River Kelvin, Wemyss Bay, Dumbarton and Loch Lomond/Vale of Leven. Whilst changing summer trends would most likely affect inland water and ground water abstraction, winter phenomenon will also affect estuarine areas where deposition of the river load is increased.

111 As well as creating problems associated with health and achieving environmental objectives, the financial cost of combatting flooding is of concern. The NFRA (National Flood Risk Assessment) addresses the full cross section of issues associated with flooding: health, economy, environment and cultural heritage and looks at strategy for protecting and reducing the £1.5 billion in damages created annually through flooding. NFRA identified 243 potentially vulnerable areas (PVAs) in Scotland that contain 92% of properties at risk. Map 29 highlights the 13 sizeable PVAs of Clydeplan. These areas coincide with main settlements and heavily affect the urban areas of the central belt and Glasgow and the Clyde Valley.

Figure 7: Trends in 5 water quality monitoring sectors

Topic	Summary
Groundwater Groundwater is a hugely valuable asset with more than 80% of it in good condition. Issues from mining and agriculture must be addressed.	Scotland's groundwater is a hugely valuable hidden asset, providing 75% of private drinking water supplies and 70% of the water used in distilling. More than 80% of Scotland's groundwater is in good condition; although there are particular regions with widespread problems. There is also a large number of private water supplies with localised problems. Legacy industrial activity and agriculture are the main causes of regional-scale groundwater problems, whereas inadequate construction of private water supplies and inappropriate management of wastes cause the localised problems.
Rivers and canals Half our rivers are of at least good quality but there are still problems to tackle. This requires collaboration between all water users.	The health of our rivers has improved significantly in the last 25 years and half are now good or high quality, although there are still significant problems. A better appreciation is needed of the benefits that a healthy river ecosystem provides, and a better understanding of the link between this health and a successful economy.
Lochs Scotland's lochs are generally in good condition. They are an important part of our landscape and provide benefits such as water for drinking and power generation.	Scotland's lochs are a distinctive part of our landscape and environment. Lochs supply much of our drinking water and renewable energy from hydropower. Almost three-quarters of lochs are good or high quality, although there are still a number of concerns, for example poor land management introducing excessive amounts of nutrients, and physical alterations causing changes to water levels and obstacles to fish migration. These two most significant problems require integrated management of the catchments around lochs to reduce nutrient inputs, as well as striking the right balance between maximising the hydropower generated from lochs while at the same time protecting the wider environment.
Estuaries Scottish estuaries are important resources for wildlife and humans, but are under pressure from human activity and climate change.	In the past, waste water flowed untreated into industrialised estuaries, causing serious pollution. Improved effluent treatment has resulted in better water quality; however, sediments in some estuaries remain contaminated as a result of past discharges. Important estuarine habitats have been lost in some estuaries as a result of land reclamation, construction of ports, harbours and sea defences, and canalisation. Nitrogen inputs from agriculture are a cause for concern in some estuaries in rural areas.
Coastal waters Scottish coastal waters are mainly healthy and clean but they are under pressure from human activities at sea and on land.	Overall coastal waters are high or good quality, although there are localised impacts from commercial fishing, aquaculture and diffuse inputs. The growth in industries such as aquaculture and renewable energy is putting additional pressure on the coastal environment, and a new marine planning structure, including a national marine plan, has been put in place to manage the conflicting demands on coastal waters to ensure the seas remain clean, safe, healthy, biologically diverse and productive.
Scotland's seas Detailed asssessment in Marine Atlas Overall, Scottish seas are clean, safe, healthy, biologically diverse and productive. But increased and varied use may mean competition for sea space.	Scotland's seas are mainly clean and safe although there are some localised areas of concern. The seas support a diverse array of habitats and contain nationally and internationally important populations of certain species. There are two significant pressures on the marine area which are widespread:

[76] HR Wallingford, AMEC Environment & Infrastructure UK Ltd, The Met Office, Collingwood Environmental Planning, Alexander Ballard Ltd, Paul Watkiss Associates, Metroeconomica (2012) A Climate Change Risk Assessment for Scotland, DEFRA

Key Issues

112 Future SDPs should ensure that new development does not coincide with high flood risk areas or increase the risk of flooding. As well as seeking to minimise risk Clydeplan should also ensure that development does not affect water quality or threaten existing objectives. Water infrastructure and networks should also be enhanced to reduce leakage and meet anticipated demands including contingency for drought.

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