



THE
ENVIRONMENT
PARTNERSHIP



CHESHIRE EAST GREEN INFRASTRUCTURE PLAN

Appendix A - Evidence Base Mapping

OCTOBER 2019



Prepared by The Environment Partnership
for Cheshire East Council

Appendix A - GI Priority Areas: Evidence Base and Mapping

Aims

This appendix has two aims:

1. To describe the method for selecting priority areas for GI investment in Cheshire East;
2. To illustrate where the various priority areas are and provide the evidence underpinning their selection.

Method for Identifying GI Priority Areas – Overview

GI priority areas are identified on the basis of “public benefit” i.e. where the greatest social, economic and/or environmental benefit can be secured through policy and funding intervention. As GI is inherently multifunctional, evidence must be drawn from a wide range of data sources; using Geographic Information Systems (GIS) to spatially analyse and map assets and areas of need.

GIS analysis is an **aid** to strategic planning and investment; the insight that it provides should always be tested and weighed against local knowledge, community needs and values.

Four Strategic themes

The need for a planned, strategic approach to GI intervention is driven by policy requirements and local characteristics and obligations. It is important that these key drivers are understood, so that recommendations can account for and respond to the particular needs present in Cheshire East. Cheshire East’s Local Plan (2017) has four strategic themes which underpin the analysis for GI planning:

- Economy
- Life chances and choices
- Environment
- Connectivity and movement

While it is important to understand the key drivers, it should also be recognised that GI can extend across one or more of the four strategic themes. Indeed the intersection between these themes, whether in terms of need or opportunity, along with the quality and functionality of GI over more than one thematic strand, can be of particular interest when addressing plan priorities. This appendix explains and provides the thematic analysis that underpins the main plan.

Method for Prioritisation and GI Planning

A sequence of maps has been produced for each of the four strategic themes following the process on Figure 1 and is detailed below.

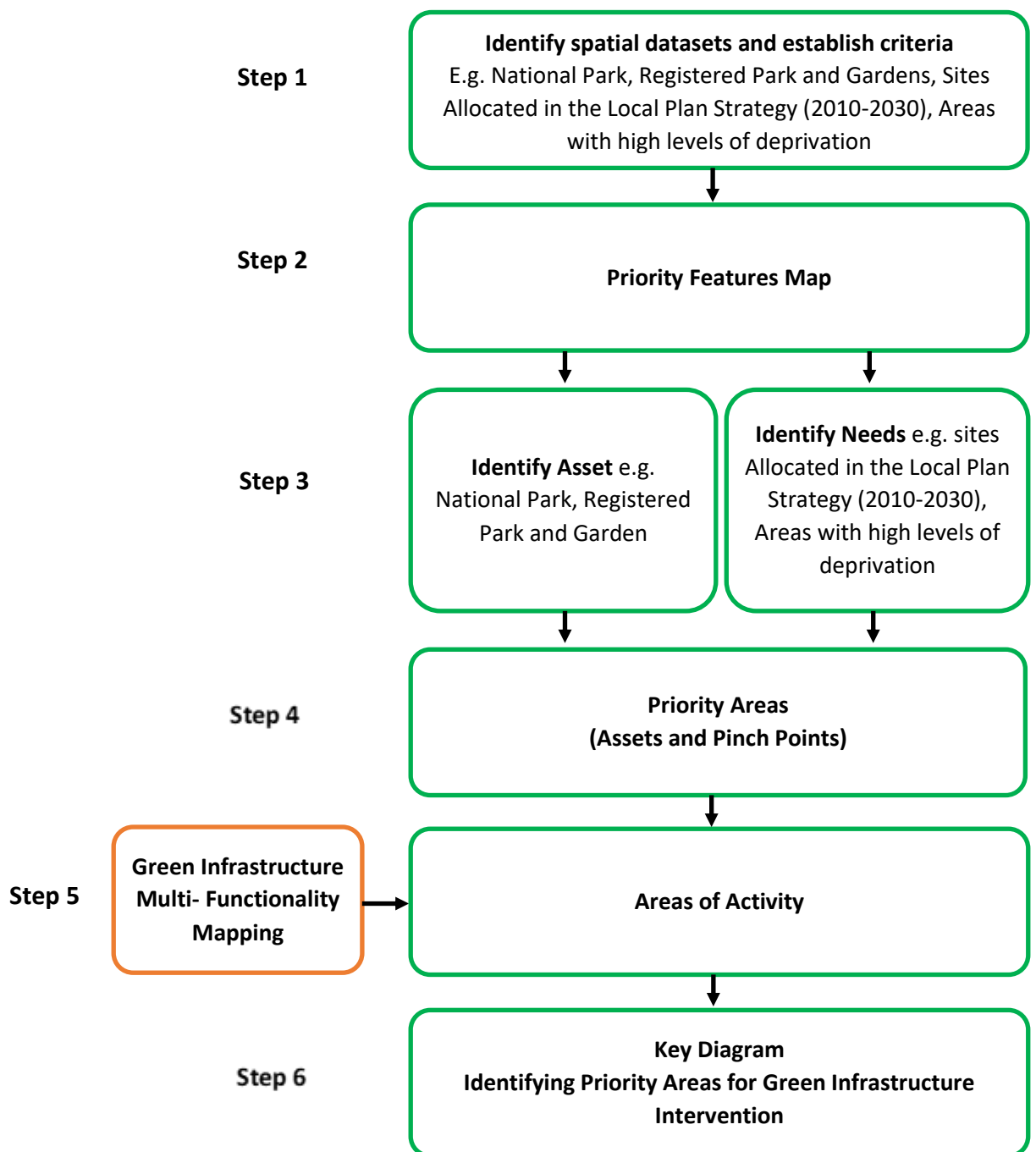


Figure 1: Identifying Priority Areas for GI Intervention

Step 1: Identify Relevant Datasets

A range of datasets have informed this study. Each strategic priority is assigned a group of relevant spatial datasets that present existing assets and inform the need for GI, such as health deprivation, poor air quality and poor green space provision. The relevant datasets are tabulated at Step 3

Step 2: Map priority features

Given that 93% of Cheshire East is green infrastructure, the focus of this stage is to build a picture of where GI interventions should be targeted to have the most effective outcomes. This includes gathering data and comparing it with established GI guidance, or with national and local benchmarks, or with the GI functionality maps, to identify areas where green infrastructure is expected to be performing effectively and areas where it is either absent or functioning poorly.

Step 3: Identify Assets and Needs

This stage assesses which of the priority features identified in Step 2 are GI assets for Cheshire East, and which are pinch points. Figure 2 illustrates what is understood by the terms 'asset' and 'pinch point'.

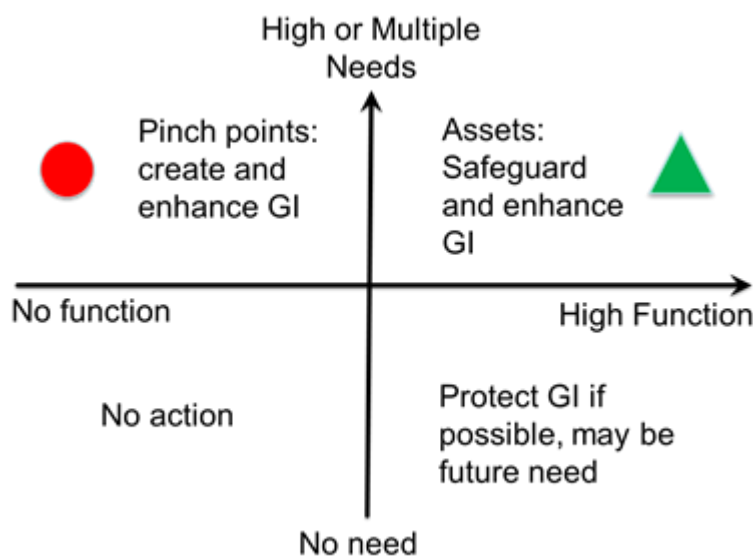


Figure 2: Asset and Pinch Point Matrix

An asset is where need aligns with GI functioning effectively. For example, amenity space at the Carrs and Bollin Valley Way in Wilmslow is an asset as it provides functioning GI that aligns with local need for open space.

A pinch point is where current need for GI is not provided by high-functioning GI; or where future development or infrastructure will place additional demands on existing GI; or where statutory or locally-adopted environmental objectives will not be met unless there is GI investment. An example in Cheshire East could be a new residential development with no nearby accessible amenity space. Another example may be a waterbody catchment where bad water quality can only be corrected under the Water Framework Directive by GI activity.

For the purpose of this study, pinch points and assets have been defined using the following criteria:

Criteria used to identify assets and pinch points	
Assets	Pinch Points
Strategic theme: Economy	
Registered Parks and Gardens	Allocated Sites within the Cheshire East Local Plan Strategy (2010-2030)
National Trust Properties	Middle Super Output Areas in the top 10% for business density per square kilometre
Peak District National Park	

Criteria used to identify assets and pinch points	
Strategic theme: Life Chances and Choices	
Accessible Green Spaces larger than 2ha	300m buffer from Accessible Green Spaces larger than 2ha
	Urban Areas within the 20% lowest Lower Super Output Areas for tree canopy coverage
	Lower Super Output Areas within the 10% most deprived in Cheshire East according to the Indices of Multiple Deprivation
	Lower Super Output Areas within the highest 10% for Risk of Poor Mental Health in Cheshire East
	Lower Super Output Areas within the highest 10% of Air Pollution Exposure in Cheshire East
Strategic theme: Environment	
Internationally, Nationally and Locally Designated Sites	The 20% lowest Lower Super Output Areas for tree canopy coverage
Core Biodiversity Areas identified in the Cheshire East Ecological Framework	Lower Super Output Areas with sealed surface coverage over 50%
Rivers and Canals	Floodzones 2 and 3
	Waterbody catchments with bad water quality (Environment Agency, 2016)
Strategic theme: Connectivity and Movement	
Public Rights of Way	2km Buffer from Sites Larger than 20ha
Cycle Paths	
Canals	
Accessible Greenspace larger than 20ha	
Corridors and Stepping Stones as identified in the Cheshire East Ecological Framework	

Step 4: Map Priority Areas (Assets and Pinch-points)

Once the assets and pinch points have been identified, they are mapped to show broad areas where GI is meeting current need and functioning well (assets) and areas where there is an existing need for GI, often due to an absence of GI or because GI is currently functioning poorly (pinch points).

Assets and pinch-points are identified separately for each of the strategic themes. For example central Macclesfield is shown as an economic pinch-point and north Macclesfield as a pinch-point for life chances and choices.

A brief narrative of the reason for selection of the asset or pinch-point is provided. Some areas are assets or pinch-points for more than one theme, which gives additional justification for prioritisation of such areas.

The assessment is also cross-checked with information from stakeholder consultation, in order to validate selection of assets and pinch-points. In some cases, stakeholders identified additional assets or pinch-points on the basis of evidence from additional sources beyond those listed above.

Step 5: Assess multi-functionality

A GI functionality plan is produced for Cheshire East. This uses open-source datasets to assess the number of functions that each area can provide, based on its GI typology and its location. 28 different functions of GI are relevant to Cheshire East, such as carbon storage, recreation, shading from the sun, providing a corridor for wildlife, intercepting water and the removal of pollutants. It is unlikely that any individual parcel of land can support 28 functions, and in practice scores of over 10 indicate moderate functionality and scores over 15 indicate high functionality.

The priority areas identified at Stage 4 are mapped onto the multi-functionality map. It is seen that, in general, GI functionality is low at pinch-points and high at assets.

It would be desirable to have a borough-wide assessment of GI quality, but this is not yet possible. GI functionality is a partial proxy for GI quality. High functionality usually implies diversity and maturity of GI, and usually implies the site is valued by a range of users, but it would require site-specific assessment to judge whether a given area is managed well and is in good condition. Conversely, low functionality may imply low quality but this cannot be assumed, as certain sites and vegetation types are not inherently capable of delivering multiple functions.

Stakeholder consultation has given some indication of quality issues, which have influenced the selection of priority areas.

The GI activity needed varies between assets and pinch points.

For areas identified as GI assets, the necessary intervention may include enhancement, or increasing connectivity to an existing open space. For pinch-points, the necessary intervention may be to create or restore GI.

Step 6: Produce Key Diagram

The key diagram pulls the analysis together and provides a visual overview of the priority areas for green infrastructure intervention. The key diagram identifies areas which are identified as enabling the following opportunities and benefits:

- Areas where there are multiple assets and/or pinch-points, meaning that there is greatest likelihood of GI investment addressing multiple strategic themes;
- Areas which will provide the best return on investment, whether that be lessening healthcare spending for the NHS due to improved mental health or a decrease in obesity levels, or reducing cost burdens for car users by providing alternative green travel modes to the car;
- Areas where GI has the potential to effectively connect to neighbouring authorities, providing cross-border benefits;
- Areas where green infrastructure has the potential to provide maximum functions, providing benefits for a wide range of end users and biodiversity.

The key diagram can only communicate the headlines so must be read alongside the priority maps for each strategic theme (economy, life chances and choices, environment, connectivity and movement) which give more detail on the boundaries of each asset or pinch-point.

A summary table of the assets and pinch-points is provided. This includes the recommended GI activity is included, using the headings of the GI plan's Programmes (i.e.

Urban Greening, Getting Outdoors Easily, Rivers and Valleys, Thriving Nature, Working with Infrastructure, A Distinctive Place, Environments for Business, and Farmland and Soils).

Strategic Theme 1: Economy

GI can deliver many aspects of sustainable economic development by supporting quality of place and reducing the impact of economic and housing development on the natural environment. GI planning can also provide environments conducive to productive lifestyles through connecting people with the outdoors and by the provision of new GI near to homes and places of work. Some GI is itself an economic asset, notably estates, waterbodies and open spaces which support businesses and jobs.

GI features of economic significance (assets and areas of need) are mapped at Figure 3.

Assets and needs are identified on the basis of their borough wide significance and therefore will exclude some local features which might be prioritised in neighbourhood GI plans.

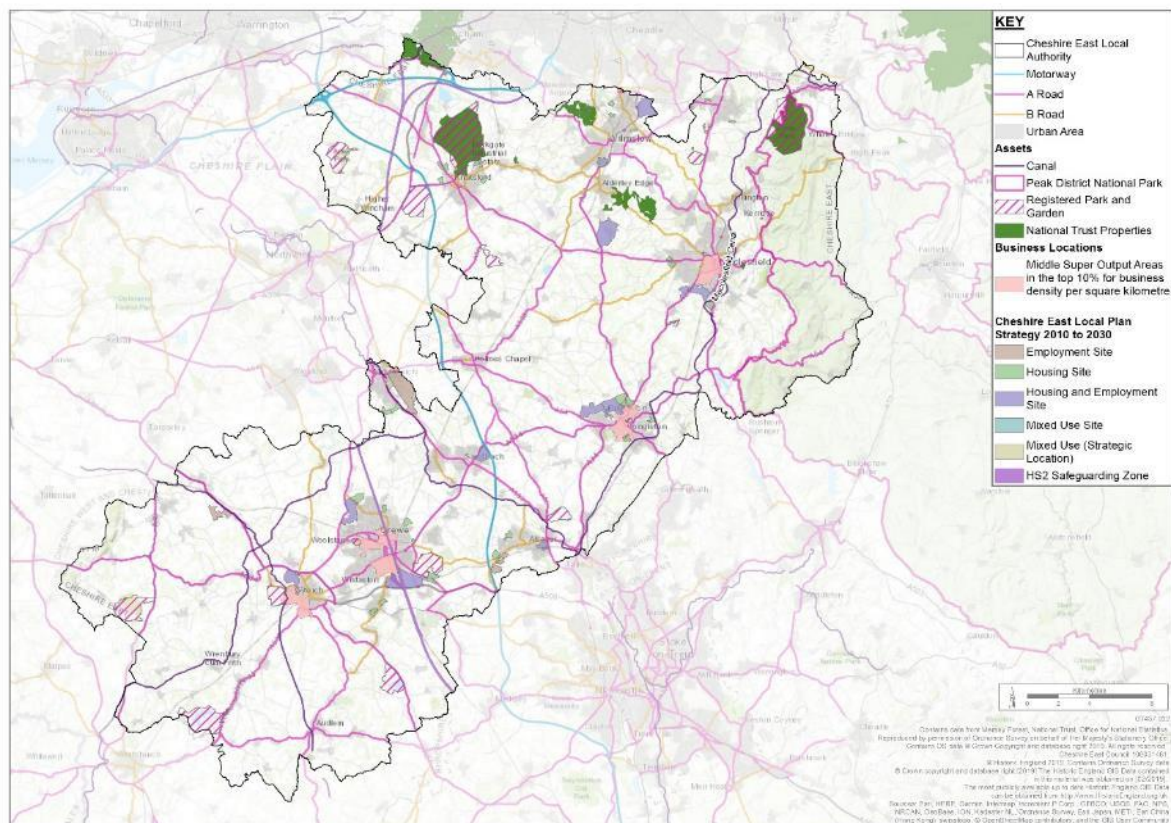


Fig. 3: Economy - Features Plan

Assets

- Peak District National Park

The Peak District National Park is a vital asset to the local economy bringing in visitors and capturing spend from Cheshire East residents choosing to engage in leisure and recreation locally and attracting business opportunities along its fringe. There is opportunity to provide better GI links from the National Park to areas of need in Cheshire East, while there is a continuing need to conserve and enhance the asset value of the National Park and its fringe areas as a contributor to 'Quality of Place' and distinctiveness.

- Registered Parks and Gardens
- Registered parks and gardens are popular for their links to culture and history and capture spend from Cheshire East residents and visitors from outside the borough. Many National Trust properties fall within this category, while private estates such as Arley, Capesthorne, Cholmondeley and Combermere provide similar economic and other benefits to the area. These registered parks and Gardens are an important contributor to the landscape character of Cheshire East, providing 'distinctive place' attributes that need to be protected and be economically viable to help retain the 'Quality of Place' that is an economic driver in its own right.. National Trust Properties

National Trust properties are primarily located in the northern part of the borough (Tatton Park, Quarry Bank, Alderley Edge, Hare Hill, the southern part of Dunham Massey Estate, Mobberley Fields, the Cloud, Mow Cop, Maggoty Wood and Lyme Park), with Bickerton and Bulkeley Hills within the Sandstone Ridge. While attracting Cheshire East residents, the proximity of Greater Manchester means that these sites are also popular with residents from the conurbation bringing additional spend. Visits to many of these sites are purely about recreation for local people and the primary aim is largely walking and dog walking. The sites are also highly conducive to healthy and productive lifestyles.

- Cheshire Ring Canal

The Cheshire Ring Canal network is important for tourism and place-shaping. For example in Macclesfield it provides a connection for day visitors from Greater Manchester and Cheshire and walking along the towpath enables healthy lifestyles. The Trent and Mersey canal link between Middlewich, Sandbach and Alsager is in a major housing growth corridor so it will assist with place-shaping. In Nantwich and the south-west of the borough, the Shropshire Union Canal provides place-shaping for Nantwich as a high-business density centre and sustains local hospitality businesses near some of its points of visual and historic interest.

Need

- High business density (top 10% for business density per square kilometre)

This has been selected as an indicator as to where existing economic activity is concentrated in Cheshire East, with the opportunity to prioritise GI investment through retrofitting GI to encourage inward investment and maintain staff retention. Macclesfield, Crewe, Congleton and Nantwich for example have high business density (1E, 2E, 3E and 4E) and relatively low GI cover (3E, 4E, 2T and 12T). Retrofitting GI also assist in climate resilience by reducing surface water run-off and the 'heat island' effect. Green travel routes to homes and existing GI assets encourage sustainable commuting and recreation respectively.

Four pinch-points at central Macclesfield, Crewe, Congleton and Nantwich (numbered 1E to 4E respectively) are identified on the Economy priorities map.

- Allocated sites (Cheshire East Local Plan Strategy 2010 to 2030)

This dataset is a useful predictor as to the location of future communities and neighbourhoods and their proximity to existing GI networks. It will also indicate where there may be loss of GI to development and the need for offsetting that loss. Thirteen pinch-points (numbered 5 to 17) are shown on the Economy priorities map.

- High Speed 2 (HS2) safeguarding zone

HS2 will involve significant infrastructure including tunnels, cuttings, embankments and viaducts with the potential to sever existing GI networks. Including the HS2 corridor as a pinch-point highlights where the risk of severance is greatest (including the Bollin Valley and adjacent Rostherne Mere) and where there are opportunities for compensatory establishment of alternative connected GI networks. As the HS2 infrastructure will be of national significance, it is important that it is resilient to climate change and GI can improve the environmental quality and resilience of the corridor. On a similar note, the infrastructure will disrupt existing land uses and, possibly, land values. GI can play a part in assisting landowners to adapt to the changed landscape and can reduce the adverse effects of the infrastructure on the surrounding land.

The HS2 safeguarding zone is shown as Pinch-point 18E on the Economy Priorities map.

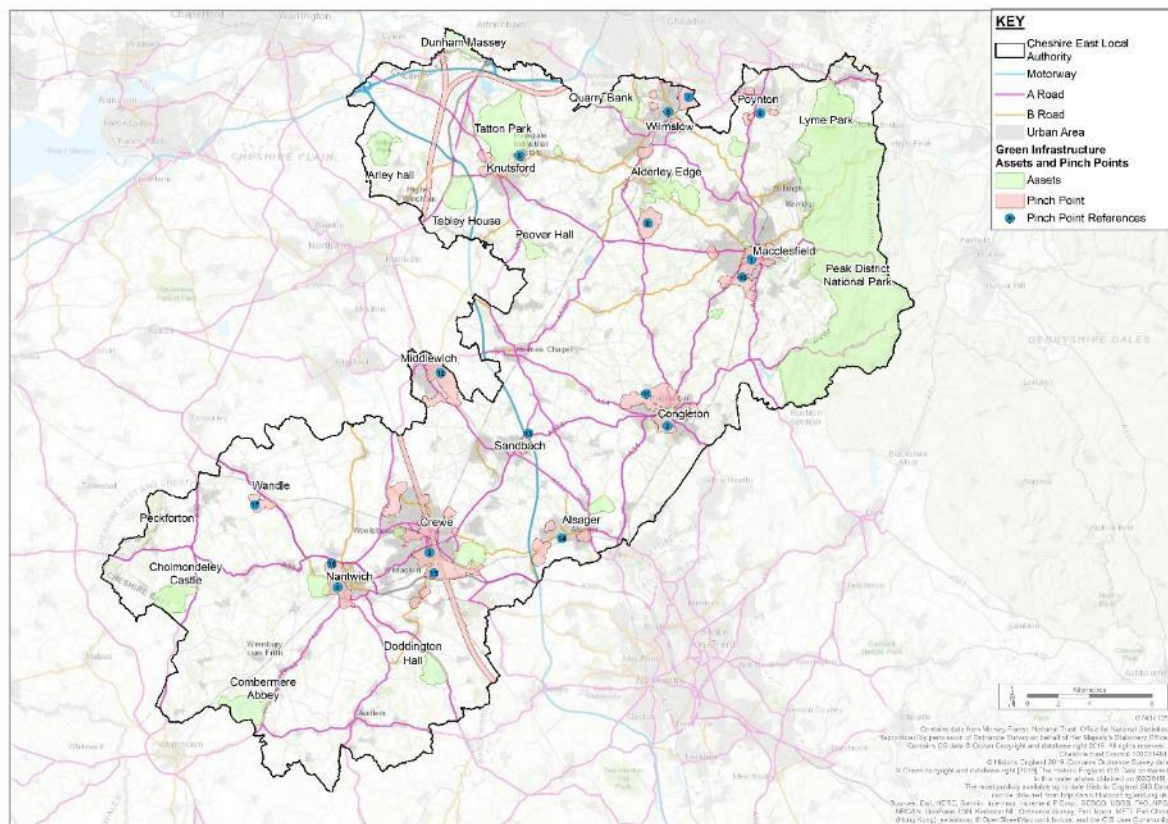


Figure 4: Economy - Priority Plan

<i>Ref</i>	<i>Location</i>	<i>Specific Need</i>
1E	Central Macclesfield	High business density
2E	Central Congleton	High business density
3E	Central Crewe	High business density
4E	Central Nantwich	High business density
5E	Knutsford	Allocated housing & employment sites
6E	Wilmslow	Allocated housing & employment sites
7E	Garden Village at Handforth	Allocated housing & employment site
8E	Alderley Edge - Alderley Park	Allocated housing & employment site
9E	Poynton	Allocated housing & employment sites
10E	Macclesfield	Allocated housing & employment sites
11E	Congleton	Allocated housing & employment sites
12E	Middlewich	Allocated housing & employment sites
13E	Sandbach	Allocated housing & employment sites
14E	Alsager - housing & employment sites	Allocated housing & employment sites
15E	Crewe - housing & employment sites	Allocated housing & employment sites
16E	Nantwich - housing & employment	Allocated housing & employment sites

<i>Ref</i>	<i>Location</i>	<i>Specific Need</i>
	sites	
17E	Wardle – employment site	Allocated employment site
18E	HS2 safeguarding zone	Severance to GI networks

Functionality Assessment

The priority areas can also be assessed for their GI functionality, as shown on Figure 5, which should be read alongside Figure 4 to look at how assets and pinch-points currently deliver GI functions.

Most economic assets have GI which is already delivering many functions; for example the National Trust properties, registered parks and gardens and the Peak District National Park.

Most economic pinch points currently have relatively little GI, or the GI currently delivers fewer than average functions. This implies that there is a need for investment in GI to sustain the economic investment proposed, and to enhance quality of place.

Some pinch points at strategic growth areas (such as North Congleton (11E) and Handforth Garden Village (7E)) currently have relatively high GI functionality. In such cases, the masterplanning process will need to safeguard GI, or where loss is unavoidable, ensure that compensatory GI is provided in and around the development to maintain multi-functionality and quality of place. GI can also contribute to high quality public realm in areas of high business density, increasing inward investment opportunities whilst promoting social benefits for workers.

Functionality is only a partial proxy for quality of GI, which requires site-specific assessment as part of the masterplanning process needed at each pinch-point.

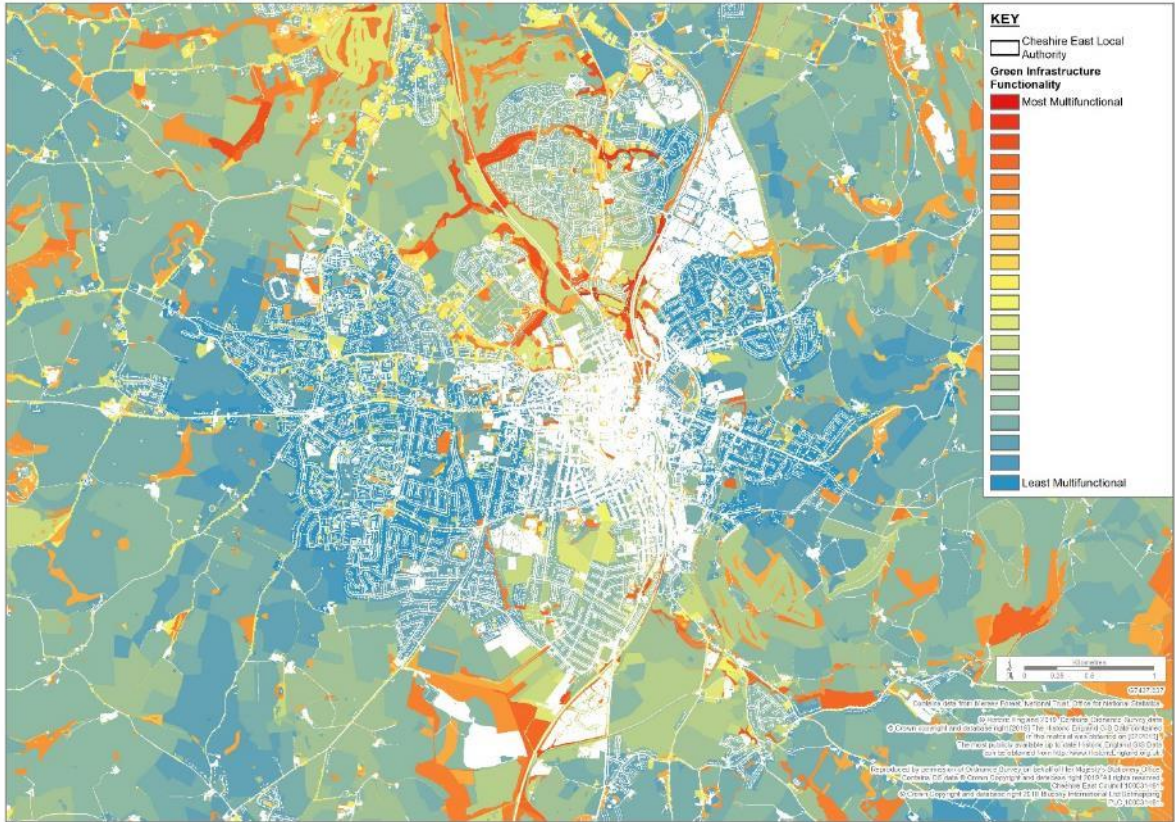


Fig. 6: Macclesfield GI Functionality Plan

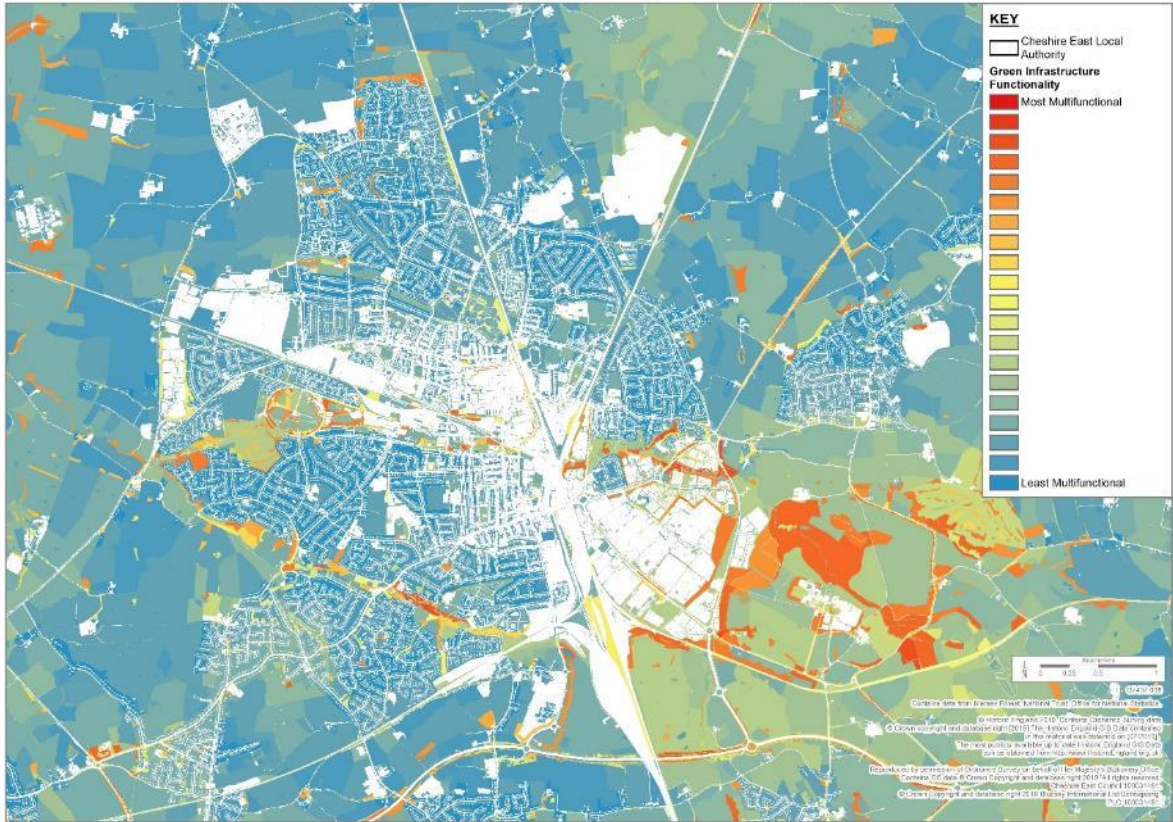


Fig. 7: Crewe GI Functionality Plan

Strategic Theme 2: Life Chances and Choices

GI can deliver many aspects of sustainable communities by helping to address some of challenges presented by high deprivation, poor health and poor air quality. GI planning can deliver environments that engage people suffering from poor physical or mental health by connecting people with the outdoors near to homes and places of work. In some situations it may be that neighbourhood are deficient in GI and due to physical constraints it is not possible to provide GI in the immediate locality. In such situations, the imperative here is to link areas of need to assets.

Assets and needs are identified on the basis of their borough wide significance and therefore will exclude some local features which might be prioritised in neighbourhood plans.

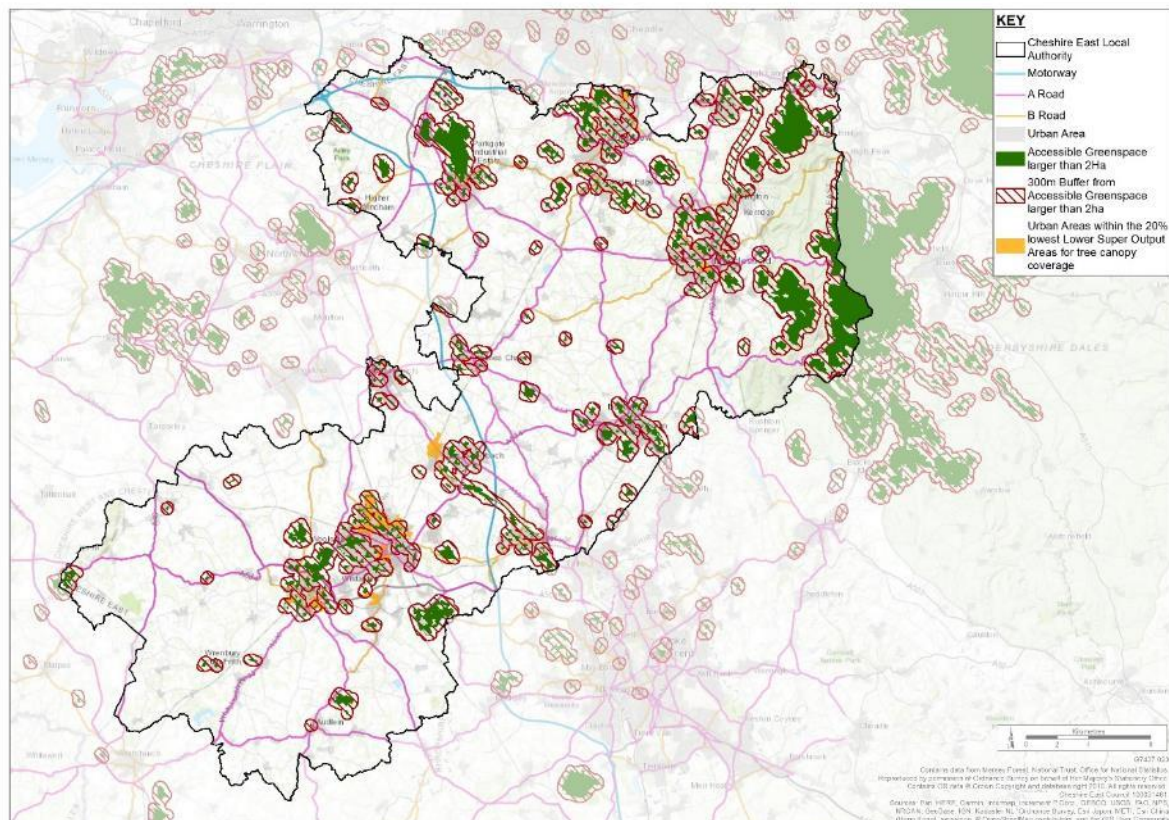


Fig. 8: Life Chances and Choices (Accessible Greenspace and Urban Tree Canopy) Plan

Figure 8 shows assets and pinch-points that relate to the provision (or lack of) greenspaces and tree canopy. Areas outside the greenspaces and associated buffer zones (assets) are deficient in access to neighbourhood greenspace. In rural areas, this is not a priority, but in urban areas, particularly those with health concerns (Figure 9), this is a priority.

Urban tree canopy is related to health and wellbeing, with higher-canopy areas generally better for shading and climate management (physical health) and mental wellbeing.

Assets

- Accessible greenspace larger than 2 hectares

Accessible greenspaces over 2 hectares in size are able to provide more recreational options for people and hence are regarded as assets. Natural England guidance is that people should live within 300m of a greenspace of this size, so urban areas of deficiency in access to such greenspaces can be regarded as being pinch-points.

Stakeholders noted that large accessible greenspaces outside towns (such as the National Trust properties and the Peak District National Park) can also provide a setting for addressing issues of mental and physical health e.g. by provision of Forest Schools and outdoor play.

Figure 9 shows a range of health-related issues where neighbourhoods are amongst the most vulnerable, in a Cheshire East context.

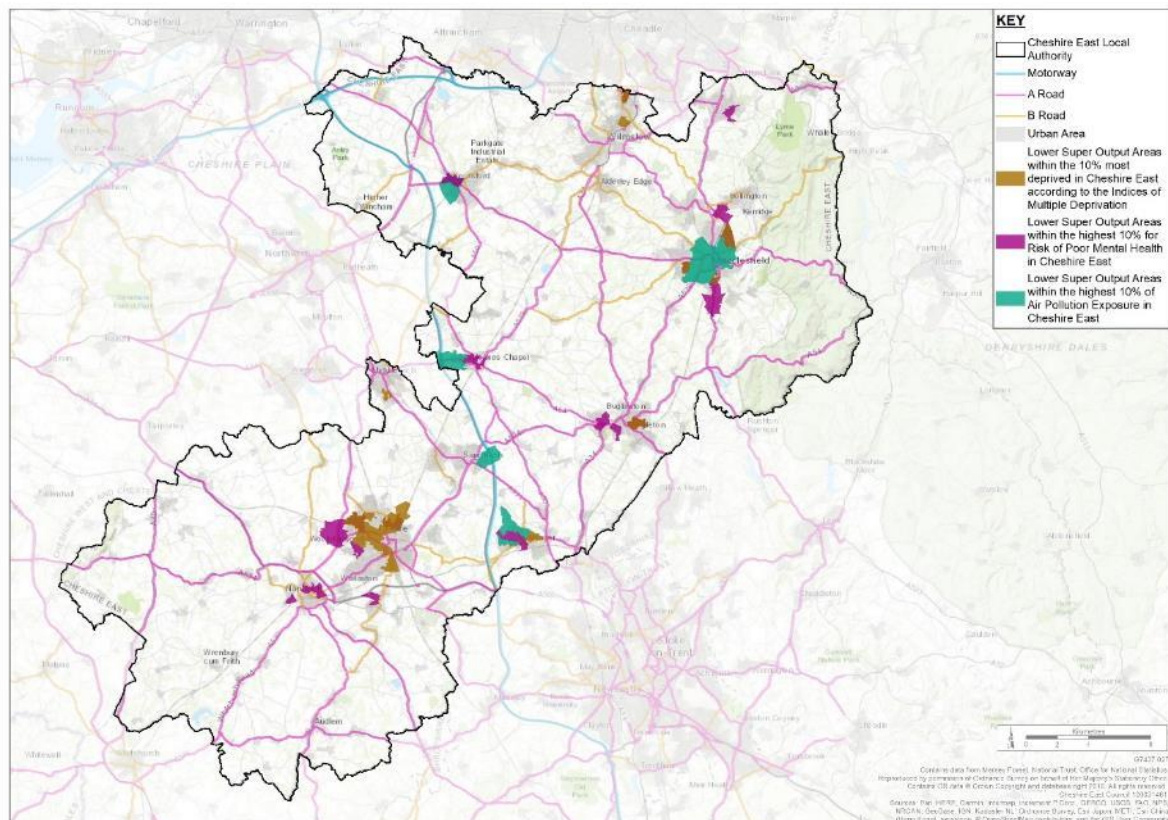


Fig. 9: Life Chances and Choices (Needs) Plan

Need

- High level of multiple deprivation (10% most deprived in Cheshire East)

Aspects of multiple deprivation include low income, poor health and living environment. To assist people on low incomes, the imperative here is to provide easily accessible GI involving limited cost. There is considerable evidence of health and wellbeing benefits of increased physical activity including walking and cycling to work or increased active recreation in GI networks. Increasing GI networks can also improve a poor quality living environment.

- High risk of poor mental health (highest 10% in Cheshire East)

Walkable local GI can promote physical activity in daily life and can increase opportunities for social engagement, this encourages social wellbeing, increases people's sense of security and can address poor mental health.

- High risk of air pollution exposure (highest 10% in Cheshire East)

High risk of air pollution has been identified near to the motorway and main road network. GI particularly trees, hedgerows and shrubs, is effective in locking atmospheric carbon dioxide (CO₂), emissions such as nitrogen oxides (NO₂) and capturing particulate matter.

- Poor access to greenspace

Urban areas that are more distant than 300m from accessible greenspace are regarded as being deficient in access. In identifying priority areas at a Borough basis, a pragmatic approach was taken to rule out small areas that were otherwise served by nearby countryside with public rights of way, or were 300-400m from accessible greenspace.

- Low tree canopy coverage (lowest 20% in Cheshire East)

Cheshire East has relatively low tree canopy coverage compared with the England average and there is a marked differential between the north (higher) and the south (lower). Trees provide shade and cooling during periods of high temperatures. The visual amenity provided contributes to health and wellbeing benefits and trees also contribute to the setting for physical recreation.

The pinch-points in the Life Chances and Choices category are shown at Figure 10 and the specific reason for selection is tabulated below. The specific location of each pinch-point can be ascertained by study of the maps showing accessible greenspace (Figure 8) and Life Chances and Choices Needs (Figure 9). The town names given in the table are for reference only and do not imply the whole town experiences need.

Urban areas with particularly low tree canopy coverage are not tabulated below because (to avoid double-counting) they are listed as terrestrial environment pinch-points. Nevertheless it is important for public health reasons to concentrate urban tree-planting efforts in such areas.

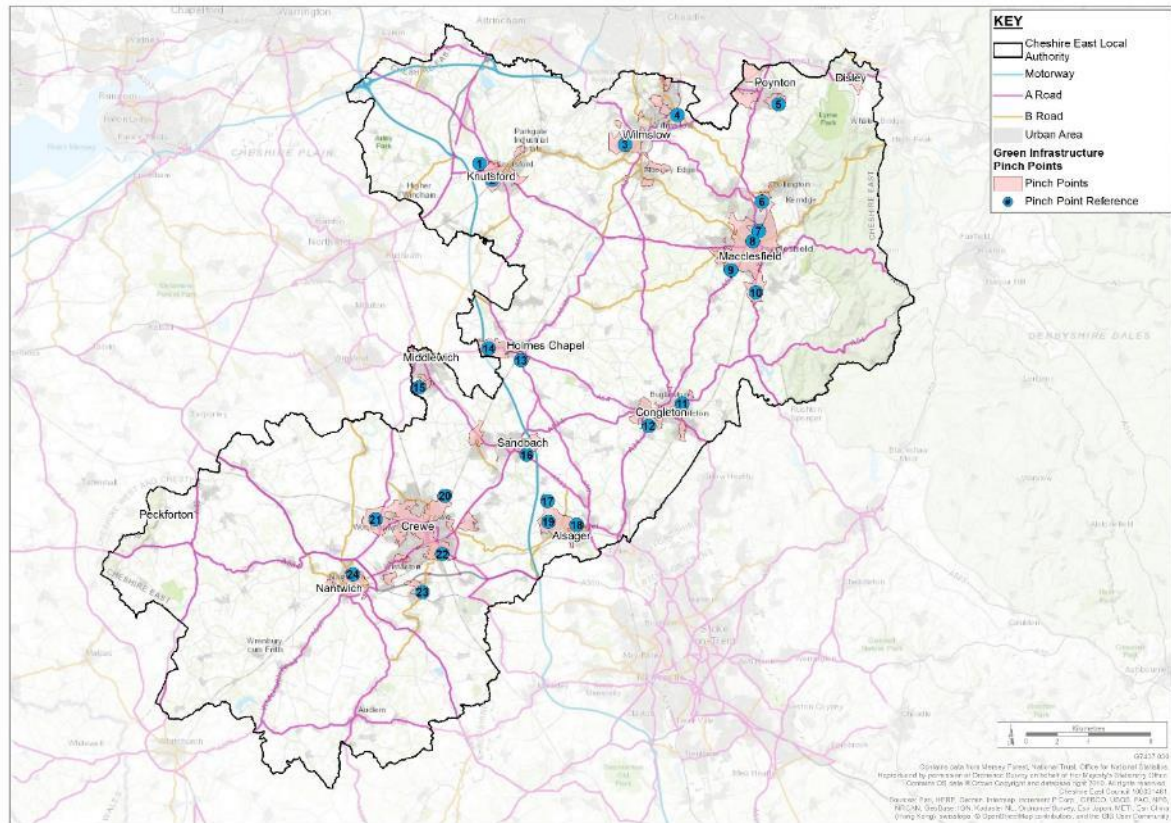


Fig. 10: Life Chances and Choices Priorities Plan

<i>Ref</i>	<i>Location</i>	<i>Specific Need</i>
1L	North west Knutsford	High risk of poor mental health
2L	South west Knutsford	High risk of air pollution
3L	South west Wilmslow	Poor access to greenspace
4L	North Handforth	High level of multiple deprivation
5L	South east Poynton	High risk of poor mental health
6L	North Macclesfield	High risk of poor mental health
7L	North east Macclesfield	High level of multiple deprivation
8L	Central Macclesfield	High risk of air pollution
9L	South west	High level of multiple deprivation

<i>Ref</i>	<i>Location</i>	<i>Specific Need</i>
	Macclesfield	
10L	South Macclesfield	High risk of poor mental health
11L	East Congleton	High level of multiple deprivation
12L	South Congleton	High risk of poor mental health
13L	South east Holmes Chapel	High risk of poor mental health
14L	West Holmes Chapel	High risk of air pollution
15L	South west Middlewich	High level of multiple deprivation
16L	South Sandbach	High risk of air pollution
17L	North west Alsager	High risk of air pollution
18L	West Alsager	High level of multiple deprivation
19L	Central Alsager	High risk of poor mental health
20L	North east Crewe	High level of multiple deprivation
21L	North west Crewe	High risk of poor mental health
22L	South Crewe	Poor access to greenspace
23L	Shavington (South of Crewe)	High risk of poor mental health
24L	Central Nantwich	High risk of poor mental health

Figure 11 shows an overlay of the pinch-points on the GI Multifunctionality map. In the majority of cases, pinch points have low functioning GI or GI is absent. In other words, most of the areas experiencing constraint on life chances and choices also have little GI.

Whilst GI functionality is only a partial proxy for environmental quality, there is a substantial body of evidence linking better public health to higher quality environments with good access to greenspaces.

Figure 11 shows that the pinch-point areas for life chances and choices will generally require retrofitting GI into the existing urban environment, management of existing GI and outreach programmes to encourage greater use of greenspaces. Insets for Macclesfield and Crewe (Figures 12 & 13) show GI functionality in the principal towns.

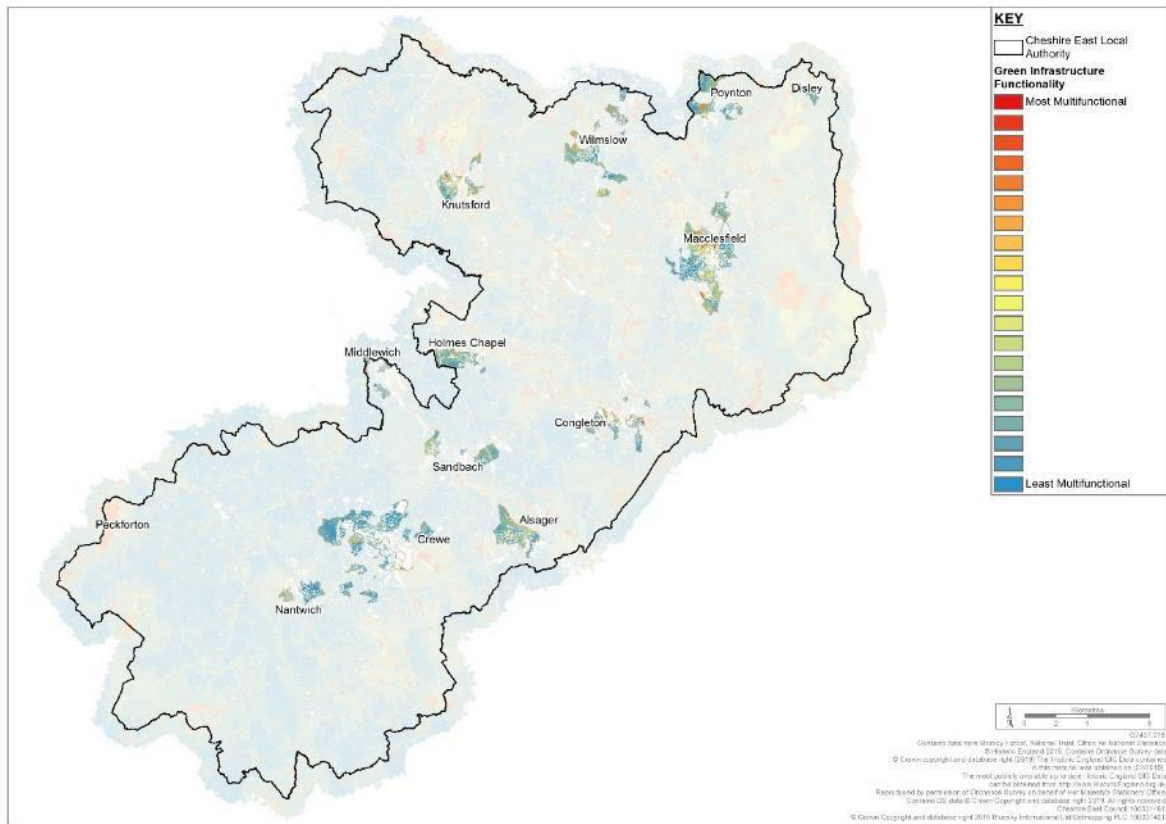


Fig. 11: Life Chances and Choices GI Functions Plan

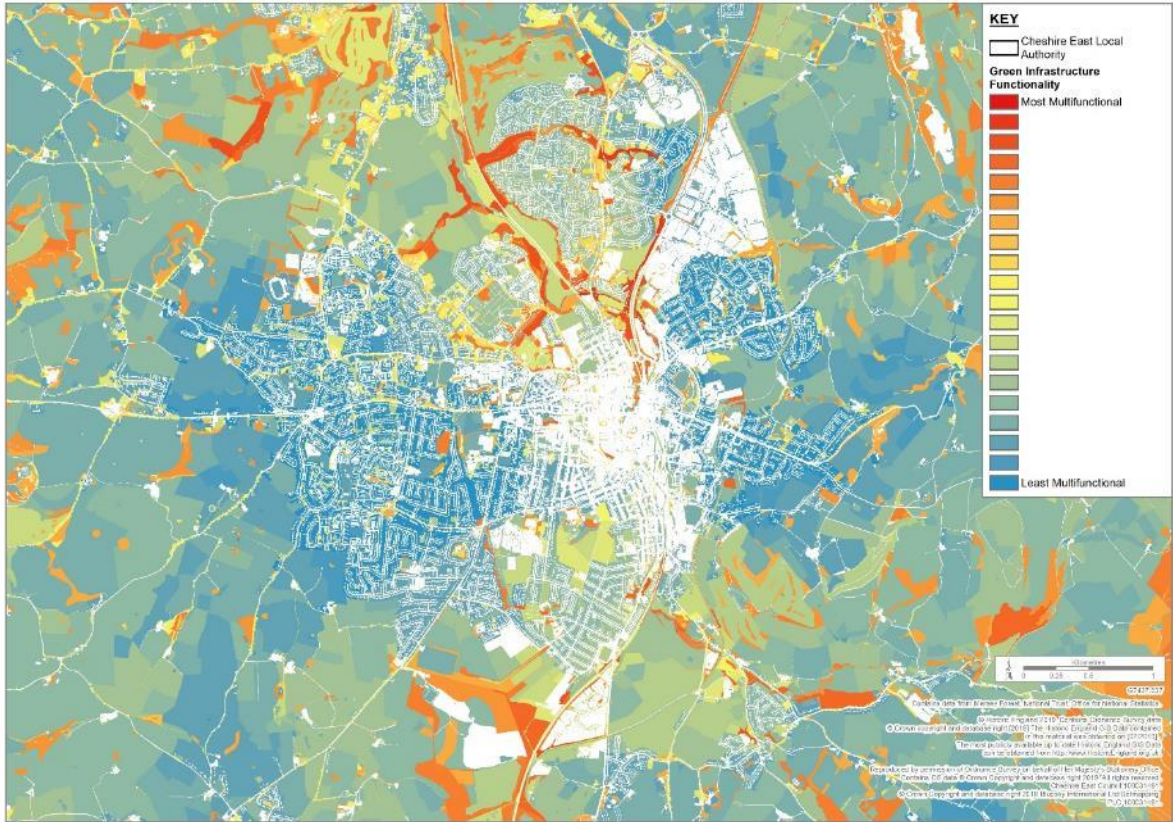


Fig. 12: Macclesfield GI Functionality

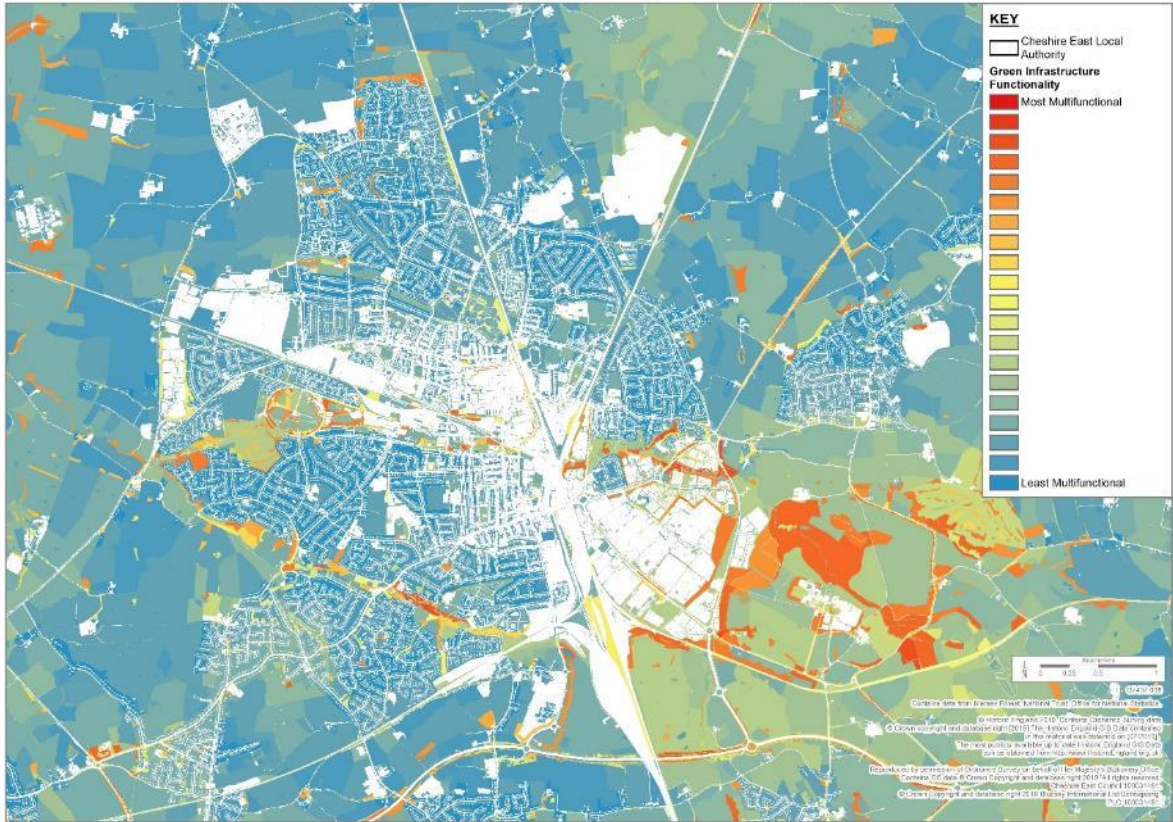


Fig. 13: Crewe GI Functions

Strategic Priority 3: Environment

To understand and convey multiple priorities on maps, the environmental analysis has been carried out separately for terrestrial and aquatic features. The two are of course intrinsically interlinked and the overall table of assets and pinch-points integrates the two strands of analysis.

Green infrastructure planning is a means of delivering net gain in natural capital, including biodiversity. Key issues to address in Cheshire East are:

- Addressing flood risk and bad water quality in certain catchments, which results in societal costs through the need for additional water treatment and flood prevention measures, alongside reduction in biodiversity and potential adverse effects on the integrity of the Natura 2000 network of designated sites;
- Restoring habitats and ecological networks that have become fragmented over long periods of urbanisation, transport infrastructure and agricultural intensification, exemplified by the relatively low tree cover in the borough, particularly in the south. In Cheshire East, areas with high tree cover are usually associated with attractive settings for settlements and heritage assets. High tree canopy cover also provides greater resilience to climate change and damage caused by pests and diseases, such as ash dieback.
- Increasing the resilience of urban areas to the “heat island” effects of future climate change, especially in areas with few trees and high proportions of sealed surfaces which result in higher surface temperatures and rapid run-off of storm water;
- Providing guidance on targeting of compensatory funds arising from development, minerals, waste and transport-related activity, so such funds deliver multiple benefits in areas of greatest need.

Terrestrial Environmental Features are shown on **Figure 14** below.

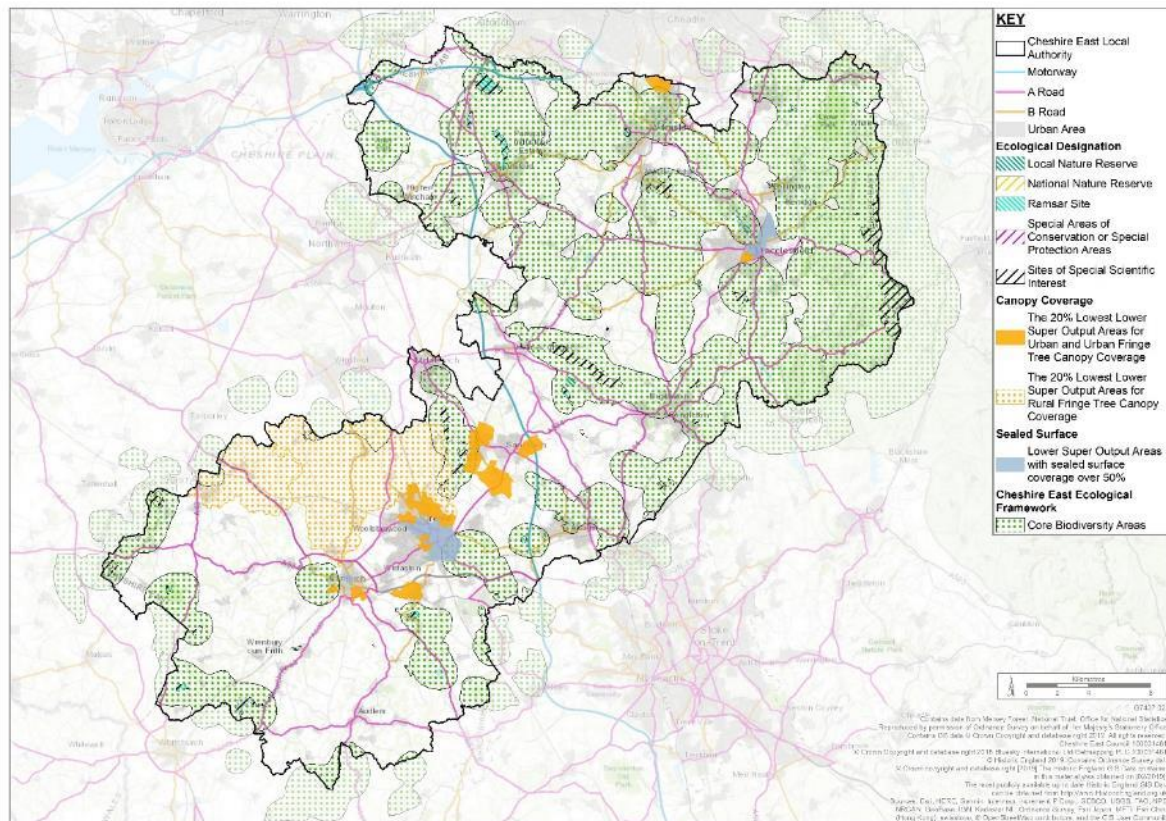


Fig. 14: Environment (Terrestrial) Features Plan

Assets

- Statutorily-designated nature conservation sites

These are key assets. Most are in “favourable” or “favourable-recovering” condition, as defined by Natural England. GI activity must take account of site-specific conservation advice to ensure that potential adverse effects from recreation or tree-planting are avoided.

- Core Biodiversity Areas

All statutory and many locally-designated sites are included in the borough’s Core Biodiversity Areas. These Core Areas are regarded as GI assets, even though not all land parcels are currently under nature conservation-oriented management. Development, recreation and agriculture will take place in Core Areas, but the GI Plan, in conjunction with planning policy, will seek a continuous process of biodiversity net gain in Core Areas.

Needs

Low Tree Canopy

Given that Cheshire East has tree cover significantly below the English average (7% compared to 10%), the borough has a lower resilience to climate change and is more vulnerable to loss of biodiversity and landscape distinctiveness associated with extreme weather, pests and diseases that are associated with a rapidly changing climate.

Areas of Cheshire East with the lowest proportion of tree canopy cover are classed as areas of need. A 20% threshold is used to identify greatest deficit i.e. the lowest quintile of “Lower

Super Output Areas” in terms of tree canopy. Tree planting is a useful part of catchment-sensitive farming, which is an Environment Agency priority in certain waterbody catchments, discussed in relation to the aquatic environment below.

Some low canopy areas are rural, notably the clay-dominated landscape of the Weaver Valley north of Crewe. Several urban and urban-fringe areas are also areas of need in respect of tree canopy, especially in Crewe and Macclesfield.

- Sealed Surfaces

Urban areas with more than 50% sealed (hard) surface are also classed as areas of GI need due to their vulnerability to climate change, with knock-on effects on public health (overheating) and property (flash-flooding).

Unsurprisingly, comparison with Figure 9 (Life Chances and Choices) shows that many of these urban environmental pinch-point areas are also relatively deprived in respect of public health

Aquatic Environmental Features are shown on Figure 15.

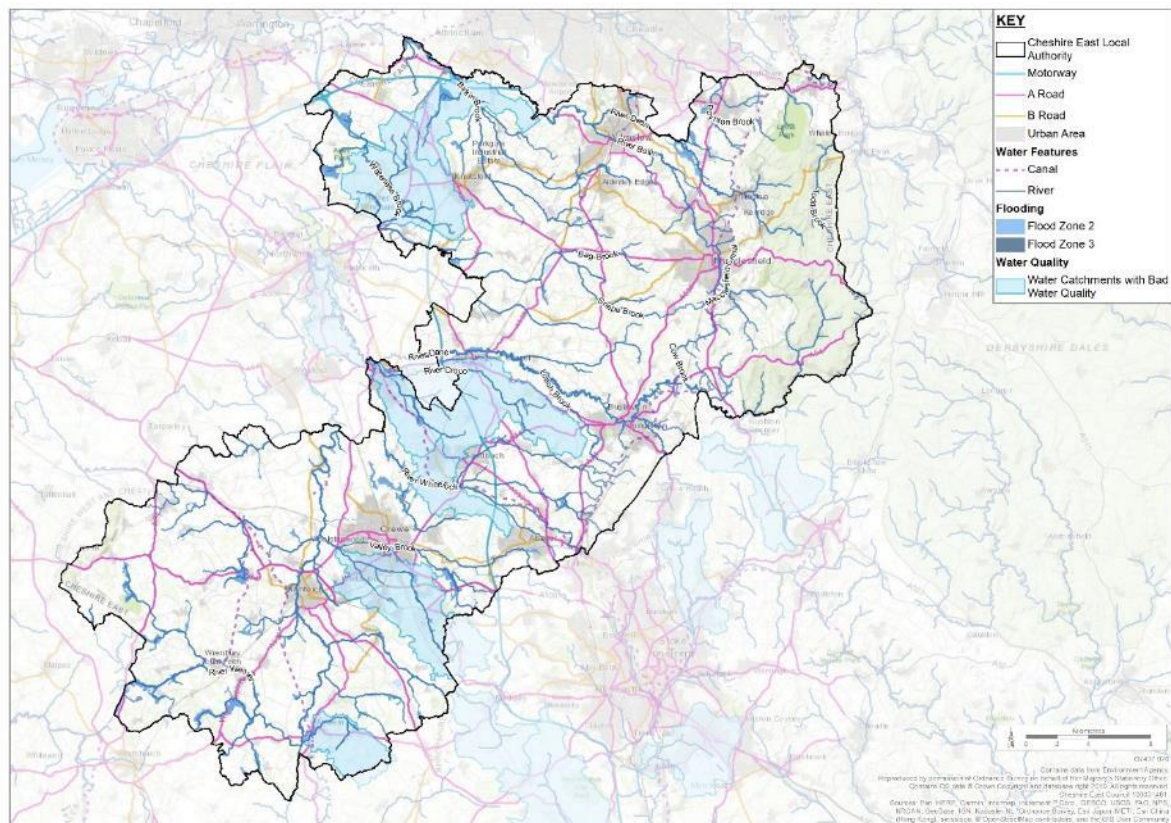


Fig. 15: Environment (Aquatic) Features Plan

Assets

- Rivers and Canals

All rivers and canals are classed as GI assets for the strategic environmental priority (as well as for the connectivity and movement priority described later).

Needs

- Flood Zones

For the purposes of the GI Plan, flood zones 2 and 3 are classed as pinch-points. It is recognised that flood zones can be classed as assets due to the biodiversity and flood storage functions they provide. But in practice, many flood zones could be better managed to maximise these functions and also to improve carbon sequestration through creation of wetlands. Hence they are treated as pinch-points requiring GI investment to safeguard and enhance their value to society and, in some cases, reduce the risk of property damage from flooding.

- Waterbodies with Bad Water Quality

The Environment Agency has identified eight river waterbodies as having bad water quality, largely due to effects of diffuse source pollution from agriculture and urbanisation. Under the Water Framework Directive, there is a need for water quality improvements to achieve Good Ecological Status (or Good Ecological Potential). Poor water quality, especially from fine silt, can be a proxy indicator of catchments with soil conservation problems since soil erosion results in excessive sediment flows. These waterbodies are thus mapped as pinch-points, since investment in GI measures such as natural flood management, tree and hedge planting is needed to reduce overland flows of sediment and nutrients (alongside measures to address problems at source).

The Environment Priority Plan (Figure 16) shows assets (annotated) and pinch-points (numbered).

It is important to note that environmental priority assets often have some overlap with pinch-points; e.g. most Core Biodiversity Areas are centred on rivers which include floodzones upstream of settlements and some include waterbodies with bad water quality (e.g. the Wade and Smoker Brooks CBA).

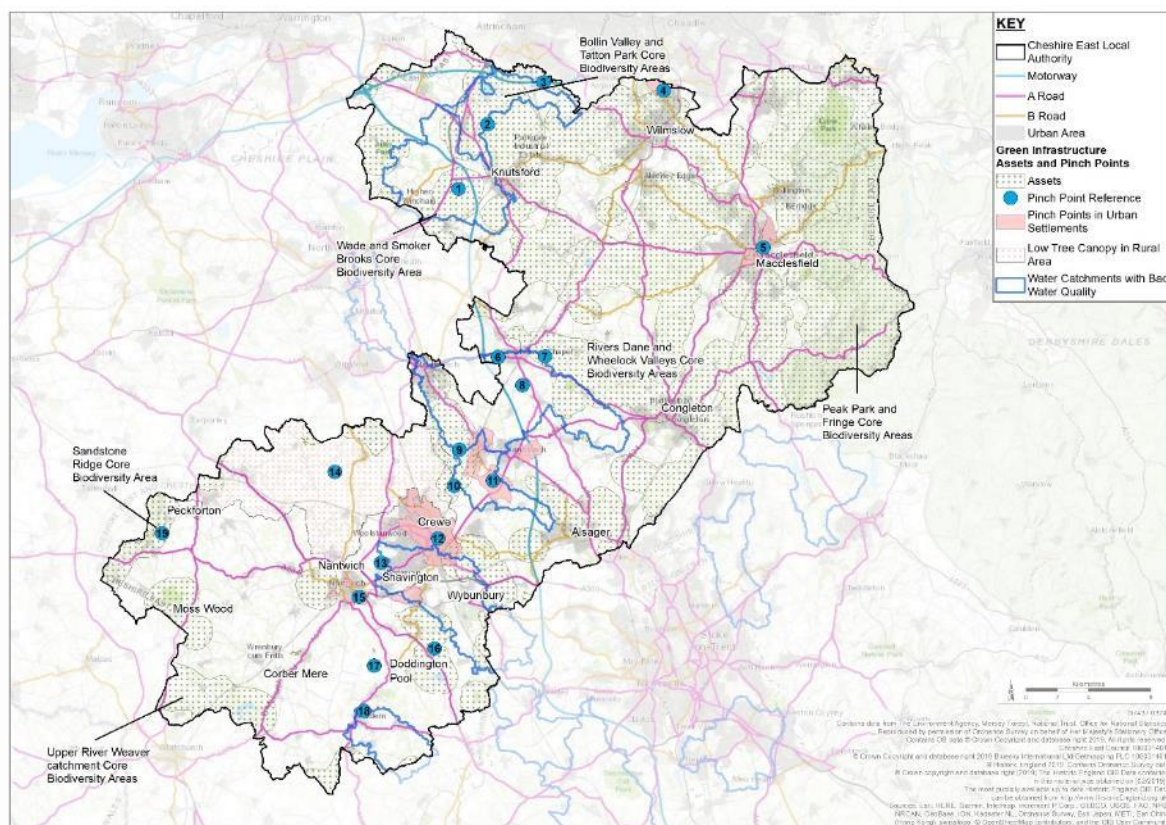


Fig. 16: Environment Priority Plan

Asset Location
Peak Park and Fringe Core Biodiversity Area
Bollin Valley and Tatton Park Core Biodiversity Areas <i>(includes pinch-point waterbodies)</i>
Wade and Smoker Brooks Core Biodiversity Area <i>(includes pinch-point waterbodies)</i>
Rivers Dane and Wheelock Valleys Core Biodiversity Areas <i>(includes pinch-point waterbodies)</i>
Sandstone Ridge Core Biodiversity Area
Upper River Weaver catchment Core Biodiversity Areas

Pinch Points

Ref	Location	Rationale
1	Smoker Brook (Gale Brook to Wincham Brook) waterbody catchment	EA priority for addressing bad river quality, including measures to reduce diffuse source pollution
2	Birkin Brook and Mobberley Brook to River Bollin waterbody catchment, including Rostherne Brook and Rostherne Mere	EA priority as for Smoker Brook (ref 1) Also includes Meres and Mosses catchment buffer zone

<i>Ref</i>	<i>Location</i>	<i>Rationale</i>
3	River Bollin between Wilmslow and Dunham Massey	Reengage the river with the wider landscape
4	Handforth	Lowest 20% tree canopy cover
5	Macclesfield centre	Lowest 20% tree canopy cover and >50% sealed surfaces
6	The section of the River Dane between the M6 and Winsford, Northwich and the Weaver Valley	A wildlife corridor currently exists along the Dane west of the M6. There are opportunities to extend the 'wildlife corridor' west of the M6 along the Dane
7	River Dane waterbody catchment (Wheelock to Weaver)	EA priority as for Smoker Brook (ref 1) Also includes Meres and Mosses catchment buffer zone
8	River Croco waterbody catchment	EA priority as for Smoker Brook (ref 1)
9	River Wheelock waterbody catchment and Hassall Brook	EA priority as for Smoker Brook (ref 1)
10	Sandbach Flashes	Manage and restore the Sandbach Flashes
11	Sandbach fringes	Lowest 20% tree canopy cover
12	Central and East Crewe	Lowest 20% tree canopy cover and >50% sealed surfaces
13	Wistaston Brook waterbody catchment	EA priority as for Smoker Brook (ref 1)
14	Weaver Valley north of Crewe and Nantwich	Lowest 20% tree canopy cover
15	Nantwich and south of Crewe	Lowest 20% tree canopy cover and >50% sealed surfaces
16	Lea waterbody catchment	EA priority as for Smoker Brook (ref 1)
17	Upper River Weaver towards Nantwich	Natural Flood Management techniques to slow the flow
18	Audlem Brook waterbody catchment	EA priority as for Smoker Brook (ref 1)
19	Sandstone Ridge Lowland Heath Habitat	Manage the landscape to ensure that woodland does not over-dominate

Figure 16 can be read alongside the associated GI functionality maps (Figures 17 and 18) which clearly shows that many of the pinch-point areas are currently low-functioning, suggesting that enhancements to quality and function should be feasible, provided that mechanisms to transfer development and land management funds to these areas can be found.

Natural capital could clearly be uplifted in the pinch-point areas. Water quality improvements and carbon sequestration arising from catchment-sensitive farming can be ascribed a value. In urban areas, the "avoided healthcare costs" arising from better mental health, leisure-provision and increased shade arising from urban greening measures will be significant, especially as many of the pinch-points are in health-deprived neighbourhoods.

By contrast, GI assets are usually multi-functional, indicating the importance of GI conservation. Some development is expected in the asset areas, on top of ongoing pressures from climate change and human activity, so the functionality plan highlights the importance of sensitive and well-designed development to maintain existing natural capital in asset-rich areas.

The canal network, including the Macclesfield, Trent and Mersey, Shropshire Union and Shropshire Union – Llangollen Branch supplements the PRoW network providing movement corridors for boats and pedestrians and in some cases cyclists. The canal network is particularly suited to longer distance journeys and provides off road connectivity throughout Cheshire East. This is particularly of benefit to pedestrians moving through towns and villages.

- Ecological corridor and stepping stones and restoration areas

This refers to the Ecological Network for Cheshire East and the policies in the Local Plan to protect and enhance the natural environment. The five components of the ecological network drawn from Making Space for Nature¹ are core areas, corridors and stepping stones, restoration areas, buffer zones and sustainable land use areas. Core areas (statutory sites, non-statutory sites (Local Wildlife Sites) and UK priority habitats) are highlighted on Figure 20. Corridors and stepping stones enable species to move from core areas to the wider landscape. Areas identified as corridors and stepping stones include non-statutory sites, priority areas (outside core areas), in addition to watercourses, canals and greenways. Restoration areas are the links between the core areas and stepping stones are designed to enhance connectivity, resilience and the functioning of the ecological network. (Restoration areas not shown on Fig. 20: Cheshire East Ecological Framework)

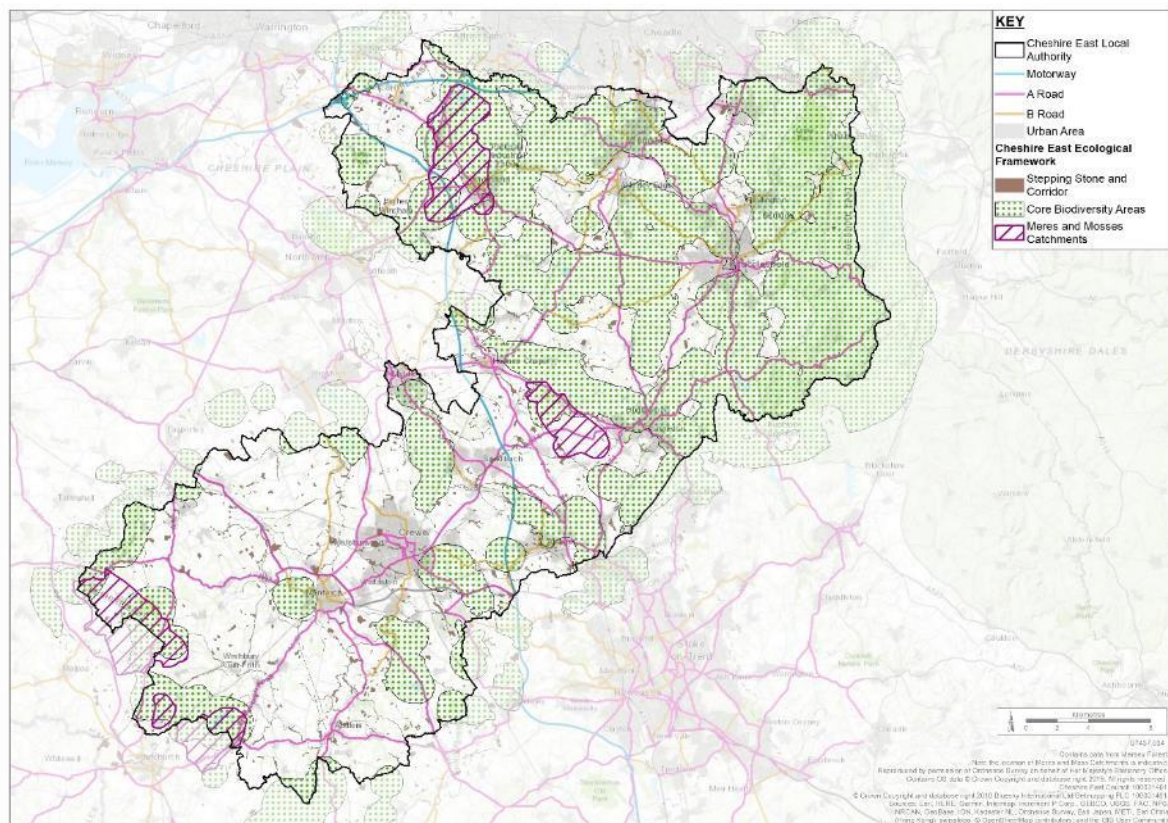


Fig. 20: Cheshire East Ecological Framework

¹ Making Space for Nature (2010), Lawton

Need

- Public right of way (PRoW) network

This considers where the PRoW network is less comprehensive and connected. This typically occurs at the edges of some towns and villages. Other gaps in the network, particularly where an area of need requires linking to an asset, are highlighted in the table below and Figure 22.

- Highways network

Existing road corridors are often sparse of GI, and instead of connecting habitats, large roads often sever links. The emerging Local Transport Plan for Cheshire East (2018-2023) considers the role that transport plays in protecting and enhancing the environment. If planned for multi-functional, and well connected GI, highway networks have the ability to act as ecological corridors.

- Accessibility to green space larger than 20 hectares

This size of green space is identified on the basis of borough wide significance and include the National Trust properties, Poynton Park, Macclesfield Riverside Park, Macclesfield Forest, Brereton Heath and Queen's Park (Crewe). Smaller local features are excluded in the mapping but might be prioritised in neighbourhood plans at a later date.

Figure 21 highlights the 2km buffer to these green spaces (over 20 ha) using the accessible natural green space standards (ANGSt). Areas outside those accessible standards include Holmes Chapel, Middlewich and Crewe East and Crewe South.

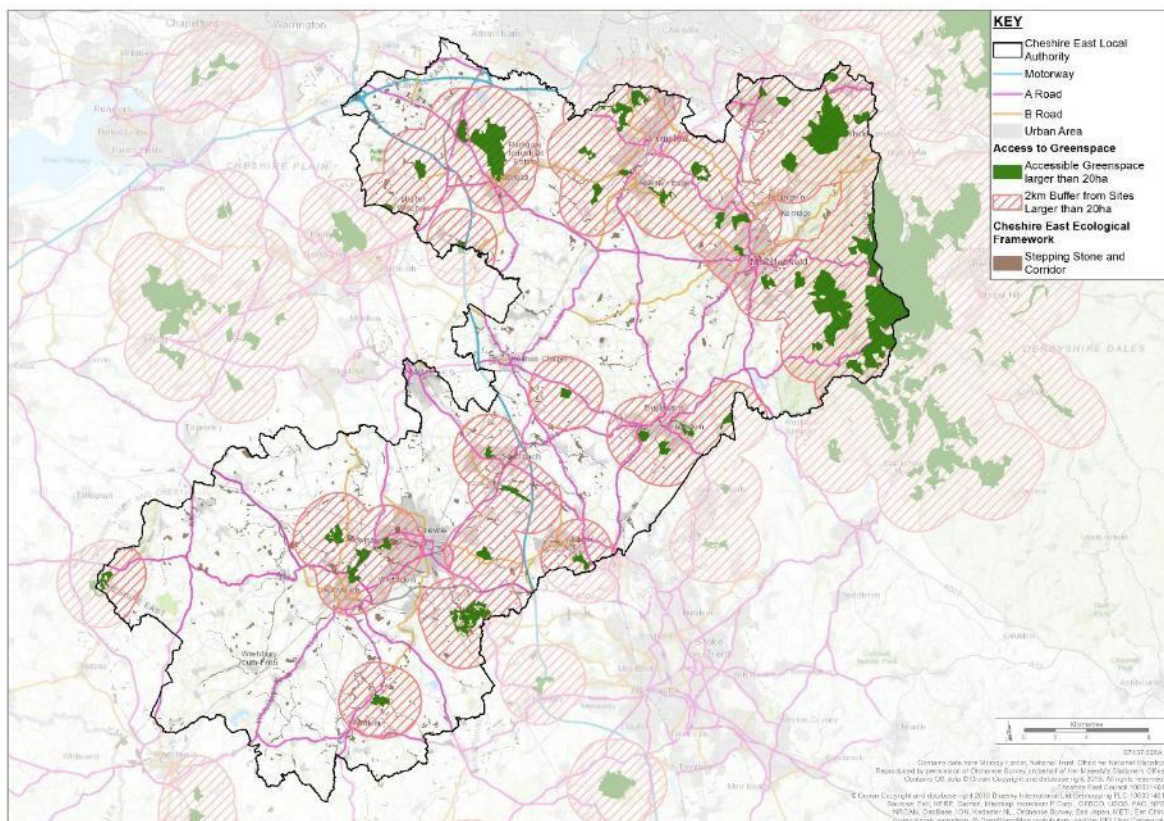


Fig. 21: Accessibility to green space larger than 20 hectares

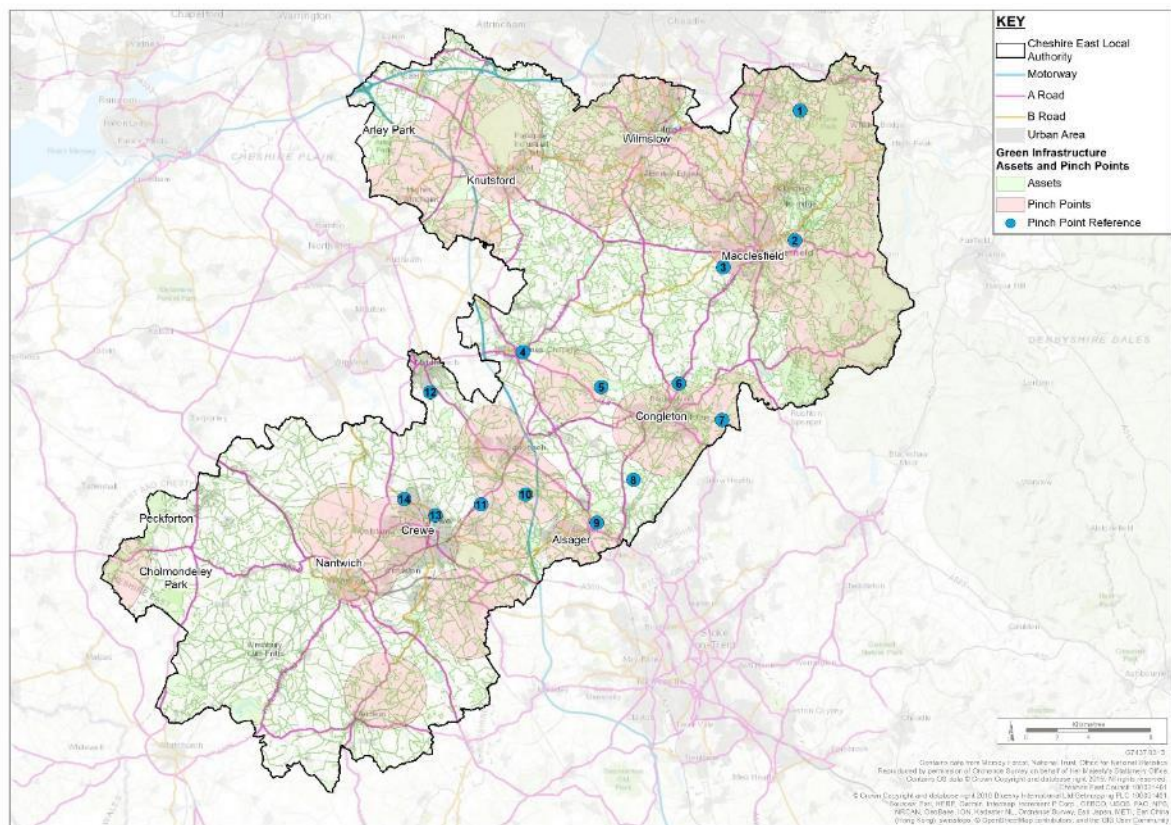


Fig. 22: Connectivity and Movement Priorities Plan

Connectivity and Movement – Pinch points

<i>Ref</i>	<i>Location</i>	<i>Need</i>
1	Land between Lyme Park & Macclesfield Canal	Under use of PRoW network
2	Macclesfield East	Limited PRoW network
3	Macclesfield South West	Limited PRoW network
4	Holmes Chapel	Accessibility to green space >20ha
5	Dane Valley between Congleton & Holmes Chapel	Limited PRoW network and public access

<i>Ref</i>	<i>Location</i>	<i>Need</i>
6	Congleton north	Limited PRow network
7	Congleton east & Timbersbrook	Limited connectivity between GI typologies
8	Land between Little Moreton Hall and Macclesfield Canal	Under use of PRow network to fringes of canal corridor
9	Alsager	Lack of connections between canal network and Salt Line
10	Middlewich to Alsager	Incomplete sections of Salt Line and Wheelock Rail Trail
11	Crewe to Sandbach	Poor cycle connectivity
12	Middlewich	Accessibility to green space >20ha
13	Crewe north east & Crewe south	Accessibility to green space >20ha
14	Crewe north west	Accessibility to green space >20ha
X	Borough wide	Ecological Framework restoration areas

