Non-technical summary

Why is this study needed?

The Trent Valley within Derbyshire is becoming an increasingly fragmented landscape facing significant pressures for change as a result of mineral extraction, urban development, transport infrastructure and agriculture (arable and pastoral). These different land uses compete for space and resources, presenting opportunities and threats to the established landscape character of the area. A map of the study area is given in Figure 1.

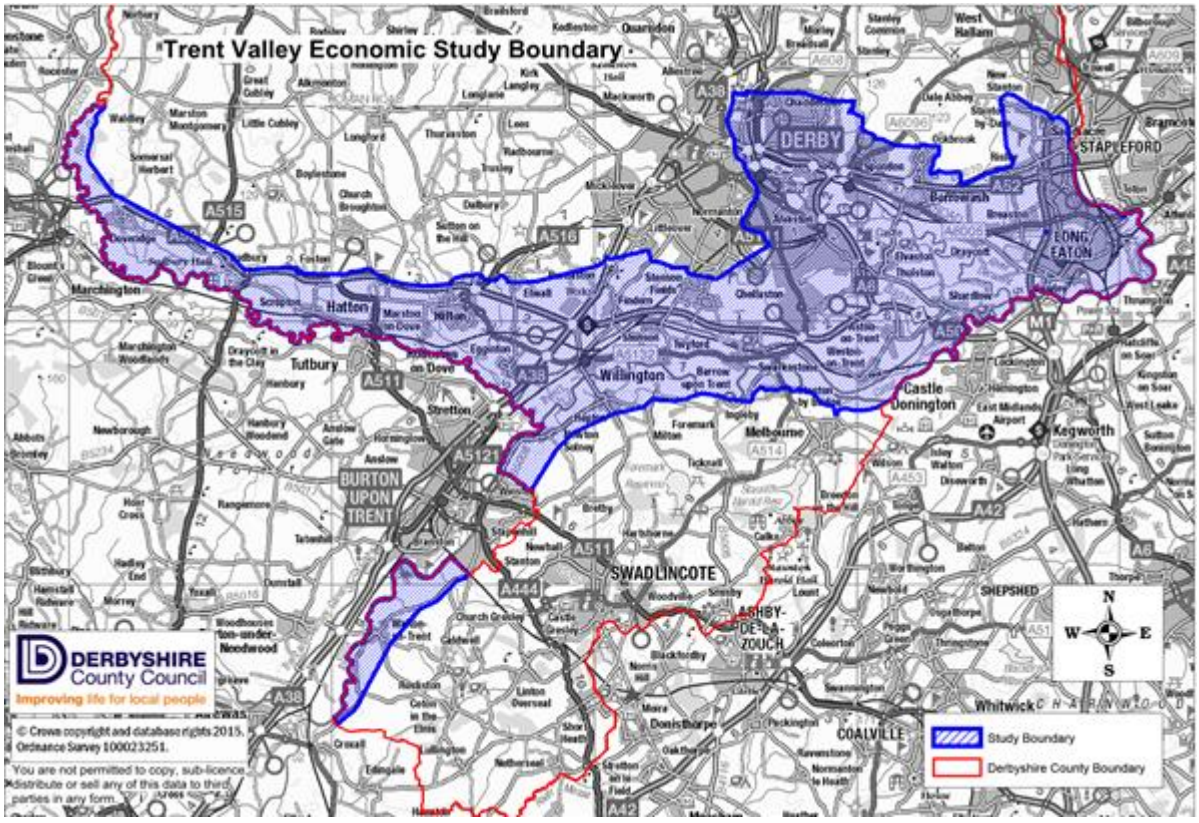

Figure 1: Map of the study area (Source: Derbyshire County Council)

Evidence suggests that the Trent Valley is currently at a pivotal moment, with two possible options for the way forwards:

- Continue to follow **an uncoordinated approach** to the development of the area. Changes will occur in a disjointed, piecemeal fashion with the potential to result in a degraded natural environment; or
- Adopt **a coordinated approach** to the area's development**.** This will involve all sectors working together to establish a long-term vision and strategy for the Trent Valley landscape that can deliver environmental, social and economic benefits.

What are the aims of the study?

Derbyshire County Council commissioned Risk & Policy Analysts Limited (RPA) in association with the Planning Cooperative to undertake this study. The aim is to undertake an economic assessment of the Trent Valley study area to estimate the economic, social and environmental benefits of moving to a coordinated approach as opposed to following an uncoordinated one.

How will the results be used?

The results will provide evidence to help decision makers with future planning, to inform a future strategy for the area and to potentially attract investment to help deliver the coordinated approach.

What are the key findings?

Working together to deliver a long-term vision for the Trent Valley could provide significant economic, social and environmental benefits. In 2050, the coordinated scenario could deliver:

£2.8 billion per year in additional economic benefits (range £800 million to £4.8 billion per year)	**150,000** jobs (range **110,000** to **190,000** jobs)	**£80 million** per year in additional social and environmental benefits (range £44 million to £110 million per year)

In total between 2020 and 2050, the benefits of the coordinated scenario over the uncoordinated scenario are estimated to be:

- **£16 billion** for the economic benefits (range £6.1 billion to £26 billion)
- **£450 million** for the social and environmental benefits (range £300 million to £750 million)

Notes: the total benefits have been discounted using the Treasury Green Book and so are given as present values; all other values are undiscounted and given as annual (per year) values

How were the benefits estimated?

The approach to the study is shown in Figure 2. Further details on each step are provided below.

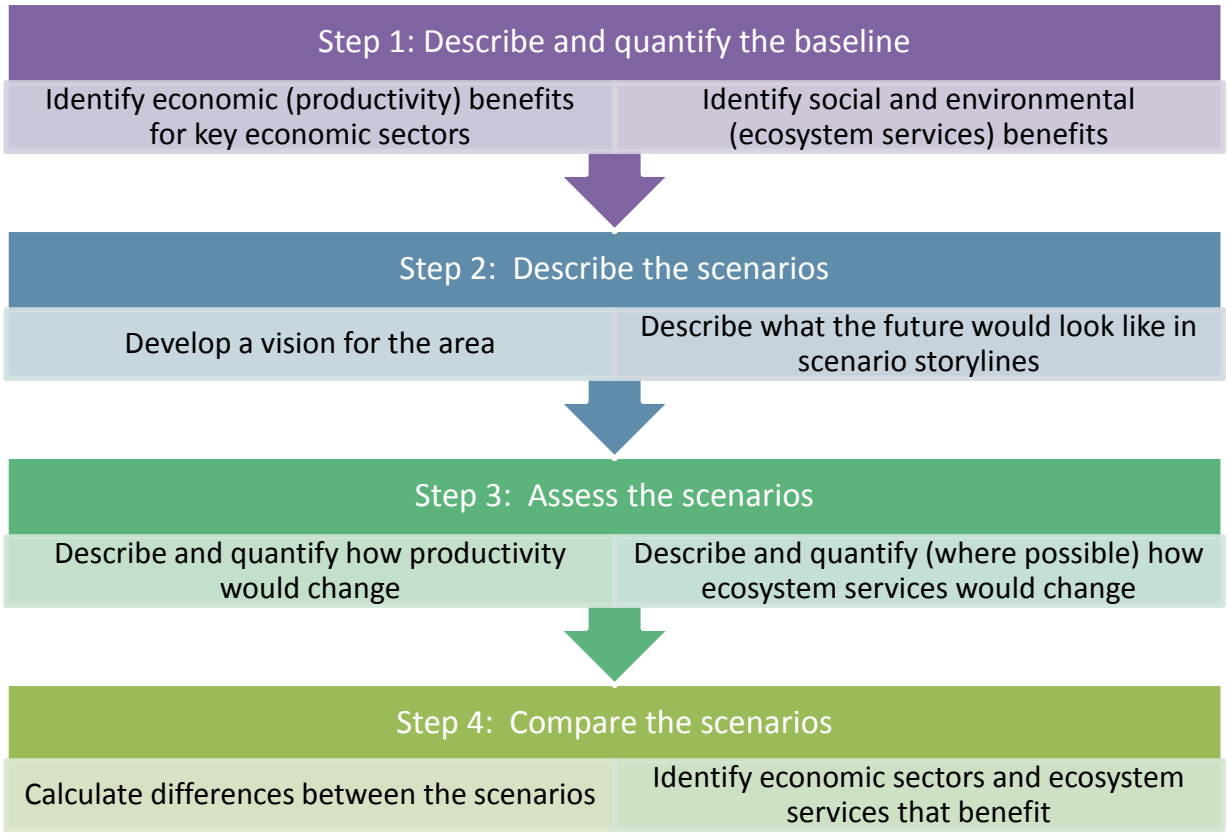

Figure 2: The approach to the study

Step 1: Describe and quantify the baseline

The study combined a review of existing plans, policies and strategies with engagement with key stakeholders to describe the current baseline for the study area. The current economic benefits were described and quantified in terms of productivity and outputs from key sectors. In addition, an ecosystem services (see Box 1) baseline was described to capture the social and environmental benefits.

The study captured the economic benefits to eight key sectors: aggregates, agriculture, construction, energy generation, physical infrastructure, manufacturing and R&D, tourism/recreation and water. This included identifying the current Gross Value Added and number of jobs as well as quantifying the current value of outputs.

Box 1: What are ecosystem services?

These are the goods and services provided by the environment that provide benefits to people. They are divided into four types:

- Provisioning such as freshwater, crops (these are captured as the economic benefits);
- Regulating e.g. carbon sequestration (social and environmental benefits);
- Cultural e.g. opportunities for recreation (social and environmental benefits); and
- Supporting e.g. nutrient cycling. This category underpins the other three types.

This study also included 'biodiversity' as a service so these benefits are explicitly captured within the assessment

The assessment described the current baseline for nine ecosystem services: biodiversity, air quality, climate regulation, water purification, water regulation (flood risk), educational value, cultural heritage, aesthetics and wellbeing. This allowed the identification of changes for three further sectors: health and wellbeing, heritage, and wildlife and biodiversity. Note that it was not possible to estimate the current value of ecosystem services due to data gaps.

Combining the economic benefits with an assessment of social and environmental benefits provided the basis for assessing overall impacts for the wider economy of the Trent Valley study area.

Step 2: Describe the scenarios

The first part of step 2 was to develop an overarching vision for the area, describing how the Trent Valley might look should a coordinated approach to planning and development be followed (see Box 2). Sector specific visions were also developed using existing plans and strategies where possible.

Box 2: Vision for the Trent Valley

The coordinated scenario would promote the creation of an attractive, multifunctional new landscape character within the valley.

This new landscape would be designed and planned to mitigate the adverse effects of mineral extraction and housing growth, and create greater environmental capacity to both absorb and facilitate further development. The landscape framework would also seek to maximise ecosystem services delivery, stimulate and diversify economic activity, and increase social benefits, by providing a multifunctional, multifaceted resource.

By directing sand and gravel extraction towards the least sensitive areas, the most valuable and sensitive areas can be protected, whilst restoration schemes will deliver landscape-scale change through the creation of interlocking water bodies and robust areas of woodland. These will integrate with the best of the existing landscape, including historic and natural assets, to provide a range of recreational and leisure opportunities. This new landscape framework will be an attractive setting for high quality new housing development with direct access to a new and enhanced Green Infrastructure network.

The new landscape will be recognised by residents and businesses alike as an invaluable resource, an attraction and a valued asset, making the valley a desirable location in which to live, work and play.
New waterways will provide additional economic opportunities through their use by pleasure craft, sports and recreational users, and as transport corridors. The newly configured landscape will accommodate new economic activities such as leisure and holiday accommodation and associated services, renewable energy and other diversification opportunities for sectors not previously prevalent in the valley.

Threaded throughout the entire valley will be extensive opportunities for nature conservation not only through the extensive woodland and wetland creation but also through the improved management of existing historic landscape that would be retained as part of the vision

Scenario storylines were then developed for both the uncoordinated and coordinated approaches to describe what the future would look like for each sector at four time points: 2020, 2025, 2030 and 2050:

- For the **uncoordinated approach**, the storylines draw on existing plans and strategies published for individual sectors (where available); and
- For the **coordinated approach**, the storylines reflect the overarching vision taking account of likely interactions between the sectors. Opportunities for synergies between sectors were

taken up (e.g. constructing high quality housing that reflects the nature of the valley was assumed to improve the attractiveness of the area to investors and highly skilled people), whilst mitigating actions were included to deal with any negative feedback between sectors.

Step 3: Assess the scenarios

The scenario storylines provide the basis for developing assumptions that are used to identify how each sector might change (i.e. grow, stabilise or decline) under the uncoordinated and coordinated approaches. The direction and magnitude of change are then used to assess whether there would be benefits (positive impacts) or dis-benefits (negative impacts) at each time point in the future. As well as identifying changes to the sectors individually, feedback between sectors was also considered. For example, aggregates extraction could negatively impact agriculture through affecting water availability/quality and through using land, yet agriculture in turn could benefit the tourism sector if high quality local food was produced and marketed under the Trent Valley brand.

To estimate the changes and value them in monetary terms, two types of assumption were needed: those related to the magnitude of the change, and those related to assigning a monetary value to that change. These two aspects of uncertainty were combined to provide an overall uncertainty rating running from Low to Very High. The ratings were converted to percentages and used to calculate a range (lower and upper bound estimates) for the benefits.

For assumptions on the magnitude of change, the study referred to data from plans or strategies, or existing trends from analysis of historical data, where these were available. Where no such information was available, the assumptions made were validated against data from other areas (e.g. data on visitor numbers from the Norfolk Broads) to verify that they were realistic. In all cases, there was a focus on ensuring that the magnitude of change was realistic.

Box 3: What is a willingness to pay (WTP) value?

This is a value that has typically been identified from a survey where individuals are asked for their willingness to pay for a particular attribute or change. For example, they might be asked how much they would be willing to pay for an improvement in water quality.

There are strict guidelines that need to be followed for these surveys to ensure that the results are as robust and reliable as possible. This study has only used values from studies that follow these guidelines.

When valuing the benefits in monetary terms, market values (e.g. £/tonne, £/ha, average house price) were used for the economic (productivity) benefits. For the social and environmental benefits, where market values are not available, a process called benefits transfer was used. This involves the application of values from one context or situation to another similar one. For example, a study might have identified a 'willingness to pay' value (see Box 3) for an improvement in air quality in a particular location. This value is then applied to the situation in the Trent Valley. The value transferred is applied to the assumptions on magnitude of change. For air quality, this is the number of people benefitting from an improvement in air quality. Benefits transfer is a recognised technique for valuing benefits where market values are not available. The benefits transfer values used in this study have been taken from peer reviewed journals, to ensure that they are as reliable and robust as possible.

Step 4: Compare the scenarios

Step 3 provides a description and monetary estimate of the benefits under the coordinated and uncoordinated scenarios. This information was used in Step 4 to compare the two scenarios at each time point. This enabled the study to identify which sectors would benefit and by how much under the coordinated scenario for each time point.

Differences between the scenarios in terms of economic (productivity) benefits

Figure 3 presents the economic (productivity) benefits for the coordinated and uncoordinated scenarios. It shows that should an uncoordinated approach be followed, the value of the economy in 2020 is estimated as £3.2 billion (central estimate). If a coordinated approach is taken, the value of the economy in 2020 is assumed to be slightly greater at £3.3 billion (central estimate). However, the two approaches diverge over time. Applying the assumptions from the uncoordinated approach results in an economy valued at £3.3 billion in 2050 (central estimate). Should a coordinated approach be applied with sectors working together to implement the vision for the Trent Valley, the value of the economy in 2050 is estimated as £6.2 billion (central estimate), equivalent to an increase of £2.8 billion from 2020 (based on calculated rather than rounded figures). However, it should be acknowledged that uncertainty is greatest for this time point, such that the additional economic benefits of the coordinated scenario could be £800 million per year (low estimate) to £4.8 billion per year (high estimate).

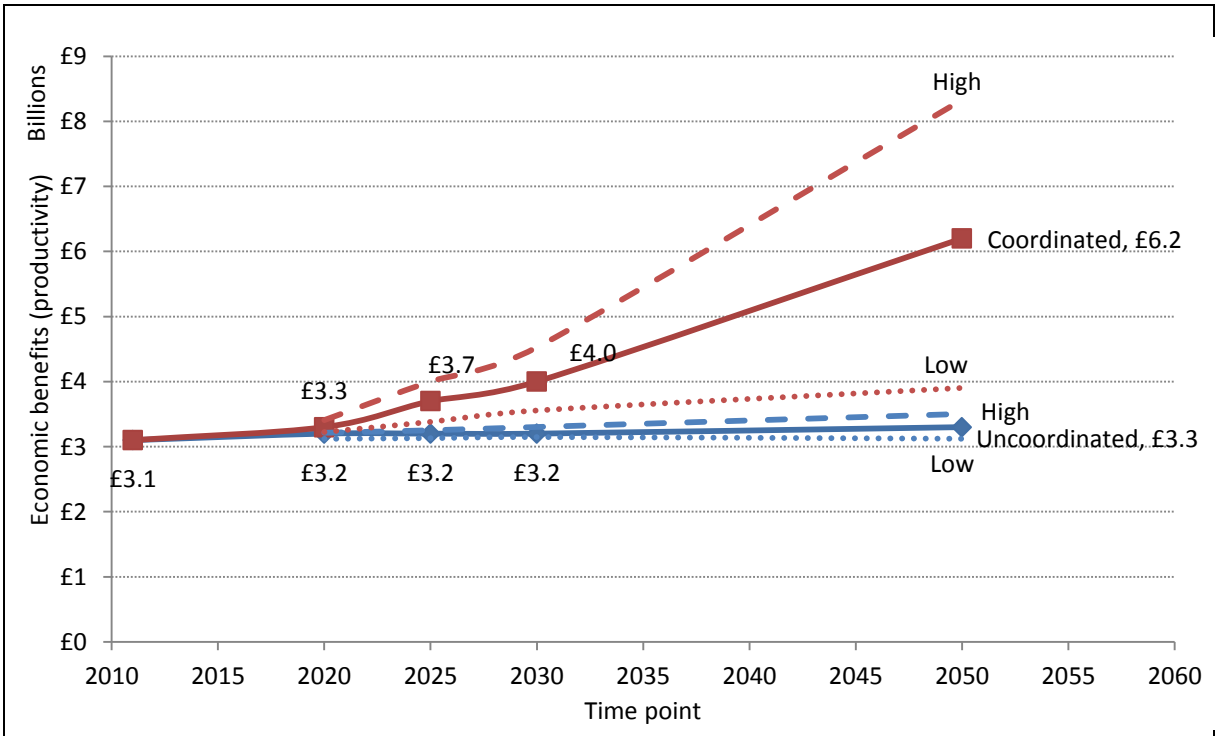

Figure 3: Estimated value of the economic (productivity) benefits for the uncoordinated and coordinated scenarios

Note: the coordinated scenario has much higher uncertainty since the magnitude of change is projected from the scenario storylines; the uncoordinated scenario is based on changes projected in existing plans and strategies (where available)

The sectors that are contributing the most to this increase in value in the economy of the coordinated approach are:

- **Manufacturing, R&D**: grows from £2.8 billion in 2020 to £5.1 billion by 2050 (central estimate, range £3.4 billion to £6.9 million). One of D2N2 LEP's priority sectors, manufacturing is assumed to have a consistently strong growth rate, benefiting from improved infrastructure in the area as well as from the formation of a specific Manufacturing and Research Board. Links to large transport infrastructure projects assist sector growth, and businesses and employees are attracted to the area by the high quality landscape and housing; and
- **Tourism, recreation, retail and leisure**: grows from £150 million in 2020 to £680 million in 2050 (central estimate, range £300 million to £1.1 billion). Another of the LEP's priority sectors, tourism is assumed to grow significantly in response to investment in the Trent Valley brand, the local food offering, the heritage and other attractions of the locality. A major growth area is the development of a network of interconnected waterbodies offering water based activities, wildlife watching and other recreational opportunities including boating day trips and holidays. The Trent Valley is assumed to become well known for its waterways and associated leisure opportunities.

This increase in value is expected to lead to additional jobs in the study area. Using data from the ONS, it is estimated that there were around 93,000 jobs in the Trent Valley in 2011 (based on the estimated GVA of the sectors). Following an uncoordinated approach could result in a slight increase to 104,000 jobs by 2050. However, implementing the coordinated approach could greatly increase the number of jobs, with an estimated 150,000 jobs in 2050.

Differences between the scenarios in terms of social and environmental (ecosystem services) benefits

Figure 4 shows that in 2020, impacts under the uncoordinated scenario are negative in terms of ecosystem services at around £0.6 million less than the baseline (central estimate)[1]. In contrast, for the coordinated scenario, the ecosystem services delivered are worth around £2.4 million more than under the baseline (central estimate). By 2050, the difference between the two scenarios is much greater, with the coordinated scenario delivering around £63 million of social and environmental benefits per year over the baseline, whilst the uncoordinated scenario provides around £13 million fewer benefits than under the baseline (central estimates). Again, there is considerable uncertainty associated with these figures as illustrated by the low and high ranges shown in Figure 4. However, even taking the low and high values into account, there is still a considerable difference between the two scenarios with the coordinated scenario providing significantly more social and environmental benefits than the uncoordinated scenario.

The ecosystem services providing a significant proportion of the benefits under the coordinated scenario are carbon sequestration and value of the landscape and its appearance. This is largely due to the provision of green infrastructure which provides opportunities for carbon sequestration as well as enhancing the appearance of the area. In addition, there are significant additional benefits to health and wellbeing under the coordinated scenario and to biodiversity.

[1] Low and high values for landscape benefits are presented in the report based on the ranges provided in the benefits transfer values used. For presentation purposes, the mid-point has been used in the non-technical summary to give just one low and high estimate for both the coordinated and uncoordinated scenarios.

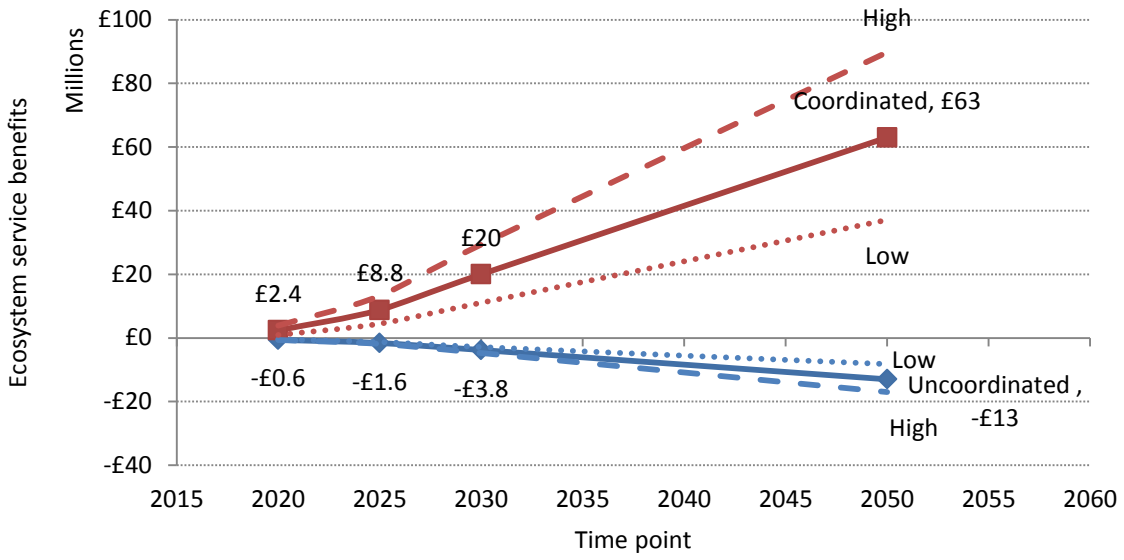

Figure 4: Estimated value of the social and environmental (ecosystem services) benefits for the uncoordinated and coordinated scenarios

Note: *the coordinated scenario has much higher uncertainty since the magnitude of change is projected from the scenario storylines; the uncoordinated scenario is linked to changes projected in existing plans and strategies (where available)*

Under the uncoordinated scenario, the decline in service provision is driven particularly by loss of carbon sequestration (loss of soils to development and aggregates extraction with limited green infrastructure provision), increased risk of flooding linked to higher runoff from existing hard surfaces and a decline in air quality.

The sectors and ecosystem services that benefit from a coordinated approach

Implementation of a coordinated approach to planning and development could therefore lead to considerable benefits for the Trent Valley area over and above those provided by an uncoordinated approach. Following a coordinated approach is likely to bring benefits to key sectors including manufacturing, R&D; and tourism, recreation, retail and leisure. These sectors perform better under the coordinated scenario than the uncoordinated one. Manufacturing and tourism represent key sectors where the Trent Valley has a competitive advantage, should progress be made towards the vision identified by the coordinated scenario.

Similarly, a coordinated approach that follows the Trent Valley vision described in Box 2 could enhance the provision of many ecosystem services and deliver significant social and environmental benefits. A focus on the provision of green infrastructure and careful management of the landscape would lead to carbon sequestration, landscape, health and wellbeing and biodiversity benefits. In contrast, an uncoordinated approach has the potential to decrease the provision of many ecosystem services (air quality, carbon sequestration, water quality) resulting in a reduction in the social and environmental benefits from those currently experienced by people living, working and visiting the Trent Valley.

How can these benefits be realised?

Several changes need to take place to enable progress to be made towards the Trent Valley vision. In addition to sector specific changes, this study has identified two key changes that will require partnership working across the sectors. These changes include:

- **The formation of a coordination board** that is supported by appropriate staff to enable delivery of the coordinated approach; and
- **The development of a business case for the delivery of the coordinated vision**. This will need to identify the structure of the organisation that will be responsible for management, monitoring and evaluation of progress in delivery of the vision. It will also need to update and revise the vision to take account of new developments and approaches to ensure that the vision remains innovative and forward-thinking and retains a focus on delivery of the highest quality outcomes, economically, socially and environmentally. This will require development of a business plan showing how, where and why the coordinated scenario could work and what the benefits and costs of different approaches might be. This will help decision-makers identify the best mechanism for delivery of the vision to 2050 and beyond.

The study has also considered the actions required to implement the coordinated scenario. A key action is the development and promotion of a detailed vision for the Trent Valley. The vision will need to include the key principles underlying the coordinated approach and also the development of a master plan to 2050. Development of the vision will run alongside partnership working and engagement to ensure that there is buy-in from all those who need to be involved with its delivery. Promotion of the vision will help ensure that organisations in the area are inspired to contribute and feed in their ideas. The involvement and commitment of all stakeholders is important due to the linkages between the sectors and the services. Should one aspect of the vision not be taken forwards, this could have knock-on impacts for benefits in several areas. Achievement of the full benefits requires the coordinated vision to be implemented as a whole.

Realisation of the benefits will additionally require funding. This study has identified a range of funding streams that may be able to contribute towards the implementation of the Trent Valley vision. These include both private sources (e.g. payments for carbon offsetting, entrance fees for attractions) and public sources (e.g. the Heritage Lottery Fund, investment leveraged through the LEP). Private companies and individuals may be willing to contribute towards the implementation of a coordinated approach to development should they expect to receive direct benefits, whether these be to a particular economic sector or ecosystem service.

What are the next steps?

This study has shown that significant economic, social and environmental benefits can be realised should a coordinated approach to landscape scale change be implemented in the Trent Valley. If these benefits are to be achieved, the required changes and actions will need to be fully supported and resourced.

Figure 5 summarises the suggested next steps for the Trent Valley.

	**Vision and approach** The delivery of a holistic, multifaceted and coordinated approach to landscape scale change in the Trent Valley will need to follow an agreed master plan, which establishes the key principles, direction of travel and spatial iteration of the aspirations for the valley. This may take some time to plan, develop and agree with stakeholders. In the short term, consideration should be given to producing an outline vision document. The vision should establish key principles for the approach proposed, and include a phased vision visualised as a spatial master plan over a suitable time frame, at least to 2050 as considered here. The vision document will be critical to communicating the proposals to stakeholders, enabling partnership development, facilitating discussion, and exploring resource and funding implications. Development of a vision should be considered a short term priority action and probably the next piece of work required
	**Personnel** A project of this scale cannot be implemented without staff. It is unlikely that current resources within existing organisations could offer sufficient time to deliver this work. Whilst the nature and number of posts required to deliver a coordinated approach cannot be established now, consideration needs to be given to the need for a staff resource (the coordination board) as well as an operational structure
£	**Resources and funding** The body responsible for the direction and operation of activities to enact a fully coordinated approach will require financial resources to operate. This study has identified a range of potential funding sources relevant to different economic sectors and ecosystem services. Whilst the amount of funding and other resources required cannot be quantified at this point, investigations should begin into relevant funding sources
	**Partnership development** To fully coordinate the breadth and depth of activities required to deliver the benefits of the coordinated scenario, it will be necessary to develop a functional partnership with a breadth of support from a wide range of stakeholders. Whilst partnership development will be a long term and ongoing activity, work should commence immediately on partnership and consensus building
	**Business case, operational structure and governance** Consideration will need to be given to the operational structure and governance required to enact the coordinated approach in the longer term (for example, this could be a not-for-profit business or charitable trust). The nature and structure of this organisation will need to develop in response to the emerging strategy and partnership, and so may evolve over time. Meanwhile, thought should be given to developing a business case building on this study, and exploring possible organisational options

Figure 5: Suggested next steps to enable the coordinated scenario to be progressed