



THE UNIVERSITY
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**Data-Driven
Innovation**

Part of the Edinburgh & South East Scotland City Region Deal



**CITY
REGION
DEAL**

Edinburgh
& South East
Scotland

DDI Economic Development Opportunities

The Lothians

Edinburgh, November 2023



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DDI Economic Development Opportunities: The Lothians

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Foreword

Professor Sir Peter Mathieson, Principal and Vice-Chancellor, The University of Edinburgh

From some of the world's earliest coal mines to ancient ports and settlements, the Lothians have a significant cultural and industrial heritage. East, Mid and West Lothian form a core part of the Scottish Central Belt, providing a centre of social life and economic activity, from the North Sea coast at Dunbar in the east, over to Queensferry and its critical crossings, as well as the historical centre of Linlithgow to the west.

Building on the success of two previous reports, with Fife Council and Scottish Borders Council, the study team moved its focus to identifying regional challenges through a combined analysis of the Lothian region. The long-term objective is to generate additional economic and social benefits by co-creating new place-based innovation strategies.

This includes identifying challenges and opportunities against the background of the Regional Prosperity Framework (RPF) for the Edinburgh and South East Scotland city region, and Scotland's National Strategy for Economic Transformation (NSET).

The study took place during the COVID-19 pandemic, the impacts of which continue to be experienced disproportionately by vulnerable social groups, including young people, older workers, women, disabled people, ethnic minority groups and low-income households. The pandemic also accelerated digital transformation, with digital skills gaps being reported by employers across the labour market.

This study aims to support strategic alignment of place-based visions to help realise Data-Driven Innovation (DDI) opportunities over the next decade. The five specific opportunity areas identified by the research team cut across interlinked themes, including transport, high street regeneration, promotion of a high-tech and circular economy, and supporting enterprise.

Five years after the signing of the City Region Deal, it is encouraging to see University of Edinburgh researchers continuing to work closely with partners in the local authorities of South East Scotland.

I hope this report adds value to regional collaboration in South East Scotland and helps address common challenges, such as changing demographics, economic stagnation and environmental crisis, as well as specific local concerns, at the time of an increasing cost of living crisis.



Peter Mathieson

This study aims to support strategic alignment of place-based visions to help realise Data-Driven Innovation (DDI) opportunities over the next decade.

1. Executive Summary

Key objectives

This study aims to identify key areas where Data-Driven Innovation (DDI) could drive socio-economic growth across the three Lothian local authorities (East Lothian, Midlothian, West Lothian) as part of the Edinburgh and South East Scotland City Region Deal (ESES-CRD), against the background of recent development of a Regional Prosperity Framework (RPF) and Scotland's National Strategy for Economic Transformation (NSET). This study is the first step in enhancing regional collaborative approaches to realise the potential these DDI opportunities represent, and achieve the regional prosperity and inclusive growth objectives by increasing the wider economic and social resilience across the Lothians.

Key findings

We identified the following five themes for the innovation-focused opportunities, based on the priorities laid out in the ESES-CRD, the RPF and the NSET, where data-driven innovation approaches could have the most significant input:

- **Sustainable housing and infrastructures**
- **Mobility and access to facilities and amenities**
- **Cross-sectoral high-tech sustainable circular economy**
- **Empowering creative and value-adding enterprises**
- **Regeneration and revitalisation of high streets and local businesses.**

There are many existing challenges, including resource constraints, disconnected infrastructure (e.g. transport), current economic conditions and climate change. Whilst these challenges are experienced locally, there are commonalities across the region that mean joined-up solutions would enable a greater regional capacity to effect change and impact. However, significant further progress could be made if a more systematic regional approach to implementing solutions could be found, including the public, private and third sectors. Leadership within this will be crucial and there is a key role for local authorities within the regional (cross-council) development planning and delivery.

Key recommendations

We recommend new regional approaches to build up links and interactions between key stakeholders and local communities across the Lothians and across the City Region. The challenges and opportunities can be addressed through a thoughtful intervention to strengthen the regional frameworks in the following areas:

- **CAPABILITY:** Build up internal DDI expertise across Councils.
- **COLLABORATION:** Ensure sharing of data, information and knowledge in the City Region.
- **LEADERSHIP:** Develop shared visions for regional development.
- **STRATEGY:** Frame joined-up approach to strengthen development funding.
- **PARTNERSHIP:** Facilitate more direct collaboration between local authorities, industry and universities.

To deliver on these key strategic objectives, we **propose a new cross-council ESES Regional Economic Development Task Force**. This would deploy the data from the emerging Regional Intelligence Centre to lead new cross-council initiatives within the City Region Deal, the Regional Prosperity Framework and beyond. Led by a dedicated manager at an appropriate level of seniority, such a group can bring about transformational change and unlock further funding.

...there are commonalities across the region that mean joined-up solutions would enable a greater regional capacity to effect change and impact.

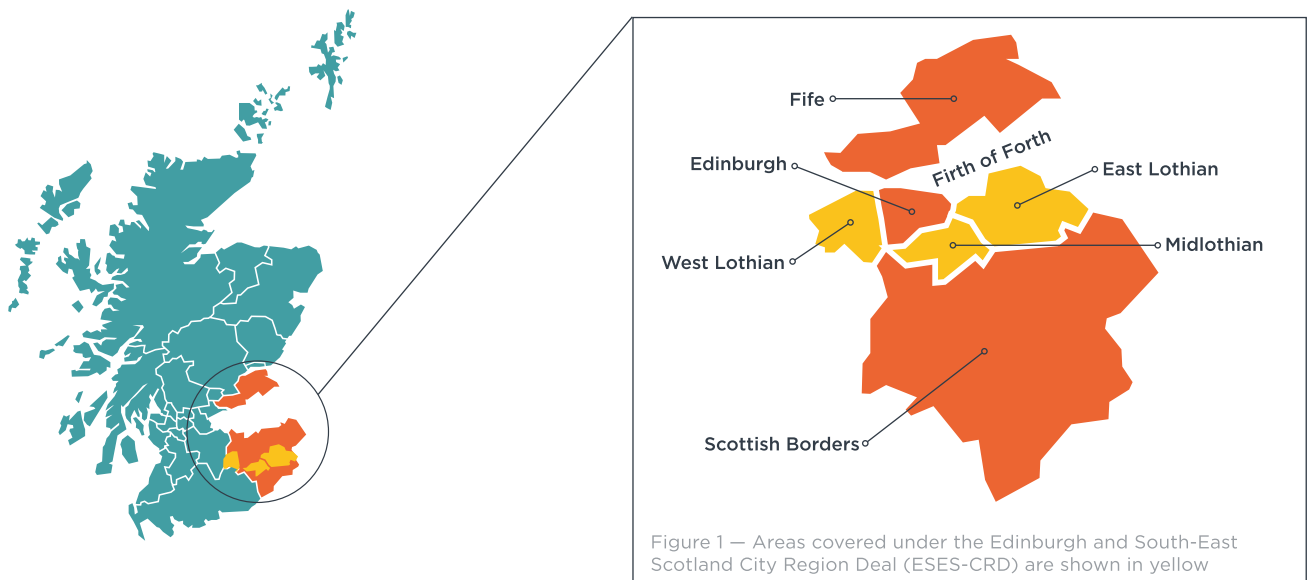
2. Introduction

The **Data-Driven Innovation (DDI) programme** is part of the **Edinburgh and South-East Scotland City Region Deal (ESES-CRD)**. At its core, the programme aims to support organisations and individuals to benefit from world-class research and development in the generation, storage, analysis and use of data. Under the DDI programme, there are data-driven initiatives taking place in the City Region, tackling both long- and short-term challenges. For instance, primary and secondary schools across the City Region are participating in the Internet of Things (IoT) project to prepare pupils for a data-driven future.¹

Between 2018 and 2021, researchers at the University of Edinburgh conducted DDI opportunity studies to identify **future DDI-related opportunities in the City Region**. Through this work, the **Opportunity Areas Analysis Tool (OAAT)** was developed to identify place-based strategic insights.² The OAAT is a new methodological approach for defining key development trends, mapping core stakeholder capabilities and

identifying project-level capacities for maximising economic opportunities. Building on the success of two previous studies, with Fife Council and Scottish Borders Council,³ the study team expanded its focus to identifying regional challenges, through a combined analysis of the Lothian region, working with East Lothian, Midlothian and West Lothian Councils throughout 2022. The objective of the study is to generate long-lasting impact by co-creating new place-based innovation strategies by deploying the OAAT as an analytical policy instrument.

The current study aims to identify challenges and opportunities across the three Lothian councils, against the background of the recent development of a **Regional Prosperity Framework (RPF)** for the ESES city region and **Scotland's National Strategy for Economic Transformation (NSET)**.⁴ The RPF is the next phase of regional development planning in the City Region, building upon the investment and achievement of the ESES-CRD.



¹ <https://ddi.ac.uk/9-5m-schools-project-gives-pupils-a-sense-of-the-power-of-data/>

² The research outcome of this work was published in Regional Studies - "Strategic Intelligence for the Future of Places: Enabling Inclusive Economic Growth through the Opportunity Areas Analysis Tool" (March 2022) (<https://doi.org/10.1080/00343404.2022.2045267>)

³ "Development Opportunities in Fife: Data-Driven Innovation and Local Economic Strategy" https://ddi.ac.uk/wp-content/uploads/2021/09/DDI_Report_Fife.pdf and "Development Opportunities in the Scottish Borders: Evolving Data-Driven Innovation and the Entrepreneurial Ecosystem" https://ddi.ac.uk/wp-content/uploads/2021/09/DDI_Report_ScottishBorders.pdf

⁴ Regional Prosperity Framework <https://esescityregiondeal.org.uk/regional-prosperity-framework> (5 April 2022); The Scottish Government's National Strategy for Economic Transformation (NSET) <https://www.gov.scot/publications/scotlands-national-strategy-economic-transformation/> (1 March 2022)

➔ Furthermore, The Scottish Government's National Strategy for Economic Transformation (NSET) in March 2022 sets out ambitions for Scotland to become “fairer, wealthier and greener” over the next ten years, with people at the heart of a wellbeing economy. These common opportunities recognised across the City Region will help provide relevant frameworks and approaches when we consider the specific challenges faced by the three Lothian local authorities.

The COVID-19 pandemic exacerbated existing inequalities and unevenly impacted some groups in society, including young people, older workers, women, disabled people, ethnic minority groups, low paid and low-income households.⁵ These impacts will continue to be experienced disproportionately by these groups. Furthermore, the pandemic has accelerated digital transformation and digital skills gaps are already being felt by employers across the Scottish labour market.⁶

“...the pandemic has accelerated digital transformation and digital skills gaps...”

Hence, within the ESES-CRD there have been ongoing programmes and projects addressing the inclusive growth and equality agenda. The **Integrated Regional Employability and Skills (IRES) Programme**⁷ is one of these initiatives. The **DDI targeted skills gateway** brings together industry, universities, colleges, schools and other partners to provide integrated and visible progression routes into DDI careers. The **workforce mobility project** focuses on the blockers to the full mobility of a regional workforce beyond individual personal skills and capabilities.

Under the **IRES Programme**, there is the **Housing Construction and Infrastructure (HCI) Skills Gateway**, hosted at Edinburgh Napier University. The HCI aims to build inclusive and sustainable construction careers in the City Region.⁸

Partnering with the three local authorities across the Lothians, this study aims to support strategic and further strategic alignment of place-based visions to help realise DDI opportunities in the next decade. In light of the priorities set out in the ESES-CRD, the RPT and the NSET, as well as existing policy priorities for the individual local authorities, we identified the following five themes for the innovation-focused opportunities in the three Lothian local authority areas that also aligned to the DDI programme:

- **Sustainable housing and infrastructures**
- **Mobility and access to facilities and amenities**
- **Cross-sectoral high-tech sustainable circular economy**
- **Empowering creative and value-adding enterprises**
- **Regeneration and revitalisation of high streets and local businesses.**

With growing regional approaches across the City Region partners, this study can add value as a timely intervention in order to tackle common challenges, such as changing demographics, economic stagnation and environmental crisis, as well as specific local concerns, at the time of increasing cost of living. Local conditions of individual places are specific and experiences of these challenges may be unique, and a ‘one-size-fits-all’ solution to the City Region would not work. However, the solutions to these challenges and issues may be shared across partners and key actors across the region.

⁵ Scottish Government (2020) “Impacts of COVID-19 on Equality in Scotland”.

<https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2020/09/the-impacts-of-covid-19-on-equality-in-scotland/documents/full-report/full-report/govscot%3Adocument/Covid%2Band%2Binequalities%2BFinal%2BReport%2BFor%2BPublication%2B-%2BPDF.pdf>

⁶ ScotlandIS (2022). Scottish Technology Industry Survey 2022. <https://www.scotlandis.com/scottisstechsurvey/>

⁷ <https://esescityregiondeal.org.uk/ires#:~:text=The%20IRES%20partnership%20is%20funded,Labour%20market%20analysis%20and%20evaluation>

⁸ <https://www.hciskills.org/>

3. Background

Covering the area east, west and south of Scotland's capital city, Edinburgh, the Lothians are core parts of the Scottish Central Belt, being a centre of social life and economic activity. Edinburgh and the Lothians have seen population growth over the past decade, at times when neighbouring areas such as the Scottish Borders have experienced population decline.⁹ Overall demographic trends in the City Region indicate that the non-working population is increasing, which could contribute to a tighter labour market in the future with growing pressure on the demand for public services.¹⁰



Figure 2 — The Lothian region.
Source: Open Street Map

The Lothian region stretches from the North Sea coast at Bilsdean in the east, to Queensferry and its critical crossing as well as the historical centre of Linlithgow to the west. With the Scottish Borders in the south and up to the Firth of Forth in the north, its predominantly rural and suburban areas are marked by a plethora of market towns and villages with extensive cultural and industrial heritage, from some of the world's first coal mines to ancient ports, settlements and defences along the coastline. The Lothian region consists of three unitary local authority areas (councils): East Lothian, Midlothian and West Lothian, established in 1996 under Scotland's Local Government Act (1994). This region is also a historic county, formally recognised in 1975 under the Local Government (Scotland) Act 1973 as the Lothian Region, but has since been dissolved into the current unitary authority areas.

Across the three Lothian local authority areas, there are new opportunities with the ongoing City Region Deal and emerging new regional approaches. To better understand specific contexts of each local authority area, key backgrounds are depicted below, including brief historical contexts, demographic trends, labour market and sectoral characteristics, and existing key educational and data infrastructures. In addition, maps showing **Scottish Index of Multiple Deprivation (SIMD)** areas of each of the Lothian councils are presented in the following sections.

Key Features of the Three Lothian Councils

East Lothian

East Lothian borders Edinburgh to the west, Midlothian to the south-west, and the Scottish Borders to the south. The area lies south of the Firth of Forth, the estuary of several Scottish rivers that meets the North Sea with Fife, and West and East Lothian on the south. Its largest town is Musselburgh, with the administrative centre in Haddington, where East Lothian Council is based. The unitary local authority contains six wards, electing 22 councillors.

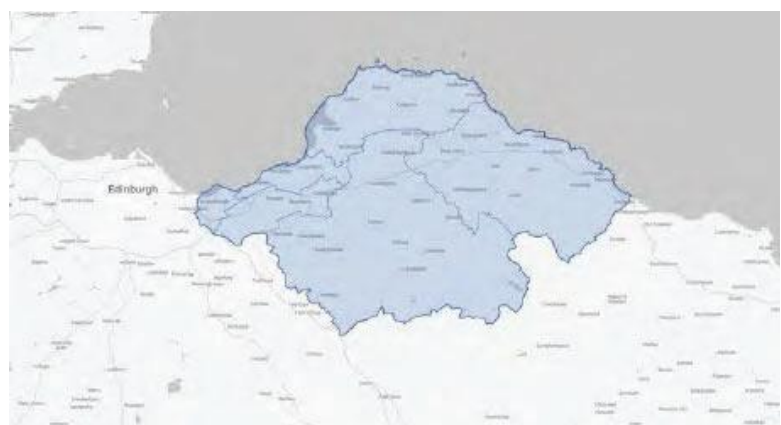


Figure 3 — East Lothian and its surroundings.
Source: statistics.gov.scot

⁹ "Regional Skills Assessment Edinburgh and South East Scotland City Region Deal", <https://www.skillsdevelopmentscotland.co.uk/media/49092/rsa-edinburgh-and-south-east-scotland-city-region-deal.pdf> (November 2022)
¹⁰ Source: "Regional Skills Assessment: Edinburgh and South East Scotland City Region"

Background

➔ Historically, agriculture has played a significant role in the East Lothian economy, together with farming, fishing and coal mining. Today, East Lothian is predominantly rural and the region has 40 miles of coastline. Along the coast, there are the towns of Musselburgh, Prestonpans, Cockenzie, Port Seton, Gullane, North Berwick and Dunbar.

East Lothian's major road is the A1, which travels through, connects with Edinburgh northbound and Scottish Borders southbound. The A1 and the East Coast Main Railway Line (ECML) pass through East Lothian and act as a major artery for transport and transit. East Lothian has rail stations in Musselburgh, Wallyford, Prestonpans, Longniddry, Drem, North Berwick and Dunbar. There are ambitions to enhance the ECML to bring forward four tracking/high-speed services, linked to wider regional measures to public transport accessibility and service provision. While East Lothian is relatively well served by the strategic transport network, particularly west/east with a focus on connecting to Edinburgh, Berwick and Newcastle upon Tyne, there is an underlying problem of limited capacity in transport infrastructure and services locally, especially in the more rural parts of the council area.¹¹

The area has an important relationship with the regional core, with about half of the working-age population commuting out of the area for work, often for higher value jobs than those available locally.¹² This impacts productivity, and manifests in the high commuting travel patterns, the demand for services, infrastructure and facilities, and in the need for more affordable housing. East Lothian is also an important destination for tourists, attracting the domestic and overseas markets but with the majority of visitors from the UK. East Lothian's beaches and coast are the main attraction for visitors and it is also a leading golf destination.

These factors are particularly relevant because travel demand is expected to increase in the coming years. East Lothian has one of the fastest rates of population growth in Scotland. Between 1998 and 2020, the population of East Lothian increased by 22.1% (currently standing at ~107,900). This was the highest percentage change out of the 32 council areas in Scotland. Scotland's population rose by 7.7% over the same period.¹³ East Lothian's population is projected to be over 125,000 by 2037, an annual growth of 1% over the next 15 years.¹⁴ The 0-16 age group is projected to grow by almost a third, while the over 75 year age group, by almost 100%.¹⁵

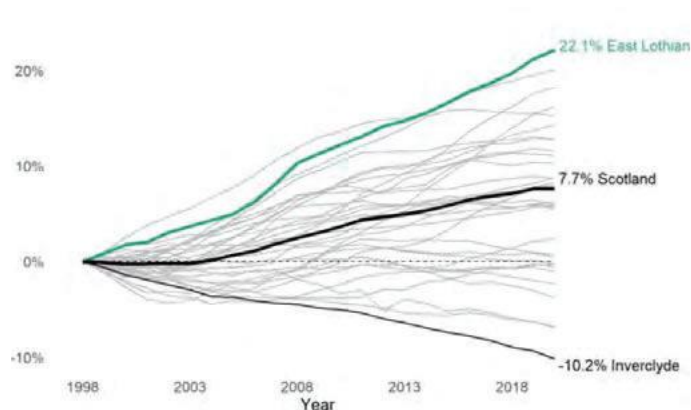


Figure 4 — Percentage change in the population of council areas of Scotland, 1998-2020. Source: National Records of Scotland. Mid-2020 Population Estimated by Council Area in Scotland. East Lothian Council Area Profile

Small to medium-size enterprise is a strength in the area – in 2017, East Lothian had approximately 3,510 business sites while in 2020, 71.10% of the working-age population was full-time employed.¹⁶ However, East Lothian currently struggles with attracting large-scale economic development and employment opportunities. By 2020, 85.5% of the businesses in East Lothian corresponded to micro businesses (1-9 employees), 12% to small businesses (10-49 employees),

¹¹ East Lothian Local Transport Strategy 2018

¹² East Lothian Development Plan 2012-2022

¹³ <https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/east-lothian-council-profile.html>

¹⁴ East Lothian Development Plan 2012-2022

¹⁵ East Lothian Development Plan 2012-2022

¹⁶ <https://statistics.gov.scot/atlas>

Background

- ➔ 2% to medium-sized businesses (50-249 employees), and 0.5% to large-sized businesses (+250 employees).¹⁷ The availability of jobs relative to the population (job density) is lower in East Lothian (0.5) than in other local authority areas and the rest of Scotland (0.78) due to the number of commuters. This dynamic provides challenges to the provision of affordable housing and capacity in roads and public transport services.



Figure 6 — Map of deprived areas in East Lothian.
Source: Scottish Index of Multiple Deprivation (SIMD) 2020

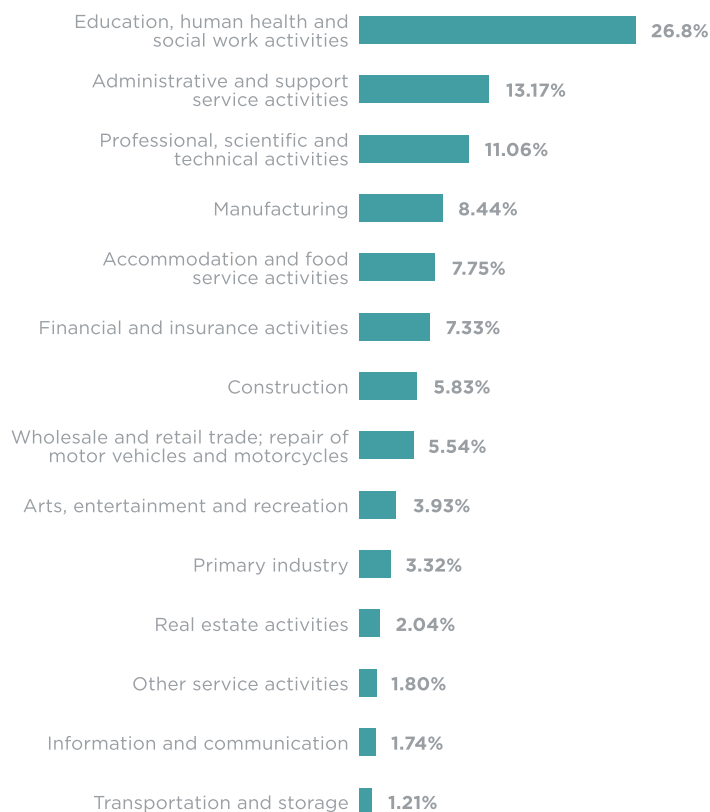


Figure 5 — Percentage of employees per sector in East Lothian.
Source: FAME Database

Midlothian

Midlothian borders the city of Edinburgh to the northwest, East Lothian to the northeast, West Lothian to the west and the Scottish Borders to the south. The region covers a geographic area of 136.6 sq miles (353.7 km²). Known until 1921 as Edinburghshire, Midlothian is also a historic county, which at the time included the city of Edinburgh. The largest town within Midlothian is Penicuik, with the administrative centre in Dalkeith, where the main seat of Midlothian Council is located.



Figure 7 — Midlothian and its surroundings.
Source: statistics.gov.scot

¹⁷ According to FAME Database. Data calculated by number of employees

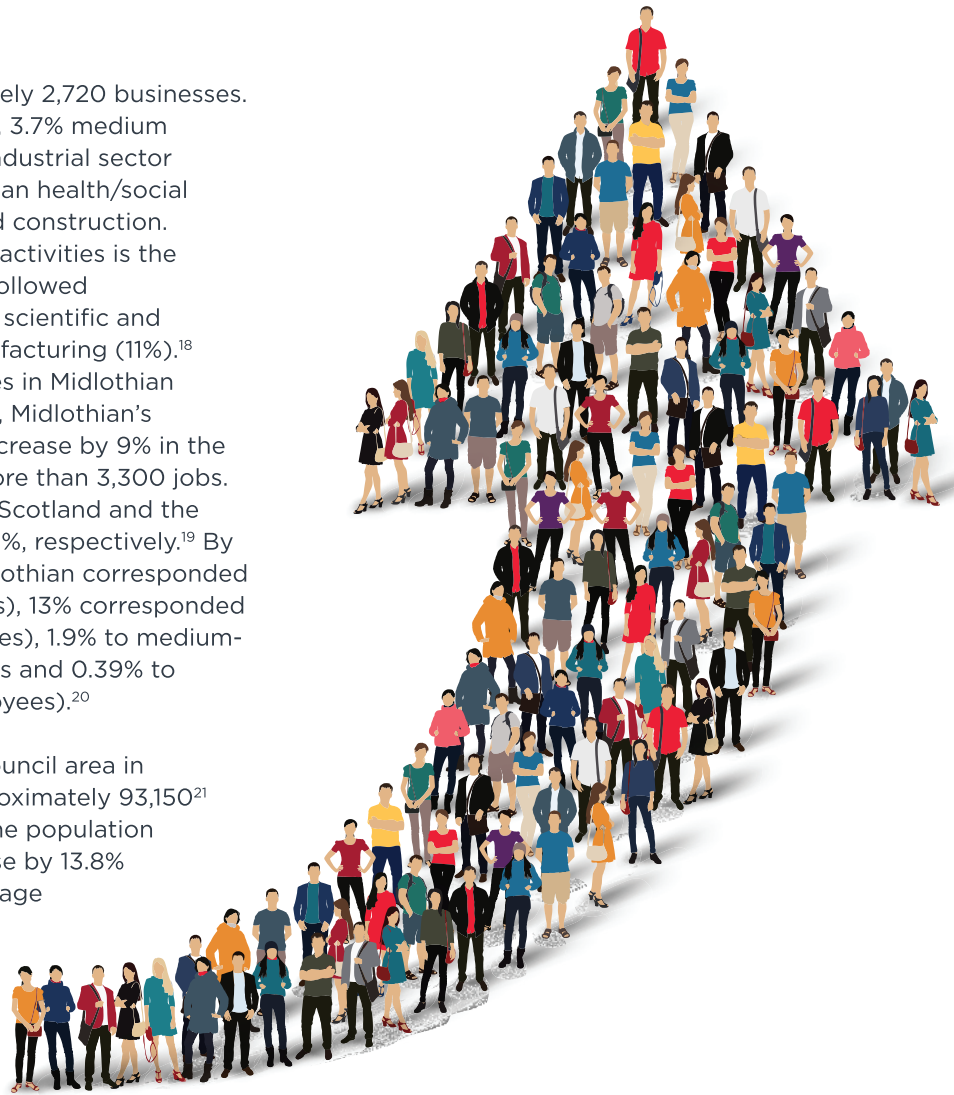
Background

→ In 2020, Midlothian had approximately 2,720 businesses. 90% of these were small employers, 3.7% medium and 6.4% large. The largest single industrial sector is retail/wholesale, followed by human health/social work, education, manufacturing and construction. Administrative and support service activities is the largest employment sector (28%), followed by construction (17%), professional, scientific and technical activities (14%), and manufacturing (11%).¹⁸ Although youth unemployment rates in Midlothian are some of the highest in Scotland, Midlothian's total employment is projected to increase by 9% in the period 2020-2030, representing more than 3,300 jobs. In the same period, employment in Scotland and the UK is expected to grow at 3% and 5%, respectively.¹⁹ By 2020, 84% of the businesses in Midlothian corresponded to micro businesses (0-9 employees), 13% corresponded to small businesses (10-49 employees), 1.9% to medium-sized businesses (50-249 employees and 0.39% to large-sized businesses (+250 employees).²⁰

Midlothian is the fastest-growing council area in Scotland, with a population of approximately 93,150²¹ in 2020. Between 2018 and 2028, the population of Midlothian is projected to increase by 13.8% (to over 100,000) with the over-65 age group increasing by 25% to more than 20,000 (over 20% of the total population). Midlothian is projected to have the highest percentage population change in all the 32 council areas in Scotland.²²

This has important implications in planning and population demands and puts pressure on transport, roads, housing, health and social care, facilities and education. From 2017 to 2018, the population increased by 1.4%, compared with Scotland's population growth of 0.2% for the same period.²³

In 2020, the first year of the pandemic outbreak, the Midlothian population grew by 0.7% in comparison to 2019; while over the same period, the population in Scotland practically remained the same.²⁴ In addition to the ageing population in market towns and villages, there are significant new developments, including the plan for 4,000 new homes within the new Shawfair community.



¹⁸ According to FAME Database. Accessed in September 2022

¹⁹ Midlothian Strategy for Growth 2020-2025

²⁰ According to FAME Database. Data calculated by number of employees

²¹ <https://statistics.gov.scot/atlas/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fid%2Fstatistical-geography%2FS12000019>

²² Single Midlothian Plan 2022-2023

²³ Midlothian Strategy for Growth 2020-2025

²⁴ National Records of Scotland

Background

→ Midlothian has four railway stations – Shawfair, Eskbank, Newtongrange and Gorebridge – as part of the Borders Railway that runs between Tweedbank in the Scottish Borders and Edinburgh.

The University of Edinburgh's Easter Bush Campus is situated in Midlothian. The campus hosts a world-leading research, work and study environment focused on clinical veterinary medicine and the biology and production of animals. The Easter Bush Campus brings together stakeholders and partners including the Royal (Dick) School of Veterinary Studies and the Roslin Institute (see *Example 3: Promoting Cross-Sectoral Entrepreneurial Capabilities, Sustainable Economy and Retaining Talents*).

The partnership has been supported by Midlothian Council, closely tied to plans for leveraging the potential of the Easter Bush site based on its global reputation in animal biosciences, comprising the Midlothian Science Zone. Midlothian also has a campus of Edinburgh College in Eskbank, which is the college centre for engineering. Newbattle High School is known for its flagship Newbattle Digital Centre of Excellence. The DDI programme's IoT project has been piloted at two Midlothian Schools – Roslin Primary and Newbattle High – as part of a wider Data Education in Schools programme.²⁵

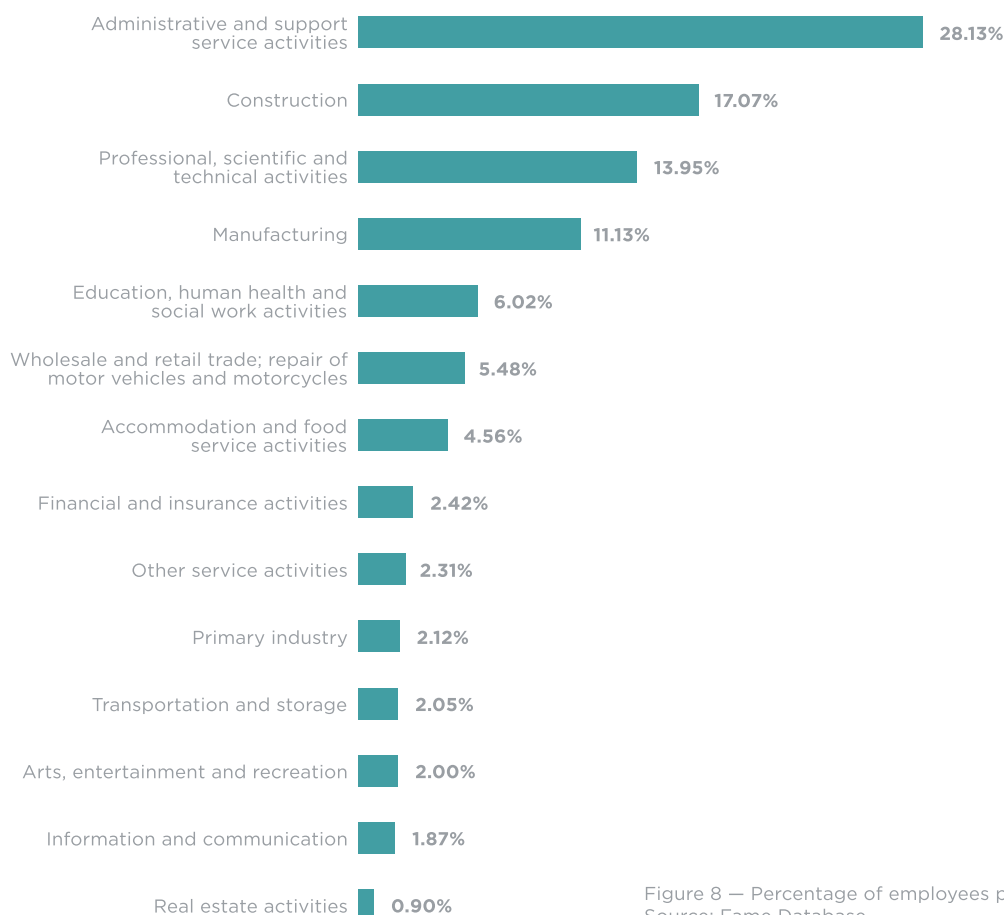


Figure 8 — Percentage of employees per sector in Midlothian.
Source: Fame Database

25 <https://ddi.ac.uk/9-5m-schools-project-gives-pupils-a-sense-of-the-power-of-data/>

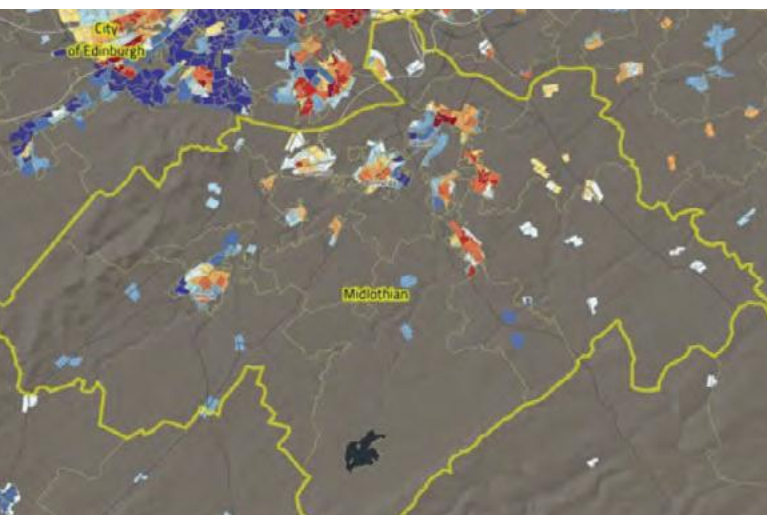


Figure 9 — Map of deprived areas in Midlothian.
Source: Scottish Index of Multiple Deprivation (SIMD) 2020.

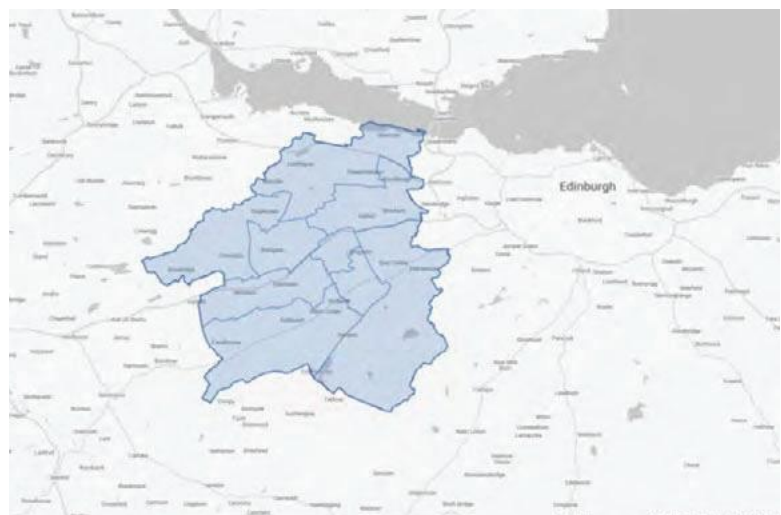


Figure 10 — West Lothian and its surroundings.
Source: statistics.gov.scot

→ West Lothian

Although the region is an historic Scottish county, the current boundary has been shaped by different political and administrative reforms to cover a larger area. West Lothian is bordered to the east with the council areas of Edinburgh, to the southeast with the Scottish Borders, south with South Lanarkshire, west with North Lanarkshire and Falkirk, and north with Falkirk and the Firth of Forth.

West Lothian covers a geographic area of 165.1 sq mi (427.7 km²), and has a population of 185,580 inhabitants (2021).²⁶ Livingston is the largest town in West Lothian, and is also the second largest town of all Lothian regions after Edinburgh.

West Lothian lies on the southern shore of the Firth of Forth and, although it is mostly a rural area, it has a long industrial tradition due to its deposits of coal, iron and oil operations, and its strategic location between Glasgow, Edinburgh and southern Scotland. However, heavy industry in the region declined after World War II, and the last shale oil mine closed in the early 1960s.

Industrial and mining activity during the 19th century and the first half of the 20th century drove population growth but also led to a rise in poor-quality housing. To address part of this problem and to ease overcrowding in Glasgow, Livingston was designated as a post-war New Town in 1962.²⁷ From 1998 to 2020, West Lothian's population grew by 20%, with notable high growth in older age groups, e.g. 45 to 64 (+44.1%), 65 to 74 (+74.9%) and over 75 (+84.6%). In the same period, 25- to 44-year-olds decreased by 5.5%.²⁸

West Lothian has a diverse economy and in 2019 had approximately 5,500 businesses.²⁹ By 2020, 85% of the businesses in Midlothian were micro businesses (0-9 employees), 11% small businesses (10-49 employees), 3% medium-sized businesses (50-249 employees), and 0.61% large businesses (>250 employees).³⁰

²⁶ Mid 2021 population estimates

²⁷ "Life is for Livingston" (PDF). West Lothian Council

²⁸ https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/west-lothian-council-profile.html#table_pop_est_sex_age

²⁹ <https://statistics.gov.scot/atlas/>

³⁰ According to FAME Database. Data calculated by number of employees

Background

➔ In 2021, West Lothian economic activity provided employment to 89,400 people.³¹ In 2021,³² the five largest employment sectors in the council area were retail (25%), manufacturing (15%), accommodation and food activities (11%), construction (9%), and information and communication (7%). While historically, mining and shale oil production were key employers in the region, as of 2021 the totality of the primary sector only accounted for less than 1% of people employed in West Lothian.

In 2021, the highest-value sectors in West Lothian were³³:

- **Manufacturing: £719m (15.3%)**
- **Wholesale and Retail: £611m (13.0%)**
- **Professional, Scientific and Technical: £525m (11.2%)**
- **Information and Communication: £455m (9.7%)**
- **Constructio: £455m (9.7%).**

Although West Lothian does not have a university presence, further adult education facilities are provided by West Lothian College which is based in Livingston. Scotland's Rural College (SRUC) also has a campus in Livingston, providing courses on subjects like agriculture, veterinary and conservation.

West Lothian is well connected by motorways, including the M8 (Glasgow-Edinburgh), and the M9 (Edinburgh towards Falkirk). Other major roads include the A89 from Glasgow to Newbridge, near Edinburgh, passing through multiple towns across West Lothian.

The region is also an important part of Edinburgh-Glasgow rail connections. The North Clyde line connects Glasgow and Edinburgh via Livingston North, Bathgate, Armadale and Blackridge. The Shotts line goes via stations including Fauldhouse, Breich, Addiewell, West Calder, Livingston South and Kirknewton. The main Glasgow-Edinburgh line via Falkirk line includes Linlithgow.

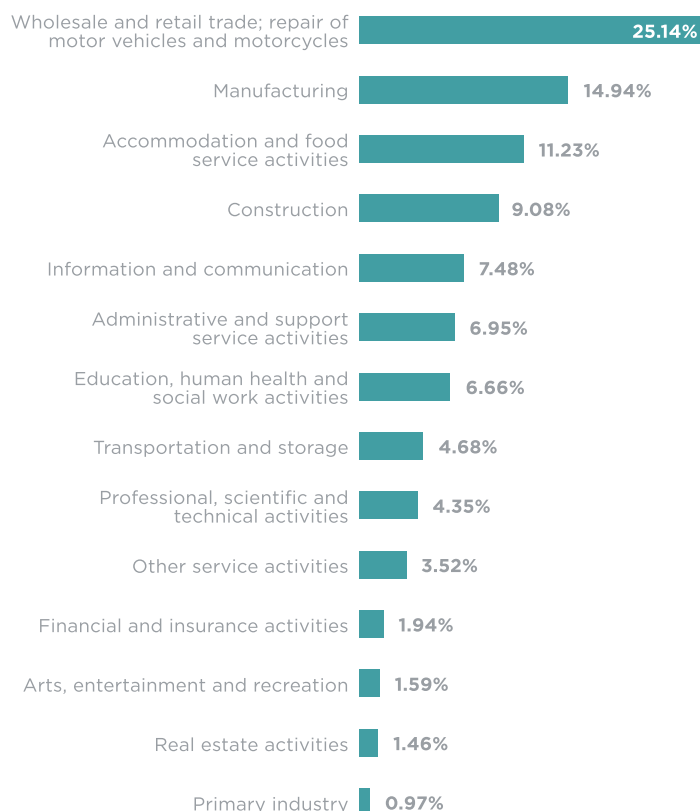


Figure 11 — Percentage of employees per sector in West Lothian.
Source: FAME Database



Figure 12 - Map of deprived areas in West Lothian.
Source: Scottish Index of Multiple Deprivation (SIMD) 2020.

³¹ <https://statistics.gov.scot/atlas/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fid%2Fstatistical-geography%2FS12000040> / "Key Facts". West Lothian Council.

³² According to FAME database. Accessed in September 2022

³³ Skills Development Scotland Regional Skills Assessment (2021) - <https://www.skillsdevelopmentscotland.co.uk/what-we-do/skills-planning/regional-skills-assessments>

4. Addressing Regional Prosperity and Developmental Challenges in the City Region

The Regional Prosperity Framework (RPF) is a non-statutory public statement of joint economic vision, ambition and priorities set by the City Region local authorities. The Framework was approved by the ESES-CRD Joint Committee in September 2021, setting out a vision to grow and recover the economy, covering a range of sectors and areas of work from transport and housing, climate change to education and digital inclusion. A final version of the framework was agreed in March 2023,³⁴ and a Delivery Plan and Prospectus has now been approved. The key themes of the RPF are identified to secure:

- A **FLOURISHING** economy, environment and ecology, households and places.
- A **RESILIENT** workforce, climate responses, infrastructure and buildings.
- An **INNOVATIVE** private sector, third sector (including further and higher education) and public sector.

The RPF report identified nine major regional opportunities across the City Region through the development process:

- A data-driven region
- New approaches to sustainable development
- Sustainable transport and mobility
- A green industrial regeneration – the Forth
- Sustainable tourism and cultural distinction
- Support for starting and building a business
- Aligning skills development and training with emerging sectors
- Health care and wellbeing for all
- Maximising the role of anchor institutions.

The report highlights the need for improved connectivity across the City Region, highlighting the high cost of transport and lack of public transport options, which contributes to the reliance on the private car. It is recognised that there is a need for more partnership and coordination across transport modes for better workforce mobility by improving employability, access to training and education, amenities and other services. As a result of the pandemic, home working across the City Region has risen sharply, with a complex set of implications for support needed for local economies and town centres through regeneration and new development.



³⁴ <https://democracy.edinburgh.gov.uk/documents/s36808/Item%205.4%20-%20RPF%20and%20app.pdf>

- The Framework also emphasises the importance of understanding the strategic requirements of rural and less densely populated areas. This opens up opportunities for flexible and digitally supported working, as well as opportunities surrounding natural capital through renewable energy and carbon storage. In the post-pandemic context, the RPF recognises the importance of new forms of supporting enterprise through start-up and scale-up processes connected by regional networks. In relation to Data-Driven Innovation, a major opportunity is recognised in terms of re-focusing on key growth areas of the economy, such as software, the creative industries, life sciences/ healthcare, business services and food and drink, by upskilling the workforce.

These have been further refined in the RPF Delivery Plan and Prospectus as targeting four priority initiatives³⁵:

- **Infrastructure for Recovery and Prosperity:** Develop, with the government, a place-based capital and revenue funding model for delivery of regional ambitions.
- **Green Regeneration:** Developing a green regeneration (focused on the Forth) investment prospectus, including the Climate Evolution Zone with net-zero infrastructure and employment at former Cockenzie Power Station site (with rail link) and Blindwells New Settlement (with potential for expansion).

The Framework also emphasises the importance of understanding the strategic requirements of rural and less densely populated areas.

- **Visitor Economy and Culture:** Secure a sustainable visitor economy and promotion of our cultural assets, including the Regional Visitor Economy Development Plan to support growth and ensure it is spread equitably across the whole of the region and linking to the Regional Transport Master Plan.
- **Data-Driven Innovation Economy:** Promote the transition to a Data-Driven Innovation (DDI) enabled economy in the region.

Linked to these strategic priorities for the Lothians, we identified the following specific challenges and developmental needs (which are often inter-linked):

- **Rise in housing demand**, especially post-pandemic, has opened up an opportunity to build a low-carbon economy with high-quality, natural and built environment, housing, transport and resource use.
- Across the three Lothians, the rapid population growth, new housing developments and the attraction of investment have added **acute pressures on the provision of transport infrastructures and connectivity**, as well as **facilities, services and amenities**.
- There is a considerable number of new high-tech enterprises and local authorities invested in new innovation zones, but there seems to be a lack of **strategic clustering and prioritisation**, with lack of skills and critical data.
- Across towns and localities in the Lothians, **local businesses and communities are striving to recover after the pandemic**, while dealing with the rising cost and energy crisis as well as meeting the net-zero agenda.
- **High streets and urban centres have been facing big challenges**, in part due to changes in consumer behaviours (e.g. growth in online shopping and home working).

³⁵ Regional Prosperity Framework Delivery Plan and Prospectus, 2023 - https://static1.squarespace.com/static/55c87967e4b05aa55020f656/t/644bdf5725979f1c3ce47ac7/1682693981689/Regional_Prospersity_FrameworkA4_06.pdf

5. Realising the Benefits from Data-Driven Innovation beyond Local Challenges: Five Opportunity Areas for the Lothians

Assessing these areas of local challenges and developmental needs, which emerged through policy documents and initial consultation processes with selected core stakeholders from policy, business and community domains, helped us identify the following five common themes as 'DDI Opportunity Areas' where data-driven innovation activities could have the largest impact in the Lothians:

- **Sustainable housing and infrastructure**
- **Mobility and access to facilities and amenities**
- **Cross-sectoral high-tech sustainable circular economy**
- **Empowering creative and value-adding enterprises**
- **Regeneration and revitalisation of high streets and local businesses.**

For each thematic area, key challenges were identified through an in-depth consultation process, including interviews and four rounds of workshops, with key stakeholders from the three local authority areas. Consultation was focused on those stakeholders directly involved in the local development and support of these areas (e.g. delegates from the three local authorities; project managers from ESES-CRD; business associations; and representatives from universities, colleges).

In the following section, each of these five themes are discussed in turn, including common issues and perceived key challenges. Although the exact circumstances of challenges are experienced differently in each local authority area, through this research project we were able to identify common dimensions to these challenges that could benefit from a regional approach to help maximise the use of resources and facilitate DDI-led solutions.

For each of the themes, we present an example of DDI-led solutions as illustrative examples.

Sustainable housing and infrastructure

Across the three Lothian local authority areas, there is a **growing demand for building more sustainable housing and public infrastructure**, especially around commuter towns and estates. As the region is experiencing such high levels of population growth, private and community developers need to maximise the functionality of infrastructure whilst also reducing the carbon footprint of the building over its whole life cycle. ^{36 37 38 39 40 41 42 43 44}



36 East Lothian Council Plan 2017-2022

37 East Lothian Local Development Plan 2018

38 East Lothian Development Plan Scheme N. 13 (2021)

39 East Lothian Housing Strategy 2018-2023

40 Single Midlothian Plan 2022

41 Midlothian Economic Growth Strategy 2020 - 2025

42 Midlothian Action Programme 2017 (Update 2020)

43 West Lothian Local Development Plan 2018

44 West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)

→ Key challenges identified by the stakeholders include:

- **Lack of consistent solutions and standards.** Sustainable housing and infrastructures involve multiple and different technologies that have not reached their maturity with many standards coexisting in the market. In order to develop net-zero houses and community buildings across local authorities, and between public and private sectors, there is a need for consistent standards and processes for planning.
- **Complex scalability under current governance schemes.** Scalability for transitioning to a net-zero economy is also limited by current legal and institutional structures. For investing at scale, there are challenges to overcome: including fragmented processes (e.g. planning, procurement, accountability) and multiple levels of governance and jurisdiction, which complicates coordination and decision making.
- **Uncertain future skills in tension with current industry needs.** Lack of clarity in terms of the skills gaps in green economy and climate change adaptation creates tension with the current industry needs in skills and capabilities. There is not yet a critical mass for training on green technologies as the demand for fossil fuel-based trades is still high.
- **Limitations in collaboration and coordination.** Development of infrastructure and housing is affected by limitations in collaboration and coordination across local authorities, sectors and other stakeholders. Under the City Region Deal, there is a need to strengthen collaboration between stakeholders.

Data-driven innovation and wider collaborative partnership approaches will provide a solution by helping community developers transition to green and smart skills in the construction industry. As the **Eco Houses project from West Lothian** shows (see *Example 1: Eco Houses for Sustainable Housing, Learning Infrastructure and Green Skills Development*),

partnerships between colleges, local authorities, universities and leading construction companies can help nurture green and smart skills development in the construction industry while promoting net-zero agenda. This activity needs to be expanded across the region and embedded as 'business-as-usual' practice in new construction activities.

A regional scaling up of the Edinburgh Home demonstrator, with Scottish Futures Trust and Scottish Government, and local authorities, landowners and developers could lead to a pipeline of such opportunities. In that context there are significant strategic sites across the area, including Blindwells in East Lothian, Shawfair in Midlothian, and Winchburgh and Calderwood in West Lothian.

Mobility and access to facilities and amenities

To respond to the need for **improved mobility and connectivity** across the three local authority areas, and to move beyond a 'collection of residential towns' and ensure a network of well-connected, mixed and more self-contained communities, **strategic partnerships** are imperative **to integrate smart mobility and access to services, facilities and amenities.** ^{45 46 47 48 49 50 51 52}

Existing challenges were identified as follows:

- **Limitations in inter-regional access and public transport options.** Using public transport to get across Lothian often involves passing through Edinburgh city centre. There are relatively few options of inter-regional public transport. Additionally, limited access to services in rural areas, public transport and roads can also represent important challenges.

45 East Lothian Council Plan 2017-2022

46 East Lothian Local Development Plan 2018

47 East Lothian Local Transport Strategy 2018 - 2024

48 Single Midlothian Plan 2022

49 Midlothian Economic Growth Strategy 2020 - 2025

50 Midlothian Action Programme 2017 (Update 2020)

51 West Lothian Local Development Plan 2018

52 West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)

- ➔ • **Gaps between rapid regional growth and transport offer.** Changes in transport depend on complex processes with multiple approvals from multiple entities. Consequently, there is a mismatch between offer and demand.
- **Limited visibility of places, activities and amenities across the Lothians.** Amenities, attractions and services are distributed unevenly across the Lothians. Consequently, the visibility of places has suffered, and this has particularly impacted the development of new attractions in rural areas.

One of the solutions to these challenges is real-time access to transport and traffic information and data by residents, visitors and transport providers. DDI-led solutions include examples such as the **Visit East Lothian App** (*Example 2: Integrating Smart Mobility and Access to Facilities and Amenities in an App*), which showcases how data-driven innovation – combining mobile technology, sensors and real-time data – can enable better mobility and management of tourist demand across the coastal areas.

Cross-sectoral high-tech sustainable circular economy

The net-zero agenda requires innovative solutions to **improve multi-sector synergies in sustainable, circular economy development**, to build resilience in the face of global challenges. Local support mechanisms are required to facilitate start-up and scale-up of enterprises to **nurture and retain local skills as well as attracting global talents to build entrepreneurial capabilities**.^{53 54 55 56 57 58 59 60}

However, we noted the following structural challenges:

- **Complex set of skills.** Working across sectors, and in high-tech fields requires a complex set of skills provision – in data science and other digital, technology and data-related roles, innovation, green economy, climate change adaptation, to mention a few. Understanding where the skills gaps are is crucial to ensure the correct provisioning.
- **Lack of accurate indicators and datasets.** For local economic development teams, cross-sectoral high-tech industries can be difficult to classify within current standards and categories. Local datasets on businesses are currently lacking, and national statistics in smaller areas tend to be inconsistent. This affects the data available for measuring impact and decision-making by local authorities, and possibly constrains their capacity to compare across social, economic, environmental and innovation activities and impacts.



53 East Lothian Council Plan 2017-2022

54 East Lothian Local Development Plan 2018

55 Development Plan Scheme N. 13 (2021)

56 Single Midlothian Plan 2022

57 Midlothian Economic Growth Strategy 2020 - 2025

58 Midlothian Action Programme 2017 (Update 2020)

59 West Lothian Local Development Plan 2018

60 West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)

- In terms of the DDI-led solutions, there are several examples. As illustrated in *Example 3: Promoting Cross-Sectoral Entrepreneurial Capabilities, Sustainable Economy and Retaining Talents*, the **Roslin Innovation Centre in Midlothian** demonstrates recent cross-sectoral entrepreneurship efforts that aim to attract and retain talent in the City Region. The start-up programme exemplifies data-driven innovation potential at the intersection of agriculture, food security and ecological sustainability.

Empowering creative and value-adding enterprises

In order to sustain local economic development, businesses, individuals and community groups need to build **innovation ecosystems, economic activity and opportunities for sustainable employment**, including empowering creative and high-value adding enterprises.^{61 62 63 64}

The following challenges are recognised by the key stakeholders in the Lothians:

- **Conditions for creative and value-adding enterprises are difficult to replicate beyond large urban areas.** Cities and urban areas are known to have attracted creative and value-adding initiatives and enterprises with a diversity of people, access to facilities, professional services and creative talents, and multiple social spaces beyond cities and urban centres. It is difficult to build such conditions organically, with limited incentives and resources to create, attract, develop and retain creative and value-adding businesses.
- **Gaps between rigid processes from local authorities and the diversity and risk of the industry.** There is a perceived gap between the diversity and dynamics of industry and policy communities. For instance, the creative industry requires flexibility and collaboration, with agile project-based approaches. Value-adding enterprises can require a long time to bring benefits. These conditions are in constant tension with policy cycles, parameters and restrictions from local authorities.⁶⁵

Efforts to build infrastructure ensuring access to services and transportation will attract further investment and talents. The impact of public-private partnerships and values of innovation ecosystems across supply chains cannot be overstated here. For instance, **The Food and Drink Hub and Edinburgh Innovation Park** (see *Example 4: Building Innovation Ecosystems with Public-Private Intermediaries*) illustrates a strategic development effort over time focused on key areas of current and future concern to the local economy and communities, which can build data skills and cohesive and innovative business environments.



61 East Lothian Local Development Plan 2018

62 Midlothian Economic Growth Strategy 2020 - 2025

63 West Lothian Local Development Plan 2018

64 West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)

65 Moreover, there is a perception from actors in the creative industry and arts and culture sector, of a limited attention and understanding from Local authorities of the dynamics and incentives of a sector that is diverse and wide in scope

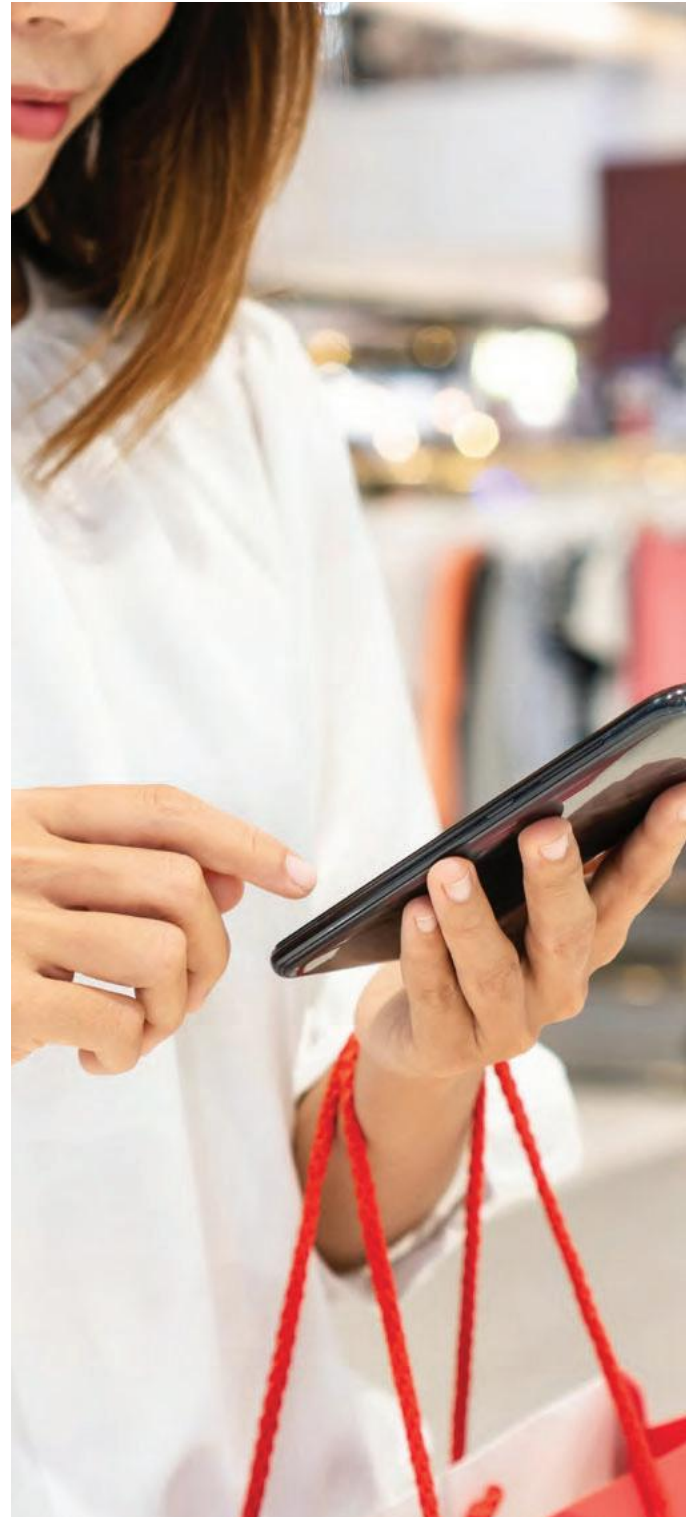
→ Regeneration and revitalisation of high streets and local businesses

Regeneration and revitalisation of high streets and local businesses is complex with a situation that limits the capacity to renew public engagement, and increase the participation and promotion of new ideas. Local authorities have been supporting small local businesses and citizens' needs by using integrated data to better respond to real-time demand for public services, for example. Such **services** could help regenerate local business activity and adapt to integrated trans-local retail and service economies.^{66 67 68 69 70 71 72 73}

Key challenges recognised by the stakeholders include:

- **New patterns of consumption.** Consumer and citizens' behaviours are changing due to growth in hybrid working and online shopping, with fewer people consuming and buying directly on the high streets. At the same time, transport and access issues can limit the flow of people in some areas.
- **Complex long-term coordination.** Revitalisation of high streets is a long-term cross-sectoral task that requires coordination of multiple and diverse stakeholders and agendas over an extended period. This complex coordination contrasts with shorter administrative periods, and changes and rotation of public officials.
- **Limitations in engagement and mobilisation.** Local authorities are limited in their capacity to engage and mobilise citizens' participation in these discussions, affecting the emergence of innovative ideas and new visions across different generations.
- **Lack of clarity of types of data for understanding changing citizens' behaviours.** Revitalisation requires research for planning with data. Although there are data repositories (e.g. demographics), there are inconsistencies and constraints.

DDI-led solutions include the use and better management of data which can help high street regeneration and business revitalisation. As can be seen in *Example 5: Open-Source Data for Revitalising the Local High Street*, open-access datasets can help co-design new solutions to high street regeneration with citizens, as demonstrated in **Dalkeith town centre in Midlothian**.



66 East Lothian Council Plan 2017-2022

67 East Lothian Local Development Plan 2018

68 East Lothian Development Plan Scheme N. 13 (2021)

69 Single Midlothian Plan 2022

70 Midlothian Economic Growth Strategy 2020 - 2025

71 Midlothian Action Programme 2017 (Update 2020)

72 West Lothian Local Development Plan 2018

73 West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)



➔ **Example 1: Eco Houses for Sustainable Housing, Learning Infrastructure and Green Skills Development**

The development of new skills and the application of standards are critical to the growth of sustainable infrastructure, but the application can be a complex and uncertain task. The development of new skills and the application of standards are critical to the growth of sustainable infrastructure. Together with the development of new skills for the labour market in the transition to a green economy, the Eco Houses will also be used for training West Lothian College staff as part of its Net-Zero Plan 2021-2026. For the construction of these Eco Houses, the college secured £493,000 from West Lothian Council, awarded from West Lothian's Place Based Investment Capital Grant 2021/22, through the Scottish Government's Place Based Investment Programme.

Example 2: Integrating Smart Mobility and Access to Facilities and Amenities in an App

Tourism is important for East Lothian, with its coastline, scenic attractions, golf courses and food and drink sector. However, though tourism is creating significant economic benefits, at the same time, it is also generating additional vehicle movements, car parking demand and pressure on the local environment, facilities and services, and the experience of residents and tourists. To tackle this, with the help of a team at the University of Edinburgh, an app was launched in the spring of 2022 combining mobile technology, sensors and real-time data. Sensors were allocated across 11 of the East Lothian Council's coastal car parks. The app links to the Visit East Lothian website and offers visitors, local people and services up-to-date, real-time information on the flows of tourists and traffic and access the wider destination offer, enabling informed choices and better mobility and management of demand across the coastal areas.



→ Example 3: Promoting Cross-Sectoral Entrepreneurial Capabilities, Sustainable Economy and Retaining Talents

Promotion of cross-sectoral capabilities relies, to an important extent, on the development of long-term alliances, skills and social infrastructure for innovation. For example, Midlothian Council has built a strategic collaboration with the Easter Bush Campus over a decade, the University of Edinburgh; which along with other partners, conforms to the Midlothian Science Zone. Such a partnership, focused on agritech and related technologies, encompasses local government organisations, science and business parks, research institutes and industry stakeholders. Another example of collaboration is the Food & Agriculture Science Transformer (FAST) programme, which was launched in 2020 by the University of Edinburgh. The initiative aims to provide scientists with opportunities to research, design and then start their own companies at the intersection of agriculture, food security and ecological sustainability. The programme is a collaboration between Deep Science Ventures and the University of Edinburgh and is supported by the University's Data-Driven Entrepreneurship programme.

Example 4: Building Innovation Ecosystems with Public-Private Intermediaries

The development of innovation ecosystems is strongly linked to the development of spaces, conditions and infrastructure, and novel public-private schemes to incentivise innovation. An example of this is the Food and Drink Hub and Edinburgh Innovation Park. Currently under construction in Craighall, East Lothian, this initiative is a joint venture between East Lothian Council and Queen Margaret University. Scottish Government's Place Based Investment Capital Fund. The Food and Drink Hub is closely aligned with Queen Margaret University's strengths and installed base in

food and drink-related innovation, health science and business management, within the context of health and wellbeing. The project also seeks to strengthen and support existing alliances that are part of the sector's supply chain, for example with Scotland's Rural College (SRUC) and the James Hutton Institute. The hub will also accommodate the facilities of the Scottish Centre for Food Development and Innovation.

Example 5: Open-Source Data for Revitalising the Local High Street

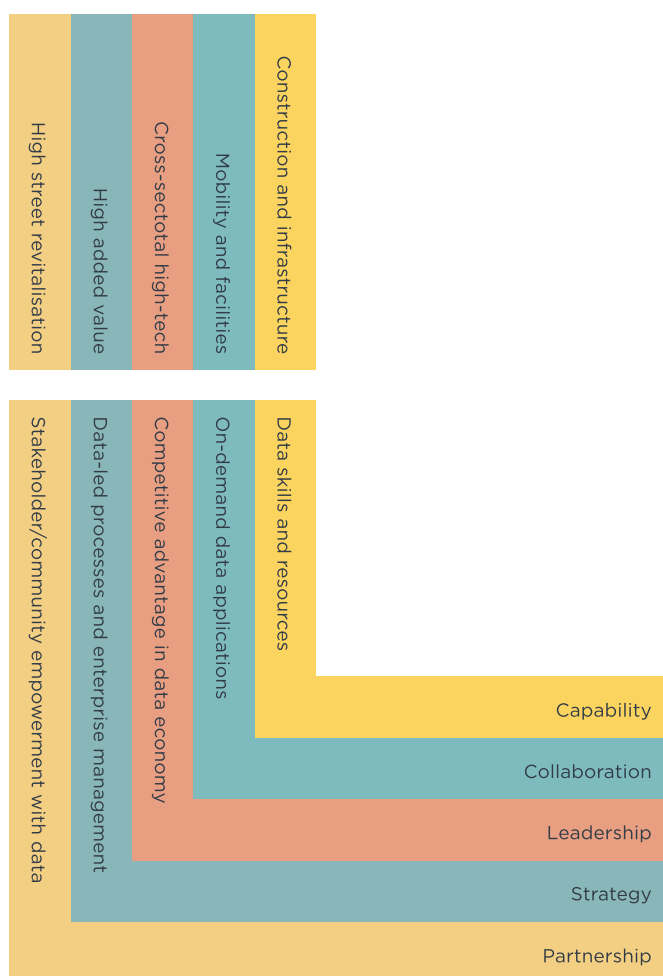
Local authorities face multiple challenges in supporting the revitalisation of high streets in the post-pandemic era. Challenges include the availability of data, the involvement of citizens and the quick testing and development of ideas. A small-scale project conducted in the high street of Dalkeith town centre in Midlothian, was an efficient platform for illuminating the impact of the pandemic on high streets and the changing nature of public life as experienced by pedestrians. Insights and findings seek to create open-source datasets that can be helpful to stakeholders and citizens, whilst providing a baseline of evidence. A combination of urban data, citizens' engagement, understanding of the contexts, and co-design with rapid prototyping allows a more complete perspective on the current state of the high streets and their uses. The project, part of the 'Future of the High Street' initiative, was funded by the Scottish Funding Council (SFC) and delivered by an interdisciplinary team of the Edinburgh Futures Institute and Edinburgh Living Lab in collaboration with the Data-Driven Innovation initiative and New Practice architects.

6. Recommendations – Building and Accelerating DDI Initiatives

We discussed five common themes as ‘**DDI Opportunity Areas**’, in which data-driven innovation activities could have the largest impact in the Lothians:

- **Construction of sustainable housing and infrastructure**
- **Mobility and access to facilities and amenities**
- **Cross-sectoral high-tech sustainable circular economy**
- **Empowering creative and value-adding enterprises**
- **Regeneration and revitalisation of high streets and local businesses.**

In order to capitalise on the benefits outlined above, we propose the following five intervention objectives: to build **Capability**, ensure **Collaboration**, develop **Leadership**, frame **Strategy** and facilitate **Partnership**.



One of the most optimal ways to deliver transformational change in this area and unlock further regional funding is through the **establishment of a Regional Economic Development Task Force that can initiate, develop and coordinate the delivery of activities** drawn from the data emerging from the new DDI’s Regional Intelligence Centre and funding unlocked under the RPF (see Box 1).

During the study, local authority participants emphasised the dearth of locally available data on demographics, particularly in small towns, and data on a variety of socio-economic dimensions, such as disability and other specific social needs. Local authorities would need data skills and resources to deploy technological solutions into local specific socio-economic conditions. The five case studies presented earlier exemplify good practices with existing networks and intermediaries that mobilise and manage resources and innovative activities. The critical missing link is the systematic application of these solutions across local authorities. We conclude this study by celebrating the new regional approaches and recommending the development of links and interactions between key stakeholders and local communities across the Lothians, and across the City Region. Starting from RPF-identified priorities, there is a need to identify regional projects (as opposed to dispersed/local ones, which currently dominate) and determine partners regionally. This would allow people, capital and future revenue to be leveraged on a regional scale.

Recommended priorities for enabling regional action

CAPABILITY: Build up internal DDI expertise across councils. Local authorities have already expressed both a need and desire for greater data skills. The current challenge is to address the expertise demands and resource constraints within the public sector to attract and retain a data-skilled workforce. The involvement of people delivering initiatives in high-level City Regions discussions can represent an opportunity not only to scale up, but to have regional projects with local impact. This can be implemented with better vertical integration of information sharing within the councils, as well as upskilling staff.



➔ **COLLABORATION: Ensure better sharing of data, information and knowledge in the City Region.** There is an opportunity to share good practices across the region. From such exchanges and interactions, there can also be opportunities not only towards horizontal cross-sectoral collaboration, but to change the narrative and shift focus from “the budget” to “outcomes”. It is important to note that in the longer-term such an exercise requires (shared) dedicated resources. Facilitating additional cross-council meetings could help with operational information sharing, whereas strategic workshops, forums and studies can help with agenda setting and alignment of interests of multiple and diverse stakeholders.

LEADERSHIP: Develop shared visions for regional development. Creating opportunities for pursuing joint regional actions towards a shared, long-term place-based vision for the Lothians will help create momentum among the diverse range of local stakeholders. Building on the work of the Regional Prosperity Framework’s Delivery Plan and Prospectus, the Lothians local authorities’ planning teams can integrate their vision for the region, and help create new and stronger partnerships across key sectors: e.g. transport, health, sustainability, high streets, creative/high value industry.

STRATEGY: Frame joined-up approach to strengthen development funding. Pressures on local authority funding require innovative approaches to local and regional development. Currently, development funding is fragmented on the level of local projects. A more joined-up approach is required in the context of the City Region Deal as well as other emerging regional development partnership and delivery models. This could include joint public procurement, community wealth building, involving key private stakeholders in local and regional development projects and collectively raising innovation funds.

PARTNERSHIP: Facilitate more direct collaboration between local authorities, industry and universities.

There is an opportunity for local authorities to tap into expertise, equipment and skills at the universities to engage and solve local problems. This can be done through mechanisms such as secondments, student (Masters) projects, participation of local authorities in research funding applications, but critically, it has to be demand-driven (following the CivTech 7 Challenge model⁷⁴) and supported by central project management and/or matching services (e.g. Research Data Scotland, Interface, etc.).⁷⁵



⁷⁴ <https://www.civtech.scot/civtech-7-challenges>

⁷⁵ Good practices are found in sector-based consortia – jointly led by public and private actors (e.g. Construction Innovation Centre, Knowledge Transfer Networks)

BOX 1: ESES REGIONAL ECONOMIC DEVELOPMENT TASK FORCE

Under the Regional Prosperity Framework's (RPF) Delivery Plan and Prospectus it is proposed that further work in framing, scoping and developing the above areas are supported by the **Regional Intelligence Centre**, based within the Data-Driven Innovation programme work across the City Region (including in this and related reports). However, as Robert Carr (Regional Enterprise Council), one of the RPF Delivery Plan and Prospectus co-authors, noted: "As the Framework process now moves from design, the team is wrestling with how the pace of delivery can be accelerated."

It is recognised widely that in order to deliver on the insights emerging from these efforts there is a need to regionally pool together the required capabilities and expand the cross-council collaboration in the utilisation of this resource and exploitation of emerging opportunities.

The councils could **set up a joint (ESES) Regional Economic Development Task Force**, led by a **dedicated regional manager/director** with an appropriate level of seniority to effect change. The core team could be seconded from existing council staff. In addition to this core team, staff members with particular expertise can be pulled into working groups and projects on an ad hoc basis, as needed. This should include the City of Edinburgh, as well as Fife and Scottish Borders Councils.

This standing group could be **leading stakeholder engagement, data collection and analysis, development of joined-up strategies**

and applications for funding. Following the identified challenges and the recommended priorities this group could:

- **Co-develop a central information database/exchange (within the Regional Intelligence Centre) and lead upskilling programmes of colleagues across the councils and in communities.**
- **Facilitate cross-council meetings to determine shared priorities, share best practice and evidence opportunities and challenges.**
- **Prepare strategic visioning documents and socialise them with internal (council) and external stakeholders.**
- **Lead funding bids, administer development funding and steer strategic cross-council procurement.**
- **Provide project and partnership management in key strategic areas.**

These interventions would serve to unlock new funding and resources across a number of programmes, from the Regional Prosperity Framework, to the City Region Deal, as well as other public and private funding and investment. Through liaison with key development agencies, especially Scottish Enterprise, Scottish Development International and intermediaries such as the Interface and the Innovation Hubs and Centres, this **joined-up approach could also pave the way for new economic and development policies at a national level.**

7. Appendices

Appendix 1 – Data Sources

Primary Data Sources and Informants

- East Lothian Council
- Midlothian Council
- West Lothian Council
- Edinburgh & South East Scotland City Region Deal
- West Lothian College
- Edinburgh College
- Edinburgh Innovation Park

Others

- Heriot-Watt University (Graduate Apprenticeships Programme)
- Historic Environment Scotland
- NHS Lothian
- Interface
- Traveltech

University of Edinburgh

- DDI Programme team
- Data-Driven Innovation Hubs (Easter Bush, Bayes Centre, Usher Institute, Edinburgh Futures Institute)
- The Roslin Institute and the Royal (Dick) School of Veterinary Studies
- Institute for Education, Community and Society, at the Moray House School of Education and Sport
- Information Services Group

Secondary Data Sources

Information sources on Lothian includes:

- East Lothian Local Development Plan 2018
- East Lothian Development Plan Scheme No. 13 (2021)
- East Lothian Housing Strategy 2018-2023
- Single Midlothian Plan 2022
- Midlothian Economic Growth Strategy 2020-2025
- West Lothian Local Development Plan 2018
- West Lothian Economic Recovery and Growth Plan 2020-2023. West Lothian Jobs Task Force (Version 2.0)
- Linlithgow: A Plan for the Future 2020-2035
- Fame Database
- Scottish Index of Multiple Deprivation



→ Appendix 2 – Supplemental materials and sources for examples

Example 1: Eco Houses for Sustainable Housing Learning Infrastructure and Green Skills Development

Colleges face challenges in the response to current and future labour demands in core capabilities in data science, and the transition to a green economy. As a response to this, West Lothian College is implementing changes to the curriculum together with a five-year plan to refurbish the campus and its facilities.⁷⁶ Such plans aim to have a more up-to-date approach towards the development of digital/data-related and green economy abilities as critical core skills, to address current and forecasted skills gaps, and to ensure validity and responsiveness to changes in the region in demographic, environmental and technological issues.⁷⁷

Beyond the West Lothian Regional Skills Assessment, the College maintains links and regular engagement with different entities to obtain labour market information (for example the Federation of Small Businesses, the local Chamber of Commerce and industry bodies, West Lothian Economic Recovery Group and West Lothian Council). Likewise, the college designs courses in conjunction with employers to address skills gaps in industry sectors. A critical challenge, however, is how to reconcile labour demands that seek skills for the most immediate challenges, versus preparation for those longer-term challenges, whose skills may not yet be as much in demand.

An example can be found in sustainable construction. Without the required incentives, the transition to a green economy can be a slow and long-term process. However, if we take house construction as a reference, the greatest demands for capacities are not yet necessarily in sustainable houses or smart construction, since the market in this area is moving slowly. Sustainable houses are not a mature market yet, and construction costs, gaps in new construction skills, and scalability are still critical challenges.

This tension between current and future capacities implies that the course curriculum must have a balance of capacities, with a view to generating increased expertise and awareness in new topics, without ceasing to address current issues. Another important challenge

colleges face is how to translate into concrete actions the teaching of skills that may still be diffuse, or even not yet seen on the horizon. West Lothian College, for example, has begun to address this dilemma by betting on the demonstration effect of two Eco Houses being built on campus.

The Eco Houses is a new project that will be part of an environmental construction training facility on West Lothian College campus, a new training centre to deliver sustainable construction skills.⁷⁸ These Eco Houses will be a proof-of-concept, designed to be skilled centres for passive housing and modern construction skills. Such houses will not only be demonstrative but active learning centres and will have the conditions and the kit to develop and put into practice the required skills for sustainable and smart housing construction.

These houses will have two styles: one will be built traditionally, and the other will be built with sustainability standards and criteria with renewable energy sources to achieve zero-carbon capability. The design of each house will allow training in two fundamental areas: reduction of carbon emissions of existing houses; and using new construction techniques and low carbon technologies in new builds. In the design and development of these houses and the preparation of courses and activities of learning, West Lothian College has engaged with a range of suppliers and partners of the industry in the region and other partners such as universities. This gives indications of a process of collaboration and co-creation to respond to new challenges.



Figure 13 – Eco/passive house schema. Source: <https://fontanarchitecture.com/sustainable-house-design-21-ideas/>

⁷⁶ <https://www.west-lothian.ac.uk/media/5091/papers-from-lt-committee-24-november-2021.pdf>

⁷⁷ <https://www.west-lothian.ac.uk/media/5217/west-lothian-outcome-agreement-2021-22.pdf>

⁷⁸ <https://www.west-lothian.ac.uk/media/5217/west-lothian-outcome-agreement-2021-22.pdf>

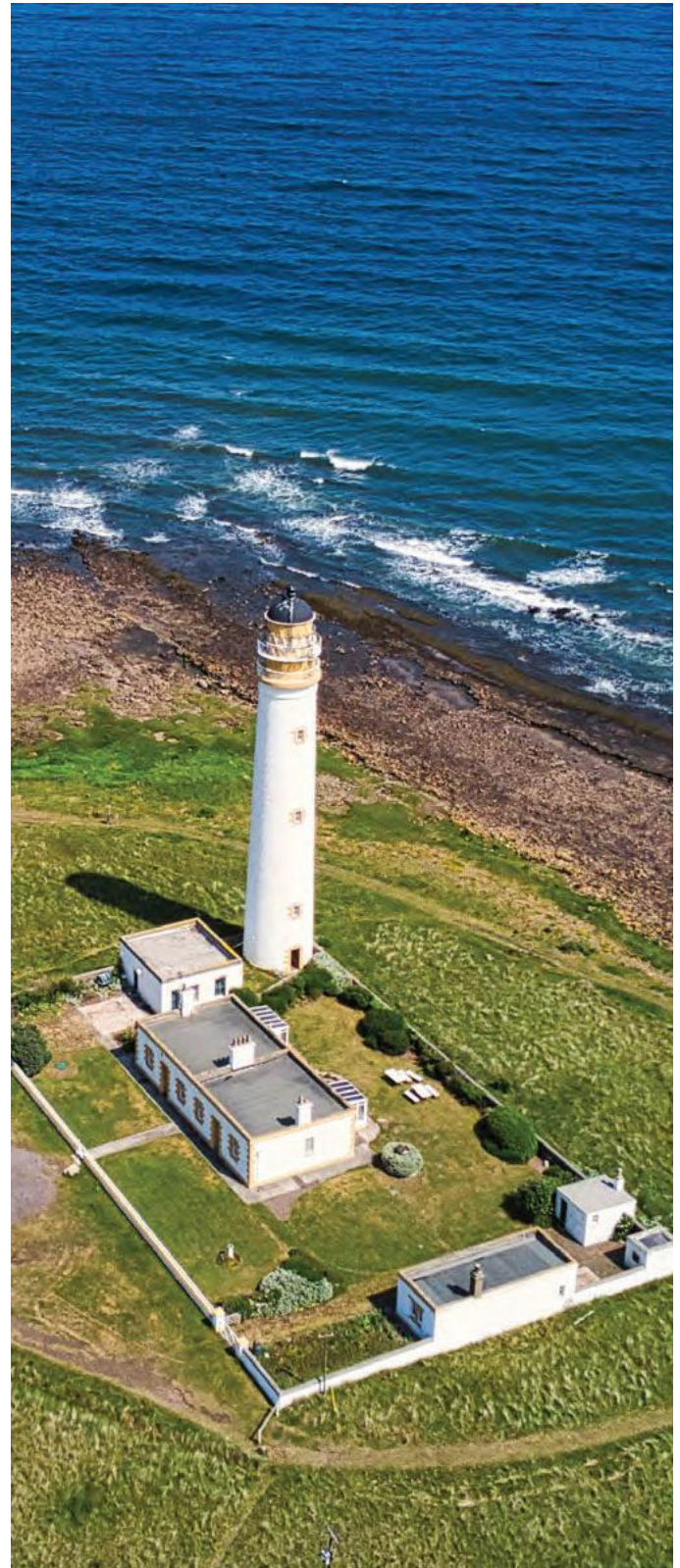
- Together with the development of new skills for the labour market in the transition to a green economy, the Eco Houses will also be used for training West Lothian College staff as part of moving forward its Net Zero Plan 2021-2026.⁷⁹ Scotland's colleges are committed to achieving net zero by 2040, to take urgent action to help reduce or halt climate change.

For the construction of these Eco Houses, the college secured, in late 2021, £493,000 from West Lothian Council, awarded from West Lothian Place Based Investment Capital Grant 2021/22, through the Scottish Government's Place Based Investment Capital Fund. According to the decision by the West Lothian Council Executive, the project complies with the criteria of plural ownership of the economy; making financial power work for local places; fair employment and just labour markets; progressive procurement of goods and services; and socially productive use of land and property.

Example 2: Integrating Smart Mobility and Access to Facilities and Amenities in an App

East Lothian is characterised by its coastal spots, and many of them can be very busy at certain times of the year. In some places, roads and accesses through the coastline can be easily saturated by cars and other vehicles. Such a situation can put stress on the local environment, facilities and services, affecting the quality of life of local people and the experience of the tourists. At the same time, some other places within the region could have much less visitation, which represents a lost opportunity for tourists and local businesses.

As part of the approach to offer a solution to this situation, EDINA and the IoT innovation teams at the University of Edinburgh developed and launched (spring 2022) an app that combines mobile technology, sensors, and real-time data. Such novel infrastructure offers visitors, local people and services up-to-date information on the flows of tourists across the region, so they can know how busy an area is at a certain moment. The expectation is that by having this type of information, tourists can be more informed about their journeys and encouraged to explore other areas across the region and potentially consume in different localities. This is a dynamic that has the potential to incentivise better mobility and distribution of tourists across the region's coastal area.



⁷⁹ <https://www.west-lothian.ac.uk/media/4995/net-zero-plan-2021-26-final.pdf>

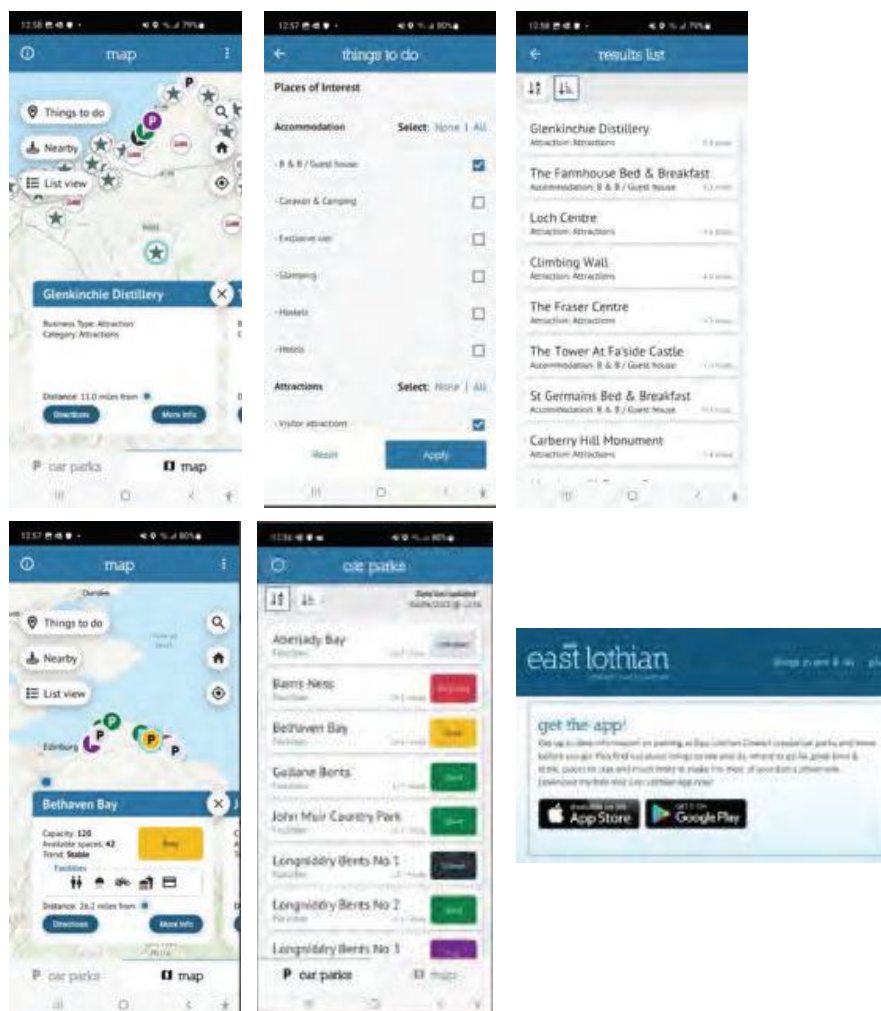
→ How does the infrastructure work?

- **Sensors collecting data in strategic locations:**
Sensors allocated across the East Lothian Council's 11 coastal car parks collect real-time information about the busyness of each place. This information is used as a proxy of visitation for a determined coastal spot.⁸⁰
- **Data is automatically processed:** In real-time, collected data is automatically processed. Processed data becomes input for the app.
- **App:** The user interacts with the app. The app has a user-friendly interface that works with a simple traffic light system (green means quiet, amber means getting busy and red means very busy), to inform users which areas are busy, and which are not.

Complementary services

Using technology like a geo-located advertisement, the system can also collect similar information about local places to eat, drink, and sleep⁸¹ and share it through the same app⁸², providing a more regional vision and visibility of places.

The project is at the forefront of Scotland's Traveltech work enabling the use of technology in the tourism and hospitality industry.⁸³ The project is funded by the East Lothian Council's business recovery investment funding for 2021-2022 and is part of the data-driven initiatives at the University of Edinburgh.



80 <https://www.eastlothiancourier.com/news/2017614.new-visit-east-lothian-app-help-visitors-find-less-busy-spots-coast/>

81 https://www.eastlothian.gov.uk/news/article/13828/new_visit_east_lothian_app

82 <https://www.scotsman.com/news/opinion/columnists/scotlands-traveltech-industry-can-revolutionise-trips-to-the-seaside-and-speed-the-covid-recovery-joshua-ryan-saha-3419821>

83 https://www.eastlothian.gov.uk/news/article/13828/new_visit_east_lothian_app

→ Example 3: Promoting Cross-Sectoral Entrepreneurial Capabilities, Sustainable Economy and Retaining Talents

Midlothian Council has built more than a decade's strategic collaborative relationship with the Easter Bush Campus and the University of Edinburgh, which, along with other partners, consists of Midlothian Science Zone focused in the fields of animal health, human health, agritech and related technologies. The partnership encompasses Local Government organisations (Midlothian Council, Business Gateway Midlothian, Locate in Midlothian), Science and Business Parks (e.g., Pentlands Science Park, Roslin Innovation Centre, Edinburgh Technopole, BioCampus), Research Institutes (Roslin Institute, Moredun Research Institute, SRUC) and Industry Stakeholders. The Roslin Innovation Centre (RIC) was opened in 2017 as a business gateway focused on knowledge exchange and commercialisation at the Easter Bush Campus.⁸⁴

For instance, the University of Edinburgh launched the Food & Agriculture Science Transformer (FAST) programme in 2020.⁸⁵ The programme aims to provide scientists with opportunities to research, design and then start their own companies at the intersection of agriculture, food security and ecological sustainability. The programme is a collaboration between Deep Science Ventures and the University of Edinburgh, and is supported by the University's Data-Driven Entrepreneurship programme. The FAST venture studio will help deliver the ESES-CRD Agritech ambitions and Data-Driven Innovation entrepreneurship goals. The programme aims to attract entrepreneurial founder talent to Scotland, by providing the opportunity to locate a start-up company in the RIC. One of the recent start-ups from the FAST programme includes Rhizocore Technologies which offers a sustainable solution to accelerate woodland regeneration, improve forest productivity and increase natural capital benefits. Headquartered at RIC in Edinburgh, the company secured a series of equity investments throughout 2022.⁸⁶



Figure 15 - Opening of Easter Bush Innovation Hub.
Source: https://www.heraldsotland.com/business_hq/20036219.rhizocore-technologies-creates-jobs-edinburgh/



Figure 16 - Living Agri-tech Laboratory in Midlothian.
Source: <https://www.rhizocore.com/>

⁸⁴ <https://www.roslininnovationcentre.com/>

⁸⁵ <https://www.roslininnovationcentre.com/food-agriculture-science-transformer-fast#:~:text=The%20FAST%20programme%20brings%20together,veterinary%20biosciences%2C%20biotechnology%20and%20agriculture>

⁸⁶ <https://www.rhizocore.com/>

→ Example 4: Building Innovation Ecosystems with Public-Private Intermediaries ⁸⁷

The Food and Drink Hub and Edinburgh Innovation Park is a research, new skills, innovation, and entrepreneurship development that is currently under construction in Craighall, East Lothian. Located on the outskirts of Queen Margaret University, this project is a joint venture between East Lothian Council and Queen Margaret University. The project began construction in 2021 and is expected to be operational by 2025.

The Food and Drink Hub is closely aligned with Queen Margaret University's strengths and installed base in food and drink related innovation, health science, and business management, within the context of health and wellbeing. It is estimated that by 2030, the food and drink industry in Scotland will double to £30 million. The industry currently employs more than 119,000 people, and over the next decade more than 27,000 new jobs will be needed. The hub was conceptualised to enhance the development of skills and research in the food and drink sector,⁸⁸ and offer a response to the demands of a sector that has gained importance in global trends, due to challenges such as climate change, health and nutrition, sustainability and an ageing population, to mention a few.

Ecosystem and complementarities

It is expected that when the Hub is operational, it will complement and support Queen Margaret University in the development of new skills pathways, such as data science skills, both in research and teaching. The project also seeks to strengthen and support existing alliances with other centres that are part of the sector's supply chain, for example with Scotland's Rural College (SRUC) and the James Hutton Institute. The Hub will also accommodate the facilities of the Scottish Centre for Food Development and Innovation, a partner with extensive experience in the sector, which will play an important role as a platform for the launch of new products.

This project will also be an anchor development for Edinburgh Innovation Park, a new science and technology park. Edinburgh Innovation Park will be developed in different stages, and together with the Hub and Queen Margaret University will provide a platform for the development of innovative business ideas (including but not exclusively those in the food and drink sector that support the diversification and added value of the industry, e.g. genomics in the food and drink sector). The impact of the Edinburgh Innovation Park is expected to transcend the region and become a centre that promotes the exchange of ideas, innovation and the development of new business models.⁸⁹



Figure 17 – Visualisation of Edinburgh Innovation Park.
Source: <https://www.edinburghinnovationpark.co.uk/>

⁸⁷ <https://www.qmu.ac.uk/news-and-events/news/2022/20220225-food-drink-innovation-hub-plans-progressing/>

⁸⁸ https://www.eastlothian.gov.uk/news/article/13586/40m_city_deal_funding_unlocked

⁸⁹ https://www.eastlothian.gov.uk/news/article/13586/40m_city_deal_funding_unlocked

→ Infrastructure and transport

The scale of the project also entails changes in infrastructure. In terms of connectivity, the project includes the construction of a new junction that will provide connectivity and direct access with the A1, and a travel corridor through the development, as well as strengthening existing public transport. The project also contemplates the construction of 1,500 houses, a new primary school and community facilities such as a community centre.

Investment and inflation risk

The project represents a multimillion-pound investment. East Lothian Council and Queen Margaret University have secured funding of £30 million (£28.5 million from the UK Government and £1.4 million from the Scottish Government). Additionally, East Lothian Council has provided a capital contribution of £10 million (£6 million for the construction of the Hub and £4 million for the acquisition of the land).⁹⁰ Although funding has been secured, increased inflationary pressures are increasing project costs,⁹¹ which represents a significant challenge at this early stage of the project.

Example 5: Open-Source Data for Revitalising the Local High Street

Among the challenges faced by public leaders in charge of local economic development, is not only how to justify plans related to new ideas or projects, the attraction of investment, or economic reactivation, which can be a task that can take a long time but, also, how to quickly obtain and pilot inputs for the generation of these ideas. In part, the need to have data or evidence to support such plans or ideas can often affect or even paralyse the implementation of specific actions. An important part of the data and evidence that is needed many times is linked to the understanding of citizens' dynamics and their interaction with the environment.

In many cities and towns, urban centres and high streets have been subject to great challenges. From being the main point of commercial, social and cultural activity of

the towns, to a growing deterioration in its offer, infrastructure, and attractiveness. Changes in consumer behaviour (like online shopping), and the restrictions caused by the pandemic have accentuated many of these challenges and created new ones.

Public Life Study and Co-Design

In that sense, in the first half of 2021, a small-scale project was conducted in the high street of Dalkeith town centre,⁹² as part of a larger project looking at the impact of the pandemic on high streets. Among the purposes of the project was to obtain a better understanding of the challenges and opportunities of the high streets, and to provide a baseline understanding of public life and how the high street was being used by pedestrians, as an input to promote the regeneration of the high streets after COVID-19. The project, part of the 'Future of the High Street' initiative, was funded by the Scottish Funding Council and delivered by an interdisciplinary team of the Edinburgh Futures Institute and Edinburgh Living Lab in collaboration with the Data-Driven Innovation Initiative and New Practice architects.

The project's methodology was designed as an iterative process of collaborative learning and dialogue with local community members from Dalkeith, as well as public space practitioners from across Scotland and the UK. Insights and findings seek to create open-source datasets that can be helpful to stakeholders and citizens, whilst providing a baseline of evidence and references.

In the case of this project, a combination of urban data, citizens' engagement, understanding of the contexts, and co-design with rapid prototyping allowed a more complete perspective on the current state of the high streets, their uses, and possible improvement scenarios in the changing context of COVID-19 restrictions. The holistic approach of this Public Life Study included footfall, stationary activity, dwell time, tracing studies, business activity, overall place quality, and user experience interviews, surveys, short films, co-design workshops, and prototypes.⁹³

⁹⁰ <https://democracy.edinburgh.gov.uk/documents/s46793/6.2%20Edinburgh%20Innovation%20Hub%20East%20Lothian%20Council-Queen%20Margaret%20University%20VAT%20Reinvestment.pdf>

⁹¹ <https://democracy.edinburgh.gov.uk/documents/s46793/6.2%20Edinburgh%20Innovation%20Hub%20East%20Lothian%20Council-Queen%20Margaret%20University%20VAT%20Reinvestment.pdf>

⁹² "The Future of the High Street". The University of Edinburgh. July 2021

⁹³ https://issuu.com/hellojennyyelliott/docs/210723_future_of_the_high_street_final_report_indi



→ Knowledge exchange

To build a professional community of interest, share best practices and learnings, forge connections and relationships, and discuss and ask for inputs on the project process, the project was supported by an advisory board that included representatives of organisations across Scotland, including the Scottish Government and Connected Places Catapult to UK

High Streets Task Force, Midlothian Council, and other practitioners and leaders, e.g., Calvium, CoLab, Dudley and Scotland's Towns Partnership. This type of project aims to serve as a baseline of evidence and ideas, and as a space for stakeholders to develop shared criteria for a successful public space through the exchange, deliberation, and debate. The project was led by University of Edinburgh researcher Jenny Elliot.



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