

## Notice of meeting and agenda

### **Edinburgh and South East Scotland City Region Deal Joint Committee**

**10.00 am Friday, 5th March, 2021**

Virtual Meeting - via Microsoft Teams

This is a public meeting and members of the public are welcome to watch the live webcast.

#### **Contacts**

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## **1. Order of Business**

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- 1.1** Including any notices of motion and any other items of business submitted as urgent for consideration at the meeting.

## **2. Declaration of Interests**

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- 2.1** Members should declare any financial and non-financial interests they have in the items of business for consideration, identifying the relevant agenda item and the nature of their interest.

## **3. Previous Minutes**

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- 3.1** Minute of the Edinburgh and South East Scotland City Region Deal Joint Committee of 4 December 2020 – submitted for approval as a correct record 7 - 12

## **4. Forward Planning**

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- 4.1** Joint Committee Work Programme – report by Steve Grimmond, Chief Officer, Edinburgh and South East Scotland City Region Deal 13 - 16
- 4.2** Joint Committee Rolling Actions Log

## **5. Items for Consideration**

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<b>5.1</b>	City Region Deal Progress Report – report by Steve Grimmond, Chief Officer, Edinburgh and South East Scotland City Region Deal	17 - 32
<b>5.2</b>	Revision of Terms of Reference for Elected Member Oversight Committee – report by Steve Grimmond, Chief Officer, Edinburgh and South East Scotland City Region Deal	33 - 38
<b>5.3</b>	Easter Bush Business Case – report by Professor Johnathon Seckl, Senior Responsible Officer, Data Driven Innovation Delivery Board and Derek Oliver, Senior Responsible Officer, Transport Appraisal Board, Edinburgh and South East Scotland City Region Deal	39 - 174
<b>5.4</b>	Fife Industrial Innovation Investment Programme – ESESCR Deal – Full Business Case for Tranche 2 – report by Keith Winter, Executive Director Enterprise and Environment, Fife Council	175 - 246
<b>5.5</b>	ESESCR Deal Transport Appraisal Board bid into the Bus Partnership Fund – report by Dr Grace Vickers, Chair, ESESCR Deal Transport Appraisal Board	247 - 254

## **Gavin King**

Clerk

## **Membership**

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**The City of Edinburgh Council**

Councillor Adam McVey

**Scottish Borders Council**

Councillor Shona Haslam

**East Lothian Council**

Councillor Norman Hampshire

**West Lothian Council**

Councillor Lawrence Fitzpatrick

**Fife Council**

Councillor David Alexander

Councillor David Ross

**Higher/Further Education Consortium**

Professor Peter Mathieson

**Midlothian Council**

Councillor Russell Imrie

**Regional Enterprise Council**

Leeann Dempster

Claire Pattullo

## **Further information**

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If you have any questions about the agenda or meeting arrangements, please contact Veronica MacMillan, City of Edinburgh Council, Business Centre 2.1, Waverley Court, 4 East Market Street, Edinburgh EH8 8BG, Tel 0131 529 4283, email [veronica.macmillan@edinburgh.gov.uk](mailto:veronica.macmillan@edinburgh.gov.uk).

The agenda, minutes and public reports for this meeting can be viewed online by going to <https://democracy.edinburgh.gov.uk>.

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## Minutes

### **Edinburgh and South East Scotland City Region Deal Joint Committee**

#### **Microsoft Teams**

**10.00am, Friday 4 December 2020**

#### **Present:**

**City of Edinburgh Council** – Councillor Adam McVey)

**East Lothian Council** – Councillor Norman Hampshire (In the Chair)

**Fife Council** – Councillor David Alexander, Councillor David Ross

**Midlothian Council** – Councillor Russell Imrie

**Scottish Borders Council** – Councillor Shona Haslam

**Higher/Further Education Consortium** – Professor Peter Mathieson

**Regional Enterprise Council** – Claire Pattullo

#### **In attendance:**

Andrew Kerr, Chief Executive, City of Edinburgh Council

Steve Grimmond, Chief Executive, Fife Council

Monica Patterson, Chief Executive, East Lothian Council

Dr Grace Vickers, Chief Executive, Midlothian Council

Andy Nichol, City Region Deal Programme Manager, City of Edinburgh Council

Graeme Rigg, City Region Deal PMO, City of Edinburgh Council

Rob Dickson, Executive Director, Scottish Borders Council

Adam Dunkerley, Opportunities Fife Partnership Manager, Fife Council

Steve Grimmond,

David Hanna, City Region Deal PMO, City of Edinburgh Council

Lisa Howden, Trainee Accountant, City of Edinburgh Council

Veronica MacMillan, Committee Services, City of Edinburgh Council

Morag Millar, Strategic Growth and City Deals Programme Manager, Fife Council

Alice Mitchell, Economic Development and Regeneration Manager, West Lothian Council

Craig McCorriston, Head of Planning, Economic Development and Regeneration,  
West Lothian Council  
Derek Oliver, Chief Officer, Place, Midlothian Council

Alison Irvine, Director of Transport Strategy and Analysis, Transport Scotland  
Amy Phillips, Head of ITS Operations, Transport Scotland  
Jarmo Eskelinen, Executive Director, Data Driven Innovation Programme  
Ritchie Somerville, Head of Strategy, Data Driven Innovation Programme

## **1. Minutes**

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### **Decision**

To approve the minute of the Edinburgh and South East Scotland City Region Deal Joint Committee 4 September 2020 as a correct record.

## **2. Work Programme**

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The Work Programme was presented and detailed the planned dates for the City Region Deal business case approvals by Joint Committee.

### **Decision**

- 1) To note the Work Programme.
- 2) To note that an additional Joint Committee could be required to approve the Easter Bush and the Edinburgh Innovation Park (Queen Margaret University) business cases either in February 2021 or later in March 2021.

(Reference – Work Programme, submitted.)

## **3. Sheriffhall Update**

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A verbal update was provided by Alison Irvine from Transport Scotland on the progress that had been made with the Sheriffhall project.

The public transport and active travel review was now being finalised following the workshop that was held with partners. The review would be made available on the Transport Scotland website. Further feedback was expected from City of Edinburgh Council.

The project team were working on objection responses with a view to issuing them early in 2021. Transport Scotland offered to provide an update on this at a future meeting of the Joint Committee. Given the scale and the nature of the objections, Transport Scotland advised that it was unlikely that all of the objections would be able to be resolved. Transport Scotland would take a view for starting a public local



enquiry in the Spring of 2021 after all the objection responses had been received. A public local enquiry may be possible late in 2021.

### **Decision**

To note the update.

(Reference – verbal update by Transport Scotland, submitted.)

## **4. City Region Deal Progress Report**

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Andy Nichol began by paying tribute to Henna Khatoon Accountant for the City Deal's Accountable Body function, who had sadly passed away. Mr Nichol recognised the valuable role and the central contribution that Henna had made to the City Region Deal. Henna was dedicated, insightful, tenacious and brave and it was a privilege to have worked with her. She was a valued member of the Programme Management Office and had established strong relationships with the project leads throughout the Deal and that in turn had helped to ensure that the Deal's financial management had been recognised and appreciated by Scottish Government and UK Government colleagues.

Details were provided on progress across all aspects of the City Region Deal. The progress report was updated and shared with Government on a weekly basis and taken to all Board meetings.

A RAG (Red, Amber, Green) scale was assigned to programmes and projects by the Programme Management Office (PMO), as well as scores for inclusive growth and partnership working.

### **Decision**

- 1) To note the sad passing of Henna Khatoon, Accountant for the City Deal's Accountable Body and to recognise the valuable role and the central contribution that Henna had made to the City Region Deal.
- 2) To note the progress across the City Region Deal Programme.
- 3) To note that Lisa Howden had joined the Programme Management Office to provide accountancy support to the City Region Deal.

(Reference – report by the Chief Officer, Edinburgh and South East Scotland City Region Deal, submitted.)

## **5. Integrated Regional Employability and Skills (IRES) Update - Presentation**

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The Joint Committee considered a presentation by Adam Dunkerley that provided an update on Integrated Regional Employability and Skills.

The IRES programme was working towards five pillars to make the project happen:

- Pillar 1 - Regional Leadership and Improvement Capacity
- Pillar 2 – Understanding Need and Opportunity
- Pillar 3 – Building Strong Employer and Citizen Relationships
- Pillar 4 – Targeted Skills Development
- Pillar 5 – Active Opportunity Matching

The Employability pipeline was an enhanced skills pipeline and aimed to encourage inclusive growth and movement into higher paid, higher skilled jobs. In terms of performance, the IRES was strongest in terms of the governance structure and strategic direction, and in the collaboration with colleagues and partners, especially within the Higher Education and Further Education sector.

The IRES team had developed and commenced all business cases that were part of the programme, especially during such a disruptive year due to Covid-19. The project had given the opportunity to look at projects beyond our reach such as the Health and Social Skills Gateway. The project was in a good position to support economic recovery and help businesses to bounce back. Tourism and Hospitality would be looked at specifically when restrictions started to be lifted. The impacts of Brexit and Covid-19 would be looked at going forward.

A spend was currently projected of £2.98m which was an underspend of the allocated £3m. Colleagues were currently working with project leads to see how they could get the spend back up to £3m. The delays were due to Covid-19 and having to revise the activity to make it adaptable so that something could be delivered within this financial year.

The Inclusive Reach and Early Growth project was designed to promote career opportunities and jobs to young people. New Trades and Short Courses were being promoted within the construction industry. Various other programmes were underway.

Various activities were underway as part of Integrated Employer engagement.

### **Decision**

To note the Integrated Employability and Skills update presentation.

(Reference – presentation, Integrated Employability and Skills, submitted.)

## **6. Data Driven Innovation Programme Update - Presentation**

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Professor Peter Mathieson provided an update on the Data Driven Innovation Programme.

Professor Mathieson paid tribute to Henna Khatoon, Accountant to the Accountable Body for the City Region Deal who had sadly passed away.

There were concerns about the affordability of the Easter Bush business case but there was work going on to address these concerns.

The DDI Programme was delivering ahead of schedule and delivering targets. The outcome measures that the DDI project were looking to report against the key elements of the project were jobs created or sustained, inclusive growth and regional investment. There had been nearly £160m of capital investment to date and £97m of that had already been drawn down. So far, there had been £82m of programme investment which was 26% ahead of the target.

Construction was significantly impacted by Covid-19 and construction work had to be suspended and the slowed down after resumption. Despite that there had been major progress on the work on buildings.

There were various data sharing agreements in development with people involved in programme initiatives. The programme was able to adapt to the online environment created as a result of Covid-19.

DDI research activities had attracted £238m of funding which was positive for the programme.

### **Decision**

To note the presentation.

(Reference – presentation by the Data Driven Innovation Programme, submitted).

## **7. City Region Deal Benefits Realisation Plan – Approach Towards Developing an Implementation Plan**

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The City Region Deal Benefits Realisation Plan was approved by the Joint Committee on 4 September 2020 and set out the overarching approach to reviewing and evaluating benefits.

The Joint Committee considered a report that set out an approach towards developing an implementation plan and sought views from the Joint Committee as part of a wide consultation. The finalised implementation plan would be submitted to the Joint Committee for approval in March 2021.

### **Decision**

- 1) To note the proposed approach towards developing an Implementation Plan for the Benefits Realisation Plan.
- 2) To agree that any comments would be fed back to the City Region Deal Programme Management Office (PMO).

(Reference – report by the Chief Officer, Edinburgh and South East Scotland City Region Deal, submitted.)

## **8. Regional Growth Framework Update**

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An update was provided on the development of the Edinburgh and South East Scotland Regional Growth Framework (RGF) that included a general update since progress was last reported to the Joint Committee; initial proposals in terms of the focus on the of the RGF; and the proposed timescale to produce the RGF.

### **Decision**

- 1) To note the progress to date on the development of the Regional Growth Framework.
- 2) To endorse the proposed vision and themes which would guide the focus of the RGF.
- 3) To note the proposed timescale to produce the RGF, including the timeframe for wider consultation.

(Reference – report by the Chief Officer, Edinburgh and South East Scotland City Region Deal, submitted.)

## Edinburgh and South East Scotland City Region Deal Joint Committee

**10 am, Friday 5 March 2021**

### **Work Programme for City Region Deal Joint Committee**

**Item number 4.1**

#### **Executive Summary**

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This paper outlines the planned dates for City Region Deal business case approvals by Joint Committee.

#### **Steve Grimmond**

Chief Officer, Edinburgh and South East Scotland City Region Deal

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## Work Programme for City Region Deal Joint Committee

### 1. Recommendations

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- 1.1 To note the planned dates for future business for the City Region Deal Joint Committee.

### 2. Background

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- 2.1 The City Region Deal partners and Government are working towards business case approval timelines, as set out in this report. This matches with the timeline for drawing down funds from Government over the 15 years of the City Region Deal as set out in the Financial Plan agreed in summer 2018, and grant offer letter for 2020/21.
- 2.2 In addition to the business cases, other reports that are expected to be submitted to Joint Committee are included in the work programme.

### 3. Main report

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- 3.1 The work programme for Joint Committee meetings that partners are currently working towards is shown in Table 1. The dates are subject to business cases being approved by: The Scottish Government; the UK Government; the relevant Boards within the City Region Deal structure; and the relevant Council committees and/or Higher and Further Education Courts, prior to Joint Committee consideration.

**Table 1: Work Programme for Joint Committee**

Joint Committee Date	Reports for consideration
5 March 2021	<ul style="list-style-type: none"> <li>• ESESCR Deal Transport Appraisal Board bid into the Bus Partnership Fund</li> <li>• Easter Bush business case</li> <li>• Elected Member Oversight Committee – Supplementary to Terms of Reference</li> <li>• Fife Industrial Innovation Investment programme tranche 2 business case.</li> </ul>
4 June 2021	<ul style="list-style-type: none"> <li>• A720 (Sheriffhall roundabout) progress update (presentation)</li> <li>• Benefits Realisation Plan Implementation Plan Dunfermline strategic housing site business case</li> <li>• Edinburgh Innovation Park (Queen Margaret University) business case</li> </ul>
3 September 2021	<ul style="list-style-type: none"> <li>• Annual Report 2020/21</li> <li>• Dunard Centre revised business case</li> <li>• Regional Growth Framework: final report</li> </ul>
3 December 2021	<ul style="list-style-type: none"> <li>• A720 (Sheriffhall roundabout) progress update (presentation)</li> </ul>

- 3.2 The A720 City Bypass grade separation of Sheriffhall Roundabout is being managed and delivered by Transport Scotland. Transport Scotland are scheduled to provide updates on progress to the Transport Appraisal Board, as well as the Executive Board and Joint Committee every six months.

## 4. Financial impact

- 4.1 There is no financial impact relating to this report. Financial cases are being set out in detail in the respective business cases. Financial contributions that are required by partner organisations for projects are being requested in separate reports to councils or courts prior to being taken to Joint Committee for approval.

## 5. Alignment with Sustainable, Inclusive Growth Ambitions

- 5.1 Inclusion is a key driver for the City Region Deal. Business cases for projects included demonstrate how they will reduce inequalities and tackle the inclusion challenges specific to the city region.
- 5.2 The [City Region Deal Benefits Realisation Plan](#) (BRP) was approved for the programme on 4 September 2020. This incorporates clear indicators to align with the Scottish Government's Inclusive Growth Framework. The impact on equalities, human rights and sustainability will also be measures. A BRP Implementation Plan is

being developed, with input from key stakeholder groups within and outwith the City Region Deal Governance structure, including the Regional Enterprise Council, third sector partners, the NHS and elected members. A progress update on this is being taken to this meeting, and feedback from the Joint Committee would be welcomed.

## **6. Background reading/external references**

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6.1 [City Region Deal Document](#): August 2018

## **7. Appendices**

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None.



## Edinburgh and South East Scotland City Region Deal Joint Committee

**10 am, Friday 5 March 2021**

### **City Region Deal Progress Report**

**Item number 5.1**

#### **Executive Summary**

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The Edinburgh and South East Scotland City Region Deal progress report gives an indication of progress across the City Region Deal programme.

In this update, the overall status is assigned as “Amber”. There are no actions required from the Joint Committee.

#### **Steve Grimmond**

Chief Officer, Edinburgh and South East Scotland City Region Deal

Contact: Andy Nichol, Programme Manager, Edinburgh and South East Scotland City Region Deal

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# Report

## City Region Deal Progress report

### 1. Recommendations

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- 1.1 To note the progress across the City Region Deal Programme.

### 2. Background

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- 2.1 This progress report is being used across the City Region Deal's governance structure to monitor progress across all aspects of the City Region Deal. It is updated and shared with Government on a weekly basis and is taken to all Board meetings. A RAG (Red, Amber, Green) scale is assigned to programmes and projects by the Programme Management Office (PMO), as well as scores for inclusive growth and partnership working.
- 2.2 Tables and 2 show the guidelines that are used when determine RAG statuses and scores:

**Table 1: RAG Status Guidelines**

**T:** Status against **timeline** set out in business case/implementation plan;

**B:** Status against **budget** set out in financial plan

RAG Status	Definition - Timeline	Definition - Budget	Action Required
Green	In line with business case/implementation plan	In line with financial plan.	No management action required
Amber	Delay is considered acceptable by PMO.	Within acceptable range.	Management action is in place by senior management to address issues, and project is being closely monitored.
Red	Delay is significant.	Outwith acceptable range.	Immediate action is required by senior management and relevant Boards as appropriate to address issues. Issues must be highlighted to Government.

**Table 2: Strategic Added Value Score**

Score	Description
1 (Low)	<ul style="list-style-type: none"><li>• There are opportunities for links with one or two other CRD themes that may add value to the proposal.</li><li>• Partnership working with wider stakeholders, to add value to the proposal has not been thoroughly considered, but may be possible, and should be explored.</li><li>• One or two of the five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li></ul>
2 (Medium)	<ul style="list-style-type: none"><li>• There are opportunities for links with two or three other CRD themes that may add value to the proposal.</li><li>• Partnership working with wider stakeholders, to add value has been factored into the business case to some extent, but there are opportunities to enhance.</li><li>• Two or three of the five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li></ul>
3 (High)	<ul style="list-style-type: none"><li>• There are opportunities for links with three or four other CRD themes that may add value to the proposal.</li><li>• Partnership working with wider stakeholders, e.g. private/third sector is already taking place and strategic added value effects are clear.</li><li>• Three, four or five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li></ul>

### 3. Main report

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- 3.1 The performance report is shown in Appendix 1. The overall status of the City Region Deal is assigned as “Amber”. There are no actions required from the Joint Committee.

### 4. Financial impact

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- 4.1 Quarterly financial information on Sheriffhall Roundabout is now being received from Transport Scotland. Transport Scotland provided an update which shows £172,000 was drawn down in Quarter 3 for 2020/21. The financial summary has been updated to reflect this.
- 4.2 The overall cumulative total of Grant claimed for the Deal to date (2018 – present) is £127.6 million. This total includes the funding issued by Transport Scotland and Scottish Government Housing.
- 4.3 Since the onset of Covid-19, Scottish and UK Governments have agreed to allow the draw down monthly in arrears as opposed to quarterly for projects entirely funded by Government that have asked for the flexibility.

### 5. Alignment with Sustainable, Inclusive Growth Ambitions

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- 5.1 Inclusion is a key driver for the City Region Deal, and scores have been included for each project. Business cases for projects included demonstrate how they will reduce inequalities and tackle the inclusion challenges specific to the city region.
- 5.2 The [City Region Deal Benefits Realisation Plan](#) (BRP) was approved for the programme on 4 September 2020. This incorporates clear indicators to align with the Scottish Government’s Inclusive Growth Framework. The impact on equalities, human rights and sustainability will also be measured. A BRP Implementation Plan is being developed, with input from key stakeholder groups within and outwith the City Region Deal Governance structure, including the Regional Enterprise Council, third sector partners, the NHS and elected members. A progress update on this is being taken to this meeting, and feedback from the Joint Committee would be welcomed.

### 6. Background reading/external references

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- 6.1 [Edinburgh and South East Scotland City Region Deal Document](#) (August 2018)
- 6.2 [City Region Deal Benefits Realisation Plan](#): ESESCR Deal Joint Committee report 4 September 2020

## 7. Appendices

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- 7.1 Edinburgh and South East Scotland City Region Deal Progress Report (March 2021)

# Progress Report

Last updated: 1 March 2021

Overall Status Last Period	Overall Status This Period
Amber	Amber



## Page 1: Dashboard Recent Achievements and Milestones

Achievement/Milestone	Date
Annual Conversation between CRD Partners and Governments	<b>Nov 20</b>
Regional Growth Framework update paper	<b>Dec 20</b>
Benefits Realisation Implementation Plan approach for Implementation	<b>Dec 20</b>

Upcoming Milestones	Target Date
Easter Bush Business Case	<b>Mar 21</b>
Fife I3 Phase 2 Programme Business Case	<b>Mar 21</b>
Benefits Realisation Plan Implementation Plan update to Joint Committee	<b>Mar 21</b>
Regional Growth Framework – Report for Consultation	<b>Jun 21</b>
Benefits Realisation Plan Implementation Plan final	<b>Jun 21</b>
QMU Innovation Park Business Case	<b>Jun 21</b>
Dunfermline Housing Business Case	<b>Jun 21</b>
Dunard Centre Revised Business Case	<b>Sep 21</b>
Regional Growth Framework Final Report	<b>Sep 21</b>

## Financials Summary

\*Funding issued by Transport Scotland and SG Housing not included in this total

Total CRD grant £000	CRD grant drawdown to date £000		20-21 CRD Grant allocation	20-21 Grant drawdown
600,000	127,575	21.26%	£47.00m*	£21.97m*

## Top 3 Risks (from PMO Risk Register) - last updated Feb 21; next update May 21

Risk	Impact	Likehood	Severity	Resolution Plan or Mitigating Action
Covid-19 impacting the City Region Deal projects resulting in potential delays and cost increases	4	3	12	<ul style="list-style-type: none"> <li>Regular updating of progress report and monthly financial forecasts, so that project leads can inform PMO of any issue well in advance, and PMO can raise with Government, Executive Board and Joint Committee as appropriate.</li> <li>Establish Change Management process as set out in the Benefits Realisation Plan.</li> <li>Review outputs and timelines in the light of Covid-19, and consider advancement of spend where appropriate</li> <li>Pivot projects proactively where possible in line with need and opportunity.</li> </ul>
Impacts of Brexit	4	3	12	<ul style="list-style-type: none"> <li>Regular engagement with project leads to highlight any risks well in advance, so that PMO can raise with Government, Executive Board and Joint Committee as appropriate.</li> <li>Establish Change Management process as set out in the Benefits Realisation Plan.</li> <li>Review outputs and timelines for business cases at every stage of development in the light of Brexit uncertainty.</li> <li>Regional Growth Framework under development has "Adaptable" as one of its three themes, where Brexit risks are noted.</li> </ul>
Financial profile: underspends across the national City Region and Growth Deals will cause reprofiling pressures for Government	4	2	8	<ul style="list-style-type: none"> <li>Continue to spend according to agreed profile.</li> <li>Achieve business case approval in line with Deal Implementation Plan.</li> <li>Regular programme monitoring and reporting.</li> <li>Close engagement with Government.</li> </ul>

## Project Stages

Stage no.	Definition
1. Define	Business case being developed, and not yet approved by Thematic Board and Joint Committee.
2. Implement	Business case has been approved by Thematic Board and Joint Committee, and is being implemented. In a capital project, this may be construction; for skills projects this may be establishing a course or system.
3. Deliver	Project is in place and monitoring and evaluation is in framework to assess if it is achieving its objectives.
4. Legacy	Project has resulted in mainstreaming or improvements to business as usual (impact) that is generated beyond the funded period

## Red, Amber, Green

**T:** Status against **timeline** set out in business case/implementation plan; **B:** Status against **budget** set out in financial plan

RAG Status	Definition - Timeline	Definition - Budget	Action Required
Green	In line with business case/implementation plan	In line with financial plan.	No management action required
Amber	Delay is considered acceptable by PMO.	Within acceptable range.	Management action is in place by senior management to address issues, and project is being closely monitored.
Red	Delay is significant.	Outwith acceptable range.	Immediate action is required by senior management and relevant Boards as appropriate to address issues. Issues must be highlighted to Government.

## Strategic Added Value Score

Score	Description
1 (Low)	<ul style="list-style-type: none"> <li>There are opportunities for links with one or two other CRD themes that may add value to the proposal.</li> <li>Partnership working with wider stakeholders, to add value to the proposal has not been thoroughly considered, but may be possible, and should be explored.</li> <li>One or two of the five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li> </ul>
2 (Medium)	<ul style="list-style-type: none"> <li>There are opportunities for links with two or three other CRD themes that may add value to the proposal.</li> <li>Partnership working with wider stakeholders, to add value has been factored into the business case to some extent, but there are opportunities to enhance.</li> <li>Two or three of the five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li> </ul>
3. (High)	<ul style="list-style-type: none"> <li>There are opportunities for links with three of four other CRD themes that may add value to the proposal.</li> <li>Partnership working with wider stakeholders, e.g. private/third sector is already taking place and strategic added value effects are clear.</li> <li>Three, four or five “inclusive growth” measures listed in the <a href="#">Deal Document</a> could be incorporated into the delivery of the project.</li> </ul>

Overall Total			Project Name	2020 - 2021							Comments
Total Budget £000	CRD Grant Total £000	CRD Grant Claimed To Date £000		Grant Allocation £000	CRD Grant Claimed (Q1) £000	CRD Grant Claimed (Q2) £000	CRD Grant Claimed (Q3) £000	Spend to Date (Apr-Jan) £000	Forecast Outturn £000	Forecast vs Allocation Variance £000	
101,047	32,545	32,545	Bayes Centre	0	0	0	0	0	0	0	Construction start delayed by 2 months due to Covid-19
22,469	22,469	1,561	National Robotarium	13,563	232	227	102	649	775	-12,788	
189,297	57,920	46,288	Edinburgh Futures Institute	14,067	1,509	4,020	6,539	14,067	14,067	0	
190,620	79,595	21,064	Edinburgh International Data Facility (was WCDI)	3,641	3,418	223	0	3,641	3,641	0	
84,610	49,205	4,148	Usher Institute	2,889	194	670	1,781	2,889	2,889	0	Delay with Full Business Case due to Covid-19
42,596	17,366	0	Easter Bush	0	0	0	0	0	0	0	
30,000	10,900	0	Easter Bush Link Road - A701 & A702	327	0	0	0	0	0	-327	
52,003	30,000	0	Food and Drink Innovation Hub	988	0	0	0	0	0	-988	
49,425	35,000	3,094	Fife Industrial Innovation Investment	2,840	189	0	1,473	1,667	2,840	0	Variance due to COVID-19 and the inability to commence construction with the Class 4 building
29,050	15,000	187	Scottish Borders - Innovation Park	3,500	36	57	14	116	500	-3,000	
791,111	350,000	108,886	<b>Total Research, development and innovation</b>	<b>41,815</b>	<b>5,578</b>	<b>5,197</b>	<b>9,908</b>	<b>23,028</b>	<b>24,712</b>	<b>-17,103</b>	
25,000	25,000	2,342	Integrated Regional Employability & Skills	3,000	289	366	630	1,581	2,624	-376	
25,000	25,000	2,342	<b>Total IRES</b>	<b>3,000</b>	<b>289</b>	<b>366</b>	<b>630</b>	<b>1,581</b>	<b>2,624</b>	<b>-376</b>	
120,000	120,000	4,163	Sheriffhall Roundabout*	-	57	243	172	547	-	-	SG to fund up to £120m to support improvements to the A720 City Bypass for the grade separation of Sheriffhall Roundabout via Transport Scotland
36,000	20,000	0	West Edinburgh Public Transport Infrastructure	1,183	0	0	0	11	40	-1,143	
156,000	140,000	4,163	<b>Total Transport</b>	<b>1,183</b>	<b>57</b>	<b>243</b>	<b>172</b>	<b>558</b>	<b>40</b>	<b>-1,143</b>	Consultants working on the project plan, looking to finalise soon with approval from stakeholders
44,990	20,000	0	IMPACT/Dunard Concert Hall	1,000	0	0	0	0	0	-1,000	JR set aside following mediation. To be redesigned and variation made to planning application.
44,990	20,000	0	<b>Total Culture</b>	<b>1,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-1,000</b>	
263,000	15,000	12,184	Housing Company (Edinburgh Living)**	5,000	748	0	1,184	3,000	5,000	0	Separate grant letter from SG
50,000	50,000	0	Housing Infrastructure Fund**	12,500	0	0	0	0	0	-12,500	
313,000	65,000	12,184	<b>Total Housing</b>	<b>17,500</b>	<b>748</b>	<b>0</b>	<b>1,184</b>	<b>3,000</b>	<b>5,000</b>	<b>-12,500</b>	
1,330,107	600,000	127,575	<b>Total Programme</b>	<b>64,498</b>	<b>6,672</b>	<b>5,806</b>	<b>11,894</b>	<b>28,167</b>	<b>32,376</b>	<b>-32,122</b>	Shortfall of utilising grant funding

**Page 4: Research, Development and Innovation**  
**Theme**  
**Data-Driven Innovation**

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Bayes Centre	Deliver	Sep 18: Opening	N/A	G	G	3	In compliance with latest Government guidance C-19 guidance, the Bayes Centre is currently closed, and is supporting all members and partners remotely.
National Robotarium	Implement	Jan 21: Start on Site	March 22: Complete construction	A	G	2	Construction commenced on 18 Jan 21 with a initial 4-week set-up stage. Procurement of specialist equipment underway. CEO recruitment process recommenced.
Edinburgh Futures Institute	Implement	Start on site	Jun 22: Complete construction	A	G	3	A revised handover agreed for June 2022 (user fit out by September 2022). Contractor is back on-site, with appropriate on-site working arrangements in place. Operational staff working from home where possible. Currently assessing further impact on delivery of EFI building and programmes – further update in Easter 2021, when impact of social distancing on delivery dates is better known.
Usher Institute	Implement	Feb 21: Planning application approved	Jul 21: Commence construction	A	G	2	Planning application approved. Construction due to commence Summer 2021 with construction expected to be completed by Spring 2023.
Easter Bush	Define	Aug 18: Deal agreement	Mar 21: FBC approved by Joint Committee (following TAB approval)	G	G	2	Final draft of business case was submitted to Government 18 Jan. Meeting to discuss final changes took place on 12 Feb. On track for Joint Committee approval.
Edinburgh International Data Facility	Implement	Start on site	Apr 21: Building opening	G	G	2	Procurement of large equipment is completed and supplier (HPE) appointed. Aim for official building opening early Spring subject to availability of senior official.

T: On Time?; B: On Budget?; SAV: Strategic Added Value score



**Page 5: Research, Development and Innovation  
Theme  
Edinburgh Innovation Park (QMU Food and  
Drink)**

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Edinburgh Innovation Park (QMU Food and Drink Hub)	Define	ELC/QMU received feedback on first draft FCB Contract for junction works issued . Estimated tender period February to June 2021	Targeting JC approval June 2021  Tender for Junction will be complete June 2021.	A	A	2	First draft FBC submitted to Gov December 2020. Initial feedback received from SG and UK and responses collated to aim for a further iteration to be submitted end of February.  The intention is to complete the tender of the junction works in June 21 – albeit this will be subject to any response from the tenders and a better understanding as to whether Covid-19 will impact that timeline. The shift in this programme is to accommodate the erection of a vaccination Centre - operational from mid-Feb until July 2021.

**Page 6: Research, Development and Innovation Theme**  
**Projects in Fife and Scottish Borders**

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Borders Innovation Park	Implement	Start of site works for Phase 1.	Site works for Phase 1 ongoing.	A	G	2	Site works for Phase 2 were delayed owing to disruption caused by the Covid-19 pandemic. This issue was discussed at the November meeting of the Tweedbank Project Board. The building of Phase 1 is continuing, but it has been decided that officers will undertake a workshop to revisit the business case for Phases 2 and 3.
Fife Industrial Innovation Investment (Fi 3P)	Implement	Project 3 (Kirkcaldy, Dunnikier) – construction commenced.	<p>Q3: Acquisition of Fife Interchange North, Dunfermline (delayed)</p> <p>Q4: Completion of Flemington Road, Glenrothes</p> <p>Q4: Planning consent for Lochgelly Site Servicing (delay expected)</p>	G	G	2	<p>The completion of the site acquisition at Fife Interchange North, Dunfermline is expected in Q4.</p> <p>Completion of Flemington Rd, Glenrothes on track. Marketing underway.</p> <p>Construction continues at Dunnikier Business Park, Kirkcaldy – completion expected Q3 21/22</p> <p>The need for further drainage assessment at Lochgelly, required by Scottish Water, is expected to delay planning consent.</p>

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
IRES Programme	Implement/Deliver	Positive and well attended IRES board on 8 <sup>th</sup> Dec and IRES presentation at Joint Committee on 4 <sup>th</sup> Dec 2020. Benefits Realisation Plan approved at Joint Committee in Sep 2020 stating thematic outcomes including those for the IRES programme.	Work progressing to align project outcomes with overall IRES Benefits Realisation targets; and reprofile based on Covid impact and available funding as we approach end of financial year.	A	A	3	<ul style="list-style-type: none"><li>IRES Programme Connector has met project leads and is progressing Benefits Realisation plan framework.</li><li>IRES board met on 8th December 2020 with presentations on Covid-19 response under Integrated Employer Engagement, Workforce Mobility plans, Health and Social Care Gateway development, and Benefits Realisation – all well received.</li><li>New change proposal process put in place to help audit trail and appropriate level of approval confirmed.</li><li>Planning taking place for IRES board on 16<sup>th</sup> February 2021.</li><li>Budget spend being reviewed and actions implemented.</li></ul>
Integrated Knowledge System	Implement/Deliver	Management Information System (MIS) European Single Procurement Document (ESPD) submission reviewed.  5 organisations asked to provide bids based on Invitation to Tender (ITT) deadline - 11 Feb 2021.	Scoring panel to confirm outcome 25 <sup>th</sup> February with standstill to be issued.  Subject to standstill, contract to be issued w/c 8 <sup>th</sup> March 2021.	G	G	3	<ul style="list-style-type: none"><li>MIS Procurement – ITT is live, scoring panel and process confirmed. Aiming to issue contract w/c 8<sup>th</sup> March 2021.</li><li>Data analysis (internship) – 4<sup>th</sup> year student at Edinburgh Napier University on project until end of March. Looking at the Maximise! project, reviewing the data language across the 3 systems holding client information. An insights and recommendations report will show learning for IKS.</li><li>GDPR project –conversations continue on data sharing implications of the IKS project. Discussion on data gathering for the Workforce mobility project.</li></ul>
Labour market analysis and evaluation	Deliver	Analysis of responses from IRES project leads around gaps in Labour Market Intelligence and data.  Ekosgen to complete stakeholder and employer consultations.	Regional Intelligence Hub options paper to be developed for presentation at Directors' Group  Ekosgen to share and validate initial findings with key partners.	G	G	2	<ul style="list-style-type: none"><li>The Labour Market Toolkit is being promoted - available on SDS' corporate website under 'What We do/Skills Planning'.</li><li>There have been ongoing discussions around the Regional Intelligence Hub concept following meetings last year with Local Authorities, and academic partners. It was agreed that the RIH could potentially focus on short and medium-term skills and labour market challenges, framed around sectors, businesses and people, and considering the impact of COVID-19 and Brexit. An approach has also been made to IRES project leads to ask them to identify information that they do not have that would be useful. An options paper is being created for consideration at the Directors' group.</li><li>Ekosgen work started on the cross-cutting research into the skills needs of the financial services; health and social care and construction sectors. Target completion - March 2021.</li></ul>

Project	Stage		Next Milestone	T	B	SAV	• Comments
Integrated Employer Engagement	Implement	<p>IEE Employer fund feedback &amp; outcome survey issued.</p> <p>Community Benefits Portal contract advertised on Public Contracts Scotland (PCS).</p> <p>Fife care academy pilot start.</p>	<p>IEE Employer Fund case studies.</p> <p>Community Benefits Portal offer close on PCS.</p> <p>Outcomes published (jobs/training) of Fife care academy pilot.</p>	A	G	2	<ul style="list-style-type: none"> <li>Covid19 Jobs Support runner-up in Scottish Public Service Awards in COVID response category. Site has now advertised 3,707 vacancies. Sample call canvassing will take place in Q1 to identify job outcomes where possible.</li> <li>First point of contact for cross regional recruitment opportunities at Fort Kinnaird through retail rapid response programme; project now supported over 340 jobseekers. 30 verified job outcomes (4 additional unverified).</li> <li>Fife Care Academy pilot course underway – 10 candidates started on 25<sup>th</sup> Jan. Framework adjusted due to lockdown, physical training will be offered following job offers. Supporting Glenevin construction (WL) and The Ridge foundations (EL) with academy proposals.</li> <li>As chair of DYW Employer Engagement short life working group task force (Nov – Jan), driving a recommendations paper for employer engagement trends and activities across the school calendar year to inform 2021 onwards.</li> <li>Covid19 has impacted employers general recruitment practises since business approval; being addressed and offer adjusted to support businesses and client groups.</li> </ul>
Intensive Family Support	Implement/Deliver	<p>Community of Practice(CoP development plan for 20-21 finalised with service delivery providers.</p> <p>CoP Family and Youth Worker caseworker regional collaborative meeting held.</p>	<p>CoP Advice and Employability caseworker regional collaborative meeting scheduled for February.</p> <p>Scottish Borders and West Lothian begin operational delivery.</p>	G	G	2	<ul style="list-style-type: none"> <li>Edinburgh, Fife, East Lothian and Midlothian service in place. West Lothian delivery to start in February 2021. Scottish Borders service still in development.</li> <li>All current IFSS caseworkers trained on IFSS Information Management Software.</li> <li>Further training for CoP members – welfare benefits and systemic practice in development</li> <li>Marketing and communications plan in place</li> <li>Significant integration between IFSS and Scottish Government Parental Employment Support fund</li> <li>School and Early Years based IFS providers have experience delays in service development due to COVID-19 policies restricting third party work within those environments.</li> <li>Supporting development of local project steering groups.</li> <li>Continued building of relationships across services via CoP.</li> <li>Continued Caselink support for IFSS delivery partners.</li> </ul>

**Page 9: Integrated Regional  
Employability and Skills  
Theme (3/3)**

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Housing and Construction Infrastructure (HCI) Skills Gateway	Implement	Agree 2021/22 Budgets and KPIs with FE and HE Partners.	Launch 2021 Skills Programmes and Activities, including regional student challenges for COP26.	A	G	3	<ul style="list-style-type: none"> <li>Some delays in delivery of short courses and other activities due to further Covid-19 restrictions from 26 December 2020 – impact to be considered on wider programme once activities can resume.</li> <li>Revised financial spend advised to IRES PMO due to Scottish Government stipulation that funds awarded by HCI to delivery partners can only be claimed once activity delivered.</li> <li>Paper of HCI's contribution to a Circular Economy compiled by Prof Sean Smith &amp; Prof Robert Hairstans for circulation.</li> <li>Industry partnership pipeline development and community benefits programme now in discussion with Integrated Employer Engagement and Developing the Young Workforce.</li> </ul>
Data Driven Innovation (DDI) Skills Gateway	Implement	Development of second live lesson – “Data Selfies”. Working with Moray House ITE (initial teacher education) to introduce data skills opportunities to trainee teachers. Launch individual Data Skills Credits (DSC) fund. ‘Into Work’ and ‘Women Returners’ courses in Jan 2021.	Launch DDI SG Case Studies – <i>For the love of data</i> . Increase DEC Staff development activity. Complete delivery of Women into Work pilot. Further promotion of Data Skills Credits funds.	G	A	2	<ul style="list-style-type: none"> <li>The Data Education in Schools <a href="#">website</a>, launched in September 2020 progressing well. 16 new resource packs were added in Q3 2020/21.</li> <li>Learner and Teachers Guides for NPA Data Science on SQA website.</li> <li>Six seminars were held as part of a programme of CPD events for teachers on data and digital literacy. There were over 200 attendees.</li> <li>A range of free short courses have been <a href="#">promoted</a> to regional learners, providing opportunity to develop data literacy skills across skills levels.</li> <li>A pilot delivery of <i>Data Science for Finance</i> is now being delivered by Fife College to around 24 women returners. Input from EQUATE Scotland.</li> <li>11 applications were received from companies for the Data Skills Credit scheme and £16,500 of funding was awarded to 33 learners in the region. Aim is to support another 30-40 additional learners before end of March.</li> <li>The Data Lab has been awarded significant additional resources from The Scottish Government to support SMEs to invest in Data and AI.</li> </ul>
Workforce mobility	Implement	IRES Board December 2020 – Validated Steering Group Recommendations	IRES Board May 2021 – Baseline Assessment & Next Steps	A	G	2	<ul style="list-style-type: none"> <li>Commenced Procurement of the Baseline Assessment Stage Project Manager (PM) – Approved through Scottish Borders Council (SBC) Procurement protocols.</li> <li>Meetings continued to focus on Transport Scotland &amp; SEStran to feed into ‘National Transport Strategy Delivery Plan’, ‘Transport Young People &amp; Employment Partnership’ and the regional ‘Mobility as a Service’ bid for regional funding. Continue to refine pilot of data capture for roll out across region. Further work with DWP, SDS &amp; DYW.</li> <li>Working with SDS on partnership approach to Baseline assessment.</li> <li>Workforce Mobility Manager coordinated the City Deal response to the U19 Free Bus Travel consultation. Progressing transport funding opportunity pilot to support Kickstart, to be rolled out across region if effective and appropriate.</li> </ul>

T: On Time?; B: On Budget?; SAV: Strategic Added Value Score

## Page 10: Transport Theme

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
A720 Sheriffhall  <i>(last update provided by Transport Scotland on 26 Feb 21)</i> Page 30	Define	Consultation on draft orders closed 31 January 2020. Transport Scotland is currently considering the responses.	Ongoing statutory process and drafting of responses to representations.	G	G	1	<ul style="list-style-type: none"> <li>Public Transport and Active Travel review report published on the Transport Scotland website in December. Discussions ongoing with the City of Edinburgh Council to close out matters.</li> <li>Discussions/meetings now underway to inform objection resolution.</li> <li>Formal objection response drafting substantially complete.</li> <li>Legal advisors appointed for inquiry preparation.</li> <li>Background inquiry evidence preparation underway.</li> <li>Transport Scotland continue to provide quarterly technical and spend updates as part of the City Deal reporting process.</li> </ul>
West Edinburgh	Define	Appointment of Transportation and Engineering Consultants Jacobs to deliver the next stage of the project.	Permission being sought from SG/TS for drawdown on advance/preparatory business case costs to be shared proportionately between the funders (TS/CEC)	G	G	1	<p>£36m of funding identified (£20m from SG to support public transport infrastructure improvements) and £16m from City of Edinburgh Council plus contributions from the private sector and developers (TBC).</p> <p>In 2019, CEC developed a model to further prioritise the measures set out in the 2016 West Edinburgh Transport Appraisal (which amounted to £108m inc. optimism bias), with an emphasis on public transport and active travel prioritisation. Joint Committee have approved the appointment of Jacobs to execute Stage 1 of the project delivery plan. This will include further feasibility of proposals, developing outline designs, refining the current business case and updating the West Edinburgh programme delivery plan accordingly (including financial profiles).</p> <p>Agreement on funding between CEC and Transport Scotland has been agreed and Stage 1a has commenced.</p>

Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Dunard Centre	Define	Project taken off pause following agreement to dispose of judicial review against CEC.	Variation to planning application.	A	A	2	Judicial Review set aside following successful mediation. Concert hall to be redesigned and variation made to planning application in spring 2021, and full business case thereafter.



Project	Stage	Last Milestone	Next Milestone	T	B	SAV	Comments
Affordable housing	Deliver & Define	SHIP leads meeting early 2021.	Collate Regional SHIP April 21.	A	A	2	<ul style="list-style-type: none"> <li>Regional SHIP to explore collaboration opportunities on 21/22 programme.</li> </ul>
Strategic sites	Implement & Define	Site Leads meeting 11 Jan.	Site Leads meeting 8 March. Dunfermline OBC – June 2021.	A	A	2	<ul style="list-style-type: none"> <li>Outline Business Cases for sites are at different stages of development.</li> <li>Regular leads meetings now established to explore challenges, innovation and shared learning from business case development.</li> </ul>
Innovation & skills	Implement	ESESCR Deal Home Demonstrator has secured funding from Scottish Gov.	Establish regional workstream looking at standardisation.	A	A	3	<ul style="list-style-type: none"> <li>Demonstrator project will look at standardised housing types, procurement and delivery models to increase offsite manufacturing across the city region.</li> </ul>
Infrastructure, funding and land assembly	Define	Develop proposal for regional infrastructure forum.	Proposal to ensure alignment with IRSS and emerging RGF.	A	A	2	<ul style="list-style-type: none"> <li>Forum proposal to be developed in line with the recently published Interim Regional Spatial Strategy and emerging Regional Growth Framework ahead of a initial meeting to test appetite of partners and infrastructure providers.</li> </ul>
Housing company	Deliver	Homes under construction across various sites.	Ongoing Delivery.	G	G	1	<ul style="list-style-type: none"> <li>The City of Edinburgh Council and Scottish Futures Trust will continue to share learning and financial models with partners, to explore regional delivery models.</li> </ul>



## Edinburgh and South East Scotland City Region Deal Joint Committee

**10 am, Friday 5 March 2021**

### **Revision of Terms of Reference for Elected Member Oversight Committee**

**Item number 5.2**

#### **Executive Summary**

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Draft revision of Terms of Reference for Elected Member Oversight Committee.

#### **Steve Grimmond**

Chief Officer, Edinburgh and South East Scotland City Region Deal

Contact: Andy Nichol, Programme Manager, Edinburgh and South East Scotland City  
Region Deal, 0131 529 4461, [andy.nichol@edinburgh.gov.uk](mailto:andy.nichol@edinburgh.gov.uk)

## Revision of Terms of Reference for Elected Member Oversight Committee

### 1. Recommendations

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- 1.1 To agree to adopt the revised Terms of Reference for the Elected Member Oversight Committee.
- 1.2 To appoint Cllr Altany Craik, Fife Council, as the Convener of the Elected Member Oversight Committee

### 2. Background

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- 2.1 Committee received an update in March 2020 on the development of the Edinburgh and South East Scotland City Region response to the [National Planning Framework 4 “Call for Ideas”](#). That report highlighted that an Elected Member Oversight Group would be established to oversee the longer-term progress of the Regional Growth Framework and Regional Spatial Strategy.
- 2.2 The Terms of Reference for the Elected Member Oversight Committee were approved by this [Committee on 4 September 2020](#).
- 2.3 The Elected Member Oversight Committee has now met twice: 15 January 2021 and 19 February 2021.

### 3. Main report

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- 3.1 Two revisions are proposed to the Terms of Reference for the Elected Member Oversight Committee and are in Section 1 (Membership) and Section 7 (Meeting Frequency)
- 3.2 The first amendment to Section 1 (Membership) reflects the desire for flexibility in membership; and the fact that the Regional Enterprise Council and Higher/Further Education are considered equal partners in developing the Regional Spatial Strategy and Regional Growth Framework. It allows for greater flexibility in the membership in the future.
- 3.3 The previous text stated for Section 1 stated:

*Two Members from each constituent Council, up to four members from the Higher Education/Further Education consortium and up to two members from the Regional Enterprise Council.*

3.4 The revised text states:

*Two Members from each constituent Council, up to six members from the Higher Education/Further Education consortium and the Regional Enterprise Council.*

3.5 The second amendment to Section 7 (Meeting Frequency) reflects the desire that the Committee had in its first meeting for thematic workshops. Members felt that holding informal workshops in the place of every alternate meeting would serve to keep them well informed on the progress of the two documents, and allow them to shape them more effectively.

3.6 The previous text stated:

*The sub-committee will usually meet monthly but may meet more frequently if determined necessary by the Chair or the Sub-Committee.*

3.7 The revised text states:

*The sub-committee will usually meet bi-monthly but may meet more frequently if determined necessary by the Chair or the Sub-Committee.*

3.8 The Terms of Reference also state that the chair will be appointed by the Joint Committee and should be from the Council in the annual lead role for the City Region Deal. The Elected Member Oversight Committee has nominated Cllr Altany Craik to be Convener.

## 4. Financial impact

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4.1 N/A

## 5. Alignment with Sustainable, Inclusive Growth Ambitions

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5.1 N/A

## 6. Background reading/external references

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6.1 [Supplementary Agreement to Minute of Agreement for the Edinburgh and South East Scotland Region Joint Committee](#) (Joint Committee Report, September 2020)

## 7. Appendices

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7.1 Elected Member Oversight Sub-Committee – Terms of Reference (revised)

## **Appendix**

### **Elected Member Oversight Sub-Committee – Terms of Reference**

#### **1. Membership**

Two Members from each constituent Council, up to six members from the Higher Education/Further Education consortium and the Regional Enterprise Council.

#### **2. Convener/Chair**

The chair will be appointed by the Joint Committee and should be from the Council in the annual lead role for the City Region Deal.

#### **3. Quorum**

The Quorum will be one-third of the membership.

#### **4. Substitutes**

Substitutes are permitted from the same local authority.

#### **5. Officers**

Officers will attend to support meetings.

#### **6. Remit**

The powers and responsibilities of the Elected Member Oversight Sub-Committee cannot extend beyond those of the Edinburgh and South East Scotland City Region Deal Joint Committee. The remit of the Elected Member Oversight Sub-Committee would be:-

- a. To provide oversight of the Regional Growth Framework and Regional Spatial Strategy.
- b. Working in partnership with public authorities, public bodies and other public or private organisations it deems appropriate, including but not limited to the UK and Scottish Governments, SESplan and SEStran, to co-ordinate, plan, prepare, deliver, review and renew, any Regional Growth Framework and Regional Spatial Strategy for Edinburgh and South East Scotland, interim and final, or any replacement or reiteration or analogous such framework, strategy or plans, subject to the constituent councils' agreement to policy proposals.
- c. To co-ordinate amongst the constituent councils, a contribution to the preparation, review and renewal of the National Planning Framework (NPF4) and its subsequent iterations or replacements, subject to the constituent councils' agreement to policy proposals, and to co-ordinate and support the constituent councils in their own contributions to it.
- d. To support and encourage a sustainable approach to managing growth which aligns to local sustainability, energy and low carbon plans and strategies.
- e. To encourage and facilitate a close working partnership with SEStran, SESplan and other relevant organisations.
- f. To provide oversight and consider recommendations from the Regional Housing Board and the Transport Appraisal Board.
- g. To scrutinise the work of the SESplan Officer Board in regard to the Regional Growth Framework.

- h. To advise the City Region Deal Joint Committee in regard to the Regional Growth Framework and Regional Spatial Strategy.

## **7. Meeting Frequency**

The sub-committee will usually meet bi-monthly but may meet more frequently if determined necessary by the Chair or the Sub-Committee.

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## Edinburgh and South East Scotland City Region Deal Joint Committee

**10 am, Friday 5 March 2021**

### **Easter Bush Business Case**

**Item number 5.3**

#### **Executive Summary**

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This report seeks approval to secure funding for, and enact, the Easter Bush project as set out in the Easter Bush Final Business Case. Preparation of this Business Case has been led by the University of Edinburgh and Midlothian Council - on behalf of the Edinburgh and South East Scotland City Region Deal consortium partners - in accordance with the HM Treasury 5 Case model guidance.

#### **Professor Jonathan Seckl**

Senior Responsible Officer, Data Driven Innovation (DDI) Delivery Board, Edinburgh and South-East Scotland City Region Deal.

E-mail: [J.Seckl@ed.ac.uk](mailto:J.Seckl@ed.ac.uk)

#### **Derek Oliver**

Senior Responsible Officer, Transport Appraisal Board, Edinburgh and South-East Scotland City Region Deal.

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Criteria	Details/Link to Document
<p>Contribution to City Region Deal commitments and Inclusive Growth Framework</p>	<p>The Easter Bush project supports the inclusive growth ambitions of the City Region Deal including:</p> <ul style="list-style-type: none"> <li>• <b>Accelerating inclusive growth</b> the Agri-Tech programme will both accelerate growth in the Region and also allow the Easter Bush Campus to build upon and enhance a wide range of existing inclusive growth and equality activities (including out-reach, public engagement, citizen science and the Athena and Investors in Young People programmes);</li> <li>• <b>Removing the barriers to growth</b> through interventions to unlock current physical barriers to growth, including enabling road infrastructure and innovative Agri-Tech facilities;</li> <li>• <b>Community benefits through procurement</b> by integrating the University of Edinburgh and Midlothian Council approaches to employer engagement and procurement to increase the value achieved from our collective investments;</li> <li>• <b>Targeted skills interventions</b> through integrated and targeted employability and skills interventions focused on agriculture, food and environmental security; and,</li> <li>• <b>Social benefit through innovation</b> to drive agri-tech benefits across the City Region and Scotland over the medium and long-term.</li> </ul> <p>The University of Edinburgh has committed (in its Procurement Strategy) to add value to local and regional communities by identifying and achieving robust, relevant and proportionate Community Benefits (CBs) from the:</p> <ul style="list-style-type: none"> <li>• University's Procurement Strategy: <i>"For every procurement over £4million, the delegated authority of the University will consider how the acquisition can improve the economic, social or environmental wellbeing of our area through inclusion of community benefit clauses, to assist with our strategic objective of Community Engagement."</i>; and,</li> <li>• Procurement Category Strategies: <i>"Contributing locally [by] applying community benefits to major contracts, engagement in local collaborations in the city and with Scottish peer groups, including shared services and collaborative framework agreements."</i></li> </ul> <p>Consequently, for the Easter Bush project, robust, relevant and proportionate CBs will be incorporated in future procurements of £4 million and above and will be considered in regulated procurements below £4 million at strategy stage (i.e. at £50,000 and above).</p> <p>Where CB requirements are included in a DDI contract, the contracting authority must include in the award notice a statement of the benefits it considers will be derived from those requirements.</p> <p>The project sponsors, procurement manager and any other participating University entity must agree who will be responsible post-contract award for the initiation of engagement with the supplier to achieve the CB commitments, as well as who will be responsible for delivering, monitoring and reporting the achieved CB.</p> <p>At the discretion of the University, CBs offered as part of the tender response may be enforceable as part of the final contract (or where submitted after contract award, pursuant to a legally compliant contract variation process). On high risk projects, written commitments may be required from suppliers that obligate them to follow through with offered CBs, which include means to penalise suppliers who are non-compliant.</p> <p>In addition, projects will also specifically address agreed inclusive growth objectives. Based on the University's existing inclusive growth-related policies and programmes, activity in scope includes:</p> <ul style="list-style-type: none"> <li>• Addressing skills shortages and gaps, and delivering improvements to boost the flow of individuals from disadvantaged groups into good career opportunities in the City Region and wider Scottish agriculture sector;</li> <li>• In collaboration with local education authorities and community groups extending School, College, Family &amp; Adult Learning Programmes to cover a wider range of Agri-Tech</li> </ul>



Criteria	Details/Link to Document										
	<p>science activities, as well as develop on-line interactive activities to reach rural communities in the Region and elsewhere in Scotland and the rest of the UK; and,</p> <ul style="list-style-type: none"> <li>Working closely with the Scottish and UK public sector to inform future food and environmental policies (including the Animal and Plant Health Agency (APHA), Scottish Government Animal Health and Welfare Division, Department for Environment, Food &amp; Rural Affairs (Defra) and industry organisations such as the Agriculture and Horticulture Development Board (AHDB)).</li> </ul> <p>The adopted Midlothian Development Plan (MLDP) sets out a long-term development strategy for Midlothian and provides a policy framework for assessing and determining applications for the development and change of use of land up to 2027. The proposed roads element of the Easter Bush project is identified in the plan as essential infrastructure necessary to enable new development in the A701 corridor to take place (policies IMP2 and TRAN2) and its delivery will accelerate development at the Easter Bush Campus as well as the Midlothian Science Zone and other locations.</p> <p>The design and development of the roads infrastructure elements of this project will be led by Midlothian Council and its Civils Project Management Team. The economic and social themes of the current Midlothian Council Procurement Strategy includes a commitment to securing community benefits through the procurement process by, amongst other things:</p> <ul style="list-style-type: none"> <li>Securing learning, education, employment, skills and career development opportunities through contracts where possible;</li> <li>Encouraging suppliers to engage with local job centres and other local employment and training initiatives;</li> <li>Engaging with local suppliers, SME's, Voluntary Organisations and Social Enterprises, publishing our procurement plan to enable suppliers to prepare;</li> <li>Encouraging main contractors to hold local supplier engagement events prior to undertaking any major project work;</li> <li>Sponsorship and support for community/local group projects and initiatives;</li> <li>Environmental benefits – Midlothian's environment is protected through joint projects with the Community/Council (reduce, re-use, recycle) and its communities are supported through Active Travel measures; and,</li> <li>Maximise community benefits wherever possible through relevant requirements and specifications.</li> </ul> <p>The appointment of the Civils Project Management consultant and the remaining project team is subject to this procurement requirement and they will have to demonstrate, to the satisfaction of Midlothian Council, how each of the professional disciplines will address and secure community based benefits.</p>										
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Scale and regional	<p>As illustrated, in the table below, a range of ("net additional") outcomes have been identified for the Easter Bush project over the period of CRD funding, namely:</p>										

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distribution of expected outcomes, benefits, and leverage, from activity	<ul style="list-style-type: none"><li>• <b>Talent:</b> directly engaging with around 141,000 people in the application of data to develop genetics and health innovations in agriculture and aquaculture of whom 25,000 will attain certification;</li><li>• <b>Research:</b> through hosting world-leading applied researchers and projects worth an additional £116 million over the lifetime of the DDI Programme hosting with world-leading applied researchers and DDI projects worth £138 million, including £50 million leveraged private R&amp;D funds, through public sector and industry awards;</li><li>• <b>Adoption:</b> engaging 100 public, private and third sector organisations, including early stage and scale-up companies;</li><li>• <b>Data:</b> supporting new initiatives to curate, analyse, and translate huge datasets – such as the new centres of Data Driven Breeding and Aquaculture Genetics and Health – to encourage and enable the creation of Agri-Tech assets; and,</li><li>• <b>Entrepreneurship:</b> establishing an additional 30 new high-growth firms in the ESES region over the life of the programme.</li></ul> <p>Based on the distribution of current activities across the areas of talent, research, adoption, data and entrepreneurship the anticipated direct net economic benefit of the Easter Bush Agri-Tech Hub is projected to be in the region of £248 million for the whole of the UK of which a minimum of £67 million to accrue to the City Region. These benefits exclude – by definition – the wider eco-system effects of the Programme on the current Data Driven Innovation (DDI) cluster within the Region. While no explicit quantitative analysis of these wider impacts has been undertaken, they are likely to be significant if the Programme achieves one of its longer term objectives of the City Region becoming a world-leading centre of excellence for applied data science.</p> <p>In addition preliminary analysis by Ernst &amp; Young/Midlothian Council, of the related benefits associated with the proposed transport enhancements, suggest that up to a further £189 million economic benefits could be generated from associated development uplifts and capacity improvements.</p> <table><tr><th>Outcome or benefits</th><th>Baseline (without DDI)</th><th>Target Uplift (with DDI)</th><th>Date</th></tr><tr><td><b>Total (certification) learners engaging with DDI Programme</b></td><td>4,493</td><td>25,345</td><td rowspan="5">Programme lifetime</td></tr><tr><td><b>DDI research funding</b></td><td>£507m</td><td>£623m</td></tr><tr><td><b>DDI collaborative adoption assignments</b></td><td>0</td><td>100</td></tr><tr><td><b>DDI data sets acquired</b></td><td>0</td><td>N/K</td></tr><tr><td><b>New spin out, scale-up and spin in companies</b></td><td>0</td><td>30</td></tr></table>	Outcome or benefits	Baseline (without DDI)	Target Uplift (with DDI)	Date	<b>Total (certification) learners engaging with DDI Programme</b>	4,493	25,345	Programme lifetime	<b>DDI research funding</b>	£507m	£623m	<b>DDI collaborative adoption assignments</b>	0	100	<b>DDI data sets acquired</b>	0	N/K	<b>New spin out, scale-up and spin in companies</b>	0	30
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Compliance with financial requirements and agreed expenditure profile	The vision of the City Region Deal partners is for Edinburgh to become the “Data Capital of Europe”. To realise this vision the University of Edinburgh and Midlothian Council are proposing a combined capital expenditure of £74 million. This business case is specifically seeking £28.3 million in Government funding towards this expenditure.																				
Equalities Impact	This Programme of work sits within the Equalities Framework laid out by the City Region Deal, through its Inclusive Growth Framework, which has five key themes aimed at accelerating inclusive growth and social benefit through innovation, with specific regard to minorities and																				

Criteria	Details/Link to Document
	<p>disadvantaged population. The University of Edinburgh also has an Equality and Diversity Strategy, Outcomes and Action Plan, which outlines the University's continuing commitment to equality and diversity for both students and staff. These frameworks highlight the central concepts of fair and equitable treatment regardless of race, disability, ethnicity, gender (including transgender), age, sexual orientation or beliefs. These will be key principles governing the development and delivery of programme activities outlined in this document. For all projects carried out within the Programme of work, equalities screening will be carried out to ensure that these issues are raised and addressed from project inception through to delivery and evaluation.</p> <p>As a local authority, Midlothian Council is required to implement the Public Sector Equality Duty in addition to the other provisions (relating to employment, education and training requirements) of the 2010 Equality Act. This duty comprises the general duty and the specific duty. The general duty was developed for public bodies recognising the significant impact that the delivery of public services has on people's lives and is designed to ensure that, if followed, services are designed to meet the diverse needs of the community and also builds inclusive services. The specific duty is designed to help authorities to put the general duty into practice.</p> <p>Midlothian Council's corporate Equalities Plan identifies eight equality outcomes of which number six (Midlothian has strong, vibrant communities where residents have a sense of belonging) and number eight (Midlothian Council services will meet the needs of all those in the community) are relevant in connection with the impact of the proposed roads infrastructure. At a Service level, the preparation of the Midlothian Local Development Plan was subject to a separate Equalities and Human Rights Impact Assessment (EqHRIA) to assess the overall impact of the policies and proposals of the MLDP as they relate to the Public Sector Equality Duty and people/groups who share the protected characteristics. The MLDP incorporates minor amendments as a result of the EqHRIA process.</p>
Alignment and fit with City Region Deal governance arrangement	<p>The University and Midlothian Council will respectively oversee the Agri-Tech developments and transport improvements identified in the Business Case. These two partners are currently in the process of agreeing a concordat to ensure complimentary development timescales, adherence to joint project management protocols and common methods of progress reporting to the City Region Deal Joint Committee (that is responsible for delivering value for money from the Edinburgh and South East Scotland City Region deal and wider regional collaboration).</p> <p>The DDI Delivery Board is responsible for assuring commissioning of the University elements of the project investment including working with the Easter Bush Senior Executive to establish and support the Agri-Tech Delivery Team and Agri-Tech Delivery Advisory Group and defining the key resources, financial and Key Performance Indicators (KPIs) delivery parameters within which the Agri-Tech components of the Campus will operate.</p> <p>The Agri-Tech Delivery Team is responsible for the overall direction and management of the all Agri-Tech activities described in this document. As such, it is ultimately accountable for success of the University elements of this project.</p> <p>Midlothian Council is engaging a team of Project Delivery Partners (PDP) to deliver the A701 Relief Road and A702 Link. Their roles are: Civils Project Manager (CPM) – to manage the delivery of the project; Design Consultant (Designer) - design and technical specifications for the scheme; Planning and Environmental Consultant (PEC) - managing the planning application and related environmental matters; Lands Consultant (PC) – consult and manage all landowners; Cost Consultant/ Quantity Surveyor (QS) - cost management and estimating; Appraisal Consultant - traffic and transportation modelling and appraisal services; Road Safety Auditor – undertake road safety audits; and, NEC Construction Consultant: supervise and administer the construction works for the project.</p>

Criteria	Details/Link to Document
PMO compliance check	All evidence provided.
Government approval	Final comments were provided on the 17 <sup>th</sup> February 2021 and responses returned on the 22 <sup>nd</sup> February 2021 with sign off on the 26 <sup>th</sup> February 2021.
Partner sign-off	In December 2020 the University of Edinburgh, and subsequently Midlothian Council Councillors in January 2021, agreed that this Business Case can progress for formal approval.
Advisory Board sign off	On the 1 <sup>st</sup> February 2012 the Transport Advisory Board were provided with a summary presentation of the case and confirmed their on– going advisory role in relation to the transport dimensions of this project post any formal approval.
Executive Board sign off	Obtained on the 18 <sup>th</sup> February 2021.

# Report

## Easter Bush Business Case

### 1. Recommendations

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- 1.1 To approve the Easter Bush final business case and implementation of the associated Agri-Tech activities and transport improvements.

### 2. Background

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- 2.1 As evidenced in various Scottish and UK Government policy documents, and publications by the OECD and global consultancies, Data-Driven Innovation (DDI) has become a key pillar of 21st century growth with the potential to significantly enhance social wellbeing; productivity; resource efficiency; and, economic competitiveness.
- 2.2 This potential is particularly pertinent in relation to food production. The world population is currently 7.8 billion. The United Nations Food and Agriculture Organization (FAO) predicts that this will rise to 9.7 billion by 2050.<sup>1</sup> Feeding this growing population well - while protecting biodiversity and natural capital - is one of the greatest global challenges we face. To ensure future food security the FAO estimate that by 2050 global agricultural production (including crops and animals) will need to be 70% higher.<sup>2</sup> As the World Economic Forum has recognised: *“at its core, Agri-Tech is about using advanced monitoring and data analysis to do more with less – to find ways to increase yields without burdening already overtaxed resources such as land and water”*<sup>3</sup>. The Easter Bush Agri-Tech Hub will be focused on helping local and international agriculture achieve these aims.
- 2.3 The [Edinburgh and South East Scotland Science and Innovation Audit](#) (SIA), published in 2016, identified that:
  - The City Region is already a powerhouse in Data-Driven Innovation;

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<sup>1</sup> [http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How\\_to\\_Feed\\_the\\_World\\_in\\_2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)

<sup>2</sup> i.e. globally the demand for food will grow disproportionately as more countries emerge from poverty and their populations can afford diets higher in protein especially that of livestock origin.

<sup>3</sup> <https://www.weforum.org/agenda/2019/02/why-the-agtech-boom-isn-t-your-typical-tech-disruption/>

- Growth in DDI is at a tipping point and requires further investment to meet demand and deliver its potential;
- There are a number of industry sectors that are key to the local economy and which align to national areas of focus; and,
- Realising DDI opportunities are most likely to generate sustainable socio-economic benefits and support inclusive growth.

- 2.4 The DDI Programme vision is establish the region as the Data Capital of Europe. It will do this by playing to the City Region Deal partner strengths in education and research and significantly boosting activities with public, private and third sectors. In relation to Agri-Tech University of Edinburgh will work with regional partners to create a world-leading innovation hub, where key organisations from the public, private and third sectors collaborate and access data in a trusted, secure environment, to enable data-driven advances in the delivery of agriculture and aquaculture improvements and create innovative commercial solutions.
- 2.5 The Agri-Tech Hub will bring together world-leading researchers from University of Edinburgh and other Higher Education institutions, public and third sector organisations, to focus on four activity areas crucial to the advancement of Agri-Tech - **acquisition**: by sourcing and curating multiple data sets and modalities; **analysis**: through increasingly sophisticated curation, data-cleaning and innovative interrogation and analysis of large Agri-Tech data sets within data-safe havens; **access**: providing information to enable access to the data revolution the Agri-Tech community is about to embrace (for example to better share and leverage leading practice in agriculture methods); and, **connectivity**: to ensure awareness across stakeholder communities.
- 2.6 Through this business case, Midlothian Council and the University of Edinburgh seek approval for capital investment of £74 million (of which the Scottish and UK Governments are asked to fund £28.3 million) for the development of the Hub and associated enabling transport infrastructure. For the University the capital investment will enhance, and further leverage, an already-extensive range of agri-tech facilities located at the Easter Bush Campus, and in complementary facilities across Midlothian, East Lothian and the City of Edinburgh. These investments encompass new data and other on-site facilities and related on and offsite transport improvements and energy infrastructure. The latter investments (in transport and energy) are essential in enabling investment in the local area and eliminating key constraints on further development of the Easter Bush campus, including increased occupation by partner organisations.
- 2.7 This Business Case has been endorsed by UK and Scottish Governments and is now presented to the Joint Committee for approval.

### 3. Main report

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- 3.1 The City Region has a long history of excellence and leadership in informatics and data science including: one of the largest computing school in Europe (the University of Edinburgh's School of Informatics); the UK's principal super-computing facility

(Edinburgh Parallel Computing Centre); and, the largest concentration of internationally-significant and world-leading informatics research in the UK.

- 3.2 Moreover, in the last four years, local DDI capability has grown significantly as multiple new initiatives within the data science, robotics and computer systems areas have been secured. This is amplified by the progress already made in setting up and implementing core elements of the DDI Programme (including the Bayes Centre which has already secured significant levels of private investment) and a range of initiatives addressing COVID and post-COVID issues across a range of city region sectors.
- 3.3 The Easter Bush Campus already provides a dynamic and vibrant home - with world class facilities equipped with the latest technologies - to over 1,000 scientists, lecturers and clinicians as well as co-locating industry business partners across animal biosciences and food security. It is the academic home for animal science within Scotland and is Europe's largest concentration of animal science research expertise. In addressing these needs the City Region Deal investment in the Easter Bush Agri-Tech Hub will enable a **step-change in the scale and impact** in the Campuses teaching, research and innovation outputs.
- 3.4 As with the DDI programme as a whole, the Easter Bush Agri-Tech Campus is designed around five key areas of intervention (or "TRADE" themes):
- **Talent:** Develop a flow of talent in data driven entrepreneurship and the application of Agri-Tech;
  - **Research:** Develop, in conjunction with industry, a world-leading research capability in data science;
  - **Adoption:** Undertake a range of industry engagements focused on building collaborative partnerships to enable new research and innovation activity;
  - **Data:** Support initiatives, such as the Agri-EPI Centre, to create data assets to help businesses with IoT, technology, robotics and novel systems of production; and,
  - **Entrepreneurship:** Generate a pipeline of new high-growth start-ups and scale-ups, and support equity investment.
- 3.5 By demonstrably improving innovation and incrementally enhancing the City Region DDI ecosystem the Easter Bush Agri-Tech Campus will, over the next 15 years, deliver:
- **Talent:** by directly engaging with around 141,000 people, including around 25,000 undertaking credit bearing CPDs and other courses, in the application of data to develop genetics and health innovations in agriculture and aquaculture;
  - **Research:** through hosting world-leading applied researchers and projects worth an additional £116 million over the lifetime of the DDI Programme;
  - **Adoption:** increasing new company engagements (100) to enhance data adoption in agriculture;



- **Data:** supporting new initiatives to curate, analyse, and translate huge datasets – such as the new centres of Data Driven Breeding and Aquaculture Genetics and Health – to encourage and enable the creation of Agri-Tech assets;<sup>4</sup> and,
- **Entrepreneurship:** through the establishment of an additional 30 new high-growth firms and support to around 150 graduates in setting up or joining micro Agri-Tech companies.

### **Intervention 1: Talent**

- 3.6 If the benefits of the Agri-Tech data revolution are to be realised it is vital that agri-food professionals are skilled and confident in data acquisition, handling, interrogation, application and data-driven innovation. A key aspect of the Hub vision will be to diversify and proliferate training capability to provide the talent pool needed to deliver Agri-Tech DDI. Through partnership and active involvement of the commercial pre-farm sector, talent development will be structured to provide targeted up-skilling and delivery to specific sector needs.

### **Intervention 2: Research**

- 3.7 To enable a stepwise increase in Agri-Tech research and innovation outputs a range of topic focussed DDI initiatives will be developed to complement, build on and grow the current campus research capabilities undertaken by the:
- **Centre for Aquaculture Genetics and Health** – providing world leading teaching, training and knowledge exchange in aquaculture genetics and health research, supported by new strategic partnerships with world-leading companies across the Future Food and One Health agenda;
  - **Centre for Data Driven Breeding** – delivering training, research and a translation hub for animal and crop breeding globally (in collaboration with wider University partners in Geoscience and School of Biological Sciences) targeting both Future Food and One Health agendas;
  - **Epidemiology Centre for One Health and Sustainable Development** – transforming veterinary epidemiology and population medicine through the development of people-centric analytics to solve planetary One Health challenges (in collaboration with wider University partners in Geosciences); and,
  - **Centre for ‘Net Gen’ Veterinary Diagnostics** – developing novel diagnostic tests to transform veterinary patient care globally through quicker diagnosis enabling disease mitigation and animal welfare delivery. This will enable collaborative activity with the wider College on “One Health”, with many of these discoveries also impacting on human health, particularly those in zoonosis.

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<sup>4</sup> Large datasets relating to host-pathogen interactions and animal behaviour will drive solutions to animal diseases and are a critical tool to mitigate the impact of drug resistance. More over rich data on microbiomes and metagenomes in states of health and disease will help to define the role of microbial communities in animals as well as yield opportunities in industrial biotechnology.



### **Intervention 3: Adoption**

- 3.8 Enhanced research excellence, output and profile will provide both the ‘magnet’ and basis for transformative DDI commercial activity particularly in the fields of genetics, biotechnology, and health applied to both terrestrial agriculture and aquaculture. The Roslin Innovation Centre - through the provision of a supported flexible working environment at Easter Bush – will act as the gateway to facilitate a growing community of collaborators in Agri-Tech commercial activity.
- 3.9 Current tenant collaborators cover a mixture of 16 start-ups and SMEs. The success of securing these 16 partners within 18 months of opening highlights the opportunities available within the sector for collaborative campus-based growth.
- 3.10 The collaboration potential offered by the Roslin Innovation Centre is also enhanced by the 50+ commercial animal health and agribusiness collaborations that have been nurtured on the Campus over recent years and provide (potential) access to various relevant datasets.
- 3.11 Agri-EPI Centre will host and expand its national support ecosystem offering locally to businesses aligned with its mission and objectives, focusing on IoT, technology, robotics and novel systems of production. It has just opened its Hub and already incubates 4 companies, with ambition for many more. Linking with Agrimetrics at-market business model will add additional value at the higher TRL level of data integration solutions and securing mutually beneficial revenue streams through its data marketplace model.

### **Intervention 4: Datasets**

- 3.12 The Hub will function as a ‘meeting place’ where innovative up-stream research mixes with entrepreneurial thinking, industry focused research and accelerated adoption, all driving the appropriate talent development and upskilling needed to transform agriculture and aquaculture. As a conduit for knowledge flow both from research to industry and vice versa, the Hub activity will be driven by data generation and sharing, analysis and interpretation and communication to all users by integrating multi-dimensional datasets (harbouring trillions of data points) to gain knowledge and drive innovation across pre-production agri-science sector by:
- Initial integration of genomics data (or huge volumes of sequencing data) with novel ‘phenotyping’ technologies to capture farm-level data on farmed animals and crops, and their environments; and, then,
  - Moving to multidimensional data sets to: underpin agribusiness product development for improved health surveillance; inform policy for infectious zoonotic disease outbreaks and food borne disease; support the development of diagnostics and animal vaccines; and, develop next generation breeding strategies for improved production efficiency, disease resistance and reduced environmental footprints.

3.13 Both public sector sourced and business generated datasets will be accessed enabling data-driven innovation (DDI) to develop innovation which benefits the industry throughout the food supply chain. The outputs will drive growth of breeding, biotechnology, and animal health companies, while producers will also benefit from solutions to ensure their livestock, crops, or fish are high-performing and robust to environmental change.

#### **Intervention 5: Entrepreneurship**

3.14 A strong focus for the University will be mentoring to support start-up growth and creating a robust pipeline to attract corporate capital and other forms of inward investment. Many of the corporate partners involved in research and innovation are also interested in engaging with early-stage high-growth ventures that may be acquisition targets or who offer increased competitive advantage.

3.15 This will involve identifying, enabling and growing new Agri-Tech talent and facilitating new connections and supporting emerging commercial Agri-Tech activities in collaboration with the local ecosystem and Agritech centres to foster growth and impact through their national and international members by providing the space and ecosystem to innovate through a range of activities, including:

- **Venture Studio within** the Roslin Innovation Centre at Easter Bush. Termed the **FAST for Food and Agriculture Science Transformer** this will be first venture studio in Scotland and the first food and agriculture venture studio in Europe. The recently established FAST programme is structured to enhance the likelihood of producing innovative, high-value Agri-Tech companies within the ESES region. Through the current year activity, FAST (funded by the BBSRC and Roslin Foundation) three initial areas are being piloted: regenerative aquaculture, pollinator enforcement and controlled environment agriculture;
- **Hackathons/Plotathons** based around specific Agri-Tech challenges in partnership with other University of Edinburgh DDI Hubs, these events will identify and empower budding entrepreneurs, from within the Region, to develop their business propositions and progress to commercial activity within the Roslin Innovation Centre or elsewhere with the ESEC commercial infrastructure; and,
- **An Entrepreneur Club** to upskill individuals through a series of bespoke interactive events that focus on networking, emotional intelligence, marketing as well as understanding of funding for enterprise and pitching events – with the aim to help individuals towards commercial activity or spin out a company.

3.16 The cohorts emerging from the Entrepreneur Club represent a 'ready-made' pool of talent for FAST. All companies created and supported by FAST, as well as existing tenants of the Roslin Innovation Centre and commercial players born out of the Hackathons/Plotathons, will also provide the inspiration and role models, as well as an

informal supportive entrepreneurial ecosystem, for aspiring graduates, postdocs and individuals from the local community.

- 3.17 To further enhance this ecosystem and best exploit Agri-Tech opportunities support will be provided by the **Research Hotel**. Located within the Roslin Innovation Centre the Research Hotel currently provides established companies and start-ups with ready to use state-of-the art office and fully fitted out lab space with access to standard lab equipment. This facility will be expanded to support entrepreneurs and micro businesses that (successfully) emerge from the Hackathon, Plotathon and FAST activities
- 3.18 In addition a dedicated space called **the 'Makers Barn,'** tailored to facilitate co-production of innovative solutions for on-the-ground active small and micro Agri-Tech companies, will be developed to enhance the facilities offered at the Edinburgh hub of AgriEPI. This open facility will promote the interaction between community players, academics at Easter Bush and co-located Agri-Tech companies with the goal of developing new, better and/or less expensive products and services.

#### **Intervention 6: Inclusive Growth**

- 3.19 The DDI Agri-Tech programme will allow the Campus to build upon and develop a wide range of existing inclusive growth and equality activities. Foremost amongst these is the Easter Bush Science Outreach Centre (EBSOC).<sup>5</sup> The current geographical reach across Scotland is extensive and, on a 2 to 3-day week capacity, in 2018-19 engaged over 3,500 pupils mainly from SMID 1-2 areas.
- 3.20 The DDI Agri-Tech programme provides significant opportunity to expand the operational capacity and remit of EBSOC (from an animal bioscience focus to a wider DDI Agri-Tech portfolio). It is the intention to increase the capacity of the EBSOC to 5 days a week over the next 2-3 years (funding dependant) with a focus on engaging regional areas with low science capital and/or restricted access due to their rurality. This expansion will dovetail and contribute to the development of a STEM focused High School adjacent to the Easter Bush Campus.
- 3.21 Capacity will also be extended through the "Public Engagement Public Lending Library" - a student-led public engagement activity co-ordinated by EBSOC staff. Students participating in the Agri-Tech Talent courses with a research element, will be encouraged to shape a public engagement activity linked to their specific Agri-Tech research which can be communicated to school pupils and adults in the community. Agri-Tech students will receive mentoring and coaching from the EBSOC team in order to develop interactive, hands-on activities, to be placed in the lending library, which can be utilised by campus staff for any community events, science festivals, school visit or outreach events. In addition, as part of the Agri-Tech activity, it is proposed to expand veterinary outreach activities to the rural communities and those with limited ability to access Campus facilities.
- 3.22 Citizen science activity will also be expanded to involve the public with the collection, curation and analysis of data, so that communities can become actively involved and

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<sup>5</sup> <https://www.ed.ac.uk/easter-bush-campus/science-outreach-centre>

contribute to the DDI Programme.<sup>6</sup> This activity links into and complements more focussed projects with partners which seek to address social issues - for example the student led “All for Paws” vet outreach clinic for animals of homeless and vulnerably-housed people, which has resulted in partnership with Turning Point Scotland, NHS Lothian and the Grassmarket Community Project.

3.23 With regard to equality ambitions, the Roslin Institute is one of only nine research entities in the UK to achieve Athena SWAN Gold status which recognises and celebrates good employment practice for women working in science, engineering and technology within the Higher Education & Research sector.<sup>7</sup> The principles of such practice will be embedded within the DDI Agri-Tech Programme, particularly impacting the Research and Adoption aspects. This will include woman acting as positive role models to early career scientists, provision of Carers Grants for staff with caring responsibilities when they attend conferences vital for career development, gender balance for all interviews and participation in “Coaching for Success”, which provides individual career coaching for staff at key stages of their career.

3.24 Finally, the Easter Bush Campus was the first University body in the UK to hold an Investors in Young People accreditation at a Silver level.<sup>8</sup> Again the commitment the Campus has made to providing opportunities and experience for young people within the community will also be embraced within the DDI Agri-Tech Programme through a strong, positive and supportive culture on the campus, and access to training and development opportunities, including provision of both Foundation and Modern Apprenticeships.

## **Intervention 7: Transport Improvements**

3.25 Both Midlothian Council and the University of Edinburgh recognise that adequate road access to the site must be provided if constraints on the further development of Easter Bush are to be avoided. In particular, the Midlothian Local Development Plan transport modelling - of all committed developments in the area - highlighted potentially serious road traffic congestion, capacity issues and delays along the A701<sup>9</sup>. City Region Deal funding would enable the early prioritisation and, therefore, the effective implementation of the Local Development Plan strategy in the A701 corridor.

3.26 The proposed roads infrastructure changes will be a key enabler of the future development of the Easter Bush Campus comprising the A701 Relief road, A702 Link Road, Bush Loan Junction and Straiton junction. These improvements will also enable and support future investment across the wider Midlothian Science Zone (including the

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<sup>6</sup> Current examples of such engagement include the Scottish Beekeeping Society being actively involved with the Easter Bush apiary and the Dogslife project where citizen science is key to data acquisition.

<sup>7</sup> <https://www.ed.ac.uk/roslin/work-study/award-winning-environment/athena-swan>

<sup>8</sup> <https://www.ed.ac.uk/easter-bush-campus/where-people-thrive/staff/awards/investors-in-young-people-silver-award>

<sup>9</sup> See the Midlothian Local Development Plan Main Issues Report, Transport and Infrastructure Technical Note - <https://www.midlothian.gov.uk/downloads/file/2517/transport-and-infrastructure-technical-note> and the Report of Examination, issue number 6, page 144 – 181, which addresses the A701 Relief Road/A702 Link Road and the approach of the Council in preparing the transport appraisal of the Midlothian Development Plan (to comply with Scottish Planning Policy) - <https://www.midlothian.gov.uk/downloads/file/2292/report-of-examination-into-mldp-proposed-plan>

Biocampus, Technopole and Moredun Institute) as well as throughout the whole A701 corridor including significant planned housing (1,570 units) and economic and commercial development in the A701/A702 corridor (circa 90Ha). In addition the new roads and junctions will add significant additional highway capacity to the local road network, improve journey times compared to the existing delays on the A701 and facilitate re-prioritising road space to deliver sustainable transport improvement measures (prioritising walking, cycling and bus based public transport) along the existing A701 from Straiton to Gowkley Moss roundabout. These measures will create safer (and potentially segregated) access to and from the Easter Bush Campus from the A720 Edinburgh City Bypass.

3.27 As illustrated, in the figure overleaf, the A701 Relief Road will comprise:

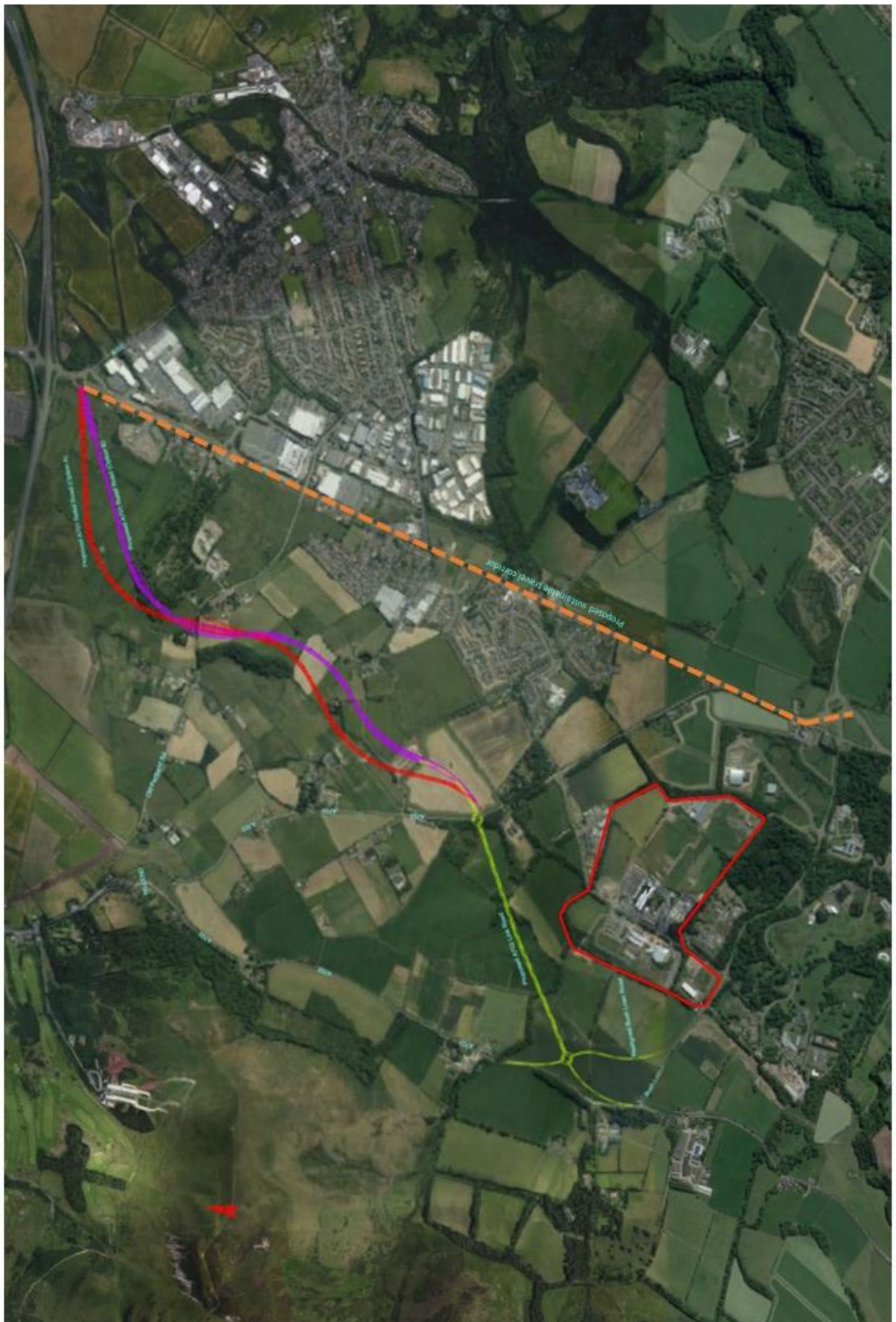
- New road infrastructure between Straiton Junction and Pentland Road;
- A new bridge crossing or four-arm roundabout junction at Pentland Road; and
- New road infrastructure between Pentland Road and A703 Seafield Moor Road.

The A702 Link Road will consist of:

- A roundabout junction with the A703/A701 Relief Road; and,
- The A702 Link road.

3.28 The A702/Bush Loan junction will incorporate a new four-armed roundabout junction connecting the A702 (north and south), Bush Loan and the A702 Link Road.





## 4. Financial impact

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- 4.1 Through this business case, Midlothian Council and the University of Edinburgh seek approval for capital investment of £74 million (of which Government is asked to fund £28.3 million).
- 4.2 In addition to underwriting up to £16.6 million of the total capital requirement, and leveraging a further £10 million from the Biotechnology and Biological Sciences Research Council, the University of Edinburgh will:
  - Fund on-going operating costs; and,
  - Fully fund the continued operation of the Agri-Tech Hub beyond the duration of the DDI Programme.
- 4.3 Midlothian Council has secured funding of £10 million for the transport elements of the current proposals and will forward fund a further £9 million which includes sums it expects to secure from further residential and commercial developments along the transport corridor.
- 4.4 The actual spend profile will vary across the funding period and will be regularly updated in response to learning and changing circumstances to ensure maximum impact against its programme and wider inclusive growth goals.
- 4.5 Overall the initial due diligence undertaken by both Midlothian Council and the University of Edinburgh indicates that the two components of this project and associated risk profiles are affordable if the capital grant is approved at the currently requested level and phasing.

## 5. Alignment with Sustainable, Inclusive Growth Ambitions

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- 5.1 City Region Deal partners are committed to ensuring that Inclusive Growth ambitions are embedded across the deal, reflecting the challenges being faced across the region.
- 5.2 In this context - beyond the inclusive growth interventions already identified at Section 3 the Agri-Tech Hub - will actively seek to improve the flow of disadvantaged individuals into good employment and careers by working with Midlothian Council:
  - In maximising the potential benefits - of this project and future investments- within the local economy;
  - To future proofing the regional economy through stimulating a positive step change in equality, capacity and productivity;
  - Encouraging meaningful participation by stakeholders in designing and delivering services and interventions; and,
  - Providing opportunities to strengthen career progression routes for those who face significant labour market disadvantage

## 6. Background reading/external references

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- 6.1 [Edinburgh and South-East Scotland City Region Deal Document](#), August 2018

- 6.2 [Enabling a World-Leading Regional Digital Economy through Data Driven Innovation](#),  
Edinburgh & South East Scotland City Region Science and Innovation Audit,  
November 2016

## 7. Appendices

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- 7.1 Easter Bush Business Case Summary



# **Programme for Delivery of a Data-Driven Innovation Cluster in the Edinburgh and South-East Scotland City Region**

Final Business Case for Investment in Easter Bush



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# 1 Executive Summary

The world population is currently 7.8 billion. The United Nations Food and Agriculture Organization (FAO) predicts that this will rise to 9.7 billion by 2050.<sup>1</sup> Feeding this growing population well - while protecting biodiversity and natural capital - is one of the greatest global challenges we face. To ensure future food security the FAO estimate that by 2050 global agricultural production (including crops and animals) will need to be 70% higher.<sup>2</sup> Delivering this increase will also need to be balanced against reducing the environmental footprint of food production.<sup>3</sup> The dilemma of producing more food from less resource while also addressing zero-carbon and reduced emission goals is set against a backdrop of farming supporting over 25% of global employment<sup>4</sup>.

Achieving these goals will require long-term improvements in the genetics and health of farmed populations in both agriculture and aquaculture. Advances in data-driven sciences such as high-throughput genomics and digital trait recording provide major opportunities to achieve this. When these technologies are effectively integrated they will: improve the efficiency of food production; accelerate the path to zero carbon and reduced emissions; and ensure product quality, animal health, robustness and welfare. Moving increasingly to real-time, data-based decision making by intersecting genomics, biotechnology, artificial intelligence, digitalisation, and robotics with local and global data (in terms of food species genetics, disease state, vet epidemiology and animal diagnostics, soil condition, weather patterns and market drivers) current productivity levels can be increased in a manner that will enhance the high-health status and reduce the harmful emissions of agricultural systems.

The Edinburgh and South East Scotland (ESES) City Region Deal investment proposed at Easter Bush will provide the infrastructure and capacity to create the **Easter Bush Agri-Tech Hub** (Hub) to transform innovation and knowledge exchange related to data-driven breeding and health of farmed populations. This Hub will function as an early-stage innovative funnel of research and talent, through to adoption and entrepreneurial activity, all based on data acquisition, sharing, and translation to achieve impact for the region and further afield. Working with the Edinburgh International Data Facility (EIDF), and other City Region Deal University Hubs, Agritech Innovation Centres and other commercial and academic partners across the UK, the aim of this Hub is to be the **Agri-Tech innovation destination of choice for the public, private and third sectors**.

The Hub will function as a 'meeting place' where innovative up-stream research mixes with entrepreneurial thinking, industry focused research and accelerated adoption, all driving the appropriate talent development and upskilling needed to transform agriculture and aquaculture. As a

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<sup>1</sup> [http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How\\_to\\_Feed\\_the\\_World\\_in\\_2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)

<sup>2</sup> i.e. globally the demand for food will grow disproportionately as more countries emerge from poverty and their populations can afford diets higher in protein especially that of livestock origin.

<sup>3</sup> e.g.: "emissions from agriculture account for 20% of total Scottish emissions and agriculture-related land use accounts for a further 5%, making agriculture-related emissions the third largest emissions sector (after industry and transport). This illustrates how important it will be to reduce emissions in this sector, especially as in recent years there has not been any significant progress in reducing agriculture emissions". Reducing emissions in Scotland 2018, Progress Report to Parliament, Committee on Climate Change, September 2018.

<sup>4</sup> <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS>

conduit for knowledge flow both from research to industry and vice versa, the Hub activity will be driven by data generation and sharing, analysis and interpretation and communication to all users by integrating multi-dimensional datasets (harbouring trillions of data points) to gain knowledge and drive innovation across pre-production agri-science sector by:

- Initial integration of genomics data (or huge volumes of sequencing data) with novel 'phenotyping' technologies to capture farm-level data on farmed animals and crops, and their environments; and, then,
- Moving to multidimensional data sets to: underpin agribusiness product development for improved health surveillance; inform policy for infectious zoonotic disease outbreaks and food borne disease; support the development of diagnostics and animal vaccines; and, develop next generation breeding strategies for improved production efficiency, disease resistance and reduced environmental footprints.

Both public sector sourced and business generated datasets will be accessed enabling data-driven innovation (DDI) to develop innovation which benefits the industry throughout the food supply chain. The outputs will drive growth of breeding, biotechnology, and animal health companies, while producers will also benefit from solutions to ensure their livestock, crops, or fish are high performing and robust to environmental change.

### **Strategic intent**

Through enabling investment in Talent, Research, Adoption, Data and Entrepreneurship (TRADE), the Hub – and wider activities across the Easter Bush campus (campus) - will support, over the next fifteen years, the development of new digital solutions in Agri-Tech through:

- **Talent:** by directly engaging with around 141,000 people<sup>5</sup> in the application of data to develop genetics and health innovations in agriculture and aquaculture;
- **Research:** through hosting world-leading applied researchers and projects worth an additional £116 million over the lifetime of the DDI Programme;
- **Adoption:** increasing new company engagements (100) and continuous professional development (CPD) to enhance data adoption in agriculture;
- **Data:** supporting new initiatives to curate, analyse, and translate huge datasets – such as the new centres of Data Driven Breeding and Aquaculture Genetics and Health – to encourage and enable the creation of Agri-Tech assets;<sup>6</sup> and,

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<sup>5</sup> Including around 24,000 undertaking credit bearing CPDs and other courses.

<sup>6</sup> Large datasets relating to host-pathogen interactions and animal behaviour will drive solutions to animal diseases and are a critical tool to mitigate the impact of drug resistance. Moreover rich data on microbiomes and metagenomes in states of health and disease will help to define the role of microbial communities in animals as well as yield opportunities in industrial biotechnology.

- **Entrepreneurship:** through the establishment of an additional 30 new high-growth firms and support to around 150 graduates in setting up or joining micro Agri-Tech companies.

In addition, the Hub will undertake various **inclusive growth** activities in Science and Agri-Tech data skills (engaging with around 58,000 people in Scottish Index of Multiple Deprivation (SIMD)<sup>7</sup> and rural communities over 15 years).

### What will be different?

City Region Deal partners have set out a total capital investment funding proposal of £73.9 million of which £28.3 million is requested from the ESES City Region Deal. The associated capital investment will enhance, and further leverage, an already-extensive range of agri-tech facilities located at the UoE Easter Bush Campus, and in complementary facilities across Midlothian, East Lothian and the City of Edinburgh. These investments encompass new data and other on-site facilities, and related on and offsite transport improvements and energy infrastructure. The latter investments (in transport and energy) are essential in enabling investment in the local area, and eliminating key constraints on further development of the Easter Bush campus, including increased occupation by partner organisations.

The breakdown of the five funding sources anticipated to deliver the overall investment of £73.9 million are illustrated in Table One below.

*Table One: Funding Sources and Breakdown*

Source	Amount (£m)
Requested from the ESESCRD	28.3
Committed by Midlothian Council	7.0
(To be) Realised from third parties to fund transport upgrades	12.0
Underwritten by the University of Edinburgh	16.6
Leveraged from the Biotechnology and Biological Sciences Research Council (BBSRC)	10.0
<b>Total</b>	<b>73.9</b>

Overall the preferred project option and associated risk profile is affordable and capable of being self-sustaining over the longer term if the capital costs are met by capital grant and University of Edinburgh contributions. A dedicated Agri-Tech Delivery Team will be accountable for the day-to-day operations and delivery of the Agri-Tech programme. The Agri-Tech Senior Responsible Officer, who will lead delivery of the programme, is Professor Bruce Whitelaw - a global leader in the application of biotechnology and DDI in the agri-science environment. The Agri-Tech Delivery Team will report to the School Senior Management Team for approval of projects. Chaired by the Head of School (currently Professor David Argyle) the School Senior Management Group will review activity within the Agri-Tech

<sup>7</sup> <https://www2.gov.scot/Topics/Statistics/SIMD>

Programme and ensure it is adequately resourced and supported, as well as linked into to the wider School activity on the Campus. Finally, the Agri-Tech Delivery Team will interface with the DDI PMO to ensure that there is a 'chain of command' in terms of alignment with the wider DDI programme and ensuring consistency in communications, PR, CRM and marketing.

As illustrated, in Table Two, the net present value (NPV) of the gross value added (GVA) of the Easter Bush proposal is forecast to be £437 million of which £248 million is directly attributable to DDI Programme activity. By applying an undiscounted public sector cost of £51<sup>8</sup> million the UK Cost Benefit ratio, for the latter DDI related activities, is likely to be around 1 to 8.6.

*Table Two: Cost-Benefit Analysis for Easter Bush*

Benefit Ratio for Easter Bush DDI activities based on Government funding contribution: 1:8.6				
GVA (£ million)	City Region	Rest of Scotland	Rest of UK	UK as a Whole
Easter Bush DDI	66.7	27	154.3	248
Road upgrade <sup>9</sup>	189	0	0	189
<b>Total</b>	<b>255.7</b>	<b>27</b>	<b>154.3</b>	<b>437</b>

Finally, it is important to note, that the developments proposed in this Business Case will be the first and significant step to developing an Agritech & One Health<sup>10</sup> hub in the region (and a beacon in the UK). This will involve collocating Medical and Veterinary research (the importance of which is recognised already by the interactions of the DDI hubs most recently in the context of COVID).

One Health will provide a 'focussed lens' to attract inward investment and international (strategic partnerships). The vision for the University is, over the next few years, to be one of the top three global One Health providers with the expectation of drawing in significantly higher levels of (capital) investment and grant (revenue) funding over and above the initial projections and associated GVA benefits outlined in this case.

<sup>8</sup> i.e. £28.3 million City Deal funding, £6 million allocated EIDF costs, £7 million from Midlothian Council and £10 million from BBSRC.

<sup>9</sup> Source: EY, December 2015 as quoted in EDINBURGH AND SOUTH EAST SCOTLAND CITY REGION DEAL - DECEMBER 2015 SUBMISSION.

<sup>10</sup> "One Health is a collaborative, multisectoral, and trans-disciplinary approach - working at local, regional, national, and global levels - to achieve optimal health and well-being outcomes recognizing the interconnections between people, animals, plants and their shared environment" [https://www.onehealthcommission.org/en/why\\_one\\_health/what\\_is\\_one\\_health/](https://www.onehealthcommission.org/en/why_one_health/what_is_one_health/)

## 2 Introduction

### About this Document

This business case outlines the investment required to create the **Easter Bush Agri-Tech Hub** (Hub) to undertake data-driven innovation in **Agri-science and Agri-business**.

This case has been developed by the City Region Deal consortium partners in accordance with the HM Treasury Five Cases model.<sup>11</sup> As described in Appendix A capital investment of £28.3 million from the UK and Scottish Governments is requested for:

- Enhanced data technology facilities, equipment and infrastructure across the Easter Bush campus to support the acquisition, curation, analysis, adoption and translation of Agri-science data into genetics and health innovations driving growth of Agri-business (£8.7 million);
- Combined heat and power infrastructure (£8.7 million); and,
- Roads infrastructure improvement - A701 relief road and A702 link road (£10.9 million).

The above (as illustrated at Table One previously) will be further complemented by investment of:

- Up to £19 million in other roads infrastructure improvements by Midlothian Council and third parties;
- £16.6 million from the University of Edinburgh over the 15 years project lifecycle; and,
- £10 million investment by the BBSRC in facilities, equipment and infrastructure to support Hub research and adoption activities.

### 2.1 Project Vision

The Hub will become the Agri-Tech innovation destination of choice for the public, private and third sectors. This vision will be realised by focusing on the benefits of the “Fourth Agriculture Revolution”<sup>12</sup> to create the infrastructure and capacity for DDI translation and adoption in UK and global livestock, aquaculture and crop agriculture.

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<sup>11</sup> <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

<sup>12</sup> Michael Gove, Secretary of State for Environment, Food and Rural Affairs, stated at The Oxford Farming Conference (3<sup>rd</sup> January, 2019) that we are moving into the: “fourth agricultural revolution”. Or as another source indicates: “The fourth industrial revolution (4IR) is starting to change how every agricultural player, from a family farmer to a global conglomerate, produces food and related products. The spread of the so-called *essential eight* technologies — including AI, blockchain, drones, and the Internet of Things (IoT) — to agriculture is leading to increased yields, lower costs, and reduced environmental impact. These tools are also empowering farms to unlock new plant-based innovations and increasing their resilience to extreme weather events and climate change”. <https://www.strategy-business.com/article/The-fourth-industrial-revolution-in-agriculture>



The world's population is forecast to reach 9.7 billion by 2050 placing severe pressures on the global food supply chain. Agri-Tech innovation - using transformative data-driven technologies and analytics - is set to make agriculture more efficient and sustainable by enabling quicker and better responses to these pressures. This is particularly important where food security is endemic and livestock are especially vital to provide protein, create employment and generate income.

Infectious disease is a major burden to all agriculture and aquaculture sectors, in many cases also presenting broader risks to human populations such as AMR and zoonoses. Decisions based on the intercalation of new and diverse data sets will enable: reduced disease spread and enhanced mitigation as outbreaks occur; improved animal welfare delivery, reduction and re-use of waste driving targets in environmental footprints; and, optimisation in feed and food production.

The impacts of using such data can be illustrated, for example, in relation to the higher health and welfare status of livestock. One of the focuses of Hub activity will be better diagnostic and vaccine solutions to manage livestock infectious diseases whilst removing antimicrobials from the food system. Additional solutions will emerge from prevention of outbreaks via improved genetic resistance and integration of genetic and environmental prediction of disease risk. Emerging and endemic diseases pose a threat not only to the health of animals but also humans. It is estimated that zoonoses<sup>13</sup> are responsible for some of the most high profile and devastating epidemics with 2.5b<sup>14</sup> cases of human illness and 2.7m human deaths worldwide each year. Fostering a one health approach of collaboration between human, animal and environmental health sectors is a critical step forward to creating sustainable food supplies.

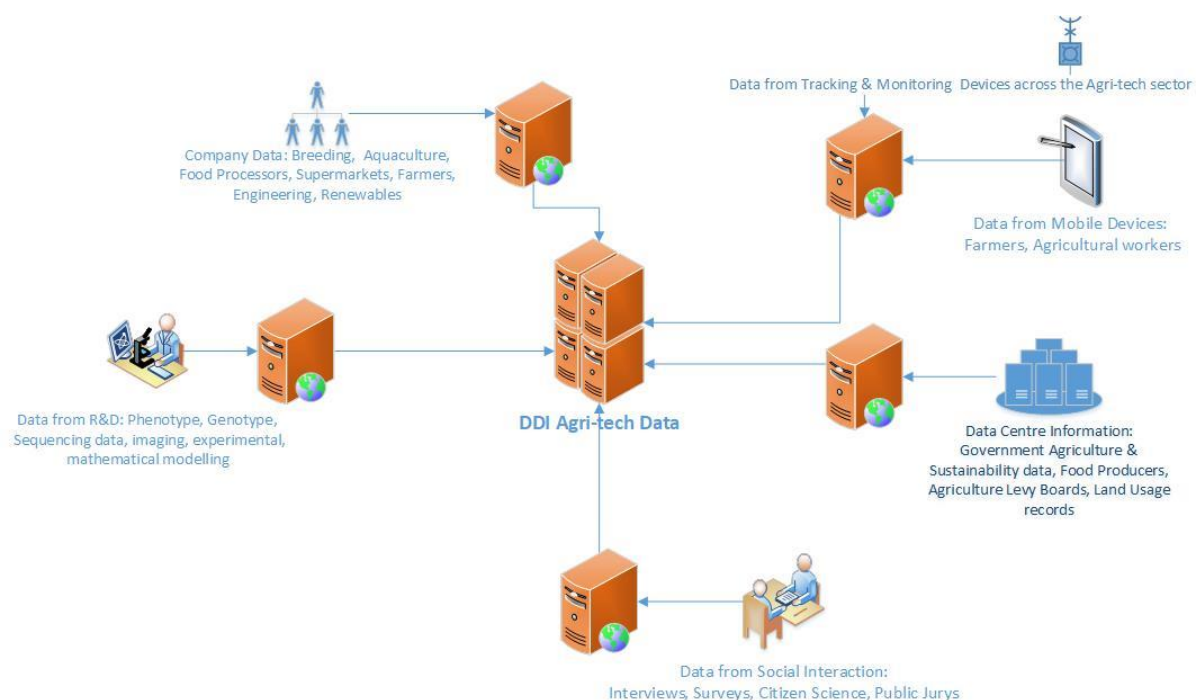
As illustrated, in Figure One, access to datasets to support such an approach will involve a complex matrix of relationships with a variety of partners from across the globe. The ability to build these relationships, collate data, then understand, translate, interconnect, develop and implement innovative responses will be key to the successful delivery of the Hub.

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<sup>13</sup> Are infectious diseases caused by bacteria, viruses and parasites that spread between animals (usually vertebrates) and humans. Major modern diseases such as Ebola virus disease and salmonellosis are zoonoses. In addition the WHO suggests that: "*all available evidence for COVID-19 suggests that SARS-CoV-2 has a zoonotic source*". <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200423-sitrep-94-covid-19.pdf>

<sup>14</sup> PLoS neglected tropical disease 2014: The Global One Health Paradigm. <https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0003257>

**Figure One: DDI Agri-Tech Data Interactions**



The Hub will be at the forefront of devising new and early-stage technologies and approaches to improving livestock and agricultural productivity by:

- Uplifts in the national and international Agri-Tech DDI talent pool - through a range of onsite and virtual courses allied to the data and analysis capability available at Easter Bush - to ensure current practitioners, and the future workforce and leaders, are confident in data acquisition, handling, application and data-driven innovation;
- Facilitating an “inclusive research-based innovation and translation ecosystem” by co-location of world-leading academics and researchers with key strategic partners (in the public and private sectors) such as the UK Agri-tech Centres, which extends to their extensive industry members and through their current and expected local presence. These enhance all aspects of connectivity in order to encourage interdisciplinary collaboration and transformative research and innovation as well as acceleration of high growth firms and spin outs;
- The acquisition, curation and analysis of Agri-Tech Data. Development of a digital twin by intersecting – in real-time – a multitude of local and global data, related to the Easter Bush research expertise (in terms of food species genetics, animal diagnostics, livestock epidemiology and One Health) and in collaboration with AgriEPI, Agrimetrics and CIEL, to benefit from where there is synergy, and through pursuing opportunities including UKRI’s ISCF and GCRF call Transforming Food Production Fund and subsequent calls – current productivity

levels can be increased by having *the right food species and products in the right field at the right time*; and,

- Catalysing and enhancing adoption and translation of data-driven innovation in agriculture sciences through the creation of focussed activities in data-driven breeding in livestock and crops, aquaculture genetics and health, veterinary epidemiology, animal medicine and veterinary diagnostics.

Through these developments the Hub will interface and build on established local, national and international animal health and agribusiness partners to access and produce more datasets and research activity – achieving international recognition and respect as a robust and reliable data haven, integrated with world-leading compute, analysis expertise, and translational routes to maximise impact. In time the Hub will expand its relationships with farmers and whole food supply chain - in collaboration with other established and complimentary UK Agritech Centres (CIEL, CHAP, AgriEpi, & Agrimetrics) and farmer-facing organisations - to maximise on-farm innovation capabilities by providing cross-hub collaboration across world class informatics, robotics and satellite technologies. It will do so through developing synergies with the other DDI Hubs within UOE, and external agencies, to enable the Hub to develop analytical processes and strategies to enable more accurate and rapid decision making from the farmer to the consumer.

## 3 Project Description

### 3.1 Opportunity Realised through the Vision

#### 3.1.1 Agri-Tech Opportunity

The world is changing faster than ever. New technology is creating new industries, changing existing ones and transforming products and services. Described as the Fourth Industrial Revolution, change is of a scale, speed and complexity that is unprecedented. It is characterised by a fusion of technologies – such as artificial intelligence, high-throughput screening, gene editing and advanced robotics – that is blurring the lines between the physical, digital and biological worlds. It will disrupt most industries and have a global impact creating new opportunities and challenges for our society.

Agri-Tech is central to this transformation, both in its growing dependence on multiple, large if not massive datasets and the potential to deliver a sustainable, carbon zero food supply to adequately nourish the growing world population. The Hub will contribute to this sustainability goal through focussing on the Future Food and One Health sectors, addressing global needs to achieve zero carbon livestock (part of the zero-carbon food chain) and markedly reducing infectious diseases in farmed animals.

The value of data comes from its use in real time, or aggregation over long periods, to understand and predict behaviour. While data is becoming ubiquitous, the challenge is to use this data effectively to shape, develop and deliver innovative products and services throughout the food supply chain – from the pre- and on-farm sector to consumers. The aim of the Hub will be to utilise data to produce the talent, knowledge and IP pipeline at the early stage of the agritech innovation funnel, driving entrepreneurial and adoption activities through external partnerships in the digital, life science and food and drink sectors and interfaces with the public, livestock, wildlife and the environment.

DDI has the potential to be a key pillar of 21<sup>st</sup> century growth by significantly enhancing productivity, resource efficiency, economic competitiveness and social wellbeing. In harnessing such opportunities, the Edinburgh and South East Scotland Science and Innovation Audit<sup>15</sup> (SIA) identified that:

- The City Region is already a DDI **powerhouse**; with the largest concentration of animal science research related expertise in Europe with world leading schools in veterinary science and informatics. Key research capabilities lie in genetics and systems biology, underpinned by informatics and engineering strengths. Specifically, Edinburgh leads the UK livestock and aquaculture genetics research expertise;
- Growth in DDI is at a **tipping point** and requires further investment to meet demand and deliver its potential specifically where data underpins science and policy to coordinate a common approach that addresses human, animal and ecology in balance and globally;

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<sup>15</sup> <https://www.gov.uk/government/publications/science-and-innovation-audits-first-wave-reports>

- There are several **industry sectors** that are key to the local economy and which align to national and global areas of focus including food production and associated infectious diseases; and,
- Realising such DDI opportunities are most likely to generate sustainable socio-economic benefits and support **inclusive growth**.

### 3.1.2 Easter Bush Vision

The DDI Programme vision is to establish the Edinburgh and South East Scotland City Region as the Data Capital of Europe. This will be achieved by playing to the City Region Deal partners' strengths in education and research, as well as significantly boosting commercial activity. Easter Bush will contribute to this vision becoming an internationally recognised **Agri-Tech innovation destination of choice for the public, private and third sectors**.

Agriculture is a well-established and important UK sector. The entire agri-food supply chain in 2018, from agriculture to final retailing and catering, is estimated - as detailed at Table Three below – to have contributed £121 billion or 9.4% of UK GVA.

Table Three: Total Agri-Food Sector GVA<sup>16</sup>

2018	£ billion
Agriculture and Fishing	£10.4bn
Food and Drink Manufacturing	£28.6bn
Food and Drink Wholesaling	£14.5bn
Food and Drink Retailing	£30.6bn
Non-Residential Catering	£36.9bn
<b>Total</b>	<b>£121.0bn</b>

Based on the farm-gate value of unprocessed food in 2018 the UK supplied just over half (53%) of the food consumed in the UK. The leading foreign suppliers of food consumed in the UK were countries from the EU (28%) with Africa, Asia, North and South America each providing a 4% share. The ability to source food from a diverse range of stable regions is a key focus of UK government policy on food security.

<sup>16</sup> <https://www.gov.uk/government/publications/food-statistics-pocketbook/food-statistics-in-your-pocket-summary>.

Agri-Tech, through data-driven innovation, is now poised to transform this sector enabling UK and international farmers, and related industries, to provide food security while accelerating the path to zero carbon in the agriculture sector. This can be achieved by innovation in systems biology approaches to providing the 'right' genetics, vaccines, diagnostics and epidemiology to work in partnership with on-farm innovation. The Hub at Easter Bush is structured to provide the upstream drivers for the sector, initially through innovative livestock genetics, subsequently broadening into crops and on-farm through strategic partnerships. Increasing international engagement will attract additional capacity and encourage international businesses to 'land' in the local ecosystem.

The UK Government Industrial Strategy<sup>17</sup> identifies the data revolution and clean growth as two of its four Grand Challenges – both highly relevant to Agri-Tech DDI. The strategy prioritises industrially relevant R&D that will require more suitably skilled graduates and postgraduates.

As part of the UK strategy for agricultural technologies four Agritech Centres have been established and investment provided to transform food production. Easter Bush will actively partner with these Agritech Centres to collaborate with their membership across the whole agri-food chain, utilise their satellite farm network and enable research science into practice. This partnering, in addition to that with other local strategic partnerships (e.g. The James Hutton Institute, Scottish Aquaculture Innovation Centre) will ensure the stepwise transformation of agri-science research into agri-business.

### 3.2 Current Position – world leading but further investment needed

***“We have Edinburgh as kind of a world capital for livestock health and genetics”***, Bill Gates, House of Lords, 10 November 2014.

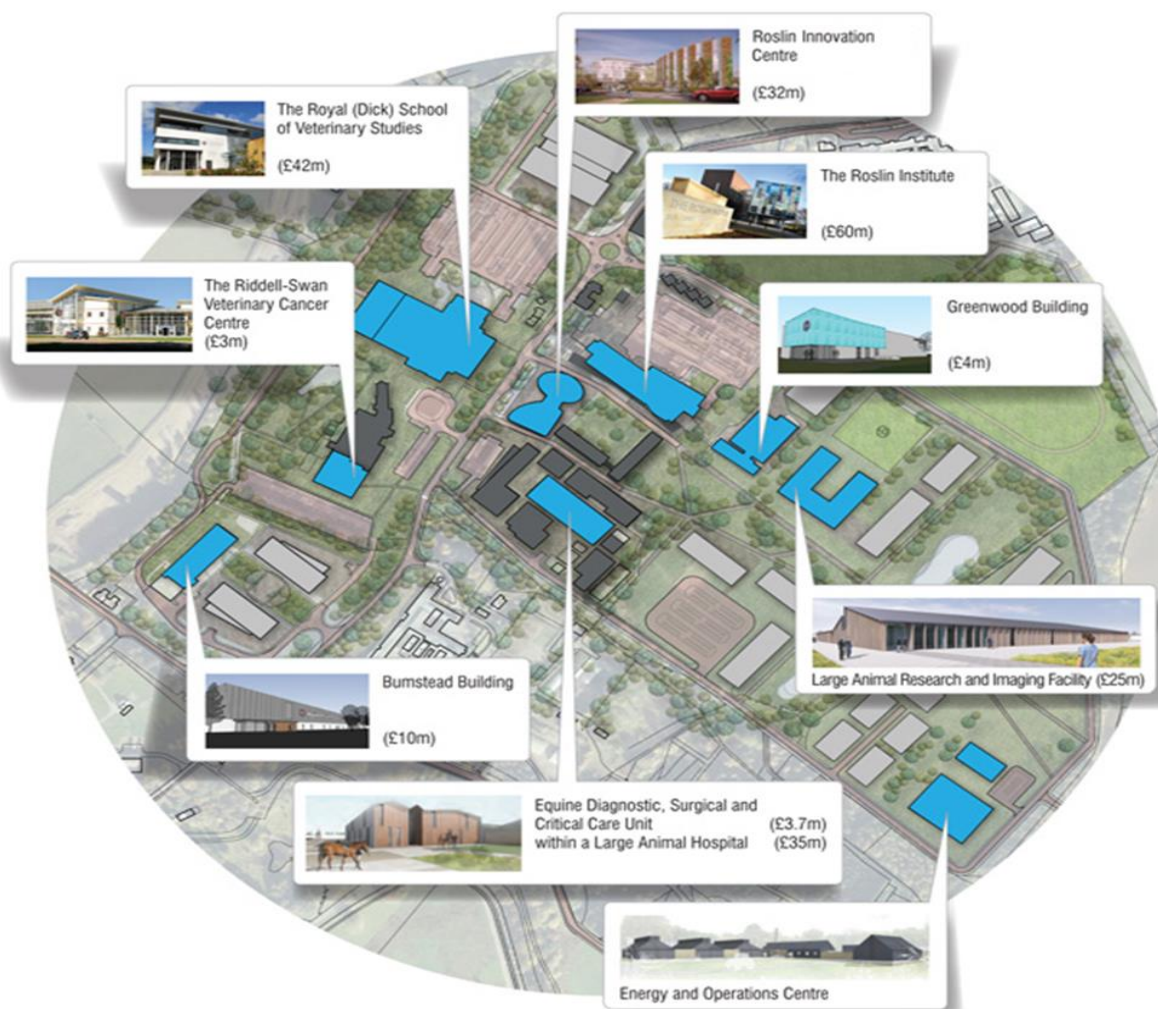
As outlined, in Figure Two, the Easter Bush Campus provides a dynamic and vibrant home - with world class facilities equipped with the latest technologies - to over 1,000 scientists, lecturers and clinicians as well as co-locating industry business partners across animal biosciences and food security. It is the academic home for animal science within Scotland and is Europe's largest concentration of animal science research expertise.

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<sup>17</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf)

**Figure Two: Easter Bush Campus**

*(The values in Figure Two represent the levels of capital investment already committed to expanding the Campus over the last ten years).*



The focal points of the campus are the Royal (Dick) School of Veterinary Studies (RDSVS), Roslin Institute and Scotland's Rural College (SRUC):

- The **RDSVS** aims to benefit society and the environment by educating veterinary surgeons to become members of world-wide public and professional health care teams and to advance veterinary and comparative medicine through research into disease and disease processes with the goal of improving the health and welfare of both animals and human beings;
- The **Roslin Institute** is perhaps the foremost animal research institute on the international stage and aims to improve the lives of animals and humans by applying world class research in animal biology through Blueprints for Healthy Animals, Control of Infectious Diseases and Improving Animal Production & Welfare; and,



- **SRUC** delivers comprehensive skills, education and business support for Scotland's land-based industries, founded on world class and sector-leading research, education and consultancy to the agriculture and rural sector.

The RDSVS, Roslin Institute and SRUC together achieved the top Research Excellence Framework ranking (first by research power, REF2014) for agriculture and research in the UK. The Easter Bush Campus is the location for:

- The recently formed **Global Academy for Agriculture and Food Security (GAAFS)**, which brings together academics from across the University and partner institutions to work on this complex global challenge by applying systems thinking and data skills to agriculture, food and environmental security. GAAFS's multidisciplinary format provides academic leadership in the interplay between farming and the environment to input into policy and social dialogue;
- **The Roslin Innovation Centre.** Initially funded by the BBSRC, Scottish Enterprise and the University of Edinburgh, the Centre is a gateway for businesses to engage with the scientific output of the Easter Bush Campus by aligning with Campus research strengths in genomics for breeding, epidemiology and animal health. The Roslin Institute, as a BBSRC supported research Institute, synergistically aligns with other BBSRC Institutes such as John Innes;
- The Bill and Melinda Gates Foundation-funded **Centres for Tropical Livestock Genetics and Health (CTLGH)** and **Supporting Evidence-Based Interventions (SEBI)** initiative; and,
- The Easter Bush Campus hosts major facilities within two Innovate UK Agri-Tech Centres' portfolios - the **Centre for Innovation and Excellence in Livestock (CIEL)** and the **Agricultural Engineering Precision Innovation Centre (AgriEpi)**. The former delivers global livestock production and product quality research to enable improved food quality and farming systems, while the latter explores how to optimise the performance of the highly complex production and processing systems in agriculture. Both are key partners for driving adoption and enterprise activity in the sector.

Finally, located adjacent to the Easter Bush Campus, the **Moredun Research Institute** is internationally recognised for work on infectious diseases of sheep and other ruminants.

This combination of capabilities, providing a scale unique within the UK, together with the internationally recognised academic leadership available, provides a platform for world-class teaching and training of the next generation of Agri-Tech students, practitioners and entrepreneurs.



## 3.3 Creating Easter Bush as the Agri-Tech Destination of Choice

### 3.3.1 Expand and Diversify Teaching Provision

The Wakeham review identified agriculture, animal and food sciences as lagging behind other sectors in the level of technical training of their workforces<sup>18</sup>. If the benefits of the Agri-Tech data revolution are to be realised it is vital that agri-food professionals are skilled and confident in data acquisition, handling, interrogation, application and data-driven innovation. A key aspect of the Hub vision will be to diversify and proliferate training capability to provide the talent pool needed to deliver Agri-Tech DDI. Through partnership and active involvement of the commercial pre-farm sector, talent development will be structured to provide targeted up-skilling and delivery to specific sector needs.

### 3.3.2 Grow Emphasis in Research Topics

Excellence in research underpins the delivery of training at Easter Bush. To enable a stepwise increase in research and innovation output a range of topic focussed DDI initiatives will be developed to complement, build on and grow the current campus research capabilities undertaken by the:

- **Centre for Aquaculture Genetics and Health** – providing world leading teaching, training and knowledge exchange in aquaculture genetics and health research, supported by new strategic partnerships with world-leading companies across the Future Food and One Health agenda;
- **Centre for Data Driven Breeding** – delivering training, research and a translation hub for animal and crop breeding globally (in collaboration with wider University partners in Geoscience and School of Biological Sciences) targeting both Future Food and One Health agendas;<sup>19</sup>
- **Epidemiology Centre for One Health and Sustainable Development** – transforming veterinary epidemiology and population medicine through the development of people-centric analytics to solve planetary One Health challenges (in collaboration with wider University partners in Geosciences); and,
- **Centre for ‘Net Gen’ Veterinary Diagnostics** – developing novel diagnostic tests to transform veterinary patient care globally through quicker diagnosis enabling disease mitigation and animal welfare delivery. This will enable collaborative activity with the wider College on “One Health”, with many of these discoveries also impacting on human health, particularly those in zoonosis.

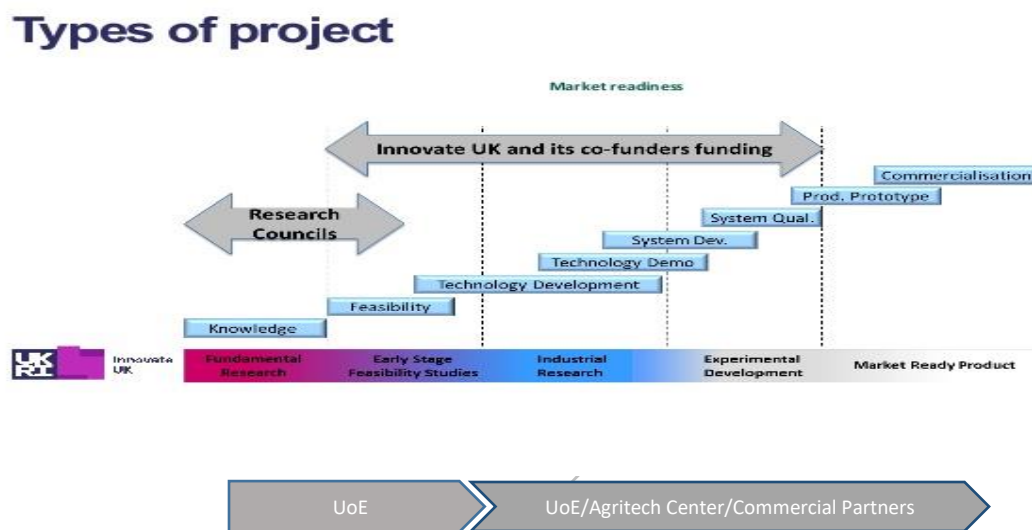
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<sup>18</sup> In regard to these sectors the review suggested that while: “The existing data is not sufficiently detailed to allow certainty about the situation now and the pace of change in the industry is likely to place new pressures on both HE and the industry to match demand with the supply of appropriately skilled graduates”. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/518582/ind-16-6-wakeham-review-stem-graduate-employability.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/518582/ind-16-6-wakeham-review-stem-graduate-employability.pdf)

<sup>19</sup> Which as a recent IP Pragmatics Market Analysis Report suggests: “As for the core offering of the CDDB, within the context of industries that have growing demands to produce ‘more from less’, it was unanimous across the companies and other organisations we received feedback from that the Centre’s data analysis software, tools and expertise would be beneficial to their work and aims. Quantitative genetic approaches are beginning to impact in these industries and the CDDB could become a leading global centre of excellence”.

As illustrated in Figure Three the research in these Centres will primarily be directed at fundamental research innovation and early-stage feasibility studies (i.e. technology readiness levels 1-3). The science will be transformed into practices by harnessing the knowledge exchange and entrepreneurial ecosystem surrounding Easter Bush Campus (through strategic partnerships and collaboration with commercial partners, globally-leading research organisations and the Agritech Centres) to enable proof of concept in real life conditions (i.e. technology readiness levels 4-7).

**Figure Three: Research to Commercialisation Eco-System**



### 3.3.3 Expanding Business Opportunities

Enhanced research excellence, output and profile will provide both the 'magnet' and basis for transformative DDI commercial activity particularly in the fields of genetics, biotechnology, and health applied to both terrestrial agriculture and aquaculture. The Roslin Innovation Centre - through the provision of a supported flexible working environment at Easter Bush – will act as the gateway to facilitate a growing community of collaborators in Agri-Tech commercial activity.

Current tenant collaborators cover a mixture of 16 start-ups and SMEs (i.e. Abacusbio Ltd, Agrenta Ltd, Beta Bugs, Casta Spes Technologies Ltd, Censo Biotechnologies Ltd, Cytochroma, Green Bioactivities, Greengage Enlightened Farming Ltd, Ingenza Ltd, Kajeka Ltd, Hendrix Genetics, MV Diagnostics Ltd, N2 Pharmaceuticals Ltd, Roslin Technologies Ltd, Synpromics Ltd and Tropical Animal Genetics Ltd). The success of securing these 16 partners within 18 months of opening<sup>20</sup> highlights the opportunities available within the sector for collaborative campus-based growth.

<sup>20</sup> With a current ambition to extend this to over 30 partner tenants during the next 2 years.

The collaboration potential offered by the Roslin Innovation Centre is also enhanced by the 50+ commercial animal health and agribusiness collaborations<sup>21</sup> that have been nurtured on the Campus over recent years and provide (potential) access to various relevant datasets.

Agri-EPI Centre will host and expand its national support ecosystem offering locally to businesses aligned with its mission and objectives, focusing on IoT, technology, robotics and novel systems of production. It has just opened its Hub and already incubates 4 companies, with ambition for many more. Linking with Agrimetrics at-market business model will add additional value at the higher TRL level of data integration solutions, and securing mutually beneficial revenue streams through its data marketplace model.

### 3.3.4 Inclusive Growth

The Campus is also home to the **Easter Bush Science Outreach Centre (EBSOC)** that provides experience of real-life science in a purpose-built teaching laboratory. EBSOC provides workshops/experiences that are linked to both the SQA Curriculum of Excellence and Scotland's developing the Young Workforce (DYW) Programme. In collaboration with local education authorities and community groups the EBSOC will extend School, College, Family & Adult Learning Programmes to cover a wider range of DDI Agri-Tech science activities, as well as develop on-line interactive activities to reach rural communities in the Region and elsewhere in the UK. In addition the University is actively involved in Midlothian Councils plans to develop a STEM High School adjacent to Easter Bush offering substantial opportunities for further knowledge exchange within the local community.

## 3.4 Easter Bush Agri-Tech Hub

Globally the demand for food will grow disproportionately as more countries emerge from poverty and their populations can afford diets higher in protein. Infectious diseases remain a key impediment to animal production and welfare, not least owing to the rise of drug resistance and zoonoses in farmed animals that, in turn, exert high societal and economic costs.

This disease burden is not only felt by the farmers and their communities. Around 60% of all human diseases, and 75% of all emerging infectious diseases are zoonotic amounting to economic losses of \$6.7b annually<sup>22</sup> (due to zoonotic outbreaks between 1997 and 2009).

Agriculture is the largest consumer of antibiotics globally with an estimated 67% usage<sup>23</sup>. The industrialisation of livestock production has driven the rise of intensive farming in confined spaces and reliance on routine antibiotic use for disease prevention and growth promotion (rather than for therapeutic treatment of sick animals). This overuse and misuse is a key contributor to Antimicrobial

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<sup>21</sup> As detailed in Appendix E.

<sup>22</sup> The World Bank 2012: People, pathogens and our planet, the economies of One Health (<https://openknowledge.worldbank.org/handle/10986/11892>)

<sup>23</sup> PNAS 2015: Global trends in antimicrobial use in food animals (<https://www.pnas.org/content/112/18/5649>)

Resistance (AMR) which is estimated to cause 700,000<sup>24</sup> human deaths each year globally. In addition, unwanted microbial residue may be present in animal waste contaminating the environment further.

These challenges are all significant in their own right but need to be addressed in a world with a changing climate and growing pressure on natural resources. Delivering and sustaining increased agriculture output will need to be balanced against UK zero carbon targets.<sup>25</sup>

In addressing these needs the Easter Bush Agri-Tech Hub will enable a **step-change in the scale and impact** of education (Talent), knowledge generation (Research through Data Driven innovation) and translation activities (Adoption and Entrepreneurship) – to grow the Agri-Tech data-driven talent pool, enhance the research ecosystem and DDI adoption across the sector.

At the heart of the Campus the Hub will comprise a number of entities that have data ‘in their DNA’. As detailed below these entities comprise the Centre for Aquaculture Genetics and Health, Centre for Data-Driven Breeding, the Epidemiology Centre for One Health and Sustainable Development, and the Centre for ‘Next Gen’ Veterinary Diagnostics.

**3.4.1 Centre for Aquaculture Genetics and Health:** *“providing world leading teaching, training, and knowledge exchange to support growth of aquaculture as a sustainable source of animal protein for human diets.”*

**Aquaculture is the fastest growing food production sector<sup>26</sup>** and its importance is predicted to rapidly increase relative to terrestrial livestock in coming decades. The strategic importance of aquaculture is increasing at local and international levels, and it has a major role to play in addressing several of the UN sustainable development goals, in particular, as detailed in Section 4: Goal 2 (Zero Hunger) and Goal 14 (Life below Water). This focus also reflects the United Nations 2021 launch of its Decade of Ocean Science for Sustainable Development.

The use of modern technologies to improve aquaculture stocks is underutilised and has the potential to address several major production barriers across multiple sectors as highlighted in a recent United Nations Report on Aquatic Genetic Resources.<sup>27</sup> The University of Edinburgh already has a world-leading reputation in aquaculture genetics, and development of this Centre will build on this to deliver a step-increase in research output, commercial partnership, education and training, intellectual property generation and entrepreneurship. The CAGH will be co-developed via public-private strategic partnerships with four major aquaculture genetics entities (Hendrix Genetics, Benchmark PLC, Centre

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<sup>24</sup> HM Government 2019: Tackling antimicrobial resistance 2019-2024 <https://www.gov.uk/government/publications/uk-5-year-action-plan-for-antimicrobial-resistance-2019-to-2024>

<sup>25</sup> “As the UK prepares to leave the EU, greater competitive pressures are likely to be exerted on the (agriculture) sector. New ideas and practices will be essential to enable a move towards low emission and high productive farming”. <https://www.theccc.org.uk/wp-content/uploads/2017/11/Letter-to-Rt.-Hon-Michael-Gove-MP-Agriculture-and-Natl-Environment-November-2017.pdf>

<sup>26</sup> “Aquaculture continues to grow faster than other major food production sectors although it no longer enjoys the high annual growth rates of the 1980s and 1990s (11.3 and 10.0 percent, excluding aquatic plants). Average annual growth declined to 5.8 percent during the period 2000–2016” <http://www.fao.org/3/i9540en/i9540en.pdf>

<sup>27</sup> “There are proven genetic technologies that have generated significant production gains, particularly from well-managed selective breeding programmes, but adoption of these technologies is relatively slow, limiting their impact on global aquaculture production to date”. <http://www.fao.org/3/CA5256EN/CA5256EN.pdf>

for Aquaculture Technologies and Worldfish) These companies will provide substantial seed funding to catalyse the expansion necessary to capitalise on the opportunities provided by the increasingly technology and data-driven aquaculture innovation landscape

A core goal of the Centre will be improving genetics and health in finfish, crustaceans and shellfish. This will be achieved by tackling major infectious diseases through new breeding technologies, especially gene editing and genomic selection. CAGH will also enable a marriage between these biotechnologies and the step-change in applications of digital technologies such as computer vision diagnostics and sensor-driven aquaculture farm systems. Combining the use of advanced digital technology with our well-established genetics and biotechnology research will provide a global USP for the local region as the aquaculture industry “transformers” over the coming decade.

The CAGH will provide the infrastructure and long-term capacity to enable this step-change in research, training, innovation, knowledge exchange, and entrepreneurship by:

- Significant expansion of aquarium infrastructure, including the Aquaculture Genetics Research Facility developed in collaboration with AgriEPI, or to include high-throughput invertebrate (shrimp, oyster) phenotyping capabilities to support genetic improvement of seed stock;
- Enhancing capabilities for marine aquaculture research and innovation by facility development and partnership including with St. Abb’s Marine Station and Agri-Epi for major 3<sup>rd</sup> party investment into marine disease challenge and data capture technologies;
- Strategic partnership with aquaculture companies sharing the common vision of CAGH as a vehicle for translation of research outputs and intellectual property into practice to generate revenue;
- Increasing entrepreneurial activity in aquaculture genetics and biotechnology via spin-off and incubator activity, including links to the FAST scheme and Roslin Innovation Centre; and,
- Transformation of teaching and training capabilities in aquaculture to develop a talent pipeline through development of an aligned MSc course, together with CPD activities targeted at strategic and local commercial partners.

**3.4.2 Centre for Data-Driven Breeding (CDDDB):** *“delivering world leading training, research and a translation hub for animal and crop breeding globally.”*

Modern genetic improvement of both livestock and crops depends heavily on data science but the two domains use different approaches. In crop breeding transgenic and molecular technologies have increased the importance of molecular genetics to the detriment of quantitative genetics. In livestock breeding the success of genomic selection has enhanced the importance of quantitative genetics with transgenic and molecular approaches still to make a significant impact.

The Centre will focus on innovation directed at the next generation breeding to capitalise on technology advances in sequencing and –omics to form the base for progression to Breeding3.0.<sup>28</sup>

This will involve building upon the success of the previous decade by: expanding genome-enabled selection to additional species; establishing new traits through genetic improvement for all species; and, more complex models for predicting phenotype from genotype and environmental variables. These and other technologies are expected to enhance productivity, sustainability and profitability while improving animal well-being, health and overall fitness.

The application of current and emerging genomic, proteomic and metabolomic technologies from human and model species will improve annotation of agricultural animal genomes and identification of functional variants and provide information that can be used to develop strategies that improve animal production, including:

- Predicting the effect of functional variants that are responsible for desired variation for a wide diversity of breeds to meet a range of target environments;
- Improving animal productivity through better understanding of the structure and function of animal genomes and genome biology to accelerate economically important traits and reduce the effects of animal disease;
- In-depth understanding of genome biology to effectively implement selection and expand the capacity to characterise and measure phenomes;
- Developing genomic tools, technologies and resources for agricultural crops and livestock;
- Advancing biotechnology to improve sustainability and efficiency; and,
- Characterising and preserving genetic diversity for future animal production.

These strategies create the opportunity to develop data science for genetic improvement with a unified, transformative approach to crop and livestock breeding. The Centre will realise this opportunity through the co-location of established research expertise in The Roslin Institute, SRUC, CTLGH, GAAFS, RDSVS, and strategic partnerships with leading commercial livestock companies (e.g. Aviagen, Genus) and crop breeding (e.g. Bayer Crop Science). Adoption and Entrepreneurial activities will build through strategic partnerships (e.g. with the James Hutton Institute and John Inness Centre).

Such partnerships are central to research activity, training platforms and translational output. Breeding organisations provide access to breeding and genomic datasets. This a precious resource for research in quantitative genetics and artificial intelligence that supports breeding theory and breeding programme design, not just because these datasets represent multi-billion pound investments by

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<sup>28</sup> USDA blueprint for animal genome research 2018-2017: Frontiers in Genetics May 2019.  
<https://www.ars.usda.gov/ARSUserFiles/02080000/Animal%20Genome%20to%20Phenome%20Executive%20Summary.pdf>

these companies, but also because without such datasets there would be no way to test new developments in crop and livestock AgriTech.

Functioning through “a virtuous circular network” – CDDDB allows organisations to adopt more effective breeding program designs, fuelling demand from organisations that breed other species, enabling access to new breeding and genomic datasets that will support further research. While upstream connections create the necessary conditions to access the diverse and large datasets that industry produce, downstream connections bring opportunities for exploitation through training, adoption and entrepreneurial activity.

The CDDDB will provide the infrastructure, which cannot be obtained by a series of research grants, to underpin the:

- Development and delivery of (i) training for the academic and agricultural workforce required for application of genomics technologies; and (ii) the infrastructure for collection, storing, analysing, and sharing huge volumes of genomic, pedigree, and trait data;
- Equipment and infrastructure for the creation of genomic resources, tools and materials, functional genomics;
- More effective organisation of activities by:
  - Including cross-hub working and engagement with AgriTech centres and multiple commercial partners;
  - Ensuring that decision makers and partners understand the benefits and implications of genomic data science (KE-hub); and,
  - The development, deployment and sharing of data for applied research and translation.
- Infrastructure, capacity building, and training that will provide a platform to build and secure additional research funding more effectively.

**3.4.3 Epidemiology Centre for One Health and Sustainable Development (ECODE):** *“transforming veterinary epidemiology and population medicine through training and research in systems-based approaches and human -centric algorithm design to solve One Health and planetary health challenges.”*

ECODE aims to strengthen animal, human and public health at their interface and inform animal and public health policies that support and enhance sustainable development. ECODE will integrate multiple data streams generated from the lab, the field and the farm, with statistical and quantitative modelling techniques on a secure data platform to promote intelligent information sharing and decision-making. The ECODE mission is to co-construct, with end-users and beneficiaries, locally- and

culturally-appropriate data-driven strategies aimed at improving resilience and timely responses to emerging and existing One Health and Planetary Health risks.

ECODE will address intergenerational global-health challenges (such as AMR, climate change-related disease risks and chronic non-infectious diseases), as well as (re-)emerging sanitary crises (such as infectious zoonotic, transboundary animal diseases and foodborne disease outbreaks) which have direct and indirect impacts on human and animal health, food security and sustainable development.

An important and unique feature of the Centre is the synergistic relationship between multi-disciplinary, multi-sectoral networks of expertise across *academia, policy, industry and practitioners*. The Centre will bring together subject experts in epidemiology (e.g. molecular/genomic, clinical, nutrition, field and public health epidemiology) with biologists, pathogen experts and vaccinologists and experts from the humanities and social sciences, to undertake a systems approach to risk assessment at multiple levels of causation (e.g. sociodemographic, clinical and biological), risk management and risk communication.

The Centre will offer a multi-level career-track programme, promoting research and teaching in epidemiology, statistics, quantitative modelling, population medicine and veterinary public health policy. Training provision will be across undergraduate, postgraduate, CPD and short courses to deliver talent into the veterinary, public and one health/planetary health landscapes. The Centre's outbreak science and policy programme will provide policy- and decision-makers, as well as students and academics from other fields, the opportunity for training in risk assessment and outbreak preparedness and response.

ECODE will work closely with the EIDF and external partners – building on strategic links internationally with intergovernmental agencies, NGOs and private funders and data providers as well as within Scotland and the UK (including the Animal and Plant Agency (APHA), Scottish Government Animal Health and Welfare Division, Department for Environment, Food & Rural Affairs (Defra) and industry organisations such as the Agriculture and Horticulture Development Board (AHDB).

ECODE will provide the organisational capacity and infrastructure to consolidate what would otherwise remain disparate and potentially fragmented sources of data and human/veterinary population medicine and epidemiological expertise and intelligence across Easter Bush and University. ECODE aims to turn One Health evidence into action through a series of activities including:

- Building capacity through provision of research-led veterinary epidemiology and data analysis training, education and CPD for veterinary and non-veterinary undergraduates, postgraduates and government and industry professionals;
- Strengthening multi-sectoral partnerships in academia, industry and policy to develop and implement culturally appropriate One Health technical and social solutions;
- Improving outbreak planning and preparedness through the use of existing data (e.g. ScotEID) and modelling tools to respond to emerging One Health threats;



- Developing new frameworks and approaches for systems epidemiology that combine knowledge within and across disciplines to respond to adaptive One Health challenges such as AMR and emerging zoonoses;
- Developing and strengthening new and existing decision-support tools to translate policy aims into operational objectives for public health benefits by:
  - o *Assisting* decision-makers explore and communicate changing policy scenarios, while questioning the socially-produced basis of these changes;
  - o *Identifying* most effective and least harmful interventions to achieve veterinary public health policy aims;
  - o *Evaluating and translating* evidence for decision-makers to improve long-term resilience to infectious zoonotic /animal disease outbreaks, food security threats and biosecurity concerns (including release of GM crops, live vaccines, and biological control strategies); and,
  - o *Providing* training in science and risk communication and dissemination.

#### **3.4.4 Centre for 'Next Gen' Veterinary Diagnostics: *"supplying state-of-the-art veterinary care to animal owners."***

Many production animal diseases cannot be accurately diagnosed. Similarly assessment of treatment efficacy and prognostication remains suboptimal for many veterinary conditions. Consequently there is a strong and unmet clinical need to develop superior diagnostic assays for the veterinary sector.

Focussing on cage/field side diagnostics, digital pathology and application of innovative genetic markers, animal patient care will improve through 'next gen' diagnostic interventions and enable the development of novel therapeutic interventions and disease preventative strategies. Telemedicine and 'virtual patient care' approaches will be deployed, initially across the City Region, before roll-out nationally and internationally. In parallel this activity will provide the innovative ecosystem to training and upskill the talent pool for this sector and drive the development of commercial activity.

With the growth of the livestock sector there is a greater need for more sensitive, specific and high-throughput diagnostics for better detection and management control of animal health & welfare caused by disease. This can be met by molecular diagnostics, and the discovery of biomarkers with proven clinical utility, to identify multiple pathogens quickly in animal patients. In turn the advances in biomarker discovery is reliant on multi-omics data which includes genomics, transcriptomics, proteomics, metabolomics and epigenetics to help understand pathogens and their hosts.

Easter Bush is well placed to lead on next generation veterinary diagnostic by utilising the EIDF to analyse the big data sets required for biomarker discovery and providing a route to gather clinical utility data by developing a transparent and ethical biobank infrastructure (to ensure ethically

approved clinical samples whose clinical history is well known and can be interrogated). Activities will include:

- Whole genome sequencing, flow cytometry and mass spectrometry;
- Developing better tools to accurate diagnosis disease outbreaks in the field and to link this data into our epidemiological modelling infrastructure;
- Generating a large volume of clinical samples which can be interrogated in future research programmes;
- Assays focussed on metabolite measurement and diagnostic tools which better phenotype the entire patient holistically;
- Academic collaborations to develop the Immune Toolbox to support diagnostic and vaccine development;
- Strategic relationships with commercial animal health companies to gain market adoption and next generation collaborative research; and,
- Collaborating with non-traditional partners, notably in the area of chemistry, physics and engineering. These partners offer excellent opportunities to develop technologies such as novel optical probes and sensors that will allow diseases to be better phenotyped in-situ and treatment complications to be detected earlier.

### 3.4.5 Conclusion

The Centres highlighted above build on the core skills and relationship established at Easter Bush and will lead on collaborating across the other hubs and schools to develop awareness of agriculture, livestock and aquaculture research. This will ensure that Easter Bush can maximise value from world leading innovative research in artificial intelligence, machine learning, robotics and satellites that can advance on-farm technology across the food value chain. This will include developing relationships with technology commercial innovators entering the AgriTech sector and through farmer-facing organisation such as Scottish Agricultural Organisation Society (SAOS), Scottish Salmon Producers' Organisation and the National Farmers Union.

The research excellence applicable to agritech across the University of Edinburgh is summarised in Table Four.

*Table Four: Relevant Agri-Tech Research Capabilities*

Agritech sub-sector	Location of research capabilities at UoE.
Agricultural systems, ecology and soil science	Global Academy of Agriculture and Food Security, School of Geosciences, School of Biological Sciences

<b>Land use, environmental and agri-food systems</b>	Global Academy of Agriculture and Food Security, School of Geosciences
<b>Climate Change impacts, adaptation and mitigation</b>	Global Academy of Agriculture and Food Security, School of Geosciences, School of Engineering, School of Chemistry
<b>Agricultural and natural resource economics and sustainability</b>	Global Academy of Agriculture and Food Security, School of Geosciences
<b>International law and governance of natural resources</b>	Global Academy of Agriculture and Food Security, School of Law
<b>Data Science, Mathematical modelling and decision support</b>	Global Academy of Agriculture and Food Security, The Roslin Institute, R(D)SVS, School of Mathematics, School of Informatics
<b>Innovation, regulation, policy and governance</b>	Global Academy of Agriculture and Food Security, School of Social & Political Science, Innogen Institute (UoE/Open University collaboration)
<b>Animal Science and livestock systems</b>	Global Academy of Agriculture and Food Security, The Roslin Institute, R (D) SVS.
<b>Veterinary public health, population medicine and animal health policy</b>	Global Academy of Agriculture and Food Security, The Roslin Institute, R (D) SVS, Medical School.
<b>Functional genetics and mathematical biology analysis in plant, livestock and aquaculture</b>	The Roslin Institute, R(D)SVS, School of Biological Sciences
<b>Understanding animal health development and disease</b>	The Roslin Institute, R(D)SVS
<b>Gene editing agri-science disruptive technology</b>	The Roslin Institute, R(D)SVS
<b>Alternative Protein disruptive technology</b>	The Roslin Institute, R(D)SVS, School of Biological Sciences
<b>Artificial Intelligence, Data Mining, Machine Learning and Blockchain</b>	The Roslin Institute, School of Informatics
<b>Satellite, GPS, EO, UAVs and Ag-Robotics</b>	The School of Informatics, School of Engineering, School of Geosciences, School of Mathematics, School of Physics
<b>Sensors and IoT</b>	The School of Informatics, School of Engineering, School of Chemistry, School of Biological Sciences

### 3.5 How University and Partners will deliver their Vision

The proposed investment at Easter Bush will enable the creation of a stepwise transformation in Agri-Tech DDI. Achieving this vision will involve three distinct components:

1. **Addressing capability gaps:** to enhance and develop capabilities across the five key areas identified in the ESES SIA – Talent, Research, Adoption, Data and Entrepreneurship (TRADE);
2. **Organising activities effectively:** to create an effective operating model to successfully organise, optimise and execute all these activities, underpinned by the creation of robust governance with clear accountability and delivery plans, and;
3. **Strategic asset development:** through refurbishment and co-location to create the infrastructure and capacity for data-driven innovation, translation and adoption in agriculture and aquaculture to enable the stepwise expansion in delivery of training, research and industry engagement captured through the TRADE activities.

#### 3.5.1 Investing in and addressing core capabilities and gaps: TRADE

Table Five illustrates the current campus baseline TRADE (and inclusion) position and the significant opportunities afforded by the Hub proposals to improve and enhance these capabilities.

Table Five: Easter Bush Agri-Tech Capability Assessment

Capabilities	Position	Journey
Talent	Data Skills across the Agri-Tech sector (students/professionals/public) are uneven	Embed data capability, enabling students, professionals and public to realise the value of data
Research	High quality interdisciplinary research capability	Increase interdisciplinary engagement with industry & third sector
Adoption	Strong partnerships with public sector and industry but not across whole Agri-Tech sector	Effectively bring together and link up the public, private and third sectors across the Agri-Tech sector
Data	Access to industrial and public data sets are in place but Agri-Tech data is difficult to integrate and interpret	Expand acquisition, curation and analysis of relevant data across the Agri-Tech sector which is easy to integrate and interpret
Entrepreneurial	Limited success with spin out activity, active innovation hub with collaborative companies in field co-located	Increased spin out activity with an expanded collaboration network within the co-located innovation hub
Inclusive Growth	Outreach activity in place for some components of Agri-Tech with a young people focus (Investors in Young People) and established activity recognised for equality within STEM (Athena SWAN Gold)	Increased outreach activity for all aspects of Agri-Tech - with expansion of activities for those with low science capital and /or rural communities. Continuation of young people and equality in STEM activities

### 3.5.2 Talent

There is an urgent demand globally for skilled workers equipped to help tackle global agri-food challenges. Several recent UK reports have identified a demand for more skilled agri-food scientists, with DDI/ICT skills being especially relevant including the 2012 sector UK Skills Assessment<sup>29</sup> (and the Agri-Skills Forum's Strategy, which draws on this Sector Skills Assessment).<sup>30</sup> To meet these needs DDI Agri-Tech courses will be developed and delivered through a range of teaching methods:

- Embedding data science and DDI in campus-based **BSc Agricultural Science/Agricultural Economics** and **BVM&S** degree programmes, by strengthening existing DDI-relevant courses and providing new DDI electives;
- Developing new campus based and/or online Cert/Dip/MSc programmes in **Applied Animal and Plant Breeding** and **Planetary Health Policy** or similar, with strong DDI bases;
- A **Distance Learning At Scale (DLAS) / Massive Open Online Courses (MOOC)** series: **"Digesting the Data"** across a range of key DDI challenges/opportunities;
- A series of **Continuing Professional Development (CPD) / Executive Education /summer school events** over a range of key Agri-Tech challenges/opportunities;
- **Open and Distance Learning (ODL) courses / 'classrooms in a box' for FE students / teachers** spanning a range of key Agri-Tech challenges/opportunities;
- **ODL courses / 'classrooms in a box' for high school students / teachers** covering a range of key Agri-Tech challenges/opportunities;
- **Doctoral programmes** in each of the three Agri-Tech TALENT theme areas; and,
- Delivery of an **extensive programme of events** for Agri-Tech professionals from across the City Region. This will encompass lectures highlighting data-driven research and exemplar projects in the practical application of data in Agritech.

### 3.5.3 Research

Research focussed activities within the Agri-Tech Data Innovation Hub will involve the:

- **Centre for Aquaculture Genetics and Health** – DDI research will focus on the interface of biotechnology, genetics and infectious diseases in aquaculture, by generating and hosting large-scale genomic and phenotype databases in collaboration with strategic company partners. The research strategy will include applications of advanced digital technologies with CAGH strengths in genetics and biotechnology to provide a global USP in this rapidly expanding field. Harnessing datasets across multiple aqua species to capture the diverse data impacting on the aquaculture ecosystem (enabled by the development of new invertebrate and marine research capabilities) will deliver genetic, biotechnology and agritech solutions to

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<sup>29</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/312548/briefing-paper-ssa12-agriculture.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/312548/briefing-paper-ssa12-agriculture.pdf)

<sup>30</sup> <http://www.agriskillsforum.co.uk/>.

overcome major aquaculture production barriers. In turn, the research outputs will support the rapid global growth of aquaculture as a sustainable source of nutritious animal protein;

- **Centre for Data Driven Breeding** will focus on integration and interrogation of large commercial crop and livestock datasets, which combined enable ‘deep phenotyping’, with the long term ambition to develop an accessible data platform which expands beyond breeding organisations to include other entities in the food production lifecycle including producers, food processors, supermarkets and animal welfare bodies;
- **Epidemiology Centre for One Health and Sustainable Development** to provide a home for UK and international datasets (public and commercial) on animal health (particularly livestock and infectious disease analytics) and a ‘bridge’ between animal and human health (One Health). The focus will be on improving data integration of animal health data, maintenance and further development of analytical models and tools, as well as providing quality assurance and support for the Agri-Tech sector. This will allow improved horizon scanning (e.g. evolutionary changes in pathogens, emergence of a new livestock disease threat) dynamic adaptive management of disease outbreaks (emphasising real time exploitation of data) as well as integration of human dimensions (behaviour, economic and social structure) that also influence likely disease emergence; and,
- **Centre for ‘Next Gen’ Veterinary Diagnostics** will deliver a diverse research agenda ranging from the agonistic interrogation of large datasets and clinical samples to identify novel targets through to specific, individual target led assay development which will, for the first time, quantify defined biomarkers.<sup>31</sup> Biomarkers are currently challenging to measure in standard clinical samples. The research will aim to develop detection modalities onto scalable and cost-effective platforms to ensure wide-scale industry uptake.

The data sets from the above can potentially be linked together within the **Agri-Tech Hub at Easter Bush** to maximise interdisciplinary opportunities and enhance TRADE objectives. In doing so, the AgriTech Hub will be both the driver for innovative research and the focus for external engagement and adoption. For example, dissemination of the latest developments in breeding strategies from the Centre of Data Driven Breeding could be modelled by the Epidemiology One Health Centre and/or utilised in the latest aquaculture research by the Centre of Aquaculture Genetics and Health.

#### 3.5.4 Adoption

Agri-Tech aims to secure the food supply chain emerging from agricultural activities. To ensure maximum benefit is realised from the talent and research portfolio at Easter Bush three pathways to adoption will be established:

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<sup>31</sup> Biomarkers are indicators of biological processes and pathological states that can reveal a variety of health and disease traits. Biomarkers are particularly relevant in medical and veterinary research where they have an important role in the characterization of human and animal diseases.

**(1) Adoption by local and smaller commercial partners with direct benefit to ESES region, while looking for expansion and growth opportunities more widely.**

Working with both Edinburgh Innovations and Roslin Technologies connectivity will be enhanced between Easter Bush and commercial players across the food supply, animal health and Agri-Tech sectors to drive adoption of data-drive innovation into the commercial Agri-Tech sector.

This will strengthen links with the two local nodes of the Innovate UK Agri-Tech Innovation Centres AgriEpi and Centre for Innovation Excellence in Livestock (CIEL), and co-location with leading small companies, such as Greengage and IceRobotics, and large Agri-Tech companies, such as Benchmark and Aviagen in the aqua and poultry sectors respectively. The majority of this activity will take place within the Roslin Innovation Centre located within the Charnock Bradley building at the heart of the Easter Bush Campus.

**(2) Adoption by established, often international players.**

Wider adoption of DDI research outcomes will be structured through Easter Bush's established interaction with international funding bodies, such as the Bill & Melinda Gates Foundation initiatives based at Easter Bush,<sup>32</sup> and the established links between the academic community at Easter Bush and international pre-farm gate companies such as Genus, Cobb Vantress, and Hendrix Genetics in the first instance and then through strategic partnerships expanded to on-farm and crop sectors.

**(3) Adoption by local and wider societal stakeholder communities**

To enable the wider use of data to drive insights, benefits and inclusive growth a range of community activities will be pursued through the Easter Bush Science Outreach Centre (EBSOC). EBSOC gives school pupils and community group's hands-on experience in a real laboratory setting. The Centre uses research-grade laboratory equipment to deliver interactive, curriculum-linked, learning experiences for pupils from 10 to 18, as well as workshops for community groups of all ages.

### **3.5.5 Data**

The organisations and facilities hosted at Easter Bush Agri-Tech Hub, together with EIDF, will increase the ESES region's ability to access and utilise a combined pool of diverse Agri-Tech data assets in a trusted and safe environment.

Gaining convenient access to 'real' data is a recurring issue. The Open Research Data Task Force has recognised that several technical, cultural and behavioural issues require attention to make data sharing more accessible,<sup>33</sup> while the FAIR Guiding Principles for scientific data management and

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<sup>32</sup> Supporting Evidence-based Interventions (SEBI) and Centre for Tropical Livestock and Genetic Health (CTLGH).

<sup>33</sup> <https://www.universitiesuk.ac.uk/policy-and-analysis/research-policy/open-science/Pages/open-research-data-task-force.aspx>

stewardship emphasises the need for data to meet standards of Findability, Accessibility, Interoperability and Reusability.<sup>34</sup>

The Edinburgh Parallel Computing Centre (EPCC) currently provides the infrastructure and support for the secure environment in which both current public and private Agri-Tech datasets are linked and accessed. There is a significant opportunity to build on this foundation through EIDF with the integration of a wide range of structured and unstructured Agri-Tech datasets relating to both local and international agriculture systems. By combining data from multiple sources and using these in a single analysis will enable co-analysis of multiple datasets increasing the statistical detection power for signals that are currently too faint to detect in individual datasets.

### 3.5.6 Entrepreneurship

A sustainable and growing Agri-Tech enterprise culture at Easter Bush will be established through (1) fostering entrepreneurial endeavour; and, (2) providing an innovative ecosystem for emerging commercial activities.

#### (1) Fostering entrepreneurial endeavour

This will involve identifying, enabling and growing new Agri-Tech talent and facilitating new connections and supporting emerging commercial Agri-Tech activities in collaboration with the local ecosystem and Agritech centres to foster growth and impact through their national and international members by providing the space and ecosystem to innovate through a range of activities, including:

- **Venture Studio within** the Roslin Innovation Centre at Easter Bush. Termed the **FAST for Food and Agriculture Science Transformer** this will be first venture studio in Scotland and the first food and agriculture venture studio in Europe. The recently established FAST programme is structured to enhance the likelihood of producing innovative, high-value Agri-Tech companies within the ESES region. Through the current year activity, FAST (funded by the BBSRC and Roslin Foundation) three initial areas are being piloted: regenerative aquaculture, pollinator enforcement and controlled environment agriculture;
- **Hackathons/Plotathons** based around specific Agri-Tech challenges in partnership with other UoE DDI Hubs, these events will identify and empower budding entrepreneurs, from within the Region, to develop their business propositions and progress to commercial activity within the Roslin Innovation Centre or elsewhere with the ESEC commercial infrastructure; and,
- **An Entrepreneur Club** to upskill individuals through a series of bespoke interactive events that focus on networking, emotional intelligence, marketing as well as understanding of funding for enterprise and pitching events – with the aim to help individuals towards commercial activity or spin out a company.

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<sup>34</sup> <https://www.go-fair.org/fair-principles/>



## **(2) Innovative ecosystem for emerging commercial activities.**

The cohorts emerging from the Entrepreneur Club represent a 'ready-made' pool of talent for FAST. All companies created and supported by FAST, as well as existing tenants of the Roslin Innovation Centre and commercial players born out of the Hackathons/Plotathons, will also provide the inspiration and role models, as well as an informal supportive entrepreneurial ecosystem, for aspiring graduates, postdocs and individuals from the local community.

To further enhance this ecosystem and best exploit Agri-Tech opportunities support will be provided by the **Research Hotel**. Located within the Roslin Innovation Centre the Research Hotel currently provides established companies and start-ups with ready to use state-of-the art office and fully fitted out lab space with access to standard lab equipment. This facility will be expanded to support entrepreneurs and micro businesses that (successfully) emerge from the Hackathon, Plotathon and FAST activities

In addition a dedicated space called **the 'Makers Barn,'** tailored to facilitate co-production of innovative solutions for on-the-ground active small and micro Agri-Tech companies, will be developed to enhance the facilities offered at the Edinburgh hub of AgriEPI. This open facility will promote the interaction between community players, academics at Easter Bush and co-located Agri-Tech companies with the goal of developing new, better and/or less expensive products and services.

### **3.5.7 Inclusive Growth**

The DDI Agri-Tech programme will allow the Campus to build upon and develop a wide range of existing inclusive growth and equality activities. Foremost amongst these is the Easter Bush Science Outreach Centre (EBSOC).<sup>35</sup> The current geographical reach across Scotland is extensive and, on a 2 to 3-day week capacity, in 2018-19 engaged over 3,500 pupils mainly from SMID 1-2 areas.

The DDI Agri-Tech programme provides significant opportunity to expand the operational capacity and remit of EBSOC (from an animal bioscience focus to a wider DDI Agri-Tech portfolio). It is the intention to increase the capacity of the EBSOC to 5 days a week over the next 2-3 years (funding dependant) with a focus on engaging regional areas with low science capital and/or restricted access due to their rurality. This expansion will dovetail and contribute to the development of a STEM focused High School adjacent to the Easter Bush Campus.

Capacity will also be extended through the "Public Engagement Public Lending Library" - a student-led public engagement activity co-ordinated by EBSOC staff. Students participating in the Agri-Tech Talent courses with a research element will be encouraged to shape a public engagement activity linked to their specific Agri-Tech research that can be communicated to school pupils and adults in the community. Agri-Tech students will receive mentoring and coaching from the EBSOC team in order to develop interactive, hands-on activities, to be placed in the lending library, which can be utilised by campus staff for any community events, science festivals, school visit or outreach events. In addition, as part of the Agri-Tech activity, it is proposed to expand veterinary outreach activities to the rural communities and those with limited ability to access Campus facilities.

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<sup>35</sup> <https://www.ed.ac.uk/easter-bush-campus/science-outreach-centre>

Citizen science activity will also be expanded to involve the public with the collection, curation and analysis of data, so that communities can become actively involved and contribute to the DDI Programme.<sup>36</sup> This activity links into and complements more focussed projects with partners which seek to address social issues - for example the student led “All for Paws” vet outreach clinic for animals of homeless and vulnerably-housed people, which has resulted in partnership with Turning Point Scotland, NHS Lothian and the Grassmarket Community Project.

With regard to equality ambitions, the Roslin Institute is one of only nine research entities in the UK to achieve Athena SWAN Gold status, which recognises and celebrates good employment practice for women working in science, engineering and technology within the Higher Education & Research sector.<sup>37</sup> The principles of such practice will be embedded within the DDI Agri-Tech Programme, particularly impacting the Research and Adoption aspects. This will include woman acting as positive role models to early career scientists, provision of Carers Grants for staff with caring responsibilities when they attend conferences vital for career development, gender balance for all interviews and participation in “Coaching for Success”, which provides individual career coaching for staff at key stages of their career.

Finally, the Easter Bush Campus was the first University body in the UK to hold an Investors in Young People accreditation at a Silver level.<sup>38</sup> Again the commitment the Campus has made to providing opportunities and experience for young people within the community will also be embraced within the DDI Agri-Tech Programme through a strong, positive and supportive culture on the campus, and access to training and development opportunities, including provision of both Foundation and Modern Apprenticeships.

### 3.5.8 Easter Bush Objectives and Key Performance Indicators

Table Six below highlights the high-level Agri-Tech TRADE objectives and KPIs over the 15-year lifetime of the CRD programme:

*Table Six: DDI Agri-Tech Investment Objectives and KPIs*

Theme	Investment Objective	KPIs
<b>Talent</b>	Create a vibrant learning environment which enables the Agri-Tech sector to realise the potential of their data	117,000 credit / non-credit bearing engagements (excluding CPDs below)
<b>Research</b>	Facilitate collaborative integrated research to deliver data- driven research that impacts the Agri-Tech sector	£116m research income

<sup>36</sup> Current examples of such engagement include the Scottish Beekeeping Society being actively involved with the Easter Bush apiary and the Dogslife project where citizen science is key to data acquisition.

<sup>37</sup> <https://www.ed.ac.uk/roslin/work-study/award-winning-environment/athena-swan>

<sup>38</sup> <https://www.ed.ac.uk/easter-bush-campus/where-people-thrive/staff/awards/investors-in-young-people-silver-award>

<b>Adoption</b>	Drive innovation through increased partnerships with the public, private and third sectors to address challenges in the Agri-Tech sector by linking of data	100 Company Interactions 24.000 DDI credit bearing CPDs and courses
<b>Data</b>	Through the acquisition and curation, analysis and adoption - increasing the translational power of the Agri-Tech datasets	To be monitored on an ongoing basis (but subject to appropriate information sharing agreements likely to include UK Government datasets in Agri-Tech and industrial partners depositing datasets for research, curation and analysis).
<b>Entrepreneurship</b>	Expand the growth of the Agri-Tech business activity through increased spin-out and co-location activity	30 new Agri-Tech Business activity Support to over 150 graduates in setting up or joining micro Agri-Tech companies
<b>Inclusive Growth</b>	Increased outreach activity for all aspects of Agri-Tech - with expansion of activities for those with low science capital and /or rural communities. Continuation of young people and equality in STEM activities	58,000 public interactions via outreach centre activity; retention of Athena SWAN Gold Status and Investors in Young People Silver accreditation; increase in rural community vet outreach and student led vet practice activity and 2 new lending library activities per annum

### 3.6 Organising Activities Effectively

Outlined below are the **key players** and **operating model** that will (both) support the delivery of these Agri-Tech TRADE and inclusion objectives.

#### 3.6.1 Key Players

While the Easter Bush Campus is already a centre of excellence in the Agri-Tech field DDI investment will allow more and closer partnerships with several internal and external partners.

##### Internal partners within the University

**The Edinburgh Medical School:** is a “World Top 20” medical school in multiple league tables. Across its three Deaneries and five research institutes,<sup>39</sup> there are various opportunities to consolidate and develop Agri-Tech human-animal zoonotic “One Health” objectives. The Easter Bush Agri-Tech Data Innovation Hub will have particularly strong collaborative links and interactions with both the Usher Institute and the Institute of Genetics and Molecular Medicine, as well as actively participating in cross-cutting network activity such as Edinburgh Infectious Disease and Edinburgh Neuroscience.

**Edinburgh Parallel Computing Centre (EPCC):** is an international centre of excellence in all aspects of high-performance and data-intensive computing and will make available the EIDF in which all Agri-Tech Innovation Hub data will be housed.

**Edinburgh Innovations (EI):** is the University of Edinburgh’s commercialisation division offering a wide range of services to assist researchers, students and industry drive innovation. EI will provide dedicated on Campus resources to support relevant Agri-Tech research, adoption and entrepreneurship activities.

<sup>39</sup> <https://www.ed.ac.uk/medicine-vet-medicine/about/organisational-structure>

**School of Biological Sciences:** there has been a longstanding EB Campus collaboration with the School of Biological Sciences (SBS), especially in the field of Animal Genetics (with the University celebrating 100 years of animal genetics research in 2019). Research in this School offers knowledge contribution to expanding impact in animal and crop based agriculture.

**School of Geosciences:** there has been an evolving collaboration in talent and research activity in order to address the challenges within agriculture, food security and planetary health. There are shared appointments in place between the GAAFS and Geosciences in order to deliver forward collaboration in these fields.

**School of Informatics:** Europe's largest centre for informatics and computing science research with over 250 academic and research staff and 1,400 students from 70+ countries. It is a world-leading research institution in Data Science and AI with a breadth and diversity that is at the forefront of new advances in the field. It will support the programme in various aspects of the TRADE objectives, including the support of research partnerships in health informatics.

**Usher Institute:** works with people, populations and their data to understand and advance the health of individuals and populations through innovative collaborations in a global community. Linkage will focus on One Health sector opportunities.

### **External partners**

The Easter Bush Campus has well established regional partnership with local external partners:

**Midlothian Science Zone** <https://midlothiansciencezone.com/about/>. This includes a number of SME's in the Agri-Tech and Life Science field based within the Biocampus and Technopole, as well as the well- established nationally recognised research organisations of the Moredun Research Institute and SRUC. The Midlothian Science Zone creates a centre of excellence for research and innovation in animal health and life sciences, which has been instrumental for attracting and facilitating interactions between business and academia.

**Heriot-Watt University,** The Campus has established ongoing collaborations with the engineering department with a recent joint funded collaboration on the use of micro-sensors within vet diagnostics. The campus is at the early stages of evolving this partnership further with the Robotarium - the increasing use of drones within agricultural research being a key interaction for the future.

**Agritech Centres:** The centres will provide key facilities and access to network farms to help transform science into practice, facilitate relationships with commercial parties across the food chain and enable proof of concept in real life conditions. In particular, established partnerships with AgriEPI and CIEL will be strengthened to enhance Adoption and Entrepreneurial activities. With regard to AgriEPI the initial focus will be to complement UOE enterprise activities with AgriEPI's Makers Yard and joint aquaculture facilities. Furthermore, collaboration with Agrimetrix will provide additional opportunities for data acquisition, management, and commercialisation.

**Scottish Aquaculture Innovation Centre:** SAIC is dedicated to aquaculture innovation and collaborates with a range of research partners to facilitate relationships across the aquaculture sector.

**James Hutton Institute:** combines strengths in crops, soils, land use with environmental research and will be a key partner for the expansion of the Easter Bush Hub into data-driven aspects of crop agriculture to identify synergies between crop and livestock research and accelerate adoption within these sectors.

**Industry, Third Sector, citizen bodies and public partners.** The list of over 50 external partners in Appendix E of this Business Case is not exhaustive. Allied to current partnerships and networks, extensive stakeholder mapping has taken place and an engagement strategy is being developed to ensure appropriate prioritisation.

Internal and external partners identified above will help address core Agri-Tech capabilities as shown in Table Seven.

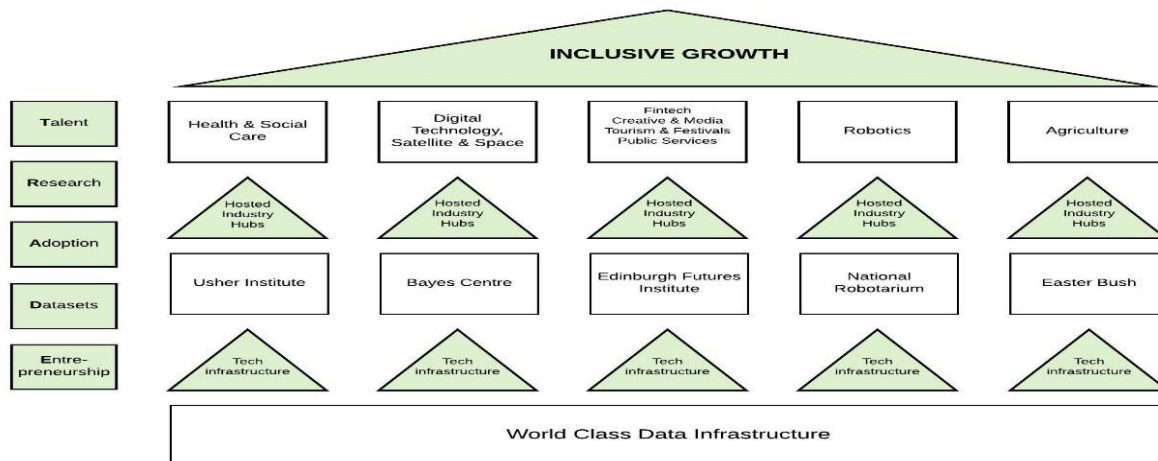
*Table Seven: DDI Agri-Tech Partnership TRADE Linkages*

Delivery Partner	Talent	Research	Adoption	Datasets	Entrepreneurship
Easter Bush	✓	✓	✓	✓	✓
Edinburgh Parallel Computing Centre		✓	✓	✓	
Edinburgh Innovations			✓		✓
Edinburgh Medical School		✓	✓	✓	
Bayes Centre	✓	✓	✓		✓
School of Geoscience	✓	✓	✓	✓	✓
School of Informatics		✓	✓		
School of Biological Sciences		✓	✓	✓	
Usher Institute	✓	✓	✓	✓	
Edinburgh Futures Institute	✓	✓	✓		
Agritech Centres			✓	✓	✓
Midlothian Science Zone		✓	✓		
Commercial, public and 3 <sup>rd</sup> sector (appendix E)		✓	✓	✓	
HWU and Robotarium		✓	✓		

### 3.7 Operating Model

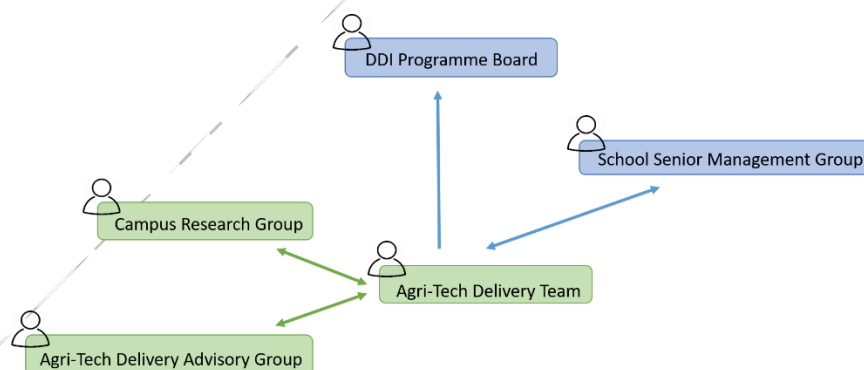
The Agri-Tech operating model is founded on the need to generate value for the City Region, nationally and globally. As illustrated, in Figure Four, this will be achieved by the Agri-Tech Programme operating in alignment with the wider DDI Programme.

**Figure Four: Structure of the overall DDI Programme**



As illustrated, in Figure Five, the **Agri-Tech DDI Delivery Team**, will be accountable for the day-to-day operations and delivery of the Agri-Tech programme. Based at the Easter Bush Campus this team will report to the School Senior Management Group and the DDI Programme Management Office (PMO).

**Figure Five: Programme Management & Governance**



#### 3.7.1 Agri-Tech Delivery Team

This team are the principal owners of the Operational Delivery Plan by which activities across the TRADE themes will be aligned to ensure that there is an appropriate balance of effort and objectives are being met. Key activities include:

- Sector programme management (identifying sector market and commercialisation opportunities);
- Resource management;

- Communications;
- Project alignment, coordination and oversight;
- TRADE KPI reporting;
- Financial management; and,
- Compliance against relevant regulatory and legal standards.

The Agri-Tech Delivery Team consists of the Campus Chief Operating Officer (COO), the Agri-Tech Innovation and Enterprise Lead (AIEL), the Easter Bush Estates Programme Lead and the Agri-Senior Responsible Officer (Agri-Tech SRO)

The **Campus Chief Operating Officer** (currently Val Hughes-White) will oversee the reporting, regulatory and legal, communication and financial management elements of the Programme (as well as facilitating the co-ordination of projects within the programme).

The **Agri-Tech Innovation and Enterprise Lead** (currently Helen Dundas) will target and align market and commercial opportunities with delivery capability. This post was created to realise key new Agri-Tech opportunities afforded by City Region Deal investment in the EB Campus through the development of a Sector Plan.

The **Easter Bush Estates Programme Lead** (currently Helen Wood) drawn from within the Universities Estates office will be responsible for the delivery of the capital aspects of the Programme.

The **Agri-Tech Senior Responsible Officer** (currently Prof Bruce Whitelaw) will lead delivery of the programme, providing the overall co-ordination, alignment and oversight of the projects within the Programme. To enable the design and delivery of specific DDI projects the Agri-Tech SRO will – where appropriate – also set up **short term action groups** comprising colleagues from the other DDI Hubs and from across the University. Pending development stage of individual projects, colleagues may be seconded onto the Agri-Tech Delivery Team to develop project proposals.

The **Agri-Tech Delivery Team** will work with **Easter Bush Campus Research Group** to develop strategic direction and provide oversight to ensure that the Operational Delivery Plan is aligned with Agri-Tech plans by:

- Review and advise on the Agri-Tech Strategy, as well as any other strategic capital activity; and,
- Ensure the DDI Programme appropriately links into the wider Campus and University portfolio of activities through addressing the goals of the Edinburgh & South East Scotland city Deal

The Agri-Tech Delivery Team will form the core of the **Agri-Tech Delivery Advisory Group** who will advise and contribute to the co-design of the Agri-Tech projects. The Agri-Tech Delivery Advisory Group consists of the Agri-Tech Delivery Team and the leads for Talent, Research, Adoption, Entrepreneurial and marketing communication activities. As the Agri-Tech programme grows, the

Agri-Tech Delivery Advisory Group will grow to include representatives from the other DDI Hubs and external Agri-Tech partners.

The **Agri-Tech Delivery Advisory Group** consists of the user representatives, delivery partners, and the Agri-Tech Delivery Team. The **user representatives** are responsible for identifying the needs of the users of Easter Bush and wider University through monitoring that the deliverables will satisfy those needs. The representatives will also specify the benefits that will be realised by Easter Bush deliverables and will be held to account for their realisation. The **delivery partners** are responsible for enabling the co-ordination of Easter Bush DDI activity with those of the wider DDI Programme and will identify any emergent inter-dependencies or cross-programme opportunities.

The Agri-Tech Delivery Team will report to the **School Senior Management Team** for approval of projects. Chaired by the Head of School (currently Professor David Argyle), the School Senior Management Group will review activity within the Agri-Tech Programme and ensure it is adequately resourced and supported, as well as linked into the wider School activity on the Campus. The School Senior Management Group will:

- Approving the Operational Delivery Plan;
- Authorise any major deviations from the agreed Operational Delivery Plan;
- Approve any additional resource required by the School to support the Agri-Tech DDI Programme to ensure required resources are available;
- Assist in the resolution of any internal and external stakeholder conflicts as identified by the Agri-Tech Delivery Team; and,
- Provide overall strategic direction for the programme.

Finally, the interface with the Agri-Tech Delivery Team and **DDI PMO** will also ensure that there is a 'chain of command' in terms of alignment with the wider DDI programme and ensuring consistency in communications, PR, CRM and marketing.

### 3.7.2 How do we manage the pipeline activity and relationships with partners?

The campus benefits from a well-established Knowledge Exchange and Commercialisation (KEC) team which is part of the University's Edinburgh Innovations (EI) team - a team of three business development managers are permanently located on the campus in order to actively participate in engagement as it takes place between our academics and external partners. The sector lead is also based on the campus within the Roslin Innovation Centre and has developed strong collaborative links with the KEC team. Table Eight below illustrates how the scope and scale of business innovation engagement opportunities will be transformed.

*Table Eight: Changes in approach to engagement and partnerships with industry*

Approach & Focus	Summary Description	Current Activities	Future Activities	Example Initiatives
<b>Identify opportunities &amp;</b>	Better understand opportunities and	● Opportunity identification tends to	● Engage a broad range of	🔍 Industrial Challenge



<b>challenges (SME &amp; corporates)</b>	challenges around Agri-Tech issues to inspire new ideas.		be driven in collaboration with Agri-Tech providers.		organisations to identify and validate high-impact opportunities and challenges.	Research Fund applications (UKRI) Bill & Melinda Gates Fund (BMGF)
<b>Generate ideas (SME &amp; corporates)</b>	Explore and develop ideas that address opportunities and challenges in Agri-Tech.	①	Occasional engagements with organisations in the generation of new ideas and concepts.	●	Work with the above to realise high-impact opportunities.	Focused Industry Days Participation in Hackathons
<b>Development &amp; testing (mainly SME focus)</b>	Test ideas in practice so that plans can be refined and improved.	②	Limited focus, mainly through tenants co-located in local area (Roslin Innovation Centre and wider Midlothian Science Zone).	●	Make extensive use of dedicated on-site accelerator capabilities and local tenants to validate early stage concepts.	Increased interaction tenants in Roslin Innovation Centre and wider Midlothian Science Zone DDI student placements
<b>Making the case (mainly SME focus)</b>	Persuade others that new idea works better than existing approaches.	○	Not a focus area currently.	●	Make extensive use of dedicated on-site accelerator capabilities to validate new business models.	Dedicated Agri-Tech sector Venture Studio InnovateUK (UKRI)
<b>Deliver &amp; implement (SME &amp; corporates)</b>	Moving ideas from concept to reality.	○	Not a focus area currently.	●	Make extensive use of dedicated on-site accelerator capabilities to market-test new products.	and Agriculture Science Transformer (FAST)
<b>Grow &amp; scale (SME &amp; corporates)</b>	Enact strategies that grow and spread innovations.	①	Track record of collaborations with SE for the support of companies incubated at the University of Edinburgh.	●	Systematically collaborate with SE and other public sector partners to incubate a long pipeline of digital Agri-Tech activity.	Roslin Technologies Dedicated Food and Agriculture Science Transformer (FAST)
<b>Systems change (mainly corporate focus)</b>	Identify changes in the Agri-Tech sector that enable new ways of thinking & working.	①	Record of accomplishment of collaboration with Knowledge Exchange and Commercialisation to support Agri-Tech innovations.	●	Apply challenge-based innovation approach that engages organisations of all types and sizes.	Data-led approaches to breeding in crop and livestock Data-led approaches in Aquaculture Data-led vet diagnostics

Key					
○	Low level of activity	●	Occasional activities with SMEs & corporates	●	Extensive activities with SMEs & corporates
●	Occasional activities with SMEs or corporates	●	Extensive activities with SMEs or corporates		

This expanded range of innovation activities will create engagement opportunities for SMEs and corporates alike, including potential inward investors that are seeking to grow their commercial activities in the City Region.

## 4. Strategic Case

This strategic case is in two parts:

- **Part A: The Strategic Context** – setting out the alignment of the Easter Bush proposals with government policy and existing University assets and strengths; and,
- **Part B: The Case for Change** – setting out the objectives to be addressed by the Easter Bush Campus, existing arrangements and identified investment needs, risks, constraints and dependencies to intervention.

### 4.1 PART A: The Strategic Context

This section provides an overview of the key global, national and regional strategies - and the University's current DDI related capabilities - that have (both) informed and shaped the Easter Bush proposal. More detailed evidence of these strategies and capabilities are provided at:

- Appendix B: Easter Bush fit with Global Policies;
- Appendix C: Easter Bush fit with UK and Scottish Government Policies;
- Appendix D: Organisational fit; and,
- Appendix E: Partner Engagement and Current Demand.

#### 4.1.1 Global Context and Alignment

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*“Eight hundred million people go to bed hungry every night. If the situation does not improve and population grows as predicted, the number of people that go hungry every night may dramatically increase by 2050. By making data open and building capacity for open data use by all stakeholders, we will stimulate economic growth and support farmers, scientists, consumers and entrepreneurs who are working to solve the world’s long-term food security needs. If we can forecast the weather around the world utilising today’s available data and technologies, we have the capacity to solve global food insecurity. We need a global comprehensive data ecosystem to enable and empower us to find the right balance of solutions” – Open Access Government.*<sup>40</sup>

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In 2011 John Beddington, then UK’s Chief Scientific Advisor, placed the links between global demand for food, energy and water within the context of climate change, describing the concurrent and rapid increase in demand for these commodities as a perfect storm.

His subsequent FORESIGHT report identified six key pressures on global food production systems that have already led to the failure to feed the global human population: population increases, changes in consumer demand, changes in local and global governance, climate change, competition for key

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<sup>40</sup> <https://www.openaccessgovernment.org/can-open-data-feed-world/41419/>

resources (e.g. clean water), and changes in the ethical stance of consumers.<sup>41</sup> The report concluded that to address these issues: *“more food must be produced sustainably through the spread and implementation of existing knowledge, technology and best practice, and by investment in new science and innovation and the social infrastructure that enables food producers to benefit from all of these”*.<sup>42</sup>

The FAO predict that, by 2050, existing global agricultural production (including crops and animals) will need to be 70% higher as the demand for food will grow disproportionately as more countries emerge from poverty.

Globally, agriculture already has major environmental impacts which need to be reduced (which in turn could have serious negative effects on productive capacity<sup>43</sup>). Infectious diseases remain a key impediment to animal production and welfare, not least owing to the rise of drug resistance and zoonoses.

The FAO has set these challenges within the context of the UN Sustainable Development Goals which in turn<sup>44</sup> emphasise the importance that Agri-Tech may play under several of these goals, for example:

- Goal 2: *“Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries”*;
- Goal 9: *“Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending;”* and,
- Goal 14: *“Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.”*

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<sup>41</sup> *“Any one of these pressures (‘drivers of change’) would present substantial challenges to food security; together they constitute a major threat that requires a strategic reappraisal of how the world is fed”*.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

<sup>42</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

<sup>43</sup> Some studies estimate, for example, that the aggregate negative impact of climate change on African agricultural output up to 2080-2100 could be between 15 and 30 percent.

[http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How\\_to\\_Feed\\_the\\_World\\_in\\_2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)

<sup>44</sup> Transforming our world: the 2030 Agenda for Sustainable Development, United Nations, General Assembly, and 18th September 2015.

In addition, in 2021 the United Nations launched its Decade of Ocean Science for Sustainable Development, reflecting both the opportunity to increase food production from aquatic animals and plants, and the imperative that we do this in a sustainable manner.

Addressing these challenges will need world-leading, integrated research, education, knowledge exchange and consultancy, all underpinned by data science to make a real difference in practice: *“at its core, Agri-Tech is about using advanced monitoring and data analysis to do more with less – to find ways to increase yields without burdening already overtaxed resources such as land and water”*.<sup>45</sup>

As detailed at Appendix B the Easter Bush Agri-Tech Hub will help local and international agriculture achieve these aims by focussing on four areas:

- **Acquisition:** by sourcing and curating multiple data sets and modalities in partnership with the farming community and Agri-Tech industries (to improve crop, livestock and aquaculture productivity) with datasets accessed from commercial and public sources, in addition to new datasets generated through innovative research;
- **Analyse:** through increasingly sophisticated curation, data-cleaning and innovative interrogation and analysis of large Agri-Tech data sets within data-safe havens, thus providing a secure platform for academia to interact with industry (for example to improve crop yields and monitor disease transmission during outbreaks);
- **Access:** providing information - using digital and other EIDF interfaces - to enable access to the data revolution the Agri-Tech community is about to embrace (for example to better share and leverage leading practice in agriculture methods);<sup>46</sup> and,
- **Connectivity:** to ensure awareness across stakeholder communities to all the above.

Appendix C details how the Hub aligns with key UK and Scottish Government DDI and agricultural policies and in particular the vision of the (previous) UK Government that: *“The UK becomes a world leader in agricultural technology, innovation and sustainability; exploits opportunities to develop and adopt new and existing technologies, products and services to increase productivity”*.<sup>47</sup>

Similarly, there is a close match with Scottish Government’s Economic and Digital strategies,<sup>48</sup> as the Easter Bush Hub will establish confidence in data, facilitate ethical debate with the public on the use

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<sup>45</sup> <https://www.weforum.org/agenda/2019/02/why-the-agtech-boom-isn-t-your-typical-tech-disruption/>

<sup>46</sup> *“This report makes specific recommendations for the creation of a global, spatially explicit, open-source data base for the analysis of agriculture, the food system, and the environment, and the setting up of an International Food System Modelling Forum to enable a more systematic comparison of different models, to share results and to integrate their work better to meet the needs of policy-makers”*.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

<sup>47</sup> A UK Strategy for Agricultural Technologies, 2013.

<sup>48</sup> In line with the Data Management Board: A Data Vision for Scotland <http://www.gov.scot/Resource/0044/00448438.pdf>

of technology and encourage the exploration of new technologies, techniques and skills to develop and grow the next generation of digital agriculture businesses in Scotland.

#### **4.1.3 Existing DDI TRADE Strengths, Assets and Activities**

As detailed in Appendix D the combination of capabilities at the Easter Bush campus, together with the internationally recognised academic leadership available, provides a unique UK platform for engaging with the agriculture sector while providing world-class teaching and training of the next generation of Agri-Tech students, practitioners and entrepreneurs.

Within the livestock Agri-Tech sector the Easter Bush campus already houses the world's largest cluster of academic institutions including the:

- World-renowned Roslin Institute, one of the BBSRC's strategically supported National Institutes of Bioscience;<sup>49</sup>
- Royal (Dick) School of Veterinary Studies the UK's leading vet school (as demonstrated through the Research Excellence Framework); and,
- Scotland's Rural College, arguably the leading Scottish agricultural college.

Building on the above, and in order to increase on-site Agri-Tech impacts, the new £30 million Roslin Innovation Centre opened in August 2017. The Centre acts as the business location of choice for companies undertaking strategic, commercial and collaborative research in animal and veterinary Agri-Tech. With the Innovation Centre now being open for two years it is already at 75% committed occupancy with 23 local and international companies seeking to benefit from co-location and collaboration at Easter Bush including: Ingenza, Censo, Synpromics (now AskBio), Landcatch (now Hendrix Genetics) and Roslin Technologies.

With initial private sector funding of £10 million Roslin Technologies<sup>50</sup> was formed by the University of Edinburgh with JB Equity as the commercialisation arm of The Roslin Institute and Royal (Dick) School of Veterinary Studies. As well as developing a range of new products Roslin Technologies offers strong platforms for industry engagement through a range of services, licencing and collaboration opportunities.

Easter Bush is home to major facilities of two Innovate UK innovation Centres - the Centre for Innovation and Excellence in Livestock (CIEL) and the Agricultural Engineering Precision Innovation Centre (AgriEpi). The former delivers global livestock production and product quality research to deliver improved food quality and farming systems while the latter is bringing together key organisations in the food supply chain to become a world-leading centre for excellence in engineering and precision agriculture.

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<sup>49</sup> In addition to the £6.5M per annum of Institute Strategic Programme Funding from the BBSRC towards the running of the Roslin Institute, it has also committed £10M of capital to the Easter Bush Campus over the next ten years in order to leverage the overall strategic vision of "Data Driven Agri-Tech"

<sup>50</sup> <http://roslintech.com/>

As a result the Easter Bush campus already has the physical and analytical capability to devise, plan, house and perform proof-of-concept studies in the livestock and companion animal sphere (as reflected in the numerous Agri-Tech companies either working with Easter Bush or who are co-locating to the Roslin Innovation Centre as listed in Appendix E).

The proposed capital investment from City Region Deal, coupled with the University of Edinburgh and BBSRC funding, will enable a **step-change in the scale and impact** of Agri-Tech education, research and consulting through a range of new programmes of data-led innovation, translation and adoption in agriculture and aquaculture.

## 4.2 PART B: Case for Change

### 4.2.1 Market Failure & the Need for Change

The latest (2020) HM Treasury Green Book indicates that the rationale for government intervention: *“can be based on strategic objectives, improvements to existing policy, market failure or distributional objectives that the government wishes to meet<sup>51</sup>.”* This section therefore sets out the strategic and policy objectives for Government investment in the DDI Programme and consequent market failures and distributional benefits that will be specifically addressed by this support in relation to the Easter Bush Agri-Tech Hub.

#### Government Strategic Objectives and Policies

Public sector investment in digital infrastructure and innovation is a strategic priority for both UK and Scottish Governments. As highlighted by the House of Commons Science and Technology Committee Second Report of Session: *“the digital skills gap (estimated at levels of 750,000 in 2017) is approaching crisis levels and this not only has economic implications but also puts the quality and security of this data at risk. This (also) risks UK Business being unable to grow the big data sector at the rate it should. In the meantime this skills gap is due to grow exponentially as big data reaches further into the economy”.*<sup>52</sup>

Consequently, government investment in the DDI Programme is predicated on various grounds, not least:

- **Pooling risk:** as recognised in the Industrial Strategy addressing this skills gap requires Government intervention and investment: *“governments can make long-term investment that no single commercial or academic player can take alone. The modern nation state is the most powerful means we have of pooling risk”.*<sup>53</sup> Adopting this investor of first resort role reflects

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<sup>51</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/685903/The\\_Green\\_Book.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf)

<sup>52</sup> <https://publications.parliament.uk/pa/cm201617/cmselect/cmsctech/270/270.pdf>

<sup>53</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf)

the importance of Governments in supporting technological change – such as Agri-Tech<sup>54</sup> – and achieving public-private partnerships that are more symbiotic;<sup>55</sup>

- **Providing cornerstone funding:** as recognised by the ESES City Region Deal Document<sup>56</sup> the Universities do not have access to sufficient levels of other funding sources (either internally or externally) to deploy the data infrastructure and physical Hubs necessary to create the sustainable system of TRADE innovation activities - to the scale and timescales - that will support the Scottish and UK economies address the critical skills gaps identified above and, by extension, the agriculture productivity growth both Governments seek; and,
- **Maintaining and enhancing the City Regions and UK competitive advantage:** the Department for Business, Energy and Industrial Strategy (BEIS) sponsored Science and Innovation Audit (SIA), which identified the City Region's pre-eminent position (within the UK) to best respond to global DDI opportunities as well as competitive threats, concluded that: *"if (public) investment is deferred, we run the risk of losing both competitiveness and output to other (global) digital clusters that have the confidence to invest. We also risk losing jobs in myriad parts of the economy as a result of automation extending into knowledge-intensive services"*.<sup>57</sup>

Given the above (rationale) the market failures that will be addressed by - and distributional or equity benefits that might be generated through support for - the Agri-Tech Hub are detailed below.

### Market Failures Addressed

In the context of the Easter Bush Hub proposals there are two specific (missing market<sup>58</sup>) failures that government intervention (and investment) will address, namely:

- **Positive Externalities:**<sup>59</sup> in relation to the wider, spill over benefits from Easter Bush TRADE

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<sup>54</sup> "From robotics to genetics and feeding the world, the UK is a pioneer in technological innovation. We know that this work in innovation is key to increasing productivity and sustainability in agriculture and will allow the UK to continue to compete globally." <https://www.gov.uk/government/news/lord-duncan-hails-golden-age-of-agricultural-innovation-at-royal-highland-show>

<sup>55</sup> As indicated, for example, by Professor Mariana Mazzucato's: *"The Entrepreneurial State: debunking public vs. private sector myths."*

<sup>56</sup> "This ambitious City Region Deal identifies **new and more collaborative ways** that partners will work with UK Government and Scottish Governments to deliver transformational change to the city regional economy. The Governments will jointly invest £600 million over the next 15 years and regional partners committed to adding in excess of £700 million, overall representing a deal worth £1.3bn". <https://static1.squarespace.com/static/55c87967e4b05aa55020f656/t/5c263201898583ec74c01146/1546007049724/ESESCR+Deal+Document+6+August+2018+signed.pdf>

<sup>57</sup> SIA Summary.

<sup>58</sup> i.e. an efficient free market enables a Pareto efficient distribution of resources. In contrast under a "missing market" such distribution cannot result for various reasons including poor or imperfect information, high transaction costs or the inability to price all social costs/benefits e.g. through externalities.

<sup>59</sup> "Externalities arise when an economic activity results in costs and benefits for others which are not reflected in market prices..... **Positive externalities** are also possible, for example education provision can bring additional benefits to the wider economy and society, in addition to those gained by the direct beneficiaries and the provider". [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220541/green\\_book\\_complete.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf)



outcomes (and related DDI research and EIDF computing infrastructure) resulting in uplifts in productivity and public benefits for the agriculture sectors in the Scottish, UK and global economies<sup>60</sup> which will not be captured in financial returns to the University; and,

- **Imperfect Information:**<sup>61</sup> given the nascent nature of Easter Bush Agri-Tech market opportunities and related uncertainties, there are information deficiencies and private sector investment (risk adverse) inertia that could, however, be broken by the innovation at scale objectives of the Agri-Tech Hub TRADE activities.

The ultimate outputs and related impacts of Government intervention will (therefore) be to:

- Provide agricultural and related sector students, academics, workers and existing and new businesses with better DDI Agri-Tech focused skills, facilities and infrastructure; and, in turn,
- Attract new investors, Agri-Tech companies, students and academics to the City Region through enhanced DDI focused training, research and development, incubation and commercialisation support and computing provision.

Through the above there will be improved information flows and positive externality benefits and consequent economic growth and public sector benefits through three broad sources, namely:

- Sector efficiency gains in terms of improved performance, environmental sustainability, food security (and reduced costs and expanded revenues);<sup>62</sup>
- Consequent uplifts in R&D from reinvestment of profit uplifts and potentially public exchequer savings; and,
- New market entrants leading to efficiency gains and new products and services.

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<sup>60</sup> "Our aim is that the whole Agri-Tech sector should lead, participate and co-invest. The potential rewards are in increased productivity, reduced costs, growth, new investment and jobs and **tackling the challenges of sustainable intensification and global food security**". A UK Strategy for Agriculture Technology, 2013.

<sup>61</sup> "**Information deficiencies:** where there is a lack of information of sufficient quality to enable informed decisions to be made" [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/220541/green\\_book\\_complete.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf)

<sup>62</sup> From a private sector perspective as detailed by a recent CEBR and SAS report: "we consider six mechanisms through which the information and insights gathered through the use of big data and the IoT can help businesses to improve performance and add greater value to the economy. These channels, or mechanisms, allow firms to **optimise their operations by, for example, reducing costs and/or expanding revenues** in relation to: customer intelligence; supply chain management; quality management; risk management; performance management; and fraud detection". [https://www.sas.com/content/dam/SAS/en\\_gb/doc/analystreport/cebr-value-of-big-data.pdf](https://www.sas.com/content/dam/SAS/en_gb/doc/analystreport/cebr-value-of-big-data.pdf). These effects are equally applicable in the agriculture sector. For example the Agriculture and Horticulture Development Board estimate that if the UK agriculture sectors rate of growth had kept pace with the US since 2000, the contribution of UK farming to the rural economy would have been £4.3 billion higher by 2013.

Consequently, as detailed in the Economic Case section of this case, the extent of the productivity gains (alone<sup>63</sup>) that the Easter Bush Hub will generate are estimated to exceed over £248 million gva in net present value terms.

### Distributional Benefits

East Bush Hub activities – as with all components of the DDI Programme – are aligned to the Scottish Governments inclusive growth strategy of ensuring that Scotland will be: *"more ambitious, with government, businesses and wider society working together to lead on the key technological and social changes of the future"* and ensuring economic growth is *"inclusive, so that everyone benefits and has a fair chance to contribute"*.<sup>64</sup>

In particular all proposed Easter Bush Agri-Tech Hub activities (as in the case of every DDI hub) will need to demonstrate how they will firstly ensure inclusive growth<sup>65</sup> but also, as importantly, meet (at least one) of the other identified overarching City Region Deal inclusive growth objectives, namely:

- **Removing Physical Barriers to Growth:** through interventions to unlock current physical barriers to growth, including housing and transport connectivity as key components of the Deal. This Case addresses such barriers by increasing transport connectivity and network capacity to and from the Campus (as well as in the local area) in order to realise the benefits of the Hub and potential longer-term on-site facility expansion;
- **Pro-Active Procurement:** a significant programme of construction is planned across the city region. The City Region Deal Partners are working with both Governments to develop a clear vision for Community Benefits and supporting guidance to maximise Inclusive Growth objectives. At Easter Bush there will be various ways to realise such opportunities including development of the Energy Centre which will use local apprenticeships and enable regional skills development for emerging low carbon heat technologies and construction practices;
- **Targeted Employability & Skills Interventions:** a programme of integrated and targeted employability and skills interventions will be directed at widening access, addressing skills shortages and gaps, and delivering improvements to boost the flow of individuals from disadvantaged groups into good career opportunities. Easter Bush activities will be focused on supporting partners – where relevant – in addressing employment issues and standards in the City Region and wider Scottish agriculture sector; and,
- **Social Benefit through Innovation:** by recognising the potential presented by a significant investment in DDI and opportunities to drive out challenged-based social benefit projects and programmes across the City Region over the medium and long term. Currently the University

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<sup>63</sup> i.e. excluding transport benefits.

<sup>64</sup> First Minister, 31<sup>st</sup> August 2017.

<sup>65</sup> Under the first inclusive growth objective of the Deal Document it is recognised that: *"The Data Driven Innovation (DDI) programme of investment will be a key driver in helping to deliver a step-change in regional economic activity"*.

of Edinburgh and other Partners are examining the type of challenge programmes that could be developed under this objective and, in particular whether they should be explicitly aligned to the community benefits approach suggested above, embedded in hubs activities and co-produced with Governments to focus on demonstrator projects with potentially wider application than the CRD Region.

## Conclusion

In conclusion, the premise of the Easter Bush Hub (as reflected by Callon<sup>66</sup> and others) is that:

- Private and public sector markets tend to “use up” the existing sources of research, leading to convergence and irreversibility and locking society into particular technological options;
- Government action is required to break this cycle through funding (such as that identified for Easter Bush) that creates novel approaches to addressing and resolving technical problems by increasing the variety of (technological) options available to the agriculture sector; and,
- Adoption of an interdisciplinary portfolio approach (as reflected in the previous section and as a central tenant of the DDI Programme overall) increases the likelihood of such options addressing a wider range of food production needs<sup>67</sup> generating positive externalities, improved market information flows and better more inclusive outcomes.

### 4.2.2 Challenges & Business Needs

In its current form Easter Bush faces various challenges:

- The site lacks the energy and road infrastructure capacity to ensure the buildings, and the site as a whole, continue to remain capable of offering the environment and servicing to house the academic and industry research being carried out, secure new funding and to attract the co-location of more industry and development partners;
- There is inadequate infrastructure to create and manage the increasingly diverse and ever-increasing datasets that the agricultural industry generates and to enable the industry partnerships through which the commercial value of this data can be harnessed; and,

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<sup>66</sup> “Is science a public good?” Callon, M., 1994 Science, Technology and Human Values 19, 345–424. See also: “The economic benefits of publicly funded basic research: a critical review”, Ammon J. Salter and Ben R. Martin, Research Policy, 2001.

<sup>67</sup> “In determining where and how much to invest in producing more food, policy makers will need to consider a range of criteria, rather than increases in production alone. These criteria will need to acknowledge the existence of both positive and negative externalities associated with different forms of food production..... The development of better metrics and a new more embracing set of standards for sustainable food production that incorporates best practice from all types of production systems should be a priority”.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

- The lack of shared data infrastructure prevents certain critical interdisciplinary research, entrepreneurship and adoption activities from taking place (particularly in relation to working collaboratively with external partners).

Adequate road access to the site must be provided if constraints on the further development of Easter Bush are to be avoided. The intended development of Easter Bush will increase demand for travel to the site: whilst the modal share of sustainable transport (public transport and active modes) access to the site is good (52% by bus, 5% of students by active modes<sup>68</sup>) private car access is and will remain important.

The rationale for the A701 Relief Road and A702 Link Road emerged from the Midlothian Local Development Plan transport modelling of all committed developments in the area that highlighted potentially serious road traffic congestion, capacity issues and delays along the A701<sup>69</sup>.

City Region Deal funding would enable the early prioritisation and, therefore, the effective implementation of the Local Development Plan strategy in the A701 corridor. Failure to deliver at an early stage of the plan period will act as a significant constraint to growth, particularly at Easter Bush, and across the regional economy generally.

These challenges also need to be considered against a UK context of pressing Agri-Tech TRADE challenges and needs:

- **Talent: emerging data-intensive Agri-Tech activities need appropriately skilled workforces.** The ever increasing role of data collection and utilisation in the rapidly changing commercial agriculture environment demands different skills to those traditionally deployed;
- **Research: DDI R&D will be essential to address future sector needs.** As: *“investment in research on modern technologies is essential in light of the magnitude of the challenges for food security in the coming decades,”*<sup>70</sup>
- **Adoption: new adoption processes and commercialisation routes will be needed.** With new data-driven systems and approaches new exploitation strategies are also required in order, for example: *“to give greater priority to the food production sector as an engine for both rural and urban development; invest in the economic, physical and social infrastructure to facilitate food production; and promote entrepreneurship along supply and value chains,”*<sup>71</sup>

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<sup>68</sup> Source: *Bush Transport Strategy*, JMP report, Jan 2017.

<sup>69</sup> See the Midlothian Local Development Plan Main Issues Report, Transport and Infrastructure Technical Note - <https://www.midlothian.gov.uk/downloads/file/2517/transport-and-infrastructure-technical-note> and the Report of Examination, issue number 6, page 144 – 181, which addresses the A701 Relief Road/A702 Link Road and the approach of the Council in preparing the transport appraisal of the Midlothian Development Plan (to comply with Scottish Planning Policy) - <https://www.midlothian.gov.uk/downloads/file/2292/report-of-examination-into-mldp-proposed-plan>

<sup>70</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

<sup>71</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288329/11-546-future-of-food-and-farming-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288329/11-546-future-of-food-and-farming-report.pdf)

- **Datasets: capturing and using big data is new to the farming community.** There is a need for both pre-farm (UoE) and real-on-farm (through partnership) data to inform talent development and research and for access to this data to be made more straightforward; and,
- **Entrepreneurship: to increase the supply of leaders and access to investment.** Many commercial opportunities will be generated from the transformation of current agricultural practices to those based on data-driven innovation. These opportunities need to be realised through a diverse platform of entrepreneurial activity and investment support.

#### 4.2.3 Investment Objectives & Benefits Criteria

In response to the challenges and business needs described, Table Nine below sets out the SMART objectives identified for Easter Bush.

Table Nine: DDI Programme investment objectives and benefits criteria

Theme	Investment Objective(s)	Benefits Criteria
<b>Talent</b>	Develop a vibrant learning environment with a range of data skills to realise the potential of the data driven e Agri-Tech sector	<ul style="list-style-type: none"> <li>• KPI - Total numbers engaged 141,000 credit /non-credit bearing</li> <li>• Benefit measure – Salary uplifts and graduate retention in the UK</li> </ul>
<b>Research</b>	Develop, in conjunction with industry, a world-leading Agri-Tech research capability. Facilitate collaborative integrated research which delivers impact to the sector	<ul style="list-style-type: none"> <li>• KPI – Total £117m research funding</li> <li>• Benefit Measure- return on investment</li> </ul>
<b>Adoption</b>	Undertake a range of industry engagements focused on building collaborative partnerships to enable new research and innovation activity to address challenges in Agri-Tech sector	<ul style="list-style-type: none"> <li>• KPI – 100 company interactions</li> <li>• Benefit Measure – return on investment</li> <li>• KPI – 24,000 CPDs</li> <li>• Benefit measure – Salary uplifts</li> </ul>
<b>Data</b>	Support initiatives to encourage and enable the creation, acquisition and curation of new forms of data asset. Increase the translational power of the datasets through analysis and adoption	<ul style="list-style-type: none"> <li>• KPI – New data sets utilised as industrial partners deposit data for research</li> <li>• Benefit Measure – N/A</li> </ul>
<b>Entrepreneurship</b>	Expand pipeline of business activity and support equity investment	<ul style="list-style-type: none"> <li>• KPI – 30 new business activities through increased co-location of Agri-Tech partners</li> <li>• Benefit Measure – return on investment</li> </ul>
<b>Inclusivity</b>	Increased outreach activity for all aspects of Agri-Tech, with specific expansion for those with low science capital and/or rural communities	<ul style="list-style-type: none"> <li>• KPI – 58,000 public interactions, retention of Investors in Young People Silver accreditation and Athena SWAN Gold status</li> <li>• Benefit Measure – delivery of SIMD social inclusion targets as per section 3.5.6<sup>72</sup></li> </ul>

<sup>72</sup> NB some of these inclusivity targets are depend on securing funding from non CRD sources.

## Easter Bush Activities

To realise the full potential of the Campus to develop data-driven agriculture - through DDI investment and other associated funding sources - the Agri-Tech Hub will:

- Build on current Campus strengths in **Data Science** to underpin research and development, creating capacity for curation and data analysis followed by adoption of evidence-based ‘precision agriculture’;
- Provide the infrastructure for data curation, including the expansion of animal facilities underpinning **animal biotechnology and gene editing**, and growth of in **aquaculture genetics and health**; and,
- Embrace emerging technology platforms in order to underpin strategically supported research including evolving **phenotypic and genomic** technologies, as well as modernisation of **proteomic and bio-imaging** technologies.

## Investing in and addressing core capabilities and gaps: TRADE

The activities, through which the objectives of the Easter Bush proposals will be achieved, are summarised below in Table Ten. Future use cases, that describe the practical application of these activities, are provided in Appendix F.

Table Ten: DDI Programme Activities

SIA Theme	Activity Proposed
<b>Talent</b>	<p>To address the shortage of DDI skills in the economy, develop a sustainable pool of talent in the City Region and build a workforce more resilient to data driven change by:</p> <ul style="list-style-type: none"> <li>• Developing a new series of undergraduate, postgraduate and professional training opportunities through delivery of Easter Bush DDI courses at different qualification levels to address gaps in current provision;</li> <li>• Increasing data skills capacity through the delivery of the training;</li> <li>• Improving access to in-work training through an improved CPD offer;</li> <li>• Offering better scope for informal learning through MOOCs and an increased on-line portfolio;</li> <li>• Maintaining a leading training offer in the City Region through access to the latest research and facilities;</li> <li>• Attracting talent from outside of the City Region to study and relocate to the City Region;</li> <li>• Increasing the ability to apply data to “real world” food security problems; and,</li> <li>• Improving the employability of students through the provision of real-world data skills.</li> </ul>
<b>Research</b>	<p>To maintain, build upon and extend the reputation of the Easter Bush Campus for leading research and to attract talent, data and investment to the City Region and unlock more insight from data by:</p> <ul style="list-style-type: none"> <li>• Extending the scope and scale of DDI Agri-Tech research undertaken in the City Region;</li> <li>• Improving the range, quality and critical mass of Agri-Tech facilities available to leverage more research investment;</li> <li>• Increasing the connectivity of research data to facilitate a more integrative collaborative approach to deliver data –driven research solutions to Agri-Tech issues;</li> <li>• Improving the pathways through which Agri-Tech research translates into economic, sustainable and social outcomes; and,</li> <li>• Creating the conditions for chance interaction and coproduction.</li> </ul>
<b>Adoption</b>	To unlock the wider benefits of DDI for the economy and society through increasing the awareness

SIA Theme	Activity Proposed
	<p>and uptake of DDI amongst agricultural businesses by:</p> <ul style="list-style-type: none"> <li>• Extending the number and level of partnerships with public, third sector private sector partners through co-funded applied research and coproduction activities;</li> <li>• Enabling closer working of partners, increased connectivity of data and dissemination of best practice through realising opportunities for addressing wider sector issues;</li> <li>• Providing access to “living lab” capability which is in high demand from industry to help test and develop products in real world, safe, conditions which can be hard to produce in isolation;</li> <li>• Allowing better public access to the Agri-Tech activity being undertaken to build awareness of and trust in the DDI economy; and,</li> <li>• Demonstrating the potential of data to unlock opportunity.</li> </ul>
<b>Data</b>	<p>To increase the City Region’s stock of data, the value generated from it and its accessibility by:</p> <ul style="list-style-type: none"> <li>• Developing the facilities needed to securely store and manipulate data;</li> <li>• Agreeing more data partnerships with partners in order to acquire and curate more data in the sector;</li> <li>• Increasing the breadth of Agri-Tech related datasets available for correlation and interrogation;</li> <li>• Improving the accessibility, usability and cost of access to data assets and thus “the translational power” for wider user groups to underpin more research, adoption and entrepreneurship activity; and,</li> <li>• Promote the data-assets available to attract investment and talent.</li> </ul>
<b>Entrepreneurship</b>	<p>To increase the level of DDI related economic activity in the City Region by:</p> <ul style="list-style-type: none"> <li>• Identifying and encouraging the formation of more Agri-Tech spin out activity;</li> <li>• Improving the level and consistency of support available to these spin outs;</li> <li>• Productive utilisation of space available to accommodate early stage spin outs at the Easter Bush Campus as well as encouraging Agri-Tech partners to co-locate on the campus to maximise partnership potential;</li> <li>• Promoting better industry awareness, participation in and investment in spin-out activity;</li> <li>• Improving access to support services; and,</li> <li>• Widening access to data assets and reducing the cost of access to foster entrepreneurial activity.</li> </ul>

#### 4.2.4 Scope of Investment Requirements

As illustrated previously, the Easter Bush Campus is already host to various buildings, on site agricultural facilities and Institutes through which DDI Programme-related Agri-Tech outcomes will be realised. Table Eleven illustrates how - with City Region Deal, BBSRC, Midlothian Council and third-party investment - the impact of these Institutes will be expanded through a capital investment programme including:

- Enhanced data technology facilities, equipment and infrastructure to support the acquisition, curation, analysis, adoption and translation of Agri-Tech data across Easter Bush;
- Combined heat and power infrastructure; and,
- Road infrastructure improvement (A701 relief road, A702 Link Road, Bush Loan Junction and Straiton Junction) and the provision of sustainable transport improvement measures (prioritising walking, cycling and bus based public transport) along the former A701 corridor.

Table Eleven: Programme Funding

	Projects within City Region Deal Scope	BBSRC Funded Projects within the investment
Underpinning Campus Infrastructure for Data Driven Innovation	Campus Infrastructure (Water/SUDS) £2m	Research Sample Archive Facility £1m
Expansion of Data Driven Global Agri-Tech Hub facilities	Agri-Tech hub £4m	
Creation of the Agri-Tech Data Innovation Hub +	High Performance Computing £2m	
Equipment to enhance and expand the acquisition of data through phenotypic and genotypic range and resolution	New and Emerging Technologies £4m	Phenotype Platform £4m Genotype Platform £1m
Enhanced Translational Facilities		LARIF phase 2 £3m Aquaculture £1m
Combined Heating and Power	CHP Infrastructure £12m	
Other Campus Infrastructure	Campus Infrastructure £10m	
Subtotal	£34m	£10m
Road Infrastructure	£30m	
Total	£64m	£10m

### Enhanced Data Technology Facilities, Equipment and Infrastructure

The first component of this capital investment will be distributed across five key areas, namely:

- a) **Underpinning Infrastructure for Data Driven Innovation:** to provide the basic infrastructure to support the expansion of operations (water/heat), creation of Combined Heat and Power (CHP) facilities (as per the next section below) and storage of biomaterials (Research Sample Archive Facility). An element of these infrastructure costs will also be required for minor works and/or refurbishment of laboratories and offices;
- b) **Expansion of Data Driven Global Agri-tech facilities:** to enhance the co-located space and resources from across the University of Edinburgh and partner institutions;
- c) **Creation of the Agri-Tech Hub** – funding will increase the high performance computing capability, network capability and the associated services necessary to allow the expansion of the acquisition, curation and analysis of data required (in epidemiology, animal, aquaculture and veterinary digital health provision);



- d) **Equipment to enhance and expand the acquisition of data through phenotypic and genotypic range and resolution** - to allow new end-to-end scientific analyses (from the level of molecules to whole animal populations) in a wide range of biological contexts; and,
- **Enhanced Translational Facilities** - including expansion of the Aquaculture Genetics Research Facility to facilitate Shellfish and Crustaceans, to support the growing aquaculture research, and to allow co-location of the remaining LARIF facilities from Dryden to Easter Bush Campus to support animal research.

In addition to the specific capital investment above the Easter Bush Campus will significantly benefit from the funding that has already been awarded through City Region Deal via EIDF to upgrade networks and provide much needed super computing capabilities for the Easter Bush campus.

### **Combined heat and power (CHP) infrastructure**

The Easter Bush CHP Energy Centre is an essential component of the next phase of development for the Campus. The new building will provide robust, flexible and low carbon infrastructure to heat and cool buildings on the Campus while also meeting a significant proportion of the base electrical demand on site.

The University of Edinburgh has committed to becoming carbon neutral by 2040. The Easter Bush Energy Centre is a major milestone in the delivery of the University's 'Zero by 2040' Climate Strategy and Energy Masterplan.<sup>73</sup>

The University will utilise the Energy Centre as a 'living laboratory' for innovation in advanced analytics of smart energy grids and act as a learning hub embedding 'living laboratory' opportunities for the local community.

In 2019 Vital Energi were commissioned to provide dynamic energy modelling of the Easter Bush campus to evaluate the energy supply and demand characteristics of existing buildings, the energy centre, HV and DHN infrastructure and pending 1.5MW solar PV installation. Financial and environmental benefits were identified in extending the HV ring main (to interconnect all Easter Bush electrical loads to the Energy Centre) and the DHN to supply the Vet School, Small Animal Hospital and Bumstead building. This will allow the CHP Centre to significantly increase operating hours to maximize the utilization of onsite heat and electrical generation. The environmental benefit includes a reduction in GHG emissions of 2,100 TCO<sup>2</sup>e.

### **Other Campus Infrastructure**

As part of the wider University of Edinburgh 2025 Estates strategy, the University is currently delivering, or has delivered, a number of Capital Projects at the Easter Bush Campus. These projects will be supported and connected by new roads, paths and services networks provided as part of the

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<sup>73</sup> That includes advanced renewable technologies, 'next generation' energy networks and smart district heating controls all of which are critical to enabling the transition to 'net zero'.

Easter Bush Infrastructure Project. The scope of this project includes all of the physical systems a campus of this scale requires, including transportation, communication, sewage, water, electric and public realm. Each of these elements will be delivered as individual design lots or work streams. This suite of works will focus on improving links between campus assets, ensure business continuity and to safeguard campus resilience.

### **Road infrastructure requirements**

The A701 corridor is a highly urbanised location with all settlements and employment/retail destinations serviced from the A701. The Easter Bush Campus (and Midlothian Science Zone<sup>74</sup> or MSZ) is also accessible from the A702 and A703. To date, incremental interventions have not resolved the capacity and junction issues on the local and trunk road networks, particularly at Bush Loan/A702. The physical limitations of the A701 carriageway also prohibits multi modal solutions to mitigate the scale of planned developments.

The proposed roads infrastructure changes will be a key enabler of the future development of the Easter Bush Campus comprising the A701 Relief road, A702 Link Road, Bush Loan Junction and Straiton junction. These improvements will also enable and support future investment across the wider Midlothian Science Zone (including the Biocampus, Technopole and Moredun Institute) as well as throughout the whole A701 corridor.

Through the planning process recent development projects on the Easter Bush Campus have been subject to a Transport Scotland objection, based on safety concerns at the Bush Loan junction. Transport Scotland has stated that: *“the latest assessments undertaken to inform these applications has demonstrated that we are now at the point where any further development cannot be considered without significant mitigation at the A702/Bush Loan junction. Given the concerns there are with the level of queuing on the local road, we are concerned that this could cause issues to the safe operation of the trunk road (which is not easily measured using traditional standalone junction assessments)”*.

The transport proposals will provide a physical infrastructure solution to unlock not only the Midlothian Science Zone but also significant planned housing (1,570 units) and economic and commercial development in the A701/A702 corridor (circa 90Ha). The infrastructure improvements will therefore facilitate:

- Accelerated growth in the life sciences sector;
- Promotion of and greater collaboration and innovation across the DDI Hubs and the University of Edinburgh as a whole; and,
- The delivery of public transport and active travel infrastructure (on the bypassed section of the existing A701) that will lead to more sustainable travel options and choices and (when aligned with additional A720 improvements) improved travel times, connectivity and accessibility with Edinburgh and around the City Region.

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<sup>74</sup> <https://midlothiansciencezone.com/>

In addition to the above benefits, the new roads and junctions will add significant additional highway capacity to the local road network, significantly improve journey times compared to the existing delays on the A701 and facilitate re-prioritising road space to deliver safer (and potentially segregated) access to and from the Easter Bush Campus via the A720 Edinburgh City Bypass, the A702, the A703 and/or the A701 Relief road. Most significantly the roads proposals will not compromise the operational network management of the Trunk Road network in the vicinity of the Easter Bush Campus and will reduce existing concerns in respect of traffic movements, particularly at the A702/Bush Loan junction<sup>75</sup>.

As illustrated, in Figure Six overleaf, the A701 Relief Road will comprise:

- New road infrastructure between Straiton Junction and Pentland Road;
- A new bridge crossing or four-arm roundabout junction at Pentland Road; and,
- New road infrastructure between Pentland Road and A703 Seafield Moor Road.

The A702 Link Road will consist of:

- A roundabout junction with the A703/A701 Relief Road; and,
- The A702 Link road.

The A702/Bush Loan junction will incorporate a new four-armed roundabout junction connecting the A702 (north and south), Bush Loan and the A702 Link Road.

The A701/A720 Straiton Junction will also require to be upgraded as part of the overall scheme. Early microsimulation work (conducted by Jacobs in April 2018<sup>76</sup>) identified a preferred signalised junction solution which would require minimum reconfiguration of existing road space and positively assist the delivery of improved Active Travel measures at this junction. Whilst the Council is confident that this solution would work, and could be delivered within budget, the exact cost and final design will be determined through more detailed modelling (led by Acardis), ongoing discussions between Midlothian Council and Transport Scotland as well as other stakeholder engagement.

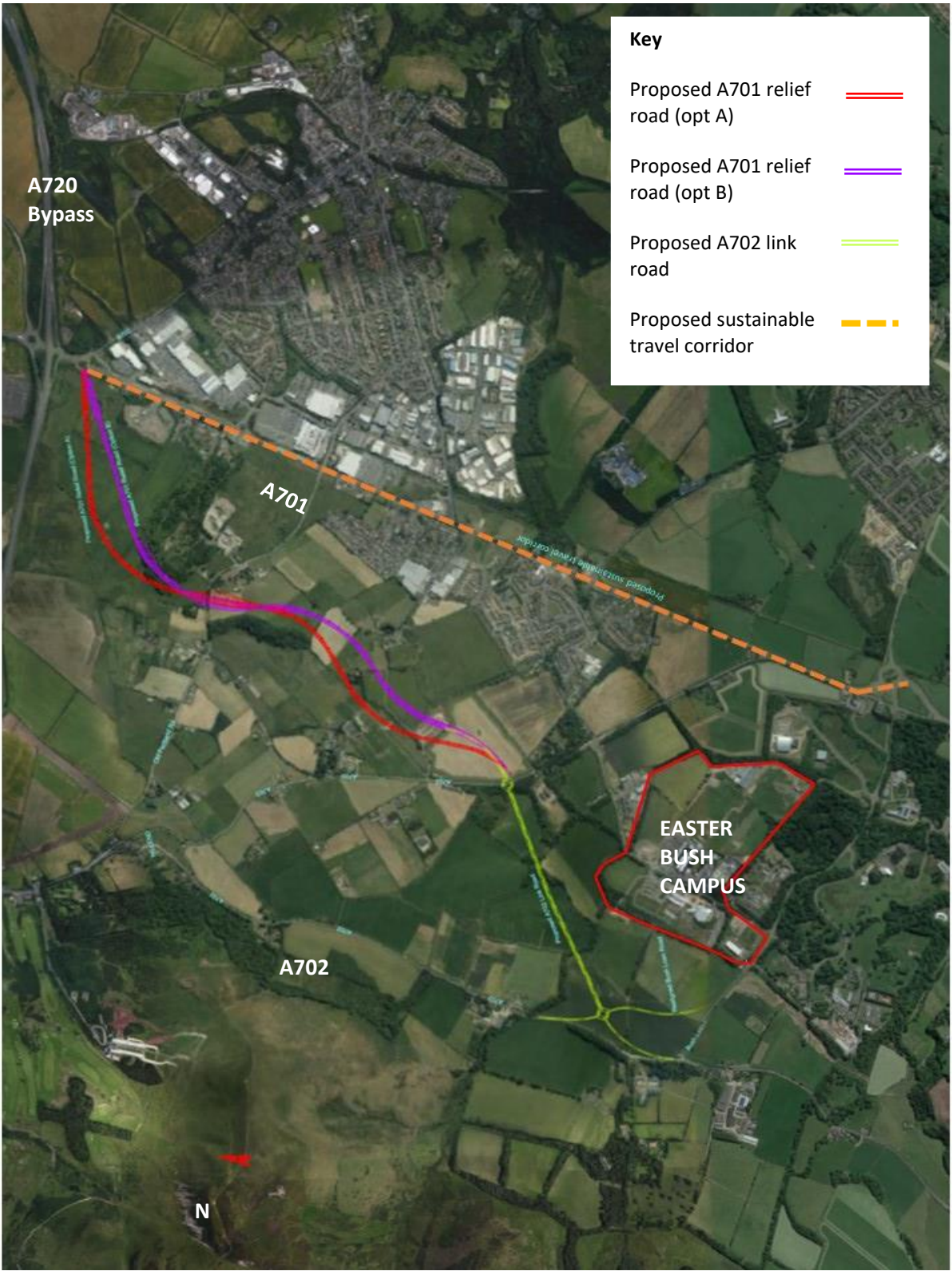
The Council is also collaborating with SEStran on a feasibility study into possible sustainable transport and travel improvements. As illustrated in Figure Six there is the potential to re-prioritise road space along the bypassed section of the A701 (Straiton to Gowkley Moss) to promote sustainable travel choices. The Council will investigate any additional funding initiatives to assist in the delivery of the preferred option including bus based, walking and cycling initiatives as well as post Covid-19 measures.

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<sup>75</sup> The full modelling analysis is available on request. Transport Scotland have advised that additional microsimulation modelling may be required at a later stage in the design process.

<sup>76</sup> This assessment is also available on request.

Figure Six: Proposed Road Developments



#### **4.2.5 Constraints**

The development and appraisal of options in this business case has been prepared under various key constraints:

- The location of new facilities need to complement the existing Easter Bush Campus to develop the 'cluster' effect recognised as necessary in the SIA;
- The potential Government funding envelope has been set through the City Region Deal Heads of Terms;
- A requirement that each element of the DDI Programme has to become self-financing over the longer term to satisfy University of Edinburgh governance and charitable obligations to seek to maintain a surplus;
- The technical, ethical and legal constraints of collecting and accessing appropriate data sets;
- The new energy infrastructure works cannot impact the existing campus. Uninterrupted servicing must be maintained or prior notice agreed with User Groups so as not to impact on active research and teaching;
- Underground infrastructure routes should follow the agreed "2025 Vision Masterplan";
- University of Edinburgh proven estate management design, procure and build process and associated timescales; and,
- The development of Easter Bush Campus must not lead to unacceptable congestion on local roads, including the A701, A703 Seafield Moor Road and Bush Loan.

#### **4.2.6 Dependencies**

The heat and power infrastructure works and campus infrastructure works are dependent on prompt responses and collaboration from the relevant Utilities suppliers. In turn the DDI programme, research and teaching initiatives are dependent upon the new energy centre and infrastructure providing the servicing required to grow the campus.

The delivery of the A701 Relief Road and A702 Link Road are dependent on:

- Approval by Midlothian Council and Transport Scotland as well as successful land acquisition; and,
- Parallel funding from the Council and third parties being realised.

## 5 Economic Case

This section provides an overview of the:

- DDI Programme level impact pathway and associated benefits that have informed the development of this business case;
- Selection process involved in short-listing the Agri-Tech delivery options that are most likely to realise these Programme benefits;
- Assessment of the anticipated types and levels of economic costs and benefits that might be generated by each of these options;
- Consequent rationale for the selection of a preferred approach;
- Resultant net economic benefits that will be generated to the Scottish & UK economies; and,
- Consequent SMART objectives.

In addition, it is important to note that the original and detailed impact analysis of the economic impacts likely to be associated with Easter Bush were conducted using the guidance outlined in the 2013 Green Book. Post the release of the revised 2018 Green Book<sup>77</sup> it was agreed with (UK and Scottish) Government representatives that the:

- Initial analysis (as summarised in this section) would remain unchanged; however,
- Revisions implied<sup>78</sup> by the new guidance should be captured within sensitivity analysis of the aggregate Easter Bush impacts identified above.

### 5.1 Programme Level Context

An impact pathway was developed at the Programme level - as set out in Figure Seven overleaf - to determine the range of potential impacts that might be realised and the consequent SMART objectives and “success factors” (in terms of inputs, activities and market interactions with potential beneficiaries) required to deliver these impacts.

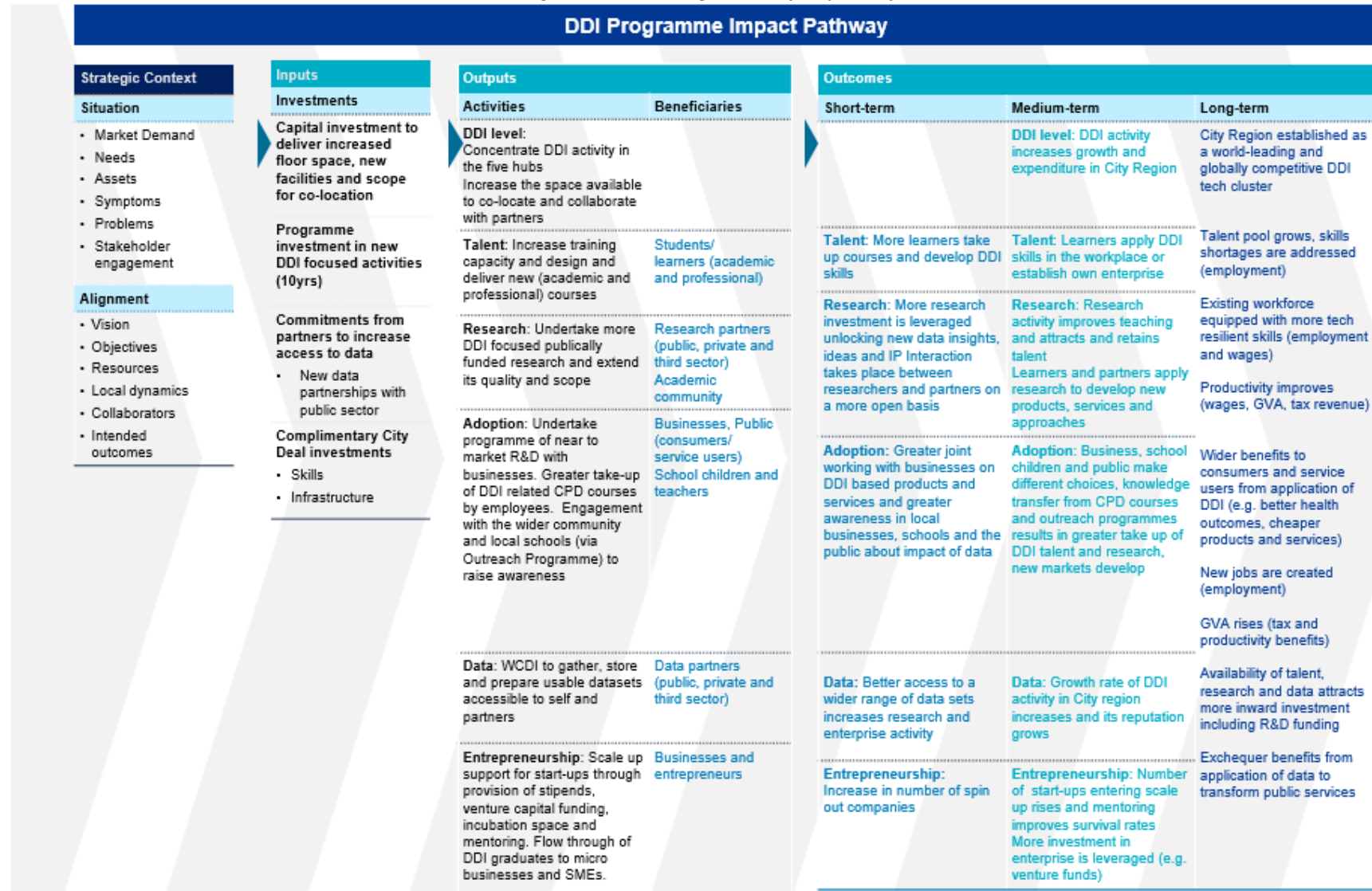
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<sup>77</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/685903/The\\_Green\\_Book.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf)

<sup>78</sup> Such as capturing net additional uplifts in GVA for employment impacts, 100% displacement at a UK level and use of Type 1 multiplier values at a local level.



Figure Seven: DDI Programme impact pathway

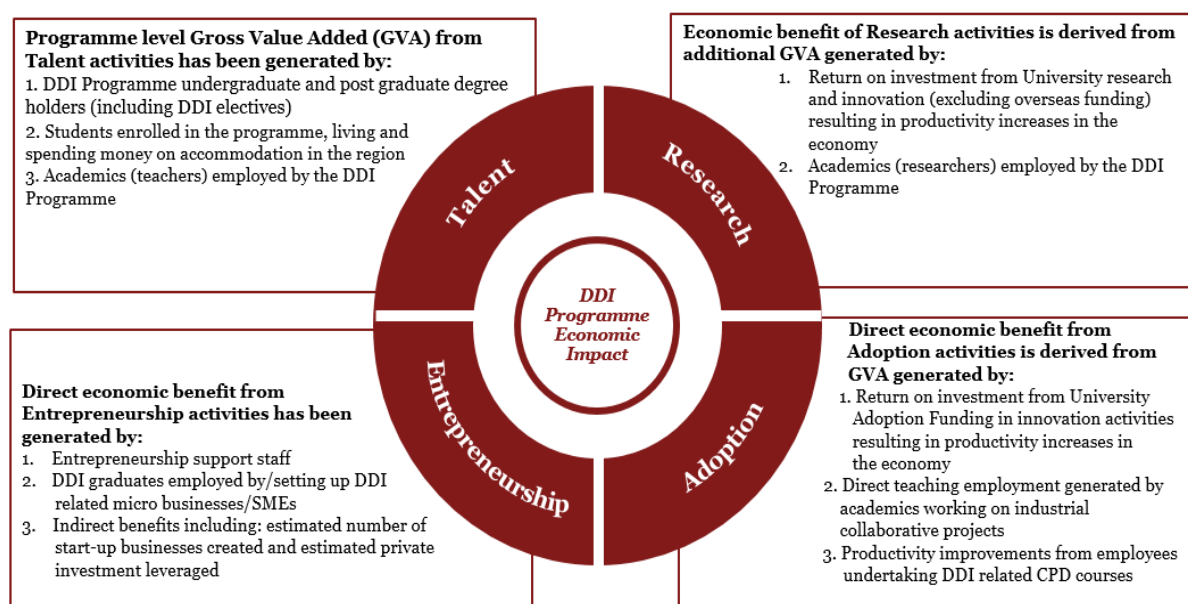


As illustrated the objectives of the DDI Programme will be met by the proposed Easter Bush TRADE activities delivering a range of economic and social benefits, including:

- **Talent:** creating and retaining a sustainable pool of DDI talent in the Agri-Tech sector across the City Region, Scotland and the UK;
- **Research:** expanding and enhancing DDI Agri-Tech research activities across the Easter Bush Campus;
- **Adoption:** increasing the use and adoption of DDI by the public, private and third sectors in the City Region and beyond;
- **Data:** providing the data accessibility and analytical capacity to underpin all Easter Bush DDI activities; and,
- **Entrepreneurship:** enabling City Region based and other entrepreneurs to develop new DDI-Agri-Tech based businesses.

Figure Eight below summarises the key outputs and related impacts that have been used - across each talent, research, adoption and entrepreneurial theme<sup>79</sup> – to assess and measure the net impacts of the Easter Bush Hub.

**Figure Eight: Allocation and Measurement of Easter Bush Impacts**



<sup>79</sup> No direct impacts are attributed to EIDF (and hence the "Data" theme) given the enabling role that this facility plays in supporting the Easter Bush Agri-Tech Hub to deliver activities and the consequent benefits that are derived across the other four "TRADE" themes.



In summary, it is anticipated that the Easter Bush Agri-Tech proposals will generate a range of direct and indirect economic impacts as a result of utilising data to deliver activities in relation to:

- **Talent (via):**

- Direct impacts – through the GVA generated from the employment of additional academic staff to deliver DDI Agri-Tech related teaching courses and on site students spending impacts in the City Region while undertaking courses; and,
- Indirect impacts – through the GVA generated as a result of the provision of DDI Agri-Tech related undergraduate and post graduate degrees and pathway courses resulting in long-term productivity improvements once DDI students enter the UK workforce.

- **Research (via):**

- Direct impact – through the GVA generated as a result of the creation of additional DDI Agri-Tech related research staff posts; and,
- Indirect impacts – from the return on investment from the successful awards of DDI Agri-Tech related public and private research funding and the private funds leveraged as a result of the former funds.

- **Adoption (via):**

- Direct impact – through the creation of GVA from adoption support staff posts; and,
- Indirect impacts – from the return on investment from the allocation of DDI Agri-Tech adoption funding to the Easter Bush Hub including private leveraged funds and productivity impacts from employees undertaking DDI related CPD training.

- **Entrepreneurship (via):**

- Direct impact – through the creation of GVA from entrepreneurship support staff posts;
- Indirect impacts – through the successful creation of new DDI Agri-Tech spin out and start-up businesses that attract private investment funds; and,
- GVA from DDI graduates employed by and/or setting up DDI related micro businesses/SMEs.

## 5.2 Identification of Delivery Options

City Region Partners concluded Heads of Terms with the UK and Scottish Governments for an overall City Region Deal in July 2017 and signed a full “Deal Document” in August 2018<sup>80</sup>. In addressing the market failures (identified in the Case for Change in Section 4) both documents provided financial parameters within which the capital development of the DDI Programme could be progressed and set the capital costs for Easter Bush at a total of £33 million. Subsequent to further discussions with both Governments this has been revised to £28.3 million and for the purposes of this assessment the projected level of £10 million BBSRC funding has also been included (giving a total public sector contribution of £38.3 million<sup>81</sup>).

Recognising that *“the cut-off or budget constraint for considering which options are affordable should be the capital budget”*<sup>82</sup> the approach, to identifying options for Easter Bush, focused upon the:

- Operational or delivery approaches that could be adopted within this (constrained) capital budget; and,
- Any alternative approaches that might be considered to both secure funding and ensure ongoing operational sustainability.

In identifying realistic delivery options that might be taken forward (given the above) assessment was given to:

- Developing, through workshops with internal and external stakeholders, the range of activities needed to deliver the vision and associated outcomes for Easter Bush;
- The scale of the facilities required to deliver optimum impact across the 15 years of City Regional Deal funding;
- Operational options for the provision of (net) additional Agri-Tech facilities and future Easter Bush services at the Campus; and,
- The alternative funding routes open to the University of Edinburgh to deliver these facilities and services.

Based on the above a long list of 9 options were identified (including the “as is” plan for Easter Bush in the absence of City Region Deal funding), namely:

1. **As Is:** i.e. the Campus continues on a “business as usual” basis;

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<sup>80</sup> Both documents are accessible via: <http://www.acceleratinggrowth.org.uk/>

<sup>81</sup> The road infrastructure contribution of £7 million is excluded from this analysis given the focus on Campus developments and the transport costs and benefits have previously been provided in a separate Strategic Outline Case.

<sup>82</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/685903/The\\_Green\\_Book.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf)

2. **Partnership with other Institutes:** Easter Bush would partner with non-UK Institutes to complement the capacity available in the local region;
3. **Third Party provider of data services and Infrastructure:** comprising all the current elements of the DDI Programme except EIDF (whose role would be undertaken by a third party provider);
4. **Private Sector Operates:** a private sector organisation takes responsibility for the operational delivery of all aspects of Easter Bush Agri-Tech activities and impacts;
5. **Incremental Investment:** involves the breakdown of the Programme into sequential steps (for example only taking forward discrete elements in terms of near-to-market opportunities);
6. **University led:** with operational responsibilities and delivery residing with the DDI Programme;
7. **Special Purpose Vehicle (SPV):** namely a separate entity oversees - and contracts in delivery partners to operate - the Programme against specified output (performance) measures;
8. **Seek alternative (non-UK) funding:** funding is secured to operate the Easter Bush Campus proposals from other sources (for example India given existing linkages to Easter Bush); and,
9. **Philanthropic funding:** funding is received to operate Easter Bush by donations from appropriate sources (for example the Bill and Melinda Gates Foundation).

In order to select a short-list of preferred options<sup>83</sup> a range of selection criteria were identified (using extant guidance<sup>84</sup>) to rank this long list (in terms of the likelihood or otherwise of meeting DDI Programme objectives) namely:

- **Strategic Fit;** namely the degree to which each option is likely to meet Easter Bush's strategic objectives, vision and aspirations and current and future market needs;
- **Benefits Realisation;** in terms of both the levels of likely benefit (in relation to key SMART objectives) and the timescales required to secure these levels;
- **Deliverability;** relative to existing organisational capabilities and expertise across and outwith the Universities and City Deal partners;
- **Sustainability;** in relation to the potential likelihood of securing re-investable returns from revenue (in particular post the initial 10 years of operation);

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<sup>83</sup> for further review and analysis to identify, in broad cost benefit terms, that option which is most likely to deliver the best NPV outcome at the least risk.

<sup>84</sup> Including Public Sector Business Cases: Using the Five Case Model, HM Treasury, 2013 and other guides such as CIPFAs: Appendix\_A4\_3\_general\_guidance\_on\_option\_appraisal\_12\_02\_10\_v1.pdf.

- **Affordability**; to the extent that any given option is likely to fall within (or not) current budget projections for Easter Bush operation;
- **Additionality**; by demonstrating that an option is complimentary to and adds value to existing activities and, if implemented, would be unlikely to cause significant “displacement” effects;
- **Cluster Potential**; to assess whether options might be supportive of the potential to develop a range of (thematic) clusters as envisaged within the SIA<sup>85</sup>;
- **Flexibility**; to respond to future external factors in relation to market needs, political context, IT innovation and other changes that might impact on future Easter Bush operations and impact delivery;
- **Risk**; in terms of the ranges and levels of risk (and, ultimately, potential failure) that might be associated with each option;
- **Social Impact**; namely the extent or otherwise that an option will deliver the inclusive growth objective targets set and meet the wider Scottish Government objectives in regard to such impacts;
- **Stakeholder Acceptance**; in terms of the relative likelihood of support for each option from stakeholders, funders and potential Easter Bush user groups (e.g.: students, private sector companies and public and third sector bodies);
- **Mobilisation**; that captures the relative timescales that might be involved in delivering the Agri-Tech facilities and services required; and,
- **Data Availability**; namely whether third parties – including both the private and public sectors – would be prepared to share data under each option.

As illustrated in Table 12 overleaf by ranking<sup>86</sup> options against these criteria three options were short-listed<sup>87</sup>:

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<sup>85</sup> “Moving forward rapidly we propose to create a disruptive regional ecosystem that unlocks value from public data and delivers sustainable gains in private sector activity, public sector transformation and digital skills. We will do this through investment in a Regional Data Science Innovation Cluster comprising three closely-linked nodes which will bring together over 5,000 people from business, the public sector, academia and the community. With investment in this Cluster we will harness our trusted existing partnerships across the public sector to create the foundation for a unique data-driven regional economy operating at a significant scale”. Enabling a World-Leading Regional Digital Economy through Data Driven Innovation Edinburgh & South East Scotland City Region A Science and Innovation Audit Report sponsored by the Department for Business, Energy & Industrial Strategy MAIN REPORT, 2016.

<sup>86</sup> With a ranking of + 1 for a given option where a criteria was likely to be met, -1 where the criteria would not be met and a zero value where it was uncertain whether an option might meet a given criterion.

<sup>87</sup> These options were selected on the basis that each scored more highly than business as usual and generated, on aggregate, a positive score (implying that each of these options is more likely than not to deliver Programme aims and objectives).

- **University led:** involving all **collocated components of the DDI campus** as reflected within the EESCR SIA and detailed University of Edinburgh assessments<sup>88</sup> of the relative capital and operating costs associated with building and operating the Easter Bush Agri-Tech Hub;
- **Incremental Investment:** in the absence of City Region Deal funding - at the levels and timing anticipated under the July 2017 Heads of Terms and subsequent 2018 Funding profile agreement – it is anticipated there will be slower and (**comparatively more expensive**) piecemeal development of the Easter Bush Hub and associated service profiles given the requirement to secure alternative (and as yet untargeted) public and private funding sources; and,
- **SPV:** namely a separate entity that would oversee - and contract in delivery partners to operate – some of the services envisaged under the current Agri-Tech proposals. This option would necessarily exclude the talent element of the current proposals, would be slower to implement and require additional management fees and potentially risks (in relative terms to other options) a focus on near to market opportunities rather than the more strategic Agri-Tech research activities that might be supported (and funded) by the public sector and other sources.

Table 12: Ranking of long listed Easter Bush Hub options

SELECTION CRITERIA	Business as Usual	Partnership with other Institutes (for Additional Capacity)	Third Party provider of Data Services	Private Sector Operator	Incremental Investment	University led	SPV	Seek alternative (non UK) funding	Philanthropic Donation
Strategic Fit (incl. Themes & Geography)	1	0	-1	-1	1	1	1	1	1
Benefits Realisation	-1	0	0	-1	0	1	0	-1	0
Deliverability	0	0	-1	-1	0	0	0	-1	0
Sustainability reinvestment	-1	0	0	-1	0	0	0	-1	0
Affordability	0	0	0	0	0	1	0	0	0
Additionality	0	1	-1	0	0	1	1	0	0
Cluster potential	-1	-1	-1	-1	-1	0	0	-1	-1
Flexibility	1	0	0	-1	1	1	1	1	1
Risk	-1	-1	-1	-1	0	0	-1	-1	-1
Social impact	0	0	-1	-1	0	1	0	0	0
Political acceptance	0	0	0	-1	0	0	0	0	0

<sup>88</sup> Including estates, procurement and finance assessments reflected in the Commercial and Management sections of this Business Case.

Mobilisation	-1	-1	-1	-1	0	0	-1	-1	-1
Data availability	-1	-1	-1	-1	-1	0	-1	-1	-1
Total	-4	-3	-8	-11	0	6	0	-5	-2

### Short Listed Options Cost Benefit Analysis

Analysis of each of these shortlisted options was undertaken in terms of the:

- Likely public sector costs associated with each option including an allocation of £6 million or 10% of EIDF costs (given projected Easter Bush EIDF use levels);
- Flow of net additional TRADE benefits in (net present value) GVA terms;
- Timescales required to deliver these benefits (across the fifteen-year Programme lifetime);
- Risks associated with delivery; and,
- Net additional GVA benefits over and above the status quo position.

This analysis suggests that the greatest net benefit in (net present value) GVA terms will be generated by the DDI option given that:

- The costs of the DDI option will be lower than the incremental approach as – by definition – this latter option assumes the requirement for the same facility requirements (as the DDI option) but building on a piecemeal basis and longer time scale (and therefore no economies of scale) it is assumed additional capital costs will be up to 20% more than the DDI approach (at around £53.6 million);
- In contrast, the SPV approach is unlikely to incur more or less capital costs than the DDI option given that this option is focused on the alternative operation of the facilities and equipment proposed under the DDI approach;
- In practice it is likely that the time required to set up and operate the Easter Bush Hub - under either the incremental or SPV - is likely to be longer than the DDI option. In addition, the relative level of benefits likely to be generated by the latter SPV approach will (always) be lower than either alternative option given that it will exclude any Talent component;
- As a result, the net benefits of these (other) two options will be lower than under the DDI Programme within the 15-year appraisal period considered. The assumptions drawn are that realisable net benefits might be 10% lower in the case of the incremental option (at around £223 million GVA to the UK economy) and at least 30% lower under the SPV option given both (relative) time delays and lower service levels (reducing GVA to around £174 million); and, finally,

- Consideration of the relative risks (of failing to deliver the objectives and outputs anticipated under the DDI approach) suggests that both the incremental and SPV options have a greater risk of failure than the DDI approach given the piecemeal and lower scale of benefits (if not also quality) of the likely operational profiles of each of these approaches. Accordingly benefit levels have been (further) discounted by 10% under each of these two options (to GVA levels respectively of £201 million and £157 million).

As indicated by current HM Treasury Guidance<sup>89</sup> : “where optimising over a constrained budget, as is usually the case for government spending, the BCR can be constructed as a measure of social value divided by the relevant public spending constraint (e.g. NPSV/£ or the Present Value of Benefits/£). This assesses the benefits bought per £ of public spending”.

Consequently, as illustrated in Table 13 below, the option with the highest cost benefit ratio is the **DDI approach** at 1:6 compared to 1: 3.8 under the incremental option and 1:3.5 for the SPV approach.

Table 13: Relative net benefits of short-listed Easter Bush options

Options	Public Sector Costs <sup>90</sup>	Timing	Benefit (GVA)	Risk <sup>91</sup>	Benefits - Costs	Cost Benefit Ratio
DDI	44.3	Baseline DDI timescales	248	Baseline risk	248	1:6
Incremental	53.16	Longer than DDI	223	Higher	201	1:3.8
SPV	44.3	Longer than DDI	174	Higher	157	1:3.5

### 5.3 Preferred Option

This section sets out the key steps that have been undertaken to identify and quantify the TRADE related outputs and outcomes for the selected Easter Bush DDI option and consequent rationale for Government intervention to address the market failures identified in the previous section. In particular, consideration is given to the:

- Economic impacts likely to be generated under the “as is” scenario under which no government investment is provided (and consequently the previous market failures will be manifest); and,

<sup>89</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/685903/The\\_Green\\_Book.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf)

<sup>90</sup> Including an allocation of £6 million – based on Easter Bush EIDF service usage levels – of the total net present value EIDF capital costs but **excluding any road improvement costs** (or associated benefits).

<sup>91</sup> Where a higher risk option will lead to a reduced level of benefits being potentially delivered.

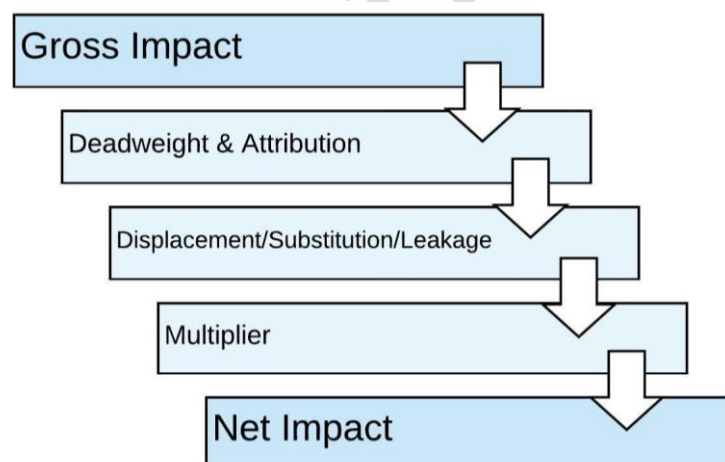
- Impacts where such support is provided under the preferred option and the consequent net additional benefits that intervention will deliver in addressing these failures (compared to the above).

### Key Assumptions

The key assumptions that have been made in measuring the economic impact of Easter Bush across all TRADE elements are:

- **Timescale:** the analysis is based on the economic impact that is likely to be generated over the 15-year City Region Deal Funding period;
- **Geographic areas:** the analysis has been undertaken at the ESES City Deal Region, Scotland and UK levels to reflect the distributive impacts of the economic value created for each region;
- **Net impact:** the economic impact of TRADE has been adjusted for additionality factors including deadweight, displacement, leakage and multiplier effects in order to generate the net economic impact of the DDI Agri-Tech Programme (as per Figure Nine below); and,
- **NPV of benefits and costs:** all net benefits and public sector costs have been discounted at 3.5% (per Green Book Guidance (2018)) to reflect the value of impacts in current terms.

**Figure Nine: Key Stages in undertaking Gross to Net Analysis**



### Estimating Benefits/Outputs

In order to estimate the gross outputs and outcomes for the Easter Bush Agri-Tech Hub a “bottom-up approach” has been taken to identify and quantify anticipated outputs and outcomes. In summary this approach consisted of three stages:

- **Identification of outputs and outcomes** – a qualitative and quantitative questionnaire was provided to the University of Edinburgh Easter Bush leads to capture the range of activities and expected outputs envisaged under the Do Nothing and Reference case scenarios (as per Appendix G);
- **Quantification of gross outputs and outcomes** – building upon the above templates, a



detailed breakdown of anticipated outputs, costs and income over a fifteen-year period was developed to estimate **the uplifts** in jobs created, GVA, and wider benefits (where possible) as a **result of DDI funding**; and,

- **Analysis of net impacts** – comprising additionality analysis (as per the steps outlined at Figure Nine above) of the gross DDI outputs and outcomes to identify levels of net impact based primarily on estimates of the levels of leakage, displacement and multiplier impacts from current and historic data (including the “BiGGAR Economics - Economic Impact of the University of Edinburgh 2013-14” report and student and staff data from the University of Edinburgh in relation to graduate destination survey data).

The output of the above steps is provided in summary form in Table 14 for three scenarios (i.e. Do Nothing, Reference case and **consequent** DDI Uplift by employment and TRADE outputs).

Table 14: Easter Bush Employment and TRADE Gross Outputs

Category	Baseline	Reference Case	DDI Uplift
<b>Employment</b>			
Talent	8	17	9
Research	144	186	42
Adoption	0	3	3
Data	N/A	N/A	N/A
Entrepreneurship	0	1	1
<b>Talent</b>			
No. of students taking DDI pathway course <sup>92</sup>	3,597	3,677	80
No. of new DDI undergraduates commencing courses	40	40	0
No. of new DDI residential masters students	0	490	490
No. of DDI masters level online distance learners	256	915	659
No. of new DDI PhD students	600	680	80
No. of DDI credit bearing CPDs and courses	0	24,036	24,036
No. of non-credit bearing DDI CPDs and other courses <sup>93</sup>	45,000	160,939	115,939
<b>Research</b>			
DDI Funding from UK Research Councils	£172.4m	£212.6m	£40.2m
DDI Funding from UK Government Departments	£38.3m	£47.2m	£8.9m

<sup>92</sup> In order to estimate the GVA impact of those students in receipt of DDI pathway courses compared to those undertaking a full DDI undergraduate degree the proportion of their degree spent on a DDI pathway course has been captured by assuming each student would take one pathway course over their undergraduate degree programme worth 20 points out of 480 for a full degree programme or 4% of any future uplifts in GVA compared to their peers that take a “full” DDI course.

<sup>93</sup> The majority of Easter Bush outreach will be delivered through uptake of DDI MOOCs supplemented by public facing DDI learning and engagement events across a range of tailored Easter Bush inclusive growth engagement programmes with schools and HE organisations. The potential economic impacts from these non-credit bearing courses has not been included in the rest of this section given the uncertainty surrounding the potential productivity uplifts associated with such courses (such as online non-credit bearing MOOCs) and attendance at DDI related workshops and events.

Total Public Sector Research Funding	£210.7m	£259.8m	£49.1m
DDI Funding from Industry & Commerce	£2.2m	£2.7m	£0.5m
DDI Funding from Overseas (EU)	£10.5m	£12.9m	£2.4m
DDI Funding from Overseas (outwith EU)	£19.7m	£24.3m	£4.6m
DDI Funding from UK Charities	£23.8m	£29.3m	£5.5m
DDI Funding from HEI partners	£14.0m	£17.3m	£3.3m
Total Third Party Research Funding	£70.3m	£86.6m	£16.4m
DDI Leveraged private R&D funds	£225.8m	£276.1m	£50.3m
Total DDI Research Funding	£506.7m	£622.5m	£115.8m
Adoption			
DDI Adoption income	0	£52.9m	£52.9m
Entrepreneurship			
No. of teams entering DDI accelerator programme	0	30	30

A detailed breakdown of the above profile of these annual outputs is provided at Appendix G.

The subsequent economic impact assessment has been undertaken for the DDI uplift scenario only and as such isolates the uplift in TRADE related activities as a result of the DDI Programme (i.e. net of the counterfactual scenario).

### Net Impacts

This section details the **direct** (employment and student spending) and **indirect** (TRADE) **impacts** of DDI funding of the Easter Bush Hub to provide an overview of the steps taken (in terms of both economic metrics and additionality assumptions applied) to generate net economic impacts from the initial outputs identified (under the DDI Uplift column at Table 14 above).

### Direct Impacts

#### *Employment Outcome Analysis*

Table 15 to 19 below present the steps taken in quantifying the GVA generated from the estimated additional employment that will be generated as a result of the DDI Uplift scenario. The key assumptions drawn in relation to measuring employment impact are:

#### **GVA:**

- **Academic staff** - the economic impact for academic staff has been calculated for a 15 year period and discounted at 3.5% based on the average GVA per job for the Education and ICT sectors in Scotland (i.e. to represent the average GVA per job from academic staff posts); and,
- **Research, Adoption and Entrepreneurship Staff** - the economic impact for implied research and adoption employment has been calculated for a 15 year period and discounted at 3.5% based on the average GVA per job/per head of the ICT and Professional and Technical sectors in Scotland and the rest of the UK.

### Additionality:

- **Counterfactual** – A nil counterfactual scenario is assumed (at all geographic levels) as without the DDI Programme investment in these additional academic, research, entrepreneurship and adoption staff posts would not be created;
- **Leakage** – Leakage values have been based upon the ‘staff by area of residence’ data as provided by the University of Edinburgh in the “BiGGAR Economics - Economic Impact of the University of Edinburgh 2013-14” report that indicates the majority of the University’s staff reside within the City Region at 78%, falling to 19% and 2% at the rest of Scotland and UK levels respectively;
- **Displacement** – Displacement levels for academic staff are based on the HCA Additionality Guide (2014) and vary by geographic level from between 10% (for the City Deal Region reflecting the likelihood of fewer competing academic and research institutions) to up to 50% (for the Rest of UK based on the greater likelihood of competing institutions whose activities might be displaced); and,
- **Multiplier** – Type II multipliers have been applied for SIC code 72 (R&D) 2014 for employment benefits for the City Deal and Scotland levels based on Scottish Government data for the Scottish economy. The UK level multiplier has been based on PwC Analysis of UK Type II Employment Multipliers.

Further details regarding the assumptions used to estimate both the GVA per employee figures and additionality ratios that have been applied can be found at Appendix H.

Table 15: Easter Bush Talent Employment Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Talent employment outputs - total over 15 years</b>		
<b>Incremental Talent Employment Outputs (Baseline &amp; Reference Case) over 15 years</b>	Provided by the UoE and summarised at Table 12	Reference case:  Total Easter Bush: 17  Baseline:  Total Easter Bush: 8
<b>Step 2: Calculation of incremental DDI Uplift Talent employment outputs - total over 15 years</b>		
<b>Incremental DDI Uplift Talent Employment Outputs over 15 years</b>	<ul style="list-style-type: none"> <li>Reference case minus baseline outputs</li> </ul>	Uplift:  Total Easter Bush: 9
<b>Step 3: DDI Talent employees net of leakage (based on staff location data from UoE) – total over 15 years</b>		
<b>Talent jobs location/Leakage</b>	Incremental talent positions multiplied by Teaching Jobs Location factor by region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 78%</li> <li>Rest of Scotland: 19%</li> <li>Rest of UK: 2%</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>9 * 78\% = 7.02</math></li> <li>Rest of Scotland: <math>9 * 19\% = 1.71</math></li> <li>Rest of UK: <math>9 * 2\% = 0.18</math></li> </ul>
<b>Step 4: DDI Talent employees net of leakage and displacement – total over 15 years</b>		

Steps	Calculation	Worked Example
<b>Displacement</b>	Teaching Jobs Location numbers multiplied by (1 minus the Teaching jobs Displacement factor) by region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 10%</li> <li>Rest of Scotland: 20%</li> <li>Rest of UK: 50%</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>7.02 * 90\% = 6.32</math></li> <li>Rest of Scotland: <math>1.71 * 80\% = 1.37</math></li> <li>Rest of UK: <math>0.18 * 50\% = 0.09</math></li> </ul>
<b>Step5: DDI Talent employees net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Employment GVA Impact<sup>94</sup></b>	Displacement numbers multiplied by net discounted Teaching position GVA (over duration of the programme) per region, as follows: <ul style="list-style-type: none"> <li>City Deal region: £558,274</li> <li>Rest of Scotland: £620,305</li> <li>Rest of UK: £686,587</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>6.32 * £558,274 = £3.5m</math></li> <li>Rest of Scotland: <math>1.37 * £620,305 = £0.8m</math></li> <li>Rest of UK: <math>0.09 * £686,587 = £0.06m</math></li> </ul>
<b>Step 6: GVA from Net DDI Talent employees with discount factor applied over 15 years</b>		
<b>Net Employment Impact NPV</b>	Net Employment GVA Impact numbers multiplied by the discount factor of 3.5% per region per year.	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £3.1m</li> <li>Rest of Scotland: £0.7m</li> <li>Rest of UK: £0.05m</li> </ul>
<b>Step 7: Discounted GVA from Net DDI Talent employees including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	Net Employment Impact NPV numbers multiplied by the multiplier Employment Type II per region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 1.40</li> <li>Scotland: 1.7</li> <li>UK: 2.2</li> </ul> With: <ul style="list-style-type: none"> <li>Scotland = CD region + Rest of Scotland; and</li> <li>UK = CD region + Rest of Scotland + Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>£3.1m * 1.4 = £4.3m</math></li> <li>Scotland: <math>(£3.1m + £0.7m) * 1.7 = £6.4m</math></li> <li>UK: <math>(£3.1m + £0.7m + £0.05m) * 2.2 = £8.4m</math></li> </ul>
<b>Total DDI Talent Employment GVA (UK)</b>		<b>£8.4m</b>

Table 16: Easter Bush Research Employment Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Research employment outputs - total over 15 years</b>		
<b>Incremental Research Employment Outputs (Baseline &amp; Reference Case) over 15 years</b>	Provided by the UoE and summarised at Table 12	Reference case: <ul style="list-style-type: none"> <li>Easter Bush: 186</li> </ul> Baseline case: <ul style="list-style-type: none"> <li>Easter Bush: 144</li> </ul>
<b>Step 2: Calculation of incremental DDI Uplift Research employment outputs - total over 15 years</b>		
<b>Incremental DDI Uplift Research Employment Outputs over 15 years</b>	<ul style="list-style-type: none"> <li>Reference case minus baseline outputs</li> </ul>	Uplift: <ul style="list-style-type: none"> <li>Easter Bush: 42 research staff</li> </ul>
<b>Step 3: DDI Research employees net of leakage (based on staff location data from UoE) – total over 15 years</b>		

<sup>94</sup> In calculating the GVA impact from direct employment the full DDI academic employment GVA has been calculated over 15 years in line with the 2013 Green Book approach to quantifying the employment impacts of interventions.

Steps	Calculation	Worked Example
<b>Research jobs location/Leakage</b>	Incremental Research positions multiplied by Teaching Jobs Location factor by region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 78%</li> <li>Rest of Scotland: 19%</li> <li>Rest of UK: 2%</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>42 * 78\% = 32.43</math></li> <li>Rest of Scotland: <math>42 * 19\% = 7.90</math></li> <li>Rest of UK: <math>42 * 2\% = 0.83</math></li> </ul>
<b>Step 4: DDI Research employees net of leakage and displacement – total over 15 years</b>		
<b>Displacement</b>	Research Jobs Location numbers multiplied by (1 minus the Research jobs Displacement factor) by region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 10%</li> <li>Rest of Scotland: 20%</li> <li>Rest of UK: 50%</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>32.43 * 90\% = 29.18</math></li> <li>Rest of Scotland: <math>7.90 * 80\% = 6.32</math></li> <li>Rest of UK: <math>0.83 * 50\% = 0.42</math></li> </ul>
<b>Step 5: DDI Research employees net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Employment GVA Impact<sup>95</sup></b>	Displacement numbers multiplied by net discounted Research position GVA (over duration of the programme) per region, as follows: <ul style="list-style-type: none"> <li>City Deal region: £810,595</li> <li>Rest of Scotland: £660,247</li> <li>Rest of UK: £769,409</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>29.18 * £810,595 = £23.7m</math></li> <li>Rest of Scotland: <math>6.32 * £660,247 = £4.2m</math></li> <li>Rest of UK: <math>0.42 * £769,409 = £0.3m</math></li> </ul>
<b>Step 6: GVA from Net DDI Research employees including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	Net Employment GVA Impact numbers multiplied by the multiplier Employment Type II per region, as follows: <ul style="list-style-type: none"> <li>City Deal region: 1.40</li> <li>Scotland: 1.7</li> <li>UK: 2.2</li> </ul> with: <p>Scotland = CD region + Rest of Scotland; and</p> <ul style="list-style-type: none"> <li>UK = CD region + Rest of Scotland + Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>£23.7m * 1.4 = £33.1m</math></li> <li>Scotland: <math>(£23.7m + £4.2m) * 1.7 = £47.3m</math></li> <li>UK: <math>(£23.7m + £4.2m + £0.3m) * 2.2 = £61.9m</math></li> </ul>
<b>Step 7: Discounted GVA from Net DDI Research employees with discount factor applied over 15 years</b>		
<b>Net Employment Impact NPV</b>	Multiplier numbers multiplied by the discount factor of 3.5% per region per year.	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £29.0m</li> <li>Scotland: £41.4m</li> <li>UK: £54.2m</li> </ul>
<b>Total DDI Research Employment GVA (UK)</b>		<b>£54.2m</b>

Table 17: Easter Bush Adoption Employment Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Adoption employment outputs - total over 15 years</b>		
<b>Incremental Adoption Employment Outputs (Baseline &amp;</b>	Provided by the UoE and summarised at Table 12	<ul style="list-style-type: none"> <li>3 adoption staff (reference case)</li> <li>0 adoption staff (baseline)</li> </ul>

<sup>95</sup> In calculating the GVA impact from direct employment the full DDI academic employment GVA has been calculated over 15 years in line with the 2013 Green Book approach to quantifying the employment impacts of interventions.

Steps	Calculation	Worked Example
Reference Case) over 15 years		
<b>Step 2: Calculation of incremental DDI Uplift Adoption employment outputs - total over 15 years</b>		
<b>Incremental DDI Uplift Adoption Employment Outputs over 15 years</b>	<ul style="list-style-type: none"> <li>Reference case minus baseline outputs</li> </ul>	<ul style="list-style-type: none"> <li><math>3 - 0 = 3</math> adoption staff (uplift)</li> </ul>
<b>Step 3: DDI Adoption employees net of leakage (based on staff location data from UoE) – total over 15 years</b>		
<b>Adoption jobs location/Leakage</b>	<p>Incremental Adoption positions multiplied by Teaching Jobs Location factor by region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 78%</li> <li>Rest of Scotland: 19%</li> <li>Rest of UK: 2%</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>3 * 78\% = 2.72</math></li> <li>Rest of Scotland: <math>3 * 19\% = 0.66</math></li> <li>Rest of UK: <math>3 * 2\% = 0.07</math></li> </ul>
<b>Step 4: DDI Adoption employees net of leakage and displacement – total over 15 years</b>		
<b>Displacement</b>	<p>Adoption Jobs Location numbers multiplied by (1 minus the Adoption jobs Displacement factor) by region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 10%</li> <li>Rest of Scotland: 20%</li> <li>Rest of UK: 50%</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>2.72 * 90\% = 2.44</math></li> <li>Rest of Scotland: <math>0.66 * 80\% = 0.53</math></li> <li>Rest of UK: <math>0.07 * 50\% = 0.03</math></li> </ul>
<b>Step 5: DDI Adoption employees net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Employment GVA Impact<sup>96</sup></b>	<p>Displacement numbers multiplied by net discounted Adoption position GVA (over duration of the programme) per region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: £810,595</li> <li>Rest of Scotland: £660,247</li> <li>Rest of UK: £769,409</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>2.44 * £810,595 = £2.0m</math></li> <li>Rest of Scotland: <math>0.53 * £660,247 = £0.4m</math></li> <li>Rest of UK: <math>0.03 * £769,409 = £0.02m</math></li> </ul>
<b>Step 6: GVA from Net DDI Adoption employees including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	<p>Net Employment GVA Impact numbers multiplied by the multiplier Employment Type II per region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 1.40</li> <li>Scotland: 1.7</li> <li>UK: 2.2</li> </ul> <p>with:</p> <ul style="list-style-type: none"> <li>Scotland = CD region + Rest of Scotland; and</li> <li>UK = CD region + Rest of Scotland + Rest of UK</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>£2.0m * 1.40 = £2.8m</math></li> <li>Scotland: <math>(£2.0m + £0.4m) * 1.7 = £4.0m</math></li> <li>UK: <math>(£2.0m + £0.4m + £0.02m) * 2.2 = £5.2m</math></li> </ul>
<b>Step 7: Discounted GVA from Net DDI Adoption employees with discount factor applied over 15 years</b>		
<b>Net Employment Impact NPV</b>	<p>Multiplier numbers multiplied by the discount factor of 3.5% per region per year.</p>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: £2.3m</li> <li>Scotland: £3.2m</li> <li>UK: £4.2m</li> </ul>

<sup>96</sup> In calculating the GVA impact from direct employment the full DDI academic employment GVA has been calculated over 15 years in line with the 2013 Green Book approach to quantifying the employment impacts of interventions.

Steps	Calculation	Worked Example
<b>Total DDI Adoption Employment GVA (UK)</b>		<b>£4.2m</b>

Table 18: Easter Bush Entrepreneurship Employment Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Entrepreneurship employment outputs - total over 15 years</b>		
<b>Incremental Entrepreneurship Employment Outputs (Baseline &amp; Reference Case) over 15 years</b>	Provided by the UoE and summarised at Table 12 above	<ul style="list-style-type: none"> <li>1 entrepreneurship staff (reference case)</li> <li>0 entrepreneurship staff (baseline)</li> </ul>
<b>Step 2: Calculation of incremental DDI Uplift Entrepreneurship employment outputs - total over 15 years</b>		
<b>Incremental DDI Uplift Entrepreneurship Employment Outputs over 15 years</b>	<ul style="list-style-type: none"> <li>Reference case minus baseline outputs</li> </ul>	<ul style="list-style-type: none"> <li><math>1 - 0 = 1</math> entrepreneurship staff (uplift)</li> </ul>
<b>Step 3: DDI Entrepreneurship employees net of leakage (based on staff location data from UoE) – total over 15 years</b>		
<b>Entrepreneurship jobs location/Leakage</b>	<p>Incremental Entrepreneurship positions multiplied by Teaching Jobs Location factor by region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 78%</li> <li>Rest of Scotland: 19%</li> <li>Rest of UK: 2%</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>1 * 78\% = 0.40</math></li> <li>Rest of Scotland: <math>1 * 19\% = 0.10</math></li> <li>Rest of UK: <math>1 * 2\% = 0.01</math></li> </ul>
<b>Step 4: DDI Entrepreneurship employees net of leakage and displacement – total over 15 years</b>		
<b>Displacement</b>	<p>Entrepreneurship Jobs Location numbers multiplied by (1 minus the Entrepreneurship jobs Displacement factor) by region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 10%</li> <li>Rest of Scotland: 20%</li> <li>Rest of UK: 50%</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>0.4 * 90\% = 0.36</math></li> <li>Rest of Scotland: <math>0.10 * 80\% = 0.08</math></li> <li>Rest of UK: <math>0.01 * 50\% = 0.01</math></li> </ul>
<b>Step 5: DDI Entrepreneurship employees net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Employment GVA Impact<sup>97</sup></b>	<p>Displacement numbers multiplied by net discounted Entrepreneurship position GVA (over duration of the programme) per region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: £728,925</li> <li>Rest of Scotland: £671,880</li> <li>Rest of UK: £740,834</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: <math>0.36 * £728,925 = £0.3m</math></li> <li>Rest of Scotland: <math>0.08 * £671,880 = £0.05m</math></li> <li>Rest of UK: <math>0.01 * £740,834 = £0.004m</math></li> </ul>

<sup>97</sup> In calculating the GVA impact from direct employment the full DDI academic employment GVA has been calculated over 15 years in line with the 2013 Green Book approach to quantifying the employment impacts of interventions.

Steps	Calculation	Worked Example
<b>Step 6: GVA from Net DDI Entrepreneurship employees including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	<p>Net Employment Impact NPV numbers multiplied by the multiplier Employment Type II per region, as follows:</p> <ul style="list-style-type: none"> <li>City Deal region: 1.40</li> <li>Scotland: 1.7</li> <li>UK: 2.2</li> </ul> <p>With:</p> <ul style="list-style-type: none"> <li>Scotland = CD region + Rest of Scotland; and</li> <li>UK = CD region + Rest of Scotland + Rest of UK</li> </ul>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: £0.3m * 1.40 = £0.4m</li> <li>Scotland: (£0.3m + £0.05m) * 1.7 = £0.6m</li> <li>UK: (£0.3m + £0.05m + £0.004m) * 2.2 = £0.8m</li> </ul>
<b>Step 7: Discounted GVA from Net DDI Entrepreneurship employees with discount factor applied over 15 years</b>		
<b>Net Employment Impact NPV</b>	<p>Net Employment GVA Impact numbers multiplied by the discount factor of 3.5% per region per year.</p>	<p>Easter Bush:</p> <ul style="list-style-type: none"> <li>CD region: £0.1m</li> <li>Scotland: £0.2m</li> <li>UK: £0.3m</li> </ul>
<b>Total DDI Entrepreneurship Employment GVA (UK)</b>		<b>£0.3m</b>

Table 19 below summarises the total (direct employment) net (discounted) GVA of £67.1m that will be generated as a result of the DDI Programme investment in Easter Bush.

Table 19: Summary of Easter Bush DDI TRADE Employment - Net GVA (discounted)

Category	GVA – UK
Talent	£8.4m
Research	£54.2m
Adoption	£4.2m
Entrepreneurship	£0.3m
<b>Total</b>	<b>£67.1m</b>

### Student Spend Outcome Analysis

The indirect impacts from the DDI talent theme student spending impacts generated from on campus undergraduates and postgraduates is based upon:

#### GVA:

The economic impact of student spending for campus based graduates and post graduates has been calculated for a 15 year period and discounted at 3.5% based on an average student spend of £6,990 per annum. This figure represents the economic impact of the spending of students



during their time at University and has been calculated based on data presented in the “BiGGAR Economics - Economic Impact of the University of Edinburgh 2013-14” report.

#### **Additionality:**

- **Counterfactual** – A nil counterfactual scenario is assumed (at all geographic levels) as without the DDI Programme investment these additional Easter Bush graduate and post graduates would not be in receipt of teaching at the University;
- **Leakage** – Leakage levels are assumed to be in line with the student spend profile provided within the: “BiGGAR Economics - Economic Impact of the University of Edinburgh 2013-14” report which indicates the majority of the University’s graduates spend takes place within the City Region at 93%, falling to 7% and 0% for the rest of Scotland and UK levels respectively;
- **Displacement** – based on the HCA Additionality Guide<sup>98</sup> – with an assumption of low levels of displacement of between 10% (for the City Deal Region) to up to 25% (for the Rest of Scotland) with 0% assumed for Rest of UK based on the local nature of on campus undergraduate students location and therefore spend profiles. Postgraduate student spending displacement is assumed to be medium (at 50%) given the greater likelihood of part-time post graduate students with a more diverse accommodation profile across the three regions; and,
- **Multiplier** – The GVA Type II multiplier has been applied for SIC code 72 (R&D) 2014 for GVA benefits generated from student spending effects for the City Deal and Scotland levels, based on Scottish Government data for the Scottish economy. The UK level multiplier has been based on PwC Analysis of UK Type II GVA Multipliers<sup>99</sup>.

Table 20 presents the steps taken in calculating gross to net GVA from DDI student spending.

*Table 20: Easter Bush Student Spending Economic Outcome Analysis Process*

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross DDI Student Spending outputs – total over 15 years</b>		
<b>Uplift numbers</b>	As per step 4 of table 24 below (for graduates)	<p>Easter Bush on-campus graduates (uplift case):</p> <ul style="list-style-type: none"> <li>• CD region: 0</li> <li>• Rest of Scotland: 0</li> <li>• Rest of UK: 0</li> </ul> <p>Easter Bush on-campus <b>post graduates</b> (uplift case):</p> <ul style="list-style-type: none"> <li>• CD region: 180</li> <li>• Rest of Scotland: 56</li> <li>• Rest of UK: 71</li> </ul>
<b>Step 2: DDI Talent outputs converted into student spend GVA net of leakage – total over 15 years</b>		

<sup>98</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/378177/additionality\\_guide\\_2014\\_full.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf)

<sup>99</sup> As detailed in Appendix I.

Steps	Calculation	Worked Example
<b>Student Spend Location</b>	DDI uplift on-campus graduates and post graduates x £6,990 (student spend GVA p.a.) x Student Spend Location factor as follows: <ul style="list-style-type: none"> <li>93% City Deal Region</li> <li>7% Rest of Scotland</li> <li>0% Rest of UK</li> </ul>	Easter Bush on-campus post graduates <ul style="list-style-type: none"> <li>CD region: <math>180 * £6,990 * 93\% = £1.2m</math></li> <li>Rest of Scotland: <math>56 * £6,990 * 7\% = £0.08m</math></li> <li>Rest of UK: <math>71 * £6,990 * 0\% = £0</math></li> </ul>
<b>Step 3: DDI Student Spend GVA net of leakage and displacement (based on graduate destination data from UoE) – total over 15 years</b>		
<b>Displacement</b>	Student Spend Location numbers multiplied by 1 minus the Graduate displacement factor as follows: <ul style="list-style-type: none"> <li>50% City Deal Region</li> <li>50% Rest of Scotland</li> <li>50% Rest of UK</li> </ul> And for post graduates: <ul style="list-style-type: none"> <li>10% City Deal Region</li> <li>25% Rest of Scotland</li> <li>0% Rest of UK</li> </ul>	Easter Bush on-campus post graduates <ul style="list-style-type: none"> <li>CD region: <math>£1.2m * 90\% = £1.1m</math></li> <li>Rest of Scotland: <math>£0.08m * 75\% = £0.06m</math></li> <li>Rest of UK: <math>£0 * 100\% = £0</math></li> </ul>
<b>Step 4: DDI Student Spend GVA net of leakage and displacement with discount factor applied – total over 15 years</b>		
<b>Student Spending NPV</b>	Displacement numbers multiplied by the discount factor of 3.5% per region per year	<ul style="list-style-type: none"> <li>CD region: £0.7m</li> <li>Rest of Scotland: £0.04m</li> <li>Rest of UK: £0</li> </ul>
<b>Step 5: GVA from Net DDI Student Spend with discount factor and multiplier applied – over 15 years</b>		
<b>Multiplier</b>	Student Spending NPV multiplied by the graduate GVA impact multiplier per region, as follows: <ul style="list-style-type: none"> <li>1.27 for City Deal Region</li> <li>1.5 for Scotland (Rest of Scotland + CD Region)</li> <li>2.6 for UK (Rest of Scotland + CD region + Rest of UK)</li> </ul>	<ul style="list-style-type: none"> <li>CD region: <math>£0.07m * 1.27 = £0.9m</math></li> <li>Scotland: <math>(£0.7m + £0.04m) * 1.5 = £1.2m</math></li> <li>UK: <math>(£0.7m + £0.04m + £0) * 2.6 = £2.0m</math></li> </ul>
<b>Step 6: Discounted Net GVA from DDI Student Spend – total over 15 years</b>		
<b>Total GVA</b>	Sum of the Net GVA after multiplier for each degree per region, minus the CPD Net GVA (which is allocated to Adoption)	<ul style="list-style-type: none"> <li>CD Region: £0.9m</li> <li>Scotland: £1.2 m</li> <li>UK: £2.0m</li> </ul>
<b>Total DDI Student Spend GVA (UK)</b>		<b>£2.0m</b>

## Indirect Impacts

### Talent Outcome Analysis

This section presents the approach that has been undertaken to quantify the **indirect** DDI based teaching impacts based on the net additional earnings GVA impact from the training of DDI undergraduates and postgraduates at the Easter Bush Hub. It is important to note that this analysis:

- Does not include the impact of credit bearing CPDs which has been captured under Adoption given CPD courses are predominantly undertaken by individuals in employment; and,

- Is based on 88% of students taking DDI degrees and pathway courses with the remaining 12% being allocated to Entrepreneurship to reflect the proportion of graduates likely to join/establish DDI focused micro businesses or SMEs as a result of the DDI Programme<sup>100</sup>.

In regard to **talent outcomes** consideration has, therefore, been given – in line with BEIS Guidance<sup>101</sup> regarding “wage uplifts” – to the likely increases in the net present value of the lifetime income and GVA of those students securing DDI related employment in the City Region, Scotland and the UK.

Consequently, as detailed at Appendix H and outlined below, the key assumption drawn are:

- **Counterfactual GVA:** comprises the average GVA per employee across all SIC codes for each area (City Region, Scotland and UK) representing the GVA that could be generated by graduates not in receipt of DDI related teaching. This has been calculated on a lifetime basis (i.e. 40 year employment profile) and discounted at 3.5%. Table 21 below sets out the counterfactual GVA assumptions.

Table 21: Counterfactual Employee GVA for the DDI Programme

Area	Average GVA (2017)	Discounted lifetime average GVA (2017)
City Region	£42,408	£905,626
Scotland	£53,057	£1,133,036
UK	£54,843	£1,171,176

From: ONS NUTS1 Level GVA by Standard Industrial Classification (SIC), 2017 and PwC analysis of ONS GVA data discounted by 3.5% over 40 years.

- **DDI GVA:** it is assumed that on graduation each Easter Bush graduate will secure a new FTE DDI related Agri-Tech position. Given the absence of sector specific GVA data it is assumed that an appropriate proxy for an Easter Bush graduate is the average GVA for the Professional and Technical and ICT sectors (as per Table 22 below).

Table 22: Projected Annual GVA of an Easter Bush DDI Graduate by Sector<sup>102</sup>

Sector	ONS SIC Category for DDI Sector	City Deal Region	Scotland	UK
Easter Bush	Professional Technical & ICT	£70,380	£57,326	£66,804

Source: ONS GVA per worker, 2015.

<sup>100</sup> Student destination data from UoE (2017) indicates approximately 7% of graduates are employed by micro businesses (i.e. businesses with less than 10 employees) in the City Region with a further 5% employed within small businesses (between 10 to 50 employees) indicating approximately 12% of graduate destinations within micro and small businesses.

<sup>101</sup> Per HM Treasury, The Green Book: Central Government Guidance on Appraisal and Evaluation, 2018 and BEIS email to the ESESCR Deal Chief Executive and PMO on 19th March 2018.

<sup>102</sup> The DDI sector related GVA has been based on publically available data from the Office of National Statistics (ONS) on GVA per worker for Standard Industrial Classification (SIC) codes. Given the limitations of this data in terms of sectoral composition we have made assumptions regarding the most appropriate sector DDI graduates are likely to be based in post completion of their course (e.g. it is assumed a Easter Bush graduate is likely to work in a job with a GVA equivalent to that of the average GVA of a Professional Technical and ICT worker).

Average current GVA and lifetime discounted GVA for these sectors has been provided in Table 23 below, for the City Region, Scotland and UK levels - indicating between £1.22m and £1.43m of uplifts in GVA at the Scottish and UK levels respectively.

Table 23: DDI Easter Bush Employee GVA

Area	Average GVA (2017)	Discounted lifetime average GVA (2017)
City Region	£42,408	£1,502,970
Scotland	£53,057	£1,224,201
UK	£54,843	£1,426,604

From: ONS NUTS1 Level GVA by Standard Industrial Classification (SIC), 2017 and PwC analysis of ONS GVA data discounted by 3.5% over 40 years.

The total net DDI uplift in GVA that might therefore be generated by Easter Bush Graduates has been calculated by discounting the DDI Easter Bush GVA in Table 23 from the counterfactual GVA in Table 21 to calculate the **net uplift** in lifetime GVA (for Easter Bush graduates) as a result of DDI training.

As indicated in Table 24 below, this implies a wage uplift of between £597,344 and £255,428 for each Easter Bush graduate over their lifetime at the City Region and UK level respectively.

Table 24: DDI related GVA Uplift in Easter Bush Employee lifetime earnings

Area	Discounted lifetime average DDI GVA (2017)	Discounted lifetime average counterfactual GVA (2017)	Discounted lifetime average Net DDI GVA (2017)
City Region	£1,502,970	£905,626	£597,344
Scotland	£1,224,201	£1,133,036	£91,165
UK	£1,426,604	£1,171,176	£255,428

From: PwC analysis of ONS GVA data by SIC discounted by 3.5% over 40 years.

To estimate the net additional DDI Talent GVA per graduate, assumptions have been made in relation to:

- **Leakage:** this has been based on data from the University of Edinburgh student destination figures for 2017, indicating – as illustrated in Table 25 below - that approximately 65% of their undergraduate student body leaves the City Deal Region post-graduation rising to 75% at the UK level.

Table 25: Student Destination Data for UoE

Qualification Type	City Deal Region	Scotland	UK
UoE Undergraduates	35%	13%	25%
UoE Masters	35%	13%	25%
UoE PhD	35%	13%	25%
UoE Distance learning Masters	5%	5%	29%
Credit Bearing CPD	35%	13%	25%
Non-credit Bearing	5%	5%	29%

Based on data from University of Edinburgh (UoE), 2018.

- **Displacement:** given the unique and innovative nature of the proposed DDI training courses, displacement is assumed to be low, (at 10%) at the City Deal Region level for non-Scottish and EU Funded students. While, at minimum, displacement levels might be as high as 50% at the UK level given the greater likelihood of other/competing academic providers offering similar courses; and,
- **Multipliers:** Type II multipliers have been applied for the SIC code 72 (R&D)<sup>103</sup> 2014 for GVA and Employment impacts for the City Deal and Scotland levels based on Scottish Government data for the Scottish economy. The UK level multiplier has been based on PwC Analysis of UK level Type II GVA and Employment Multipliers.

Table 26 presents the steps taken (in terms of the additionality factors and economic metrics applied) to calculate the GVA generated as a result of DDI related teaching activities.

Table 26: Easter Bush Talent Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Talent outputs – total over 15 years</b>		
<b>Outputs</b>	Provided by the UoE and summarised at Table 12	<p>Easter Bush (reference case):</p> <ul style="list-style-type: none"> <li>• 80 pathway courses undergraduates</li> <li>• 3 pathway courses FTE equivalents (20/480 ratio)</li> <li>• 1,028 undergraduates</li> <li>• 490 masters</li> <li>• 680 PhDs</li> <li>• 24,000 CPDs</li> <li>• 160,939 non-credit bearing</li> <li>• 915 distance-learning masters</li> </ul> <p>Easter Bush (baseline case):</p> <ul style="list-style-type: none"> <li>• 0 pathway courses undergraduates</li> <li>• 0 pathway courses FTE equivalents (20/480 ratio)</li> <li>• 1,028 undergraduates</li> <li>• 0 masters</li> <li>• 600 PhDs</li> <li>• 0 CPDs</li> <li>• 45,000 non-credit bearing</li> <li>• 256 distance-learning masters</li> </ul>
<b>Step 2: Calculation of cumulative DDI uplift Talent outputs – total over 15 years</b>		
<b>Uplift numbers</b>	<ul style="list-style-type: none"> <li>• Reference case minus baseline outputs numbers</li> </ul>	<p>Easter Bush (uplift case):</p> <ul style="list-style-type: none"> <li>• 80 pathway courses undergraduates</li> <li>• 3 pathway courses FTE equivalents (20/480 ratio)</li> <li>• 0 undergraduates</li> <li>• 490 masters</li> <li>• 80 PhDs</li> <li>• 24,000 CPDs</li> <li>• 115,939 non-credit bearing</li> <li>• 659 distance-learning masters</li> </ul>
<b>Step 3: DDI Talent outputs net of leakage (based on graduate destination data from UoE) – total over 15 years (PhDs only)</b>		

<sup>103</sup> The R&D multiplier has been used as a proxy for the DDI programme impacts due to limitations in the SIC breakdown of multiplier data which does not allow cross tabulation for each of the DDI sectors.

Steps	Calculation	Worked Example
<b>Graduate destinations/Leakage</b>	Uplift numbers multiplied by graduate destination factors per region (for PhDs), as follows: <ul style="list-style-type: none"> <li>35% City Deal Region</li> <li>13% Rest of Scotland</li> <li>25% Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>80 * 35\% = 28</math></li> <li>Rest of Scotland: <math>80 * 13\% = 10</math></li> <li>Rest of UK: <math>80 * 25\% = 20</math></li> </ul>
<b>Step 4: DDI Talent outputs net of leakage and displacement (based on secondary data sources) – total over 15 years (PhDs only)</b>		
<b>Displacement</b>	Graduate destination number multiplied by 1 minus the graduate displacement factor, as follows: <ul style="list-style-type: none"> <li>50% for City Deal Region, Rest of Scotland and Rest of UK for undergraduate displacement (not applicable for PhDs); AND</li> <li>10%, 25% and 50% (respectively CD Region, Rest of Scotland and Rest of UK) for UK and Overseas UGs, Masters and PhD displacement.</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>28 * 90\% = 25</math></li> <li>Rest of Scotland: <math>10 * 75\% = 8</math></li> <li>Rest of UK: <math>20 * 50\% = 10</math></li> </ul>
<b>Step 5: DDI Talent outputs net of leakage and displacement converted into GVA – total over 15 years- (PhDs only)</b>		
<b>Net GVA uplift</b>	Displacement numbers multiply by the GVA uplift per graduate (lifetime, discounted) as follows:  Easter Bush: <ul style="list-style-type: none"> <li>£597,344 for CD Region</li> <li>£91,165 for Rest of Scotland</li> <li>£255,428 for Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>25 * £597,344 = £3.2m</math></li> <li>Rest of Scotland: <math>8 * £91,165 = £0.2m</math></li> <li>Rest of UK: <math>10 * £255,428 = £0.5m</math></li> </ul>
<b>Step 6: GVA from Net DDI Talent with discount factor applied over 15 years (PhDs only)</b>		
<b>Net Teaching Impact NPV</b>	Net GVA uplift multiplied by the discount factor of 3.5% per region per year.	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £2.2m</li> <li>Rest of Scotland: £0.1m</li> <li>Rest of UK: £0.4m</li> </ul>
<b>Step 7: Discounted GVA from Net DDI Talent including multiplier effects – total over 15 years (PhDs only)</b>		
<b>Net GVA after multiplier</b>	Net Teaching impact NPV multiplied by the graduate GVA impact multiplier per region, as follows: <ul style="list-style-type: none"> <li>1.27 for CD Region</li> <li>1.5 for Scotland (Rest of Scotland + CD Region)</li> <li>2.6 for UK (Rest of Scotland + CD region + Rest of UK)</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD Region: <math>£2.2m * 1.27 = £2.8m</math></li> <li>Scotland: <math>(£2.2m + £0.1m) * 1.5 = £3.5m</math></li> <li>UK: <math>(£2.2m + £0.1m + £0.4m) * 2.6 = £7.0m</math></li> </ul>
<b>Step 8: Discounted GVA from net DDI Talent students (all DDI graduates) – total over 15 years</b>		
<b>Total GVA</b>	Sum of the Net GVA after multiplier for each degree per region, minus the CPD Net GVA (which is allocated to Adoption)	<ul style="list-style-type: none"> <li>CD Region: £21.8m</li> <li>Scotland: £27.2m</li> <li>UK: £62.4m</li> </ul>
<b>Step 9: Discounted GVA from net DDI Talent graduates post allocation to Entrepreneurship – total over 15 years</b>		
<b>Graduate GVA Impact</b>	88% of the Total Talent GVA (12% allocated to Entrepreneurship) per region	<ul style="list-style-type: none"> <li>CD Region: <math>£21.8m * 88\% = £19.1m</math></li> <li>Scotland: <math>£27.2m * 88\% = £23.9m</math></li> <li>UK: <math>£62.4m * 88\% = £54.9m</math></li> </ul>
<b>Total DDI Talent Graduate GVA (UK)</b>		<b>£54.9m</b>

As a result of the above additionality adjustments, and as demonstrated in Table 27 below, net uplifts in GVA (over the lifetime of the Programme) from DDI trained talent at Easter Bush is estimated to be £54.9m (excluding student spending (of £2m) and teaching employment impacts (of £8.4m).

Table 27: DDI Talent related Net GVA (discounted)

Category	GVA
Talent Graduates	£54.9m
Talent Student Spending	£2.0m
Talent Employment	£8.4m
<b>Total Talent</b>	<b>£65.3m</b>

### Research Outcome Analysis

This section presents the approach that has been undertaken to quantify DDI based research funding impacts. For the purposes of the economic case DDI Agri-Tech Easter Bush Research **impacts** have been based upon all direct public, private and third sector DDI research funding attracted to the UoE as a result of the Easter Bush Hub activities. Table 28 presents the split of DDI research funding by source e.g. public and private funds (including private leveraged funds of £50.3m). This data has also been used to calculate the potential return on investment that could be generated in GVA terms over the Programme period from the Easter Bush's anticipated research funding profile.

Table 28: DDI Research Funding Split by Funder

DDI Hub	Public funding	Third party (including private leveraged funds) Funding	Overseas Funding
Easter Bush	£49.1m	£59.6m	£7.0m

It is important to note that while the volume of overseas funding attracted is recognised in the commercial case as an **income flow** in the economic case the **impact** of these funds has **not been quantified** at this time due to the lack of certainty regarding whether any subsequent returns will be captured at a UK level.

In regard to **research outcomes** analysis has been based on existing evidence in relation to the likely GVA uplifts resulting from this research. The key assumptions drawn from this evidence are:

#### GVA:

- **Rates of return:** research from the University of Edinburgh<sup>104</sup>, Russell Group Universities<sup>105</sup> and wider sources<sup>106</sup> have indicated the average rate of return from R&D investment to be between 20% to 30%. In order to be prudent a 20% rate of return p.a. until the end of the DDI Programme for public and private research funding has been assumed; and,
- **Time lags:** this research also indicated the need to take time lags into consideration when measuring the impact of R&D funding indicating a 4 year time lag for public and private sector

<sup>104</sup> From: A Science and Innovation Audit Report for University of Edinburgh, 2016.

<sup>105</sup> From: London Economics – The Economic Impact of Russell Group Universities, 2017.

<sup>106</sup> Including (amongst other reports): Frontier Economics – Rates of Return to investment in Science and Innovation, 2014 and Haskel et al - The Economic significance of the UK Science Base 2014.

R&D i.e. funding in year 1 will start generating impact in Year 5 for the remaining 10 years of the Programme.

### Additionality Effects:

The key additionality assumptions applied to DDI research funding are:

- **Leakage:** a low level of leakage (of 10%) has been assumed on the basis the majority of the research funding will be retained within the University and hence City Deal Region boundary with 95% leakage assumed for the Rest of Scotland and Rest of UK (given the majority of impact is expected to occur and remain within the City Deal Region);
- **Displacement:** different displacement levels have been applied to the different types of research funding and geographical areas. For example, we have assumed no displacement for public and private funds at the City Deal Region level given the innovative nature of R&D the funding will be seeking to unlock and the lack of alternative Higher Education Institutions/competitor bodies likely to undertake similar activity within the City Region. Higher levels of displacement of between 20% to 30% have been assumed for the Rest of Scotland and UK levels; and,
- **Multipliers:** Type II multipliers have been applied for the SIC code 72 (R&D) 2014 for GVA and Employment impacts for the City Deal and Scotland levels based on Scottish Government data for the Scottish economy. The UK level multiplier has been based on PwC Analysis of UK level Type II GVA and Employment Multipliers.

Table 29 presents the steps taken (in terms of the additionality factors and economic metrics applied) to calculate the GVA generated as a result of DDI related research activities.

Table 29: Easter Bush Research Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Research outputs – total over 15 years</b>		
<b>Outputs</b>	Provided by the UoE and summarised at Table 12	<p>Easter Bush (reference case):</p> <ul style="list-style-type: none"> <li>• £212.6m from UK Research Councils</li> <li>• £47.2m from UK Government Departments</li> <li>• £2.7m from Industry &amp; Commerce</li> <li>• £12.9m from Overseas (EU)</li> <li>• £24.3m from Overseas (outwith EU)</li> <li>• £29.3m from UK Charities</li> <li>• £17.3m from HEI Partners</li> <li>• £276.1m from Leveraged Private Funds</li> </ul> <p>Easter Bush (baseline case):</p> <ul style="list-style-type: none"> <li>• £172.4m from UK Research Councils</li> <li>• £38.3m from UK Government Departments</li> <li>• £2.2m from Industry &amp; Commerce</li> <li>• £10.5m from Overseas (EU)</li> <li>• £19.7m from Overseas (outwith EU)</li> <li>• £23.8m from UK Charities</li> <li>• £14.0m from HEI Partners</li> <li>• £225.8m from Leveraged Private Funds</li> </ul>
<b>Step 2: Calculation of cumulative DDI uplift Research outputs – total over 15 years</b>		



Steps	Calculation	Worked Example
<b>Uplift numbers</b>	<ul style="list-style-type: none"> <li>Reference case minus baseline outputs numbers</li> </ul>	Easter Bush (uplift case): <ul style="list-style-type: none"> <li>£40.2m from UK Research Councils</li> <li>£8.9m from UK Government Departments</li> <li>£0.5m from Industry &amp; Commerce</li> <li>£2.4m from Overseas (EU)</li> <li>£4.6m from Overseas (outwith EU)</li> <li>£5.5m from UK Charities</li> <li>£3.3m from HEI Partners</li> <li>£50.3m from Leveraged Private Funds</li> </ul>
<b>Step 3: DDI Research outputs net of leakage (based on funding destination data from UoE) – total over 15 years</b>		
<b>Funding destination</b>	Uplift numbers multiplied by Research funding ultimate destination factor per sectors as follows: <ul style="list-style-type: none"> <li>90% City Deal Region</li> <li>5% Rest of Scotland</li> <li>5% Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: <math>£115.8m * 90\% = £104.2m</math></li> <li>Rest of Scotland: <math>£115.8m * 5\% = £5.8m</math></li> <li>Rest of UK: <math>£115.8m * 5\% = £5.8m</math></li> </ul>
<b>Step 4: DDI Research outputs net of leakage and displacement (based on secondary data sources) – total over 15 years</b>		
<b>Displacement</b>	Funding destination number multiplied by 1 minus the Research displacement factor, minus the leveraged private funds, as follows: <p>UK Research Councils</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>20% Rest of Scotland</li> <li>30% Rest of UK</li> </ul> <p>UK Government Departments</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>20% Rest of Scotland</li> <li>30% Rest of UK</li> </ul> <p>Industry &amp; Commerce</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>10% Rest of Scotland</li> <li>20% Rest of UK</li> </ul> <p>Overseas (EU)</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>10% Rest of Scotland</li> <li>20% Rest of UK</li> </ul> <p>Overseas (outwith EU)</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>10% Rest of Scotland</li> <li>20% Rest of UK</li> </ul> <p>UK Charities</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>10% Rest of Scotland</li> <li>20% Rest of UK</li> </ul> <p>HEI Partners</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>10% Rest of Scotland</li> <li>20% Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £58.9m</li> <li>Rest of Scotland: £2.7m</li> <li>Rest of UK: £2.4m</li> </ul>
<b>Step 5: DDI Research outputs net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Research GVA Impact</b>	For each year (1 to 15) <ul style="list-style-type: none"> <li>Sum of all regions Displacement numbers minus all regions Overseas numbers, multiplied by 20%, applying a 4 years delay</li> </ul>	<ul style="list-style-type: none"> <li>Easter Bush: £35.1m</li> </ul>

Steps	Calculation	Worked Example
<b>Step 6: Discounted GVA from Net Research GVA including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	Net GVA Impact number multiplied by the Research impact multiplier of 2.6 for UK	<ul style="list-style-type: none"> <li>Easter Bush: £35.1m * 2.6 = £91.3m</li> </ul>
<b>Step 7: GVA from Net Research GVA discount factor applied over 15 years</b>		
<b>Net Impact NPV</b>	Multiplier number multiplied by the discount factor of 3.5% per year.	<ul style="list-style-type: none"> <li>Easter Bush: £59.4m</li> </ul>
<b>Step 8: Discounted GVA from net impact NPV – total over 15 years</b>		
<b>Total Research GVA</b>	Net Impact NPV number split per region at hub level as follows: <ul style="list-style-type: none"> <li>CD region: 4%</li> <li>Scotland: 8%</li> <li>Rest of UK: 92%</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £2.4m</li> <li>Scotland: £4.8m</li> <li>Rest of UK: £59.4m</li> </ul>
<b>Total DDI Research Funding GVA (UK)</b>		<b>£59.4m</b>

As a result of the above additionality adjustments, and as demonstrated in Table 30 below, net uplifts in GVA (over the lifetime of the Programme) from research are estimated to be £59.4m (excluding - as mentioned previously - research employment impacts of an additional £54.2m). In order to demonstrate the geographical split of Research impacts the current regional split of DDI sector GVA (comprising the Education and Human Health, ICT, Professional and Technical, Construction and Arts and Entertainment and Financial Services sectors) has been used as a proxy, namely: City Deal Region 2%, Scotland 6% and UK 94% (based on data from Scottish Government and ONS 2015).

Table 30: Net Discounted GVA Impact for DDI Research Funding (excluding Overseas Research Funding)

DDI Hub	Net Additional DDI Research GVA – City Deal Region	Net Additional DDI Research GVA – Scotland	Net Additional DDI Research GVA – UK
Easter Bush	£2.4m	£4.8m	£59.4m

Based on data from UoE, 2018 and PwC analysis of Net DDI Research Outputs and Impacts over 15 years.

### Adoption Outcome Analysis

This section presents the approach undertaken to quantify DDI based adoption funding impacts in GVA terms. The analysis of **net adoption outputs** has involved assessing likely levels of adoption funding attributable to Easter Bush with and without the DDI Programme. This is based on the leveraged private sector investment of £50.3m (based on the public sector funding identified under Research above) and the near to market activities undertaken as a result of the direct DDI Adoption funding of £2.6m that will be made available by UoE to the Easter Bush Hub as part of the DDI Programme.

Analysis of adoption impacts has been undertaken of the projected levels of such adoption funds over the next 15 years with and without the DDI Programme to isolate **net adoption leverage outputs** attributable to Easter Bush of £52.9m (as presented in Table 31 below).

Table 31: DDI Adoption Uplifts

DDI Hub	Private Leveraged DDI Adoption Funding	UoE DDI Adoption Funding	Total Gross DDI Adoption Funding
Easter Bush	£50.3m	£2.6m	£52.9m

In quantifying the type and level of impacts that might be created from Adoption activities consideration has also been given to the uptake of CPD DDI modules. The projected levels of CPD uptake have been estimated over the next 15 years with and without the DDI Programme to isolate the **net CPD outputs** attributable to Easter Bush (of £3.9m).

In regard to **Adoption outcomes** the key assumptions drawn are:

**GVA:**

- **Private sector leverage:** this has been estimated by applying a level of £1.25 (discounted) (equating to £1.36 undiscounted) over 8 years for every £1 of public sector research funding based on research commissioned by BIS on the crowding in effects of university public sector research funding in the UK<sup>107</sup> that indicates “£1 of publicly funded research that is conducted within HEI results in private sector funding an additional £0.29 of research that is conducted within HEIs, and an additional £1.07 that is conducted outside of HEIs”;
- **Rates of return:** per the Research section above a 20% rate of return p.a. is applied until the end of the DDI Programme for direct DDI Adoption funding and the leveraged private funds from public sector research; and,
- **Time lags:** a reduced time lag of 2 years has been applied to adoption funding to reflect the nearer to market nature of such private funded research.

**Additionality Effects:** in the absence of alternative information, and based on discussions with the University of Edinburgh, the additionality assumptions as outlined under the research section above have also been applied to DDI Adoption funding with the exception of displacement where - given the innovative and bespoke nature of close to market research undertaken as a result of DDI Adoption funds - it is assumed that displacement levels are likely to be zero.

In order to demonstrate the geographical split of adoption impacts the current regional split of DDI sector GVA (comprising the Education and Human Health, ICT, Professional and Technical, Construction and Arts and Entertainment and Financial Services sectors) is used as a proxy, namely: City Deal Region 2%, Scotland 6% and UK 94% (based on data from Scottish Government and ONS 2015) and applied these proportions to the Adoption GVA impact of the Easter Bush Hub.

Table 32 presents the steps taken (in terms of the additionality factors and economic metrics applied) to calculate the GVA generated as a result of DDI related adoption activities.

<sup>107</sup> From: BIS – Research and development: What is the relationship between public and private investment in science innovation and research? 2015.

Table 32: Easter Bush Adoption Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Adoption outputs – total over 15 years</b>		
<b>Outputs</b>	Provided by the UoE	<ul style="list-style-type: none"> <li>DDI Adoption Funding- n/a – all outputs are incremental</li> </ul> <p>Easter Bush Private leveraged funds:</p> <ul style="list-style-type: none"> <li>£225.8m (baseline case)</li> <li>£276.1m (reference case)</li> </ul>
<b>Step 2: Calculation of cumulative DDI uplift Adoption outputs – total over 15 years</b>		
<b>Uplift numbers</b>	Provided by the UoE	<p>Easter Bush (uplift case):</p> <ul style="list-style-type: none"> <li>DDI Adoption Funding £2.6m</li> <li>Private leveraged funds £50.3m</li> </ul>
<b>Step 3: DDI Adoption outputs net of leakage (based on funding destination data from UoE) – total over 15 years</b>		
<b>Funding destination</b>	<p>Uplift numbers multiplied by Adoption funding ultimate destination factor as follows:</p> <ul style="list-style-type: none"> <li>90% City Deal Region</li> <li>5% Rest of Scotland</li> <li>5% Rest of UK</li> </ul>	<p>Easter Bush – Adoption funding:</p> <ul style="list-style-type: none"> <li>CD region: £2.6m * 90% = £2.3m</li> <li>Rest of Scotland: £2.6m * 5% = £0.1m</li> <li>Rest of UK: £2.6m * 5% = £0.1m</li> </ul> <p>Easter Bush – Private Leveraged Funds</p> <ul style="list-style-type: none"> <li>CD region: £50.3m * 90% = £45.3m</li> <li>Rest of Scotland: £50.3m * 5% = £2.5m</li> <li>Rest of UK: £50.3m * 5% = £2.5m</li> </ul>
<b>Step 4: DDI Adoption outputs net of leakage and displacement (based on secondary data sources) – total over 15 years</b>		
<b>Displacement</b>	<p>Funding destination number multiplied by 1 minus the Adoption displacement factor, as follows:</p> <p>DDI Adoption Funds:</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>0% Rest of Scotland</li> <li>0% Rest of UK</li> </ul> <p>Private leveraged Funds</p> <ul style="list-style-type: none"> <li>0% City Deal Region</li> <li>0% Rest of Scotland</li> <li>0% Rest of UK</li> </ul>	<p>Easter Bush – Adoption funding:</p> <ul style="list-style-type: none"> <li>CD region: £2.3m</li> <li>Rest of Scotland: £0.1m</li> <li>Rest of UK: £0.1m</li> </ul> <p>Easter Bush – Private Leveraged Funds</p> <ul style="list-style-type: none"> <li>CD region: £45.3m</li> <li>Rest of Scotland: £2.5m</li> <li>Rest of UK: £2.5m</li> </ul>
<b>Step 5: DDI Adoption outputs net of leakage and displacement converted into GVA – total over 15 years</b>		
<b>Net Adoption GVA Impact</b>	<p>For each year (1 to 15):</p> <p>Sum of all regions Displacement numbers - multiplied by 20%, applying a 2 years delay</p>	<p>Easter Bush – Adoption Funding: £1.9m</p> <p>Easter Bush – Private Leveraged Funds: £26.7m</p>
<b>Step 6: Discounted GVA from Net Adoption GVA including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	Net GVA Impact number multiplied by the Adoption impact multiplier of 2.6 for UK	<ul style="list-style-type: none"> <li>Easter Bush – Adoption Funding: £1.9m * 2.6 = £5.0m</li> <li>Easter Bush – Private Leveraged Funds: £26.7m * 2.6 = £69.3m</li> </ul>
<b>Step 7: GVA from Net Adoption GVA discount factor applied over 15 years</b>		
<b>Net Impact NPV</b>	Multiplier number multiplied by the discount factor of 3.5% per year.	<ul style="list-style-type: none"> <li>Easter Bush – Adoption Funding: £3.4m</li> <li>Easter Bush – Private Leveraged Funds: £45.0m</li> </ul>

Steps	Calculation	Worked Example
<b>Step 8: Discounted GVA from net impact NPV – total over 15 years</b>		
<b>Total Adoption GVA</b>	Net Impact NPV number split per region at hub level as follows (for Adoption Funding only): <ul style="list-style-type: none"> <li>• CD region: 4%</li> <li>• Scotland: 8%</li> <li>• Rest of UK: 92%</li> </ul>	Easter Bush – Adoption Funding: <ul style="list-style-type: none"> <li>• CD region: £0.1m</li> <li>• Scotland: £0.3m</li> <li>• UK: £3.4m</li> </ul> Easter Bush – Private Leveraged Funds: <ul style="list-style-type: none"> <li>• CD region: £1.8m</li> <li>• Scotland: £3.6m</li> <li>• UK: £45.0m</li> </ul>
<b>Total DDI Adoption Funding GVA (UK)</b>		<b>£48.3m</b>

As a result of the above additionality adjustments, and as demonstrated in Table 33 below, net uplifts in GVA (over the lifetime of the Programme) from adoption funds are estimated to be £48.3m (excluding - as mentioned previously – adoption employment impacts of an additional £4.2m and CPD impacts of £3.9m<sup>108</sup>).

Table 33: Net Discounted GVA Impact for DDI Adoption Funding

Source of Impact	Net Additional DDI Adoption GVA
DDI Adoption Employment	£4.2m
DDI Adoption Funds	£48.3m
DDI CPD Training	£3.9m
DDI Adoption Total	£56.4m

### Entrepreneurship Outcome Analysis

This section presents the approach undertaken to quantify DDI based entrepreneurship impacts based on the:

- Increase in DDI start-ups likely to be generated by Easter Bush activities projected to be approximately 30 over 15 years; and,
- Number of undergraduates likely to engage in setting up or joining DDI micro/SMEs.

In the case of DDI start-ups it has been assumed that - in the absence of the Programme – no such DDI start-ups will occur (and therefore all such start-ups may be attributed to the Programme). The profile of DDI start-ups for Easter Bush has been provided in Appendix G and indicates a steadily rising level of DDI start-ups over the 15 year period profiled.

<sup>108</sup> A breakdown of the GVA and additionality assumptions underpinning the calculation of CPD impacts for Easter Bush, has been provided in Appendix J of this business case.

In regard to the **GVA outcomes**, associated with this level of start-ups, analysis has been based on existing evidence in relation to the estimated (direct) investment levels likely to be provided through various funding rounds via the DDI Entrepreneurship Programme.

This is based on data from the UoE indicating the vast majority (up to 90%) of start-up companies are based within the City Deal Region. For displacement, low levels (10%) have again been assumed at the City Deal and Scotland level, as it is assumed that the DDI start-up companies will attract new and different investment streams into the region that will seek to embed benefits locally by partnering with Easter Bush start-ups. In the absence of evidence, and given the presence of a larger pool of alternative funders and investors, it is assumed these funds would be fully displaced at the UK level.

The additionality assumptions, as outlined under the Research and Adoption sections above, have also been applied to DDI Entrepreneurship funding in relation to leakage (i.e. low leakage of 10% at City Deal level) and multiplier effects.

Table 34 below presents the steps taken (in terms of additionality factors and economic metrics applied) to calculate the GVA generated as a result of DDI related entrepreneurship activities.

Table 34: Easter Bush Entrepreneurship Economic Outcome Analysis Process

Steps	Calculation	Worked Example
<b>Step 1: Identification of gross Entrepreneurship Funds – total over 15 years</b>		
<b>Entrepreneurship Funds</b>	Provided by the UoE	n/a – all outputs are incremental
<b>Step 2: Calculation of cumulative DDI uplift Entrepreneurship Funds – total over 15 years</b>		
<b>Uplift numbers</b>	Provided by the UoE	Easter Bush (uplift case):  Venture Capital funding from new companies formed of: £3.9m
<b>Step 3: DDI Entrepreneurship Funds net of leakage (based on funding destination data from UoE) – total over 15 years</b>		
<b>Funding destination</b>	Uplift numbers multiplied by Entrepreneurship funding ultimate destination factor as follows: <ul style="list-style-type: none"> <li>90% City Deal Region</li> <li>5% Rest of Scotland</li> <li>5% Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £3.9m * 90% = £3.5m</li> <li>Rest of Scotland: £3.9m * 5% = £0.2m</li> <li>Rest of UK: £3.9m * 5% = £0.2m</li> </ul>
<b>Step 4: DDI Entrepreneurship Funds net of leakage and displacement (based on secondary data sources) – total over 15 years</b>		
<b>Displacement</b>	Funding destination number multiplied by 1 minus the Entrepreneurship displacement factor, as follows: <ul style="list-style-type: none"> <li>10% City Deal Region</li> <li>10% Rest of Scotland</li> <li>100% Rest of UK</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £3.5m * 90% = £3.2m</li> <li>Rest of Scotland: £0.2m * 90% = £0.2m</li> <li>Rest of UK: £0.2m * 0% = £0</li> </ul>
<b>Step 5: Discounted GVA from Net Entrepreneurship GVA including multiplier effects – total over 15 years</b>		
<b>Multiplier</b>	Net GVA Impact number multiplied by the Entrepreneurship impact multiplier per region, as follows: <ul style="list-style-type: none"> <li>1.40 for CD Region</li> <li>1.7 for Scotland (Rest of Scotland + CD Region)</li> </ul>	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £3.2m * 1.40 = £4.4m</li> <li>Scotland = (£3.2m + £0.2m) * 1.7 = £5.7m</li> <li>UK: (£3.2m + £0.2m + £0) * 2.2 = £7.3m</li> </ul>

Steps	Calculation	Worked Example
	<ul style="list-style-type: none"> <li>2.2 for UK (Rest of Scotland + CD region + Rest of UK)</li> </ul>	
<b>Step 7: GVA from Net Entrepreneurship GVA discount factor applied over 15 years</b>		
<b>Net Impact NPV</b>	Multiplier number multiplied by the discount factor of 3.5% per year.	Easter Bush: <ul style="list-style-type: none"> <li>CD region: £2.9m</li> <li>Scotland: £3.8m</li> <li>UK: £4.9m</li> </ul>
<b>Total DDI Entrepreneurship GVA (UK)</b>		<b>£4.9m</b>

As a result of the above additionality adjustments, and as demonstrated in Table 35 below, net uplifts in GVA (over the lifetime of the Programme) from such DDI start-up investment is likely to be £4.9m (excluding graduate impacts of £7.5m<sup>109</sup>).

Table 35: Net Discounted GVA Impact for DDI Entrepreneurship

Source of Impact	Net Additional DDI Entrepreneurship GVA
DDI Entrepreneurship Employment	£0.3m
DDI Entrepreneurship Funds	£4.9m
DDI Entrepreneurship Graduates	£7.5m
DDI Entrepreneurship Total	£12.6m

## Benefit Cost Ratios

In this section the analysis above (of net impacts and estimated net costs) is used to provide a basis upon which to draw conclusions concerning the “value for money” of the DDI Agri-Tech Uplift option. Value for money has been considered in terms of efficiency i.e. the ratio of outputs and impacts to the public sector costs of obtaining such effects.

Table 36 compares the net public sector funding requirement of £44.3 million<sup>110</sup> to the estimated net GVA impacts at the City Region, Scotland and UK wide levels. This analysis demonstrates a return to public sector funding of:

- £66.7m at the Edinburgh City Region level;
- £93.7m at a Scotland level; and,
- £248.0m at the UK wide level.

Table 36: Easter Bush Benefit Cost Ratio

	Public Sector Funding	Expected net benefit (NPV)	Ratio
Edinburgh City Region	£44.3m	£66.7m	1.51

<sup>109</sup> This is based on existing evidence from the UoE that on average 12% of graduates are employed in small and micro businesses.

<sup>110</sup> i.e. £28.3 million City Region Deal, £10 million BBSRC and £6 million EIDF.

Scotland	£44.3m	£93.7m	2.11
UK	£44.3m	£248.0m	5.59

## Sensitivity Analysis

### Optimism Bias: Capital Costs

In regard to capital costs - given the experience over the last decade of the Universities Estate department in successfully managing and delivering a wide range of new build projects on time and to budget - any risk of Easter Bush capital cost overruns is likely to be both minimal and, if manifest, will be borne by the University. Consequently, from a public sector funding perspective, there is no requirement to model optimism bias in regard to capital cost variations<sup>111</sup>.

### Optimism Bias: Time Delays

There may be the potential for **unexpected time delays** in completing the development of the new building or associated road infrastructure upon which development is predicated. Table 37 below outlines the impact upon the Easter Bush Cost Benefit ratios of 1, 2 and 3 year time delays. As illustrated, these suggest that while CB ratios will fall, they will remain positive at levels of 1: 3.37 even after a 3 year delay.

Table 37: Net GVA and Cost Benefit Ratios including development time delays

	City Region	Rest of Scotland	Rest of UK	UK	Cost Benefit Ratio
<b>Current Estimates</b>	£66.7m	£27.0m	£154.3m	£248.0m	5.59
<b>1 year delay</b>	£40.9m	£15.8m	£128.7m	£185.4m	4.18
<b>2 year delay</b>	£36.9m	£14.3m	£115.1m	£166.4m	3.76
<b>3 year delay</b>	£33.0m	£12.9m	£103.5m	£149.4m	3.37

### Optimism Bias: Operational costs and benefits

In this context HM Treasury Supplementary Guidance on Optimism Bias<sup>112</sup> states: “due to a lack of available data, Mott MacDonald was unable to recommend sound upper and lower bound optimism bias levels for operating expenditure (except for outsourcing projects) or benefits shortfall. Optimism bias should still be considered for these parameters. If there is no other evidence to support adjustments to operating costs or benefits, appraisers should use sensitivity analysis to check switching values. This should help to answer key questions such as:

- By how much can we allow benefits to fall short of expectations, if the proposal is to remain worthwhile? How likely is this?

<sup>111</sup> Recognising, however, that any such cost overruns represent an unanticipated use of (scarce) resources and consequent opportunity cost to the University and benefit realisation.

<sup>112</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/191507/Optimism\\_bias.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/191507/Optimism_bias.pdf)



- How much can operating costs increase, if the proposal is to remain worthwhile? How likely is this to happen?
- What will be the impact on benefits if operating costs are constrained?

In order to account for these risks and therefore **optimism bias** (such as **overestimating** the number of students trained and their subsequent employment destinations or **future cost increases reducing the delivery of benefits**) - the percentage reduction in benefits required (under the 2013 Green Book scenario) was also stress tested ("switched").

As indicated in Table 38 below benefits would need to reduce significantly – by as much as 82% - before this 'threshold' is breached.

Table 38: Easter Bush Benefit Cost Ratio – Optimism Bias Sensitivity Analysis

Easter Bush	DDI Programme Benefit	DDI Programme BCR	Reduction in DDI Programme Benefit	BCR Threshold	Reduction in DDI Benefit level
UK level	£248.0m	5.59	£44.3m	1	82%

#### **Specific Assumption changes and 2018 Green Book guidance**

In relation to the above four scenarios have been considered:

- Green Book (2013) assumptions – with talent benefits reduced by 50% to stress test the possibility that not all projected graduates receive DDI training over the 15 year programme period and/or of those trained only 50% may seek or gain employment in DDI related sectors;
- Green Book (2013) assumptions – with return on investment from research being achieved with a 6 year time lag (to reflect findings from BIES studies indicating a time lag of up to 6-7 years for research funding);
- Green Book (2018) assumptions for direct employment – with GVA uplift considered (net of counterfactual GVA) for direct TRADE related employment; and,
- Green Book (2018) assumptions – with 100% displacement at the UK level and Type I multipliers at the City Deal and Scotland levels.

As presented, in Table 39, when applying the above sensitivities to the Easter Bush Hub impacts, against the total undiscounted DDI Easter Bush costs of £44.3 million the UK BCR is:

- 2013 Green Book 50% Talent impact: 4.46;
- 2013 Green Book 6 year time lag for Research impacts: 5.03;
- 2018 Green Book GVA uplift for direct employment: 1.66; and,
- 2018 Green Book: 2.13.

In all four scenarios the DDI Programme impacts comfortably exceeds the minimum BCR 'threshold' of over 1:1 at the UK level.

Table 39: Easter Bush Benefit Cost Ratio – Additional Sensitivity Analysis

Cost Benefit reduction	Easter Bush – 100% scenario	50% Talent	6 year lag for Research	2018 Green Book GVA uplift for direct employment	2018 Green Book
City Deal Region	1.51	1.23	1.48	0.77	1.21
Scotland	2.12	1.76	2.07	1.99	1.64
UK	5.60	4.86	5.03	1.66	2.13

## Overall Summary

Table 40 presents a summary of Easter Bush benefits over 15 years (based on the approach described above for each element of TRADE). As illustrated this suggests that the Agri-Tech Hub will generate an overall discounted net GVA of £179.6m over the Programme lifetime.

Table 40: Summary of DDI TRADE Outcomes and Consequent Net GVA Impacts Summary (discounted)

DDI Target Outcomes	Projected DDI Uplifts in Easter Bush Activity	Read Across to Appendix I
Talent	<b>All the numbers presented in this table relate to the DDI uplift tables at Appendix G (namely Tables 3, 6, 7, 8 &amp; 9).</b>	
Total number of additional students and others engaged with DDI	141,284	<ul style="list-style-type: none"> <li>Equals the sum of all the DDI Talent uplifts in Table 9 (namely all credit bearing/non-credit bearing DDI participants and pathway courses, CPDs, MOOCs and other forms of interaction with Easter Bush Institute (i.e. <math>80 + 490 + 80 + 24,036 + 115,939 + 659 = 141,284</math>).</li> </ul>
Total number of additional DDI data-certificated students	1,084	<ul style="list-style-type: none"> <li>UG/PGT/PGR totals (as above) <b>BUT</b> for the purposes of identifying subsequent GVA impacts the first total of Table 3 Appendix G has been converted to "UG FTE"<sup>113</sup> [i.e. 80 pathway courses is converted to 3 UGs "equivalents"]. This level (of 3) has then been added to UG/PGT/PGR/ODL total levels (of 0, 490, 80 and 659) and 12% of this total amount removed and recognised under <b>Entrepreneurship</b>. (i.e. <math>(3 + 490 + 80 + 659) \times 88.0\% = 1,084</math>). Also note that CPDs (of 24,036) are excluded and allocated to <b>Adoption</b> and the 115,939 non-credit bearing and other interactions are <b>excluded</b> on the grounds that - for the purposes of the Easter Bush economic impact analysis - these interactions are not assumed to generate any substantive economic impact.</li> </ul>
Additional uplift in GVA	£65.3m	<ul style="list-style-type: none"> <li>This is based on the discounted lifetime earning impacts of the FTE DDI certificated students identified above, on campus student spending while attending courses in Edinburgh (in Table 9 of 490 Masters and 80 PhDs) and the direct income and expenditure related to the additional 9 academic staff employed by Easter Bush as identified at Table 7 (by 2031/32).</li> </ul>

<sup>113</sup> In order to subsequently estimate the GVA impact of those students in receipt of DDI Pathway Courses compared to those undertaking a full DDI undergraduate degree the former students proportion of their degree spent on a DDI Pathway Course has been captured by assuming each student would take one Pathway Course p.a. over a four year undergraduate degree programme worth 20 points (this has been adjusted to 10 points for Public Sector Pathway Courses) out of 480 for a full degree programme. Consequently 4% (or 2% for Public Sector Pathway Courses) of any future uplifts in GVA compared to their peers that take a "full" DDI programme course.

Research		
Total additional research income	£65.5m	<ul style="list-style-type: none"> <li>All funding streams excluding inflation and leveraged private R&amp;D funds identified in the total column of Table 9 (i.e. UK Research Councils (40.2), UK Government Depts. (8.9), Industry (0.5), EU and non-EU Overseas (7.0) UK Charities (5.6) &amp; HEI Partners (3.3)).</li> </ul>
Additional uplift in GVA	£113.6m	<ul style="list-style-type: none"> <li>Based on a net present value of the assumed return on investment of 20% per annum after 4 years to the wider economy<sup>114</sup> from this research funding over the lifetime of the City Deal programme and the GVA uplift from additional DDI related Easter Bush research staff employed of 42 (as identified at Appendix G by 2031/32).</li> </ul>
Adoption		
Total additional private sector investment leveraged (including DDI Adoption funding)	£52.9m	<ul style="list-style-type: none"> <li>Comprising the assumed (off campus and uninflated) £50.3m leveraged private R&amp;D spend (identified at Table 27) stimulated by University research<sup>115</sup> and the £2.6m direct adoption income (on campus and uninflated) identified at Table 28.</li> </ul>
Additional CPD modules	24,036	<ul style="list-style-type: none"> <li>As identified (previously) at Table 9.</li> </ul>
Additional uplift in GVA	£56.4m	<ul style="list-style-type: none"> <li>Based on the net present value of the assumed return on investment of 20% per annum after 2 years<sup>116</sup> to the wider economy from private leveraged funding (of £50.4 million at Table 28), assumed DDI adoption funding (of £2.6 million in Table 9) the GVA uplift from credit bearing CPDs (derived from BiGGAR Economics analysis) and the 3 adoption staff supported by Easter Bush activity (as per Appendix G by 2031/32).</li> </ul>
Datasets		
Number of new TRADE data sets utilised	~100 new data sets	<ul style="list-style-type: none"> <li>This is a "target level" which in the absence of any other information was assigned to each Hub based on allocated capital spend by UK government as % of total spend on innovation which in the cases of Easter Bush is 10%. Note that no economic impacts are assigned to these data sets (except as a potential facilitator of other Talent, Research, Adoption and Entrepreneurial activities).</li> </ul>
Entrepreneurship		
Number of DDI companies formed on campus	30	<ul style="list-style-type: none"> <li>As identified at Table 9 and is based on data supplied by academic sector leads in relation to the likely number of teams entering incubation programmes as supplied by these leads.</li> </ul>
Number of degree holding graduates likely to engage in DDI micro/SMEs	148	<ul style="list-style-type: none"> <li>Assumes that 12% of DDI undergraduates are likely to engage in setting up or joining DDI micro/SMEs upon graduating based on student destination data provided by the Careers Service (i.e. <math>(3 + 490 + 80 + 659) \times 12.0\% = 148</math>).</li> </ul>
Investment leveraged	£3.9m	<ul style="list-style-type: none"> <li>As identified at Table 9 (i.e. 30 start-ups) and based on past EI average funding of £129,750 per start-up based on the likelihood of securing successive support over each funding round from seed corn to series A-C funding.</li> </ul>
Additional uplift in GVA	£12.6m	<ul style="list-style-type: none"> <li>This is based on the discounted lifetime earning impacts of the 148 FTE DDI certificated students and direct company investment of £3.9 million in DDI start-ups.</li> </ul>
<b>Total GVA</b>	<b>£248.0m</b>	

<sup>114</sup> See in particular: <http://www.rsc.org/globalassets/04-campaigning-outreach/policy/research-innovation/economic-significance-uk-science-base-2014.pdf> and <https://london-economics.co.uk/wp-content/uploads/2017/11/LE-Economic-impact-of-Russell-Group-universities-19-10-2017-FINAL.pdf>

<sup>115</sup> See: <https://www.gov.uk/government/publications/research-and-development-relationship-between-public-and-private-investment>

<sup>116</sup> A reduced time lag of 2 years has been applied to adoption funding to reflect the nearer to market nature of such private funded research.

## SMART Objectives

The goal of the Data Driven Innovation (DDI) Programme is to establish the Edinburgh and South East Scotland City Region (City Region) as the **Data Capital of Europe**. In realising this ambition – as detailed below - the DDI Programme has a series of SMART objectives.

### Specific

As illustrated, in Table 41 overleaf the Easter Bush Agri-Tech Hub will deliver a range of (“net additional”) Programme outcomes:

- **Talent:** through net uplifts in FTE certified student participation levels of 1,084 across a range of online and on campus DDI courses;
- **Research:** in terms of attracting additional on and off campus research funding of around £65.5 million;
- **Adoption:** research effects which represent uplifts in industry focused research of around £52.9 million and 24,036 CPDs;
- **Data:** of around 100 new data sets (from, for example, the pooling of public and private sector Agri data to deliver new high impact insights) that will ensure the generation of the economic benefits from the other activities; and,
- **Entrepreneurship:** outcomes of around 30 new DDI Agri-Tech start-up companies (and around 150 graduates likely to be attracted to start up or join DDI micro and SME businesses).

Table 41: Summary of DDI objectives

DDI Target Outcomes	the Easter Bush Net Additional Fifteen –year uplift over Baseline position
<b>Talent</b>	
• Total number of DDI “FTE” data-certificated students	1,084
<b>Research</b>	
• Total research income	£65.5m
<b>Adoption</b>	
• Investment leveraged <sup>117</sup>	£52.9m
• CPD modules <sup>118</sup>	24,036
<b>Datasets</b>	
• Number of TRADE data sets utilised	~100 new data sets
<b>Entrepreneurship</b>	

<sup>117</sup> This includes the DDI Adoption funding.

<sup>118</sup> Only credit bearing CPD courses.

DDI Target Outcomes	the Easter Bush Net Additional Fifteen –year uplift over Baseline position
<ul style="list-style-type: none"> <li>Number of DDI companies formed on campus</li> </ul>	30
<ul style="list-style-type: none"> <li>Number of undergraduates likely to engage in micro/SMEs <sup>119</sup></li> </ul>	148

## Measurable

As reflected in each of the Hub Business Cases these specific outcomes have been modelled annually over the 15 year time period of the City Deal Programme. Progress against each target TRADE outcome will therefore be compared to each Hub Target and progress measured accordingly.

## Achievable

City Region partners (local business leaders, 6 local councils, 5 universities and 5 further education institutes) concluded Heads of Terms with the UK and Scottish Governments for an overall City Deal in July 2017. While agreement on the profile of funding is still to be finalised these Terms provided clear financial parameters within which the development of the innovation element of this Deal - namely the DDI Programme - could be progressed in terms of:

- **A Network of five DDI Innovation Hubs (Bayes Centre, Easter Bush Campus, Edinburgh Futures Institute, National Robotarium and Usher Institute):** that will enhance and accelerate the City Region's existing DDI capabilities (in *talent* development and *research, adoption* and *data* analysis);
- **The EIDF<sup>120</sup>:** to ensure international competitiveness by transforming the City Region's *data, research, adoption* and *talent* capacity through sustained capital investment in underpinning data capability, computing and data storage infrastructure; and,
- **The DDI Programme Delivery Office:** to engage with key industry sectors and drive cross-sectoral innovation through a range of *adoption* and *entrepreneurship* activities and inward investment and inclusive growth programmes.

A range of public, private and third sector partners have been engaged in developing the DDI Programme and projected outputs. All have expressed support for participation in the TRADE activities proposed. As a result the Programme has a strong pipeline of industry and public sector collaboration opportunities.

In addition the DDI Programme, and associated risk profile, is affordable and capable of being self-sustaining over the longer term. Both the capital investment and Programme activities proposed can

<sup>119</sup> As above footnote

<sup>120</sup> The EIDF infrastructure includes the provision of a regional IoT innovation platform covering an area of approximately 7,780 square kilometres. The network will provide the ability to generate dynamic data at scale to support the activities of EIDF and the Innovation Hubs and will provide a pre-commercial platform to support IoT-based data development in Scotland.

be accommodated within the Universities current business procurement and estates management processes.

Finally, DDI Programme activities will be governed by a dedicated DDI City Deal Executive Governance Board that will report to the overall City Deal Joint Committee (the latter of which will assume responsibility for the monitoring and evaluation of DDI Programme outcomes at the regional level).

In addition – and prior to setting up a separate Easter Bush Advisory Board – the University in general and the Easter Bush team in particular will seek advice, guidance and support from the Regional Enterprise Council that has recently been set up to support the wider City Regional Deal programme<sup>121</sup>.

## Relevant

Public sector investment in digital infrastructure and innovation is a strategic priority for both Scottish and UK Governments. As highlighted by (and referenced in the market failure section) the House of Commons Science and Technology Committee Second Report of Session : *“the digital skills gap (estimated at levels of 750,000 in 2017) is approaching crisis levels and this not only has economic implications but also puts the quality and security of this data risk. This risks UK Business being unable to grow the big data sector at the rate it should. In the meantime this skills gap is due to grow exponentially as big data reaches further into the economy”*.<sup>122</sup>

Consequently government intervention is predicated on:

- **Minimising risk:** as recognised in the Industrial Strategy addressing this skills gap requires Government intervention and investment: *“governments can make long-term investment that no single commercial or academic player can take alone. The modern nation state is the most powerful means we have of pooling risk”*.<sup>123</sup> Adopting this investor of first resort role reflects the importance of Governments in supporting technological change – from the internet to bio-tech – and achieving public-private partnerships that are more symbiotic;<sup>124</sup>
- **Providing cornerstone funding:** this role is also recognised by the Heads of Terms. The Universities do not have access to sufficient levels of other funding sources (either internally or externally) to deploy the data infrastructure and physical Hubs necessary to create the sustainable system of TRADE innovation activities - to the scale and timescales - that will support the Scottish and UK economies address the critical skills gaps identified above and, by extension, the industrial growth both Governments seek; and,

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<sup>121</sup> The overarching purpose of the group is to provide the voice of the business and third sector to guide the implementation of the Deal and support the other City Region deal partners towards a shared ambition for achieving sustainable and inclusive economic growth for the City Region. Government representatives are currently drawn from Skills Development Scotland and Scottish Enterprise.

<sup>122</sup> <https://publications.parliament.uk/pa/cm201617/cmselect/cmsctech/270/270.pdf>

<sup>123</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf)

<sup>124</sup> As indicated, for example, by Professor Mariana Mazzucato's: *“The Entrepreneurial State: debunking public vs. private sector myths.”*

- **Maintaining and enhancing the City Regions and UK competitive advantage:** the BEIS-sponsored Science and Innovation Audit (SIA) - which identified the City Region's pre-eminent position, within the UK, to best respond to global DDI opportunities as well as competitive threats - concluded that: *"if (public) investment is deferred, we run the risk of losing both competitiveness and output to other (global) digital clusters that have the confidence to invest. We also risk losing jobs in myriad parts of the economy as a result of automation extending into knowledge-intensive services"*.<sup>125</sup>

### Time Bound

The specific target outcomes are all set within the 15-year funding profile defined by the Heads of Terms.

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<sup>125</sup> SIA Summary

## 6 Commercial Case

### 6.1 Introduction

The Campus is in year 9 of an ambitious 20 year capital plan (with over £400m of funds being invested in the campus over the past 9 years<sup>126</sup>).

The plan aims to provide a dynamic and vibrant working environment with world-class facilities equipped with the latest technologies in order to:

- Continue to attract research scientists and clinicians of the highest quality;
- Foster and enhance collaborative Agri-Tech research; and,
- Provide an educational environment which sustains and expands links with industry.

### 6.2 Output Based Specification

#### Facilities and Equipment

As illustrated in detail at section 4.2.4 to realise the full potential to develop data-driven agriculture and translation to products, City Region Deal activities (and investment) will be distributed across the Easter Bush campus through:

- **Data Science** to underpin research and development, creating capacity for curation and data analysis followed by adoption of evidence-based ‘precision agriculture’;
- Infrastructure for data curation, including the expansion of animal facilities underpinning **animal biotechnology and gene editing**;
- Increased capacity in **Aquaculture genetics and health**; and,
- **Emerging technology platforms** in order to underpin strategically supported research; including evolving phenotypic and genomic technologies, as well as **modernisation** of proteomic and bio-imaging technologies.

#### Energy Centre (Combined heat and Power – CHP)

The University of Edinburgh Climate Action Plan sets out carbon reduction targets to the year 2020. To help address these targets large scale carbon emission reductions are required through investments in engineering infrastructure across the whole University Estate. In response to these targets and in support of the wider objectives of the Easter Bush Campus Masterplan 2025, the Easter

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<sup>126</sup> For further information on the capital building completed within the current development plan, which will be utilised by the Agri-Tech Programme, please see the campus development website: <https://www.ed.ac.uk/easter-bush-campus/where-people-thrive/campus-development/campus-buildings>



Bush Energy Centre and associated infrastructure were proposed. The Energy Centre is an essential component of the next phase of development for the Easter Bush Campus.

### **Other Infrastructure**

Alongside the Energy Centre, the other infrastructure works are fundamental to further developing the Easter Bush Campus and individual buildings. Roads, pathways and public realm works connect the buildings and allow ease of access for campus users. Low and high voltage electrical works provide supplies to current and future developments. Sustainable Drainage Systems (SuDS) allow surface rain water to soak away in a natural manner, with minimal impact to the surrounding environment and have no impact on the existing drainage network.

### **Roads**

The local road network (and junctions) which support access to the Midlothian Science Zone and Easter Bush Campus are currently operating at or over capacity and are a constraint on development. Planned future investment at the Easter Bush Campus will generate increased traffic movements. To address these issues this business case includes the construction of the A701 Relief Road, Bush Loan Junction, the connecting A702 Link road and Straiton Junction, which together will allow traffic to access the Easter Bush Campus from the A702 and A720 Edinburgh City Bypass, reducing the impact of congestion, particularly at Bush Loan.

The A701 Relief Road and A702 Link road will have various features:

- 7.3-metre-wide single carriageway (plus additional land for future dualing) ;
- 3-metre-wide shared path separated from the carriageway by a maintained verge strip between the carriageway and shared path;
- Four post and rail timber fences to be provided to both sides of road reserve; and,
- Street lighting throughout.

As indicated previously proposals to re-prioritise road space along the bypassed section of the A701 (Straiton to Gowkley Moss) to promote sustainable travel choices (walking, cycling and bus based public transport) will be developed in partnership with SEStran. This will also enhance the accessibility of the Easter Bush Campus for staff, students and visitors travelling from City centre campuses and from further afield.

## **6.3 Sourcing Approach**

The future build and management of Campus developments building has been and will be undertaken by the Estates Department of the University of Edinburgh. Similarly, procurement of services and equipment for Agri-Tech related matters will be undertaken in accordance with the University's own internal procurement policies and procedures, via the procurement team. More details on the build and procurement approach is set out in Appendix I.

The build and management of the enabling roads infrastructure (A701Relief Road, A702 Link Road, A702/Bush Loan junction and A701/A720 Straiton junction) will be undertaken by Midlothian Council

in line with their 2018 – 2030 Procurement Strategy<sup>127</sup> (and the Find a Tender Service or FTS, the successor to the OEJEU process) using a standard design and build approach.

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<sup>127</sup> With full details at: [https://www.midlothian.gov.uk/downloads/file/3055/procurement\\_strategy\\_2018-2023](https://www.midlothian.gov.uk/downloads/file/3055/procurement_strategy_2018-2023).

## 7.0 Management Case

### 7.1 Project Roles

The University and the Council will respectively oversee the Agri-Tech developments and transport improvements identified in this case. They are currently in the process of agreeing a concordat to ensure complimentary development timescales, adherence to joint project management protocols and common methods of progress reporting to the City Region Deal Joint Committee (that is responsible for delivering value for money from the Edinburgh and South East Scotland City Region deal and wider regional collaboration).

In the rest of this section consideration is given firstly to the University management case and then subsequently the Councils approach to project delivery.

### 7.2 University of Edinburgh

**The DDI Programme Board** is responsible for commissioning Agri-Tech investment at Easter Bush, working with the Easter Bush Senior Executive to establish and support the Agri-Tech Delivery Team and Agri-Tech Delivery Advisory Group (as detailed at Section 3.7, Figure 5).

The Agri-Tech Delivery Team will be responsible for the overall direction and management of Easter Bush data-related activities. Activities developed by the Agri-Tech Delivery Team will be presented to the School Senior Management Group for in-Campus approval before progressing to the DDI Programme Board.

The School Senior Management Group is ultimately accountable for the success of Easter Bush data investments and providing unified direction. The duties of the School Senior Management Group will include:

- Facilitating integration of the Easter Bush management team with the functional units of the DDI Programme, other DDI hubs and participating external organisations;
- Approval of major plans and resources and authorising any significant plan deviations;
- Approval of the initiation and completion of agreed DDI activities;
- Providing resources and authorising the funds necessary for completion of DDI activities;
- Ensuring effective communication within the Easter Bush team and with other stakeholders including periodic progress and KPI reporting to the DDI Programme Delivery Board;
- Providing strategic and operational advice to wider City Region Deal and University of Edinburgh governance as required; and,
- Advising on the resolution of disputes as they arise.

The **Agri-Tech SRO** Professor Bruce Whitelaw will report to the Head of School and SRO of the University **DDI Programme Delivery Board**, and chair the Agri-Tech Delivery Team.

The role of the **SRO** in the wider DDI Programme Board will be to ensure that the Easter Bush City Deal Programme is focused, throughout its life, on achieving and delivering outputs that will contribute to achievement of the KPI's and forecast benefits for the Easter Bush Campus and the wider DDI Programme.

The **Agri-Tech Delivery Team** are the principal owners of the Operational Delivery Plan delivering the TRADE themes, representing the interests of those designing, developing, facilitating, procuring and implementing the activities of Easter Bush. In this role the representatives are accountable for the quality of Easter Bush DDI activities and outputs. The role includes provision of necessary resources and ensuring that proposals for activities to be undertaken are feasible and realistic.

### **Agri-Tech Delivery Team**

Details of the remit and membership of the Agri-Tech Delivery Team are detailed at section 3.6.2. This team will work alongside the SRO to ensure the day-to-day management is within the parameters set out in the remit above.

The Agri-Tech Delivery Team will report to and inform the DDI Programme Board. The SRO is responsible for the appointment and on-going appraisal of the staff for the DDI Programme. The prime responsibility of Agri-Tech Delivery Team is to ensure that Easter Bush produces required Agri-Tech outputs in accordance with identified time, cost, quality, scope, risk and benefit performance objectives.

## **7.3 Procurement Strategy**

Please refer to Section 6.

## **7.4 Project Plan**

The Easter Bush offering is based on:

- Diversifying the teaching portfolio in Agri-Tech data skills especially in postgraduate and CPD activity;
- Enhancing the research capabilities for data acquisition (e.g. enhanced genotyping by DNA sequencing combined with innovative deep-phenotyping through enabled animal and research facilities);
- Improving the acquisition, curation and analysis of data through the creation of an Agri-Tech Data Innovation Hub which will be home to several specialist Hubs – to enhance research, adoption and entrepreneurship activity accordingly; and,
- Sharing knowledge with the public by disseminating the Agri-Tech data skills into outreach activities for areas with low science capital and in rural communities.

The above will facilitate appropriate long-term partnerships and collaborations with academic and private sector data owners, provide the environment to nurture and up-skill the needed talent pool, and act as a powerful attractor with which to build commercial partnerships and private sector investment.

Appendix J presents a summary project plan that describes the Agri-Tech proposition which underpins the themes of Talent, Research, Adoption, Data and Entrepreneurship at Easter Bush. Each theme has component activities that are designed to support the deliverables expected of Easter Bush. Enabling resources are also considered.

The formal points at which progress will be monitored, controlled and reviewed are annually, with gateway reviews undertaken at years 3, 5 and 10.

## **7.5 Contract Management**

Not applicable.

## **7.6 Risk Management Strategy**

Appendix K sets out the approach to Risk Management for the Project. This approach conforms to existing risk management protocols<sup>128</sup>. Risks that could impact Easter Bush's ability to deliver its target outputs have been identified. The most pressing risks are presented in Table 43 overleaf.

## **7.7 Benefits Realisation Plan**

Please refer to the Programme M&E plan for further details.

## **7.8 PIR/s and PER**

A well-established Post Implementation Review (PIR) process is in place, comprising both non-financial and financial evaluations. The first Easter Bush PIR should occur within 12 months of operation. A number of follow up reviews can be initiated as required to ensure the project remains on track to meet financial and non-financial targets.

## **7.9 Contingency Plan**

The Easter Bush Campus undertakes annual reviews of its risk registers across all aspects of the teaching, clinical, science and operational activity. These registers rank the risks in line with the University's policies and procedures then, dependent upon the risk level, sets policies, procedures and action plans to mitigate the risk, and contingency plans where risks are difficult to mitigate. These risk registers inform the annual review of both Business Contingency Plans and Disaster Recovery Plans for the overall Campus. As a consequence, if any specific aspect of the Programme is not performing as per expectations, then there are clear mitigation and contingency plans in place to address this.

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<sup>128</sup> Further information can be found at <http://www.ed.ac.uk/internal-audit/associated-processes/risk-management>.

Table 43: Easter Bush key risks and mitigation actions

Type	Description	Probability	Impact	Rank	Proximity	Response	Mitigation
<b>External</b>							
	Delivery of road component of the EB Programme – due to delivery being dependant on external parties to the University increases scope and cost.	3	5	15	Medium	Treat and Monitor	Strategic influence at the highest level to move the project on to the correct trajectory - pursue close working relationship with Midlothian Council to deliver designs
	New Courses (PGT/CPD/MOOCs etc.) are not developed in time to produce the planned outputs	3	3	9	Medium	Treat and Monitor	Appointments of CPD Director and Talent Lead to activity, workshops to promote the development of courses and organise resources
	Infrastructure costs (Computer/utilities) and timescales exceed plan	2	5	10	Medium	Treat and Monitor	Build in adequate contingencies and ensure that regular project comms take place with EPCC, Procurement, Estates and Scottish Power
	Damage to reputation/scientific credibility especially in commercial sector	1	3	3	Low	Mitigate	Allocate specific responsibilities to senior management for strategic partnerships. Work with EI to ensure maintenance of confidentiality between companies  Monitor and re-enforce adherence to appropriate policies and procedures
	Easter Bush campus facility destroyed by e.g. flood, fire etc. losing significant equipment and halting all projects	1	3	3	Low	Mitigate	Adopt leading practice building protection approaches Maintain disaster recovery plan Ensure H&S compliance and regular building maintenance to mitigate likelihood of accidental damage
	Changes in UK Funding Environment impacts on availability of research funding available	3	3	9	Medium	Mitigate	Promote awareness of new initiatives and mentor academics. Develop a close partnership relationship with key strategic funding bodies.
	Unable to secure the Data Agreements required with external partners	3	4	23	High	Treat and Monitor	Ensure that EI & Legal are actively involved with negotiations with partners, work with programme and

Type	Description	Probability	Impact	Rank	Proximity	Response	Mitigation
							project leads to ensure the strategic partnership lead is involved at early stage Ensure data agreements have flexibility for the linked-up analysis research
	Major objections result in stakeholder disagreement and withdrawal of support	1	2	2	Low	Mitigate	Conduct thorough stakeholder engagement to assure buy-in
<b>Operational</b>							
	Unable to recruit staff in niche skill areas (e.g. bioinformatics, quantitative genetics etc.)	2	2	4	Low	Mitigate	Promote the additional benefits of working on Campus (work/life balance support, training, pensions etc.) Have a focussed succession and recruitment plan, and a highly evolved staff training and rewards plan Make sure of market retention supplement mechanism is in place, where required.
	Inadequate data protection policies and A(SP)A controls	1	3	3	Low	Mitigate	Ensure policy compliance to both data protection and security and Home Office A(SP)A
	IT and data infrastructure is inadequate for demands	2	3	6	Medium	Mitigate	Ensure on-going EIDF group dialogue and shared agreement of IT/data requirements
	Demand from other Estates projects affects ability to deliver Easter Bush required infrastructure	2	3	6	Medium	Mitigate	Maintain Estates focus on project
	Insufficient engagement and adoption (both internally and externally) impacts reputation and demand	2	3	6	Medium	Mitigate	Develop and enact engagement plan – with EI and Outreach and Public engagement team
	Innovation Centre tenants not recruited as per plan	1	2	2	Low	Mitigate	CEO maintains dialogue with current tenants and management recruitment of new tenants
	Global Academy recruitment (undergrad, postgrad & online) does not happen as per plan	2	3	6	High	Mitigate	Effective leadership via new Chair Maintain strong focus on recruitment against plan – with marketing involved in recruitment strategy

Type	Description	Probability	Impact	Rank	Proximity	Response	Mitigation
	Scientific requirements and technology assumptions prove to be incorrect	2	2	4	Low	Mitigate	Ensure good awareness of technology demands and technology solutions – undertake horizon scanning and market analysis at regular intervals
	Inability to reach agreement with delivery partners	2	3	6	Medium	Mitigate	Maintain strategic partnerships and activities through leadership in both programme and with EI
<b>Change</b>							
	User requirements assumptions prove to be incorrect	2	2	4	Low	Mitigate	Establish action groups. Undertake market analysis and public surveys at regular intervals to test assumptions
	Loss of ability to influence regulatory fora that guide and constrain Easter Bush activity	2	2	4	Low	Mitigate	Identify gaps in spheres of influence, involve wider University and its partners where appropriate to assist with influence
	Change in core systems make it difficult to secure data for evidencing DDI deliverables	2	2	4	Low	Mitigate	Establish contingency plan – have clear links to other ways of securing data if core system does not deliver.

## 7.10 Midlothian Council

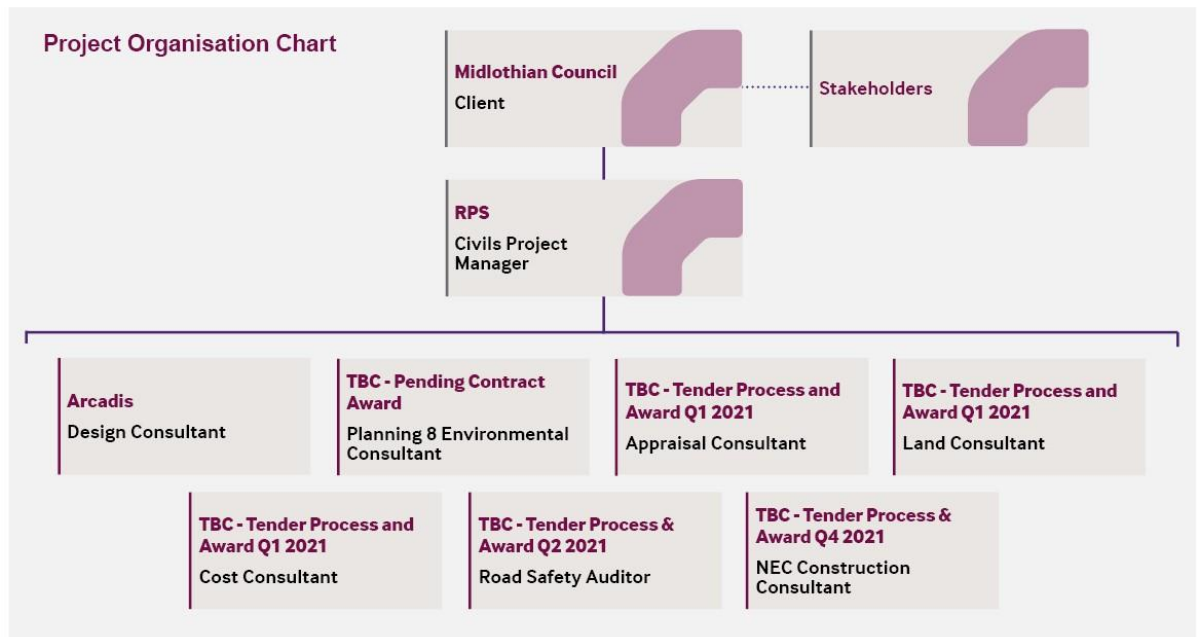
Midlothian Council (MLC) is engaging a team of Project Delivery Partners (PDPs) to deliver the A701 Relief Road and A702 Link Project. The management structure of the PDPs is set out in Figure 9 overleaf and their roles are:

- Civils Project Manager (CPM) - manage the delivery of the project;
- Design Consultant (Designer) - design and technical specifications for the scheme;
- Planning and Environmental Consultant (PEC) - managing the planning application and related environmental matters;
- Lands Consultant (PC) – consult and manage all landowners;
- Cost Consultant/ Quantity Surveyor (QS) - cost management and estimating;
- Appraisal Consultant - traffic and transportation modelling and appraisal services;



- Road Safety Auditor – undertake road safety audits; and,
- NEC Construction Consultant: supervise and administer the construction works for the project.

*Figure 9: Proposed Project Management Structure Midlothian Council*



RPS were commissioned in June 2020 by MLC as the “CPM” (for the A701 Relief Road and A702 Spur Road project) to:

- Provide technical advisers support to the Employer’s Project Team to support the management, procurement and delivery of the project;
- Engage with key stakeholders and act as a point of contact for all stakeholder introduction meetings;
- Progress consultations with the various bodies required to ensure the project constraints, stakeholder requirements and project outcomes are fully understood; and,
- Manage regular Stakeholder Steering Group meetings.

Arcadis were appointed as the “Designer” in December 2020 following a tender process through Lot 1 of the Scotland Excel framework. The Designer role includes:

- Provision of all design services for the delivery of the scheme through the statutory procedures, up until handover to the Design and Build Contractor;
- Deliver a robust options case and final route option;
- Develop a planning stage scheme design that is accepted by all key stakeholders (including regulatory bodies);
- Design of all Accommodation Works;
- Obtaining all technical approvals;

- Preparation of a complete set of performance specifications, specimen designs and the like for inclusion in the Construction Contract Documents; and,
- Reviewing the Design Build Contractors design submissions and verification for compliance.

The tender process has concluded for the PEC, under Lot 3 of the Scotland Excel framework, and an award is pending. A detailed topographical and underground utility survey is currently being procured under Lot 4 of the Scotland Excel framework. Tender returns are scheduled for 22.01.21 and an award is anticipated mid-February. Finally, the Lands, Appraisal and Cost Consultants will be tendered during January 2021 with all awarded during Q1 2021.

The management of the transport improvements will involve seven specific work stages:

1. Options Generation/Appraisal;
2. Specimen Design;
3. Statutory Procedures (including Land Acquisition);
4. Tender Document Preparation;
5. Procurement Support of Contractor;
6. Construction/Site Supervision; and,
7. Post Construction, Defects Management and Maintenance.

The Scottish Transport Appraisal Guidance (STAG) principles and criteria are the overarching requirements applicable to the above and will be applied throughout all stages of the project.

### **7.11 Options Generation/Appraisal**

This stage will involve the generation and evaluation of options for the works, to deliver the required project outcomes, and the refinement - through an appraisal process - to establish the most appropriate and cost-effective option.

Alternative route options, to those proposed routes identified in the Midlothian Local Development Plan, which have the potential to deliver the project objectives, will also be assessed in accordance with the principles of Stage 1 - Design Manual for Roads and Bridges (DMRB) Assessment, to identify the land use, environmental, engineering, economic and traffic advantages, disadvantages and constraints.

A Stage 2 assessment will be undertaken of short listed options identified at Stage 1. This will include analysing and presenting in more detail the advantages, disadvantages and constraints associated with the options, including the factors to be taken into consideration in choosing a preferred option. It will also include feedback from consultations with key stakeholders, statutory authorities and statutory consultees.

## **7.12 Specimen Design**

This stage will cover:

- Preparation of an assessment in accordance with the principles of Stage 3 DMRB scheme assessment for a preferred option;
- Voluntary and statutory consultations, including organisation of, and attendance at, public exhibitions, meetings etc; and,
- Preparation of specimen designs (including relevant Road Safety Audits and works cost estimates) for the preferred option to a level of detail sufficient to permit the preparation of statutory consent applications.

## **7.13 Statutory Procedures (including Land Acquisition)**

This stage covers the obligations in relation to delivering the statutory procedures and land acquisition for the scheme.

## **7.14 Tender Document Preparation**

This stage covers the preparation and collation of tender documentation in sufficient detail to enable tenders to be obtained for the construction of the project.

## **7.15 Procurement Support of Contractor**

This stage will cover assessing, evaluating and appointing a contractor to construct the scheme.

## **7.16 Construction/Site Supervision**

This stage will cover the construction of the project by the appointed Design and Build contractor and supervision of the construction works.

## **7.17 Post Construction, Defects Management and Maintenance**

This stage will cover the post construction administration, evaluation and monitoring of the project post-construction during the handover and defects period.

## **7.18 Identifying & Managing Risks & Potential Obstacles**

The risk management process adopted throughout the project stages will be aligned with the STAG process for risk management and will incorporate value engineering and management. Current risks are outlined in Table 44.

Table 44: Identified risks and mitigation approaches

Identified Risk/Challenge	Probable.	Impact	Rating	Potential Impact	Mitigation and Management	Interactions, Risk Owner (Support)
Managing Stakeholder Expectations – Potential new developable commercial allocation identified in LDP (EC3)	H	M	6	Scheme considerations within LDP, including ensuring road access to development sites, new road openings, proposed road speed or access visibility requirements, pedestrian or cycling allowance or links with wider area is incorporated within the design	CPM to verify and confirm design requirements, to ensure they are reflected in Design Brief. Ensure pedestrian or cycling standards are allied. Ensure consistency with Design Consultant.  Ensure that appraisal brief accounts for existing modelling and can be developed for full appraisal. Ensure developments within the LDP are included in the brief for appraisal.  Continued engagement with MLC planning and economic development teams to confirm appraisal parameters and planning requirements. (CPM)  CPM to ensure existing relationships (landowners and developers) are integrated into the consultant teams.	CPM, Design Consultant, Appraisal Consultant, Midlothian, Other Stakeholders
Managing Stakeholder Expectations – Potential residential area partners in central areas near A703 crossover junction, and west to A702	H	M	6	Third parties, such as housing developers influencing design, access, proposed road speed, pedestrian, cycling allowance or construction phases due to developer contribution payments		
Scheme route option changes, including junction type or routing – either to cater for objections or other planning conditions	L	H	3	Delay in carrying out redesign Requirement for further investigations (delay) due to revision of scheme	Planning and design consultants brief will highlight the need for a robust options report, to support the planning application route.  CPM to understand the planning department requirements prior to developing the brief for consultants.  Early agreement of junction needs and layout with Transport Scotland (Design Consultant)	Planning Consultant (CPM, Design, Environment, Midlothian Council)
Extents of the Environmental Statement not full defined – May be requirement for extended	M	H	6	Additional planning and environmental costs, delays	EIA Screening and Scoping to be incorporated into the brief for the Environmental Consultant. CPM will get an initial opinion (from	Initially: CPM After Inception: Environmental Consultant

<b>monitoring and elements of a full EIAR</b>				to programme delivery	Planners) prior to establishing the brief (during inception) Research and liaison with Planning Team and Council Planning Department Effective management of the Environmental Consultant to ensure that scope is fully realised (including statutory consultations)	
<b>Difficult/ Objectionable landowners / community action groups and other stakeholders</b>	M	H	6	May limit or delay access to specific areas of site for surveys and investigations. CPO process delayed by challenges to the schemes	Maintain good relationships created during the A701 GI phase. The connections made with landowners to be passed on to the design, environment and other consultants. Other consultant briefs to emphasise the importance of communications and agreement with landowners. Consideration to engaging Community Engagement specialist to help steer land acquisition/ access.	CPM, (Midlothian Council, Community Engagement, Environment and Planning Consultants)
<b>Scheme Cost Benefit Analysis fails to demonstrate value for money</b>	M	M	4	The scheme fails to justify construction, due to failure to properly consider wider benefits, traffic volume changes or high capital cost elements	Ensure the Appraisal Consultant brief specifies proper and detailed approach to capturing scheme benefits, such as Community Benefits Wider Safety Benefits Environmental Benefits Effective Traffic Modelling cordon (and benefits to other parts of the network) Working with QS and Design Consultant to maintain capital cost of the scheme, with enhancements being incorporated only when a tangible benefit can be identified. Manage land costs through efficient design.	CPM, Appraisal Consultant, Quantity Surveyor, design Consultant, Midlothian
<b>Environmental Risk – ecology / protected species encountered</b>	L	H	3	Delays or need to change route at a late stage in the project	CPM to provide early scoping brief, to include early identification, to Environmental Consultant (walkovers and consultation) Monitor outcome	CPM (Environmental Consultant)
<b>Environmental Risk – Archaeology encountered</b>	L	H	3	Delays or need to change route at a late stage in the project	CPM to provide early scoping brief, to include early identification, to Archaeological Consultant (desk study and field work). Monitor outcome	CPM (Archaeological Consultant)
<b>Environmental Risk – ground contamination</b>	L	H	3	Unforeseen contamination risk and large additional associated costs	CPM to provide early scoping brief, to include early identification, to Environmental Consultant (review GI and site history). Monitor outcome	CPM (Environment – Geocontam. Consultant)
<b>Excessive scheme Cost or funding Risk</b>				Project fails due to poor business case	Prepare thorough cost estimates at appropriate stages to avoid surprises.	

					Match scheme specification and costs to expected benefits.	
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## Edinburgh and South East Scotland City Region Deal Joint Committee

**10am, Friday 5 March 2020**

### **Fife Industrial Innovation Investment Programme – ESESCR Deal - Full Business Case for Tranche 2**

**Item number 5.4**

#### **Executive Summary**

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This paper seeks approval for the second tranche of investment (years 4 – 6) of the Fife Industrial Innovation Investment (i3) Programme. The Fife i3 Programme is a ten-year investment programme in innovation, business property and employment land in Fife.

**Keith Winter**

Executive Director Enterprise & Environment, Fife Council

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## **Fife Industrial Innovation Investment Programme – Edinburgh and South East Scotland City Region Deal - Full Business Case for Tranche 2**

### **1. Recommendations**

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- 1.1 To approve the Full Business Case (FBC) included as Appendix 1 to this report;
- 1.2 To note that the Full Business Case (FBC) included as Appendix 1 to this report has been approved by Fife Council's Policy & Coordination Committee on 23 November 2020, confirming Fife Council's commitment of the resource required for delivery;
- 1.3 To note that this paper follows the Full Business Case for the Fife i3 Programme, which was approved by this Committee on 1 March 2019; and
- 1.4 To note that a further Full Business Case for the third tranche (years 7 – 10) of investment will be prepared in 2023/24.

### **2. Background**

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- 2.1 The Fife Industrial Innovation Investment (i3) Programme is being delivered as part of the Edinburgh and South East Scotland City Region Deal's innovation theme. The Programme will deliver a sustained investment programme in modern business premises to support the delivery of Inclusive Growth and Innovation in Fife. It will increase the supply of serviced employment land and new industrial, office and business space in Fife.
- 2.2 The business case for a ten-year programme of investment has been approved, along with a detailed business case for the first three years of the programme (Tranche 1). This Business Case (Appendix 1) sets out the detailed arrangements for years four to six of the Fife i3 Programme (Tranche 2) and confirms the agreed profile for investment, grant drawdown and Council's capital contribution.
- 2.3 Since the original Programme business case was approved, the COVID-19 pandemic has affected programme delivery (in particular costs and timescales) and this updated business case reflects a base case expected scenario that factors in the latest information on this and other risks. This is a time of significant uncertainty and, where possible, actions to mitigate risk are being identified and developed in parallel with the delivery of the Programme.



- 2.4 The investment plans for Tranche 2 also reflect a stronger focus on carbon reduction and management measures than the original business case, following the declaration of a climate emergency. The preparation of this business case draws on feasibility work undertaken during Tranche 1 of the programme to explore opportunities to improve the carbon efficiency of the programme across the building life cycle (construction, operation, demolition and/or re-use). This work is ongoing and will continue to inform the approach.
- 2.5 The programme is on track to deliver almost 4,000m<sup>2</sup> of new business accommodation and provide 4.8ha (gross) of immediately available, serviced employment land.

### 3. Main report

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- 3.1 The original Full Business Case for Tranche 1 was based on delivery over 10 years of a total of £48.4m investment. The total programme of investment outlined in this updated business case has increased in response to rising costs of site servicing and construction, bringing the total investment to £50m. The additional investment comes from the Vacant and Derelict Land Fund (VDLF).
- 3.2 Some changes have been made to the Programme to respond to:
- Cost rises (both prior to, and as a result of, COVID-19)
  - Private sector interest in engaging with the Programme to deliver some outputs in a different way
  - Lessons learned from Tranche 1 (particularly in relation to procurement)
  - An increased focus on carbon reduction and a desire to explore refurbishment activity as a means of managing costs and reducing the overall carbon footprint of the programme's activities
  - Lower than expected capital receipts in the early years of the Programme due to loss of net site area available for disposal
  - Rephasing and consolidation of some projects to manage some delays, to deliver improved value for money, and to keep the Programme on budget
  - Reconsideration / delay of projects delivering office space to account for uncertainty about medium/long-term office market prospects post-COVID.
- 3.3 An update on each project in the Programme is provided in Section 3.3 (Table 3) of the appended Full Business Case. Overall, there is a reduction in the expected programme outputs, and an increase in the level of investment required to deliver these outputs. This has arisen due to the significant cost increases (mainly associated with COVID-19). Ongoing cost rises are assumed to continue throughout Tranche 2 of delivery.
- 3.4 An Economic Impact Assessment (EIA) has been undertaken to appraise the likely impact of the Fife i3 Programme on key economic indicators. The EIA uses economic data and evidence, alongside key assumptions to model the impact of the programme. The inputs and assumptions have been updated in line with Tranche 1

delivery (actual and expected). The expected number of permanent jobs created by the Programme has reduced slightly from 1,095 to 1,035. This is still in line with expectations of around a thousand jobs, and the modelling should be considered indicative. The Benefits Realisation Approach for the Programme is shown in Appendix 3 of the Tranche 2 FBC.

- 3.5 Arrangements for internal reporting and issue management within the Council are now established. It is envisaged that these arrangements will continue throughout Tranche 2. This provides three formal escalation points for issues / gateways for decision-making within Fife Council, depending on their severity and importance. The Fife i3 Programme ultimately reports to the Edinburgh and South East Scotland City Region Deal Executive Board and its Joint Committee. As well as regular monthly reporting, this is the escalation point for major issues that threaten the programme's viability.

## 4. Financial impact

- 4.1 The updated Full Business Case for Tranche 2 shows a small increase in the Programme surplus from £14 million in the Programme Business Case to £15.7 million. The NPV for the programme is expected to be a surplus of £3.5 million – this is an increase from the original Programme Full Business Case, which showed a £0.177 million NPV surplus. Any surplus will be managed by Fife Council's Enterprise and Environment Directorate in accordance with Fife Council's medium-term financial strategy.
- 4.2 The results of the latest financial modelling and the movement between the financial modelling for the Programme Business Case and Tranche 2 Business Case are shown in Section 7 of Appendix 1.
- 4.3 The movement in grant profile from the City Deal Financial Plan is shown below, this is based on claims being made annually in arrears for 79% of costs incurred. Compared to the City Deal Financial Plan, the Programme has advanced spend in Year 1, and is on profile for the remainder of its delivery. It is assumed that there will be a reduction in grant in Year 9, recouping early advancement, however this could vary to respond to pressures elsewhere in the wider City Deal Programme.

	2019/ 20 Year 1	2020/ 21 Year 2	2021/ 22 Year 3	2022/ 23 Year 4	2023/ 24 Year 5	2024/ 25 Year 6	2025/ 26 Year 7	2026/ 27 Year 8	2027/ 28 Year 9	TOTAL
City Deal Financial Plan		(2.840)	(3.748)	(5.173)	(6.317)	(8.046)	(2.852)	(3.928)	(2.096)	(35.000)
Current Position*	(1.433)	(2.840)	(3.748)	(5.173)	(6.317)	(8.046)	(2.852)	(3.928)	(0.663)	(35.000)

\* variable BCIS during Tranche 2

## 5. Alignment with Sustainable, Inclusive Growth Ambitions

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- 5.1 The Inclusive Growth Challenges for the City Region and a Framework to tackle these are set out in Pages 6/10 of the City Region Deal document. The innovation focus of the Fife i3 Programme offers an opportunity to support companies to work in new ways that allow them to succeed and create new and better jobs. The Fife i3 Programme aligns with the City Region Deal's Integrated Regional Employability & Skills Programme (IRES), which includes a data-driven innovation (DDI) targeted skills gateway. Together these deliver a strong contribution to inclusive growth.
- 5.2 The commitment to this is unchanged from the original Fife i3 Programme Full Business Case and aligns with the recently approved Benefits Realisation Plan for the Edinburgh and South East Scotland City Region Deal.
- 5.3 Moving into Tranche 2, all sites have been reassessed and a number of new sites considered, based on proximity to the public transport e.g. the Fife Circle railway line. New assessment criteria have been added to support a stronger focus on their low carbon potential and overall sustainability in line with the climate emergency declaration locally and nationally.
- 5.4 The additional criteria considered were:
- Greenfield – greenfield sites are generally not preferred unless they fulfil other sustainability criteria or make a significant contribution to other strategic objectives
  - Passive design – can the site accommodate a passive design, particularly in relation to the orientation of the building to maximise passive solar gain?
  - Renewables – does the site have access to any renewable energy source (e.g. district heat network, air source or solar power)?
  - Vacant and Derelict Land – will the project remediate vacant and derelict land or property?

## 6. Background reading/external references

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- 6.1 [Edinburgh and South East Scotland City Region Deal Joint Committee. Friday, 1st March 2019 10.00 am \(Item 5.4\)](#)
- 6.2 [Fife Council Policy & Coordination Committee. 23 November 2020 \(Item 11\).](#)

## 7. Appendices

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- 7.1 Appendix 1 – Fife Industrial Innovation Investment Programme – Tranche 2 Investment Full Business Case

# **Fife Industrial Innovation Investment Programme – Tranche 2 Investment**

## **Full Business Case (FBC)**

Edinburgh and South East of Scotland City Region Deal

**Version No: 0.0**

Issue Date: October 2020

## Purpose of this document

This document sets out the Full Business Case for years 4 to 6 (Tranche 2) of the Fife Industrial Innovation Investment (i3) Programme. It builds on the Full Business Case for the Fife i3 Programme, which was developed and approved in March 2019<sup>1</sup>. This set out the principles of the Programme and a detailed plan for years 1 to 3 (Tranche 1) of investment.

This document updates each of the five cases with the latest information available, including the outlook for recovery from the COVID-19 pandemic and the Programme response to the climate emergency. It considers the detailed arrangements for delivery of the upcoming tranche and affirms that:

- the most economically advantageous investment programme is being delivered;
- the Programme is affordable and financially viable; and
- the required outputs and benefits can be successfully delivered.

## Version history

Version	Date Issued	Brief Summary of Change	Owner's Name
Draft 0.0	17.08.20	First Draft Table Outline	K Marsh
Draft 1.0	24.09.20	First Draft	K Marsh
Draft 2.0	12.10.20	Updated draft reflecting financial model results	K Marsh
FINAL	05.11.20	Approved by FC P&C Cttee	K Marsh

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<sup>1</sup>

[https://democracy.edinburgh.gov.uk/documents/s9936/Full\\_Meeting\\_Papers\\_Edinburgh\\_and\\_South\\_East\\_Scotland\\_City\\_Region\\_Deal\\_Joint\\_Committee\\_01.03.19.pdf](https://democracy.edinburgh.gov.uk/documents/s9936/Full_Meeting_Papers_Edinburgh_and_South_East_Scotland_City_Region_Deal_Joint_Committee_01.03.19.pdf) (see Item 5.4)

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# 1. Executive summary

## Overview

The Fife Industrial Innovation Investment (i3) Programme is being delivered as part of the Edinburgh and South East Scotland City Region Deal's innovation theme. The Programme will deliver a sustained investment programme in modern business premises to support the delivery of Inclusive Growth and Innovation in Fife. It will increase the supply of serviced employment land and new industrial, office and business space in Fife.

The business case for a ten-year programme of investment has been approved, along with a detailed business case for the first three years of the programme (Tranche 1). This business case sets out the detailed arrangements for years four to six of the Fife i3 Programme (Tranche 2).

Since the Programme FBC was approved, the COVID-19 pandemic has affected programme delivery (in particular costs and timescales) and this updated business case reflects a base case expected scenario that factors in the latest information on this and other risks. This is a time of significant uncertainty and, where possible, actions to mitigate risk are being identified and developed in parallel with the delivery of the Programme.

The investment plans for Tranche 2 also reflect a stronger focus on carbon reduction and management measures than the original business case, following the declaration of a climate emergency. The preparation of this business case draws on feasibility work undertaken during Tranche 1 of the programme to explore opportunities to improve the carbon efficiency of the programme across the building life cycle (construction, operation, demolition and/or re-use). This work is ongoing and will continue to inform the approach.

## Phasing and Delivery

The original FBC was based on delivery over 10 years of a total of £48.4m investment. The total programme of investment outlined in this updated business case has increased this is in response to rising costs of site servicing and construction. The additional investment comes from Vacant and Derelict Land Funding (VDLF).

Some changes have been made to Tranche 1 delivery to respond to:

1. Cost rises (both prior to, and as a result of, COVID-19)
2. Private sector interest in developing a site that was originally envisaged for City Deal development – this has created an opportunity to replace a build project with site servicing activity (and servicing a larger site area than originally envisaged)
3. Lessons learned from procurement – much larger than expected economies of scale from procuring larger projects
4. A desire to explore refurbishment activity as a means of managing costs and reducing the overall carbon footprint of the programme's activities
5. Lower than expected capital receipts due to loss of net site area available for disposal (partially recovered in Tranche 1, with further efforts in Tranche 2)



6. Delay to the planned works at Fife Interchange North which have arisen due to site constraints. A risk mitigation plan developed before the Programme commenced to advance preparatory work for a site at Dalgety Bay has been activated and these sites will be reordered, bringing forward the site at Dalgety Bay and pushing back Fife Interchange North. This brings an added opportunity to combine two planned phases of build out into a single consolidated project, delivering improved value for money. The Dalgety Bay project build has also increased in size from 966 m<sup>2</sup> to 1,393 m<sup>2</sup> of floorspace constructed

Overall these changes result in

- An additional 739 m<sup>2</sup> of floorspace (including 692 m<sup>2</sup> of refurbished space)
- 1.7 Ha less serviced land
- An additional £2.8 million in Programme investment costs for this Tranche – these have been met from a combination of Fife Council capital investment, Vacant and Derelict Land Fund (VDLF) grants and accelerated drawn down of City Region Deal grant.

During Tranche 2 further amendments are envisaged to the delivery of the Programme, specifically:

1. Review of commitments to reflect anticipated cost increases relating to Brexit, COVID-19 and carbon reduction measures, and the need to continue to deliver the Programme within the agreed overall funding available
2. Review of all new build projects to look at carbon reduction opportunities, improving building flexibility and future-proofing – a budget allowance of 10% of original expected costs has been added to all Tranche 2 and Tranche 3 projects to allow for changes to be implemented
3. Reconsideration / delay of projects delivering office space to account for uncertainty about office market prospects post-COVID
4. Additional build at West Way, Dalgety Bay, delivering more floorspace at this location – this project will be accelerated and will now be delivered during Tranche 1 of the Programme
5. A single phase build out at Fife Interchange North, with the previously envisaged Tranche 1 investment delayed to Tranche 2 and the two projects combined. The overall floorspace being delivered has reduced from 2,787 m<sup>2</sup> to circa 2,300 m<sup>2</sup>. The site will still be acquired and serviced during Tranche 1.
6. Development of risk mitigating measures reflecting the significant uncertainty in the wider environment relating to land values, development costs, rental demand and the wider macroeconomic environment.

Overall these changes result in

- A reduction in completed floorspace of 2,381 m<sup>2</sup>
- No change to the expected area of land serviced

- A reduction of £1.8 million in Programme investment costs for this Tranche. This offsets some aspects of increase during Tranche 1 that were simply accelerated spend, rather than additional monies.

It is envisaged that further changes will be required to Tranche 3 of the Programme. At this point these have not been explored in detail, but it is clear that the development envisaged in the original Programme FBC is no longer deliverable due to accelerating costs beyond the level of inflation used to develop the original business case and the financial implications of changes to respond to the climate emergency. In order to put forward a viable Programme the following changes have been made to Tranche 3:

1. The two investments proposed in Glenrothes – the Queensway Innovation Centre and the industrial investment at Westwood Park have been combined into a single project. The exact nature and location of this investment will be determined when there is more clarity on the longer term nature of any changes arising from COVID-19. The combined budget for this is £5.8m (the original budget for both projects being delivered separately totalled £9.1m). An assumed build out of circa 1,600 m<sup>2</sup> has been assumed for the purposes of modelling benefits.
2. The development of 966 m<sup>2</sup> at Site 3 in Dalgety Bay has been removed from the Programme. The site will still be serviced in Tranche 2 of the Programme as originally envisaged but will then be marketed for sale rather than developed by Fife Council.

Overall these changes result in

- An increase in completed floorspace of 132 m<sup>2</sup>
- No change to the expected area of land serviced
- An increase of £0.9 million in Programme investment costs for this Tranche. This balances the total budget for the Programme as a whole.

The impact of these changes for each Tranche and for the Programme as a whole is summarised in the table below:

**Table 1: Overview of Expected Programme Outputs**

	Original FBC	Updated FBC	Variance
<b>Phase 1 (Years 1-3)</b>			
New Build	3,227 m <sup>2</sup>	3,966 m <sup>2</sup>	+ 739 m <sup>2</sup>
Site Servicing	7.8 ha unlocked	6.1 ha unlocked	- 1.7 ha
Acquisitions	2	2	No change
Investment	£13.5m	£16.3m	+ £2.8m
<b>Phase 2 (Years 4-6)</b>			
New Build	7,063 m <sup>2</sup>	4,682 m <sup>2</sup>	- 2,381 m <sup>2</sup>
Site Servicing	3.9 ha unlocked	3.9 ha unlocked	No change
Acquisitions	0	0	No change
Investment	£23.9m	£22.1m	- £1.8m
<b>Phase 3 (Years 7-10)</b>			
New Build	1,932 m <sup>2</sup>	2,064 m <sup>2</sup>	+ 132 m <sup>2</sup>
Site Servicing	47 ha unlocked	47 ha unlocked	No change
Acquisitions	0	0	No change
Investment	£10.2m	£11.1m	+ £0.9m
<b>Broadband</b>			
Investment	£0.7m (over 10 years)	£0.5m (over 7 years)	- £0.2m
<b>Programme Total</b>			
New Build	12,222 m <sup>2</sup>	12,105 m <sup>2</sup>	- 1,510 m <sup>2</sup>
Site Servicing	59 ha unlocked	57 ha unlocked	- 2 Ha
Acquisitions	2	2	No change
Investment	£48.4m	£50m	+ £1.6m

The need for flexibility during the 10-year investment programme continues to be required. Several factors could potentially alter which projects should be prioritised. These factors include:

- Securing of statutory consents;
- Abnormal costs e.g. onerous ground conditions;
- Changes in market conditions and the wider economy (especially as a result of COVID-19);
- Changes in development costs, including construction costs (especially as a result of COVID-19 and BREXIT); and
- Specific investment opportunities that may emerge.

The Programme will be formally reviewed at the end of Phases 1 and 2, and upon its completion. Lessons learned from reviews will be incorporated into future projects and phases. Work to prepare for the Tranche 3 business case will begin in Quarter 3 of financial year 2023/24.

## **Prioritisation of Sites**

All potential employment sites within the Fife Employment Land Audit [https://www.fifedirect.org.uk/uploadfiles/publications/c64\\_FINAL\\_ELA20161.pdf](https://www.fifedirect.org.uk/uploadfiles/publications/c64_FINAL_ELA20161.pdf) including Fife Council's industrial portfolio were assessed in terms of priority and risk, based on the criteria drawn from agreed Fife Council priorities e.g. those detailed in FIFEplan. These factors include:

- Supports strategic business clusters;
- Well located to strategic growth corridors (M90, A92);
- Fit with existing predominant land use;
- Potential impact on sensitive and incompatible land uses; and
- Potential to deliver lower-cost business space.

The short list of sites was further refined for their deliverability within the City Deal timescales and to ensure a balance of investment between mid and south Fife, brownfield and greenfield sites.

Moving into Tranche 2, all sites have been reassessed and a number of new sites considered, based on proximity to the Fife Circle railway line. New assessment criteria have been added to support a stronger focus on low carbon potential and overall sustainability.

The additional criteria considered were:

- Greenfield – greenfield sites are generally not preferred unless they fulfil other sustainability criteria or make a significant contribution to other strategic objectives
- Passivehus – can the site accommodate a passivehus design, particularly in relation to the orientation of the building to maximise passive solar gain?
- Renewables – does the site have access to any renewable energy source (e.g. district heat network, air source or solar power)?
- Vacant & Derelict Land – will the project remediate vacant and derelict land or property?

Phase 1 of the programme is developing sites at:

- Queensway Industrial Estate, Glenrothes;
- Fife Interchange, Dunfermline;
- Dunnikier Business Park, Kirkcaldy;
- The Avenue, Lochgelly; and
- Hillend and Donibristle Industrial Estate, Dalgety Bay.

Industrial market demand has held relatively firm in the face of COVID-19 disruption and whilst there are some short term challenges, it is not anticipated that the Programme will suffer from a long term drop in rental income from these properties. There is, however, significant uncertainty around prospects for office demand. Whilst it is envisaged that the office market will strengthen again within the lifetime of the Fife i3 Programme, it is not clear at this point what the specific requirements of office occupiers will be. It is therefore proposed that office projects in Tranche 2 will be subject to review and possible reconfiguration or delay. This business case sets out current preferred options for these projects but it is anticipated that these will be subject to change beyond what would normally be expected at this stage of development.

This affects proposed projects in:

- Kirkcaldy Town Centre;
- Cowdenbeath Town Centre; and
- Queensway Business & Technology Park (Innovation Centre Project).

## Expected Benefits

An Economic Impact Assessment (EIA) has been undertaken to appraise the likely impact of the Fife i3 Programme on key economic indicators. The EIA uses economic data and evidence, alongside key assumptions to model the impact of the programme. The inputs and assumptions have been updated in line with Tranche 1 delivery (actual and expected). The table below summarises the movement predicted by the EIA model between the preparation of the Programme FBC and the latest position.

**Table 2: Overview of Expected Programme Benefits**

	Original FBC	Updated FBC	Reason for movement
Permanent jobs (net average p.a.)	1095	1035	Loss of land at Fife Interchange North as a result of planning requirements. Reduction in scope of some projects to reduce floorspace completed.
Gross Construction Jobs (cumulative)	596	1,229	Inclusion of VDLF and other funding – partly to address additional COVID costs – based on assumptions from FBC and new metrics may be required to reflect significant changes created by COVID-19.
GVA per £1 invested	£28	£24	Rising costs meaning increased expenditure, and reduced project outputs
Cost per job	£44,340	£49,224	Inclusion of VDLF and other funding – partly to address additional COVID costs, alongside reduction in projected number of jobs

The Benefits Register is set out in Appendix 3.

## Inclusive Growth and Innovation

The Inclusive Growth Challenges for the City Region and a Framework to tackle these are set out in Pages 6/10 of the [City Region Deal](#) document. The innovation focus of the Fife i3 Programme offers an opportunity to support companies to work in new ways that allow them to succeed and create new and better jobs. The Fife i3 Programme aligns with the City Region Deal's Integrated Regional Employability & Skills Programme (IRES), which includes a data-driven innovation (DDI) targeted skills gateway. Together these deliver a strong contribution to inclusive growth.

The commitment to this is unchanged from the original Fife i3 Programme Full Business Case and aligns with the recently approved Benefits Realisation Plan for the Edinburgh and South East Scotland City Region Deal.

## **Programme Risks**

The risks relating to Interest Rates; Construction and Completion; Operating Risks; Demand Risk; Force Majeure; and changes in Law, Political, Regulatory, Environmental and Social Risks associated with the delivery of the Fife i3 Programme will be allocated to the party that is best placed to manage them in a cost-effective way to maximise value for money, including to the private sector.

For Tranche 1 of the programme, these risks were allocated to Fife Council. The intention during Tranche 2 is to begin to risk-share with the private sector on some projects through different development models (e.g. joint ventures).

## **Funding and Affordability**

The Programme FBC showed a surplus of £14m, and the NPV for the programme was expected to be a £0.177m surplus. The results of the latest financial modelling and the movement between the financial modelling for the Outline Business Case and Full Business Case are shown in Section 7.

This updated FBC shows a small increase in the Programme surplus from £14 million in the Programme Business Case to £15.7 million. The NPV for the programme is expected to be a surplus of £3.5 million – this is an increase from the original Programme FBC, which showed a £0.177 million NPV surplus. Any surplus will be managed by the directorate in accordance with Fife Council's medium-term financial strategy.

## **Project and Programme Management Arrangements**

The Fife Industrial Innovation Investment Programme ultimately reports to the Edinburgh and South East Scotland City Region Deal Executive Board and its Joint Committee in terms of the City Region Deal governance. As well as regular monthly reporting, this would be the escalation point for major issues that threaten the programme.

Arrangements for internal reporting and issue management are now established and it is envisaged that these arrangements will continue throughout Tranche 2 of the Programme. This provides three formal escalation points for issues / gateways for decision-making within Fife Council, depending on their severity and importance:

- The Fife i3 Programme Manager
- The Fife i3 Programme Board
- The Sustainable Growth and City Deals Board.

## 2. Introduction

### 2.1 Objective of this Business Case

1. This document sets out the Full Business Case for years 4 to 6 (Tranche 2) of the Fife Industrial Innovation Investment (i3) Programme. It builds on the Full Business Case for the Fife i3 Programme, which was developed and approved in March 2019. The Programme business case can be found online at [https://democracy.edinburgh.gov.uk/documents/s9936/Full Meeting Papers Edinburgh and South East Scotland City Region Deal Joint Committee 01.03.19.pdf](https://democracy.edinburgh.gov.uk/documents/s9936/Full_Meeting_Papers_Edinburgh_and_South_East_Scotland_City_Region_Deal_Joint_Committee_01.03.19.pdf) (see Item 5.4). The Programme business case set out the principles of the Programme and a detailed plan for years 1 to 3 (Tranche 1) of investment.
2. This document updates each of the five cases with the latest information available, including the outlook for recovery from the COVID-19 pandemic. It considers the detailed arrangements for delivery of the upcoming tranche and affirms that:
  - the most economically advantageous investment programme is being delivered, also taking into account sustainability and inclusion objectives;
  - the Programme is affordable and financially viable; and
  - the required outputs and benefits can be successfully delivered.

### 2.2 Structure of this Business Case

3. This Final Business Case adopts the 5-Case structure and together these show how the ongoing delivery of the Fife Industrial Innovation Investment Programme is:
  - Closely aligned to wider strategies and objectives – **the strategic case**.
  - Best value for money – **the economic case**.
  - Achievable in commercial terms – **the commercial case**.
  - Affordable – **the financial case**.
  - Achievable in practical terms – **the management case**.

### 2.3 Key Stakeholders

4. The principal stakeholders for the Programme's delivery are Fife Council, the partners in the Edinburgh and South East of Scotland City Deal, and Scottish Enterprise in its role as national economic development agency but also in its role as a current and potentially future joint venture partner. Other important stakeholders include the Fife Economy Partnership; the Fife business community; private landowners and developers; and the workforce in Fife and other parts of the City Region.

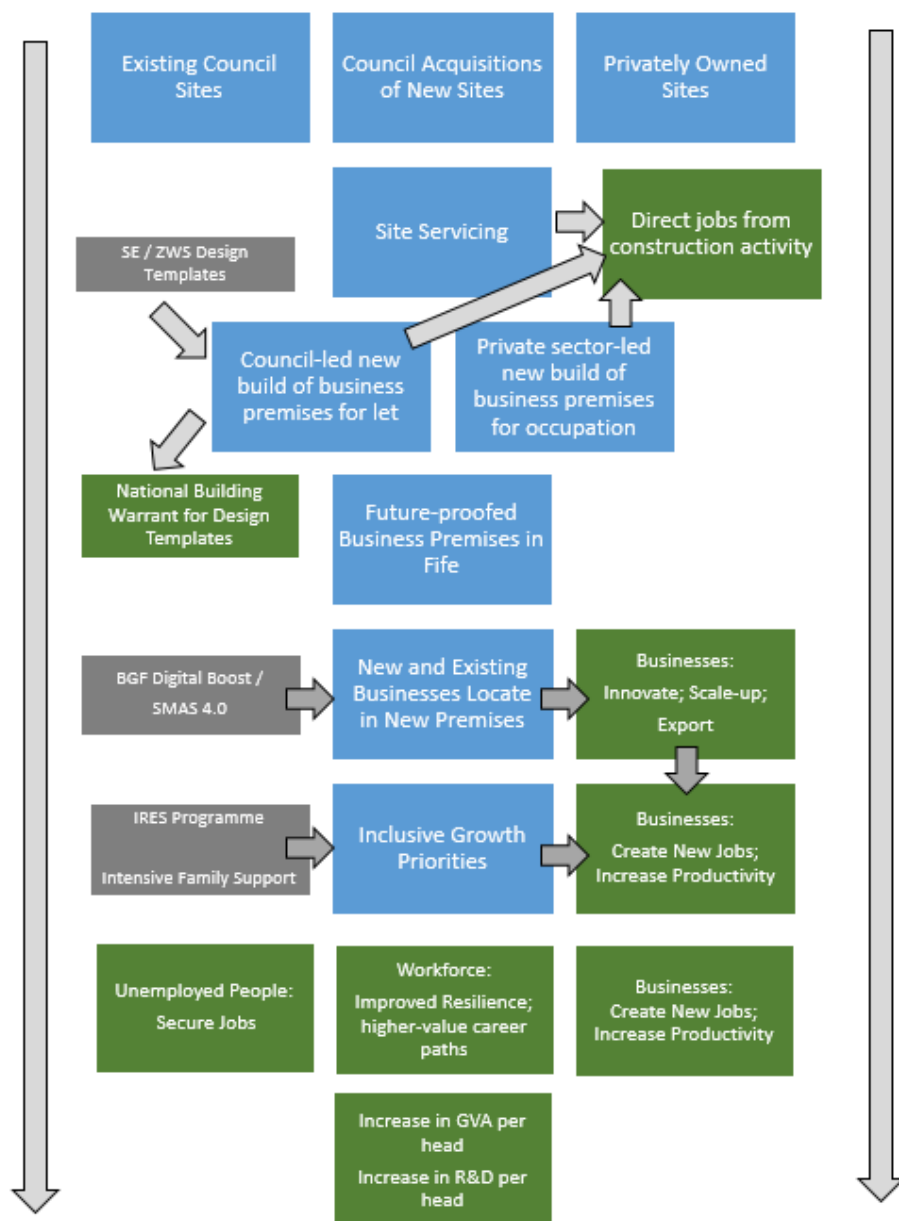


### 3. Programme Description

#### 3.1 Overview

5. The Fife i3 Programme is being delivered as part of the Edinburgh and South East Scotland City Region Deal's innovation theme. The Programme will deliver a sustained investment programme in modern business premises to support the delivery of Inclusive Growth and Innovation in Fife. It will increase the supply of serviced employment land and new industrial, office and business space in Fife. The diagram below provides an overview of the Programme, including both public and private sector-led elements.

**Figure 1: Overview of Fife Industrial Innovation Investment Programme**



### 3.2 Phasing and Delivery

6. The Fife i3 Programme is being delivered in three Tranches of investment:
  - Tranche 1 (Years 1 to 3 of the Programme): 3-year duration
  - Tranche 2 (Years 4 to 6 of the Programme): 3-year duration
  - Tranche 3 (Years 7 to 10 of the Programme): 4-year duration
7. The business case for a ten-year programme of investment has been approved, along with a detailed business case for the first three years of the programme (Tranche 1). This business case sets out the detailed arrangements for years four to six of the Fife i3 Programme (Tranche 2). The updated 10-year Investment Programme is set out in Table 9.
8. The Fife i3 Programme builds on and complements previous investment in site infrastructure e.g. Queensway Industrial Estate and a number of previous projects funded by Fife Council, Scottish Enterprise and Scottish Government. It includes direct investment by the Council in its existing land holdings, and new acquisitions, as well as working in partnership with private sector landowners and developers to leverage additional investment and funding into Fife and the City Region. The Programme will also explore alternative development models as part of the upcoming Tranche of investment.
9. The original FBC was based on delivery over 10 years of a total of £48.4m investment. The total programme of investment outlined in this updated business case has increased to £50m – this is in response to rising costs of site servicing and construction. The additional investment comes from Vacant and Derelict Land Funding (VDLF).
10. Some changes have been made to Tranche 1 delivery to respond to:
  - Cost rises (both prior to, and as a result of, COVID-19)
  - Private sector interest in developing a site that were originally envisaged for City Deal development – this means replacing a build project with site servicing activity (and servicing a larger site area than originally envisaged)
  - Lessons learned from procurement – much larger than expected economies of scale from procuring larger projects
  - A desire to explore refurbishment activity as a means of managing costs and reducing the overall carbon footprint of the programme's activities
  - Lower than expected capital receipts due to loss of net site area available for disposal (partially recovered in Tranche 1, with further efforts in Tranche 2)

11. During Tranche 2 further amendments are envisaged to the delivery of the Programme, specifically:
  - Review of commitments to reflect anticipated cost increases relating to Brexit, COVID-19 and carbon reduction measures, and the need to continue to deliver the Programme within the agreed overall funding available
  - Review of all new build projects to look at carbon reduction opportunities – a budget allowance of 10% of original expected costs has been added to all Tranche 2 and Tranche 3 construction projects to allow for changes to be implemented
  - Reconsideration / delay of projects delivering office space to account for uncertainty about office market prospects post-COVID
  - Additional build at West Way, Dalgety Bay, delivering more floorspace at this location – this project will be accelerated and will now be delivered during Tranche 1 of the Programme
  - A single phase build out at Fife Interchange North, with the previously envisaged Tranche 1 investment delayed to Tranche 2 and the two projects combined. The overall floorspace being delivered has reduced from 2,787 m<sup>2</sup> to circa 2,300 m<sup>2</sup>. The site will still be acquired and serviced during Tranche 1.
  - Development of risk mitigating measures reflecting the significant uncertainty in the wider environment relating to land values, development costs, rental demand and the wider macroeconomic environment.
12. It is envisaged that further changes will be required to Tranche 3 of the Programme. At this point these have not been explored in detail, but it is clear that the development envisaged in the original Programme FBC is no longer deliverable due to accelerating costs beyond the level of inflation used to develop the original business case and the financial implications of changes to respond to the climate emergency. In order to put forward a viable Programme the following changes have been made to Tranche 3:
  - The two investments proposed in Glenrothes – the Queensway Innovation Centre and the industrial investment at Westwood Park have been combined into a single project. The exact nature and location of this investment will be determined when there is more clarity on the longer-term nature of any changes arising from COVID-19. The combined budget for this is £5.8m (the original budget for both projects being delivered separately totalled £9.1m). An assumed build out of circa 1,600 m<sup>2</sup> has been assumed for the purposes of modelling benefits.
  - The development of 966 m<sup>2</sup> at Site 3 in Dalgety Bay has been removed from the Programme. The site will still be serviced in Tranche 2 of the Programme as originally envisaged but will then be marketed for sale, rather than developed by Fife Council.

13. Fife Council worked with Scottish Enterprise and Zero Waste Scotland, within a wider UK and global challenge of climate change and the government objectives set-out in policies such as "Making Things Last" - the Scottish Government policy for a "circular economy strategy to build a strong economy, protect our resources and support the environment" Scottish Enterprise, Zero Waste Scotland, Construction Scotland Innovation Centre and their partners launched PORTAL, as a new-way of thinking about how we deliver quality industrial space and premises in Scotland. PORTAL is an approach to building. Not a building solution, It is a product based on improving the value of our buildings while also taking positive steps towards meeting the challenges of the Circular Economy. The PORTAL product is built around a methodology and toolkit that offers a staged approach to designing industrial buildings. For further detail see: <https://www.cs-ic.org/innovationcentre/innovation-support/online-resources/project-portal/>
14. During Tranche 1 this work has been further developed with consultants appointed to carry out a feasibility review of the standard specification and cost plans for the industrial units at Fife Interchange North that have been developed by the Council over the last 3 years by using the Portal framework. The intention is that the findings from this feasibility work will influence the approach to delivery in Tranche 2 of the Programme.
15. The need for flexibility during the 10-year investment programme continues to be required. Several factors could potentially alter which projects should be prioritised. These factors include:
  - Securing of statutory consents
  - Abnormal costs e.g. onerous ground conditions
  - Changes in market conditions and the wider economy
  - Changes in development costs, including construction costs (due to COVID-19 related and other factors) and
  - Specific investment opportunities that may emerge.
16. The Programme will be formally reviewed at the end of Tranches 1 and 2, and upon its completion. Lessons learned from reviews will be incorporated into future projects and tranches, and the approach set out in this FBC will be continuously refined in advance of, and during, its delivery. Work to prepare for the Tranche 3 business case will begin in Quarter 3 of financial year 2023/24.
17. The first tenants of the Programme are expected to take up leases in spring 2021. This is later than outlined in the Programme FBC. The delay is due to a complete construction site shutdown due to COVID-19 restrictions and an eventual resumption with additional distancing measures in place, which mean that work is progressing at a slower rate than previously envisaged. There is uncertainty over the duration of build required for the remainder of Tranche 1 and subsequent tranches. This business case assumes that Tranche 2 projects will take longer, and cost more, with a base case assumption that draws on experience from site restart onwards in Tranche 1 (i.e. it assumes no additional complete lockdowns, although it is recognised that this remains a possibility it is not possible to predict or

programme these). In all cases the Programme will respond to Government guidance on safety measures and this may result in additional delays.

18. A Programme letting and disposal policy and an engaging tenancy application process have been developed as part of Tranche 1 delivery, however at the time of the preparation of this business case these had not yet gone live. Work has also begun to develop links with other parts of the Data-Driven Innovation (DDI) Programme, in particular the DDI Hubs. It is envisaged that these links will strengthen once the Fife i3 Programme has
  - property available for rent that may be suitable for tenants whose requirements can't be accommodated by the DDI Hubs and
  - tenants in situ who can benefit from access to some aspects of the DDI Programme.
19. These linkages form part of a wider package of tailored support for all tenants in the Fife i3 Programme that focuses on innovation support and raising awareness of digital opportunities.

### **3.3 Prioritisation of Sites**

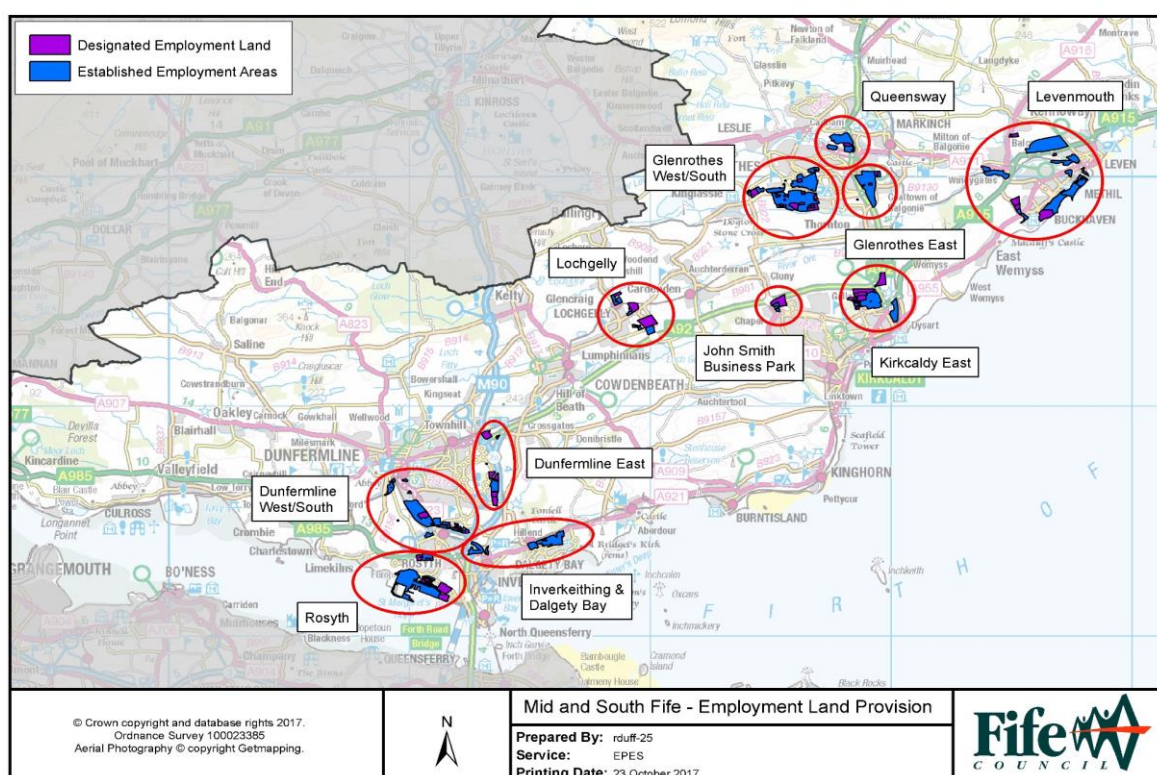
20. All potential employment sites within the Fife Employment Land Audit<sup>2</sup> including Fife Council's industrial portfolio were assessed in terms of priority and risk, based on the criteria drawn from agreed Fife Council priorities e.g. those detailed in FIFEplan. These factors include:
  - Supports strategic business clusters
  - Well located to strategic growth corridors (M90, A92)
  - Fit with existing predominant land use
  - Potential impact on sensitive and incompatible land uses and
  - Potential to deliver lower-cost business space.
21. The short list of sites was further refined for their deliverability within the City Deal timescales and to ensure a balance of investment between mid and south Fife, brownfield and greenfield sites.
22. Tranche 1 of the programme is developing sites at:
  - Queensway Industrial Estate, Glenrothes
  - Fife Interchange, Dunfermline
  - Dunnikier Business Park, Kirkcaldy
  - The Avenue, Lochgelly and
  - Hillend and Donibristle Industrial Estate, Dalgety Bay.

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<sup>2</sup> [https://www.fifedirect.org.uk/uploadfiles/publications/c64\\_FINALLELA20161.pdf](https://www.fifedirect.org.uk/uploadfiles/publications/c64_FINALLELA20161.pdf)

23. Moving into Tranche 2, all sites were reassessed and additional sites considered, with criteria added to support a stronger focus on low carbon potential and overall sustainability.
24. The additional criteria considered were:
- Greenfield – greenfield sites are generally not preferred unless they fulfil other sustainability criteria or make a significant contribution to other strategic objectives
  - Passive design – can the site accommodate a passive design, particularly in relation to the orientation of the building to maximise passive solar gain?
  - Renewables – does the site have access to any renewable energy source (e.g. district heat network, air source or solar power)?
  - Vacant & Derelict Land – will the project remediate vacant and derelict land or property?
25. The geographical spread of projects across Fife is set out in Figure 2. This is unchanged from what was envisaged in the Programme FBC, although some changes to the specifications, detailed designs and site layouts will be incorporated to reflect the increased focus on carbon reduction. The Programme will continue to adapt and respond to opportunities for carbon reduction and more sustainable practices.

**Figure 2: Map of Fife i3 Programme Investment Locations and relevant Employment Land Designations**



26. Since the Programme FBC was approved, the COVID-19 pandemic has affected programme delivery (in particular costs and timescales) and this updated business case reflects a base case expected scenario that factors in the latest information on this and other risks. This is a time of significant uncertainty and, where possible, actions to mitigate risk are being identified and developed in parallel with the delivery of the Programme.
27. Industrial market demand has held relatively firm in the face of COVID-19 disruption and whilst there are some short-term challenges, it is not anticipated that the Programme will suffer from a long term drop in rental income, or loss of demand, from these properties. There is, however, significant uncertainty around prospects for office demand. Whilst it is envisaged that the office market will strengthen again within the lifetime of the Fife i3 Programme, it is not clear at this point what the specific requirements of office occupiers will be. It is therefore proposed that office projects in Tranche 2 will be subject to review and possible reconfiguration or delay. This business case sets out current preferred options for these projects but it is anticipated that these will be subject to change beyond what would normally be expected at this stage of development.
28. This affects proposed projects in:
- Kirkcaldy Town Centre;
  - Cowdenbeath Town Centre; and
  - Innovation Centre Project at Queensway Business & Technology Park.
29. The investment plans for Tranche 2 also reflect a stronger focus on carbon reduction and management measures than the original business case, following the declaration of a climate emergency. The preparation of this business case draws on feasibility work undertaken during Tranche 1 of the programme to explore opportunities to improve the carbon efficiency of the programme across the building life cycle (construction, operation, demolition and/or re-use).
30. All proposed Projects outlined in the Programme Business Case are briefly outlined in the Table below, with a short update on their current status:

**Table 3: Project Updates**

Site and Location	Project Type	Latest Update
<b>Tranche 1</b>		
Glenrothes – Queensway Ind Est	Construction – Business Units, use class 4, 5 and 6	Floorspace increased from Programme FBC. Project completion delayed due to COVID-19 by approx. 6 months.
Dunfermline – Fife Interchange N.	Site Servicing	Project delayed due to issues with foul water drainage by approx. 1 year.

Dunfermline – Fife Interchange N. (Phase 1)	Construction – Business Units, use class 4, 5 and 6	This project has been moved into Tranche 2 and combined with Phase 2 Build Project.
Kirkcaldy – Dunnikier Business Park	Construction – Business Units, use class 4, 5 and 6	This project has been delayed due to COVID-19 by approx. 6 months but is otherwise unchanged.
Dalgety Bay – Hillend & Dalgety Bay Ind Est, Ridgeway	Site Acquisition	This project is now complete.
Lochgelly – The Avenue	Construction – Business Units, use class 4, 5 and 6	This project has been closed and replaced with a site servicing project (detailed below).
Lochgelly – The Avenue	Site Servicing	A private sector interest has emerged, and it is now proposed that a site of approx. 2 ha is serviced at this location. A portion will then be sold for private development (similar to what was proposed in the Programme FBC).
Dalgety Bay – Hillend & Dalgety Bay Ind Est (Site 3)	Site Acquisition	Expected to go ahead as envisaged in Programme FBC.
Dalgety Bay – West Way	Site Servicing	Expected to go ahead as envisaged in Programme FBC.
Glenrothes – Queensway Ind Est New project (pilot)	Refurbishment – use class 4 and 5	A new project to refurbish an existing building. This supports wider regeneration efforts on this Industrial Estate and offers a potential carbon and cost saving.
Dalgety Bay – Hillend & Dalgety Bay Ind Est	Construction – Business Units, use class 4, 5 and 6	Additional floorspace to be delivered at this location to benefit from economies of scale in procurement. This project will be accelerated from Tranche 2 to replace the build project at Fife Interchange North.
Tranche 2		
Dalgety Bay – Hillend & Dalgety Bay Ind Est, West Way	Construction – Business Units, use class 4, 5, 6	This project will now be delivered during Tranche 1.



Dalgety Bay – Hillend & Dalgety Bay Ind Est, Site 1 & Site 3	Site Servicing (x2)	Expected to go ahead as envisaged in Programme FBC.
Kirkcaldy – John Smith Business Park	Construction – Business Units, use class 4 and 5	Expected to go ahead as envisaged in Programme FBC. Possibility of developing additional floorspace (new build or refurb) at this location in event of any underspend elsewhere
Dunfermline – Fife Interchange North	Construction – Business Units, use class 4, 5, 6	Site will be acquired during Tranche 1 – due to delay in acquisition this project will be delivered in a single phase, and the combined floorspace will be reduced from 2,787 m <sup>2</sup> to circa 2,300 m <sup>2</sup>
Buckhaven – Levenmouth Business Park	Construction – Business Units, use class 4, 5, 6	Expected to go ahead as envisaged in Programme FBC.
Glenrothes – Flemington Road,	Construction – Innovation Centre, use class 4 and 5	Significant doubt over the scope, specification and timing of this project. COVID-19 impact on office / innovation provision is still not clear. <b>Project delayed until Tranche 3.</b>
Kirkcaldy – Town Centre	Construction (or refurb / fit out) – office space, use class 4	No site identified yet for this to go ahead. Significant doubt over the scope, specification and timing of this project. COVID-19 impact on office / innovation provision is still not clear. <b>Project delayed until Tranche 3.</b>
Cowdenbeath – Town Centre	Construction – office space, use class 4	Preferred site and partner identified – project specification under review to enable self-contained provision to reduce unplanned interaction between tenants. Expected to go ahead with modifications. The budget has been reduced to reflect the changed specification.

Tranche 3		
Glenrothes – Further Investment	Construction (nature and location tbc)	This project will combine the proposed investment in the Queensway Innovation Centre and at Westwood Business Park. The combined budget has been reduced and it is envisaged that there a single development of circa 1,600 m <sup>2</sup> will be brought forward
Dalgety Bay – Hillend & Dalgety Bay Ind Est, Site 3	Construction – Business Units, use class 4, 5, 6	This project will be closed. Once this site is serviced (during Tranche 2) it will be immediately marketed for sale
Kirkcaldy – Mitchelston Ind Est	Site Servicing	Expected to go ahead as envisaged in Programme FBC.
Rosyth – Waterfront	Site Servicing / Infrastructure	Expected to go ahead as envisaged in Programme FBC.
Kirkcaldy – Town Centre	Construction – Innovation Centre	Delayed from Tranche 2, this project is likely to change significantly in its scope.

31. The two new projects at Lochgelly (change form construction to site servicing) and Glenrothes, Queensway Industrial Estate (refurbishment of Q10) are set out in more detail in Appendix 1.

### 3.4 Programme Objectives and Expected Benefits

32. The Strategic Objectives for the Fife i3 Programme, set out in the Programme FBC are, by 2029:
- To increase the supply of modern business accommodation and facilitate investment by the private sector, by servicing 60 ha of employment land; and building 12,000 m<sup>2</sup> of new business accommodation with at least £30m Private Sector investment levered
  - Working in partnership with the Edinburgh and South East Scotland City Region Deal Data-Driven Innovation Programme, to assist 1,000 businesses to become innovation-active, to reduce their costs and improve their productivity
  - To ensure that Fife businesses sustain and improve their economic performance as the City Region progresses towards becoming the Data Capital of Europe, through improved value from their data and the adoption of digital technologies to create/safeguard jobs and turnover.

33. Whilst there has been a small reduction on the expected outputs of serviced land and business floorspace, the Programme is still on track to deliver its objectives and support the creation of around 1,000 permanent skilled jobs.
34. The Fife i3 Programme is intended to create conditions for start-ups and SMEs to grow, innovate and internationalise – to create more businesses in Fife and more jobs. It will create a “ladder” of new, modern, flexible business property across a range of locations, sizes and uses.
35. Innovation is being defined as “doing things in new, hopefully better, ways” that ultimately lead to a transformational change in business performance and local economy mix and strength. In the longer-term, Fife businesses could sustain and improve their economic performance through increasing the value they generate from their data by adopting digital technologies - to create new products, new supply chain arrangements, new business models, individually and through collaboration - thereby creating/safeguarding jobs and turnover. The aim is to create a long-term investment programme in Fife that can be replicated elsewhere in the City Region through other economic development and investment projects.
36. These strategic objectives developed for the Programme business case remain relevant and continue to be the guiding principles of all investment and activity delivered by the Programme.
37. An Economic Impact Assessment (EIA) has been undertaken to appraise the likely impact of the Fife i3 Programme on key economic indicators. The EIA uses economic data and evidence, alongside key assumptions to model the impact of the programme. The inputs and assumptions have been updated in line with Tranche 1 delivery (actual and expected) and the revisions to the Programme planned for Tranches 2 and 3 put in place to keep the Programme viable despite significant changes to external conditions.
38. The table below summarises the movement predicted by the EIA model between the preparation of the Programme FBC.

**Table 4: Overview of Expected Programme Benefits**

	<b>Original FBC</b>	<b>Updated FBC</b>	<b>Reason for movement</b>
Permanent jobs (net average p.a.)	1095	1035	Loss of land at Fife Interchange North as a result of planning requirements
Gross Construction Jobs (cumulative)	596	1,229	Inclusion of VDLF and other funding – partly to address additional COVID costs – based on assumptions from FBC and new metrics may be required to reflect significant changes created by COVID-19.
GVA per £1 invested	£28	£24	Rising costs meaning increased expenditure, and reduced project outputs
Cost per job	£44,340	£49,224	Inclusion of VDLF and other funding – partly to address additional COVID costs, alongside reduction in projected number of jobs

39. The Benefits Register is set out in Appendix 3. This shows the expected level of benefits from the programme in relation to:

- Private sector investment leveraged
- Companies supported to become innovation-active
- Direct jobs created by specific investment location
- Salary levels for “better quality jobs” supported by the programme
- Rental levels by specific investment location (subject to inflation increases, and in line with market rents for the local area)
- Sites acquired and, where relevant, serviced and disposed.

## 4. Strategic case

### 4.1 The Strategic Context

40. This section sets out how the Programme will contribute to the relevant strategic objectives at local, regional and national levels. Since the preparation of the Programme FBC, a number of additional relevant strategic documents have been published. This FBC takes a number of key changes into account including findings and recommendations from

- Scottish Infrastructure Commission's Key Findings (Jan 2020) and Delivery Findings Reports (July 2020)
- The Scottish Government's inclusive growth outcomes and equalities work
- Climate Fife – The Sustainable Energy and Climate Action Plan (SECAP) for Fife
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
- The Emerging National Transport Strategy
- The report findings of the Advisory Group on Economic Recovery (Higgins Report)
- The interim Regional Spatial Strategy for Edinburgh and South East Scotland
- The emerging Regional Growth Framework for the Edinburgh and South Scotland City Region

### 4.2 Contribution to National, Regional and Local Policy Objectives

41. The strategic objectives for the Fife Industrial Innovation Investment Programme contribute to national policies outlined in:

- UK Government's Industrial Strategy White Paper; 'Building a Britain fit for the future';
- Scotland's Purpose and National Outcomes;
- Scotland's Economic Strategy
- The Scottish Government's Inclusive Growth Outcomes Framework and the "5 Ps" of Productivity, Population, Participation, People and Place)
- The Infrastructure Commission for Scotland's Phase 1 Key Findings Report "A Blueprint for Scotland" (January 2020) and Phase 2 Delivery Findings Report (June 2020), and its key recommendations on
  - Prioritising an Inclusive Net Zero Carbon Economy
  - Enabling Sustainable Places
  - Delivering a Thriving Construction Sector, with a focus on skills development and modern methods of construction
 which have strongly informed the refresh of priorities for Tranche 2 of the Programme
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
- The report findings of the Advisory Group on Economic Recovery (Higgins Report)
- The Emerging National Transport Strategy
- A Manufacturing Future for Scotland Action Plan, 2016

42. Figure 3 sets out how Fife Industrial Innovation Investment Programme contributes to Scotland's Purpose and National Outcomes.

**Figure 3: The contribution by the Fife i3 Programme to relevant National Outcomes and Strategies**

<b>Scottish Government Purpose</b>	<b>To create a more successful country with opportunities for all through increasing sustainable economic growth</b>			
<b>Scottish Government National Outcomes</b>	Scotland is the most attractive place for doing business in Europe	We realise our full economic potential with more and better employment opportunities for our people	Well-designed, sustainable places	We are renowned for our research and innovation
<b>Scottish Government National Strategies</b>	Scotland's Economic Strategy – Increasing competitiveness AND tackling inequality			
	Realising Scotland's full potential in a digital world	Scotland Can Do; Boosting Innovation	National Planning Framework	Low Carbon Scotland
<b>Strategic outcomes</b>	Internationally competitive, digitally mature businesses across all sectors	Directly encourage more business innovation; make best use of University research, knowledge and talent to drive growth	Successful, sustainable places that support sustainable economic growth and regeneration	Reducing our carbon emissions and adapting to climate change; transition to a low carbon economy.
<b>Contribution by the Fife Investment Programme</b>	Adoption of data-driven innovation and digital technologies	More organisations in Fife are innovation-active	Locations for programme investment reflect strategic priorities in existing or designated employment areas	Increased supply of modern premises that meet or exceed environmental standards
<b>Longer-terms outcomes supported by the Programme</b>	Improved economic performance		Strong and inclusive growth, with access to opportunities for a wide range of individuals in Fife	The Programme influences wider approaches to building sustainability across Scotland
	Fife businesses extract more value from their data and adopt digital technologies to create / safeguard jobs and turnover	Fife businesses reduce their costs and improve their productivity		

43. The Fife i3 Programme contributes to regional and local policy objectives outlined in:
- The Edinburgh and South East of Scotland City Region Deal;
  - Draft SESplan 2016;
  - The interim Regional Spatial Strategy for Edinburgh and South East Scotland
  - The emerging Regional Growth Framework for the Edinburgh and South Scotland City Region
  - Climate Fife – The Sustainable Energy and Climate Action Plan (SECAP) for Fife
  - Fife's Local Outcome Improvement Plan – The Plan4Fife;
  - Fife's Economic Strategy 2017 – 2027; and
  - FIFEplan 2017.
44. The Inclusive Growth Challenges for the City Region and a Framework to tackle these are set out in Pages 6/10 of the [City Region Deal](#) document. In the short term, the Fife Industrial Innovation Investment Programme will help accelerate Inclusive Growth across the city region as it delivers a significant programme of construction. Over the medium and long term, the programme will deliver new jobs as the new business property is occupied.

### **4.3 The Case for Change**

#### **4.3.1 Supply – Business Property and Employment Land**

45. The proposed Fife i3 Programme is designed to meet an identified, long-term supply challenge in Fife for modern office and industrial space and effective employment land.
46. The Programme Business Case drew on research by Ryden, carried out in 2014, which identified widespread obsolescence in Fife's Industrial Estates, Business Parks and mixed (industrial / office) estates. The Ryden report also highlighted the lack of an effective employment land supply, recognising that whilst Fife has a good supply of strategically located employment land, few sites have appropriate infrastructure and utilities to render them effective for immediate development.
47. These challenges around effective land supply and modern property continue to exist, despite the significant disruption of COVID-19.

#### **4.3.2 Demand – Business Property and Employment Land**

48. Fife Council is the largest single landlord in Fife for commercial property and therefore has been able to monitor demand over the course of the pandemic. Whilst some challenges remain with rental arrears, most tenants are now back on a positive footing and demand (as evidenced by enquiries) has largely recovered for industrial property. Office demand has a much more uncertain outlook, with significant shift to home working for most office staff it is unclear at this stage what the longer term equilibrium will look like but early indications are that not all office workers, or employers, will return to a working pattern of five-days in the office. Meantime, until a vaccine is developed, the risk of short-term disruption, is acute and ongoing and most pronounced in the office sector.
49. The Programme Business Case was based on long-term trends away from heavy manufacturing and more businesses seeking smaller, more flexible premises, capable of adaptation for a range of technology uses. Modern technology could include higher levels of automation, 3D and laser printing, with increased demand on data analytics required within most industry sectors, gigabit broadband connections and the ability to incorporate, for instance, sensor technology.
50. Fife's business base is more dependent on SMEs than the Scottish average and the strongest demand is strongest for units up to around 500 m<sup>2</sup>. The Fife i3 Programme targets this market specifically with modern, flexible properties of around 100 m<sup>2</sup> (some with options to combine to deliver larger units).
51. Uptake of employment land has been relatively constant since 2013 at around 40 ha per year of completed development. A period of lockdown in 2020 will affect completions, but there is little indication of a slowdown in the underlying demand, with enquiries for sites during Tranche 1 of the Fife i3 Programme remaining strong.

### **4.3.3 Market Failure**

52. The build cost of the industrial units within the Fife Industrial Innovation Investment Programme is based on an open tender construction contract entered in 2017 by the Council for a similar specification and uses. This cost analysed to c £2,200 per m<sup>2</sup> built, inclusive of all construction costs and professional fees. The private sector through the Fife Investment Delivery group has indicated that, at this cost, development in Fife is unviable. Early procurement activity for Tranche 1 delivered a cost of c £2,750 per m<sup>2</sup> constructed (pre COVID-19) – these costs have risen by a further 14 – 15% as a result of COVID-related additional costs.
53. There is clear market failure for private sector provision of the essential infrastructure required to increase the stock of serviced employment land capable of development, as well as developing new employment units.
54. The Fife Industrial Innovation Investment Programme will deliver “patient, committed” investment in commercial property – both for local businesses seeking to grow and for inward investors. The prioritisation of sites in strategic locations and growth corridors continues to satisfy the requirements of both local and mobile occupiers.

### **4.3.4 Programme Delivery Approach**

55. In Tranche 1 of the programme, the individual projects were undertaken directly by Fife Council on sites within its control to minimise risk of slippage. Tranche 1 also included acquisitions of sites to be serviced in subsequent tranches.
56. Work has been commissioned to consider different approaches to stimulate private sector investment and risk share with partners in the private sector and this is being developed in preparation for Tranches 2 and 3 of the Programme. Specific opportunities have been identified and discussion with potential Joint Venture partners have begun.
57. All properties and sites delivered by the Fife i3 Programme will be marketed openly and as widely as possible. The Council uses commercial property websites e.g. Costar, Novaloca, both widely used by property agents throughout the Scotland and UK. A policy for letting and disposal has been drawn up and agreed for the Programme during Tranche 1 to ensure that tenants have the innovation focus that the Programme is designed around.



## 5. Economic case

### 5.1 Economic Objectives of the Fife i3 Programme

58. The Fife i3 Programme is expected to deliver Inclusive Growth and Investment in line with the Edinburgh and South East Scotland City Region Deal agreed in August 2018. This section sets out how the economic impact will be delivered from the funding investment in new commercial premises and site servicing in Fife. This is summarised in Figure 4 below.

**Figure 4: Pathway from Intervention to Impact**

Input →	Activity →	Outputs →	Outcome →	Impact
<b>Funding for new commercial premises and site servicing</b>	New commercial premises are built by public sector of required size and with modern specification to allow businesses to optimise and streamline processes	Private sector investment in new buildings and processes	Ability to grow using additional profitability and hire more staff, and more higher value jobs	Increased employment rate
		Removal of cost from business processes, leading to enhanced productivity		
	Employment land servicing	Increased supply of fully serviced employment land; new business units built by private sector occupier	Leverage of private sector investment in additional premises built by private occupiers	Possibly involves better jobs, with a better career path, contributing to higher median weekly earnings
	Community benefits from construction, including training and modern apprenticeships	% of procurement spend in city region	Businesses committed to innovation improve their competitiveness and increase sales	Uplift in Gross Value Added (GVA) per head
<b>Innovation support activities</b>	Businesses are supported to be innovation-active	% of occupiers committed to innovation activity		
	Businesses undertaking SMAS Reviews and data-driven research projects	Drawdown of innovation funding e.g. specialist grant support to realise projects	Outcomes from Data driven research projects with city region's universities	Business expenditure on R&D per head (£) increases

Source: Fife Council and Scottish Enterprise

## 5.2 Options Appraisal

59. The table below sets out options considered for the delivery of the Fife i3 Programme looking at the areas of
  - Scope – the extent and coverage of the Programme’s activities
  - Solution – the nature of the response
  - Delivery – the nature of implementation (in this case construction and property management)
  - Implementation – the duration of the Programme
  - Funding – the funding approach and sources used
60. It highlights where a change to the Preferred Way Forward (PWF) has been identified between current thinking and what was outlined in the Programme Business Case.

**Table 5: Options Appraisal**

	Option 1	Option 2	Option 3
Scope (no change to PWF)	Focus all investment on mid-Fife	Focus all investment on areas with higher demand (Forth Bridgehead and Dunfermline)	Balance investment over the six areas covered by Edinburgh & SE Scotland City (Programme Business Case PWF)
Solution (change to PWF to increase focus on carbon reduction and re-use of existing assets)	Focus exclusively on site servicing and new build – a mix of office and industrial property (Programme Business Case PWF)	Focus mainly on-site servicing and new build, with a small refurbishment element to deliver carbon and financial savings – principally focus on industrial / hybrid space, reduced office investment	Reduce site servicing and new build elements to bring forward a significant refurbishment programme (potential consideration for Tranche 3, or by variation to Tranche 2)
Delivery (no change to PWF)	Procure using design and build or other private sector led approaches – to be explored during Tranche 2	Procure using in-house methods (Programme Business Case PWF)	Develop Joint Ventures with private sector (or other public sector) partners – to be developed during Tranche 2
	Outsource management of property	Manage in-house via Fife Council Business Property Team (Programme Business Case PWF)	No management – dispose of property on completion
Implementation (no change to PWF)	Implement over 8 years, in three phases	Implement over 10 years, in three phases (Programme Business Case PWF)	Implement over 12 years, in four phases
Funding (change to PWF to bring in a wider range of funding sources)	Fund via a mix of <ul style="list-style-type: none"> <li>• City Deal grant</li> <li>• Fife Council capital and</li> <li>• capital receipts generated by the Programme</li> <li>• private sector leverage and</li> <li>• VDLF</li> </ul> Explore potential low carbon funding sources	Fund via a mix of <ul style="list-style-type: none"> <li>• City Deal grant</li> <li>• Fife Council capital and</li> <li>• capital receipts generated by the Prog</li> </ul>	Fund via a mix of <ul style="list-style-type: none"> <li>• City Deal grant</li> <li>• Fife Council capital and</li> <li>• capital receipts generated by the Prog</li> <li>• and private sector leverage</li> </ul> (Programme Business Case PWF)

### 5.3 Economic Appraisal findings

61. An Economic Impact Assessment (EIA) has been undertaken to appraise the likely impact of Fife Industrial Innovation Investment Programme on key economic indicators. The model is the same as that used to develop the Programme FBC.
62. The EIA uses economic data and evidence, alongside key assumptions to model the impact of the programme. Programme impacts are assessed over a 30-year timeframe. The key assumptions are:

- Inflation has been added at a bespoke rising rate
  - 21/22: 7%
  - 22/23: 11%
  - 23/24: 16%
  - 24/25: 21%
  - 25/26 onwards: 3.75% in line with a BCIS (Building Cost Information Service) average rate pre-COVID

All other assumptions are unchanged from the Programme Business Case:

- The displacement rate is 25%
  - Financial contributions by Fife Council and Scottish Government are fixed in nominal terms
  - The first year of the programme is 2019/20
  - Job densities are 1 FTE per 47 m<sup>2</sup> (Net Internal Area) for completed buildings, and 70 jobs per hectare (gross) of serviced land unlocked to reflect the end use being Use Class 4
  - Employment multipliers (Type II, reflecting indirect and induced effects) are 1.7 for office and 2.03 for industrial employment
  - The properties will have an average 15% vacancy rate from completion, throughout the lifetime of the programme
  - £30m in private sector investment will be levered by the Programme.
63. The Fife i3 Programme investment would have both a regional and national impact on the business infrastructure in east central Scotland. This includes direct and indirect employment as well as increased household income and demand for local services. Furthermore, investment of this scale would have major benefits for supply chain businesses located in Fife, the wider east central belt and Scotland more generally.
  64. The EIA is based on the development proposals set out for the Programme in Table 9. The key inputs and findings of the assessment are summarised below:

**Table 6: Modelling Inputs**

	Input	
	Programme FBC	Updated FBC
Office floorspace	2,300 m <sup>2</sup>	928 m <sup>2</sup>
Industrial floorspace	9,700m <sup>2</sup>	9,784 m <sup>2</sup>
Capital Cost	£48.4m	£50m

Source: Fife Council

**Table 7: Modelling Outcomes and Impacts**

<b>GVA (Gross Value Added) Impact</b>	<b>Programme FBC</b>	<b>Updated FBC</b>
NPV (Net Present Value) of Net GVA	£711m	£530m
NPV of Construction	£191m	£178m
<b>Job Impact</b>		
Direct Net Jobs (average per annum)	1,095	1,035
Gross Construction Jobs (cumulative over life of Programme)	596	625
<b>Tax Impact</b>		
NPV of Direct Net Income Tax	£35m	£26m
NPV of Direct National Insurance	£53m	£40m
NPV of Direct Net Corporation Tax	£7m	£5m
NPV of Gross Non-Domestic Rates Income	£10,000	£6,000

65. Based on the preferred option for delivery, an additional £24 of GVA is generated for every £1 spent (down from £28 in the Programme FBC). Overall, the programme will increase GVA in Fife by an estimated 1.88% (down from 1.94% in the Programme FBC).

**Table 8: Summary of Programme Impacts on Key Indicators**

Key Indicator	Programme FBC	Updated FBC
GVA (NPV of Net GVA = £530m)	1.94% annual uplift in Fife's GVA	1.88% annual uplift in Fife's GVA
Jobs (Direct Net Jobs ave. p.a.)	Reduction of 0.6% in Fife's unemployment rate	
Qualitative Impacts	<ul style="list-style-type: none"> <li>• Increase in private sector investment</li> <li>• New premises to support and stimulate economic growth</li> <li>• Increase in innovation activity in Fife companies</li> <li>• Improved quality of jobs, and better career paths</li> </ul>	
Cost per job	£44,340	£49,224
GVA generated, per £ spent	£28	£24

#### 5.4 Overall findings: the preferred option

66. The preferred option combines new build and servicing of employment land to open up new sites for private development, alongside an innovation programme to benefit occupants of new premises and those in surrounding areas. It balances investment across mid and south Fife and builds in an increasing focus on the response to the climate emergency. The Programme generates £24 of GVA for every £1 invested by the public sector. The programme will be developed in tranches with opportunities to review successes and lessons learned between tranches.

## 6. Commercial case

### 6.1 Key contractual arrangements

67. The partners in the Edinburgh and South East of Scotland City Region Deal, including Fife Council developed an Implementation Plan and a Financial Agreement that profiled the drawdown of the City Region funding based on the Outline Business Cases. The Outline Business Case for the Fife i3 Programme input into this profile. This was updated during the Programme FBC
68. City of Edinburgh Council as the Accountable Body for the Edinburgh and South East of Scotland City Region Deal have entered into a Minute of Agreement with Fife Council that sets out the contractual obligations on Fife Council in respect of the City Region funding, the outputs and reporting.
69. In Year 1 of its implementation (2019/20) the Fife i3 Programme advanced City Region Deal grant funding of £1.4m. This was available to the Fife i3 Programme due to underspend in the wider City Region Deal. It is anticipated that a further advancement in grant will be made available to the Fife i3 Programme in Year 2 (2020/21).

### 6.2 Agreed risk allocation mechanism

70. The risks relating to Interest Rates, Construction and Completion, Operating Risks, Demand Risk, Force Majeure and changes in Law, Political, Regulatory, Environmental and Social Risks associated with the delivery of the Fife i3 Programme will be allocated to the party that is best placed to manage them in a cost-effective way to maximise value for money, including to the private sector. This allocation and/or transfer will include the occurrence and impact of the risk, be informed by market conditions and transaction costs. For Tranche 1 of the programme these risks have been allocated to Fife Council. At key points in the construction programme key risks will be transferred to contractors, and opportunities will be sought to take approaches that reduce or transfer risk wherever possible.
71. The intention during Tranche 2 is to begin to risk-share with the private sector on some projects through different development models (e.g. joint ventures) and early discussions have taken place with potential partners and Joint venture models explored.
72. An update on Programme risks is prepared annually as part of the Edinburgh and South East Scotland City Region Deal Annual Report<sup>3</sup>. This report is published on the website for the City Region Deal <http://esescityregiondeal.org.uk/>

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<sup>3</sup> The latest Annual Report is available here

<https://static1.squarespace.com/static/55c87967e4b05aa55020f656/t/5f58a05ce81c0c5f1363efd5/1599643749050/2019-20+Annual+Report+-+City+Region+Deal+%28updated+08-09-20%29.pdf>

### 6.3 Prioritisation of Sites

73. All potential employment sites within the Fife Employment Land Audit<sup>4</sup> including Fife Council's industrial portfolio were assessed in terms of priority and risk, based on the criteria drawn from agreed Fife Council priorities e.g. those detailed in FIFEplan. These factors include:
- Supports strategic business clusters
  - Well located to strategic growth corridors (M90, A92)
  - Fit with existing predominant land use
  - Potential impact on sensitive and incompatible land uses and
  - Potential to deliver lower-cost business space.
74. The short list of sites was further refined for their deliverability within the City Deal timescales and to ensure a balance of investment between mid and south Fife, brownfield and greenfield sites.
75. Tranche 1 of the programme is developing sites at:
- Queensway Industrial Estate, Glenrothes
  - Fife Interchange, Dunfermline
  - Dunnikier Business Park, Kirkcaldy
  - The Avenue, Lochgelly and
  - Hillend and Donibristle Industrial Estate, Dalgety Bay.
76. Moving into Tranche 2, all sites have been reassessed and additional sites considered (any site identified within 2000m of a Fife Circle railway station), with criteria added to support a stronger focus on low carbon potential and overall sustainability.
77. The additional criteria considered were:
- Greenfield – greenfield sites are generally not preferred unless they fulfil other sustainability criteria or make a significant contribution to other strategic objectives
  - Passive design – can the site accommodate a passive design, particularly in relation to the orientation of the building to maximise passive solar gain?
  - Renewables – does the site have access to any renewable energy source (e.g. district heat network, air source or solar power)?
  - Vacant & Derelict Land – will the project remediate vacant and derelict land or property?

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<sup>4</sup> [https://www.fifedirect.org.uk/uploadfiles/publications/c64\\_FINALLELA20161.pdf](https://www.fifedirect.org.uk/uploadfiles/publications/c64_FINALLELA20161.pdf)



78. The geographical spread of projects across Fife is set out in Figure 2 (above). This is unchanged from what was envisaged in the Programme FBC, although some changes to the specifications, detailed designs and site layouts will be incorporated to reflect the increased focus on carbon reduction. The Programme will continue to adapt and respond to opportunities for carbon reduction and more sustainable practices.
79. Fife Council worked with Scottish Enterprise and Zero Waste Scotland Scotland, within a wider UK and global challenge of climate change and the government objectives set-out in policies such as "Making Things Last" - the Scottish Government policy for a "circular economy strategy to build a strong economy, protect our resources and support the environment" Scottish Enterprise, Zero Waste Scotland, Construction Scotland Innovation Centre and their partners launched PORTAL, as a new-way of thinking about how we deliver quality industrial space and premises in Scotland. PORTAL is an approach to building. Not a building solution, it is a product based on improving the value of our buildings while also taking positive steps towards meeting the challenges of the Circular Economy. The PORTAL product is built around a methodology and toolkit that offers a staged approach to designing industrial buildings. See: <https://www.cs-ic.org/innovationcentre/innovation-support/online-resources/project-portal/>
80. During Tranche 1 this work has been further developed with consultants appointed to carry out a feasibility review of the standard specification and cost plans for the industrial units at Fife Interchange North that have been developed by the Council over the last 3 years by using the Portal framework. The intention is that the findings from this feasibility work will influence the approach to delivery in Tranche 2 of the Programme.
81. Areas for focus for this work include:
- modern methods of construction
  - structural frame options and cladding
  - low-cost maintenance solutions for external works
  - low carbon options - heating solutions and the impacts of a passive solution and a "fabric first" approach.
82. In order to respond to the expected requirements of the climate change agenda all new build projects in Tranches 1 and 2 have had a 10% budget increase applied to allow for implementation of design changes that reduce carbon and future-proof the buildings.

## 6.4 Development Plan

83. The key project delivery dates, project investment and outputs are shown in the Table below:

Table 9: Overview of Delivery Programme

		Capital Investment (£m)		Outputs			Tranche 1	Tranche 2			Tranche 3
								22/23	23/24	24/25	
							Years 0 - 3	Year 4	Year 5	Year 6	Years 7 - 10
		Prog FBC	Updated FBC	Prog FBC	Current FBC						
<b>Tranche 1</b>											
1	Glenrothes - Flemington	New Development	2.1	3.6	766	1,115 sq m	In delivery				
2	Dunfermline - Fife In'chge North	Site Servicing	3.0	1.8	6.45	2.8 ha (gross)					
3	Dunfermline - Fife In'chge North (delayed)	New Development	2.4	0.0	929	0 sq m	Prog FBC				
4	Kirkcaldy - Dunnikier	New Development	2.1	2.5	766	766 sq m	In delivery				
5	Dalgety Bay - Site 1	Site Acquisition	0.7	0.8	0	0 -	Complete				
6a	Lochgelly - The Avenue (closed)	New Development	2.7	0.0	766	0 sq m	Closed				
6b	Lochgelly - The Avenue	Site Servicing	0.0	1.3	0	2 ha (gross)					
7	Dalgety Bay - Site 3	Site Acquisition	0.3	0.4	0	0 -					
8	Dalgety Bay - West Way	Site Servicing	0.2	0.2	1.32	1.32 ha (gross)					
17	Glenrothes - Queensway	Refurbishment	0.0	1.4	0	692 sq m	New				
9	Dalgety Bay - West Way (accelerated)	New Development	0.0	4.3	0	1,393 sq m	T2 FBC	Prog FBC			
	<b>TRANCHE 1 TOTALS</b>	<b>13.5</b>	<b>16.3</b>	<b>3,227</b>	<b>3,966</b>	<b>sq m</b>	739	-1.7	2.8		
				<b>7.8</b>	<b>6.1</b>	<b>ha (gross)</b>					
<b>Tranche 2</b>											
9	Dalgety Bay - West Way (accelerated to T1)	New Development	2.9	0.0	966	0 sq m	T2 FBC	Prog FBC			
10	Glenrothes - Q'way Inn. Centre (delayed & combined with p19)	New Development	5.0	0.0	1,393	0 sq m		Prog FBC			T2 FBC
11	Dunfermline - Fife In'chge North 1 and 2	New Development	5.8	10.6	1,858	2,300 sq m	Prog FBC	Prog FBC	T2 FBC		
12	Buckhaven - Levenm'th Bus Park	New Development	2.9	4.3	966	966 sq m					
13	Kirkcaldy - JSBP	New Development	3.6	5.5	952	952 sq m					
14	Kirkcaldy - Innovation Hub - delayed to Tranche 3	New Development	1.7	0.0	464	0 sq m				Prog FBC	T2 FBC
15	Cowdenbeath - Innovation Hub	New Development	1.6	1.0	464	464 sq m					
16	Dalgety Bay - Site 3	Site Servicing	0.3	0.5	1.32	1.32 ha (gross)		Prog FBC			
18	Dalgety Bay - Site 1	Site Servicing	0.1	0.2	2.59	2.59 ha (gross)		T2 FBC		Prog FBC	
	<b>TRANCHE 2 TOTALS</b>	<b>23.9</b>	<b>22.1</b>	<b>7,063</b>	<b>4,682</b>	<b>sq m</b>					
				<b>3.9</b>	<b>3.9</b>	<b>ha (gross)</b>					
							-	2,381	0	-1.8	
<b>Tranche 3</b>											
19	Glenrothes - Further Investment (combined with p10)	New Development	3.3	5.8	966	1600 sq m		Prog FBC			
21	Dalgety Bay - Site 3 (closed)	New Development	3.3	0.0	966	0 sq m					
22	Kirkcaldy - Mitchellston	Site Servicing	2.1	2.1	32	32 ha (gross)					
23	Rosyth - Waterfront	Site Servicing / Infrastructure	1.5	1.5	15	15 ha (gross)					
14	Kirkcaldy - Innovation Hub - delayed to Tranche 3	New Development	0.0	1.7	0	464 sq m				Prog FBC	
	<b>TRANCHE 3 TOTALS</b>	<b>10.2</b>	<b>11.1</b>	<b>1,932</b>	<b>2,064</b>	<b>sq m</b>					
				<b>47.0</b>	<b>47.0</b>	<b>ha (gross)</b>					
	Broadband		0.7	0.5				132	0	0.9	
	<b>PROGRAMME TOTAL</b>	<b>48.3</b>	<b>50.0</b>	<b>12,222</b>	<b>10,712</b>	<b>sq m</b>					
				<b>58.7</b>	<b>57.0</b>	<b>ha (gross)</b>		-	1,510		

## 6.5 Contractual Arrangements

84. The partners in the Edinburgh and South East of Scotland City Region Deal, including Fife Council, are developing a regional approach to delivering community benefits from procurement to help deliver Inclusive Growth in the City Region. Fife Council published its Procurement & Commercial Strategy 2019-2024. The Council believes that public procurement contracts can help realise a wide range of social and environmental benefits, including more and better employment opportunities. Fife Council has also adopted a 'Construction Charter' which applies to construction projects and seeks commitment to upholding and maintaining standards. The Council uses a strategic framework of support to provide a single point of contact and end-to-end support to procuring areas, contractors and individuals to maximise sustainable outcomes. One of the Council's recovery priorities is to adopt a more progressive procurement of goods and services as recommended to deliver Community Wealth Building by advancing greater economic, social and environmental benefits, within the economy.
85. For Tranche 1, the programme's Procurement Strategy used existing Frameworks and Contracts. This approach supported the pace of delivery required to meet investment timescales agreed with regional partners. Fife Council's Building Services acted as the principal contractor for construction activities and Transportation Services for site servicing activities. During Tranche 1, the Council had hoped to test out alternative procurement strategies but delays from the COVID-19 lockdown meant that this was not possible without further risk of delay. This approach will continue for Tranche 2 investment. Alternative strategies may be tested during Tranche 2 depending on the impact of Covid-19 and the UK's exit from the European Union on market conditions.
86. Following the award of a procured project and any subsequent individual work packages, the contractor is required to support the Inclusive Growth objectives through the delivery of agreed community benefits. There are six main ways in which the procurement helps deliver Inclusive Growth in the city region:
  - New employment opportunities
  - Working with local supply chains through the Scottish Supplier Development Programme
  - Sustainability/reduced carbon
  - Fair work practices
  - Education and outreach and
  - Community cohesion.
87. Supplier engagement will be at the core of delivering Inclusive Growth supported by good procurement. Fife Council's Property and Building Services support suppliers to shape delivery of these benefits and provide supplier support and tendering training when bidding direct or as a sub-contractor of a prime contractor.

88. A series of engagements has been developed with the national Supplier Development Programme, with support and advice available for potential contractors to help them develop the expertise required to deliver these projects and to produce high quality tenders. This is aligned with the Fife i3 Programme plan to raise awareness of tender opportunities as they occur.

## **6.6 Accountancy treatment**

89. The assets created by the Fife Industrial Innovation Investment Programme will become the assets of Fife Council. These will be transferred to the Business Property Portfolio on completion. Subject to the terms of the offer of grant from Scottish Government, and the Minute of Agreement with the accountable body (City of Edinburgh Council) the rental income and any capital receipts will be used to fund the programme in order to repay borrowing. Any maintenance and management costs will be met from the rental income in line with the assumptions in the Financial Model. Any surplus will be managed by Fife Council's Enterprise and Environment Directorate in accordance with the Council's Medium-Term Financial Strategy.

## 7. Financial case

### 7.1 Profile of Funding

90. The Fife i3 Programme is funded from an annual, variable Scottish Government grant; Fife Council capital funding; capital receipts from the sale of developed land; and rental receipts from leased premises. In order to cope with additional costs and to take advantage of specific opportunities to strengthen the Programme additional funding has been brought in from Fife Council capital to support a new project that pilots a refurbishment approach; and from VDLF to remediate challenging sites. This funding approach underpins the financial modelling undertaken, which now includes more refined information on the expected costs and delivery timetable for the programme.

### 7.2 Summary of assumptions used in the Financial Model

91. The financial model makes the following key assumptions:
- Bespoke inflation assumptions have been applied based on BCIS rates for the next 5 years of the Programme. These rates reflect expected ongoing COVID-19 disruption:
    - 21/22: 7%
    - 22/23: 11%
    - 23/24: 16%
    - 24/25: 21%
    - 25/26 onwards: 3.75% in line with a typical BCIS (Building Cost Information Service) average rate pre-COVID.
92. The maintenance cost assumptions have also been refined since the Programme FBC was developed:
- Operational / day-to-day maintenance is assumed at 0.17% of development capex and is 85% recovered from tenants
  - More significant maintenance (e.g. new roof, windows, boiler replacement, etc) is assumed at 0.15% of development capex, but no allocation is made until Year 11 of the Programme
93. All other assumptions are unchanged from the Programme Business Case and are used consistently in both the financial and economic modelling:
- The displacement rate is 25%
  - Financial contributions by Fife Council and Scottish Government are fixed in nominal terms
  - The first year of the programme is 2019/20
  - Job densities are 1 FTE per 47 m<sup>2</sup> (Net Internal Area) for completed buildings, and 70 jobs per hectare (gross) of serviced land unlocked to reflect the end use being Use Class 4

- Employment multipliers (Type II, reflecting indirect and induced effects) are 1.7 for office and 2.03 for industrial employment
- The properties will have an average 15% vacancy rate from completion, throughout the lifetime of the programme
- £30m in private sector investment will be levered by the Programme.
- Net Developable Site Area (Ha) is 60% of gross site area
- Of the gross internal area of space that could be built over a site, we assume only 70% of that potential is built out
- Site enabling works to bring employment sites up to a developable standard is assumed at £150,000 per Ha (gross site area) – these assumptions are refined when site investigation work is completed
- 70 jobs are created per Ha
- As properties are completed, they are not all immediately occupied. In the first year following completion 40% are assumed to be rented; in year 2, 60%; in Year 3 85%; and in Year 4 100%. Although these percentages are based on a “full occupancy rate” of 85%
- Rents differ on the basis of estimated market rents in each local area
- Management costs are assumed to be 7.5% of rental income;

### 7.3 Overall affordability

94. Since the preparation of the Programme Business Case, the financial modelling shows some movement in the expected NPV (Net Present Value) for the programme. This is principally caused by a changes to the Programme to respond to the COVID-19 pandemic, including additional investment being used to support the delivery of the Programme.
95. This updated FBC shows a small increase in the Programme surplus from £14 million in the Programme Business Case to **£15.7 million**. The NPV for the programme is expected to be a surplus of **£3.5 million** – this is an increase from the original Programme FBC, which showed a £0.177 million NPV surplus. The main reasons for the increase in surplus is revision of maintenance cost assumptions. Any surplus will be managed by the directorate in accordance with the medium-term financial strategy.
96. The results of the latest financial modelling and the movement between the financial modelling for the Programme Business Case and the latest position are shown below:

**Table 10: Financial Modelling Results and Movement from Programme FBC to Current Position**

Sensitivities (£m)	NPV of (Surplus) / Deficit	(Surplus) / Deficit	Investment	Capital Receipts	Interest (%)
Base Case - FBC 3.75% BCIS	(0.2)	(14.1)	48.4	(5.3)	3.64
Tranche 2 FBC Update	(3.5)	(15.7)	50.0	(5.3)	3.64
Movement	3.3	1.6	1.6	(0.0)	0

Note: figures may not sum due to rounding

97. The movement in grant profile from the City Deal Financial Plan is shown below, this is based on claims being made annually in arrears for 79% of costs incurred. Compared to the Financial Plan this results in advancement of grant drawdown in Year 2 (relating to Year 0 and 1 activity), followed by slippage for three years. The slippage principally relates to re-profiling of some activity on Levenmouth Business Units from Year 3 to Year 5 of the programme.

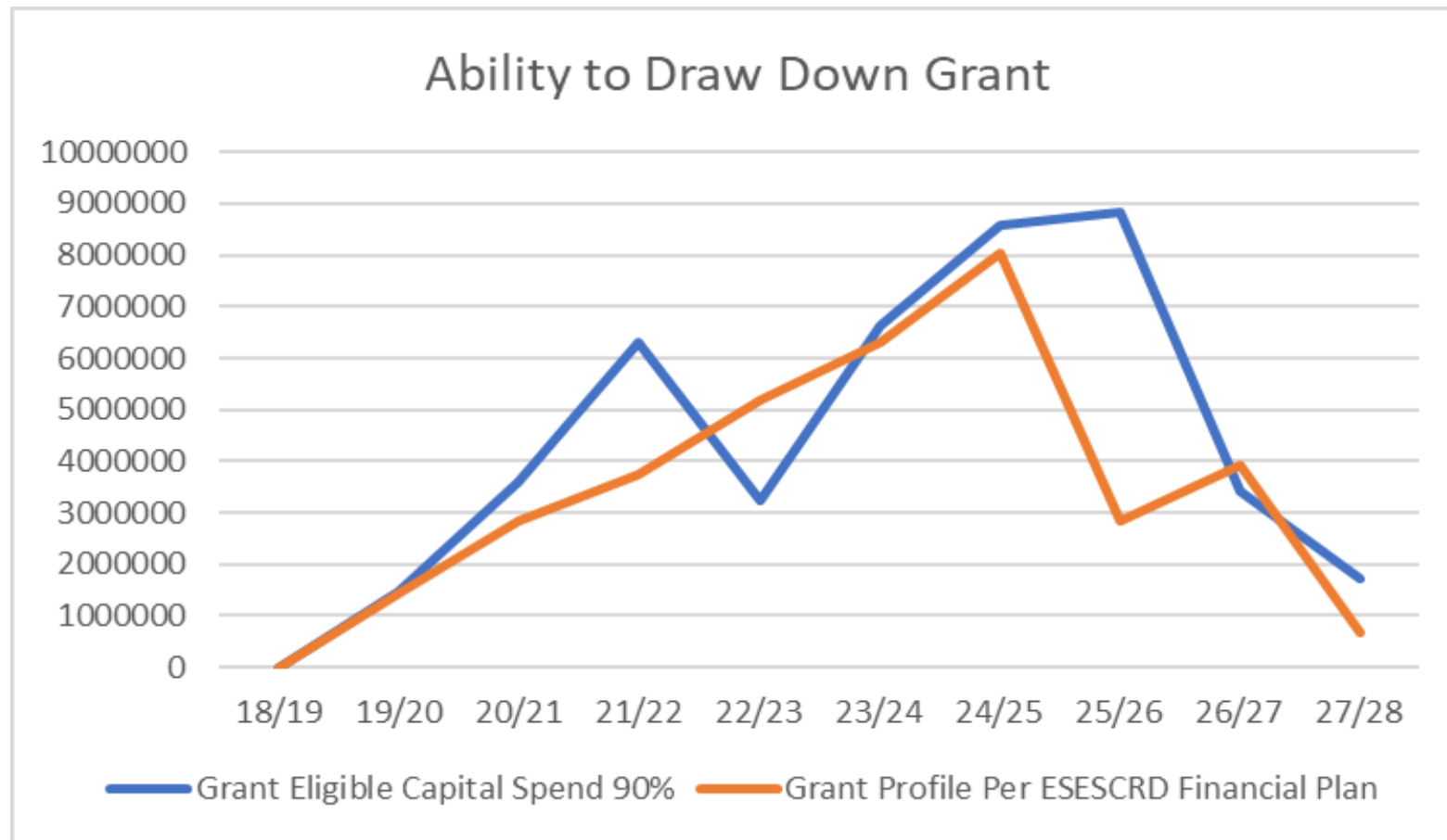
**Table 11: Movement in Grant Profile from Programme Full Business Case to Current Position**

	2019/20 Year 1	2020/21 Year 2	2021/22 Year 3	2022/23 Year 4	2023/24 Year 5	2024/25 Year 6	2025/26 Year 7	2026/27 Year 8	2027/28 Year 9	TOTAL
City Deal Financial Plan		(2.840)	(3.748)	(5.173)	(6.317)	(8.046)	(2.852)	(3.928)	(2.096)	(35.000)
Base Case - FBC 3.75% BCIS		(3.243)	(3.665)	(4.489)	(4.119)	(7.863)	(5.410)	(3.745)	(2.465)	(35.000)
Current Position * (variable BCIS during Tranche 2)	(1.433)	(2.840)	(3.748)	(5.173)	(6.317)	(8.046)	(2.852)	(3.928)	(0.663)	(35.000)

\* current position aligns with City Deal Financial Plan, but shows advancement of grant in Year 1, and reduction to offset this in Year 9

98. The alignment between Programme activity and grant drawdown is shown in Figure 6. This shows that in Year 4 of the Programme eligible spend significantly exceeds the available grant profile, whilst in Year 5 the eligible spend is insufficient to draw down the available grant. In order to smooth the peak in Year 4, it is possible to delay a project so that it straddles Years 4 and 5. This change will be implemented in the event that there is no unplanned slippage elsewhere, but can be considered a risk mitigating action against delays on early Tranche 2 projects.

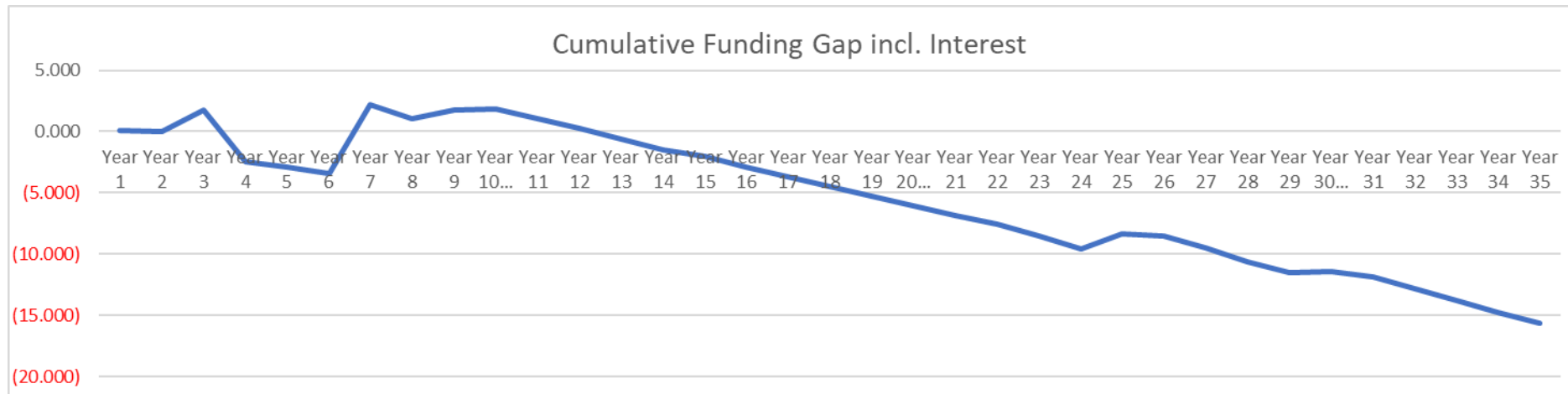


**Figure 5: Eligible Capital Spend Vs Grant Profile**

## 7.4 The Council's Debt Requirement

99. Figure 7 (below) shows the funding gap for the duration of the programme. Overall Borrowing peaks at £2.25m in Year 7 and is repaid by 2032. Thereafter the programme generates a surplus to the end of the 35 year programme life. Any surplus will be managed by Fife Council's Enterprise and Environment Directorate in accordance with Fife Council's Medium-Term Financial Strategy. This differs from the Programme FBC, which showed a borrowing peak in Year 5 of £6.2m.

**Figure 6: Cumulative Funding Gap Including Interest (£m) over 35 years**

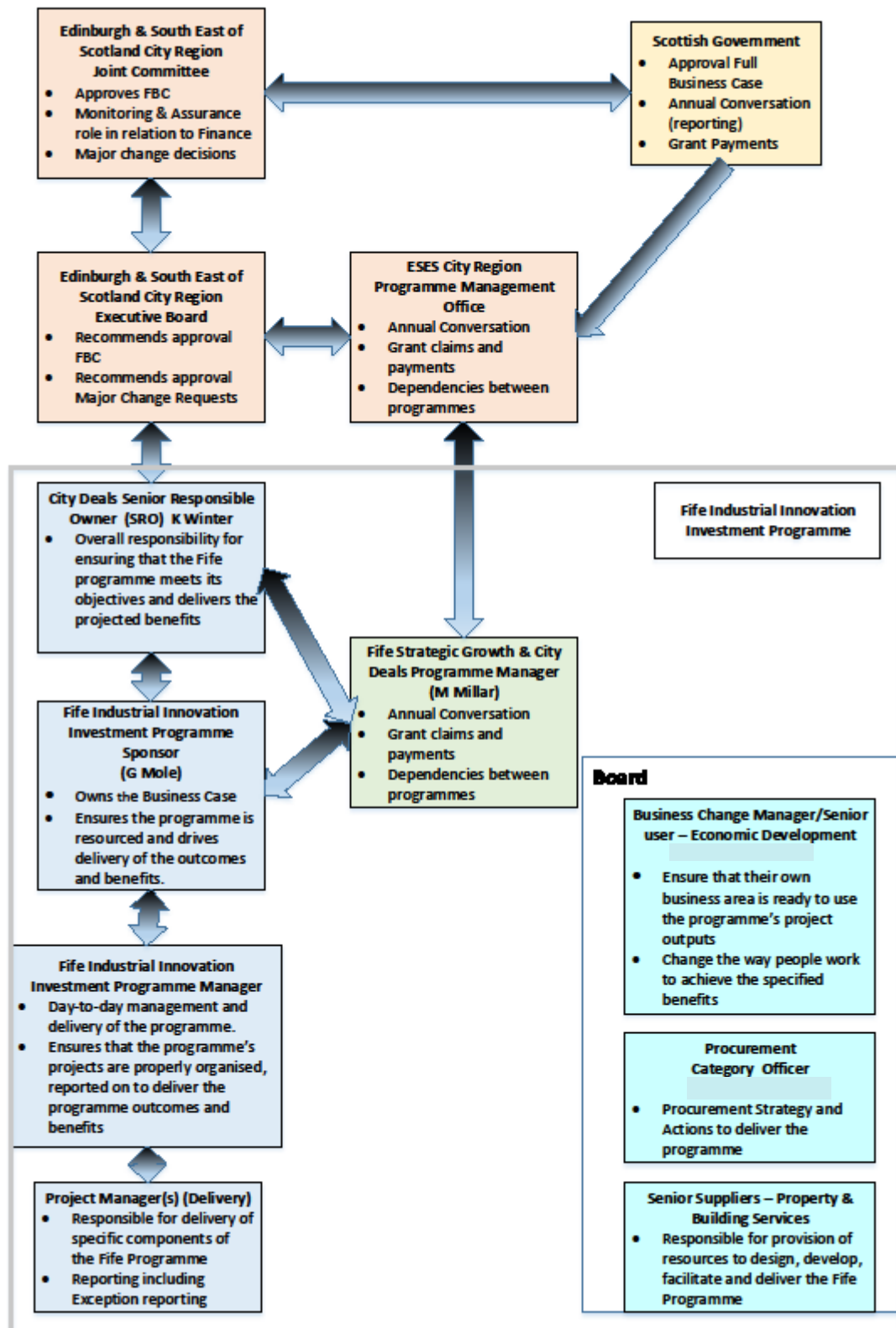


## 8. Management case

### 8.1 Programme and Project Management Arrangements

100. The governance structure for the Edinburgh and South East Scotland City Region Deal and how the Fife Industrial Innovation Investment Programme fits with this set out at <http://esescityregiondeal.org.uk/about-us>. This was agreed as part of the Deal document.
101. The Fife Industrial Innovation Investment Programme reports to the Edinburgh and South East Scotland City Region Deal Executive Board and its Joint Committee.
102. Fife Council established a Sustainable (formerly Strategic) Growth and City Deals Programme Board in 2018 to provide strategic direction and oversee all city deal activities, programmes and projects. Its remit includes management of the Fife Industrial Innovation Investment Programme, to ensure it is controlled and benefits realised. The Fife Sustainable Growth and City Deals Programme Board also integrates the governance relating to both Edinburgh and South East Scotland and Tay Cities Deals. The individual project and programme management arrangements for the Fife Industrial Innovation Investment Programme that were set up at the start of Tranche 1 are shown below:
103. A Programme Board for the Fife i3 Board has also been established and is responsible for management of the Programme. The individual project and programme management arrangements are shown below:

Figure 7: Project and Programme Management Arrangements

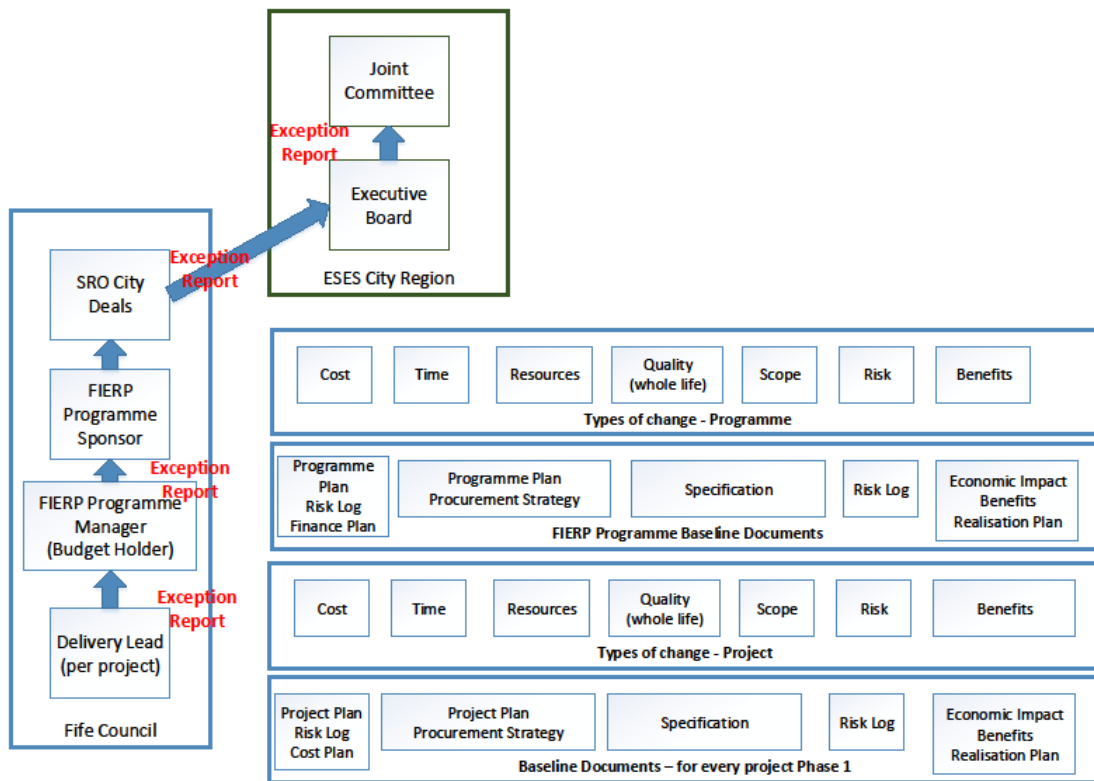


104. During Tranche 1, the Board used the Association of Project Managers (APM) Assurance toolkit to develop an action plan to set up the governance processes to ensure that these complied with best practice. Corporate processes for benefits, change, risk, issue and opportunity, stakeholder and communications management have been tailored by the Fife i3 Programme. The Programme has been able to sustain its investment programme during Tranche 1 and the COVID-19 restrictions.

## 8.2 Managing Change

105. The Deal Document set out the regional partners' processes for decision-making and management of change. During Tranche 1, project and programme tolerances for the Fife i3 Programme were agreed by the Programme Board in terms of cost, time, resources, quality, scope, risk and benefits. Where project or programme tolerances are exceeded, exception reports are triggered and escalated as outlined below:

**Figure 8: Change Control Process**



106. Major change decisions are escalated from the Fife Industrial Innovation Investment Programme to the Executive Board and if appropriate to the Joint Committee. During Tranche 1, the change activity related to actions to mitigate against the impact of COVID-19 on the programme's costs and timescales, to sustain the realisation of programme benefits and actions to respond to opportunity to improve value for money for the programme. All projects in Tranche 1 established their baselines as set out in Figure 11. The Programme baseline documents were also approved by the Board. These will be reviewed as part of the preparation for delivery of Tranche 2.

### **8.3 Benefits realisation**

107. The Benefits Register was set out in Appendix 5 to the FBC approved in March 2019. During Tranche 1, the Edinburgh and South East of Scotland City Region developed its Benefits Realisation Approach. The approach for the Fife i3 Programme is set out in Appendix 3. These are managed and reviewed through the Governance and change management processes.

### **8.4 Approach to risk management**

108. The main programme risks relate to delivery and viability; finance; and legal. A copy of the risk register for Tranche 2 is set out in Appendix 4. Actions to mitigate risk are developed and managed as part of the Project and Programme governance established in Tranche1. Risks within the control of Fife Council, (staff capacity, appropriate governance arrangements, early site investigation and utility scoping), are actively managed. Mitigation strategies relating to the wider economic environment (economic instability, interest rates) are tracked and are deployed in response to change. All risks are regularly reviewed and managed by the Programme Board.

### **8.5 Programme and project evaluation arrangements**

109. Each project has its own detailed Business Case setting out its expected contribution to the Fife i3 Programme outcomes, and how and when these will be measured and monitored. These are approved by the Programme Board if within tolerances. Further reviews are carried out after the procurement is completed for each project; and when each project is completed and ready for service. Lessons learned are a regular part of these reviews. Benefit Realisation Reviews will also be conducted once the projects are completed and occupied.
110. A programme evaluation will be carried out after 5 years in line with the overall review of the City Region programme. The evaluation will capture lessons learned from individual project reviews and for the wider programme including:
- Post-occupancy surveys with tenants of new-build units (undertaken around 6 months after occupation) to identify any missed opportunities and/or over-specification in order to optimise future investment plans
  - Regular ongoing tenant satisfaction survey results to identify longer-term maintenance or management issues
  - Lessons learned from procurement, construction and marketing/letting activities
  - Tracking of business performance associated with the programme including actual employment achieved, plans for growth and innovation activity and
  - Regular discussion with Scottish Borders Council and other stakeholders to share best practice and lessons learned.

## 9. Recommendation

111. It is recommended that the Full Business Case for Tranche 2 of the Fife i3 Programme is approved, and the programme be authorised to proceed into delivery.

**Signed:**

**Date:**

This section will be completed subject to approval and/or amendment by Fife Council Policy and Coordination Committee on 19 November
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**Senior Responsible Owner, Fife i3 Programme**

## Appendix 1: New Projects

<p>Lochgelly The Avenue Business Park</p> 	<p>The proposed development site is owned by Fife Council. It is a prime development opportunity in a thriving and vibrant business/ industrial park. The access road has already been constructed so the site is suitable for immediate development. Originally it was envisaged that this project would consist of site servicing of a small site area and a subsequent build project.</p> <p>Fife Council has been approached by a private sector developer looking to construct business property for let and has therefore altered the proposal at this location to service a much larger site area (circa 2 ha) and dispose of these sites.</p>
<p>Glenrothes Queensway Industrial Estate Q10 Building Refurbishment</p>	<p>Queensway Industrial Estate is one of Glenrothes' highest profile and formerly most popular industrial estates which has over many years been home to a wide range of businesses. However, the age and condition of existing buildings, derelict land and property, retail encroachment, poor image and a lack of management and maintenance, has resulted in the Estate being unable to realise its full economic potential. To secure the future success of the Estate, the Council prepared a Regeneration Action Plan and has focused investment in this area in recent years.</p> <p>This project will comprise part of an overall property transaction with the owner of existing commercial premises at Flemington Road, Queensway Industrial Estate which will facilitate the relocation of part of the owner's existing business accommodation to a redundant Council owned building and which will allow the demolition of former office accommodation which has been vacant for some years and which otherwise could not be demolished. As part of the transaction the Council will secure ownership of an existing under-utilised stand-alone warehouse building owned by the company which will be subdivided and refurbished to provide a terrace of small business units for employment uses within use class 4, 5 and 6 extending to a total of 692 m<sup>2</sup>. The refurbishment and provision of this accommodation would support a more environmentally sustainable approach by re-purposing second-hand accommodation, enhancing thermal efficiency thereby reducing energy demand as well as reducing the impact of embedded carbon in new build construction. This will also contribute further to the delivery of the Queensway Regeneration Action Plan and complement earlier/ongoing investment in the area. The contribution to net zero carbon ambitions will be assessed as the project develops.</p>



## Appendix 2: Programme Approvals

Copies of Programme Documentation are available on request from report author

Date	Board	Document	Status
180412	Policy & Coord C#	Outline Business Case (Private Paper) - Fife Industrial Estates Regeneration Programme, Edinburgh & South East of Scotland City Region Deal.	Approved
180412	Policy & Coord C#	Financial Model - OBC (Informed Financial Profile and commitments within ESES City Region Deal document).	Approved
190124	Policy & Coord C#	Full Business Case - Fife Industrial Innovation Investment Programme (Fife i3 P)	Approved
190124	Policy & Coord C#	Financial Model FBC - variations from OBC profile	Approved
190103	ESES Joint C#	Fife Industrial Innovation Investment (Fife i3) Programme Business Case	Approved
190103	ESES Joint C#	Financial Model for JC Business Case	Approved
190212	Fi3P	Change Request: Westway, Dalgety Bay - approach to split costs with Taskforce Units	Approved
190212	Fi3P	Assurance Review (Thomas & Adamson) and Action plan	Approved
190212	Fi3P	Change Control and Tolerances Approach (Benefits Section not yet completed)	Endorsed
190212	Fi3P	Procurement Strategy	Approved
190312	Fi3P	Fife i3 Programme Roles & Responsibilities	Endorsed
190312	SG&CD	Roles and Responsibilities Decision: the paper was agreed, subject to minor clarifications in recommendations 2 and 3 and Figure 2.	Approved
190321	SG&CD	Change Control / Tolerances Approach (Benefits Section not yet completed) Decision: the process set out in the paper was endorsed by the board as a current position to support delivery, subject to further work with the PMO and SBC on what constitutes “major / significant” and to develop benefits tolerances	Approved
190321	Fi3P	PF01 Flemington Road, Queensway, Glenrothes (Build)	Approved
190411	Fi3P	Site and road layout plans for Fife Interchange North, Dunfermline	Approved
190411	Fi3P	Updated PF01 Flemington Road (build) - Once financial profiles are prepared, this info to be slotted into PF01; compare with the Programme FBC, noting any variations; and final version circulated to Board by email for approval	Further work
190509	Fi3P	Exception report: Fife Interchange Site Servicing – Substation. Agreed to accept quote from Scottish Power for Substation	Approved
190509	Fi3P	Risk & Opportunity Management Plan	Approved
190509	Fi3P	PF01 Fife Interchange North (Site Servicing/Acquisition).	Approved

190613	Fi3P	PF01 Ridge Way, Dalgety Bay (Build) – subject to adding £30,000 of Vacant and Derelict Land Fund expenditure agreed for site investigation work	Approved
190613	Fi3P	PF01 West Way, Dalgety Bay (Site Servicing)	Approved
190613	Fi3P	PF01 Dunnikier, Kirkcaldy (build)	Approved
190613	Fi3P	PF01 Cochrane Way, Dalgety Bay (Acquisition)	Approved
190711	Fi3P	PF01 The Avenue, Lochgelly, (build)	Approved
190711	Fi3P	PF01 Westway, Dalgety Bay (build)	Approved
190711	Fi3P	PF01 Fife Interchange North, Dunfermline (build)	Approved
190711	Fi3P	Exception Report: Fife Int N (Site Servicing/Acquisition) underspend. Recommendation agreed - to pursue in more detail <u>both</u> Option 3 (Additional Build at Flemington Road, Queensway Ind Est, Glenrothes) and Option 2 (Additional Infrastructure Investment at The Avenue, Lochgelly). Option 8 (Programme Contingencies) is the default for any residual monies.	Approved
190808	Fi3P	Exception Report: Set financial tolerances for Ridge Way, Dalgety Bay acquisition (Lower £627k - £660k upper)	Approved
190808	Fi3P	Q1 Financial Performance Report	Approved
190808	Fi3P	Y2 (2020/21) financial forecast for ESES City Region Deal	Approved
190808	Fi3P	Exception Report: West Way, Dalgety Bay (Site Servicing) – Agreed to "do nothing" to secure additional Electricity Supply to avoid additional cost of £25k	Approved
190912	Fi3P	Exception Report: Levenmouth Business Park (Tranche 2 Project) Power. Agreed early expenditure of £30,048 from the City Deal Levenmouth Business Units budget, in respect of the proportion of the sub-station costs.	Approved
190912	Fi3P	ESES CRD Q2 Financial Performance Report	Approved
190912	Fi3P	Communications Plan	Approved
191010	Fi3P	Letting and Disposal Policy	Approved
191114	Fi3P	Cross Service Payment process	Approved
191114	Fi3P	Financial model review - inflation assumptions	Approved
191114	Fi3P	Exception Report: The Avenue, Lochgelly (timescales)	Approved
191114	Fi3P	Change request: Flemington Road, Glenrothes. Extension to the tender period agreed (retrospective). All endeavours will be made to mitigate any delayed start after 4th Nov 2019.	Approved
191114	Fi3P	Programme Management Plan	Approved
191212	Fi3P	The Quality Assurance Management Plan reviewed. Agreed to be amended to include a link to the Change Control document and to set out how exception reporting will include quality (A111). The quality process section to be amended to include a design review and pre-tender evaluation process (A112).	Further work (completed 200514)
191212	Fi3P	Document Management Plan (interim approach)	Approved
191212	Fi3P	ESES CRD Q3 performance report	Approved

191212	Fi3P	Financial Model update	Approved
191212	Fi3P	Tenant Application Process	Approved
200204	Fi3P	Private Sector Leverage Realisation Plan	Approved
200319	Fi3P	Change request: COVID-19 Review	Approved
200409	Fi3P	Fife i3 Programme Master Schedule	Approved
200409	Fi3P	Exception report: Flemington Road, Glenrothes - site closure	Approved
200514	Fi3P	Updated Programme Quality Assurance Management Plan (include the resources required to manage and administer the various contracts should be clearly identified)	Approved
201008	Fi3P	Benefits Management Plan	Approved
201008	Fi3P	A Development Models Options Plan	Continue to next stage of development
N/A	Fi3P	The Monitoring and Evaluation Framework for the Fife i3 Programme	In development
N/A	Fi3P	Change Control and Tolerances Approach – Benefits Section	In development
N/A	Fi3P	Close-out (handover) procedures for site servicing and build projects	In development

### Appendix 3: Benefits Register

#### Expected Project Benefits – Construction Projects

#### During Construction

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Community benefits (external)	Awaiting regional approach							
Construction jobs supported	Jobs supported by construction contracts let	NA	Year 0	<ul style="list-style-type: none"> <li>• 100 jobs (cumulative during Tranche 1)</li> <li>• 600 jobs (cumulative over the lifetime of the Programme)</li> </ul>	Service Manager – Major Works, Environment & Building Services (Steve Anderson)	<ul style="list-style-type: none"> <li>• By end March 2022</li> <li>• By end March 2029</li> </ul>		

### On Completion of Project Build

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Tranche 1 - Floorspace completed (internal)	Floorspace (m <sup>2</sup> ) completed Vs expected floorspace for the project in the approved programme business case	NA	NA	<b>Tranche 1 Projects</b> <ul style="list-style-type: none"> <li>1. Flemington – 1,115 m<sup>2</sup></li> <li>3. Fife Interchange Phase 1 – 1,421 m<sup>2</sup></li> <li>4. Dunnikier – 766 m<sup>2</sup></li> <li>6. Q10 (refurb) – 692 m<sup>2</sup></li> </ul>	Fife i3 Programme Manager (Ronnie Hair)	<ul style="list-style-type: none"> <li>By end of March 2022</li> </ul>	3,994 m <sup>2</sup> of floorspace constructed in Tranche 1 of the programme	

## On Occupation of Units

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Rents achieved (internal)	Rents achieved - £ per m <sup>2</sup>	Based on market assessment FBC	N/A	<b>Tranche 1 Projects (£ per m<sup>2</sup> in year 1, rising at 2% p.a)</b> <ul style="list-style-type: none"> <li>1. Flemington – £65</li> <li>3. Fife Interchange – £75</li> <li>4. Dunnikier – £70</li> <li>6. Q10 (refurb) – £65</li> </ul>	Service Manager Economic Development (Pamela Stevenson)	One year post-completion of each project	Positive programme NPV	
Jobs created per development (external)	No of employees based in City Deal premises (actual and forecast)	FBC assumptions	NA	<b>Tranche 1 Projects</b> <ul style="list-style-type: none"> <li>1. Flemington – 24</li> </ul>	Service Manager Economic Development (Pamela Stevenson)	Three years post-completion of tranche (85% occupancy	85 direct jobs created by Tranche 1 projects by Year 6 Multiplier	

				<ul style="list-style-type: none"><li>• 3. Fife Interchange – 30</li><li>• 4. Dunnikier – 16</li><li>• 6. Q10 (refurb) – 15</li></ul>		expected)	effects based on assumptions to be estimated	
Companies with innovation outlook (external)	No of City Deal units leased to companies that meet letting criteria inc. commitment to balanced workforce and innovation aspects of Scottish Business Pledge.	NA	NA	<b>Tranche 1 Projects</b> <ul style="list-style-type: none"><li>• 1. Flemington – 7</li><li>• 3. Fife Interchange – 8</li><li>• 4. Dunnikier – 5</li><li>• Q10 (refurb) – 5</li></ul> (80% = 25 across Tranche 1)	Service Manager Economic Development (Pamela Stevenson)	In line with occupation of properties, subject to ongoing review	Higher Business Expenditure on R&D per head Vs Fife average	

## Post Occupation

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Private sector leverage	Capital investment by tenants fitting out interior	N/A	N/A	<b>Tranche 1 Projects</b> <ul style="list-style-type: none"> <li>1. Flemington – £90,000</li> <li>3. Fife Interchange – £90,000</li> <li>4. Dunnikier – £60,000</li> <li>Q10 Refurb – £40,000</li> </ul> (average £10,000 per new build unit, £8,000 per refurbished unit = £280,000 from Tranche 1 projects)	Service Manager Economic Development (Pamela Stevenson)	One year post-occupancy	Private sector leverage of £30m across programme	



**Expected Project Benefits – Serviced Sites (including acquisitions, disposal and land deals) Projects  
On Completion**

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Tranche 1 – Ha of Immediately Available Serviced Land (external)	Ha of Immediately Available Serviced Land Vs expected Ha for the project in the approved programme business case	NA	NA	<b>Tranche 1 Projects</b> <ul style="list-style-type: none"> <li>2. Fife Interchange – 6.45 Ha (gross)</li> <li>6B. Lochgelly 2 Ha (gross)</li> <li>7. West Way – 1.32 Ha (gross))</li> </ul>	Fife i3 Programme Manager (Ronnie Hair)	By end of March 2022	7.8 Ha (gross) of land serviced and available in Tranche 1 of the programme	<b>Tranche 1 Projects</b> <b>On track to deliver</b> <ul style="list-style-type: none"> <li>2. Fife Interchange – <b>1.7</b> Ha (gross)</li> <li>6B Lochgelly tbc (subject to site investigations)</li> <li>7. West Way – <b>1.32</b> Ha (gross)</li> </ul> <b>TOTAL 6.1 Ha</b>

Tranche 1 Sites Acquired (internal)	Sites brought into Council ownership for future servicing / development	NA	NA	FC ownership of <ul style="list-style-type: none"> <li>Fife Interchange North (Dunfermline)</li> <li>Ridge Way (Dalgety Bay)</li> <li>Cochrane Way (Dalgety Bay)</li> </ul>	Fife i3 Programme Manager (Ronnie Hair)	By end of March 2022	Input to site servicing and construction projects (internal benefit)	<ul style="list-style-type: none"> <li>Ridge Way (Dalgety Bay) acquisition complete</li> </ul>
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## Post Completion

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Tranche 1 – Capital Receipts from Sale of Land (internal)	£ value of capital receipts received in-tranche	NA	NA	<b>Tranche 1 Projects</b> Receipts not expected until Tranche 2	Fife i3 Programme Manager (Ronnie Hair)	Beginning during FY 22/23	Supports positive prog NPV. Delivers financial support to realise other benefits.	
Private sector investment (external)	Private sector investment – new-build and fit-out of premises on serviced sites	NA	NA	<b>Benefits from Tranche 1 Projects are not expected until Tranche 2. Average of £0.5m per Ha</b> <ul style="list-style-type: none"> <li>2. Fife Interchange – £1.4m</li> <li>6B Lochgelly - £1m</li> <li>7. West Way – £660,000</li> </ul>	Service Manager Economic Development (Pamela Stevenson)	Beginning during FY 22/23 and ongoing	Private sector leverage of £30m across programme	

## Expected Project Benefits – Business Innovation

### Post Completion

Benefit name (and type)	Measure(s)	Baseline per measure(s)	Date of baseline	Target per measure(s)	Benefit Owner	Timescale	Programme end benefit	Actual result to date per measure(s)
Better Quality jobs (external)	Salary in line with (or higher than) Programme FBC assumptions (via post-occupancy annual survey)	N/A	N/A	Fife i3 Tenants & occupiers, and any related supply chain, etc  Industrial employment with salaries over £30,100  Office employment with salaries over £26,600	Service Manager Economic Development (Pamela Stevenson)	One year post-occupancy, and ongoing	At least 80% of direct jobs created are higher wage jobs	
Innovation Active Companies (external)	Follow-on innovation activity	N/A	N/A	Fife i3 Tenants & occupiers, and related supply chain, etc  Business Gateway engagement and/or relevant activities	Service Manager Economic Development (Pamela Stevenson)	One year post-occupancy, and ongoing	The Programme supports Innovation which leads to higher productivity and protects jobs	

## Appendix 4: Risk Register

### High Level Programme Risks – Summary and Mitigation

Risk	Mitigation
Cost increases due to higher construction inflation than assumed in the Business Case (including increases driven by a potential no-deal Brexit and/or related to COVID-19), with consequent reduction in outputs.	Looking for opportunities to align other funding, such as VDLF, to support Programme Delivery. Considering prioritisation of sites to reduce overall scope if required.
Programme underspend due to third party delay with site acquisitions and/or servicing.	Monitoring closely and opportunities to advance other projects identified in case of delays
Changes in the wider policy environment, including COVID-19 restrictions and requirements, that impact on the delivery or requirements of the programme (planning, building control, environment, etc) and increase costs or slow down delivery.	Key policies are being monitored closely, in particular implications of COVID routemap and its implications for the Programme. Opportunities to future-proof the Programme's outputs are being actively considered e.g. installing additional ventilation systems. Some degree of risk and uncertainty is inevitable.
A lack of private sector appetite to invest and low tenant demand due to a slowing or weakening in the economy which would reduce expected leverage and / or jobs.	Ongoing market testing and discussion with potential investors and tenants across proposed programme locations.
A lack of suitable occupiers for the industrial premises (prepared to innovate and work with the Universities to deliver inclusive growth).	Letting policy developed and agreed by Programme Board that makes it clear what the tenant requirements are. Tenancy application process in development to deliver on this.

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## Edinburgh and South East Scotland City Region Deal Joint Committee

**10 am, Friday 5 March 2021**

### **ESESCR Deal Transport Appraisal Board bid into the Bus Partnership Fund**

**Item number 5.5**

#### **Executive Summary**

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As part of its response to the climate emergency, the Scottish Government have to providing a long-term investment of over £500m through the [Bus Partnership Fund](#) to deliver targeted bus priority measures on local and trunk roads. This is intended to reduce the negative impacts of congestion on bus services and address the decline in bus patronage.

The Bus Partnership Fund will complement the powers in the Transport (Scotland) Act 2019, enabling local authorities to work in partnership with bus operators, to develop and deliver ambitious schemes that incorporate bus priority measures. The Fund will focus on the evidence of how bus services will be improved by addressing congestion, but the partnership approach is also expected to leverage other bus service improvements to help tackle the climate emergency, reduce private car use and increase bus patronage.

The closing date for Phase 1 submissions into the Bus Partnership Fund is 19 April 2021. It is proposed that the City Region Deal's Transport Appraisal Board coordinate a regional bid into the fund. A corridor approach to identify interventions across the South East Region will be taken. This regional bid can be submitted together with individual bids by Councils or other bids as appropriate. The proposed approach will be subject to approval by the relevant Councils in March and April 2021.

#### **Grace Vickers**

Chair, ESESCR Deal Transport Appraisal Board

Ewan Kennedy, Policy and Planning Manager, The City of Edinburgh Council

E-mail: [ewan.kennedy@edinburgh.gov.uk](mailto:ewan.kennedy@edinburgh.gov.uk) | Tel: 0131 469 3575

## ESESCR Deal Transport Appraisal Board bid into the Bus Partnership Fund

### 1. Recommendations

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- 1.1 To note the timetable for bidding into Transport Scotland's £500 million [Bus Partnership Fund](#).
- 1.2 To note that the Transport Appraisal Board has a remit to consider the benefits of collective regional based bids for external funding as set out at Appendix 1 to this report.
- 1.3 To authorise the Transport Appraisal Board to prepare a collective South East of Scotland regional bid for submission to Transport Scotland for funding from its Bus Partnership Fund, subject to agreement by the six individual Councils.
- 1.4 To note that Clackmannanshire and Falkirk Councils have been invited to join the Transport Appraisal Board to participate in the regional bid.
- 1.5 To note that the applications must be from partnerships working towards Bus Service Improvement Partnership (BSIP) status, as defined by the Transport (Scotland) Act 2019.
- 1.6 To note that separate partnership bids into the fund may be submitted in addition to the regional bid, and that the partnerships will remain in close contact to ensure that bids complement and do not duplicate one another.
- 1.7 To receive further reports on the progress of any measures and interventions together with any additional proposals to support the work of the Transport Appraisal Board.

### 2. Background

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- 2.1 As part of its response to the climate emergency, the Scottish Government are providing a long-term investment of over £500m through the Bus Partnership Fund to deliver targeted bus priority measures on local and trunk roads. This is intended to reduce the negative impacts of congestion on bus services and address the decline in bus patronage.
- 2.2 The Bus Partnership Fund will complement the powers in the Transport (Scotland) Act 2019, enabling local authorities to work in partnership with bus operators, to develop and deliver ambitious schemes that incorporate bus priority measures. The



Fund will focus on the evidence of how bus services will be improved by addressing congestion, but the partnership approach is also expected to leverage other bus service improvements to help tackle the climate emergency, reduce private car use and increase bus patronage.

- 2.3 Transport is one of the five key themes of the City Region Deal and is integral to securing the overarching aim of achieving sustainable inclusive growth across the region. The City Region Deal agreement specified as part of the governance structure the requirement for a Transport Appraisal Board (TAB) to focus on a regional approach to upgrading existing transport infrastructure to support regional activity in innovation, employability/skills and housing. The Terms of Reference for the City Region Deal include considering the benefits of collective regional based bids for external funding, and are shown in Appendix 1, and the Governance structure for the City Region Deal is shown in Appendix 2.
- 2.4 The region has already successfully bid into Transport Scotland's Bus Priority Rapid Deployment Fund, through the South-East Scotland Transport Transition Group (subgroup of the Transport Appraisal Board), securing £1.8 million of measures to help improve bus priority during the pandemic, This regional approach was approved by this Committee on [7 August 2020](#), and ratified by the constituent councils thereafter.
- 2.5 The fund is to deliver bus priority infrastructure to help tackle the climate emergency, reduce private car use and increase bus patronage. The fund encourages ambitious proposals, including park and ride where it can be demonstrated to have a clear benefit in effecting modal shift, but all proposals will be considered in light of the evidence provided and how successful the interventions are expected to be in achieving the targeted outcomes of the fund.

### 3. Main report

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- 3.1 The Edinburgh and South East Scotland City Region Deal Transport Appraisal Board (TAB), comprising officer representatives of the six City Region Deal Councils together with officer representatives from Transport Scotland and the Regional Transport Partnership, SEStran, have agreed that a regional approach should be taken to bid into the fund. Clackmannanshire and Falkirk Councils have been invited to join the TAB to participate in the regional bid. This approach will be recommended for approval by the Joint Committee on 5 March 2021.
- 3.2 An approach largely based on a strategic review of corridors is recommended to ensure that packages of interventions for bus improvements that cross local authority boundaries can be identified in a systematic way. Measures will be developed on a corridor end-to-end basis where the individual interventions will work together as a holistic joined-up corridor route treatment.
- 3.3 The most efficient and effective way of managing the development of proposals in graduality is to subdivide the South East Region into three groups (subgroups of the TAB. The lead authority in coordinating the bid will be the City of Edinburgh Council.
- 3.4 The deadline for initial applications is 16 April 2021. In this submission, the following will be set out:

- approach and governance of project and the basis of developing Bus Service Improvement Partnerships.
- high level proposals (estimated costs for key corridors)
- funds required to secure consultancy resources to deliver the required Outline Business Cases for proposals and develop a further bid for October 2021's deadline.
- funds required to implement any "priority" and "shovel ready" type schemes

3.5 For the second deadline in October, the TAB will build on the initial bid and develop additional interventions not contained within the April submission.

3.6 Separate bids from regional partners on measures outwith the main corridors will also be submitted to the fund. The detail of such local schemes will be coordinated with the regional bid to avoid potential overlaps. Fife Council has already established a bus partnership for its area and will be submitting two bids to the fund in April: one for West/South Fife and one for Central Fife. The Forth Valley Bus Alliance is also working towards the submission of a bid, which involves Clackmannanshire, Falkirk and Stirling councils, along with the operators and SEStran. West Lothian Council is currently considering local bus partnerships options. These will also be coordinated with any regional bid to avoid potential overlaps.

## 4. Financial impact

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4.1 A Finance Subgroup of the Transport Appraisal Board will be formed to consider the resource issues; and this will include not only funding, but the operational capacity of local authorities to implement and support the approved measures.

4.2 At this stage, the financial impact is not possible to assess, the totality of the bid that we will be progressed is not yet known. The consultancy costs estimates are in the process of being prepared and will be reported on when available.

## 5. Alignment with Sustainable, Inclusive Growth Ambitions

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5.1 An efficient regional public transport system will be an essential requirement if the regional economy is to experience strong and rapid recovery in a range of sectors, including employment, education/training, retail, commercial leisure and other services.

5.2 The interventions will align closely with the environmental objectives of maximising public transport and active travel; and thereby reducing the amount of travel undertaken by private car.

## 6. Background reading/external references

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6.1 [Bus Partnership Fund website](#): Transport Scotland

## 7. Appendices

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Appendix 1: Terms of Reference for City Region Deal Transport Appraisal Board (revised January 2020)

Appendix 2: Edinburgh and South East Scotland City Region Deal Governance Structure

## **Appendix 1: Revised Terms of Reference for the Edinburgh and South East Scotland City Region Deal Transport Appraisal Board (January 2020)**

### **Membership**

The Edinburgh and South East Scotland City Region Deal Transport Appraisal Board (hereinafter referred to as ‘the Board’) to comprise:

- South East Scotland Regional Transport Partnership (SEStran)
- Transport Scotland
- Representatives from the six constituent local authorities (inc. SESplan)
- Representative from the higher education/further education (HE/FE) sector
- City Region Deal Project Management Office (observer)

The Board is also able to co-opt representatives of other bodies and/or individuals for limited periods to address specifically defined matters.

### **Context**

Investment in transport infrastructure is a major theme of the City Region Deal, as it is an essential component of driving inclusive growth. It extends across almost all of the other City Region Deal themes. Two specific named transport projects are included in the inventory of City Region Deal investments, these being the upgrade of the A720 Sheriffhall junction, and public transport improvements at West Edinburgh. City Region Deal investment projects need to maximise and seek to ensure that opportunities for improving accessibility across the region (as well as to areas outwith the region) are fully taken, and need to align with appropriate strategies so as to meet the overall ambitions of the City Region Deal.

### **Purpose**

To make recommendations to the Joint Committee on the approach towards delivering the transport elements of the City Region Deal Investment Programme. This will include recognition of pertinent strategy and include matters of overall regional policy and strategy in relation to City Region Deal aims, objectives, and specific investment projects.

### **Responsibilities**

- To work as a partnership of Transport Scotland, SEStran, the six Councils (inc. SESplan) and the HE/FE sector in assessing and agreeing upon the optimal transport interventions to meeting the objectives of the City Region Deal; and to do so within the context of extant and emerging policies and strategies at national, regional, and local levels. These will include the National Transport Strategy, the Strategic Transport Projects Review, and the Regional Transport Strategy, as well as local transport strategies and local development plans, together with any similar relevant plans/policies/strategies, including the Regional Spatial Strategy, that emerge during the City Region Deal period.
- To recognise the role of transport policy and interventions in addressing climate change and the need for a low carbon economy.

- To use that assessment as the basis for direct transport input to the City Region Deal's Regional Growth Framework and any subsequent review or update of that document.
- To work with the statutory planning and transport authorities of the region together with the statutory agencies responsible for economic development and growth, and any other relevant bodies.
- To ensure that TAB input and resulting transport interventions, are consistent with the delivery of a regional spatial strategy.
- To ensure close liaison of the Board with the City Region Deal Boards responsible for Data Driven Innovation, Housing, and Employability/Skills.
- To ensure positive and regular engagement with the City Region Deal Regional Enterprise Council so as to be well-informed of the transport related views, issues and objectives of the commercial/business/third sectors.
- To use the extensive stakeholder base of the Board partners and the outcomes of consultation work by partners, to ensure that policy and strategy is suitably informed.
- To consider the benefits of collective regional based bids for external funding.
- To ensure a consistent approach to the business cases underpinning the specific transport projects, and those with a transport element, thereby enabling a region-wide view of the cumulative impact of transport related City Region Deal projects.

*To assist in this work the Board will be expected to have regard to the following.*

- *The strategic rationale, demand/need, objectives, evidence, costings and delivery programme and mechanisms for projects, their relationship and phasing in the overall programme, including cumulative impact.*
  - *Shared use of data to provide a common evidence base.*
  - *Recognition of best practice, including Treasury Green Book, and Scottish Transport Appraisal Guidance.*
  - *Access to funds and budgets.*
  - *Maintain an overview of the impact of interventions across the region through environmental and other assessments.*
- To review these terms of reference on an annual basis to ensure that they remain relevant and optimal in supporting the delivery of City Region Deal objectives.

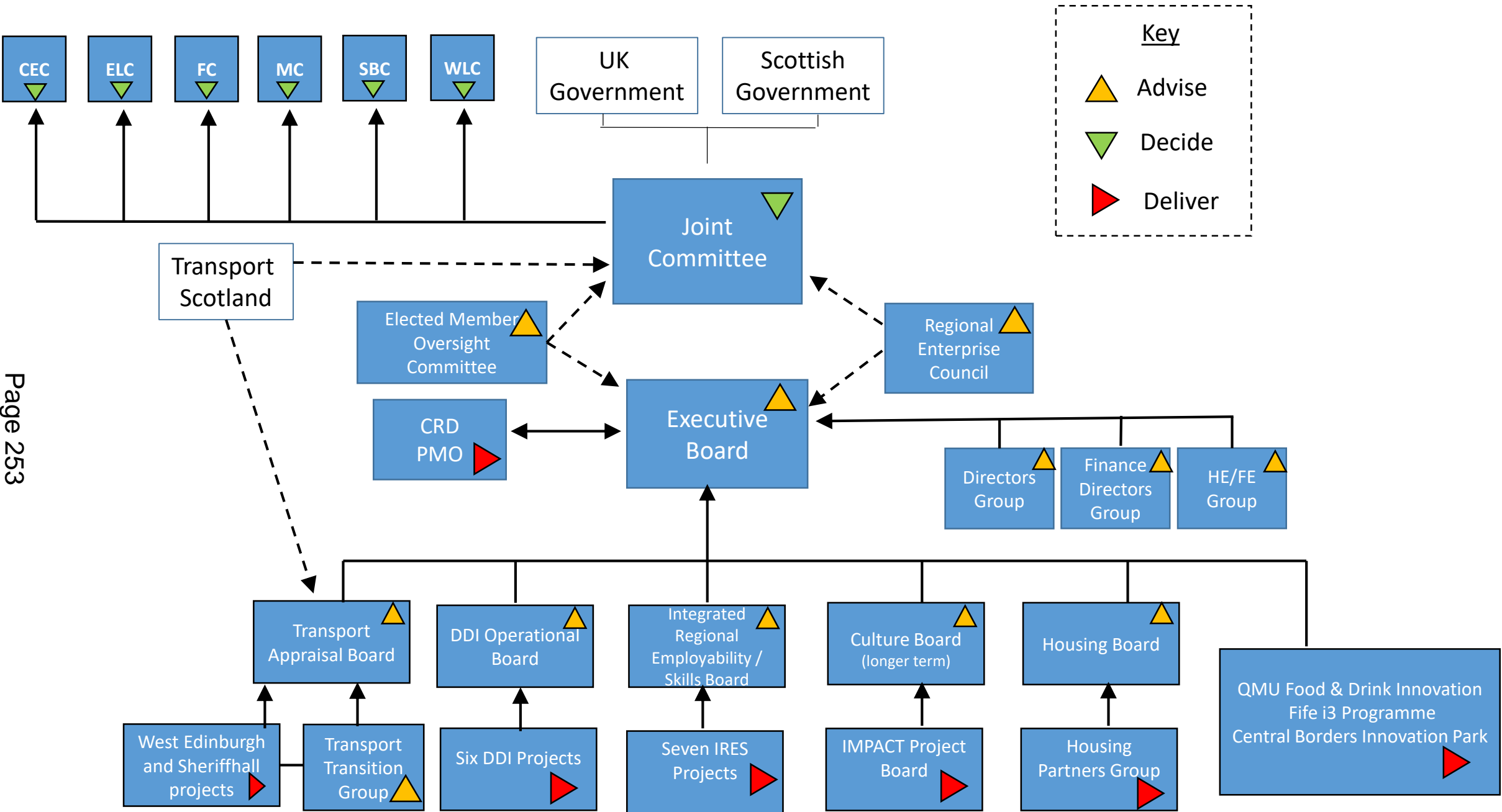
## **Meetings**

Six weekly or as may otherwise be agreed by the Board; or as may be called by the Chair. Meetings will normally be held in Edinburgh to minimise travel demand on attendees. The City Deal Project Management Office will provide the secretariat.

## **Sub Groups**

Where agreed by the Board as necessary and beneficial, a sub-group comprising members of the Board and, with the agreement of the Board, any co-opted bodies and/or individuals, may be established for a specified period to consider and report to the Board on a defined relevant transport related matter.

These Terms of Reference agreed by the City Region Deal Transport Appraisal Board on 20<sup>th</sup> January 2020.



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