



**THE BUSINESS BOARD**

Agenda Item No: 3.3

## High Performance Computing Study and Roadmap

To:	Business Board
Meeting Date:	19 July 2021
Public report:	Yes
Lead Member:	Chair of the Business Board, Austen Adams
From:	SRO LGF and Market Insight & Evaluation, Steve Clarke
Key decision:	No
Recommendations:	<p>The Business Board is asked to:</p> <ul style="list-style-type: none"><li>a) Approve the commissioning of a feasibility study for the High Performance Computing and Artificial Intelligence capability to support the Digital cluster development; and</li><li>b) Recommend the Combined Authority Board approve £46,000 Enterprise Zone Reserve funding to commission the development of a feasibility study for the High Performance Computing and Artificial Intelligence capability to support the Digital cluster development across Greater Cambridge and wider Combined Authority area.</li></ul>

# 1. Purpose

- 1.1 This paper seeks to present to the Business Board the scope of the opportunity related to High Performance Computing capability and to seek a recommendation to the Combined Authority Board to fund a feasibility study to understand and produce a roadmap that frames routes to benefit from this capability and outlines core actions to deliver on one of the key recommendations in the Digital Priority Sector Strategy.

# 2. Background

- 2.1 The Digital Sector Strategy was completed, approved and adopted by the Business Board and Combined Authority in March 2019.
- 2.2 The Digital Sector Strategy is one of the Four Priority Sectors as outlined in the Cambridgeshire and Peterborough Local Industrial Strategy, the strategies have been developed in following priority sectors:
- Agri-Tech
  - Advanced Materials and Manufacturing (AMM)
  - Life Sciences
  - Digital
- 2.2. The Digital strategy recommendations were refreshed and agreed by the Business Board on 19<sup>th</sup> May 2021, then recommended to and approved by the Combined Authority Board on 30<sup>th</sup> June 2021, these revised Digital Strategy recommendations to be included to original strategy as an addendum on Combined Authority website.
- 2.3 The recommendation to deliver a feasibility study and roadmap for the Digital Sector was within the refreshed set of recommendations approved by the Business Board on the 19<sup>th</sup> May 2021. It was agreed at the same Business Board that an implementation plan would be compiled across all the sector strategies once the fourth final sector strategy is completed on Agri-Tech sector.
- 2.4 This request to fund a study and produce a Roadmap for High Performance Computing is being brought forward to the Business Board ahead of completing an implementation plan that will cover delivery across all the sector strategies when they are completed. This is because of high interest in this particular subject instigated by significant press following the high profile investment being made by key digital companies Kao Data and NVIDIA into the new super-computing Cambridge-1 capability in the region.
- 2.5 In December 2020, a bespoke roundtable event was held led by Kao Data (home of NVIDIA Cambridge-1), in conjunction with Business Weekly newspaper and the large data-hungry companies and organisations in Cambridge. This event created the idea for an HPC roadmap for Cambridge, which would not just be relevant to large companies but would also support the city's unique AI/ deeptech start-up ecosystem. The roundtable subsequently began a series of discussions on the potential of the roadmap covering Greater Cambridge in respect of x-tech and x-region.
- 2.6 Post-pandemic, it has never been more important for Cambridge to be leading the way in AI, innovation, technological developments and drug discovery. However, supercomputing, the foundational building block for further growth, requires reliable and abundant sources of

power. There are currently an estimated 40 trillion gigabytes (40 zetabytes) of data in the world due, in part, to machines signing on to networks and the Internet – and this figure is set to continue doubling every two years.

### 3. High Performance Computing Roadmap Proposal

- 3.1 In recent years, significant resources have been spent on progressing housing, transportation and community in the city– but now we need to move Cambridge forward technologically to support our existing businesses and be a location of the future.
- 3.2 Many of the larger companies are currently served by their own means. As their computing technology requirement grows, their needs will inevitably change and they steer their investment strategies to accommodate this. Meanwhile, smaller companies do not believe they have a voice at the table. Their needs are subsequently uncoordinated, unrepresented and under-served – which affects their ability to remain in the region. This needs to be addressed as part of this roadmap, to ensure they are part of the convened group.
- 3.3 With the imminent arrival of exascale computing (some 1,000 times faster and more powerful than the petascale), Cambridge’s unique and highly skilled ecosystem urgently requires a specific HPC roadmap to:
  - ensure there is suitable future provision of 100% sustainable power for its prolific research communities and power-hungry sectors
  - ensure the provision of world-class data centre facilities and fibre within the Cambridge region
  - support the convergence of technology for global advances
  - strengthen and retain its global positioning as one of the premier hubs for both
  - supercomputing and AI in the UK and Europe, and stay ahead of the game
  - HPC/ AI Roadmap concept as core pillar of Cambridge ICT strategy, but this project will be relevant across the Combined Authority region, and beyond
  - The creation of a genuine supercomputing ecosystem to ensure accessibility to all, sharing of best practice and networked working between smaller start-ups and established research institutions.
- 3.4 The intention for the HPC roadmap is to become a core pillar of the technological future of Cambridge and the extended region, as part of the Combined Authority’s remit and ICT strategy. As we level-up and progress post COVID, we also need to be getting ahead of the need to retain our regions contribution to the rest of the country.
- 3.5 The HPC roadmap proposal is detailed further in Appendix 1.
- 3.6 Four quotes have been obtained for completing the work and they range from £25,000 to £45,200. The process to select one of the bidders for the work is underway but subject to confirmation of approved budget.

- 3.7 The Business Board is asked to approve the commissioning of a feasibility study for the High Performance Computing and Artificial Intelligence capability to support the Digital cluster development, which was one of the recommendations agreed by the Business Board on 19<sup>th</sup> May 2021 as part of the refreshed Digital Strategy set of recommendations.
- 3.8 The Business Board is asked to recommend the approval of a budget of £46k funding from Enterprise Zone Reserve Funds to fund the HPC feasibility study and production of a Roadmap.
- 3.9 If funding is approved by the Combined Authority Board the completed HPC study and Roadmap will be brought back to the Business Board for approval of final draft, once the final draft is agreed by the Business Board this will then be recommended to the Combined Authority for adoption as an addendum to the original Digital strategy.

## Significant Implications

### 4. Financial Implications

- 4.1 The cost of commissioning the HPC feasibility study and Roadmap, if approved, should be no more than £45,200. A budget of £46k is being requested for this to be funded from the Enterprise Zones Reserve Fund.
- 4.2 The table below shows the impact of the requested decision on the MTFP.

Financial change summary (£'000)			2021-22	2022-23	2023-24	2024-25
Change Requested	<b>HPC Study and Roadmap (new line)</b>	Approved	<b>46</b>	-	-	-
		STA	-	-	-	-
Revised MTFP	<b>HPC Study and Roadmap</b>	Approved	<b>46</b>	-	-	-
		STA	-	-	-	-

- 4.3 Please refer to Table 8 in Agenda Item 2.1, Budget & Performance Report, which gives an overview of the asks on the Enterprise Zones Reserve Fund. As can be seen, there are sufficient funds forecast to be received within 2021/22 to meet this funding requested here, along with those in Item 3.2 and Item 3.4, whilst leaving an in-year surplus of £114k.

### 5 Legal Implications

- 5.1 There are no direct legal implications.

### 6. Other Significant Implications

- 6.1 None.

## 7. Appendices

7.1 Appendix 1 – High Performance Computing Briefing and Roadmap Proposal

## 8. Background Papers

8.1 [Business Board Sector strategies update approval and adoption 19th May 2021](#)

8.2 [Business Board approval and adoption of Digital Sector Strategy 23rd September 2019](#)

8.3 [Local Industrial Strategy and associated sector strategies](#)

8.4 [Digital Sector Strategy \(published September 2019\)](#)

8.5 [Combined Authority Board 30 June 2021 – Sector Strategies \(Item 7.6\)](#)