

Getting Building Fund (GBF)

Project Sifting Checklist

Project Details

Project Name:	Advanced Braking Facility
Location:	Silverstone Technology Park
Applicant:	D2H Advanced Technologies
Project Type:	Innovation
Project Summary:	<p>Electric Vehicles (EVs) have an important role to play in enabling the UK to meet the Government's greenhouse gas emissions target (net zero by 2050). Deterrents to consumer uptake include charging, range and costs. To increase EV adoption, further improvements in range and costs are required.</p> <p>UK automotive companies require new tools to help them deliver improved EVs to market faster and with reduced R&D costs.</p> <p>Part of this is vehicle braking systems, which are evolving rapidly for EVs. Currently, automotive companies have limited digital development tools for brake systems and are reliant on track testing in Southern Spain or Italy. This adds significant time and cost to new vehicle development and reduces the scope for system optimisation.</p> <p>UK automotive companies recognise the need for improved digital tools in brake system development to improve simulation capacity and speed and bring down the costs of R&D.</p> <p>D2H has been developing an Advanced Braking Model (ABM). The model has a unique digital design process that uses fast and cost-effective dyno and computational analysis. This enables the user to characterise brake friction and thermal performance, and then uses artificial intelligence (AI) models to predict system performance faster than can be tested in real-time. Advanced Braking Models are used worldwide in motorsports for off-line simulations and provide fast and accurate performance predictions for optimisation of the brake system and associated vehicle systems.</p> <p>Further development of ABM requires new and more advanced dyno test capability to allow more extensive and more precise testing. It also enables gathering of information required for developing the AI capability further to meet automotive client requirements.</p> <p>This project seeks to deliver the Advanced Braking Facility in conjunction with an Advanced Braking Model to allow automotive companies to develop virtually – reducing cost, time, and risk, and delivering better lighter brake systems with reduced drag.</p> <p>These benefits will contribute to the automotive sectors UK based capabilities local capability and deliver world leading tools for</p>

	performance and productivity gains, aiding post-COVID recovery and competitiveness, and the UK's drive to net zero.
Total Project Cost:	£800,000
GBF Request:	£247,000
Match Funding:	£553,000 from D2H (funding confirmed)
Project Start Date:	1 June 2021
Date of Practical Completion:	March 2022
Date of Financial Completion:	All GBF spending will take place before March 2022.

Assessor Comments:

The project by D2H seeks to deliver a new testing facility and model for EV braking systems. This capability is not currently available to major automotive companies (JLR, Lotus Cars, McLaren Automotive) in the UK, which results in higher costs in the development process and limits the ability for companies to optimise braking and vehicle systems. It also results in valuable economic activity and research and development taking place overseas rather than in the UK. High cost of R&D is shown to be a deterrent in the successful deployment and commercialisation of EVs.

By enabling cross over between motorsports capabilities at Silverstone and electric vehicle development, the project would support the UK's automotive sector, local capability at Silverstone and deliver world leading tools to improve performance and productivity.

The Advanced Braking Facility is a new project to supplement self-funded R&D work carried out by D2H on the Advanced Brake Model. Failure to continue work in this area will delay the project, which will have consequences for the development of brake technology, impacting the UK automotive industry's productivity and recovery. It may also erode the capability for the UK to commercialise this technology as alternative developments are being pursued in Europe and the US.

The total project cost is £800,000.

- £247,000 capital funding is sought from the Get Building Fund and will be spent by March 2022.
- The remaining capital costs of £553,000 will be provided by D2H. This funding is fully committed.

All GBF funds will be spent by March 2022 and the construction of the facility will be completed. The project plan has been revised with additional resource to deliver in a 10-month timeframe (between 1st June 2021 and 31st March 2022).

Strategic Alignment

LIS Pillar:	Ideas, Business Environment
MHCLG Objectives:	Growth and Jobs and Green Recovery
MHCLG Priority Interest:	Innovation Ecosystem and Human Capital

Assessor Comments:

The applicant indicates that the project is will support the realisation of the vision in Buckinghamshire's Local Industrial Strategy (LIS), as well as the MHCLG's objectives and priority interest areas.

The project's strategic aims align closely with national and regional priorities.

- To increase the UK's visibility, profile and recognition in this sector, attracting inward investment, creating jobs and economic growth
- Working with UK automotive OEMs, deliver significant changes to vehicle development protocols to save time and cost and reduce time to market and price of EV platforms. This should support recovery from the impact of COVID-19 and increase competitiveness of the UK in the global market, further delivering increased prosperity to the UK automotive sector.
- Collaborate with universities and research organisations to provide a test location for brake research, especially in the field of particulate emission and cleaner air requirements.
- To influence skills, in next generation automotive disciplines as well as use of data, AI and machine learning and sharing knowledge across sectors.
- Create lasting economic value for Buckinghamshire and the area's contribution to the Cambridge-MK-Oxford Growth Corridor.

Strategic Alignment Score: High – 5

Economic Contribution

Direct Project Impacts:	<p>The project is expected to deliver the following:</p> <p><u>Jobs Created:</u> 10 FTEs 2 x mechanical engineer 1 x controls engineer 1 x electronics engineer 1 x project manager 2 x brake test engineers 2 x controls/electronics engineer 1 x facility manager</p> <p><u>Jobs Safeguarded:</u> 5 FTEs The applicant indicates that D2H has several jobs reliant on developing brake technology and maintaining the world-leading modelling capabilities that the ABF project will supplement. Hence the project will safeguard 5 jobs at D2H: 2 x simulation and modelling engineers 2 x software engineers 1 x aero/thermal engineer</p>
Indirect and Wider Project Impacts:	<p>All major components, delivery and installation support is sourced in UK, resulting in the creation of further upstream jobs creation.</p> <p>The project will also deliver wider project impacts:</p> <ol style="list-style-type: none"> 1) Enhanced reputation of D2H Advanced Technologies resulting in internationally raised awareness attracting high-calibre engineers to Buckinghamshire.

	2) Overall enhancement to Buckinghamshire, the Silverstone Cluster and the Oxford-Cambridge Arc as a market leader in automotive test and development.
BCR:	A BCR has not been provided for the project, however on the basis of the proposed outputs (i.e., high value jobs generation), the project is expected to deliver good value for money.

Assessor Comments:

The applicant indicates that the rationale for public sector investment is driven by the fact that the project is still very much R&D-focused. In response to clarifications around the requirement for the project to receive public sector funding, the applicant highlights that:

- It is important for the project to be taken forward independently, rather than through investment from an automotive OEM or brake manufacturer, as this may undermine the potential for wider benefits realisation.
- Given the project is delivering novel technology, there may be some challenges to securing finance on competitive terms, however BLEP may want to seek greater assurance that all routes to finance have been explored before entering into a grant agreement.

The project's outputs remain the same as in the initial submission. The applicant has not monetised the new jobs creation and has not provided a BCR, however, given that the jobs created are expected to be direct and net additional, the assessor anticipates that the project would deliver good value for money. In terms of the timescales of benefits realisation, new jobs will start being created right from the outset of the project, developing the physical and electronic control design of the facility. Further jobs will then be created for the operation, maintenance and engineering support.

Additionally, wider benefits of the project referenced reinforce the case for investment.

On the basis of the information provided, the project is expected to satisfy the GBF criteria in providing direct outputs and potential to deliver value for money. However, a score of 3 is awarded in light of the outstanding query above concerning the potential for external finance.

Economic Contribution Score: Medium –3/5

Deliverability

Assessment Area	Assessor Comments																																																																																																																	
Project Funding:	Total project cost is £800,000. £247,000 capital funding is sought from GBF £553,000 has been committed by D2H																																																																																																																	
Planning permission:	No planning permission is required. The facility will be housed in a suitable industrial unit with all environmental and health and safety provisions made.																																																																																																																	
Scheme design and development:	The requirements for the facility have been defined and preliminary concept modelling carried out in computer aided design (CAD). Major component/equipment contributors in the UK have been contacted to establish costs and delivery timelines and ensure alignment with the overall project plan.																																																																																																																	
Procurement:	<p>The applicant indicates that the procurement approach has been adjusted to support accelerated project delivery:</p> <ul style="list-style-type: none"> - Items with the largest expenditure and longest lead times have had outline specifications drawn up part of the project planning process. On commencement of the project, these will be firmed up and suppliers engaged in a competitive tendering process to ascertain costs and delivery timescales. - Design of test equipment will use off-the-shelf components, minimising the need for bespoke design and lowering delivery risks. - UK suppliers will be used as far as practicable to minimise issues around importing/COVID-19. This will also ensure that the wider benefits of the project are kept as local as possible. - Orders will be in place for the longest lead time items at the end of month 2, in the expectation that deliveries will be completed by the end of month 5. This allows a 1-month contingency with time to complete the construction of the test rig. 																																																																																																																	
Project Timescales	<p>The project plan was originally 11 months in duration. Given the delay of around 2 months, the project will run from 1st June 2021 to 31st March 2022.</p> <p>In order to expedite delivery, D2H will assign additional engineering resource to deliver the specification definition of key components so that procurement can be brought forward. Additional resource will remain in place to continue to detail design and finalisation of the facility layout faster than originally planned. This will enable the project delivery to be sped up by 1 month.</p> <p>Project timescales are as follows:</p> <table border="1"> <thead> <tr> <th>WORK PACKAGE</th> <th>TASK</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> <tr> <th></th> <th></th> <th>01-Jun</th> <th>01-Jul</th> <th>01-Aug</th> <th>01-Sep</th> <th>01-Oct</th> <th>01-Nov</th> <th>01-Dec</th> <th>01-Jan</th> <th>01-Feb</th> <th>01-Mar</th> </tr> </thead> <tbody> <tr> <td rowspan="7">Brake Research Facility</td> <td>Requirements consultation with customers</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Overall facility location search and hardware & layout concept design</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Main brake dyno hardware design</td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Ancillary facility & systems design</td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Main dyno control system design & coding</td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Component & equipment procurement</td> <td></td> <td></td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> <td>█</td> </tr> <tr> <td>Dyno build</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>█</td> <td>█</td> <td>█</td> </tr> <tr> <td>Dyno commissioning</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>█</td> </tr> </tbody> </table>	WORK PACKAGE	TASK	1	2	3	4	5	6	7	8	9	10			01-Jun	01-Jul	01-Aug	01-Sep	01-Oct	01-Nov	01-Dec	01-Jan	01-Feb	01-Mar	Brake Research Facility	Requirements consultation with customers	█										Overall facility location search and hardware & layout concept design	█	█									Main brake dyno hardware design		█	█	█							Ancillary facility & systems design		█	█	█	█						Main dyno control system design & coding			█	█	█	█					Component & equipment procurement					█	█	█	█	█	█	Dyno build								█	█	█	Dyno commissioning										█
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	<p>The dyno commissioning phase will validate the operational performance of the systems and bring the facility to the point of being ready for commercial use.</p>
Project Management & Delivery Arrangements:	<p>A named steering committee has been identified and experience provided. The committee will provide overall direction to monitor and evaluate the project and deal with project management issues such as change and risk management.</p> <p>The steering committee will be supported by technical specialist sub-committees responsible for each aspect of the design, development, procurement and installation of the facility.</p> <p>The applicant indicates that as an organisation, D2H Advanced Technologies has a track record of successfully completing and delivering commercial and grant funded R&D projects. Examples have been provided.</p>
Other Potential Risks:	<p>A full Failure Modes and Effects Analysis (FMEA) risk analysis has been carried out to capture the main potential risks. Key risks to delivery and mitigations include:</p> <ul style="list-style-type: none"> • Shortened timeframe – D2H will apply additional engineering resource up front to expedite design and start procurement as early as possible. Furthermore, tight project monitoring controls will be in place to monitor and act on any deviations to the plan. • Component lead times – Orders for long lead time items will be placed as early as possible. Suppliers will be assessed on capability of delivery as much as cost. UK suppliers to be used as far as practicable to minimise supply chain and import risks. • Control system issues – All main systems will be built and simulated in the digital domain to assess potential areas for issues. Designs will be modified if required or control system parameters will be updated to ensure smooth interfacing between hardware and software <p>Risks will be monitored by the project manager.</p>
Covid-19:	<p>In order to minimise risks from COVID-19, the project will be managed as follows:</p> <ul style="list-style-type: none"> - Using UK supply chains to limit delivery risks - All design can be undertaken using home working if required - Strict COVID-19 social distancing and cleaning is in place at D2H already and can be continued as required - Suppliers and external contractors will be required to adhere to D2H Covid protocols and numbers of people at any site will be limited as required to maintain social distancing

Assessor Comments:

The project is a new project, supplementing the ongoing self-funded R&D work being carried out by D2H on the Advanced Brake Model (ABM). Requirements to deliver the testing capability ("rig") have been defined and concept modelling has taken place.

The current project timescales have been compressed since the initial project application was submitted in order to fulfil the GBF requirements for financial and practical completion by March 2022. The applicant indicates that the introduction of additional engineering resource to deliver key components will enable procurement to be brought forward and allows for buffer time in the project timescales in the event of delay.

Risks to delivery, particularly in light of compressed timescales and COVID-19, have been identified and mitigations have been developed.

Project management and governance arrangements appear robust and the applicant has significant experience delivering similar technical facilities.

Deliverability Score: High – 4

State Aid / Subsidy Control

The applicant indicates that D2H has experience and a track record of fulfilling grant funded projects and will continue to ensure compliance with all required regulations.

Total Score: 12/15