



Department
for Transport



Transport Research and Innovation Grants
Department for Transport

TRIG 2021 Cohort Brochure

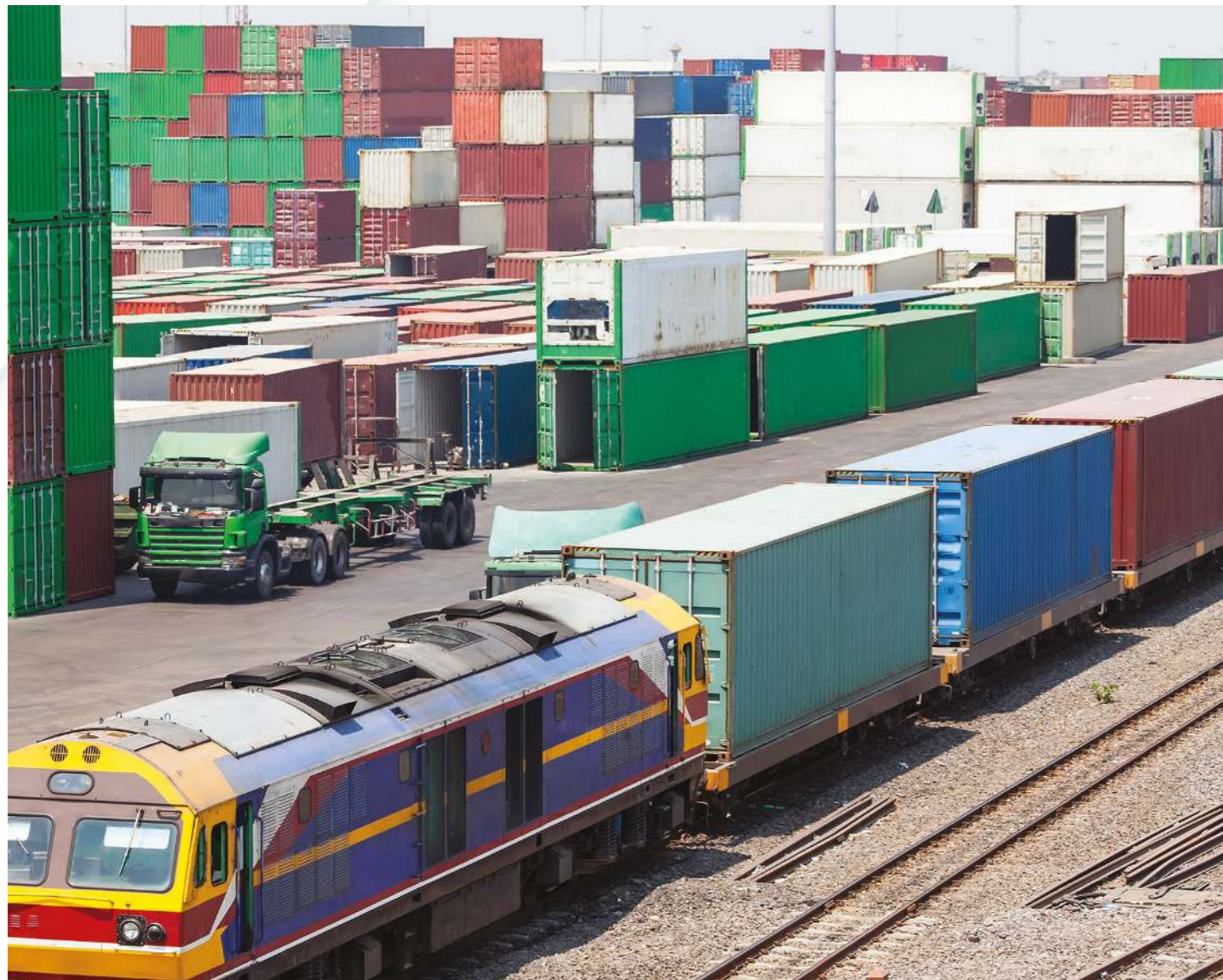
Delivered by
CATAPULT
Connected Places

Connected Places Catapult is delighted to be delivering the Department for Transport's (DfT) 2021 Transport Research and Innovation Grants (TRIG).

Through TRIG 2021, £1.95m will fund 51 projects that fall within three key challenge areas (in addition to our traditional Open Call); the Future of Freight, Maritime Decarbonisation and COVID-19 Recovery and Resilient Transport Systems.

Within the Future of Freight challenge, the DfT has awarded six companies a higher grant of £100k each to enable technological advances resulting in the creation of minimum viable prototypes and subsequent testing.

You can see the variety of 51 projects within this brochure. Some of which include; accelerating the installation of electric vehicle charge points, validating a virtual reality hazard perception training tool for HGV drivers, and creating a planning tool for rural and urban mobility hubs.


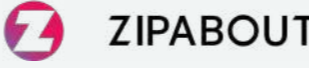




Transport Research and Innovation Grants Programme 2021 Recipients




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www.makesense-technology.com | 
www.zipabout.com | 
www.passage-way.com | 
www.signalbox.io | 
www.esitusolutions.com |
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www.honeycomb-network.co.uk | 
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www.cityscience.com | 
www.wordnerds.ai | 
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www.calyo.co.uk | 
www.quell.ie | 
www.strath.ac.uk | 
www.stormchain.org | 
www.armada-technologies.co.uk |



Open Call

<p>Makesense Technology Limited</p>	<p>Shape-changing haptic navigation technology</p>	<p>MakeSense Technology Limited is a deep start-up developing effective ways of non-visually interfacing computer vision technology with people – particularly those with visual impairments. With an appropriate interface that can communicate 3D navigational information derived using computer vision, we can enable visually impaired persons to navigate any indoor or outdoor environment without further investments in infrastructure. Beyond the visually impaired community, our proprietary technology could have other applications in transport, mobility and tourism.</p>
		
<p>Zipabout Limited</p>	<p>Why do they all come at once? Improving Bus Information Accuracy to Increase Confidence, Satisfaction and Usage</p>	<p>This project involves the development of a Machine Learning Model to create better bus arrival forecasts, calculating potential delays based on a number of features such as weather and time of day, allowing us to better inform travellers in advance of travel. We use an iterative approach with qualitative feedback to ensure our service is accessible and useful. With the ability to digitally engage users through the Zipabout platform, we will conduct real-world user-research to explore how useful people find the predictions.</p>
		
<p>Digital Signs For Transport Ltd</p>	<p>Real-Time Digital Signs For Remote Train Stations In Wales Trial</p>	<p>The project to deliver true real-time information will involve PassageWay smart digital signs working in partnership with Transport for Wales and SignalBox.io to leverage their 3G train geolocation data. PassageWay will take this data and generate real-time train arrivals/departures digital signs for three trial train stations, in both English and Welsh. Customers will access the digital signs by scanning a QR code published on a poster at the applicable station and the signs will also be available for use on other screens across the community, in places like pubs, schools and hospitals, with any web-connected screen.</p>
		
<p>Signalbox Technologies Limited</p>	<p>Improving Incident Response on Britain's Rail Network Through Automatic Train Identification</p>	<p>Every year millions of incidents are reported on Britain's railways. Matching these incidents to a specific train, quickly and accurately, is a challenge for control room staff whose priority is delivering a rapid informed response.</p> <p>For the TRIG project, Signalbox will develop technology that identifies the train based upon where it originates from, anywhere in Great Britain. This proof of concept will demonstrate that automatically matching a device with the geolocation of a moving train can enable incident response teams to deliver a faster and more informed service, increasing passenger confidence and making our railways safer.</p>
		




<p>Esitu Solutions Limited</p> 	<p>The development and validation of a hazard perception (HP) training tool for heavy goods vehicle drivers that can be delivered in virtual reality (VR) headsets</p>	<p>This project aims to improve HGV safety by developing and validating hazard perception (HP) training for drivers that can be delivered in virtual reality headsets. Pre-existing 360° video footage, filmed from HGVs, will be developed into novel training materials. A large sample of HGV drivers will be trained to assess whether our training materials improve driver HP skill and attitudes towards road safety. The results of these behavioural tests will allow iteration of the materials, eventually ensuring we have a validated training solution for HGV drivers that improves driver safety.</p>
<p>Honeycomb Network Ltd</p> 	<p>Project Nectar: retrofitted, universal smart-charging infrastructure for e-bikes</p>	<p>Honeycomb Network aims to operate a network of smart micromobility infrastructure. Project Nectar will adapt Honeycomb's novel e-scooter smart-charging system for e-bikes. This development will result in a universal, smart e-bike charger, which retrofits onto existing bicycle storage infrastructure and can charge up to eight bikes at once. Honeycomb smart charging uses cutting-edge research to extract data, optimise charging and improve battery health, prolonging asset lifetime. Project Nectar will culminate in a two-month-long pilot project to test user interaction, validate business need and demonstrate operation.</p>
<p>Go Eve Ltd</p> 	<p>DockChain: Charging electric vehicles at scale</p>	<p>DockChain is an innovation that allows multiple parking spaces to be 'electrified' from a base power source with a daisy chain of extendable charging docks. This results in the speed and operational benefits of rapid DC-charging at the cost of equipment normally associated with slower AC-charging. The project will build a rapid charging prototype DockChain running Go Eve's software and signalling.</p>
<p>City Science Corporation Limited</p> 	<p>Optimal Planning for Rural and Urban Mobility Hubs</p>	<p>Mobility hubs are highly visible, safe, and accessible spaces where public, shared and active travel modes are co-located to maximise accessibility to journeys while minimising the need for private vehicles. It is already understood that for optimal impacts mobility hubs should be planned as network integrated with public transport and a key part of planning strategy. However, the specific planning and design of mobility hubs is currently left to individual authorities with limiting modelling or data support. Our project develops an AI-Generative Design system that will enable Local Authorities to design mobility hubs to maximise positive impacts and sustainable travel choices.</p>

<p>Nerds with Words Ltd.</p> 	<p>All passengers travel equally Eliminating AI bias from customer communications in UK public transport</p>	<p>As we all seek to rebuild passengers' confidence to travel, dealing with feedback effectively is vital, especially for people from marginalised groups. AI is increasingly useful and necessary as part of that feedback process. Unfortunately, all Natural Language Processing models contain bias, which can compound the problems faced by marginalised passenger groups. Wordnerds proposes to build a new, agile neural network which has two unique features:</p> <ul style="list-style-type: none"> • It is specifically trained to minimise bias in the UK • It is trained on passenger data <p>To our knowledge, this is the first AI of its kind in the world.</p>
<p>RazorSecure Limited</p> 	<p>Enabling Safe and Reliable Digital Maintenance for Passenger Train Operating Companies</p>	<p>Our project will demonstrate a proof of concept solution for secure maintenance operations, capable of integration with legacy and new build rail vehicles, to protect the integrity and reliability of rail passenger services. We believe this will help to reduce the occurrence of poorly managed software and digital maintenance errors that led to urgent rail safety alerts in 2021.</p> <p>Our proof of concept will address three 'Safety Related Application Control' requirements for rail passenger trains, ensuring that future maintenance can be completed in a safe manner while taking advantage of advances in digital innovation and new technologies.</p>
<p>Diode Group Limited</p> 	<p>The Diode Shared Survey Platform: Accelerating the installation of electric vehicle charge points by enabling multiple installers to quote with just a single shared site survey</p>	<p>The UK must install on average 2,500 workplace charge points over the next decade to phase out new petrol and diesel cars. Big savings can be made by shopping around for multiple quotes to install these, but carrying out individual site surveys is an expensive and time-consuming bottleneck for installers. Diode's Shared Survey Platform allows for just a single survey to be carried out, with the results shared with multiple installers. This minimises the time, cost and carbon of charge point installs, optimises installer capacity, and lets installers of all sizes benefit from the EV transition.</p>

<p>Robotiz3d Limited</p> 	<p>Seal-It: rigorous testing of crack sealing materials and procedures for preventative road maintenance</p>	<p>The Seal-It project will create the first proof-of-principle prototype of a test-rig for quantitatively assessing the performance of road crack sealing materials and methodologies. Road samples where cracks have been repaired will be subject to realistic thermo-mechanical loads such as combined bending, stretching and temperature cycles. Seal-It will go beyond the qualitative and simplistic methods currently used in industry – mainly visual observations and simple loading such as tensile forces and peeling tests – and will stimulate further development in materials, processes and regulations needed to enable a truly preventative approach to road maintenance.</p>
<p>Evotrack Ltd</p> 	<p>Delivering real-time forecast of electric vehicle charging demand to support the life cycle of public charging infrastructure and better investment decisions</p>	<p>Electrification of the car fleet is an essential way of reducing environmental impact of road transportation and global public charging infrastructure will expand drastically to enable an 'electric revolution'. However, building a charging infrastructure is capital and material intensive and we need it to be as efficient as possible. This TRIG project will help Evotrack mature its state-of-the-art data analytics technology for planning and operating the charging infrastructure. This technology will analyse usage patterns of public charging stations and generate predictions of future charging demand. This type of information will enable smart decision-making for the future of public charging infrastructure.</p>
<p>Queen's University Belfast</p> 	<p>Human Centred Pedestrian Avoidance System: Modelling and Testing (HumanPAS)</p>	<p>Future automated vehicles not only need to guarantee the safety of the transport, but also need to offer comfort to both on-board users and other human road users. Due to the complexity and uncertainty of human road users' behaviour, current automated vehicles are not able to provide satisfactory motion behaviour when interacting with human road users. This project aims to develop a human-centric pedestrian-avoidance system that enables the AVs to behave like human-driven vehicles when interacting with the vulnerable road users, with which method the behaviour of AVs will be more natural and acceptable for drivers and other road users.</p>

<p>Vanguard Sustainable Transport Solutions Ltd</p> 	<p>HySense: Intelligent interface between infrastructure and rolling stock/end user designed to manage, monitor, maintain and optimise hydrogen use, demand and supply across a transport network</p>	<p>HySense is an intelligent optimisation engine that uses a combination of historical data and live data to provide valuable data to prospective and operational users of hydrogen as a fuel for transportation systems. This project will build upon the initial concept developed by Vanguard, exploring data availability and end user needs, culminating in a commercialisation plan for HySense.</p>
<p>TravelAi Ltd</p> 	<p>Accelerating the ICE-to-EV transition</p>	<p>The project aims to advance (from TRL2/3 to TRL4/5) critical components central to delivering a mobile phone app to offer an individual's EV assessment over an ICE car. By differentiating between public and private transit choices, it can accurately single out and analyse their ICE trips, including duration, trip mileage, intervals between trips, charge locations and the time of day they drive as part of an ICE-to-EV assessment. Designed to be a personalised, trusted and effortless mass adoption tool for decarbonising road transport, accelerating EV adoption and better battery sizing options.</p>
<p>University of Surrey</p> 	<p>Indirect Inspection of Railway Bridges using Train-Borne Monitoring System</p>	<p>The project aims to produce a damage detection system for railway bridges using an instrumented train that can inspect bridges on the network while travelling at operational speed. In this system, a bridge's condition is assessed by analysing the data collected on a moving train while crossing the bridge, thus acting as an actuator to excite the bridge and as a sensor to record its response for a known excitation input. This can transform railway bridge monitoring regimes and lead to automated bridge inspections, improving maintenance effectiveness and reducing human exposure to hazardous tasks.</p>
<p>Swansea University</p> 	<p>Safety Assessment for Urban-Air-Mobility (UAM) System in Metropolitan Areas</p>	<p>This research will deliver a novel method to assess UAM safety. Firstly, a universal UAM modelling method will be developed for multiple configurations to allow a comprehensive simulation of UAM operations, including dynamics, navigation systems, and pilots. Secondly, a safety assessment will be built that incorporates uncertainty quantification to calculate the reliability of UAM in multiple risks. Thirdly, simulator-based experiments will be implemented to validate the proposed methodologies. This research outcome will assist in developing the UAM aviation regulation in various urban areas.</p>

COVID 19 Recovery and Resilient Transport Systems

<p>Flit (Cambridge) Limited</p> 	<p>Circular economy battery for e-bikes and e-scooters</p>	<p>FLIT aims to develop a micro mobility (mainly e-bikes and electric scooters) battery that is easy to disassemble for reuse, remanufacturing, or recycling. Currently, most micro mobility batteries sold across Europe use spot welding as a primary process during manufacturing, which is predominantly carried out in the Far East. This makes batteries uneconomical to repair or remanufacture at the end of their useful life. By removing welding from the manufacturing process, this project will allow for more local manufacturing and easier repair and remanufacturing.</p>
<p>EcoCool</p> 	<p>EcoCool</p>	<p>The proposed project would entail designing, developing, and testing EcoCool in the UK. EcoCool is a solar-powered transportable refrigeration container. EcoCool is a solar-powered portable refrigerator specifically designed to move chilled foods, vaccines, and medical supplies with as minimal environmental impact as possible. In addition, Eco-cool offers an innovative solution in cooling using the locally available energy source. It also delivers this solution in a portable, modular form that can easily transport across locations.</p>
<p>Calyo</p> 	<p>Novel ultrasound navigation and collision avoidance phased-array sensor</p>	<p>This proposal is developing an ultrasound-based navigation and collision avoidance system encompassing phased-array technology that offers unprecedented combination of high performance, flexibility and low cost for autonomous vehicles. These novel foundational sensors will offer a solution that complements other sensing technologies which utilise lasers, radio waves, and optical instruments, and adding an additional layer of vision for robots and autonomous systems, and providing the redundancy to sense the 3-D environment safely. The output will be an assessment of the potential of the sensor system and, if required, recommendations on how to take the work further.</p>


<p>AJEA Products Ltd</p> 	<p>Climate Change Resilience – Autonomous Flood Protection for Critical Transport Infrastructure and Assets</p>	<p>Flooding has been identified as the greatest climate risk to the UK rail network.</p> <p>Our project aims to identify key areas of the network vulnerable to flooding, then demonstrate how it can be protected now and in the future by our patented flood protection system – Quell.</p> <p>Quell is a game changing flood protection system that provides reliable flood protection and is also very easily retrofitted to existing assets and infrastructure. Once installed, Quell provides protection by actively harnessing the forces of a flood to protect the asset from that flood, providing an excellent cost-to-benefit ratio for the end user.</p>
<p>University of Strathclyde</p> 	<p>Low-cost sensor system for enhanced bridge flood resilience</p>	<p>Bridge scour is the most common cause of bridge failure in UK and worldwide, resulting in significant disruptions to transport infrastructure networks, and major costs for risk mitigation.</p> <p>This project aims to 1) evaluate current approaches for scour risk management adopted by transport agencies in UK, and 2) to develop a tool for early warning and real time scour risk assessment of bridges exploiting information from flood forecasting, hydraulic modelling and low-cost flow sensors. The proposed tool will help to transform current bridge management practice through more accurate scour risk evaluations, increasing safety and resilience of critical transport assets.</p>
<p>City Science Corporation Limited</p> 	<p>Bus Network Performance Measurement Tool</p>	<p>The National Bus Strategy sets out bold plans to transform bus services to improve connectivity, build confidence in the transport network and address climate change. As a result of the National Bus Strategy, Local Authorities have now developed their first Bus Service Improvement Plans (BSIPs) that set out local ambitions for improved bus services. To support bus service improvements our project develops a consistent, streamlined approach to Bus Performance Monitoring, Reporting and Analysis that can be rolled out across LTAs and published openly on their own websites.</p>
<p>John Lamb Executive Solutions Ltd</p> 	<p>Stormchain – Highway-asset Rapid Impact Assessment</p>	<p>Intense storms and other emergencies are increasingly impacting the ability of Local Councils and network operators to maintain network and community resilience. Highway Authority incident response is already constrained by having no consistent method for identifying and assessing network impacts during live incidents.</p> <p>Stormchain applies global learning from recent emergencies to create a comprehensive Rapid Impact Assessment. Consistently capturing failure of highway and aligned assets (e.g. fibre, gas), Stormchain uniquely manages complex events with unparalleled, live, situational awareness of impacts on our key community lifeline infrastructure. Councils and Government can depend on Stormchain's unique mapping and tailored live incident reports.</p>

Maritime Decarbonisation



<p>Armada Technologies Limited</p> 	<p>Passive Air Lubrication system (PALs). Progression, TRL3 to TRL4, towards a feasible, commercial, sustainable vessel fuel consumption and carbon emission reduction system that significantly contributes to reduced global warming</p>	<p>19th century scientist William Froude realised ship-hull water interaction causes some 85% of drag.</p> <p>Air lubrication reduces drag and fuel consumption by pumping air bubbles into the boundary layer between ship and sea. Armada's radical, largely passive design uses less power to produce bubbles delivering greater emission reductions than today's systems.</p> <p>Trig21 will develop Armada's system from TRL3 to 4 by collaboration with academia and ship owners and build on Trig20, testing improved boundary layer injection and sidewall lubrication.</p> <p>This project will significantly contribute to Armada's commercial system deployment over a wide range of ships and "zero carbon" maritime transport.</p>
<p>Malakoff Limited</p> 	<p>Small Zero Emission Vessel</p>	<p>Malakoff Limited's 'Small Zero Emission Vessel' project aims to design and build a small catamaran suited for workboat, harbour, inland waterway and U10m fishing duties. The project aims to produce a fully electric vessel with no emissions producing power systems onboard. The vessel would be used as a demonstrator for replacement of existing vessels, thus allowing the reduction of the environmental impact of the local fleet. Feasibility studies have already been completed for the project, with the next stage entailing the detailed design of the vessel and construction of a demonstrator vessel.</p>
<p>JET Engineering System Solutions LTD</p> 	<p>5G Smart Connected Port Data Dashboard</p>	<p>JET Engineering System Solutions project conducts detailed R&D for an innovative system using both floating 5G buoys and cloud computing to provide weather and sea-state conditions, extending the data horizon to port sea channels and open ocean. Improved data capabilities will enable real time assessment and decision making, through the identification of operational opportunities during adverse weather. This contributes to the efficiency and decarbonisation of the maritime sector, mitigating pollution related to port-weather delays and ship idling, improving UK transport infrastructure and generating business growth.</p>
<p>Materials Nexus</p> 	<p>SmoothSurf</p>	<p>Marine biofoul – a mixture of bacteria, seaweed and shellfish – accumulates on the bottoms of ships, slowing them and increasing fuel consumption. Existing anti-fouling materials are either toxic to wildlife or lack the robustness to fully withstand ocean conditions. Project SmoothSurf aims to deliver a step-change in longer-lasting antifouling paint for the shipping industry.</p> <p>Using our Material Discovery Platform, we can rapidly screen broad ranges of materials to find those that are stronger and more effective in reducing bioaccumulation. Improved paints would lead to reduced fuel, increased competitiveness and considerably lower CO₂ emissions.</p>




<p>Unitrove Innovation Limited</p> 	<p>Further Development of the World's First Liquid Hydrogen (LH₂) Bunkering Facility for Zero-Emission Ships</p>	<p>In November 2021 during the UN COP26 climate change conference, Unitrove unveiled the world's first liquid hydrogen (LH₂) bunkering facility for fuelling zero emission ships. The clean tech company seeks to further develop its small scale portable unit so that it is ready for commercialisation and for rapid deployment into ports across the world in support of decarbonisation efforts by 2050. Key innovations include the development of intelligent fuelling control logic, an integrated safety instrumented system, precise two phase flow metering, and an extremely compact network of fully vacuum insulated pipework and cryogenic valves that is suitable for handling both liquid hydrogen and liquid helium.</p>
<p>ACUA Ocean</p> 	<p>Increased automation of hydrogen-battery power systems for uncrewed vessels</p>	<p>ACUA aim to progress the design and build of an advanced control and optimisation algorithm with a specific focus around the control of liquid hydrogen powered marine vessels.</p> <p>An increased level of autonomous control for hydrogen power systems on uncrewed vessels will overcome system failure risks, including remote operator error and burden to accelerate the adoption of hydrogen powered vessels for decarbonising the maritime industry.</p>
<p>University of Birmingham</p> 	<p>Coordinated Energy Storage Systems For Electric Vessels</p>	<p>This project will focus on HIL implementation and proof-of-concept for advanced energy storage systems based on ultra-capacitor and superconducting magnetic technologies including power-electronic converters and controllers, and their integration to electric vessels. The systems aim to support the vessel's battery pack under harsh operational scenarios that require high-level transient power to be delivered to or absorbed from the load. This process reduces power exchange with the vessels battery, which is the most expensive part of the power supply system, and eventually will prolong its life span.</p>
<p>C-MAT Technologies</p> 	<p>SEFAD lite</p>	<p>C-MAT Technologies will – for the first time – study and test filtration technologies based on novel nanoporous materials to enable capture and storage of CO₂ in marine specific environments. The project will endeavour to find the most promising materials for scale up and integration via retrofitting to marine propulsion systems. The premise of our project is to significantly reduce the carbon emissions of the shipping sector by marrying existing systems with a novel filtration technology, to produce a commercially viable and marine specific CO₂ capture solution.</p>


<p>Industrial Systems and Control Limited</p> 	<p>Optimal Control of Hydrogen Driven Marine Vehicles</p>	<p>Hydrogen fuel cells are an attractive solution to zero emission shipping, since pure battery power will have severe limitations for most long distance applications. This project will look at the design of an advanced optimal Energy Management System (EMS) that maximises range and responsiveness whilst at the same time minimising the degradation in major high cost components including the batteries and fuel cells. Extending the life of these components will be a key driver in reducing operating costs, and ISC will transfer its work on optimal EMS for hydrogen and EV automotive vehicles to deliver these benefits.</p>
<p>Canal & River Trust</p> 	<p>Oxfordshire Waterways Electrification Transition (OxWET)</p>	<p>The OxWET project will develop learning, identify challenges and solutions to the challenge of current and future electric charging needs of users for the 26 mile stretch of the Oxford Canal from Oxford to Banbury. This will look to provide a suitable business model and technologies for the Canal and River Trust to facilitate change and addressing the shift to zero carbon transport, with a variety of additional potential benefits such as air quality, equitable uptake, supporting local businesses and assisting residents at risk of being locked out of a zero-carbon future.</p>
<p>Ecomar Propulsion Limited</p> 	<p>Marine Clean Energy Multi-Motor Feasibility Project for Large Commercial Vessels</p>	<p>The project is a feasibility study to define operational parameters and design characteristics for a unique gearbox that delivers clean electric propulsion for use in large marine vessels.</p> <p>Success will result in a new product line that allows for integration of multiple smaller motors which work in sequence and deliver a wide range of powers according to operational need. The design provides for redundancy and rapid service and motor/parts replacement. This creates a unique modularity throughout the propulsive system, reducing costs, operational risk and increasing flexible responses for vessel operators, delivering maintenance, operational, and safety benefits.</p>
<p>The University of Strathclyde</p> 	<p>A toolkit to evaluate shore side infrastructure requirements for rural islanded communities</p>	<p>Battery-electric ferries, suitable for passenger-service and tourism applications, are beginning to enter the market and offer a more environmentally friendly solution over existing fleets. However, without shore-side electrification investment, the greening of these services can become challenging. This is particularly true in rural communities where grid upgrades can be expensive due to the lack of existing infrastructure and the lower rating of existing assets. An understanding of fleet energy requirements is therefore required to inform shore-side electrical investment. This project will create a common reusable toolkit that considers the service and energy requirements for future small-passenger services.</p>

<p>MSE International</p> 	<p>Modular Onshore Power Supplies (ModOPS)</p>	<p>ModOPS will explore how shore power can reduce emissions from vessels visiting ports by defining tools to compare competing options for shore power within ports. The project will assess potential early-adopters (ferries, cruise ships and wind farm support vessels) where ModOPS would be especially attractive as well as identifying business models looking at the role of third-parties to share the investment risk, accelerate deployment and identify supply chain opportunities. The project will examine the cost of the delivered energy including supply security and operational flexibility and aims to strengthen the case for investment of Onshore Power Supplies by ports.</p>
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Future of Freight – £100k

<p>Voltempo Limited</p> 	<p>Redeployable HGV and Bus EV Charging Hub</p>	<p>Voltempo is developing the next generation of EV charging hubs, focused around the needs of fleets. Based around a central 1,000kW charging core, Voltempo's patented technology is capable of charging up to 24-vehicles simultaneously or providing a full 1MW charge for the next generation of HGV.</p> <p>One of the biggest challenges facing fleets today is the opportunity to trial electric HGVs and installing temporary charging facilities. Our TRIG grant will enable us to create a redeployable HGV and Bus EV charging hub that can be delivered to site and operational within a few hours, providing charging to multiple vehicles and taking power from multiple power sources to reduce the impact on the grid.</p>
<p>CGA Simulation</p> 	<p>Last Mile Freight Hub Planner (LMF Hub) Proof of Concept</p>	<p>LMFHub is a predictive, digital twin simulation supporting micro-consolidation of goods at facilities much closer to the delivery point. This reinforces new forms of small freight, such as cargo bikes, drones, autonomous pods as well as traditional modalities for last step delivery. LMFHub is designed for planning infrastructure build without the usual pre-existing data around use.</p> <p>CGA Simulation's existing digital twin platform will use Agent Based Modeling to provide predictions on potential shifts in the pattern of the logistics network.</p> <p>LMFHub will be trialled by Transport for Greater Manchester during the project.</p>



<p>Hypermile</p> 	<p>Machine Learning-Based Intelligent Driver Platform to make Diesel & Electric Commercial Vehicles more Energy Efficient</p>	<p>Driver behaviour is the biggest factor affecting fuel-economy, with studies (DfT,ATA) estimating a ~35% contribution. Thus, drivers are required to manage fuel economy to meet the sector's carbon reduction goal. To support driver's changing skills requirements, Hypermile and OX are bringing their AI, Automotive and Logistics expertise together to develop an in-cab driver training platform for diesel and electric commercial vehicles. The product will identify sections of inefficient driving along a journey, providing real-time guidance and post-journey feedback on how the same scenario could have been driven more efficiently – thereby, improving margins, safety and driver learning experience.</p>
<p>3Squared Ltd</p> 	<p>Levelling-up Freight</p>	<p>The Levelling up Freight project seeks to address the current inability of rail freight to flex quickly to changing customer demand and looks to promote rail as a competitive option to road, which currently carries about nine times more container freight than rail.</p> <p>Using 3Squared's PathPlanner tool, we will seek to identify ways to:</p> <ol style="list-style-type: none"> 1. Make sure freight trains are more profitable by helping to fill them before they depart ports. 2. Make rail freight more responsive by improving the process for finding additional train paths at short notice.
<p>Anteam</p> 	<p>Development of "Sharing Logistics" with Embedded Trust Models for Near-Zero Carbon Delivery</p>	<p>The aim of this project is to develop an AI-driven, Community-based Sharing Logistics Network. It delivers logistics capacity without the need for additional infrastructure or the proportional increase in CO₂ emissions, pollution, and traffic congestion. A feasibility study has been completed, funded by the Department for Transport under the T-TRIG 2020's Decarbonisation theme, to demonstrate the feasibility of using an innovative Artificial Intelligence technology to reduce the number of journeys taking place. This project will build upon the AI technology, focusing on the human factors of sharing logistics and its integration with the AI, complete with experimental trials.</p>

<p>Fishbone Solutions</p> 	<p>Freight Wagon Condition Monitoring Trial (FWCOMS)</p>	<p>Freight Wagon Condition Monitoring System (FWCOMS) focuses on the application of remote condition monitoring approaches for rail freight wagons, as an enabler for implementing monitoring and predictive maintenance methods on both wagons and fixed track infrastructure.</p> <p>Fishbone has developed a data analytics platform that has established useful vibration/harmonic data can be collected for fault analysis on passenger trains. MoniRail has developed a system that can accurately measure both ride comfort and track geometry from in-service passenger trains. In collaboration, this project aims to apply MoniRail's sensors alongside Fishbone's algorithms to demonstrate that cost-effective predictive maintenance can be achieved on freight wagons.</p>
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Future of Freight – £30k

<p>The Chancellor, Masters, and Scholars of the University of Cambridge</p> 	<p>Brake-Actuated Steering to reduce the carbon emissions of HGVs</p>	<p>This project aims to develop and test a novel, low-cost, and lightweight active rear-steering system, Brake-Actuated Steering, to improve the manoeuvrability of a wide range of Heavy Goods Vehicles. The manoeuvrability improvements will unlock the use of higher capacity vehicles in many urban and rural areas, improving efficiency, and reducing emissions and operating costs. In addition, the system eliminates tyre wear during cornering, enabling the use of more fuel-efficient tyres. The system will be validated through controlled track testing for a variety of road surfaces, loads, and number of steered axles.</p>
<p>Brunel University London</p> 	<p>Non-linear boat-tails (NON-BOTS): A pathway to realising future Heavy Goods Vehicle aerodynamic performance</p>	<p>This project seeks to demonstrate the feasibility of a novel, small-scale prototype trailer incorporating a new non-linear boat-tail design concept as a means for Heavy Goods Vehicle(HGV) drag reduction. Fundamentally, this concept is expected to provide greater operator performance, increased damage tolerance with minimal impact to payload capacity. There are three main aims; 1) validate overall feasibility; 2) demonstrate a quantifiable benefit of at least 10% drag reduction, and; 3) conduct a preliminary design exercise for full-scale integration.</p>

<p>CurbCargo Limited</p> 	<p>Reducing pollution and congestion from freight in our cities</p>	<p>Freight vehicle emissions are estimated to increase by 32%, and congestion by 28% in the Top 100 cities globally until 2030. In response our project will prototype the use of technology to:</p> <ul style="list-style-type: none"> • Provide 'Booking' as a Service to better manage deliveries (and collections) into businesses, capture vehicle movement and emissions data, and improve the management of delivery 'end point' resources. • Reduce the environmental impact of freight by prompting changes to how businesses order goods, including ordering frequency and delivery method, to reduce vehicle movements. • Foster collaboration between businesses to identify collaborative procurement opportunities to further reduce freight vehicle movements.
<p>Mole Solutions Ltd</p> 	<p>Development of a Control Module for intermodal operations on an innovative Underground Freight Transport system (UFT)</p>	<p>Supported by Transport for West Midlands (TfWM), UFT is an emerging innovative concept using the sub surface to mode shift freight from road-based HGV to electrically powered capsules travelling autonomously on rail tracks in low-cost tunnels.</p> <p>A key throughput parameter is the intermodal load/unload operational efficiency and its interfaces. This project develops a software control module that monitors and controls that activity.</p> <p>Development is lab computer based with peripheral simulated real world data interfaces. The TRL4 deliverable is a validated module for a follow-on activity using real hardware.</p>
<p>Cyth Limited</p> 	<p>Rail-specific energy harvesting module for unpowered freight wagons</p>	<p>Preventative, or predictive maintenance represents a paradigm shift in asset management across every industrial sector. By screening digital 'signatures' of operating equipment in real time, faults can be detected long before they cause (sometimes catastrophic) failure of a machine or system. However, most rail freight vehicles are not equipped with a way to provide power to electronic screening equipment. This application will fund the development of a mechanical energy-harvesting module that will scavenge vibration and rocking/swaying of rail freight carriages. Success of this mission will allow deployment of sophisticated asset monitoring equipment across the strategically important rail freight sector.</p>

<p>Kale Collective</p> 	<p>AI infrastructure for a cargo bike logistics transition in the last mile of urban freight</p>	<p>Kale Collective is building a data-driven platform for logistics operators that optimises fleet and infrastructure investment decisions based on historical performance and topology information.</p> <p>The logistics market is under double pressure to minimise its climate impact and to improve efficiency. Alternate configurations leveraging e-cargo bikes or microhubs in urban centres have big potential to tackle both issues, but lack of insights and multiple layers of uncertainty make experimentation and transition tricky.</p> <p>Using data-driven simulations, operators can compare commercial and environmental efficiency of many configurations at once, moving away from decision making based on instincts and small-scale trials.</p>
<p>London South Bank University</p> 	<p>Low carbon food transport refrigeration trucks with hydrogen fuel cell and metal hydride reactors</p>	<p>Food transport refrigeration trucks (FTRTs), powered predominantly by diesel fuel, can lead to excessive carbon emissions and air pollution. It is thus urgently desired to electrify the FTRTs with applicable technologies such as hydrogen fuel cells (H2FCs). In this project, a novel H2FC system for FTRT will be designed and simulated. The metal hydride (MH) tanks will be applied to ensure compact and safe onboard hydrogen storage. Meanwhile, the hydrogen desorption process from the MH tanks will be applied to produce cooling for the refrigerated storage and thus eliminate the conventional refrigeration system.</p>

If you are interested in finding out more information about the grants or have any queries,
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