HORIBA MIRA: Shaping Journeys for 70 Years

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For over 70 years, HORIBA MIRA has supported many of the world's most prominent vehicle manufacturers and suppliers, by providing them with cutting-edge design, test and development capabilities. The company has remained at the forefront of vehicle development and has broken many records throughout its rich history, by providing customers with services tailored to their exact requirements, by investing in the latest technology, and by fostering a culture of teamwork and innovation amongst its dedicated workforce. HORIBA's successful acquisition of MIRA in 2015 marked a significant milestone in the history of the company. By combining two highly respected global brands to form HORIBA MIRA Ltd. and by establishing MIRA Technology Park as a centre of excellence in developing the latest transport technologies, the company is continuing to shape journeys of the future around the world by making vehicles safer, cleaner, smarter and rewarding to drive.

Introduction

HORIBA MIRA (formerly known as MIRA) was founded in 1946 and has been based at the heart of the UK's automotive industry for over 70 years. From its early beginnings as the government funded, Motor Industry Research Association, HORIBA MIRA has grown to become a global provider of pioneering engineering, research and test services to the automotive, aerospace, rail and defence sectors and a centre of excellence for vehicle development. The company works in close collaboration with vehicle manufacturers and suppliers around the world, providing comprehensive support ranging from individual product tests to turnkey engineering design, development and build programmes.

The company has seven decades of experience in developing some of the world's most iconic vehicles, with HORIBA MIRA's engineers utilising the latest test facilities and simulation tools.

With a suite of 37 major test facilities, 100 km of specialised proving ground and a wealth of engineering experience, combined with an expanding international presence, HORIBA MIRA is working hard to achieve its vision – that "By 2020 every journey in the world will be positively influenced by HORIBA MIRA." In order to realise this ambitious vision, HORIBA MIRA is developing MIRA Technology Park, the 1.75 million sq ft (162,500 sqm) site where its headquarters are located. The development is set to create over 2000 new jobs at a variety of skill levels, from apprentices to leading technical experts, and will become Europe's largest transport centric technology park and the home of European R&D centres for some of the world's most prominent vehicle manufacturers and Tier 1 suppliers.

HORIBA MIRA's proven track record and on-going ability to operate at the forefront of vehicle technology development has led it to become a globally recognised brand for vehicle development. By applying its advanced engineering, test and validation capabilities to customers' challenging programmes, HORIBA MIRA is already shaping journeys of the future.

History

The Beginning (Figure 1, 2 and 3)

HORIBA MIRA's drive towards positively influencing every journey in the world began on 1st January 1946, when the UK motor industry established its own research association known as 'MIRA', the Motor Industry Research Association. Formed from the Automobile Research Committee (ARC) of the Institution of Automobile Engineers, MIRA was carefully constructed to serve the needs of the industry itself.

From its beginning, MIRA has been instrumental in making engineering knowledge and experience available to the world's vehicle and component manufacturers. As its story has unfolded the company has survived the peaks and troughs of an industry which, since its birth, has been used by various governments as an economic regulator. It has survived national and world industrial recessions, emerging fitter, stronger and more focused than ever before.

Figure 1 34° banking under construction

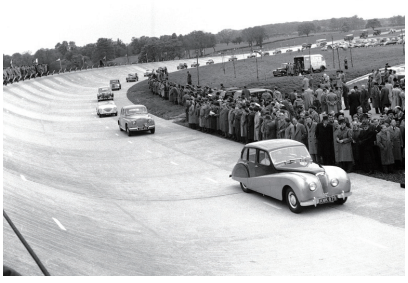

Figure 2 Opening of the High-speed Circuit

Figure 3 HORIBA MIRA's famous Belgian Pavé test facsility

Figure 4 The original Crash Laboratory

Figure 5 A climatic chamber

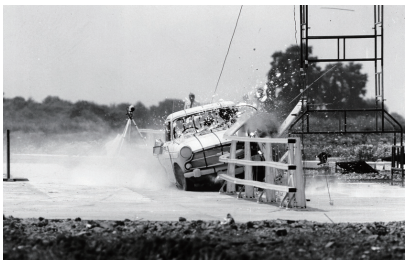

Figure 6 Crash testing on the High Energy Facility

Figure 7 An early Land Rover model being tested

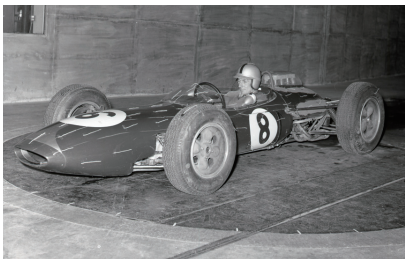

Figure 8 Aerodynamic testing of a Formula 1 car

1940s & 1950s (Figure 4 and 5)

Following an evaluation of over 40 potential sites including Donington Park and Silverstone, MIRA's Proving Ground was established at RAF Lindley, a former airbase near Nuneaton in 1948. The early site consisted of more than 650 acres of land with three concrete runways, perimeter tracks, dispersal and hard standings, a control tower and one hangar.

The first major development to the Proving Ground – which would later grow to become the centrepiece of MIRA Technology Park – was a half-mile section of the famous Belgian Pavé road, which was opened for use in early 1950. The MIRA laboratory facilities were also constructed during this time on a prominent 11 acre site along the historic A5 London to Wales, Roman trunk road known as Watling Street.

By 1952 construction was underway on of one of the three super-elevated bends on the High-speed Circuit. This 34° banking is still used today, and allows a neutral-steer speed of 85mph, meaning constant 100mph laps can easily be achieved.

At the end of the 1950s an extensive investigation of wind tunnel testing was carried out using the 24 foot diameter aircraft wind tunnel at RAE Farnborough. The conclusion was that the automotive industry required a purpose-built wind tunnel, and that MIRA should set about designing and building the world's first full-scale wind tunnel. It was built inside the remaining aircraft hangar on the Proving Ground and was one of the first purpose built facilities at MIRA which started a series of developments that would continue throughout the 1960s.

1960s & 1970s (Figure 6, 7 and 8)

During the 1960s, MIRA rapidly built facilities to accommodate the newly emerging engineering disciplines of the time. Developments included a crash laboratory, NVH (Noise, Vibration and Harshness) chambers and an 'Atmospheric Pollution' Emissions Laboratory that was built in 1967. In 1968 the Crash Laboratory was opened by Anthony Wedgwood Benn, who, at the time, was the UK Government's Minister of Technology. This laboratory was the most advanced crash facility in the world and helped MIRA lead the way in the science of safety development engineering.

Also during this time, plans for extending MIRA's safety facilities at Nuneaton intensified which resulted in the installation of a HyGe reverse impact sled facility, and improvements to the crash test rig. These projects provided a greater range of crash test possibilities and were ideal facilities for the development of passenger restraint systems. The HyGe Laboratory was formally opened by HRH Queen Elisabeth II's cousin, Prince Michael of Kent in March 1979. Following the opening, a variety of work was undertaken, including seat testing, seatbelt evaluation, and pedestrian impact testing using both adult and child dummies. During this time, MIRA was also involved in a large cooperative project concerning the restraint of children in cars using adult seat belts, and the creation of design parameters for booster cushions.

1980s and 1990s (Figure 9, 10, 11, 12 and 13)

The 1980s saw many additions to MIRA's facilities; with the opening of the Engine Test Laboratory by HRH Prince Michael of Kent and the creation of a Straight Line Wet Grip surface on the Proving Ground, which was opened on

an extremely wet day in April 1986 by Mr Peter Bottomley, MP - Parliamentary Under-Secretary at the Ministry of Transport.

In 1987 MIRA's first Semi Anechoic Electromagnetic Compatibility (EMC) chamber was also opened by Sir John Egan, Chairman and Chief Executive of Jaguar Cars.

MIRA's propensity for record breaking began in the 1980s when Richard Crane set a new world record for human powered vehicles during one hour's running on the Proving Ground's Horizontal Straights in September 1985, achieving a speed of 41.28 mph. The existing record he broke was 37.5 mph, and the aerodynamic development of the vehicle; 'Bluebell' achieved a drag coefficient of 0.095, after being development in MIRA's Full Scale Wind Tunnel.

The company's trend for record breaking continued into the 1990s. In preparation for the 1992 Barcelona Olympic Games, British racing cyclist Chris Boardman and Lotus Engineering took cycling to another level when they perfected the aerodynamics of both the Lotus 'super bike' and Chris's riding position. The revolutionary bike helped Chris to catch his opponent Jens Lehmann in the final of the 4km cycling pursuit and he went on to win the Olympic gold medal.

MIRA's vehicle dynamics capabilities significantly advanced in the 1990s when the company opened Europe's most advanced independent Kinematics and Compliance (K&C) Facility in 1996. This new rig enabled MIRA to accurately establish the kinematic characteristics of a vehicle's suspension and steering system geometries, and the compliance characteristics of the suspension springs, anti-roll bars, elastomeric bushes and component deformations. Knowledge of these characteristics is an essential aid for suspension engineers wishing to establish a thorough understanding of a vehicle's performance in terms of ride, impact isolation, steering and handling, and immediately became an essential engineering tool for vehicle and component manufacturers.

During this decade, MIRA also played a significant part in another world record. The company's input during secret tests on the unique rear-wheel steering system and vital model wind tunnel developments on Thrust SSC, meant the team were able to break the sound barrier with a car, achieving a speed of 763.035mph (Mach 1.007) on 15th October 1997.

Figure 9 Peter Taylor breaking the lap record on the High Speed Circuit in a McLaren F1

Figure 10 Chris Boardman's Olympic winning Lotus 108 in the Full-Scale Wind Tunnel

Figure 11 Crash Laboratory

Figure 12 Aerodynamic development of Thrust SSC

Figure 13 HORIBA MIRA's first Kinematics and Compliance Test Facility

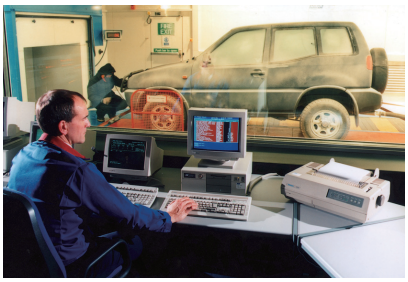

Figure 14 Climatic Wind Tunnel One

Figure 15 MIRA's Quatro Park

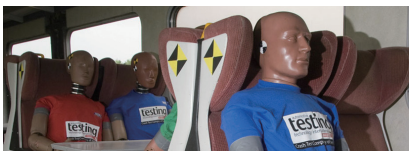

Figure 16 Crash test dummies used in full-scale rail crash testing

Speed was also on the agenda on a cold, damp day in December 1998, when a new lap record for the High-Speed Circuit was set in a McLaren F1. It broke the record by averaging 168mph (270.36 km/h) around the circuit, and at one point reached speeds of 196.2 mph (315.75 km/h), beating the previous lap record of 161.655mph (260.15 km/h) which was achieved in a Jaguar XJ13 in April 1967.

The final major success for MIRA during the 1990s occurred in December, when the company won the top award for the best Teaching Company Scheme (TCS) programme.

The 2000's (Figure 14, 15 and 16)

MIRA's ambitions for expansion were boosted at the start of the decade, when the company established a sister-site in Basildon, Essex. MIRA Quatro Park was opened on 27th June, 2000, by Dr Wilfried Janke, European Technical Director of Visteon. At the time it was built, this bespoke engineering test facility was the largest of its kind in the UK. Today it continues to offer independent validation testing on a variety of products for all engineering sectors.

In order to meet customer requirements, improvements were made to a number of facilities at the site in Nuneaton between 2003 and 2006. A second Climatic Wind Tunnel (CWTtwo) was opened in 2003, and MIRA's comprehensive Electromagnetic Compatibility (EMC) capabilities were further enhanced in 2006 with the opening of the Heavy Vehicle Semi Anechoic Chamber (HVSAC).

In 2007 MIRA won Automotive Testing Technology International magazine's 'Crash Test Company of the Year' award. This was a major achievement for the company, and signalled the culmination of decades of hard earned experience gained in the field of vehicle safety development.

Throughout 2009, MIRA was involved in numerous high-profile projects, including the SAFERIDER programme which focused on Advanced Rider Assistance Systems and On-Bike Information Systems. This innovation provided speed alert, curve warning, frontal collision warning and lane change support functionality.

A cooperative system, WATCHOVER, was also designed in 2009. This prevented accidents involving vulnerable road users in urban and extra-urban areas where clear line of sight was unavailable.

FOOTLITE was another project MIRA worked on during this decade. It highlighted the close-coupled relationship between Intelligent Transport Systems (ITS) and low carbon technology via the delivery of driver information systems that educate and encourage safer, greener driving and longer term behavioural changes.

In 2009 the company's research activities within the rail sector became centred on passenger safety, when MIRA entered into a partnership with Motorail Logistics to perform the first full-scale rail crash test in over 20 years. Later that year MIRA collaborated with fifteen partners from European rail operators and manufacturers as part of the SAFE INTERIORS research programme, which addressed the complexities arising from standing and unrestrained passengers.

The Dr Gillespie Era / HORIBA Acquisition (Figure 17, 18 and 19)

After taking charge of MIRA in January 2009, CEO, Dr George Gillespie formed a new Executive Team to lead the company, which drew upon a wide range of experience from across the engineering industry. Their vision was to bring the company together to form a cohesive commercial enterprise that was capable of expanding into international markets, while cultivating the very essence of the company that made it so unique and endearing to both its established customer base and its talented workforce. By strengthening its core capabilities within traditional vehicle engineering disciplines and investing heavily in emerging areas such as xEV systems and functional safety, the company quickly began to realise this vision.

MIRA's ambitious plans for establishing itself as a world leader in vehicle engineering first began to emerge with the announcement of MIRA Technology Park in 2010. MIRA Technology Park's vision was to build a state-of-the-art Engineering Centre and create the most advanced, independent transport Technology Park in Europe. This ambitious project, which is still ongoing, aims to generate more than 2,000 jobs by 2020.

During 2011 and 2012, The MIRA Technology Park plans attracted a lot of praise from the Government. In separate meetings with Nick Clegg (Deputy Prime Minister at the time), and Business Secretary Vince Cable, George Gillespie explained how a state-of-the-art Engineering Centre and Technology Park would help attract international companies looking for advanced engineering expertise and facilities.

Planning approval for MIRA's 1.75 million sq ft Technology Park development was endorsed by Secretary of State Eric Pickles in March 2012, and by November 2012 the first new building on the Technology Park, MIRA's new 43,000 sq ft Control Centre was opened by the Rt Hon Dr Vince Cable, Secretary of State for Business, Innovation and Skills.

Large advances within MIRA's autonomous and connected capabilities have been fostered during George Gillespie's leadership. Central to this is the development of MIRA's Connected Vehicle, a highly automated car that integrates with MIRA's City Circuit – a facility which provides a safe, comprehensive and fully-controllable connected city environment dedicated to the testing, validation and demonstration of co-operative systems in an urban and sub-urban environment and allows synchronisation of intelligent infrastructure and other intelligent vehicles. This research, which is still on-going, is an enabler of enhanced test capability for the City Circuit and also the foundation for further proving ground automation.

Figure 17 Dr. George Gillespie welcoming Aston Martin to MIRA Technology Park

Figure 18 HRH Prince Harry training for a South Pole expedition in one of the Climatic Wind Tunnels

Figure 19 Transport Secretary Sajid Javid visiting HORIBA MIRA

Figure 20 The masterplan of MIRA Technology Park

Figure 21 An artist's impression of MIRA Technology Park in the future

Figure 22 Vince Cable with HORIBA MIRA's Connected Vehicle

A spin-off from the Connected Vehicle programme is the field of Cooperative Driving. While independent autonomous vehicles currently tend to be very cautious due to their situation awareness limitations, MIRA's work involving data sharing is helping to improve awareness and cooperative actions amongst connected vehicles and infrastructure that can optimise traffic flows. This activity builds on the Connected Vehicle's foundations and is seen by MIRA as an enabler of technologies for the wider deployment of future autonomous vehicles.

In September 2013 MIRA hosted another royal visitor. This time it was HRH Prince Harry and the UK team of the Walking With The Wounded Allied South Pole Challenge. During the 24 hour exercise, the team were subjected to temperatures as low as -35°C, snow blizzards, and winds of up to 200 km/h so they could prepare for the brutal environment of Antarctica. The event received international media coverage and generated a significant amount of interest in MIRA's environmental testing services.

Figure 23 Bob Joyce and Dr. George Gillespie at the opening of the new Kinematics and Compliance Facility

2014 saw Bob Joyce, Jaguar Land Rover's Executive Director of Product Creation and Delivery, launch MIRA's newly expanded Kinematics and Compliance Facility featuring Europe's only independent Suspension Parameter Measurement Machine (SPMM) with moment of inertia capability.

As 2014 came to a close, Dr Gillespie was awarded an OBE in the Queen's New Year's Honours List. The award was presented to George for his services to international trade, following his continued commitment to building business overseas. On route to gaining this award, George accompanied Britain's Prime Minister, David Cameron, on a trade visit to China in December 2013, and visited Japan, India and China on several occasions during 2014 to build long-term business relationships between international markets and the UK.

The latest chapter in MIRA's history was written in 2015 when HORIBA increased its operation through the purchase of MIRA. The major investment, which was completed on 14th July 2015, saw HORIBA expand its portfolio with a move into vehicle engineering and testing consultancy. By combining two highly experienced and internationally recognised companies to form the HORIBA MIRA brand, significant gains can continue to be made towards making vehicles and journeys across the word safer, cleaner, more efficient and rewarding.

HORIBA MIRA's Current Capabilities

HORIBA MIRA has a unique combination of test facilities and complementary engineering capability, and also provides a location for organisations to locate their R&D activities.

HORIBA MIRA's headquarters, based in the UK, house 37 major test facilities and over 100kms of test tracks. Test facilities include comprehensive suites of crash and safety development facilities, climatic and aerodynamic wind tunnels, EMC test laboratories, emissions and powertrain test labs as well as a range of component and structure test facilities.

The HORIBA MIRA Proving Ground is very comprehensive and allows vehicle, component and tyre testing across a range of high and low speed, durability and low friction surfaces.

HORIBA MIRA has engineering expertise that relates to the test facilities that already exist. In addition, HORIBA MIRA engineering expertise has been traditionally focussed on vehicle systems with a long-standing tradition of using this expertise to develop vehicle attributes and DNA, typically, ride and handling, steering, braking, durability, NVH and passive safety.

Over the past 20 years, vehicles have evolved with conventional diesel and gasoline powertrain systems being replaced with hybridised and electrical architectures. In response to this HORIBA MIRA has evolved comprehensive capability in electrical powertrain architectures, battery systems and energy management, underpinned by HORIBA MIRA's core capabilities in electrical systems and EMC.

In more recent years HORIBA MIRA has taken a leading role, globally, in the areas of systems safety. As vehicles have become more complex and reliant on electrical systems or systems that are safety critical, the importance of the application of a systems engineering approach and ISO 26262 has become more important. In response to this, HORIBA MIRA has pioneered engineering consultancy capability in this area.

HORIBA MIRA has traditionally encouraged many of its valued customers to locate their R&D capability at HORIBA MIRA's traditional headquarters in the UK. These customers have benefited from easy access to test facilities and engineering capability and thus HORIBA MIRA has served as an attractive location looking to fast-track their R&D activity. Since 2010 HORIBA MIRA has built on this original principle, and has entered a period of on-going development as customised facilities are designed and built for a range of global customers looking to establish an R&D presence in Europe, and primarily the UK.

Current Areas of Research in Response to Industry

Following the arrival of the new Executive Team through 2009/10, and over the past 5 years, HORIBA MIRA has undertaken increasing levels of R&D. All R&D has been strictly focussed on developing capability and intellectual property in technical areas that have aligned with the overall strategy and business plan. Some key areas have included:

Battery pack design for vehicle applications, and development of battery management systems to ensure maximum life and performance

- HORIBA MIRA has designed and supplied bespoke battery packs for new Korean buses: a plug-in HEV and a pure EV with swappable packs. It was responsible for cell selection, hardware specification, BMS software, pack test and validation. The company worked in partnership with a Korean production supply chain and carried out cell characterisation and calibration using a unique process. The BMS was calibrated to cell characteristics and application for maximum performance of the pack and HEV system. In-house development and validation with advanced HIL and exercisers was also carried out.

- The finished pack had an integrated thermal system and platform and could be optimised for the local supply base. The pack's scalable architecture and BMS platform allowed pack development to be based off

Figure 24 A. HORIBA and G. Gillespie


Figure 25 The Management Team at HORIBA MIRA Ltd.


Figure 26 HORIBA MIRA's Control Centre

common systems and delivered in 9 months, while the BMS and pack design gave c.10% additional usable energy density compared to the industry standard.

Use of hydrogen for fuel cells application

- This is being conducted within a collaborative R&D project to develop a unique hydrogen generator using solid complex hydrides. HORIBA MIRA will develop a highly innovative continuous flow hot cell, producing 1 kW of hydrogen from a nano-structured ammonium borane composite. The project will develop a detailed understanding of the principles and material properties of the solid precursor material and thermal modelling, and simulation will be carried out to drive the design concepts. The project will also involve the development and build of a compact system incorporating thermal management, gas management, and movement of material and control electronics to generate hydrogen on-demand.

- The project is aimed at developing a patentable system for generating hydrogen from a solid fuel cartridge, and the system will mitigate the need for high barometric pressure and/or cryogenic hydrogen storage systems. The project is also aimed at drastically reducing the infrastructure and vehicle system costs.

Use of cryogenic fuels and liquid air as an alternative energy vector for fuel economy benefit

- HORIBA MIRA is actively researching technologies for the recovery of energy from liquid air through expansion, including how to integrate and control such cryogenic energy recovery systems in vehicles. A consortium of the Dearman Engine Company, HORIBA MIRA, Air Products and Loughborough University, with a grant from Innovate UK (the UK's innovation agency), have enabled the completion of the world's first demonstration of a liquid air engine in a commercial vehicle.

Cybersecurity of vehicle systems

- The growing importance of cyber security and vehicle resilience is closely aligned to the dual trends of increasing automation in vehicles and increasing growth in the use of consumer devices in vehicles. These parallel developments mean that ensuring the resilience of these systems is now a top priority for the industry, and HORIBA MIRA is taking a lead in this.

Intelligent and connected vehicles

- The automotive sector is facing various global challenges, and the requirement for safe, secure and environmentally friendly transport has never been greater. By developing automated intelligent and connected vehicles, HORIBA MIRA will make journeys of the future safer, more efficient and convenient. OEMs, infrastructure providers and suppliers require support to design, develop, validate and test these new vehicle systems and HORIBA MIRA is able to support them with this, as it has experience in developing vehicles that interact with intelligent infrastructure using its City Circuit Facility (a dedicated ITS proving ground). The company has also created Network Guided Vehicle - a highly automated demonstration platform for testing driverless

technologies, as well as a scaled-down testing environment (co-operative robots) which allow engineers to understand vehicle interactions and test algorithms/software.

- HORIBA MIRA has also developed a vehicle-in-the-loop system with its City Circuit to demonstrate cooperative vehicles with intelligent infrastructure, and had developed the intelligence and algorithms required for safe and highly efficient cooperative operation of autonomous vehicles. HORIBA MIRA's experts predict that up to a 25% improvement in efficiency can be achieved if vehicles and infrastructure cooperate effectively.

Lightweight commercial vehicle structures

- HORIBA MIRA worked on a project with a commercial vehicle OEM where it was responsible for the design, construction and testing of the hybrid technologies of a lightweight hybrid HGV. The aim of the project was to develop a hybrid HGV that was fuel efficient, quiet, highly manoeuvrable, had low emissions and an adaptable architecture. The OEM engineering team was based at MIRA Technology Park and HORIBA MIRA designed, integrated and validated the complete drivetrain. HORIBA MIRA was also involved in the sizing and design supply of the APU, battery pack and BMS, rear axle with integrated steering, traction motor and gearbox, thermal management system and hybrid control system.

- The finished vehicle featured a 25% payload increase, 4 wheel steer, zero emissions mode (EV), and achieved a reduction in CO2 greater than 53%. There is a patent pending on body, rear axle and APU designs and HORIBA MIRA has secured a follow-on contract for the Urban Vehicle Range project, which will create low emission and fuel efficient refuse collection vehicles in the form of a CNG vehicle and a plugin-hybrid vehicle.

Unmanned ground vehicle technology

- HORIBA MIRA has experience of successfully designing and supplying an unmanned IED detection capability that was required in response to a UK MoD Urgent Operational Requirement. The vehicle needed to be safely controlled remotely and MIRA Autonomous Control Equipment (MACE) technology enabled the vehicle to be converted to feature unmanned capability. The MACE was integrated into a Land Rover Defender as part of a 12 month engineering development and delivery programme. A team of more than fifty HORIBA MIRA team members were involved in the project, and the company provided full field support including all upgrades to the customer.

- The system has been in service with the British Army since 2011 and was used extensively for rapid and safe route proving. It has also been cited in UK MoD reports as "...a game-changing capability and the best system of IED detection currently deployed within the NATO group."

Future Strategy

HORIBA MIRA solves problems, driven by key megatrends that will shape the transport industry over the next 25 years. The company's future strategy is

based around four key themes which will guide its overall direction and growth, namely;

- Making vehicles CLEANER
- Making vehicles and journeys SAFER
- Making journeys SMARTER
- Ensuring vehicles remain REWARDING to drive

These key themes underpin the company's long term vision that "one day every journey in the world will be positively influenced by HORIBA MIRA".

A major part of the business growth strategy will involve research and development of new capabilities and intellectual property across a range of emerging technology areas. To accelerate this development a new business unit, Strategic New Growth (SNG) has been formed to focus on this challenge. SNG will take the lead in identifying, developing and maturing the new capabilities needed to achieve growth plans. The priority strategic technology themes for SNG have already been identified, namely:

- Future energy vectors
- Intelligent and connected vehicle technology
- Vehicle resilience
- Advanced vehicle technologies including light weighting

HORIBA MIRA has already developed the seeds of new capabilities in these technology areas from recent investments in research. Its growth strategy is to scale these capabilities up by establishing the operational structure for SNG and investing in the skills and facilities needed for expansion of these four technology areas. For example, expansion of its capabilities in the area of vehicle resilience will require research into potential vehicle vulnerabilities and investment in facilities for the evaluation of real vehicles and systems in a secured quarantined environment using realistic infrastructure (e.g. cellular communications) without disrupting public services.

For the core Engineering and Testing business HORIBA MIRA ensures its remaining facilities remain relevant to the current needs of the industry. Whilst this generally requires HORIBA MIRA to ensure its test facilities are kept up to date, it does also require it to enter new avenues and as demand requires.

Following the recent controversies concerning the measurement of vehicle tailpipe emissions and their reporting, the topic of Real World Emissions has become immensely topical and HORIBA MIRA has noticed a seismic shift in the emissions measurement requirements of the industry. As a result, HORIBA MIRA is developing leading test and measurement capability in this field and has begun to plan the installation of a new Advanced Emissions Test Centre at MIRA Technology Park. This new high-tech facility will see a number of teams from across the HORIBA Group coming together to deliver the project, including HOR (HORIBA Japan – Project Management), HF (HORIBA France – Climatic System), HTA (HORIBA Test Automation – Emissions Test Automation System), HE (HORIBA Europe – Chassis Dyno), HUK (HORIBA UK – Emissions Measurement & Analysis Equipment) and H-M (HORIBA MIRA – Project Management, building and integration).

This is just one example, but areas of technical development that include test facility development include vehicle connectivity, Advanced Driver Assistance

Systems and Active Safety.

Amongst HORIBA MIRA core engineering teams it continue to enhance its existing capability by continuing to develop improved simulations techniques, engineering processes and technical disciplines.

With a heritage of 70 years in the automotive industry and a strong culture of innovation, HORIBA MIRA is well equipped to continue to develop and deliver core engineering and test services. Increasing vehicle automation and connectivity is creating a revolution in the automotive industry, bringing many new challenges for the industry. Wherever there are new challenges there are new opportunities for HORIBA MIRA, and with the combination of our innovation culture and our growth strategy, we are well placed to face the future.

Geoff DAVIS, PhD
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HORIBA MIRA Ltd.