

# AUTO

INTERNATIONAL JOURNAL OF THE FIA

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## THE FIA

The Fédération Internationale de l'Automobile is the governing body of world motor sport and the federation of the world's leading motoring organisations. Founded in 1904, it brings together 236 national motoring and sporting organisations from more than 135 countries, representing millions of motorists worldwide. In motor sport, it administers the rules and regulations for all international four-wheel sport, including the FIA Formula One World Championship and FIA World Rally Championship.

## THE FIA FOUNDATION

The FIA Foundation is an independent UK-registered charity that supports an international programme of activities promoting road safety, the environment and sustainable mobility. It was established in 2001 with a donation of \$300 million from the FIA and is governed by a Board of Trustees. Among its activities, the Foundation participates in various UN road safety and environment-related partnerships and is a member of the UN Global Road Safety Collaboration.

## THE GLOBAL INSTITUTE

The Global Institute for Motor Sport Safety is an international organisation based in Switzerland that undertakes research to improve motor sport safety worldwide. As the safety research partner of the FIA, it conducts practical research at all levels of motor sport, from professional categories to grassroots racing. It aims to provide motor sport with the means to operate as safely as possible, and to use safety research for the benefit of public roads and society in general.





*Dear reader,*

The cover story in this issue of AUTO deals with the topic of urban mobility and the challenge it presents. Erik Solheim, executive director of UN Environment, recently said: “We are moving towards electrical vehicles in cities very fast. *The biggest killer of all humans is now pollution*, affecting our hearts, causing cancer and other diseases. So *we need to fight pollution*.” To see how cities are dealing with this and other issues, AUTO spoke to experts and administrators in three major urban centres – Accra, Montréal and Paris.

Our series of exclusive interviews with some of the most important personalities in the motor industry continues with DR ANDY PALMER, CEO of legendary British sports car marque Aston Martin.

In motor sport, we speak to ROBERT KUBICA, who recently made an *emotional return to Formula One* action – something that seemed highly unlikely after a serious accident in 2011 – and KALLE ROVANPERÄ, a talented youngster impressing experts in rallying.

Since 2014, Formula One cars have been powered by hybrid engines, which have delivered an amazing step forward in terms of efficiency. They are *highly sophisticated pieces of technology* and yet they and their creators do not get the recognition due. We wanted to put this right, by talking to the engine chiefs of the constructors currently involved in the top category of motor sport, to highlight how the current powertrains can also be beneficial in terms of the *development of engines for road-going cars*.

One of the leitmotifs of 2017 has been the road safety advertising campaign run by the FIA in partnership with JCDecaux. In this edition, we hear from campaign spokesman, Olympic superstar and 400m world record holder WAYDE VAN NIEKERK on why caring for others at the wheel is key to staying safe on the world’s roads.

In the usual section on heritage, we focus on one of the great sports car racers, HANS-JOACHIM STUCK, and we also look at the sports car that put Japanese auto manufacturers on the global map – the ICONIC DATSUN 240Z.

On the subject of Japan, the JAPAN AUTOMOBILE FEDERATION, which is hosting the 25<sup>th</sup> FIA Mobility Conference, is featured along with its Canadian opposite number in the section dedicated to our clubs. We hope that you enjoy these features and more besides and, as usual, we welcome ideas and suggestions to make AUTO even better. *Enjoy the read!*

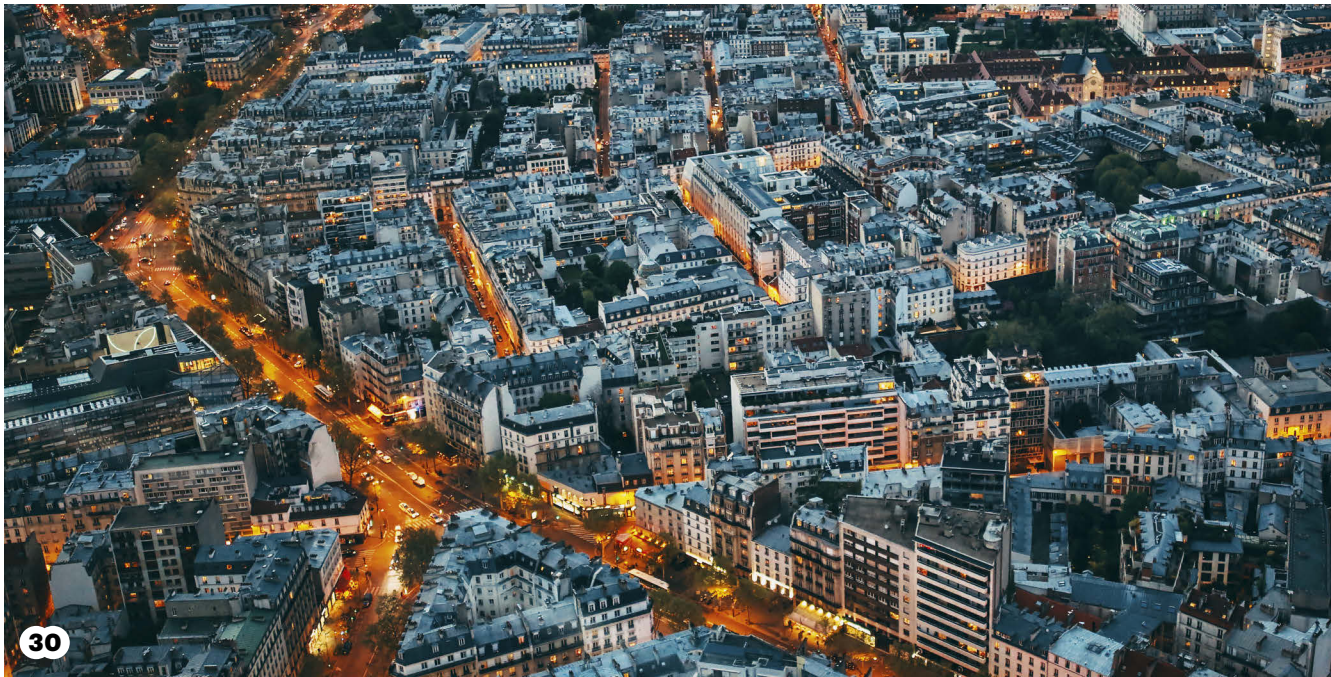
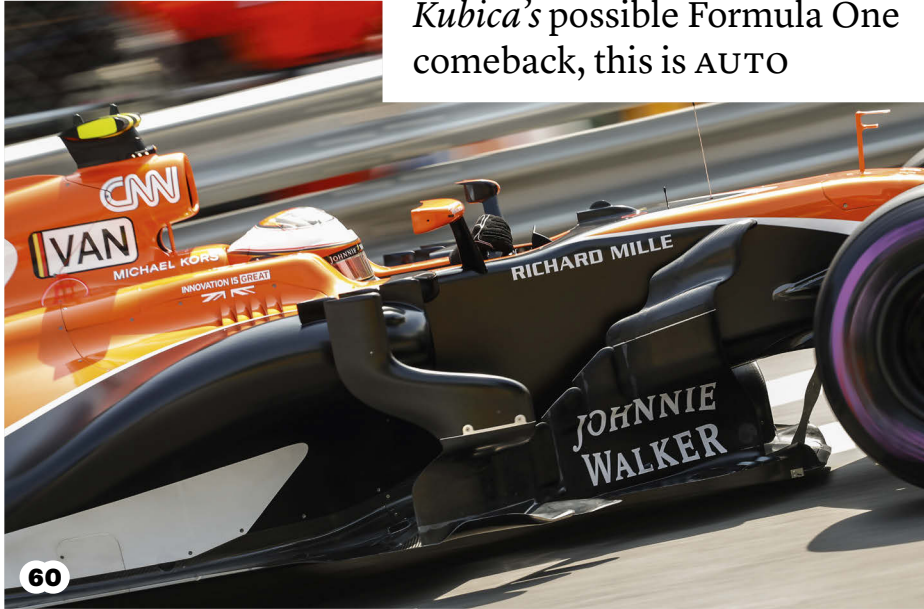


JEAN TODT,  
FIA President



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**Racing's daddy cool**

Jean Alesi explains how he is taking a measured approach to his son's racing career



**TECHNOLOGY TRANSFER**

F1 design ace Adrian Newey has brought his aero know-how to the eagerly-anticipated Aston Martin Valkyrie, which should boast some of the best downforce levels of any hypercar. Attention has also been focused on the interior, which features reclined F1-style seats and a detachable steering wheel.





ASTON MARTIN VALKYRIE

**BELIEVE  
THE HYPE**

Aston Martin has revealed some of the secrets behind its hotly-anticipated Valkyrie hypercar – created in conjunction with renowned F1 designer Adrian Newey. The new road car, which is also designed for track use, features two huge Venturi tunnels that run either side of the cockpit floor. Aston Martin says they are “key to generating extraordinary levels of downforce while

also keeping the upper body surfaces free from additional aero devices”. Interior space has been maximised so that two large adults can occupy F1-style reclined seats, while the traditional doors mirrors have been replaced by more discreet rear-facing cameras. The all-enveloping bodywork and roof-mounted engine air intake means no rear window or rear-view mirror.





**LOOKING TO MAKE HIS MARK**

Elfyn Evans' sixth-place finish on Rallye Deutschland, round 10 of this year's FIA World Rally Championship, consolidated his sixth place in the drivers' standings. The 28-year-old Welshman has previously finished second in Argentina and Finland this season, his fourth with the M-Sport team.





**CLOSE TO  
THE EDGE**

Elfyn Evans navigates the tricky Baumholder military stages in his Ford Fiesta WRC during Rallye Deutschland in August, round 10 of this year's FIA World Rally Championship. The Welshman and co-driver Daniel Barritt just missed out on fifth place in the tricky asphalt event after a spirited run for the M-Sport team. Evans' team-mate Sébastien

Ogier, meanwhile, had reason to celebrate after his third-place finish helped him to regain the lead of the drivers' championship from main rival Thierry Neuville, who retired from the rally. The result means that defending champion Ogier goes into the final three rounds of this year's series with a 17-point lead over his Hyundai Motorsport rival.





01

# NEWS

In this issue: The FIA hails ongoing success of the Formula E Championship, World Rallycross introduces a new race control system, Hyundai promises a performance boost with its hydrogen fuel-cell SUV and the latest Nissan LEAF is to feature new e-Pedal technology

Audi is to take over the entry previously held by Abt Sportsline for season four of the Formula E Championship.

## NEWS FIA predicts bright future for Formula E

The FIA has hailed the success of the pioneering Formula E Championship, saying it has surpassed all expectations in its first three seasons.

With bold ambitions and a powerful message of sustainable mobility, the all-electric city circuit series has made a big impact on the landscape of world motor sport, added the governing body.

Having raced in locations such as Paris, Hong Kong, New York and Mexico City, the FIA said the series is continuing to attract support and interest as it adds Rome and Santiago de Chile to its calendar for the upcoming fourth season.

The FIA pointed out that Formula E has also succeeded in attracting some of the world's leading car manufacturers, with the championship helping them to develop key road-going electric vehicle technologies and reach target audiences at the heart of urban centres.

The 2016/17 season saw the addition of Jaguar Landrover to the roster, which already included the likes of Renault, DS, Mahindra and Venturi. The upcoming campaign will boast a full works effort from Audi Sport for the first time, with the German marque previously giving support to the ABT squad.

BMW has, like Audi, been supporting one of Formula E's teams – Andretti – since the series' second season of racing and is confirmed to be entering as a full manufacturer for season five (2018/2019), while both Mercedes-Benz and Porsche recently announced plans to join the championship in 2019/20 pending completion of the official entry process.





Formula One's stars have helped to promote the FIA and Essilor's good vision message in a photo call attended by Jean Todt.



## NEWS FIA and Essilor join forces to improve road safety

The FIA and leading prescription lens company Essilor have announced a three-year partnership as part of the FIA Action for Road Safety campaign to promote good vision as a key pillar of road safety.

The campaign aims to highlight the fact that road safety begins with good vision – the most important sense when taking decisions on the road. But access to quality glasses remains limited in many regions of the world. In addition, many drivers are not aware of the need to protect their vision from glare in sunny conditions or when driving at night.

The FIA and French firm Essilor plan to fight a lack of awareness on this global health issue and highlight the importance of regular eye checks for safe driving. They will promote a 'Check your vision' call to action among local authorities, institutions, NGOs, eyecare and medical professionals as well as driving schools.

"I am delighted to welcome Essilor as a partner of the FIA Action for Road Safety campaign," said FIA President Jean Todt. "Vision is of critical importance to taking decisions when driving and I look forward to working with Essilor to promote this important message worldwide."

Laurent Vacherot, Essilor President and Chief Operating Officer, said: "We are very excited to join forces with the FIA to create such a partnership. Together, we will work towards raising awareness and providing people with good vision across the world to have safer drivers and safer roads."

## NEWS UN ambassadors call for action on road fatalities at Global Goals forum

The annual United Nations High Level Political Forum has heard a call for urgent action to meet the global health target on road safety.

Other mobility-related targets on air pollution and sustainable cities were also discussed at an event organised by the Global Initiative for Child Health & Mobility and G4 Alliance.

Hosted by the FIA Foundation at the UN Headquarters in New York, ambassadors discussed their challenges and successes in reaching the Sustainable Development Goals to achieve safe and sustainable mobility. They were joined by representatives of more than 20 countries, the UN Special Envoy for Road Safety, World Health Organization experts, and participants from other UN organisations, NGOs, academia and the private sector.

A side event at the July forum, 'The role of safe and sustainable mobility in eradicating poverty and improving health', brought together a range of interests connecting road safety to broader health issues such as surgical and trauma reduction. Nearly 130 participants attended the meeting, convened by the Global Initiative for Child Health & Mobility and the G4 Alliance for Surgical, Obstetric, Trauma and Anaesthesia care, and co-sponsored by the FIA Foundation among others.

FIA Foundation Executive Director Saul Billingsley described the scale of road traffic injury as "a public health emergency. Yet in too many countries legislative change is slow."

The UN Secretary General's Special Envoy for Road Safety, Jean Todt, urged countries to support a new UN Road Safety Fund: "The UNECE has put forward a detailed proposal which calls for an estimated \$770 million annually over the next decade to reduce fatalities by 50 per cent."



FIA Foundation Executive Director Saul Billingsley: 'It is a right to walk to school without being killed or maimed.'



## NEWS FIA introduces Mobile Video Race Control in World Rallycross Championship

The introduction of an all-new Mobile Video Race Control Unit at every round of the FIA World Rallycross Championship this year has been deemed a success by the governing body.

As the FIA's newest world series, WRX has faced some unique challenges as it rapidly grows into one of the most popular motor sport series. While the likes of Formula One, the World Touring Car and World Endurance championships visit established circuits that have tried and tested infrastructure to monitor the track, the challenges of the mixed-surface courses in WRX demanded a new approach to race control.

The FIA together with Hungarian company ChronoMoto Timing – the official timekeeper for European and World Rallycross since 2013 – developed a computer program to work specifically with the Mobile Video Race Control Unit and its 10 associated cameras around the circuit, allowing officials to monitor up to four of those cameras in a single screen (above).

Officials also have access to the video footage captured by World Rallycross Promoter IMG for TV production, and regulations stipulate that all drivers must have on-board cameras and provide footage on request to FIA officials. Incidents are logged and saved should they need to be referred to in future, creating a bank of useful data to improve the stewarding process.

WRX's sporting regulations have been updated to ensure that the spirit of the discipline, which allows a certain degree of race contact, is preserved, while adding a scale of reprimands similar to those used in F1. The new camera system will allow officials to more quickly and accurately identify incidents that are deemed to be beyond the boundaries of fair competition.

There have also been some operational improvements to WRX, with a permanent Judge of Fact appointed to assist the Race Director.





Safe Kids interim CEO Torine Crepy and Chair of the Board, Hon David Strickland, joined the FIA Foundation's Executive Director Saul Billingsley and North America Director Natalie Draisin on stage at PREVCON, together with the Safe Kids global road safety team and Shane O'Connor of FedEx.

## NEWS Safe Kids Worldwide joins Child Health & Mobility Initiative

Safe Kids Worldwide, the US child injury prevention non-profit organisation, has joined the Global Initiative for Child Health & Mobility.

The announcement was made at Safe Kids' PREVCON in July, a major injury prevention convention held in Baltimore that attracted more than 500 participants.

Safe Kids interim CEO Torine Crepy and Chair of the Board David Strickland joined the FIA Foundation's Executive Director Saul Billingsley and North America Director Natalie Draisin on stage at the event. Crepy signed the 'Speed Vaccine' statement, pledging the support of Safe Kids Worldwide to a campaign to reduce urban traffic speeds to safe levels for children. "We at Safe Kids are excited to be joining this global alliance working for safe and healthy journeys for every child," said Crepy.

During PREVCON the aims of the Global Initiative for Child Health & Mobility were promoted to participants from around the world. Speaking at a Global Network Meeting, Billingsley explained how the coalition's work was motivated by social justice and to overcoming institutionalised obstacles to fair access to safe and healthy mobility for every child.

Child health partners also participated in a panel session on 'integrating child injury into the Sustainable Development Goals'.

At another session Julio Urzua, Latin America Director for the International Road Assessment Programme, introduced iRAP's new FedEx-funded 'Star Rating for Schools' app, which will provide schools and communities with a tool to undertake road safety assessments of their neighbourhoods, enabling advocacy with local authorities.

NEWS

## FIA clubs translating global vision into local action, says Todt

FIA President Jean Todt travelled throughout Central America during August, meeting with government representatives and FIA club member presidents from several countries in the region to promote road safety.

This included meetings with the presidents of FIA clubs in Puerto Rico, Barbados, Costa Rica, El Salvador and Belize, all of whom provided updates on their local safety initiatives.

"It is through our local FIA member clubs that we are able to translate the global vision of safer roads for all into concrete local actions," said President Todt.

"FIA clubs have taken this vision and tailored campaigns specific to the region to ensure that our messaging is both meaningful and impactful."

The week-long tour of Central America took place from 4-11 August. On 9 August, President Todt arrived in Costa Rica to promote the United Nations road safety legal instruments, as well as share established road safety best practices with local government officials and key stakeholders. During his visit he met with government ministers, key stakeholders and the country's Vice-President Ana Helena Chacon to discuss road safety developments.

The day began with President Todt meeting with representatives from the UN Civil Society Advisory Group and other representatives of civil society to discuss safe mobility in the country.

He then met with the local UN Country Team, along with participants from the World Bank and



From left: Andrew Mallalieu, Barbados Motor Sport Federation President; Stephen O'Malley, UN Resident Coordinator in Barbados; Freundel Stuart, Prime Minister of Barbados; FIA President Jean Todt; Michael Lashley, Minister of Transport and Works of Barbados; and John Broyce, Minister of Health of Barbados during their talks.

Inter-Development Bank, where Costa Rica's progress on safe and accessible mobility in relation to the UN Sustainable Development Goals was discussed. The meeting also established what steps still needed to be taken to improve road safety in Costa Rica.

In a press conference President Todt, who is also the UN Special Envoy for Road Safety, said: "After discussion with key players at the global and local level, I believe there is a general consensus that road safety must be a priority for the upcoming years. It is by no means an easy road ahead, but with close collaboration, Costa Rica will be able to improve its road safety dramatically over the coming years."

As well as assessing road safety situations, President Todt also promoted the FIA's #3500Lives campaign in El Salvador, a campaign that will have been displayed in 30 languages across 80 countries by the end of 2017.

He then returned to the island of Barbados, and on 8 August held talks with Andrew Mallalieu, President of the Barbados Motorsport Federation, regarding the future of the country's motor sport development.

"It is very pleasing for me as FIA President to see what's been achieved in Barbados," he said in a radio interview. "With Bushy Park Circuit it shows that when you have the will, the energy and the passion that anything is possible."



## NEWS Nigeria hosts third African FIA Sport Regional Congress

The Automobile and Touring Club of Nigeria has hosted the third edition of the African Sport Regional Congress following successful events in Uganda and Ethiopia in the previous two years.

This year's congress, held in August, focused on the further development and growth of motor sport at all levels within the region. Representatives from 19 African countries were joined by delegates from the FIA, motor sport experts and stakeholders as they continue to take steps towards achieving best practice and ensuring the sport grows in Africa.

The congress heard that while African motor sport faces a number of shared challenges with the rest of the world, such as improving training and safety measures at all levels of the sport, there are a number of unique concerns to this region.

Improving infrastructure in an affordable manner is a key area for African motor sport to develop, while a number of National Sporting Authorities (ASNs) on the continent have rolled out karting slalom beginner and talent identification programmes for young people.

The congress also heard that rallying remains at the heart of motor sport in Africa and there is a strong focus on strengthening this discipline with the FIA's support, especially within the FIA African Rally Championship. Other focal points include new developments such as the introduction of an affordable R4 category within national rally series.



Willie du Plessis, chairman of stewards for the African Rally Championship, receives an award for best organised rally from FIA President Jean Todt.

## NEWS Hyundai promises performance boost with new hydrogen SUV

The Hyundai Motor Group has offered an early glimpse of its next-generation fuel-cell vehicle ahead of the hydrogen-powered SUV's official launch early next year.

Unveiled at a special preview event in Seoul, the near-production-ready SUV is Hyundai Motor Group's second commercially-produced

hydrogen model and uses the company's fourth generation of hydrogen fuel-cell technology.

Hyundai said the new model has been developed on four key pillars that focus on fuel-cell system efficiency, performance, durability and tank storage density.

"With exceptional efficiency, serene styling and uncompromised performance, our next-generation fuel-cell SUV is the true epitome of an eco-friendly vehicle of the future," said Lee Ki-sang, Senior Vice-President of Hyundai Motor Group's Eco Technology Centre. "Hyundai Motor will take a lead in developing and producing green energy vehicles that would ultimately complement a near-zero emission society."

By enhancing fuel-cell performance, reducing hydrogen consumption and optimising key components, Hyundai said that the vehicle's efficiency is greatly improved compared to its predecessor, the ix35 Fuel Cell. As a result, the new model targets a driving range of 800km on a single charge.

Hyundai added that the new model's maximum output is enhanced by 20 per cent compared to its predecessor, boasting 163PS of power. The fuel-cell SUV also improves the car's cold start capability, overcoming the challenges of starting fuel-cell vehicles in temperatures below freezing point.

The mass-produced vehicle will feature advanced driver assistance technologies. The details of these new features will be disclosed in January at the 2018 Consumer Electronics Show, along with the official model name.



Hyundai says its new hydrogen-powered SUV can cover a distance of 800km on a single charge.

Toyota's current CHR model uses a Nickel-metal Hydride battery, with the company looking to increase production of EVs.



## NEWS New battery-powered Toyota will recharge 'in a few minutes'

Toyota Motor Corp is working on an electric car powered by a new type of battery designed to significantly increase driving range and reduce charging time –with plans to sell it by 2022.

The car, to be built on an all-new platform, will use all-solid-state batteries allowing it to be recharged in just a few minutes, according to Japan's *Chunichi Shimbun* newspaper.

By contrast, current electric vehicles that use lithium-ion batteries need 20-30 minutes to recharge and typically have a range of just 300-400 kilometres.

Toyota spokeswoman Kayo Doi said the company would not comment on specific product plans but that it aimed to commercialise all-solid-state batteries by the early 2020s.

Japan's biggest car maker is looking to close the gap to EV leaders such as Nissan Motor Co and Tesla Inc as battery-powered cars gain traction around the world as a viable emission-free alternative to conventional cars.

Having long touted hydrogen fuel-cell vehicles and plug-in hybrids as the best way to make cars greener, Toyota last year said it wanted to add long-range EVs to its line-up and set up a new in-house unit, headed by President Akio Toyoda, to develop and market EVs.

Toyota is reportedly planning to begin mass-producing EVs in China, the world's biggest car market, as early as in 2019, although that model would be based on the existing C-HR sport utility vehicle and use lithium-ion batteries.

Other car makers such as BMW are developing all-solid-state batteries, eyeing mass production in the next decade. Solid-state batteries use solid electrolytes rather than liquid ones, making them safer than lithium-ion batteries.





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## NEWS Honda unveils automated driving goals for 2025

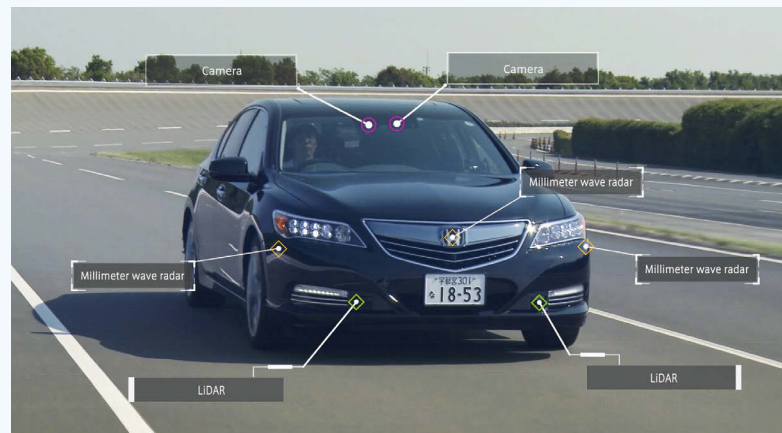
Honda has announced that it is targeting the year 2025 for the introduction of vehicles with highly-automated capability in most driving situations.

This new goal builds upon earlier plans for Honda and Acura vehicles to have highly-automated freeway driving capability by 2020. Honda says these are critical steps in its commitment to contributing towards a collision-free society.

The announcement was made by Honda Motor Co Ltd President and CEO Takahiro Hachigo at a briefing held at its Japanese headquarters, where invited media were able to test-drive Honda automated vehicle technologies in several complex scenarios.

"We are striving to provide our customers with a sense of confidence and trust by offering automated driving that will keep vehicles away from dangerous situations and not make people

Members of the media put Honda's automated driving technology to the test on a multi-lane freeway.



around the vehicle feel unsafe," said Hachigo.

The freeway test-drive demonstration was conducted on a closed course using a vehicle equipped with an advanced suite of sensors, showing the capability for automated driving system utilisation on a multi-lane freeway in the presence of traffic. The test vehicle utilised an advanced sensor package which included multiple cameras as well as five LiDAR and five radar sensors.



A second driving scenario, simulating a common urban driving experience, was conducted using the latest generation of Honda Artificial Intelligence with Deep Learning capability. Equipped with camera sensors only, Honda's Deep Learning system can sense and respond to complex driving environments, such as roads without proper lane markings. It can also detect pedestrians and cyclists at night and through experience can improve its ability to predict an outcome and take appropriate action.



The latest Nissan LEAF is set to feature an e-Pedal, allowing the driver to accelerate, decelerate and stop using just the one pedal.

## NEWS e-Pedal technology to feature on new Nissan LEAF

Nissan has announced that its latest LEAF will come with an e-Pedal – a new technology designed to transform the way people drive.

With the flip of a switch, the new technology will turn the accelerator into an e-Pedal allowing drivers to accelerate, decelerate and stop using just the one pedal. Nissan says e-Pedal technology is the world's first one-pedal operation that allows drivers to bring the car to a complete stop even on hills, stay in position and resume driving instantly.

It adds that 'people can cover 90 per cent of their driving needs with the e-Pedal, making the process of driving more exciting. In heavy traffic and during city commutes, drivers will greatly reduce the need to shift from one pedal to the other, making your drive simpler and more engaging.'

Nissan believes the e-Pedal technology represents another milestone in its ongoing commitment to bring accessible, advanced driver assistance technologies to the mainstream. The development of these technologies is part of Nissan Intelligent Mobility, the company's blueprint for transforming how cars are driven, powered and integrated into society.

The Nissan LEAF became the world's first mass-market electric vehicle when it was launched in 2010. Today, the LEAF is the world's best-selling electric vehicle with more than 277,000 sold worldwide.



QUESTION:

# WHY AREN'T ELECTRIC CARS PUSHING THE BOUNDARIES OF VEHICLE DESIGN?

02

**Electric powertrains promised to change the shape of automotive design – but so far the alternative fuel vehicles in production all come with curiously conventional packaging. What forces are at work? Three industry experts give us their opinions**

## THOMAS BRACHMANN

CHIEF PROJECT ENGINEER,  
HONDA R&D EUROPE

Looking at this from an engineering perspective, in principal we don't have specific aerodynamic requirements for our alternative powertrains, simply because the cooling performance provided in a conventional car will cover the requirements of an alternative powertrain – whether that's natural gas, battery EV, hybrid or fuel cell EV. If we do not have to change the design, the question becomes: do we want to?

The breakthrough with our latest Clarity Fuel Cell car was shrinking the powertrain. The target was to minimise and integrate the fuel cells, electric motor and power electronics to package everything under the front bonnet in a vehicle of conventional shape. This wouldn't have been possible with the previous generation – it would have needed a much higher front end, which would have totally destroyed visibility.

We wanted to demonstrate that this is an alternative powertrain that has the functionality of a conventional car and is easily recognised as such by the public – but it isn't just a case of public perception. The industry functions on economies of scale and those are difficult to achieve with a unique car. You need to build – and sell – a lot, which is a risk with new technology. You have to find a way to maximise the volume, which means working within a platform shared by conventional and alternative vehicles alike – hence the decision with the

Clarity Fuel Cell, which can now share a platform with the Clarity Plug-in Hybrid and Clarity Electric. Will we continue to use these conventional shapes for alternative powertrains?



Thomas Brachmann



I think real change requires a society that is a little more rational in assessing its requirements. It is difficult to integrate 90kWh of battery, or a 700bar tank system holding 5kg of hydrogen for a fuel cell – but perhaps familiarity with electric vehicles and, in the future, the potential of autonomous vehicles will create a much more honest view of range requirements.

At present, the target for electric vehicles is to emulate the sort of range possible with a 70-litre tank of diesel. This gives us packaging headaches and it isn't really rational, because it relies on a notion that people are regularly driving 1000km without pause. Nobody does that – even truck drivers aren't allowed to do that sort of distance! If we get beyond thinking this sort of range is desirable, then perhaps design will change.

## PROFESSOR DALE HARROW

ACTING HEAD OF PROGRAMME, VEHICLE  
DESIGN, ROYAL COLLEGE OF ART, LONDON

These are interesting times in the car industry. There are new players, new markets and new technology. The golden trinity of connectivity, automation and electrification have removed many certainties from car design – and that's quite exciting.

The arrival of electric cars hasn't happened quite as forecast. Everyone expected little city cars, but in reality battery technology has coalesced around premium products. Tesla is the obvious example, but we'll see others following in their wake. It makes a lot of sense: the larger platform allows for good range and high performance and, given the expense of building Electric Vehicles, establishing in a premium niche allows those costs to be recovered. But by their nature premium brands tend to be conservative. Companies are designing cars that look fairly conventional on the surface to appeal to conventional customers – albeit conventional customers who see the appeal in the technology.

Logically the price of electric technology will fall and we'll see trickle down through the market. There are, however, other factors at work.

There's no question autonomous cars are going to create a wholly new driving environment (or not-driving environment). Chances are vehicle architecture will respond and we'll see radical solutions: if AI can prevent collisions, then crash protection will change; if a driver doesn't need to look through glass, then screens will change.

Usage is changing too: we're seeing city planners keen to get the car out of the city; we're hearing about smart vehicles that will work with smart cities, harnessing AI to do away with congestion. We also have a consumer market increasingly comfortable with services downloaded and rented, rather than physically owned. I don't think we're going to be whizzing around in pods – people will still want the individuality of a car – but there

is room for all sorts of radical propositions.

Who's going to do it? Maybe not the major manufacturers. They've become highly skilled at making a refined product and minimising risk. The issue with their method is that the space to be inventive becomes smaller because the pressures to succeed are great – but there are technology companies out there who have financial clout and a willingness to be imaginative. The likes of Apple and Google can start a car business tomorrow. They don't have car-building technology but that's almost secondary – they can buy in those skills.

There's potential to do an awful lot. Whether it happens is a different matter, but I feel the pendulum is swinging that way.

## DR BRAD DUNCAN

SENIOR DIRECTOR, AERODYNAMICS  
APPLICATIONS, EXA CORPORATION

At Exa we specialise in simulation-driven design to the automotive industry, helping designers to realise their vision digitally before exploring physical models. The tools we develop at Exa don't really differentiate between electric and conventional vehicles, so we get to work on both sides of the divide. With regard to vehicle styling and aerodynamics, my perception is that the demands aren't so different. Whether it's a designer working on the Jaguar XE or a Tesla Model 3, in terms of design parameters, they're both trying to get to the same place.

And that makes sense. The company selling an electric car wants to compete head-on with any other vehicle: that's why so much of the effort goes into providing the same amount of interior space, performance potential, etcetera. They are firmly focused on ensuring the consumer doesn't have to make sacrifices with an Electric Vehicle.



Dr Brad Duncan

Market segmentation plays a role. There are people buying an electric car to make a statement, but that segment is always going to be much smaller than the potential market for consumers who simply want the best vehicle that fits their needs and price range. The people buying a Tesla predominantly want the best vehicle they can get. They don't want to compromise. The American consumer in particular isn't going to sacrifice styling or performance when they're buying something that costs as much as a Mercedes.

Electric vehicle makers have to be more stringent with their vehicle dynamic and aggressive with their aerodynamics to get to that level of performance – but that doesn't really impact the general requirements of the vehicle in terms of the shape. Rather than making a few enormous changes, the trend we're seeing with electric cars is performance gains made through touching every aspect of design. It means more work everywhere on the vehicle.

This isn't cheap – but what we see is, the earlier in the design process the work takes place, the easier it is to achieve those design targets without employing the sort of expensive mechanisms that made early electric prototypes stand out. There was a trend to use active devices for instance – but you don't have to go that high-technology route to make the big performance gain if you can make lots of small gains to the same effect. It usually requires a lot more collaboration between styling and engineering at an earlier stage of the design process – which, of course, is one of the benefits of using more simulation. ◀



Professor Dale Harrow



03

One of motor sport's most exciting young talents, *Kalle Rovanperä* is gearing up for the big stages of world rallying – just as soon as he passes his driving test

TEXT

/  
JUSTIN HYNES

# Licenced to thrill

There's an old adage in motor sport that says if you're good enough, you're old enough – sporting shorthand for a belief that age should not be a bar to competition and that drivers, no matter how young, should be afforded the chance to marry precocious talent with craft and experience as soon as they have attained a level that makes heads turn. Think Max Verstappen first clambering into a Formula One car at a test in Italy aged just 16.

Following hard in the tracks left by Verstappen is Kalle Rovanperä, though the Finnish wunderkind's talent is being exhibited at the wheel of a rally car rather than a single-seater.

In many ways Rovanperä was destined to be a rally star. The son of former FIA World Rally Championship competitor Harri Rovanperä – a works driver for Ford, SEAT, Peugeot, Mitsubishi and finally Škoda – Kalle was born just four months shy of his father's one and only WRC win, at the 2001 Swedish Rally.

It wasn't long before the youngster took to four wheels, at first on small quad bikes and motorcycles, and later in go-karts. However, his first experience of a real-world rally car, aged eight, and at the wheel of a rear-wheel-drive Class-F Toyota Starlet his father had bought, changed everything.

"I think I drove a car for the first time when I was three. My father never pushed me to drive, but I just found it so tempting. [In karting] I was in the top three almost every time, but going around did not feel that great for me," Kalle explains. "I had been racing go-karts for two years, but after driving a rally car for the first time, I never touched other racing cars any more."

The eight-year-old's precocious gifts are amply displayed in a video made by his father. The footage, showing Kalle peering over the dashboard and through the steering wheel while also expertly power-sliding the old Starlet around the icy roads and through forest tracks near the family's Jyväskylä home, was

sent to a connection who worked in Belgian TV. The video was uploaded to YouTube and promptly went viral.

"From the first moment that rally car felt so good," says the youngster. "Then when I was 13 or 14 we started to compete in rally. Obviously, there would not be any sense to just take part. You either go for it flat out, or you go and do something else."

## MAKING AN ENTRANCE

Finding competitive rallying at such a young age is no easy task, however. Rovanperä was too young to compete on the roads of his homeland, so instead turned to neighbouring Latvia, where no road licence is required to compete in rallies.

His first outings were conducted in a Citroën C2 in the R2 category, though he was only allowed to compete on special stages, with his father old co-driver Risto Pietiläinen driving the teenager on the public road sections. He still won the two-wheel-drive open championship.

Last year, Rovanperä stepped up, first competing with a Škoda Fabia S2000 and then an R5 version. The results were staggering. In the Latvia Rally Sprint he won at the first time of asking, claiming all eight stages on the Alüksne Rally. In the Latvian Rally Series, on Rally Liepāja, also a round of the FIA European Rally Championship, Rovanperä's stage times were a match for ERC event winner Ralfs Sirmacis, also driving a Fabia R5. As a result, the then 15-year-old was handed the ERC's Colin McRae Flat Out Trophy for outstanding performer at the event.

That, though, was the entrée. The main course was the championship itself and, with five wins from eight events, Rovanperä was crowned Latvian champion, 21.5 points ahead of nearest rival Jānis Vorobjovs, a driver almost three times the youngster's age.





**'People say I demand too much from myself... but a bad result is never good enough. Good results are the only ones I am looking for'**

The 15-year-old's performances were also catching the eye of WRC teams with M-Sport's Malcolm Wilson saying: "It's incredible what he's achieving at that age. I think we were all surprised when we first saw the video when he was eight years old, but he is clearly growing into a quick young driver."

Toyota was quick to take notice, too, and gave Rovanperä his first taste of the top rank – testing its 2017 Yaris WRC car in a 25-mile endurance run, a feeling he described as "incredible".

And so to this year and a season in which Finnish national motor sport organisation the AKK handed Rovanperä an exemption allowing him to compete in the Finnish Rally Championship, in which he has won both events he has so far contested. He also returned to Latvia and is competing in Italy.

"The Italian rally series is one the strongest at national level, together with the French one," he says. "For a newcomer it is very challenging, as the local drivers know those tarmac roads by heart. If I would go there next year, it would be a total different story, but now all the places are brand-new for me."

Rally Finland, though, is still beyond him. "Actually I have not driven ever any of those stages, but I have watched them year after year, so they feel quite familiar to me," he sighs.

The young star's frustration at being edged out because of his youth could be about to end, however.

#### **WORLD STAGE BECKONS**

On October 1 Rovanperä will turn 17. His birthday present, courtesy of the Finnish government, is a waiver for him to take his driving test a year early. If he is successful he will make his WRC debut at the end of the same month, with M-Sport boss Wilson set to confirm his admiration of the Finn's talent by putting him behind the wheel of one of the team's Fiesta R5s.

Beyond Wales Rally GB is the prospect of wider FIA World Rally Championship exposure in 2018. The current thinking sees Rovanperä contesting a partial (five-to-six event) WRC campaign in an R5 car, as well as taking on the challenge of a full-season tilt at the British Rally Championship, with the most likely team again being M-Sport. It's a test the teenager says he is ready for, largely because he is his own sternest critic.

"Obviously, I am quite strict to my own performances," he says. "Other people insist I demand too much from myself, but I cannot understand why I should not be that critical. A bad result is never good enough. Good results are the only ones I am looking for. When we manage to get a rally without mistakes and to stand on top of the podium, for me it is a perfect rally."

Parallels with the rise of F1's Verstappen are easy to draw and the similarities were reflected in May when Rovanperä was picked up by Red Bull, the company that took Verstappen racing in F1 at the tender age of 17. The comparison between the prodigies is one Rovanperä is aware of but not troubled by.

"To be honest, I have not been thinking about it much. I don't care what the other people might think of me. I just focus on my own doings. Generally I am glad that young drivers make it through to the top. Verstappen has done great job in F1 and there are some young guys coming up in rally, as well."

As for the influence of his father, Kalle says that Harri tends to shy away from too much intervention.

"He has never been that much involved in my decisions," says Rovanperä Jr. "It is good to know my father is there to follow how it goes, but he gives me freedom to go my own way."

And at the moment Rovanperä's career is only going one way – on an upward trajectory and at high speed. ◀



Formulating the ideal medical response in the event of a racing incident relies on access to the right data. In order to provide track doctors with that information, the FIA is set to introduce a remarkable new race glove that sends potentially life-saving data from car to medical crew

04

# SAFETY IN THEIR HANDS

TEXT

/  
MARC CUTLER

The glove you see on the right might appear to be just a standard piece of racewear, the sort of fireproof clothing drivers from karting right the way through to Formula One pull on every day at circuits around the world.

This one, though, has a small but crucial difference. Stitched into the glove is a flexible sensor that's about to have a big impact on F1. Measuring just 3mm in thickness, it is the sport's first biometric monitoring device and is set to be inserted into drivers' gloves next season in a bid to monitor their vital signs during the race.

Primarily, the sensor is another weapon in the armoury of doctors at the track. So it is appropriate that the project is being led by two people who are on the frontlines of F1 medical care – FIA Deputy Medical Delegate Dr Ian Roberts and F1 Medical Car Driver Alan van der Merwe.

"We know that the monitoring of people is essential in terms of their medical care," says Roberts. "Drivers in incidents are no different. We would like to start monitoring and assessing them as soon as we possibly can. But the equipment that we currently use is relatively bulky and is only applied after the incident has happened. There are also times when the driver isn't immediately accessible to us, so if we can't see him or we're not actually next to him, there's limited information that we can get."

F1 driver Carlos Sainz's accident during the 2015 Russian GP is a case in point. The Spaniard lost control of his Toro Rosso at Turn 13 during

the third practice session and hit the barrier head-on at 153km/h. It was one of the highest impact speeds measured in Formula One in recent years, but thanks to the absorption properties of the barrier, and those of the car's nose, Sainz was unhurt.

The only problem was that it was difficult for the F1 medical team to know this, as the first row of the barrier came to rest on top of the driver. So when they arrived at the scene they had to wait until the barrier was removed from the car without knowing the extent of his injuries.

"Accurate monitoring was impossible until we got hands-on, and obviously we couldn't do that until the barriers were moved," says Roberts. "If we had monitoring on him straight away we could have planned our rescue even better than we did. With this new technology, the moment a driver has an incident we will receive physiological readings and biometrics, so he is continually monitored from point zero right through to the initial response and on to the medical centre."

## HANDS-ON DATA FLOW

The idea is to incorporate this monitoring technology into gloves so the drivers have sensors on them at all times during a race. Prototype gloves have already been tested at the track and have passed the FIA's required fire safety requirements. The FIA is also about to publish the first Biometric Standard, that all

'biometrics' products wishing to be used on a racing car or driver will have to pass.

During the Hungarian Grand Prix weekend, drivers from Mercedes, Ferrari and Red Bull tested the devices. The feedback will be used to help decide where in the gloves to place the sensor in the final versions. The technology will be available for all glove manufacturers and initially the devices will use an optical sensor to measure 'pulse oximetry', or the amount of oxygen in the blood, alongside the pulse rate.

"That gives us the most 'bang for buck'," says Van der Merwe. "Pulse oximetry is one of those metrics where with a little information, you can deduce quite a lot from it. You can change what you do in a rescue scenario based on that metric." ▶

The crash barrier got in the way of F1 medical teams wanting to assess Carlos Sainz after his 2015 Russian GP practice crash.









"It's a well-established clinical measure," adds Roberts. "Basically you have a small probe that sits on an extremity, like a finger or an ear, that transmits two wavelengths of light that are then detected by a sensor. The amount of light that is absorbed versus the light that's transmitted is converted into an electrical signal which is electronically processed to give the blood's oxygen content."

This is potentially important in the context of a racing driver because if they have an injury that is affecting breathing, the oxygen content of the blood will begin diminishing immediately.

"For someone who is involved in a trauma situation where their respiratory system is in some way impaired, then it gives us an indication of that straight away," says Roberts.

Monitoring the data also offers a range of vital information for track doctors before they even arrive on scene.

#### TINY BUT TOUGH

Clearly, this is a very useful device but incorporating it into the Formula One environment has been no easy task.

"A lot of the systems on an F1 car are only designed to be working when all is well," says Van der Merwe. "But very often we get to an accident and the antennas of the telemetry systems have been knocked off, or the car has been completely powered off. So in terms of how we get the signal, there are several levels of redundancy. This is why we have ensured that the sensor in the glove will be fully self-contained and will always work in the worst-case scenario."

To achieve this the sensor uses a new industrial version of Bluetooth that can send information over a 500-metre radius.

"A lot of people when they hear 'Bluetooth' think about desperately trying to pair a mobile

## 'The sensor in the glove will be fully self-contained and will always work in the worst-case scenario'

phone with their car, but this is not the same," says Van der Merwe. "It is essentially a very lightweight but robust version of consumer Bluetooth."

The hardware can send out 20 data packets a second and has a self-contained power source via a small battery. This battery can be charged inductively, so when the drivers take their gloves off they just lie them on a charging mat and it replenishes automatically.

"We wanted to make it as frictionless as possible to use for the drivers," says Van der Merwe.

The data, which will be encrypted and secure, is also recorded on the gloves and can be downloaded by teams when the driver is back in the garage.

"We'll give access to the teams in year one and that will be on a download basis, so they'll have the data from the full race weekend to look at," says Van der Merwe. "Once we have done the initial roll-out the idea is that they will have a receiver on the car showing the drivers' pulse oximetry in real time."

To help with this, Van der Merwe and Roberts have set up a company – Signal Biometrics – to develop the bespoke sensor technology and integrate it into the materials. This has been essential to drive the project forward.

As Van der Merwe says: "When we first established the scope of the project, we thought we could probably take some fairly 'off the shelf'

medical sensors and just integrate them into a glove. However, as we got into it and the FIA's biometric standards started to take shape we realised together with the FIA that there's no product currently in existence that can withstand the fire tests or the comfort that's required, so we've had to basically make a sensor from scratch with materials that are not currently being used for this sort of thing."

Fortunately, with Signal based at the Silverstone race track in the middle of motor sport valley, there are numerous niche industry suppliers that have been able to offer support. This has enabled them to take proven designs and adapt them in a Formula One way, shaving off as much as they can in terms of weight.

"We've essentially done most of the work ourselves because there isn't currently anyone out there who does sensors that are supposed to be continually worn and used in an environment like Formula One, where there's potentially fire and a lot of RF (Radio Frequency) interference."

There is an economic benefit for this too as the device could have applications outside the sport.

"What we feel like we're making here is essentially a blueprint to be used in a very harsh environment," says Van der Merwe. "If we make it scalable, potentially it could have a big impact. There are all sorts of industries that could benefit from continuous wearable sensors which are lightweight and fireproof."

F1 is also only the first step in terms of motor sport as the idea is to filter down the technology to other championships.

To help with this, the project is being supported by the Global Institute for Motor Sport Safety, the FIA's safety research partner.

"The Global Institute has been instrumental in allowing a project like this to take shape, to give us the avenues to have access to the teams and track time," adds Van der Merwe.

#### FORWARD THINKING

The 2018 roll-out is just the start of the biometric monitoring project. There are already plans to implement sensors for respiratory rate and temperature. In addition to the safety benefits, these will help teams and drivers with performance monitoring.

"They're the next two big things," says Roberts. "Respiratory rate gives a very good indication of a driver's state of health and stress, while temperature is well known for affecting performance. They are the two for us that we're going to be looking at more than any others."

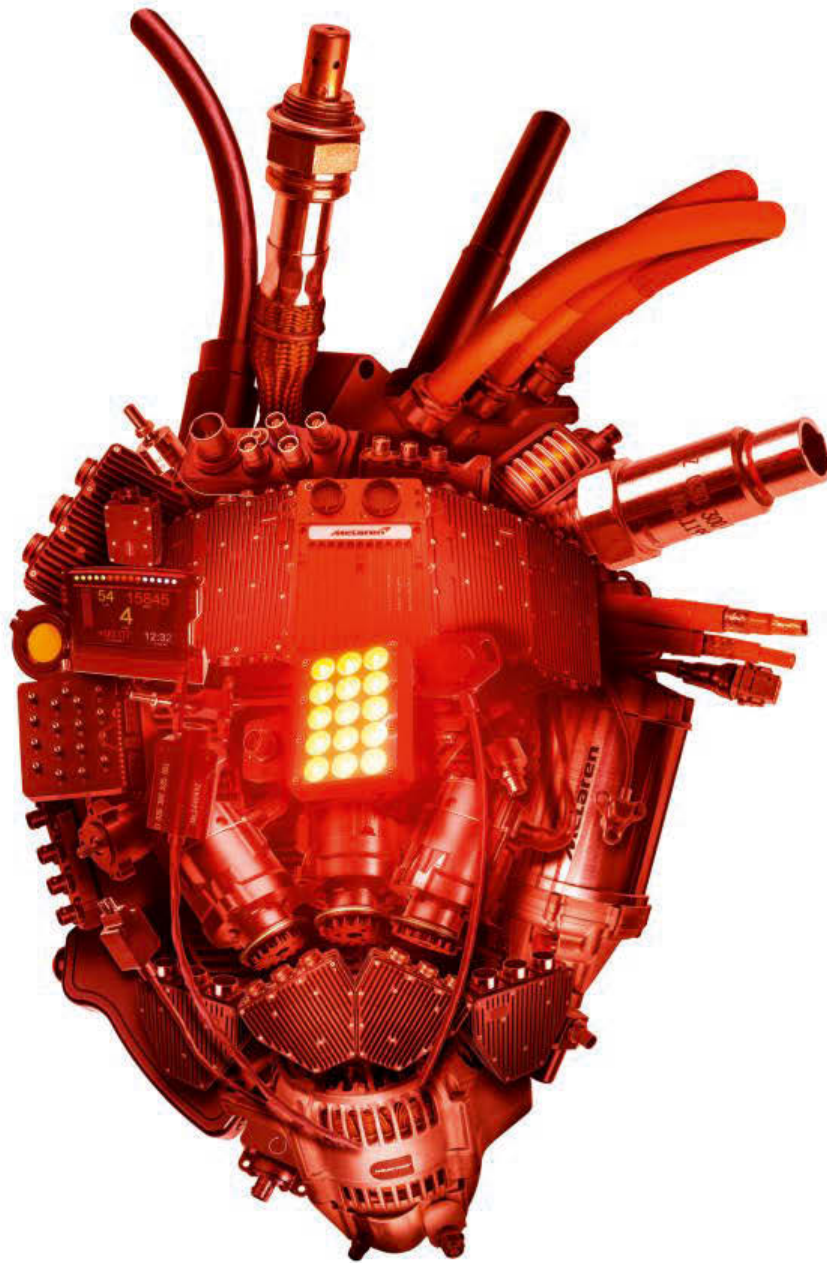
These sensors may be placed on other parts of the body, following feedback and further testing in 2018.

"The processes and how we're integrating the sensor into other fireproof fabrics will serve as the blueprint for other sensors," says Van der Merwe. "For year two we're already working on other projects that will define how you integrate a soft, comfortable sensor that's fireproof into an environment like Formula One." ◀



Mercedes were among the first Formula One teams to test the new biometric glove, at this year's Hungarian Grand Prix.





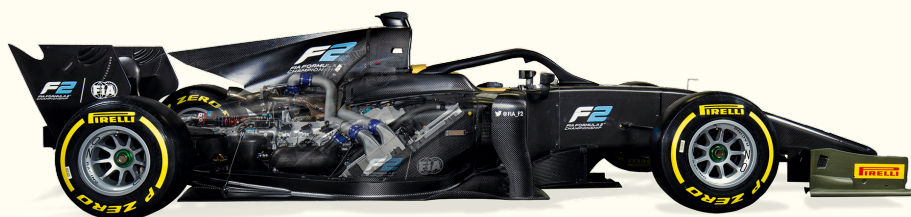
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# FORMULA 2 FEELS THE HALO EFFECT

Like its big brother F1, Formula two is set to benefit next year from the introduction of the new Halo driver protection system

04

TEXT

/

JUSTIN HYNES

The 2018 F2 car, which features the new Halo driver protection device, has already tested at Magny-Cours.

The Formula 2 Championship may be the final step in the FIA's driver ladder before grand prix racing, but it is set to receive the same benefits as the premier category next year when it too debuts the much-touted Halo head protection device.

First, a little background: this year's F2 championship is the last to be contested with the current-specification car, introduced in 2011. At this year's Italian Grand Prix, the FIA and series promoter, the Formula One organisation, unveiled the new-look F2 car set to race for the next three seasons in the one-make series.

The new car, which complies with the latest F1 safety standards, features architecture typical of a modern F1 car and a 3.4-litre turbocharged Mecachrome engine, delivering 620bhp at 8,750rpm. The new engine replaces the 4.0-litre normally-aspirated powerplant currently in use.

It will also be the first series after F1 to implement the Halo device designed to protect drivers' heads from debris on track, primarily wheels that come loose from other vehicles.

"After the decision to go ahead with Halo in F1 in 2018, it was always clear that we wanted to cascade it down to the other single-seater formulas," says FIA Safety Director Laurent Mekies. "We develop solutions in F1 because there we have all the firepower to do difficult things and then it normally takes a bit more time to cascade it down.

"The thing that is specific about this car and about 2018 for Formula 2 is that it will deploy at the same time as in F1, and there have been a very limited number of cases where we have done that in the past. It was a difficult call, but it's a new car that will last for at least three years and we could not miss that opportunity."

## ON THE SAFETY TRAIL

Mekies added that the F2 implementation is the beginning of a trickle-down process to improve safety across the FIA's single-seater universe. "It is the first step towards a rapid cascade into the other single-seater formulas. It will arrive in Formula E midway through next year, for season

five, and then will be implemented in F3 in 2019."

The opportunity represents a stern technical challenge, however, with just over six months in which to homologate the device for the F2 series, identify suppliers and integrate it with the car, which is being built by Italian constructor Dallara.

"It's a real challenge to deploy on a support category," adds Mekies. "Because it is a one-make series, it's a little easier because you are talking to one manufacturer, but it is more complex because you have to accept that you have a bit less firepower than F1 teams and you need the cost aspect in perspective when it comes to timing. We are running as fast as we can in order to make the threshold, but it's a great signal to be able to deploy things at the same time on single-seaters.

Apart from the Halo device, the new Formula 2 car features a number of other safety updates such as the Drag Reduction System (DRS) and upgraded electronics, while the series will also benefit from a Virtual Safety Car (VSC).

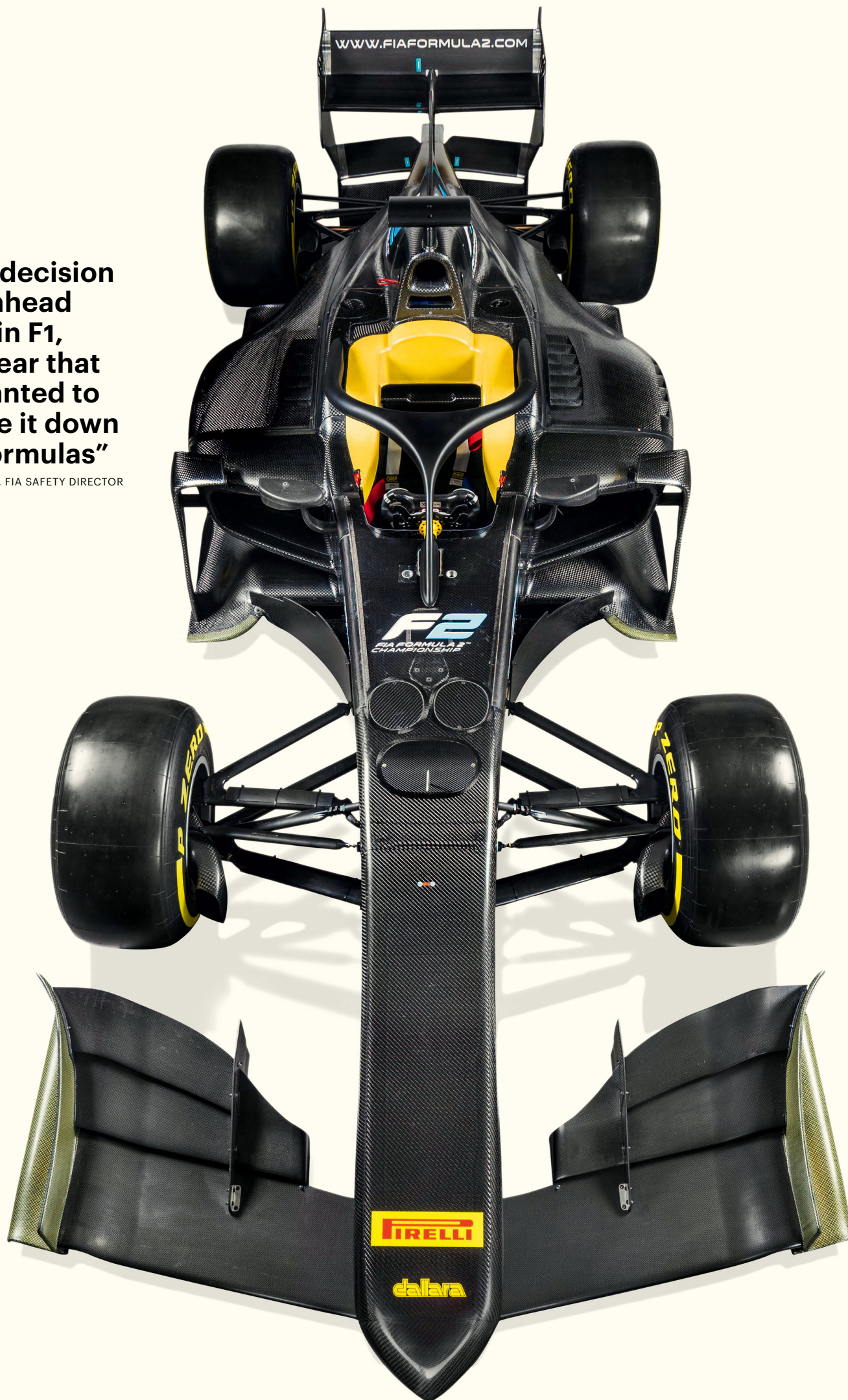
The new car completed a successful shakedown in July at Magny-Cours, France and the development programme will continue over a number of tests across the remainder of the year to accumulate sufficient mileage. A first car is set to be delivered to the teams in mid-January 2018, with a second available in mid-February.

Italian manufacturer Pirelli is once again the official tyre supplier to the F2 championship and has been integral to the car design process to ensure continuity with respect to the tyres. ◀



**“After the decision  
to go ahead  
with Halo in F1,  
it was clear that  
we wanted to  
cascade it down  
to other formulas”**

LAURENT MEKIES, FIA SAFETY DIRECTOR







**Navigating**

**the**

**next**

**level**



05

Imagining the future of urban transport invariably conjures up images of airborne cars and robot drivers. But what does the next stage of transport development mean for real-world cities across the globe, and how does planning to level up differ according to economic power and social development? AUTO travels to three very different cities – Montréal, Accra and Paris – to find out

**of****cities**



## The new world city: MONTRÉAL, CANADA

### Redrawing the transport map

The transport network of Quebec's largest metropolis is stretched to capacity. The next level is therefore to reconstruct how the city moves

#### TEXT



JEFF PAPPONE

When Montréal decided to bring the FIA Formula E Championship to its streets this year, it was always about much more than a simple car race.

The symbolism of having all-electric race cars battling on the streets of Montréal as it grapples with the changing transportation needs of its citizens was not lost on its mayor, Denis Coderre.

"It's more than just an event, it's a statement," he said when the race was first announced. "By participating in that race you contribute to saving the planet because you have an alternative, and everybody will say, 'Gosh, I should have an electric car.' The mission and the goals attached to it are amazing. We have a wonderful opportunity to be the bridge builder with the universities and with the research and development – it's a laboratory of innovation and that's exactly what we have been witnessing."

The inaugural Formula ePrix in July was the first in a three-year deal, which also includes an option for a three-year extension. The symbolic high-profile series aside, Montréal has working hard to address the next stage of urban transportation in a metropolitan area of about four million people.

When it comes to bike share services, pedestrian streets, increasing citizen security, the adoption of the Vision Zero accident approach across its road network, and road infrastructure, the city has been active and gets high marks. On the other hand, some major projects such as the extension of the subway network and the idea of having a tramway in downtown Montréal haven't even gotten off the ground.

Nevertheless, the city gets a passing grade on transportation from Raphaël

Fischler, Associate Professor at McGill University's School of Urban Planning.

"On balance, we have a good public transit system, by North American standards, with a coordinated system of bus lines, metro lines and suburban train lines. Their functioning isn't always perfect, but I think there's a genuine effort to keep improving the service," he says.

"It has a high modal share for public transportation in North American terms, is doing better and better as a cycling city and is seeing public authorities finally work hard to restore and upgrade road and other infrastructure after decades of under-funding. Efforts to make automobile drivers, cyclists and pedestrians use streets together in greater harmony and safety are underway in many boroughs and suburbs of Montréal."

In some respects Montréal's transportation development hands are tied due to the funding model preferred by the province, which holds many of the purse strings. Essentially, it must lean toward cars and the associated infrastructure, rather than allocating funds to transit because that's how the pie is divided by the province.

"If you look at the transportation budget, Quebec invests about 70 per cent on roads, either for maintenance or new construction, and 30 per cent on transit and active transportation. In Ontario [the neighbouring province], the percentage is 60 for transit and active transportation and 40 on roads," says Steven Guilbeault, senior director of environmental advocacy group Equiterre.

"There's way too much money going into roads and it's not being allocated properly. The Quebec Federation of Boards of Trade called for a moratorium on road expansion a few years ago, arguing that the money should go to maintaining the existing road network and more should go into transit."

While there may be debate over where the money is going, Montréal is experiencing a massive period of infrastructure investment with a record \$718 million budgeted for 2017, an increase of 35 per cent over last year. These investments will continue to 2019.

#### REVOLUTION AND REPAIR

The projects set to transform Montréal in the next decade include the Transportation Electrification Strategy, an electric train initiative called the Réseau Électrique Métropolitain (REM), investments in active transportation, the Vision Zero strategy, and the city creating a digital and intelligent office. One long-range goal that's not really a project but rather more a general policy is the province's desire for the wholesale electrification of transportation in Quebec. This will help the province leverage the cheap and relatively clean electricity obtained from its power generation system.

That's where the planned REM comes in, which will offer a clean automated train system designed to move people in and out of the city from the suburbs.

"Suburban trains are at capacity and people are demanding more of it, so if we give them the option of not using their cars they will take it — not everybody, but a lot of people will for a whole bunch of reasons," says Guilbeault.

"I'm worried how unprepared our decision-makers are to face the transportation challenges that are coming. If you think Uber is a problem, what will happen when thousands of people lose their jobs because of transport automation? It's not a question of if it's going to happen, but when."

Interestingly, the REM is planned and financed by a pension fund called the Caisse de dépôt et placement du Québec, not the city or province.





As far as automobile infrastructure goes, the work includes updating the largest interchange in the province, Turcot, which lies southwest of downtown and links highways 15 (the Décarie Expressway), 20 (Remembrance Highway) and 720 (Ville-Marie Expressway), as well as being an access route to the Champlain Bridge.

The Turcot Project also includes the reconstruction of three nearby interchanges and sections of the three highways that connect to it. Many feel that the replacement, repair and maintenance of infrastructure and lessening congestion will remain the main challenges for the years to come. The auto infrastructure task at hand is massive.

The conundrum is that sustainability really hinges on decreasing the numbers of solo drivers in Montréal just as the city spends billions on auto infrastructure, insists Veronique Fournier, executive director of the Montréal Urban Ecology Centre.

"The number of cars has increased faster than the population, so every year the Island of Montréal has to deal with more and more cars, which has an impact on local neighbourhoods, on safety, on congestion and on the deterioration of the infrastructure," she says.

"We need to offer different solutions for mobility and integrated mobility, I think people are ready for it. They are tired of the congestion and the orange construction signs, so I think people are ready to look at new things in transit."

The good news is that when those different modes and strategies in transportation are added, it can decrease the pressure on solo driving and the infrastructure. This in turn allows the city more opportunity to create a better mix of transport so its citizens can get from A to B in their own way.

"One interesting thing happening in Montréal is there's a lot more pedestrian streets and shared streets, and the city has implemented a new programme which takes the local population into account when implementing changes," adds Fournier.

"The perception of what the streets are for is changing and the city of Montréal is supporting it. Citizens are involved in transforming their city." ▶

## Sustaining change



**Montréal mayor Denis Coderre believes that to keep his city moving, it must change how mobility is powered**

### Why join the C40 network of cities? How does membership position Montréal?

The C40 Cities Climate Leadership Group is a prestigious network of cities committed to addressing climate change. Montréal's inclusion is recognition of its meaningful role in this sector – and it's proving to be a major asset for our metropolis. The city is committed to taking action on sustainable development, the fight against and adaptation to climate change and biodiversity, both on the local and international stage. Joining C40 allows Montréal to be a key player in the field of climate change.

### What are Montréal's targets and how confident are you that they are attainable? Are there overarching goals beyond climate change?

During the 4th Summit of Municipal Leaders on Climate Change held in Montréal in 2005, the city committed to reducing its greenhouse gas (GHG) emissions by 30 per cent below 1990 levels by 2020. More recently, the city endorsed the Declaration of the Paris Climate Summit for Local Elected Officials and committed to reducing its GHG emissions by 80 per cent by 2050.

In 2013, the Montréal Agglomeration community's GHG emissions amounted to 11,088 kt CO<sub>2</sub> eq, a 25 per cent reduction compared to 1990. If this trend continues, the 2020 objective will be attained. The scope goes far beyond the fight against climate change, including for example improving air quality, increasing the re-use of recyclable and organic materials, increasing the modal transit share for travel on foot or by bicycle and public transit, increasing protection of natural areas, and more.

### What challenges does Montréal face and what is the city doing to respond to them when they

### arise? What issue/barrier most concerns you?

The highest proportion of GHG emissions in 2013 came from the transportation sector, which accounted for 42 per cent of total emissions versus 28 per cent in 1990. Along with the industrial processes and use of products sector, it is one of only two sectors reporting growth in emissions. Road transportation is the main contributor and it will not suffice to adapt vehicles to consume less fossil fuel. It will be necessary to innovate in the field of urban development and encourage lifestyle changes in terms of mobility.

### Does the US pulling out of the Paris Accord make the contribution and leadership role of individual cities more vital?

In the context of the United States' withdrawal from the Paris Agreement, C40 is a priority mobilisation tool for American cities and towns in general. The commitments made by C40 member cities, in particular by adhering to the 2020 Declaration, demonstrate their determination to pursue their efforts regardless of the American administration's decision. Yes, this reinforces the relevance of Cities for Climate Change's actions and constant commitment.

**'People are tired of the congestion, so I think they are ready to look at new things in transit'**

VERONIQUE FOURNIER

**Updating Montréal's Turcot interchange – the largest in the province – is seen as vital in easing traffic congestion in the near future.**



## The emerging economy: ACCRA, GHANA

### Growing pains

While major metropolises in the developed world plot a connected future, fast-expanding cities in emerging economies are still grappling with the problem of creating the building blocks of safe and secure transport

TEXT

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CHESLEY HICKS

Around the world an urban transit revolution is under way, whether planned or not. And everyone is along for the ride, whether they have one or not.

From East to West, urban areas are growing fast – engulfing surrounding communities into ever-denser city centres. According to UN estimates, by 2050 two-thirds of the world's population will live in cities, which means a lot of people will be on the move.

However, the transit revolution varies vastly by region, influenced largely by a place's topography, history, culture and economy, and encompasses a vast array of developmental stages.

For instance, Los Angeles, a modern city that grew primarily around automobile infrastructure, is currently undergoing an extensive transportation overhaul to encourage mass transit, walking and cycling for environmental, economic and human health benefits. However, older and more

ancient cities around the world, urban centres that grew around foot, hoof, carriage and cycle traffic, have struggled to accommodate more recent influxes of motorised forms of transport.

Indeed, while many cities worldwide are planning for the integration of self-driving cars into transport systems and how to best apply modern technology to mitigate traffic and connect commuters with seamless, smooth transport, countless other urban areas are struggling to implement basic traffic rules or install simple safety infrastructure such as stop signs. The difficulties of taking transport systems to the next level of safety and accessibility are exacerbated by the fact that many of these struggling cities are also expanding at the swiftest rates.

Ninety per cent of projected urbanisation is underway in fast-developing Asia and Africa, often among old towns and agrarian communities. Ghana's capital city, Accra, once itself a suburb, is such a place.

In Accra, newer roads allow cars to move fast, but little has been done to regulate those cars and accommodate the city's numerous pedestrians, which include many children. According to analysis from the Global Burden of Disease, more than 85,000 African children and youths are killed or seriously injured on the continent's roads each year. Africa still has the world's lowest motorisation rate, but the most dangerous roads.

For Accra, growth is economically promising, but without planning and design, such growth is ushering in an accompanying traffic safety epidemic that is especially harmful to children.

While international aid streams steadily into many African countries, the funds are often focused on singular projects that don't take holistic account of reality on the ground. For instance, the installation of smooth paved roads will improve access for vehicles and the minority of the population who own them, but, without pedestrian provisions, fast roads create tragedy zones for the vulnerable majority of the population who walk and cycle.

Ayikai Charlotte Poswayo, programme director at road safety non-profit NGO Amend, explains one aspect of the

current development conflict: "In some neighbourhoods, where the roads are rough, it forces traffic to slow down – where there are children playing and running in and out of houses, etc. However, in order to drive growth and development, we need the new road infrastructure. In order to get the funding, there is a lot of focus on the car, and pedestrians and facilities like footpaths are neglected. There's not much focus on who else is using the roads: children, cyclists. The city is not able to manage the pace and scale of growth."

Amend is a non-profit organisation acting to fix this problem. With offices in Ghana, Tanzania, and Mozambique, Amend works in countries across sub-Saharan Africa to "develop, implement and evaluate evidence-based interventions that reduce the incidence of road traffic injury among the most vulnerable road users in Africa today, while working to help create an environment for long-term, sustainable injury reduction."

Amend's focus is prevention at every level. From educating schoolchildren on traffic safety and painting zebra stripes at road crossings, to collaborating with government authorities and capturing media attention, the organisation functions in communities, on the ground, to find out what works best where and how.

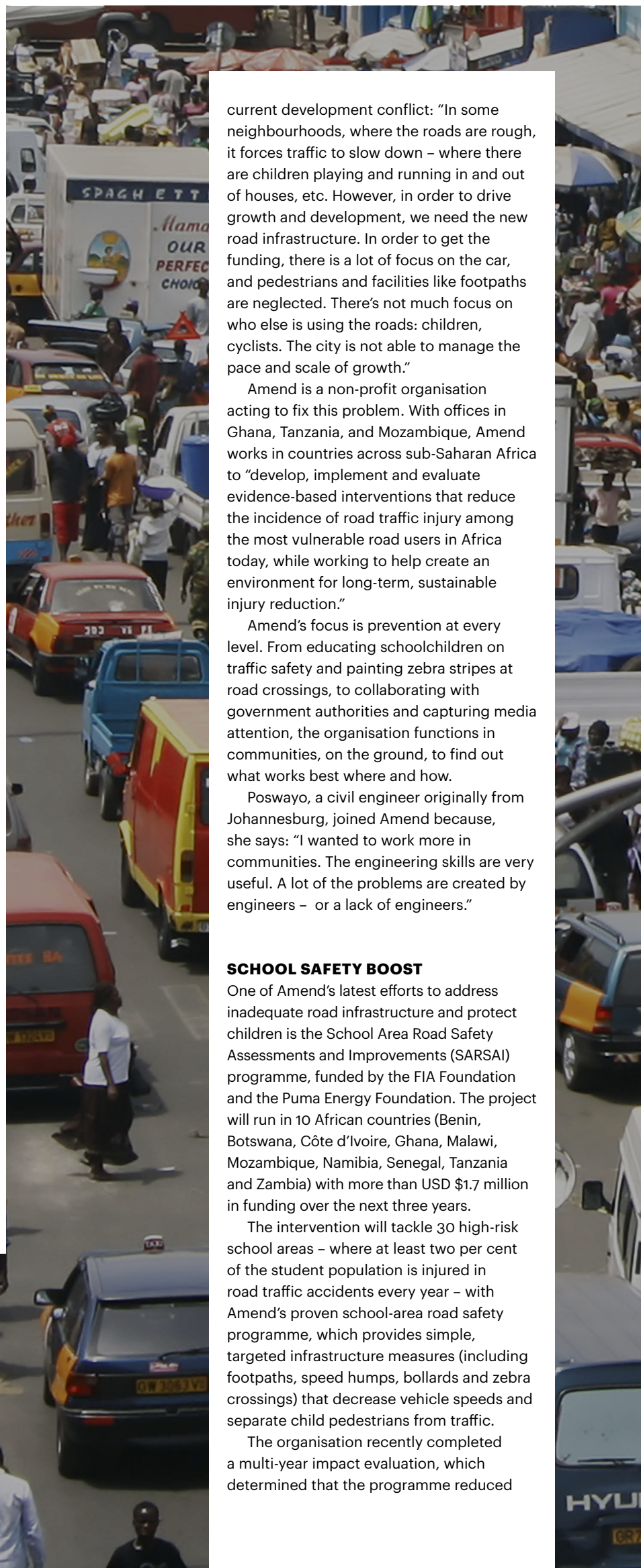
Poswayo, a civil engineer originally from Johannesburg, joined Amend because, she says: "I wanted to work more in communities. The engineering skills are very useful. A lot of the problems are created by engineers – or a lack of engineers."

#### SCHOOL SAFETY BOOST

One of Amend's latest efforts to address inadequate road infrastructure and protect children is the School Area Road Safety Assessments and Improvements (SARSAI) programme, funded by the FIA Foundation and the Puma Energy Foundation. The project will run in 10 African countries (Benin, Botswana, Côte d'Ivoire, Ghana, Malawi, Mozambique, Namibia, Senegal, Tanzania and Zambia) with more than USD \$1.7 million in funding over the next three years.

The intervention will tackle 30 high-risk school areas – where at least two per cent of the student population is injured in road traffic accidents every year – with Amend's proven school-area road safety programme, which provides simple, targeted infrastructure measures (including footpaths, speed humps, bollards and zebra crossings) that decrease vehicle speeds and separate child pedestrians from traffic.

The organisation recently completed a multi-year impact evaluation, which determined that the programme reduced





## Creating routes towards success



Accra's mayor, Mohammed Adjei Sowah, is determined to make Accra "a smart, sustainable and resilient city" and maintaining safe traffic flow is key to his goals

### What is your view of traffic and transport issues in Accra?

I believe productive hours spent in traffic – congestion – do not help a nation develop. Quantifying these productive hours in monetary terms should tell you that we are losing so much revenue as oppose to if these times were spent at our workplaces or in productive ventures. Our public transport systems need to be safe, reliable, accessible, efficient and affordable. Other modes should also be developed so that people have alternatives in moving about the city safely.

### What in your opinion are the chief areas of concern?

The major concern is the lack of a concerted effort at addressing road safety

challenges in our city. It is not encouraging that pedestrian fatalities have increased: comparing the 2013 figures to 2015. A number of factors contributed to this, but it is imperative that there be a collaborative, strategic plan to arrest this situation, one that all actors will be adhering to [in order] to reverse these unfortunate statistics. I have demonstrated, and will continue to demonstrate, able leadership in addressing road safety issues in Accra. For instance, there is a strong collaboration with Bloomberg Initiatives on Global Road Safety (BIGRS), providing technical assistance to the city and supporting it in developing a pedestrian safety action plan. As part of the plan, specific interventions, resources, key stakeholder support and an implementation scheme with timelines will be developed.

### What is your vision for how the city should be developed?

The vision is to become a smart, sustainable and resilient city. So all the various components that contribute to this vision will be developed. We will strive to improve the quality of life for our citizens by providing social and economic development, while maintaining a clean, attractive and secure environment. This is the promise of the city of Accra – to its residents and to visitors – and it's one that my administration is very focused on achieving.

### In what areas do you think resources should be applied?

My key focal areas include participatory government, traffic management, infrastructure development, social services delivery, waste management, asset and cash flow and economic development, and job creation within the city of Accra. Most of these focal areas interlink. For instance, if we can manage traffic flow well and in a safe manner by providing the necessary infrastructure and education, the city's economic fortunes will be enhanced and our vision will be gradually met.

### Do you have a comment on Amend's work?

In the last year, Amend has conducted its School Area Road Safety Assessments and Improvements (SARSAI) programme around selected schools in Accra. It has also undertaken road safety education in some high-risk schools. During the UN Global Road Safety week, I observed Amend's involvement in road safety education. They also collaborated with Bloomberg Philanthropies (AMA-BIGRS) to undertake a driver-sensitisation exercise at a major bus terminal in Accra, and I can only thank them and congratulate them for their efforts. We are looking forward to Amend becoming more of an active partner with the city of Accra in promoting initiatives that reduce the risk of accidents and make it safer.

injury rates by more than 26 per cent and lessened the severity of the injuries that did occur.

In Accra, Poswayo says Amend has gained a notable foothold: "We definitely see a difference after we carry out a minor infrastructure improvement around a school – the students and teachers say they see changes immediately."

The city's mayor, Honorable Mohammed Adjei Sowah, says: "We are looking forward to Amend becoming more of an active partner with the city of Accra in promoting initiatives that reduce the risk of accidents and make our city safer."

The goal with each intervention is to provide inspiration and a model that will be followed elsewhere, multiplying the number of protected children. "An NGO can't provide infrastructure to all schools," says Poswayo. "We reach just a tiny proportion with the funding we get to provide examples. [Yet] we do see more interest. The challenge we face is we put in infrastructure, but it is not always maintained by the local authority or whoever owns the roads outside the school. Some interventions, like speed humps, last a long time. Others, like zebra crossings, don't last as long. A positive thing about Accra is that a lot of people are pushing this agenda."

Poswayo is heartened by the far-sighted and granular efforts she sees afoot: for instance, a growing understanding that we need to rethink how civil engineers are educated via programmes such as the FIA's collaboration with Delft University of Technology in the Netherlands, which will train local engineers with global knowledge and innovation. "We need to learn from other cities and think about what can be applied in a city like Accra," she says.

Traffic remediation in Accra could involve making walking easier than driving, for example. "Accra is very hot and humid," Poswayo says. "If they can, people drive short distances to escape the heat. People who walk do so because they have to. One can make it more comfortable to walk with trees and other types of shade. Singapore is hot and humid, but you can walk there and not feel assaulted by the weather because they have covered walkways and trees." She points out that this sort of approach dovetails with environmental protection interests as well, opening avenues for supportive, shared efforts.

With burgeoning city populations comes the potential for more minds to collaborate and ameliorate conditions within them. Via communication, reliable leadership and the hard work of groups like Amend, the urban transit revolution can be steered in the right direction – to improve and save lives. ▶

**'There is a lot of focus on the car, but not on who else is using the roads: children, cyclists'**

AYIKAI CHARLOTTE POSWAYO

Accra is typical of fast-emerging cities where transport use is growing without much-needed planning and design.



## The old world city: PARIS, FRANCE

### Historic street, new networks

Hampered by ancient boundaries, narrow streets and a densely-packed populace, Paris is embracing innovative transport thinking as it plans for the future

TEXT

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DANIEL ORTELLI

When in May of last year Anne Hidalgo walked onto the starting grid of the first Formula E race to be held in Paris, VIPs around the Mayor of Paris were all united in the effort to raise consciousness about sustainable mobility issues. Since then, the Paris Mayor has continued to implement her radical circulation and transportation plan for the French capital with one major target: to physically eliminate a huge proportion of the vehicles that cross – and pollute – the City of Light.

One significant decision, in July 2016, was to make the Voie Georges-Pompidou – a sort of highway along the river Seine – a pedestrian area with a cycling path and not just for the summer period of 'Paris sur Seine', when Parisians enjoy artificial beaches created in the heart of the city.

The decision to extend its implementation caused havoc among regular users of this short and rather quick link between the west and east Paris, which also allows direct access to such prestigious areas as Place de la Concorde, Le Louvre and Bastille.

This significant restriction to circulation created traffic jams and united hundreds of taxi drivers with thousands of residents of the Paris suburbs in almost unanimous criticism of the 'war against cars'. An open letter was signed by 168 mayors of the Ile-de-France region, which is now ruled by a former right-wing minister of the Republican camp, Valérie Pécresse.

Hidalgo stuck to her guns, however, and maintains a position that the number of cars in Paris must be cut in half by 2020, with

diesels banned altogether. Hers is a continuation of a programme initiated by her predecessor, Bertrand Delanoë, and traffic in Paris has already been reduced by 30 per cent over the past 15 years, with a much greater proportion of Parisians using collective transportation as well as the city's highly successful and free 'Velib' bicycles.

The free bikes are another major lynchpin of Hidalgo's mobility plans, announced in April 2016: to double the number of cycle paths available before the year 2020.

#### EXPLORING ALL AVENUES

While city centre traffic reduction is working, however, the capacity of the city's notoriously packed ring road, the Périphérique, will not change simply due to a lack available space – an ever-present issue in ancient cities.

Up to a million vehicles use the Périphérique every day as drivers try their luck at one of the many 'gates' that provide access to the heart of the city. This is the new frontier, in fact, with two sets of concrete walls separating the suburbs, where 93 per cent of 'low-budget' residents regularly use cars, as opposed to 62 per cent of Paris' 'intra-muros' or centrally located residents.

Part of the reason for the lower figure is an increasing reliance on public transport – the Metro, RER and RATP train systems – by residents in the centre. However, the positive impact of that reliance is counterbalanced by the political fallout emanating from the fact that users only pay a fraction of what it costs to operate these costly services. The necessary subsidy and the public opinion questions raised by it is another element of the political complication of transport policy-making in a city such as Paris.

The city is not solely focused on road and rail, however, and is examining every example available to expand or evaluate clever use of local rivers, and also the cycle transit models of cities such as Amsterdam and Copenhagen. Other solutions exist, such as electric buses, which in a few years time, will be driverless.

But there is a long way to go in terms of infrastructure, as most of the effort in recent years has been squarely aimed at discouraging car drivers stuck in traffic jams and/or unable to find a parking space. Deliveries by commercial vehicles are another major issue, due to the narrowness of Paris streets and the limited number of dedicated parking spaces.

Christian Scholly is general manager of France's Automobile Club Association, which boasts 1,000,000 members. According to recent statistics, at any time during the day an average 20 per cent of the cars in Paris are in the process of searching for a place to park.

Scholly insists that 'smart parking' must be implemented as soon as possible with efficient street signage and better connectivity implemented in vehicles. He also insists that the approach in Paris has to be pragmatic rather than dogmatic, as "citizens will need all transportation modes, including electric, autonomous and connected vehicles".

He adds that stakeholders, regardless of political stripe, need to "work together, achieving closer partnership between private and public players". Scholly is also convinced that "anti-car" policies do not work in the long term, especially if heavy investment is not scheduled and financed well in advance.

This is where Serge Van Themsche comes in. An international consultant and researcher in the areas of automation, energy and transportation, he explains that fully-connected cars, most of them autonomous, will "modify the space in modern cities". This aspect of urban development has not been taken into account yet, at least not enough in long-term planning, and the impact will be huge if only because new spaces will be needed for quick-charging stations (380V DC, 20-25 minutes maximum).



## 'Citizens will need all transport modes, including electric, autonomous and connected vehicles'

CHRISTIAN SCHOLLY

### Building towards a more durable Paris



Paris Mayor, Anne Hidalgo believes: "The challenges are pollution and climate change. Paris is already transforming itself to tackle them"

**What kind of Paris are commuters going to be navigating in 10 years' time?**

The Paris we would like to see is more durable, calmer, less polluted but still as dynamic, tending towards innovation and economic activity. Mobility is central to achieving that. We have been working since the start of our mandate on developing a more durable mobility: in 10 years' time mobility will be electric, hydrogen-powered, with a network of charging points. There will be hydrogen and gas refuelling points. There will be no more diesel vehicles and combustion engines will be in the minority, thanks to a

restricted area that has been in place since the start of 2017, with vehicles needing the Crit'air license, which allows for greater bans on circulation for the worst polluting vehicles.

**Mobility is likely to be more and more about shared transport. Is that a positive trend?**

Another feature will be autonomy, with autonomous buses providing safe, reliable and optimised transport. We have already tested an autonomous bus between the Austerlitz and Lyon stations and there's another test taking place in the Bois de Vincennes. Mobility will be 'soft'. Already in Paris, 55 per cent of journeys are on foot. The Conseil de Paris has adopted a Pedestrian Plan and a Bicycle Plan with the aim of tripling cycle trips by 2020.

**What are the main challenges to building the kind of urban mobility you would like to see?**

First of all, we need to convince users. In fact, the effect of pollution on public health in our towns is such that we cannot go on the way we are with the car being dominant. That's why the city has to change, but mobility must also change and we have to change our habits. It's not easy and everyone must make an effort. We are working on it by coming up with alternatives to the personal car.

The structures we are putting in place are aimed at balancing the use of public space and giving more room to soft forms of mobility and this involves roadworks, which can be a pain, we are well aware of that. However, we must get through this to evolve our habits and achieve a cleaner form of mobility.

**You are the chairperson of the C40 group of cities. Is there a commonality of approach? Surely the issues affecting many cities in the developing world are more concerned with simple safety than sustainability?**

C40 brings together 91 'world cities'. Each has its local issues, but we are sharing this global challenge to guarantee a better planet for future generations, with healthier air for the population. And on this topic, as with so many, the experiences from one town can impact on others. Tokyo is one of the most inspiring cities in terms of air quality and we are learning from their knowledge base. Voluntary initiatives in Bogota, Vancouver, Addis Ababa, Sydney, Quito and Oslo are also extremely useful. That is the strength of C40: where some see unsolvable differences, we show in concrete ways that our cities have everything to gain from thinking globally in order to work better at local level.

According to Van Themsche, the need for costly parking spaces will be reduced because autonomous electric cars will cruise through the city, from one quick stop to another, picking up pedestrians and/or delivering goods before departing for another halt. He is an optimist, convinced that they will create "fewer traffic jams, fewer accidents and less pollution, especially if most of them are electrically-powered".

So this urban and ecological transition will produce a change in mentality, in the way people use a series of different transportation modes for one single trip, as well as a change in the size of streets, cycling paths and pavements.

Scholly adds that there will also be a crucial need for new logistical platforms. In Paris, these might be located outside the city and ready to send freight to the city centre throughout the night when traffic is low. They could also utilise idle tramway lines. These are just a few examples of how cities like Paris need to become much smarter in the near future as the need for mobility is projected to increase by 20 per cent over the next 15 years.

Working modes are changing and tight personal budgets are being oriented to other products and services than just buying and maintaining individual cars. All these concepts for the future are regrouped under a couple of significant banners: the 'Smart City' programme, which is supported and advocated by FIA President Jean Todt, and 'Mobility As A Service' (MAAS), a platform and application which puts users at the core of transport services, offering them tailor-made mobility solutions based on their individual needs, with personal data at the core of the system. This is the future of urban transportation, with permanent connection between infrastructures, vehicles and users. But we are not there yet... <

All options are being explored within the narrow confines of Paris' streets to find ways of easing congestion.



An F1 outing in a 2017 car pre-race at Hungary was as much a test of *Robert Kubica's* resolve as his physical limits, following the life-changing rally crash six years ago that threatened to leave him forever on the sidelines

# ROBERT'S RETURN

06

TEXT

LUCA COLAJANNI

For Robert Kubica, climbing into the cockpit of Renault's current RS17 Formula One car at the Hungaroring at the beginning of August meant attaining possibly the most important goal he had ever set himself. It also marked the conclusion of a journey that had begun in traumatic fashion more than six years ago, when the Pole suffered serious injuries in a horrific crash on the low-key Ronde di Andora rally.

From that day on, Kubica had to deal with the physical pain and innumerable operations aimed at repairing his severely damaged right forearm. He also had to deal with the intangible trauma that would hit him in the lonely moments – convalescing in his hospital bed, the days spent accepting that he was no longer able to turn a steering wheel with the necessary strength or speed, or the darkest hours when he was enveloped by the crushing doubt that he would return to doing what he had fought for ever since he was a kid. The knowledge that a hugely successful career that had seen him on the verge of racing for Ferrari in F1 was apparently over.

"After the accident, I never wanted to visit a grand prix paddock or attend a test, despite being

invited to do so on numerous occasions," he admits. "People thought I didn't want to accept my new circumstances, but the truth is that I'd decided to only come back when I felt I could be an actual Formula One driver again."

## BACK WHERE HE BELONGS

Kubica didn't need any sort of contract to reach this goal. He just needed the chance to prove, first and foremost to himself, that he was still capable of driving an F1 car. And, thanks to Renault, the team he raced for in F1 at the time of his rally accident, he was able to get a feel for it in a five-year-old car first at the Ricardo Tormo circuit in Valencia, Spain and then at France's Paul Ricard circuit before taking part in a current official F1 test in Hungary, driving the same car that regular race drivers Nico Hülkenberg and Jolyon Palmer are piloting this year.

It was not only a sign of loyalty and affection from the French car company, it was an indicator of the team's growing confidence in the Pole's ability. His times at Paul Ricard had been competitive, his stamina solid over 90 laps.

It was time to see if he could replicate the performance in a more physically demanding car, in the punishing heat of high summer and on a tight and twisting circuit that would test his physical capabilities to the limit.

Kubica didn't disappoint, completing 142 laps of the Budapest track and finishing fourth quickest on his return to contemporary F1.

"Renault was just amazing to give me this chance, but more than that I felt a great sense of affection," he says. "There's a special DNA at Enstone, the feeling that it's a real team, and that's something which has never changed over the years. Even those who didn't know me gave me a warm welcome and that was very important for me, as it was not something I could take for granted. We are all human beings and it would be normal for them to have some doubts."

Kubica is definitely not the sort to delude himself. Even when he was at the peak of his career, he always had a wryly realistic view of the world around him and that has not changed.

"I am very realistic and I know that the possibility of my returning full-time to racing in Formula One is very slight," he says. ▶

Renault gave Kubica two outings in a five-year-old F1 car before progressing to the 2017 runner, in which he showed an impressive turn of speed.







“Every day, I discover my new limits, but I have always hoped that I’d at least get the chance to give it a go. I’ve done a lot of kilometres in the simulator and I’ve driven in other categories [Kubica took part in 33 championship rallies between 2013 and 2016, winning the WRC2 title in 2013], but I knew that only driving a Formula One car would give me those special feelings again and that proved to be true.”

He smiles as he casts his mind back to the Valencia test in June, his return to F1 driving.

“The 6th June, the day I drove at Valencia, was one of the best days of my life even if I didn’t win anything or stand on the podium,” he says. “It only took me a few laps to get some amazing feelings, which made me realise why I love this sport so much. I don’t get emotional easily but that day I really did, because I realised that driving a Formula One car was the thing that made me happy and I finally felt at peace.”

But it had not been easy getting to this point, especially psychologically, and Kubica does not hold back when talking about the difficulties he has encountered.

“Life had given me so much and then, in an instant, it took it all away,” he says. “They say time is a healer but that wasn’t the case for me – in fact it made me suffer more. At first I thought I’d get full functionality back quite quickly, but that didn’t happen and the improvement I was hoping for didn’t come. It was tough, but I realised I had to accept it. Once I managed that, I was able to embark on a new chapter.”

The rally crash in Testico, Italy, was not Kubica’s first major accident. At the 2007 Canadian Grand Prix, driving for the BMW-Sauber team, the Pole was involved in a huge crash, but thanks to the strength of the car’s carbon fibre ‘tub’ he escaped with just a few bruises, though he did sit out the following race at Indianapolis (and thus provided an F1 debut for a certain Sebastian Vettel).

Despite Kubica’s trials both in F1 and rallying, the risks were always understood and accepted by the Pole. Fear was never part of the equation. “It’s true, I never felt it. I know the risks are there, I see it every morning and it is part of the calculation of what can happen, as it is part of the fabric of motor sport, but fear has no place here.”

A few months ago, a young driver, Billy Monger, had a very serious accident racing in the British Formula 4 Championship at Donington Park, which resulted in him losing both legs. It was a truly traumatic event, especially as Monger is only 18 years old, and Kubica speaks about it with understandable reserve.

“It’s very difficult to talk about it and I don’t want to tell anyone what to do. Billy will have to get to know himself again and first of all find peace with himself, accepting the new reality of his situation,” he says. “Then he can start thinking about achieving certain things that [after his crash], lying in his bed staring at the ceiling and feeling lost – which is something I have experienced several times over the past few years – he believes are no longer possible.

**‘I don’t get emotional easily but that day I did, because I realised driving an F1 car was the thing that made me happy and I felt at peace’**

After his struggles of the last six years, Kubica was delighted to have the chance to prove he could still be competitive in F1.







“I think that when something like this happens to a person, before looking to the future one must first find some sort of balance. Over time, I have realised that the brain can develop the ability to compensate, at least partly, for one’s physical limits. I realise it’s difficult to explain something like this and only those who have experienced it can really understand what I’m talking about.”

Kubica is adamant, however, that safety in racing has improved dramatically in recent times: “Over the past decades giant steps forward have been made, thanks to the efforts of the FIA, and safety has to remain an absolute priority. The Halo? I can’t say it’s pretty, but if it improves head protection then it must be used, in all categories.

“In a few years time, it won’t even be noticed,

just as has happened with the HANS device. But there’s a lot more to do when it comes to safety on the roads: I’m thinking for example of the use of telephones while at the wheel, which is very dangerous because it only takes a moment’s distraction to lead to an accident. You can do everything to improve the technological support that makes the cars we drive on a daily basis ever safer, but the human element is always the most important thing and we have to work a lot on educating people.”

For many people, seeing Kubica back on track at the Hungaroring was an emotional moment. But maybe even better was seeing him walking around the paddock in Monza during the Italian Grand Prix because maybe that was the definitive

**The Pole completed 142 laps and was fourth fastest during official testing at the Hungaroring in this year’s Renault RS17.**

sign that, in his heart and in his head, the circle is now closed. Robert Kubica is back, fully fledged, in the world of which he felt an integral part until that black day in 2011. Today it does not matter if he manages to find a drive for next year in F1 or if he will race in another category. What matters is that he feels that, after all the pain, after all the darkness, he once again knows who he is.

“The accident turned my life upside down, but I’m aware that a few centimetres more and I wouldn’t be here talking about it. The biggest job I had to do was in my own head. There were some terrible times in which I no longer felt up to it. It was worse than a physical pain, but now I can finally feel at peace with myself, because I’m back to being who I was – a Formula One driver.” ◀



# THE DIS RUPT TORS

A new wave of start-up car brands  
is aiming to transform every  
element of the auto industry,  
from the way we buy cars to the  
power that drives them

06

TEXT

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MARC CUTLER

Germany's Sono Motors  
has created a car with  
solar and battery power  
that doesn't rely on sunny  
weather to get around.







**T**he automotive industry is at tipping point. Electric energy, autonomous technology, solar power and even mobile phones are fundamentally shifting the way cars are built, sold and driven.

And the major manufacturers that have dominated the industry for the past 100 years are no longer leading this charge. Instead, a number of new upstarts have moved quickly to embrace these technological changes and the big guys are playing catch-up.

More new car brands have been launched in the last few years than at any time previously in the history of the automobile. When US electric car manufacturer Tesla went public in 2010 it became the first American car company to do so since Ford in 1956. Its success (at least in stock market terms) has opened the door for other new brands to enter the market with unique ideas.

Companies such as Germany's Sono Motors, China's NIO and Sweden's Lynk & Co are bringing new offerings and approaches to the industry.

"We're on the cusp of a dramatic shift in how we think about our cars and their impact on our daily lives," says Padmasree Warrior, CEO of new electric car brand NIO, a global start-up with headquarters in Beijing, China.

"On the technical side, we've seen vehicles evolve from complex mechanical contraptions to computers on wheels. At the same time, the public is finally beginning to recognise the toll that traditional transportation has taken on society – not just on our planet and the millions of injuries and lives lost each year, but in massive productivity loss. We're finally at the point where the technology is enabling our ambitions to make a better, safer, cleaner and more productive world."

The automotive industry is shaking from this 'shock of the new', according to Laurin Hahn, CEO of Sono Motors, a new solar car company based in Munich, Germany. "There's fear in the automotive industry of all the things that are coming up – connected cars, autonomous driving, electro mobility – because they are all new and it is not just the big OEMs that can develop them, but also tech companies and big IT companies that are starting to get into this sector.

"What the industry is facing is a new chapter where other companies that weren't capable of producing cars now are, so everything is changing."

This change is not limited to the cars themselves – the whole way consumers purchase cars is set to shift. "The motoring industry needs a new business and usership model," says Alain Visser, Senior Vice-President of Gothenberg-based Lynk & Co, which is attempting to disrupt the car ownership model for consumers.

"We looked at the introduction of the iPhone to the market and we are inspired by the revolutionary change that innovation and technology can bring about. We are born digital and that is our overriding aim from the way to purchase the car to the way members use it."

## ELECTRIC POWER

The incredible acceleration of electric engine technology is the number one factor driving change in the automotive industry.

NIO is utilising this to develop a new concept of car that will not only take people from A to B but give them a whole range of other options while doing so.

"Our vision is to give people their time back," says Padmasree Warrior. "That begins with tailoring everything around the user's needs. To most people around the world, cars are no longer a mode of conveyance – they are becoming people's living space on wheels. As a start-up, we are manically focused on this vision. And unlike other auto makers, we're unencumbered by legacy, allowing us to both execute and evolve quickly as the market transforms."

NIO sees itself as a global start-up but it is initially focusing its business on the United States and China, two massive markets that are ripe for revolution.

It has already launched the NIO EP9, an electric-powered, mid-engined two-seater supercar that recently broke the production car lap record at the Nürburgring in Germany (until it was broken again by the new Hybrid McLaren P1 two weeks later). Powered by four electric motors delivering a total of 1,341hp, the EP9 may not

be the focus of NIO's business (only 10 are being sold to the public for \$1.48 million each) but it has demonstrated the huge potential of electric technology.

NIO is now turning its attention to the ES8, an all-electric seven-seater SUV that is due to launch in 2018 for the China market. The company is also working on an autonomous car, the NIO EVE, due for production in 2020.

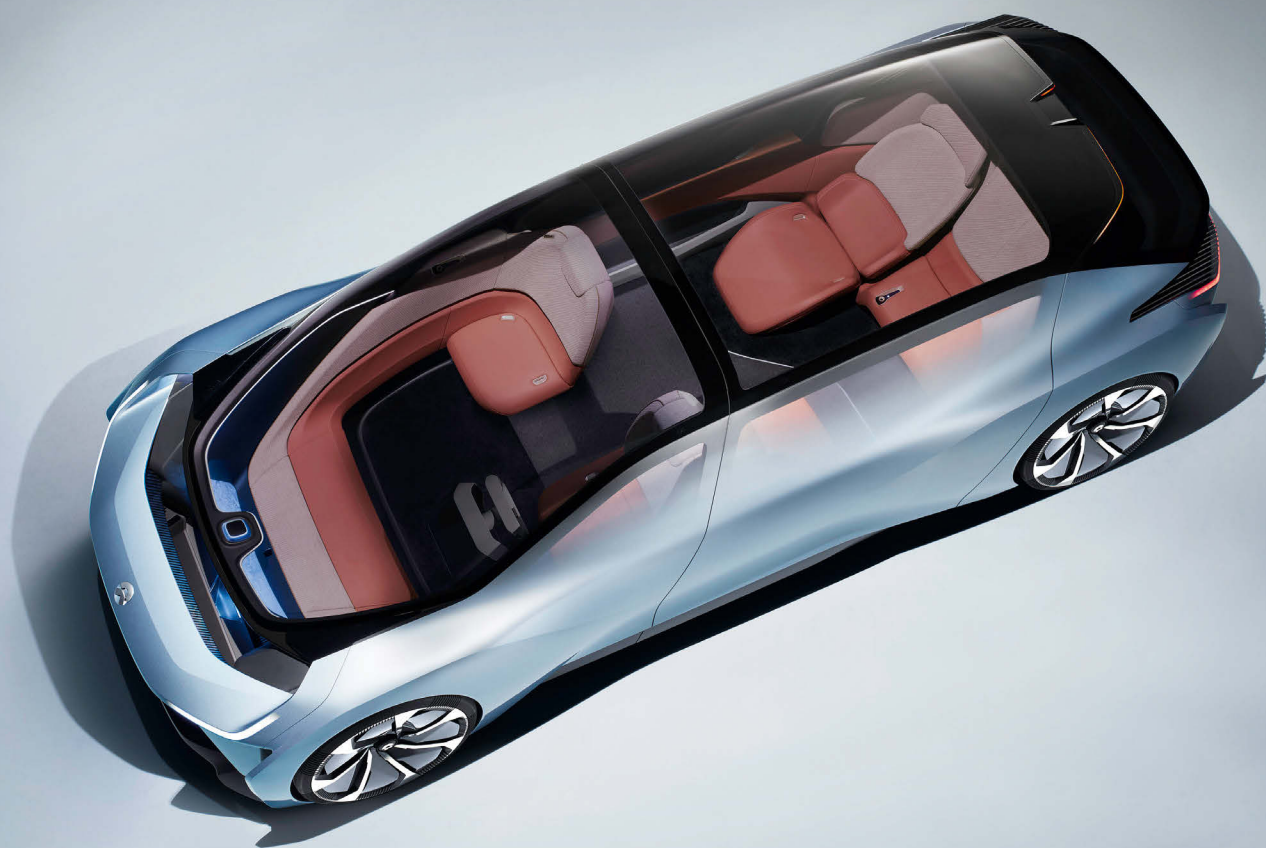
NIO's ambitious plans are a direct reflection of the transformation in automotive development. "I've described this transformation as the move to Car 3.0, where innovation is dictated by the dominance of digital systems, making the vehicle fully autonomous, flexible, and personalised," says Warrior. "This is going to be realised through software-defined hardware, combining self-driving technology with electrification."

The major manufacturers have woken up to this threat to their dominance and have put all their chips on electric. Germany's Volkswagen Group (comprising Volkswagen, Audi, SEAT, Škoda, Bentley and others) plans to launch 30 new all-electric models by 2025 and aims to sell three million battery-electric vehicles a year. But Warrior is not worried by this threat as she believes start-ups like NIO have an advantage in this brave new world.

**NIO's EP9 has shown the potential of electric technology – powered by four electric motors, it is capable of huge speed and power.**







Padmasree Warrior, CEO of Chinese start-up NIO, says the company benefits from being freed from the constraints of traditional car makers.



"We've been experiencing a rising tide in the EV market, which is tremendous for consumers and is pushing the technical abilities of auto makers to new heights. Nearly every auto maker is either shipping or developing a multitude of electric-hybrid or fully electric models, and that's set to dramatically expand. Our unique position within the industry is being freed from the constraints of traditional auto makers, allowing us to constantly iterate, intelligently scale, and bring new products and services to the market that will redefine how the world moves."

#### SOLAR POWER

Another start-up trying to do things differently is Germany's Sono Motors, which is combining solar power with battery technology to develop a car that will never need to be plugged in or refuelled.

Solar power has been around for the last two centuries, but Sono Motors co-founder Laurin Hahn believes there are good reasons why it has never succeeded as a genuine source of energy for transport. Until now.

"When we started to think about solar cars, we looked up other projects and quickly began to see that they didn't do things in the right way," says Hahn. "Some of them used glass instead of polycarbonate, for example. Glass is too heavy and it's not crash-resistant, so it doesn't make sense to integrate it into the body.

"We also saw solar cars that didn't have any battery, so you can only drive when the sun is out. So we said, 'Why not develop an electric car that is for everyone, that has a range of 250km, a price of €16,000 and recharges itself with the sun?'" ▶

The EVE is NIO's first autonomous car, due for production in 2020, which reflects the company's aim to make the car a "living space on wheels".



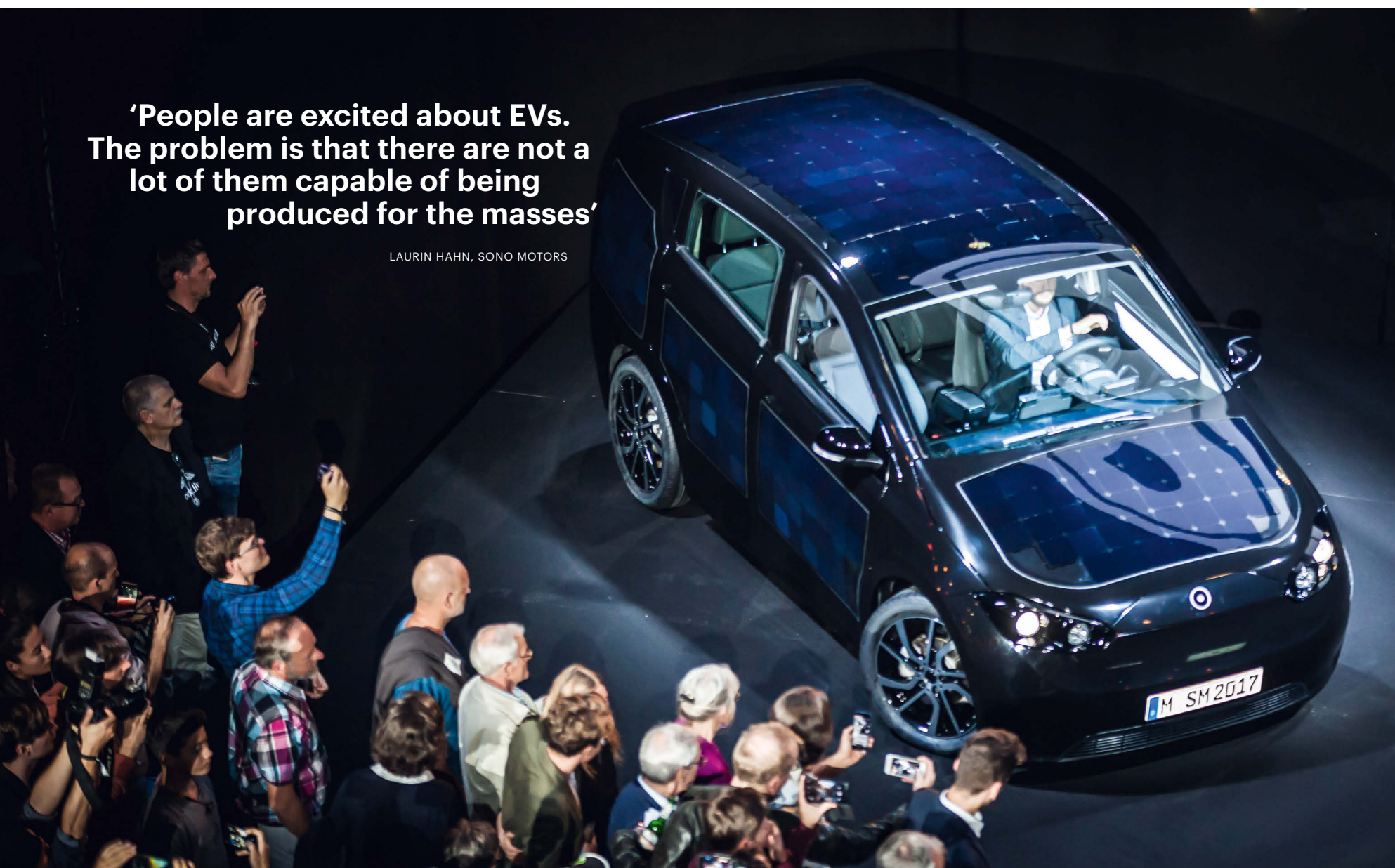
**'We've experienced a rising tide in the EV market, which is pushing the technical abilities of auto makers to new heights'**

PADMASREE WARRIOR, NIO



**'People are excited about EVs. The problem is that there are not a lot of them capable of being produced for the masses'**

LAURIN HAHN, SONO MOTORS



The result is the Sion, the first electric car capable of recharging its batteries using solar power. Covered in 330 integrated solar cells, which generate enough energy to cover 30 kilometres per day, the car has a range of 250km overall.

"There are so many commuters out there who drive to work for 10 kilometres," says Hahn. "But with electro mobility there are always the same problems: charging infrastructure, price, and range. With the solar integration, we are able to minimise two of those three: the range and the infrastructure."

Like many other start-ups (but unlike anything previously seen in the automotive industry), Sono Motors turned to a familiar source to prove its concept – crowd-funding.

Sono raised over €500,000 via crowd-funding site Indiegogo, and then major investors took notice and came on board. But they didn't stop at money in their pursuit of the crowd. Sono has even crowd-sourced its designs.

"We have a new design, because we're also asking the crowd a lot about development and to give their opinion on the old design," says Hahn.

"We worked the whole of last year and promised them a test drive one year later. We kept this promise and presented the prototype in July, and now there will be test drives for 7,000 people across Europe."

Sono Motors aims to deliver the Sion in mid-2019 and is planning to produce big numbers. "It will be a six-digit figure, so it's a medium to high volume we are producing. It will not be a small production."

Its advantage is that can move lot quicker than the big manufacturers, according to Hahn.

"I see a lot of manufacturers are taking way too long and we cannot just wait for someone else to come along, we have to do it ourselves. There is a tipping point that has been reached in 2017 where people are talking about Electric Vehicles in a very positive way. They are excited about them. The problem is that there are not a lot of them capable of being produced for the masses."

Sono is building a car by the crowd for the crowd and plans to sell it direct to the crowd.

As Hahn says: "We will sell it online and make direct sales, because everything is sold online

**Sono used crowd-funding to gain support for its solar and battery-powered Sion, which is covered in 330 solar cells. Right: Sono co-founder Laurin Hahn.**



right now, so why do this differently? Why have huge buildings with thousands of cars packed in when we can just have customers order online in whatever colour they want?

"Big OEMs are having problems in achieving or making that change because they have the old system of dealerships, which they're not keen to get out, so I think that is one of our advantages, that we can start new and fresh."



### CONSUMER POWER

Certainly the consumer will have more choice in the future. That is the philosophy of another new brand – Sweden's Lynk & Co. Backed by China's Geely Motors (which also owns Volvo), Lynk & Co is planning to make the car much more accessible to the consumer.

"Our car is dubbed a 'smartphone on wheels' and our format for purchasing is akin to the way we pay for our smartphones," says Lynk & Co's Alain Visser. "In terms of the customer, this is a new way of thinking in terms of tech and payment, in a similar way to how we use and pay for a smartphone today."

Lynk & Co will sell direct to the consumer, offering not only online sales and home delivery services but also a subscription model.

"The automotive space traditionally relies heavily on a dealership model, while we will interact with our customers directly," says Visser. "Cars will be sold online or in owned stores in strategic retail and heavy footfall locations, with fixed and transparent prices. There will be opportunities for traditional ownership and leasing to subscription and sharing-memberships."

Visser is planning an aggressive market strategy and has already offered lifetime warranties and free data connectivity on every Lynk & Co car.

He says: "There is a very real difference in the way consumers approach products these days and we are aiming to be at the cutting edge of the new mechanisms to purchase or own products. It's a solution we are sure consumers are ready for."



**'The automotive space traditionally relies on a dealership model, while we will interact with our customers directly'**

ALAIN VISSER, LYNK & CO

Left and below: Lynk & Co is producing a car akin to a 'smartphone on wheels' that is marketed in much the same way. Below: The Swedish firm's Alain Visser.



### FUTURE POWER

No doubt there are other new car brands with new ideas waiting in the wings as the automotive industry faces up to the biggest changes in its history.

As Warrior says: "The automotive industry is going to change dramatically in the next 10 years. It's not immune to the same disruptions that have overtaken commerce, media and – most tellingly – mobile. For the auto industry, electrification and autonomy are going to be two of the largest disruptive forces, both of which will have profound changes on every aspect of the vehicle experience."

Sono's Hahn agrees: "A lot of people out there think electro mobility will come really slow and step by step, but there is a tipping point – which I believe is in 2017 – and then everyone will start to buy an EV."

The new kids are certainly making their presence felt on the block. ◀









06

TEXT

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BEN BARRY

# 'The luxury sports car market is an arms race'



Aston Martin CEO *Dr Andy Palmer* wants to safeguard the iconic sportscar manufacturer's place as a uniquely British brand while taking it to the next level of success. AUTO finds out how he plans to turn ambition into reality

**You've been Aston Martin Chief Executive Officer for three years now. How's it going?**

It's gone amazingly quickly and we've made substantial progress – our first quarter was the first time in profit in 10 years.

**Prior to joining Aston Martin you enjoyed a long career at Nissan – what prompted you to move?**

I left Nissan as the Chief Operating Officer, arguably number two in the company, but I was never going to be CEO. I always wanted to be CEO of a company – a bit of ego perhaps – and I came to Aston Martin because I saw a lot of opportunity and the ability to really make a mark. I joined the automotive industry aged 16 and I've spent 38 years in this business. I'd had all that training – first at AP, then Austin Rover, then Nissan – and I wanted to bring that to turn a company around. I also feel a deep devotion to ensuring the UK has at least one independent car company. Britain is one of the inventors of the car and we deserve to have one independent maker. That's my mission in life, to ensure Aston is that company and that it's not just surviving, but flourishing. ▶

Palmer wants to ensure that independent British car maker Aston Martin is not just surviving, but flourishing.





**‘The Vanquish replacement is one step beyond the DB11; internally we call it the brute in the suit’**

**Has coming to a smaller company allowed you to make a greater impact more quickly?**

Size can be measured in different ways. We make a small number of cars and employ a relatively small number of people, although 3,000 people is still fairly meaty. But if you look at potential value and you look at Ferrari, our closest quotable competitor, Ferrari is worth over \$15 billion – that’s bigger than Fiat – so size is relative.

I would like to be credited with seeing that potential size of business, rather than the number of cars we produce. This is a company with the capability to stand up against any other car company in the world in terms of value. It’s that value which I’m trying to create, while remaining small and niche,

because the value of the company comes from being rooted in luxury.

**How much can you expand Aston Martin while remaining true to that vision?**

Broadly speaking, we need to sell 4,000 units per year to break even and we were selling 3,200 when I joined. We’re well above 5,000 units now and our capacity at Gaydon is 7,000; the goal is to fill that capacity with 7,000 sportscars.

We’ve created a similar facility in St Athan, Wales, for our large-car platform, be it the Aston SUV or future Lagondas, so we have a capacity of 14,000 units. I hope that we’re cycling somewhere between 10,000 and 14,000 units in the future. At that level, we’ll be fabulously profitable.

**Does your engineering background mean that you are very hands-on when it comes to car development?**

I’m a pain in the arse! I consider myself a petrolhead – I was head of product at Nissan. When I first came here, I made many changes, but the first one was creating something

Since Palmer took over as CEO, Aston has gone from producing just over 3,000 units a year to well above 5,000 – with more to come.

called the planning division, which was basically responsible for corporate product planning and included the vehicle line directors; I fancied myself as head of that.

**So when you are developing new cars, what’s your focus?**

Hopefully I’ve brought a sense of the customer. Rather than segmentation, we’re developing clusters of cars and from that cluster and that proxy customer we create the best product for their needs. You won’t see that in the new DB11 alone, because it hasn’t got that cluster of other models around it yet, but we designed it for a mythical gentleman named ‘Philippe’. It’s a GT car, a bit softer than its predecessor,



and only really makes sense when you see the next Vantage and Vanquish.

The next Vantage is designed for 'Marcus', looking for his weekend warrior, that's a much more sports-driven car. The Vanquish replacement is for 'Richard', one step beyond DB11; internally we call it the brute in the suit. Hopefully by being a gearhead and getting involved I've brought that focus on the customer – and that customer isn't always a 50-year-old Englishman.

**How vital has the powertrain and electronic architecture partnership that was signed with Mercedes-AMG in 2013 been in creating a new generation of cars?**

The electrical architecture is key. I don't want to be rude about our past, but I think we would all accept that the DB9's electronics were a bit clunky. Now we've got cutting-edge technology from the Mercedes S-class. We don't have to worry about development or evolution – it's future-proof, we're sitting on the back of Mercedes' development, so that helps to avoid a massive development bill. The V8 engine is important, don't get me wrong, but it has allowed us to develop in-house our own V12 and our own Electric Vehicle. We've not been spread so thinly, and that's allowed us to invest more time and more of our limited cash on those projects.

**You've developed the RapidE with Williams Advanced Engineering. Do you sense a strong opportunity in the luxury EV market?**

We can't avoid having an EV and more importantly we embrace it. You need to make a decision about what you are and what you're not. We're a V12 company and if you want to keep a V12, you need to do something to offset emissions. We didn't want diesels or four cylinders, and we don't want hydrogen or plug-in hybrids. We will either have gasoline engines, gasoline with KERS, or EV.



**How has the luxury sports car market changed over the last few years?**

The predominance in the market is mid-engined and Ferrari has become quite dominant. If you go back to 2006 and look at volumes, Aston Martin was actually bigger than Ferrari. Ferrari has benefited from being well managed – Luca di Montezemolo did a fabulous job, there was a lot of investment through Fiat and they've created this wildly profitable company. We haven't had the investment, but we now do, and Aston is back to being second in terms of market share. The luxury sports car market is almost an arms race, with the mid-engined players like Ferrari, McLaren and Lamborghini in one camp, and then Aston Martin – classically a front/mid-engined brand – in another, and I quite like where we are because we hold a unique niche in the front/mid-engined GT market. But that does leave us with the opportunity to go head-to-head in the mid-engined segment.

**We know Aston Martin is producing 150 road-going examples of the Valkyrie hypercar, created with Formula One designer Adrian Newey. So will we also see a more affordable mid-engined Aston?**

It'll come after the new SUV, in 2020 or 2021. I don't want to say too much about it now, but broadly speaking it will compete with a Ferrari 488. The Valkyrie is key in that process: it defines the bloodline, gives us credibility in that market and creates the halo for that car.

**Where are you at in the process of Valkyrie?**

We've frozen the design and the carbon tub, and we're currently cutting tooling for it. We've got 150 customers clamouring for the cars, but we haven't made the allocation yet. One of the nice things but also one of the terrible things is being able to pick your customers, so you'll always upset someone!

**Aston Martin now has factories in England and Wales, so Brexit negotiations are being monitored carefully...**

**There's a real appetite for low-volume cars that command a significant premium, then go on to appreciate. Has that given you confidence to be bolder with your projects?**

Absolutely. We've just done a small series on the Zagato Speedster and they've all immediately sold out. The Shooting Brake took a day to sell out.

**Where do you see growth in the more mainstream luxury market?**

The DBX SUV is key. It defines the next definition of a sports car, particularly for places like China. We're vying for the number one market in China with Ferrari, though it is only 300 cars a year currently. But when you look at what a Chinese customer perceives as a car, they perceive an SUV, therefore it's really important we define a sports car that sits in that category.

**You've committed to manufacturing the SUV at the new St Athan plant, in addition to your existing facility at Gaydon. How much of a headache is Brexit for a company with a UK manufacturing base?**

In the very short term it presents us with the opportunity of a weak pound. Eighty per cent of what we make is for export, so a weak pound drives profit. Whether that continues to be the case will be defined by what the exit means. We hope it means no customs duties, implied or actual, and no loss of consumer confidence. ▶



**The new Aston Martin DB11 has been designed with the customer very much in mind.**



**We've seen a huge growth in classic car values over recent years and you already have Aston Martin Works to cater to that market. Where do you see future opportunities?**

We're shortly announcing a brand centre in Tokyo and within that will essentially be an extension of Aston Martin Works. Classic cars are predominantly sold in the United States or the UK, but we see a growth market in Asia and Japan – Japan is the world's second-largest luxury market – and you'll start to see a globalising of that classic capability. And you come back to the two main players in classic cars, Ferrari and Aston Martin. It's a big and important market for us and we partially drive it. We've also entered into a new phase, manufacturing 25 DB4 GT continuation cars – they sold out on the day I announced it.

**Aston Martin's history is grounded in motor sport and you've been racing in a Vantage GT4. How are you getting on?**

I'm trying to work my way up to being competent – I'll never be great – in the GT4, and then the GT8 and GT3. I love it – it's stress relief, an opportunity to get away from the troubles of the world. I'm scared stiff before the race, but behind the wheel I really switch into it. It's therapeutic and I like to think it's useful for the business. A GT4 race car is very similar to a road car and it allows me to better express what the car is doing at the edge of traction to the engineers. I just wish I was better!



**The Aston Martin Vantages at this year's Le Mans 24 Hours. The number 97 winning GTE car was driven by Britons Darren Turner and Jonathan Adam along with Brazilian Daniel Serra.**

**Do you see opportunities to expand the customer racing business?**

We have a business with the GT4 and GT3 cars which does okay, but with the new Vantage road car comes a new race car, and there's a real opportunity with gentlemen racers. The GT4 is relatively affordable, bloody quick, not a handful and just one of the most beautifully balanced analogue cars. If you're stepping up from something like a Caterham series and into a proper GT class, there can't be much better than an Aston GT4.

**Do you see your commitment to the Le Mans 24 Hours continuing?**

I love the GTE category. We just won Le Mans in the last year of the Vantage's life and that was fabulous. That race must be in the top five I've ever watched. And you can relate to that car, aspire to drive it on the road. As long as I'm sitting here, Aston will remain in Le Mans GTE. The other classes – GT3, GT4, the GT8 at the Nürburgring 24 Hours – that's a given, right down to the club racing, which is the AMOC series I'm doing.

**There's been talk of more Formula One involvement...**

We're in bed with Red Bull, and we're using F1 technology to develop the Valkyrie hypercar, with Adrian Newey, but it's been somewhat one way at the moment. You'll see us gradually increase our involvement.

**Does that increase include some kind of engine supply arrangement?**

You're certainly hinting in the right direction, but I can't possibly comment at the moment! ◀



**The Vanquish Zagato Speedster was an immediate sell-out. Above: Palmer races a Vantage GT4 in his spare time.**





**'I love the GTE category.  
We just won Le Mans in the last year  
of the Vantage's life and that was  
fabulous. As long as I'm sitting here,  
Aston will remain in Le Mans'**



06

# POWER FOR CHANGE

Since their introduction in 2014, Formula One's hybrid engines have delivered astonishing results in terms of power and efficiency. As the sport begins the process of defining the next generation of powerplants to be used, AUTO looks back at the gains that have been made and how advances in F1 are helping efficiency on the road

TEXT

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JUSTIN HYNES

With just over three years to go before Formula One introduces its next generation of power units – engines likely to shape the sport until the start of the fourth decade of the 21st century – F1 stands at something of a crossroads.

Should the architecture of grand prix racing's engines continue to chime with the imperatives bearing down on the development of the cars we drive every day on the road – ever-more efficient, with ever-evolving rates of hybridisation – or should the argument that racing must exist independent of outside concerns hold sway.

As with most debates in Formula One, it's coloured by high emotion – a dialogue in which empiricism is countered by tradition and the memory of a sport that has thrived on the visceral thrill generated by the thunder of enormous, normally-aspirated engines. It is, to coin a phrase, a conversation frequently drowned in sound.

The opposite side of the debate is one in which the manufacturers responsible for the tiny 1.6-litre, turbocharged, hybridised power units that have propelled Formula One competition since 2014 insist that having embraced road-relevant technology – and developed it into supremely efficient and incredibly powerful units capable of almost 1000bhp – there is no going back. The future is now.

"With the previous [normally-aspirated] V8 we had a great engine, but it was not compatible with the new century, with the expectation

of car makers involved in the sport," says Cyril Abiteboul, Managing Director of French automaker Renault's Formula One squad. "On entering F1 you have to recognise the fact that it is expensive and when you make a decision to enter into the sport it has to work for your brand, for exposure, awareness and opinion. It has to tell the story that the technology in which you are investing is relevant to what you are doing on a day-to-day basis.

## EFFICIENCY GAINS

"There will always be large discrepancies between race and road cars, but what you need to do is demonstrate that a certain type of technology is good for consumers, is good for their choices. Not only in day-to-day cars, but also in sports cars and, ultimately, in terms of racing cars," he adds.

This was the thinking behind the introduction of F1's current power unit specification in 2014, and while Abiteboul insists that these power units have been a success, he feels the gains made have not been promoted well enough.

"The message is a very good message – that with these engines we were able to reduce fuel consumption by 35 per cent and we did that without degrading the power or the absolute performance of the car.

"In my opinion that's a fantastic message and one that was not promoted well enough,"



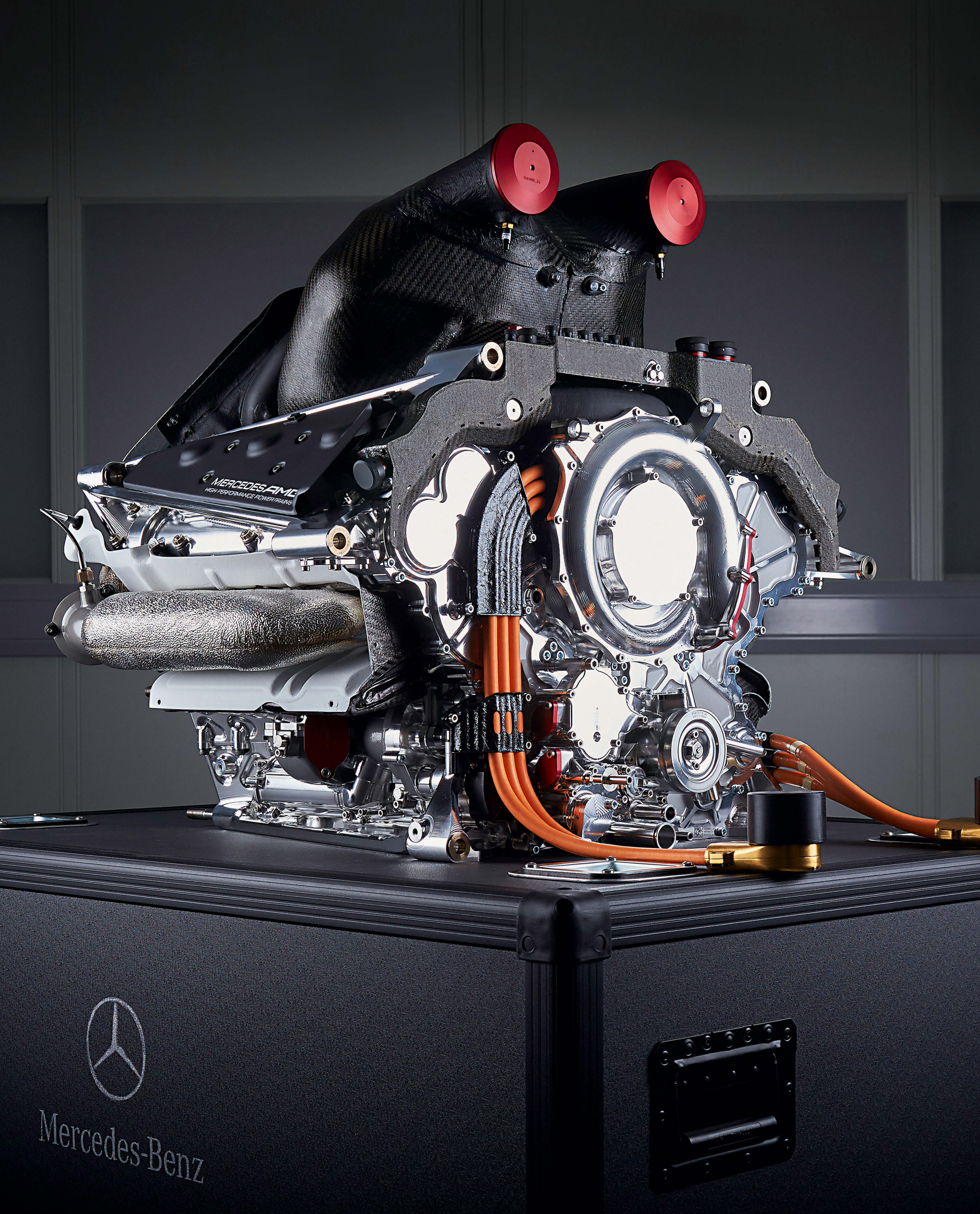
**Andy Cowell, MD of Mercedes AMG High Performance Powertrains, says fuel efficiency has been key to their current power unit's success, allowing it to dominate F1 since its 2014 introduction.**

he adds. "If you think that 25 per cent of all CO2 emissions in the world are related to car and transportation, if we could apply our 35 per cent cut in emissions in F1 to the 25 per cent in road cars, then that will have a massive impact on total emissions on a worldwide basis. So that's something to take in to account."

Andy Cowell, Managing Director of Mercedes AMG High Performance Powertrains, admits the gains with their unit were hard won but that the outcome has been beyond expectation.

"I think the major challenge was looking at the combustion process, because the heart of the power units is the combustion conversion. ▶





MERCEDES-AMG  
HIGH PERFORMANCE POWERTRAIN



Mercedes-Benz





**'With these engines we reduced fuel consumption by 35 per cent without degrading the power or performance'**

CYRIL ABITEBOUL, RENAULT SPORT F1

So from fuel, chemical energy and heat release we needed to recover as much of that heat energy as possible and put it to useful work out the back of the crankshaft.

"The main challenge with that is when you are presented with the opportunity to use direct injection – which the previous engines specifically restricted and was allowed in these units – to run a single compressor and turbine, and have a compound loop, it was really looking at what's possible with all of those technologies.

"What's the best overall position to chase across those items?," he continues. "And so you do research work, theoretical work and then you do experiments to correlate that. Then you put a package together. And all of those individual technologies improve and then you put another package together. So, that was probably the biggest challenge to get that running sweetly."

Mercedes, F1 Constructors' champion in each of the three seasons since the introduction of the current formula, has undoubtedly hit that sweet spot and victory, according to Cowell, most significantly stems from fossil fuel efficiency.

"The very simple message from the FIA was that they wanted us to work on energy efficiency

and how do we get Formula One technology development to genuinely help what was going on in the road car world," he explains.

"So, instead of it being focused on the capacity of the engine and the speed at which you can run it, focus it on the amount of fuel you're permitted to put in, because then you get your performance by that conversion efficiency. Prowess on conversion efficiency wins you races. And prowess in conversion efficiency knowledge is useful in every single industry that converts fossil fuel into useful work."

The result is a power unit in which efficiency has increased in leaps and bounds.

"The naturally-aspirated engine started at about 29 per cent, which isn't bad for a naturally-aspirated engine with port fuel injection. Where are we now? We're not far off 50 per cent thermal efficiency. That simply translates to being able to go further on the same tank of fuel. So there has been a 20 per cent gain in just a few years."

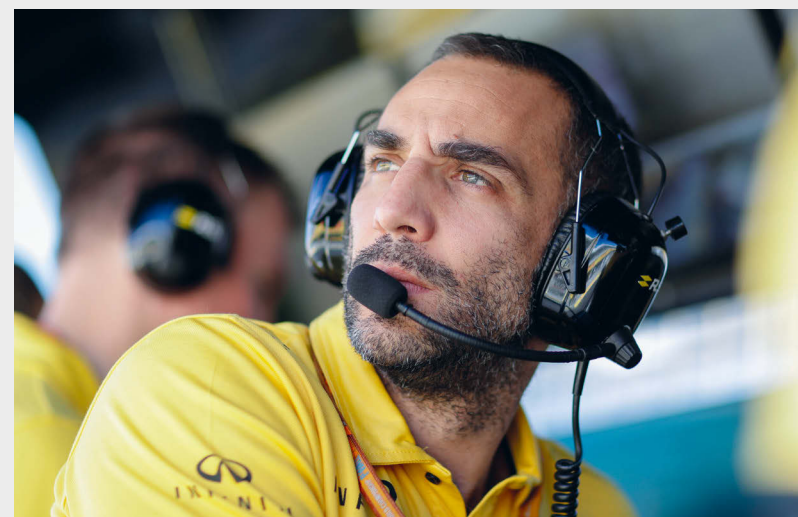
The question remains, however: are those gains being translated from track to road?

Yusuke Hasegawa, head of Japanese manufacturer Honda's Formula One programme, says that crossovers do exist.

**Renault Sport F1 boss Cyril Abiteboul believes gains made with the current F1 power unit need to be promoted better.**

"We are using some of our mass-production technology to help F1 and vice-versa," he says. "The key technology is the same: the combustion, turbine and motor. But you can't always introduce the exact parts to mass production."

Cowell points to number of projects being developed by Mercedes as evidence of a trickle-down of technology, even if those projects







currently occupy the rarefied space inhabited by high-performance vehicles.

"There are several projects we're working on where there is direct transfer of technology," he says. "HPP is 100 per cent owned by Daimler. We fit into the research and development group of Daimler. So as we've learnt, we've transferred that knowledge and that then gets used on various road car projects."

**Ferrari CEO Sergio Marchionne says the hybrid technology currently being used by the F1 team (below) will factor in the Italian make's future car range.**

## RANGE FINDING

"I guess the most direct transfer is the AMG Project 1 hypercar that we're working on where it really is a case of taking a Formula One power unit and dropping that into the rear of the sports car, and then taking two MGU-Ks and dropping those into the front of the car," adds Cowell. "You end up with more than 1,000 horse power, four-wheel drive. Not only great performance that you want from a hypercar but remarkable fuel efficiency as well."

Cowell also points to improvements in battery technology in F1 as being beneficial to wider programmes.

"When we look at the journey we had with KERS after it was introduced in 2009, that development – done by several manufacturers driving battery companies – turned lithium-ion batteries from a pure energy storage device in to a power delivery device. And it's that technology development now that is yielding all these great results that we're seeing in high-performance EV cars."

"However, the range and the charging infrastructure is still a challenge. I think that's the challenge with electric cars. We've got great infrastructure for filling cars up with petrol,

with gas. If you've got an incredible 50 per cent thermal efficiency device for turning that fuel energy into either direct propulsion or storing it electrically, then that as an overall package would be remarkable."

The spread of technology from Formula One even influences a company such as Ferrari, a low-volume manufacturer of high-performance sports cars that might be considered far removed from concerns of efficiency.

The company's LaFerrari, introduced just prior to the current generation of Formula One power units, utilised the kind of hybridisation developed during the sport's KERS period post-2009 as a performance booster. And while the development cycle of such models has yet to see its current F1 technology exploited, CEO Sergio Marchionne is adamant that the kind of hybrid technology being employed by the team in F1 will factor in Ferrari's future road car range.

"Electrification via hybridisation is going to be part of our future," he says. "Hybridisation is crucial to Ferrari. There is no denying that regulations put us under pressure, but we could reach those targets in other ways. The challenge is to benefit from hybridisation not just in terms of emissions reduction, but also performance. ▶





"We have already developed a hybrid supercar, LaFerrari, and on future Ferrari models we will leverage new technologies as well as electrification." Indeed, the Ferrari chief recently commented that "all Ferraris sold from 2019 will have some hybrid elements".

## TRANSFER OF EXPERTISE

Crossover occurs not just in terms of hardware. Honda's motor sport programmes have traditionally revolved around the rotation of designers and engineers through racing programmes, so that expertise gained in the hothouse environment of competition is transferred to the wider business.

"Of course we don't want to collapse our organisation every year, and so normally we keep the development engineer on site," says Hasegawa. "But definitely the race engineers will go to other mass-production programmes or research programmes and there is no doubt that their experience comes with potential everywhere. We have engineers with both kinds of experience, the mass-production technology and motor sport – even me! And so, it is good to encourage the mass-production engineer to have more opportunities."

Renault's Cyril Abiteboul concurs, saying: "As far as Renault is concerned it has enabled us to create more synergies between road car engineering and racing engineering. And we've got a dialogue that is happening."

"It happened in one direction at the start of the current regulations in the sense that Renault was leading in the deployment of electric vehicles, and is still European leader in electric vehicle sales and not far from being the leader on a worldwide basis. By doing that, we developed an awful lot of know-how in things like battery management. And I can tell you that the people who have developed the Zoe, which is a road car, actually helped the people in Formula One."

"Now that F1 has obviously caught up a lot, we've done a lot of development and it's now the other way around. It's Formula One people who are starting to offer solutions to the people from the road car programmes. So there's a great synergy happening."

While it's clear that the development of Formula One's current engine technologies has resulted in ground-breaking levels of efficiency while simultaneously increasing the amount of power available to the sport, debate still continues as to the shape of the engines of the future.

Cost remains a consideration, both on the side of manufacturer development and supply price to teams, though the sport's governing body the FIA has made great strides in implementing cost reduction measures. The seasonal price of supply for teams in 2017 was reduced by €1 million and next year will fall by a further €3m.

The high cost of development, and a level of complexity which has seen some existing manufacturers struggle for competitiveness, has

also had an impact on the willingness of other manufacturers to join the F1 party.

The concerns have led to a wish for the generation of power units that will enter the sport for the 2021 season to be simplified in order to reduce cost and encourage new competitors. But while there is tacit agreement from many stakeholders, existing manufacturers insist that there can be no retreat from hybridisation, sustainability and road relevance.

"Electrification is definitely the way to go," insists Abiteboul. "There will obviously be a co-existence of the internal combustion engine and electric engine for a period of time. So Formula One is very relevant in that respect."

"We need to be careful of a knee-jerk reaction regarding existing engine regulations. Our existing engine can be easily improved without having to be completely written off. Something that we would like to avoid is starting from scratch that process again, because a lot of investment has gone into this engine."

"We can extract more power and we can also lower the price. We can improve the noise without having to review completely the architecture. That would certainly be the position and the preference of Renault."

Hasegawa adds: "[At Honda] we believe that we won't lose the internal combustion engine for another 20 or 30 years. So there is no question that we need to invest more technical development for the internal combustion engine. And from that point of view, Formula One has a highly-efficient engine technology; it is very attractive for us. I support some simplification



**Yusuke Hasegawa, head of Honda's F1 programme, says there is crossover between its F1 designers and engineers with those working on road cars.**

**Technology developed with its F1 power unit and its relevance to road cars makes the sport an attractive proposition for Honda, adds Hasegawa.**

and some cost reduction of course. The current engine is very expensive. But the only thing I can tell you is that we would like to keep the hybridisation, definitely."

The last word goes to Cowell, who insists that regardless of whether the power units are simplified, there will be more to learn and more efficiencies to find.

"There's always a challenge for engineers who love the competitive ingenuity that Formula One throws at you. There's a fascination in optimisation and doing it better than your fellow competitor," he says. "Simplification doesn't mean zero challenge, it means new challenge and that brings lots of fascination into the sport. Let's not think backwards, let's think forwards." ◀







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Formula One giant McLaren may be being eclipsed by grand prix racing rivals but according to *Zak Brown*, the Executive Director of its Technology Group, the sun will inexorably rise on its fortunes in the future. In the meantime, there's a 'whole galaxy of motor sport' to explore

# NEW WORLDS OF RACING

06

TEXT

/

JUSTIN HYNES

It's a little over 10 months since Zak Brown stepped into the role of Executive Director of McLaren Technology Group, a role that according to the team's website gives him responsibility 'for commercial and strategic operations' and which tasks him with a 'critical role in realigning and transforming the organisation behind some ambitious performance, growth and development goals'.

In the time since, those ambitions have swung wildly between the emotional high of a return to competition in the Indianapolis 500 after almost four decades and the conclusion of a stuttering Formula One partnership with engine supplier Honda. Between the peaks and troughs, the group's automotive and technology arms continue to provide succour, bolstering the outfit against the commercial vagaries of the financially fickle world of F1 sponsorship.

Brown, though, is bullish about the prospect of flattening the wave, eliminating the troughs and returning McLaren's F1 operation to heights it hasn't scaled in almost five years, when a win was last secured at the 2012 Brazilian Grand Prix.

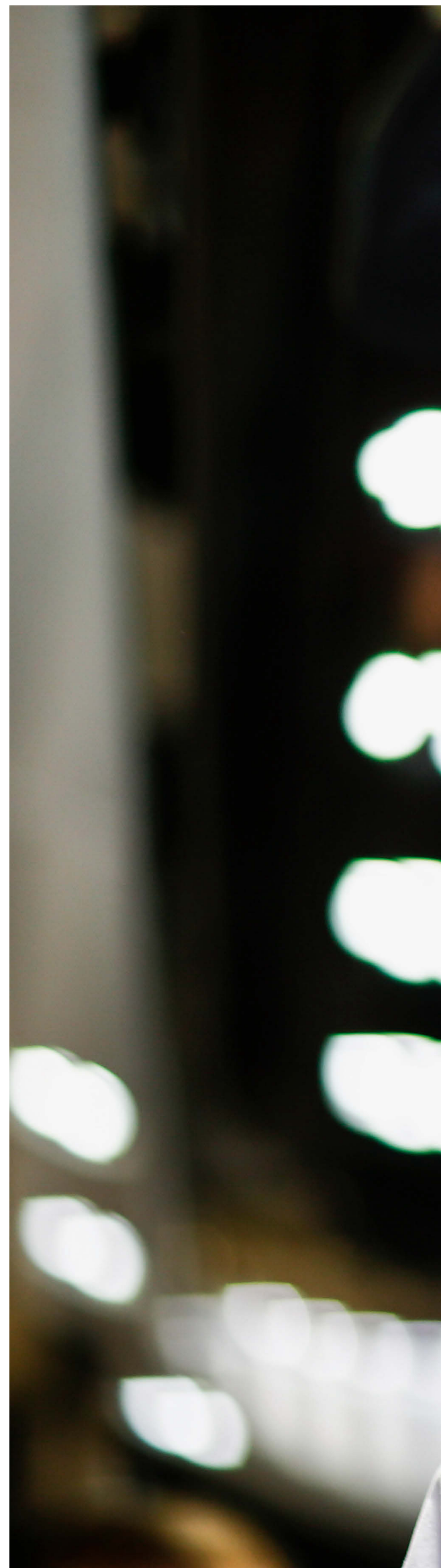
There's a difficult journey to be made, he admits, but in broadening the motor sport philosophy of the team there are new worlds to win, a 'galaxy of motor sport' for McLaren to conquer, commercially and on track.

#### What did you expect when you went into the job and what did you find, both good and bad?

I knew I was joining a world championship team. There is a rebuilding phase to get back to winning world championships, so I knew I was going to be entering something that had a lot of energy and excitement, but needed a lot of work done in various areas. So it was going to be a big challenge, which it certainly has been, and still is, but that's fun.

What I've been most impressed with – and I'm probably not surprised – is the quality of the people within the team. It is a world championship team and you can tell when you meet the people – you see the facility and you don't scratch your head wondering why those teams won 20 world championships. ▶

**Brown says he is enjoying the challenge of helping McLaren to turn around its fortunes in F1 and progress in other areas.**















## 'McLaren is not just an F1 team, we've got great technology and automotive businesses, and that will differentiate us'

### Did you see anything that surprised you – elements that needed restructuring, or that weren't working well?

It needed a new view, commercially. I don't think that we had done – and it's still a work in progress – a good enough job of telling the story of McLaren Technology Group. So it's not just a Formula One team, we've got a great technology business and we've got a great automotive business, and that will differentiate us from every other team. You've got some teams that have two legs to the stool or one leg to the stool. We've got three legs. There's breadth and depth in how we can help companies grow their business – and I think we've got a wider set of assets that companies can tap into for us to help them grow their business. And I don't think we had communicated that as precisely as we could and should – and also I don't think we were as modern as we needed to be in how you work with sponsor partners.

### What was the shift that had to take place?

Very data driven, very measurement driven, very results driven and not just on track but doing partnerships that tied to their business success. Whether that's helping companies sell more product or getting to new retailers, whatever that may be. We're a performance-minded culture, where sponsorship isn't just that we finished first, second or third – it's about 'did we help grow your business?'

### What were the immediate things you wanted to do in terms of changing that culture?

Restructure the commercial side, the marketing department. Have leaders in each different region. It was a bit of a heavy outsource model, so I've got more resource inside now. We've really beefed up what I call our engine room, which is our marketing department, our data, our analytics, our measurement. Our strategic insight is that a lot of race teams are purely sellers and then they execute what they've sold you, and the big gap in the middle is how is it working? Is it working for you? We need to be flexible, adaptable and creative, because companies' needs change, sometimes day by day, quarter by quarter or year by year. So setting up an environment

**McLaren has fresh young talent in the shape of 2015 GP2 Series winner Stoffel Vandoorne – but Brown concedes it must improve to attract top drivers in the future.**

that allows us to be a more flexible and adaptable partner.

Technically, I think the team is very strong, so there's not been much work needed there, we just need to get a little bit more horsepower! If you can get an organisation like ours all rowing in the same direction, it's quite a powerful force.

### Can you explain a bit about your broader philosophy of the motor sport business of McLaren – not solely in F1 but beyond it?

We've got a long history in different forms of motor racing and, as I view it, there's a McLaren galaxy of motor sport out there and within that they're on different planets. The biggest planet is Formula One, then there's the GT planet, an Indy 500 planet – which was a huge success – there's Formula E with our technology, McLaren Applied Technology and then there's eSports, which is something to be another racing team, if you like. So it's that solar system of different McLaren motor sports planets we are building up, because we have a need to promote our brand, because we're selling cars all over the world. Some F1 teams may not need to build their brand. We do because we're selling road cars and we have a big technology business.

### Are there elements of embracing that planetary system that stem from your own passion for motor sport? You've been involved in motor sport for many years and race yourself...

It's all business driven. So yes, I've got a lot of passion for it, but there are other forms of motor racing and sport I like that don't make sense for McLaren. When McLaren gets involved in motor racing, it has to tick a few boxes. One, it can't detract from our F1 operation, that's the first priority. It has to fit our brand and not all forms of motor racing fit our brand. It has to be commercially viable and we have to be able to win.

You've got to make a dispassionate business decision and that's our criteria when we look at motor racing moving forward – does it tick those boxes? If it does then it's something that we'll evaluate further and maybe deal with. If it doesn't, then it's something we'll pass on for the near future. ▶



**McLaren has a strong presence in GT racing. How does that help the brand? Does it feed directly into automotive sales?**

It's a great proving ground, a great test bed. The people who watch sportscar racing buy our road cars and we've been successful at it. So again, it sits in the McLaren automotive group, it doesn't draw on our F1 resources. Like the Indy 500, it ticks all those boxes.

**Is it a pure marketing exercise, or is there an element that says the technology we develop within the racing field goes into the road cars?**

Both. I think that's the beauty of motor racing – it allows you to entertain your customers, develop technologies, be a marketing platform and again it ticks quite a few boxes.

**If you talk about motor sport being a like a solar system, do you need to make the sun shine on planets other than F1 given the difficulties the team has experienced in recent times?**

No. Formula One is still the flagship, always has been, always will be. We're very clear about that. If we're not successful in F1 over a longer period of time, it would hurt our brand. However, I think our brand is very resilient within the racing and automotive community. We've won 20 world championships collectively and among the drivers, and you don't erase that overnight.

**Was there a specific moment where the team felt the decision to split with Honda was unavoidable??**

I don't think there was a specific tipping point other than we knew we were in trouble in pre-season testing and we needed to improve upon our 2016 results. So, we knew we were in trouble then. We've spent quite a bit of time, most of it has been in the public domain, trying to find ways to get Honda competitive with us, and we ultimately couldn't get there in the end – but it's great that they're staying in the sport [with Toro Rosso].

**How frustrating were the past few years?**

Very. When you're counting on your partner to hold up their end of the bargain it's very frustrating, because it's nothing that we could jump in and fix ourselves.

**McLaren have now entered into an engine supply deal with Renault. How did that come about?**

We're very excited to be partnering with Renault and all the work that [Renault Sport Managing Director] Cyril Abiteboul and his team have put in. It took the collaboration of Christian [Horner, Red Bull Racing Team Principal], Toro Rosso and Red Bull, and then the FIA and [Formula One's] Ross Brawn and Chase Carey. So, there were a lot of people that had to come together to make this happen. I think everyone's going to be excited for Australia next year.

**The deal with Renault is for three seasons and will take you through to when F1's engine regulations are set to change. What happens after that?**

No one knows yet what the engine rules are in 2021, so I think it's hard for anybody to look beyond 2020 because we don't know what '21 looks like. We think we've got a long-term partnership, the foundation for it. Renault's got a great history in the sport, won a lot of championships with Red Bull, won a lot of championships themselves, so we're very happy where we are: we think we'll be very competitive together.

**How much does this help in your efforts to retain Fernando Alonso for 2018?**

We've been speaking a lot. He's been waiting to see what technical solution we came up with. He won his two championships with Renault. He's very happy with the racing team and we're very happy with him, so I think in the not too distant future we should be able to get something done and that'll be the last big piece of the puzzle. Then I've got to find us some sponsorship with our commercial team and get ready for next year.



**Looking to the future, what do you want out of the business? Where would you like to see it in a couple of years' time?**

I think it's pretty straightforward – winning world championships and being associated with great brands. You know, we don't have as many... The brands we have are great, but we don't have as many as we once had. So I think we need to get back to the McLaren everyone knows – a team with two of the greatest drivers in the sport, with a car built by the greatest team, winning world championships along with blue chip, leading, like-minded companies – you know, the easy stuff! ◀

**Fernando Alonso and McLaren made their mark on this year's Indy 500, leading the race before engine failure struck late on.**

## Technical Showcase

Beyond Formula One, the motor sport division of McLaren applied technology helps to keep a huge variety of championships on track. Now it's bringing its considerable technical expertise to the science of boosting fan appeal, as Motorsports Director *Rodi Basso* explains

**What do you see as being McLaren Applied Technology's key functions in motor sport beyond the marquee world of Formula One?**

The idea has been to become a product-driven company, and of course to keep liaising with the main motor sport stakeholders such as federations and promoters globally in order to maintain our position as a trusted standard solution provider.

We very much specialise in helping make each of the series we are involved with happen. We see ourselves as a technical partner, a partner that eases access to the series, even though we are introducing complicated and complex technology. We try to make it simple.

At the moment, I am keen on expanding the business in the USA, in Japan, where I definitely think we can provide good solutions. I'm keen to get involved with motorcycle racing where we have already some products running in a few teams. But we would like to expand that.

**You already have quite a presence in the US, in IndyCar and NASCAR. Where is further growth possible?**

I think they both have an interesting technology road map. They want to make the series more interesting, more appealing for the fans and for the manufacturers. Of course, every series has got its culture and its own pace, so we need to understand and respect that, and tune our offer in order to let their vision happen.

**How does your technology help with that? Because you're a technical partner, what you do is supply product to it, so where does that cross over with entertainment?**

◀ This is an area I am massively interested in.





I strongly believe we can play a part in the entertainment business. The mental switch we need to make is to look at the data, not just as technical content, but as media content. We are exploring lots of possibilities, getting to know interesting companies more involved in the world of entertainment. And you know, there are a lot of common points between us and them in terms of a technology baseline. I'm not asking McLaren to change its DNA to enter and contribute to the entertainment business, but actually, what we already do in terms of data can certainly increase engagement and fun. So we are working on the strategy around this and we are making a very good step forward.

**You're talking about leveraging the data you harvest at the track – from cars, the infrastructure etc – and providing an offering to fans that enriches their experience of the race...**

Enrich is a key word but the one I like most is 'immersive experience'. Previously I was involved at races for nine years and when I stopped going to events I felt that just watching the race remotely there was so much missing. But whenever I go to mission control of the race team [the real-time connected factory-based department teams use to liaise with trackside engineers to manage race weekends], it's just unbelievable – the adrenalin, the tension, the competitiveness. I believe we can definitely take a part of it and make it available without disclosing any deep secrets... Of course, there are some paradigm to be challenged, like data ownership, but with new stakeholders coming into Formula One,

into motor sport globally, the prospects are encouraging. In the US we are already very active in this regard.

On the entertainment side, we are still in the analysis phase really. But the intention is that by the end of this year we will be ready with a proposition, and to make some strong and compelling proposal to the main stakeholders.

**You mentioned MotoGP earlier. How is a company predominantly active in car racing getting involved with motorcycles?**

One example is a sensor that we have designed, and we manufacture, to check the temperature and pressure internally to the tyre. It's mounted on the rim and it's looking at the internal side of the tyre, of the compound. Safety is a key point for motorbikes and we are very keen in trying to understand more. Plus, the very fascinating aspect of MotoGP is that the vehicle dynamics are a complex science. The role of the driver movement on the bike has got an incredible impact on the inertia and rotational inertias of the bike. And I was very impressed when I heard from studies that even the muscle tension of the biker can make a difference in the rotational inertia of the bike, so it's difficult to measure the grip. So everywhere there's a challenge, of course I see opportunity. As a group of

**MAT's Rodi Basso is keen to apply the company's skills beyond its traditional motor sport base.**

**'I strongly believe that we can play a part in the entertainment business'**

scientists and engineers, I think they can definitely take the challenge on, like they did – and I introduced also this topic – of the simulator. You know, 20 years ago, exactly what I said about a bike was applicable to the simulator for racing cars.

**MAT is heavily involved in driver development. How does that work?**

McLaren was a pioneer in the use of simulators and part of my strategy is to exploit this, partly with a business built around team and driver development. I would like to get drivers on board and raise their game to go anywhere in the main series globally, not just Formula One, but anywhere.

We are talking about a Centre of Excellence with human performance sensors in order to really understand the limit of the driver, and each performance. Then there is also technical education; they need to understand how to talk to engineers.

Last but not least, we ask the drivers to be also marketing people, so they need to know how to market themselves, because people have to be willing to come to the track and look at them, and see what they are doing on the track, and listen to the comments – before the race and after the race.

So you know today being an athlete, as a driver, is a multi-disciplinary exercise, and we are at the point where they really have to be excellent in all areas. The simulator is part of this journey.

**Now with all of these topics, of course we do it for racing, but I'm sure they will have an impact also for road cars, where you will be able to assess if a driver is too tired to keep going...**

The other aspect is team development. There are many teams in many formulas that need the simulator to understand how to design the car, or improve the car set-up, or even improve their – let me call it – technical education.

**Where are we now with simulation tools? Are we beginning to exhaust the possibilities?**

In motor sport, I think we are exploiting really very close to the best of it. However, in the automotive world we are just in beginning of the journey, so there are for sure manufacturers using it. We can partner with them with our simulators, our technology, and there will be a big benefit for the automotive industry in saving money and testing in the same conditions – set-up, car design and also letting the engineer grow and approach the car design in general.





06

# 'We are putting so many lives in danger'

Olympic and world champion *Wayde van Niekerk* is taking on a new challenge - the race to save lives on the world's roads. And for the fastest man ever over 400m, victory is all about making simple and safe choices

South African athlete *Wayde van Niekerk* is a motor sport fan but also a strong advocate of safe driving.

## Global Reach

The FIA's #3500Lives campaign can only succeed if its safety messages reach as many people as possible around the world. In partnership with advertising giant JCDecaux the campaign messages will be displayed on the company's advertising spaces worldwide, as seen in these pictures of #3500Lives going global. However, materials associated with the campaign are available to everyone and can be accessed through the #3500Lives campaign site. To find out more, simply scan the QR code at the bottom right of this page to discover all about the FIA's mission to save lives on the world's roads.



Brazil



Australia



**What made you decide to get involved with the FIA's #3500Lives campaign, which involves stars from sport, music and film spreading the word about road safety?**

Largely because it's something we tend to neglect. As drivers we end up taking for granted the basic rules in place for us staying safe on the roads. What hit me most was that there are so many drivers out there who don't consider one another, particularly those at risk on the roads. The choices we make are basic but at the end of the day we are putting so many people at risk other than ourselves. Also, it was the fact that I have the honour to be part of a campaign involving so many great sports people and entertainment personalities. It's really a matter of honour for me to be standing alongside all these great people, people I have personally learned from.

**How important is it to have celebrities and sports stars involved in a campaign such as this? Do you believe in the power of role models?**

Yes, for sure I do. I love learning and picking up qualities from different personalities and people I meet. That's where I find my inspiration as a person. In these last few years alone in track and field I've come across such great characters, such amazing people. It makes life so much better to learn how to love, how to respect and how to be humble. It's something that has been massive in my career so far.

**The statement you're associated with in the campaign is 'never drink and drive'. Have you been exposed to the dangers of other people driving while under the influence?**

Yes definitely. In South Africa it's a massive problem. It's something I'm really proud to stand up for and hopefully we can create a bit of awareness when it comes to drinking and driving, and as a result we'll learn to make

better choices. So many lives are lost through drink-driving and it's time that someone stood up and said no, and I'm really glad that I can be one of those people in this campaign.

**What's your personal experience of the road safety situation in South Africa?**

Honestly, we have a bit of everything in terms of problems. We have quite a lot of negligence, a lot of drink-driving, a lot of silly accidents. Being part of the campaign is a real opportunity to stand up for something positive.

**The country has a poor safety record and according to government figures almost 13,000 people were killed on South Africa's roads in 2014 – that's 35 a day. What do you see as the worst contributing factors?**

In South Africa, seatbelts, speeding and drink-driving rates are quite high. Many people see it as the norm, but I think if we make people aware of the dangers that come with this kind of behaviour we can have an effect.

**What do you hope will be the outcome of this campaign – in South Africa and across the world?**

Personally, I hope behaviour is going to change. We are putting so many lives in danger and I wish we could see that. I have definitely become a better driver when it comes to safety and making the right choices when I go out on

the roads. I hope more people will take time to research and educate themselves on how to be a safer driver and experience it for themselves, and how dangerous it can become when you don't consider others.

**Speed is obviously your great strength, but recently you experienced speed of a different kind at the Formula E race in Paris. Do you enjoy motor sport?**

I think it develops each time I get exposed to it. I've obviously been watching it on TV. So yes, I do enjoy speed but I try to be a safe driver in general. But I enjoy supporting and watching motor sport. Seeing Formula E, I wished I could have sat in one of the cars to see how it feels.

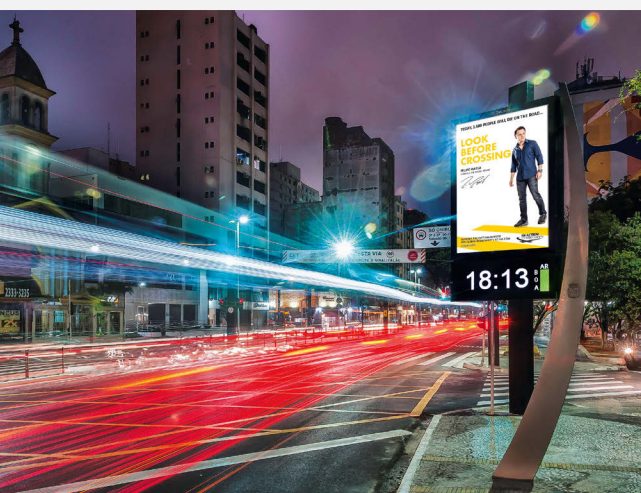
**South African athletics appears to be on an upward trajectory at the moment. Is there untapped potential there?**

Most definitely. One of my closest friends is Akani Simbini and we've been touring together for a few years now. This year he had the opportunity to break through and win one of the major Diamond League events. He's one of the big South African athletes to look out for. We have some great track and field athletes coming through. South Africa can definitely be a powerhouse within that, but we need to be managed properly and hopefully the guys will make the right choices. It's personal choices that take you as an athlete to the next level.

**What about your own future? What targets do you have for the next few years and at the 2020 Olympics?**

I love doing the 100 metres as well as the 200m and 400m, so hopefully I can do that as well. I really don't set limits for myself. I try to go out there and just enjoy myself and use whatever opportunities come my way. The rest I leave in the Lord's hands. ◀

**'So many lives are lost through drink-driving and it's time someone stood up and said no, and I'm glad I can be part of this campaign'**

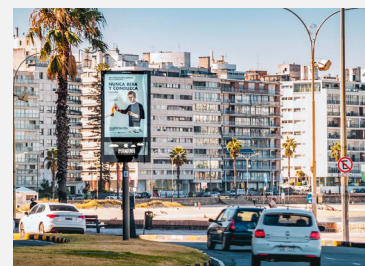


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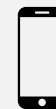
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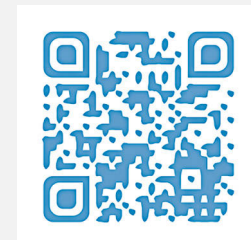
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06

TEXT

UMBERTO ZAPPELLONI

Almost four decades after a chance New York market stall find set *Diego Della Valle* on the path to enormous business success in the luxury goods sector, the Tod's CEO insists that the pillars on which he built his empire are more important than ever – whether that involves driving shoes or the supercars in which they're worn

# THE DRIVING PRINCIPLES OF LUXURY

As is often the case with fairytales, this story begins a long time ago on the streets of a small market in a big city. The city, though, is New York, where a man is browsing through a pile of old and vintage clothes when something catches his eye. The man is Diego Della Valle and the something an old pair of driving shoes featuring rubber pimples on the soles to provide better grip on a car's pedals. Upon that casual rummage was born an empire.

Della Valle took the less than perfect shoes, which originated in Portugal, with their 133 rubber pimples and turned them into the supple handmade moccasins that have become his family company Tod's signature product – shoes made for the road that became a fashion staple, especially after Hollywood fell in love with the design perfected by Diego's father Dorino.

The Tod's company was set up in the early 1900s by Filippo, Diego's grandfather, before it passed on to Dorino. But it was only at the end of the 1970s, with Diego Della Valle at the helm, that the business became a holding company for Tod's, Hogan, Fay and Roger Vivier – all leading luxury brands.

"There's one guy I really wanted to get wearing my shoes and never managed it and that was John Kennedy, but I was too late," says Della Valle with a smile.

Everyone has their heroes and his was JFK, but if he missed out on the US president, he made up for it with his descendants. Today, Diego Della Valle is the owner of 'Marlin', the yacht that had belonged to the young Kennedy since 1952 and became the official presidential yacht. It used to sail the waters of Hyannis Port, Massachusetts, and now travels the seas around Capri. Della Valle is happy to make it available

to the Kennedys whenever they are in Italy. "I'd say, now, that they use it more than I do..."

If asked to divulge the secrets of his brands at, say, Milan's Bocconi University, or Harvard or MIT, he explains it as thus: "I have always said that the success of our group is down to having the best possible quality and maintaining the exclusivity of our products. The fact that we represent Italian lifestyle is a modern way of communicating this, because today the market is global."

These values have always been a key company trademark and they have not been cast aside with the arrival of new brands and the discovery of new markets. Exclusivity, elegance and communication are three words that sum up the basis of its success.

## THE FERRARI CONNECTION

But at the heart of it all is the man himself. Even when he buys a Ferrari – "for me they are more a work of art to admire than a car to drive" – he looks at the detail and the personal touches. Apart from those made for the late Gianni Agnelli, he was the first to have cars made-to-measure in Maranello.

"I had fun combining colours and materials," he said. "I always loved finding different combinations and looking for new materials. I was really more interested in the interior of the Ferraris I bought rather than their technical characteristics. I always preferred looking at them to driving them. I can't claim to be much of a driver and if I did my friends would laugh at me. Even today, I like to roll them out into the garden and admire them. Ferraris really are works of art."

Tod's CEO Diego Della Valle says the luxury goods market must adapt to competition from large foreign businesses.







His love of Ferrari grew during Luca di Montezemolo's time as president of the Prancing Horse, as they were good friends, spending holidays together before becoming partners in various business dealings. He attended a number of grands prix then, getting to know Michael Schumacher and then Ferrari team boss Jean Todt, with whom he is still on good terms.

Della Valle is not just a Ferrari owner, but a business partner too, given that there is a Tod's Ferrari range. "It's a natural partnership," he reckons. Luxury with luxury, and Hogan, another brand within the family, produces an Aston Martin collection just to reinforce the concept.

"Today, the luxury goods market finds itself facing great changes," he says. "We have to stop being victims of individualism. We must learn from the large foreign businesses that build up a team and create a pool of brands and companies which can compete with other international entities.

"It's time to stop talking about oneself and taking pot shots at others," he adds, before speaking about Italian products. "In order to safeguard the small artisanal businesses, which are the heart of Made in Italy and the soul of Italian luxury goods, one has to think big. Otherwise, we will be supplanted by new competitors. Luxury needs to be developed, treated well, looked after and protected. Even on the internet, where one can buy

### **'Ferraris really are works of art. I like to roll them out into the garden and admire them'**

everything, today's consumers and those of tomorrow will want labels that say Made in Italy, rather than Made in China."

In the group's factories, every product is made by hand, going through many stages and checks before becoming a recognisable and exclusive object, while at the group's workshops in Casette d'Ete, on Italy's Adriatic coast, there are six buildings producing footwear and two for leather goods.

The main building, in white marble with large glass areas, is surrounded by greenery. It boasts several works of modern art including a centrepiece staircase in the shape of a wave designed by Ron Arad, a hanging work made from rice paper by Japanese artist Jacob Hashimoto, including one composed of a thousand kites made on site, some blow-up photographs by Giovanni Gastel and a sculpture of the face of a woman by Igor Mitoraj. It's as much a museum as a workplace and it's an expression of what Della Valle calls 'contemporary luxury'.

Indeed, it's reminiscent of one of the factories in the Emilia region of Italy, where the supercars of Ferrari and Lamborghini take shape. The processes are advanced, aimed at global demand, but the essence still rests in the human touch.

"Visiting the Ferrari and the Tod's of today, while they are working on completely different products, there's a shared sense of the sacred in the way people go about their work. They know they are not just working on an item on a machine, but on something special. You can see that with Ferrari and with us."

Luxury, craftsmanship, hand-finishing, an eye for beauty and a passion for perfection – the parallels with racing, with Ferrari and with supercars are clear and ultimately hark back to that New York street market where the spirit of driving pleasure sparked a business phenomenon. ◀



# 'I JUST WANTED TO START THE RACE AND GIVE EVERYBODY HELL!'

Born into a motor sport family, *Hans Stuck* was fated to become a racing driver – a destiny for which he will always be grateful

07

TEXT

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TONY THOMAS

Right: Stuck's varied career took him from touring cars to F1 and success in sports cars, especially at Le Mans.

"Flat on the gas! Use all the road! Stay on the gas... No lifting! Stay on!" This is Hans Stuck laid bare. A great racing driver in his absolute element, at the wheel of a full race-spec BMW M3. This one was designed for competition in America's IMSA sports car series, with the sole aim of taking on its nemesis, the Porsche 997 GT3.

A lightweight coupé, driven by a four-litre V8, pushing out 500bhp and more than 500Nm of torque via a six-speed semi-auto transmission, made for a handy racing tool. Compact and nimble, it was perfect for an assault on, say, the full-length Nürburgring – the original 'Green Hell'.

And it's here that we find Stuck, captured on in-car video, teasing the limit as he dances his way around all 14.2 miles and 174 turns of the daunting 'Ring. He's commentating as he drives, noting points of compression, fast cornering and braking, while assessing the actions of other drivers as he advances in a tsunami of speed. "He's seen me,

he's seen me... good... Ach! No, I've lost some time."

Stuck's lap, recorded in 2004 and preserved on YouTube, is a mesmerising stream-of-consciousness insight into what a racing driver experiences while performing at somewhere near his peak. Concentration, elation, frustration... and eventually, sheer, fist-pumping exhilaration as he crosses the line and registers that his lap is a good one: "And... Wow! Eight-nineteen, forty-nine. New record on the track! That was a cool one!"

He's well qualified to judge the merits of his effort, perhaps uniquely so, having virtually fallen from the womb onto this hallowed speedway.

"When I drove my very first lap of the Nürburgring I was nine years old," he chuckles. "I remember it to this day – it was in a BMW 700 [a small two-cylinder rear-engined saloon, later developed into an effective racing machine] and I was sitting on a couple of cushions to reach the pedals and steering wheel." ▶









An explanation might be helpful at this point. Hans-Joachim was born with a handy advantage in the automobile world: his father, also Hans, was a fabled pilot of the pre-war Auto Union grand prix cars – hugely advanced racing leviathans with V16 supercharged engines mounted behind the driver and capable of powering them past 170mph.

In one of these ‘Type A’ cars, Stuck Sr, already a noted hillclimb ace, won the 1934 German, Swiss and Czech Grands Prix, and would have been European Champion had the title been awarded that year.

He survived this perilous racing era, and the Second World War, to resume his motor sport career in peacetime; a final flourish came with victory in the German Hillclimb Championship at the age of 60, whereafter he took up a role as a Nürburgring racing instructor. It was only natural that he should teach young Hans-Joachim the secrets and nuances of this daddy of all race tracks.

“I was already in love with cars and motor sport by then,” admits Hans, a still-lean 66. “I used to try building racing cars in our garage in Bavaria when I was only six or seven. Once in a while I would put a cigar in the exhaust box and

## ‘When I drove my very first lap of the Nürburgring I was nine years old. I was sitting on a couple of cushions to reach the pedals and steering wheel’

my father and his friends wouldn’t be able to find it until... when they started the car... BOOM! It would fly out in flames.”

A path, pre-destined by birth, was being charted, though not without obstruction. “My mum was very strict,” Stuck recalls. “She insisted that I finish school before there was any talk of motor racing, so I was 18 before I was allowed to start. It was difficult in the beginning to convince her that it was the right way to go, but up against the two of us – me and my father – there was no chance. Still, it was a long time to wait!”

Stuck, who would become a father himself to racing sons (Johannes and Ferdinand), remembers that his own dad was nonetheless

**Above: Stuck's early career was focused on touring cars – this is the 1974 Nürburgring 6 Hours in a BMW 3.0 CSL.**

hesitant before allowing him to race – “he knew that once I started that would be it” – but as a petrol-veined teen he could have no empathy for his parents’ angst at seeing their boy take up a perilous endeavour. “That came later, when my own sons started to race. For me, there was never any pressure inside the car. But from the outside, watching your son race...”

Stuck’s pursuit of the family business began at the Nürburgring – of his first race there, in 1969, he says: “All of a sudden, my wish to become a racer came true. I just wanted to start the race and give everybody hell!” – and took off in earnest in 1970, racing a BMW 2002ti saloon. The early years of his career were dedicated to tin-tops, campaigning in



classic events such as the Nürburgring 24 Hours and Le Mans in iconic metal including the BMW 3.0 CSL and Ford Capri RS2600.

"Somehow I always liked to have a roof over my head," says Stuck, partly in jest, but also, given his six-feet-four height, because he never felt entirely comfortable with his star-spangled helmet emerging at an undesirably prominent elevation from the cockpit of a single-seater. "I always had my head stuck in the air," he says, "and the wind – turbulence – always affected my helmet. I think because of that I felt most at home in a car with a roof."

#### THE ROAD TO F1

Tin-top racing of some stripe is traced through Stuck's long and enviably successful racecard. His first flashes of talent were seen in a Capri at the 1972 Spa 24 Hours, where he won his class from pole. Later, in his pomp, he became 1990 DTM champion, taking seven wins in his Audi V8 quattro against a talent-rich field that boasted stars including Johnny Cecotto, Steve Soper, Jacques Laffite, Emanuele Pirro, Walter Röhrl, Alain Menu and Bernd Schneider.

He last competed in the VW Scirocco-R cup in 2013, but between those bookends lies a richly varied career.

Notwithstanding his instinctive preference for "a car with a roof", Stuck's talent propelled him towards single-seaters and Formula Two – then as

now the finishing school for future stars. There was a pole in his first (part-) season, in 1973, driving a March, and from there it was only a short springboard bounce to Formula One.

Stuck's 74 F1 starts didn't bring the success his skills perhaps merited, though two 1977 podiums in a Brabham-Alfa, at the Austrian and German Grands Prix, were evidence of his ability. He has no regrets about not having made the F1 big time, not least because he'd never set his sights on the premier category. He's far happier to count his blessings in surviving motor sport's most dangerous era, having witnessed its dark side first hand: "Formula One was very exciting, of course," he says, "and I had some really cool teammates like Ronnie Peterson and Vittorio Brambilla. The competition was intense and the cars were really powerful. But I also saw some fatalities when I was close by: Tom Pryce [who was killed during the 1977 South African GP] and Ronnie Peterson [who died after a start-line accident at the '78 Italian GP]. That was a very difficult time and there were some races when I very deliberately prepared my room before leaving the hotel, so that the cleaner wouldn't find a mess if I didn't come back. Luckily I never had these thoughts when I started the engine, but I knew when I stepped into the car, there was a chance I could have a bad accident."

One particular twist of fate still resides in



**Above: Stuck enjoyed back-to-back wins at Le Mans with Derek Bell and Al Holbert in the iconic Porsche 962C. This is the first in 1986. Below: It was on home soil at Hockenheim that Stuck recorded the first of two F1 podiums in a Martini Racing Brabham BT45B. He was third in Germany and then again in Austria.**

Stuck's mind. He was offered a drive with the Ensign F1 team for 1980, but chose not to take it having had his fill of uncompetitive F1 machinery. The seat went instead to Clay Regazzoni. At the fourth race of the season, the US GP (West) around the Long Beach street circuit, Regazzoni's car suffered a brake failure, resulting in an accident that left him paralysed from the waist down. "That could have been me," Stuck reflects. "But I am here, I am in one piece and I am very happy." ▶





**'The 956 was a  
beast... you really  
had to grit your  
teeth to drive it fast.  
It was a man's car'**

**SOMETHING SPECIAL**

It is for his exploits in sports cars that Stuck is most highly regarded. The 1985 world sports car title and two Le Mans wins - 1986 and '87 - were the highlights, as was a relationship with his winning car, the Porsche 956, that he recalls as "something special". "When I stood on the top step at Le Mans, it was one of those moments in your career that is hard to believe," he says. "I started out racing with a win at Le Mans as a target. I'd read so much about it and, you know, it's one of the 'big three' with the Indy 500 and the Monaco Grand Prix. I always believed that a good race car driver should win at least one of those three, so when I was standing up on the podium, I remember thinking: 'Yes, Stucky, this is so cool. Now you've made it.' This really was a great moment in my life."

Alongside team-mates Derek Bell and Al Holbert, Stuck was briefly on top of the racing world and, like all winners at the summit of their Everest, he'd made victory look somehow easy. Any such appearance belied the difficulties he experienced mastering the 956 - the car he would come to reckon his favourite.

There's little contention that the 956 and its 962 iteration were among the greatest endurance racers ever crafted. Their stats alone attest to their excellence: six straight Le Mans wins from 1982-87 and a seventh in '94 with the much-modified Dauer-Porsche entry.

The 956 was the first Porsche to feature ground-effect aerodynamics beneath its swoopy bodywork and it could boast three times more downforce - 'stiction' - than its stellar ancestor the 917, also dominant a decade earlier.

Power came from a three-litre flat-six turbo and at Le Mans the 956 was capable of topping 230mph down the Mulsanne Straight. All this with designed-in Porsche durability. "This was the education in Porsche," says Norbert Singer, architect of the 956. "Everybody was thinking: 'whatever you do, does it last 24 hours?'"

Of much more immediate concern to the drivers of this paradigm-shifting machine - drivers







such as Stuck – was the sheer damn speed of the thing: “It was a beast, you know, with so much downforce and a lot of power. It was always hot inside the car with little cooling and you really had to grit your teeth to drive it fast. It was a man’s car. There was actually a great balance between power and grip, but when I first drove the 956, I was completely off the pace – like 15 seconds a lap – and it forced me to completely change my driving style,” Stuck recalls. “There was just this tremendous amount of downforce, which allowed you to brake into the corners so much later. It was all very different for me and initially I found it difficult to adapt to. But I did a race with Stefan Bellof [the young German hotshot, touted by many as the man most likely to become his country’s first F1 world champion] and he was so kind to me. Basically he showed me how to drive it properly. I learned everything from him.”

#### FRIENDS LOST AND GAINED

Stuck’s memory of the one race in which he and Bellof competed as team-mates – the 1984 San Marino round of the World Sportscar Championship – is tainted with sadness: Bellof

**Left: The popular German raced on into his sixties. Above: Once Stuck had tamed the Porsche 956, it became a favourite. Right: After struggling for results in an uncompetitive ATS Wheels Ford Cosworth, Stuck bowed out of F1 in 1979.**



**‘There were races when I very deliberately prepared my room before leaving the hotel, so that cleaner wouldn’t find a mess if I didn’t come back’**

was killed in a 956 at the 1985 Spa 1000km race as he attempted to pass Jacky Ickx for the lead. Better, perhaps, to remember Bellof for his singular achievement in Porsche’s masterpiece: setting an outright lap record of 6m11.13s around the Nürburgring Nordschleife on May 28, 1983, as he set pole for the 1000km race.

“He was such a funny guy,” says Stuck. “My only sadness is that we never got to know each other better.”

He’s happier talking about another of his former team-mates, the sports car legend Derek Bell, with whom he shared cockpit duties for both of his Le Mans wins.

“I first came across Derek when we were racing Formula Two in 1973,” Stuck says. “He showed me a few lines at one circuit and that was the beginning of a long-term friendship and partnership. When I was signed by the Porsche factory team for 1985, I was very happy about that, as you might imagine. But then to be alongside Derek... If you could have asked me to be team-mate to any driver in the world, it would have been him. Sometimes the engineers would write our initials down in their notebooks: ‘BE-ST.’ And that was pretty much how I felt about it, too.” ◀



07

# JAPAN'S FIRST LADY

It may have begun life with the unsporting name of Fairlady, but renamed the 240Z, Datsun's iconic sports car went on to enormous success on the road and in rallying – and it helped turn the Japanese auto industry into a global player

TEXT

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JUSTIN HYNES





As with so many legends, the story of what is perhaps Japan's most iconic sport car begins with a moment of good fortune.

In 1969, Nissan's Yutaka Katayama, head of the company's US division, convinced senior management to introduce the firm's new sports model to the American market.

The cars were shipped bearing the Datsun brand the firm used internationally and also, thanks to Nissan president Katsuji Kawamata, who had been very taken with a performance of the Lerner and Loewe musical *My Fair Lady* on a visit to the US in 1958, the name it had been given upon its Japanese launch – the Fairlady Z.

Appalled by what he believed to be too feminine a name for the US market the story goes that Katayama, affectionately known as 'Mr K', took matters into his own hands and personally

stripped the nameplate off each car. And so, reverting only to its model number for sales purposes, the 240Z was born.

The rest would be history, with production of the Z line in the region of one million examples worldwide by the end of the 1970s, and with the 240Z alone pushing Datsun/Nissan from the fourth most imported brand in the US at the time of its launch to first, above Volkswagen, by the time of its replacement with the 260Z. The Z's origins went back considerably further than its October 1969 launch in the US, however.

Nissan had been building 'sporty' cars since its earliest days and in the early 1960s enjoyed success with models such as the original Fairlady, the 1500, and then its successors, the 1600 Sports and the 2000 Roadster. In 1961 the company began to develop a car that would take it into

a slightly more elevated market segment and which would burnish the image of the company.

Drafted in to help with the project was designer Albrecht Graf von Goertz, a star contributor to the design of classics such as the BMW 503 and 507, and who had worked on Nissan's Silvia 1600 Sports Coupe first shown at the Tokyo Motor Show in 1964. Goertz would also later contribute to the design of the equally iconic Toyota 2000GT.

Working alongside the in-house Nissan design team, Goertz certainly helped with initial concepts for the Z and as such over the following decades was often credited as 'the father of the Z'.

Indeed, such was the controversy surrounding Goertz's involvement that in the 1980s Nissan released correspondence that it'd had with the designer about his links with the company. ▶

**The hugely popular Datsun 240Z helped to establish Nissan as a major global player on the road and in motor sport.**







Acknowledging his influence on the project but not giving him sole credit, the letter stated that Goertz was “retained by Nissan during the period from 1963-65 as an automotive design consultant” and that “while it is our view that the design of the 240Z was the product of Nissan’s design staff, Nissan agrees that the personnel who designed the automobile were influenced by your fine work for Nissan and had the benefit of your designs.”

The 240Z, it seems, was a truly collaborative effort, with a number of iterations being drawn and modelled before the final version was approved for production in November 1967. Certainly Yoshihiko Matsuo, head of the Sports Car Design Studio, played a major role in the design and development of the car.

Indeed, Matsuo later admitted that he had been inspired to create the 240Z by Katayama.

“When Mr Katayama came back from America and visited my department the words he said made me determined to follow my dream,” he said. “He stated that we could go on making cheap economy cars forever, but by doing so, we would never be able to move forward in export markets. Nissan, and Japan as a whole, needed to build something stunning, something original that would make foreign manufacturers sit up and take notice of us.”

The 240Z was the embodiment of Katayama’s wishes. On its launch in the US sales were brisk, especially on the back of Katayama’s insistence that the car had been designed with the US market in mind and that “its heart is Japan and its soul is America”.

Datsun sold some 23,000 240Zs in 1970 and the popularity of the new sports car helped boost sales of other models in the company’s range, so that total sales swelled from 58,000 to over 104,000. For 1971, US sales of the Z climbed again, to over 33,000. The success was translated

to other markets where the new sports car hit sales of domestic models hard, including those of MG (B), Opel (GT) and Porsche (914).

The 240Z was not just a success in showrooms and on the road—the model was also a big winner in motor sport as well.

In the US, Bob Sharp and Peter Brock campaigned the 240Z successfully in Sports Car Club of America (SCCA) road racing, where it dominated the C-Production class for nine years in a row. But it was on the stage of the world’s biggest rallies that the Z made its most significant impact.

In 1971 a 240Z driven by Tony Fall took first place in the Welsh Rally. Rauno Aaltonen then drove the car to fifth in the Monte Carlo Rally with Fall 10th. In 1972 Aaltonen, with co-driver Jean Todt, took the 240Z to third overall.



**Above left: The Datsun 240Z was a motor sport success on track and the world’s rally stages. Right: Edgar Hermann and Hans Schuller in their winning 240Z on the 1971 East African Safari Rally.**

**Datsun enjoyed more notoriety with the 240Z in 1971 with a Welsh Rally win and top-10 finishes in Monte Carlo (pictured).**

**‘Nissan needed to build something stunning that would make foreign manufacturers sit up and take notice of us’**

It was on the East African Safari Rally that the 240Z achieved greatness. Succeeding the legendary Bluebird rally car (Datsun 510) that put Nissan on the world rally map, the Safari Rally Z claimed a one-two in the 1971 event, with Edgar Hermann and Hans Schuller victorious ahead of team-mates Shekhar Mehta and Mike Doughty.

After leading by a healthy margin Mehta lost out to Hermann by just a few minutes, largely due to a long halt when his car got stuck in a mudhole near Mount Kilimanjaro.

Mehta’s pain was erased at the 1973 event, however, when he took the overall win despite running out of fuel, hitting a flock of birds that took out most of the night driving lights and then damaging the front of his car when he collided with a bank on the Meru Embu section of the course, a bank that had earlier caused team-mate Aaltonen to crash out of the event.

The 240Z would eventually be superseded by the 260Z model in 1974 – which sold in the US for a single year but carried on in Europe until 1978 – and then by the 280Z that was introduced in the US in 1975.

While both models were as successful as their progenitor, the purity of the original 240Z was steadily diluted. A boxier facelift in 1979 brought about the 280ZX and further styling tweaks were introduced in 1983 as Goertz and Matsuo’s design neared the end of its life. It eventually gave way to the new design of the 300ZX and an icon was consigned to the annals of Nissan history.

Perhaps the last word on the 240Z should go to the man who inspired its birth, Yutaka Katayama, who in describing its exceptional characteristics simply said: “It was a car that anybody could drive easily and which would give the driver that incredible feeling of jubilation that comes when car and driver are as one.” ◀







08

# Pioneers of the road less travelled

TEXT

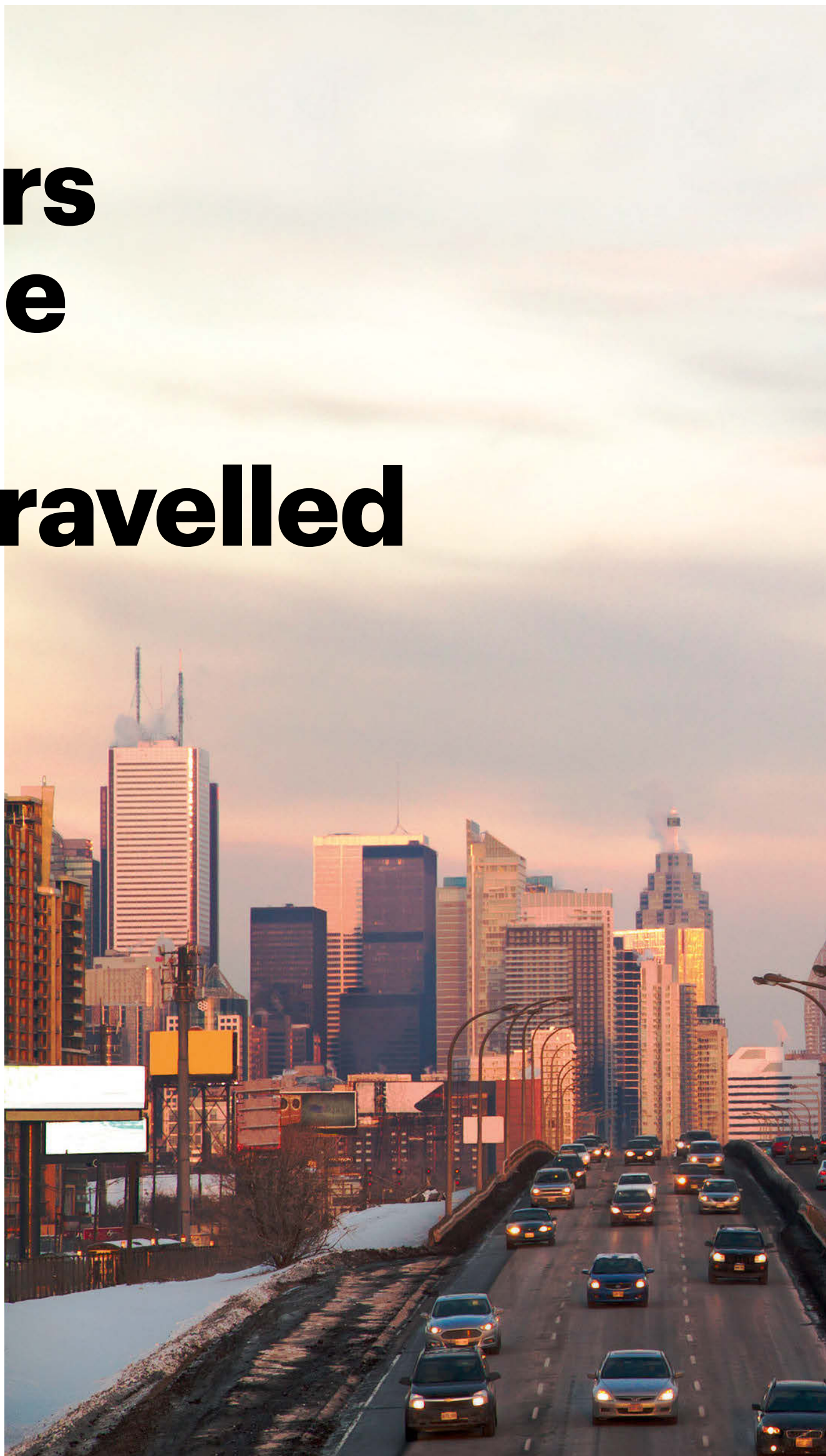
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GAIA PELLICCIOLI

For more than a century the Canadian Automobile Association has been a champion of advances that help keep motorists on the move in the safest, most efficient manner possible. It's a philosophy club president *Tim Shearman* insists will keep the organisation at the forefront of future mobility development



The Canadian Automobile Association has a wide range of interests that are championed by its President Tim Shearman.







In 1926, a man drove his Model-T Ford across the almost 8,000km that separate Halifax, Nova Scotia, from Vancouver on the Canadian West Coast. With the road network patchy and large stretches only navigable by resorting to existing railway line, the journey was long and almost impossibly arduous.

That man was Perry Doolittle, the first President of the Canadian Automobile Association (CAA), who undertook the expedition in order to show the importance of building an adequate national automobile infrastructure that would allow such journeys to be conducted safely.

Twenty-four years later, building work on the Trans Canada Highway – the first true pan-Canadian motorway – began, thus realising Doolittle's dream.

In 1930, recognising the importance of a safe

## **'CAA is one of the most recognised brands; we didn't achieve that by going with the flow'**

road network, Doolittle's organisation established the CAA School Safety Patrol Program. This programme sees tens of thousands of students involved in ensuring that their classmates get to school safe and sound.

The Canadian Automobile Association, which today represents over six million people, has built its reputation on the importance of commitment to the wider community, going well beyond roadside assistance.

"CAA is one of the oldest and most recognised brands in Canada, and we didn't achieve that by going with the flow," explains current CAA President Tim Shearman.

"We were founded out of a desire to advocate for a new technology and its users, and we continue to embody this with our business decisions and the direction of the federation.

"We have been building our rewards programme to demonstrate value to our members beyond roadside assistance," he adds. "Our always-expanding list of partners offer discounts and deals for automotive, entertainment, restaurants, home, retail and travel."

In an ever-changing market, the CAA quickly understood that to stay relevant for its members it was vital to diversify the services provided.

"CAA is [also] one of the largest leisure travel companies in Canada and we have a long history of offering Canadians travel services, whether it is for a weekend road trip or travelling across the world," Shearman says. "Canadians can stop into one of our stores for destination information, like travel guides, or to sit down with one of our travel agents and book a full vacation with every detail ironed out."

While simultaneously opening up to the travel sector, the association has strengthened its efforts to defend and support travellers. ▶





This year's CAA-backed Smart Cities Forum in Montréal coincided with the city hosting the Formula E series and focused on improving urban mobility.

## Keeping Canadian motor sport on track

With events ranging from the global scale of Formula One's Canadian Grand Prix and the FIA World Rallycross Championship round in Trois Rivières (below), to local-level junior category events, Canada has a rich motor sport scene. The ASN Canada FIA is responsible for overseeing this activity.

Based in Oakville, Ontario the organisation has sanctioned national-level motor sport as well as international events taking place in Canada since its foundation in 1989. It is also responsible for issuing competition licences and organising training events for Canadian race officials and volunteers.

ASN Canada FIA has a range of national series catering for a large number of competitors across the disciplines. Its headline series currently include the National Karting Championship, Porsche GT3 Cup Challenge Canada and the Canadian Touring Car Championship. With Canada being such a large country, the club has five affiliates that manage amateur events in their regions. They are: Canadian Association of Car Clubs (CACC), British Columbia; Western Canada Motorsport Association (WCMA); Canadian Automobile Sport Clubs Ontario Region (CASC-OR); Auto Sport Quebec (ASQ); and Atlantic Region Motor Sports Inc (ARMS).

As with many of the FIA's national sporting authorities, ASN Canada FIA offers additional services beyond sanctioning motor sport events. These include a programme of insurance products for its affiliates and members, and offering advice on competition facilities and driving schools.



"We are one of the only organisations in Canada that is lobbying for air passenger rights, ensuring Canadian travellers get fair treatment and compensation for delays or issues caused by airlines. CAA is proud to see our hard work starting to be realised with the introduction this year of legislation for an air passenger bill of rights."

### FUTURE FOCUS

The need to adapt to a fast-paced market and the careful analysis of new data and social trends has pushed the CAA to invest in the car-sharing sector.

"We've seen that younger people are delaying car ownership and our British Columbia club, BCAA, has expanded into the car-share business to capitalise on this trend," Shearman explains.

"Their car-share company, EVO, allows people access to a car when they need it without the financial responsibility of ownership."

In the debate on how new technology is changing vehicles and the way we use them (from personal goods to goods we rent when needed), and on who should have control over the new data produced by automobiles – car manufacturers, software developers, or infrastructure providers – the CAA is convinced that it should be car drivers who manage this information as they see fit.

"Cars now collect large amounts of data, such as destinations, driving habits and daily routines," says Shearman. "To help protect people's rights, CAA has been lobbying the government to ensure drivers have control over this information."

If on one side, technological developments have made vehicles safer, on the other they have introduced new challenges for road safety. This includes, for example, the dangers produced by smart phones, which in Canada have become the main cause of death on the roads.

"Research has shown that drivers who text are 23 times more likely to have a collision," says Shearman. "We are starting to see a change in how people perceive texting while driving, but they are still sneaking it in. In 2016, CAA polling showed 70 per cent of Canadians thought it was wrong to text while stopped at a red light, but one third admitted to doing it in the last month."

"To help combat these behaviours CAA continues to educate the public through campaigns, polling, and recently, a game. We developed TXT U L8R, an online game that rewards players for avoiding distractions on the road."

Cannabis-impaired driving is another significant threat for Canadian road safety. "The Canadian government has committed to legalise marijuana by 2018 and according to our polling two thirds of Canadians are concerned that this will negatively impact road safety," Shearman says.

"We are putting together a digital public education campaign targeted at young drivers which aims to remind them that marijuana impairs their ability to drive and this behaviour has social consequences, such as losing friends."

In addition to promoting road safety initiatives, on an internal level Shearman considers it vital to develop closer bonds with members of the FIA network. This was the objective of the 19th American Congress, held by the CAA in Toronto in August. It brought together sports and mobility clubs to exchange ideas and best practices.

Another significant event on the FIA calendar, the Smart Cities Forum, welcomed by the CAA, took place in Montréal in July. It was organised at the same time as the FIA Formula E championship ePrix in the city, and had the ambitious goal of promoting more secure, accessible and sustainable urban mobility.

"CAA is an eco-friendly organisation which is always looking to support the growth of clean automotive technology," says Shearman. "We run the most comprehensive electric vehicle charging station map in Canada."

"We hope the forum will help with our efforts to encourage government and drivers to invest in green, sustainable technology and infrastructure."

Investing in technology to improve services for members is the key to success for Shearman.

"Mobility in Canada will continue to evolve as autonomous vehicles enter the market and new technologies provide more options for consumers," he adds. "CAA is committed to remaining a strong leader in mobility through its own innovations and through its work with stakeholders to achieve safe mobility for all." ◀



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08

# Powered for progress

TEXT

/  
GAIA PELLICCIOLI

With more than 18 million members, the Japan Automobile Federation is one of the world's largest motoring organisations and one of the most potent. Club President *Takayoshi Yashiro* explains how the group is meeting modern mobility challenges and driving the future of motor sport

If any country embodies the social and technological trends set to influence the future of mobility in developed regions, it is Japan. From the need to integrate infrastructural change in megacities such as Tokyo, with 35 million inhabitants, driven by its increasing development of connected technologies, to dealing with demographic changes that are set to become prevalent elsewhere, the Land of the Rising Sun presents something of a case study of changes in modern mobility.

As such there was perhaps no territory more suited to hosting the 25<sup>th</sup> edition of the 2017 FIA Mobility Conference, with the Japan Automobile Federation (JAF) welcoming the FIA's key mobility event to Tokyo in September.

"We are striving to include not only advanced vehicle technology in Japan but also topics such as other mobility services and traffic safety in order to provide a broad programme that will be of use to all automobile clubs, irrespective of whether they are from developed or developing nations," says JAF President, Takayoshi Yashiro."

## ADAPTING TO CHANGE

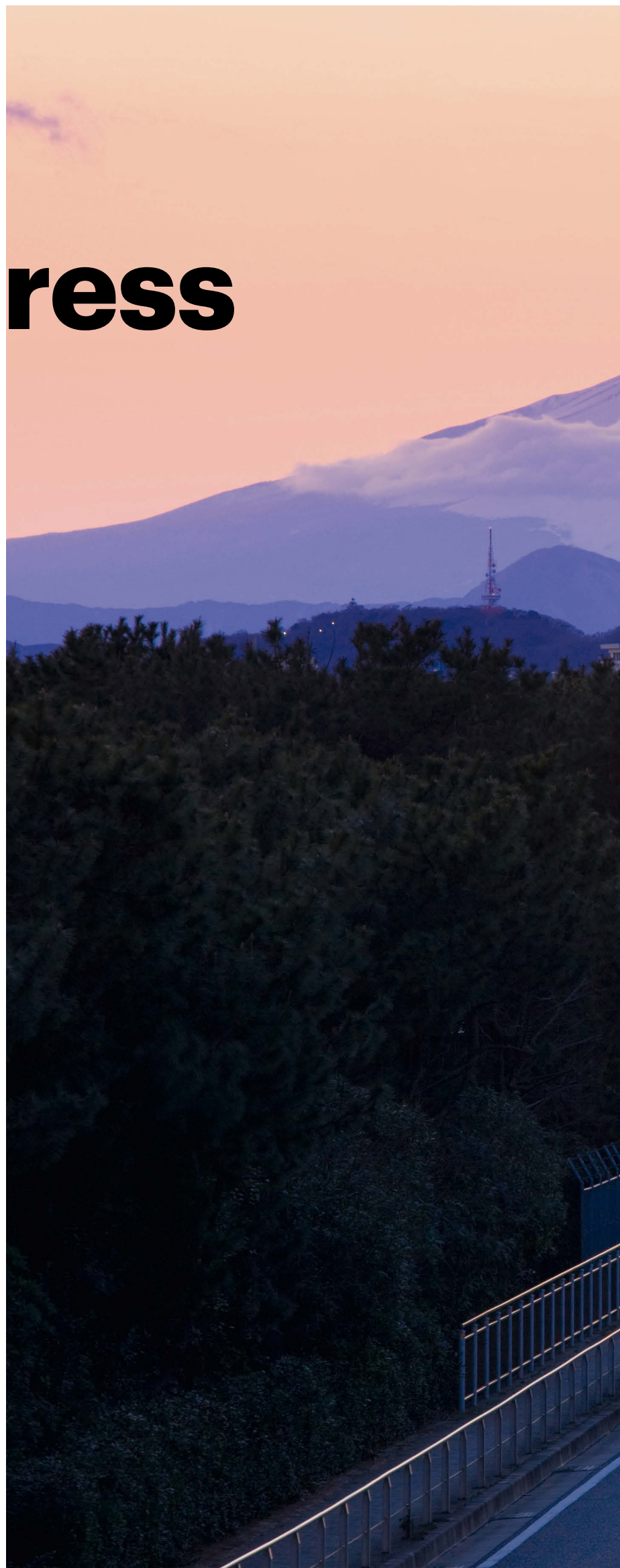
The Japan Automobile Federation, with more than 18 million members and extensive resources of information, is an excellent benchmark for identifying and understanding the new challenges of mobility and providing useful tools to other national automobile organisations.

Founded in 1963 to cope with the rapid motorisation triggered by the opening of the Olympic and Paralympic Games in Tokyo the following year, the club has since evolved significantly, though not without challenges of various nature and degrees of difficulty.

"We had to withdraw from the tourism business in 1997 after the government indicated that public services should not be involved in activities that exert pressure on private enterprises," explains Yashiro. "After closing that part of the business, we put our strength behind member loyalty services, and the number of partner facilities offering preferential service to JAF members rose to 45,012 by the end of June 2017, with a total of 28.72 million members using those services in the fiscal year 2016." ▶



JAF President Takayoshi Yashiro believes Japan faces unique motoring challenges.









In a highly competitive market, JAF has had to look for new outlets to attract members: not just roadside assistance, but touring, information and e-commerce services. Partnerships with regional municipalities have been significant in this context, enabling the club to expand and helping to revitalise local communities by attracting tourists to rural areas that are often penalised by the concentration of the population in large cities.

"In April, we grew our membership structure by creating a corporate membership geared towards car rental and leasing companies," says Yashiro.

"Next, we would like to prepare a membership that accommodates elderly drivers and other people who might return their licences voluntarily, by offering services that will convince them to retain their membership even after they no longer have a licence."

From the point of view of road safety, the elderly are one of the most at-risk categories in Japan. With 34,590,000 people aged over 65, accounting for 27.3 per cent of the population, Japan has one of the oldest populations in the world and this trend shows no signs of stopping.

"The number of elderly people who have a driving licence continues to rise," explains Yashiro. "There are concerns that as these elderly drivers age, their physical or mental functions may deteriorate. In recent years there have been accidents involving the driver mistakenly pressing the accelerator instead of the brake or driving down the wrong way of a highway."

Despite the number of traffic accident deaths for every 100,000 elderly people declining year on year, 2,138 elderly citizens died in collisions in 2016 in Japan. This represents 54.8 per cent of the total, which is the highest ever percentage and indicates that accidents remain a very serious problem.

JAF is pursuing a number of initiatives in this regard, such as the 'Omoiyalty drive' ('drive with consideration') road traffic safety promotion, which is supported by the FIA Road Safety Grant Programme and aimed at drivers as well as vulnerable road users (cyclists and pedestrians). There is also the promotion, through workshops, of Advanced Safety Vehicles (ASVs) – vehicles that are safer and easier to use than existing models

and which, through the use of collision-avoidance systems, are well adapted for elderly drivers.

Sustainable mobility is another major challenge for the Japan Automobile Federation.

"Approximately 15 per cent of the total CO<sub>2</sub> emissions in Japan comes from cars," says Yashiro. This has been gradually reduced from the peak in 2001 due to improvements in car fuel efficiency and increased effectiveness in distribution logistics. However, Japan has a target of reducing greenhouse gas output by 26 per cent [28 per cent in the transportation sector] compared to 2013 levels by 2030 in accordance with the Paris climate agreement, and it is therefore necessary to take new measures to reach these goals."

If you look at what JAF has done in the field of environmental protection – through the implementation of education activities on eco-driving, recommendations to local and national government on the purchase of eco-friendly vehicles in terms of tax incentive and the introduction of a special Environmental Working Group for motor sport – it is not difficult to envisage a future mobility compatible with the preservation of the environment.

The club's sustainable actions gain greater traction when seen in the light of an increasing

## 'Manufacturers have turned to motor sport as their business results improved'

rate of motorisation. After several years of decline, vehicle registrations in Japan are rising again and increased by 7.3 per cent to 1,577,750 vehicles during the first quarter of 2017. Increases in ownership come with running costs, however.

"Car users in Japan have had to bear the weight of a heavy tax burden," adds Yashiro. "JAF has used its position as an organisation of 18.81 million members to conduct a national survey and call for a fair, equitable and simple tax system that its members agree to."



Yashiro says a strong focus on grassroots competition, such as Auto Tests, should help boost motor sport in Japan.

But it is not only on the roads that JAF is active. As one of the FIA's national sporting authorities (ASNs), the Japanese club is involved in a wide range of motor sport services.

With over 68,000 competition licences and 854 events sanctioned in 2016, the club's main aims are to strengthen motor sport at the grassroots level.

Although the economic crisis in 2008 had wide-reaching implications affecting many car makers around the world, the Japanese economy can now be said to be gradually recovering and its involvement in world motor sport is increasing.

"Toyota has continued to participate in the FIA World Endurance Championship and returned to the World Rally Championship in 2017, Honda returned to providing power units for F1 cars from 2015, and other manufacturers also turned to motor sport as a way to market their own brands as business results improved," says Yashiro.

Away from top-level competition, JAF's other priority is to make motor sport more accessible.

"The introduction of F4 has established the single-seater pyramid in Japan from the OK kart category to F4, F3 and Super Formula, and the continuation of this hierarchy is important."

Through 371 grassroots events such as Auto Tests and Gymkhanas, a highly active JAF Women in Motor Sport Working Group and a new FIA Intercontinental Drifting Cup being launched imminently in Tokyo, the club hopes to expand participation in motor sport as much as possible.

"When we advocate involving more people in motor sport, we are often told that it has a very high entry threshold. We believe that introducing a form of motor sport where people can easily participate using their daily cars would be one effective method of expanding participation."

Returning to the roads, Yashiro believes that despite the rapid development of autonomous technologies, Japanese motoring will remain a car and driver environment for some years to come.

"We assume that the trend [of car ownership] will continue, excluding major metropolitan areas," concludes Yashiro. "Moving forward, there will come a time when all automobiles shift to being completely automated, and this will change the business environment. However, this transition is still far in the future and we have no way of predicting how that will play out." ◀

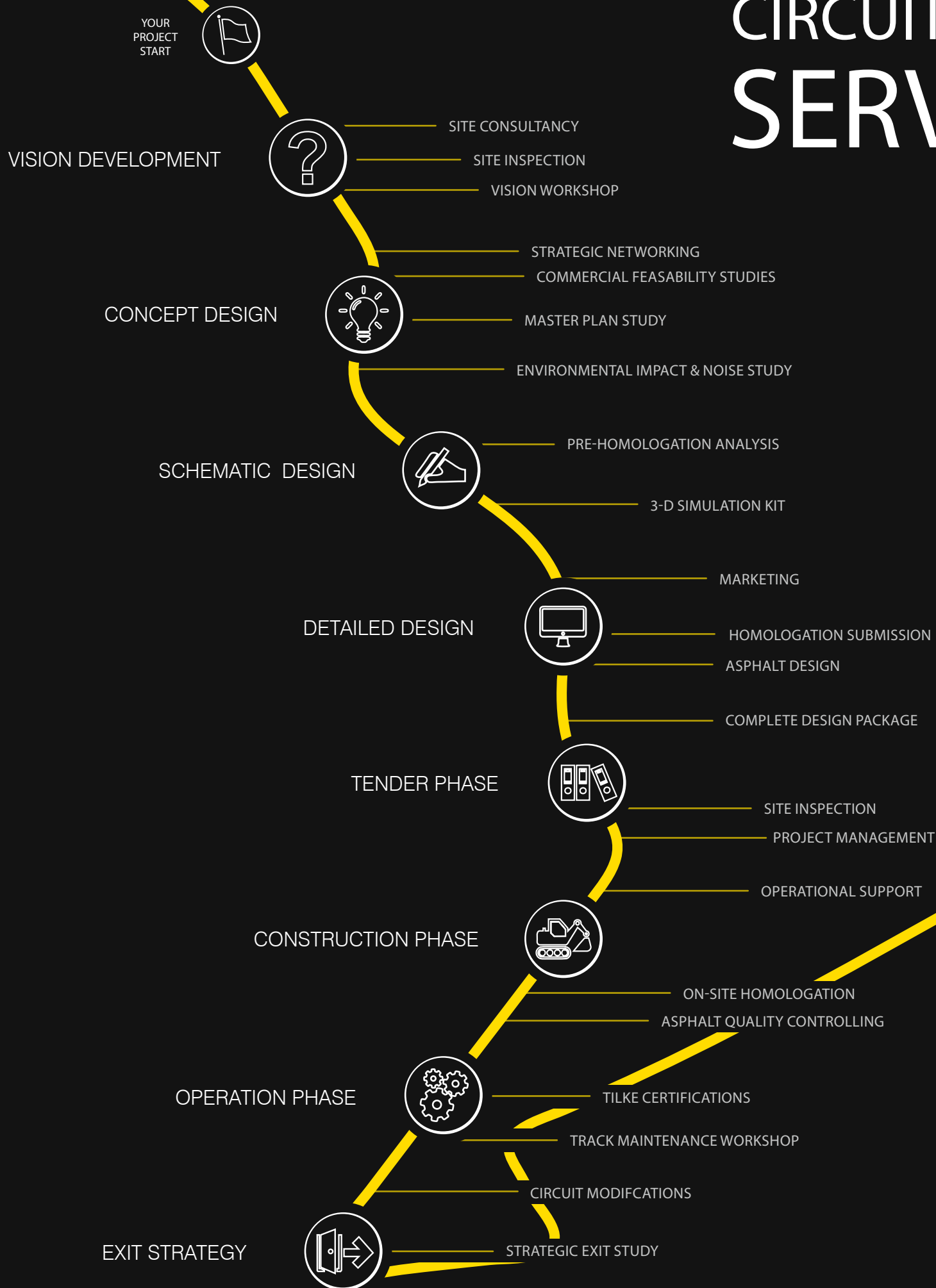


Japanese make Toyota returned to world rallying in 2017 (above), while Super Formula has an important place in the country's single-seater pyramid.





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09

As Formula E prepares to power up for the 2017/18 season, AUTO looks back at the big data from Season 3 of motor sport's most electrifying championship to see who sent sparks flying

# HIGHLY CHARGED RACING



0.001s

CLOSEST QUALIFYING

Just one thousandth of a second separated ABT's Lucas di Grassi from DS Virgin Racing's José María López in qualifying for Round 7 in Berlin, making it the tightest margin for pole position all season. Round 6 in Paris was almost as tight, with Renault e.Dams' Sébastien Buemi beating Techeetah's Jean-Eric Vergne to the front of the grid by just 0.006s. The biggest gap between front-row starters was the 0.238s between DS Virgin's Alex Lynn and ABT's Daniel Abt in Round 9 in New York.

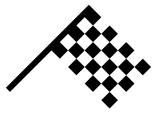
45m45.623s

QUICKEST RACE

The quickest race of season by far was Round 3 in Buenos Aires ePrix. Next on the list was the second race in New York, with a time of 52m29.275s, and then the second race in Berlin with a time of 53m19.661s. The slowest race of season was Round 6, the Paris ePrix, with a time of 59m41.125s.







# 104.7km

LONGEST RACE DISTANCE

In terms of distance, Round 8 in Berlin was the longest race of the season. The shortest was the opening round, the Hong Kong ePrix, at 83.7km.



# 154

MOST LAPS LED

Throughout the 2016/17 season Sébastien Buemi led the most laps of any driver. Next on the list are Felix Rosenqvist (131), Lucas di Grassi (77) and Sam Bird (74).

# 6

MOST WINS

Renault e.Dams' Sébastien Buemi took the most wins in 2016/17. But the benefit of the defending champion's success was undone by his absence in New York and disqualifications elsewhere. Consistency was the key to title glory for Lucas di Grassi, who took two wins.

#### 6 - Sébastien Buemi

Hong Kong, Marrakech Buenos Aires, Monaco, Paris, Berlin (Race 2)

#### 2 - Lucas di Grassi

Mexico City, Montréal (Race 1)

#### 2- Sam Bird

New York City (Races 1 and 2)

#### 1 - Felix Rosenqvist

Berlin (Race 1)

#### 1 - Jean-Eric Vergne

Montréal (Race 2)

# 11.83s

BIGGEST WINNING MARGIN

The biggest winning margin of the season came in Round 10 in Race 2 at New York. DS Virgin Racing's Sam Bird beat Mahindra's Felix Rosenqvist by 11.83s after taking the lead on lap 11. The tightest race finish was in Round 5 at Monaco, where Sébastien Buemi beat eventual champion Lucas di Grassi by just 0.320s.



# 3

MOST POLE POSITIONS

Three pole positions each for Felix Rosenqvist and Lucas di Grassi were the most achieved by any driver last season. Rosenqvist's came in Marrakesh, the second ePrix in Berlin and Race 2 in Montréal. Di Grassi qualified first in Buenos Aires and for Race 1 in Berlin and Montréal.

# 7

MOST PODIUM FINISHES

Lucas di Grassi enjoyed seven trips to the podium – more than any other driver last season. His path to the title was carved out by podium finishes for third place in Buenos Aires and Berlin (Race 2), second in Hong Kong, Monaco and in Race 1 at Berlin, and with wins in Mexico City and Race 1 at Montréal. Sébastien Buemi took six podiums, while Mahindra's Nick Heidfeld scored five.





TEXT

ERIC SILBERMANN

Jean Alesi is the latest F1 star of yore to be guiding his teenage son's burgeoning motor sport career – but he's determined to do it the right way

10

# A DAD WHO PLAYS IT COOL

**FINAL LAP**  
*the last word*

One of the most gifted grand prix drivers of his generation, France's mercurial Jean Alesi brought passion and high emotion to the Formula One grid, especially during an intense spell at Ferrari in the early-1990s. So, when

his son Giuliano started racing, the chances of Jean turning into the 'Racing Dad From Hell' looked pretty high. However, as 17-year-old Giuliano goes for glory in the GP3 Series, Jean is taking a dispassionate approach to his son's career.

**Did Giuliano ask to go racing or did you suggest it?**

He grew up with racing people and it struck him as perfectly natural to be in this world, so he didn't realise the difficulty entailed in being a racing driver.

When he was about five, he had little buggies at home. I let him do his own thing in the garden, wearing seat belts and a helmet so I didn't care if he rolled it over!



He never said anything about wanting to go racing and, naturally, neither did I. Then, five years ago in Indianapolis (Jean made an unsuccessful assault on the famous 500-mile race in 2012), he told me he wasn't sure if he wanted to do Indianapolis or Formula One!

**How did you react?**

I explained to him that as a 13-year-old he would be starting very late, up against kids who had been doing it since they were eight. I told him he'd have to start in karts to see if he could hack it and that he'd take a real pasting... and he did for two years.

**When he started karting did you teach him how to drive?**

No, because today karting is a very professional environment and from the moment you put him in a well-run team you have to let the pros tell him how to drive.

**But you drove in 201 F1 races, so surely you would have been his best tutor?**

It would be really stupid if I said, "listen guys, let me tell you how it is". My Formula One has nothing to do with the Formula One of today. The only area I discuss with him is his state of mind. I also took him to see the 'museum' my mother has at home with all my trophies and photos from my early days.

Giuliano knew his father as a Formula One

driver, but I did all the junior categories too. I showed him my results from when I was starting out: sixth, eighth, crashed, 10th... I told him that before you can run you have to walk and just because your father was in F1 it doesn't mean you will be.

**And what about his mother?**

She asked me if he had the talent. It was a good question and one I could answer having driven against the likes of Senna. When he started in Formula 4, I got in one car and told him to follow me in his and then I followed him. I could see him driving on instinct, because he was only 15 and knew nothing. He drove like a cat being chased by a dog, but I could see he had the control and I was convinced there was something there. But I insisted that he had to continue his studies, because I did not want to ruin my son's career.

**So you know how not to be the pushy dad?**

Yes, I'm not the sort to say that I want my son to be in Formula One and push to achieve that at all costs.

**Emotionally, is it hard to watch Giuliano race?**

At first, it was very stressful, but I'm getting calmer now because he can deliver the performance. But he's also got some experience and he doesn't seem to do stupid things at the wheel.

**Presumably, because he started late, you moved him on from karting quite quickly?**

Yes, when he was 15 I moved him straight up into French Formula 4 where everyone has the same equipment, so it would be a good way to evaluate him against the others. It was not too bad and he won three races.

**And you pursued your fast-track policy again last year?**

Yes, I then decided to present him with a big step forward into a category where he would have to learn as he went along. That's what happened, as he had a difficult 2016 in GP3, racing against guys with a lot more experience.

**Were you already thinking about Formula One at this stage?**

No, and I'm still not thinking about it today. The way I got to F1 wasn't planned. You can't plan it, but it's a world I know and I understand how it works. All I can plan is what category he should race in and try to find sponsors.





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