Automotive World MAGAZINE



Nikola exclusive:
'We're going to control trucking in America'

Green mobility proves the real winner in post-COVID support packages | Ford doubles down on CVs in new mobility vision | Why BMW remains bullish on hydrogen | 'Radical action' from Nissan signals end of Ghosn era | Volkswagen CEO faces uphill battle with COVID recovery | Yandex moves closer to universal robotaxi tech |

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Editor's note

"We beat Daimler, Volvo, Tesla, everybody..."

A sudden appearance on the NASDAQ in early June—thanks to a complex reverse merger that increased Nikola's stock from US\$3bn to US\$10bn before it went public—saw the company's valuation exceed US\$30bn to briefly top Ford Motor Company. The subsequent slide in share value brought the company's market cap back down, but it settled at a nonetheless staggering US\$23bn. And the company has yet to deliver a single truck.

With bold and seemingly incredible ambitions—"We're going to completely control trucking in America" and "We will become the leader in electrified pick-up trucks"—it's easy to understand why Nikola and its founder and Chairman Trevor Milton command equal measures of passion and cynicism.

In an exclusive and fascinating interview with *Automotive World*, Milton discusses a range of subjects, from battery and fuel cell electric trucking to the importance of connectivity, autonomous driving, and the company's plans to dominate North America's electric heavy-duty and pick-up truck markets.

Nikola claims to be "a global leader in zero-emissions and infrastructure solutions", but it's in the truck market and out on the road where Nikola will need to show that it can convert those solutions into credible products.

Martin Kahl Editor-in-Chief, Automotive World

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Could cleaner mobility be a crisis success story?

How much impact will various governments' post-COVID industry support packages have on the automotive industry?

By Megan Lampinen





he automotive industry has been particularly hard hit by the novel coronavirus (COVID-19). Demand for new vehicles disappeared almost overnight, factories were halted, workers furloughed and cash reserves burnt through rapidly. While operations are tentatively restarting, the coming economic downturn offers little hope for a rapid recovery in demand.

In Europe, sales forecasts have been lowered dramatically. The European Automobile Manufacturers' Association (ACEA), for instance, now expects demand across the region to fall 25% year-on-year to around 9.6 million units—that would mark the sharpest decline on record. But ACEA suggests there are remedies at hand.

"ACEA maintains hope that this dramatic scenario can be mitigated through fast and strong measures by the EU and national governments," stated ACEA Director General, Eric-Mark Huitema. "Given the unprecedented collapse in sales to date, purchase incentives and scrappage schemes are urgently required right across the EU to create much-needed demand for new cars. In the interest of our industry and the wider EU



Governments are supporting EV uptake through vehicle subsidies and charging infrastructure investment

economy, we are calling for the necessary political and economic support—both on the EU as well as the member state levels—in order to limit the damage to production and employment over the months to come."

A handful of governments have responded to the call, stepping forward with a range of economic stimulus measures from Value Added Tax (VAT) reductions and new vehicle incentives to job retention and loan schemes.



The French government was the first in Europe to come forward with an automotive stimulus plan, allocating €8bn (US\$9bn) to various forms of industry support. The move was not surprising considering what lies at stake both in terms of the sector's GDP contribution and the government's 15% holding in Renault. President Emmanuel Macron told media that any setback to the automotive sector would represent a wider setback "to French identity."

The package focuses heavily on the transition towards cleaner transport, specifically electric vehicles (EVs). Macron wants France to lead Europe's EV revolution and has set the goal of producing one million EVs by 2025. To reach that target, the government is offering up to



€12,000 off the price of a new EV as well as incentives for the conversions of combustion engine vehicles to electric ones and an increase in the number of charging points. Notably, the French government also provided a €5bn loan guarantee for Renault.

Just days after France unveiled its package, Germany came forward with its version. Around €2.2bn has been allocated towards incentives for electrified vehicles-both full EVs and plugin hybrids. For EVs with a price tag of up to €40,000, the government will offer subsidies of €6,000. More expensive EVs will receive a slightly lower €5,000 subsidy. Subsidies on plug-ins come in at €4,500 and €3,750, depending on price bracket. Notably, these are just the government's contribution

and come in addition to the subsidies offered by automakers. In some cases, shoppers could see a total price reduction of up to €9,000.

Other transport-related support includes €2.5bn for EV charging infrastructure and battery production, €1.2bn for clean trucks and buses, €7bn in support for hydrogen investments and €5bn for the railway company Deutsche Bahn. Indirectly, Germany is also supporting automakers through reduced interest rates on car loans and increased commercial lending to companies. A cut in the standard VAT rate from 19% to 16% will run from 1 July to 31 December 2020. While this is a welcome message for the public, the consensus is that it is unlikely to convince many to go out and buy a new vehicle.

In Spain, the government has allocated €3.75bn to help the local automotive sector, which supports two million jobs and accounts for about 10% of the country's GDP and one-fifth of its exports. As with the other governments, Spain's package aims to promote the industry's competitiveness and ensure sustainable mobility. It, too, emphasises EVs, providing

€250m in subsidies and trade-in discounts until 2022.

Spain has also agreed to grant €2.6bn in loans and loan guarantees to industry players, including suppliers and retailers, through 2022. The credit line includes loans to modernise factories and for companies to renew their fleets. Along with new tax breaks for the sector,

the government is also supporting grants of up to €415m for R&D and €95m for training programmes.

A greening of the industry

As outlined above, the stimulus measures in these key European markets show a decided push on



low-emission technology. This stands out from other regions, particularly the US. "European governments are looking at a green recovery from COVID-19, in clear contrast to the US where federal emission legislations set under Barack Obama are being rolled back by the Trump administration," noted Arushi Kotecha, Research Analyst at The Economist Intelligence Unit (EIU).



"Even in China, the government had extended the generous subsidies at the height of the pandemic until end-2020 but has since tightened eligibility criteria."

As Jonathan Storey of Automotive Reports observed: "France, Germany and Spain are clearly looking to do more than simply provide support to their automotive sectors-which are just one of many sectors affected by COVID-19. There is a common theme emerging of increasing subsidies for the purchase of new EVs and hybrids, with France and Spain also offering reduced incentives for the purchase of less polluting gasoline or diesel vehicles." Notably, all three plans confine their subsidies to vehicles costing up to €45,000, which typically includes models such as the BMW i3, Hyundai Ioniq Electric, Hyundai Kona Electric, Kia Nero Electric, Peugeot 208 Electric, Renault Zoe, Tesla's Model 3 and the VW ID.3, deliveries of which start later this year.

Government may have a green agenda and automakers are developing green models, but will consumers play along? Initial feedback indicates they will. "EV sales have been relatively resilient so far in 2020, meaning that consumers are also willing to support a green recovery," Kotecha told Automotive World. "The increased incentives are targeted at wealthy, urban professionals who are doing least badly during the recession. Since EVs are better suited to cities, there will be higher uptake by individuals wanting to avoid public transport."

Upnext: UK

During the last economic crisis, the UK government implemented a scrappage scheme and many have been waiting for news of another such measure. "A scrappage scheme would be a massive boost to the UK car industry," said James Hind, Chief Executive of car buying comparison site Carwow.

To date, the government has outlined a £73.5m (US\$92.25m) funding package for green automotive projects, geared at safeguarding jobs, but many are calling for more. "From a motor retailer and manufacturer perspective, this funding doesn't help them now because this money is set for forthcoming projects in years to come," said John Roberts, Head of Automotive and Roadside at Colliers International. "The sustainable automotive industry agenda is vital, and we do need a strategy that encourages the public and stakeholders to move away from more polluting vehicles to greener cars. A solution could be for the government to consider introducing a new scrappage scheme."

UK automotive industry body
Society of Motor Manufacturers
and Traders (SMMT) has been
vocal in its concerns. "With
strategic support we can make
sure that staff come back to work
and not into redundancy," said
SMMT Chief Executive Mike
Hawes. "We have seen
governments in Germany,
France and Spain commit
billions. The UK government

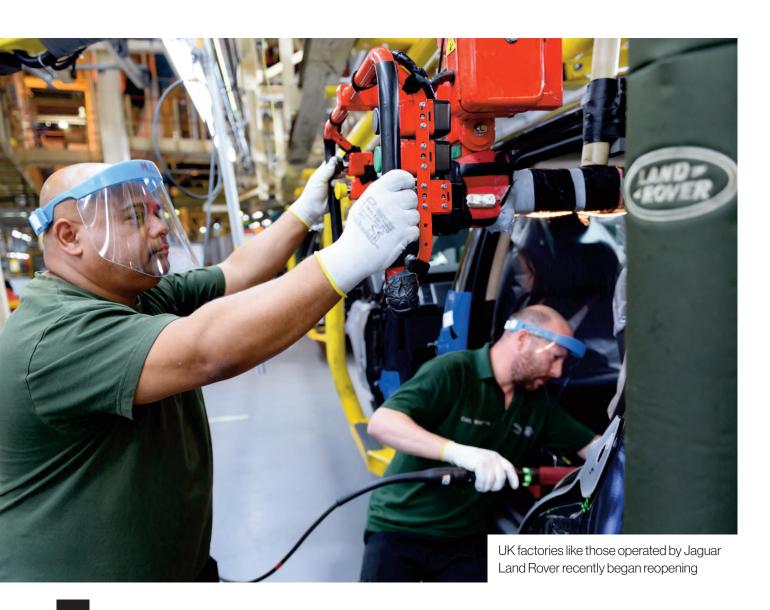
threw its arms around businesses when they first shut, and it shouldn't let go now. With the right support we can overcome this crisis."

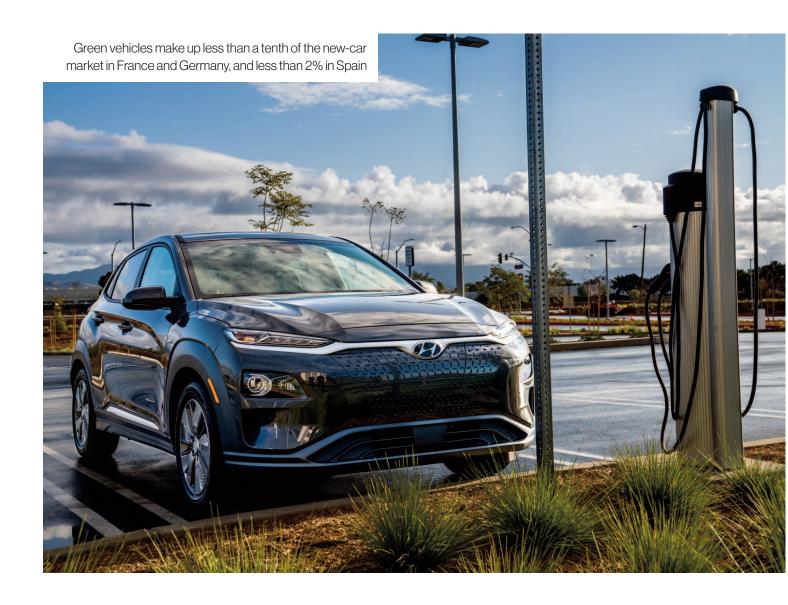
However, such support may not be forthcoming. "I do not see things like a car scrappage scheme being on the government's agenda," warned Chris Giles, Economics Editor at the *Financial Times*. "It doesn't really help the UK economy–90% of cars bought in this country are imported, so the scheme effectively helps other economies. It may help car dealers but not the UK economy as a whole."

Helpful but not game changing

The industry response to measures outlined so far has been generally welcoming but subdued. S&P Global Ratings Credit Analyst Vittoria Ferraris described them as "helpful but not game changing." The EIU's Kotecha has warned that the strong focus on EVs will limit volume impact, as green vehicles currently make up less than a tenth of the new-car market in France and Germany, and less than 2% in Spain, according to 2019 data.

The impact on the EV segment specifically may also be modest. Moran Price, Chief Executive of electric powertrain specialist IRP Systems, warns these will only ever be short-term solutions. "These stimulus measures are directly connected to efforts to accelerate electrification," she pointed out. "I appreciate that the regulators and governments are pushing this. It is very important, but it's really only showing the direction in which the industry needs to go. These are not long-term solutions." To attain sustainability, she urges the industry to focus on the economics of EVs, which remain





more expensive than their traditionally powered counterpoints.

Matthias Heck, a Vice President and Senior Credit Officer at Moody's, told *Automotive World* that "the stimulus measures are credit positive for automakers and parts suppliers as they could lead to a lower decline in unit sales in 2020. However, we do not expect those measures to have a structural positive impact on sales over the medium term."

Beyond unit sales, these measures are also geared at injecting liquidity into the market and extending guarantees on new debt issues. This reduces the general financing risk for issues, and is critical for many players as they prepare to restart production using working capital. "However, even where government support bolsters near-term liquidity, our expectations for the longer-term operating performance and credit metrics of borrowers remains key to possible rating changes," warned Ferraris. "We think the crisis will reveal even more sharply the quality of companies' competitive positioning, cost management, and financial strength, which will be important rating drivers beyond liquidity."

Ferraris went on to caution that, while automakers are key economic contributors, their importance to wider mobility developments-and hence to government-is limited: "Although ensuring the mobility of businesses and consumers is critical to an economy, we believe the importance of individual automakers is limited to governments. That's because a potential default of any carmaker would not necessarily impede mobility. Consumers would still have access to a large variety of competitors' offering products and services."



eavy trucks, according to the California Air Resources Board (CARB), are the US state's largest single source of vehicular air pollution, "responsible for 70% of the smogcausing pollution and 80% of carcinogenic diesel soot even though they number only 2 million among the 30 million registered vehicles in the state."

In the six short years since it was founded, the Phoenix, Arizona-based company has become a leading name in Trevor Milton Nikola tweet response to CA electric truck mandatethe truck industry, thanks primarily to securing the confidence of a number of major names in vehicle manufacturing and trucking, and the recent IPO which saw Nikola Corporation's value briefly



In the days after it went public in early June 2020, Nikola Corporation's value briefly surpassed Ford Motor Company's US\$30bn market capitalisation. It is currently worth around US\$23bn

No great surprise, then, that in late June 2020, California would adopt the world's first mandate for emissions-free truck sales; binding annual targets from 2024 to 2035 require truck manufacturers to sell zero emissions trucks. By 2045, notes CARB, every new truck sold in California will be zero-emission.

"Big news for Nikola and BEV / FCEV demand," tweeted Trevor Milton, Chairman and founder of Nikola Corporation in response. "The markets are asking for more options. We won't be the only ones, it'll help everyone. Nikola is in a great position. Our 300+ mile BEV is amazing and needed. Our 500+ mile FCEV is long haul game changing."

surpass Ford Motor Company's US\$30bn market capitalisation, before settling at a nonetheless eye-watering US\$23bn.

That valuation

Whether such a valuation helps or hinders a company that has yet to produce and sell its first vehicle "depends on what the conversation is about," Milton tells *Automotive World*.

"When you have the kind of success Nikola's had in the stock market, you become a target for those who don't understand the business model or make profits in shorting," he explained. "For the



Nikola will build its own hydrogen fuelling stations and locate them strategically along routes where it has customer orders, reportedly starting with ten stations in California

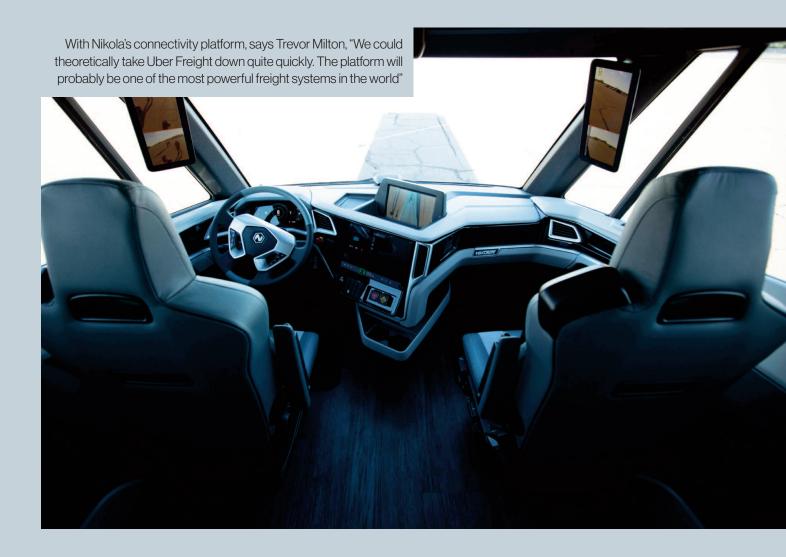
most part, it's a positive. The market cap allows us to have incredible conversations and relationships with groups around the world. It brings a validity to our business model when it comes to joint ventures and partnerships."

The company has the backing of Robert Bosch and CHN Industrial, the owner of Iveco trucks, and prominent shareholders include VectoIQ, Iveco, ValueAct and Fidelity. Milton is keen to insist that it is Nikola's long-term strategy that attracts investors, who see greater value in vision than in near-term revenue.



We came to the conclusion that if you took Nikola's intellectual property and combine it with Iveco's 50-plus years of chassis manufacturing and supply chain for heavyduty trucks, we could become one of the top manufacturers in Europe, and also the USA

Trevor Milton, Nikola



"The only thing many people have against us is that we don't produce anything," he notes. "And we just laugh at that. It took Tesla nearly ten years to get to where it is today, and it took it many years to get to where we are now in our first year." Like Tesla, Nikola has a passionate online following, counterbalanced by equally passionate critics and doubters—and Milton is prepared to engage and debate publicly with them.

"We went public specifically because people could see exactly where we are, that we're legitimate," he insists. "Everyone's willing to give you one year. We have the most advanced semi-trucks in the world, built. We've shown them on video, at Nikola World, and we've delivered beer with them. We also have one of the most advanced pick-up trucks in the world coming out. So, yes, there's no doubt we have to deliver, but it's not really that big of an issue."

Blank cheque?

If it felt like the stock market launch and the subsequent valuation came around very quickly, there's good reason: a complex reverse merger by New York-headquartered VectoIQ—a 'blank cheque' investor in future mobility companies led by former General Motors Vice-chairman Steve Girsky—played a major role

in Nikola's sprightly appearance on the NASDAQ. So too did the recent WeWork scandal, which caused panic amongst investors, explains Milton. When WeWork went public, "all the ugliness started to show," he says, and understandably, investors questioned Nikola. "That was one of the big reasons why we decided to go public and show everything. When you go public, you can't hide anything-it's all there. We decided it's time to let people see our business model, it's time for people to ask questions."

The relationship with VectoIQ offered mutual benefits. "Our bankers and advisors saw an opportunity with a company





Based on an Iveco S-WAY chassis, the Tre is Nikola's pure battery electric cabover truck with a range of 300 miles (482 km)



looking to go public with a company just like ours. We met with them and six months later we were public." Much of this was facilitated by Girsky's presence, notes Milton. "That brought considerable comfort to the investors, knowing that someone who used to run GM along with all of his due diligence team came in and looked at Nikola and gave a stamp of approval."

VectoIQ voted in favour of the reverse merger with Nikola on 2 June 2020. That move boosted Nikola's value from US\$3bn to US\$10bn before it went public under a new NASDAQ ticker, NKLA. Its stock surged 104% on the third day of trading, briefly giving the company a higher market cap than Ford.

Nikola's planned range consists of the Nikola One, Two and Tre heavy trucks, the Badger pick-up, and electric powersports vehicles including a dune buggy and a jet ski. The company has booked orders worth over US\$10bn, primarily from Budweiser owner Anheuser-Busch, which has ordered 800 units. In terms of revenue, Nikola plans to have sold or leased 7,000 BEV and 5,000 FCEV trucks by 2024, by when it anticipates annual revenue of US\$3.2bn.

As for production, Nikola will break ground in July 2020 on a 35,000 upa factory in Coolidge, Arizona. In Europe, it will build vehicles in partnership with CNH Industrial's truck brand Iveco.

'The perfect relationship' with CNH

Among the major companies working in fuel cell truckingnotably Toyota, Paccar, Hyundai, Daimler and Volvo-there was previously no sign of Iveco, but the companies were introduced whilst Nikola was raising capital and Milton calls it "the perfect relationship". A leader in natural gas trucking in Europe, Iveco has been pushing a post-diesel agenda since the 2018 IAA when it ran a diesel-free stand; however, it was Iveco's lack of expertise in heavy-duty truck electrification that drew it to Nikola. "We came to the conclusion that if you took Nikola's intellectual property-the batteries, the inverters, the controllers, the HMI, the vehicle controls, electrification and combine it with Iveco's 50-plus years of chassis manufacturing and supply chain for heavy-duty trucks, we could become one of the top manufacturers in Europe, and also the USA."

The partnership, says Milton, will enable Nikola to produce and launch the first zero emissions semitruck that can go more than 300 miles (482km). "That's one of the greatest achievements in the world. We beat Daimler, Volvo, Tesla, everybody. And that comes out next year. We have hand-built units coming off the assembly line right now and we enter into limited assembly next year."

The trucks are built via a joint venture operation at Iveco's Ulm, Germany factory, which is currently assembling test versions of the Nikola Tre pure battery electric cabover truck. Based on an Iveco S-WAY chassis, "we revised it dramatically to be completely built around the Nikola electrification platform," explains Milton. "All the electrification was provided by Nikola-the batteries, e-axles, motors, inverters, controls, as well as the infotainment system and overthe-air updating. The chassis is co-engineered with Iveco. You could not ask for a better relationship."

operating cost is different from the day before. And sometimes it can go up 30% over one month. This is a huge problem." With its pay-per-mile business model, says Milton, "Nikola figured out how to simplify that whole process." Nikola will build its own hydrogen fuelling stations and locate them strategically along routes where it has customer orders, reportedly starting with ten stations in California.

"All customers do is pay us per mile," he explains. "We cover everything—the truck, the hydrogen, the fuel, the service, the warranty. You don't do anything



Unfortunately, we've reached the pinnacle of what you can do for a driver in a diesel truck. We have yet to even scratch the surface on what you can do for a driver with an electric truck

Selling routes

Nikola's strategy hinges on more than the sale of the trucks. The biggest problem in trucking is the unpredictable operating cost, explains Milton, due to frequent fluctuations in diesel, service and warranty costs. "Your daily truck except pay the same cost per mile for seven years. It's the first time in trucking that customers could standardise their rates. We've seen a huge success on this, and one reason why Nikola's valuation is where it's at is because it fixes the supply chain of trucking. No-one's been able to do that, until Nikola came along."



On taking down Uber Freight

A key area for Nikola is connectivity, which serves to provide fleet managers with clear visibility of truck and driver performance. Crucially, however, Nikola's connectivity plans also benefit drivers beyond operating in a state-of-the-art cab. "We've worked hard on allowing private drivers to be able to see all the loads available within the city. And the algorithms will actually make the most money for them. It's all built in," he explained. "Because we are the only ones that own the truck and the fuel, we have a

unique advantage. We could theoretically take Uber Freight down quite quickly. And that's because they don't control the cost of the fuel. All they control is the load."

Nikola's platform, says Milton, "will probably be one of the most powerful freight systems in the world because it'll allow truck drivers to see every load. You can tell it where you want to go, it'll give you every load going that you could pick up and how much time it will take you to go get the load, how much money you'll make on the route. And everything's through our system. There are no variables. You don't

have to worry about what the fuel prices are going to be along that route."

So confident is Milton of Nikola's load matching algorithms, that he tells Automotive World: "I think in the next ten years we're going to literally completely control the supply chain and trucking in America." Moreover, drivers are "lining up to work for companies that are going to offer our truck," he claims, adding: "Unfortunately, we've reached the pinnacle of what you can do for a driver in a diesel truck. We have yet to even scratch the surface on what you can do for a driver with an electric truck."





Available as a 120kWh blended FCEV/BEV with up to 600 miles range, and a 160kWh BEV with 300 miles range, the Badger will be built from 2022 through a joint venture with a yet to be announced major automaker

Autonomous trucking creates jobs

Autonomous drive technology is widely seen as finding its first success in trucking; how, then, does Milton square the excitement of driving Nikola trucks with autonomous trucking?

No threat, he says. "Autonomous trucks will definitely be the future of all transport across the freeway systems, but not inside the cities. Our trucks are fully autonomous capable. We've built it to where they can handle Level 4 and 5 directly to our gateway. We don't do autonomous ourselves, but it's compatible with pretty much all the top autonomous systems. And that allows us to move all of our freight on the freeway without a driver," said Milton. "Drivers want to be inside the city anyway. They don't want to be on the road, away from their family, having to deal with travelling and food and poor health and everything else. We're going to move drivers away from freeway driving and move them to city driving. The autonomous trucks will drop their loads off outside the city and then these drivers will take five, ten or 20 loads into the city a day."

Crucially, he says, autonomous drive technology does not replace jobs. "It just increases the number of jobs within driving trucks in the city. Because now you have more loads arriving quicker, they need more drivers to deliver."

The Badger

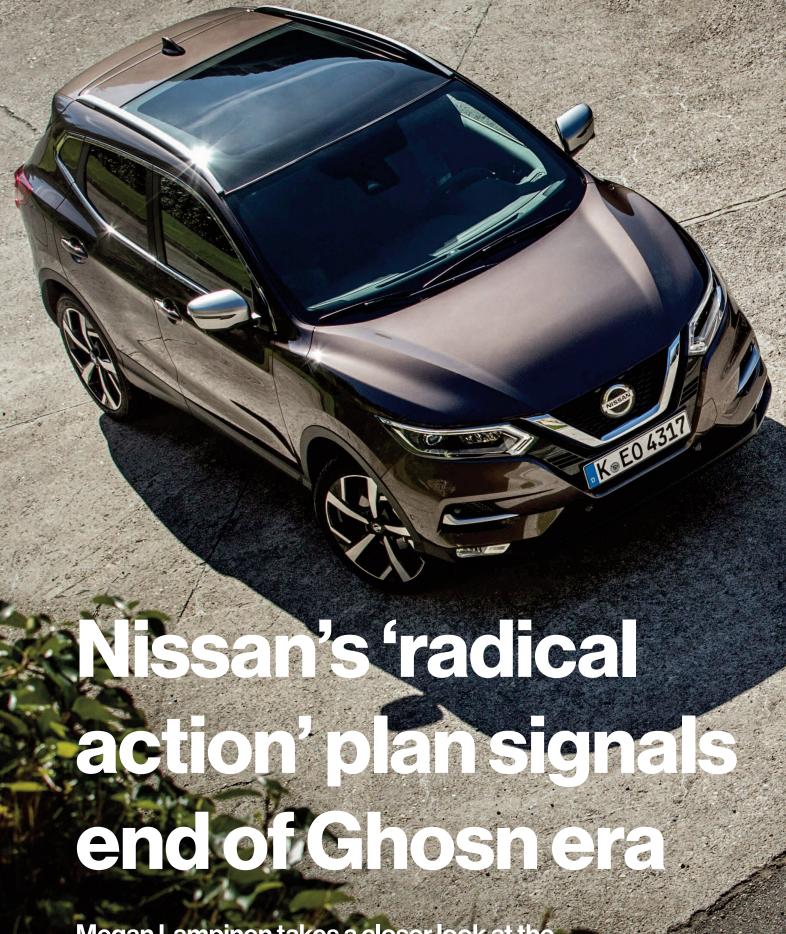
Nikola could hardly be described as lacking momentum, and reservations opened at the end of June for the

Badger, Nikola's bold entrant into what looks set to be a crowded electric pick-up truck market, going up against offerings from Ford, GM, Lordstown Motors, Rivian and Tesla. Available as a 120kWh blended FCEV/BEV with up to 600 miles range, and a 160kWh BEV with 300 miles range, the Badger will be built from 2022 through a joint venture with a yet to be announced major automaker, and sold as a product line alongside their offering. By sidestepping the need to develop manufacturing and sales operations, Milton believes Nikola could save five years and US\$5bn, and "allow us to kick our competitors really hard. We will become the leader in electrified pick-up trucks."

The company is currently planning to host the 2020 edition of its open doors event, Nikola World, in early December, at which it will unveil the Badger. "But obviously we hope COVID's fully under control by then," he added.

Global leader?

With seemingly incredible ambitions for a company currently without any market presence other than merchandise, but a host of highly credible industry partnerships and a stunning market cap, it's easy to understand why Nikola commands equal measures of passion and cynicism. Confident communications that open with statements about being "a global leader in zero-emissions and infrastructure solutions" may have excited the stock markets, but it's in the truck market and out on the road where Nikola will need to show that it can convert those solutions into credible products.



Megan Lampinen takes a closer look at the dramatic cost-cutting strategies outlined by Nissan and its Alliance partners

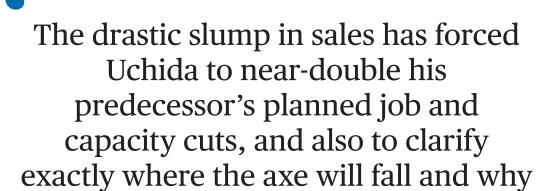


issan's new Chief **Executive Makoto** Uchida has outlined a wide-ranging operational overhaul that signals a decisive break from the Carlos Ghosn era. Uchida himself has described the four-year blueprint as "radical action" that is designed to bring Nissan back on track towards sustainable growth. "We must concentrate on core strengths while enhancing the quality of our business," Uchida told media. "We are transforming business in face of major economic headwinds for the automotive industry, which have been intensified by the novel coronavirus (COVID-19) pandemic."

Nicholls, Director of Industry
Operations at the Economist
Intelligence Unit. "That was
before the coronavirus struck
and completely upended the
global automotive sector. The
drastic slump in sales has forced
Uchida to near-double his
predecessor's planned job and
capacity cuts, and also to clarify
exactly where the axe will fall
and why."

Where the axe falls

Under the restructuring plan, Nissan wants to shave around ¥300bn from its annual fixed costs. Production volumes will be slashed by 20% to 5.4 million



The automaker recently reported a ¥671bn (US\$6.17bn) net loss for the latest fiscal year, marking the first annual loss in a decade and the biggest loss in two decades. "Back in December last year, Uchida was already apologising for the company's financial slump, blaming it on "overambitious goals"—and therefore, implicitly, Carlos Ghosn," commented Ana

units a year and the plant utilisation rate will jump to more than 80%. That will entail closures, and the Barcelona facility in Spain is on the chopping block. According to Automotive World's Global vehicle assembly plant database – 2020 edition, output at the plant declined by almost 34% last year. Assembly of the Nissan Navara, NV200 and Pulsar, and

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We are transforming business in face of major economic headwinds for the automotive industry, which have been intensified by the novel coronavirus (COVID-19) pandemic

Makoto Uchida, Nissan



the Renault-badged Alaskan totalled 55,878 in 2019, down from 84,217 units in 2018. Reports suggest that Nissan's Sunderland factory in the UK will add Renault production to improve its capacity utilisation.

Nissan's Purwakarta assembly plant in Indonesia will also close. This facility has been operating well below capacity, with volumes last year down by two-thirds from 2018 levels. The Purwakarta closure will leave Thailand as Nissan's sole remaining production base in the ASEAN region. Notably, the company has also decided to exit South Korea and withdraw the Datsun brand from Russia. These withdrawals mark a significant dialling back from the aggressive global expansion pushed by predecessor Ghosn, but along with the plant closures they should make a

dent in fixed costs and reduce Nissan's exposure to less profitable markets.

Regionally, the new strategy refocuses Nissan's core operations on the markets of Japan, China and North America. There is also a shift in strategy regarding model lineup: the number of models will drop from 69 at the moment to less than 55, with more emphasis on electric vehicles (EVs) and sport cars. "The scaling back of its model line-up will focus its energies on betterselling models, as well as its new EV launches," Nicholls told Automotive World. Nissan has set a target of more than 1 million sales of electrified vehicles a year by the end of fiscal year 2023. In its home market it will introduce two new EVs and four more e-POWER hybrid vehicles.

Nissan's Barcelona facility is slated for closure under the cost-cutting plan

The Alliance

"By spelling all this out, Uchida is leaving no doubt about the seriousness of the overhaul," noted Nicholls. But it's not just Nissan. The company is part of a the wider Renault-Nissan-Mitsubishi Alliance (RNMA), and its mid-term plan needs to be seen alongside the simultaneous announcements coming out of its partners-all of which face stiff headwinds from the market's collapse in the wake of the pandemic and increased pressure around electrification and autonomous driving. Renault, for instance, has also announced a plan designed to slash its fixed costs by more than €2bn (US\$2.24bn) over three years. Like Nissan, this blueprint calls for a 20% capacity cut.

Even more noteworthy is the Alliance-wide revamp that takes in all three partners and introduces a new business model for their collaboration. At the heart of this strategy is the 'leader-follower scheme', which will result in less independence around car development. In this model, the lead company in a particular region or segment will develop and build the vehicles for the Alliance. "The new approach has both operational and symbolic significance," stated Jonathan Storey of Automotive Reports.



"Operationally, it can be seen as a natural evolution of this long-standing and generally successful alliance. However, it is still a significant step-change and the flip-side of integrating the partners more closely is that further brand individuality will be lost. Whether this turns out to matter or not will be down to the plan's execution."

Nicholls specifically highlights the change in the partners' cost-cutting tools: where previously they looked to cooperation, shared model development, and joint purchasing, now they hope to achieve savings through making their businesses more complementary and reducing overlap. "That should reduce

some of the bureaucracy that was involved in their grand alliance, but it will arguably leave each focusing much more on its own business—essentially carmakers co-existing," she said. "Friction should be reduced, but the alliance will still be fragile."

At the same time, this Alliance reboot sends a message to the industry about the unity of the partners. "Symbolically, the new RNMA plan makes the statement that the partners not only remain committed to the Alliance, but will increase their dependence on it and each other," suggested Storey. "Such a statement was sorely needed after about two years of doubts and rumours of break-up."





utomation and electrification have dominated industry headlines and conversations for the past few years as automakers pour billions of dollars into new technology. While these investments are geared at securing brand viability in the future, near-term investments are just as important to keep the cash flowing and finance these developments. For Ford, fresh investments in the commercial vehicle (CV) segment could prove the key to securing muchneeded revenue in both the near and long term.

Three new models, 8 million units

Ford currently allocates 80% of its vehicle spend on CVs, pickups and utilities, up from just over 60% a few years ago. It was the leading CV brand in Europe in the first quarter this year, during which time its share jumped 40 basis points, giving it 15% of the market. To further its standing here and to help with development costs and timelines, it is forging ahead on new projects with Volkswagen Group.

The two first outlined plans to work together on a number of projects last July. Such collaboration is an increasingly common theme across the industry as players grapple with the hefty financial demands required for new model development and CASE (connected, autonomous, shared and electric) technology. As well as electric vehicles and autonomous driving, this particular partnership also extends to commercial vehicles.

"In light of the COVID-19 pandemic and its impacts on the global economy, more than ever





COVID has had a pretty material impact on how we look at mobility



it is vital to set up resilient alliances between strong companies," said Volkswagen Group Chief Executive Herbert Diess. "This collaboration will efficiently drive down development costs, allowing broader global distribution of electric and commercial vehicles, and enhance the positions of both companies."

Last year, Ford and VW had a combined 27.6% share of Europe's LCV market. Only the combined operations of FCA and PSA hold a bigger share at 32.8%. Renault-Nissan, meanwhile, holds a 20% share. "This is a key segment because of its profitability," said

Felipe Munoz, Global Automotive Analyst at JATO Dynamics. "Usually these vehicles don't require a lot of investment as they don't have to meet as strong safety or emissions regulations as passenger cars. OEMs can build these vehicles using old platforms and still make money as the design is not a relevant thing here."

Three new models should emerge from the newly hammered out deal. Volkswagen Commercial Vehicles will design and build a city delivery van based on its Caddy model, which will be followed by a one-ton cargo van

engineered by Ford. There are also plans for Volkswagen to offer a medium-duty pick-up under the Amarok badge, but built on Ford's Ranger platform. The city delivery van could come as early as next year, with the new VW pick-up in 2022. In total, the partners plan to produce 8 million vehicles.

"This alliance will result in greater scale and more efficient technology development," asserted Ford Chief Operating Officer Jim Farley. The partners have made it clear that this search for scale and efficiency will not extend to cross-shareholding or any sort of M&A.

European restructuring

For Ford, this collaboration sits conveniently within its ongoing European restructuring plan. "Let's be clear-Ford desires to stay in Europe," asserted company President and Chief Executive Jim Hackett speaking at the Deutsche Bank 2020 Global Auto Industry Conference one day after the details of the partnership were unveiled. As well as cutting jobs, slashing structural costs and chopping out layers of bureaucracy, this plan calls for a greater focus on Ford's strengths, and that means CVs.

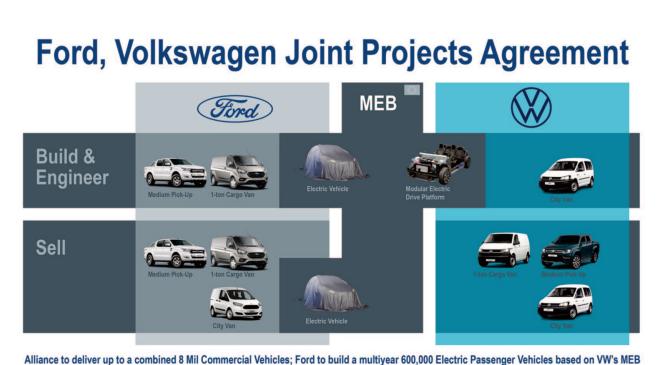
"Creating value means rethinking our product portfolio," added Hackett. "We expect strong global industry growth and demand for commercial vans as well as medium pick-ups over the next five years." This collaboration should ensure that Ford has the line-up to meet that demand. As Farley put it: "Our strong CV line-up provides a strong foundation to accelerate and expand our business. This is such a key profit pool for us in Europe, and we are a lot stronger now through our collaboration with VW."

Post-COVID demands

Both Ford and Volkswagen have been preparing for an autonomous future and have been working closely with Argo AI to develop a self-driving system (SDS). "The LCV segment is due to become the first one to start using the coming autonomous driving technology," Munoz told *Automotive World*. "Any collaboration in this segment will allow its members to save time and money on the development of this technology."

The novel coronavirus crisis and the concerns around contagion, however, could create an even bigger demand for autonomous vehicles, and sooner than expected. "We can only imagine what an autonomous and connected vehicle could have done during the recent shelter in place edict," said Hackettt. "We will likely witness a softening of previous concerns [around autonomous driving] because of COVID, which will enable where we are going with this portfolio."

In terms of Ford's strategy, it could prompt greater investment in commercial goods



Alliance to deliver up to a combined 6 will Commercial vehicles, Ford to build a multiyear 600,000 Electric Passenger vehicles based on vwv s ME



transportation. During lockdown, last-mile delivery operations have been booming. "COVID has had a pretty material impact on how we look at mobility," Farley told conference attendees. "We see an important shift in moving goods, which was always part of our portfolio and ambition for autonomy. Post-COVID that becomes even more important."

Ford has been exploring a whole range of automated delivery projects, including the final step of delivery from the vehicle to the door. Pizza delivery has been

one area of focus, and pilot projects in collaboration with Dominos have been delivering food orders with no human interaction. Customers receive text messages as the delivery vehicle approaches, then use a unique code to unlock the Domino's Heatwave Compartment inside the vehicle and retrieve their food. Another project with Agility Robotics has Ford exploring a humanoid robot called Digit to convey packages from the vehicle to the individual's front door. At the moment, Ford is using the collaboration with Agility to

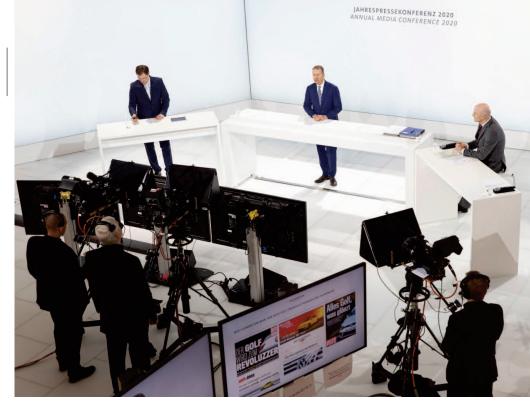
determine the best way to bring together its self-driving vehicles with Digit and understand the potential for new delivery methods.

Whether it is pizza or Amazon parcels, Ford anticipates a boom in automated delivery. Positioning its commercial fleet to take advantage of that will be key. "With our commercial experience and so many customers transporting products on Ford vehicles, we are really interested in this change of focus to moving goods seen with COVID," added Farley.



The world's largest automaker has some of the industry's biggest problems. Megan Lampinen takes a closer look at recent developments

Herbert Diess is reportedly looking to slash R&D expenditure, investment and fixed costs



t's been a rough year for Volkswagen Group, and it's only at the half-way mark. The Dieselgate scandal refuses to die and a recent ruling by Germany's highest civil court paves the way for hefty consumer compensation payouts. The software behind the muchanticipated ID.3 has proven more of a challenge than expected, threatening the production ramp up. Then the novel coronavirus (COVID-19) hit, forcing factories and dealerships to close. At the height of the pandemic, VW was reportedly burning through €2bn (US\$2.2bn) a week.

Just when it seemed like it couldn't get any worse, a racist advert for the Golf 8 appeared on its Instagram page.
Executives claim to be "horrified" over it, and investigations into potential sabotage at the advertising agency that created the clip are

currently under way. On top of these setbacks, recent sales results do not bode well. While they show a rise in the China market, where VW is stepping up investments, most other markets reflect worrying declines in the wake of the pandemic.

VOLKSWAGEN



If you asked which carmaker's Chief Executive faced the biggest struggle to get cost-cutting and restructuring approved by his or her board of directors, most industry insiders would point to VW



Amidst these developments, there's been a major management reshuffle. Herbert Diess, who has been serving as Chief Executive of both the Volkswagen Group and the Volkswagen brand, will wear just one hat moving forward. As of 1 July, he will hand over responsibility for the VW core brand to Ralf Brandstätter, who has been serving as its Chief Operating Officer. The official message is that this will result in "a stronger focus on the asks at the top level of the Group and the brand in the current transformation phase of the automotive industry."

Some industry watchers see solid logic in the move. "In theory, the

idea of separating the running of the Volkswagen brand from that of the Volkswagen Group is sensible," said Ana Nicholls, Managing Editor of the Industry Briefing at the Economist Intelligence Unit (EIU). "It may, for example, lead to more evenhanded management of the group's other brands, such as Skoda, Audi and Seat. It also avoids the dubious example set by Carlos Ghosn, who as head of the Renault brand as well as the Renault-Nissan Alliance amassed far too much power in one pair of hands."

Others see it as a reflection of continued dissent at the top. "The recent weakening of Diess' position is just the latest in a

long line of conflict between a Chief Executive focused on business performance and a Supervisory Board which attaches higher priority to the preservation of jobs," suggested Jonathan Storey of Automotive Reports. The group is under political pressure not to cut jobs, but that could prove a real challenge in the current environment. Diess and the Supervisory Board have been at odds over various issues and passions have been running high. At a recent 'internal event', Diess reportedly accused members of the board of leaking sensitive information. He later apologised, "declaring that these statements were inappropriate and wrong."

On the whole, Nicholls is not surprised by the reports of strategy disagreements at the top, noting: "These are difficult times for the world's biggest automaker. Diess is not to blame for most of these problems, but they will need careful management in the months ahead as cost-cutting speeds up."

approved by his or her board of directors, most industry insiders would point to VW," noted Storey.

The latest statements from the Supervisory Board suggest all is forgiven now and it continues to support the Chief Executive. "The fact that Diess has apologised in recent days



In theory, the idea of separating the running of the Volkswagen brand from that of the Volkswagen Group is sensible

There has also been talk of a coming cost-cutting plan, which would make sense given the current market challenges and would tie in with the recent restructuring announcements from Renault and Nissan. *Automobilwoche* reported that during a recent internal event, Diess told managers the company needed to "significantly cut" spending in areas like R&D, investments and fixed costs. He may not find that easy. "If you asked which carmaker's Chief Executive faced the biggest struggle to get cost-cutting and restructuring

suggests that he is still hopeful of holding on to his position and drawing a line under the problems," said Nicholls. "The board seems to have given him tentative backing, on condition that he steps back from leading the core VW brand, but any further missteps could see him ousted." Moving forward, much may depend on the relationship Diess has with Brandstätter, who has been working with him closely as brand Chief Operating Officer for two years. However, Nicholls warns that Brandstätter "may want to exercise his increased power."

BMW confident in a hydrogen fuel cell future as others jump ship

- Though numerous automakers have begun to distance themselves from passenger fuel cell vehicles, BMW is aiming to
 - launch series production this decade. By Jack Hunsley



or decades it has felt as though a hydrogen energy future was just around the corner. If the likes of BMW are to be believed, that prediction is about to finally come to fruition.

BMW's work in hydrogen mobility dates back almost 40 years to the BMW 520h. In the years since, it has also chased and broken speed records for hydrogen vehicles, most notably with the V12 hydrogen combustion engine-powered BMW H2R. However, given difficulties in tank insulation, it is now looking at a fuel cell future for its hydrogen passenger cars.

"We had BMW Hydrogen 7, which also had a hydrogen combustion engine and liquid hydrogen (LH2) tank system. However, insulating a tank which is -252 degrees Celsius remains problematic,'

explained Jürgen Guldner, Vice President, Hydrogen Fuel Cell Technology and Vehicle Projects, BMW. "Instead, we decided to look into gaseous hydrogen storage in combination with a fuel cell as this is the most feasible way forward for hydrogen mobility in passenger cars. In 2013, we brought our first fuel cell electric prototype onto the street."

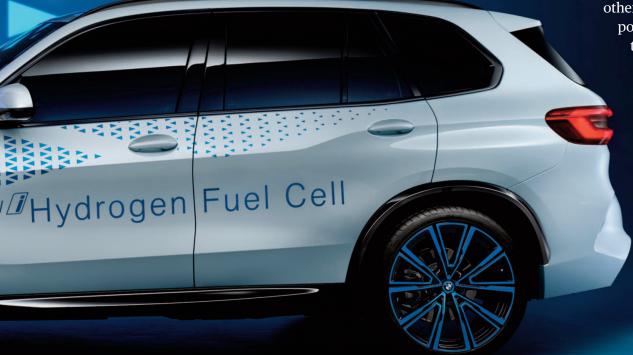
Sticking points

Though BMW's work in fuel cell is well known, in recent months its commitment to the technology has become contrary to other automaker outlooks. Daimler, for instance, announced in April 2020 that it was bringing its hydrogen passenger car development to a close for the time being, although it will continue to work

truck solutions in line with its partnership with Volvo Trucks. It was a move that had been on the cards for some time, with Daimler research boss Markus Schäfer stating in January that while the technology itself "works great," there is currently insufficient volume to make it economically viable.

Similar conclusions have also been reached by Volkswagen and Honda. A research paper from the former points instead towards electrification as the goto green tech: "The conclusion is clear: in the case of the passenger car, everything speaks in favour of the battery and practically nothing speaks in favour of hydrogen". Meanwhile, Honda's European President, Katsushi Inoue, has stated that Honda will focus on electric vehicles (EVs) and hybrids, with hydrogen fuel cell likely "a technology for the next era." At BMW, however, the hope is to

pair fuel cell
development with
other new
powertrain
technologies.



"We see fuel cells as a potential addition of a fully electric and 100% emission-free powertrain, next to our successful BEVs," Guldner told Automotive World. "We are convinced that the best strategy is to give our customers the power of choice, to offer the vehicle and the powertrain that best suits their needs. Once the framework conditions allow it, hydrogen fuel cell technology can

become an additional drivetrain option for customers who frequently travel long distances, need high flexibility or do not have regular access to charging infrastructure."

BMW is, of course, not alone in its optimism. Another proponent is Hyundai, which is currently predicting that its FCEVs will reach total cost of ownership (TCO) parity with EVs sooner rather than later. "As a first step to gain sustainable momentum in the build-up to a hydrogen society, steady and continuous cost reduction must be achieved through technological innovation," a Hyundai spokesperson told *Automotive*

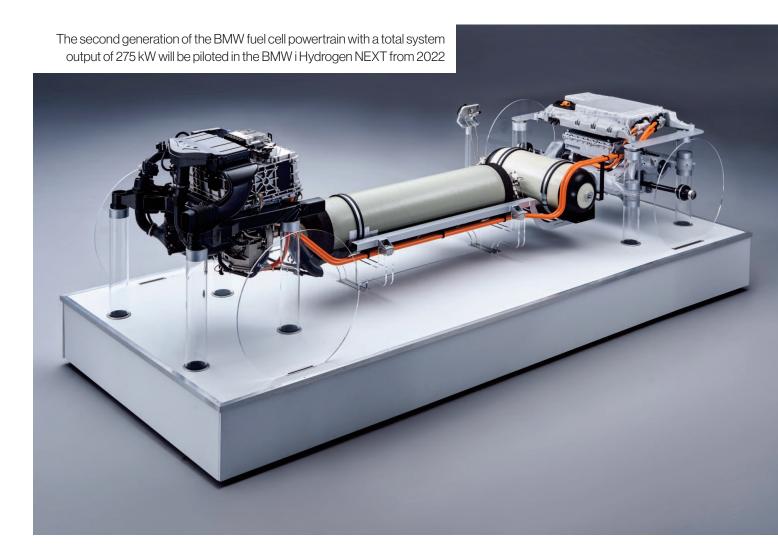
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World. "We expect Hyundai FCEVs to achieve TCO parity with vehicles that run on battery systems, such as the Kona Electric, by 2025."

Infrastructure

Although hydrogen fuel cell technology could theoretically help alleviate certain consumer fears on EV battery range, hydrogen fuel stations remain few and far between. According to the European Alternative Fuels Observatory, there are currently 122 filling stations in Europe. Though Germany leads with 83 stations, the fact that France comes in second with just 13

We anticipate that the second half of this decade could be the right time to offer a first BMW production model. To be able to do that, we have to pilot and master the technology



underlines the infrastructure challenge. California, the hydrogen capital of the US, has spent the last 16 years developing its hydrogen highway. However, even though the majority of the 7,800 hydrogen vehicles in the US are in the Golden State, data from January 2020 shows there are just 44 stations to fuel them. Clearly, work is still to be done on preparing the infrastructure for a fuel cell future.

"Refuelling infrastructure is currently being built up at different speeds in different markets," detailed Guldner. "Our premium customers expect a reasonable spread of hydrogen fuelling infrastructure and also a reasonable price of green hydrogen at the hydrogen pump. Hence the infrastructure is a decisive factor."

"We need to accelerate the expansion of hydrogen infrastructure," added the Hyundai spokesperson. "Until recently, infrastructure was more of a concern for fuel cell system manufacturers and automotive OEMs that produce FCEVs. Now it has become more of a common understanding among many different industries and sectors." On this front, Hyundai-along with BMW-is a member of the Hydrogen Council, a global Chief Executive initiative to foster the role of hydrogen technologies in the global energy transition.

One potential hope for the technology in automotive is the work currently being carried out in other industries. In particular, the energy sector's work on using hydrogen as a means to store and transport renewably generated energy could help speed up infrastructure installation, while also providing the automotive industry with the crucially important 'green' hydrogen that a true zero-emissions mobility future would require.

"Hydrogen has enormous potential to take on an important role in the energy transition. It can be used to store and transport clean hydro, solar and wind power. It can also be used

to import clean green energy," said Guldner. "It could also be used as a clean power source for industrial applications, aviation, marine shipping, long haul transport and continuous operation where direct use of electric power does not work or isn't practical. The potential is great, but there are many challenges to be solved by politics and the energy sector to set the right framework conditions."

the benefit of both parties. "Just like in other technological areas such as autonomous driving, collaborations help to share experiences, expertise and development costs as well," detailed Guldner. "This also applies to the development of hydrogen fuel cell powertrains. The BMW i Hydrogen NEXT with our second generation of fuel cell electric powertrains will help us to further master the technology."



The conclusion is clear: in the case of the passenger car, everything speaks in favour of the battery and practically nothing speaks in favour of hydrogen

In the meantime, while infrastructure is developed and work continues in delivering sustainably produced hydrogen, BMW aims to use the coming years to reduce the powertrain costs.

Collaboration

Another key to this puzzle is collaboration. For BMW, that includes a partnership with Toyota, first locked in back in 2013. Since then the duo has spent the intervening seven years refining fuel cell technology for

This collaboration also feeds into infrastructure. In its native Germany, BMW is part of the Clean Energy Partnership initiative, which is aiming to have 130 stations up and running by 2022, allowing approximately 60,000 fuel cell vehicles to operate. As more fuel cell vehicles make it into the market, the partnership hopes to increase that number to 400 stations by 2025.

"We are monitoring the framework conditions worldwide, taking into account customer demand, the build-up of hydrogen fuelling



infrastructure, green hydrogen availability in global markets, and of course the cost development, to decide when a potential first customer offer makes sense," added Guldner.

Power of choice

Overall, and like several of its competitors, BMW's outlook on fuel cell comes down to being able to offer consumers a choice. The automaker does not currently see the future as being wholly fuel cell-powered, nor wholly electric-powered, but rather that a wider powertrain mix will be required. In this vision, fuel cell will, in the long run, become the fourth pillar in BMW's portfolio. How long it might

take to bring fuel cell into mainstream use, however, is unclear.

As Guldner noted, current framework developments in markets such as Japan, Korea and the European Union leave BMW confident of a series model launch in the second half of the 2020s at the earliest. However, the model in question would be positioned in the "upper vehicle segment" of BMW's portfolio. Technology and infrastructure are also clear sticking points, but, if fuel cell can follow a similar development timeline as EVs saw in the 2010s, fuel cell could well be up and running by 2030 in good numbers. Plus, if BMW's current roadmap is achievable, it could well put itself in an advantageous position if and when hydrogen mobility can truly be considered 'mainstream'.

"We anticipate that the second half of this decade could be the right time to offer a first BMW production model. To be able to do that, we have to pilot and master the technology. Our next step is the rollout of our BMW i Hydrogen NEXT test fleet, an X5based FCEV with 275kW system output," added Guldner. "There are numerous reasons to be confident that we will be able to integrate hydrogen fuel cell technology into a universal vehicle architecture. That is one of the preconditions for a production model, next to the precondition of sufficient refuelling infrastructure and green hydrogen availability."

Automakers urged to introduce battery passports for electric vehicles

Freddie Holmes speaks to the Global Battery Alliance to find out why traceability and sustainability should become key priorities moving forward

he sourcing of raw materials required to produce electric vehicle (EV) batteries has raised concern around the true benefits of such vehicles on the environment. As such, industry-wide initiatives are in place across the industry to ensure that EVs are as clean as they profess to be—from mine to wheel.

The Global Battery Alliance (GBA) is a multi-sector initiative that aims to create a 'circular and responsible' battery value chain, and is in the process of establishing a digital Battery Passport. Based on blockchain technology, a series of transactions would show how the materials used in EV batteries are sourced, and provide greater transparency throughout the overall supply chain. Formed during the 2017 World Economic Forum, the Alliance now counts 70 members from across the public and private sectors, including automakers, suppliers, tech companies and national governments.





The industry must ramp up production of electric vehicle batteries, but in a responsible manner

What is the idea behind the Battery Passport?

As governments remember the agenda of the Paris agreement and how they can link stimulus to achieving those greenhouse gas targets, we're seeing subsidies and support for both charging infrastructure and EVs, which is a great development.

The challenge we have is that from a manufacturing point of view of those batteries, the supply chain for building these EVs is just not established yet because the ramp-up has been so rapid—it's probably the biggest purchase order in the history of the automotive industry. That has a massive impact on the supply chain because it needs time to be built up in a sustainable way, all the way from the raw materials and cell manufacturing to the battery management systems.

Today's predominant battery chemistries use materials such as lithium, nickel and of course cobalt, which are produced in very remote areas, and sometimes very sensitive areas with the aspect of child labour. Forecasts suggest a tenfold increase in material volume from this industry over the next nine years, and so one of the main objectives of the GBA is initially to raise awareness of tackling this challenge. All that material has to come from somewhere, and must be produced and transported sustainably. The CO2 footprint of an EV must be net positive in the end.

Benedikt Sobotka is Co-chair of the GBA, but also serves as Group Chief **Executive of Eurasian Resources** Group (ERG), a large producer of cobalt and copper. As he explained to Automotive World, companies like ERG are directly impacted by the work being carried out by the battery alliance, but in a positive way. The challenge, he says, is not only ramping up the production of EV batteries on a global level, but ensuring that process is as sustainable as possible. A common motto for sustainable production is 'reduce, recycle, reuse'. But as demand for EVs grows, a more apt expression may be: 'produce, recycle, reuse?'

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The mining of cobalt, a vital material for current battery chemistry, is tarred with child labour at unregulated artisanal mines

So the Battery Passport will almost serve as a Fairtrade sticker of sorts?

It will be much more than just a logo that manufacturers pay for as part of a commercial model. The GBA is pushing for the production of batteries that are sustainably sourced, meaning there are no human rights violation, and no conflict minerals being used. Batteries should also be environmentally friendly and sustainably produced, which is important because the raw materials come from so many different places. Currently, most raw material refining is performed in China, in a very opaque part of the industry that is extremely cost driven. To date, regulation has not been very strict, but that is changing as large automakers enter with brand reputations to protect.

Today, somebody may ask where the cobalt came from, but at the moment it is very difficult to say because the material is blended and shipped. Automakers must be able to trace the social, environmental and regulatory footprint of their battery materials.

What are the obvious attractions for an automaker to adopt a **Battery Passport across its EVs?**

We have a number of large global automakers in the GBA, including BMW, Volkswagen and Volvo, that have a very strong interest in making sure that they can explain how the



was battery manufactured, how it is being used and how it is going to be recycled. Those are all questions that, at the moment, haven't been answered well.

At the moment, when you buy a car you've no idea what's inside. We want the customer to have the choice to say that the material in one car has been produced sustainably and responsibly, and the materials in another car have not. For the automaker, it is important not just for the brand but also for price differentiation: there are green cars and there are greener cars. At the moment, that choice just isn't there for customers.



Will that be enough to sway manufacturers looking to keep costs to a minimum wherever possible?

The Battery Passport also essentially serves as an insurance policy. A second Dieselgate-style PR disaster could happen at any moment in relation to EVs and child labour, because these materials are just not traceable enough. Of course, you may also be able to attract potential customers that have a greener conscience.

It is correct to say that moving the EV into the mass market is about cost, but a focus on traceability and sustainability makes good business sense too. Why do people buy material that is not compliant?

Because it's cheaper. There are companies that break the law, pollute the environment, use informal labour in their supply chain and cut corners—that's why it's cheaper. But in the long term, that's not a sustainable business model. You might make more profit buying this material for a year, but in the long run, it doesn't work.

Will the Battery Passport be regulated, or will it take a collective buy-in among GBA members as part of a gentleman's agreement?

No, this has to have teeth. We will also have a blockchain solution that makes cheating very difficult, if not impossible. The pilot we're running today allows you to trace the original bag of material from where it has

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been produced to the refinery, and then from the refinery to the battery maker, and so on. That system is very difficult to cheat because there is a single-use, clearly defined tracking code on the blockchain solution.

Has there been a similar level of interest in the Battery Passport from outside the automotive industry as well?

Yes. Some governments, such as the Dutch Government and the European Commission itself, are pushing very strongly for traceability; they don't want the technology of the future to be based on environmental practices of the 18th century.

chain into Europe—not just the cell manufacturing, but also the battery management systems. China accounts for over 50% of the world's EV battery demand, but that is beginning to change as EVs become popular elsewhere, so it makes sense for European governments and the United States to have their own battery production, and to be independent.

Is the recyclability of EV batteries also important?

Circularity is certainly important: the cheapest material and the material with the best traceability and environmental footprint is a recycled



The Battery Passport also essentially serves as an insurance policy. A second Dieselgate-style PR disaster could happen at any moment in relation to EVs and child labour, because these materials are just not traceable enough

How important will localised production of battery materials be in the coming years and decades?

The vast majority of battery manufacturing is in China, where almost all of the cell manufacturing and raw materials refining is carried out. There are discussions around how to extend that part of the supply

battery. We need to be able to bring the same material back into the raw material cycle where feasible. As an industry, this hasn't been figured out just yet.

As part of our industry consortium, we are now beginning to shape the entire value chain across all these areas, which is extremely exciting.



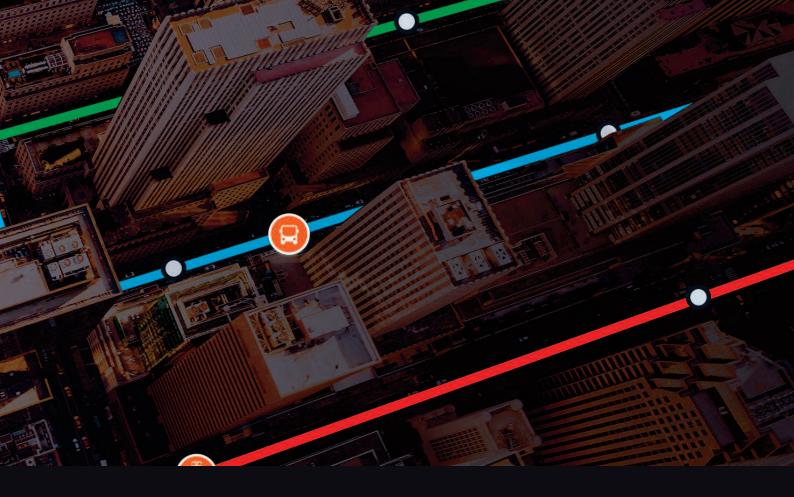
Intel's Moovit move underlines importance of multimodal mobility

Though future platforms may rely on new vehicles and technologies, convincing commuters to ditch personal vehicles relies on offering personalised journeys. By Jack Hunsley

utomotive industry investment strategy is at times a complex beast, with automakers and suppliers often surprising industry watchers with M&A decisions. Yet in recent years, few companies have put their money where their mouth is in the same way Intel has.

Since 2017, the semiconductor expert has bet big on a self-driving future, first putting down US\$15.3bn to acquire autonomous

driving expert Mobileye in 2017 and, more recently, US\$900m to bring multimodal mobility aggregator Moovit into the Intel fold in May 2020. These acquisitions, of course, were not made on a whim. At the turn of the century, it had little to do with the automotive scene; in 2020, it is focused on becoming a "complete mobility provider" and leveraging the forecasted annual US\$160bn market value expected to come from the space by 2030.



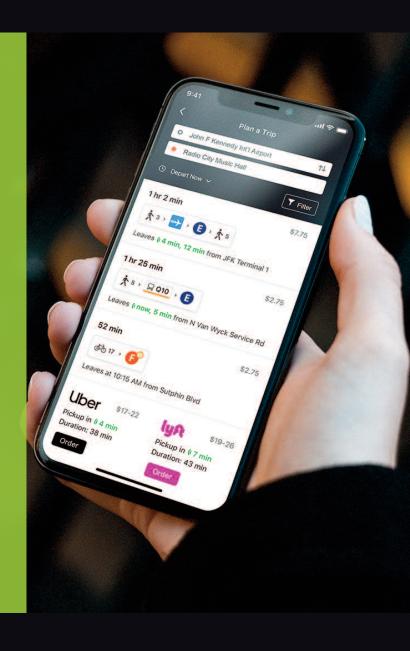
For Intel, the Moovit acquisition fits nicely into its broader Mobility-as-a-Service (MaaS) goals. While Mobileye has plenty of knowledge and understanding of the self-driving space and the technology required, Moovit provides Intel with an appropriate service layer to apply this technology in the real-world. "Moovit is already supporting

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Moovit is collecting more than six billion data points per day. It has coverage in more than 100 countries and 3,200 cities. More than 800 million users and 50 million monthly active users. That is a valuable user base

human-driven services in several parts of the world across various cities," explained Johann Jungwirth, Vice President of Mobility as a Service Operations at Mobileye. "Moovit is collecting more than six billion data points per day. It has coverage in more than 100 countries and 3,200 cities. More than 800 million users and 50 million monthly active users. That is a valuable user base."

Moovit already offers multimodal transportation today with our app, which allows users to plan a trip from multiple options. As we learn what users prefer, we can prioritise these options



As Jungwirth told Automotive World, Mobileye firmly believes that the foundations and relationships already carved out by Moovit, with both commuters and cities themselves, will play a key role in not only making self-driving MaaS offerings a success but also in integrating these future vehicles into the existing urban mobility networks. "When you look at Moovit today, it has relationships with more than 7,500 public transportation agencies and municipalities. It is integrated into the fabric of public transportation and current mobility offerings," he added. "It was very clear that we needed to fill these gaps."

"The combination of our millions of users, our deep understanding of people's mobility usage patterns and needs, together with Mobileye's world-leading self-driving vehicle technology, will create revolutionary transportation alternatives-fleets of shared autonomous vehicles and robotaxis," added Yovav Meydad, Chief Growth and Marketing Officer at Moovit. "Riders around the world will have access to a wider range of mobility alternatives to choose, including multimodal routes that combine public transit, bikes, scooters, shared-cars, ridehailing, and ultimately fleets of self-driving vehicles."

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Autonomy

What exactly would an Intel and Mobileye-driven multimodal future look like though? Unsurprisingly, at the core of this vision is the self-driving vehicle, with Mobileye looking to automate anything from autonomous shuttles to self-driving limousines. While these vehicles may not account for the entire multimodal network, the theory goes that automating as much as possible will be what allows Mobileye to unlock a cheaper, quicker and more convenient mobility future across the board.

"Let's assume that the studies are correct and 20% to 30% of traffic in urban centres is just searching for a parking space. With self-driving vehicles we can make the transportation networks much more efficient," said Jungwirth. "That's where we think self-driving vehicles can fit in and be migrated into the fabric of urban transportation."

As stated, however, this is not to say that the self-driving vehicle will be a catch-all multimodal solution; even Jungwirth concedes that there is still a "certain joy" in riding a scooter or a pushbike. What is critical is understanding how best to integrate new self-driving offerings with existing mobility solutions, particularly in cities which have already invested heavily in concepts such as micromobility or bus rapid transit (BRT), for example.

"It starts with a good public transportation network. That is enabled by buses, trains and subways." This is the baseline, he suggested, for assessing how prepared a city is for multimodal mobility. "Then comes the street level infrastructure. There we're also looking at V2X communication, whether things like traffic lights are connected and whether they can communicate through V2X directly to vehicles. Then, of course, comes micromobility, and whether cities have added infrastructure like bike lanes for both general use and high-speed users." The goal is to link self-driving vehicles into these existing networks and infrastructure, for example, by allowing them to use BRT lanes.

COVID-19 road bump

Though the long-term future of this space may look promising, the shared mobility market currently finds itself in a difficult situation.

Although lockdowns from the novel coronavirus (COVID-19) pandemic are beginning to ease, there is no guarantee that commuters will be eager to return to MaaS operators once commuting patterns return to normal. On this front, however, Mobileye hopes its focus on self-driving multimodal offerings can help ease consumer hygiene concerns.

"We're in this for the long term, and in the long term we do not see a significant impact [on ridership]," said Jungwirth. "In the short term, we have seen a spike in people using bikes or their own cars to have their personal and private space. With self-driving mobility, especially in MaaS-operated fleets, removing the human driver will allow us to eliminate one source of the virus."

This is not a foolproof solution, however. Although these vehicles could be operated as essentially isolated pods, removing the driver also raises questions as to how fleet operators can ensure vehicles are kept clean and appropriately sanitised from trip to trip. Here, Mobileye plans to use existing sensing technology to monitor vehicle cleanliness.

"That's quite easy to do and similar to what we already have today on buses and trains with in-cabin sensing," Jungwirth added. "With these in-cabin sensing modules, you have cameras, sensors and other technology which allows us to check that no one is littering or breaking things. However, if someone does then we can take the vehicle out of service and back to a service hub to either get cleaned or serviced."

Moovit, on the other hand, is anticipating a shift in mobility requests towards on-demand transit and micromobility. "Public transportation will always be that backbone of societal life, but it seems that there has been a wider path paved for more multimodal services such as on-demand transit and micromobility solutions to take on a greater role in transporting people quickly and safely," added Meydad. "In addition, we'll most likely see more cashless and in-app payment options for public transit systems to help curb health concerns on public transportation."

Foundations first, personalisation second

New technologies may be the ultimate driver of multimodal mobility, but the belief at Mobileye and Intel is that truly cracking this market will require competitors to do more than just offer a broad range of transit options. The key to getting commuters to adopt these new platforms lies in personalising journeys to specific consumer preferences.

"Moovit already offers multimodal transportation today with our app, which allows users to plan a trip from multiple options. As we learn what users prefer, we can prioritise these options," said Jungwirth. "By having this whole suite of services, from bikes and scooters to public transportation, car-pooling and self-driving vehicles, we can see what people prefer and how they use it. Part of the disruption is first of all enabling and adding to this suite of services, and then connecting them and learning from that."

AI and machine learning will play crucial roles in refining the multimodal space. Particularly, their core use is expected to lie in designing bespoke commutes from already completed trips, not only to improve urban mobility but to entice commuters to ditch the personal vehicle. "Two people using the app might get different offerings, the same way they might get different search results on Google based on their habits and what they prefer," he added. "We can allow people to use what they prefer and not force them into a certain pattern if that's not right from them. That's what makes multimodal mobility so attractive."

"Multimodal transportation has already made an impact on riders around the globe, but there is still work to be done," added Meydad. "The holy grail of true multimodality—drive, park, and ride using public transit—hasn't yet



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Let's assume that
the studies are
correct and 20% to
30% of traffic in
urban centres is
just searching for a
parking space.
With self-driving
vehicles we can
make the
transportation
networks much
more efficient

been implemented to its full capacity in order to get people out of their cars. By being able to better inform and connect people with micro-mobility options and ridesharing, more people will be encouraged to use them to connect to public transportation. This will help shift more people from using private cars to using public transportation to get to their destination."

If done well, the expectation is that Intel, Mobileye and Moovit together can begin to reshape urban mobility. Across the next few years, the trio will begin to roll out their very first driverless taxi services with partners such as Volkswagen and in locations including South Korea, China, France and Israel. By the end of this decade, the aim is to have these taxis running in "hundreds of cities" with Moovit offering rides via its app. Although early days still, it will not be long before commuters begin to see how a self-driving future could revolutionise the way they get from A to B, and how these vehicles could begin to fill in gaps in existing transit networks.

From taxis to trucks: Uber's disruption efforts in trucking continue

Can Uber profitably apply its model to the freight sector? Maybe, say analysts, but there's a sizeable culture gap to bridge. By Xavier Boucherat



ber's evolution from ride-hailing start-up to globe-spanning mobility service giant has been characterised in part by an expansion into services including food-delivery and micromobility. Chief Executive Dara Khosrowshahi has noted the importance of these new endeavours: food delivery in particular, he told Forbes, was once "an interesting part-time endeavour," but would go on to grow into a significant business. It's welcome news for a company which posted losses of US\$8.5bn for 2019.

shippers and drivers flexibility, allowing the choice of which companies they work with. In 2019, some 12% of the 350,000 owner-operators in the US reported that they had completed the onboarding process, meaning they had completed a journey with the platform or were ready to. Over the same year, it grew gross revenues from US\$359m in 2018 to US\$737m, and also expanded into Europe.

In May 2020, the unit's future was briefly cast into doubt following a letter to employees



The key task for any digital freight marketplace seeking success will be to build reliable networks which can guarantee capacity, but the way owner-operators and small fleets work will make this difficult

Less visible to the public has been Uber Freight: launched in 2017, the platform connects truck drivers with shippers in much the same way as the ridehailing app connects drivers with passengers. Importantly, it offers from Khosrowshahi, which said Uber would be 're-evaluating' Freight in the wake of the novel coronavirus disease outbreak (COVID-19). This followed an 80% drop in ride-hailing over April 2020, and combined layoffs of 6,700 staff. But since then, Uber has moved to confirm it has no plans to leave the market, with Head of Operations Bill Driegbert stressing that the product road map and service offering remains the same, and that any changes were concerned with profitability.

New normal?

Indeed, the flexibility offered by a digital freight platform like Uber's may just have made it more relevant in the age of COVID-19, with Driegbert noting that the once-in-a-lifetime event meant that shippers were now changing plans on a weekly basis. Could the likes of Uber Freight supplant traditional businesses and become the new normal?

"My answer would be no," said Bart De Muynck, Research Vice President, Supply Chain Research at Gartner. "Digital freight networks only account for a small part of total freight, and compete mainly with the spot market and some of the traditional brokers." As things stand, he adds, digital freight networks are not currently replacing common carrier contracted freight.

Part of the advantage still held by traditional brokers is cultural. "They have very long relationships with both shippers and carriers," notes De Muynck. "Transportation is still a peopledriven business, especially on the transportation procurement side which is very conservative. This makes transportation harder to digitalise than the taxi business, for example." Similarly, shippers want to know their

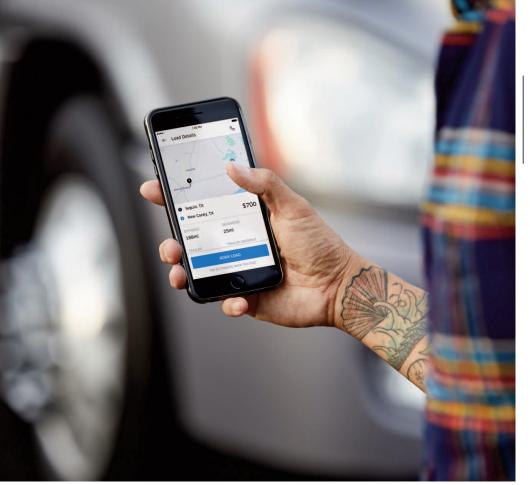
drivers, ensuring that both they and their vehicles meet requirements, and that they are familiar with sites and facilities. Whether the Uber Freight model can offer sufficient assurances is debatable.

Securing capacity

Matthew Kropp, Managing
Director and Partner at Boston
Consulting Group, agrees that a
part of the challenge will be
cultural. The key task for any
digital freight marketplace
seeking success will be to build
reliable networks which can
guarantee capacity, but the way
owner-operators and small fleets
work will make this difficult.

"The culture and mentality of smaller operations tends towards securing the best load," he says, "and so there is a question





Finding and booking freight can be the most expensive and often the most complex piece of the supply chain. Pictured: Uber Freight app

around loyalty. Even though services like Uber Freight can provide a steady flow of business, there is a hesitation on the part of drivers to commit. They will still look to compare one load with another offer from a broker or a load board. This inability to commit means capacity can't be guaranteed."

In the ride-hailing sector, Uber has worked hard to ensure driver loyalty through a combination of financial incentives, gamification of its platform and, where enforceable, restrictions on working for other platforms. "It is unclear whether we'll see this in trucking," says Kropp. "Securing this will be the key step for successful economics. If all you have is a network of supply and trucks that are potentially available to shippers, then you really don't have much of an advantage over a traditional freight brokerage with hundreds of people on the phone."

However, says De Muynck, it is clear that the real-time access to rates and capacity offered by digital freight networks is setting new expectations for both shippers and carriers in terms of how they interact with logistics partners. In some sense, it is already transforming the industry. What's more, says Kropp, those seeking to compete can be confident that the challenge is no longer a technical one, particularly with the introduction of the electronic logging device (ELD) mandate in the US. "It's no longer difficult to track trucks, particularly now that they have to report their position and phone home in accordance with regulations. At this point, more or less all of

them have location data." In theory, he says, everything needed for a load-matching operation is in place.

The tech mindset

Where Uber has clear strength is technical innovation, and what's more, it has enough clout to bring strategic partners on board which can help it roll out new ideas. One particular area of focus has been automation. "Shippers are looking for partners who can also help them become touchless," Lior Ron, Head of Uber Freight, wrote in a statement. "Uber Freight's pricing API allows shippers to eliminate significant labour and friction in their operations."

A touchless load requires little human intervention, with Uber Freight automatically requesting and verifying appointments, generating a price based on realtime market data, and making the load available to carriers. Tracking events are then sent to a shipper's transport management system, and through the app a driver can upload proof of delivery for invoicing. High levels of automation have been made

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possible through Uber Freight's recent integration with the SAP Logistics Business Network. BluJay, a supply-chain software developer, has also played a large role in making this possible.

"Finding and booking freight can be the most expensive and often the most complex piece of the supply chain," said Hala Zeine, President, ZAP Digital Supply Chain, in a statement. "This combined solution will remove roadblocks and offers a simpler, more automated approach that streamlines operations." Uber Freight reports completing tens of thousands of touchless operations. Another collaboration has seen the company partner with CloudTrucks, a software-as-aservice company targeting owner-operators and small fleets, and Coop by Ryder, an 'AirBnB' style service in which asset owners can lease and rent tractors and trailers.

Drivers on Uber's platform can now access CloudTrucks services. These provide back-office support normally only available to the larger fleets which, with more resources, have been better positioned to weather COVID-19. Those without assets will also have access to Coop, with deposits handled by CloudTrucks.

"Truck drivers are the backbone of our economy, and communities are depending on them now more than ever," said Laurent Hautefeuille, Head of **Business Development and** Strategy & Planning at Uber Freight. "Our objective is to support all truck drivers, whether they are industry veterans or just starting out." Uber Freight's profile has been raised by COVID-19, with the company moving over 30,000 relief loads cross the US since lockdowns went into effect. How it will evolve from here will depend on its ability to innovate in a market likely to remain unstable for some time, and the strength of benefits it can offer drivers in return for loyalty.



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Corporate debt piles up as CASE and COVID-19 challenges collide

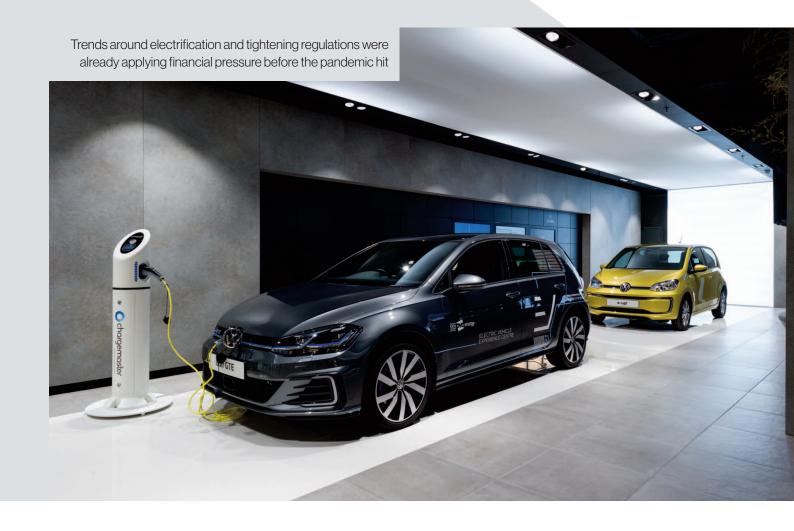
The industry was entering a profit desert, and then came the global pandemic.

Megan Lampinen takes a look at some of the current financial responses

he novel coronavirus and the subsequent economic downturn have thrown the global automotive industry into a rapid decline. As factories halted and demand disappeared, cash reserves dwindled. For automakers and suppliers alike, recovery could prove to be a significant challenge.

"In the short term, the expected reduction in turnover is absolutely massive," noted Thierry Bolloré, former Chief Executive at Renault in

a recent webinar. "This year you can expect to see a drop of about 20%, with a 5-10% drop in 2021." Toyota, the world's second largest automaker, recently warned that its income could plummet by 79.5% over the next fiscal year (FY), which ends in March 2021. It also forecast a 20% drop in vehicle sales to 1.95 million units, which would mark a year-over-year decrease of more than 20%. Chief Executive Akio Toyoda has cautioned that this could be worse than the global financial crisis of 2008.



The profit desert

Part of the problem is that many companies were already feeling headwinds before the pandemic hit. "Going into this, automakers and suppliers were in the least healthy state they have been in since 2010, when they began a recovery from the recession," pointed out Mark Wakefield, Global Automotive & Industrial Practice Co-Leader at AlixPartners.

In 2019, only a small percentage of suppliers were financially 'strong', according to AlixPartners' formula, which takes into account debt-to-equity ratio, working capital and return on capital employed (ROCE). The 'strong' category

consists of suppliers accounting for just 6% of the sector's revenues. On the other hand, companies representing 43% of revenues were classified as 'stressed', with 7% 'distressed'.

ROCE, a useful measure for how well a company generates profits from its capital, was on the decline across the value chain due to the significant investment requirements around CASE (connected, autonomous, shared and electric) technology. AlixPartners estimates that ROCE declined 47% on average for automakers globally last year versus 2015, with a 36% drop for suppliers. "The industry was entering a profit desert," said Wakefield.

Corporate debt, meanwhile, has been on an upward swing. AlixPartners estimates that the past five years have seen a 35% increase in debt among both suppliers and automakers. "We expect that to skyrocket in 2020," said Stefano Aversa, Chair-EMEA, Global Vice Chair-Revenue, at AlixPartners.

Financial levers

Initial figures speak loudly. Wakefield estimates that the industry as a whole has accumulated US\$72bn in debt since mid-March. "That's an extraordinary number that has to be paid off," Wakefield emphasised.



Renault has outlined a cost-cutting programme and secured a €5bn loan guarantee from the French government

In some cases, governments are stepping in. Renault was granted a €5bn (US\$5.4bn) loan guarantee in early June from the French government to see it through the crisis. "This €5bn French loan guarantee will help the Renault group to obtain liquidity that it urgently needs due to the impact of the coronavirus outbreak," commented Margrethe Vestager, Executive Vice-President at the European Commission, in charge of competition policy. Elaborating on the reasons for this move, she noted: "Renault is an important European car manufacturer, employing directly more than 73,000 workers in Europe. Renault is engaged in the research, development and production of the next generation of electric vehicles, the rollout of which is

essential for meeting the EU's

climate goals."

FCA is currently seeking a €6.3bn loan from the Italian government for similar reasons. If granted, it would mark the largest government-backed loan to a single company in Italy. "On a positive note, the credit markets for consumer and corporate debt are more open and liquid, offering attractive terms due to aggressive government policies," noted Wakefield.

Loans alone will not be enough. Both Nissan and Renault have come out with dramatic cost-cutting plans, each aiming to shave billions from their fixed costs. "We are transforming business in the face of major economic headwinds for the automotive industry, which have been intensified by the novel coronavirus pandemic," said Nissan Chief Executive Makoto Uchida.

Nissan is slashing production, closing plants and scaling back its model offering. Commenting on the plan, Moody's Vice President Mariko Semetko told Automotive World: "Nissan's restructuring plan is credit positive in that, if successful, it will reduce costs and improve the company's weak profitability. Having said that, it is unclear how long it will take for the effects to show in the company's profitability and cash flow. The coronavirus pandemic will further exacerbate its already weak credit profile, leaving the company with little cushion."

Loans and restructuring may help on some level, but with the massive pressure around new technology investment, they may not be enough. "The huge challenge now for everyone is how to make money," added Bolloré. "Automakers need to not only survive but to actually make money with a level of turnover not the same as before. You can't finance anything if you don't make a 6-7% operating profit."

With the continued shift towards CASE, investment demands are intense. Wakefield warns that not all of these will go ahead as planned: "Investments are likely to be pulled back somewhat as a result of the pandemic." Recent statements from Volkswagen Group suggest it is preparing to do just that. A company spokesperson was quoted by *Automobilwoche* as stating that

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talks on further cost cutting measures were taking place. Chief Executive Herbert Diess reportedly informed management that reductions would need to be made across R&D expenditure, investments and fixed costs.

Interdependencies

While the financial pressure is real, the interconnectedness of the automotive industry opens the door to new relationships and M&A potential. "If any part is missing, you can't deliver a car," emphasised Bolloré, "and you can't just switch to a new supplier in a couple of months."

Automobile and Volvo Cars. He suggests that most rescue activity will take the form of consolidation, as automakers ask suppliers to look after each other. "In some cases the industry will look after itself on the lower tier levels," he added. "If the market rebound is slower than we hope for, we will have to help numerous Tier 2, 3 or 4 suppliers."

Bankruptcy, though, is not high on Forster's list of expected outcomes. He added: "We are such a finewebbed network of interdependencies that it would be hard to accept many bankruptcies. It would cut through supply chains. The last crisis did not produce many

bankruptcies. If there is one, someone else will come in, pick up the assets and continue operations. Otherwise the supply chain will not work."

Clearly the entire value chain is in for a tough slog, but which players stand the best chance of emerging from the profit desert in good health? "Given what we've seen in

terms of industry recovery, those that are focussed on China will do the best," Aversa told *Automotive World*. "Players in the US will pick up quicker, while those that focus exclusively or proportionally more on Europe may have to suffer a bit more, at least for the next two to three years."



The huge challenge now for everyone is how to make money. Automakers need to not only survive but to actually make money with a level of turnover not the same as before

So what happens if it looks like a supplier is falling into serious financial trouble? "We will probably see a lot of rescue consolidation among Tier 2 and 3 suppliers, particularly in Europe and potentially in the US," predicted Carl-Peter Forster, Former Chief Executive of Opel and Tata Motors and Board Director at Geely

The clock is ticking for the 'global automaker'

Despite current challenges, the global automotive industry remains intact, and the term 'global automaker' still bears some weight for now, writes Martin Kahl



or so long, the world's major vehicle manufacturers have been referred to as global automakers-and with good reason: global models assembled in factories around an ever-shrinking world were targeted at increasingly aligned customer bases. Building vehicles on global platforms, in standardised factories, supported by global Tier 1 suppliers with lean and often lengthy supply chains, the world's automakers seemed to pursue globalisation and sales volume at almost any cost.

markets and market segments—all in the face of declining sales as vehicles last longer and consumers question the need to even own a car. Maintaining a presence in highly competitive and often price sensitive markets at almost any cost is no longer an option.

Consider the Renault-Nissan-Mitsubishi Alliance (RNMA); until just a few short years ago, RNMA had its sights set on becoming the largest global automaker. The massive reversal of fortunes for the French and Japanese automakers—all of



The message here is clear: the key to survival lies not in a merger of global automakers but in a closer alliance of integrated regional specialists

Being a global automaker and maintaining such operations has, however, become increasingly costly. The challenges facing the automotive industry are well known—the need to meet evermore stringent emissions regulations; the need to show leadership in emerging CASE technologies; and the struggle to sustain market share and profitability in traditional

which date from pre-COVID times—left the Alliance with very different priorities, primarily the need to restructure for near-term survival, and longer-term growth. With new management in place, the RNMA board will be hoping that a revitalised Alliance can bury corporate and cultural acrimony and misunderstandings and move on.



Gone is the Ghosn philosophy of merging Renault and Nissan, the separate automakers instead deepening their cooperation. With a focus on efficiency rather than volume, regional responsibilities have been allocated; Nissan will represent the Alliance in Japan, China and North America, Renault in Europe, Russia, South America and North Africa, and Mitsubishi in Southeast Asia and Oceania. The message here is clear: the key to survival lies not in a merger of global automakers but in a closer alliance of integrated regional specialists.

The trend is underlined by the deepening alliance between Ford and Volkswagen Group on a range of projects including electric vehicles (EVs), autonomous vehicles (AVs), light commercial vehicles (LCVs) and pick-ups. No talk of M&A activity between Wolfsburg and Dearborn in the search for scale and efficiency-the press release clearly states that this "does not include cross-ownership between the companies, which will remain competitors in the marketplace"-yet the alliance could result in up to 8 million medium-duty pick-ups and LCVs alone.

"Driven by the lure of ever-greater scale economies, many firms put up with substantial losses while waiting for their expansion plans to come right. Much of the automotive industry has now entered an era of new realism in which long-term losses or weak performance are no longer tolerated," explains Jonathan Storey, author of the latest edition of *Automotive World*'s annual report on automaker activity, "The world's car manufacturers - 2020 edition'.

"Recent years have seen Ford's withdrawal from Russia and partial withdrawal from India,



The coronavirus pandemic exposed pre-existing and underlying conditions, raising urgent and important questions for automakers about their global strategies

GM's withdrawal from Europe, India, Russia and some other markets, Suzuki's withdrawal from the US, Honda giving up its manufacturing operations in Europe, and Renault abandoning its passenger car business in China."

The changes in strategy reflect, among other things, "a new generation of managers, prepared to slaughter a few sacred cows—think Mary Barra at GM", notes Storey, and the need to harness resources for the substantial level of investment the automakers are intending to make in CASE technologies.

'The world's car manufacturers - 2020 edition' explores the aforementioned automakers' recent changes in strategy, and analyses the financial and operating performance of the world's major car manufacturers.

"Becoming a global automaker used to be like a set menu, featuring operations in every major region building global models on global platforms and components," comments Storey. The Volkswagen Group and Toyota stand tall as archetypal global automakers, but industry trends are changing and evolving. "Now if you look at automakers like Ford, GM, Renault and Suzuki," he notes, "the strategy looks more like an a la carte menu."

Storey emphasises the need to keep these changes in context, however. "Previous eras have seen, for example, PSA and Renault quit the US market, and Chrysler sell up in Europe. Even in the current era, the traffic is not all one way, with companies such as Kia making a bold entry into an Indian market

which has acquired a reputation for dashing the hopes of new entrants."

Beyond the myriad commercial and regulatory pressures lie other wider issues which guide automakers' global strategies, including geopolitics, protectionism, looming trade wars—and now, of course, the coronavirus pandemic. liquidity has plunged the automotive industry into what AlixPartners calls "a profit desert", with automakers forced to secure loans and draw on credit lines that, at the time of writing, already amount to US\$72bn in a heavily depressed market. According to 'The world's car manufacturers - 2020 edition', this year the global car market will barely



For now, the shape of the global automotive industry is clear, and the term 'global automaker' still bears some weight

As the city of Wuhan and then Hubei province went into lockdown, the fragility of lengthy global supply chains became all too apparent; the first automaker factory shutdowns in Europe were blamed on shortages of parts from China, and European automaker plant stoppages in the US were initially due to disrupted parts supplies from Europe.

The coronavirus pandemic did not create fragility in the global automotive industry—it simply exposed pre-existing and underlying conditions, raising urgent and important questions for automakers about their global strategies. The need for reach 70 million units, down almost 21% from 88.4 million units in 2019.

"With most markets facing the prospect of a post-COVID-19 downturn in sales, we may yet see some further closures of unprofitable or marginal operations," cautions Storey. For now, the shape of the global automotive industry is clear, and the term 'global automaker' still bears some weight. The fate of both, however, depends on the strategies they employ to manage liquidity, weather the pandemic, survive the subsequent recession and deliver CASE technologies in a global market that is impossible to predict.

COMMENT:

The auto industry must prove that black lives matter

US autoworkers will pause work today in solidarity with the Black community and the struggle against racial injustice, as the industry examines its structural inequalities. By Xavier Boucherat

he UAW has asked members to pause work today, at 08:46am EDT for eight minutes and 46 seconds. Both date and time are significant: June 19th, or 'Juneteenth', is a day of observance in the US which marks the anniversary of the Union Army's arrival in Galveston, Texas, in 1865. Major General Gordon Granger read federal papers that ordered the immediate freeing of the 250,000 slaves that remained in the state, following the end of the American Civil War.

The eight minute and 46 second stoppage refers to more recent history that could prove similarly consequential—the length of time that a white police officer knelt on the neck of George Floyd, the 46-year-old African American

whose death has rightly prompted global outrage. Derek Chauvin now faces charges of second-degree murder and second-degree manslaughter, yet the response to Floyd's death demands more than simply justice for him and his family. It demands action against the institutionalised racism that enabled his death, and the countless abuses of power that preceded it.

For example: who would have predicted that the idea of defunding police departments—in which financial resources are reallocated amongst specialist safety groups—would become a mainstream conversation under the Trump administration? Yet this is exactly what has happened, with a supermajority of nine Minneapolis City Council



Amidst this groundswell of support for wholesale reform, it is understandable when initiatives and responses from the corporate world are met with cynicism: after all, racism did not arrive last month. Last week, for example, Apple announced a US\$100m initiative to fight racism, which would also address issues inside the company. Whilst welcome, it will no doubt exasperate those who have previously pointed out that the US tech sector has a clear race problem. In 2018, just 6% of its workforce was black, representing no change on 2014 figures and speaking to the lack of employment and advancement initiatives for minorities.



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On the macro-industrial scale, the Fortune 500 has just four black chief executives, and among the major automakers there are none. This comes despite black workers representing a substantial percentage of the modern automotive workforce since its inception. It wasn't long after Granger's proclamation in Galveston that African Americans would begin leaving the south in search of work-and in many cases, safety. Automotive was one of the first major manufacturing industries to employ black workers. According to Joyce Shaw Peterson, a professor of US labour history and author of American Automobile Workers: 1900-1933, by 1930, 14% of all auto workers in Detroit were black.

If the industry is to move into a future of mobility that fairly serves everyone, it must now take stock of its own relationship



GM's response to George Floyd's death came quickly, with Barra condemning the incident and announcing the creation of an Inclusion Advisory Board, and designating US\$10m to support organisations that promote inclusion and racial justice, including US\$1m to the NAACP Legal Defense and Educational Fund

with race. It must listen to and act on concerns from those affected, and send an unequivocal message to its workforce and customers: black lives matter. It must send this message through both words and deeds. The challenge today is countering not only the violent, explicit forms of prejudice, but

the unconscious biases enforced throughout a lifetime. Unchallenged, the latter can result in deserving workers being denied promotions and opportunities. It also creates environments where concerns are not taken seriously. As was demonstrated last year, the consequences of this can be foul.



An investigation by CNN reported that a culture of intolerance and racial bullying reigned at GM's Toledo Powertrain plant, Ohio. Black employees were subject to racial slurs and violent threats: nooses were left hanging in workspaces, and signs reading 'whites only' were left on bathroom doors. Marcus Boyd, a former supervisor at the plant, told CNN that over the course of 14 months, leadership showed little willingness to take action, frequently telling him to deal with the problem himself. Later he would leave the job with concerns for his life.

An investigation by the Ohio Civil Rights Commission, prompted by several complaints and a lawsuit



In a note to staff, Ford Chief Executive Jim Hackett and Chairman Bill Ford wrote: "This is our moment to lead from the front and fully commit to creating the fair, just and inclusive culture that our employees deserve."

against GM filed by a number of employees, found that that the automaker had allowed a racially hostile environment. The company appealed, and failed: the decision was upheld. Mary Barra herself would visit the plant in February 2019. "I commend GM leadership for coming to Toledo Powertrain,"



Boyd told CNN. "My question is, why weren't these incidents taken seriously when reported over and over again? Diversity and inclusiveness should be more than a general statement."

GM's response to George Floyd's death came quickly, with Barra condemning the incident and announcing the creation of an Inclusion Advisory Board, and designating US\$10m to support organisations that promote inclusion and racial justice, including an initial donation of US\$1m to the National Association for the Advancement of Colored People's (NAACP) Legal Defense and Educational Fund. In a note to staff, Ford Chief Executive

Jim Hackett and Chairman Bill Ford wrote: "This is our moment to lead from the front and fully commit to creating the fair, just and inclusive culture that our employees deserve." GM has confirmed that its plants will participate in the Juneteenth pause, as has Ford. Cadillac's social media has been especially vocal on the subject, writing that black people not only built the automotive industry, but created a car culture in the USA. Other responses from the industry include Mercedes-Benz USA and BMW confirming donations to the NAACP Legal Defense Fund.

These shows of solidarity must now become meaningful, ongoing efforts to fundamentally transform workplace culture. It is a particularly pressing concern as the industry embraces connected, autonomous, shared and electrified (CASE) technologies, for two reasons.

Firstly, without diversity in development, there is sizeable risk that the biases and prejudices which inform racism could become entrenched in technology itself. Already there have been studies which show that machine vision, which could be key for self-driving vehicles, is consistently better at identifying lighter skinned persons. Machine vision is by no means a new technology, raising question about how such a fundamental shortcoming has vet to be addressed. Concerns have also been raised that training data used for deep learning may lead to self-driving

AI making decisions that are ridden in discriminatory treatment of minorities.

Secondly, the digitisation of mobility and the onset of Industry 4.0 calls for new skills. Traditional manufacturing jobs will be affected, and recent history shows us that in these situations, minorities suffer disproportionately. Just over ten years ago, Detroit was hurting as the recession took hold. The Economic Policy Institute, a research firm, found that between the start of the economic crisis and November 2008, 20,000 African American auto workers lost their jobs, representing a 13.9% drop in employment among the group. Compare this with a 4.4% decline for all workers in manufacturing, and a common saying in the US jumps to mind: when America catches a cold, black America catches the flu. As automakers move deeper into a period of great change, they must sustain their commitments to black workers, and offer up the opportunities needed to work in tomorrow's workplace. If they don't, they risk losing what progress they have made to date.

Some responses to the Black Lives Matter movement have made clear that the worst forms of racism-those which make everyday life unsafe for black people-are by no means resigned to history: they are alive and well. For that reason, the industry must now follow through on its anti-racist commitments, both for its own sake, and for the safety and wellbeing of its workers.

Russian tech giant in pursuit of universal robotaxi tech

Megan Lampinen speaks to Yandex about the latest technological developments in its self-driving fleet

andex is pushing ahead with its ambitious robotaxi plans despite the current challenges in the wake of the novel coronavirus pandemic.

The Russian technology giant, known for its popular search engine, unveiled its first-generation self-driving vehicle for ride-hailing services in 2017. Although this put it nearly eight years behind rival Google, subsequent progress has been rapid.

In August 2018, a fleet of its self-driving taxis began commercial service in the Russian university city of Innopolis, and two months later a second service kicked off in Moscow's Skolkovo district. These

vehicles operate with an empty driver seat and just a safety engineer up front to monitor the system. So far, there have been more than 8,000 autonomous passenger rides, and every journey contributes useful information for the developing self-driving system, which is also supported by noncommercial test fleets in Tel Aviv and Las Vegas.

New partner

Next on its agenda was a new collaboration partner, which it found in the form of Korean supplier Hyundai Mobis. Partnerships like this have become



increasingly common as companies look for ways to shorten development times and share expenses. One of the first tasks under this collaboration was to update the vehicle in which they were testing self-driving technology.

The first-generation self-driving vehicle from Yandex was based on the Toyota Prius, a model that had previously been used as a base by other self-driving companies. Yandex also used it for its second and third-generation system.

For the fourth generation,

though, Yandex turned to the Hyundai Sonata.

"A couple of months after we signed the MoU, Mobis sent over one of the first Sonatas produced in Korea. When it arrived in Moscow, we took the sensor stack from the second-generation Prius and put it on the Sonata roof," explained Pavel Vorobev, Head of Product at Yandex. The team transferred the whole self-driving system over to the new body and confirmed it could function as designed. "This proved our concept that we could develop

universal technology that can be applied to a mass-produced car," he emphasised.

The new vehicle

The next six months saw
Hyundai Mobis teams and
Yandex teams working together
to refine the self-driving system.
The Hyundai Mobis team needed
to modify the vehicle's electronic
control units to interface more
effectively with Yandex's
driverless control technology.
Yandex engineers, meanwhile,
improved the vehicle sensor set,



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adding three additional camera units and pushing the total number to nine. The radar system was also shifted from beneath the bumpers to the roof, a move that made it easier for the system to distinguish more objects around the vehicle.

LiDAR units in the front fender were relocated to offer a wider, overlapping field of view. The last Hyundai Mobis team left Moscow just one day before South Korea closed its borders due to the coronavirus.

Today, the initial fourthgeneration Sonatas are operating on the streets of Moscow and by the end of this year Yandex plans to add 100 to the existing fleet of around 100 self-driving Prius models. They will also be integrated into the robotaxi programme in Innopolis and join the test fleet in Michigan.

Despite the numerous additions and improvements in functionality around the sensor set, costs are improving. Compared to the secondgeneration Prius which was put on the roads a year and a half ago, this sensor set is half as expensive. It could drop even further if Yandex perfects its own LiDAR. Yandex has been relying on systems from Velodyne but more recently began exploring in-house developments. Specifically, it is looking into solid-state LiDAR, which has a 120 degree field of

view and can provide a highly detailed view of objects in front of the vehicle. It is also developing LiDAR that provides a 360 degree view for the car, creating a detailed model of the wider environment.

"We want LiDAR to be not just a sensor but deeply integrated in the system," explained Vorobev. Bespoke LiDAR can bring serious advantages, and not just around price. Yandex claims that its LiDAR technology allows it to receive more information about the vehicle's surroundings because its engineers can access the raw sensor data. Most LiDAR units from third parties analyse and filter data as it is collected.

Learnings from robot delivery

Yandex's interest in autonomous driving is not limited to robotaxi services. It has also been exploring driverless goods delivery with the 'Rover' robot. It harnesses the same algorithms around object detection and path pandemic and the subsequent rise in online shopping and contagion concerns. Like Yandex, Ford is pursuing both robotaxi and delivery applications, and looking to transfer the learnings from one field to the other. As a company blog posting states: "A self-driving vehicle is capable of creating a detailed map of the



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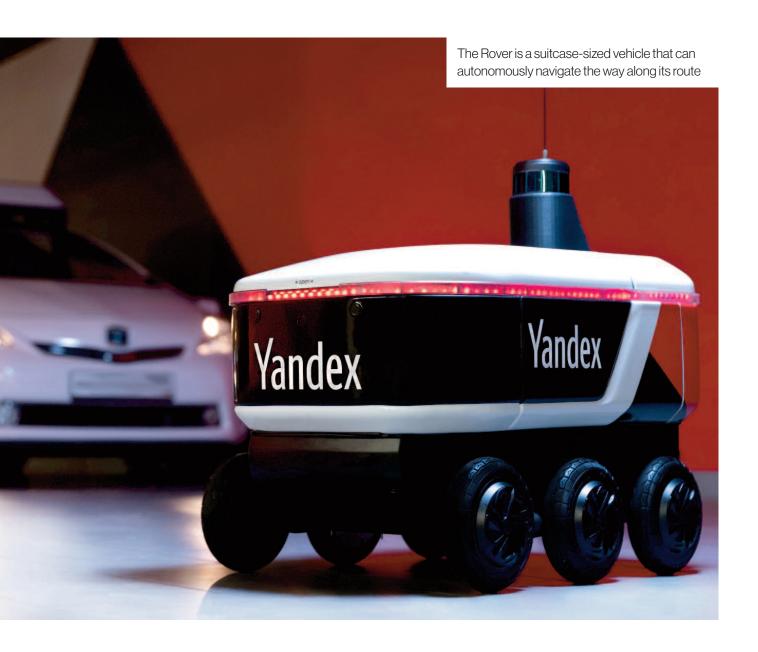
planning deployed in the taxi fleet but positioned on a smaller body. The system has been in operation in Moscow, delivering parcels from Beru, Yandex's online marketplace. "Aside from the fleet of vehicles, this is another way we are looking to improve mobility," *Automotive World* heard.

Many industry watchers and players are bullish on the future for driverless delivery, particularly in light of the global surrounding environment, so why not share that data with Digit [Ford's delivery robot] instead of having it recreate the same type of information?"

Up next

While Yandex's robotaxi developments have been focused on sedans, it is open to other body styles down the line. "It could be interesting to incorporate some van-like vehicles, which offer more room for passengers and things like electrified doors," a company spokesperson explained. "That would be good for the robotaxi services. We plan to try other vehicles and are open to collaborating with new automakers."

However, electrification is not high on its list. While Hyundai offers a hybrid version of the Sonata, Russia's electric vehicle (EV) charging infrastructure has not received the sort of investment or interest seen in



the US or Europe, and is far from ready to support mass volumes of EVs. "We use the same cars in Russia and Israel that we use in the US, so it has to work for all markets," the spokesperson pointed out. However, she noted that as a technology company, Yandex's system could work with any powertrain.

Regionally, Yandex could soon turn its attention to the US state of Michigan. Before the global pandemic hit, it had been selected by the Michigan Department of Transportation (MDOT) to provide self-driving vehicles for the Michigan
Mobility Challenge as part of
the 2020 North American
International Auto Show
(NAIAS). In collaboration with
Hyundai Mobis and Lawrence
Technological University,
Yandex was to run ten robotaxis
operating with fixed stops,
which would have marked the
largest demonstration of its
fleet in the US.

This technology demonstration ended up being cancelled in the wake of the virus, but Yandex still has its eye on opportunities in the region. Notably, Hyundai

Motors has a branch in Detroit. Vorobev and a colleague have had plenty of time to get to know the area: they arrived early to prepare for NAIAS and found themselves stuck there during lockdown, unable to return to Russia. But when Vorobev eventually makes it back home, others could take his place. "As soon as lockdown lifts we will expand the fleet there and continue testing," he said. "We like the state and its legislation. In Michigan, we can move to the next level of AVs and drive with nobody in the car at all. We may have more to say on this soon."

Einride outlines its vision for sustainable trucking

Autonomous, electric trucking start-up believes now is the moment to lay down centralised, digital foundations for a sustainable trucking future. By Jack Hunsley



he autonomous logistics space is currently witnessing a huge surge in demand. Though the impact of the novel coronavirus (COVID-19) has had a significant impact on automotive industry's spending power, the potential for contactless, driverless delivery has raised anticipation among many operators and developers. However, though an autonomous logistics future is attractive, unlocking this future will not be easy.

Though quite the challenge, many players in this space have made great strides in recent months. From TuSimple delivering post with the United States Postal Service (USPS) to Toyota-backed Pony.ai expanding into the delivery space, the sheer number of trials in this sector is indicative of its potential. Another competitor here,

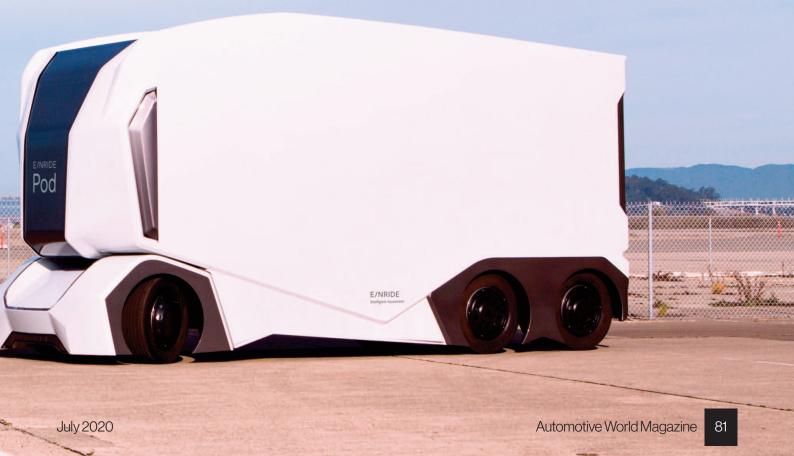
and perhaps one of the fresher entrants, is Einride. It might have initially cut its teeth designing autonomous technology for the Swedish lumber industry, but in June 2020 it outlined its vision of the future for all trucking activities. And, as it detailed to the media, it is a future that could arrive sooner than some might think.

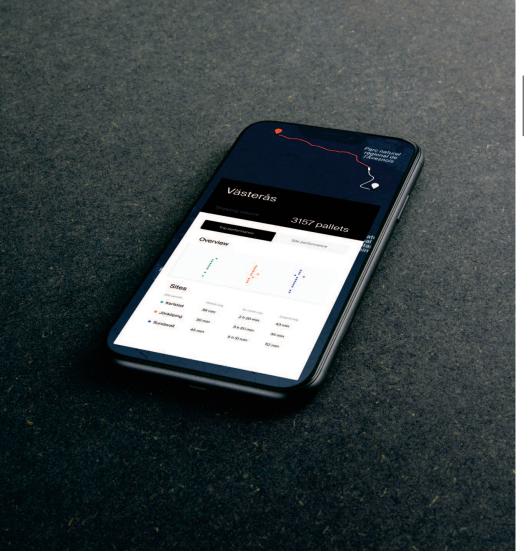
More than autonomy

Although Einride's expertise lies in autonomous, electric trucking, the company is eager to stress that digitisation is critical for more than just its AVs. With a growing number of EVs beginning to find their way into commercial fleets, any player looking to maximise its potential has to take a completely new approach.

"There's a common understanding that AVs need a centralised operating system to function, but it isn't as clear that the same approach is needed when it comes to electric trucks as well," said Karin Schlingmann, Vice President of Product, Digitalisation & Electrification. "Because of this, when we try to fit them into the current system architecture it becomes inefficient and expensive."

As Schlingmann explained, the numerous factors required to design and operate a fleet of electric trucks require huge technical sophistication, far beyond what a human could design or implement alone. The result, in Einride's view, is that those which so far have simply looked to directly switch diesel vehicles for electric alternatives are missing out on critical gains and learning opportunities.





Einride believes its Freight Mobility will be critical in enabling long term gains in freight management

"This is where the Freight

Mobility Platform comes in. Not only does it plan and operate a fleet of EVs, but it also uses the same technology to suggest where the transitions to electric transportation should start by identifying cost and environmentally beneficial shipping volumes," she said.

Though this transition will not be cheap, Einride hopes that players will see the value in future proofing their operations for if and when autonomous trucks enter mainstream operation. "Early adoption will not only unlock access to costcompetitive sustainable transportation today but also allow organisations to get ready for autonomous, electric options we see ahead," added Schlingmann. "The earlier you can shift to this new technology, the faster it can be adopted."

"The majority of [trials] suffer from the most common mistake which is that electric trucks are placed into the existing transport ecosystem as if they were a diesel truck. With limited system support, this results in placing them in simple use cases," she said. "By doing this, the user misses out on the business opportunity of electrification." In theory, it may also limit their potential to cut emissions if those vehicles end up being underutilised.

Instead, Einride proposes a complete rethink on fleet management, catered for via its Freight Mobility Platform. This platform, it claims, will be critical in enabling long term gains. "This is a massive

undertaking," said Schlingmann.
"This will take time, but it will
take even more time if no one
thinks it is needed."

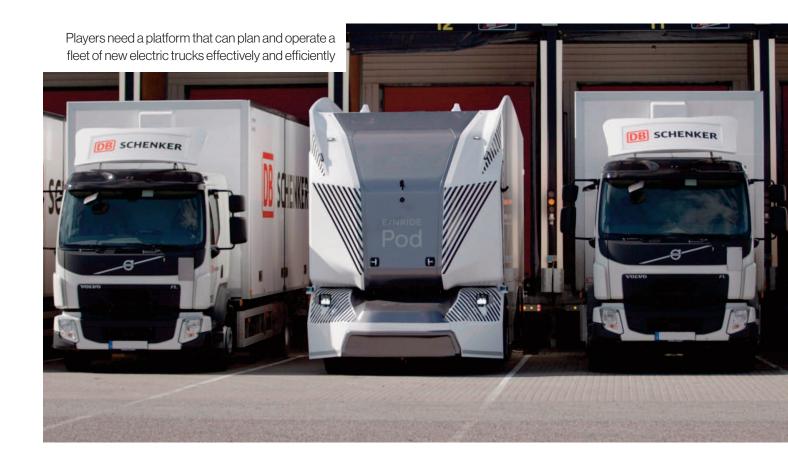
Shipper first

Kickstarting this revolution,
Schlingmann detailed, starts
with the shipper. Although endcustomers and shippers can
demand sustainability and that
many shippers are eager to make
the transition, without the right
tools the current operating
model cannot be overturned.
Instead, she said, players need a
platform that can plan and
operate a fleet of new electric
trucks effectively and efficiently
and spot opportunities which
human eyes may miss.

COVID squeeze

Shifting quickly, however, is far easier said than done, especially in the current COVID-hit market. Automakers, suppliers and technology companies alike are feeling a financial squeeze which, by many counts, is just as stressful as that seen 12 years ago: "The business case for autonomous is here. However, what we're seeing in the world in the wake of the current situation is that investors have sobered up," conceded Pär

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Degerman, Einride's Chief Technology Officer.

Capital pressure aside, though, Einride feels confident enough to ramp up its plans, with Chief Marketing Officer and CoFounder, Linnéa Kornehead, stating that Einride is now ready to invite carrier partners to join its platform moving forward. This coming autumn, it will also announce a new product line with new vehicle types and

updated software functionalities in what it says is just a snippet of what it intends to reveal in just a few months time.

"We're learning about our customers' and partners' challenges in going electric and autonomous, and we have found a way to enable sustainable transport that also makes a good business case. To make the transition achievable today, you need to use a centralised approach for the whole transport management. That means that the first steps towards autonomous and electric transport is to digitise," said Kornehead. "We have the responsibility to challenge ourselves and our way of living. Change is never easy, and this will be no different. But we can change, and we must, because we must strive to go forward."



The majority of [trials] suffer from the most common mistake which is that electric trucks are placed into the existing transport ecosystem as if they were a diesel truck

Karin Schlingmann, Einride