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Telematics Industry
Insights by
Michael L. Sena

THE DISPATCHER

IN THIS ISSUE

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- *Near-term mobility and community service benefits*
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http://summit.smartdrivingcar.com/

ITU and UNECE

The SYMPOSIUM ON THE FUTURE NETWORKED CAR 2020
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5 MARCH 2020.

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- *Connected and automated vehicles at the crossroads to success*
- *Cybersecurity impact and outlook for automotive systems*
- *AI for autonomous and assisted driving*
- *Policy and regulatory issues to support deployment of automated mobility*

https://www.itu.int/en/fnc/2020/Pages/default.aspx

THE DISPATCHER

Telematics Industry Insights by Michael L. Sena
February 2020 – Volume 7, Issue 4

Open Data Access Challenges Entire Car Ecosystem

1. Eleven industry, consumer and SME associations contributed to the preparation of the ***Manifesto for fair digitalization opportunities*** delivered to the European Commission in October 2019.

ADPA represents the European independent automotive data publishers.
CECRA represents the European motor trade and repair businesses.
CITA represents the organisations inspecting or supervising inspection of in-service motor vehicles and their trailers.
EGEA represents the European garage and test equipment manufacturers and importers.
ETRMA represents the European tyre and rubber goods producers.
FIA Region I represents the European motoring and touring clubs.
FIGIEFA represents the European independent automotive aftermarket distributors.
Insurance Europe represents the European insurance and reinsurance sector.
Leaseurope represents the European leasing and automotive rental industries.
SMEunited represents the European crafts, trades and SMEs.
UEIL represents the European lubricants industry.

SERVICE AND PRODUCT providers in the European automotive ecosystem have been growing more and more restive over the years. These providers include those who contract with the automotive OEMs to deliver services to owners and drivers, such as roadside assistance providers (B2B and B2B2C), and those who sell directly to the owners and drivers of cars, such as insurance providers (B2C). Their apprehension has escalated in direct proportion to the degree of connectivity the automotive OEMs are embedding into the cars they manufacture and the amount of data being collected and used by the car OEMs. Insurance companies, motor clubs, tire manufacturers, parts distributors, independent repair workshops, among others, have now decided it's time to act.[1]

The problem, as this group of companies and organizations see it, is that "with the advent of the 'connected car', competition now starts in the vehicle where the data quality and the ability to safely access car functionality determines the quality of the service." The car companies have designed their telematics systems so it is they and no one else that are at the end point of data sent from their vehicles, and it is they and no one else that communicate with their vehicles. ***Unfair!*** say the service and product providers in their **Manifesto**: "In an increasingly digitised automotive sector, the whole automotive value chain must have the right to evolve their business models and thus compete on an equal footing with vehicle manufacturers (Editor's emphasis) to be able to continue to offer the competitive services expected by their customers."

What the eleven organisations are asking for—demanding—from the European Commission is a legislative solution that will guarantee nothing less than free, open, direct, real-time and bi-directional access to in-vehicle data. Firstly, they do not want to ask for permission from the OEMs for this access; they do not want their access monitored by the OEMs; and, above all, they do not want to receive data after it has been processed by the OEMs' data

servers. Secondly, they want to interact with the driver directly via the vehicle's HMI. Thirdly—and this is the big one—they want to be able to run independent software directly in the vehicle (and I quote from the **Manifesto**) "using onboard computational capabilities to process any dynamically generated data as closely as possible to its source."

How the seeds of discontent were sown

This issue, made manifest by the eleven organizations on behalf of those who they represent, has been simmering below the surface from a time long before cars were connected to a mobile network.[2] Vehicle OEMs, with their warranty service and "genuine" parts, did everything they could to bring their cars into their own workshops because that was (and stilll is) where the greatest profits are made. They threatened to invalidate the new car warranty if aftermarket parts were used. In 1975, the U.S. *Magnuson-Moss Warranty Act of 1975* established that a dealer must prove that aftermarket equipment caused the need for repairs before it can deny warranty coverage. It took thirty-five years for the EU to recognize and address the same issue. In December 2009, the European Commission found in the market for repair and maintenance of vehicles that "structural factors, such as the brand-specific nature of the markets and the prevalence of captive spare parts intrinsically limit competition."[3] The EU introduced a new competition law framework for the automotive sector, effective the 1st of June 2010.

Roadside assistance has been another area of contention between the OEMs and, particularly, the motor clubs. Motor clubs like the AMERICAN AUTOMOBILE ASSOCIATION (AAA) in the U.S. and ADAC in Germany, had the business of pre-paid roadside assistance pretty much to themselves until the 1980s. The independent tow truck operators who signed up to work for motor clubs did so in order to take the broken down cars to their shops where they could earn real money by getting them back on the road. When I began working as a consultant to AAA in 1984, I heard the story of a foreign automobile company approaching them with the idea of offering a branded service to their warranty customers. Behind this brainstorm was, of course, the towing of their cars only to their own dealers' workshops. AAA, with its then-30 million-or-so members told the interloper that anyone who would purchase their cars would already be a member of AAA and would not need to have both a belt and suspenders (braces), and

2. Car meets mobile/cellular network. This happened in various tests in Europe, Japan and the U.S. during the 1980s, but the first commercial telematics systems were the FORD *RESCU* (Remote Emergency Satellite Cellular Unit), introduced on the 1996 Lincoln Continental, and the GM *OnStar*, introduced on 1997 model year vehicles. FORD actually patented the concept of sending a position along with other data via the cellular network to a receiving server, which became known as the telematics service provider. FORD licensed their patent to all car OEMs at no cost.

3. https://ec.europa.eu/commission/presscorner/detail/en/IP_09_1984

sent him on his way. I heard a similar story when I started consulting to the U.K. Automobile Association in 1991, except it was an American OEM doing the asking.

In the U.S., AAA's demurral ended up with the meteoric rise of CROSS COUNTRY GROUP as the largest independent provider of roadside assistance, and in Britain, the RAC mushroomed from 700,000 to 7 million members. The motor clubs eventually joined the independent roadside assistance providers, competing with them for the OEM contracts.

The EU began to take notice of the growing conflict between vehicle OEMs and their sometime partners/sometime competitors when, instead of greasy parts, cars started being driven with proprietary software. VW claims that it introduced the first on-board computer system in 1969 in their fuel-injected Type 3 models. In 1988, the Society of Automotive Engineers (SAE) recommended a standardized diagnostic connector (OBD, for *On-board Diagnostics*) and a set of diagnostic test signals (Diagnostic Trouble Codes or DTCs). If there was ever a reason for cars to require a dealer workshop, rather than an independent, this was it. Software from either a tier one supplier of a particular part, or directly from the OEM, was downloaded to an OEM-specific workshop system that was connected to the vehicle's electronic network.

Not much time passed before the service and product suppliers cried foul. The fact that each OEM had its own system for communicating with its vehicles was eventually seen by the European Commission as anti-competitive. In 2007, the EU passed a Regulation that manufacturers "shall provide unrestricted and standardised access to vehicle repair and maintenance information to independent operators through websites using a standardised format in a readily accessible and prompt manner, and in a manner which is non-discriminatory compared to the provision given or access granted to authorised dealers and repairers. With a view to facilitating the achievement of this objective, the information shall be submitted in a consistent manner, initially in accordance with the technical requirements of the OASIS format. Manufacturers shall also make training material available to independent operators and authorised dealers and repairers."[4]

Everyone wants the same thing: the customer

I have worked on both sides of the automotive products and services fence for the past forty-two years, on the supplier side and

4. REGULATION (EC) No 715/2007 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information https://eur-lex.europa.eu/eli/reg/2007/715/oj

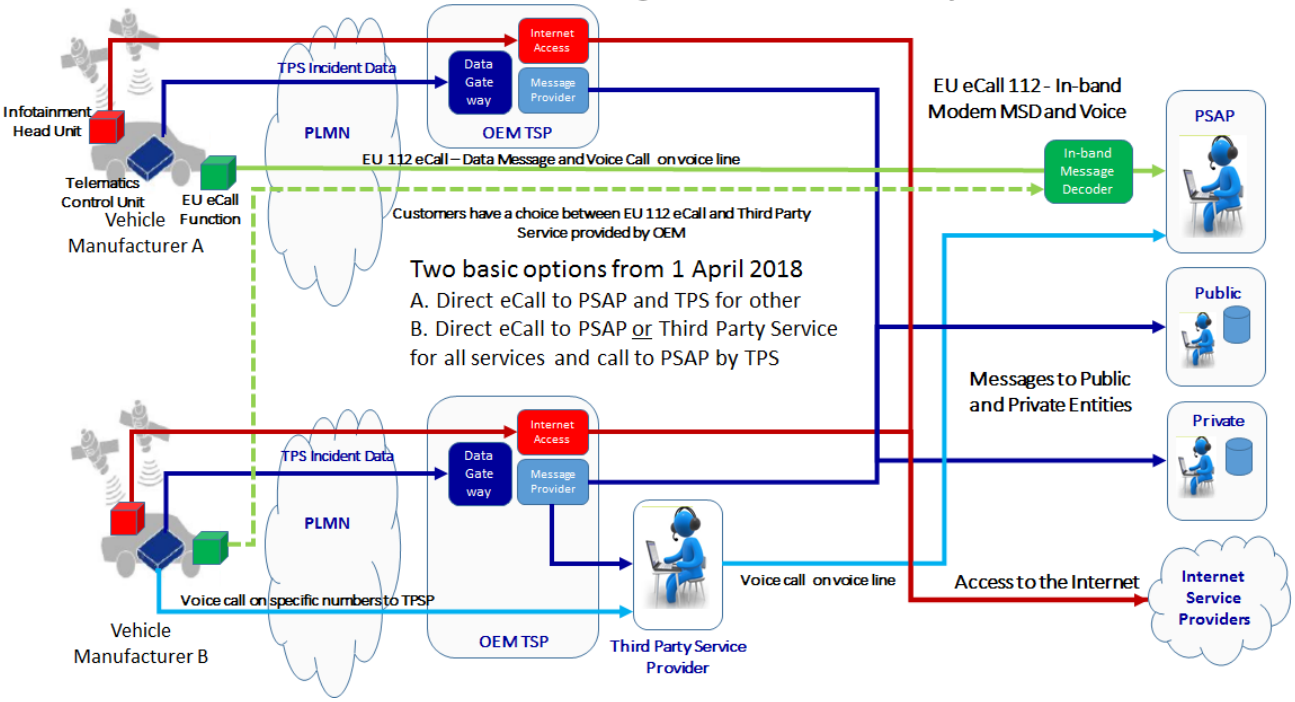
on the vehicle OEM side, both as an employee and as a consultant. I can state with certainty that both sides have been totally transparent about their intentions and their objectives: Up until now, they have both wanted to be the primary contact for the customer, who is the owner or driver of a vehicle. Neither has wanted to be intermediated by the other. Neither has wanted to be subservient to the other. Neither has hidden these facts from the other.

For the automotive OEMs, adding connectivity to the vehicle was viewed simply as a way to enhance the brand's appeal in the eyes of customers because automotive OEMs are in the business of selling cars. The more cars they sell, the more parts, maintenance services and accessories they can sell. They are not in the insurance-selling business (although they broker it) or in the roadside assistance business (although they contract for it).

In 1996, the first devices were placed in vehicles that provided the position of the vehicle to a call center via a mobile network.[5] Their principal purpose was to remotely request emergency services in case of a crash or a breakdown and for safety warnings. As the capabilities of the mobile networks grew from their analog beginnings (AMPS) in the U.S. with *OnStar* and *RESCU*, and second generation GSM (2G) in Europe, services grew. Remote door controls, destination download to the navigation system, remote heater start and many others services were added. From country-

5. OnStar and RESCU had already been announced when, at the end of 1996, Volvo's management team gave the green light to commercialize what became ***Volvo On Call***. The work was funded by the department responsible for the alarm system, and its principal purpose was to alert the emergency services in case of a crash. I was part of the team developing Volvo On Call, and worked for the next twenty years introducing it into global markets.

OEM Solutions for Delivering Vehicle Connectivity: 2019

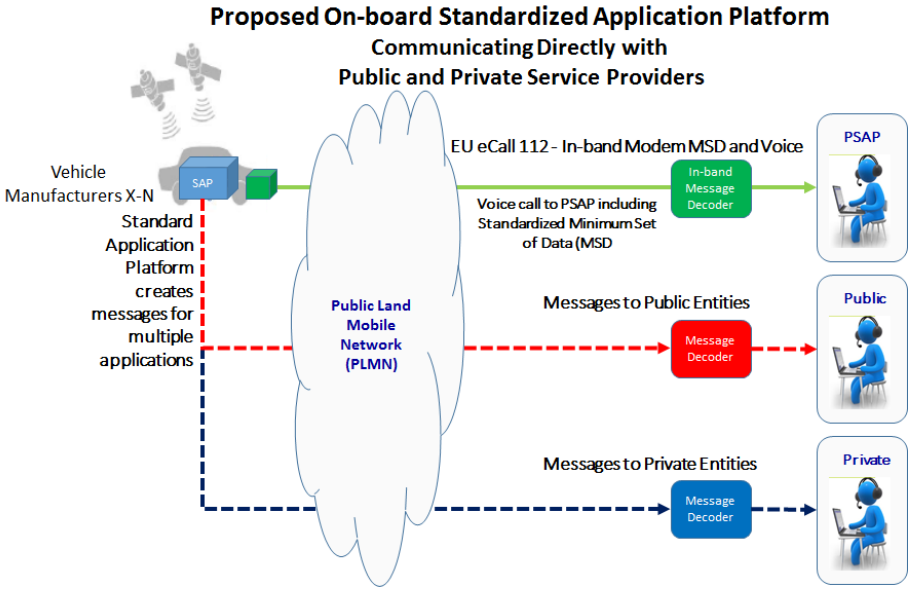


specific SIM-cards and service providers, the OEMs, each with their ecosystem of trusted partners connected through their centralized telematics service providers (e.g. WirelessCar), developed multi-country SIMs with services delivered seamlessly across country borders. From sending and receiving data via SMS and GPRS, messages today are processed using IP, such as MQTT. Telematics control units have been joined by Internet-capable infotainment head units. In April 2018, the functionality to deliver direct calls to public safety answering points (PSAPs) within the EU was required for all cars type-approved after 31 March 2018.[6]

Today, we have two solutions that have been implemented by most OEMs for their EU offerings (as shown above). Both use a data gateway in the form of a TSP, which is either operated by the OEM or operated by a third party (e.g., WirelessCar) on behalf of the OEM. Both have Internet capabilities which either use a filter to provide an OEM-specific experience on the HMI or allow access via *Apple CarPlay* or *Android Auto* for non-vehicle-critical applications, such as radio and navigation. Both deliver data to public and private organizations for use in traffic information and warning systems, usage-based insurance or other types of services. The main difference between the two solutions is the addition of a call center for remote access to the vehicle, either for providing information to the driver or providing a first line of service in case of a breakdown, a crash or an attempted theft.

It is having to receive data after it has been processed by the OEM's off-board gateway, the TSP, which the service and product providers object to. They want what they have described as an "in-vehicle interoperable, standardized, secure and open-access

6. There is no equivalent to EU eCall in any other part of the world except Russia, which has a similar standard but with the addition of SMS messaging to complement the 112 phone call that includes an embedded minimum set of data (MSD).



platform in which the vehicle is equipped with a platform capable of communicating directly with service and product providers." Such a solution was described in a report commissioned by the European Commission in 2017, and compared with other solutions presented by the OEMs.[7] It is comprised of a Central Connectivity Unit that communicates with the in-vehicle systems via a 'Gateway' (a to-be-standardised open vehicle interface) and an 'automotive firewall', both of which would need to be developed and integrated into the vehicle. This would obviate the need for a TSP, even for the OEM, since the OEM would be accessing data on the same terms and using the same system as all other vehicle data users. The solution would look like the diagram above.

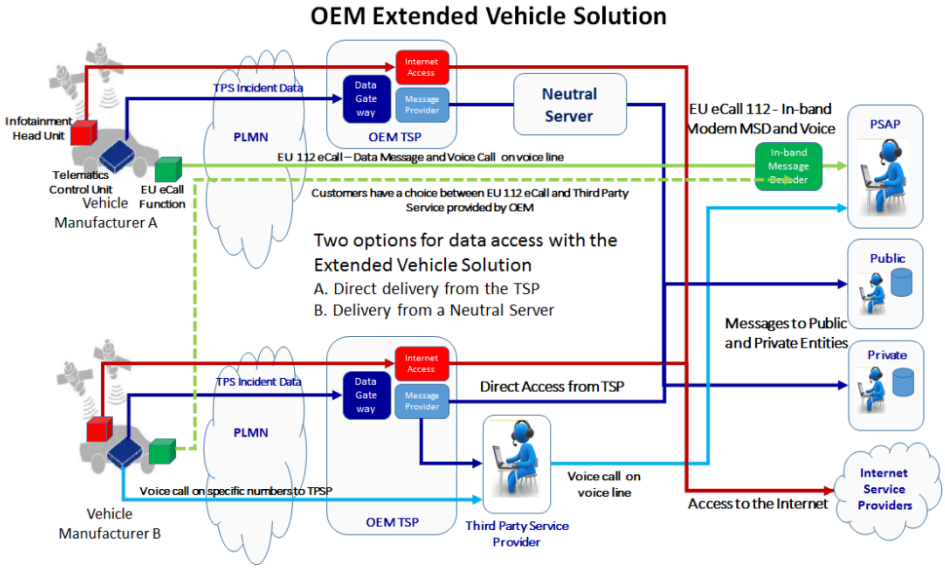
7. Transport Research Laboratory (TRL) study on 'Access to In-vehicle Data and Resources', August 2017.

After carefully reading the TRL report, I reviewed it in the October 2017 issue of *THE DISPATCHER* (The Dispatcher October 2017). I stated my reasons in this review why I believe its evaluation of the various options, including the one proposed by the OEMs, was biased in favor of the *standardized application platform* proposal. I stated further that the report does not directly address the four principal problems identified by the OEMs with external, third-party access to vehicle-critical systems and functions proposed with the *standardized application platform*. These problems are: 1) every data interface increases the entry points of hackers, significantly reducing security; 2) external access to the HMI increases the risk of inconsistent presentation of commands and actions required by the driver, thereby increasing the risk of driver distraction; 3) software installed in the vehicle cannot malfunction while the vehicle is being driven and rebooted like a PC; the software must be tested and operationally secured with all the other software in the vehicle; and, 4) the solution must not undermine the liability of the vehicle manufacturer so it must be tested and certified along with all other vehicle components.

In spite of these issues, this is the solution that is presented by the service and product providers in its **Manifesto**. Those behind the **Manifesto** will at all costs avoid being obligated to sign a data transfer contract with the vehicle manufacturer. It states that its solution "is without prejudice to the principle of technology neutrality," as the functional requirements are defined, but the technical implementation remains at the discretion of the implementing party (i.e., the OEM).

The OEMs do not agree. They have offered to deliver data to the service and product providers after the vehicle has sent data to the TSP, either directly from their own TSPs or via a neutral server

set up by an independent agent, as shown in the diagram below. IBM launched a neutral server service in 2017 that delivers data it receives from BMW to anyone wishing to use vehicle data to develop services for BMW ConnectedDrive customers.[8] This solution has been called the '***Extended Vehicle***' concept (see diagram above). It was standardized as ***ISO 20077-1:2017 Road Vehicles*** in 2017 by ISO Technical Committee 22/SC 31 Data Communications. Everything one could want to know about this solution can be found on the web site Car Data Facts that has been developed and operated by ACEA, the *European Automobile Manufacturers' Association*.[9] There you will find all the reasons why the OEMs do not want to accept the service and product providers' request for direct access to their vehicles.



For the OEMs, this is bigger than electrification

It looks as if we have another standoff, like the one that developed with the ***European eCall*** proposal that was first put forward in 2002 by the European Commission. In that case, because the initial solution the EC arrived at (in-band modem with a 112 voice call and no possibility for a third-party service provider (TPSP) call center) was strongly resisted by the OEMs, it took sixteen years before a solution acceptable to both parties (barely by the OEMs and the only under duress by the Commission) could be adopted. In the end, the Commission relented on its TPSP stance so companies like VOLVO, BMW and PSA that together had millions of customers connected to their third party services could continue to use these services even for new customers, and the OEMs accepted that they would have to install an in-band modem and permit their customers to decide whether they would use their TPSPs or go directly to the PSAPs.

8. In 2017, IBM became a pilot partner of BMW CarData that will allow up to 8.5 million BMW customers globally to make use of third party services. BMW was the first OEM to release an open data platform which gives BMW ConnectedDrive customers the ability to share telematics data from their BMW vehicles with third parties of their choice. IBM integrated its Bluemix with the BMW CarData platform. Vehicle data is enhanced by IBM Watson IoT, using cognitive and data analytics services to enable third parties, such as automotive repair shops or insurance companies, to develop entirely new customer experiences.

9. https://cardatafacts.eu/about-us/

Once again today, the Commission is orchestrating an effort to develop a technical solution, one that the OEMs have not worked on nor sanctioned. This is exactly the wrong thing to do because the car industry will spend years explaining why the technical solution will not work—which is what the ACEA site does in highly detailed and articulate terms. RENAULT, PSA, MERCEDES-BENZ, BMW and VW will work on their EU representatives to veto any proposal that forces them to install a system that removes their ability to control what happens in their vehicles. France and Germany blocked the eCall proposed Regulation until their car companies were comfortable with the proposal. In which other industry do politicians tell businesses how they should design their products? For some reason, the EC feels compelled to do this with the car industry. It should state the requirements and let the industry reply with proposals on how the requirement can be satisfied.

The Commission has ignored or simply not understood that the European car industry is fighting its own battle for its continued existence, and if it does not survive, neither do the service and product providers. PSA isn't merging with FCA because the two companies want to create a powerhouse; they are merging in order for both to continue to exist. MERCEDES-BENZ did not just announce cost-cutting and staff-cutting measures because it wants to increase its profits; it must cut costs to stay in operation and try to resuscitate its stock price, which has halved since 2015. OPEL wasn't sold by GM at a rock bottom price to PSA because GM wanted a little extra money to invest in its electrification and self-driving car efforts; it sold OPEL for the same reason it closed factories and laid off thousands of workers. If any one believes that China is leading the world in the sale of battery electric vehicles because it is concerned with the environment, they need a little course in geopolitics.[10] If China can build up its capacity to manufacture electric cars, it can flood the rest of the world with them, just as it is flooding it with all the other products it manufacturers, and these will be cheaper than anything European or American car manufacturers can produce. This is what the European car industry is facing.

10. China leads the world in the burning of coal to produce electricity, and using its own coal is cheaper than buying oil from foreign countries.

Connectivity of vehicles today is more important than whether the cars are run on electricity or fossil fuels because, during the coming five years, most cars that are sold globally will continue to be fueled by gasoline and diesel fuels. That is a fact. Connectivity of vehicles today is much more important than whether the car can drive itself on highways or byways. The degree and quality of

connectivity is what is going to determine if a car company survives within the coming decade, not whether the cars drive themselves. One car OEM after the other has said during the past six months that self-driving cars are not around the corner.

If the car companies do not do all they can to ensure that their vehicles have safe, secure, affordable and highly functional connectivity, they will not be ready for the changes that will eventually come in how cars are driven and used. The next generation of mobility users (whether they own or drive a car is less important than whether they use a car) are already connected to each other and to everything, and they will expect their mobility devices to be highly connected as well. One of the absolute keys to the future is over-the-air updating of software and firmware so that as soon as a new function is ready it can be delivered to customers. Today, only Tesla has mastered this function and that is because it designed end-to-end connectivity into its vehicles from the start. After twenty years, the rest of the OEMs are still struggling to build their on-board and off-board infrastructures. Many are close, but much work is still needed. The last thing the European car companies need now is to be forced to turn over their connectivity operations to independent third parties, thereby losing an important competitive advantage they have as car companies.

What is the requirement that the Commission wants to ensure that car companies satisfy? The Commission has adopted a *Communication on Building a European Data Economy*.[11] One of its fundamental principles related to transport is that "customers (vehicle owner/drivers) will have the freedom to choose a service based on accessing in-vehicle data to meet their specific needs, which the Commission assumes will require an open and undistorted competition for the provision of these services." This statement can be interpreted in countless ways, but designing a box that is placed in every vehicle and sends data messages directly to every possible service provider is certainly neither the only way to ensure such open access, nor, according to those companies responsible for building the cars in which these boxes would be inserted, the best way.

Luckily, it appears a solution to this conundrum is hiding right there in plain sight.

Car companies already signaled acquiescence

The cat was let out of the bag when two of the four telematics pioneers turned over their infotainment systems to Google.[12] If

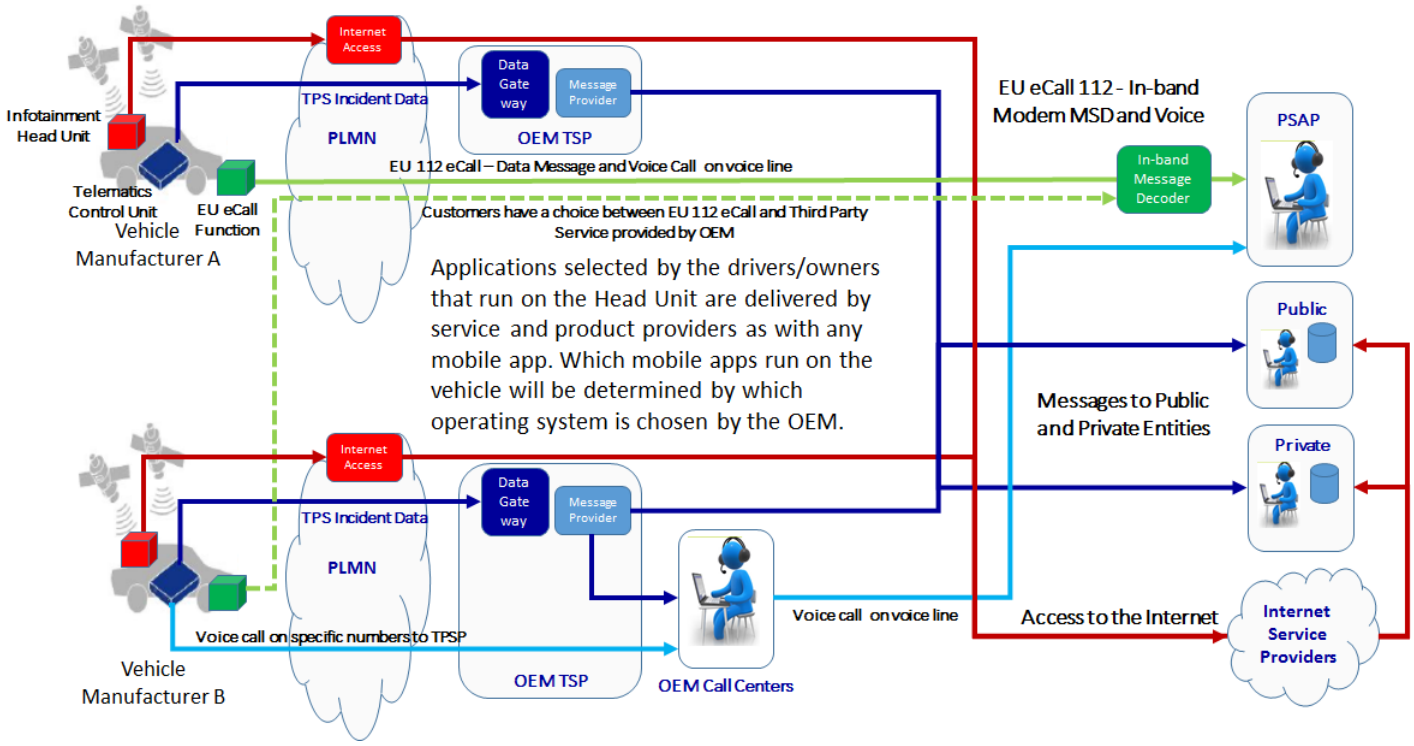
11. https://eur-lex.europa.eu/content/news/building_EU_data_economy.html

12. The two are Volvo Cars and GM. See the December issue of The Dispatcher, *Good for Google is not always good for us ganders* for Volvo. In September 2019, GM detailed plans to work with Google to install their apps and functionality directly into the vehicle. Google's Android operating system will enable drivers to access and use apps and functionality without having their phone or personal device wired directly to the car; however, they will need to provide consent to the companies to gather data from apps and services they use.

they can permit one company (i.e., Google) to have direct contact with drivers through the vehicle's HMI, and allow driver and vehicle data to be passed directly to this company, then there should be no argument over tolerating other third parties having similar access. Service and product suppliers could develop applications running on Android, iOS or other operating systems installed by the OEMs at their discretion which could function in a similar fashion as on a mobile phone with mobile apps.

How easy it would be to program the vehicle's roadside assistance emergency button to phone and send data to the driver's preferred supplier, rather than to the roadside assistance provider selected by the OEM. CONTINENTAL, MICHELIN, GOODYEAR, NOKIA

OEM Solutions for Delivering Vehicle Connectivity: 2025



or any tire manufacturer could develop an app that monitors tire pressure. Digital trouble codes could be sent to any independent repair workshop that developed an appropriate app, and data for pay-as-you-drive insurance or car leasing could be directed to the customer's chosen provider. It would be up to the OEMs to determine how actions triggered by the service provider are executed in the vehicle and how the required data is delivered to the application. Standardizing the data requirements for various applications would be a pre-condition. This should be done with the OEMs participating in the standardization work, rather than each

interest group (e.g., roadside assistance, insurance, etc.) developing a proposal and then handing it over to the OEMs after it is finished.

Service and product providers are asking for open and direct access to data. The solution I have proposed provides that access with no permissions required by the OEMs and no passing of data through the OEMs' servers. This solution does not preclude the OEMs from continuing to provide their own services directly to their customers and delivering data as they do today, at their own discretion, to public and private service providers who choose to work with them. Why should they be precluded from doing so? Do car manufacturers have to hand over their entire business to the service and product providers? Is that the end game? Motor clubs do not hand over to the OEMs their tow truck databases. Insurance companies do not provide the OEMs with the algorithms they use to determine insurance rates.

What seems to be missing in these discussions is an acknowledgement that vehicle connectivity does not change the basic business models for any of the parties. The generation of on-board data was, and still is, intended to support the car OEMs' business models, not those of its suppliers, just as the digitalization of the suppliers' businesses was never intended to help car companies sell cars but to make their own businesses more profitable and attractive to their own customers. Each company uses data as a competitive advantage to obtain and retain customers. Service and product providers need data to deliver their services and products, and the car OEMs require data as well to deliver their vehicles, to keep them running safely, economically and with the lowest possible impact on the environment.

Where things will get much trickier is with remotely downloading and running software in the vehicle and with over-the-air updating of firmware and software. Tier one component suppliers are already part of the OTA process since they deliver software updates to the OEMs for updating by the OEM systems. Third-party service providers have no business updating software developed by the OEMs or any of their tier one suppliers, but they should be able to update their own app software that is loaded into the vehicle. Work is proceeding within the UNECE WP.29 on standardizing a secure method for over-the-air updating which should help to make it possible for both the OEMs and third party service providers to perform updates.[13,14]

13. ***Economic Commission for Europe; Inland Transport Committee World Forum for Harmonization of Vehicle Regulations***
Working Party on Automated/Autonomous and Connected Vehicles
Second session
Geneva, 28 January-1 February 2019
Item 5 (c) of the provisional agenda
Automated/autonomous and connected vehicles:
Software updates (incl. Over-The-Air updates)
Draft Recommendation on Software Updates of the Task Force on Cyber Security and Over-the-air issues

14. In 2020, the World Forum for Harmonization of Vehicle Regulations under the United Nations Economic Commission for Europe (UNECE) is expected to finalize its regulations on cybersecurity and software updates132, making cybersecurity a requirement for future vehicle sales. Experts see this upcoming regulation as the beginning of an era of technical compliance in the automotive sector.

The last thing the car industry needs now—and this includes all companies and organizations working directly and indirectly with the manufacture, sale and service of the vehicles and their drivers—is an internal battle among the members of the automotive ecosystem that will severely weaken car manufacturers and thereby reduce the viability of the suppliers' businesses as well.

Motorized road transport has been demonized, by, among others, *Extinction Rebellion (see sidebar)*, as a major source of greenhouse gas emissions and a cause of millions of deaths and injuries. Its worst critics ignore the significant improvements to all types of vehicles that have been and continue to be made in reducing their environmental footprint and increasing safety for those inside and outside these vehicles. Forgive my over dramatisation, but even worse, they completely ignore the hundreds of millions of lives that have been saved by ambulances and fire trucks during the past one hundred years, the children who survived childbirth because their parents had a car that could take them to the hospital and all the other positive contributions cars and trucks and other road transport vehicles have made.

All participants in the automotive ecosystem should be cooperating to work through the transition that is now taking place within the industry, whoever or whatever is driving and no matter what the method of propulsion in the coming years. That transition will deliver clean, safe and equitable vehicular mobility which will complement all other modes, removing the label of villain and restoring the reputation of cars and trucks as one of the most useful inventions of all time.

The protesters from ***Extinction Rebellion*** at the Brussels Motor Show on the 18th of January are not evil. They're not terrorists either. They are simply freightened out of their wits, freightened that Earth will not support life while they are still planning to inhabit it. "We call it 'the Salon of Lies' because we absolutely don't believe the automobile industry can bring solutions to this ecological and climate crisis. It has already lied in the past, is still lying and will continue to lie to us if we don't stop it," said Sara, calling for a new model of transport that respected the ecological and social good. A little more respect for other people's property might be a good *quid pro quo*, but when you're frightened out of your wits, how can you spare the paint. Since it was Saturday, at least they weren't skipping school.

Dispatch Central

***FNC2020** confirmed speakers and moderators include:*

***Jean Todt**, President of FIA and UN Secretary General's Special Envoy for Road Safety*

***T. Russell Shields**, President and CEO, RoadDB*

***Roger C. Lanctot**, Associate Director, Global Automotive Practice, Strategy Analytics*

***Michael L. Sena**, Editor, The Dispatcher*

***Ian Yarnold**, Head, International Vehicle Standards Division, U.K. Department for Transport*

***Bilel Jamoussi**, Chief, ITU-T Study Groups Department, ITU*

***Francois Guichard**, WP.29/GRVA Secretary, UNECE*

The symposium will be followed by a meeting of the Collaboration on Intelligent Transport System (ITS) Communication Standards at ITU Headquarters, 6 March 2020, an open platform to advance the development of globally harmonized ITS communication standards.

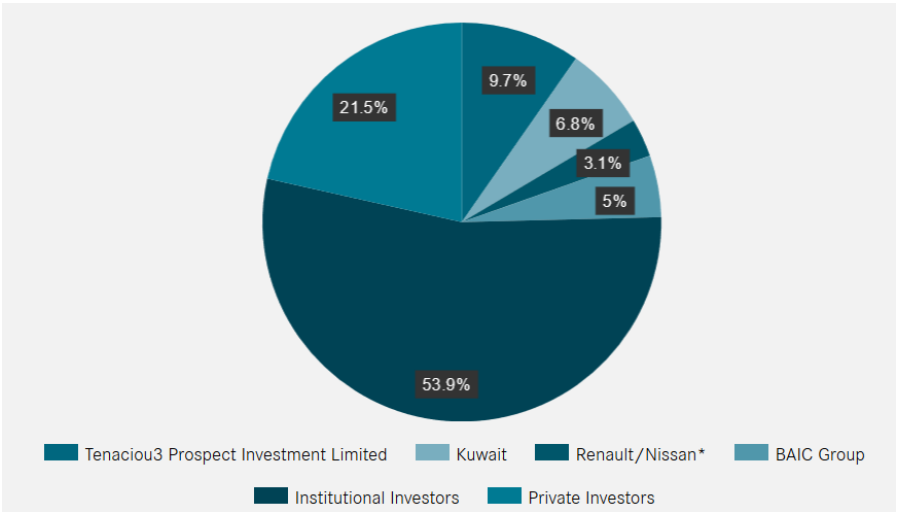
Future Networked Car 2020 (FNC2020)

The *Symposium on the Future Networked Car 2020* is just a little over two months away. It is always held at the start of the Geneva International Motor Show and co-located with that event at the Palexpo convention center located next to the Geneva Airport. This year, FNC2020 is on the 5th of March.

The event brings together the automotive and ICT industries to explore advances in connected, automated vehicles and associated implications for technology, business and regulation. It is convened by International Telecommunication Union (ITU) and the United Nations Economic Commission for Europe (UNECE). This will be the 15th edition of the Symposium. It will highlight the state of the art in automotive cybersecurity; discuss the route towards an International Driving Permit for the AI 'drivers' in control of automated vehicle; explore the status and future of safety-critical radio communications for the road; and, present the latest developments in the review of regulations governing road transport.

Participation in the Symposium is free of charge and open to all. It is one conference that should not be missed.

China is buying the European car industry



Shares by ownership in % of registered capital stock (October 31, 2019)

Two Chinese companies together now own 14.7% of Daimler. Daimler's biggest individual shareholders are Kuwait's Sovereign Savings Fund (since 1974), Renault-Nissan (cross-holdings since 2010), Chinese investor Li Shufu and BAIC Group. Li Shufu holds the largest single equity stake in Daimler through Tenaciou3 Prospect Investment Limited (since 2018). In July 2019, the Chinese BAIC Group acquired 5 % of the voting rights in Daimler. It is reportedly

poised to double its holding, which would give the two Chinese companies together almost 20% of DAIMLER ownership.

BAIC (BEIJING AUTOMOTIVE INDUSTRY HOLDING CO. LTD.) is a state-owned enterprise and holding company of several automobile manufacturers based in Beijing. Its main business has building MERCEDES-BENZ and HYUNDAI cars in joint ventures set up with these companies when such JVs were the only way a non-Chinese company could manufacture and sell vehicles in China.[14] in 2018, Beijing Benz accounted for 90% of BAIC's total revenue, and generated a profit of $1.5 billion. In the same year, BAIC lost $1 billion on its domestic brands. In 2009, BAIC was able to purchase certain SAAB intellectual property assets from GENERAL MOTORS that GM was willing to sell before selling the rest of the company to SPYKER CARS in January 2010. BAIC paid $197 million for the rights and equipment to make SAAB's 9-5 and 9-3 sedans.

Besides Li Shufu's holdings in Daimler, he has complete ownership of European car makers VOLVO CARS, LOTUS CARS, LONDON ELECTRIC VEHICLE COMPANY and LYNK & CO. He also owns the largest share of VOLVO GROUP with 8.2% of the shares and 15.6% of voting rights.

SAIC (formerly SHANGHAI AUTOMOTIVE INDUATRY CORPORATION), a subsidiary of state-owned SHANGHAI ASSETS SUPERVISION AND ADMINISTRATION COMMISSION, owns MG and LDV (Leyland DAF Vans). SAIC bought the intellectual property in LDV from ROVER GROUP/BRITISH LEYLAND. Finally, SAIC also owns the technology for what was once ROVER, which was sold in 2005 by MG ROVER, but without the rights to the name. The *Rover* is sold as *Roewe*.

There are still a few vehicle manufacturers left in Europe that could be picked up by the Chinese. ASTON MARTIN comes to mind, and Geely appears interested. TATA may tire of topping up the coffers of JAGUAR LAND ROVER. BENTLEY is not bound to VW in the same way as the other brands, nor is ROLLS-ROYCE bolted to BMW.

It is worth noting how Li Shufu acquired his stake in Daimler. German regulations require companies to notifiy authorities if their share of voting rights pass 3% and then again if they pass 5%. When Daimler announced that TENACIOU3 was a new owner with almost 10% of the voting shares, the markets and the German authorities were surprised. However, Li Shufu did nothing wrong. His shares were built up gradually using shell companies, derivatives, bank financing and carefully structured share options. When it all came together, he made the $9 billion investment and only then did he have the voting shares.[15]

14. In April 2018, the *National Development and Reform Commission* (NDRC), China's top economic planning agency, announced that the country will within a five-year period phase out the 50-percent ownership limit for foreign companies in a JV with a Chinese partner. According a statement from the NDRC, China announced it would scrap the ownership limit for foreign carmakers in special-purpose vehicle JVs and new-energy vehicle JVs in 2018, in commercial vehicle JVs by 2020 and in passenger vehicle JVs by 2022. Tesla became the first company to announce it would set up a manufacturing facility in China as a result of the change.

15. *How Geely's Li Shufu spent months stealthily building a $9 billion stake in Daimler*. *REUTERS BUSINESS NEWS* (March 1, 2018).

California Consumer Privacy Act vs. GDPR

ON THE FIRST day of 2020, the *California Consumer Privacy Act (CCPA)* went into effect.[16] Is it America's version of the *EU's General Data Protection Regulation (GDPR)*? Will it apply to all U.S. companies doing business with residents of California or just to those operating in the state? How will it impact businesses in foreign countries or foreign residents using products and services from California companies, such as Google, Facebook, Uber and many, many more? CCPA raises a lot of questions, just as GDPR did when it became an EU Regulation in May, 2018.

It's important to appreciate the difference between U.S. Federal law (i.e., laws passed by the United States Congress) versus State law. Federal law is created at the national level, and applies to the entire nation (all 50 states and the District of Columbia), and U.S. territories. The U.S. Constitution forms the basis for Federal law; it establishes government power and responsibility, as well as preservation of the basic rights of every citizen.[17] State law is the law of each separate U.S. state and is applicable in that specific state. The state law applies to residents and visitors of the state, and also to business entities, corporations, or any organizations based or operating in that state.

When a state law is in direct conflict with Federal law, the Federal law prevails. A state law can afford more rights to its residents than Federal law, but is not meant to reduce or restrict the rights of a U.S. citizen. There are no specific Federal laws governing the right to privacy, although there are interpretations of privacy referenced to the Bill of Rights and certain Amendments to the Constitution. So the California law is clarifying for the citizizens of its state only how they should be treated.

The CCPA law states the following:

> *It is the intent of the (California) Legislature to further Californians' right to privacy by giving consumers an effective way to control their personal information, by ensuring the following rights:*
>
> *(1) The right of Californians to know what personal information is being collected about them.*
>
> *(2) The right of Californians to know whether their personal information is sold or disclosed and to whom.*
>
> *(3) The right of Californians to say no to the sale of personal information.*

16. Assembly Bill No. 375 CHAPTER 55 - An act to add Title 1.81.5 (commencing with Section 1798.100) to Part 4 of Division 3 of the Civil Code, relating to privacy. [Approved by Governor June 28, 2018. Filed with Secretary of State June 28, 2018.] This bill would enact the California Consumer Privacy Act of 2018. Beginning January 1, 2020.

17.Reference: https://www.diffen.com/difference/Federal_Law_vs_State_Law

(4) The right of Californians to access their personal information.

(5) The right of Californians to equal service and price, even if they exercise their privacy rights.

There are many similarities between CCPA and GDPR. The biggest one is that CCPA applies only to one state, while GDPR has been passed by the EU Parliament as a Regulation that must be incorporated into the laws of each EU member country. One major difference is that CCPA does not require firms to have a legal basis for collecting and using personal data or restrict the international transfer of this data. If a business wants to collect data and obtains the resident's consent to do so, that is enough. Another major difference is that a person cannot request to be forgotten. Such a request apparently conflicts with the First Amendment to the Constitution, which protects the freedom of speech, religion and the press.

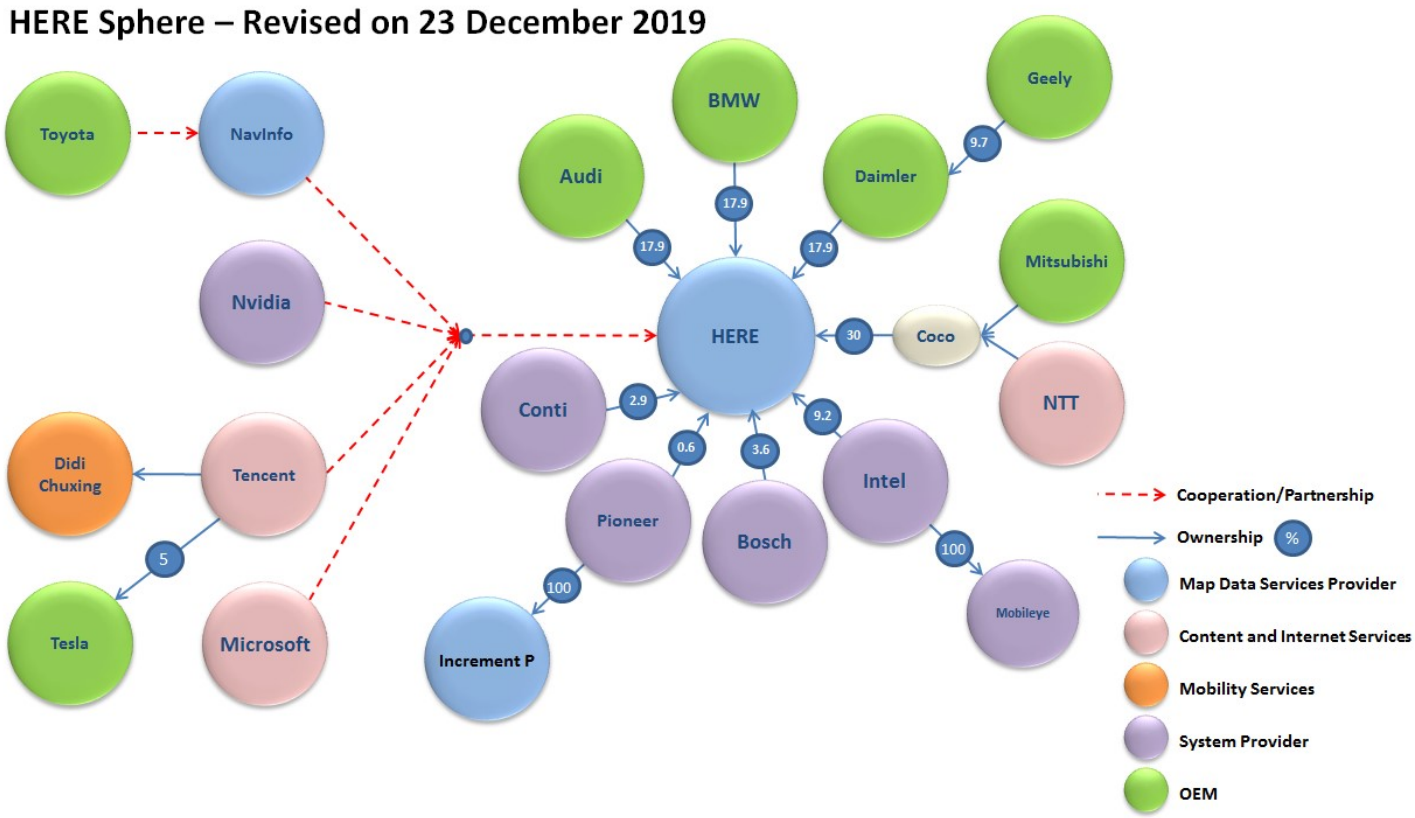
CCPA applies to businesses doing business in California that meet one or more of the following thresholds: has gross revenues in excess of $25 million; annually buys, receives for the business' commercial purposes, sells, or shares for commercial purposes the personal information of 60,000 or more (California) consumers, households, or devices; or, derives 50% or more of its annual revenues from selling consumers' personal information. This applies to companies that are owned or controlled by companies that meet one or more of criteria, even if it does not do so itself. For example, Waymo, which is wholly owned by Google, would fall into this category.

Businesses are petitioning the Federal government to enact a law that would apply evenly in all states, rather than having each state enact its own law, each containing different criteria that would have to be met. The States of New York and Washington are currently considering legislation. Given the current focus of the U.S. Congress on other matters, including impeachment proceedings agains the sitting President, and the fact that it is presidential election year, it is unlikely that any progress would be made on a nation-wide consumer privacy act during 2020.

HERE TECHNOLOGIES gets two new investors

THE THREE car OEMs that bought HERE from NOKIA in 2015 for €2.8 billion have gradually reduced their ownership in the digital map producers. Just before Christmas this year the company announced that two new owners, MITSUBISHI CORPORATION and NTT,

were joining the other seven. I confirmed with HERE the share percentage for each of the nine owners after the purchase is finalized, as shown below in the ***HERE SPHERE*** diagram.



Japanese companies MITSUBISHI CORPORATION and NTT (NIPPON TELEGRAPH AND TELEPHONE CORP) become the largest shareholders with 30%. They are co-investing through a holding firm called COCO TECH HODING B.V. based in The Netherlands. The three original owners' share will thereby be reduced to just under 54%.

HERE's CEO, Edzard Overbeek, was quoted in a news release announcing the sale that Mitsubishi's and NTT's investment "means we are further diversifying our shareholder base beyond automotive, which is important given the appeal and necessity of location technology across geographies and industries." The companies said they have invested in Here in order to develop services related to reducing road congestion and improving supply chain efficiencies.

As I wrote in the January issue of *THE DISPATCHER*, DAIMLER has signaled that it will reduce costs on non-core automotive business and have less focus on self-driving cars. BMW and DAIMLER announced in December that they would exit the North American car sharing market and concentrate on Europe. While Overbeek said in connection with the addition of two new owners that it is

"sticking to its goal of developing high-definition maps to help guide driverless cars," he also said that "fully autonomous driving in city centres will come 10, 15 20 years from now." Until the transaction is finalized, which is estimated to be during the first half of 2020, no financial details are being disclosed.

Tech Titan Turnover: Part Two

IN DECEMBER'S issue of *THE DISPATCHER*, I wrote about the potential perils of turning over the vehicle infotainment system's operating system to the tech titans. In addition to security and data privacy concerns, which are not insignificant, there is the matter of the selected supplier's future business direction if it isn't totally dedicated to the automotive sector. The biggest danger with choosing to hand over such a critical component to Google, APPLE or ALIBABA, as I said in the December article, is that governments might decide to target the companies for their business practices or simply to protect their domestic companies. A new example of such targeting has just surfaced, in Russia.

On the 2nd of December 2019, Russia's indomitable president signed a law that prohibits, as of July 2020, the sale of any device that is not preloaded with to-be-determined application software produced by Russian companies. It is seen as a strike against APPLE since, unlike its Android-based competitors, APPLE is determined to control all applications that operate on its devices. Companies have until July to comply. APPLE, for one, may decide it's not worth the trouble, even though Russia is the fourth largest smartphone market after the U.S., China and India. APPLE has already made a concession to Russia with its maps. It has 'given' the Crimean Peninsula to Russia on the maps used on its iPhone inside of Russia, although it still legally Ukrainian territory. On APPLE maps used by us folks outside of Russia, there is a troublesome border between Crimea and the rest of Ukraine, but no national boundary between Crimea and Russia. Just for information, MICROSOFT (*Bing-maps*) shows the legal borders correcty (kudos to MICROSOFT and HERE), but *Google Map*s are the same as APPLE's.

From a motor vehicle standpoint, Russia is small beer.[18] To make matters even worse, beginning on the 1st of November, 2019, Russia cut off its Internet (called RuNet) from the rest of the world, and it has begun to block companies from reaching Russian users if they do not build data servers on Russian territory. China, of course, does the same. Are we reaching a point where we were in the early days of mobile phone technology, when phones—and now connected cars—work only in your home country?

A Note from a Faithful Reader

"Your lead article (in the December 2019 issue) about the infotainment is indeed showing the juxtaposition that most OEMs find themselves in. Interestingly enough, there is a another development on the horizon that arguably goes well beyond the Google ecosystem, and that is the fast growing influence of the Chinese equivalents, the "BAT" ecosystem. As you may know, both Baidu, Alibaba and Tencent (plus a few other smaller players), "BAT", are making fast inroads into the automotive space and any non-domestic OEM wanting to sell in any meaningful volumes in the near future, will have to have feature one or more BAT platform components. Given the scale of the Chinese market, I believe that there is a fair chance that we'll be seeing a spill-over effect to other markets (perhaps somewhat similar to the effect of California historically has had on the overall US market) in that the BAT platforms will become available more broadly. If and when that happens, most industry analysts will probably agree with me that in comparison to the BAT players, the Borg may look like an innocent toddler."

Michel Annink, Director
Hampleton Partners

18. Total motor vehicle sales in Russia in 2018 were 1.82 million, up from 1.66 million in 2017. Sales in 2019 are projected to be slightly up from the previous year. In 2008, 3.2 million vehicles were sold, and sales rebounded after the financial crash to 3.1 million in 2012 and 3 million in 2013. But then came the Crimea caper in 2014, and that was it for the economy.

A Dispatcher's Musings: High-Speed Rail is Too Slow

MODERN-DAY HERESY is questioning environmentalist dogma.[19] Some western politicians compete with each other to obtain a stamp of approval for their proposals from the 'green police', and promoting a car-friendly, meat-friendly or plane-friendly policy is a sure way to get yourself shamed, banished from the canteen or symbolicly burned at the stake by being kicked out of office. One such tenet is that **high-speed rail** (**HSR**) should replace airplanes for travel between a country's or region's largest cities.

I submit that we should leave airplanes alone and let them become more fuel efficient, which they certainly will be by the time any HSR is built if it were started today. If people are willing to submit to full-body scans and pat downs, standing for hours in queue after endless queue before and after the actual flight, and enduring the most uncomfortable seats in too-close proximity to everyone while trying to do something to avoid either eating plastic food, being sneezed upon or breaking one's neck while dozing off, then no one should be telling them they can't, especially not teenage storm troopers who will be boarding planes as soon as they need to earn their own livings and/or get over their fear of flying. In any case, airplanes are not going away and we will probably be flying in them to places near and far long after we are being chauffeured around by a driverless ground vehicle.

My proposal is that instead of building high-speed railways to give high wage earners and politicians living in the large cities an additional way to get to their meetings, social engagements and, in the case of elite CEOs, to their jobs in other large cities, we should find a way to allow low wage earners living in communities where jobs have disappeared (for example, Detroit, Michigan, Naples, Italy or Cottbus, Germany) to commute quickly and comfortably to places where all the jobs can be found, like Chicago (452 kilometers from Detroit), Rome (302 kilometers from Naples) and Berlin (131 kilometers from Cottbus).

Let me start by stating that I am a *ferroequinologist*, not an *aerophile*. Trains have always been my preferred mode

19. Merriam-Webster defines 'dogma' as "a point of view or tenet put forth as authoritative without adequate grounds."

of travel when time allows. In fact, during a six-month period in my first job after returning to the U.S. from a year working in London, I developed a fear of flying. During this time, once every other week, I took the overnight Boston-to-Washington, DC *Metroliner* to attend project meetings with my employer's clients, and then returned to Boston on the overnighter. I wouldn't fly. My boss, a former U.S. Air Force navigator, thankfully snapped me out of my phobia (Fly or else! Your next assignment is in Atlanta.), and I have flown the equivalent of four round trips to the moon since then. Nevertheless, I continue to choose the train over the plane when there is a real choice.

The LACKAWANNA, NEW JERSEY CENTRAL and DELAWARE AND HUDSON railroad tracks formed the boundaries of the neighborhood where I grew up in the transistion era between steam and diesel trains.

It's not just the emissions that count

Let's begin by framing the discussion in concrete terms. There are four types of high-speed rail proponents. The first group states that airplanes generate ten times more harmful emissions than trains running on electricity and they want to ban them altogether for every trip that could possibly be taken by rail. The HSR proponents claim building HSR as a substitute for flying will allow us to continue to travel as much as we do now without emitting all those harmful emissions.[20] As with battery electric vehicles, the source of the electricity determines how environmentally friendly electric-powered rail is. In China, where two-thirds of electricity is generated with coal, the environmental argument does not hold as much water as in France, where 76% of electricity is generated by nuclear power plants.

I will choose *Eurostar* rail for travelling between London and Paris any time unless I live next to London City Airport and have a meeting at Charles de Gaulle Airport. But with the fastest, high-speed train between Berlin and Paris, a trip of around 900 kilometers, still taking five hours, I will opt for the plane if I need to make that particular trip. And if I have a meeting in Geneva or Amsterdam, there is no option from Stockholm with rail and never will be one if I don't want to spend two nights in a sleeper. As I said, did that. Check ✓.

The second group argues that HSR is a more cost-effective and time-efficient method of making trips covering distances of up to five hundred miles (800 kilometers) between high population centers along densely populated corridors. The Japanese government was not thinking about the environment back in the early 1960s when it decided to build *Shinkansen*, its high-

20. The Swedish newspaper, DAGENS NYHETER, decided to show its readers that it was possible to take a trip that had become difficult to make by train since air travel had become more convenient and affordable, a journey from Stockholm to Venice. As if Venice needed more tourists—it doesn't, as I have written in these pages (and after a meter-and-a-half of water flooded the city in December, its tourist bookings collapsed)—the newspaper decided to rent an entire train from a German company and organized a week-long, round-trip excursion, Stockholm to Venice. There were 350 travellers who could afford the $3,500 base cost before food and other extras. They had the time and the desire to spend most of the time on the train and not actually in Venice. A return flight, Stockholm-Venice, on a reputable airline (i.e., not RyanAir) and six nights stay in a three-star hotel in Vehice would cost less than one-half the DN fee. Future trips are being organized by DN which will include 'cultural profiles' to help the passengers pass the time. DN runs similar trips by ferry across the Baltic Sea.

speed railway. It was intended to connect distant regions with Tokyo to aid economic growth and development. Two assumptions behind replacing air with rail for trips up to 500 miles are: a) most people live in high-density cities where everyone is within a short distance to the HSR station; and, b) anyone not within a short distance can travel to the station by some form of public transport.

Both of these were satisfied by the first stage of *Shinkansen* with Japan's three largest cities, Tokyo, Nagoya and Osaka on a single line. Nagoya is 320 kilometers distant from Tokyo and Osaka is another 160 kilometers away. It allowed the companies based in Tokyo to expand the area from which it could pull its company men and enabled those same companies to extend their tentacles into other markets. With three stops along the way, at Yokohama, Nagoya and Kyoto, the 480-kilometer trip to Osaka with the fastest Nozomi service takes 2½ hours.

Few places have such a dominant capital city as Tokyo, the largest metropolitan area in the world with its 38 million inhabitants.[21] And few countries have other large cities within such close proximity. Osaka's metro area is similar in size to New York's, 19 versus 20 million.

The four largest cities in the United States are thousands of miles from each other. London, Rome, Berlin and Paris make the list of one hundred of the world's largest metropolitan areas, but they pale in comparison to Tokyo and even Osaka. Sweden's high-speed rail proposal (that is currently being hotly debated) would connect its three largest cities, Stockholm, Göteborg and Malmö, which, by global standards, are quite diminutive. The Stockholm metro area is only 2.2 million. If the cities are connected on a single train line, the distance is 500 kilometers from Stockholm to Göteborg and another 320 kilometers from Göteborg to Malmö. These cities and the remainder of the largest twenty cities in Sweden, are within the southernmost 25% of the country's land area where 50% of the country's population of 10 million lives. The other 50% of the population lives in the upper 75% of the country and this area is not on anyone's map for future high-speed rail projects. However, it is in the top 75% of the country where there are towns and villages that were the engine of Sweden's industrial

21. A metropolitan area is a region consisting of a densely populated urban core and its less-populated surrounding territories, sharing industry, infrastructure, and housing. A metro area usually comprises multiple jurisdictions and municipalities: neighborhoods, townships, boroughs, cities, towns, exurbs, suburbs, counties, districts, states, and even nations like the eurodistricts.

growth, with steel mills, copper mines and forests. These towns are experiencing depopulation as the mills and mines are closed or the jobs are automated.

The country's current high-speed train, the X2000,[22] makes the 500-kilometer trip between Stockholm and Göteborg in just under three hours without a stop, and in 3 hours 20 minutes with four stops. In order to make the proposed high-speed rail service for Sweden even remotely attractive from a time-savings point of view, the train would have to swoosh past those few stops that the current high-enough-speed X2000 trains call at today. They would also bypass all of the other places that trains stop at on the regional train schedule. In other words, if you don't live in Stockholm, Göteborg or Malmo, you will be literally and physically off the map and out in the cold.

It is little wonder that so many businessmen and politicians in Sweden, even those who previously supported the concept, are urging the government to remove the high-speed rail proposal from its development plan and instead concentrate on improving the current rail and road infrastructlure.

High-speed rail service that connects large, high-density areas has the effect of increasing urbanization in the largest, most populated and most popular cities at the expense of former industrial towns with populations that are aging and with economies that are in decline.

The third group of high-speed rail proponents includes the 'Jobs Promoters'. In this group are businesses that will be the beneficiaries of large government contracts to build the rail beds and deliver the trains, land owners who are along the new rights-of-way, and, of course, the politicians who will hand out the contracts and thereby garner votes. There are no arguments that trump more jobs—except if those jobs go primarily to businesses and workers from other places, as they are doing with the China's *Belt and Road Intiative* and as they seem to have done with Sweden's recent railroad and Stockholm metro projects. It turns out that airplanes don't have the same attracton from a jobs, real estate and pork belly contract handout standpoint.

Politicians and businessmen have combined their powers to build transport infrastructures since the invention of the wheel. They built the railroads, which initially allowed the wealthy and then the middle class to move to villages in the suburbs and commute to jobs in the cities. Then they built the highways that helped

22. Sweden introduced its X2000, Tilt Train in 1990. Initially, it was first-class only, but five years later second class was added. The trains are designed for a top speed of 210 km/hr. With their unique tilt design, they can maintain high speeds on standard rail beds.

Since 2017, I have taken the X2000 from Södertälje Syd to Göteborg and back every two weeks, with a connection to Strängnäs. Home to hotel takes 3½ hours. It would take five hours by plane, and 1½ of those hours I would be driving. The high-speed rail option would take as long because I would have to get myself to Stockholm.

make it possible for the businesses to move out of the cities and the suburban-livers to get to their jobs and the shopping malls. And they they built the airports. We have come full circle and are back to railroads again after many of the rail lines in many of the western countries have fallen into disrepair and disuse. These lines connected the villages to cities so that the villages could grow and send their products back to the cities so that the cities could grow and the country could prosper. Now the cities get their products from other countries, the children who grew up in the villages have moved to the cities where there are jobs, and many of those who are left are elderly or unemployed.

Finally, the fourth group is comprised principally of public transport planners who believe they can bring back the golden days of rail freight if they can move passenger transport to a separate set of tracks. Their actions are guided by a disdain for long-haul truck freight transport. There was no global conspiracy to replace long-haul transport by train with trucks. It happened because trucks satisfied the requirements for flexible movement of goods from port to market with a stop at a logistics center in between. Fixed-bed rail cannot compete unless the logistics paradigm changes, and that does not appear to be on the horizon.

Perhaps we could combine all the real advantages of flying, like speed and zero footprint on the ground, with everything we like about taking the train.

Time for a reality check on our goals

I submit that so-called high-speed rail is a waste of valuable resources that could better be used to improve the existing rail network by putting up fences along the rights-of-way and eliminating dangerous grade crossings, purchasing trains like the X2000 tilt technology that can travel at high speeds on standard track beds and doing everything possible to get the trains to run on time. The main problem with HSR is that it does not solve a problem. It creates a parallel transport network to three existing functioning networks, rail, road and air, that together deliver fast and efficient transport from and to places where people want to travel and goods need to be delivered. As I have said, by the time any high-speed line is completed, the current systems will be at least as good or better from an environmental standpoint as well.

What is needed is a transport option that delivers a solution to a real problem, one that exists in all western countries. As societies did during the First Industrial Revolution (see the October issue of The Dispatcher, *Deciders Will Decide If or When Driverless Arrives*), we are sucking people out of out of once-thriving communities and are pushing them into metropolitan areas where jobs

are being created, but where neither the public nor the private sectors can deliver the housing and services needed to support expanding populations.[23]

What if we all took a step back for a moment and tried to see the world from the perspective of another self. Environmentalists and believers in high-density urbanism might say that people who are living in places where jobs have disappeared can move to places where there are jobs. Problem solved. Now what if they put themselves in the shoes of the people living in places where jobs have disappeared. You're jobless after the coal mine or coal production electricity plant closed down or the car assembly plant was shuttered. You are living in a declining place where you are trapped in a mortgage on a house you cannot sell. You have family, parents and in-laws who depend on you and who cannot move for similar reasons. You may have skills which can be transferred to a place where jobs exist, maybe at a lower pay than you were receiving in the mine or the car assembly plan, but at least ou would be working, but you can't get to those places. And even if all these anchors were not holding you down, if you move, you might lose any benefits that are tied to your location to which you are entitled. Your're stuck.

Beyond finding a job, people have to find a place to live if they want to move to places where there are jobs, and that is where the whole idea of moving collapses for anyone who does not have a high enough income to rent or buy something that is affordable in the successful cities. If you are living in a successful city, let's say London, San Francisco or Stockholm, you are very aware of what has happened with the prices of houses, condominiums and rental apartments during the past ten years. All those tourists and businesses people using AIRBNB instead of hotels are also helping to push up the cost of rentals for lower-income people in successful cities by taking places off the market where lower-income people could live.

There is no shortage of has-been cities, places that once were bustling centers of commerce and industry that time has now passed by. I have often referred to my home town of Scranton, PA as an example of such a city. It was a place where steam locomotives were built and coal was mined before the steam trains were replaced by diesels built elsewhere and the mines gave out. It has now one-half the the population it had at its height, which was 145,000 in 1935. In spite of its nearness to New York City and Phil-

23. China, with now over 60% of its population living in urban metropolitan areas, is often cited as an example of a country where urbanization is working and high-speed rail is helping it to succeed. China Railway Corporation is a state-owned enterprise that owns and operates the majority of China's railway network, including the 30,000 kilometers of high-speed rail it has built during the past twelve (Yes, 12!) years.

adelphia (120 miles/192 kilometers from both), it has not benefitted from that nearness. I'm going to use the example of a city in Germany that is right now going through the same process of agonizing decline as Scranton did during the past fifty years. Cottbus, in the Lausitz region of Germany, is an example of a city that is extremely dependent on a natural resource that environmentalists love to hate: lignite, most often referred to as 'brown coal'. The coal in the mines surrounding Cottbus or the neighboring town of Spremberg, but Germany's Greens are doing everything they can to close down the mines and the coal-burning electric generation plants in the cities. Cottbus had a peak population in 1990 of 140,000; it is now 100,000, about where Scranton was in the 1970s, twenty years after the coal mines began to close.

The Economist

Cottbus is only 131 kilometers from Berlin, a forty-five minute commute by car at 200 km/hr on one of Germany's speedlimitless Autobahn, but door-to-door with rush-hour traffic, the trip would take easily two hours. It is far enough away from Berlin for it to have lower living costs than in Berlin, and this has made it an attractive place for German authorities to direct the foreign asylum seekers that Germany welcomed in 2015. Unemployment is almost two percentage points over Germany's average of 5.6%, and there are 8,000 additional jobs that will be lost when the coal mines are closed. The number of refugees has increased the foreign population from 4.5% to 8.5% during the past four years, and this has created additional tensions in the community.

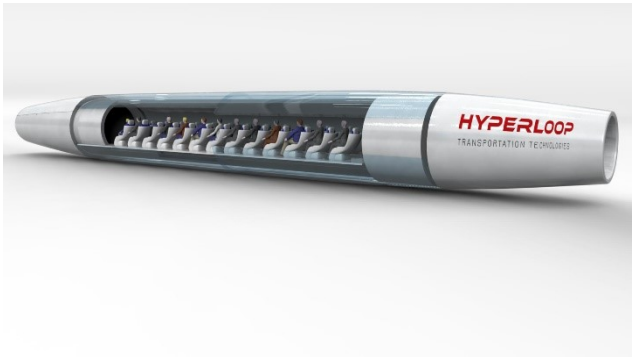
What is needed in Cottbus is jobs, not money for social problems such as increased alcohol and drug abuse and criminal behaviour.[24] The problem is that the jobs are in Berlin. Cottbus has the infrastructure to manage a 50% increase of its population up to where it was thirty years ago, but it has the jobs for less than its current 100,000. By providing a way to deliver a convenient 45-minute commute between Cottbus and Berlin, those Cottbus residents who cannot afford to live in Berlin or to move there, could stay in Cottbus and work in Berlin. An added bonus would be that people who can no longer afford or do not wish to continue living in Berlin could move to Cottbus where living costs are lower. One more possibility is that people who want to start a business with lower operating costs could set up in Cottbus and pull employees from Cottbus and Berlin.

Building a high-speed rail system for a 131 kilometer service is hardly practical. Even if service were extended into the adjacent lignite region centered around the town of Spremberg, which is

24. I have searched for studies that show substantially positive effects from social welfare programs for the residents of areas where there have been considerable numbers of job losses. I have found none. The latest suggestion to chronic unemployment is a universal basic income, which does not solve the problem of the lack of self esteem a person feels when he cannot earn the money to buy what he and his family need. Whether you read reports from the Brookings Institution (progressive) or The Heritage Foundation (conservative), the conclusions reached are the same: Give a man a fish and he eats for a day; teach a man to fish and he eats for a lifetime.

going through similar trials, HSR is too costly and would not be fast enough to address the problem. The problem needs something that is as fast as an airplane that can carry thousands of people in both directions during a few hours in the morning and evening. The problem exists now, so the solution should be deliverable within a few years, not decades. It must be much less expensive than high-speed rail, otherwise it will be subject to the same objections from fiscal conservatives.

Proponents of the hyperloop concept claim that this technology addresses and solves all of these problems. Perhaps it does, but there appear to be as many negatives as plusses with this magnetic levitation-in-a-tube transport option. On the plus side, it can reach speeds of 1000 km/hr and accelerate from 0 to 100 km/hr in a single second. It can be built on relatively light-weight pylons since the tube and the pods travelling inside it are much lighter than a train and trackbed. It is also estimated to cost less than a third to build compared to a high-speed rail line.



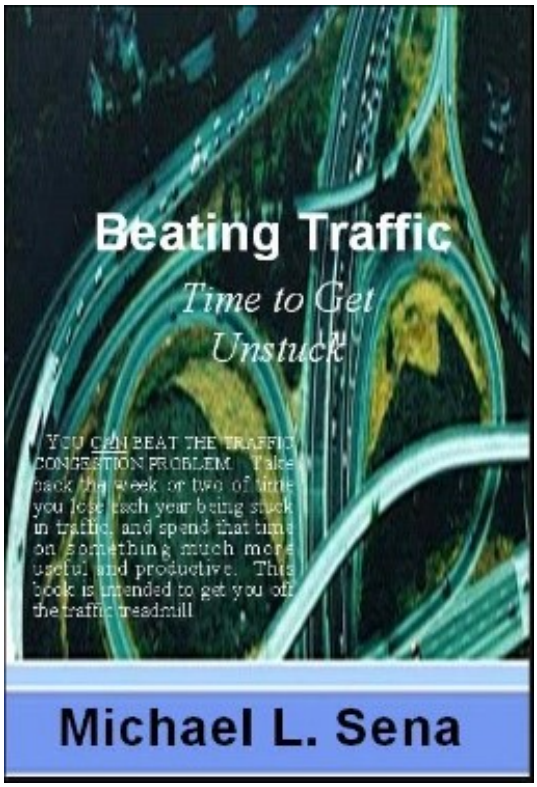
One major problem might be throughput. The capsules or pods can carry up to around 25 passengers, about one-half of a standard rail car. If a tube between Berlin and Cottbus were filled with cars, which are around 30 meters long, and two minutes were allowed for unloading at the destination, 2,620 capsules could carry 65,500 commuters in one hour. I suppose you would call that a theoretical limit. It would have to be much longer to allow for pressurizing and de-pressurizing the capsule. Shinkansen runs thirteen trains per hour with sixteen cars carrying 1,320 passengers per train. That's 208 cars carrying 17,199 cars per hour. The hyperloop will probably be closer to the Shinkansen than the theoretical limit. Another problem will definitely be passenger discomfort. The trip between Cottbus and Berlin will be short enough, around 8 minutes if the speed is 1000 km/hr, but passengers will be buckled in with no moving or eating allowed. If something does go wrong, it will happen at a very high speed.

Maybe hyperloops are not the answer, but what is important is that we put our minds and resources to work on problems which need solving so that our solutions benefit the greatest number of people. High-speed rail lines connecting urban areas where living costs are high and where there already are good transport options does not seem to be a problem that needs our attention. Getting people from where there once were jobs to where there now are jobs is definitely a problem worth solving, and soon.

About Michael L. Sena

Michael Sena, through his writing, speaking and client work, attempts to bring clarity to an often opaque world of vehicle telematics. He has not just studied the technologies and analyzed the services, he has developed and implemented them. He has shaped visions and followed through to delivering them. What drives him—why he does what he does—is his desire to move the industry forward: to see accident statistics fall because of safety improvements related to advanced driver assistance systems; to see congestion on all roads reduced because of better traffic information and improved route selection; to see global emissions from transport eliminated because of designing the most fuel efficient vehicles.

This newsletter touches on the principal themes of the industry, highlighting what, how and why developments are occurring so that you can develop your own strategies for the future.



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