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# The Dispatcher

*In this issue:*



*Relics, once indispensable tools, now museum pieces in Plexiglas cases. An IBM Selectric typewriter and generations of discs.*

*Telematics Industry Insights by Michael L. Sena*

## SAE Level 5 Driverless Cars Are Not Just Around the Corner

HYPERBOLE, AND ITS SHORTENED VERSION HYPE, is 'extravagant exaggeration', according to my favorite dictionary, *Merriam-Webster*. The word comes directly from Latin, but it is derived from the Greek verb *hyperballein*, meaning 'to exceed'. In the etymology section there is a story about a 5th century B.C. Athenian politician named Hyperbolus, "who often made exaggerated promises and claims that whipped people into a frenzy." (Sounds like a few present day politicians.) Even though this reference would be very appropriate for the story I am about to tell, Hyperbolus apparently did not have anything to do with the word 'hyperbole'.

A report—actually, it would be more appropriate to call it a marketing paper—recently passed across my desk that makes the use of the word 'hyperbole' to describe it an extreme understatement.[1] What I find most extraordinary about this paper is that the claims it makes are beginning to sound believable because they are being repeated in so many different circles. The premise of the paper is this, and I quote: "By 2030, within 10 years of regulatory approval of autonomous vehicles (AVs), 95% of U.S. passenger miles traveled will be served by on-demand autonomous electric vehicles owned by fleets, not individuals, in a new business model we call (A*s if they invented the term. Ed.)* Transport-as-a-service (TaaS)."

Based on this premise, the authors conclude the following: "The TaaS disruption will have enormous implications across the transportation and oil industries, decimating entire portions of their value chains, causing oil demand and prices to plummet, and destroying trillions of dollars in investor value. The internal combustion vehicle and oil industries will collapse."

The authors do not qualify this claim by saying 95% of trips in Silicon Valley or San Francisco where they are based will be in on-demand autonomous electric vehicles. No, it's going to happen in the entire United States, from Paintersville, CA to Podunk, CT! And this will be ten short years following when the authors assume it will be legal to drive everywhere in robotized vehicles, which in their minds is 2020. They diffuse any criticism of their work with the following statement: "We think the scenarios we lay out to be far more probable than others currently forecast. In fact, we consider these disruptions to be inevitable." Something is inevitable if it is incapable of being avoided. Nothing that is based on an assumption is inevitable because assumptions can prove to be wrong or conditions on which they are based can change.

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### *Dispatch Central*

#### *For the Record*

*The principal reason I started* ***The Dispatcher*** *and have continued writing and distributing it is that I believe in the positive safety benefits of adding full-time sensing technologies to cars, trucks, buses and motorcycles (i.e. road transport vehicles). I believe that assisting the driver in every way possible to obey the rules of the road and to avoid accidents, in some cases taking over control of the vehicle to do so, will lead to significant reductions in deaths and injuries.*

*I also felt there was a need for a voice that balanced a growing focus by both the popular and the business press on the novelty of cars driving themselves and discussions about giving cars the brains of humans. In my opinion, which I express in these pages, turning over any task to a robot should only be done after all the societal consequences are considered, not just the economic ones. The end game should not be robots building things for robots and having them delivered by robots with humans playing video games supported by a universal basic income.*

*The road transport vehicle industry and the governments of the world have not yet done enough to make vehicles and the places where they are driven safe for humans—and animals. Rather than adding a new complication (robots), we should work to make cars, drivers and infrastructure better. I*

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### *Dispatch Central (continued)*

*have offered a number of examples: cars that stop at red lights and stop signs; cars that do not start if a driver is impaired by drugs or alcohol; cars that do not drive on sidewalks or in pedestrianized zones; cars that do not exceed the speed limit or move out of their lane into an oncoming car. There are many, many more. We do not need to remove taxi drivers from the taxi equation or bus drivers from the public transport equation. They do more than add cost to a ride.*

*I admit, I am not part of the chauffeured generation. I know there is a large cohort, mainly in the U.S. and northern Europe, who grew up being driven around like only the extremely wealthy were at one time, who cannot afford their own chauffeur but see an ersatz one that has no cost as a good alternative. For them, develop a robot that can sit behind the wheel of any car. For the rest of us, invest time and money needed to make cars and the infrastructure safer.*

#### ***Update on NHTSA's Federal* Automated Vehicles Policy *in the works***

*On 5 June, Elaine Chao, the U.S. Secretary of Transportation gave a news conference in which she explained that the new automated vehicle guidance will replace the previous document and will be released "in a couple of months, if not sooner." NHTSA has been asked to accelerate the process of finalizing the updated policy. This comes after the new Secretary and her team reviewed the work done by their predecessors, headed by Anthony Foxx and Dr. Mark Rosekind, which was released on 20 September 2016.*

*On the 6th of June, the chairman of the House Energy and Commerce Subcommittee stated to the news that his committee planned to "unveil a package of legislation to overhaul federal rules governing self-driving vehicles." I watched a vide3[2] of a hearing of the Subcommittee that took place on the 17th of June, chaired by Representative Bob Latta, Republican from Ohio. Testifying at the hearing were representatives from GM, Volvo, Toyota and Lyft. They all said the same thing: The federal government should prohibit individual states from setting their own laws and test requirements, but don't expect global standards.*

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## Driverless Cars Not Just Around the Corner (continued from p .1)

The authors say they are making forecasts based on data analysis, however they are making predictions based on their particular view of the data they have selected to analyze. It appears that this paper has been deliberately written to be sensational and provocative without any attempt to relate the authors' statements to differences between regions on the basis of climate, topography, industrial or commercial focus and all the other important factors.

What's the harm, you say, with a little hyperbole? What's wrong with telling folks that they'll be able to sleep while their SUV drives them to their favorite fishing spot so they can be there at the crack of dawn? Who is hurt by people dreaming that in a few years they'll have the same advantages as those train commuters without all of the accompanying hassles with finding a seat, getting sneezed on and coughed at and listening to other peoples' music? Aren't governments paying the bill for most of the robotic research so they can carry out their operations without putting human feet into boots on the ground?[3] And if wealthy investors want to believe they will see a payback on their outlays to overnight self-driving experts, let them keep on believing.

In my opinion, the harm occurs when we—you and I—start believing the hype, when fantasy and fiction become alternative facts. There are so many important and truly useful projects that could engage all the bright minds that are now focused on hitting the self-driving jackpot. One that comes readily to mind as I write this on the 5th of June is making it physically impossible for a vehicle to drive on sidewalks, either accidentally or deliberately. I have mentioned several others in earlier issues of ***The Dispatcher***. It is a long list.

***Forget hype about autonomous vehicles being around the corner—real driverless cars will take a good deal longer to arrive***. *The Economist. Science and Technology. May 25th 2017. Los Angeles.*

***The Economist*** has been an uncritical cheerleader of autonomous and driverless cars—until now. It seems one of the staff woke from a high-tech stupor and convinced the editor to change the newspaper's tune. *"All of these things (*The long list of promised benefits. Ed.*) may come to pass one day. But they are unlikely to do so anytime soon, despite the enthusiasm of people like Elon Musk. Too many obstacles lie ahead that are not amendable to brute-force engineering. It could take a decade or two before AVs can transport people anywhere, at any time, in any condition—and to do so more reliably and safely than human drivers.*

Then there is the issue of whether vehicle drivers, both commercial and private, actually want to give up the steering wheel. According to a new study by a group from the MIT AgeLab and the New England Motor Press Association, the answer for private drivers at least is a resounding No.[4] I urge you to read the report describing the results of a survey for which 3,000 responses were received from individuals across the U.S. from various age groups. It is a follow-up to a survey conducted by the same organizations one year previously, and it was motivated by the many events that had occurred related to automated vehicles.

The main difference between the results in 2016 and 2017 is that all age groups are less willing to use automation in vehicles. The biggest drop, fully 20%, was among the 25-34 year-olds. 48% of the 2017 respondents said: "I would never purchase a car that completely drives itself." The diagram below shows indicates the reasons why.


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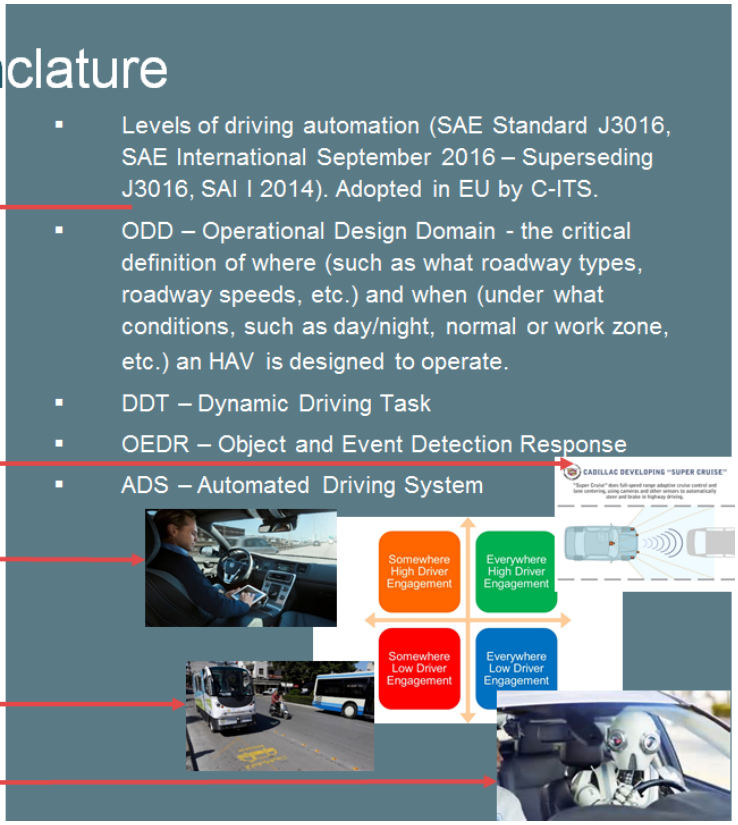
## Driverless Cars Not Just Around the Corner (continued from p .2)

| Level | Name | Narrative Definition | DDT | | DDT Fallback | ODD |
|---|---|---|---|---|---|---|
| | | | Sustained lateral and longitudinal vehicle motion control | OEDR | | |
| Driver performs part or all of the DDT | | | | | | |
| 0 | No Driving Automation | The performance by the driver of the entire DDT, even when enhanced by active safety systems | Driver | Driver | Driver | N/A |
| 1 | Driver Assistance | The sustained and ODD-specific execution by a driving automation system of either the lateral or the longitudinal vehicle motion control subtask of the DDT(but not both simultaneously) with the expectation that the driver performs the remainder of the DDT. | Driver and System | Driver | Driver | Limited |
| 2 | Partial Driving Automation | The sustained and ODD-specific execution by a driving automation system of both the lateral and the longitudinal vehicle motion control subtask of the DDT with the expectation that the driver completes the OEDR subtask and supervises the driving automation system. | System | Driver | Driver | Limited |
| ADS ("System") performs the entire DDT (while engaged) | | | | | | |
| 3 | Conditional Driving Automation | The sustained and ODD-specific performance by an ADS of the entire DDT with the expectation that the DDT fallback-ready user is receptive to the ADS-issued requests to intervene, as well as to the DDT performance-relevant system failures in other vehicle systems, and will respond accordingly. | System | System | Fallback-ready user (becomes the driver during fallback) | Limited |
| 4 | High Driving Automation | The sustained and ODD-specific performance by an ADS of the entire DDT and DDT fallback without any expectation that a user will respond to a request to intervene. | System | System | System | Limited |
| 5 | Full Driving Automation | The sustained and unconditional (i.e., not ODD-specific) performance by an ADS of the entire DDT and DDT fallback without any expectation that a user will respond to a request to intervene | System | System | System | Unlimited |




The SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) *Levels of Driving Automation specified in Surface Vehicle Recommended Practice: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles* has become the one most often referred to as the *de facto* standard. NHTSA, in its *Federal Automated Vehicles Policy* states it has adopted the SAE taxonomy and definitions because "…there are multiple definitions for various levels of automation and for some time there has been a need for standardization to aid clarity and consistency."

Trying to decipher the codes and understand exactly what it all meant the first time I encountered it left me with the feeling that I needed a Rosetta Stone. The key I realized was ODD/Unlimited. A vehicle that could operate everywhere with no human engagement was SAE Level 5. Then it was a matter of moving backward, up the scale. A vehicle that could operate on designated roads only without a driver needing to be present was SAE Level 4. If there needs to be a driver ready to take over control, and the vehicle needs to stick to designated roads, then it is an SAE Level 3. The Volvo InDrive system fits into this category. Systems which require the driver to be in charge of the dynamic driving task at all times and in all places is an SAE Level 3 system.

The problem seems to be the careless use of all the various terms: autonomous; automated and highly automated; driverless; self-driving. A vehicle can be self-driving, but that does not mean it can operate if there is no driver in the vehicle. This is the message that Dr. Alain Kornhauser has been hammering home for the past few years. I produced the above graphic initially to clarify the SAE Levels to myself so that I could then explain them to others. Vehicles that can get themselves around a city loop that has been specially built for them are on the horizon. Vehicles that can relieve the driver when conditions (road, weather, level of traffic) permit, are over the horizon. Vehicles that move around anywhere, void of any human presence, are not around the corner and will not be any time soon. The real question—one that I have posed—is <u>whether they ever should be</u>.

### *Dispatch Central (continued)*

#### *Dr. Alain L. Kornhauser on Levels of Automation*

*When the NHTSA* Federal Automated Vehicles Policy *was published, Dr. Kornhauser commented on it in his* ***SmartDrivingCars*** *web site. For those who have followed his writings and listened to his talks, you know he makes a clear distinction between 'self-driving' and 'driverless'. Here is what he said:*

*"I'm not sure this (Policy) adds clarity because it does not deal directly with the difference between self-driving and driverless. While it might be implied in level 4 and 5 that these vehicles can proceed with no one in the vehicle, it is not stated explicitly. That is unfortunate, because driverless freight delivery can't be done without 'driverless', neither can mobility-on-demand be offered to the young, old, blind, inebriated without driverless. Vehicles can't be repositioned empty, which (I don't mean to offend anyone) is the real value of a taxi driver today."*

# The Paris Agreement: Not Really the Real Deal

THE PARIS AGREEMENT, which uses as its foundation the *United Nations Framework Convention on Climate Change* that was adopted in New York on 9 May 1992, can be summed up as follows:

- It is not a treaty;
- It is not binding. The US could have stayed in and ignored it; and,
- Its main purpose is to formalize what the so-called 'developed' countries shall do for the so-called 'developing' countries.

It is not a treaty because if it were it would have to be ratified by the U.S. Senate by a two-thirds vote. Other democracies may also have to ratify treaties in their equivalent bodies, but because the U.S. is responsible for 17.89% of the world's greenhouse gas emissions, it was essential that they were part of the Agreement. Why? Because the Agreement only enters into force when 55 Parties to the Convention accounting for 55% of the total greenhouse gas emissions have 'deposited their instruments' of ratification with the Depository.

There was no way the U.S. Secretary of State, John Kerry, who represented the U.S. in the negotiations was going to be able to return to Washington with an Agreement that required Senate ratification, even by a simple majority. He made this clear to his colleagues. Hence the second point.

There are no binding requirements in the Agreement. The goal is to "hold the increase in global average temperature to well below $2^0$C above the pre-industrial levels and to pursue efforts to limit the temperature increase to $1.5^0$C above pre-industrial levels." Each country is obligated to propose a plan for reducing its own emissions, or not increasing them in the case of countries that have low emissions levels. These plans are to be public documents and submitted to the Secretariat (Article 4). A committee established by the Secretariat will oversee compliance (Article 15), but there are no consequences for a country that does not meet its planned emission reductions, save embarrassment in the press.

It's the third point that has been the 'stick in the eye' for U.S. conservatives and the Republican Presidential candidate who is now President. It is the same issue that arises whenever the U.N. and its various agencies are mentioned. They view the United Nations as a money transfer machine in which the U.S. throws in bags of money and it is redistributed to countries without the slightest degree of control over how it is used and where it ends up. Fact or fancy, this is what they believe, and it guides their thinking. The Agreement is full of references to 'developed countries aiding, accommodating, taking the lead to address climate change, funding and transferring technology to 'developing countries', and most of all, recognizing the special circumstances of 'developing countries', namely, that they want to get to where the 'developed countries' are and they will need to be able to generate greenhouse emissions to get there unless the 'developed countries' help them out.

The main problem with these special considerations is that China, Russia, India, Brazil and most other countries in the world are considered 'developing' or 'EITs'. The U.S. and Europe are 'developed'. There was a huge row at one meeting when the U.S. suggested that those 'developing' countries that could pay (e.g. China and India) should do so. China and India took a major exception to this. Then-President Obama signed the Agreement in Sept, 2016, by-passing the Senate. There was a mild outcry, but no action taken. The Republican candidate had promised to renege on the Agreement as soon as he took office, and if the Democratic candidate had won, the Republicans would have simply blocked all funding.

Now to the real deal. It is not the Paris Agreement. It is the Obama Administration's *Clean Power Plan*, which was put in place in 2014 to require states to reduce carbon dioxide emissions by about one-third of 2005 levels over 15 years.[5] The *CPP* filled with regulations Republicans worry will hurt people in their states, like coal workers in Senate Majority Leader Mitch McConnell's Kentucky. (The same Mitch McConnell who is married to the Secretary of Transportation, Elaine Chao.) The Republicans want to neuter the *CPP*. In April, a federal court granted the Administration a 60-day pause on all lawsuits by environmentalists of the *CPP* while the Administration reevaluates it. If the U.S. stays in the **Paris Agreement**, it strengthens the hands of the environmentalists, is the thinking. Not hard to imagine who came up with pulling the plug on **Paris**.[6]

### *Paris Agreement Key Points*

***Paris Agreement*** *(also referred to as the Paris Climate Accord) – An agreement within the UNFCCC requiring signatories to peak their greenhouse gas emissions according to a plan which they shall prepare, make public and regularly report on progress. The goal is limit temperature increases to less than $1.5^0$C.*

***UNFCCC*** *– United Nations Framework Convention on Climate Change (known as the* ***Convention****) The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership, 197 Parties. The U.S. ratified the Convention on 15 October 1992.*

***Parties*** *- The 197 countries that have ratified the* ***Convention*** *are called Parties to the Convention.*

***Signatories*** *– The 148 Parties, including the U.S., that have thus far ratified the Paris Agreement.*

***Developed Country*** *– In an Annex of the UNFCCC, there are 43 Parties listed as industrialized (Developed) as well as Economies in Transition.*

***Developing Country*** *– Every country that is not either 'Developed' or an 'Economy in Transition' (EIT). China, the largest greenhouse gas polluter, is Developing.*

***NDC*** *- According to Article 4 paragraph 2 of the Paris Agreement, each Party shall prepare, communicate and maintain successive* nationally determined contributions *(NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.*

*Part of Statement by the UNFCCC on the U.S. decision to withdraw from the Paris Agreement:* The Paris Agreement remains a historic treaty signed by 195 Parties and ratified by 146 countries plus the European Union. Therefore, it cannot be renegotiated based on the request of a single Party.

# The Car and Truck Business is a High Stakes Game

ROAD TRANSPORT VEHICLES represent around a $3 trillion contribution to global GDP.[7] This includes designing, building and selling passenger cars, trucks, buses and motorcycles. It doesn't include the commercial or private operation of these vehicles or their maintenance or the fuel needed to drive them. By comparison, it is approximately seven times smaller than the global retail industry, but it is still large. There is a lot of money to be made in this industry for those who make the right moves, but it is also possible to lose a bundle.

A 'stake' is an interest or a share in an enterprise. 'High stakes' involves high risks and the possible loss or gain of a large amount of money, depending on whether the venture fails or succeeds. High stakes poker involves putting up a 'stake' of maybe a $million just to sit at the table, and then minimum bets measured in $thousands. The opposite of 'high stakes' is 'penny-ante' or 'small-time'.

An example of a high stakes move is SOFTBANK's investment of $4 billion in NVIDIA, making it the company's fourth largest shareholder and giving it around a 5% stake. SOFTBANK GROUP CORP. is a Japanese multinational telecommunications and Internet company. It owns SPRINT and bought ARM last year for $32 billion. Its visionary leader is 60-year-old Masayoshi Son. Along with the Saudi Arabia's Public Investment Fund, APPLE and SHARP, SOFTBANK launched in May the world's largest technology-investment fund, worth $100 billion. This is more money than all investments of U.S. venture capital firms in 2016 combined![8] What is *Son and Co*. going to do with this pile of money? Son predicts that within thirty years the world will be populated (his word) by billions of robots, many of them more intelligent than humans. He wants to invest in companies that create and control the brains for robots.

The readers of ***The Dispatcher*** know NVIDIA as the self-declared world leader in visual computing technologies and the maker of the graphics processing unit (GPU) that is being employed as the AI brain in self-driving test cars from VOLVO, TOYOTA, TESLA and others. NVIDIA has been on a tear lately. Its share price has risen in a year from under $50 to over $150, with a market value of $90.23 billion on 16 June, up from around $12 billion a year earlier. Revenue for 2016 was $6.9 billion. It earns a profit. Its automotive-related revenues increased by 61% on a year-over-year basis to $127 million. NVIDIA's competitors are INTEL and Google on one side and CONTINENTAL and BOSCH on the other. They are all vying to supply technology to the road transport vehicle manufacturers.

Another high stakes move is TESLA's bet that it can sell 500,000 cars by 2020. It sold 83,922 in 2016. It has $700 million in customers' deposits for pre-orders, mostly for the Model 3, and has promised to start delivering the new Model 3 this year. Its stock is trading at around $370 and it has a market cap of $61 billion. It has promised self-driving (who hasn't) and the cars are battery-driven (no big deal anymore), but both consumers and investors believe it is going to win the high stakes game of delivering the best car ownership and driving experience with the best all-around cars on the road.

The current top four companies in market value, Apple, Alphabet, Microsoft and Amazon, plus Facebook, number eight, have a total of $330 billion of net cash. Apple and Alphabet have already declared their interest in car-related technology. Amazon is working on unmanned aircraft vehicles but could come down to earth at any time. Every one of them could buy almost any vehicle manufacturer tomorrow if they wanted to. Whether their end game is selling cars or the components that go into them, they are not investing their hoards of cash in building mobile apps to disintermediate road transport. They are putting their money on the table so they can play in the road transport game, and they play to win.

Vehicle manufacturers cannot afford to waste time or money on penny-ante moves, like JLR's $25 million investment in Lyft, or FORD's $65 million acquisition of Chariot, a start-up shuttle van company. BMW, AUDI and DAIMLER have made a major high stakes move with their investment in HERE. The rest of the car and truck manufacturers will soon have to make their decisions about whether they are going to reallocate their capital to new businesses and get out of their current one, as GE and IBM did with varying degrees of success—and as Ford seems to be indicating—or if they are going all-in to make cars and trucks that customers will want to be in.

### *As the Waymo Turns*

*A TV SOAP OPERA. That's what the battle between Google's WAYMO unit and UBER over automated driving intellectual property is turning into. The main character in the drama is Anthony Levandowski, a 37-year-old with bachelor's and master's degrees from the U. of California, Berkeley in Industrial Engineering and Operations Research. He began his rise in the world of automated driving by entering the DARPA Grand Challenge in 2004 and 2005 along with other Berkeley engineers with an autonomous motorcycle named* Ghostrider. *A few years later he was hired by Google to work with Sebastian Thrun (now CEO of Udacity, who was part of the Stanford team that won DARPA in 2005 with Stanley and then went to Google).*

*It seems that while Mr. Levandowski was still working at Google, and apparently with the approval of his employer, he founded two companies that were bought by Google, 510 SYSTEMS and ANTHONY'S ROBOTS. He left Google (which was WAYMO at that point, a subsidiary that had been formed in December 2016 to run the self-driving car initiative and commercialize it) in January 2016 and started a company called OTTO in May 2016 with the help of a $120 million bonus payout. OTTO was going to commercialize self-driving technology for large goods vehicles. It was acquired by UBER two months after it was launched for $680 million. UBER paid to get him and what he brought with him. Now the plot thickens. Apparently, they also issued him $250 million in restricted stock just one day after he resigned from WAYMO.*

*In February 2017, WAYMO filed a lawsuit claiming that Levandowski allegedly "downloaded 9.7 GB of WAYMO's highly confidential files and trade secrets, including blueprints, design files and testing documentation" before he resigned and started OTTO. The principal focus of the suit is the Lidar component. Levandowski refused to testify, claiming his Fifth Amendment right against self-incrimination. In May, the judge adjudicating the case ordered Levandowski to stop working on everything at OTTO related to Lidar, and ordered UBER to turn over information that it had on Lidar technology. When Levandowski refused to cooperate with UBER's internal investigation, UBER fired him. He will not see the $250 million, but neither he nor UBER are out of the woods. WAYMO seems determined to stop UBER at all costs.*

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**Footnotes:**

1. I choose not to list the name of the paper in this clickable world. I do not wish to have ***The Dispatcher*** in references along with the paper, and I do now wish to endorse it or legitimize the authors by listing it here.

2.https://www.youtube.com/watch?v=yuEoJPZgc0Q

3. On 1 June 2017, the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) signed an agreement with the Michigan Dept. of Transportation to test self-driving technology along the I-69 corridor.

4. http://agelab.mit.edu/sites/default/files/MIT%20-%20NEMPA%20White%20Paper%20FINAL.pdf

5. The final version of the plan was unveiled by President Obama on August 3, 2015. The 460-page rule (RIN 2060–AR33) titled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" was published in the Federal Register on October 23, 2015. The Obama administration designed the plan to lower the carbon dioxide emitted by power generators.

6. Two U.S. presidential advisors, H.R. McMaster and Gary Cohn, stated in a *Wall Street Journal* article that "the world is not a 'global community' but an arena where nations, non-governmental actors and businesses engage and compete for advantage…Rather than deny this elemental nature of international affairs, we embrace it."

7. The Economist. May 27th 2017.

8. Global Automotivehttp://www.oica.net/category/economic-contributions/

9. Normative Ethics defined in the Internet Encyclopedia of Philosophy (iep.utm.edu)

# Musings of a Dispatcher: Normative Ethics

DAGENS NYHETER, one of Sweden's major daily newspapers, recently carried an article on its *Debate* page with the following title (obviously in Swedish): In this acute climate crisis, we now choose not to fly on airplanes. The article is signed by eight Swedes, including climate researchers, athletes, writers and entertainers. It is a long article of 1,100 words of which only 50 words are devoted to the climate impact of transport and 40 to the authors' intention to give up air travel. The rest is on the reasons why there is general agreement that there is a climate crisis.

It probably goes without saying that the athletes are not on the Swedish national hockey team (one is an arm wrestler and the other is a retired biathlete), and the entertainers are not on the world tour circuit. Nevertheless, this decision is going to mean significant sacrifices if they indeed stick with it 100%. There will be no vacations in Bali and no shopping trips to Hong Kong. Why single out air travel, rather than stopping their use of cars, buses or trains? Surely they take more trips on those modes of travel than on planes. They say that air travel has the most negative effects on the climate compared to the other modes. You might counter with the question: But if you only take a few flights a year, which is the norm, isn't it a bit like saying you will give up eating red liquorice for Lent when you only ever eat black liquorice?

These eight individuals are clearly upset with the President of the United States for rejecting the ***Paris Agreement***. Giving up flying is their answer to their inner voices commanding: Do something! When you respond to this command with the question: What should I do? you have entered the realm of *Normative Ethics*. This is the branch of philosophical ethics that "investigates the set of questions that arise when considering how one ought to act, morally speaking."[9] The two main positions of Normative Ethics are *Deontology* and *Consequentialism*.

Immanuel Kant's *Categorical Imperative i*s the standard bearer of *Deontology*. It denotes an absolute, unconditional requirement that must be obeyed in all circumstances and is justified as an end in itself. It is best known by its first formulation: *Act only according to that maxim whereby you can, at the same time, will that it should become a universal law.* By this formulation, if we believe that stopping all air travel will help save the planet from destruction due to climate change, we must ask all to give up air travel. That's unlikely, so *Deontology* is not going to provide the ethical basis for singling out airplane travel.

*Consequentialism*, and specifically *Utilitarianism*, hold that the morality of an action is contingent on the action's outcome or result. Utilitarianism argues that an action is 'right' if it leads to the most happiness for the greatest number of people. Not using airplanes affects far fewer people than not using cars and buses and trains, so there would be fewer unhappy people out of jobs if everyone just stopped flying. That is the point of the flying boycott, to show everyone by example what they should do, correct? Otherwise, it is pure *Egoism*, which holds the belief that the moral person is the self-interested person who states that an action is right if it maximizes good for the self.

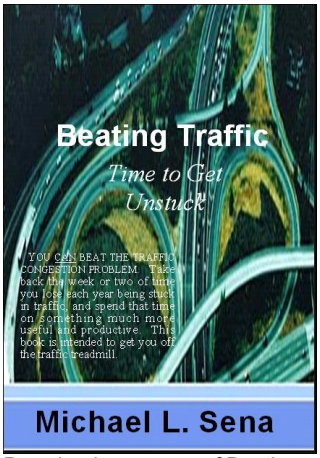
Those who support the withdrawal of the U.S. from the **Paris Agreement** also justify their moral position with the *Utilitarian* ethical position, but within the limited geographic boundaries of the U.S.A. "America First!" They state their belief that countries (e.g. China and India) and regional interest groups (e.g. the European Union) deliberately disadvantaged the U.S. in the **Agreement** in order for their countries and regions to grow and prosper at the expense of the U.S. Further, they say that by economically disadvantaging the U.S. in the short term, the U.S. will be in an even more disadvantaged position to react to the eventual catastrophic climate conditions that may, in fact, exist in the future. So, by not reducing its emissions and not contributing billions to compensate other countries, including China, the greatest number of U.S. citizens who would be alive by the end of the century will be happier—unless, of course, the planet becomes unlivable before they die a natural death.

I'm fairly certain that everyone reading this has reflected on the conundrum, and you feel you are on the horns of a dilemma. Making a personal sacrifice to contribute to the reduction of greenhouse gases may cause you personal harm in the form of reduced mobility and reduced income. In the end, commitments by governments result in personal sacrifices. What we hope is that the sacrifices are shared equally by everyone. I'll keep flying for now.

## About Michael L. Sena

Michael Sena works hard for his clients 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 is happening. Explaining and understanding the how and why, and developing your own strategies, are what we do together.

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