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# The Dispatcher

## Special interest features covered in each issue:

- Driving automation
- Map data and navigation
- Data privacy
- Third party automotive services
- Regulations and Standardization

## In This Issue:

Report from Dispatch Central	1
Automated Driving News: Intel buys Mobileye	1
What Car Companies Are Doing: Ford and EU eCall	2
The Issue of Ethics and Self-driving Vehicles	3
Musings of a Dispatcher – Cooperation	6



"Hello. My name is Val-kyrie, but please call me Mr. Colburn, or Hoke, if you like. NASA designed me to walk around on Mars, but I am free right now. Where would you like to drive to, Miss Daisy? My Cadillac is waiting outside."

Telematics Industry Insights by Michael L. Sena

## Report from Dispatch Central

WHAT HAPPENS TO ONSTAR EUROPE? That was my first thought when I heard that PSA was acquiring Opel and Vauxhall from General Motors (See page 5). On the 3<sup>rd</sup> of March 2015, Opel's CEO announced in Geneva that OnStar would be available on all of its models, starting with 13 countries and adding 18 countries in 2016. Today, two years after its start, Opel and Vauxhall probably have around a million cars connected to its service. Now, GM is giving up its position as a European manufacturer, but, it says that OnStar is staying. It will need to service the existing customers, and it makes little sense to stop installing OnStar in Opel and Vauxhall vehicles that will continue to be made for some time to come. The question is which connected vehicle platform option PSA will want to use moving forward for all of its vehicles.

There is another little twist with OnStar Europe and that is how it will connect to all of the PSAPs in the EU starting on 1 April 2018. Will Opel/Vauxhall continue to direct emergency calls to OnStar, or will it convert to a standard EU 112 eCall, as Ford will do? If OnStar receives the calls, will it try to implement a data connection to transfer the minimum set of data? These are issues that all OEMs are reviewing, and hopefully have decided by now.

## Automated Driving News

INTEL BUYS MOBILEYE. I am reminded of the journalistic aphorism: *Dog Bites Man* is not news; *Man Bites Dog*, that is news! INTEL paid \$15.3 billion for the Israeli company that develops vision-based warning systems for collision avoidance. Five years ago, INTEL bought another promising Israeli firm, TELMAP, for considerably less, but closed it a short while after the acquisition. Let's hope that MOBILEYE does not suffer a similar fate. There is some overlap between MOBILEYE

and ALTERA, which INTEL acquired for \$16.7 billion at the end of 2015. Intel has been showing strong interest in MOBILEYE for some time, so making a bid for the company surprised no one. The investment community questions whether INTEL is paying too high a premium, which is 34% over the stock price and a multiple of 56 times earnings. Clearly, INTEL wants in on the automotive market and apparently does not feel it is going to be

## REALITY CHECK

I STARTED WRITING *The Dispatcher* a little over three years ago to add some balance to the media and conference circuit discussions about the imminent introduction of no-hands-on-the-wheel automated vehicles. Today, there seem to be a few more voices offering words of caution on the subject, but I still have a feeling that there is a pervasive view in the press that the main driving force behind automation, over and above making driving safer, is that everyone in a very short while will be living in a center city apartment with no need for a private car, and all companies will be located there, just a short walk away.

I would like to ask you all for a favor. Could you send me an e-mail with your answers to the following questions:

1. Do you own an all-electric car that is your primary vehicle?
2. Are you a member of a car sharing program which you use instead of owning a car?
3. Do you use a combination of walking and public transit to get to work each day?
4. Do you walk or cycle all the way to work each day?
5. Do you own a car?

My answers: No, No, No, Yes, (My office is next door to our condo), Yes.

Continued on Page 5

### PROJECT HERO: LAND ROVER DISCOVERY ROOF-MOUNTED UAV FOR AUSTRIAN RED CROSS

JLR's Special Vehicle Operations (SVO) division has worked together with the Austrian Red Cross to create a unique search and rescue vehicle. It features a roof-mounted unmanned aircraft vehicle and a landing system that uses self-centering and magnetic retention technology to enable the UAV to land on the vehicle while the vehicle is in motion.



*Looks a lot like my idea for a Personal Periscope, don't you think?*

### PERSPECTIVE ON FACTS

LOWER FUEL PRICES and a better economy led U.S. drivers to log a record 3.22 trillion miles last year, 2.8% more than 2015, the Federal Highway Administration reported. Tesla has stated publicly that its cars drove 300 million miles in AutoPilot mode from Oct. 2015 to November 2016. This is based on its estimate that it has 115,000 Teslas capable of driving in AutoPilot mode and that all of these cars are doing so every day for at least 38 miles per day. Realistic? You decide. In any case, that total is 0.01% of the total miles driven by all cars. No further comment.

Tesla shipped a record number of cars in the first quarter of 2017, just over 25,000. That's up 69% from a year earlier. Its next goal is to turn a profit.

On April 3<sup>rd</sup>, Tesla passed Ford in market capitalization.

## What the Car Companies Are Doing

ONE YEAR AGO you couldn't find a car or truck company executive talking about the next twelve months except to predict another record year for sales. Everyone was focused on 2020 and beyond, when all-electric cars would drive themselves, and their companies would have transformed themselves into mobility service providers. How quickly the world can change. What happens in the next few months is suddenly on the agenda of all automotive industry leaders following messages emanating from the White House—or the President's phone—about what 'America first!' actually means. Will there actually be major investments in the road transport infrastructure; will the proposed DOT regulations for automated vehicles be implemented; will regulations for mandating higher fuel economy standards be rolled back; will there really be import duties of 30% or more on cars produced outside the U.S.? It looks like the auto executives are trying their best to keep their heads cool and their eyes fixed their main goal, which is selling more cars, while they talk up their future plans for self-driving cars and mobility services, and hopefully get their stock price needle moving higher.

Mark Fields, CEO of Ford, has lately been sounding more like his former mentor, Jacques Nasser. Mr. Nasser worked for Ford from 1968, fresh out of university in Australia, until 2001, when he was summarily fired and replaced by Bill Ford. Mr. Nasser claimed that Ford's future was as part of the e-economy, that the car was a mobile phone on wheels. With Qualcomm as a partner, Nasser initiated a massive investment in developing the future connected car with the *Wingcast* initiative. This was shut down the year after Nasser left, and Ford has been out of sync with the rest of the car industry since then on how best to connect vehicles to services and vice versa.

While Mr. Fields has been appearing on stages around the world talking about the company's 'future beyond car ownership', its profit engine, the **Ford F-150 Pickup**, just keeps on setting sales records. It sells one of the money machines every 41.8 seconds. Only the Toyota Corolla outsells it in the U.S. Is it because of the F-150's success that its CEO tries to promote his company as a *Big Green Machine*? "The transportation system that worked so well for us the last hundred years isn't going to cut it in its current form, particularly in urban areas," said Fields in a recent interview. Is the 'us' in this statement Ford or people who drive cars in general or who? Does buying CHARIOT, a SF shuttle service, or a partnership with a bike-sharing company, move Ford into the mobility services business and out of the F-150 business? These 'tech talks' are for investors. On April 3<sup>rd</sup>, Ford's share price was \$11.41 vs. \$298.52 for Tesla. Ford's investors are probably wishing

*Generation Y (men and women born between the early 80s and late 90s) in the U.S. want their own car, according to **Automotive News**. In 2016, 29% of new cars purchased were bought by Geners.*

*The **SmartDeviceLink Consortium Inc.** (SDLC) was established in January 2017 with the principal purpose of ensuring that Apple and Google do not dominate the vehicle dashboard. Toyota and Ford were the principal founders. Mazda, PSA Group, Fuji Heavy Industries and Suzuki are among the other car company members.*

*Ford's **City Solutions Group**, which is part of Ford Smart Mobility Division, and Bloomberg Philanthropies, backed by Michael Bloomberg the eighth richest person in the world (\$40 billion), will be cooperating to 'help cities prepare for self-driving cars and how to best use them to address city challenges, according to an article reprinted in USA Today from the Detroit Free Press.*

*Bill Gates, the richest person in the world (\$86 billion), thinks governments should tax robots to slow the pace of automation and use the extra money to improve education for the masses. **The Economist** (Feb 25 '17) opines this is unfair to robots that are seeing a shrinking share of capital coming to them. It seems that dominant firms are exploiting both humans and robots and pocketing the profits.*

*Continued on P.5*

## The Issue of Ethics and Self-driving Vehicles

TERRORISTS DRIVE TRUCKS into holiday crowds in Nice and Berlin, using the vehicles as weapons. These are conscious and immoral acts of murder. A person who commits an immoral act knows it is wrong but does it anyway. A drunk or drugged driver plows into people waiting for a bus. This is an unconscious and amoral act of manslaughter. A person who commits an amoral act does not think of the consequences of their actions (e.g. driving while intoxicated). According to the Merriam-Webster Dictionary, **ethics** is 'the discipline dealing with what is good and bad and with moral duty and obligation'. **Morals** relate to the 'principles of right and wrong in behavior', but these principles are based on the particular values and subjective preferences of those who establish them. Ethics tend 'to suggest aspects of universal fairness and the question of whether or not an action is responsible'.

Ethics and morals apply to the actions of humans toward each other and toward everything else, but they do not apply to the actions of non-human animals, plants or other living organisms, and certainly not to machines. Non-human animals and other living species may have their own methods of communicating consciousness, and animals, at the very least, are sentient.<sup>1</sup> They may also have their own sets of

morals and ethical principles, but we do not know what these are.

Again according to Merriam-Webster, 'conscious' is 'perceiving, apprehending, or noticing with a degree of controlled thought or observation'. 'Sentient' is being 'able to feel, see, hear, smell or taste'. Ask an artificial intelligence expert whether a computer can be either conscious or sentient or both, and you will most likely receive a definitive 'yes'. Ask a philosopher the same question, and a reply would be something as follows: Machines, including self-operating computers, may have intelligence (which, as you will have noticed, is not mentioned in the context of ethics and morals), but today computers are neither conscious nor sentient. Sensors that perform the tasks of seeing, hearing or even feeling can be connected to computers and provide input to algorithms that process the data and combine it with stored and learned rules of the road. This is what is done to enable vehicles to function as self-driving robots.

Before asking whether robotic vehicles or robots driving cars (i.e., androids that sit in the driver's seat of a normal cars) need to have simulated human traits beyond seeing, hearing and feeling, we should ask whether such traits are necessary in order to successfully (i.e., safely protecting the passengers, the

vehicle, pedestrians and property) drive a motor vehicle. Here is a summary of what different organizations involved with preparing individuals for a life of driving say.<sup>2</sup> A good driver:

1. Is responsible and self-disciplined for what they do while driving;
2. Concentrates on what they are doing and does not use substances that reduce concentration;
3. Anticipates what could happen around them and drives defensively;
4. Knows the rules of the road and is confident about how to drive safely; and
5. Has a good attitude and is courteous and patient with other road users.

I can see only one of these good driver criteria, the last, that requires the human trait of **empathy**: 'the capacity of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another'. The other four involve study, practice, avoidance of intoxicants or not driving when the risk of falling asleep at the wheel is great.

When I studied for my driver's licenses, at 16 in the U.S. and at 50 in Sweden, there was no mention of the *Trolley Problem* (see sidebar). Rule #1 in both cases was: Try not to kill

*Continued on P.4*

### PHILOSOPHY VS. EVOLUTION

The trolley problem is a thought experiment in ethics. The general form of the problem is this: There is a runaway trolley barreling down the railway tracks. Ahead, on the tracks, there are five people tied up and unable to move. The trolley is headed straight for them. You are standing some distance off in the train yard, next to a lever. If you pull this lever, the trolley will switch to a different set of tracks. However, you notice that there is one person on the side track. You have two options:

- Do nothing, and the trolley kills the five people on the main track.
- Pull the lever, diverting the trolley onto the side track where it will kill one person.

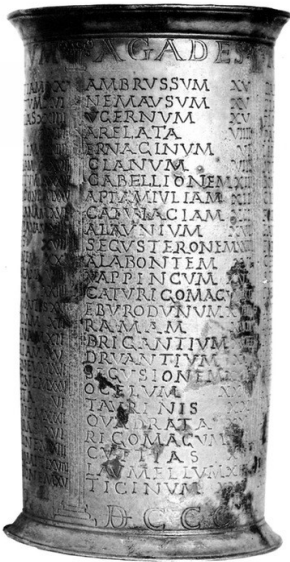
Which is the most ethical choice?

This philosophical problem and the issue of ethics has crept into the discussion of automated cars. What has not been discussed is humans' reactions in all types of situations requiring split-second decisions, and how we make these decisions.

Evolution teaches us that humans have gotten as far as we have—we can discuss what 'how far' actually means, but that would be another newsletter—because we have done a better job than other species of competing for the planet's resources. Men and women have done their respective parts to move our genes forward while our DNA are reprogrammed to adapt to changes that could eradicate us, as the 99% of the other species that have existed since the beginning of life on earth started, including earlier humans.

The two main variables in our DNA programs are self-preservation **or inclusive fitness** (organisms evolve to direct altruism towards genetic relatives) and **reciprocal altruism** (behavior whereby an organism acts in a manner that temporarily reduces its fitness while increasing another organism's fitness, with the expectation that the other organism will act in a similar manner at a later time). In other words, we do everything to protect our kin, and help others only when we believe we will get a favor in return in the future.

### Ethics and Self-driving Vehicles (continued from p.3)



VICARELLO CUP

THIS IS A MAP. What a brilliant invention made by the Romans. It is named after Vicarello, Italy, the location where four of them were found in 1852. It dates from the 1st century A.D. Inscribed on the cup is an itinerary starting in Gades (today Cádiz in southwestern Spain) and ending in Rome. There are 104 stop locations on the way. Adjacent to each stop is the distance in Roman miles (approximately 0.915 statute miles and 1472 meters) to the next stop—in Roman numerals, of course. Matched with the 'milestones that were placed along the roads, and a traveler would know precisely where they were in the Roman world.

If you want to see them for real, they are on display at the Museo Nazionale Romano in Rome. Below is the Agades-Roma cup cylinder in two dimensions.



yourself or others. My father gave me Rule #2: Under no circumstances shall you kill yourself to avoid hitting an animal. "Your mother and I would not be happy if you did," he said. That was his self-preservationist genes talking. An animal cannot reciprocate a gesture of altruism, so if you harm yourself while avoiding harming it, don't expect a thank you.<sup>3</sup>

It is not ethics that must be considered with robotic cars, but how to program the computers behind the robots to make split second decisions that are consistent with the 'thinking fast' decisions all humans make due to our evolutionary make-up. Then we can add the 'thinking slow' programming which adds the moral context.<sup>4</sup> With all due respect to the Moral Machine team at MIT, who have asked 3 million people to answer 'Trolley Problem'-type questions, you are barking up the wrong tree and wasting people's time in the process.

The people who should be answering questions are those who have experienced accidents. Why did they react the way they did? What were they thinking about when the situation that caused the accident arose? How much time did they have to react? Who was in the car with them? Did the occupants affect the way you

reacted? What was the time of year; time of day; weather and road conditions?

Someone driving in New England in the U.S. or Scandinavia must be prepared at certain times of day during certain times of the year to meet a moose weighing up to 1000 kilo. If a person is driving with their children in the car on a two-lane, undivided rural road with moose warning signs, and it is dusk to pre-dawn, they should be driving well below the speed limit, with one foot close to the brake and all of their attention on both sides of the road. Otherwise, they are irresponsible. If they are driving alone, have just had a row with their spouse or lost their job, they may want to hit a moose or risk a head-on collision by overtaking in dangerous situations. These are the drivers passing me as if I am standing still on my early morning treks to or late night rides home from the airport.

There are no moose in Florida, but running over an alligator can be just as dangerous. The point is there is no single set of rules that can be taught to a robot as right and wrong behavior that apply everywhere to everyone at any time. This applies to so-called 'deep learning' approaches as well. If a driving robot adapts to the habits of drivers in Boston

and is then sold to someone in, say, Scranton, PA, I pity the others on the road in Scranton. Boston drivers are notorious for their look right/turn left manoeuvre, free-for-all approach to roundabouts, and their 'right turn on red means I have the right-of-way' attitude. (I lived there for eighteen years; luckily I learned to drive in Pennsylvania, where Rule #3 was: Expect the worst from the other driver.)

In a recent interview shown on an Automotive News segment, Elon Musk claimed that the only chance for humans to compete with computers in the future is to connect their brains to computers so the humans can process information faster. (He said this, honest; I didn't make it up.) When it comes to robots driving cars, it should be the other way around: robots need to think like humans and react as quickly as humans react to make the right decision for the humans in the vehicle given all of the other variables that exist at the time the decision needs to be made. All the programming and all the deep learning will not make a robot a human, and will not make that robot act like the particular human would act in that particular situation. If it did, it would be a human and we would not be having this little discussion, would we?

## Automated Driving News (continued from p.1)

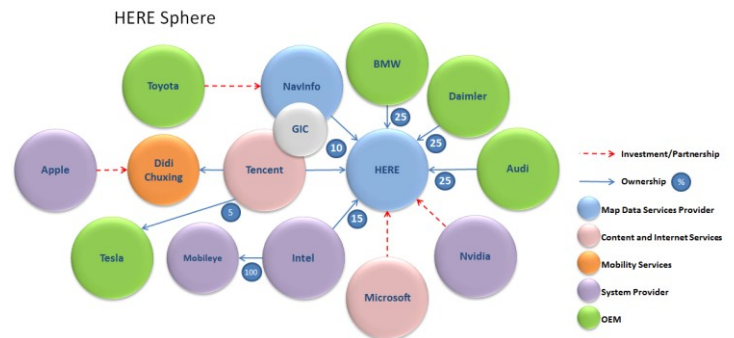
able to do it on its own. It created a new division, called the *Automated Driving Group* that was carved out of the *Internet of Things* business. In January, it announced the INTEL GO brand. It includes hardware and software development kits for autonomous driving. BMW and MOBILEYE are working with INTEL's GO platform and will have forty test cars on the road by the end of this year. Rounding off these activities was INTEL's purchase of 15% of HERE.

INTEL, with \$59.4 billion in annual sales, is fending off attacks to its market dominance from both QUALCOMM and NVIDIA, and one of the main battlegrounds is automotive. Compared to QUALCOMM, NVIDIA is a small fry, with \$2.2 billion in sales compared to QUALCOMM's \$22.6 billion. QUALCOMM's *Snapdragon* mobile application processors are in 39% of smartphones and tablets. When its acquisition of NXP SEMICONDUCTOR is complete later this year, it will have a solid foothold in the automotive connected car market. And then there is the little fact that Qualcomm generates two-thirds of its profits from patent licensing.

Compared to INTEL, NVIDIA is a peanut. But NVIDIA has something that neither INTEL nor QUALCOMM nor MOBILEYE have, at least not yet. It is the master of the Graphics Processing Unit (GPU). These chips started out

as the engines for interactive video games that require massive amount of complex calculations. Today, they have found a comfortable home in data centers running AI programs that require huge amounts of processing power, and also in automated vehicle market, where their *Drive PX2 AI Car Computer* is being used in the development of automated systems for Audi, BMW, Mercedes-Benz, Tesla<sup>5</sup>, Volvo and several other brands.

NVIDIA is not playing favorites. It is part of both the HERE and TOMTOM spheres. Below is a view of the HERE sphere with its principal owners and partners. I'm sure the main partners in the HERE sphere are thinking about how to get NVIDIA locked in.



### TRAVIS'S TRAVAILS

UBER HAS HAD a rough time lately. Key management team members have left the company, the CEO has had to utter a *mea culpa* for rude behavior and its star crossed driverless car tests experienced a major setback when one of its test cars crashed. Some (many?) would say: "Serves 'em right!" As my readers know, I have criticized Uber for using loopholes in the laws to squeeze out the established taxi companies. Nevertheless, I believe their basic idea is brilliant. They have built a peer-to-peer service platform that they proved could work in the taxi market. There are plenty of other areas into which they could and should be moving, such as roadside assistance. Uber's main problem is that they are venturing outside of their business model into areas they have no good reason to be in: maps and driverless cars.

## What the Car Companies Are Doing (continued from p.2)

the company could find a way to turn all of its vehicle fleet into F-150s, rather than seeing Ford morphing into a company that sells rides by the drink. Figure out why it's your F-150 that is competing for the top spot in car sales with a Toyota Corolla and you will be well on your way to success, Mr. Fields, and your stock price will reflect that.

IN MID-MARCH, BIL Sweden, the Swedish organization that represents manufacturers and importers of passenger cars, trucks and buses, hosted a meeting to inform the vehicle industry about the status is of Sweden's European eCall implementation. Providing the information was SOS

ALARM, the organization in Sweden that serves as the single PSAP (Public Safety Answering Point) point of contact for EU 112 eCalls with the embedded Minimum Set of Data attached. SOS ALARM reported that it will be ready as required on the 1<sup>st</sup> of October of this year to receive the standardized EU 112 eCalls.

This was an excellent initiative on the part of BIL Sweden. Similar meetings should be held in all of the other 26 EU countries that will be subject to the EU eCall regulation starting on 1 April 2018. Today, all of the car OEMs in Europe that have emergency systems direct their calls to their own service providers.

I strongly believe this will continue to be the case after 1 April 2018. Ford, and, perhaps Fiat, will be the few exceptions since they are the OEMs that do not currently have a service like Volvo On Call or GM's OnStar.

If this is the case, and I believe it will be, the PSAPs should be working now with the OEMs' telematics service providers and their third party service providers to develop a workable solution for delivering the MSD in data form from the TPSPs, rather than just allowing a phone call, as most are doing now. There are some good suggestions already on the table for how this can be done.

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## Footnotes

1. On December 1, 2009 European Union member states ratified the Treaty of Lisbon and EU Directive 86/609, which grants legal status to animals by virtue of sentience.

2. <http://www.letstalkdriving.co.uk>

3. Martel, Yann. *Life of Pi*. (2001). Piscine Molitor "Pi" Patel, an Indian boy from Pondicherry, survives 227 days after a shipwreck while stranded on a lifeboat in the Pacific Ocean with a Bengal tiger named Richard Parker. Pi saves the tiger's life, and believes they are friends, only to have the tiger walk off into the jungle when they reach land without even a look back at his co-traveller.

4. Kahneman, Daniel. *Thinking, Fast and Slow*. Daniel Kahneman (Hebrew: דניאל כהנמן, born March 5, 1934) is an Israeli-American psychologist notable for his work on the psychology of judgment and decision-making, as well as behavioral economics, for which he was awarded the 2002 Nobel Memorial Prize in Economic Sciences (shared with Vernon L. Smith). His empirical findings challenge the assumption of human rationality prevailing in modern economic theory.

5. As we went to press we learned that Tencent had taken a 5% stake in Tesla for \$1.78 billion, making it one of the company's largest shareholders. Elon Musk is the largest shareholder with 21% of the stock.

## Musings of a Dispatcher

GREAT TASTE! LESS FILLING! This was a verbal tug-of-war in *Miller Lite* beer ads in the late 1970s between two groups who both liked the beer, but for different reasons. It was a high volume bun tossing, pillow swinging argument that was both comical and effective. People were actually convinced to drink the stuff. In the early 80s, when personal computers were trying to find a niche in a business world dominated by mainframes, mini-computers and supercharged UNIX workstations, armies formed to support Apple on one side of the PC operating systems' Hadrian's Wall against IBM and its kin on the other. The diehard Apple fanatics still wear their brand badges with honor and sniff at anything but the real thing.

Brand loyalty among car buyers is legendary. 'You bought a whaaaat!?' (*Voice of an incredulous John Cleese, for example.*) I wouldn't be caught dead riding around in one of

those lemons. You're going to embarrass the whole neighborhood.' This consumer attitude is fostered and encouraged by the car companies as one way to gain competitive advantage in a viciously cut-throat industry.

There is too much at stake with vehicle-to-vehicle and vehicle-to-everything communications to engage in puerile behavior in the name of gaining competitive advantage. I have seen the process and the consequences first-hand, beginning with my work in 1994 on the ISO/TC204 committee charged with developing a physical data format for navigation systems. The delegation from Japan had a workable approach called KIWI that was implemented by most of the navigation system developers for cars sold in Japan. The U.S. and European delegations would have nothing to do with it.

Twenty years later there is a standardized physical storage format, NDS, but

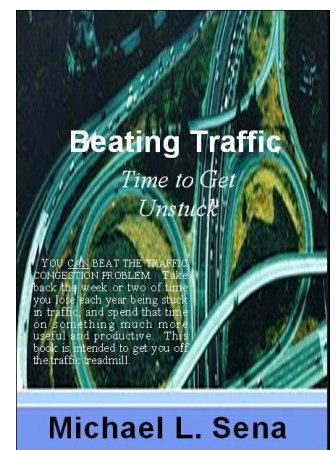
time and money were unnecessarily wasted in the meantime. Work on V2X began over a decade ago and there is still no consensus on which technology or technologies to use and who will pay for it. We are working through the bun tossing stage, but it is going to take serious discussion among the vehicle manufacturers, their suppliers and standards groups without interfering hype from companies that have products to sell.

Where do governments fit in this discussion? Not in the role of the 'Technology Decider'. Unless governments are willing to invest in the infrastructure for the 'I' side of V2I—which they have said that they are not—they should allow industry to develop solutions that work everywhere, not just in specific political jurisdictions, like within the EU or in the United States. Governments have plenty of ways of saving lives if they simply enforce the laws that are already on the books.

## About Michael L. Sena Consulting AB

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.



Michael L. Sena

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