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# The Dispatcher

## In this issue:

### Spotlight on Sweden 1-3

*Lindholmen Science Park  
Vision Zero  
Connected Car Sphere  
Drive Sweden Forum*

### Dispatch Central 1-4

*Tesla Lawsuit  
Swedish Unicorns: Skype  
and Spotify  
Amazon's Servers to  
Sweden*

### The End of Mobility 5

*It's Amazon that is the  
car killer*

### Musings 6

*Pick up those cones*



A Dalahäst is a stylized, wooden horse that is made in the cultural region of Dalarna in the geographic middle of Sweden. It has become one of the most common symbols for the

*Telematics Industry Insights by Michael L. Sena*

## The Swedish Connected Vehicle Factory

WHAT IS IT ABOUT SWEDEN? The country's companies and citizens not only compete on the global stage; they often win (e.g. Gold against Canada in the 2017 Ice Hockey World Championships in May). Although it has a land area that puts it in third place within the EU, after France and Spain, it has a population of only 10 million as of 20 January 2017. That is only 11% of Germany's, 3% that of the U.S. and less than 1% that of China. Drive or train around the country, even in the lower one-third south of Stockholm where over 75% of the population lives, and you see mostly farms and forests. 65% of Sweden's total land area is forest; 15% of the country lies above the arctic circle; and, 85% of the population lives in its cities, most of them in the three largest: Stockholm, Göteborg and Malmö. It has a parliamentary democracy form of government along with a constitutional monarchy. King Carl XVI Gustaf, among other duties, each year hands over the Nobel Prizes (except the one for Peace), and the Polar Prizes. (NB: Bob Dylan won one of each.)

According to my reading of Sweden's history, the country's secret is as follows:

- It fought all of its wars early, starting with the Vikings and ending around 1814;
- It won most of the wars it fought; and,
- Then, it used the booty from its wars to stay out of the major debilitating international conflicts during the rest of the 19<sup>th</sup> and 20<sup>th</sup> centuries and to build up its governmental, industrial and societal infrastructure.

This combination allowed Sweden to take advantage of its ample natural resources to create world-class companies, top notch educational and health care systems and a global trading mindset. A short list includes; Nobel, IKEA, Ericsson, Volvo, Scania, Electrolux, SKF, Husqvarna. Then there are the celebrities: ABBA, Ingemar and Ingrid Bergman and Björn Borg. Sweden's companies and institutions have been there from the very start of connected vehicles, advanced driver assistance systems, alternative fuels and mobility services, and they intend to stay.

*Continued next page*

### Dispatch Central Tesla Lawsuit

*Some things are predictable (like the burning out of our Sun in 4.5 billion years); others are inevitable (like the eruption of an active volcano). That a class action lawsuit eventually would be brought against Tesla Motors is a little of both. On April 19<sup>th</sup>, a suit was filed in the U.S. District Court of San Jose, California by a law firm in Seattle. The firm represents three Tesla owners who say the company "knowingly sold them vehicles with Enhanced Autopilot driving technology that can't be used" and, further, that the vehicles "lacked standard safety features". These include automated collision avoidance and automatic emergency braking system, which either have not been delivered or have defects.*

*The disgruntled owners want Tesla to buy back their vehicles and pay punitive damages, and charge the company with fraud.*

### The check's in the mail

*Tesla says the suit is groundless. "It's an attempt by lawyers to make money. We have already fixed the problems."*

*Continued next page*



**The Swedish Connected Vehicle Factory (continued from p.1)**

**Vision: Unusual foresight - Either you have it or you don't**

**Tesla Lawsuit (continued)**

Musk and Tesla overpromised again, and the lawyers jumped at the chance to catch them out. In October 2016 it moved from Mobileye to Nvidia hardware. The company said that all Tesla cars would be equipped with sufficient hardware to support "Full Self-Driving capability when the software is ready." Enhanced Autopilot (EA)—as opposed to the Autopilot that did not work in Florida for Joshua Brown in May, 2016—was promised by the end of December 2016. As of the March 29, 2017 release, update 8.1, EA was not up to the same level as the original Autopilot.

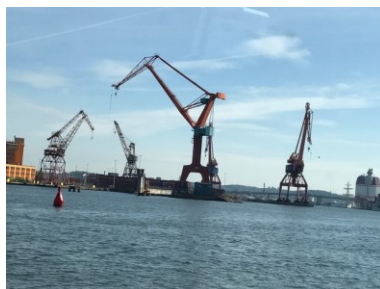
It was Tom Peters, author of the 1982 classic *In Search of Excellence: Lessons from America's Best-Run Companies*, who explained why customers reward companies that deliver on their promises and punish those who don't. Tesla and many of the other Silicon Valley high-risers missed that lecture. We shall see how this plays out.

**Swedish Unicorns**

Sweden leads Europe in the entrepreneurship league, according to data from the *Global Entrepreneurship Monitor*.<sup>1</sup> It states that the number of people actively involved in starting a business in Sweden is growing faster than in Germany and France. Fully 5% of Swedish adults are involved in setting up a new business, and close to 6% have invested in a business started by someone else. Two start-ups that have made it big are Skype and Spotify.

*Continued next page*

It's an over-used word, but in the case of what has been accomplished in transport telematics in Sweden in general, and at Lindholmen in particular, it is perfectly apt. It began to take shape in late 1980s in Göteborg in places like Chalmers Teknikpark on the campus of the Chalmers Institute of Technology. Volvo, Ericsson, Telia and a number of Swedish companies, small and large, located their 'skunk works' there, where they could develop ways of integrating the new telecommunications and electronics into vehicles. This is where Volvo Technological Development's Traffic and Transport Systems group was located, managed by Jan Hellåker (Program Director for Drive Sweden and founding CEO of WirelessCar). The Swedish Road Administration, Vägverket (now part of Trafikverket), had established its Open Arena in the center of the city under the direction of Kent-Erik Lång and Torbjörn Biding.



The **Big Vision** came from a man named Göran Johansson (1945-2014). He was the party leader of the leading party in the City of Göteborg for nineteen years until he left for health reasons in 2008. He sat in the city's governing council for 39 of his 69 years. He fought hard to keep the city's ship building industry from being dismantled. He lost that battle, but the relics remain as a reminder that victory can be snatched from the clutches of

defeat. He was both an ideologue and a pragmatist who took the cards he had in his city and played them as best he could. One result among many is the miracle on Lindholmen, where the vehicle industry and its suppliers, Chalmers, Ericsson and many other companies have created a center of excellence for research and development for connected vehicles, advanced driver assistance and new transport business concepts and technologies. Johansson could not have done it alone; Anneli Hulthén, his successor as party leader, and Niklas Wahlberg, current Managing Director of Lindholmen Science Park, provided plenty of assistance.

**Vision Zero: No one should die or be seriously injured in a car accident**

In 1997, the Swedish Parliament passed a resolution stating that "Life and health can never be exchanged for other benefits within the society, such as cost savings". This is in stark contrast to evaluating the costs and benefits of highway safety by placing a monetary value on a life and then deciding how much to spend on the transportation infrastructure to minimize the risk of accidents while minimizing the investment. It is an ethics-based approach to guiding road transport strategy. Rather than placing the sole burden on road users for safety by obeying all laws established by authorities, the **Vision Zero**<sup>2</sup> approach emphasizes a shared responsibility between transportation system designers and road users. It is based on the simple premise that humans make mistakes and the road system must be designed to protect humans to the greatest extent possible. One excellent example of this thinking is the 2+1 roads replacing the undivided single-lane roads in each direction, credited with saving 145 lives during the first ten years of **Vision Zero**. The numbers in the chart below are impressive.

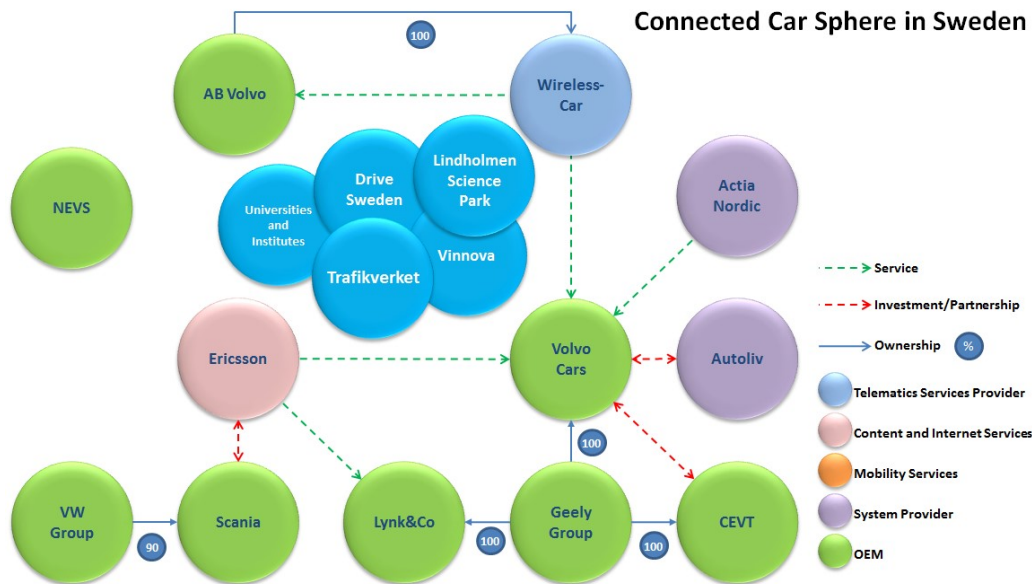
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Sweden	1965	1970	1980	1990	2000	2005	2010	2012	2013	2014	2015	Change '70-'15
<b>Total Traffic Fatalities (Annual)</b>	1313	1307	848	772	591	440	266	285	260	270	259	-80.2%

## The Swedish Connected Vehicle Factory (continued from p.2)

### Connected Car Sphere in Sweden

My Industry Sphere diagrams are intended to show the major players in a market, who owns whom, which players are providing services and which players are engaged in investment or partnership relationships. They also show organizations that support research and development investment and the public sector agencies that are responsible for overseeing the implementation of legislation.



The anchors for Sweden's connected car sphere are the three vehicle OEMs: **Volvo Cars** (Volvo Car Group owned 100% by Geely Group); **AB Volvo** (Aktiebolaget Volvo, or Volvo Group); and, **Scania** (Scania Aktiebolag, which had 90% of its shares in VW's ownership in 2014 and the company was delisted from Stockholm's stock exchange in June 2014). There is no connection, either legally, organizationally or operationally, between Volvo Cars and Volvo Group except for the joint use of the brand name 'Volvo' and the fact that both companies are headquartered in Göteborg, Sweden.<sup>3</sup> Volvo Cars, which makes and sells cars, was sold to Ford in February 1999, who in turn sold Volvo Cars to Geely Group in March 2010. AB Volvo makes and sells trucks, buses, construction equipment and boat motors.

**CEVT** (China Euro Vehicle Technology AB is a development center for the Geely Group. It is located in Lindholmen Science Park. Its first car is the Lynk&Co 01.

There is a fourth automotive OEM operating in Sweden called **NEVS** (National Electric Vehicle Sweden). It purchased certain rights in 2012 from Saab Automobile AB when that company declared bankruptcy in 2011. NEVS has as its objective to deliver its first electric car in 2020 manufactured in the former Saab factory in Trollhättan.

**WirelessCar** is part of the Volvo Group. It started life as a three-party joint venture between Ericsson, AB Volvo (before Volvo Cars was sold) and the Swedish Telecom. Gradually, it devolved to Volvo Group and divided into a section that provides connectivity services globally to the Volvo Group companies and to a section that provides connectivity services to Volvo Cars, as well as to several other automotive OEMs. Technically, WirelessCar is now used to refer only to the section that provides external services. **Ericsson's** Connected Vehicle Solutions division provides a range of Internet of Things connectivity services to the automotive sector, including globally to Volvo Cars and to Lynk&Co in China.

### Swedish Unicorns (cont.)

#### Spotify

Legally sharing a streaming copyrighted music online remains a hotly debated issue, and Swedish company Spotify has been able to bridge that gap by providing online music streaming services as a legal alternative to pirated music file-sharing sites. It was started in 2006 by Daniel Ek and Martin Lorentzon. The service allows users to freely listen to, stream and share music tracks on their computers and mobile devices. It's a private company with revenue of around \$2 billion and a value of \$8 billion. It is considering going public by directly listing its shares, rather than following the normal IPO route of selling its shares before listing.

#### Skype

Founded in 2003 by Swede Niklas Zennström and Dane Janus Friis, Skype hype is that it "singlehandedly brought grandparents living on different continents closer to their grandchildren". The name was derived from 'Sky peer-to-peer'. Simply, Skype allows us to make free voice and video calls over the Internet. eBay acquired it in 2005 for \$2.5 billion. Microsoft bought it from eBay in 2011 for \$8.5 billion. The company's official headquarters are in Luxembourg, but the development team and almost one-half of its employees are in Estonia. Skype has replaced Microsoft's Windows Messenger and Lync products.

### **Cold is Hot in the Nordic Countries**

*If you're Amazon Web Services and you are operating a cloud computing platform that is larger than all of your four largest competitors combined—those competitors include IBM, Google, Salesforce and Microsoft—you need to have a lot of computing power strategically placed around the globe to meet demand and provide adequate back-up in case of emergencies. Data centers generate massive amounts of heat, and in order to reduce cooling costs, it makes sense to locate those centers in places are generally cooler than average. Finland and Iceland (naturally) got the early attention, but Sweden has been catching up. Facebook has built two large data centers in the very north of Sweden and in May of this year, Amazon announced it would build three data centers in the middle of the country, close to Stockholm. Why there? Amazon says that it needs to have the centers close to the majority of its clients and even a one millisecond latency due to distance makes a difference.*

### **Effects of Taxes on the Automation of Labor**

*High taxes on labor increase the rate of automation, replacing manual labor with automated labor. As automation increases, fewer people working have to pay higher taxes in order to keep the same level of services. If taxes stay the same, services have to be reduced. The short-term solution is to reduce taxes on income to slow the pace of automation and begin to replace taxes on labor with other forms of tax.*

*Mårten Blix, PhD in National Economics at the Swedish Institute for Industrial Economics*

## **The Swedish Connected Vehicle Factory (continued from p.3)**

**Actia Nordic** AB was once part of Autoliv. It was Autoliv that developed the Volvo On Call system, and Actia Nordic took over all of the clients and IP related to the telematics systems developed during the Autoliv period. **Autoliv** and Volvo Cars have a long-running supplier relationship and their joint venture called Zenuity began operations in April 2017. The JV intends to create and market autonomous driving systems that will be sold to other OEMs and suppliers.

The private companies developing connected car solutions are heavily supported by publicly financed institutions and public/private partnerships. Chalmers Institute of Technology in Göteborg, Kungliga Tekniska Högskolan in Stockholm and other universities around the country provide the highly skilled men and women who are vital to the success of the companies. **Vinnova**, which is part of the Ministry of Commerce, has been funding critical research in the automotive sector since its founding in 2001.

### **Drive Sweden Forum – 31 May 2017**

The *Drive Sweden Forums* are held every six months. The previous *Forum* was in November at the Drive Sweden headquarters in Lindholmen Science Park. This *Forum* was hosted by IBM in Kista, a suburb of Stockholm that has become the largest Information and Communication Technology (ICT) cluster in Europe and the third largest in the world.

The day's program began with a welcome by the host company, IBM, and we would hear a point that would be made several times during the day: IBM today is building its future around Watson. Jan Hellåker then gave a summary of the mission and operation of *Drive Sweden*. He said that he often feels people have difficulty understanding what it does and how it works as a strategic innovation program. There is no cost to become a partner, and there is no cost for taking part in the Forums. Jan is the only full-time employee, and the board chair, Catherina Elmsäter-Svärd, former Minister of Transport, is the only part-time employee. For the 100-or-so participants in the day's conference, I believe we went home with a much better idea of the value of this important program for helping business and government appreciate the changes that are occurring in society's need for and use of transport.

The first key note presentation was given by Sonia Yeh, until recently a professor at the U. of California at Davis. She has moved to Sweden and is a Visiting Professor at Chalmers. The theme of her presentation was using big data for improving mobility, and this will also be her focus at Chalmers. By using location-enabled tweets from Twitter users, she demonstrated how travel patterns could be identified in city regions. I asked if the same result could be achieved with data from a non-social media source. Mobile phone data works just as well, or better because there could be more of it, but then you need to have agreements with multiple MNOs. Twitter is global. Since I don't use any social media apps, I guess I will not be counted.

A number of presentations followed by partners in *Drive Sweden*, including Bestmile, Freelway and Uniquesec. I was reminded of the regular lunch meetings of Telematics Valley when members would give us all an update on what they had been doing since they last had their turn on the podium. A second keynote was delivered after lunch by Robert Quinn from IBM. This talk was all about Watson. I learned that IBM has built its IoT headquarters in Munich and called it the European Watson Innovation Center, that IBM's major partners are now Apple, Twitter and Cisco and that it has integrated the Weather Company, which it acquired, in many of its AI offerings. I enjoy panel discussions, and Christina Elmsäter-Svärd did a commendable job moderating one in which Ericsson, Volvo Cars, City of Stockholm and the Swedish Transport Administration discussed what should comprise a digital infrastructure.

This was an excellent way to spend a day. Attend the next one if you can.

## The End of Mobility: How on-line shopping will contribute to the end of the need to move

WHEN I THINK of where we are heading with on-line shopping I think of Jabba the Hutt, the *Star Wars* gangster-alien who is essentially immobile and demands that everything is brought to him. We can sit in our homes today and have literally anything brought to our doors, and we don't even need an army of minions on our payroll to do our bidding as Jabba did. All we need is an Internet-enabled device and a credit card. On-line shopping is convenient, saves us loads of time and is often even less expensive than buying in a store, but there is a dark side to the whole process. Beside the economic effects it is already having on the multi-trillion dollar retail industry that employs 16 million people in the U.S. alone, on-line shopping is just one more paper cut among many on the vehicle industry. Driving to the store to pick up 'our stuff' is one of the two main reasons we need a car, the other being getting to and from work. If we don't need to drive to the store, it will be one less reason to own a car, or at least that extra car in the driveway.

### Why we travel<sup>4</sup>

- 45% of daily trips in the U.S. are taken for shopping and errands
- 27% are social and recreational, such as visiting friends and family
- 15% are for commuting to and from work
- 91% of people commuting to work use person vehicles
- More daily trips are taken between 12.00-13.00 (7.4%) than any other time
- The average driver spends 55 min/day behind the wheel and drives 29 miles (46 kms)

If you are a dedicated on-line shopper, you probably have not noticed that stores are closing in both out-of-city malls as well as in the central cities. I am not an on-line shopper, except for the odd book, so I have noticed. I recently drove to the first mall built outside of downtown Scranton, PA (my hometown) in the late 1960s. It was anchored by Sears at one end and J.C. Penney at the other. When I arrived, I found a large pile of rubble where the Sears store had been. Sears, which started as a catalog sales company (see sidebar) is close to calling it quits, and, along with J.C. Penney and Macy's, is closing stores in droves. The main competitor to the department stores and large food store chains had been Walmart, the retail behemoth that opened its first big box store in 1962 and just kept growing. But now, even Walmart is threatened by the biggest threat of all, aptly named: Amazon. Amazon on May 22<sup>nd</sup> 2017 was worth \$464 billion (Walmart's market cap was \$238 billion), had sales of \$136 billion last year and shareholders expect those sales to triple in ten years.

The share of retail shopping done on-line rose from 5.1% in 2011 to 8.3% in 2016. We buy 65% of books, films and music over the Internet, 45% of office equipment and supplies, 40% of toys and hobby goods, 35% of electronics and 22% of clothing and accessories. Food and beverages account for less than 10% today, but it is rising. Since January, 50,000 retail jobs have been eliminated in the U.S. The reason is explained by the difference between retail sales and retail floor space. In order for space to match demand, an additional 30% should close permanently. That means roughly 5 million people currently working in retail in the U.S. would be out a job. It also means that there would be roughly 30% fewer places for cars to drive to or trucks to deliver to than there are today.

### What was Jeff Bezos thinking?

He is definitely not a flashy car guy. He drives a '96 Honda Accord. It is said that his wife drops him off at work after they have delivered their kids to school in her car. Did he think the company he and his wife founded back in 1994 would eventually contribute to the demise of the car industry? He earned a degree in electrical engineering and computer science at Princeton and was president of a space exploration club. He's a pretty smart guy. Amazon's business is decreasing to zero the distance between you and any product you want to buy. It must have crossed his mind that the end result would be fewer daily trips for shopping. In any case, he has probably figured it out by now. Maybe that \$35 million placement in Uber isn't such a good investment after all, Jeff.

### To-Your-Door

*Jeff Bezos did not invent **teleemptio** (remote purchasing) combined with to-your-door delivery. Apparently, Benjamin Franklin has that honor. He reportedly produced the first mail order catalog in the United States: [A Catalogue of Choice and Valuable Books](#). He even offered a mail order guarantee, "Those persons who live remote, by sending their orders and money to B. Franklin may depend on the same justice as if present." (Interestingly, Benjamin Franklin was the Postmaster General of the U.S. at the time, and this turned out to be a good way of generating a little extra traffic. Imagine where the national postal services would be today if the postmasters general of all countries saw the possibility of requiring a stamp for all e-mails.)*

***Montgomery Ward and Sears, Roebuck & Co.** were founded in 1872 and 1886 respectively as catalog order companies. Their first customers were farmers in small rural towns who were being charged high prices for limited selection by local general stores that were usually a monopoly. Catalog orders and postal delivery reduced the distance between the buyer and the seller, in the same way that Internet on-line purchasing does. Both MW and Sears expanded into bricks and mortar retail in the early 1900s. MW returned to catalog and on-line retail in 2001 following liquidation. Sears is self-liquidating, having reduced its physical stores from 3,500 in 2010 to 695 in 2016.*

*Both of these companies could have done what Amazon did. They didn't. Next time, the travelling salesman story.*

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### Footnotes:

1. Global Entrepreneurship Monitor (GEM) began in 1999 as a joint project between Babson College (Boston, USA) and London Business School (UK). The aim was to consider why some countries are more 'entrepreneurial' than others. 17 years on, GEM is the richest resource of information on the subject, publishing a range of global, national and 'special topic' reports on an annual basis.
2. Vision Zero is a multi-national road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries in road traffic.
3. P3 – An article in an on-line publication called GreenBiz caught my attention with the headline: "Volvo plans to launch its first fully electric passenger car in China in 2019 and has developed an electric bus being used in Sweden." The bus is produced by Volvo Group, not Volvo Cars.
4. U.S. Dept. of Transportation; Bureau of Transportation Statistics

## Musings of a Dispatcher: Pick up those cones, Gov!

IT WAS 4 P.M. on a Sunday afternoon. I and my three companions were in a Chevy Suburban on our way back to Massachusetts from a five-day fishing trip to New Brunswick, Canada. We had made good time on our nine-hour journey and had about an hour to go when we came to a full stop on I-95 in Maine, near Kittery, four kilometers before the bridge over the Piscataqua River. On the other side of the river is a narrow strip of New Hampshire and then Massachusetts. In years past such a backup would be caused by the infamous Kittery Toll Booths that were single-handedly responsible for doubling the size of the English Book of Swear Words. But now the toll booths were gone, replaced by EZ Pass readers strung across the roadway. Since the 2004 Suburban lacked an integrated navigation system, each of us pulled out our phones to find out what might be the cause of the delay. Luckily, we did this before we followed the suggestion of our driver to exit I-95 and head over to Rt. 1 that runs

parallel and crosses the river on another bridge. That bridge was completely closed, so traffic was being led on to I-95 just before the bridge.

After nearly one hour from when we reached the blockage, we arrived at the ramp where cars were merging with the main flow. Then we saw that one of the three lanes on the bridge was blocked off with orange cones. After we passed the ramp, we were able to move at a reasonable speed across the bridge. There was no sign of construction on the closed off lane or on the divider. It seems that the cones had simply been left there by the construction crew so they did not have to spend time picking them up and then placing them out again on Monday.

I did a quick calculation of how many hours all of us wasted who spent an extra hour in traffic on that Sunday afternoon. I arrived at 9,600 hours, or 1 year 1 ½ months. At first my conspiratorial mind thought it was another George Washington Bridge-gate,

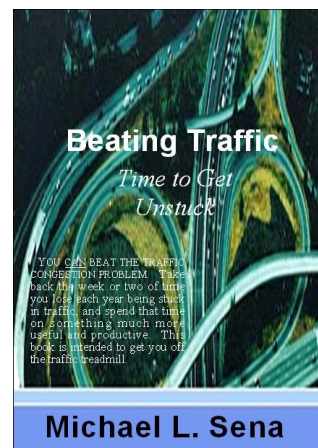
that the Governor of Maine was having it on with the Governor of New Hampshire. It turns out they are both Republicans. The two states voted for Hillary Clinton by very slight margins, so maybe both Governors were punishing their own voters. In any case, I am certain that neither one of them were anywhere near Kittery on that Sunday afternoon.

Imagine if sitting governors or mayors running for re-election were given a handicap, like in golf. For every hour their constituency members waste in traffic jams caused by repairs to the roadway, they lose a vote. Cars and trucks could be fitted with a device that records the time, place and duration of a delay and on the day of the election, just before the polls close, all of the affected vehicles download their data to a system that calculates the results. How much would you like to bet that every governor and mayor would have very specific NO DELAYS clauses in all road construction contracts? They would be out picking up those cones on Sundays.

### 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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