THE DISPATCHER

TELEMATICS INDUSTRY INSIGHTS BY MICHAEL L. SENA
August 2018 – Volume 5, Issue 10

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Most cities are known for their hubbub. Vadstena on the eastern shore of Lake Vättern in Sweden is a hub without the bub. One of Sweden's oldest political and religious centers, it is now a focal point for theater and music education and performances. It comes alive during our brief summer, but has all the amenities a city needs during the remainder of the year as well. (Image by marinas.com.)

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Roboticized Vehicles Viewed in the Wider Context

It was time to modify the format of ***The Dispatcher*** so that it works for both printing and screen reading. *Dispatch Central* and *Musings* will continue to be part of each issue, and there will be two or three main articles focusing on the business, technical and strategic issues of connected mobility. The sidebars will be used for running comments, photos and footnotes.

1. Endgame - The final stage of some action or process (Mirriam-Webster)

*Two principal camps have developed around the question of why vehicles that are not driven by humans are better than ones that are: those who believe that most accidents can be eliminated with robots in control; and those who believe that only by eliminating the cost of the driver can on-demand, shared travel become so irresistible that no one would want to ever own a car.

WHAT IS THE ENDGAME?[1] There has to be one. Is it that everyone will have a carefree life and will live forever? Will we eradicate death by eliminating disease, preventing all accidents and making self-killing in all forms impossible? And will we, at the same time, ensure that life for all humans is meaningful, enjoyable and free of exertion? Even if carefree living forever may seem unattainable in the near future, if we accept it as humanity's main goal, then all our efforts should be devoted to achieving it. We can then assume that it is the job of everyone working in any way with vehicular transport to minimize and then eliminate all vehicle-related accidents and make all forms of transport and mobility carefree.

There are those who claim that in order to make motorized vehicular travel safer, the human factors that cause accidents need to be minimized and eventually eliminated.* Advanced driver assistance systems aim to minimize human failures while driving by providing better vision with electronic horizons, 360-degree sensors and vehicle-to-vehicle communication, better braking, better steering and better overall control. Removing the human totally from the driving task and turning the task over to robotic systems is intended to eliminate the causes of mishaps that result from human failings.

There are those who believe that in order to make motorized vehicular travel carefree, vehicle ownership needs to be minimized and eventually eliminated.* The model of carefree living, in which goods and services are brought to the individual, instead of the individual having to travel to obtain them, is adapted to mobility. The individual is taken, at the asking, when and to where he or she wishes to go. Personalized mobility must be available and affordable for all, not just for the rich who have chauffeurs. This means that the costs of operating the vehicles must be as low as possible, and that the cost of the vehicle can be amortized within an acceptable period of time for the entity owning the vehicle. Mobility must be environmentally

sustainable, and it must be dependable, with no delays due to congested road networks. To satisfy all of these objectives, we must accept that all of our rides will be shared and that the vehicles operate with no paid drivers, or rather, with no human drivers that must be paid.

If you ask 100, 1000 or 1 million people if they would like to live forever if they could do so in a carefree, comfortable way with dignity, my guess was that at least 90%--maybe even 99%--would say 'yes'. It turns out that there have been quite a number of surveys, and most folks don't want to live forever. Many of those who do want to be able to continue working.[2] I didn't find any questions about whether they would like to continue driving forever. What if you told them that one condition of living forever is giving up their own car and accepting ride sharing? Would they take the trade-off? Probably. Would they still be willing to give up driving their own car and accept making all their trips with strangers if they didn't live forever but they would save the planet, reduce traffic congestion and avoid having to drive themselves? It would be my guess again that the level of acceptance would not be as high as with the 'live forever' proposition. Maybe half would opt in. One question that would probably be asked is: "Will the big shots still get to ride around in their million dollar sports cars and will the VIPs still have their very own chauffeured-driven Rolls-Royces?"

Convincing the majority of people (i.e., those who want to own and drive their own cars so that they can take themselves, their families, their friends and their stuff to places when and where only they want to go) to stop being selfish and share their rides is going to be one very difficult selling job. It will be a lot easier to work on the segment of the population who do not own or drive their own cars, either because of lack of money, lack of interest or lack of physical ability. Persuading this segment to accept a form of transport that is somewhere between taking a bus and calling for a taxi may be less problematic, but still not painless. Unless it is as cheap as a bus ticket, it may still be too expensive; unless it is at least as convenient as a taxi, it may not attract users.

The key motivation for people to choose one form of transport over another is not cost, otherwise passenger cars would never have gained a foothold in the first place.[3] There are multiple forces working simultaneously, and they all are based on numerous factors that explain why the passenger car, in the vast majority of cases owned and operated by the same person, or held within the same family, has become the dominant model for mobility for all types of trips

2. Health and wellness website LIFETIME DAILY asked 2,000 Americans questions about life and longevity in a survey. https://www.lifetimedaily.com/want-live-forever/

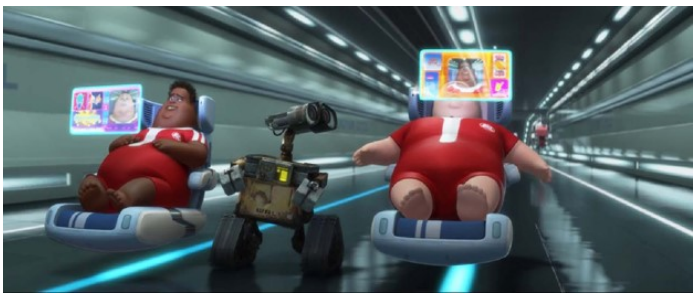
3. Vincent Kaufmann, a Swiss sociologist and one of the pioneers of mobility, looks at the question in his research. He is director of LaSUR at the EPFL, General Secretary of CEAT and professor of sociology and mobility analyses. He says that "…there are lots of others logics and actions, not just time and cost, which might influence our choices of a particular transport mean in our daily lives. Pleasure, safety and privacy are other reasons for choosing a particular means of transport."

all over the planet. Governments will fall, and kings and queens will be dethroned, if groups within countries try to force people to change their way of life without offering a very good alternative that has an endgame that people understand, believe in and willingly accept. Not even living forever seems to have the attraction we might think it would have.

Start with the question, not the answer

This is why defining the endgame before we start defining solutions is the only way to succeed. Maybe individual jet packs powered by some yet-to-be-invented dynamo will turn out to be a better means of moving people than anything that exists today. Maybe Isaac Asimov's transport solution of adjacent moving walkways that run at gradually higher speeds with the pedestrian stepping from one walkway to the other to progress to a destination, is superior to any form of motorized vehicle. Today, electric kick scooters are the craze. Anything is possible; not everything is practical.

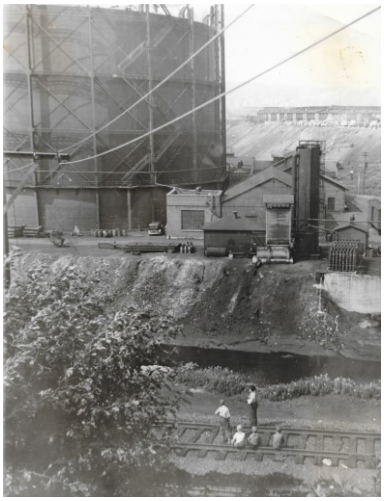
What is clear right now, half way through 2018, is that we are running headlong toward a single mobility concept that was championed twelve years ago, the robotic electric vehicle. It started with a government that wishes to find a way of projecting force without putting soldiers at risk, and now investors and governments are falling all over themselves to make sure they are not left in the financial and political dust. Those working in the vehicle and transport industry are attempting to post-justify robotic transport on safety and/or sustainability grounds, when we should be working on obtaining agreement on what problems we are trying to solve and analyzing multiple possible solutions in parallel in order to find the ones that best meet our goals for humanity on this planet.



Are we just interested in handing over the job of driving our kids to all their activities or getting home more cheaply from a night out drinking? Is that it?! If all we doing is creating a global *Downton Abbey*, where humans play and the robot butlers, maids, chauffeurs, cooks and nannies wait on us and provide everlasting life support, count me out. I'm giving back my ticket to that *Endgame*. If all this money and effort is going to help people who are underserved by the transport options that exist today, I'm in 'till the last stanza is sung.

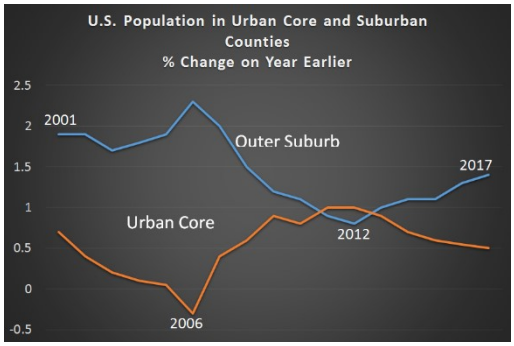
This scene in the photo is from the movie WALL-E, in which the trash compactor robot called WALL-E (Waste Allocation Load Lifter-Earth) is sentient (has thoughts and feelings), while the humans, like Mary and John, circle around in luxury spaceliners, watch videos when they are not sleeping and never leave their hoverchairs. Humans have littered the earth so extensively as a result of mass consumerism that they have had to be evacuated in spaceships like the Axiom, a starliner spacecraft built by BUY N LARGE CORP. while the earth is cleaned of garbage by WALL-Es, which the company also makes.

Death of the Suburbs Is Greatly Over Exaggerated



A view of an 'urban core' from my grandparents' back yard. We lived across the street. Central Scranton is on the plateau behind the gas tank, a ten minute walk from our house.

IF YOU GOT caught up in the urban renaissance euphoria that began in 2006 and which has been fueling mobility-as-a-service narratives ever since, it's time to update your thinking. Beginning in the 1950s, populations of urban cores[4] in the U.S. and many European cities declined. De-industrialization, globalization, increased mobility and social upheavals were among the reasons given for this phenomenon. Then, between 2006 and 2012, growth in urban cores turned positive and continued up until 2012 (see graph below). During this same six-year period, growth in outer suburbs and exurbs dropped from over 2% annually to under 1%.[5] Tales of an urban renaissance flourished. The 'Suburbs are Dead' and 'Peak Car' narratives began. Then, in 2012, everything changed. The demographic trends returned to those of the pre-2006 period. Growth of urban cores has dropped by half, while the exurban growth has quadrupled. What's happening?



Cities are not what they always were…

…nor what they always will be. I have some experience with cities having spent three-quarters of my life (to date) living in the urban cores of three cities and one-quarter living in two different exurbs. I grew up a quarter of a mile from the center of a city of 125,000, the one in the photo to the left. I spent seven years at a university an hour away by bus or train from New York and Philadelphia studying what makes and breaks cities. (Cities were mostly breaking at the time—1965-72.) After a year of living in London (Pimlico) when I worked at the Greater London Council, I worked in Boston and lived in Cambridge, close to Harvard Square (photo right) for eleven years (1973-1984). In 1982-84, I was spending a significant amount of time in Stockholm and lived in a rented apartment in the center. Seven years in an apple orchard town forty miles from

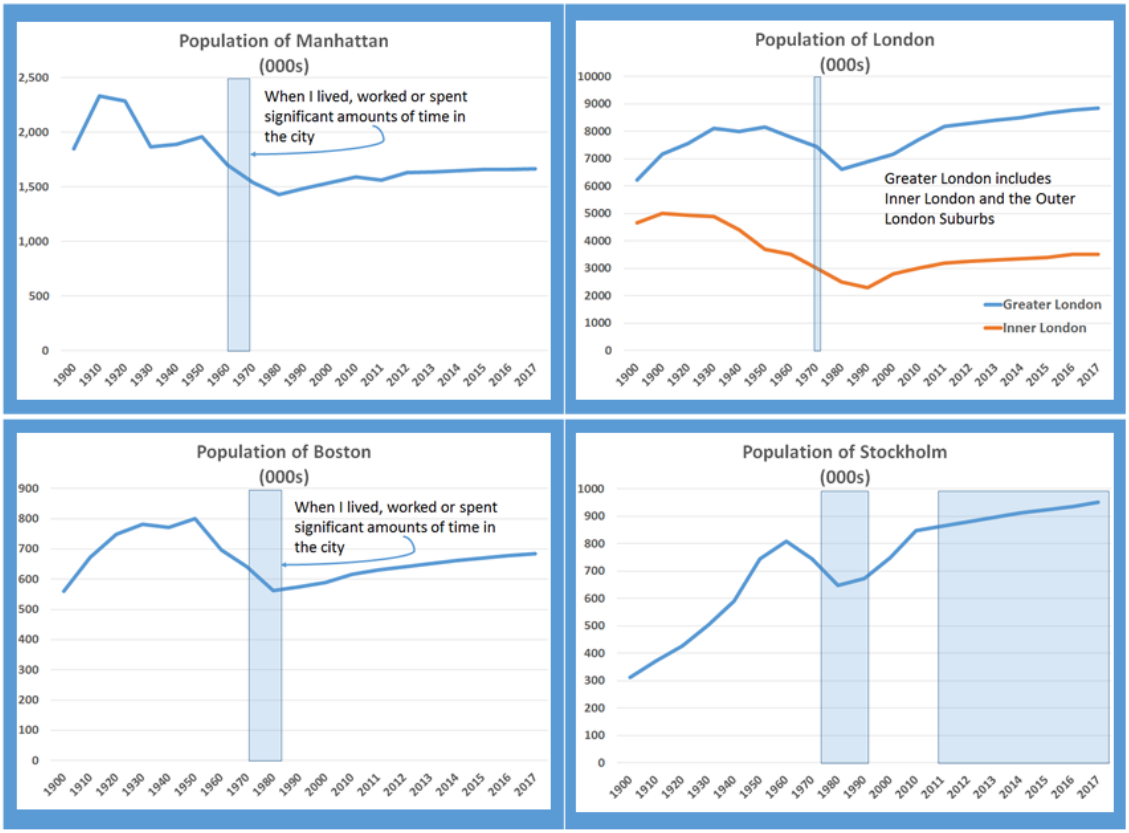
4. *Urban Cores* are the commercial, cultural and often the historical, political and geographic heart of a city, especially those in the Western world. The term 'city centre' is primarily used in British English, while in the U.S., the term 'downtown' is used. The U.S. Census delineates three geographical classifications: urban areas of 50,000 people or more; urban clusters of at least 2,500 people and less than 50,000; and, rural, which is everything not included in the other two classifications. *Urban cores* are the densely settled portions of Urban Areas.

5. William H. Frey, Brookings Institution provided in THE ECONOMIST, April 21st 2018.

Boston and eighteen years in a coastal farming community forty-five kilometers from Göteborg (the exurb period) gets us up to 2010. Since then, it's been three condos: one in a big city (Stockholm), one in small city (Strängnäs) and one in a tiny city (Vadstena).

In London, Cambridge/Boston and Stockholm, I walked or took public transit to work and to most places during the week. I had no car in London and was carless for the first three years in Cambridge. When I lived in these cities, it was a period when they were experiencing major negative growth (see charts below). It was easy and relatively cheap to find places to live. Office space was also available in the city centers at a fraction of the price that one pays today. I was managing an R&D office for a Swedish company between 1978 and 1982 and we rented space in the middle of the city for $2.50/square foot. Today, that space rents for 40 times that amount. In London, I rented for £60/month a newly renovated, two-room flat in Pimlico, 3 kilometers from County Hall where I worked. Today, that apartment costs ten times that amount—per week!!

Note that the populations of Manhattan and Boston are not as high as they were at their peaks, and that the population of Inner London is also well below its top. The growth in Stockholm is in the non-core regions. Various census and demographic sources; produced by Michael Sena.



Everyone I knew in the ten years after I finished my university studies lived in a city. Why would we live anywhere else? However, once I acquired a car, the problems started: finding a parking space, moving the car on street cleaning days, digging the car out when it snowed and losing the spot you cleaned if you had to use your car,

and the constant fight with the traffic police. Some of us toughed it out until marriage and then, for some, children, made it just too difficult and too expensive to stay. The 'burbs' beckoned. We cleared out.

Plus ça change, plus c'est la même chose

The more things change, the more they stay the same. I once believed that history started on the day I was born. When I was old enough to hear the stories from my father about when he lived in Brooklyn to attend art college, about summer weekends at Coney Island, part-time work in Woolworths in Harlem, hanging around the Broadway theater exits to get his portraits of the stars autographed, I understood that the 'Baby Boomer' time was just part of the continuum. He was in New York at its peak, while I was in 'my cities' when they were in their troughs.

"Despite the widespread perception that millennials are allergic to cars, gardens and chain stores, they are actually less urban than the previous generation. Analysis by FIVETHIRTYEIGHT, a data-journalism website, found that while the share of 25- to 34-year olds with bachelor's degrees living in hyper-urban neighbourhoods grew by 17% from 2000 to the period between 2009 and 2013, as a whole, millennials were less likely to live in urban areas than young people were in 2000."

THE ECONOMIST
(April 21st 2018)

All of these cities turned the corner. I feel fortunate to have witnessed their transformations and rejuvenations. In 1975, the urban core of Boston was dead after 5 p.m. By 1990, it was an active and vibrant place, but, by then, we (those of us who experienced the trough) had moved out or away. What is important to understand is that this rejuvenation was not at the expense of the near and far suburbs. The metropolitan areas of Boston, Stockholm, London and New York began to grow again. The urban cores of these cities are no longer stagnating or decaying, but neither are the communities outside of these cores. They did experience a period of slow growth, but they are no longer.

As the chart on the first page shows, looking at all urban areas in the U.S., their urban cores are once again losing population. The difference between what is happening now and what happened back in the 60s through the 80s is that the successful cities are becoming too expensive for both existing and potential new residents. If you live in Stockholm's inner area, need a car for your work, cannot afford an off-street parking space and the city doubles the on-street parking fees and reduces the spaces by 20% (which it did), you have a problem. If you are in a rental and the building is suddenly converted to condos that are totally out of your financial reach, as happened in Cambridge and Boston, you don't have much choice but to move out to where space is more affordable.

According to EUROSTAT[6], 23.7% of Greater London's population was in the so-called 'historical core' in 2012. It was 18.5% for Paris. Berlin, Rome and Madrid have inner cores that comprise more than

6. EUROSTAT is a Directorate-General of the European Commission located in Luxembourg. Its main responsibilities are to provide statistical information to the institutions of the European Union (EU) and to promote the harmonisation of statistical methods across its member states and candidates for accession as well as EFTA countries.

50% of the total. That means in London, for example, in three-quarters of the city you can live in a duplex, row house (terrace) or even single-family house, with your own garage, car port or designated parking spot and still be within a reasonably short distance from the bright lights and pleasure places.

With a little bit 'o luck, you can make your burb a core

I call it the 'Pygmalion Syndrome'. We want what we have to be more like the ideal that we can't have. We experienced it Åsa, our exurb of Gothenburg. The newbies who moved to Åsa to get more for their money than what they could afford in Gothenburg, asked why we didn't have a square with a latte shop and a commuter train station and rental apartments. In other words, "Why can't Åsa be more like Gothenburg?" It is now, but we don't live there anymore.

Once you have set your mind on the urban renaissance narrative, it is easier to ignore evidence that contradicts it than to change your way of thinking.[7] If you have decided that the future is shared electric and robotic vehicles for everyone, which may make some sense in denser areas, you don't necessarily want to hear that urban cores are becoming less dense because the people who can afford to live in them want more space. In the same way as people buy small houses in expensive suburbs just to knock them down and build a McMansion three times the size, people buy a few apartments and knock down the party walls or punch through the floors to create a McTownhouse. You don't want to hear that suburbs are not disappearing because owning and driving one's own car makes more sense in less dense areas where you have a garage or your own parking space.

Just the facts, ma'am. Just the facts.

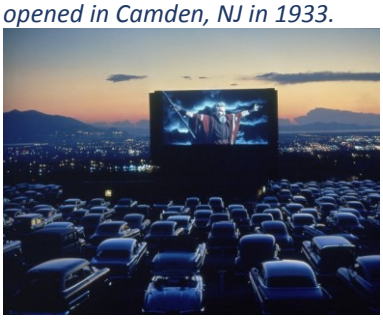
Whether you are in the car-selling business, the mobility-as-a-service-selling business, the transport infrastructure-selling business or in the business of providing solutions to all of the above, it would be wise to heed Joe Friday's words: deliver and listen to just the facts.[8] There has been enough hype about deaths and resurrections when it comes to transport methods and the places where we spend our time when we are not travelling to or from those places. Question the self-declared gurus; find out who is writing those blogs you are reading and what qualifications the authors have to be providing you with their opinions. Get the facts. And when it comes to the death of the suburbs, such news is greatly over exaggerated.

7. A book I read in one of my university psychology courses left an indelible mark on my thinking about why people hold on to ideas that have been proven to be false: When Prophecy Fails by Leon Festinger, Henry Riecken and Stanley Schachter (1956). It describes the experience of a UFO cult whose leader convinced them that the world would end on a certain date. When it didn't, the cult members simply rearranged the facts, holding even more strongly to their beliefs.

8. *Joe Friday*, played by Jack Webb, was a Los Angeles Police Department detective on ***Dragnet,*** a long-running radio and TV series that was one of your editor's favorites.

To Buy or Use: These Are the Today's Car Questions

The drive-in movie theater. What a great idea and terrific example of the flexibility of the motor car! The first drive-in movie was opened in Camden, NJ in 1933.



CARS ARE TOOLS. They happen to be very flexible tools, too. People have demonstrated exceptional skill at creating inventive uses for cars. Before discussing how we gain access to these incredible inventions, either by owning them (buying them with cash on the barrel or with a loan) or using them (renting, leasing, subscribing), I would like to present a few facts that will help frame the discussion.

In 2017, 92.84 million passenger cars and light commercial vehicles[9] were produced in the world. That is approximately one vehicle produced for every 82 inhabitants of the planet (there are currently 7.6 billion people inhabiting the Earth). The top eleven producing countries combine for 81% of the total. There were 51 producing countries in 2017, with Bangladesh in the bottom spot producing 580 vehicles and China in the top spot with 29 million. By contrast, in 2008, China produced 6.7 million vehicles.

In terms of vehicles per capita, China is in 74th place out of 193 countries with 154 cars per 1000 inhabitants, and Bangladesh is in 190th place with 3 cars per 1000. The last spot, 193, is held by Togo with 2. San Marino in Italy tops the list with 1.3 cars per person and the U.S. is in second place with 0.9 cars per person. Some people own multiple cars while others own none, so we cannot say that 0.3% of the population of Bangladesh own cars or 15% of the Chinese do, or that 90% of Americans are car owners. The actual rate of car ownership in the U.S. is 76.6%. This compares to 79% in 2006, but it has been rising since its major decline in 2009.[10] Some countries are large with a relatively small population, like Russia, Canada and Sweden; other countries are tiny with lots of inhabitants, like Bangladesh; and, still others are large with many inhabitants, like China. Some countries are heavily urbanized while others are mostly rural. Large parts of Canada, Russia and China have no roads.

Car manufacturers have adapted their vehicle lines and sales and marketing techniques to all of these situations plus many more (tax laws, lending regulations, insurance requirements, costs of fuel, traditions, etc.). An approach in one place will not work at all in another. The jobs that

9. According to the International Organization of Motor Vehicle Manufacturers (OICA), 73.46 passenger cars and 19.38 light commercial vehicles (SUVs, pick-up trucks and vans) were produced in 2017. For the rest of the article, I will refer to these two categories as *cars*.

10. Michael Sivak, University of Michigan Transportation Research Institute Report : Has Motorization in the U.S. Peaked? (Feb 2017).

cars need to perform, and the conditions in which they will perform them, are different all around the world.

It's your car; do what you want to do

Now to how we gain access to our cars. Owning is simple. You have the title to the car, whether you pay cash for it or take a personal loan, and you can drive it as much as you want to wherever you want with no strings attached. You can treat it like a prized possession, or you can do the minimum to keep it running. It's up to you. If you buy a $30,000 Toyota RAV4 for cash, rather than on credit with zero down and 5% interest over 48 months, you will save just over $3,000. The down side is the opportunity cost of spending $30,000 on a car. If I had taken a loan and invested that money in June 2010 in Tesla stock at the time of its IPO, I would be able to buy 10 RAV4s today—or one Maserati—after paying capital gains tax. (No, I am not a potential customer of Tesla, so it's not one of the options.) But then I would have had to pay around $700 per month rather than zero. If I had taken the same money and put it into Ford stock, I would get my $30,000 back but that's it, since the price of the stock is about the same today as it was eight years ago.

To lease, perchance to own

The current main alternative to owning is renting from a rental company like Hertz or Sixt--unless, of course, you are a lifetime car borrower. It's a good option when travelling and where pick-up and drop-off points are conveniently located at airports, train stations or hotels, but it's an expensive route to having a set of wheels if you use it often or over a prolonged period of time. Also, you don't really have a good choice of the vehicle you receive. For the rental operator, the vehicle is an asset that is used to earn money by renting the same vehicle multiple times. The rental company maintains, services and insures its vehicles, and when the asset has served its purpose, it is sold, usually through auction.

To rent means 'to grant the possession and enjoyment of (personal property) in exchange for rent', and rent is 'the amount paid by a hirer of personal property to the owner for the use thereof'.
Merriam-Webster Dictionary

So-called 'car sharing', such as Volvo's *Sunfleet*, Daimler's and BMW's merged *Car2Go* and *DriveNow*, are what could be called the IKEA form of car rental: do-it-yourself. You use a mobile app to locate and unlock the car that is in your vicinity and hope that the previous renter left you enough fuel to get to where you need to go and back. The advantage of these schemes is that you can decide if you want to travel around in a Mercedes or BMW brand.

car2go 4-door Mercedes-Benz B-Class and a 2-door Smart fortwo

Leasing is a form of rental. The main difference is the type of contract that is used. Renting contracts are usually short-term and renewable by mutual agreement of the parties. Leasing is a long-term

agreement. Vehicle leases are usually for two-to-four years with fixed terms. A vehicle lease may be cancelled, but the lessee must pay a cancellation fee. Leasing companies own the vehicle and purchase the vehicle at the request of the customer, who chooses the particular vehicle with preferred options. Leasing is a form of vehicle financing. At the end of the lease term, the lessee has the option of either returning the vehicle or purchasing it for its residual value. This value is calculated at the start of the lease and takes into account loan interest, depreciation and the final asset remarketing value. I have thus far leased four cars and purchased two of them at the ends of their leases. I drove each of those cars for fourteen years before trading one in and giving the other to our niece.

Suddenly, subscribing is all the rage

Membership has its privileges.
American Express

Selling a subscription instead of a product has become fashionable of late. AMAZON PRIME is one example. A customer pays $99 for a year of deliveries and also receives discounts on the goods that are bought. NETFLIX, DROPBOX and SPOTIFY are others that have a subscription-based business model. The idea is to lock in customers and impress investors with your recurring revenue stream. Sounds great, so it's natural that it would be picked up by the car companies that want to bump up their own valuations. CADILLAC (*Book by Cadillac*), FORD (*Canvas*) PORSCHE (*Porsche Passport*) and VOLVO (*Care by Volvo*) are a sample of OEMs offering a subscription option.

One definition of 'subscription' is an arrangement for providing, receiving, or making use of something of a continuing or periodic nature on a prepayment plan, such as a certain number of periodicals, new issues of a security or a series of performances (e.g., an opera). In Great Britain, it is another term for 'membership dues'.
Merriam-Webster Dictionary

The idea is to offer the use of a car (either new or used) for an all-inclusive monthly fee for a specific period of time, anywhere from six months to three years. The fee usually includes insurance, roadside assistance and maintenance as a basic set of services and then various options can be added on. One option that is offered is the possibility of using another car model than the main one chosen. Cadillac allows members to exchange cars up to eighteen times per year! What are the main advantages of the subscription option? Probably the principal advantage is that you can sit at home, choose a car, sign a contract and have a car delivered to your doorstep without having to make a down payment. It's almost as painless as ordering a pizza online. The fees are all pre-set, so there is no haggling (limiting the angst that some people apparently have with visiting a dealer). If something goes wrong with the car, you don't have to dig into your piggy bank to fix it.

Let's be clear. Offering a car on a subscription basis is another form of renting. Volvo actually calls it a 'lease' in its contract terms. The reason it has become popular is that technology has made the process of renting easier than owning an asset. Nevertheless, it's not

for everyone. If you are good at making deals and enjoy haggling on price, don't like the idea of moving your stuff from one car to another on a regular basis, don't relish the idea of being tracked by the company offering the subscription,[11] and like the idea of driving a new car that you own, then the subscription option is probably not for you.

But is it good for business?

Companies wax lyrical about the all the data that can be collected from subscribers who agree to their terms. Much closer relationships can be forged directly with customers, rather than having the filters of national sales companies and dealers. It is not, however, simply a walk in the park. It's a new business for the car companies. They are not used to paying for their customers' insurance policies, for example. With *Care by Volvo* in the U.S., according to their information site, every subscriber "receives a Liberty Mutual insurance policy, and the coverage is the same no matter where you live". I am highly doubtful that LM is going to provide the same rates for every driver. That means Volvo is going to pay the difference. The basic subscription fee is $600/month. Car insurance in Detroit is around $500/month and for all of Michigan, the country's most expensive car insurance state, it's an average of $200/month.

Paying people to deliver vehicles to customers and offering multiple models during the course of a subscription period are other expensive services that have no pay-back, except to engender loyalty. Unfortunately, having 'delight points' where you interact with customers means that expectations need to be met or exceeded, and woe to thee who do not fulfil the pledge. Dealing with churn is something that NETFLIX and SPOTIFY have learned how to handle and the mobile network operators fight tooth and nail to avoid.[12] Car companies will have to learn how to become adept at finding ways to keep current customers satisfied so that they continue subscribing and say nice things about their experience so that others are encouraged to subscribe as well.

Car companies are not the only ones offering subscriptions services. There are a bunch of companies entering the fray.[13] It's going to get crowded out there. In the end, if car OEMs are going to transition from designing, building/assembling, selling and maintaining cars to being a direct consumer services provider, and do that primarily by renting their cars, they are going to have to invent an entirely new way of doing business and making money at it. It will not be by taking on addition costs, like insurance. These will be interesting times.

11. *Book by Cadillac*, with OnStar, collects information on location, speed, airbag deployments, crash avoidance alerts, braking and swerving. The others collect similar data. Agreeing to this is part of the subscription contract. The OEMs do it to ensure that you don't disappear with their car or violate the agreement in other ways.

Anyone considering a subscription would do well to read the fine print. For example, as with a lease, the mileage you are allowed to drive is fixed. Volvo in the U.S. charges $.25/mile for every extra mile you drive over the 15,000 limit.

12. On the 16th of July, Netflx saw its share price drop 14% when it reported that its subscriber growth for the three months ending in June was 5.2 million, the same number as for the same period last year. Investors are worried that competition will erode its growth potential.

13. *Fair* and *Borrow* in Los Angeles, *Flexdrive* in Austin, Texas, *Less* in San Francisco are just a few examples.

EC Proposal for New Type Approval Regulation

THE EUROPEAN COMMISSION decided it was time to update the motor vehicle type approval procedures to meet the growing challenges of new in-vehicle and transport infrastructure systems. On the 17th of May, the Commission issued its proposal for a new Regulation.[14] The document opens with the following statement:

"Technological change is touching all parts of society and the economy and transforming the lives of EU citizens. Transport is no exception to this trend. New technologies are radically changing the mobility landscape. Against this background, the EU and its industries must meet the challenge to become a world leader in innovation, digitisation, and decarbonisation. The Commission has therefore adopted a comprehensive approach to ensure that the EU's mobility policies reflect these political priorities in the form of three EUROPE ON THE MOVE *mobility packages."*

The Commission was given power to regulate type approval[15] in the EU with **Directive 2007/46EC**, which substituted individual country type approval with a procedure that applied to all EU Member States. This established "a framework for the approval of motor vehicles and their trailer, and of systems, components and separate technical units intended for such vehicles" before being placed on the roads of EU countries. Tests of a vehicle in one country—as long as they were conducted according to the Directive—allowed the vehicle to be sold and driven anywhere within the EU.

The Commission has mastered the art of embedding wording into Directives and Regulations that authorize it to extend its remit when it feels it is necessary to do so without having to ask for further permissions. It does this through 'Delegated acts', which the Commission prepares after consulting so-called 'expert groups' of its own selection.[16] Directive 2007/46EC refers to three Regulations[17] that require the Commission to "monitor technical developments in enhanced safety technologies and consider possible extensions of the scope of the currently applicable vehicle safety feature." It has done this and is now proposing what it has determined needs to be done, and this is what is contained in the proposal for a new Regulation.

14. *Proposal for REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/… and repealing Regulations (EC) No 78/2009, (EC) No79/2009 and (EC) No 661/2009*

Brussels, 17.5.2018

15. Type approval describes the process applied by national authorities to certify that a model of a vehicle meets all EU safety, environmental and conformity of production requirements before authorising it to be placed on the EU market.

16. Although the Commission has considerable in-house expertise, it needs specialist advice from outside experts as a basis for sound policymaking. This may be provided by groups of experts or external consultants, or take the form of studies.

17. General Vehicle Saftey Regulation (GSR), Pedestrian Safety Regulation (PSR) and the Hydrogen Safety Regulation (HSR).

There is an important difference between a 'Directive' and a 'Regulation' in EU terms, as described in the sidebar to the right. A Directive must be written into the laws of each of the EU's Member States, while a Regulation is an edict, proclaimed by the EU Parliament that applies directly to the Member States without having to be adopted into the local laws. The EC wants more power to direct the course of vehicle and transport development, and that is why it is proposing a Regulation, rather than a Directive. In its justification for proposing a Regulation, it states that since the proposed changes will in essence replace the GSR, PSR and HSR, it, too, should be a Regulation.

The Commission is the Decider

In Chapter II of the Proposal, *Obligations of Manufacturers*, there are seven Articles that define the technical requirements which the Commission has determined must be met by vehicles to minimize risk of injury to vehicle occupants and vulnerable road users and improve environmental performance. There are specific provisions related to the following:

- Tyre pressure monitoring systems and tyres
- Advanced vehicle systems (intelligent speed assistance, alcohol interlock installation, driver drowsiness and attention monitoring, advanced distract recognition, emergency stop signal, reversing direction)
- Advanced emergency braking systems (two phase implementation: detect moving vehicles and stationary obstacles; detect vulnerable road users); lane-keeping systems; event data recorder installation
- Frontal protection systems
- Specific systems for buses and trucks
- Requirement relating to hydrogen-powered vehicles
- Automated vehicles (There is a list of requirement categories with which the systems must comply. Systems include those that replace the driver's control of the vehicle, including steering, accelerating and braking; those that provide the vehicle with real-time information on the state of the vehicle and the surrounding area; those that monitor driver readiness; event data recorders for automated vehicles; and those that provide for a "harmonized exchange of data for instance for multi-brand vehicle platooning.") You didn't think you were going to get through an EC document on vehicles without reference to "harmonized data exchange", did you?

The actual requirements will be specified as Delegated Acts. These will be provided by the Commission once the Regulation is enacted.

The European Union

European Parliament

It is the EU's law-making body. Directly elected every five years by the citizens of the Member States with legislative, supervisory and budgetary responsibilities.

European Commission

The EU's politically independent executive are. It alone is responsible for drawing up proposals for new European legislation, and it implements the decisions of the European Parliament and the Council of the EU.

Council of the EU

In the Council, government ministers from each EU country meet to discuss, amend and adopt laws and coordinate policies. The ministers have the authority to commit their governments to the actions agreed on in the meetings.

Regulation - are addressed to all member states and are applied in full. They are directly applicable without the need for national legislation.

Directive - are addressed to all member states and require an objective to be achieved by a given date. National authorities must draw up legislation in order to conform with the directive within a certain time frame (the date of implementation is known as the date of transposition). In the UK, Directives are usually implemented by Statutory Instruments and occasionally by Acts.

Decision - are issued by the Council or Commission; these are not of general application. They may be addressed to particular member states, individuals or companies and they are binding on those to whom they are addressed.

Delegated Acts - The Commission adopts them on the basis of a delegation granted in the text of an EU law, in this case a legislative act.

Dispatch Central

The Last Great Market for Paid Chauffeurs Falls

THE IRONY IS OVERWHELMING. While Europe, the United States, China and Japan are doing their utmost to get all humans out from behind the steering wheels of their cars and into the passenger's seats, one country, Saudi Arabia, has just franchised 43% of its 33.5 million population with the right to drive cars themselves. It happened on the 24th of June. Before this day, it was illegal for females to obtain a license and drive a vehicle—except in certain regions of the country where extraordinary conditions prevail.

Estimates of the number of chauffeurs who drive women where they need to go range from 800,000 to 1.4 million. They are all men and are mostly from South Asian countries. The cost of housing and feeding them, along with paying them a salary, is around $1000 per month. What money the men have left over is sent back to their families. The Saudi women are happy; they will save money and will now have the pleasure of driving themselves. The chauffeurs and their families are not happy.

Now, women in Saudi Arabia will be able to experience the joys of non-paid chauffeuring, just as their female compatriots in other lands have done for many years.

⌘

It's Human Nature Not to be Bored

THERE IS PROBABLY nothing quite as boring as sitting behind the wheel of a car and not driving it. This is one lesson we can learn from the tragic accident in Tempe, Arizona when a Uber taxi in self-driving mode struck and killed a pedestrian.[18] It was dark. The pedestrian was not on a crosswalk and was walking alongside her bicycle when she was struck. The person behind the wheel was functioning as a 'safety operator', in Uber's terms. According to statements by Uber, these operators are told to "pay attention at all times so that they can take over in difficult situations or when the vehicle encounters a situation it does not know how to handle." It turns out that the U.S. National Transportation Safety Board (NTSB), after carefully reviewing all the evidence, has determined that the 'safety operator' was watching a TV series on a mobile phone held in their lap, and not, as claimed, monitoring the performance of the self-driving software.

I feel sorry for the safety operator, who seems to have believed that the Uber self-driving software actually worked. It must be mind-numbing to sit in the driver's seat and not have anything to do. The mind must wander and suggest activities that may appear harmless,

18. I say the taxi killed the pedestrian because the vehicle was ostensibly under the control of Uber's software, and the person behind the wheel was not supposed to be driving the vehicle, just staying alert to the possibility that he or she might have to take over the controls in case the self-driving vehicle could not cope.

like watching a favorite TV program on a mobile phone. Driving a vehicle is a full-time job that does not lend itself to multi-tasking. Anyone who has tried to drive while texting, tried to mediate between quarreling children in the back seat or tried to designate a destination on the navigation system while the car is moving knows that this is beyond question. This is why I have repeatedly said that the testing of humanless-driven cars should not be done on public roads. I repeat my plea.

⌘

Stockholm Parking Agency Didn't Get the GDPR Memo

IN LATE MAY, the city of Stockholm removed all of its parking payment machines and replaced them with new ones. With the old machines, you paid for parking with money or a credit card, selected the amount of time you wished to park during a 24-hour period, received a ticket which you then placed on the instrument panel in front of the steering wheel. That all took about thirty seconds. Traffic officers patrolled the streets and checked whether your car was parked legally and whether you had a valid parking ticket.

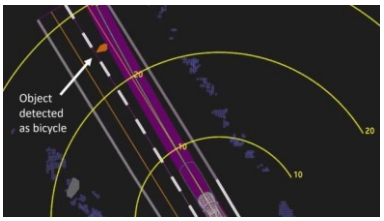
With the new system, you slide in your credit card and the display requests that you type in your car registration number (license plate number). You then select the amount of time you wish to park and the fee is debited from your card. The system requests that you type in your mobile phone number or your e-mail address to receive a receipt of payment. This process takes at least a minute-and-a-half. Traffic officers scan every vehicle on every street in their territory, and tickets are issued to whoever is parked illegally and overtime.

With the old system, if you paid with cash and you parked legally, the City of Stockholm knew nothing about your comings and goings. With the new system, it knows exactly who has been parked and for how long, and who owns the vehicles or who is driving them. Since it has scanned the license plate of every vehicle entering its so-called 'congestion charging zone', it can compare the two lists to see when the vehicle entered and how long it remained in the city.[19]

I do not recall receiving any notice that this system had been approved and would be implemented. I intend to take the matter up directly with the City of Stockholm and will apprise you of my progress. Stay tuned.

⌘

In a town called Motala, which was the home of LUXOR, Sweden's largest radio and television manufacturer that was acquired by Nokia in 1985, and once home to AUTOLIV ELECTRONICS, there is a café called 'Ubbes Café'. It is a nostalgic trip into America's automobile past, with license plates from California, advertisements for motor oil and this poster for the 1955 Chevrolet, a two-door Bel Air Sport Coupe for a suggested retail price of $2,067. A car that inspires at a price that would be $18,500 today. A bargain.



The US NTSB mapped the incident - yellow rings show metres ahead of the vehicle, orange lines centre of mapped travel and purple area the car's path. The NTSB report found that "Uber car had about six seconds to react after spotting an object crossing the road in the dark ahead of it. The car "failed" to identify the object as a pedestrian, and took no action to avoid hitting the pedestrian nor did it perform an emergency stop."

19. The congestion tax was implemented on a permanent basis on August 1, 2007. The vehicles passing the control points are identified through automatic number plate recognition. The equipment, consisting of cameras, laser detectors, antennas, and information signs are mounted on a set of gantries at each control point.

Musings of a Dispatcher: Train Stations of Dreams

The DELAWARE, LACKAWANNA AND WESTERN RAILROAD connected Buffalo, NY to Hoboken, NJ. The company built magnificent stations and grandiose feats of engineering, like the Nicholson Bridge north of Scranton.

The Nicholson Bridge, officially the Tunkhannock Creek Viaduct, is still in use for the Norfolk Southern Railway. It was designed and built by DL&W staff and completed in 1915. It is among the world's largest concrete bridges ever built.

TRAIN STATIONS HAVE always been places of magic for me. You enter through majestic doors into a splendid hall with the heavens reproduced on the ceilings and the nation's history portrayed in paintings and mosaics on the walls. You exit the waiting hall to a platform and then ascend stairs into a passenger car that transforms your present world into a totally different one when you alight. As your worlds change, you are entertained by the constantly moving scenery displayed in the window beside your seat.

Most of the world's citizens can still experience the magic, the enchantment, of train stations and the joy of being in and passing through them. The description above is fitting for the two stations I use most, Stockholm and Göteborg. For those living in the United States, that particular pleasure ended in the late 1960s and early 1970s when many of the nation's major passenger railroad companies declared bankruptcy shuttering the glorious edifices that symbolized their power for almost a century. In the summer of 1967, I boarded one of the last trains to leave the Scranton station platform shown to the left. The station was finally closed in January 1970.

New roads and highways, particularly the Interstate Highway System, are blamed for the decline of the nation's passenger railroads. They were part of the reason. They gave intercity buses, like Greyhound, a competitive advantage since the bus companies were not responsible for infrastructure maintenance. But many other factors were working against rail travel. The Erie Lackawanna, created by the merger of the Erie and the DL&W railroads in 1960, claimed in its bankruptcy filing that real estate taxes in New Jersey were the principal reason for its inability to make a profit and pay its bills. Cities along the main lines were decaying, losing both population and businesses to the suburbs. As a result, the local bus and trolley lines that brought riders to the stations were failing as well. And then there was the rise in air travel. A flight from Scranton's airport, located on a mountain top ten miles from the city, to New York's La Guardia took less than an hour, versus the three hours by train. It was a downward spiral that had no end.

Congress asks: Are stations worth preserving?

It seems that the last straw for the U.S. Congress was the 1970 bankruptcy of the Penn Central Railroad, which was

formed in 1968 by the merger of the Pennsylvania RR and the New York Central RR. The bankruptcy of the nation's sixth largest corporation was the largest in the nation's history. Congress began to take steps that would eventually lead to the formation of the Consolidated Rail Corp. (CONRAIL) for freight and AMTRAK for passenger service along the Boston-Washington corridor. While this was happening, the National Endowment for the Arts, an independent agency of the federal government established in 1965 to support projects 'exhibiting artistic excellence', asked the architecture community to evaluate the potential re-use of the now mostly abandoned railroad stations. One of the premier preservation architects at the time was Hugh Hardy who was given the task of preparing a report. Through some miracle of fate, he found me, finishing up my last graduate school year at his alma mater, Princeton, and he enlisted me to help with the report by producing a survey of all stations in the State of New Jersey, where Princeton is located.

"Why are so many railroad stations being abandoned? The answer, of course, is that the decline of passenger traffic by rail has been precipitous. In 1929, over 780 million persons were carried. Forty years later, the number had shriveled to 296 million."
From the Educational Facilities Labratories Report: ***Reusing Railroad Stations****, written by Hugh Hardy Associates with a section on New Jersey from Michael Sena.*

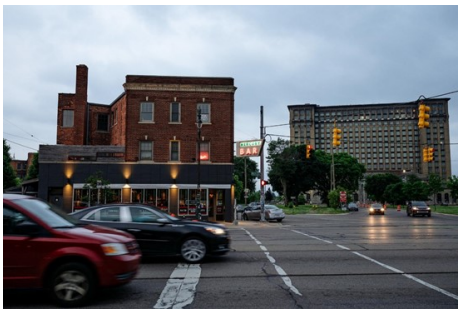
Two years later, after the main report was completed, I accompanied Hugh Hardy to a Congressional hearing where we reported our findings. There is a wealth of structures in the urban cores of all of the country's major cities, we said, that could serve as the foundations of revitalization and redevelopment. An event was held in Indianapolis at the city's abandoned Union Station, an architectural marvel. It was saved from demolition, but by the late 1970s, vagrants and vandals were doing what the demolition ball had been prevented from doing. Local business leaders took the initiative to find uses for the building, and for the next thirty years they tried to give it a new soul. Today, it's a hotel and conference center with a charter school and some offices thrown in for good measure. This same story can be retold in cities from the country's east coast to west. On several occasions, I stayed in the Radisson Hotel which is what has become of the DL&W station in Scranton.

Union Station in Indianapolis, Indiana, preserved through reuse.

To this day, I cannot look at a train station without thinking of that report, and I continue to be disenchanted by the way once noble railroad stations, like the one in Princeton, NJ, are treated. The University decided it needed a new arts center to be built right where the train station was located. This station serves the University, the Town and all of the surrounding community, connecting to the main New York to Washington corridor at Princeton Junction. Of course, the University won the battle against a group of rabble rousers (including Dr. Alain L. Kornhauser). The result: the station was moved 460 feet further away from the town. To add insult to injury, it was turned into the Dinky Bar & Kitchen and replaced with the hall of contemplation shown on the right.

Believe it or not, this is a train station, not a church

Ford takes the train back to Detroit



It wasn't just the automotive press that was abuzz with the news that Ford was acquiring the abandoned and neglected Michigan Central Station. A feature article in the NEW YORK TIMES on the 17th of June had the following title: *Ford Aims to Revive a Detroit Train Station, and Itself*. "To me this is about inventing the future," the TIMES article quoted Bill Ford as saying. He sees the station, which will take up to four years to renovate, as being a "lure for young professionals who now gravitate toward high-tech hubs like Silicon Valley." The station will be the 'centerpiece' of a new urban campus that will focus on developing businesses that use self-driving cars, and the ground floor is seen as a public space filled with stores, restaurants and coffee shops. "We really want this to be a hub of life for this part of town," said Ford to the TIMES.

Ford (the family and the company) sees the station as the first stage of a rocket that will lift the company and its stock price beyond the clouds and into the heavens where the gods of Silicon Valley now dwell. It's the wrong vision for a railroad station. These edifices were built as temples of humanism, symbols of humanity's achievements. It was no coincidence that they resembled cathedrals. Words such as 'campus' and 'office park' have no place in the architectural vocabulary of these grand structures. The great halls were meant to serve as places of spiritual transition for the very secular activity of transport. Turning them into bazaars where worldly goods are hawked is, in my opinion, a sacrilege, but if that's what it takes to keep the wrecker ball away from them until they can be returned to their original use, then so be it. Ford has a chance.

Dearborn, where Ford has its headquarters, is less than ten miles away from the station, a straight shot along Michigan Avenue, but an even straighter shot along a train track that stretches the entire distance. Use it to move your people back and forth and to places along its entire length, Bill. Imagine how you could actually integrate the original purpose of the station into your plans for future travel as well as your attempts to move your company from a global manufacturer of vehicles, the company that your great-grandfather created a century ago, to a company that will deliver transport solutions for the next century and beyond.

It was Daniel H. Burnham, the American architect who designed Union Station in Washington, DC and Penn Station in Pittsburg, who said: "Make no little plans; they have no magic to stir men's blood."

Michigan Central Station in the Corktown neighborhood of Detroit. Where's the city? The station sits in a park, four kilometers from Renaissance Center.

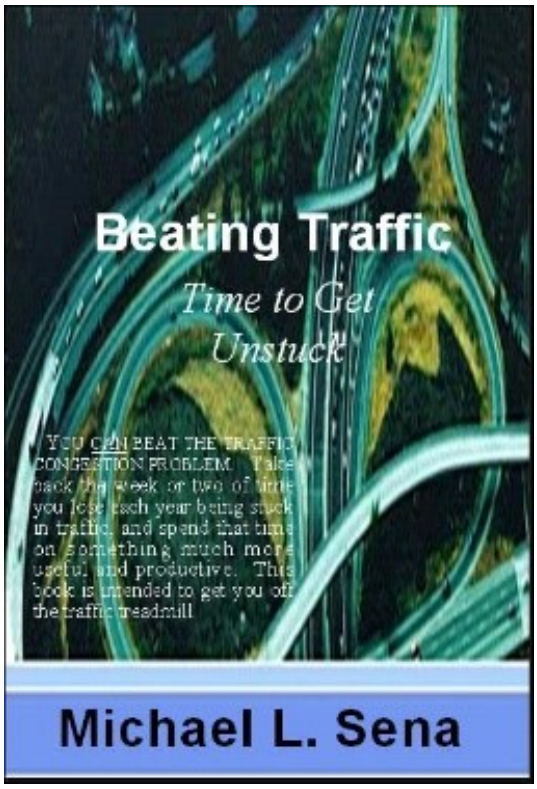
Michigan Central Station is a historic former main intercity passenger train station in Detroit, Michigan. It was built for the Michigan Central Railroad, replacing the original station after a major fire on December 26, 1913. Formally dedicated on January 4, 1914, the station remained open for business until Amtrak service ceased on January 6, 1988. It consists of a train station and an 18-story office tower with a roof height of 230 feet (70 m) It was the tallest rail station in the world at the time of its construction.

William Clay Ford Jr., sitting in a white leather chair placed in the ruins of the Detroit Station's waiting room, hands clasped as if in prayer, looking up, as if for inspiration from above, seeking enchantment for his company's new direction. I, for one, hope you find it, Bill.

About Michael L. Sena

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

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



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