Volume - Issue
10-06
May 2023

Telematics Industry
Insights by
Michael L. Sena

THE DISPATCHER

IN THIS ISSUE

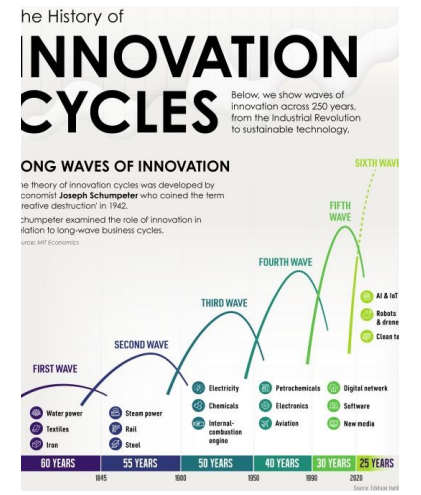
THE MAY 2023 ISSUE IN BRIEF

I did some spring cleaning of my bookshelves. They were stuffed to the gills, and it was either buy more shelves or donate some of my older volumes to the recycling center. Since I had no more wall space for shelves, I was reluctantly forced to choose the latter. It was the urban planning section where I focused my attention. Many are tomes, tall and thick. Most of them have been with me through all of my moves, some from my university course work and others bought during the time I was in the practice. I pulled out about a foot-and-a-half's worth that looked like good candidates for the bin. Before I chucked them, I sat down and leafed through each of them making sure I hadn't left a treasure between their pages, or to be certain that it really was a book I was ready to part with. No, I didn't put them all back. I kept four of them, giving me about a foot of shelf space, and two of them are now in the process of being re-read. One, *The Accidental Century*, was authored by Michael Harrington and first published in 1965. Harrington was the original Democratic Socialist, a term that has been unfortunately appropriated by people who probably don't even know it was Michael Harrington who was the founder of the *Democratic Socialists of America*. The book is a jewel. The second book, The Living End, was written by Roger Starr, a Democratic Realist, a life-long New Yorker, and an avid fly-fisher. I have devoted a few pages of *Dispatch Central* to quotes from these two books. I've been re-reading parts of another book that has been on my shelves for some time, since 1997. It is Clayton Christensen's The Innovator's Dilemma. I found my way back to it as a reference for a book that I am co-authoring with Professor Alain L. Kornhauser titled Mobility for the Non-mobile. Christensen devoted a whole chapter to why the car companies were getting it all wrong with electric cars—in 1997! There are great lessons for why everyone is getting it all wrong with driverless cars. The moral of this story: Don't be so quick to throw out old books; you never know when you are going to find them, read them, and appreciate what you didn't get the first time around.

THE DISPATCHER

Telematics Industry Insights by Michael L. Sena
May 2023 – Volume 10, Issue 6

The Missing Link in Mobility for the Non-Mobile



Source: Edelson Institute and Visual Capitalist

"We need a great leap if we are going to be able to provide mobility for a large portion of the population who need it but who cannot obtain it when they need it for a price they can afford."

Driverless cars are for people who need rides

"…(I)n capitalist reality as distinguished from its textbook picture, it is not (textbook) competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance) – competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives."

Joseph A. Schumpeter on the Disruptive Technology Threshold[1]

PROVIDING MOBILITY FOR the non-mobile requires innovation, but not just technical innovation, not just invention. Improvements in technology must be accompanied by improvements in finance and organization if a new technology is going to be bought and used, and if it is going to result in profitability for the organization that is selling it. What Joseph Schumpeter identified as the compelling reason why capitalist economies are very good at delivering innovation is that they foster the development of entrepreneurs who drive "*gales of creative destruction*".[2] Schumpeter characterizes innovation as "*industrial mutation which incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one*". *The process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in.*"[3]

What we have had for the almost twenty years that work has progressed on driverless vehicles is technical innovation, with incremental improvements in

[1] Schumpeter, Joseph A. Capitalism, Socialism and Democracy. Harper & Brothers (1942).

[2] This is a term that Schumpeter borrowed from Werner Sombart who wrote *Der moderne Kapitalismus* (Modern Capitalism), published in three volumes 1902-1927.

[3] Schumpeter, Joseph A. History of Economic Analysis. Routledge Publishers (In process at time of his death, 1950; first published in 1955).

sensors and algorithms building on each other, allowing increasing amounts of self-driving by the vehicle. But what we have not had is the disruption of entrepreneurial innovation, the one that turns an invention into a product or service that is valued and desired by consumers, that solves a problem that needs solving, not just does something that is already being done but with a slight twist. People who can afford to take taxis or who own their own cars don't need to have cars that drive themselves. They may think it's neat or cool, but their lives and livings don't depend on it. What has been missing in the CRUISES, AURORAS, WAYMOs and the others working on driverless vehicle solutions is the spark for a real innovation that will truly disrupt the provision of mobility.[4]

Schumpeter said that capitalist economies evolve, but do so discontinuously. Nature may not take leaps, as Darwin noted (*natura non facit saltum*), but economic evolution is not Darwinian.[5] **We need a great leap if we are going to be able to provide mobility for a large portion of the population who need it but who cannot obtain it when they need it for a price they can afford.** And there are no signs that a government is going to mandate affordable travel for all. There is no threat like climate change which has motivated huge sums of public money to be spent on incentives to buyers to purchase electric vehicles, and encouraged legislation that would ban the sale of anything but climate-neutral vehicles. The public sector isn't rich enough, and there is no public need that would justify a Keynesian intervention, as has been the case with automotive electrification.[6] If anything is going to happen with convenient and affordable mobility for all of those people who cannot own or drive a car, the marketplace needs to do it.

According to MCKINSEY, since 2010, investors have poured nearly $330 billion into more than 2,000 mobility companies,

[4] ARGO would have been on the list, but its principal owners, Ford and VW, decided to shut it down in October, 2022.

[5] This insight is courtesy of Thomas C Leonard, Research Scholar, Humanities Council. Lecturer, Dept. of Economics, Princeton University.

[6] Keynesian economics is a macroeconomic theory of total spending in the economy and its effects on output, employment, and inflation. It was developed by British economist John Maynard Keynes during the 1930s in an attempt to understand the Great Depression. The central belief of Keynesian economics is that government intervention can stabilize the economy.

and about two-thirds of that total, or $206 billion, went to automated driving system (ADS) technologies and smart mobility.[7] In effect, it has all gone into testing in order to get ADS technology to work safely somewhere. To-date, zero revenue has been booked for driverless passenger vehicles, and zero societal value has been captured. (It's a different story for *Driverless Work Vehicles*, which I wrote about in the February 2023 issue of *THE DISPATCHER*.) I believe the reason for this is that developers have not focused on leveraging the ADS technology's disruptive attributes. Instead, they have focused their attention on potential customers who already have excellent mobility options, such as those who currently use limousine services and taxis, those who drive their own cars, and those who are chauffeured by parents or others.

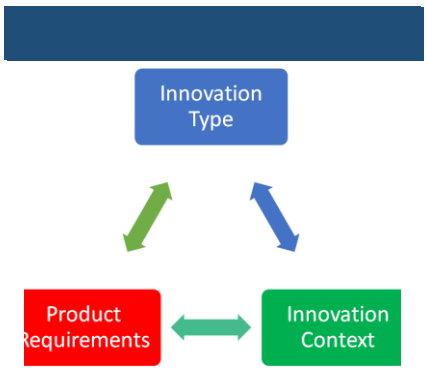
Creative Destruction or Disruptive Innovation

Today, the term "disruptive innovation" is generally associated with Clayton M. Christensen, who gained fame with his 1997 book The Innovator's Dilemma.[8] Christensen was born in 1953, three years after Schumpeter died, and wrote his seminal work forty-seven years later. They were both teaching at HARVARD UNIVERSITY at the times of their death, Schumpeter in the *ECONOMICS DEPARTMENT* and Christensen at the *HARVARD BUSINESS SCHOOL*. There is no reference to Schumpeter in Christensen's Innovator's Dilemma book (I have a first edition copy and I checked it thoroughly), which I find odd since there clearly is a thread that connects the two men's ideas. "Disruptive innovation" is a subset of Schumpeter's "creative destruction". Schumpeter did not distinguish between "sustaining disruption" and "radical disruption". They are both substitutions for an existing product, but the former is an improved version of the original (e.g., my *iPhone 7* is an improvement over my *iPhone 6*), while the latter is a new technology that undercuts an existing product on price (e.g., the *Toyota Corona* when it first entered the U.S. market in 1964), or creates a new market segment and steals customers from the incumbent (like

[7] MCKINSEY & COMPANY. Holland-Letz, D, Kässer, M.., Kloss, B., Müller, T. *Mobility's future: An investment reality check*. Article. (April 14, 2021).

[8] Christensen, Clayton M. The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail; Harvard Business Review Press (1997).

the *iPhone* did in the mobile phone market and battery electric cars are doing in the automobile market).



Christensen provided examples of both sustaining and radical destruction in his book. The real value of Christensen's book is that it clearly identifies the reasons for why companies, especially big companies, have trouble with radical innovation, and he offers a case study example of how such innovations are best introduced into a market. His case study example just happens to be the battery electric car—remember, this is 1997 when he is writing. He begins the case study by saying that the journey needs to start with: 1) a clear understanding of the type of innovation being developed, sustaining or radical, and the potential buyers of the innovation; 2) the requirements that the first release of the product would have to satisfy and its price point; and 3) the context for developing the innovation into a product fit for introduction into the market, incumbent company or start-up.

More than just another car

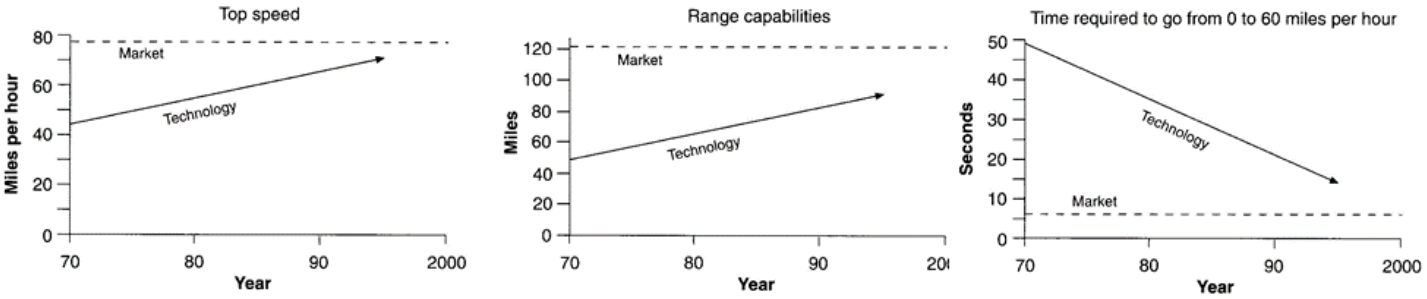
For whom are the strengths of fully driverless cars likely to be disruptive? In Christensen's BEV example, which he penned at a time when all the car companies were reacting to the State of California's 1990 *Zero Emission Vehicle Program* (*ZEV*),[9] he provided a hypothetical case study of how a vehicle manufacturer might manage a program to develop and commercialize an electric vehicle. He said that his aim wasn't to try to offer a "*right answer to this challenge, nor predict whether or how electric vehicles may become commercially successful, but rather to suggest how managers might structure their thinking about the problem*". This was written before TESLA was founded, at a time when the car companies were on the one hand struggling with the prospect of building a car, a battery electric vehicle, they knew they could not sell to mainstream car buyers, and on the other hand fighting the California law in the courts. When I reread this chapter, it struck me that we are exactly at the same point today with

[9] California's ZEV Program was designed to achieve the state's emission reduction goals by requiring manufacturers to offer for sale specific numbers of "the cleanest car technologies available. At the time of adoption, it required that 2% of the vehicles sold in the state in 1998 had to be ZEVs, increasing to 5% in 2001 and 10% in 2003.

driverless vehicles. What kind of innovation is needed, what are the real requirements, and what is the context? We can actually see how Christensen's playbook for electric vehicles played out and what lessons we can learn for how to best approach the introduction of driverless vehicles.

We haven't been asking the right questions

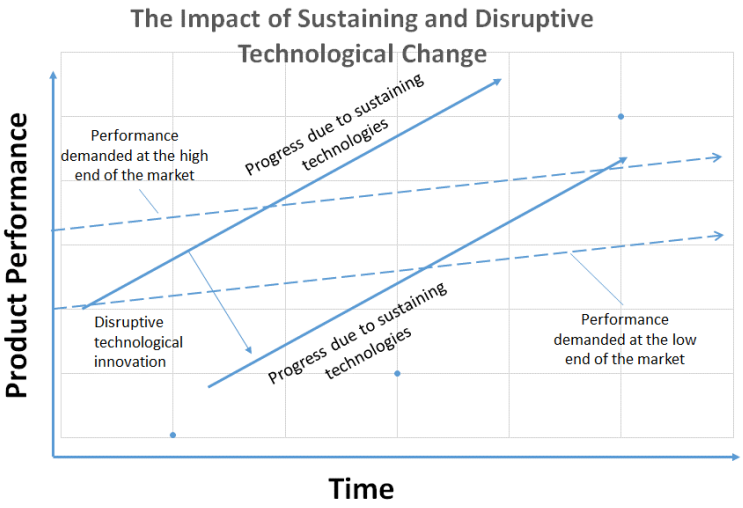
How much should the incumbent car companies need to worry about driverless cars? Do they pose a disruptive threat to their business, or do they constitute an opportunity for profitable growth? To answer these questions for electric cars in his example, Christensen produced three diagrams to graph the performance improvements demanded in the market versus the performance improvements supplied by electric technology at the time he was writing and into the near future. His aim was to show whether electric cars were actually sustainably or radically disruptive. He chose three of the most basic performance requirements: top speed; refueling range; and acceleration. Acceleration is important because it determines whether the vehicle can merge onto a highway or pass a slow-moving vehicle. It was clear from the diagrams that in 1997 electric vehicles were not ready for the mainstream market. They were subpar on all the main market requirements. Nevertheless, what the diagrams also showed was that the trajectories of improvement were radically disruptive and that eventually, with the right conditions, electric vehicles could meet customer expectations.



Christensen's The Innovator's Dilemma. page xvi

The biggest technical obstacle was the size and cost of the batteries. This is what he was told by the automobile manufacturers he interviewed. "We have to wait for the big breakthrough in battery technology before we can deliver an electric car to consumers," they said. This is where GM, FORD and the other car makers were making their big mistake, he wrote. Christensen believed that the trajectory diagrams were enough to have convinced the carmakers that they should have found a market that needed a car that could not

be driven fast, could not accelerate quickly and could not be driven far, and start satisfying that need. His experience with disruptive technology developments had shown that time and time again, once the product is in the market, the sustaining developments start occurring that move the less-than-good product to good and then better, eventually matching high end requirements. This is what TESLA did, and we see the result today.



Maybe the founders of TESLA actually read Christensen's book. They followed his script and found their market. They had a clear understanding that the innovation was radical and that eventually anyone would buy their car—but not at first. They knew they could not build a cheap, electric car. Their car was going to have to be expensive because it would cost a lot of money for the batteries. On the other hand, they knew that an electric car had two, big secret weapons: it could be driven really, really fast and it could accelerate like a drag racer. So, who were the first buyers? People who could afford to pay a lot of money for a really fast sports car. The price point was $100,000, not an affordable $20,000. People don't drive sports cars to the mountains for a skiing vacation. They don't have to drive far, just fast. Therefore, it didn't need long range. There was another bonus that came with an electric sports car, especially one being developed and sold in California. Correct, it had no tailpipe emissions. This was the context for developing the innovation.[10] Without the California law, there would never have been a TESLA, that is surely a certainty.

Context, requirements and user trajectories

To understand where driverless vehicles will make a difference, we need to start by having a clear understanding of whether the eventual product, a car being driven by a robot, will be simply a sustainable, incremental improvement over existing cars, or a radically new product. For the past twenty

[10] Higgins, Tim. Power Play: Elon Musk, Tesla and the Bet of the Century. Penguin Random House UK (2021)

years, since teams of people all around the world began working on making cars that drive themselves, the only requirement that has been clearly stated is that they will be safer because the human is removed from the equation. This has pitted driverless cars against cars with advanced driver assistance systems (ADAS) that help human drivers and sometimes take over the driving task. So far, ADAS is winning. Driverless cars have to be as safe as cars driven by humans with ADAS. That's a given. ADAS is moving the bar up faster than driverless cars can catch up. On the safety scorecard, driverless is possibly sustainable, but the automobile industry is not going to go all-in on driverless for safety reasons.

Applying Christensen's lessons learned

What are the performance improvements that driverless vehicles actually have to meet in order for them to be viewed as an innovation? Think back to electric cars. No tailpipe emissions, fast and great acceleration. You could get fast and great acceleration with any one of a number of expensive sports car, but none of them had zero tailpipe emissions. The secret weapon for driverless vehicles is that there is no driver, and no driver means there is no cost for a driver—unless the driver is free, like the dad or mom or grandparent playing chauffeur. When I drive my car, I'm free. I've sunk my money in the car, some of which I will get back when I sell it or trade it in, and the variable expenses are what I feel every time I fill it up with fuel or take it in for service. When I drive a family member or friend, I do it as a favor without charge. I donate my time and the costs for the car. But when I take a taxi, the driver's total costs have to be added to the fixed and variable costs of the car, as well as all of the back-office and administrative costs, and that's what I pay for the ride—plus the tip for the taxi driver. That, in a nutshell, is the competitive advantage for a driverless vehicle. If you don't own a car so that you can drive yourself, the cost for a trip has to be significantly lower than a trip in a taxi in which you are paying the salary and overhead for a driver. If your only alternative to a taxi is a bus, which has an affordable price, the bus would have to meet the same requirements as a taxi in terms of getting you to where you need to go when you need to get there.

Here is a list of the eventual customers:

- Those who are too old to drive themselves
- Those who are physically challenged
- Those who are too young and cannot drive themselves
- Those who cannot afford their own cars
- Those who are members of families that own a car, but the car is used by other family members

A County of Lackawanna Transit System (COLTS) bus leaves downtown Scranton on its way to Old Forge

Buses and other types of public transport offer rides that are significantly less expensive than taxis. There are, however, three problems with public transport. One is the distance between where you are when you need to travel and where you have to be in order to board the bus, trolley or train. Then there is the same issue when you disembark and have to get to your final destination. The second problem is that there may not be a public transport option available to take you from where you are to where you want or need to be, either at the time when you have to travel or at any time. Transit routes and schedules of operation may make them unusable for those who need an affordable ride outside of the times that the transit systems are operational and beyond the places where the transit systems operate.

The third problem with public transport is that the fares charged do not come close to covering the costs. In New York City, which accounts for over 40% of all transit rides in the United States, fares cover 23% of costs.[11] The rest of the costs are paid with tax money collected from the cities and states that are served and subsidies from the federal government. On the cost side, 58% is labor-related, 24% is non-labor, and 18% is debt service. Improving service, like adding coverage, reducing waiting times, and extending hours of operation, considering the cost and income structure of public transit authorities, simply adds more cost that has to be subsidized. Any politically-inspired tax cuts have a direct effect on the amount of subsidies that can be paid.

A replacement for a bus has to be much less expensive to operate so that an affordable fare can at least come close to covering the costs, and eventually deliver a profit to the operator. It has to be able to get people to where they need to go when they need to get there, and the distance from pick-up and drop-off points to trip origin and final destination

[11] https://new.mta.info/budget/MTA-operating-budget-basics

must be safely walkable. So our three performance requirements for a driverless vehicle are:

- Cost for a single rider
- Distance to pick-up and drop-off
- Operational design domain – Is it everywhere at any time, only within a specified area at any time, or only on certain roads at certain times?

What would this look like if we made similar charts as Christensen's electric vehicle trajectory charts? The trajectory of the cost of a single rider in a driverless vehicle needs to be measured against the trajectory of the cost for the available alternatives being used today. Those are the private car, taxis and buses. For U.S. tax calculation purposes, the cost per mile of a private car is $0.62.[12] This is the total cost of a car excluding cost for the driver but including fuel, insurance, storage, maintenance, and all other costs for figuring either a deduction or a salary supplement. If a person can afford to pay this cost per mile, and can drive himself or herself, from a purely economic standpoint they would be better off owning their own car to obtain all of the other advantages of a personal car. If they cannot afford this cost, then they are looking for an alternative that is less expensive. A five-mile trip by car would therefore cost $3.10.

A taxi ride is estimated to cost an average of $3-$5 for an initial charge for getting into the cab, and $2-$4 per mile. We can use a per mile cost of around $3.40. Using the average trip length of five miles, the total cost for the trip by taxi would be $17.00. The average fare (not the cost) of a bus ride in the U.S. is $2.75, which works out to be $0.55 per mile for a five-mile trip.

How about distance to drop-off and pick-up? Your own car parked in your own driveway or garage, or a taxi picking you up at your doorstep, are the closest a person can get is the most convenient option at the pick-up point. Bus stops are usually closer than metro/subway stops, and they are usually closer, on average, than commuter train stations. The third performance requirement is the extent of the oper-

12 https://exchange.aaa.com/wp-content/uploads/2019/09/AAA-Your-Driving-Costs-2019.pdf; https://www.my-moneydesign.com/what-is-the-real-cost-of-driving-per-mile/

ational design domain. There are a number of different factors that could be included here, such as the hours of operation or weather conditions that might prevent service, but in the chart I have made I have used the places that can be reached, from a single neighborhood, to an entire city up to an urban region (conurbation[13]). A vehicle that can only operate on limited access highways will not be able to reach all the pick-up and drop-off points a passenger service will need to reach all the desired destinations.

The trajectories of the existing alternatives will remain relatively flat, especially for the distance to pick-up/drop-off and ODD. Costs might change over time, but there are no reasons to believe that those costs will be drastically higher or lower. Claims that battery electric cars will be less expensive to own and operate than ICE vehicles have not been borne out in practice, and low electric charging costs benefit those who can charge at home and not those who must use public charging stations. The average price of electric cars is now about 20-30% higher than internal combustion engine (ICE) vehicles, insurance is higher due to higher costs of parts and the unknown costs of battery replacement. Costs are just as likely to be the same in the long run.

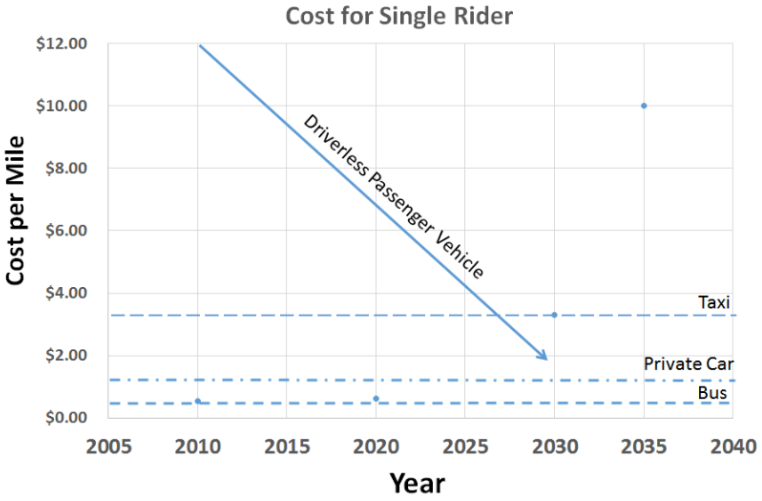
Driverless car trajectories

Will the trajectory of the cost for a driverless car approach the cost per mile of a taxi, private car or a bus ride, and, if so, when? Ideally, we would have a cost/mile for a driverless vehicle that has been calculated and is being used for building the business cases for the so-called 'robotaxis'. If they exist, I have not found them. The closest I came was an article in a January 2019 article published by *HARVARD BUSINESS REVIEW*, *The Cost of Self-Driving Cars Will Be the Biggest Barrier to Their Adoption*.[14] It was written by a legal analyst at *HARVARD LAW SCHOOL*, and a policy analyst at SECURE AMERICA'S ENERGY FUTURE. Their conclusion was that a 'robotaxi' would cost three times as much per mile to operate as a second-hand car purchased by an owner. Why? Because taxis are

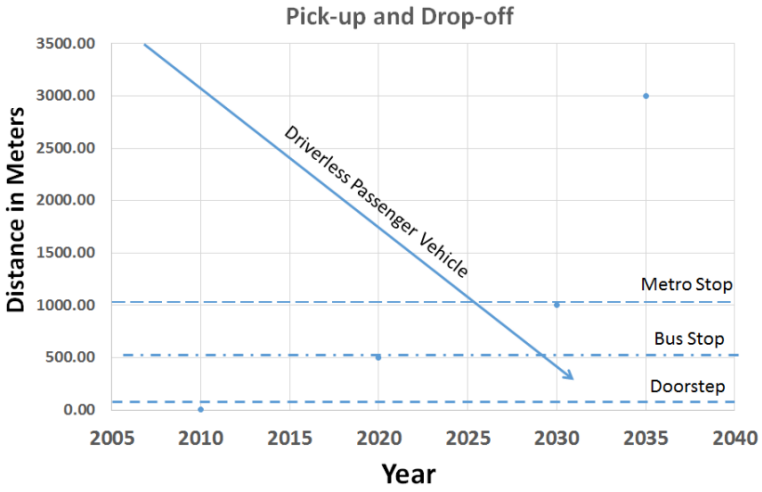
[13] An aggregation or continuous network of urban communities (*MERRIAM-WEBSTER*).

[14] https://hbr.org/2019/01/the-cost-of-self-driving-cars-will-be-the-biggest-barrier-to-their-adoption

only utilized 50% of the time and driverless cars would cost more than second-handcars. There was absolutely NO mention of the cost of the driver being removed because these authors assumed that there would have to be a "safety oversight" person on board. A driverless passenger vehicle—without a driver—can operate twenty-four/seven minus the time it needs to be refueled/recharged plus the time it requires for cleaning and maintenance. It has to be less cost than a taxi with a driver. Everything else is the same.



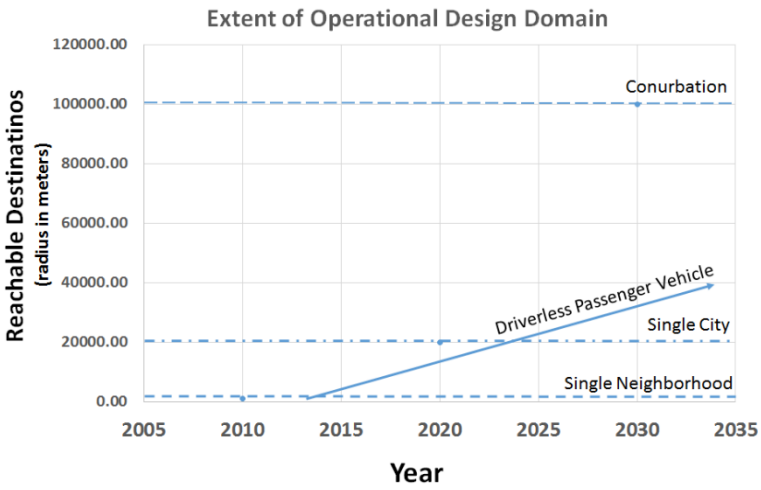
As cost per vehicle for the driverless technology is lowered as a result of scaling up production, the per mile cost to operate the vehicle, and therefore the cost per mile for a single rider, can be significantly reduced. When will a driverless passenger vehicle ride cost less than a bus ticket? When the car manufacturers start building more of them.



Today, Waymo and the other driverless software/hardware developers are testing their cars in neighborhoods. If they were put on the streets in a city where they have never operated, and the car did not have a back-up driver, they would not be able to pick up riders at their doorsteps and take them to any address. The systems need to be trained, and that takes time. They might be able to get up to speed quickly to move between a few pick-up/drop-off points, like metro stops, and then gradually move to more locations until they are ready for doorstep pick-ups and drop-offs.

How long will this take, and how long before driverless cars can navigate all the streets in a metropolitan area like New York, Washington or Boston? Will the trajectory of the type of roads on which the driverless car increase from limited access highways and arterial streets down to the smallest residential streets, and, if so, when is that likely to happen?

We are not there now, but if the sale of cars depended on it—which it does not at present—then the companies building the cars would be doing a lot more than they are now to be sure that the cars could meet the requirements.



Putting driverless cars into the market

Vehicle manufacturers know the drill; they just haven't woken up to the fact that driverless cars are a radical disruption and that they are the ones who have to meet the challenge. Musk has certainly understood this (see *Why Full Self Driving is a Must for Musk and Tesla* in the November 2022 issue of *THE DISPATCHER*), but he would do well to read Christensen's book on how to implement the strategy. His "Join our exclusive club" pitch worked for electrification, but it is not working for driverless.

First, the complexity of the vehicle should not be its selling feature. If you are replacing a bus with a vehicle that has almost the range of a taxi, the solution needs to be simple, reliable, and convenient. All "WOW" factors should be eliminated from the experience. Riders need to trust that they will be driven safely to their destination, and that if something goes wrong there will be something done quickly to fix it.

Second, because the market and the product will evolve, the product platform needs to allow feature and function changes to be made easily and progressively. TESLA understood this from the start, and built a top-end over-the-air software and function updating platform. This meant that hardware was placed into the vehicle that might not be used initially, but would be required for future features and functions. This added cost to the Tesla cars, but it proved to be a worthwhile investment. It will be the same for driverless vehicles offering low-cost rides. A balance will need to be found between keeping costs low so that rides are affordable and operators can earn a profit, and incorporating hardware that may be useful in the future.

Third, following on from the second point, the entry price for the vehicle and its operation have to be low. They cannot be a subsidized low prices as has been the case for BEVs with government subsidies and tax breaks. Maybe there will be legislation that will offer some form of tax relief for operators and for purchasing the vehicles, but the initial business cannot be based on this.

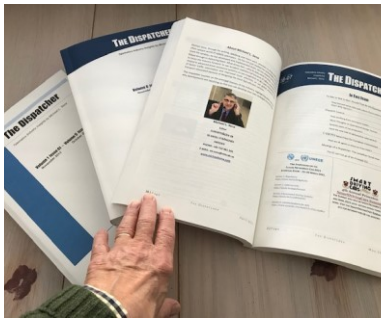
Disruptive innovations should not require tech breakthroughs

"Historically," says Christensen, *"disruptive technologies involve no new technologies; rather, consist of components built around proven technologies and put together in a novel product architecture that offers the customer a set of attributes never before available."* Tesla was not offering a new way to move from A to B. It was a car that looked and drove like a car. Teslas happened to have a battery instead of a fuel tank from the customer's point of view. It must be the same for driverless cars: the novelty is that there is no driver, and the only thing that should mean to the rider is that the cost of the trip is significantly lower. The vehicle itself should not be a novelty.

There should be comfortable seats for the riders with safety belts, and maybe cup holders and fold-down tables and windows that are kept clean and no litter on the floor or grafitti on the walls. There should be room for at least eight adults with no standing, it should have easy handicapped access and egress.

The vehicle is not a replacement for a family sedan, SUV, or van. Initially, it will not be able to drive from everyplace to everyplace, which a vehicle with a driver can easily do. But it will be able to drive to more places than big buses can be driven. In order to get the vehicles on the roads, the number of roads will be limited to those that are the safest and easiest to traverse. As the functionality of navigating in a region improves, more roads will be added. The number of pick-up and drop-off points will be more than the number of bus stops because the vehicles will not run on routes along pre-determined streets, but it will not be door-to-door. Vehicles will drive from and to designated locations, picking up and dropping off riders along the way.

Dispatch Central



The Dispatcher's Reflections on THE DISPATCHER

I SENT OUT a note to those who are on my mailing list from whom I have not had many or any comments during the past few years. It's a rather large number of the total, 75%. I asked them whether there was something I should be doing to elicit more responses from readers on the monthly issues of *THE DISPATCHER*, and, more to the point, whether they were actually reading the monthly dispatches. Around 30% responded. That's 30% of 75%, or 22.5% of the total number of people who receive *THE DISPATCHER* each month. So around 50% of the people I send the newsletter to each month are off the radar.

I thought I would summarize the main points from those responses I received, and add my thoughts on each. I will then explain what I will be doing with *THE DISPATCHER* moving forward.

About half of those who responded, or 11% of the total who receive the mailing each month, said they are not reading it when they receive it. If they get to it during the month before the next issue arrives, they give it a quick scan to see if there is something of interest. Lack of time to devote to a twenty-to-thirty page densely packed document was the principal reason given. *THE DISPATCHER* competes with other news and information sources, many of which charge heavy subscription fees. *"When The Dispatcher was 6 pages (between 2013 and 2018), I read 90%. At 25 pages, I read probably 20%,"* said one reader. I made the conscious decision to increase the page count from 6 to 25-plus back in 2018 in order to cover more topics in more detail. But if fewer people are reading because there's just too much to read, I need to rethink that decision.

Two who responded said I should go straight to the point instead of beating around the bush. That would save a lot of words. I guess I could put out the equivalent of *CLIFF'S NOTES*, but I feel there are enough of

those already out there, and I find most of them are either simply reporting or delivering biased opinions without providing the background that is needed to substantiate arguments.

Along the same line as above, it has been suggested that I should provide an executive summary of each article. As I am sure most of you know, writing an executive summary or an abstract that truly captures the essence of an article or report often takes a significant time to write. If you are not going to read the article and will only read the summary, why go through the trouble of writing the article? But if you are not going to read the article anyway, why don't I at least try to get the main point across to you? So this is something I am going to have to consider.

"Why do you publish it like it's a newspaper that should be printed out in order to read it? Why not publish it using one of the online tools like Wordpress so that it is easier to read on a smartphone?" There are two answers to this question. The first is that I don't type an article on a typewriter and then hand it in to a copy editor who fits it into a newspaper and who also chooses a photo or illustration to go with the article. Footnotes and illustrations are important parts of every article in *THE DISPATCHER*, so even though I may write an article on paper, I type it directly into the final formatted document. I use Wordpress for my web site, and have tried to use it as a way publishing articles, but I have found it to be extremely limiting and difficult to do anything other than typing text. The second answer is that I don't write for smartphone reading. It must be that 2% Neanderthal in me. I feel that the document can be read easily on an iPad, laptop screen or computer monitor if you don't want to print it out. I hope I don't lose you just on account of this point.

The other half (11% of the total who receive it monthly) responded that they do read most of each issue, that they enjoy it, learn from it and look forward to it each month. They all said they don't send comments because they don't want to engage in a conversation about it, just like they don't want to engage in social media exchanges. I understand this. I have cut back on my comments to journalists unless I just want to give them an encouraging thumbs up.

So, in total, I can say that around 36% of all those who receive *THE DISPATCHER* have confirmed that they read it monthly. I would like to get that number up closer to at least 50-60%. Here is what I plan to do.

The Dispatcher Volume 11

Beginning in September 2023 I will alter the cadence of releases of **THE DISPATCHER** beginning with *Volume 11 Issue 1*, and I will also alter the content of the issues. Every other month I will send an issue with a single article addressing one of the following six topics:

- Mobility for the non-mobile
- Vehicle-related telecommunications
- Automotive artificial intelligence
- The business of delivering transport systems
- People and transport – the effects of how and where we live, work, and recreate on our requirements for transport
- Standardization and regulation of transport systems

Every month I will send a six-page **Dispatcher Central** with topical content, similar to the *Dispatch Central* section in Volumes 6-10. This six-page **Dispatcher Central** will be included with the feature article every other month. One of the topics in the new **Dispatcher Central** section will be **Crew Comments**. This reflects my view that we are all on a journey together, members of the crew. I will list comments received from crew members, anonymously unless the commenter asks that I attribute it to him or her.

Musings of a Dispatcher will arrive at unscheduled times, intermittently. It may be my own musing, it may be a musing from a friend of the dispatcher in the form of a guest article, like the one in the May issue, or it may be a conversation with someone. In any case, it will be separate from the monthly and bi-monthly issues. I promise to keep them short.

The June issue, Volume 10 Issue 07, will be the last of *THE DISPATCHERS* as you have come to know it during the past five years. Volume 11 Issue 01 will arrive in your (e)mail box on or before the 1st of September, if all goes as planned. Thank you all for being part of the journey so far, and I look forward to making *THE DISPATCHER* an even more important part of your monthly reading material in the future.

The EU Commission's EURO 7 Proposal

AS I WROTE in the April 2023 issue of *THE DISPATCHER*, the ongoing battle between the EC and the European automotive industry is now focused on the *EUROPEAN COMMISSION*'s so-called EURO 7 proposal for updated vehicle-related pollution guidelines. The EURO 7 proposal, which has the intention of governing tailpipe emissions of pollutants such as carbon monoxide (CO) and nitrogen oxide (NOx), as well as fine particulates, won preliminary approval in the EU PARLIAMENT in November 2022. For the first time, the EU proposes to regulate particulate emissions from brake pads and tires. It replaces EURO 6 which went into effect in 2015. The EC has said that the new regulation should go into effect on the 1st of July 2025 for new passenger cars and vans, and two years later for trucks and buses.

The *COMMISSION* would have liked EURO 7 to be the final internal-combustion engine regulations enacted in Europe. It wanted a strict interpretation of its "zero emissions", meaning that only battery-electric or similar vehicles would be allowed to be sold within the EU after 2035. However, that will not be the case. Germany and several other countries ensured that ICE will live on, although the fuels used will not be petroleum-based, but e-fuels.[15]

All automakers currently selling ICE vehicles within the EU, which include manufacturers from Europe, North America, Japan, and Korea (note: not China), have strenuously objected to the introduction of any new ICE-related regulations. They have argued that money spent on new compliance measures would be more productively spent investing in lowering the cost of electrification, and that there will be little need for new rules because the proportion of internal-combustion engine sales will continue to fall ahead of the 2035 zero-emission deadline. STELLANTIS CEO Carlos Tavares recently called EURO 7 a "diversion from the major goal of electrification."

[15] Electrofuels, also known as e-fuels, a class of synthetic fuels, are a type of drop-in replacement fuel. They are manufactured using captured carbon dioxide or carbon monoxide, together with hydrogen obtained from sustainable electricity sources such as wind, solar and nuclear power.

The EU in general and the *COMMISSION* in particular have never been particularly sensitive to arguments based on economics, especially when it regards money spent by the automotive industry to meet their self-declared standards on air pollution. It has not had shown any interest whatsoever in what consumers have to pay for buying vehicles that have higher prices as a direct result of its regulations.

How has the *COMMISSION* justified these stricter controls? It points to reports saying that longtime exposure to pollution from fine particulate matter and NOx was responsible for more than 70,000 premature deaths in 2018, with 300,000 deaths from all air pollution. Road transport accounted for 39% of harmful NOx emissions that year, the EU says. NOx is higher in built-up areas, say the reports, accounting for 47% of emissions. EURO 7 regulations, says the *COMMISSION*, will cut passenger car and van NOx emissions by 35%, and by 56% for buses and trucks. Brake particulates will be cut by 27%. Over what period? Will all the cars and trucks and buses currently on the roads suddenly disappear?

There are industry backers for stricter controls, for example the emissions control industry. The AECC[16], the trade group that lobbies on behalf of companies like JOHNSON MATTHEY, NGK and VITESCO that make catalysts and filters had called for an "ambitious" EURO 7 proposal. It "welcomed" the EURO 7 proposal. It's more a matter of getting all they can while the getting's good because EU's effective ban on petroleum-based fuels after 2035 means that these companies' revenues in Europe will start to evaporate.

Who is going to pay for the party

A report from MORGAN STANLEY found that Europe's biggest automaker, VOLKSWAGEN GROUP, could face €400 million in compliance costs on car sales, with No. 2 STELLANTIS at €350 million. The increased manufacturing costs will disproportionately affect small cars and, therefore, people who (have to) purchase smaller cars. Most European car makers have closed down their small car production because the profit margins on them have disappeared due to higher costs of

[16] AECC (the Association for Emissions Control by Catalyst) is the international, Brussels-based association of European companies making emissions control technologies for engine exhaust and was first set up in 1978.

production. The COMMISSION has stated that the new regulations will add €304 to the cost of a car. As the auto industry is well aware, COMMISSION estimates have nothing to do with the price a customer will pay, nor with the actual cost to the car manufacturer. They relate to someone's estimate for a part that has to be purchased. €304 is likely to be closer to €3,040 in what will be added to the ticket price of the car.

Not so fast, say the European car manufacturers. VW has said it is impossible to meet the 2025 timeframe. It needs to be at least two years later, it said. The Commission says it has to act sooner because of the urgency of reducing emissions and particles. The proposed regulations will now go to the EUROPEAN PARLIAMENT and COUNCIL for ratification/rubber stamping. I have to wonder whether there are operatives from China working inside the COMMISSION. As costs rise for the current suppliers of ICE vehicles in Europe—which are the majority of cars sold now and will continue to comprise at least 50% of all cars sold in Europe in 2030—Chinese car makers like BYD will continue push into Europe with lower-priced BEVs that are produced in China using electricity generated principally from coal.

It's not just the EU

The U.S. *ENVIRONMENTAL PROTECTION AGENCY* has proposed its strictest-ever vehicle emissions limits for 2027-32 with the aim of increasing the sale of BEVs. It has estimated that tighter emissions regulations, coupled with higher incentives, could lead to EVs making up 67% of new light-duty vehicle sales and 46% of medium-duty vehicle sales in the 2032 model year.

"*By proposing the most ambitious pollution standards ever for cars and trucks, we are delivering on the Biden-Harris administration's promise to protect people and the planet, securing critical reductions in dangerous air and climate pollution and ensuring significant economic benefits like lower fuel and maintenance costs for families,*" EPA Administrator Michael Regan said in a statement. "*These ambitious standards are readily achievable thanks to President Biden's 'Investing in America' agenda, which is already driving historic progress to build more American-made electric cars and secure America's global competitiveness,*" he added.

For light-duty vehicles, the emissions requirements would increase in stringency each year, resulting in a fleetwide average target of 82 grams per mile of carbon dioxide in the 2032 model year. For medium-duty vehicles, the standards also increase in stringency and are projected to result in an average target of 275 grams per mile of CO_2 by the 2032 model year. The proposal equates to a combined fleet average year-over-year CO_2 reduction of 13%. The EPA said its proposed light-duty standards in the 2032 model year could lead to a 56% reduction in projected fleetwide average greenhouse gas emissions target levels compared with the 2026 model year requirements. For the medium-duty standards, the reduction is projected to be 44 percent.

Renault, Geely and Aramco makes three

Li Shufu

One must really give credit where credit is due. Li Shufu, chairman of Geely Automobile Holdings, among China's largest automakers, is a business magician. He has pulled rabbits out of hats that he created seemingly out of thin air. I'm thinking about purchasing Volvo Cars from Ford in 2010 for a song, $1.8 billion. He has appeared to cut assistants in half only have two or more assistants emerge from the cutting box. I'm thinking about brands like Polestar and *Lynk & Co* emerging out of Volvo Cars.

In the December 2022 issue of *The Dispatcher*, I wrote about how Geely acquired all of Volvo Cars' combustion engine business. First, in 2020, it directed *Volvo Cars*, then a wholly-owned subsidiary, to separate its ICE engine business into a new subsidiary called *Powertrain Engineering of Sweden*. Then, in July 2021, just before *Volvo*'s October IPO, Geely and *Volvo Cars* created a JV called *Aurobay* for their joint ICE powertrain business. Then, in November 2022, *Volvo Cars* divested all of its shares in *Aurobay*. With that sleight of hand, Li Shufu got all of Volvo almost one hundred years of ICE powertrain intellectual property. Then he set up a new 50/50 JV with RENAULT that had separated its ICE holdings into a separate division from its electric holdings. That gave him 50% of Renault's 123 years of ICE development.

Now, in March of this year, Aramco has signed a letter of intent with Geely and Renault Group for a new powertrain company to focus on lower emission technologies. Aramco?

You bet. SAUDI ARAMCO officially the SAUDI ARABIAN OIL GROUP, or simply Aramco, is a Saudi Arabian public petroleum and natural gas company based in Dhahran. As of 2022, it is one of the largest companies in the world by revenue and has repeatedly achieved the largest annual profits in global corporate history. SAUDI ARAMCO has both the world's second-largest proven crude oil reserves, at more than 270 billion barrels, and largest daily oil production of all oil-producing companies. The government of the Kingdom of Saudi Arabia owns 94% of ARAMCO's shares.

The new company with ARAMCO, RENAULT and GEELY as owners, will be dedicated to internal combustion and hybrid powertrain technologies.

Mohammed Y. Al Qahtani, ARAMCO Executive Vice President of Downstream, said: "*This letter of intent represents a new milestone in our ongoing commitment to transportation technologies and presents a platform to support Aramco's research and development in engine innovation. Our planned collaboration with Geely and Renault would support the development of powertrains across the automotive industry, and aligns with our broader efforts across our global operations.*"

Luca de Meo, CEO of RENAULT GROUP, said: "*Aramco's entry brings to the table unique know-how that will help develop breakthrough innovations in the fields of synthetic fuels and hydrogen.*"

Daniel Li, CEO of GEELY HOLDING GROUP, said: "*The proposed investment by Aramco represents recognition from global industry leaders in the PWT's future business prospects and vision for pioneering low and carbon-free fuels such as methanol and hydrogen.*"

With a global network of 17 powertrain plants and five R&D centers across three continents, the planned company is intended to be a standalone global supplier with a combined capacity of over five million internal combustion, hybrid and plug-in hybrid engines and transmissions per year, supplying over 130 countries and regions, says the press release. Ultimately, the joint venture's portfolio could cover up to 80% of the global internal combustion engine market. Nice going, Chairman Li. What else do you have up your sleeve?

Toyota and Exxon want to fill 'em up clean

TOYOTA AND EXXON have decided they aren't going to let ARAMCO, GEELY and RENAULT have all the fun. TOYOTA has not given up on its hybrids and all the ICE vehicles it will continue to produce, and it surely would like to continue selling those vehicles in Europe and North America. With that in mind, it has decided to team up with EXXON to test low-carbon fuels in engines that currently run on gasoline. The idea is to use fuel blends that are made from a mix of renewable biomass and ethanol produced using cleaner processes. Such fuels could cut greenhouse gas emissions from ICE vehicles by as much as 75% compared with regular gasoline-based ICE vehicles.

The fuels are "very much at the test phase" and would require government policy support before becoming commercially available, said a spokesperson for Exxon when the partnership was announced. "*Having a solution for liquid fuels that we can use in the existing fleet, having it in the kind of policy construct where we allow the market to innovate, is the lowest cost way to decarbonize transportation.*" Toyota and Exxon say they were motivated by the facts on the ground, that battery-powered autos still face significant hurdles to mass adoption, such as the availability of charging stations, long recharge times and the high cost of new vehicles. Also, they're not zero carbon if powered by grid electricity, which is typically generated by a mix of sources including natural gas and coal.

New EV customers are currently entitled to tax credits in the U.S. and many other countries. Exxon and Toyota say better policy would focus on so-called lifecycle emissions, which would take into account EV reliance on the grid. A lifecycle emission standard would also reward low-carbon fuels produced by companies like Exxon and drivers of internal combustion engines. "*No matter what you think the pace of electrification transition might be, there will be a billion, if not hundreds of millions of ICE vehicles on the road for quite a long time,*" said Tom Stricker, Toyota VP for Sustainability and Regulatory Affairs. Lower-carbon fuels will be "quite important in achieving those greenhouse gas reductions quickly."

Words of wisdom from forgotten sages

ROGER STARR (1918 - 2001) was a businessman and the New York City housing administrator. He became a writer for the *NEW YORK TIMES*. One of his books was called The Living End. MICHAEL HARRINGTON (1928 – 1989) was an American political activist, theorist, and professor of political science. He was a founding member of the *Democratic Socialists of America*.

Michael Harrington

"In the last decade or so, social scientists have invented a word to describe a new stage of urban life: Megalopolis. In part, this term reflects the sheer and tumultuous growth in the population of cities. In 1800, there did not exist a city of a million inhabitants…by 1930, twenty-seven exceeded that limit, and the trend, of course, continues.

"For over a hundred years, the Western poor have been the most dynamic, creative, and moral force for social justice in their culture. Some now say that their bitter struggle with the rich is at an end, resolved by a compromise. But then, what will be the political equivalent of poverty, what will replace the idealism that misery forced upon millions?

"American industry broke through a technological barrier somewhere in the mid-fifties. Cybernation made it possible to expand production and contract the work force. Less labor produced more goods. Even so, the president of a corporation making automated equipment remarked that his equipment was only at a 'primitive' level, that an accentuation of the process was imminent…The automated department store will soon appear in the United States: machines will take orders, package goods, notify inventory of the sale, and keep instantaneous financial accounts."

"To mankind which has been engaged in a grim struggle with hunger since the beginning of time, the idea that men would be forced not to work would, at first glance, seem a salvation. That could well be the case…but it would require a tremendous burst of freedom and imagination to fill up the void left by the disappearance of starvation."

"Indeed, a society split between the highly educated and sophisticated few on one side, and the passive, consuming mass on the other, could hardly be democratic, since dialogue between the rulers and the ruled would be impossible."

Roger Starr

"Living in a city is no longer regarded as a temporary necessity, perverting man's essentially rural nature; it is now generally accepted that our ancestors slid from the trees to stay, and that we had better reconcile ourselves to the pavements, or find a way to reconcile the pavements to us."

"Many components of a city are highly desirable, but only two are essential. One is people, and the other is transportation. Sometimes the critics need to be reminded that without transportation the people would not have water to drink, or power to light their homes…urban men would choke on some of their own waste products and find themselves buried in others. Transportation makes cities possible."

"The standard of comfort in the automobile…is so seductive to the American citizen that one has about as much chance to lure him away from it into a bus or subway on the grounds of economy as one would have to lure guests from the Waldorf Astoria to the YMCA by telling them how much money they might save."

"I once heard an Audubon Society lecturer sigh, while demonstrating the sad effects of overgrazing on grass cover, and the consequent wind erosion of Western lands, 'All this, just so some men could have jobs.' How fortunate, I thought of the lecturer, that he was able to earn his living differently."

"In engineering offices men spend their days thinking up new devices to increase the urban dependence on electricity. The art of brushing one's teeth by hand fast becomes as obsolete as scrimshaw work; the day is almost here when slicing a steak without an electric knife will be as quaint as a man's fly that fastens with buttons.

"It is shocking to find oneself writing that conservationists can be wrong. But they can, even if this lines me up with peddlers of used cars along the highways."

Musings of a Dispatcher's Friend

The *Guest Musings* is written by Maynard F. Thomson. Maynard and his wife Laura live in Freedom, New Hampshire. He was an Assistant Attorney General in Ohio, a staff lawyer with the Federal Trade Commission, and retired as a partner in a major international law firm, where he specialized in Antitrust and Trade Secret litigation. He has written three novels and several short stories, in addition to numerous columns in various newspapers.

"The law, in its majestic equality, forbids rich and poor alike to sleep under bridges, to beg in the streets, and to steal their bread."

A. France

YOU ARE FAMILIAR with my socio-economic class; call it the Gentry. If you're reading this, chances are you're Gentry, too. You may therefore share a common Gentry trait: a tendency to valorize that deemed "unspoiled" or "natural." Perhaps it comes of reading too much Edward Abbey in high school, or not enough Hobbes, but unfortunately the inclination to default to indiscriminate nature worship and the preservationist ideal easily elides into support for policies that can be devastating to those lower on the socio-economic ladder. This effect can be the result of cluelessness, or less charitably to a hard-wired, animal desire to exclude potential competitors; to those whose conditions are made harder to escape by Gentry aversion to that which opens opportunities, our peers' motives make little difference.

In the US Gentry concentrate disproportionately in urban and suburban enclaves reminiscent of toehold colonial settlements. Like our forebears, many of us sense "out there" is a wilderness stocked with untutored savages. We usually have initials after our names, do mind work, have healthy incomes and a positive net worth. We read serious books, the New York Times, certain magazines, and on the strength of that Junior Year Abroad fancy ourselves pretty cosmopolitan. Many of us default to the assumption that our norms are laws of nature, our values unassailable by any but troglodytes.

Someone with a desk job, no matter how perfunctory and lacking in discretion, is presumptively one of us; someone doing physical labor is probably not, even if the latter's job objectively requires more skill and responsibility than that desk job, or earns more. We think of those people as…

Well, often we don't think about them at all, and when we do, it's likely because some of them—that "basket of deplorables," as one of our number put it—are being annoyingly recalcitrant, and must be…ignored or, if that's not possible, derided and then ignored.

In the past clothes, names and accents were reliable indicia of Gentryhood. Now, though, the key tells are attitudes; you could say we can be known by that which we disdain. Hear someone say "Walmart" in the tone used to describe an anal fissure, and you can be confident the speaker's a member of the Gentry. "Housing development" is a phrase that can be expected to call out the Gentry's hair trigger indignation and formidable oppositional powers. We're all in favor of "affordable" housing…as long as it only intrudes on someone else's pastoral vistas.

Examples of Gentry obliviousness to the needs of others are legion. Where I live, for instance, recently arrived and relatively rich retirees, propelled by a Disneyfied fantasy of New England villages, pass regulations effectively ensuring that the offspring of non-Gentry families who've lived here for generations have to leave, since though we're surrounded by vast swaths of empty land, housing's no longer affordable. There's no evidence that those imposing these preservationist policies have ever considered the possibility that their aesthetic sensibilities might be weighed against the more fundamental needs of others, and found wanting.

Or consider the common Gentry aversion to the likes of Walmart. Though it and its big box ilk have been a huge anti-poverty development, estimated to have reduced the cost of poor people's basic necessities by over two thousand dollars a year, a large swath of the Gentry believe them a threat to the twee little mom and pop stores they favor, and react to them with disgust. Ditto the fast food outlets that provide jobs for the unskilled, and affordable treats for those scraping by, but the mere appearance of which is an offense against Gentry sensibilities.

We Gentry often avoid thinking too much about how the things we want and assume we should have come about; they should just be there, and God forbid that in their delivery we're forced to confront the messy, unavoidable realities that conflict with the idealized world we just know needs

only our midwifery to be born. (Liken this to English critic John Ruskin's wedding night discovery that his bride had pubic hair, so shattering him that he was asexual for the rest of his life; classic Gentry cognitive dissonance.) What's that? Your comforts, indeed your very survival, depend on roads, cars, trucks, refineries, power plants, and countless buildings? If forced to think about such realities, many Gentry begrudgingly accept their necessity…as long as it all happens…elsewhere.

Gentry are often suffused with views straight out of 19th century European romanticism. Not just the default assumption that a state of nature is an ideal with which human activity, if it's needed at all, must "harmonize" in some vague way; many of our number hold the companion Hegelian belief that "history" is purposeful, and not just a rear view mirror. Enlightened Gentry imagine themselves history's advance guard, hearing its commands and feeling bound to obey that to which the hoi polloi are deaf.

It turns out that "History" and nature worship bid us to a selective Luddism, the conviction that we're under orders to proceed toward a prelapsarian Eden, a sort of upscale Big Rock Candy Mountain: tables laden with organic, non-GMO vegetables, unlimited energy conjured literally from thin air, and teleportation transporting us to our house in the Hamptons.

Nowhere is this Luddism more deep-seated, more an unspoken assumption underlying our policy views, than in reflexive hostility to the roads and cars that are almost invariably essential to economic growth and the resulting improvement in the material condition of those with less. Thus the concomitant enthusiasm for mass transit…for others.

Mass transit, long a Gentry ideal, ranks high in the hierarchy of Gentry fixations. We love the idea of packing people onto trains and subways, controlling where they go, and when. That also serves the purpose of making the roads more open to our personal travel, since there's an interesting contrast between Gentry passion for mass transit for others, and Gentry use of mass transit. A study of mass transit support concluded that: "…half of people advocating for increases in transport spending had never used public transportation,

and that people who are wealthier are more likely to desire increases in transport spending."[17]

Gentry theoreticians churn out endless anti-car and anti-highway screeds. See, e. g., "The Absurd Primacy of the Automobile in American Life"[18]; "Bad for the environment, awful for our health and terrible for public space—this is the case for banning cars"[19]; "A proposal for limits on vehicular passenger travel levels."[20]

Cars and roads were objects of Gentry demonization long before we seized on Gaia's alleged distress as an excuse for drastically curtailing private automobiles and boosting mass transit. Over fifty years ago, we were being assured that cars were a "disease" and nothing less than a "war" against them would stop its destruction of cities.[21] Around the same time Vance Packard, one of the last century's most popular public scolds, assured us that the geographic mobility cars allowed was responsible for social isolation and loneliness.[22]

Gentry political agents translate our hostility to cars and roads into policy lauded by Gentry media: "America Has Long Favored Cars Over Trains and Buses. Can Biden Change That?"[23] "Can America Really Drive Its Way Out of Climate Change?"[24]

This last states a standard Gentry view: "That problem [America's transportation system] isn't just gas-fueled cars but car-fueled lives—a view of the world in which huge private automobiles are the default method of getting around."[25] The solution, the Gentry flack assures us, is that electric vehicles "have to be paired with dramatic land use reforms that shortens or eliminates a substantial portion of

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[17] Michigan State University, Institute for Public Policy and Social Research, M. Manville & B. Cummins, "Why do voters support public transportation? Public choices and private behavior," Sept. 2014

[18] E. Humes, "The Atlantic," April, 2016

[19] L. Murray "The Independent," Aug. 1, 2019

[20] P. Moriarity, Academia Letters, Sept. 2021

[21] K. Schneider, Autokind vs. Mankind (1971)

[22] V. Packard, A Nation of Strangers (1972)

[23] The New York Times, April 2, 2021

[24] The New York Times, Aug. 12, 2021

[25] Ibid.

all vehicle trips, and replaces them with transit, walking, biking, shared vehicles and other forms of mobility…"[26]

The Gentry—disproportionately located in urban and suburban clusters—sustain their longstanding antipathy to development in general, and cars and roads in particular, even as demographic trends are making mass transit even less relevant to more and more people. These population shifts—from urban centers and suburbs to rural areas—are making Gentry support for public investment in mass transit increasingly irrational, as private cars and adequate roads become more essential than ever.

The evidence is everywhere: "The Era of Urban Supremacy Is Over"[27]; "Big cities saw historic population losses while suburban growth declined during the pandemic"[28]; "Population Redistribution Trends in Nonmetropolitan America, 2010 to 2021"[29]; "People Working From Home Permanently Could Transform Rural America."[30]

As ever more people seek the lower costs and increased comfort of life well outside the megalopolises, the Gentry pushing for ever greater public investment in ever less rational mass transit are simply ignoring the interests of the millions for whom mass transit will never be an option. At the same time, the failure to invest in roads (new construction and maintenance) can throttle the burgeoning movement to disbursed development, and the opportunities they offer those without the resources to live and work under conditions many Gentry prefer. Thus like so many Gentry attitudes, the reflexive aversion to cars, and the corresponding promotion of mass transit (for others), is essentially reactionary and objectively anti-poor.

Ultimately, the private car is a tool the value of which is subordinate only to education and skills development in promoting individual welfare and aggregate productivity, and until we have teleportation or at least individual jet packs,

[26] Ibid.

[27] The New York Times, Mar. 15, 2023

[28] Brookings Inst., July 2022

[29] 88 Rural Sociology No. 1, at 193-219, Nov. 16 2022

[30] NPR April 5, 2021

nothing can do as much for the individual. It's a force multiplier for the human capital behind the wheel, expanding horizons and possibilities as nothing else can. Yes, it imposes costs, yet Gentry focus on those and not on the vastly greater benefits is not only morally suspect, but destructive to aggregate well-being, including that of the Gentry. Those who want their thoughts and values translated into policy, and have the resources to pursue that aim, should constantly weigh not just the assumed benefits to themselves, but the likely costs to others. We do that too rarely.

About Michael L. Sena

Through my writing, speaking and client work, I have attempted to bring clarity to an often opaque world of highly automated and connected vehicles. I have not just studied the technologies and analyzed the services. I have developed and implemented them, and have worked to shape visions and followed through to delivering them. What drives me—why do what I do—is my 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. Most importantly, I put vehicles into their context. It's not just roads; it's communities, large and small. Vehicles are tools, and people use these tools to make their lives and the lives of their family members easier, more enjoyable and safer. Businesses and services use these tools to deliver what people need. Transport is intertwined with the environment in which it operates, and the two must be developed in concert.

Michael L. Sena

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