

Accelerating the Future: The Economic Impact of the Emerging Passenger Economy

Autonomous Vehicle Service (AVS)

Report Snapshot

Intel has engaged Strategy Analytics as a partner in the preparation of this report to validate the hypothesis that a “Passenger Economy” based on pilotless vehicles is on the horizon and that it holds massive economic potential. In assessing this opportunity, Strategy Analytics and Intel aim to start a conversation that explores the catalysts for change, frames the value or economic opportunity, and begins to build use cases that can enable business decision makers to explore and develop actionable change strategies.



June 2017

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1. Purpose & Approach

Consumer adoption of peer-to-peer and ride-hailing services such as Uber and Lyft points toward a generational sea change in how consumers and businesses view transportation. These changing behaviors are combining with rising urbanization, pervasive high-speed mobile broadband, and rapid technological leaps in computing power and data center capacity to enable these new business models to drive and accelerate the development and use of autonomous mobility solutions.

Ironically, carmakers have turned to offering these same car-sharing and ad hoc use applications to drive up utilization rates. The global nature and scale of this change has major implications for the adoption and use of autonomous "Mobility-as-a-Service" among consumers and businesses alike. "Being driven" by intelligent, pilotless vehicles will represent the essential nature of future transportation.

Strategy Analytics expects that, as we move toward SAE level five¹ vehicle autonomy, these megatrends will combine and enable Mobility-as-a-Service to open the door to an emerging new market that we refer to as the "Passenger Economy." This Passenger Economy represents the value of the products and services derived from the use of fully autonomous, pilotless vehicles, including the indirect savings in both time and resources generated by the use of pilotless vehicles.

Intel, seeking to enable the computing and connectivity technologies that will drive this market, has engaged Strategy Analytics as a partner in the preparation of this report to validate the hypothesis that this Passenger Economy is on the horizon and that it holds massive economic potential. In assessing this opportunity, Strategy Analytics and Intel aim to start a conversation that explores the catalysts for change, frames the value or economic opportunity, and begins to build use cases that can enable business decision-makers to explore and develop actionable change strategies.

In this report, Strategy Analytics has predicted the potential economic impact of the Passenger Economy once fully autonomous pilotless vehicles begin to proliferate globally in 2035 and by 2050, the base year of our scenarios, account for nearly 50 percent of all vehicles sold. Our use cases look at the both consumer and business use and adoption of fully autonomous, pilotless vehicles as penetration begins to ramp dramatically. This forecast essentially refers to the time in the future when services are increasingly widespread and available at significant levels for "mass market" applications and services.

The Passenger Economy

DEFINITION: *noun*

The Passenger Economy is the economic and societal value that will be generated by fully autonomous (SAE Level five) pilotless vehicles.

A term coined by Intel and examined by Strategy Analytics to represent the value of products and services derived from the use of fully autonomous pilotless vehicles. This value includes the indirect savings for both consumers and business users regarding time freed from driving and shorter commutes, increased productivity for businesses, and cost savings from the reduced need for emergency services, traffic

¹ [International Monetary Fund, 2017 Projected GDP by country](#)

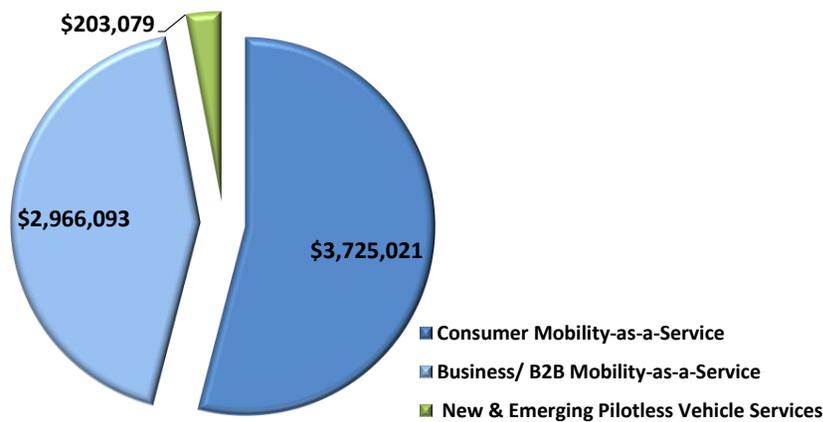
2. Key Findings

The Passenger Economy represents a US\$7 trillion global opportunity in 2050.

The Passenger Economy will stimulate value creation from the adoption of Mobility-as-a-Service and other new mobility services as well as emerging new applications and services as well as from savings in time and money associated with vehicle use and from the resulting freedom of movement.

Our research finds that autonomous driving technology will enable a new Passenger Economy worth US\$7 trillion in 2050. It will drive change across a range of industries, displacing vehicle ownership with Mobility-as-a-Service, and defining a new landscape of concierge and ride-hailing services, as well as pilotless vehicle options for businesses in industries like package delivery and long-haul transportation.

Passenger Economy: Global Revenue from Services 2050 (US\$, Millions)



Source: Strategy Analytics



Consumer use of a range of Mobility-as-a-Service offerings will account for US\$3.7 trillion, nearly 55 percent of all revenues. The evolution and mass

adoption of Mobility-as-a-Service by consumers is central to the emergence of the Passenger Economy. Consumers will continue to forgo ownership as they seek out economical, self-directed personal mobility. The range of Mobility-as-a-Service offerings will explode as autonomously operated vehicles become ubiquitous and personalized services emerge.

US\$7 Trillion Opportunity

Autonomous driving technology will enable a new “Passenger Economy” worth US\$7 trillion – more than the projected 2017 GDPs of Japan and Brazil combined.



Business use of Mobility-as-a-Service will generate US\$3 trillion in revenues, roughly 43 percent of total revenues. Industries like transportation and freight delivery and sales and service fleets will utilize pilotless vehicle technology to reshape their fundamental businesses and to leverage new opportunities.



New emerging applications and services will account for US\$203 billion of revenues. These revenues will be generated from the use of a range of new use cases for pilotless vehicles in industries like hotel and hospitality, restaurant and dining, tourism and entertainment, healthcare, and service delivery of all kinds.

In terms of the other economic and social impacts of the Passenger Economy Strategy Analytics expects that:

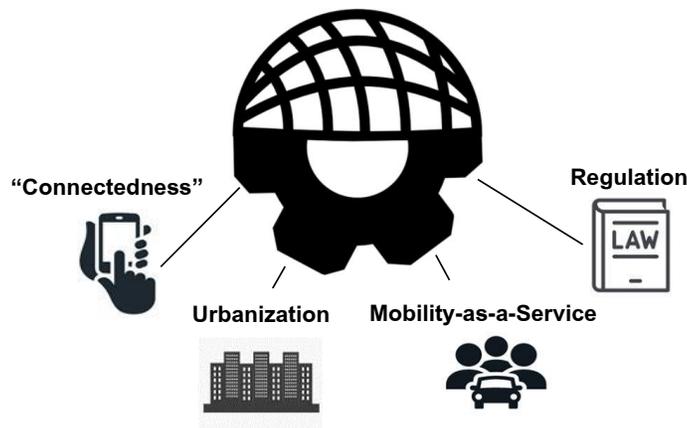
- **Conservatively, 585,000 lives can be saved** due to pilotless vehicles in the era of the Passenger Economy from 2035 to 2045. This is nearly as many people that live in the city of Dusseldorf, and would fill the Melbourne Cricket Grounds nearly six times over.
- **Pilotless vehicles will free more than 250 million hours of consumers' commuting time per year** in the most congested cities in the world.
- **Reductions in public safety costs related to traffic accidents will amount to more than US\$234 billion** over the Passenger Economy era from 2035-2045.



3. The Passenger Economy – How Do We Get There?

The onset of autonomous pilotless vehicles will converge with a number of important changes in consumer behavior that will combine to underpin the emerging Passenger Economy. We are seeing today the first green shoots of these growing shifts in consumer behavior. These changes are the leading edge of this opportunity and will be driven by several market forces we see emerging today:

Long-Term Drivers of the Passenger Economy



Source: Strategy Analytics

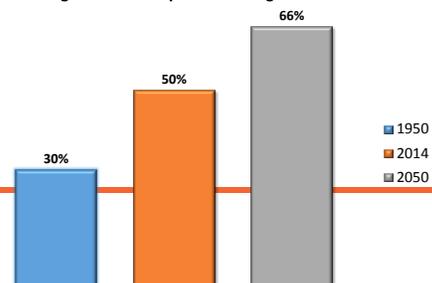


Mobile “Connectedness”: Mobile connectivity has reached nearly every consumer demographic and geographic nexus on the planet and continues to be found in an expanding number and variety of connected devices, automobiles and machines. “Connected” consumer behaviors that will underpin the growth of the Passenger Economy include:

- A continued blurring of the boundaries between work and personal life
- Telecommuting
- Remote shopping via e-tailing/e-commerce
- Growing use of social networking and communication as a primary form of human interaction
- The emergence of more ad hoc and portable working and living arrangements
- The continued growth of online consumption of video and rich media



Percentage of Global Population Living in Urban Areas





Urbanization: By 2050, nearly two-thirds of the global population will live in urban environments².

- A key factor driving this trend is the desire to be closer to work and leisure.
- As population density rises in cities, so too will the cost of living. People will flock to suburbs further from the city center to compensate, driving commute times higher and outstripping the ability of public transport infrastructure to fully meet consumer mobility needs.



Vehicle-Sharing and the Rise of Transportation Networks - Mobility-as-a-Service: Ride-hailing companies such as Uber and Lyft are pursuing pilotless fleets with the ultimate goal of obviating the need for drivers and converting what is currently a taxi alternative into, in essence, a public transportation network of shared vehicles comprising a range of vehicle types. The transportation environment will be increasingly dominated by Uber, Lyft, Zipcar and a host of other ride-hailing and car-sharing services that are already driving down owned-vehicle usage in some metropolitan areas. The global nature and scale of this change has major implications for the long-run potential for the Passenger Economy.

Mobility-as-a-Service represents the value that will be created by the shift in transportation expenditures by consumers and business from vehicle ownership, taxi use, rental car use and public transport to the use of third-party transportation services based on autonomous vehicles. Mobility-as-a-Service solutions will represent the essential nature of future transportation and open the door to the passenger economy of the future.



Regulation: Traffic congestion, pollution and safety are significant issues for every city in the world. Congestion is bad in emerging and mature markets alike. City governments in Nairobi, Kenya; Delhi, India; Istanbul, Turkey; and São Paulo, Brazil report that congestion is costing residents and businesses in each city millions of dollars *per day* in productivity. The World Bank estimates that over 1.3 million people die in traffic accidents each year. Over 90 percent of those deaths are in emerging markets.

To combat this, local, state and federal governments have their collective thumbs on the scale influencing transportation decision-making through the increased application of tolling and road-use charging and restricting cars from driving on particular streets and neighborhoods either for specified time periods or completely.

- Major metropolitan areas including Stockholm, London, Singapore, Paris and Hamburg are restricting areas from vehicle traffic, taxing private vehicle owners for driving into the city center, or otherwise discouraging or forbidding the use of vehicles within city limits.
- The pressures of mounting traffic congestion and the correlated emissions will drive regulators to include pilotless vehicles as a part of their larger public transportation networks of trains, trams, subways, busses or automated vehicles.

² [United Nations Department of Economic & Social Affairs](#)



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- In the future, public officials and city planners will treat transportation in the same manner as they treat real estate – allocating transportation resources for commercial and personal applications varying by type and time of day and dynamically allocating those resources to suit varying requirements. Some cities may choose to own the vehicle networks not unlike existing public transportation.

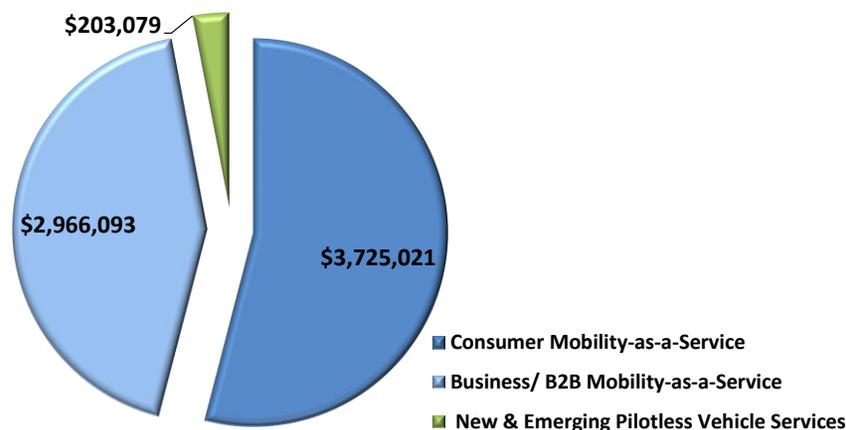
4. Valuing the Passenger Economy

The Passenger Economy represents a global US\$7 trillion opportunity in 2050.

Autonomous driving (AD) technology will enable a new global Passenger Economy worth US\$7 trillion annually in 2050. This economy enabled by autonomous vehicles will drive change across a range of industries, displacing vehicle ownership with Mobility-as-a-Service offerings and defining a new landscape of concierge and taxi services, as well as pilotless vehicle services for businesses in industries like package delivery and long-haul transportation.

In general, consumer and business use of Mobility-as-a-Service propositions are expected to deliver the greatest value since they involve shifts away from vehicle ownership. This is the direct effect of autonomous vehicles converting drivers to passengers. Businesses will be a significant driver of autonomous vehicle sales in the early commercial stages of pilotless vehicle sales.

Passenger Economy: Global Revenue from Services 2050 (US\$, Millions)



Source: Strategy Analytics



Consumer use of Mobility-as-a-Service offerings will account for nearly 55 percent of these revenues, or US\$3.7 trillion. The evolution and mass adoption of Mobility-as-a-Service by consumers is central to the emergence of the Passenger Economy. This is the disruption of the one-to-one coupling of car ownership and personal mobility. Consumers will continue to forgo ownership as they seek out economical, self-directed personal mobility. The range of Mobility-as-a-Service offerings will explode as autonomously operated vehicles become ubiquitous and instantaneously personalized services emerge. Peer-to-peer and networked ride-sharing models of today will be largely displaced by mobility service providers offering mobility for uses ranging from work-related applications or simply enabling movement around urban or suburban areas.



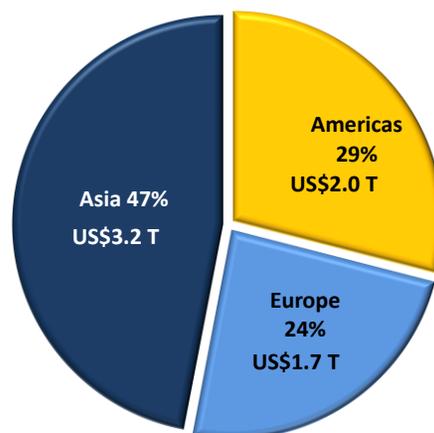
Business use of Mobility-as-a-Service will generate US\$3 trillion in revenues in industries like transportation and freight delivery, sales and service fleets, and a range of medium- and heavy-duty applications in industrial, mining and agriculture, and other production-centric and consumer goods industries. The adoption and use of Mobility-as-a-Service within the transportation industry will be a strong driver of autonomous vehicle and truck sales in the early years of the Passenger Economy. Businesses will make use of light-, medium- and heavy-duty trucks for transportation, delivery, sales and service fleets, and other business class transport vehicles within Mobility-as-a-Service models and other new mobility services. In the transportation market, the impact of these services will be global as it will relieve long-haul driver shortages around the world. Developed markets will drive the early adoption of these services, accounting for two-thirds of these revenues initially.



US\$200 billion in revenues will be generated from rising consumer use of new, innovative applications and services that will emerge as pilotless vehicle services expand and evolve. As commercialization gains steam in 2040-2050, consumers will generate an increasingly large share of value in the Passenger Economy from their adoption and use of innovative new applications and uses cases in a range of service businesses ranging from dining to medical to entertainment. They may involve shifts in business models to more usage based service revenues or to location based services where the service comes to the passenger rather than the passenger going to a specific vendor location. This is already emerging today in the decline of shopping malls as “destinations.”

When we assess the impact of the Passenger Economy on a regional basis, it is our view that developed markets will account for nearly three-quarters of these revenues in the early commercialization stages of pilotless vehicles. In emerging markets, vehicle ownership trends and a lack of infrastructure will throttle early adoption, but regulators’ long-term needs to combat congestion, pollution and safety issues in densely populated cities in this region will also fuel growth. As the market ramps in 2050, emerging markets come to account for larger share of the total. Our estimated allocation of the global US\$7 trillion in revenues in 2050 by region is provided below.

Global Passenger Economy Service Revenues by Region, 2050

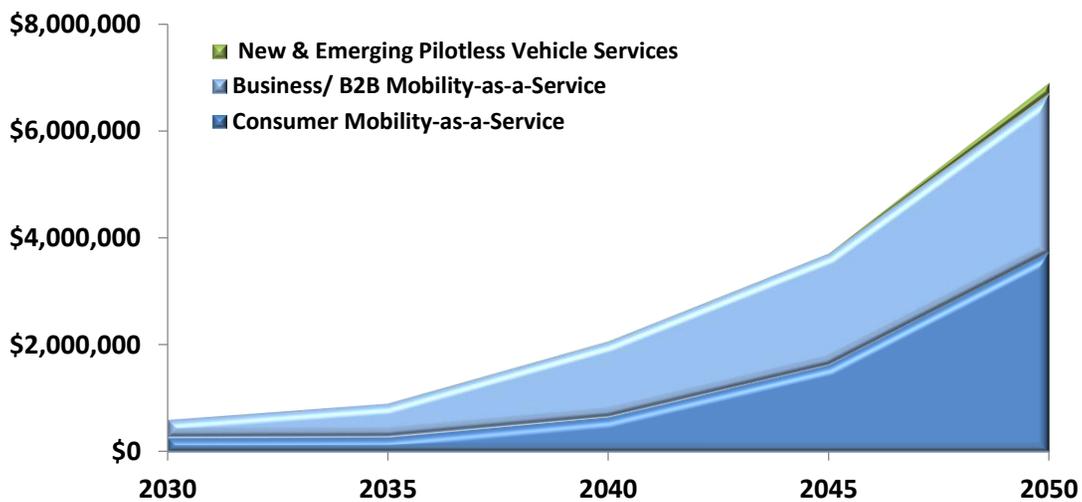


Source: Strategy Analytics

It is important to remember that the use of pilotless vehicles requires a significant paradigm shift on the part of consumers in terms of their perceptions of safety and reliability of the vehicles themselves. The use of pilotless vehicles will also require a major change in consumer views toward vehicle ownership (which are already underway) and a significant change of behaviors toward wider use of Mobility-as-a-Service offerings. The technology to deliver fully autonomous vehicles is developing rapidly but is still a number of years away. And the regulatory and potential infrastructure changes required will happen over the next several generations instead of the next few years.

As these forces collide and evolve over time, they combine to create a “long tail” of services adoption as the early sales of level five pilotless vehicles ramps through 2035. The early opportunity is still significant as momentum builds for early service offerings in the 2030 to 2035 time period, when we estimate the cumulative revenues for the period can reach toward US\$800 billion, as shown below:

Global Passenger Economy Service Revenues 2025-2050 (US\$, Millions)



Source: Strategy Analytics

4.1 Consumer Mobility-as-a-Service

The largest revenue opportunity in the Passenger Economy lies in the use of Mobility-as-a-Service offerings as consumers shift resources away from vehicle ownership. This is the direct effect of autonomous vehicles converting drivers to passengers.

The range of services will evolve from these emerging business models:



- **On-demand transportation:** Consumer and business users will be able to “order” mobility whenever needed. Consumers will order “door-to-door” mobility to move wherever they need to move to and from.
- **Work-commute sharing:** Consumer orders will be aggregated based on routing and timing, allowing users to schedule regular commutes and the network to drive scale by aggregating routes. Users can automatically receive discounts based on the number of rides, or they can pay in advance for miles or minutes or by mode (discounts available for longer-term commitments) to guarantee mobility needs.
- **Carmakers as mobility service providers:** Carmakers will be in the throes of replacing vehicle sales with Mobility-as-a-Service models. These mobility service providers will offer both on-demand and contract or subscription models that offer transportation as an amenity to their core retailing products or services. Over time service, application and content revenue generated by Mobility-as-a-Service will supplant the value of vehicle sales as core sources of shareholder value creation. They will compete with a rising tide of service providers from across a range of consumer industries, including web/internet and retailing powerhouses who offer transportation as amenities of their core product/service offerings. Mobility services will be an element of the value proposition of an office building, apartment complex, university campus or home.
- **Carmakers as transportation network operators:** Carmakers may ultimately vie to operate particular networks of vehicles for particular cities – not unlike cities in China today where local taxi franchises are assigned to particular carmakers (also partially owned by the cities). What is clear is that carmakers will themselves become fleet operators. With electrification, new market participants may challenge existing incumbent car manufacturers for these franchises.
- **Event- or theme-optimized vehicles:** Consumers will be able to avail themselves of mobility service providers that deliver specialized mobility experiences leveraging their core retailing specialties. Specialists will arise in industries like hospitality, touring and leisure, hotels and restaurants, and, of course, media.
- **Transportation as an amenity or compensation:** Condominiums, apartment and hotel chains will have specialized pilotless vehicles as amenities for added convenience. Some employees will have transportation services as a part of their compensation package. In exchange for the service, companies will maintain geo-fence limits on the “pod” while maintaining remote maintenance and service to extend the lifecycle of the investment.

In practice, consumers will be completely uncoupled from the vehicle with the ability to select from a broad range of Mobility-as-a-Service providers to move freely from place to place and vehicle to vehicle when desired. Rather than building new brick-and-mortar locations, land-restricted businesses like retail stores, hotels and restaurants will fuel another wave of business expansion by adding “mobile stores” that deliver their goods and services directly to the consumer. And consumers will now be able to choose to go to a “place” to buy a product or service or they can choose to have that “thing” delivered to their home if and whenever they wish. In short, vehicles will be delivering people and things within a vast array of networked, personalized mobility services.



Family Life Re-Engineered:

The Schmidt family, who lives in the sprawling metro-burbs of Berlin, is preparing to start their day. Nine-year-old son Peter has grabbed his school tablet, which tells him his friends from the neighborhood will be arriving in his driveway in four minutes and 30 seconds in their shared AutoBus. The 20-minute ride to school is filled with last-minute searches for homework and shared multiplayer gaming. The onboard security system provides for video supervision and security lockdown if needed.

The family's older child, daughter Jenny, is heading across town to the Advanced Math & Sciences High School. Her trip takes exactly 30 minutes due to the consistently timely autonomous vehicle network, and it is effectively used most of the time. Onboard, she completes online assignments, updates her music, and stays on top of her busy social connections.

Mr. Schmidt has three meetings during the day and a 7:00 p.m. business flight. His Mobility-as-a-Service provider has scheduled a vehicle for him for the day. His ride arrives promptly at 6:55 a.m. to allow time for luggage storage. Leaving him at his first meeting, the AutoCab retrieves a pre-ordered salad for lunch, picks up his suit at the cleaners, and picks up some toiletries for the trip at the pharmacy, and then returns to pick him up after his meeting. Mr. Schmidt completes his meetings using the travel time between meetings to pay bills, manage bank accounts and schedule a review of gift options for his wife's birthday. By 1:00 p.m., he has eaten the salad, watched a summary update of news personalized for his interests, and taken a 15-minute nap with the side glass digitally darkened. At 5:00 p.m., Mr. Schmidt arrives at the airport. As he leaves, he asks the vehicle to return some documents to his home before returning to the storage facility where AutoCab vehicles are in holding patterns for their next pickup or delivery.

Mrs. Schmidt provides counseling services and often coordinates sessions in parks or the zoo, where many patients can better interact outside of the counsellor's office. Her AutoCab receives an update of her day's schedule and plans routes, timing, and time use for her. Mrs. Schmidt uses the AutoCab as a portable office with its virtual office cloud coordinating her patient records and notes. During her lunch break, her cloud entertainment bot has assembled a summary of her favorite series edited to fit into an allocation of 20 minutes – she pays a subscription premium to skip ads. While she is completing the online paperwork for her patients, the AutoCab adjusts its route to stop by the grocery store where she had placed her online order the previous evening. Mrs. Schmidt, the groceries, and her completed records return home, and the AutoCab returns to the maintenance garage for preventative maintenance overnight after detecting a potential problem and scheduling an appointment.



- **Consumer Ownership:** The average car sits idle 92 percent³ of the time. Accounting for all costs, from fuel to insurance to depreciation, the average German car owner pays US\$8,800 per year.⁴ In the United States, estimates range as high as US\$12,544⁵ per year. Another area of opportunity in autonomous pilotless vehicles for consumer owners is to recover a significant portion of these costs by using vehicle-sharing networks to increase vehicle utilization rates. In the Passenger Economy, vehicle ownership will persist for some time. In emerging markets, for example, where vehicle ownership is still very low, there will be a segment of the rising middle class that will for several more decades seek to satisfy their long-held need for vehicle ownership. Over the long term, this will be a steadily shrinking percentage of pilotless vehicles sold, but nonetheless, there will be opportunities for owners as well as transportation service providers.

Several ownership models that will play out in the Passenger Economy are explored below:

- **Personal vehicle-sharing networks (PVSNs):** In the Passenger Economy, there will be an increasingly small but meaningful segment of the population that will prefer or require ownership of their own vehicles. Some of these vehicle owners will continue to share their personal vehicles via mobility services that are an extension of ride-hailing services seen today, with the goal of increasing utilization and realizing a return on their investment in their autonomous vehicle. In this future vision, vehicles can be linked into the mobility network with their smartphone. The car will be instantly “available for fare” and ready for dispatch. The mobility service provider would take control of the vehicle and dispatch pickup and delivery details. All payment will be automated and the mobility service provider will share fares with the owner exactly as they do today. The vehicle owner will be able to put limits on usage (e.g., distance traveled, times available).

With higher utilization, service and maintenance costs for these consumers are likely to increase. This increase will function as a “utilization ceiling” that will serve as a disincentive for consumers from attempting to reach higher utilization levels. This type of cost benefit analysis will drive consumers to manage their vehicles closely, but overall utilization rates of vehicles within these PVSNs will steadily increase through the Passenger Economy era.

- **Fractional or “Micro” Ownership:** In this case, consumers will forgo ownership of the vehicle and the costs associated with owning it but for a variety of reasons will want to retain some of the advantages of ownership. They will purchase a fractional ownership “share” or “interest” in one (or more) vehicles. This share will come with usage “rights” or “terms” that can vary depending on the consumer’s needs and the vehicle provider’s business priorities or focus. Consumers will buy these fractional or micro shares from a carmaker, for example, and could define vehicle usage or availability based on frequency, time of day, number of miles, or for specific tasks or other time-defined periods (e.g., work commutes, weekends) Individuals, too, will create their own micro-fleets. The consumer will be able to select the type or style of vehicle that they will utilize, and may be able

³ Reinventingparking.org

⁴ Siberia.io PowerPoint presentation at City Car Summit, Berlin 2017

⁵ The Atlantic



to define several different styles or types to meet one or more “uses” as defined in the contract. The vehicle provider would dispatch the vehicle to arrive at the stated contract time and location, and would recall it at the end of each of the defined terms.

The potential number or type of fractional contracts is limited only by the imagination. Consumers will also have variable contracts where they can change their contract terms when their requirements change. Fees would also change accordingly. Consumers will also have premium or exclusive usage terms where they can specify some elevated term as compared to other owners. For example, to “guarantee” availability at certain times of the day or on certain dates, etc.

The temporary nature of this business model will empower consumers to shift from car to car as needs arise and change. These types of ownership models will be popular in both emerging markets, where rising middle class owners can extend their wealth and still enjoy the privileges of ownership when they want, and in mature markets, where owners will be coming down the other side of the cost benefit ladder and will be seeking new ownership models that reduce costs but still meet the need for a vehicle whenever or wherever they may be.

4.2 B2B Mobility-as-a-Service

4.2.1 Transportation-as-a-Service

Transportation companies in many major international markets report that they expect significant shortages over the next several decades for long-haul drivers due to an aging workforce and the lack of qualified new applicants:

- In the U.K., the Road Haulage Association estimates that it was short 60,000 lorry drivers in 2016 and that will grow to 100,000 in 2017;⁶
- In the U.S., the ATA projects that by 2025, the trucking industry will face an acute shortage of over 200,000 qualified drivers;
- Trucking associations in Australia, Canada, Germany, and the United Kingdom all project that aging workforces and lack of new qualified applicants will intensify driver shortages in these countries in the next 10 to 15 years;⁷
- Japan Automobile Manufacturers Association projects that driver shortages will intensify over the next five to 10 years;⁸
- Driver shortages are intensifying in Brazil⁹ and South Africa;¹⁰
- In India, 10 percent of the national truck fleet is currently unused because of a lack of drivers. The shortfall will lead to the need for 17 million more drivers over the next decade.¹¹

⁶ [Road Haulage Association](#)

⁷ [Truckers News & related trucking associations](#)

⁸ [Japan Automobile Manufacturers Association](#)

⁹ [Latin America Herald Tribune](#)

¹⁰ [Barloworld Transport & Road Freight Association](#)



Estimates of the size of the global market for transportation services have it in the range of a \$3 trillion to \$4 trillion industry. The American Trucking Association (ATA) estimates that the U.S. trucking industry alone will generate a staggering US\$1.52 trillion in revenues by 2026.¹²

Pilotless vehicles are widely expected to solve this issue, and in our Passenger Economy scenario, long-haul Transportation-as-a-Service will account for US\$2.6 trillion in revenues, which equates to roughly 50 percent of the global long-haul transportation market globally by 2050.

4.2.2 Local Delivery

Pilotless vehicles will also be used for transport of goods in less-than-truckload (LTL) and parcel carrier service:

- **Distribution Containers:** Trucks or lorries of varying sizes will be customized for carrying and delivering inventory within a certain distance of a fixed distribution center. They will carry high-volume, high-frequency items ordered regularly by consumers with the goal of shortening delivery times to within a few minutes – e.g., Amazon dash buttons for detergent and other non-durable consumer goods. These vehicles could potentially be used in combination with drones for “last-mile” delivery.
- **Delivery pods:** Sedans, delivery vans and small trucks for small order products for local delivery (within 20 miles) that will use autopilot to deliver items as received from their dispatch location after on-loading of products. These vehicles offer several distinct advantages:
 - More cost-efficient (no driver).
 - Can expand business hours for possible delivery (e.g., a florist can deliver goods on Valentine’s Day beyond the normal eight-hour limit of a driver.)
 - May be used in combination with distribution pods/drones as noted above.

It should be noted that pilotless vehicles will likely have a negative impact on the overall employment of drivers in this sector. Drivers in these industries are likely to be displaced in significant numbers. However, it will also create opportunities for transportation companies to utilize the “freed” time of drivers to evolve and enhance their role and impact to the organization. In high-touch and high-turnover routes, drivers will become customer service professionals who can sell and market services and related goods and offerings. Drivers will also transition to become supply chain experts by extending inventory management and order processing. What is clear is that proactive transportation companies should explore these opportunities and plan for the re-training and balancing of their workforces.

¹¹ [International Road Transport Union \(IRU\)](#)

¹² [American Trucking Association](#)



4.3



Emerging New Consumer Services & Applications

The rise of the Passenger Economy will gradually reconfigure entire industries and invent new ones thanks to the time and cognitive surplus it unlocks. A generation ago, for example, the wave of women entering the American workforce led first to two-car households, then to the mass migration of employers from cities to suburbs, and finally to the advent of specialized services such as pizza delivery, video rentals and more. It's reasonable to expect similar changes as the impacts of autonomous vehicle ripple through consumers' decisions of how best to allocate their time, attention and money.

Many of the largest technology and mobility companies are already placing their bets. Taking a few of the most audacious players in turn, we can begin to see how these new services and business models might take shape:

- **Tesla: Solar Suburbs.** Tesla Motors CEO Elon Musk has never been shy about his goals. The company's US\$2 billion acquisition of SolarCity last fall points toward an integrated business model around electric, autonomous mobility. Promising to eliminate the tedium of suburban commuting through true autonomy, Tesla's vision could create new markets in smart home devices and technology, in-vehicle apps, accessories and services (estimated by A.T. Kearney to grow from US\$51 billion in 2020 to US\$298 billion by 2035), and especially real estate, as formerly marginal development sites on the metropolitan fringe become valuable.
- **Amazon: Drop-Shipping Drones.** One of Amazon's more whimsical patents envisions "aerial fulfillment centers" (i.e., blimp-borne warehouses) hovering aloft for months at a time, dispatching drones for deliveries while periodically resupplied by airship. Coupled with Amazon's patent for "anticipatory shipping," one can begin to imagine daily showers of drones delivering paper towels, pet food and laundry detergent to any point within a 100-mile radius. More realistically, OEMs such as Daimler have already begun partnering with drone-makers such as Starship and Matternet to explore autonomous last-mile delivery systems. However these experiments shake out, predictive analytics combined with autonomy represent a sea change in retail as the time savings from untold hours of shopping is redirected through the economy.
- **Alphabet, Waymo and Sidewalk Labs: Programmable Parking.** The early leader in autonomous vehicles, Alphabet (née Google) has since spun out its AV effort (i.e., Waymo) and invested in a smart city subsidiary (i.e., Sidewalk Labs), the latter of which is applying machine vision technology to street signs and parking. Coupling autonomous vehicles with real-time parking availability promises a dramatic decrease in the demand for parking. The economic implications are profound. A reduction in curbside parking would free spaces for higher uses, with corresponding effects on foot traffic and street-level retail. Self-parking cars would also lead to a dramatic decline in surface parking, which would in turn free up land for higher-density redevelopment in urban cores around the world.
- **General Motors and Lyft: Experience Pods.** As part of GM's US\$500 million investment in the ride-hailing service last year, the companies announced ambitious plans to deploy a centralized fleet of shared, electric, autonomous vehicles as early as 2018. (Lyft predicts AVs will provide the majority of its rides by 2020.) Lyft creative director Jesse McMillin envisions themed "experience pods" offering on-board beauty salons or touchscreen tables for remote collaboration will quickly be introduced alongside conventional



vehicles. Extrapolating from the idea that mature autonomous vehicles are mobile, programmable rooms, one can begin to imagine a raft of new commercial services, including dining (from fast-casual commuting to remote vending), healthcare (mobile clinic and treatments), hospitality (pod hotels), and retailing.

- **Hi-Tech Robotic Systemz: More Experience Pods.** Based in India, Hi-Tech Robotic Systemz is representative of a growing number of companies around the world that are developing autonomous pods to deliver specific services and applications to the public and private sector. The company aims to provide autonomous pods to hospitals, parks and recreation facilities, and university campuses for pilotless vehicle applications. They also create autonomous technology for cargo pods and other assistive systems.
- **2gettohere: Automated transit networks.** 2gettohere is working with municipalities in Europe and the Middle East to develop advanced, automated transit networks. The company is working with authorities in Abu Dhabi to develop a 2.5 kilometer guided network between Nakheel Harbor and Bluewaters Island. The driverless busses will run 20 hours per day and be able to carry 2,500 passengers per hour in each direction.

Work & Personal Life “On the Go”:

Miguel wakes up to another foggy morning in Cordoba, Argentina. Some things never change, he tells himself. What has changed, he learns as he dresses, is that his uncle will be arriving in Buenos Aires, 700 km away, at around 9:00 p.m. Does he have time for a late dinner and catch-up? Not great timing, what with his Ph.D. thesis due in imminently. A few short voice commands later, and it's all sorted. He schedules his regular AutoCab, which will allow him time to work on the way there, and a Sleep-Cab for the return trip will allow them both plenty of time to rest, even if dinner turns into dinner and a few drinks. The low overnight rates mean they can comfortably snooze all night in the Sleep-Cab, before it gently awakes him in the morning outside of his apartment.

4.4



Emerging New B2B Applications & Services

In the Passenger Economy, there will be significant changes in vehicle distribution, sales and service networks. Combined with electrification, the converging trends will force new car dealers into fleet operations managers and support infrastructure with consumers ordering cars directly online and dealers delivering new and replacement vehicles to consumers.

Businesses will use pilotless vehicles to extend the availability of their services by adding mobile “pods” as additional business locations. These vehicles or pods will be heavily customized to deliver a specific customer experience. The businesses most likely to develop and offer these commercial pods are:



1. Businesses that have historically grown or scaled their business by increasing the number of locations: e.g., fast food (McDonalds, etc.), coffee shops (Starbucks, etc.), and convenience stores. Mobile versions of their brick-and-mortar businesses will be made available to consumers across metropolitan markets.
2. Businesses that can significantly lower their own operating costs by having their products and services distributed more closely to or via remote connection with the end consumer location. E.g., brick-and-mortar retailers like consumer goods, grocery and convenience items, fast food and mid-market restaurants, motels, and kiosk operators.

This business fleet expansion in conjunction with the strong growth in pilotless service vehicles will create an explosion in the need for fleet management, service and storage facilities.

- **Pod fleet management services:** Service maintenance and repairs for pod fleets.
- **Fleet recharging facilities and services:** This refers to services for electrified fleets, which will be a large percentage of the vehicles. It is possible that some of this value is integrated into smart grids as additional capacity.
- **Dispatch and distribution service management:** Fleet management companies will extend their services to managing fleets of autonomous service pods.
- **Custom Fleet Storage Lakes:** Physical lots, buildings or even larger “mother-ship” vehicles where custom pods can temporarily park, restock, recharge/refuel. Could be owned by fleet owners, independent third parties or various other businesses with space (e.g., trucking companies, distribution centers, auto OEM manufacturing plants.)

Delivering consumer Mobility-as-a-Service and business use of dedicated vehicles will require pilotless vehicles (both cars and trucks) to run at much higher utilization rates. It is easy to envision an electric Uber delivering people and goods on a nearly around-the-clock-schedule as needed. It is also realistic to expect that trucks transporting goods between distribution centers and retail outlets will be able to run on an almost 24 hours a day, seven days a week schedule. These high-utilization rates will spawn a very active secondary market for used pilotless vehicles as companies replace and refresh their fleets.

4.5



Metrics of Social Benefits

4.5.1 Time Surplus – Driver Freedom

Whether commuting to work or traveling for other reasons, consumers in large metropolitan cities typically spend as much as an hour per day driving a vehicle:



Average Commute Time per Day by City¹³

City/Country	Minutes
Negev, Israel	54.3
Manila, Philippines	45.5
London, United Kingdom	41.2
Jakarta, Indonesia	42.1
New York, USA	38.7
Rio de Janeiro, Brazil	38.4

In very large cities like Beijing or Shanghai, commute times are even longer due to many commuters living in provinces and suburbs due to the high cost of living in these cities.

When you consider the time beyond work that consumers are driving, the numbers increase:

- Britons report driving more than 10 hours per week, an average of 85 minutes per day.¹⁴ This equates to three full years over a working lifetime;
- In the U.S., when including the time spent driving for personal reasons, the average total time consumers spent driving rises to 46 minutes.¹⁵ Drivers who live in rural areas report driving 20 percent more per day.

On average, most commuters spend more than 30 minutes¹⁶ in the car every workday. If we assume a conservative 300 million workers (less than 10 percent of all workers globally¹⁷) drive to work an average of 30 minutes per day, this equates to over 60 billion hours per year of time spent driving that could be freed due to pilotless vehicles.

In the new Passenger Economy former drivers now passengers will find themselves with significant amounts of freed time as a result of no longer needing to drive. Whether commuting to work or traveling for other reasons, consumers will embrace their favorite online and connected activities, e.g., social networking, checking email and video streaming. 5G connectivity will offer new connected service models as internet usage time in-vehicles becomes significant relative to in-home use.

Pilotless vehicles will also snuff out the safety concerns that have throttled the use of rich media services in the vehicle. The enhanced safety offered by pilotless vehicles will enable the vehicle to finally become a media and entertainment hub. The number of screens in vehicles will expand, and the use of heads-up displays for rich media and other content presentation and viewing will grow steadily. Media and content producers will develop custom content formats for short or long travel times. Location-based advertising will become keenly more relevant and, in pilotless vehicles, will offer advertisers and agencies a new realm of possibilities for presenting content brands.

¹³ [Waze](#)

¹⁴ [Sheila's Wheels Car Insurance](#)

¹⁵ [AAA Foundation for Traffic Safety](#)

¹⁶ [PCI Global Telework Survey 2015](#)

¹⁷ [World Bank](#)



Being comfortable with a pilotless vehicle, enough to take your attention off the road with all of its inherent concerns and dangers, is not a concept that most consumers are comfortable with today. Studies¹⁸ have highlighted this issue. For this vision of the Passenger Economy to truly arrive, consumers' perceptions of autonomous vehicles will need to evolve to where they believe and embrace as fact that these vehicles are 100 percent safe. To enable this, technology vendors will need to complete billions of miles of testing and deliver a string of commercial solutions that proves vehicle safety and reliability. In addition, regulators will need to enact legislation that supports and perpetuates the place of pilotless vehicles on roads and highways around the world. With these enablers in place, consumers will be the last and most important piece. Their perceptions and behaviors will evolve and change, but it will take time. It is a generational type of change that will take decades to come to full benefit, but it will come.

Lunch & a VR Movie

Mr. Jones Sr. is heading out for lunch with his friends. Now 85 years old, he notes with satisfaction that his AutoCab's flexible interior has automatically reconfigured itself to accommodate his power chair. As he boards the vehicle, it informs him that the journey will be leisurely. His friends are running late, and his stored personal preferences are that he would prefer to arrive with everyone else rather than wait at the restaurant on his own.

The AutoCab reassures him that it has, of course, informed the restaurant of their short delay. Never mind, he thinks – more time for some retro-gaming. He was quite the Half-Life ace back in the day. With the fully re-mastered graphics shown in full 360-degree holo-projection on the now darkened vehicle interior, he settles into his game. He thinks: How did we cope with those clunky VR headsets of 35 years ago? A discrete chime from the AutoCab brings him back to reality; he'd forgotten that he'd booked a video consultation with his physician. A few minutes later, he's a happy man. His cholesterol levels have responded very well to treatment. He will be having dessert today.

4.5.2 Time Surplus – Increased Productivity

For businesses in the transportation and delivery industry, pilotless vehicles will offer an opportunity to redefine the role of the driver. In local and less-than-truckload delivery networks, this freed time will allow drivers to take on new roles in a number of potential areas, including inventory and supply chain management and customer service. Rather than waiting to return to the office or hub to process paperwork, these former drivers, via 5G services, can spend this freed time managing inventory, entering and filling orders, planning and managing pickups and route changes, and doing other logistics tasks and a host of other potential operational and sales roles.

¹⁸ [Michigan Transportation Research Institute](#)



Transportation companies will also see improved productivity on their routes and overall revenue per load. Autonomous trucks will be able to deliver freight 24 hours a day, seven days a week. This will allow companies to maximize their rate of return when transporting goods between distribution hubs, for example, or to ship raw materials to manufacturing plants.

4.5.3 Reducing Congestion & Fatalities – Enormous Potential Savings in Lives, Time & Costs

Another great promise of pilotless vehicles resides in their potential to reduce traffic fatalities, accidents, and congestion.

- **Traffic Fatalities:** In terms of traffic fatalities, the potential impact of pilotless vehicles speaks for itself in the statistics. Approximately 1.3 million people die in car accidents per year around the world,¹⁹ with 10 countries accounting for nearly half of all road deaths. Overall, India is responsible for the highest number of road deaths, followed by China and the U.S. Developing countries have less than half of the world's vehicles but account for more than 90 percent of the total number of road traffic deaths. Poorly maintained roads and a lack of traffic safety resources are the major drivers.²⁰

Ninety-four percent of all accidents are due to human error.²¹ If we conservatively assume that just 5 percent of these accidents are avoided in the decade from 2035 to 2045 due to pilotless vehicles, 585,000 lives will be saved during that time.

- **Traffic Accidents:** The World Health Organization estimates that governments around the world spend 3 percent of gross domestic product on costs related to these accidents.²² Using projected estimates for 2017, this means that roughly US\$2.3 trillion will be spent this year globally to deal with traffic accidents. The potential savings here are staggering but should be kept in perspective. Pilotless vehicles will not be able to prevent all of these accidents, since it will take time for vehicles to be widely used, especially in some of the more rural markets where accident rates are highest. Still, if pilotless vehicles can eliminate just 1 percent of this total each year from 2035 to 2045, US\$234 billion could be saved during that decade, and be channeled for use in addressing other pressing economic or social issues.
- **Traffic Congestion:** In terms of congestion, Inrix published a study in 2008 that found that a 3 percent reduction in miles driven equates to a 30 percent reduction in traffic congestion.²³ This is one of the long-held great promises of autonomous vehicles. Pilotless vehicles' ability to access current traffic data and change the route of the vehicle to avoid heavy traffic or congestion will clearly reduce congestion. Vehicles will be able to "swarm" using crowd-sourced traffic data to optimize their route to avoid congestion, construction or special events. Furthermore, pilotless cars will have designated routes or even "standby" locations that reduce congestion that arises from the search for parking.

¹⁹ [World Health Organization](#)

²⁰ [WorldAtlas](#)

²¹ [US National Highway Traffic Safety Administration](#)

²² [World Health Organization](#)

²³ [Inrix](#)



Other factors like taxes and regulatory limits will also have an impact in reducing congestion, so it is challenging to attribute a specific reduction in congestion that will be created just by autonomous vehicles. But we can get a sense of the impact by using this 3 percent estimate for a city like Shanghai, which ranks as the 22nd most congested city in the world on TomTom's Traffic Congestion Index.²⁴ The typical commuter making their way into the city during peak hours spends on average an extra 46 minutes per day in his vehicle due to congestion, or 176 hours per year. If pilotless vehicles can reduce that time by 3 percent, it equates to a little over five hours per year saved per driver. If we conservatively estimate that 1 million of the projected daily 7 million vehicle trips into and out of the city²⁵ happen during this time, than pilotless vehicles stand to save passengers a total of 5 million hours of travel time.

Multiplying the potential impact across the top 50 most congested markets (Shanghai falls almost in the middle ranked at number 22, near median), and using the same estimate of time saved and the number of trips into the city, equates to 250 million hours of time saved per year from pilotless vehicles just from reduced traffic congestion.

²⁴ [TomTom Traffic Congestion Index](#)

²⁵ [LSE Cities](#)



5. Conclusions & Key Questions

The emergence of the Passenger Economy marks the greatest transition in human mobility since humans left their horses for a new relationship with the horseless carriage. The elimination of the need for a driver shifts human transportation behaviors freeing time while improving the safety and economics of the mobility experience.

The emergence of the Passenger Economy is a catalyst that will alter the nature of the businesses competing in this new ecosystem of mobility services. Specifically, there are five dimensions or questions for companies that seek to compete and win in this opportunity:

5.1 Where Are the Biggest Value-Added Opportunities for My Company?

With the advent of Mobility-as-a-Service, the real source of value is in the services app, effective relationship building and management, and the advanced analytics that will personalize the experience for the passenger. The product becomes a function of the relationship and how well the services enhance the passenger experience. The process of actually moving the passenger becomes more commodity-like, with fewer opportunities for differentiation that will be dominated by a few market-defining brands. Winners will ultimately be relationship management experts responsible for delivering value to the passenger and for capturing, cultivating and expanding the customer relationship.

5.2 What Level of IT Intensity Will Impact My Business?

From a financial perspective, the emergence of the Passenger Economy will result in increasing IT intensity for businesses competing in this market. The IT intensity measured by looking at IT expenditures per dollar of revenue will accelerate upward moving from a range of 3 to 5 percent for many firms today to nearly double those levels. The prevalence and use of cloud services and advanced predictive analytics will increase to provide efficient and effective dispatch, transport and CRM to support relationships. The need for robust, redundant and secure technical solutions to ensure fleet reliability will increase IT intensity as well when companies seek to provide predictive maintenance, predictive dispatch, and dynamic fleet deployment to optimize availability and asset utilization.

5.3 What Role for Data?

The evolution of Mobility-as-a-Service companies in the Passenger Economy will create businesses that are all about the data. In the Passenger Economy, data will be fundamental to the delivery and use of services. The critical success factors for ride-sharing businesses today, reside in the data managing the fleet deployment, creating a responsive user experience, building loyalty through customer satisfaction, and enhancing relationships through CRM and direct marketing. The strength of the bond between customer and service provider will be critical in maintaining and building competitive positions in this dynamic ecosystem. Data analytics, predictive analytics, and system optimization become important competitive factors in this new industry.



5.4 How Should I Think About Security?

The scope and detail of the data contained by Mobility-as-a-Service offerings in the Passenger Economy will be at a level that is unprecedented. The “who, what, where and when” of our lives will be captured and stored. The points of entry will cover our smartphones, our vehicles, our credit cards, and potentially a number of sensor inputs tied to personal security and biometrics. Firms without rigorous data security measures and vigilance will quickly face consumer and regulatory backlash. Transactional architectures, encryption, and multilevel access requirements will be needed to address the aggressive actions to hack and acquire this sensitive information.

5.5 How Will This Impact My Labor Force?

While IT intensity rises in the Passenger Economy, labor intensity (in terms of dollars of labor expenditure per dollar of revenue) will fall. Automation technology will inevitably replace some jobs resulting in operational efficiencies. The labor at the customer-facing front end will be dramatically reduced as drivers are replaced in passenger vehicles as well as trucks where physical offloading is not required by the driver. In the back end of the process, the labor requirements will also significantly change as the product itself becomes an IT flow. The jobs eliminated in the front end will be larger in number but with a lower average cost per employee. The jobs in the back end will be relatively high in terms of cost per employee but smaller in number with the addition of more data specialists including data architects, data scientists, and support for operational analytics.

Given that drivers' positions have historically been entry-level in the case of taxi drivers or requiring lower educational requirements in the case of long-haul drivers, the elimination of these jobs over time will create potential labor problems. Likewise, given the academic requirements for the new generation of data analytics jobs, labor shortages are likely causing rising costs. The transition to a Passenger Economy will require an elapsed time of one to two generations of workers, which may allow some time for labor force adjustment. Ultimately, jobs that require humans to drive, and load and unload cargo, will be replaced by robotics where economically feasible.

There is also potential to absorb workers with lower tech education skills with some retraining in two service sectors created by the Passenger Economy:

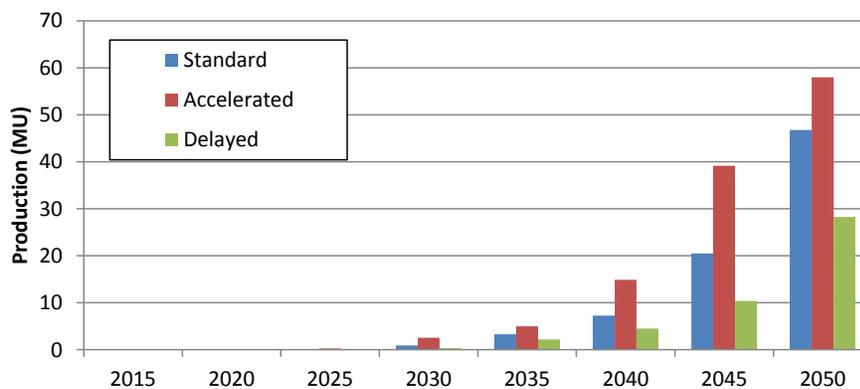
- **Fleet Maintenance** – The complexity of vehicle on-board systems, the need for well-maintained sensor systems, and the high utilization rates of vehicles will open up new opportunities for vehicle diagnostic solutions and vehicle maintenance. This area will require tech training as well as mechanical knowledge but should be a source of new jobs for displaced drivers.
- **Vehicle Refurbishing and Recycling** – High utilization of vehicles combined with the need for high vehicle reliability means that Mobility-as-a-Service companies are unlikely to keep vehicles in service beyond an optimal number of miles of use. Given an overall lower interest in private vehicle ownership, the Mobility-as-a-Service industry will need to develop new options for platform refurbishing and component recycling. With billions of vehicles in use, business opportunities to address these sustainability issues as well as the related labor requirements should develop.

6. Methodology

Strategy Analytics created these forecasts with a goal of providing industry players with high-level insights into where the value is likely to be generated within the Passenger Economy, what new opportunities will develop because of pilotless vehicles, and how it may impact different users, businesses, and markets. As anyone who has prepared a forecast can attest, it is extremely challenging to project adoption, utilization, prices and other necessary metrics needed to estimate the adoption of any service or product decades in the future. Our goal is to provide a framework for evaluating and discussing the potential opportunity and how it might evolve in one particular scenario, using the approach outlined below:

- Autonomous Vehicles: [Strategy Analytics Autonomous Vehicles Service](#) sales forecasts (shown below) are the underlying base forecast. These forecasts were published in 2016 by Strategy Analytics, separately from this report.

Global Production Scenarios: Level 5 Vehicles through 2050 (Millions)



Source: [Strategy Analytics Autonomous Vehicles Service](#)

- Passenger Economy Timeline and Units: The forecasts provide revenue estimates from 2025 through to the year 2050. All projections reflect annual totals from the year 2050 unless otherwise defined.
- Revenue Categories: These scenarios are based on the segmentation of pilotless vehicle sales units into consumer and B2B segments. Building from these vehicle forecasts, Strategy Analytics then developed a forecast of service adoption for each of three categories, Consumer Mobility-as-a-Service, B2B Mobility-as-a-Service, and New Emerging Applications (for both consumer and business segments).
- Services Revenues: These forecasts only estimate service revenues generated from consumer and business use of pilotless vehicles. They do not include vehicle and equipment sales, or the sales of technology or technology services that may be provided in these vehicles.



- Consumer Mobility-as-a-Service (section 4.1): As noted above, Strategy Analytics created a projection for the share of total global sales of level five autonomous vehicles to consumers and the corresponding number of vehicles in the installed base. From this baseline, we developed use cases for the adoption of Mobility-as-a-Service offerings in three categories: ride-hailing and peer-to-peer services, networked car-sharing and fractional ownership, and direct ownership. For ride-hailing and peer-to-peer services, and ownership car-sharing, we developed fundamental estimates for the usage elements of each service: size of the vehicle installed base for each application, the frequency of use, the utilization rate and mileage per day, the number of fares, and the average fare price being the main drivers. For networked car-sharing and fractional ownership, we established baseline estimates for the size of the installed base of vehicles, the number of annual users, and projected average fees.
- B2B Mobility-as-a-Service (section 4.2): For simplicity, we assumed B2B services would rely on two basic classes of pilotless vehicles: sedans and light-duty vehicles, and medium- and heavy-duty vehicles, including Class 8 trucks. The former were derived as a share of total global vehicle sales (relative to consumer sales) from the existing forecasts noted above. We created new forecasts of medium class (MCL) and heavy-duty class (HCL) and Class 8 vehicles for this report. From these vehicle sales forecasts we built projections for the size of the installed base of each of the following segments:
 - Sedans and light-duty vehicles were segmented into four use cases: taxi/rental, field force fleets, light-duty delivery and personalized pods.
 - MCL and HCL and Class 8 trucks were segmented into two segments: MCL and HCL/Class 8.

We then segmented the sedans and light-duty vehicle segment, MCL, and HCL/Class 8 segments based on services that would utilize each vehicle class, as outlined below:

- Autonomous local parcel delivery and less than truckload delivery: For this application, we used industry sources to estimate the number of parcels, price per parcel and metrics related to vehicle use.
- Over-the-road or long-haul trucking services: Due to the lack of consistent global metrics, we estimated the size of the market assuming the U.S. market for transportation services accounts for approximately 35 percent of the global transportation services market. We then worked back to check metrics such as revenue per container to ensure our estimates were realistic.
- Emerging New Consumer Applications (section 4.3): We segmented the market into eight basic application categories, as listed below. We then segmented the unit sales volumes of B2B sedan and light vehicles into nine categories (counting the local parcel delivery and less than truckload segment mentioned above). We created projections for the growth of the installed base of each specialized vehicle or “pod,” and then created revenues utilizing existing metrics from each industry to build service revenue estimates. Some of these metrics include the average spend, the frequency of use, average prices or fees, and other available metrics as available.
 - Health and Wellness
 - Leisure Travel and Tourism
 - Hotel and Hospitality
 - Retailing
 - Dining and Restaurant



-
- Priority Services (tolls, parking, etc.)
 - Location-based Advertising
 - Conferencing/Meeting facilities
 - Other
- Emerging New B2B Applications (section 4.4): We did not attempt to quantify these services in our forecasts.
 - Metrics of Social Benefit (section 4.5): The methodology used to derive all of the estimates of economic or social benefit is explained in section 4.5 with each example.



7. How Can We Help You?

Strategy Analytics provides strategic and tactical support to global clients through a range of customized solutions:

- Multi-country [primary research](#) assignments using leading-edge tools and techniques
- [User experience](#) design and innovation engagements
- Real-time mobile consumer [on-device tracking](#) projects
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Please contact us at Custom@strategyanalytics.com with any questions and for further details and solutions on how we can work with you on creating a custom solution to address your specific needs.