
Who needs to own a car?

Changing mobility needs and their impact on the automotive industry

The trends shaping tomorrow's auto industry

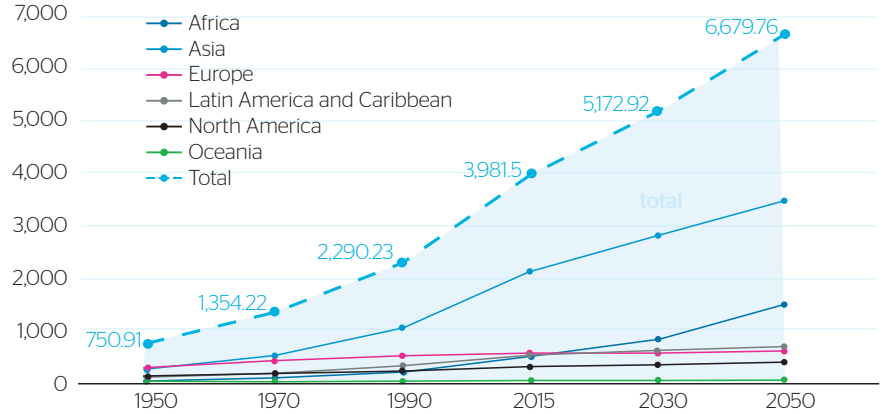
The automotive industry is experiencing one of the most disruptive periods of re-invention since 1886, when Carl Benz filed a patent for what is considered to be the first example of a production automobile.

Mass adoption of cars, motorcycles, trucks and buses have revolutionized society over the last 150 years, enabling major societal advances in both a personal and corporate context. As the mass production of vehicles became a reality, vehicle ownership evolved from a status symbol to a perceived right. As a consequence, society embraced the convenience and opportunity to travel that automobiles offer.

We are at the beginning of the next wave of evolution in the automotive industry.

Urbanization across the globe has continued to accelerate over the last century due to the shift to industrialized and service-based economies. While history has largely been characterized by populations living in low density rural locations, this trend has been reversed, particularly in the last few decades. The UN estimates that 2007 marked the inflection point when the number of people in urban areas surpassed those living in rural areas globally – and major increases in urbanization are expected to continue over the next thirty years¹.

Number of people living in urban areas in millions



Note: Worldwide The values for 2030 and 2050 are projections
Source (s): UN DESA; OECD; Arthur D, Little; United Nations

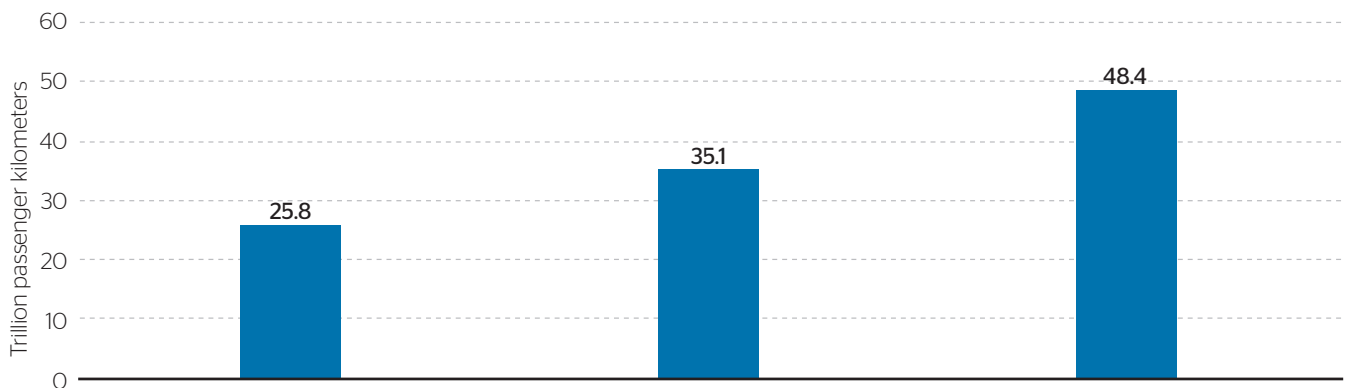
Why is this relevant for the automotive industry?

As demographic changes have occurred in the last fifty years, people's mobility needs changed and their requirements for automobiles have risen. During the latter decades of the twentieth century across the developed world, urbanization drove concepts such as business parks, out-of-town shopping and greater relocation of working age adults – creating an undeniable need for the flexible and convenient mobility that cars offer. Similarly, developing countries have adopted cars, motorcycles and other modes of personal transportation to meet their increasing mobility requirements as their economies grow.

But society is changing again...

Across western and other developed economies across the globe, technology is rapidly erasing the geographical divide between "home" and "work," a steady trend that has accelerated over the last ten years to more flexible working patterns that are beginning to erode the traditional concept of commuting. The rise of e-Commerce and store-to-door delivery has eliminated the need for many shopping trips – with many consumers preferring convenience over choice.

Urban mobility demand, 2010-2050



Source: Arthur D. Little; The Future of Urban Mobility 3.0, p.9

Society's understanding of environmental and sustainability issues has also changed radically in the last twenty years. As research has emerged and education on manufacturing's impacts on global warming, climate change, fossil fuel usage and natural resource consumption has become more accessible, people are more aware of their personal impact upon the planet. As a consequence, limiting the environmental impacts of travel is now a conscious consideration for many people in their personal and professional lives.

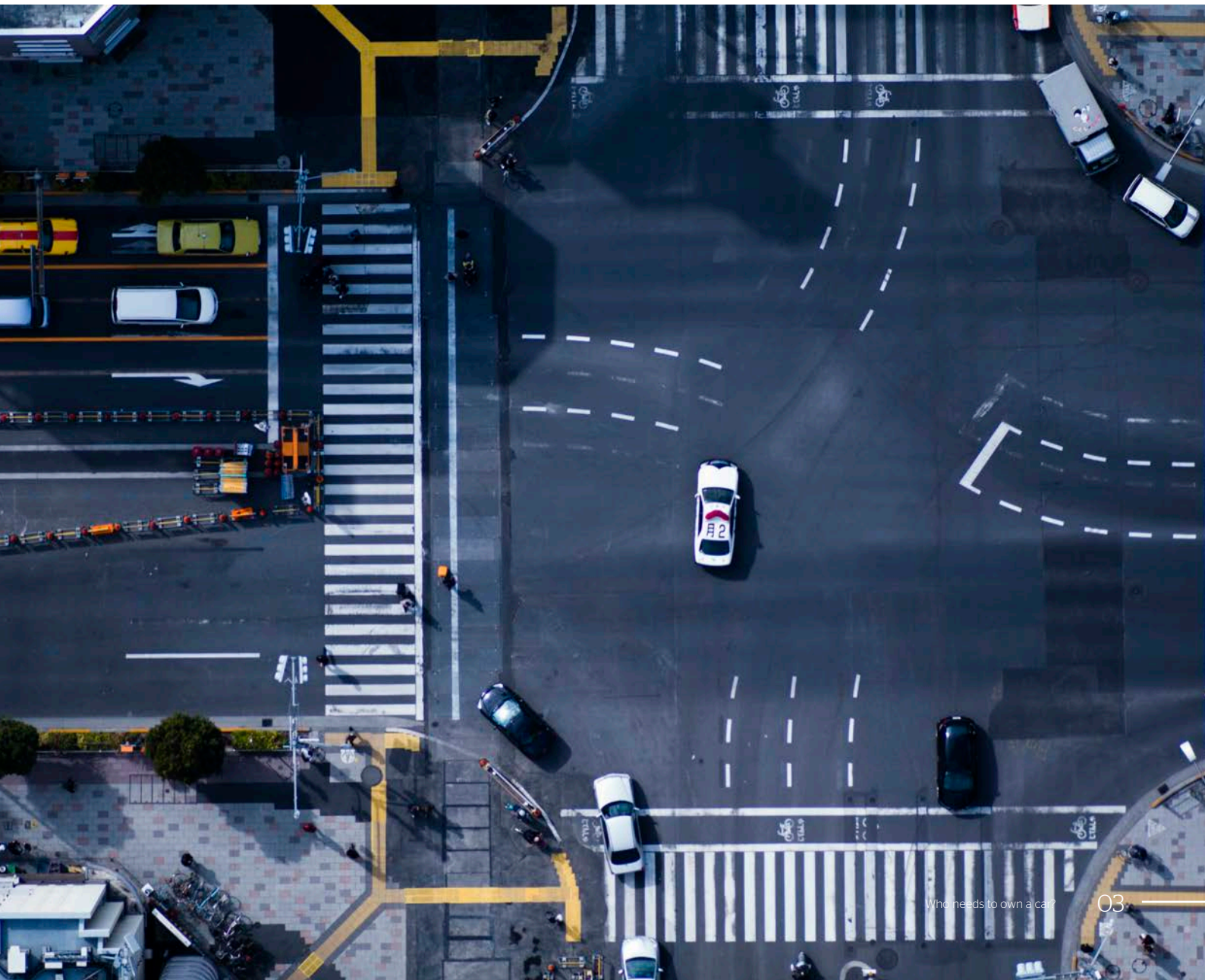
In the future, the public will increasingly ask “Do I want to travel” and “Do I need to travel?”

Finally, the emergence of the global COVID-19 pandemic has had a profound impact on lives across the globe. The need to socially distance, work from home and protect loved ones and others has affected both the desire and the ability to travel. While it is unlikely that current travel restrictions imposed by governments around the world will remain permanent after a vaccine is found, the reality is that perceptions and attitudes towards travel have changed, perhaps irrevocably.

In the future, the general public will increasingly ask the questions “*Do I want to travel?*” and “*Do I need to travel?*”

However, this transformation cannot be seen as a universal truth. For developing markets in Africa, Asia and some parts of South America, access to vehicles remains essential – particularly where mass transportation is not practical for geographical reasons and large rural economies continue to be the norm.

Therefore, what is evident is that the automotive industry will continue to face a complex tapestry of demands from customers for the foreseeable future, largely driven by the varying speed of transformation across different global markets.



The implications for auto manufacturers

Disruption” is the watchword for today’s manufacturing industry, as the delicate balance between supply and demand has become even more critical.

Demand for new cars in the European Union has been falling steadily since 2017, forcing the car industry to cut back production in order not to overproduce. Researchers predict an ongoing decline in the number of vehicles produced in the EU in 2020, with a forecast of 12 million vehicles being built. Compared with the 15.8 million vehicles produced in 2019, this represents a 24% net reduction in car production. This drop is reflected in auto manufacturer revenue and profits, and cannot be purely attributed to the impact of COVID-19.

At the same time, manufacturers are grappling with supply challenges. The total production capacity of car factories in Europe has remained unchanged at 19 million vehicles per year since 2017. This means that auto factories will only need to work at 63% capacity in 2020 to meet demand. In 2019, capacity utilization was at 83% and the previous year it was as high as 88%. Consequently, excess production capacity will remain a large balance sheet challenge for manufacturers.

Manufacturers must address issues of overcapacity as part of a new offering to customers.

However, excess capacity is not a simple equation. Quite simply, manufacturers are also burdened by having the “right capacity in the wrong location.” Regional demand for vehicles will also put additional financial pressure on manufacturers as they struggle to balance the increasing need for production capacity in Asia alongside (or instead of) their existing production locations.

Asian automotive markets have also suffered from the impact of COVID-19, but most industry predictions agree that stimulus measures such as tax incentives, subsidies and a relaxation of registration restrictions will continue to fuel growth, particularly in China.

So, what do manufacturers do? Should they keep existing production capacity and accept the cost burden of exports to other growth regions, or fund new production capacity at the expense of job losses and plant closures in underperforming regions?

In reality, there is only one realistic course of action for manufacturers. In a recent study, Dr. Ferdinand Dudenhöffer from the Centre for Automotive Research (CAR) makes specific reference to the anticipated overcapacity of almost seven million vehicles in Europe, stating that “If no capacity adjustments are made, car manufacturers will be sitting on very high cost blocks.”

Dudenhöffer considers it extremely unrealistic to maintain the current situation in the long term, because automotive companies “cannot afford long, high periods of losses in a highly competitive automotive market.”

He cites BMW’s €1.17 billion decline in the first half of 2020, as the Bavarian car manufacturer recorded considerable losses in the pure car business.²

BMW is not alone in facing these commercial headwinds. VW, Audi and Mercedes-Benz also posted significant declines in Q2 2020 as demand and production came to an almost complete standstill for weeks during the start of COVID-19 pandemic. However, BMW was in a slightly better position overall in the first half of the year. While BMW still managed to turn a €362 million profit, Volkswagen Group and Daimler Group posted losses of €1.0 billion and €1.9 billion, respectively. Part of the reason for the VW and Daimler losses was the impact of the COVID crisis on their commercial vehicle businesses as demand plummeted.

Therefore, it appears inevitable that major job losses will occur across the automotive industry as manufacturers move to re-align and transform their existing businesses. Dudenhöffer expects cuts of 100,000 jobs through capacity adjustments in Germany alone.³

With around 830,000 employees in the sector⁴, this would correspond to a job loss of 12%.

The manufacturer landscape will inevitably change as they adapt to changing market requirements.

Similarly, ongoing mergers and acquisitions will be the norm as manufacturers seek to capture remaining demand across the globe. Evidence of this is clear from PSA Groupe’s recent announcement of a merger with Fiat Chrysler Automobiles to create the Stellantis Group, which would become the fourth largest automotive group in the world.

Still, over-capacity and COVID are not the only reasons for the challenges in the industry. Another factor that has influenced demand in the market has been the ongoing focus on product quality over the last twenty years. Advances in manufacturing practices and techniques such as additive manufacturing, raw materials, technological advances in quality control and increased competition from new entrants has also affected consumer demand. Vehicles have become more reliable, have longer lifespans and typically require less regular maintenance and servicing than previous generations of vehicles.

For example, Tesla is leveraging an innovative additive manufacturing technology for the Model Y’s underbody, decreasing the number of components needed by 97%, thus becoming more independent of suppliers, reducing supplier contacts and the related risks.⁵



Many opportunities exist

Many dire predictions of the decline and death of the automotive industry exist in the popular press today. However, despite this pessimism, Atos sees this period of change as a major opportunity for **business reinvention**.

New markets will undoubtedly emerge, both geographically and from a product segment perspective. As an example, PWC⁶ predicts that vehicle stock in China will increase by over 50% by 2030 as local populations continue to experience the social improvements and wealth generation opportunities that Western countries experienced in the last thirty years.

Similarly, the last two years have seen explosive growth in electric vehicles – largely fuelled by success of disruptive new entrants like Tesla – which demonstrates that mobility is still a basic requirement for many people.

More and more localities are committing themselves to regulate the sales of zero-emission vehicles. Among those are China and the state of California, both of which have taken bold steps to encourage the development and sale of electric vehicles in the coming decades.

Therefore, while mass adoption and vehicle ownership were the primary industry drivers in the twentieth century, we are now clearly pivoting as a society, embracing responsible mobility as we all adapt to our ongoing transport needs.

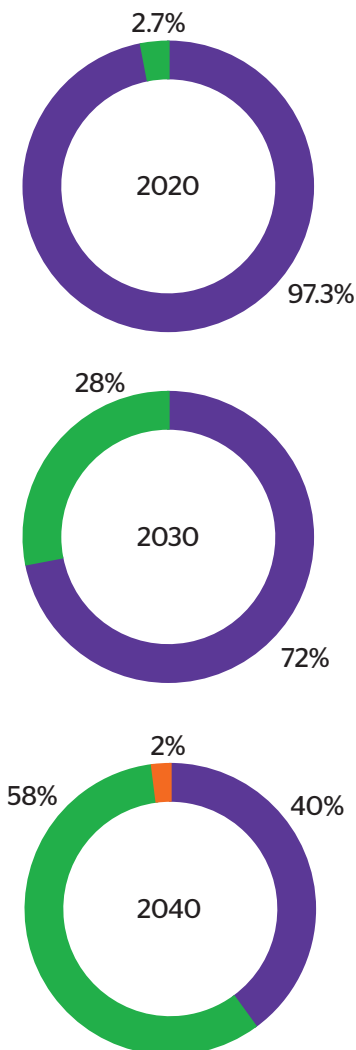
At the heart of responsible mobility is the notion of individual purpose and preference, providing a safe, secure and sustainable solution to the constantly changing mobility and transport needs of the customer.

While this may seem at odds with automakers' legacy mindset of mass production and "limited sizes fit all," **more flexible and individually tailored mobility solutions will heavily influence the direction of the automotive industry.**

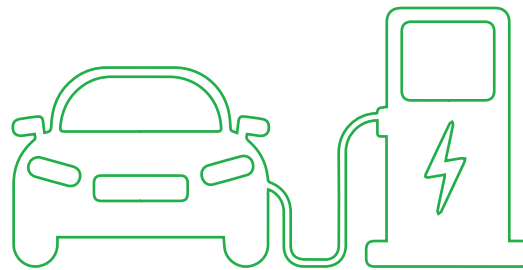
Older generations grew up with the notion of car ownership and its association with social status, while younger generations no longer attach as much importance to owning a vehicle given their differing principles and motivations.

Similarly, much has been made of the changing needs of urban dwellers – where owning a car can be as much a burden as a benefit. Congested city streets make travel difficult and slow. Parking facilities are limited, and finding a convenient parking space is time-consuming, expensive and frustrating.

Projected percent composition of passenger vehicles in China over the next two decades



- Internal Combustion
- Electric
- Fuel cell



This situation has created demand for new types of transportation, especially for short distances in urban areas. For example, the success of three major e-Scooter brands in Germany since July 2019 shows that there is significant demand for convenient, readily-available transportation that eliminates worries about ownership, maintenance, or the need to finding a parking spot. Many have turned to public transportation, yet situations remain where this is not a viable option – for example, when transporting heavy goods, traveling to locations not well served by mass transportation, ride sharing or taxis, or even instances when public transport proves to be financially prohibitive.

This will continue to be the case for many developing markets for a long time to come and reflects the diversity of mobility needs across the globe. **Therefore, access to vehicles will continue to be a requirement for many – even if they require a more cost-effective alternative to classic vehicle ownership.**

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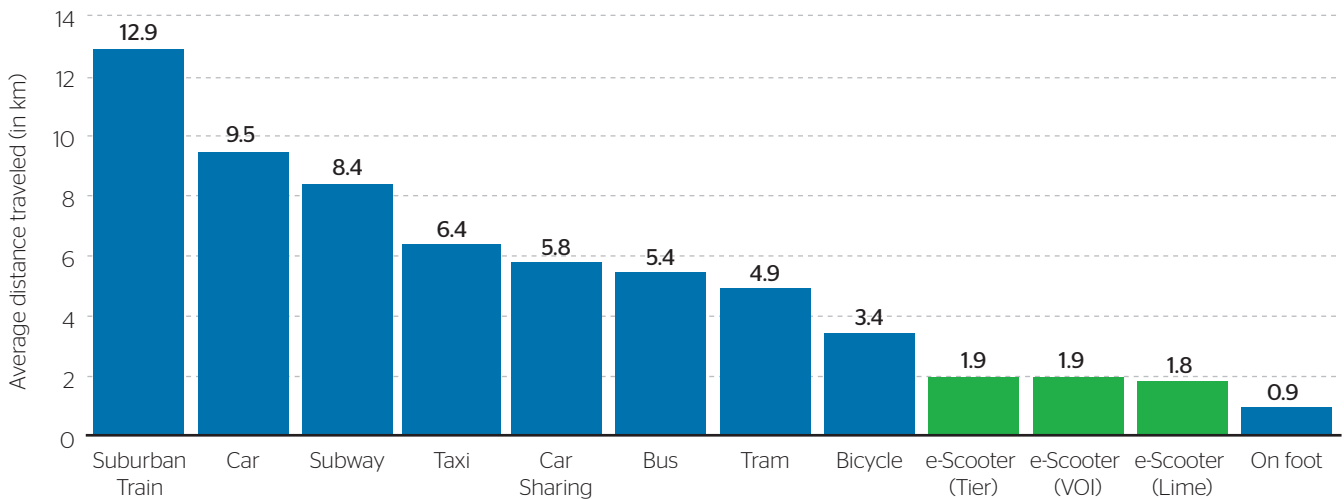
This need was underscored by the recent COVID-19 pandemic, where a return to work dealt a blow to public transportation in favor of private car usage in order to avoid unnecessary social contact. This issue is likely to become moot once an effective vaccine is found, yet it highlights the ease with which people switch back to private vehicles when it is convenient to do so.

We should also remember though that not everyone lives (or desires to live) in an urban location. For many rural dwellers, access to and use of a vehicle remains a basic requirement to conduct their daily lives – regardless of their social and economic status. In all global markets, rural demand for cars and other vehicles will continue to be fuelled by the need to travel greater distances for work, the ongoing erosion of public transportation infrastructure in rural areas, and the need to access local services that have largely been consolidated into urban areas (hospitals, shopping, etc.).

Therefore, **opportunities exist for manufacturers that can align their business models and product offerings more closely to customer motivations**, because mobility is now more personal and more aligned to usage scenarios.

One factor influencing the rise of electric vehicles has been the ongoing trend towards shorter local journeys that remove the fear factor surrounding the technology. A good example is Deutsche Post's investment in green delivery vehicles. Similarly, there is no better example of this trend in action than Tesla. By aligning its corporate vision to "accelerate the world's transition to sustainable energy" with its electric vehicle agenda, Tesla has built a global automotive business. It has managed to attract and retain customers, despite the fact that financing options are limited, its products still command a premium price and have lower perceived manufacturing quality than more established manufacturers.

Average distance per trip by transport type
Germany, 2019



The path forward for automakers

Given the challenges of today's evolving marketplace, how can automotive manufacturers deliver on the promise of **responsible mobility**?

Without a doubt, the fusion of vehicles and digital technology will provide the foundation for future innovation in many areas. All major manufacturers now have significant "connected vehicle" initiatives underway. However, many of these programmes are relatively early in their development – as manufacturers have focused on technical enablement and integrating vehicles with basic features such as vehicle data, remote locking, pre-conditioning of climate control and the ability to pre-program satellite navigation systems.

The potential fragility of connected vehicles was also demonstrated during Tesla's recent outage, which left many customers unable to access the features of their vehicles, even though basic unlocking and starting functions continued to work⁷.

In our view, manufacturers must take a broader approach to digitization, reflecting the reality that a customer-focused mindset should be applied to automotive transformation.

As a foundation, **manufacturers must embrace Digital Twins**. Creating a digital twin of every vehicle that a manufacturer builds can provide invaluable insight into not just the health of a vehicle, but also a full history of the vehicle's configuration, performance, modification, usage and ownership – from the time it is built to the time it is scrapped and recycled.

In our opinion, **combining a "vehicle twin" with a "customer twin" would accelerate a manufacturer's understanding and insight into both customer and market opportunities**. The greater granularity of digital twin data and reusing much of the telemetry that manufacturers already have access to, will enable forward thinking manufacturers to launch customer centric services that add value beyond the core features of the vehicle itself. Examples of such services could include:

- Provisioning "carbon credits" towards vehicle financing for efficient driving behaviours and usage
- Proactive remote problem diagnosis, including customer notifications and repair assistance
- Location-based access to partner services (e.g. nearby preferred parking)
- Using vehicles to automate payments to access third-party services

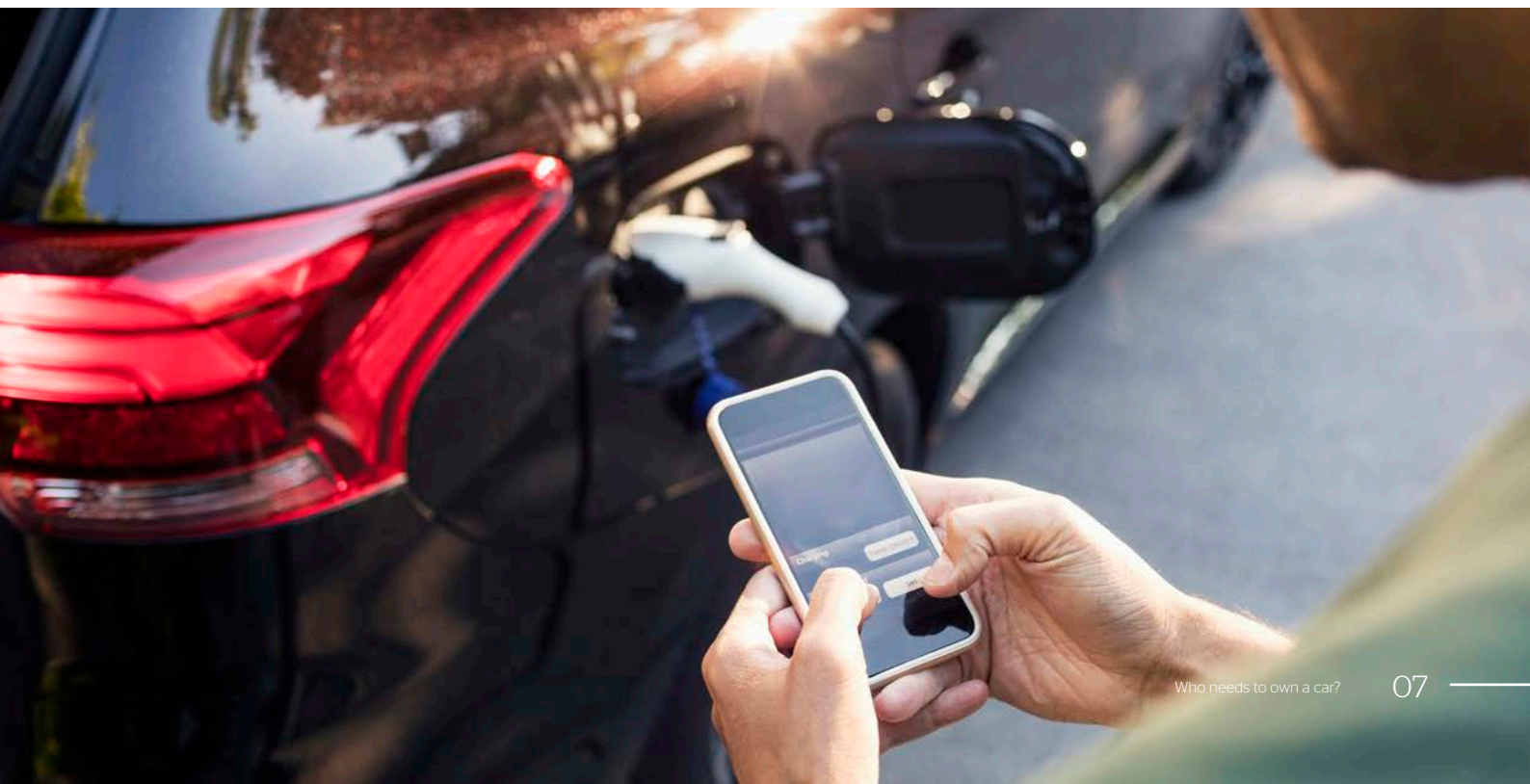
Connected vehicles are still in their infancy and further customer value is yet to be realized.

In particular, this will benefit large fleet operators where connected vehicles can create wider B2B opportunities for manufacturers.

Consequently, Connected Vehicles provide an immediate opportunity to improve customer experience, brand positioning and loyalty, significantly contributing to an automotive manufacturer's ambitious growth plans. However, **this can be only achieved if connected vehicle services directly address the personalized, fast changing needs of stakeholders like drivers, owners, fleet operators, dealers, OEMs, supplier, regulatory bodies and partners**. Manufacturers should not assume that "nice to have" digital services will automatically entice customers to spend more money or create adjacent revenue streams. In reality, connected vehicles are only one piece of the responsible mobility puzzle.

With the emerging transition to **alternative drives** like hybrid, electric and ongoing research into fuel sources like hydrogen, auto manufacturers must also consider how they can partner to enable and leverage the changing ecosystem required to make clean energy vehicles a reality for everyone. Charging networks are growing at a rapid pace alongside home charging, but this is only part of the story.

While many electric customers view home charging as convenient and hassle free, customer experience remains an issue in relation to public charging.



The need for ubiquitous access to charging networks has already spawned third-party payment intermediaries to simplify the customer experience, but many users still must register their payment cards with multiple charging networks. Manufacturers are just now waking up to this issue. Some (like Mercedes) have launched their own aggregator services to improve the experience, but **most manufacturers are still not exploiting the opportunity to build closer relationships with charging networks and leverage them to interact with customers.**

Some view swappable battery packs as a solution to make recharging a thing of the past, but the practical realities of today's battery technology keeps this vision firmly planted in the future.

By 2030, most new cars will incorporate some level of autonomous operation



Given that even today's super-fast chargers often require thirty minutes or more to complete, **thinking of the charging point as a customer touchpoint could enable manufacturers to deliver value added services outside of the vehicle.** Using interactive kiosks and digital signage combined with knowing customer identities would enable automakers to deliver very specific, targeted location-based services – from journey management to hospitality, business and marketing/commerce services.

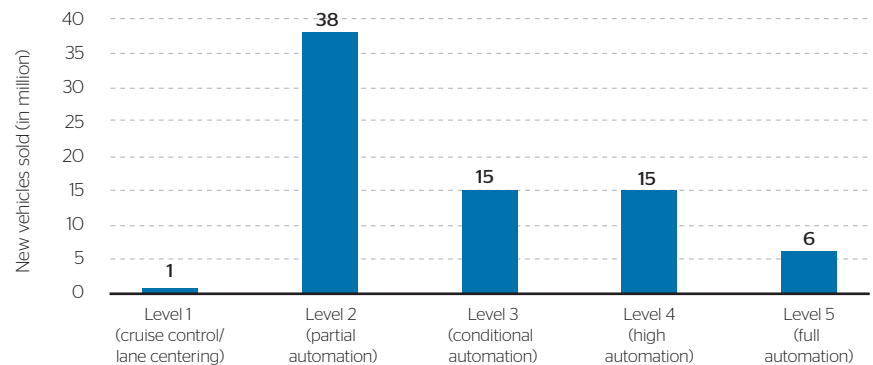
While specific use cases have yet to emerge, it's not surprising that telecom companies like Liberty Global and Deutsche Telekom⁸ are increasingly interested in using their data network infrastructure to create charging networks. Widespread, street-level provision of both power and data provides endless possibilities to capture attention, gather data and interact with customers in new ways. Therefore, manufacturers should be investing in **designing a user and journey experience that reflects the way they wish to interact with customers in the future.** This should be done alongside considering how novel partnerships can enhance their vehicle propositions to create wider service ecosystems that complement their core products. This will provide another way to promote/retain brand loyalty and defend revenues as customers in some markets increasingly lose interest in vehicle ownership alone.

It goes without saying though that connected vehicles and alternative drives are stepping stones to the industry's broader ambition surrounding autonomous vehicles, which are being pursued by all major OEMs. While mass market applications are still a long way away, this situation will be radically different in 2030 – driven by accelerating advances in artificial intelligence, sensors, new safety systems and 5G / 6G telecommunications.

As an example, a recent PWC forecast identifies that by 2030, the majority of new cars will incorporate some level of autonomous operation, allowing the driver to disengage from some tasks.⁹

Studies already suggest that autonomous driving could increase capacity on existing highways by up to a factor of three by removing human influence and optimizing speed, volume and vehicle behavior. By comparison, adding a lane to an existing five or six lane road has been proven to provide only a very small percentage gain in capacity, due to human factors.¹⁰ Consequently, apart from the obvious direct advantages of autonomous driving, there will be significant opportunities in terms of infrastructure, urban development and the shared use of existing vehicles – particularly as users become accustomed to needing "rides" rather than vehicles.

New car sales worldwide in 2030, by autonomous vehicle level



Source: PWC

This will start to become more apparent as people lose affinity with owning one vehicle and accept that different vehicles may be required for different circumstances or events, driving them to “hire” access to electric, combustion or other ride types while avoiding the sunk costs of traditional vehicle ownership.

What does this mean for automotive manufacturers? In reality it will mean the emerge of new business models that are likely to erode the notion of vehicle ownership further and accelerate customer a shift in customer mindset towards “**demand-driven mobility**” instead. The ability to request, use and return an autonomous vehicle from a shared pool or provider will become more practical without the reliance on human drivers – creating a cheaper and more effective mobility solution for many people without the constraint of living in an urban area.

This will particularly be the case as more people choose to live and work more flexibly even after we emerge from the COVID-19 pandemic. As a consequence, it is likely that automotive manufacturer customers will essentially become large scale “mobility service providers” – which stands in stark contrast to the consumer and business leasing orientation of today’s model.

In addition, automakers will also look for adjacent markets via spin-off opportunities enabled by new vehicle technology advancements. A great example is Tesla, which is exploiting its battery technology to not only service vehicles, but also to provide a clean energy solution for homes and commercial buildings.

The success of this strategy is clearly demonstrated by the construction of a new “Gigafactory” near Berlin, which is anticipated to create 12,000 jobs in Germany alone. Consequently, we expect other manufacturers to follow this route, exploiting their investments in diverse areas like sensors, safety systems, digital manufacturing and supply chain execution to move into new adjacent markets.

Transforming the automotive value proposition, though, will also mean transforming manufacturing operating models to be successful. Auto manufacturing led directly to the invention of globalized lean manufacturing operations, but further evolution is likely to occur.

COVID-19 has undoubtedly proven that flexible manufacturing operations are a must. A clear example of this occurred in the UK during Q2 2020 – when new car sales plummeted to an all-time low as the economic impact of the pandemic became apparent. However, with a large reliance on corporate car schemes, leasing and PCP schemes came an inevitable surge of demand in the summer months as many agreements came to an end. This was particularly the case for premium manufacturers such as BMW, Mercedes and Audi, where their manufacture-to-order policies combined with significant model revisions left significant demand unfulfilled.

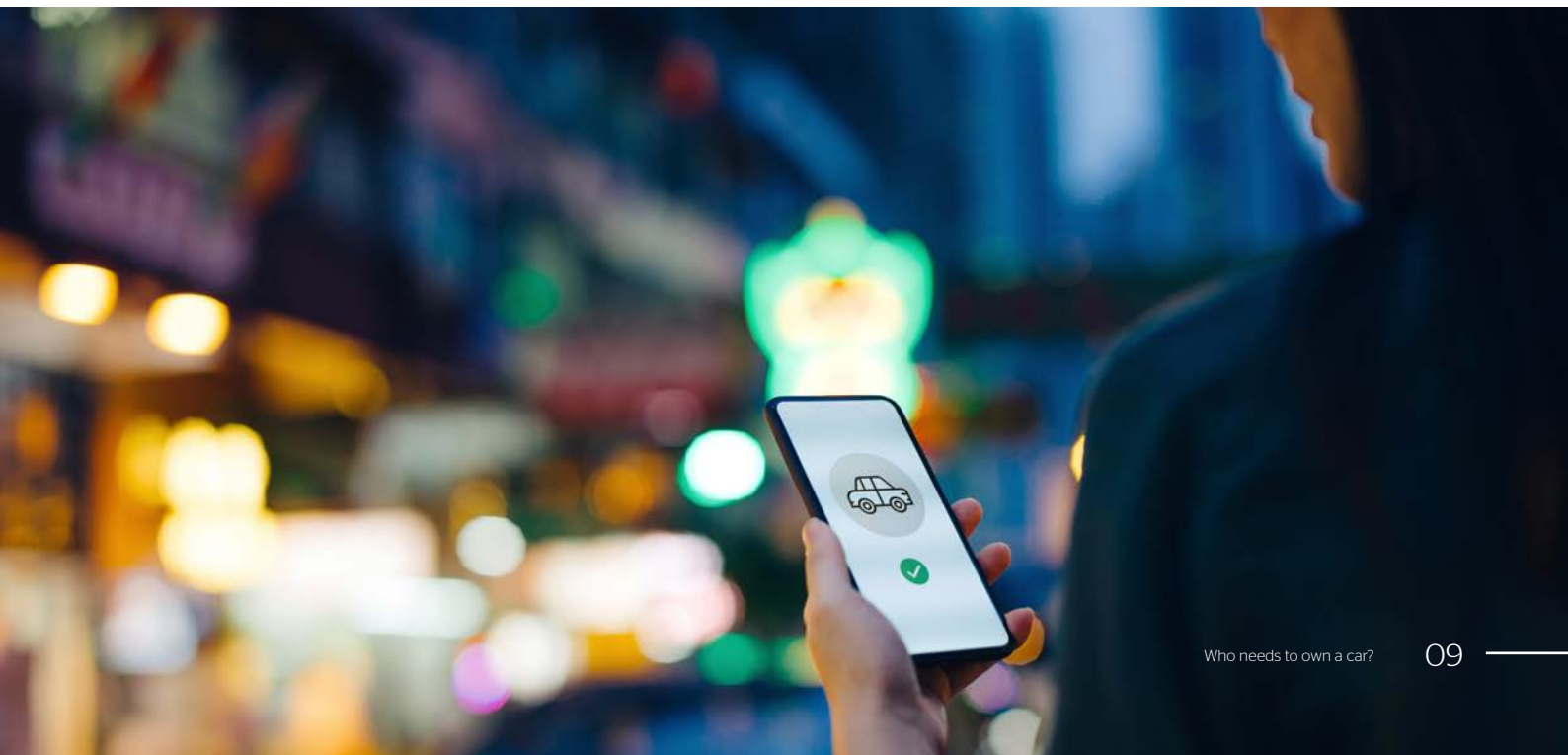
As a direct response to these difficult lessons, we expect many manufacturers will invest in **digital technologies** that enable them to create more flexible manufacturing practices, reduce time to delivery and improve availability of operations.

Today, many manufacturers continue to run their core production operations on legacy applications and systems that do not provide the levels of control and flexibility required to deliver the next wave of efficiencies in the factory.

To achieve cost savings that offset this increased flexibility will require more widespread adoption of “smart factory” techniques and the mass digitization of production lines, combined with deep analytics and artificial intelligence to accelerate decision making during production. Therefore, **manufacturers should strongly consider establishing a digital roadmap for manufacturing** that defines a clear and systematic approach to eradicating the IT risks and limitations within today’s production operations, so the promises and expectations of a smart factory approach can be fully realized.

It is likely that auto manufacturers will essentially become large scale “mobility service providers.”

Similarly, manufacturers will be forced to demonstrate that they are operating with **sustainability** in mind. Supply chains must adapt to include environmentally and socially responsible practices for material sourcing, transportation and waste management. Therefore, we expect to see broader adoption of digital technologies such as digital twins, blockchain and cloud become mainstream in production operations and after sales, as both customers and governments demand increased transparency into sustainable manufacturing practices.



Conclusion

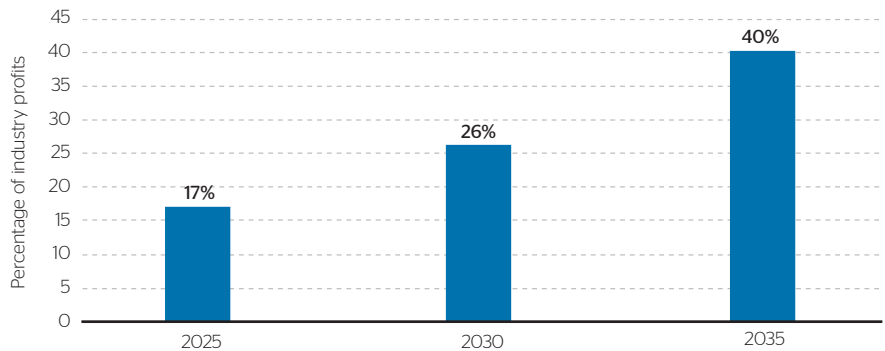
Despite many dire predictions of auto industry's slow death, the reality is that we have merely reached another milestone in its evolution. In the future, people will still want to travel and have physical experiences that are not available in the virtual world. Humans will still need to get from Point A to Point B in an efficient, environmentally responsible manner, and they will still want the flexibility and convenience that mass transportation is unable to provide. Similarly, there may be opportunities for OEMs to provide and monetize virtual mobility as a service that complements their other customer travel offerings.

One certainty is that the manner in which people require mobility to be delivered to them will be different, and that the pace of transformation will vary wildly across markets due to local market conditions and requirements. **Therefore, we expect that car ownership will remain common for many years to come,** even as customers seek better and more flexible forms of ownership beyond classical lease and purchasing arrangements.

Manufacturers should reflect on the changing mobility needs of consumers and businesses, and plan now to address the digital and physical technological revolution currently underway in the automotive industry. They should rapidly seek to identify, describe and prepare a strategy and transformation roadmap that positions them for the future.

For some, this may be difficult, as conventional wisdom and a focus upon the "vehicle as the product" continues to dominate their thinking. Others – those willing to challenge the status quo and shift towards "responsible mobility" as a guiding principle – will prevail, as they ride the industry's next wave of reinvention to success.

New mobility tech – Projected share of global auto industry profits (2025-2035)¹¹

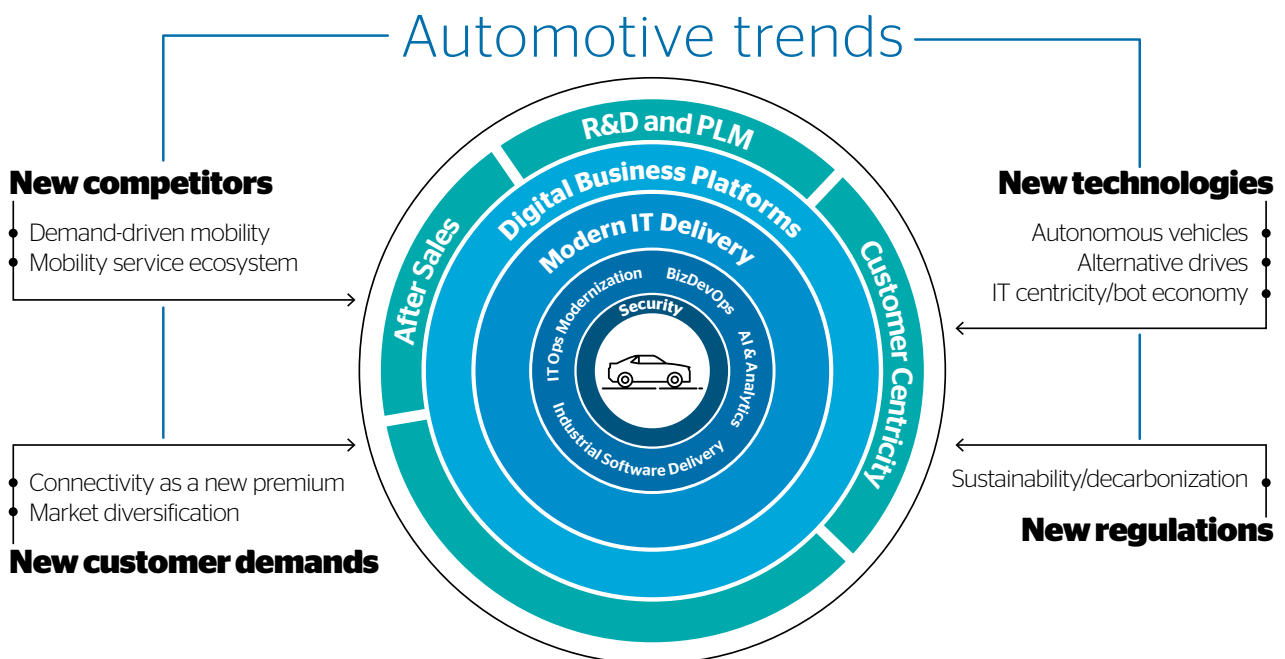


Next Steps

Some of the impending changes are revolutionary, while others are evolutionary in nature. Atos believes that there are eight key automotive trends that will shape the industry in decades to come.

All these trends have an impact on the entire value chain, and all are strongly linked to digital technology and its related processes. In the infographic below, Atos summarizes the relationships and interactions between these trends and the automotive ecosystem.

Atos offers a range of innovative products and services to make this transition successful and efficient. Make an appointment with us to learn more and discuss your path forward in detail.



Sources

¹ <https://ourworldindata.org/urbanization#number-of-people-living-in-urban-areas>

^{2,3} <https://www.businessinsider.de/wirtschaft/mobility/100000-arbeitsplaetze-bedroht-deutsche-autoindustrie-kaempft-in-corona-krise-mit-oberkapazitaeten-vw-bmw-audi-mercedes-dudenhoeffler/>

⁴ ACEA Pocket Guide 2020-2021, p.12; <https://www.acea.be/publications/article/acea-pocket-guide>

⁵ Source: Davide Sher, 2D Printing Media network, "Tesla shows massive generatively designed parts in Model Y underbody"

⁶ <https://www.pwc.com/gx/en/news-room/press-releases/2018/by-2030-the-transport-sector-will-require-138-million-fewer-cars-in-europe-and-the-us.html>

⁷ <https://www.independent.co.uk/news/world/americas/tesla-cars-electric-outage-elon-musk-b556126.html>

⁸ <https://www.ft.com/content/388012da-11eb-43da-b810-2c1ff7aabb7a>

⁹ Source: PwC Retrieved from: study_id9644_automotive-industry-statista-dossier, p.38

¹⁰ <https://www.thinktank-universe.com/interview-mobilitaet/>

¹¹ Source: BCG; Retrieved from: study_id67454_mobility-services, p.57



About Atos

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Let's start a discussion together



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