

MEGA THEMES
OF THE FUTURE
AND THEIR
IMPLICATIONS
FOR THE

INDIAN AUTO INDUSTRY

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MEGA THEMES AND THEIR IMPLICATIONS



Over the past ten years, Frost & Sullivan's Visionary Innovation Group has been engaging in a future-casting exercise where it identifies and tracks the key global Mega Themes that will define our future lives.

To do this, our team of futurists follows a rigorous three-step process. First, they determine the top ten Mega Trends of the year and the sub-trends that feed off and into them.

In this context, Mega Trends are defined as transformative, global forces that shape the future world through their far-reaching impact on business, societies, economies, cultures and personal lives. Using the lens of Mega Trends, our team of futurists tracks the future of mobility, infrastructure, energy and retail, and monitors how Connectivity and Convergence, New Business Models, Urbanization: City as a Customer, Health, Wellness & Wellbeing, and Cognitive Technologies are building brand new paradigms.

Sub-trends cover macro-level technologies, transformational shifts, capabilities, resources, demographic shifts or disruptions that enable the emergence of Mega Trends across geographies and industries. For example, 5G networks, space connectivity 2.0, and virtual reality are the sub-trends that help realize the Mega Trend of Connectivity and Convergence.

Next, our team of futurists analyzes future scenarios, case examples, cross-industry implications and future market potential of these sub-trends.

And finally, they evaluate how dominant Mega Themes—strategic outcomes created by the convergence of one or more Mega Trends and sub-trends—will create opportunities, challenges or disruptions over a 5 and 10 year horizon in industries, businesses and even our social life. 'Data as 21st Century Oil', 'Marketplaces Everywhere', 'Uberization of Industries', 'Connected Living' and 'Autonomous World' are among the Mega Themes that are already causing massive upheavals in multiple sectors and at multiple levels.



TOP 12 TRANSFORMATIONAL MEGA THEMES



Frost & Sullivan's Visionary Innovation Group has identified 12 transformational Mega Themes:

Transhumanism



The converging forces of the future shaping the human experience and refining the nature of humanity, including how humans will think, behave, experience and perform.

Autonomous World



A state when intelligent technology systems operate without human interference, enabling the emergence of innovative business models in a more efficient society.

Connected Living



A world in which consumers use many different devices to experience compelling new services that integrate video, voice, and data services to provide access and ubiquitous connectivity anytime and anywhere.

Industry 5.0



Industry 5.0 will focus on more advanced human-machine interfaces which means improved integration, allowing faster, better automation paired with the power of human brains.

Digital Reality as Frontier Technology



Augmented reality (AR) augments the real world with digital overlays, virtual reality (VR) replaces the real world environment with virtual objects, and mixed reality (MR) mixes virtual objects in the real world.

Heterogeneous Society



Represents a diverse group of people who are different in terms of income, ethnicity, gender, age, language, preferences and cultural traditions, with this diversity driving complex new customer needs.

Data as 21st Century Oil



The act of productizing data and trading it through bartering, brokering and/or business intelligence models that analyze it to offer critical insights.

Marketplace Everywhere



Intelligent Assistants represent a type of artificial intelligence (AI) in which computational and mathematical methods are used to analyze human language. A digital assistant can perform tasks based on verbal commands. This is helping create marketplaces everywhere.

'Uberization' of Industries



Sharing of assets across individuals or groups where the cost is shared across users. Within the context of platform businesses, the sharing economy can unlock value for multiple groups.

Concept of 'Zero' World



A zero concept world with zero emissions, zero accidents, zero fatalities, zero defects, and zero breaches of security.

Rise of Platform Economy



Transition from linear, manufacturing driven, resource heavy conventional business models to demand driven, multifaceted digital platform business models.

Zero Latency World



The integration of 5G, edge computing, and connected living to enable an ecosystem where data is shared instantaneously among people, devices and systems.

Source: Frost & Sullivan

Marketplaces Everywhere: A new generation of in-car marketplace applications that allow people to do virtually everything from buying food and making hotel bookings to receiving discounts – all while seated comfortably in their cars. In time, these marketplace models will have a digital currency embedded in them, making it easier to spend and buy goods & services.

CONNECTED CARS



The increasing tethering of devices to the Internet is creating a wide network of intelligence nodes that are resulting in a highly connected world. Connectivity & Convergence of new technologies are unleashing the full potential of the Internet of Things (IoT) and the launch of multiple innovative applications that will change the way we live, communicate and conduct business. Needless to add, this will have massive implications for the automotive industry.

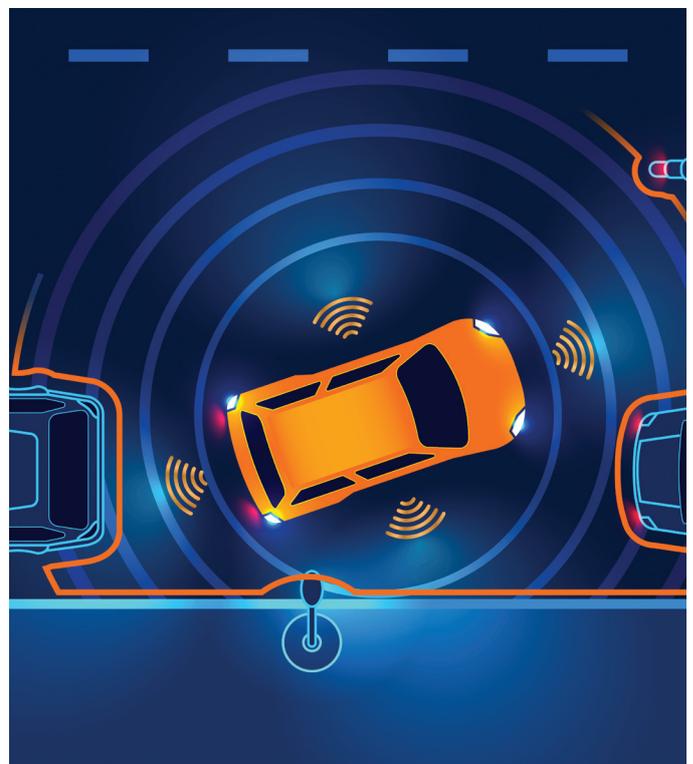
Connected cars, equipped with 5G connectivity, will enable real time, vehicle-to-everything (V2X) communication even as application rich telematics services drive vehicle efficiency. By 2030, connected cars will focus on connecting the autonomous vehicle to the ecosystem of personalized services. Based on data collected from autonomous cars, infrastructure, and other devices, connected cars will support highly individualized services for customers.

Over the next 5-10 years, in-car connectivity will surge as next generation cars increasingly begin to feature voice-assisted, embedded infotainment systems and use cloud-based platforms for secure in-car connectivity. Meanwhile, leading OEMs will push for connected services across their fleet as an enabling platform for a host of solutions.

The logistics industry will also transform in tandem, fueled by the projected 70 million trucks that are expected to be connected by 2025. Among the positive outcomes of connected vehicle technologies here will be enhanced vehicle tracking, fleet platooning and vehicle load monitoring. The 'uberization' of commercial vehicles will boost the value proposition for OEMs to collect and transmit data using connected telematics.

Connected vehicles will have implications not just for the automotive industry but for other industries as well. For instance, by focusing on health, wellness and wellbeing—emergency stop assistance system, driver health monitoring, and fatigue detection features, among them—connected vehicles will impact the healthcare industry. Automotive insurance will benefit from telematics sensors that monitor driving behavior. Automotive security scanning, anomaly detection, and cryptography will highlight the rising importance of automotive cybersecurity. Aftermarket services will receive a fillip from predictive maintenance, condition monitoring, and remote maintenance. Courier, express and parcel delivery services will make gains in the form of improved dispatch management, route optimization, and vehicle tracking.

There are five key themes related to Connectivity & Convergence that will find resonance in the automotive industry:





MARKETPLACES EVERYWHERE: RETAIL AND PAYMENT

In-car commerce or the 'car as marketplace' concept promises to enable users to access multiple services based on their day-to-day needs and travel scenarios. **Vehicular features** will cover entertainment and media; navigation, traffic, and other mobility modes; tire pressure monitoring systems (TPMS), vehicle health, prognostics; and, telephony, calendar, music, and connected services. The automotive marketplace will also support **retail features** like food & beverages and clothing. Geo-fenced retail and discounts will alert users to location-based discounts and deals being offered by their favorite brands and stores as they drive along their preferred route.



FEATURES ON DEMAND: OVER THE AIR (OTA) AND STREAMING

Features on Demand are features, services, and functionalities that are not active when acquiring the car. They will be made available remotely without the necessity of visiting a garage or dealer's service point. This means consumers will be able to get Features on Demand in a similar way to getting a system or app update on a smartphone or tablet when, without changing the phone, consumers can get additional functionalities like the addition of real time traffic to their in-vehicle maps app.

Features on Demand available in the car will be able to support new functionalities in multiple areas: car performance (e.g., engine power boost), multimedia (e.g., enhanced navigation, music and video streaming, gaming for passengers), comfort (e.g., personalized seating adjustments), convenience (e.g., parking assist and autopilot) and safety (e.g., driver and passenger health tracking). Payment for Features on Demand can take the form of either a one-time purchase for the entire life of the vehicle or monthly/annual subscription or pay-per-use. Some of the features will have a free trial period. In the first two cases, this will represent a lucrative revenue stream.

Today, in addition to passenger safety, automakers also have to focus on securing vehicles' software and electronic systems. Accordingly, in addition to the standard physical safety features typically found in cars, greater emphasis will need to be placed on protecting the electronic and digital architecture of vehicles.

Furthermore, given their lifespan, the production of connected vehicles will need to be future-proofed with the ability to apply necessary upgrades. Over-the-air (OTA) platforms, which include firmware (FOTA) and software (SOTA), will be used by automakers to deliver software updates that improve the operability and functionality of their vehicles.



IOT PLATFORMS IN VEHICLES: CUSTOMER PERSONALIZATION

IoT platforms will enable the development of customer-centric models. For example, Tesla buyers can use a touch screen display to choose the features on their customized vehicle, accessible from home or at the showroom. Personalized products / services will allow companies more flexibility by lowering inventory carrying, boost the acceptance of premium pricing, and allow data collection on customer preferences that can lead to optimized new product development.



DIGITAL ASSISTANT / BIOMETRICS: SECURITY / AUTHENTICATION

The complex electronic architecture of modern vehicles has increased the potential of their being hacked. This underlines the importance of security solutions that strengthen both the digital and electronic systems of vehicles. Such efforts will be all the more important as the car as marketplace concept takes off and the volume of in-vehicle transactions soars. The next 5-7 years will reflect a transformative scenario, wherein biometrics will be used primarily for authentication and instantaneous payment mechanisms. Over the short term, voice biometrics will be a key focus area as it offers a high degree of accuracy and is the only technology that does not require additional dedicated hardware.

Already there are some key business use cases where biometrics is being used for security and authentication. For example, Didi Chuxing uses facial recognition technology to verify driver identities, while VW and Ford use the technology for vehicle security. Volvo and BMW deploy fingerprint and palm vein authentication, respectively. Uber drivers will have to use the company's Real-Time ID check facial recognition software for authentication. In January 2018, Gentex tested iris recognition for toll payments.



DATA IS THE NEW FUEL: DATA MONETIZATION / CYBERSECURITY

Indeed, “Data is the 21st century oil.” The total worldwide generation of data is projected to expand to 163 ZB by 2025, around 10 times the amount of data generated in 2018. Collection, storage, analysis and effective utilization of such vast data volumes will drive new business models and revenue streams.

Vehicles contain massive amounts of electronics and code. Connected cars generate data from at least 200 different sensors within the vehicle and can profile everything from the vehicle's location to the user's driving habits. As a result, there will be a massive shift towards non-traditional companies leveraging data monetization strategies even as automotive companies become highly skilled at monetizing data from products and services.

Automakers' data monetization strategies will seek to optimize the value of data to reach untapped customer segments, create new markets, and open up unexplored revenue streams. Globally, 5G will increase data speeds tenfold by 2025, providing capacity for massive data traffic increases that will enable monetization of vehicle data valued globally at over \$30 billion by 2025. Already, companies such as Otonomo and Wejo are creating marketplaces and developing use cases for automotive data monetization by cleaning, aggregating, and productizing cross-manufacturer data.

Harvesting vehicle generated data and converting it into a monetization opportunity represents a positive development. It will, however, be accompanied by concerns over data security, privacy, and ownership.

Legislation will be critical to regulate this emerging area and allay these anxieties. At the same time, security solutions will come to the fore. Frost & Sullivan estimates that the automotive cybersecurity market will be worth \$900 million by 2020. The implications of cybersecurity on the automotive industry will be seen in the form of increased demand for hardened OS and secure coding, virtualization, and encrypted V2X communication, hardware security modules and firewall, intrusion detection and prevention systems.

AUTONOMOUS MOBILITY



Improvements in AI, IoT and computational power will accelerate the transition towards an “Autonomous World.” The pursuit of competitive advantage and improvements in supporting infrastructure across various sectors, including mobility, will accelerate the progress towards “fully autonomous technology.” The mobility industry has been in the vanguard of autonomous development. Automakers are targeting the mass production of self-driving cars without steering wheels and pedals. Autonomous, commercial ride-hailing taxi services are seen as a real possibility in dense, urban environments.

THREE PLATFORM APPROACH

Globally, almost 90% of new passenger vehicles will have connectivity capabilities and by 2030, 15% of these connected cars will be autonomous. By 2030, there will be 18 million highly automated vehicles (L3/4/5) plying on the roads.

There will be real technological progress in terms of functionality. In L3 automation, the autonomous driving (AD) feature will request handover. When it progresses to L4/5 automation, the AD will not request handover. There will be similar advances in terms of feature set.

The convergence of connected, autonomous, shared, and electric trends will lead to three platforms as building blocks for AD development. The vehicle platform (electric) will cover diagnostics and vehicle health monitoring, electrical power systems, backup autonomous driving system, and redundant braking and steering systems.

The digital platform will focus on ease of use, user delight and have a 3D approach for the operating system. It will also aim to enhance human-machine interface (HMI) and infotainment features, 3D car as the menu and IoT integration. And, finally, the electronic platform will work towards redundancy of electronic control units (ECUs), while moving in the direction of domain controllers and interfacing units and cybersecurity modules.

AUTONOMOUS MOBILITY IN AIR

Advances on land are being matched by advances in the air. Automated Aerial Vehicles (AAV) will find wider applications, ranging from drones for surveying and delivery to taxi services. Autonomous flying taxis under urban area conditions are likely to be tested in the near future.

The next generation of aerial urban vehicles is already being developed. These can be broadly segmented into four groups based on vehicle type. Roadable aircrafts, such as Terrafugia Transition and Aeromobil V3, are winged aircrafts that can be operated on both air and land. Roadable gyrocopters, like PAL-V Liberty Pioneer, are propeller-driven aircraft capable of operating on both air and land. Manned drones, including Ehang 184 and Cormorant Air Mule, can only operate in air and will be able to carry passengers. Hoverbikes, such as Aerofex Aero-X and Hoversurf, are the aerial equivalent of motorbikes and operate only in the air. The Dubai police are exploring the possibility of using hoverbikes for patrolling.

MICRO-MOBILITY

Micro-mobility solutions are emerging as an exciting solution for congested urban environments. These solutions range from bikes and unicycles to e-bikes, e-scooters and enclosed velomobiles. They are expected to have high growth potential in delivery services as a result of the increase in e-commerce and among city dwellers by bridging the gap in first-and last-mile urban commutes.

These compact mobility modes are expected to be the most suitable for cities and consume less energy than other transport forms. Versatility will be another benefit since they can meet diverse mobility needs; urban commuters will use it for first and last-mile connectivity to public transport nodes, while tourists will prefer it as a form of flexible personal mobility. Ageing populations will find micro-mobility solutions easy to use and convenient for their short distance needs. Importantly, micro-mobility modes will emerge as viable alternatives for delivery services, replacing CO₂ emitting vehicles such as trucks and vans.



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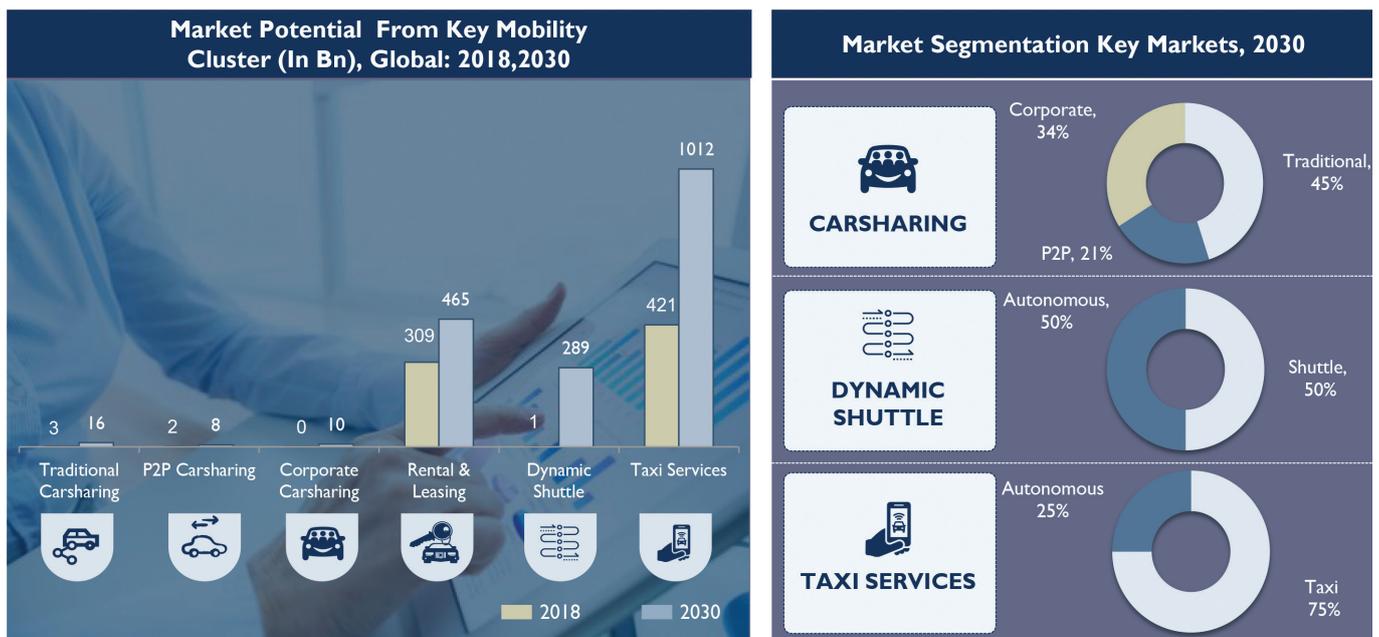


NEW MOBILITY BUSINESS MODELS

Like in other industries, technology-driven change is set to transform business models and value chains in the automotive industry. Downstream and peripheral services—mobility services, aftersales and other consumer services like vehicle insurance, among them—will make strong gains. Among upstream segments, hardware and software for automated driving and connected services are also expected to generate sizeable revenues.

NEW MOBILITY SOLUTIONS MARKET WILL GROW TO AROUND \$2TR MARKET BY 2030

Revenue from the taxi cluster alone expected to exceed \$1 trillion in 2030



GLOBAL TRENDS

The downstream services market—vehicle services, parts, accessories, driving services, mobility services, leasing, cash sales, and loans—is projected to grow aggressively in the future registering a revenue CAGR of 6% between 2018-2025. New revenue streams from driving, vehicle, and mobility services are expected to cross \$5 trillion by 2025.

Meanwhile, the new mobility solutions market will grow to almost \$2 trillion by 2030. Revenues from the taxi cluster alone are expected to exceed \$1 trillion in 2030. In the carsharing segment, traditional carsharing will comprise 45% of the market, followed by corporate and peer to peer (P2P) carsharing with 34% and 21%, respectively, by 2030. Autonomous shuttles will make up 50% of the dynamic shuttles segment by 2030. In taxi services, autonomous taxis will make up 25% of the segment.

Globally, ride-hailing is set to be a trillion-dollar industry in the future. Fleet size will expand from 10 million to 17 million over the 2017-2025 period. The market will be marked by consolidation and expansion, and will increasingly move towards mobility as a service (MaaS).

TRENDS IN INDIA

The new mobility market in India—traditional, P2P and corporate carsharing, dynamic shuttles, MaaS and taxi services—will grow to \$90 billion by 2030. Revenues from the taxi cluster alone are projected to surpass \$61 billion by 2030.

Ride-hailing will make strong gains in India, reaching an estimated \$43.3 billion by 2025 with fleet size increasing from 1.4 million in 2017 to 4.2 million in 2025. One strong trend that will characterize the market over the next 5-7 years is the move towards electrification.

TOWARD SUSTAINABLE MODES — EVOLVING COMMUTING PATTERNS ACROSS CITIES

The terms 'smart', 'shared' and 'sustainable' are often used in the context of the future of mobility.

In a unique project aimed at understanding how well cities across the globe are achieving their sustainability goals and identifying where smart mobility opportunities lie, Frost & Sullivan tracked the progress of 100 cities seen as key smart cities of the future. The study rigorously tracked and ranked cities across six critical parameters—New Mobility Solutions, Autonomous Technology, Digitization, Sustainability, Logistics, and 'Smart' indicators—to evaluate their readiness for smart mobility solutions.

The study identified three major modes of travel while tracking commuting patterns across these cities: major cities in India including Delhi, Mumbai, Chennai, Kolkata, Bengaluru fell in the category of 'Public Transport Loyalists' where the

availability of multiple public transport options resulted in less than 35% of trips by passenger trips being performed in personal cars. Cities like Singapore, New York, Boston, Dubai, and Sydney fell in the category of 'Transitioning Cities' where 40-75% passenger trips were by car, while cities like Los Angeles and Doha fell in the category of 'Car Champions' where more than 75% of passenger trips were by car.

AN EMERGING INDUSTRY: RISE OF ONLINE FOOD DELIVERY SERVICES

Online food delivery has become a major industry in many parts of the world and India is no exception. Globally, the market is expected to grow from current estimates of around \$83 billion to over \$200 billion by 2025, growing at an annual rate of 14%. Deliveries are set to double over this period from about 6.5 billion to 12.5 billion.

Today, India is one of the fastest-growing markets for online food delivery with a staggering compound annual growth rate of 9.9% projected over 2018-2025. During this period, revenues are set to surge from \$1.3 billion to almost \$11.5 billion, while deliveries are poised to increase from 266 million to 3.4 billion. This will have implications for India's automotive industry because the early adopters of electric 2 wheelers will be the food delivery players, thereby driving the development of the e-mobility ecosystem in India. This is expected to spur investments in the charging infrastructure space along with new business models such as Battery Swapping aimed at last-mile connectivity applications.

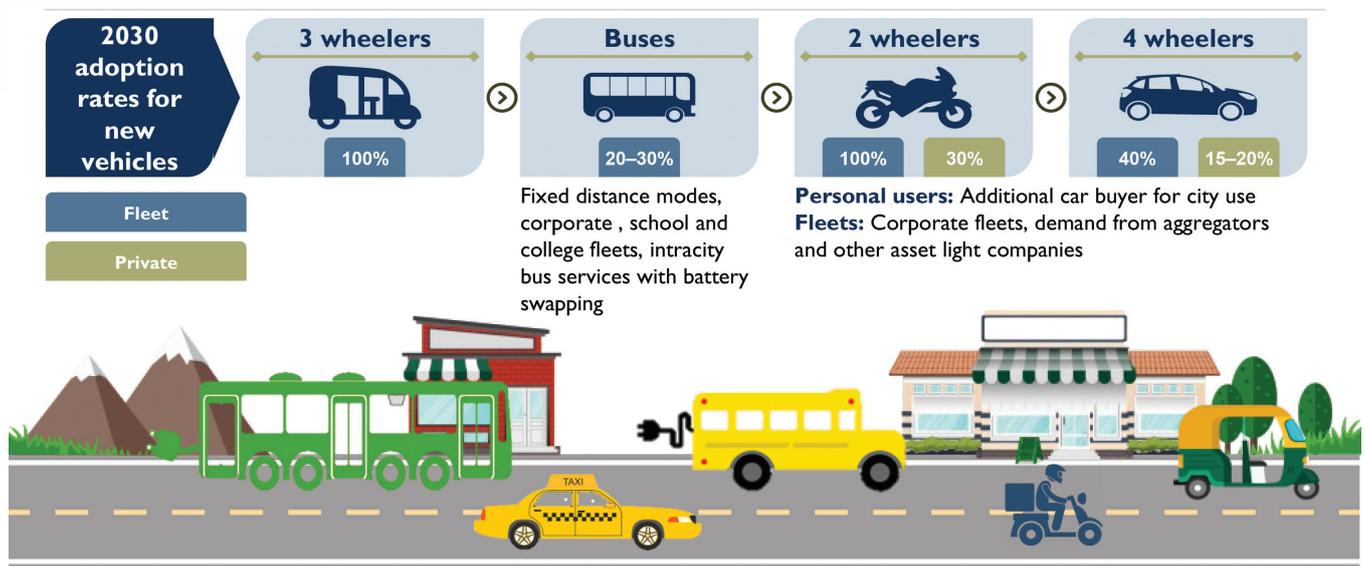
In essence, then, future consumers will think of their vehicles as an IoT platform for apps and services, providing integrated mobility services.

INDIAN ELECTRIC VEHICLE MARKET OVERVIEW



ELECTRIFICATION ROADMAP FOR INDIA – VISION 2030

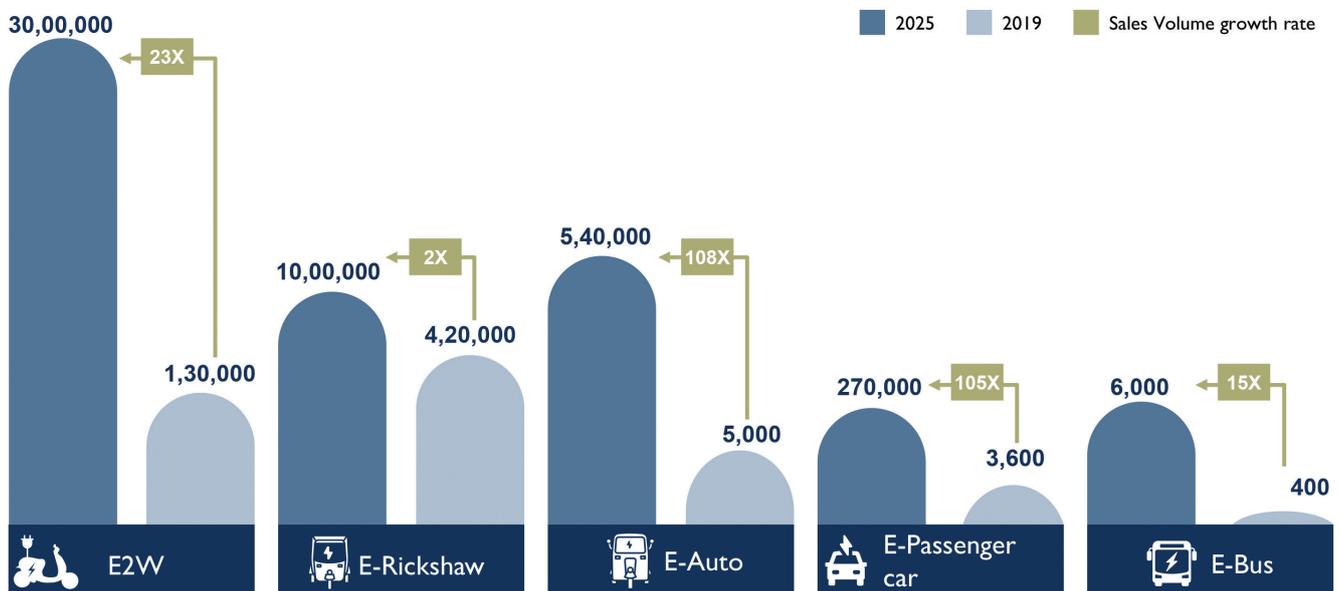
Last mile connectivity modes like 3W to be fully electrified by 2030, expect fleet segment to be electrified more due to a combination of lower cost of ownership and regulatory intervention



Source: Frost & Sullivan analysis

MARKET FORECAST TO 2025

E-rickshaws, e-autos and e-2W are the most promising segments for electrification in India; expected to account for over 4 million units by 2025



Mega Trends such as urbanization, congestion, pollution, and energy security are driving electrification in India. Around 33% of Indians prefer using a 2 wheeler to commute to work, with even a majority of car owners preferring to use 2 wheelers for their work commute. In addition to the middle and lower middle class population segments, the use of motorcycles and scooters will continue to expand among the upper middle class segment as well, by 2025. Demographics, therefore, favor the electrification of this segment.

India's working age population will constitute 68% of the population and will continue to be the biggest consumer of motorcycles and scooters. Meanwhile, with 42.5 million job opportunities in both rural and urban areas, women will become a significant part of the workforce and an important consumer of motorcycles and scooters.

Electrification in India will be fueled by government incentives like FAME II and the concerted Government push towards cleaner fuels. The growing need for clean and shared transport, paralleled by stringent emission norms with higher compliance costs for IC engines, will add further impetus to India's electric vehicle market.

These trends will be reinforced by newer business models that lower the operational cost of electric vehicles. Based on market potential, vehicle utilization, OEM investment, and ease of charging, 2 and 3 wheelers will be the key target segments for electrification in India. By 2025, e-rickshaws are anticipated to dominate the Indian electric vehicle market with a more than 80% market share.

The electrification roadmap for India – Vision 2030 – envisages last-mile connectivity modes like 3 wheelers to be fully electrified by 2030. At this juncture, the fleet segment will be more electrified than the personal vehicle segment due to a combination of lower costs of ownership and regulatory intervention.

India's electric vehicle market is envisioned to reflect the following scenario in 2030: 100% electrification of 3 wheelers, 20-30% electrification of buses used in fixed distance modes, corporate, school and college fleets, and intracity bus services with battery swapping. In the 2 wheeler segment, electrification is expected to be 100% for fleets and 30% for personal use. In the 4 wheeler segment, electrification is poised to be 40% for fleets and 15-20% for private use. In many cases, personal users will buy an electric car to supplement their primary cars, retaining their electric vehicles principally for use within the city. Demand for electric vehicles in the fleet segment will derive from corporate fleets, aggregators and other asset light companies.

The market forecast for 2025 is encouraging. E-rickshaws, e-autos and e-2 wheelers are likely to emerge the most promising segments for electrification in India, accounting for over 4 million units by 2025. Sales volume growth for e-autos will jump 108 times, with e-passenger cars rising 105 times from 2019 to 2025.

The electric vehicle market is a dense, interconnected and interdependent system that offers opportunities for all stakeholders. The electric vehicle component industry—electric motors, batteries, power electronics and charging stations—is expected to reach 4.8 billion in 2025. Growth will be led by batteries with \$1.86 billion and power electronics with \$1.47 billion. At this point, the passenger car segment's share of the battery market will be 67%, while the total demand for Li-Ion battery packs will be close to 15.6 million kWh. The 2 wheeler vehicle segment will account for a 61% share of the power electronics market in 2025.

Most electric vehicle markets throughout the world have been defined by a combination of incentives and regulations. While incentives are usually implemented during the early stages of market development and are seen as positive reinforcement for stakeholders, trends indicate that more mature markets tend to shift away from incentives towards mandates and regulations driven growth.

India's electric vehicle market is still in the nascent stages of development. In addition to central government support, several state governments have demonstrated a strong commitment to advancing this sector. Uttar Pradesh, Gujarat, Maharashtra, Karnataka, and Andhra Pradesh have proactive policies pertaining to investments. Overall, private sector investments are expected to total \$15 billion by 2030.

Uttar Pradesh aims to produce one million electric vehicles by 2024. India's most populous state has an investment target of INR 400 billion with an employment target of 50,000 people. It aims to have 50% e-mobility in fleets in 10 EV equipped cities by 2024, and in all cities by 2030. Also on the anvil is 5GWh of energy generation by 2024.

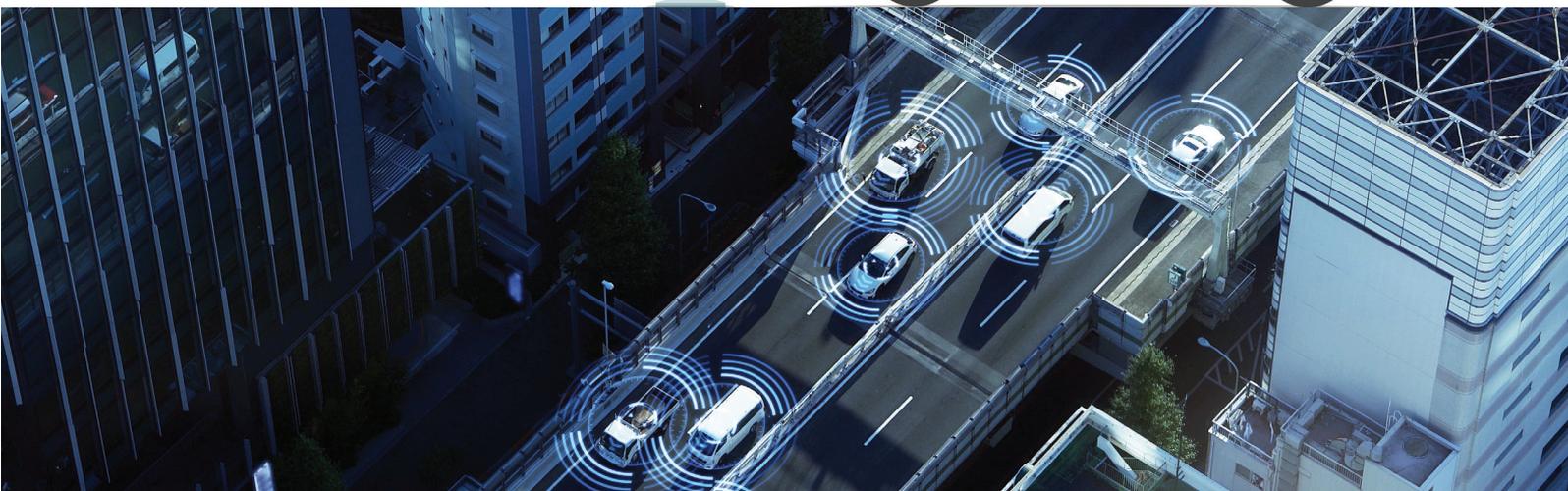
One of India's most industrialized states, Gujarat is set to offer incentives on e-taxis. The state government has also shown strong support for electric vehicles and related component manufacturing, including batteries and e-motors.

Neighboring Maharashtra aims to boost the number of electric vehicles by 500,000. The government plans to invest INR 250 billion in electric vehicles and related infrastructure development, while creating employment opportunities for one lakh people. Andhra Pradesh is targeting investments of INR 300 billion by 2030, with

job creation for 60,000 people and has ambitious plans of having all government buses and commercial vehicles going electric by 2024.

Electric vehicle markets in many countries have suffered due to a lack of adequate charging infrastructure. In India, 158,000 AC and 5,400 DC public charging stations will be required by 2025 for a total electric vehicle parc of approximately 700,000.

Among the important points to note as electric vehicle charging infrastructure is built up is that one charging station will have a minimum of two charging points which will mainly be multi-standard charging stations. The combine charging system (CCS) and CHAdeMO will be the two prevailing charging standards. In terms of their location, charging stations will be installed across national highways, state highways, and intercity roads. This will alleviate range anxiety for long distance travel. Strategic charging locations for city driving will include shopping malls, petrol stations, food malls, and public parking spaces. Mobile charging stations will also be made available across major highways.



AUTOMOTIVE AFTERMARKET OUTLOOK –

UBERIZATION & EMERGING BUSINESS MODELS



KEY TRENDS: GLOBAL

Over the next decade, global automotive aftermarket retail and distribution will be profoundly impacted by four important Mega Trends: e-Commerce and e-Retail, e-Mobility, telematics and prognostics, and service marketplaces. Retailers and distributors will have to be agile and responsive to these Mega Trends if they are to retain their competitive edge. In addition to these Mega Trends, a raft of political, economic, social, technological, legislative and environmental trends will also impact the competitive strategies of aftermarket stakeholders.

In 2019, tariffs and inflation will sustain growth in the global automotive aftermarket. Private labels and online-to-offline (O2O) hybrid retail are becoming the latest battleground for distributors and retailers. New business models like e-Commerce and service aggregation are set to disrupt traditional supplier-distributor partnerships.

Meanwhile, sourcing strategies and retail pricing structures are likely to be affected by ongoing trade deals and tariff wars. New business models and revenue streams are being tested by traditional retailers and distributors in partnership with service marketplaces.

Retailers are confronting the still niche but gradually increasing threat posed by e-Commerce competitors like Amazon, who are targeting the DIY channel and launching their own private labels.

Private labels are viewed as being crucial to helping established retailers and e-Commerce companies gain margins while supporting a wider range of prices and options for in-store and e-Portal platforms.

During 2019, South Asian economies will continue to sustain their GDP growth, while contributing to aftermarket spending. India and China are expected to continue with GDP growth, while the economies of the U.S., the U.K., and Germany will slow down.



KEY TRENDS: GLOBAL

Car sales in mature markets will continue to slow down amidst pockets of growth in Eastern Europe and Latin America led by a resurgent Brazil.

The increase in part prices, especially those manufactured in China, will continue in 2019 despite the recent tariffs wars. India and China are expected to take the lead here with Western Europe and the U.S. lagging.

Spearheaded by the U.S., China, Germany and India, online sales of replacement parts and accessories will hit nearly \$35 billion globally in 2019 with heightened OE activity in direct selling.

Shifts in the vehicle model mix, continuing digitization, and new mobility options will create churn in the automotive industry.

Amazon is likely to introduce more private label products for the aftermarket as well as continue to develop its B2B fleet business. This will have a profoundly disruptive impact in the U.S. and U.K. in particular.

Recent growth in SUV and truck sales in some regions will increase spend per vehicle – particularly tires and brakes, while creating more opportunities for accessories. Among the markets where this will be evident are the U.S. and China.

Economic protectionism is in the spotlight once again. A no-deal Brexit and ongoing trade-related tensions across major economies will have negative implications on businesses importing / exporting replacement parts. It will motivate retailers to focus on domestic investments in the short term, with the impact of trade deals being felt on parts prices and market competition.

Digitization in vehicle services will represent huge growth opportunities. Nearly \$350-\$400 million worth of vehicle service jobs are expected to be booked online from service marketplaces in 2019.

Despite economic headwinds, most markets will register an increase of 1.5%-2.0% in terms of average annual miles driven. This will be fueled by the rising uptake of ride-hailing and shared mobility options.



KEY TRENDS: REGIONAL

Increasing vehicle age, higher growth in luxury cars and light commercial vehicles (LCVs) will be the common growth influencers across most regions.

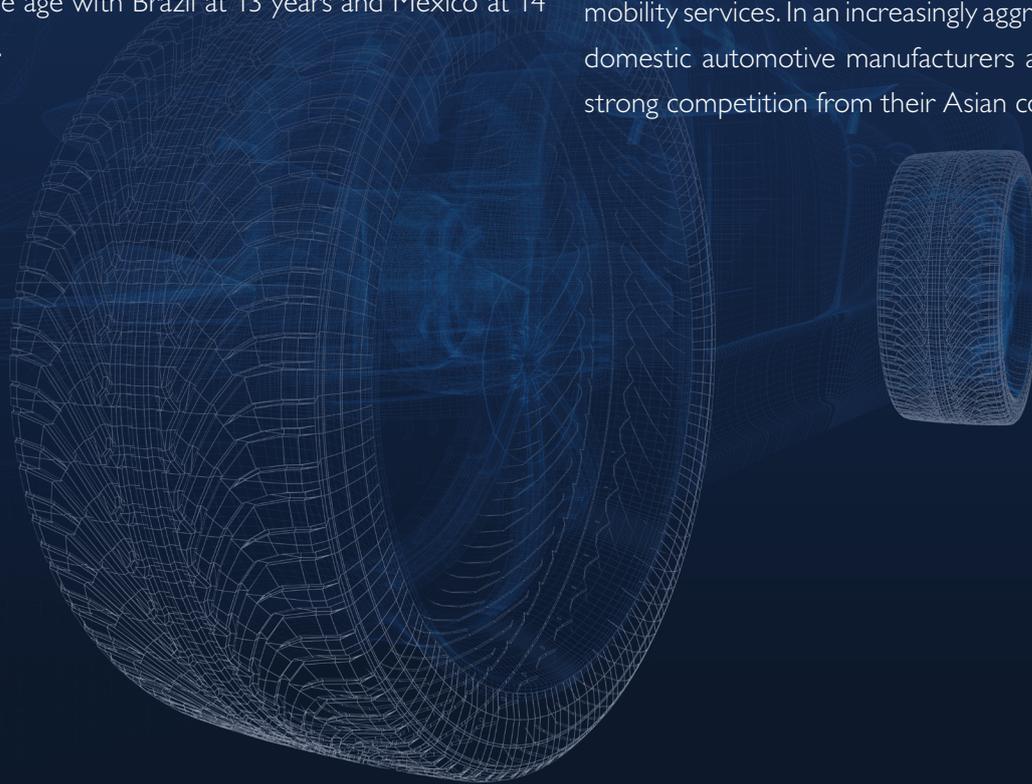
Tariffs and inflation will impact markets in North America; in the U.S. and Canada, growth will be driven by pricing. The region will also see an increase in 2nd lifecycle used vehicles with a high penetration of advanced driver assistance systems (ADAS) features. As a result of harsher winters – the Polar Vortex effect - replacement demand will surge in spring. The market will offer opportunities for fleet repair, and truck / SUV aftermarket sales.

In Latin America, Brazil's economic rebound will boost the aftermarket. As competition escalates, there will be increasing consolidation, especially in the major automotive markets of Mexico and Brazil. Both these countries also have very high average vehicle age with Brazil at 13 years and Mexico at 14 years.

In India, uncertainties brought about by national elections held earlier this year restrained consumer spending, putting skids on market growth. Anti-counterfeiting legislation and parts standardization bode well for market growth. The Indian market presents opportunities for LCVs and luxury vehicles.

Declining customer confidence, paralleled by heightened domestic production capacity, could lead to more demand for value products in China. Like in India, there are growing opportunities for luxury vehicles and LCVs. A notable trend will be the expanding market for used car imports.

Europe has witnessed intensifying competition in the distribution arena. Continued anxieties over Brexit have impacted the entire European automotive ecosystem. Several new players in the service marketplace are entering the market offering new mobility services. In an increasingly aggressive market, domestic automotive manufacturers are also facing strong competition from their Asian counterparts.





THE 4D EFFECT

Automotive aftersales are in the midst of tremendous disruption. Not just vehicles and customers but the entire ecosystem is transforming.

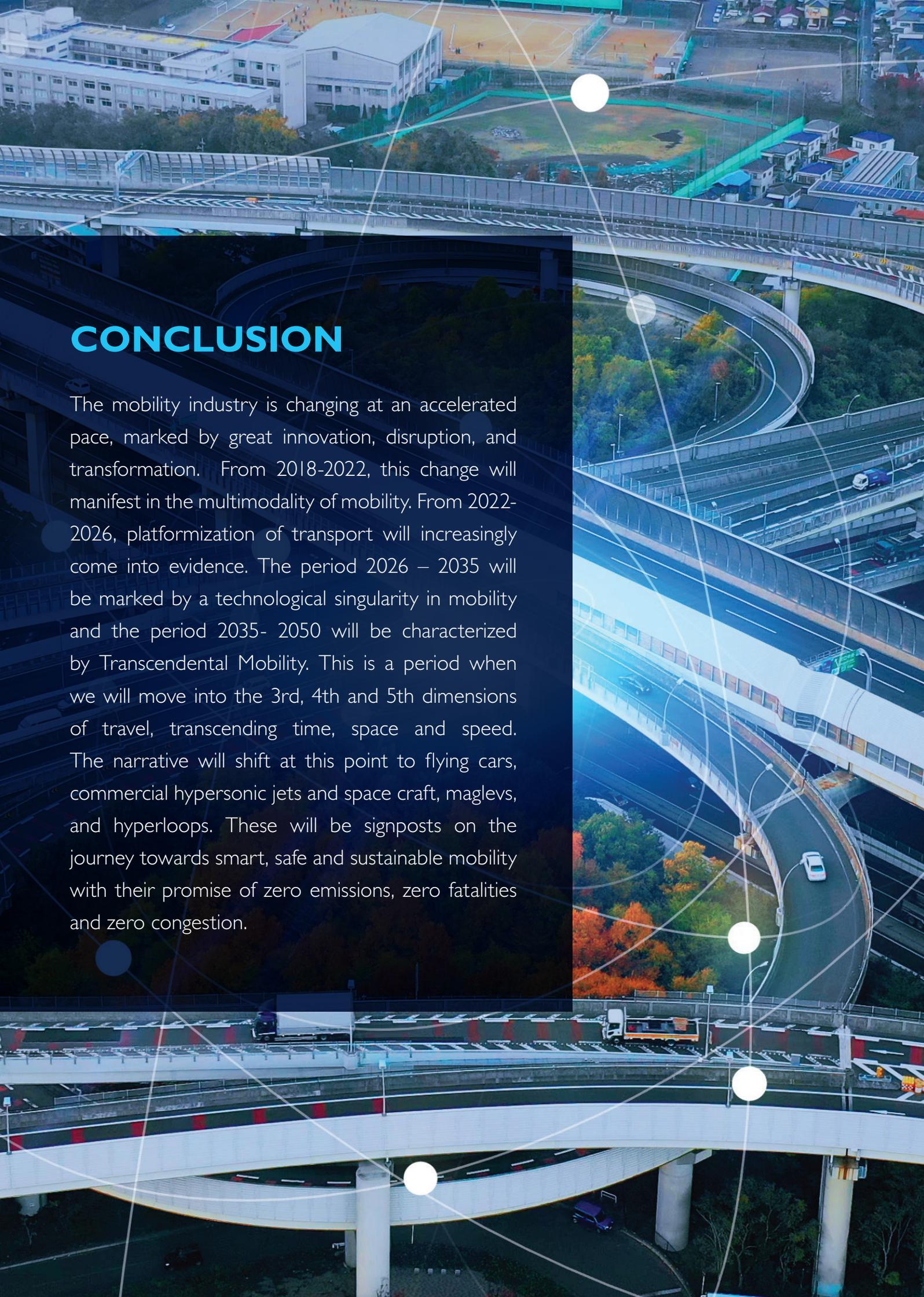
This will also lead to a shift from the traditional repair and service model to a more comprehensive vehicle management model that offers end-to-end solutions for car owners, fleets and installers.

Aftersales will feel a 4 D impact: the first will be the accelerated move to a C.A.S.E era. This will trigger disruption across the board. It will underpin a shift to vehicle ownership management and highlight the entry of new participants and intermediaries who will enhance the value chain. As the industry becomes defined by C.A.S.E, it will also unleash multiple, highly lucrative opportunities related to data access and monetization.

Indeed, every aspect of the service and maintenance ecosystem—from demand, access and support right through to delivery—is being disrupted through connectivity and digitization.

Amazon provides a glimpse of the future of automotive ownership in an omnichannel, connected environment. Its services will cover the entire spectrum from vehicle sales, B2C parts sales, B2B parts sales, and service management. It will be representative of the direction that the automotive industry will take in the future as digitization supports more interactive experiences that enhance the customer journey and enables greater customization. Thus, Amazon's automotive ownership management strategy will encompass AR / VR showrooms, in-vehicle personalized sales, diagnostic tool integration, and predictive services and sales.





CONCLUSION

The mobility industry is changing at an accelerated pace, marked by great innovation, disruption, and transformation. From 2018-2022, this change will manifest in the multimodality of mobility. From 2022-2026, platformization of transport will increasingly come into evidence. The period 2026 – 2035 will be marked by a technological singularity in mobility and the period 2035- 2050 will be characterized by Transcendental Mobility. This is a period when we will move into the 3rd, 4th and 5th dimensions of travel, transcending time, space and speed. The narrative will shift at this point to flying cars, commercial hypersonic jets and space craft, maglevs, and hyperloops. These will be signposts on the journey towards smart, safe and sustainable mobility with their promise of zero emissions, zero fatalities and zero congestion.

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