McKinsey&Company

Delivering change
The transformation of commercial transport by 2025

Advanced Industries September 2016

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Executive summary

Raising the topic of change in the commercial transport and logistics sectors immediately prompts many questions: How will consumer demand affect delivery of products? What do autonomous driving and stricter regulation entail for light commercial vehicle (LCV) and truck manufacturing? How profound will the impact of e-commerce be on the value pools available to LCV and truck OEMs? What near-term business opportunities exist for my company? Some players also ask whether the discussion of fundamental change in the industry is simply hype. This myriad of mixed reactions reveals the intense uncertainty about both the (key) future trends affecting the sector and how players should respond to them.

McKinsey has conducted significant primary market research to develop an industry-level perspective on this new market environment, including a first survey of 250 industry executives from the US, Europe (Germany and UK), and Asia (China and Japan), a second survey of more than 3,000 consumers across the US, Germany and China as well as in-depth interviews with industry thought leaders. (Further details on the methodology can be found in the appendix.) The findings reveal that the industry will experience many far-reaching shifts in the next ten years, which will pose genuine challenges but could also bring large rewards.

First, some good news: the environment for LCV and truck OEMs is favorable, as a 60-percent increase in revenues from road-based logistics is likely by 2025. (Road-based logistics consists of the trucking and the courier, express, parcel (CEP) segments; see Text Box 1.) This revenue growth will span all regions and is expected to outpace growth in GDP. Projections foresee a strong annual increase of 8 percent in demand for logistics on the “last mile” – the final delivery leg to end consumers – while long-haul trucking is expected to grow at 4 percent. Regionally, Asia-Pacific is the most powerful growth engine, with demand increasing almost twice as fast as in either North America or Europe.

Logistics demand creating further need for transport capacity is the largest single determinant of the revenue available to LCV and truck makers, adding some 40 percent to truck revenue growth. The remaining 60 percent, however, come from new revenue pools, of which vehicle automation is the largest. Specifically, the scenario developed using our market model suggests that the global revenue pool for truck OEMs will grow from approximately EUR 150 billion today to EUR 220 to 240 billion by 2025. Revenue pools for LCVs are expected to grow as well, from about EUR 130 billion now to EUR 180 to 200 billion in 2025.

Text Box 1

Road-based transport – trucking vs. courier, express, parcel (CEP)

Road-based transport is subdivided into two main segments: trucking and CEP. Trucking – in other words, the long-haul and distribution transport of goods (freight volumes above 30 kg) as either full or partial truckloads – represents the significantly larger market segment. CEP entails the delivery of generally small loads (up to 30 kg), especially on the last mile to end consumers. Although LCVs and trucks are also required in other segments of the logistics sector (e.g., mail delivery), these are not explicitly considered as the significant growth dynamics are expected from trucking and CEP.

Three types of overarching trends will drive change in the logistics industry over the next decade. The first group involves technological advancements. Of these new developments, automation technologies are the most significant by far: they are expected to reduce the total cost of ownership (TCO) for vehicles by up to 35 to 50 percent, unlocking significant financial resources for OEMs' customers. OEMs should be able to earn a portion of these funds. Connected services will generate significantly less revenue growth than automation, but they represent a critical control point. Finally, next-horizon technologies such as drones or 3-D printing are gaining a lot of attention, but will reach mass markets later.

Second, the regulatory environment will become more challenging as regulators will demand greater sustainability, and effective solutions to provide it – especially in the last mile – will become a major hygiene factor.

Lastly, end consumer demands are changing: consumers increasingly expect products and services to be personalized and delivered at the location and time they request.

The compound effect of these three types of overarching trends will open up space in the logistics industry for new players and new business models. These innovations will increase competition, but also create new opportunities for established players along the entire logistics chain to compete for revenues. As a consequence, traditional industry borders will soften, with current and new players likely to enter new areas, create platforms, and establish new forms of cooperation.

The favorable environment of a growing logistics industry will put OEMs in a strong position at this critical juncture. In particular, new technologies such as automation and connected services offer opportunities for OEMs to unlock new revenue pools and expand beyond their traditional business. Consequently, their future success will depend on their ability to effectively compete for the new data-enabled value pools. But doing so will require significant investment over the next few years – and OEMs will also need to fund the development of electric powertrains during this period.

Also they will face strong challenges from new, mainly digital players. These upstarts will possess speed, agility, and digital know-how – all prerequisites for the majority of new business models. To counter these new entrants, OEMs must act quickly to both build their own digital capabilities and enter into cooperative efforts with partners around the value chain.

* * *

We wish to express our appreciation and gratitude to the German Association of the Automotive Industry (VDA) for their support and valuable contributions. In particular, we would like to thank Henry Kuhle and Graham Smethurst from the Coordination Unit for Networked and Automated Driving.

We would also like to thank Jennifer Dungs and Steffen Raiber from Fraunhofer IAO for their guest contribution on pages 25-26.

1 The environment for LCV and truck OEMs will be positive through 2025

1.1 Markets for road-based logistics are on course to grow, creating the basis for increased demand for LCVs and trucks

The most fundamental underlying driver of demand for LCVs and trucks is global demand for road-based transport. Because the transport sector dwarves other segments of the logistics market (air/ship/rail, contract logistics, and mail delivery) in importance for LCV and truck OEMs, our analysis focuses on it exclusively. Our positive scenario indicates favorable development for the global market for road-based logistics. Revenues are expected to grow from EUR 920 to 1,470 billion in the next ten years – an increase of almost 60 percent.

The fastest growth will come in the last mile. The CEP market is growing at 8 percent annually – twice as fast as the trucking market – and will reach EUR 420 billion by 2025 (Exhibit 1). As a result, the relative size of the global CEP market will swell: from 28 percent of the trucking market in 2015 to 40 percent in 2025. The growth in CEP will mainly be driven by higher B2C volumes caused by e-commerce, as well as a reduction in average package size per delivery.

Despite CEP's stronger relative growth rate, absolute growth is higher in trucking, and is expected to outpace GDP growth. As a result, our positive scenario projects that the trucking market will reach EUR 1,050 billion in 2025. Two factors are responsible: an increasing separation of labor in production and growth in the share of road-based transport relative to rail and air. As production becomes ever more specialized and separated, manufacturers must transport more intermediary products between production sites. Furthermore, better road infrastructure and an increased need for flexibility are leading many players to transport a larger share of shipments by road – particularly since fuel prices are low. In the long run, the growth of trucking is likely to converge with GDP growth.

In terms of the regional breakdown, it comes as no surprise that the Asia-Pacific region will account for the largest share of revenue growth in both segments. At the same time, growth rates across countries within the regions will differ considerably; the market in Japan, for example, is large but slow-growing, while those in China and several other countries are growing quickly. Growth will also be strong in North America, while experts consistently predict that Europe's growth rates will be the weakest.

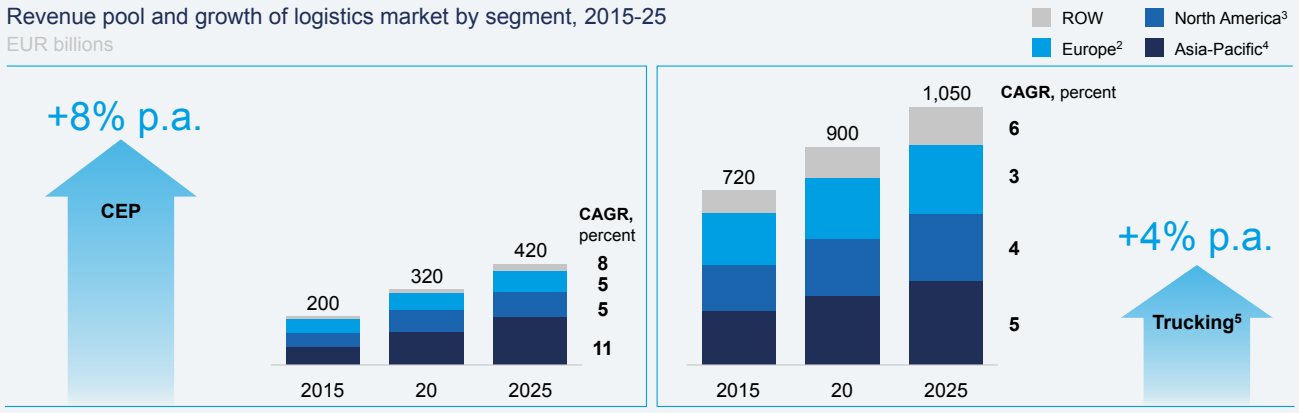
EXHIBIT 1

LCV and truck demand will grow strongly through 2025 – especially in CEP[1] segment and Asian market

POSITIVE SCENARIO

Revenue pool and growth of logistics market by segment, 2015-25

EUR billions



1 Courier, express, parcel 2 Incl. Russia and Turkey 3 US, Canada, and Mexico 4 Asia, incl. India, China, Japan, Korea, Southeast Asia, Indonesia, Australia
5 FTL (full truckload) and LTL (less than truckload); excludes bulk (liquid, dry) and special/project cargo

SOURCE: GSCI; US Census Annual Survey; American Trucking Associations; McKinsey Long-Term Logistics Market Forecast

Growth not only varies from one region to another, but also across the subsegments. The main subsegments of CEP are B2B and B2C delivery. B2B still accounts for the majority of the CEP market, but global B2C volume is expected to expand at close to double-digit rates in the years ahead. As a result, the two subsegments will likely reach a 50:50 balance at the global level by 2025. The reason for this surge in B2C delivery is the continued growth in e-commerce. The B2B market, in turn, behaves more like the trucking market in that it is growing proportionally to GDP.

1.2 Rising demand for LCVs and trucks will combine with industry-specific trends to generate larger revenue pools for OEMs

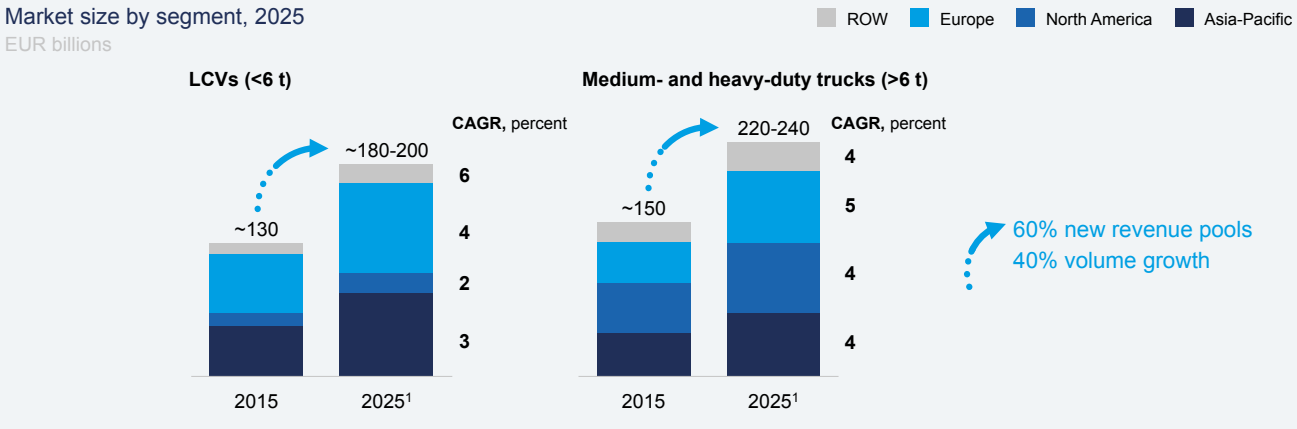
Growth in the logistics market is the primary motor for expanding the revenue pool available to LCV and truck OEMs (although there is no one-to-one correlation between the growth of the road logistics market and the revenue available for LCV and truck manufacturers). The strong growth anticipated through 2025 will combine with other industry-specific trends (see Chapter 2) to create a positive situation for both groups of manufacturers. Revenue pools for makers of medium- and heavy-duty trucks will rise by an additional EUR 70 to 90 billion, reaching EUR 220 to 240 billion by 2025 – a growth rate of approximately 50 percent. The global revenue pool for LCVs will grow by about 45 percent, from EUR 130 billion in 2015 to EUR 180 to 200 billion in 2025 (Exhibit 2).

Volume increases account for 40 percent of this revenue growth. The remaining 60 percent, however, come from new revenue pools. These pools are generated by a variety of forces that are new to the industry players, including the adoption of automation features, the need for operators to comply with stronger emissions standards, the demand for new powertrain technologies, and the demand for connected services. Automation is by far the strongest single such driving force, accounting for EUR 20 to 25 billion of additional revenue on the truck side. In other words, automation features will account for the largest share of the revenue increase (apart from market growth), composing approximately 10 percent of global truck revenues in 2025.

EXHIBIT 2

Global revenue pools for LCV and truck OEMs will grow significantly in the next 10 years

POSITIVE SCENARIO



1 Excl. inflation

SOURCE: IHS; McKinsey

These figures assume that about 33 percent of newly delivered premium trucks in Western countries will be equipped with Level 4 automation technology (meaning that the vehicle can operate without a driver but still requires a human in the driver's cabin for specific situations). Some of the projected growth in LCVs reflects vans and light trucks sold to customers outside the logistics industry, such as small businesses and individuals.

Switching perspectives from revenue pools to profit pools reveals how various trends in truck manufacturing will interact. Profit pools for truck OEMs are expected to grow by 50 percent by 2025, from EUR 9 billion to roughly EUR 14 to 15 billion (Exhibit 3). While market growth and technological trends (of which automation is the strongest) generate higher profits, the positive effects of operational improvements (mainly Industry 4.0) are used to finance compliance with emission standards, the cost of which cannot be fully passed on to customers. OEMs will only be able to compete for growing volume demand if they are on the forefront of technological developments as well.

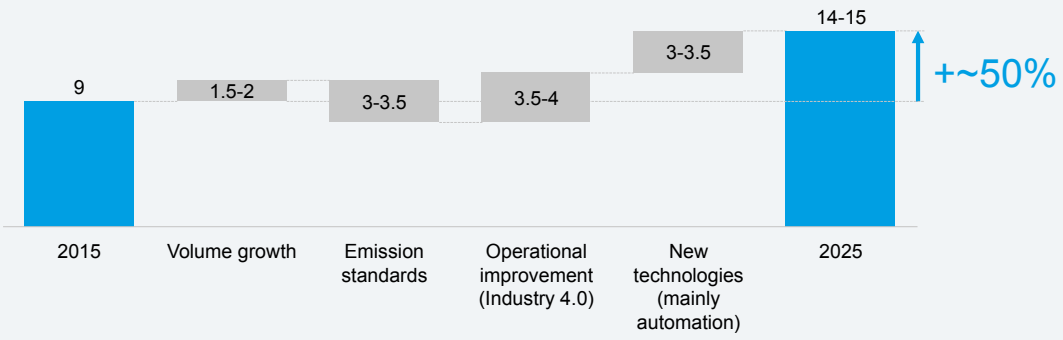
EXHIBIT 3

Global profit pool for medium- and heavy-duty trucks is expected to grow by 50%

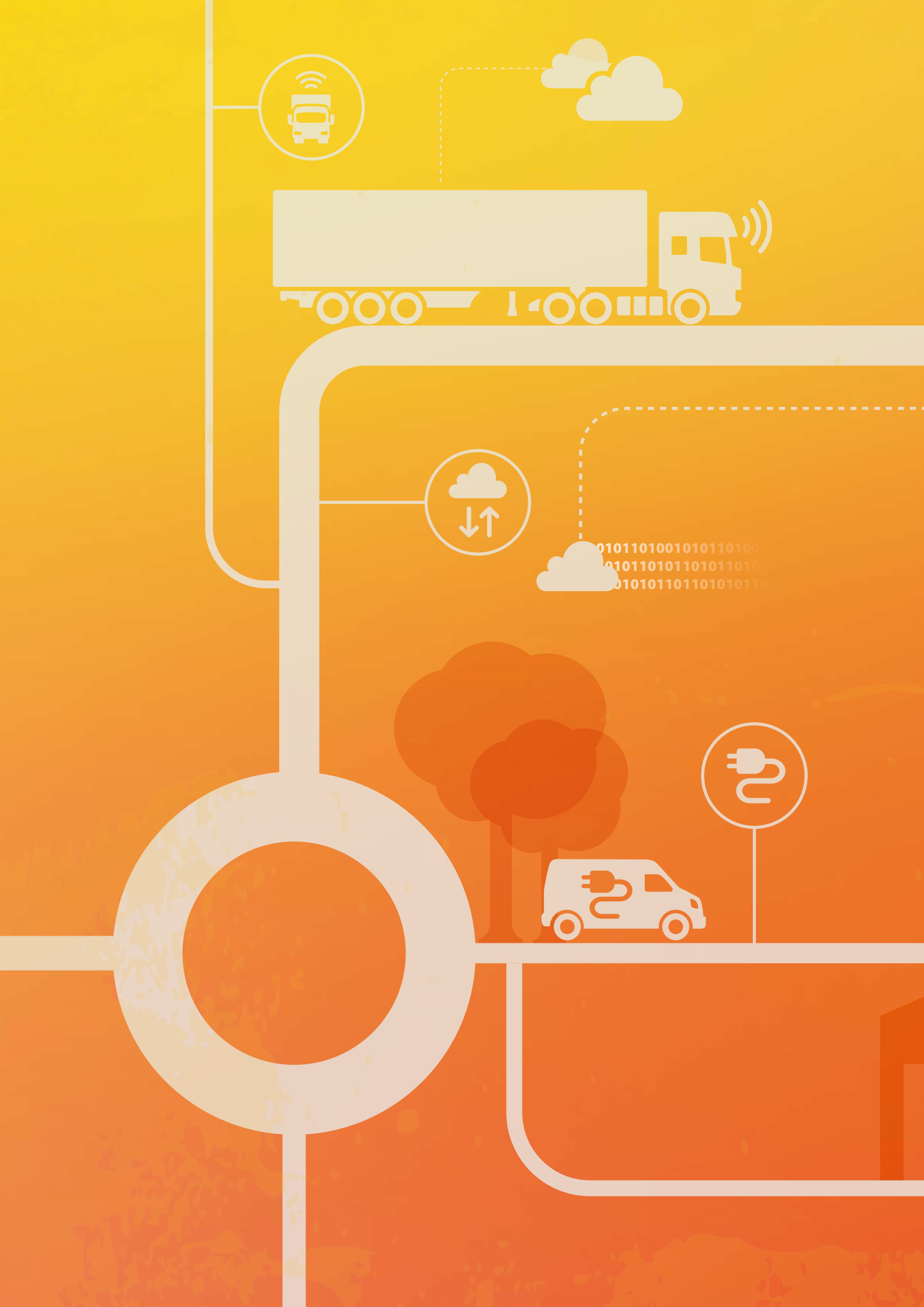
POSITIVE SCENARIO

Global profit pool for medium- and heavy-duty trucks

EUR billions



SOURCE: IHS; McKinsey



2 Six trends in commercial transport will significantly impact logistics companies – and, by extension, LCV and truck OEMs – by 2025

In addition to a rise in fundamental demand for logistics capacity across all regions, the next ten years will bring a number of industry-specific trends. Five underlying trends will impact the industry in three key areas, affecting companies occupying various points in the logistics ecosystem. The interaction of these underlying developments creates an environment in which new players and new business models are possible (Exhibit 4).

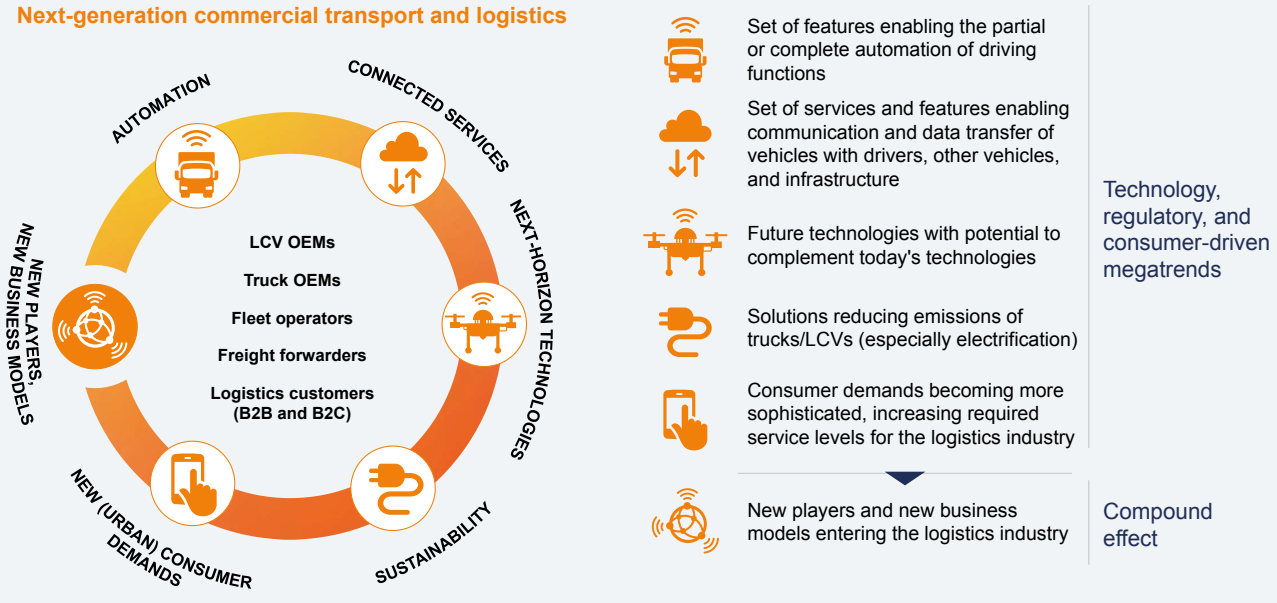
Technological advancements. Automation will be the major source of new revenue pools for both OEMs and logistics providers. In addition, logistics players of all kinds will require connected services to move into more data-enabled business models, so OEMs looking to serve these customers will have to offer them. However, next-horizon technologies such as autonomous delivery robots or 3-D printing are likely to play a smaller role at first as their full impact is expected later.

Regulations/sustainability. Logistics providers and OEMs alike will also need to be prepared for tighter regulations regarding emission standards and fuel efficiency, especially in large urban centers. They will therefore need to be concerned about sustainability solutions, especially electric powertrains.

New (urban) consumer demands. Changing expectations, especially in e-commerce, will translate into new challenges for last-mile logistics services – and, by extension, the van manufacturers who supply them.

EXHIBIT 4

Technological and consumer megatrends plus the regulatory environment will pave the way for new players and business models



SOURCE: McKinsey

Compound effect. As noted above, the confluence of these trends will pave the way for new players and new business models. We expect a softening of industry borders, with new players entering the logistics market. Furthermore, new and established players will develop new business models.

These shifts will likely change business dynamics for long-haul trucking and last-mile delivery in different ways – and thus create both new opportunities and challenges for LCV and truck manufacturers.

2.1 Automation is the main lever in generating additional revenue for LCV and truck OEMs

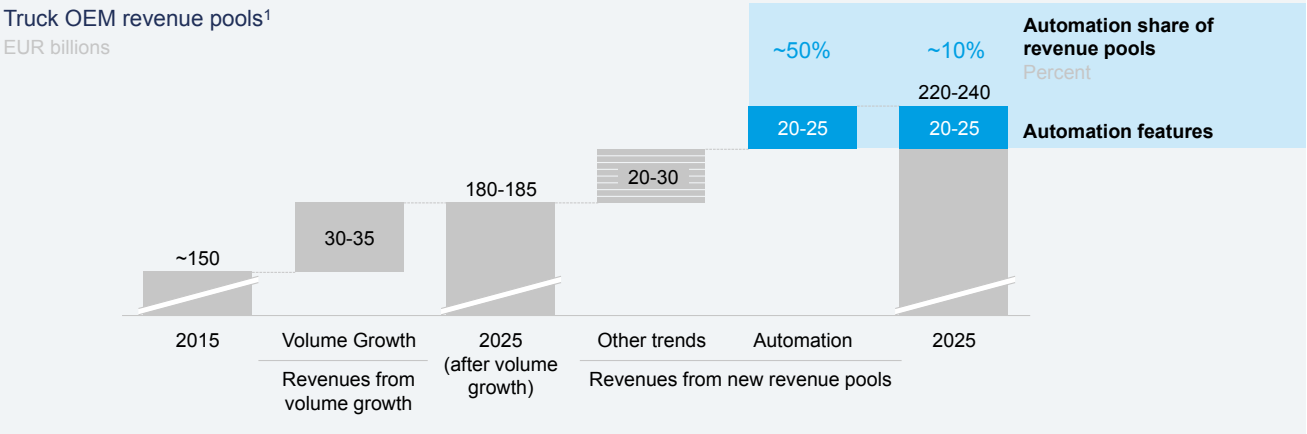
Automation will likely be the game changer in the economics of the logistics industry: it will account for 50 percent of the new revenue pools for truck OEMs (Exhibit 5). Interestingly, OEMs are already preparing for this development, as more than 50 percent of OEM executives state that automation technologies will significantly drive their companies' revenues in the future.

The growth in automation revenue pools for OEMs shown here assumes that automation technology of Levels 1 to 4 (see Text Box 2) subsequently penetrates the market. Specifically, this would mean that 33 percent of the newly delivered premium vehicles in Western countries are equipped with Level 4 automation technology in 2025; penetration in the other segments and regions would be lower.

EXHIBIT 5

Automation features constitute the single largest driver of new revenue pools for trucks, accounting for ~50% of revenue due to industry trends and 10% of revenue overall in 2025

POSITIVE SCENARIO



1 Excl. inflation

SOURCE: IHS; McKinsey

Text Box 2

Automation levels

The term “automation” refers to all technical features that reduce the need for the driver to directly control the vehicle. Two widely used nomenclatures exist for classifying automation levels, one developed by the German Association of the Automotive Industry (VDA) and one by the US-based National Highway Traffic Safety Administration (NHTSA). This publication uses the VDA system:

Levels 1 to 3. Increasing levels of driver assistance features (e.g., lane holding, lane changing); the driver needs to continuously monitor the system (Levels 1 and 2) or at least be ready to take over at any point (Level 3).

Level 4. The system can handle all situations automatically within a specific use case (e.g., driving on highway). The driver does not need to be ready to take over in that specific application. (The NHTSA system combines VDA Levels 3 and 4 into a single level.)

Level 5. The system can handle all situations automatically throughout the entirety of the trip. No driver is required. (Corresponds to NHTSA Level 4.)

Source: VDA; NHTSA

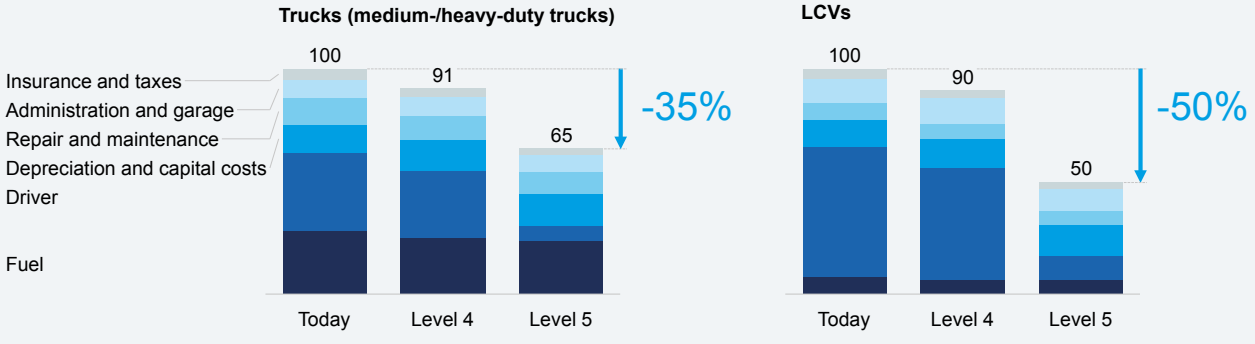
As automation technology significantly decreases TCO, customers will have the financial means to pay for the extra costs of the technology. The large impact of automation features on vehicle TCO is due primarily to a reduction in driver costs. This effect is even more pronounced for LCVs than for trucks. A fully automated, driverless truck (Level 5 automation) could cost 35 percent less to operate, while the savings for a comparable LCV could be 50 percent (Exhibit 6). As success in logistics ultimately depends on ever-lower TCO, fleet operators have a compelling interest in leveraging the new technologies to reduce these costs.

EXHIBIT 6

Level 5 automation has the potential to reduce TCO by 35% for trucks and by 50% for LCVs

TCO reduction potential from automation at vehicle level

Percent



SOURCE: McKinsey

Executives anticipate even higher penetration rates than assumed in our models with 51 percent expecting that more than half of all newly delivered commercial vehicles will be equipped with Level 4 automation by 2025.

Full automation will also change utilization patterns of logistics vehicles, especially of trucks. Specifically, we expect trucks to operate for much longer periods on the road since no driver will be necessary. The resulting higher utilization (in terms of hours per day) will likely make it possible for operators to reduce the size of their fleets – although this comes at the cost of shorter average truck lifetimes.

Furthermore, automation technology is likely to eventually ease the shortage of drivers: while drivers will remain in short supply in the near future as the overall logistics market grows, fewer will be required once Level 4 automation penetrates the market. Finally, drivers who are in the cabin but no longer solely focused on driving will be able to handle additional activities, such as dispatching tasks. Driver job profiles will therefore develop in new directions.

In short, automation technologies that enable operators to generate significant TCO savings will penetrate the truck market fastest. The picture for LCVs is somewhat different. Small and medium-sized businesses constitute a significant share of the LCV market, and these customers will likely be more willing to pay for greater driver comfort even without reducing TCO.

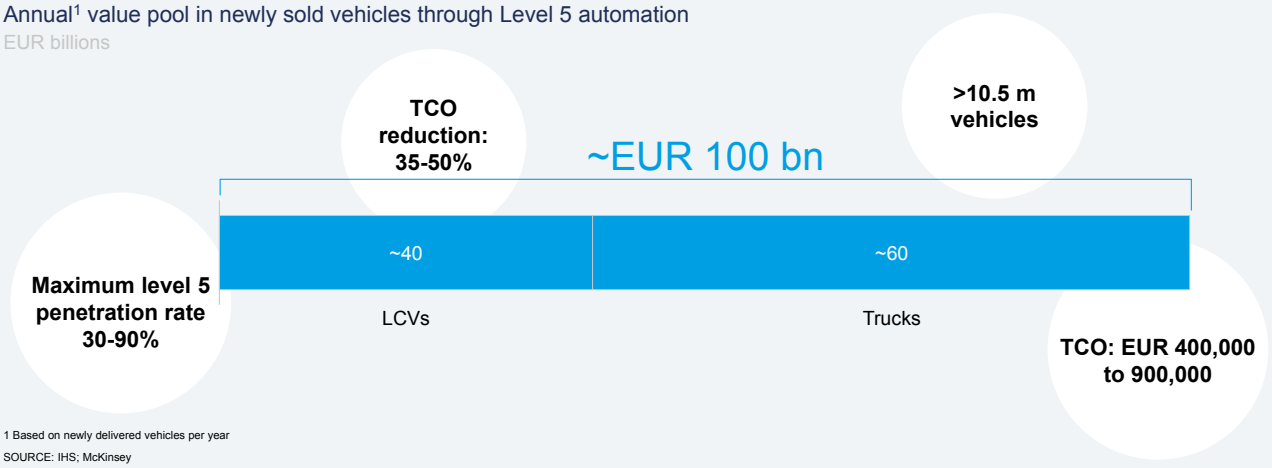
Lowering overall vehicle TCO – and hence total logistics costs – frees up a considerable value pool. Of course, logistics operators need to purchase new technology in order to realize these savings, so at least some of this available value will flow to OEMs. The biggest winners, however, could well be end consumers: lower costs will allow logistics providers to lower their prices as a way to attract more customers. The effect will be most dramatic if fully self-driving vehicles (Level 5 automation) become a reality. Overall, an additional value pool of EUR 100 billion could be up for redistribution among OEMs, freight operators, and customers and end consumers from newly released vehicles every year (Exhibit 7).

EXHIBIT 7

Level 5 automation of LCVs and trucks could add ~EUR 100 bn to global value pool each year

POSITIVE SCENARIO

Annual[1] value pool in newly sold vehicles through Level 5 automation
EUR billions



1 Based on newly delivered vehicles per year

SOURCE: IHS; McKinsey

Because automation features constitute such a significant value driver for OEMs, being at the forefront of their development will be a major differentiator for these companies. Accordingly, the large majority (63 percent) of truck and van executives are planning to develop these technologies in house, with support from selected suppliers only – despite the fact that these technologies will require significant investment. Besides the challenges in developing the technology itself, we see three hurdles for the mass deployment of automation in the market:

Regulation. Authorities are required to provide the regulatory framework and solutions for a host of related safety and liability issues. Although significant regulatory activity can be observed in both Europe and the US to pave the way for Level 4 and even Level 5 vehicles, full deployment of the technology will require a harmonized international regulatory framework.

Infrastructure. Technological advancements in vehicles need to be complemented by the corresponding advancements in communication infrastructure. Advanced automation features will most likely require frequent or constant connections to remote servers and even low-latency connections with surrounding vehicles for some use cases (e.g., platooning). These communication requirements could be addressed with the advent of 5G technology, but significant investments will be needed to ensure adequate coverage. Potential solutions could involve either cellular infrastructure or direct communication between vehicles using Wi-Fi-like standards.

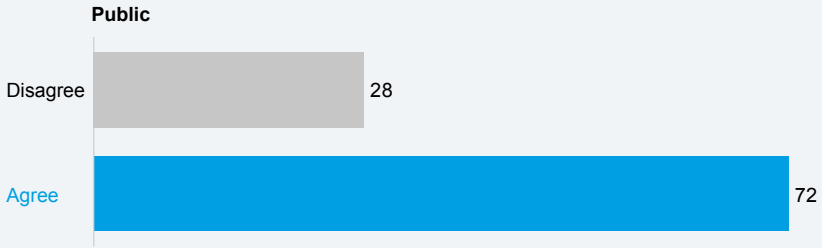
Interface automation. Fully realizing the benefits of automation technology will require automated interfaces along the logistics value chain. One such interface, the loading and unloading of vehicles in warehouses, is already subject to partial automation. The interface with the customer on the last mile is more difficult to automate. However, some concepts already exist, such as parcel-locker vans – and the majority (almost 80 percent) of consumers have stated that they are willing to accept delivery through fully autonomous vehicles. In addition, the attractiveness of fully autonomous vehicles is further supported by the fact that the public is in favor of legalizing fully autonomous trucks and LCVs if they can significantly bring down the costs of delivery (Exhibit 8).

EXHIBIT 8

The public strongly support legalization of fully autonomous vehicles if they bring down the cost of delivery

Legalization of fully autonomous trucks and LCVs to reduce delivery cost for end consumers

Share of respondents, percent



SOURCE: McKinsey

2.2 Connectivity is an important control point and enabler of data-based business models

Like automation, connectivity is a technological megatrend that will open up additional revenue and profit pools in commercial transport within the next decade.

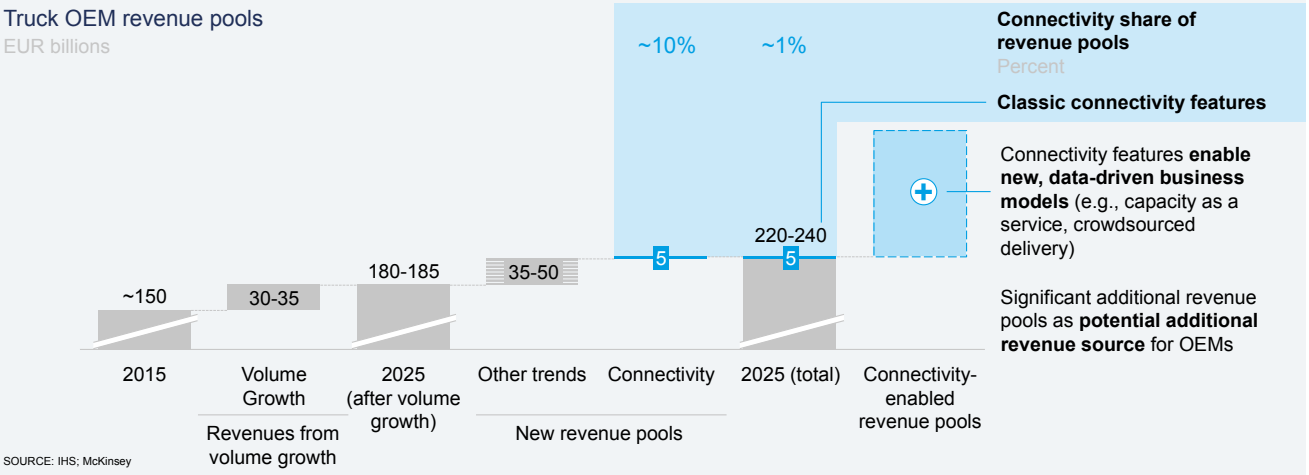
However, its impact will be based on a very different mechanism. Connected services within the traditional business model of OEMs, such as telematics and predictive maintenance, will fuel far less revenue growth for truck and van makers than automation does (Exhibit 9). At the same time, data connectivity represents both an enabler and a critical control point for future revenue and profit pools, for two reasons:

First, data connectivity and analysis will help OEMs to defend and potentially strengthen important existing revenue streams in sales and aftersales, for example, by using predictive maintenance technology to professionalize maintenance cycles.

EXHIBIT 9

Connectivity features account for a very small share of truck revenue in 2025 (~1%), but are essential for new data-driven business models

POSITIVE SCENARIO

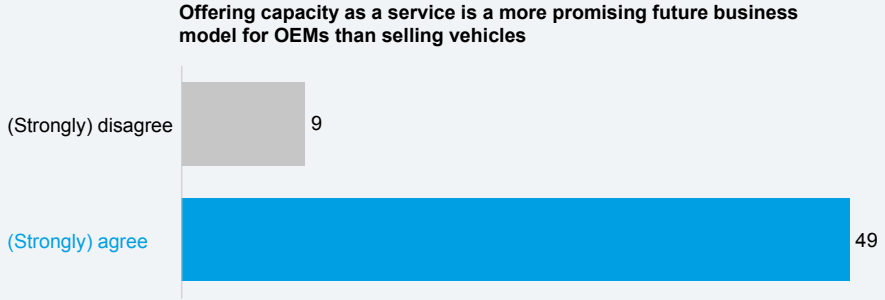


SOURCE: IHS; McKinsey

EXHIBIT 10

49% of OEM executives think offering capacity as a service is a more promising business model than selling vehicles

Share of truck and LCV executives[1]
Percent



1 Other respondents neither agreed nor disagreed

SOURCE: McKinsey

Second, connectivity technology unlocks an entire range of new nontraditional business models and applications. One of the most promising involves offering "capacity as a service," in which OEMs would sell transportation capacities while operating the fleet themselves.

Such an approach would provide them with access to highly transparent data, and could be even more lucrative in the case of Level 5 automation. A large group of OEM executives (49 percent) already think that capacity as a service could be an attractive business model in the future (Exhibit 10).

Results from our executive survey show that players across the logistics chain recognize the importance of the data pools from two main control points: real-time or predicted demand information (from consumers) and corresponding information on transportation capacity. The ability to match these two types makes drastic improvements in vehicle utilization possible and will yield significant revenues and profits for those who enable it. Indeed, data aggregation platforms might control the distribution of transport jobs in the future. Consequently, the majority of executives from both OEMs and logistics players (51 percent of respondents) state that they will strive to keep their data in house.

2.3 Next-horizon technologies will complement today's logistics offerings

The transformation of the logistics industry will continue beyond 2025. In addition to Level 5 automation, a number of next-horizon technologies are currently in development, although they are not yet ready for mass use. Three are particularly relevant to logistics:

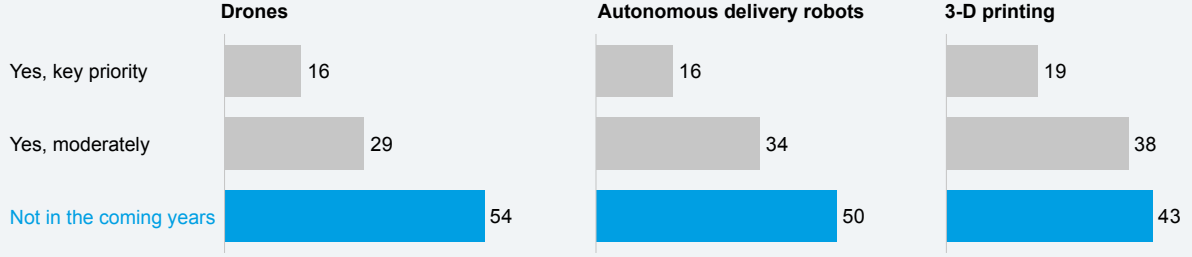
Drones have received a lot of media attention, and multiple players are testing prototypes. Because drones require an overlay network, however, using them at scale costs more than 30 percent more than traditional last-mile delivery today. Drones are therefore unlikely to compete with LCVs on a large scale, especially since Level 5 automation will further reduce the TCO of LCVs. Still, drones are well suited to overcoming pain points in today's road-based last-mile delivery, such as congestion. They are likely to play their largest role in premium services, especially in B2B environments, and thus complement traditional logistics offerings.

EXHIBIT 11

Most executives do not consider drones, autonomous delivery robots, and 3-D printing to be investment priorities today, but one-third suggest moderate investment as "a foot in the door"

Next-horizon technologies as key investment priority

Share of respondents, percent



SOURCE: McKinsey

Prototypes of fully **autonomous delivery robots** are currently being tested in the market. Given their size, speed, and flexibility, robots are likely to serve very specific niche markets only, such as grocery delivery.

3-D printing might eventually support localized production cells and thereby slow down long-haul transport. To achieve widespread acceptance, however, the technology needs to further evolve. We therefore expect that 3-D printing will remain confined to niche applications for the coming years.

Every fifth executive sees next-horizon technologies as a major investment focus in the coming years while, depending on the technology, between 29 percent and 38 percent would still recommend some level of investment (Exhibit 11).

2.4 Sustainability is an important hygiene factor given increasing emission regulation but can also offer an attractive business case

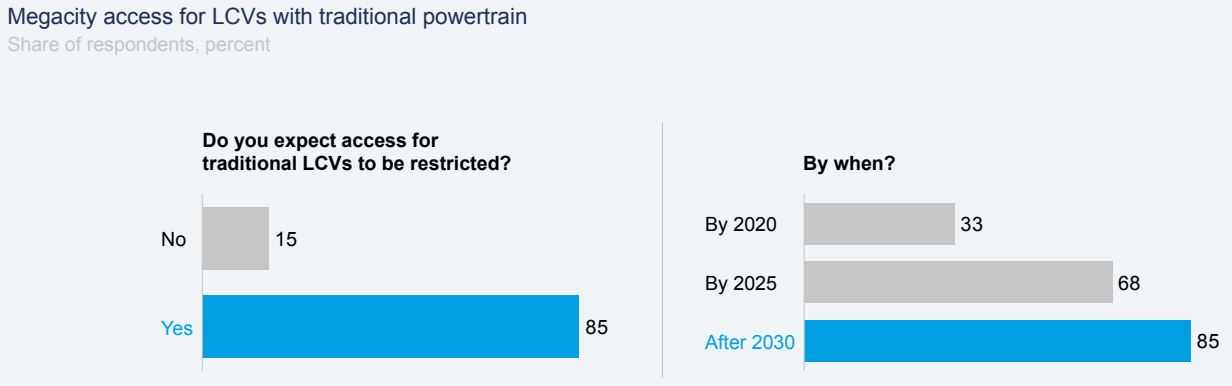
Environmental regulation will likely force logistics providers to seek sustainable solutions, especially in the form of electric powertrains. However, regulation will not be the only factor encouraging the use of sustainable vehicles, as economically viable cases for their use exist as well.

Anticipated regulation will focus on urban areas. Indeed, a significant majority (68 percent) of industry executives expect that access to large cities across the globe will be restricted by 2025 for LCVs and trucks with today's combustion engines and emissions profiles (Exhibit 12). (Nearly a third even foresee such restrictions in the next five years.) For this reason, this trend primarily affects LCVs, but is also relevant for large truck distribution traffic entering city centers.

Most executives in the logistics industry recognize the importance of developing sustainable engines and expect OEMs to deliver against these expectations. Specifically, more than

EXHIBIT 12

Regulated access to megacities is expected to increase constraints on LCVs with traditional powertrain



SOURCE: McKinsey

66 percent expect that in 2025 at least 30 percent of newly released vans globally will be electric. The magnitude of this shift indicates that while OEMs continue to improve traditional powertrains, they will face additional cost pressure as they develop alternative technologies in parallel. OEMs could potentially reduce these costs by cooperating on a shared combustion powertrain platform for LCVs.

While electrification is more likely in low-mileage use cases (i.e., last-mile distribution), trucks also enter urban centers and might therefore be subject to the same regulations as LCVs. Selected players have reacted and at least one example of an electrified distribution truck is already in development: Mercedes-Benz recently unveiled its "Urban eTruck," a fully electric vehicle with a maximum capacity of 26 tons. Mass production is slated to begin in 2020.

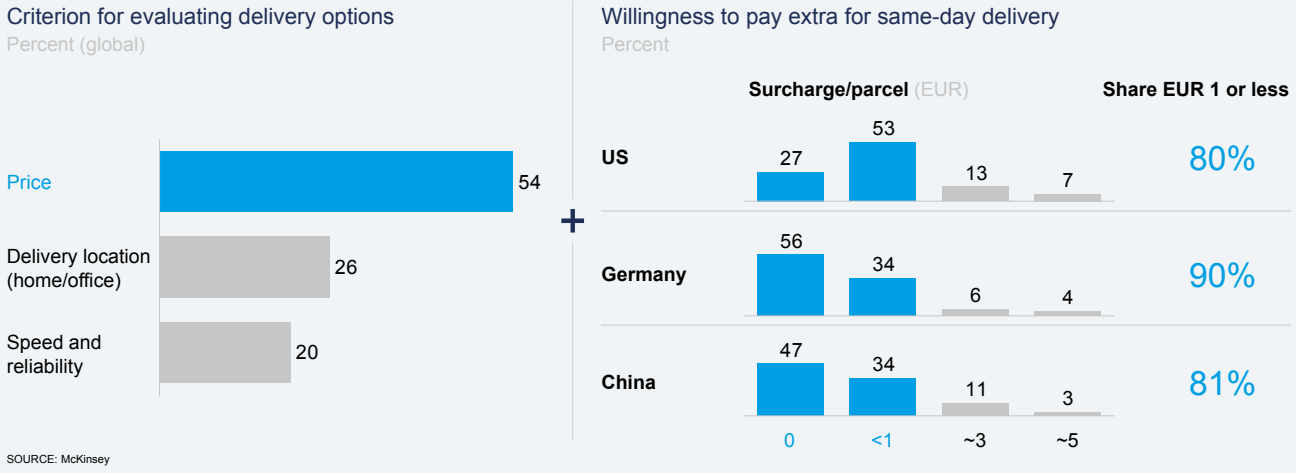
Besides conforming to environmental regulations, electric delivery vehicles actually represent an economically preferable option on the last mile. Fully electric LCVs equipped with today's technology already yield a superior business case over conventional diesel LCVs in typical use cases with daily driving distances averaging 70 km, even when R&D costs are included. The significant reduction in fuel costs more than offsets the higher costs for materials. Furthermore, battery prices are expected to fall, further improving the business case. Changing consumer demands will also help to make electric vehicles economically attractive: as consumers increasingly request same-day or even same-hour delivery, the average delivery tour will be shorter. Vehicles with more frequent opportunities to recharge can be equipped with smaller, less costly batteries.

2.5 New (urban) consumer demands lead to more dense inner-city logistics centers and more diverse delivery fleets

Consumers increasingly want products and services on their own terms: individualized and delivered at the location and time they request. This demand has been fueled in recent years as end consumers have profited greatly from rising service levels in e-commerce. As they grow accustomed to one-click ordering processes, ever-faster delivery to homes, and easy methods for returning parcels, their expectations increase even more.

EXHIBIT 13

Price remains dominant criterion in last mile – ~80% of end consumers are willing to pay no more than EUR 1 per parcel for same-day delivery



SOURCE: McKinsey

But there is a catch: consumers are not willing to pay more for these services. Price remains the number one purchase criterion for consumers, and just 10 percent of German consumers would actually pay an additional EUR 1 or more per package for same-day delivery. While the picture is slightly more positive in China (14 percent) and the US (20 percent) (Exhibit 13), logistics will clearly remain a cost-conscious game.

While willingness to pay is low to virtually inexistent, consumers will nevertheless come to see higher service levels as the "new normal." Due to this dynamic, the majority of industry executives expect same-day delivery to account for at least 25 percent of the CEP B2C market in Europe by 2025. The resulting need to offer same-day and even same-hour delivery will create new requirements regarding both vehicles themselves and their connectivity. Dynamic routes will be necessary to accommodate tight schedules and will replace fixed daily runs. Since vehicles would likely return to the warehouse frequently during the day to pick up new orders, they could be smaller. Furthermore, we have seen that shorter trips might make an electric powertrain an economical solution, since battery size could be reduced. In peak times and in certain areas, some same-day and same-hour volume could be handled by crowdsourced delivery solutions instead of traditional players.

These new customer demands also have an impact on infrastructure requirements: inner-city logistics infrastructure needs to become more dense and decentralized to ensure same-day delivery (see Text Box 3). While next-day delivery is the current norm in the CEP business, freight forwarders and retailers are already setting up the infrastructure they need to deliver goods within the same day. Examples can be found across the globe, as retailers set up small "dark" stores containing products with the shortest cycle times – in other words, products that are most likely to be needed within the next hour. This also means that predictive shipping (the ability to predict the need for a product before it has even been ordered) will likely become more common. Amazon has recently patented such an approach.

Given these developments, players within commercial transport will need to find other ways to finance these demands. Using automation to reduce TCO is certainly part of the solution, but new cross-financing revenue streams will also be essential. Amazon, for example, cross-finances higher same-day shipping/network costs through membership fees generated by their Amazon Prime service. Players that are able to manage these cross-revenues will be perceived as offering a superior service, enabling them to differentiate themselves from the competition and gain a dominant position in the overall value chain.

Text Box 3

From a mayor's perspective: New logistics concept for crowded inner-city areas

Today, most logistics companies operate single-tier networks (i.e., they bundle goods onto large trucks and send them to distribution centers on the outskirts of cities). From there, shipments are distributed within the city using smaller trucks and delivery vans.

As faster delivery times become the norm, companies using this conventional hub structure will no longer offer competitive service levels. They will need to decentralize inventories and bring them closer to consumers, especially those in urban areas.

Doing so will require setting up a second distribution tier within cities. This shift will significantly impact the kinds of vehicles in logistics companies' fleets, as well as the requirements they must fulfill. Whether these new vehicles are vans, cargo bicycles, or autonomous delivery robots, they will have something in common: their limited range and load capacity will make urban storage stations essential. As a result, a key challenge for companies will be to set up logistics sites within cities despite a general shortage of urban space and exploding property prices.

Achieving these aims in the medium to long term will require close, transparent cooperation among companies and the public sector. The first step is to create an appropriate factual basis for planning such efforts.

To respond to this need, Fraunhofer IAO initiated "Urban Logistics Traffic," a project to analyze the delivery processes of three major parcel delivery companies in Stuttgart. The study examined the physical distribution of monthly parcel volume across the city. Researchers also considered which type of vehicles were used, and where and for how long they were parked during the delivery process.

The results show that at each company approximately 35 percent of all packages underway in Stuttgart went to addresses in just 20 streets, of which 15 were identical across the three companies. Another finding showed a direct link between the average time that a vehicle was parked and the density of the surrounding area: as the number of recipients within an area increases, vehicles are parked longer. Delivery personnel frequently carry parcels or load them onto hand trucks, and delivery vehicles function more as mobile depots than means of transport.

For cities, these findings suggest that targeted measures – such as support for logistics providers to find operational space in these high-density areas – would be strong levers for increasing the efficiency of logistics processes and decreasing their negative impact on city residents. Since these logistics hotspots are strategically significant across the industry, actions to improve access to them would benefit all companies equally. The fact that this approach is "competition neutral" frees cities to pursue it.

In a joint project ("logSPAZE") of the city of Stuttgart and Fraunhofer IAO, a first new delivery concept will be implemented in October 2016, when UPS will stop using the bulk of its urban fleet for Stuttgart (light trucks, gross vehicles 7.5 tons) and switch to delivery by foot, with hand trucks, and with cargo bicycles. Parcels will be delivered from two depots in close proximity to the city's central pedestrian zone. The depots consist of standardized trailers that are trucked each morning from the UPS hub outside the city and outfitted with detachable stairs. In the afternoon, the empty containers go back to the hub, where they are loaded over night with new packages to be delivered the next day. Thanks to the pilot project, UPS can eliminate four out of every five trucks it currently uses for deliveries within Stuttgart's city center while maintaining the same level of service to customers. The remaining truck will still be required to accommodate especially large parcels.

Author: Steffen Raiber, Fraunhofer IAO

2.6 The preceding trends will lead to moves by established players along the value chain as well as new players and new (digital) business models

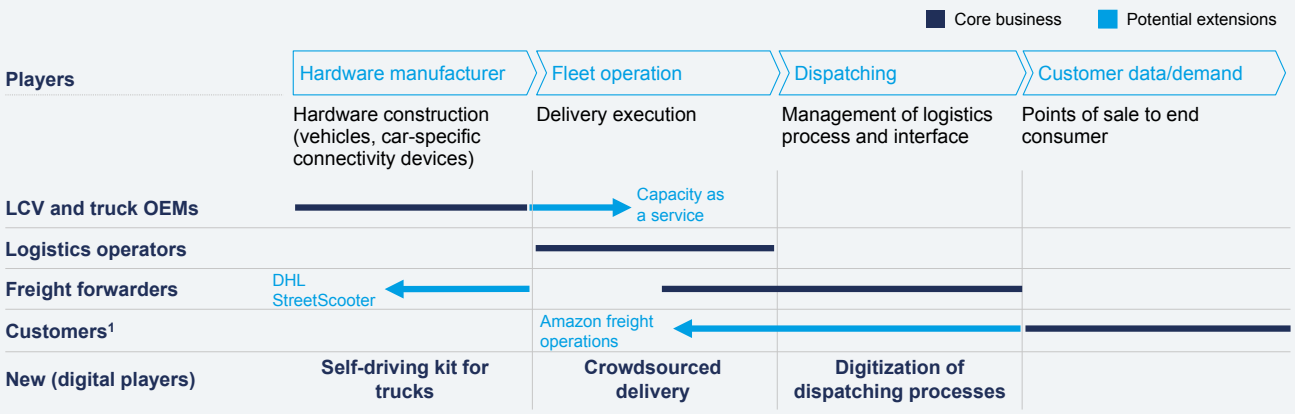
All the preceding trends will have significant implications for players in the logistics space as they unlock new revenue pools for the commercial transport industry and bring TCO down to the lowest levels ever.

TCO will remain a dominant value driver and source of competitive advantage in both trucking and CEP for the foreseeable future. At the same time, fully exploiting the potential of the value pools created by the trends above will require new business models. The mostly digital nature of such business models will also create openings for new players to enter the industry. The race to occupy important data sources and control points to industry profits is likely to kick off moves along the logistics chain by incumbents and new players alike (Exhibit 14). Several of these moves can already be observed today (see Text Box 4).

Technological development and changes in consumer demands are happening at a rapid pace – and digital native firms and start-ups are extremely quick in professionalizing specific technologies and exploiting new business models. To participate in the anticipated revenue growth and capture a share of shifting profit pools, both OEMs and logistics companies will need to speed up their development of new (data- and technology-driven) business models. Yet executives are confident about their companies' perspectives, as a majority of them (65 percent) do not believe that new entrants pose a threat to their current business models.

EXHIBIT 14

Industry borders will likely blur due to cooperations, mergers, and vertical integration



1 E.g., e-commerce, automotive

SOURCE: McKinsey

Text Box 4

Recent evidence of strategic moves beyond traditional industry roles

Uber acquired Otto – a half-year-old start-up that aims to retrofit existing trucks with an automation solution – for a total estimated transaction value of USD 680 million in August 2016. Uber is aiming to provide seamless "one-stop" transport for not only passengers, but for goods as well.

DHL codeveloped the "StreetScooter," an electric van that is in the process of replacing 30,000 existing vehicles in the delivery fleet and may also be sold to third parties.

Amazon has integrated backwards into logistics with road and airfreight operations (e.g., by purchasing several thousand delivery trucks in the US to mount its own operation) and is cross-financing superior service levels on the last mile (i.e., same day, instant) through Amazon Prime membership fees.

Tesla announced that it was expanding into the production of fully electric semi-trucks and plans to unveil the result in 2017.

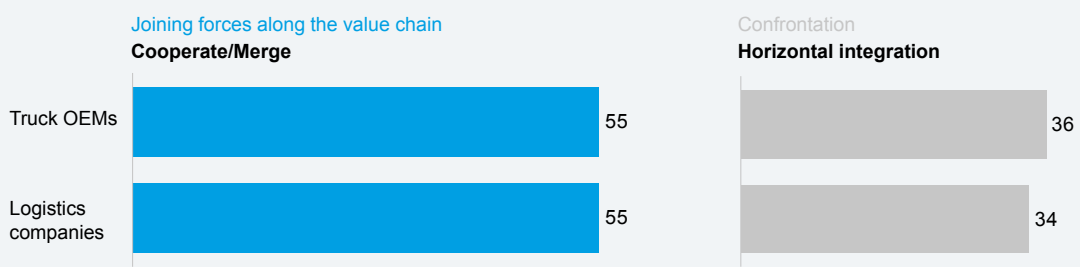
OEMs and logistics companies may struggle to develop all the competencies required to digitize their current business models and develop new ones. In this situation, joining forces with other players could be a viable approach. In fact, 55 percent of OEM and logistics executives see cooperations or mergers between both types of companies as valid options (Exhibit 15), so these activities could take place not only within but across sectors. Sector and industry borders are therefore unlikely to remain as fixed as they have been in the past. With increasing levels of automation and connectivity-enabled transparency regarding route and capacity data, LCVs and truck OEMs might choose to operate fleets themselves and partner directly with freight forwarders or even retailers. Of OEM and logistics executives, 50 percent (strongly) agree that this would represent a viable strategic alternative.

EXHIBIT 15

Executives in the logistics space prefer joining forces to confrontation

Strategic alternatives for incumbents

Share of respondents, percent[1]



1 Other respondents answered: "None of these options"

SOURCE: McKinsey

3 Significant revenue and profit potential will be available to LCV and truck OEMs – but they must act now to capitalize on it

The overall outlook for LCV and truck OEMs is positive. The logistics market that fuels demand for their products is growing. At the same time, the conjunction of technological developments with new customer and regulatory demands opens space for new business models. This situation presents exciting opportunities for established manufacturers, but also attracts new players.

Specifically, autonomous driving and connectivity have tremendous potential to unlock new revenue and profit pools, especially as they bring down TCO for operators. Yet, accessing these pools requires significant investment, adding to the cost pressure OEMs will already face as they develop new powertrain technologies. To be successful, OEMs will need to secure their existing revenue streams by capturing a significant share of the new value pools – but also extend beyond their traditional business model of selling and servicing vehicles.

The new companies challenging OEMs for these value pools will mostly be digital players. Given their speed, agility, and digital know-how – all prerequisites for the majority of new business models – they might start in an advantageous position.

OEMs must therefore act now in three areas:

Defining a clear technology strategy for developing required hardware and software, particularly around automation. It is essential that companies consider how they will accomplish their technology-related goals: by aiming to become the technology leader through in-house development or by following the market in a buying strategy.

Identifying, piloting, and establishing new business models early on that leverage their existing customer base and industry know-how. They should pursue these efforts in trial-and-error mode, and consider inorganic growth options as well.

Finding ways to cooperate along the value chain and create platforms to create scale in the identified business models. Cooperative efforts and even mergers should also be considered across segment and industry borders. Players are already integrating along the value chain to exploit opportunities in areas beyond their traditional core businesses.

Appendix

A Methodology

This report is based on three main sources: an executive survey, a consumer survey, and proprietary models of the logistics as well as LCV and truck markets. The findings are further supported by interviews with senior industry experts from across these industries.

McKinsey's 2016 survey of logistics as well as LCV and truck executives

In July and August 2016, McKinsey conducted a survey of 250 executives in the logistics, LCV, and truck industries. The questions asked these managers to assess both technological and industry trends and the extent to which their own organizations are prepared to respond to them.

Participants were drawn from Europe (100 respondents), the US (110 respondents), and Asia (Japan and China, 40 respondents). The group was evenly split between executives working in logistics (freight forwarders, freight operators, and warehouse operators) and those working for LCV and truck OEMs and their suppliers.

McKinsey's 2016 logistics consumer survey

In parallel to the executive survey, McKinsey conducted a survey of more than 3,000 end consumers, evenly split among the US, Germany, and China.

This survey focused on consumers' attitudes and preferences regarding parcel delivery, including their willingness to pay for services and their acceptance of new technologies.

McKinsey's proprietary market models

This research includes in-depth modeling of trends for the global LCV and truck industry across regions, vehicle segments, and sales segments. These proprietary market models were combined with forecasts for the global logistics market. The scenario used in this publication is optimistic in that it assumes that no major economic downturns will impede market growth. These forecasts are not deterministic in nature, but are based on probable developments given current data and expert opinion.

Executive and consumer surveys provide an in-depth view of major trends, their implications for industry structure, and what determines companies' success

Executive survey

- 40+ questions on major trends in commercial transport and logistics and preparedness of organizations
- 250 respondents from LCV/truck OEMs and logistics companies (forwarders and operators)
- 3 key regions: US, Europe (Germany and UK), and Asia (China and Japan)
- Findings supported by interviews with experts on LCV/truck OEMs and logistics companies

+

Consumer survey

- 60+ questions assessing attitudes and willingness to pay for e-commerce and new delivery technologies
- 3,000+ respondents
- 3 core markets: US, Germany, and China

SOURCE: McKinsey

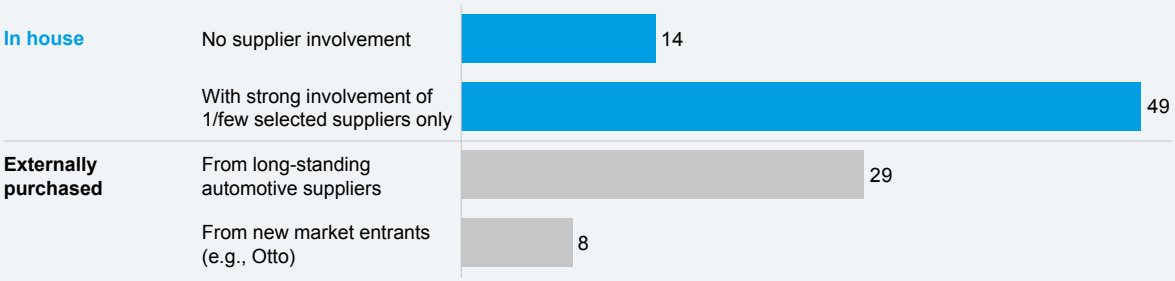
Both surveys conducted in July/August 2016

B Further key findings from the 2016 McKinsey Delivering Change Executive Survey

Source: McKinsey Delivering Change Executive Survey 2016

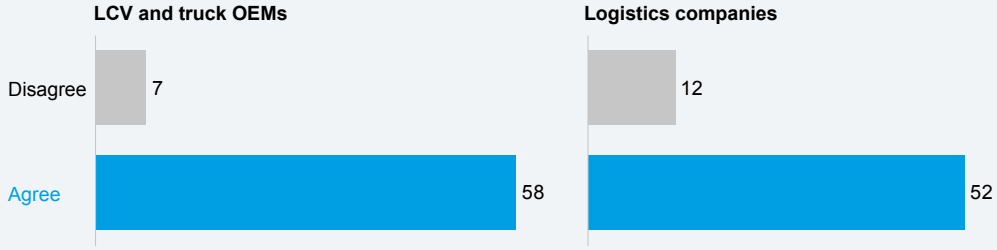
More than 60% of experts expect OEMs to develop automation systems in house

Development location of automation systems for OEMs
Share of respondents, percent



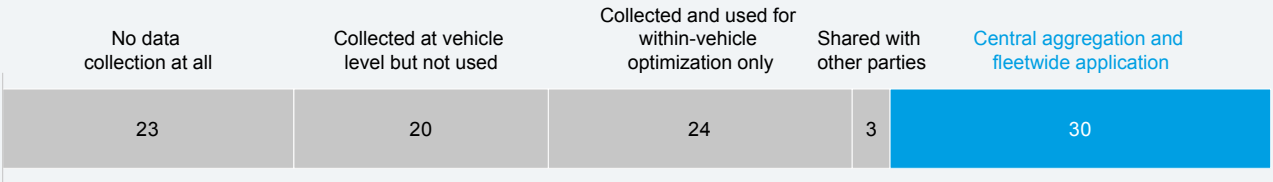
More than 50% of executives expect autonomous driving features to significantly drive OEM profits and revenues in the next decade and beyond

Automation features significantly drive OEMs' revenues and profits in next 15 years
Share of respondents, percent



Currently, just 30% of experts say that their companies use vehicle data to optimize fleetwide costs and capacity

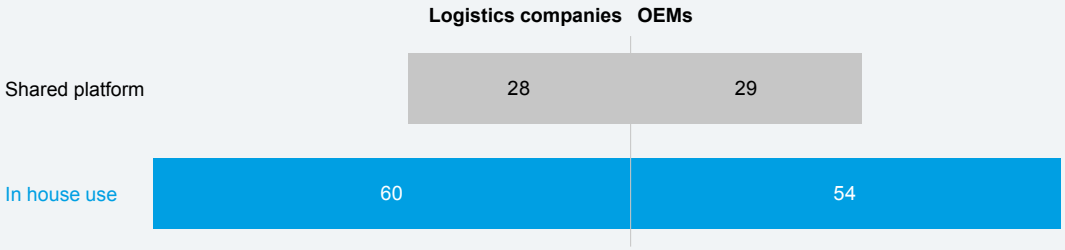
Aggregation and use of vehicle data
Share of respondents, percent



Interaction within the ecosystem is not yet defined because most executives view shipment data as key strategic asset

Willingness to participate in platform vs. purely in house data use

Share of respondents[1], percent

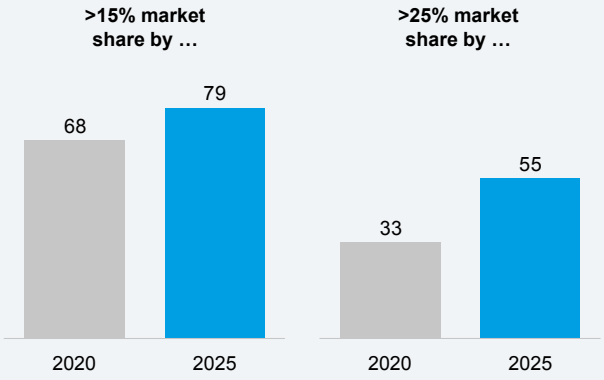


1 Remaining respondents were undecided

Experts are confident that same-day delivery will account for more than 15% of CEP market by 2025; more than half even predict a share of more than 25%

Market share of same-day delivery in CEP market

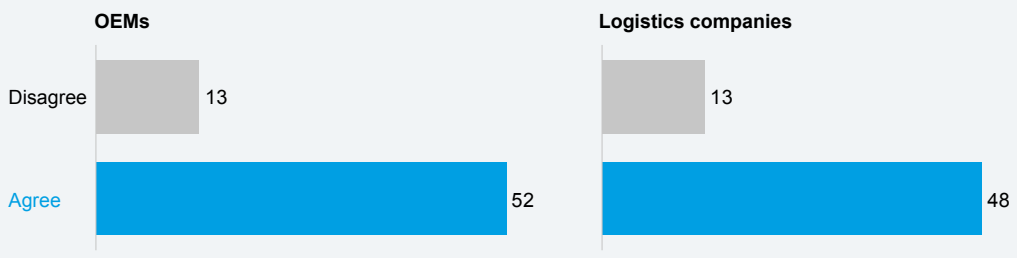
Share of respondents, percent



Although cooperative approaches are preferred, integration of OEMs into freight forwarding is considered an attractive strategic alternative

Integration of OEMs into freight forwarding is attractive for OEMs

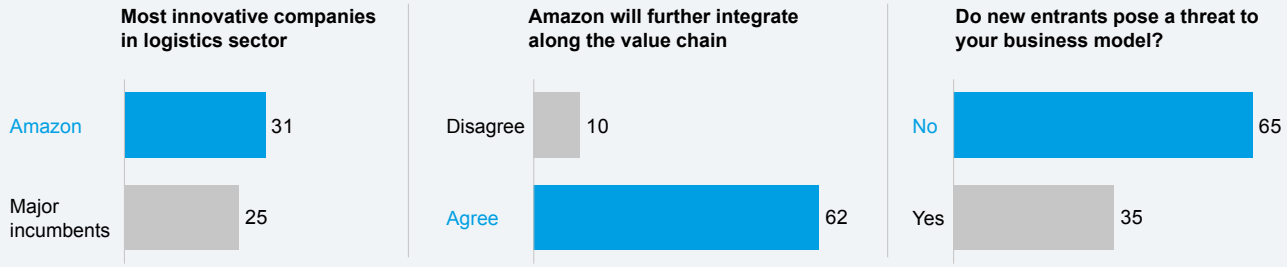
Share of respondents, percent



Selected retailers perceived as highly innovative and expected to further integrate along value chain – however, logistics companies do not fear new entrants

Perspective on retailers

Share of respondents[1], percent

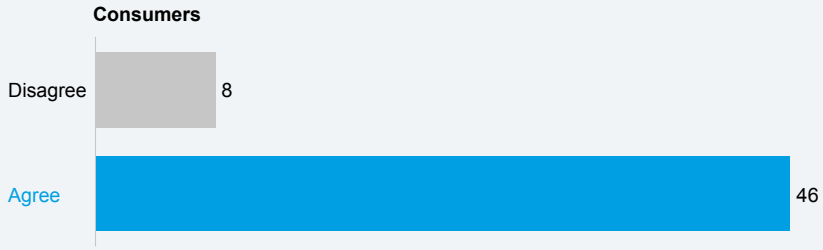


1 As for the second question, other respondents neither agreed nor disagreed

Almost half of consumers would favor regulation banning combustion-engine vehicles from city centers

Regulation forcing delivery trucks and LCVs to drive with electric engines

Share of respondents[1], percent

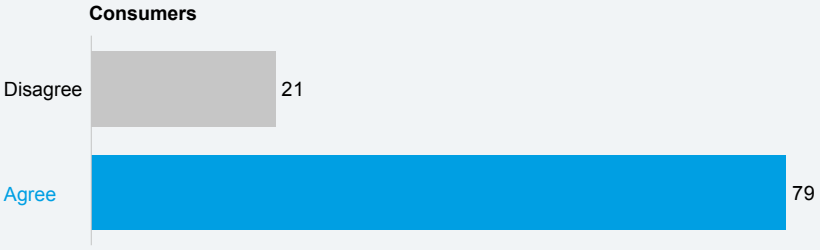


1 Other respondents neither agreed nor disagreed

Consumers are open to delivery by fully autonomous vehicles

Acceptance of delivery through fully autonomous vehicles

Share of respondents, percent



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