

Post-Pandemic Reflections: Future Mobility

COVID-19's potential impact on
the new mobility ecosystem



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Mobility-as-a-Service and the COVID-19 shock

Even prior to the COVID-19 crisis, we discussed in our first Thematic Insight¹ how the world might be in the midst of the largest transformation in mobility since the advent of the automobile some 120 years ago. Will the current pandemic prove to be a system shock that accelerates the demise of inflexible and unprofitable business models and acts as a catalyst for the growth of more digital and service-oriented businesses in the mobility space? How might industry-wide headwinds affect the new business models and technologies at least in the short-term?

New industries naturally go through a series of iterations before becoming established. In the first decade of the automobile revolution, the rush to gain a foothold led to a flood of companies producing cars. In 1899 alone, some 60 car manufacturers opened their doors, including Renault, Opel, Fiat, Packard, and the Electric Vehicle Company of New York.² By the time Henry Ford launched his Model T in 1908, there were 485 different companies producing vehicles in the United States.³

Within the last decade, we have seen a similar dramatic rise of autonomous technology, manufacturing and mobility services companies, fueled by billions in mostly venture capital funding. In California alone, as of May 2020, there were 66 technology companies and manufacturers with permits to test autonomous vehicles.⁴

A growing database collated by Neckermann Strategic Advisors has over 700 public and private companies involved with different elements of the autonomous Mobility-as-a-Service (MaaS) value chain. A list that doesn't yet include all the producers of electric, two-wheeled and public transport that contribute to the full mobility ecosystem.

In the 1910s, the automotive industry was vast, and the rising tide was lifting every boat, albeit not profitably. However, by the time the Roaring Twenties came to an end in 1929, the number of US auto manufacturers had already fallen to 44, only to consolidate much further after the Great Depression. It is, of course, tempting to see a parallel to the last five years in mobility. Just prior to the COVID-19 crisis, there were initial signs of stress in this tapestry of privately-funded companies in the Future Mobility ecosystem. As a result of COVID-19 and the consequent recession, how many players in the space will either fail, consolidate or specialize their activities? Whatever happens, the potential failure of any of these overwhelmingly private and venture-backed companies need not be a setback to the overall Future Mobility trend and how it is visible in public equity markets.



¹ "Future Mobility: Understanding a new transport ecosystem", MSCI, April 2020.

² James Flink: "The Automobile Age" (1990), via <https://www.scaruffi.com/politics/cars.html>

³ <https://www.history.com/topics/inventions/automobiles>

⁴ <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/permit>

Growing Pains in the Future Mobility Market

Our review of the potential short- to mid-term effects of the COVID-19 crisis is structured around the six key elements of the Future Mobility value chain:

- » Technology
- » Systems & Data
- » Mobility Operators
- » Manufacturers
- » Fleet Management
- » Mobility Aggregators

Exhibit 1:
COVID-19 Crisis and the Future Mobility ecosystem: An overview

Source: Neckermann Strategic Advisors





Technology

During the corona-crisis, most technology companies halted autonomous vehicle testing, which has therefore lowered demand for suppliers across the sector.⁵ Among public companies, the impact in autonomous mobility has been mixed while many autonomous tech companies have announced layoffs, reflecting growing uncertainty on returns from venture-capital backers.⁶ Some public companies are actually seeking to capture opportunities: Intel (the owner of autonomous technology company, Mobileye) purchased mobility-as-a-service pioneer Moovit in a USD 900 million value-chain integration deal.⁷ Alphabet subsidiary Waymo increased funding for its research and pilots by USD 750 million while Baidu's robotaxi launched its operations in the capital city of Hunan province.^{8,9} Nevertheless, these public R&D investment may be outliers in a general fall in overall investment spend, as projects far from generating revenue are temporarily culled.

Deeper within the mobility value-chain, suppliers to battery-tech producers (in particular lithium) have seen clear disruptions in their own operations, resulting in several Q1 revenue warnings. Mid-term, an increase in market share of electric vehicles would stabilize demand but short-term both Albemarle and SQM have adjusted projections for 2020.¹⁰



Manufacturers

Traditional OEMs and new brands such as BYD, Nio, and Naveya have been impacted by the effective loss of (so far) two months of sales and significant supply-chain disruption. One-third of respondents in a recent survey of 25,000 Americans said that "constraints on their personal finances will greatly impact their decision to buy a vehicle post-COVID-19."¹¹ Financial stress during the pandemic may leave OEMs even less prepared for mobility disruption than before. Fiat has required a EUR 6.3 billion credit line, even while its merger with PSA Group is under review.¹² Ford cancelled an electric vehicle project with Rivian and delayed its autonomous vehicle program to preserve cash.¹³ Other OEM partnerships may be re-evaluated.

New manufacturers, with more flexible supply-chains and more focus on mobility may fare better. In the midst of the crisis, Nio was still able to secure USD 1 billion in new growth funds in China, BYD launched a new electric vehicle for the European market and Naveya demonstrated its vehicles in an autonomous medical goods delivery showcase at the Mayo Clinic in Florida.¹⁴

- 5 <https://venturebeat.com/2020/03/17/coronavirus-halts-autonomous-vehicle-testing-for-uber-cruise-aurora-argo-ai-waymo-others/>
- 6 <https://www.freightwaves.com/news/another-autonomous-trucking-startup-announces-layoffs>
- 7 <https://techcrunch.com/2020/05/04/confirmed-intel-is-buying-urban-mobility-platform-moovit-in-a-900m-deal/>
- 8 <https://www.wsj.com/articles/waymo-adds-750-million-to-war-chest-as-driverless-cars-prove-tough-to-deploy-11589299200>
- 9 <https://www.caixinglobal.com/2020-04-21/baidu-trials-free-robotaxi-service-in-changsha-101545168.html>
- 10 <https://uk.reuters.com/article/us-chile-lithium-sqm/sqm-profits-plunge-again-on-lower-lithium-prices-slashes-2020-capex-plan-idUKKBN22W1KN>
- 11 <https://newsroom.ibm.com/2020-05-01-IBM-Study-COVID-19-Is-Significantly-Altering-U-S-Consumer-Behavior-and-Plans-Post-Crisis>
- 12 <https://www.autocar.co.uk/car-news/industry/fiat-chrysler-talks-£56bn-credit-line-backed-italian-government>
- 13 <https://uk.reuters.com/article/uk-ford-motor-results/ford-expects-5-billion-loss-in-current-quarter-as-coronavirus-hits-demand-idUKKCN22A1GO>
- 14 <https://newsnetwork.mayoclinic.org/discussion/autonomous-shuttles-help-transport-covid-19-tests-at-mayo-clinic-in-jacksonville/>

Amid general sales weakness, electric vehicle sales have been a rare, positive note during the crisis, with sales increasing slightly in the US, and more strongly in Germany, France and the UK.¹⁵ Europe now narrowly leads China for the highest number of new electric vehicle registrations, with Tesla leading against Renault and VW.¹⁶ Almost 15% of new vehicles in Europe sold in Q1 2020 had an electric motor.¹⁷ Anticipated scrappage schemes would likely favour greater electrification despite record-low oil prices.

Systems & Data

This segment of the value-chain includes mapping, data management and security companies, connectivity and network providers, and providers of connected mobility equipment. After short-term delays and disruption within the COVID-19 crisis, these connectivity efforts will likely continue as planned, along with the roll-out of 5G and V2X infrastructure, especially where these may be linked to tracking travel and contact.

Fleet Management

High levels of unemployment are likely to be damaging for leasing companies and manufacturers' captive financial-services companies.¹⁸ Travel-bans and global lockdowns also brought rental-car companies to the brink of insolvency¹⁹ or to seek Chapter 11 bankruptcy protection.²⁰ A surge of off-lease vehicles from the furloughed and unemployed, and a short- to mid-term reluctance by companies (and consumers) to acquire new vehicles may deflate both inventory values and revenues. Moreover, of all sectors of the mobility value-chain impacted by the COVID-19 crisis, fleet management is among the least digitalized (most asset-heavy) and therefore would seem to bear considerable risk. However, heavy-goods fleets have been broadly stable in most countries during the crisis, and the crisis has tended to highlight those companies with the most effective use of Internet of Things (IoT), telematics and other fleet management software.²¹

Mobility Operators

With likely higher levels of working-from-home and restrictions on economic activity, mobility behavior patterns may change considerably depending on personal preference, economics, and availability.

15 <https://www.forbes.com/sites/greatspeculations/2020/05/14/electric-vehicle-sales-are-surging-can-mineral-producers-meet-future-demand/>
 16 <https://cleantechnica.com/2020/04/30/tesla-model-3-reaches-1-in-europe-as-europe-reaches-10-market-share-march-2020/>
 17 <https://europe.autonews.com/automakers/europe-beats-china-ev-sales-study-shows>
 18 <https://www.bnnbloomberg.ca/german-auto-lenders-under-scrutiny-as-crisis-erodes-car-values-1.1437881>
 19 <https://www.bnnbloomberg.ca/german-auto-lenders-under-scrutiny-as-crisis-erodes-car-values-1.1437881>
 20 <http://ir.hertz.com/2020-05-22-Hertz-Global-Holdings-Takes-Action-To-Strengthen-Capital-Structure-Following-Impact-Of-Global-Coronavirus-Crisis>
 21 <https://flespi.com/blog/coronavirus-impact-on-gps-tracking-and-fleet-management-business>

Exhibit 2: COVID-19 and Potential Changes to Mobility Services

Source: Neckermann Strategic Advisors

					
	Micromobility	Public Transport	Autonomous	Carsharing/ Pooling	On-demand Mobility
Short term	Surge in bicycle use supported by temporary lanes in cities. Micromobility struggling with business model  	Lockdown and closures; services at a minimum (down 90-95%). Impact on revenues and maintenance 	Most/all AV passenger trials halted. Trials for goods (even blood tests) in crisis highlight new potential 	Pooling shut down where part of hailing; Carsharing a viable option in cities only; Questions around safety, cleaning 	Ridehailing down over 80% with travel; accelerated roll-out of goods and food delivery 
Mid term	Consolidation to build new leaders. Govt may sustain positive effect but individual behaviours will get people back to other services 	Social distancing may define lasting effect; subsidies and investment will suffer in many countries. Innovation? 	If the industry capitalises on this unexpected boost, may accelerate and facilitate the deployment of the technology esp. for goods 	Pooling recovery only as option for public transport; P2P carsharing in question. Most commercial carsharing linked to rental survival 	Accelerated innovation from well-funded, run ridehailing actors generating new revenue streams. Questions on city relationships remain 



therefore decreased competitiveness against other modes. In London, this potential pattern has already started to play out after the UK government bailout.²⁶

Autonomous passenger transport is not yet available beyond dozens of pilot programs but may likely receive long-term additional attention, as long as cleanliness protocols for shared services can be developed, not least given reduced worker exposure and potential reduced costs. Goods transport, on the other hand, seems to be the focus of live business activity sooner (as further described below).

Carsharing ventures, especially where owned by rental car companies, have struggled with profitability in recent years. Post the COVID-19 crisis, such business viability pressures seem unlikely to abate. In London, the standalone, all-electric BlueCity (backed by French conglomerate Bolloré) closed pre-lockdown in February 2020 having also struggled with scaling fleet management & servicing, and building a competitive network.²⁷

²² <https://bycs.org/cycling-towards-resilient-cities/>

²³ <https://www.latimes.com/california/story/2020-03-18/lime-scooters-california-coronavirus-covid19-jump-bikes-breeze-bikeshare>

²⁴ For example, in New York <https://www.nytimes.com/2020/04/20/nyregion/nyc-mta-subway-coronavirus.html>

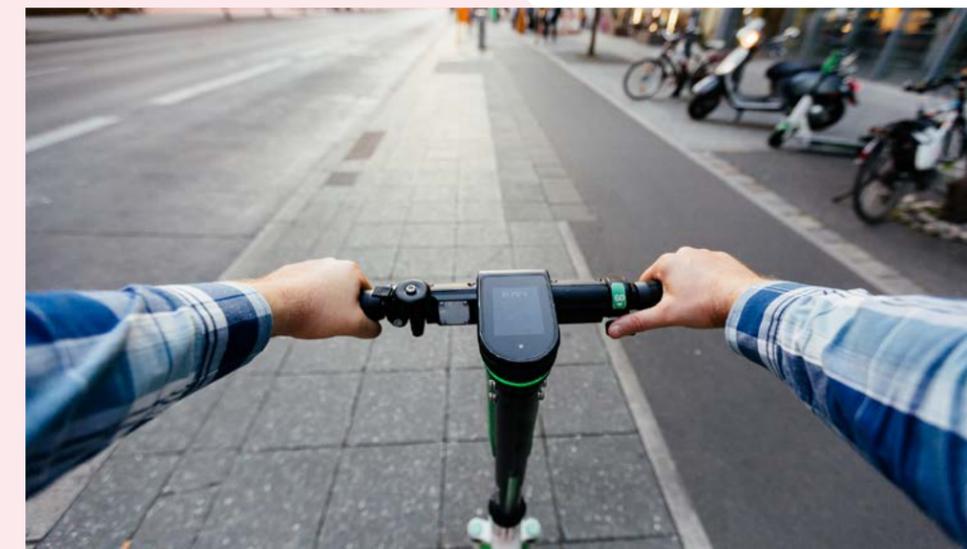
²⁵ <https://newsroom.ibm.com/2020-05-01-IBM-Study-COVID-19-Is-Significantly-Altering-U-S-Consumer-Behavior-and-Plans-Post-Crisis>

²⁶ <https://www.theguardian.com/uk-news/2020/may/15/transport-for-london-faces-3bn-funding-gap-despite-16bn-bailout-income-journeys-coronavirus>

²⁷ <https://thenextweb.com/cars/2020/01/31/ev-car-sharing-schemes-london-shutdown-expensive-councils-challenging/>

Bicycles and scooters have had some natural advantages as socially-distanced, personal transport through the crisis: both usage and sales have increased.²² Bicycle (especially e-bike) sales have surged, supported by the evident low congestion as well as temporary bicycle lanes in cities across Europe and the Americas. Shared scooter providers have not fully benefitted as the initial management reaction was to remove vehicles from the streets.²³ Nevertheless longer-term, after whatever consolidation and restructuring may occur, two-wheeled modes generally seem well-placed given the increased urban real-estate being made available and behavioral changes.

Public transport has been hit with a “triple whammy” that could affect both the short- and the medium-term outlook. Revenue, down over 90% in most cities during the crisis,²⁴ may struggle to recover fully even in the mid-term: more than 20% of 25,000 American public transit riders surveyed in an IBM study said they would no longer use buses or subways, a result mirrored in other national surveys.²⁵ Second, subsidies and public investment may well be constrained, as both national and local government agencies adapt and budget for the overall economic recovery efforts. Third, lower revenues and subsidies, combined with deferred innovations, may result in higher fares, potentially reduced service and

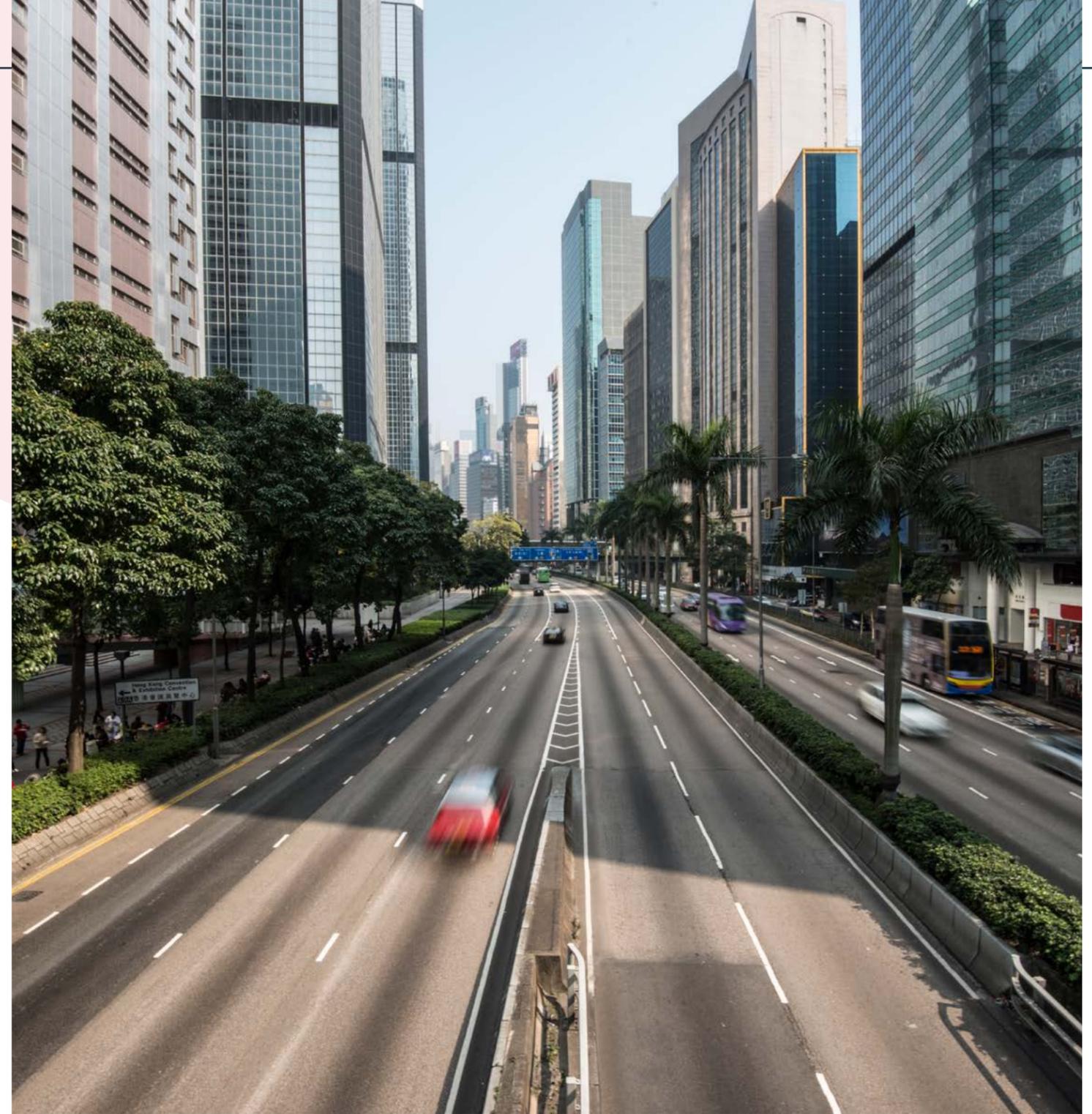


Peer-to-peer models such as GM's Maven and Turo faced obvious new potential headwinds in a post-pandemic environment: GM have already reacted by shuttering the service.²⁸ Although Avis Budget's Zipcar unit laid off 20% of its staff during the crisis, longer-term the company expects to fare better afterward, stating "we are a more affordable option than car ownership, and in times of crisis, we are an essential service."²⁹ Pooled, or shared ride providers have been mostly shut down during the crisis,³⁰ and their recovery may be slow.

On-demand (single-person, single-vehicle) transport providers have seen 50-70% reductions in passenger volumes³¹ but the companies seem to have responded with some ingenuity. Uber, Lyft and its competitors have reacted to the dearth of passengers by accelerating expansion into new verticals, including food and goods delivery and job hubs. High levels of unemployment post-crisis in many countries may mean the companies' driver recruitment model remains robust, despite the general stress on gig economy sustainability both pre-and post-crisis (regulatory and social).³² Passenger ridership will likely be depressed while cross-border and inter-state travel, as well as easy socialization, is limited, but relative competitiveness against public transport may rise (for the reasons discussed) which would help support demand (and licensing discussions with city officials). Overall, the largest and best financed providers are best placed to survive the short-term financial stress.

Mobility Aggregators

During the crisis, a considerable decrease in traffic congestion, air pollution, and road fatalities has driven transport planners in cities across Europe and the Americas to begin the process of making some of the temporarily bicycle lanes more permanent. As noted earlier, dozens of cities have accelerated plans – many already in train before the COVID-19 crisis – to ban internal-combustion engine vehicles from larger areas and increase bicycle and pedestrian infrastructure. This may naturally increase demand for alternate-travel-mode searching, which would be a boon to Mobility Aggregators.



28 <https://www.theverge.com/2020/4/21/21229838/gm-maven-shut-down-car-sharing-service>

29 <https://www.americaninno.com/boston/inno-news-boston/zipcar-lays-off-one-fifth-of-workforce-amid-coronavirus-turmoil/>

30 <https://www.npr.org/2020/03/17/817240060/uber-lyft-halt-shared-carpool-service-in-u-s-and-canada?t=1590308138124>

31 For example, <https://www.theverge.com/2020/3/19/21186865/uber-rides-decline-coronavirus-seattle-sf-la-nyc>

32 For example, <https://www.independent.co.uk/news/world/europe/eu-workers-rights-gig-economy-uber-deliveroo-training-a8874561.html> and <https://www.ft.com/content/42aae86a-5ec5-11ea-b0ab-339c2307bcd4>

Mobility Services: Expansion and Acceleration

The economic impact of any crisis is to ruthlessly expose companies with weaker business models and strategies or vulnerable financials. As Warren Buffet is often quoted as saying, “Only when the tide goes out do you discover who’s been swimming naked.” The public and private funded businesses in the Future Mobility ecosystem are unlikely to be exceptions to this dictum in the coronavirus-induced slowdown.

In the midst of the current crisis, Daimler and BMW’s joint on-demand mobility initiative, FreeNow, announced a corporate restructuring, consolidating several brands and organisations under one.³³ GM cut 8% of the staff in its Cruise autonomous division, ended production of its eBicycle, and shuttered its Maven carsharing “experiment”, noting that the “learnings... will go on to benefit and accelerate the growth of other areas of GM business.”^{34, 35, 36} In each case, the COVID-19 crisis was blamed for the closures, but on reflection, the businesses were well reported to be facing headwinds, sometimes structural³⁷. The current slowdown has acted as an accelerator of decisions and industry restructuring it seems.



Uber has taken a more positive approach, on the face of it, entering or growing new business verticals and thereby potential new revenue streams. Within highly challenging Q1 2020 results, and alongside layoffs of 6,700 staff, Uber saw over 50% growth in its food-delivery business, Uber Eats. CEO Dara Khosrowshahi said, “The big opportunity we thought Eats was, just got bigger,” and suggested the ability to deliver food was transferrable into goods-delivery.³⁸ Its key competitor in the US, Lyft, signed up over 120,000 drivers for food-deliveries less than one month after launching its own service, and added the ability for government agencies and healthcare organizations to order groceries and medical goods as well.^{39, 40} Worldwide, Uber and Lyft’s (mostly private) competitors, including Grab, Bolt, and Didi, are similarly accelerating their expansion plans into food and goods delivery, threatening further disruption of another market with entrenched players like FedEx and DHL: last-mile goods logistics.

33 <https://www.reuters.com/article/us-bmw-daimler-carsharing/daimler-bmws-free-now-service-to-restructure-integrate-french-app-kapten-idUSKCN21Y1JZ>

34 <https://www.cnbc.com/2020/05/14/gms-self-driving-unit-crusie-to-cut-8percent-of-staff.html>

35 <https://www.theverge.com/2020/5/12/21256722/gm-ariv-shuts-down-ebike-production-covid>

36 <https://www.autoweek.com/news/industry-news/a32255776/gm-shuts-down-maven-car-sharing-service/>

37 For example, <https://www.autonews.com/mobility-report/maven-executive-steyn-leaves-gm> and <https://www.ft.com/content/81a5030c-1a64-11ea-97df-cc63de1d73f4>

38 <https://www.cnbc.com/2020/05/07/uber-uber-earnings-q1-2020.html>

39 <https://www.pymnts.com/news/ridesharing/2020/lyft-turns-to-meal-grocery-deliveries/>

40 <https://venturebeat.com/2020/04/16/lyft-launches-on-demand-delivery-service-for-essential-goods/>

COVID-19: A Catalyst for Autonomous Delivery?

While most brick-and-mortar retailers and the travel industry as a whole have suffered greatly in the short term from the coronavirus crisis (and also face an uncertain recovery),⁴¹ one of the largest volume-winning sectors so far have been delivery services of all types. Online grocery delivery service Instacart saw customer order volumes increase 500% year-on-year and average basket size increase by 35%, which prompted a search for 250,000 new shoppers to deliver its service.⁴² Similarly, Amazon has hired 175,000 additional staff, as net sales grew 24% year-on-year.⁴³

The potential spread of coronavirus from delivery agents (and levels of sickness absence and self-isolation) has highlighted growth potential for autonomous delivery robots: Gary Silberg of KPMG noted, "It's a massive area and massive economic opportunity [...] COVID-19 has just accelerated it."⁴⁴ Wal-mart and Kroger are testing self-driving delivery robots from (the still private) Nuro. Hyundai and Aptiv have redeployed autonomous robotaxis to deliver meals in Las Vegas, while the Toyota-backed Pony.ai has delivered packages autonomously in Irvine, California.^{45, 46} Walgreens, CVS and Chinese ecommerce giant JD are all testing autonomous delivery drones. Already delivering in over 100 cities, Starship Technologies planned to be

delivering pizzas and late-night snacks on 100 more US university campuses by summer 2021.⁴⁷ Research and Markets expects the market to grow with close to 24% CAGR through 2030.⁴⁸ While regulations are still unclear – should autonomous delivery robots drive on pedestrian walkways, bike paths, or roads? How are collision liabilities handled? – some of the potential use-cases are becoming clearer.

- 41 <https://www.oliverwyman.com/our-expertise/insights/2020/mar/six-things-retailers-should-do-to-keep-calm-and-carry-on.html> and <https://www.nationalgeographic.com/travel/2020/04/how-coronavirus-is-impacting-the-travel-industry/>
- 42 <https://www.cnn.com/2020/05/13/coronavirus-making-grocery-delivery-services-like-instacart-popular.html> and <https://www.engadget.com/instacart-hires-250000-shoppers-adds-safeguards-170056608.html>
- 43 <https://www.fool.com/investing/2020/05/16/why-amazons-e-commerce-sales-are-about-to-surge-ev.aspx>
- 44 <https://nrf.com/blog/autonomous-deliverys-viability-grows>
- 45 <https://venturebeat.com/2020/05/11/hyundai-and-aptiv-redeploy-autonomous-vehicles-to-deliver-meals-to-vulnerable-people-in-las-vegas/>
- 46 <https://www.reuters.com/article/us-health-coronavirus-pony-ai/toyota-backed-pony-ai-to-offer-autonomous-delivery-service-in-california-idUSKBN21Y3GK>
- 47 <https://techcrunch.com/2020/04/09/starship-technologies-is-sending-its-autonomous-robots-to-more-cities-as-demand-for-contactless-delivery-rises/>
- 48 <https://www.businesswire.com/news/home/20200304005593/en/Global-Autonomous-Mile-Delivery-Market-Expected-Grow>

Exhibit 3: Autonomous delivery services

Source: Getty images



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Lukas Neckermann is the author of three books: "The Mobility Revolution" (2015), "Corporate Mobility Breakthrough 2020" (2017), and "Smart Cities, Smart Mobility: Transforming the Way We Live and Work" (2018).



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