Many voices from governments, businesses, and civil society have been calling for a response to the devastating impacts of the Covid-19 pandemic that does not turn attention away from other global challenges such as climate change, biodiversity loss, and plastic pollution. Yet, solutions from the past will not be up to the problems we face today as the multifaceted nature of the crisis we are experiencing require new thinking and the redesign of our current economic model.

In an unprecedented response to the Covid-19 crisis, trillions in economic stimulus are being unveiled all around the world and in the next stage of their recovery plans, governments will have to decide where these funds will be allocated. The circular economy, as an instrument to decouple economic growth from resource use and environmental impact, opens up the way for a resilient recovery and a next wave of economic prosperity. By fostering innovation and competitiveness, reducing resource dependency and environmental impact, and creating new jobs, the circular economy presents a promising way forward.

Building on research over the past 10 years on circular economy across various sectors and regions, the Ellen MacArthur Foundation identifies 10 attractive circular investment opportunities which address both short- and long-term goals by public and private sectors. This selection of opportunities spread across the five key sectors of built environment, mobility, food, fashion, and plastic packaging. Each sector is independently explored in a series of Insight papers, along with pieces offering perspectives on policy outlook. These can be found at the Ellen MacArthur Foundation page: Policy & investment opportunities shaping a resilient and low-carbon economic recovery.
Mobility

Two circular investment opportunities towards a resilient low-carbon economic recovery

The transport sector\(^1\) has been one of the hardest hit by the pandemic and finds itself in a serious and unprecedented economic situation. The introduction of lockdown measures, travel restrictions, the closure of schools and non-essential businesses, and social distancing, have collectively had a significant impact.\(^1\) From local transport to global supply chains, nothing has been spared, hampering not only the flow of people, but also that of goods.

In fact, global trade demand (in volume terms) is now forecasted to drop by as much as 13–32% in 2020, a striking amount when compared to the 9% decline experienced in 2009 after the financial crisis.\(^2\) It is impacting freight logistics, as well as related industries, markets, and supply chains with consequences on the economic activity of cities and regions. This is putting millions of people out of work.

For citizens, lockdown measures, coupled with travel restrictions, have forced many to stay at home, and, up until May, caused public transport ridership to fall 70–90% in major cities across the world. These measures have also caused the demand for cars to drop sharply with original equipment manufacturer (OEM) and supplier factories expected to produce 7.5 million fewer vehicles in 2020.\(^3\) While lockdown measures have, at the time of writing, eased in many places, social distancing measures are still impacting mass transit significantly.

Active forms of mobility, such as walking and cycling, have since become more widely adopted, being seen as healthier and safer than taking public transport. These radical shifts have been one of the key contributors to the observed 17% drop in global carbon emissions seen around the world (by early April).\(^4\) People living in cities are seeing clearer skies and are benefitting from breathing in cleaner air and being physically active. As such, investing in active mobility infrastructure and electric vehicles (EVs) has earned support.\(^5\)

As we look into the future, a number of trends are expected to persist and further shape the world of mobility. Physical distancing requirements, in particular, will change the mobility mix, consumer behaviour, and transportation demands, perhaps permanently.\(^6\) Remote working and online retail is predicted to stay with us in the future, decreasing the need for commuting, but increasing the demand for home delivery. This is expected to come with an increased reliance on e-commerce, a megatrend that already pre-dated the Covid-19 crisis. Other megatrends that pre-existed the crisis—such as the growth in car-sharing services, electric and alternative forms of transport, innovative lightweight materials, and autonomous vehicles—will stay relevant. The future state of these

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\(^1\) The transportation sector, as addressed in this section, focuses specifically on land transport (such as passenger cars, logistics, public transport, cycling, and walking), and not aviation and shipping.
trends, however, will depend on how the pandemic evolves, how society responds, and how the recovery plans will be shaped.\footnote{7}

A circular economy approach to the recovery offers the opportunity to leverage these trends to tackle key challenges and shape a more resilient mobility system that is clean, adaptable, and interconnected, and that also meets climate targets. In a circular mobility system, this vision is realised through designing out waste, keeping materials in use at their highest value for as long as possible, while also regenerating the natural systems in which they are embedded.

A number of attractive circular investment areas could help attain this vision, including: multimodal mobility infrastructure to ensure seamless interconnectivity, lower congestion, and zero-emission transport systems; product-as-a-service models to provide access to, rather than sell ownership of, vehicles; designing and producing more circular cars to increase durability and make them fit for shared multimodal systems; refurbishment, remanufacturing, and recycling infrastructure to deliver a more competitive and resilient recovery; zero-emission forms of transport to decouple the reliance on fossil fuels and ensure climate targets are met.

Though all of these investment areas can help contribute to the creation of a better and more resilient mobility system, two especially attractive opportunities in the current scenario emerge in:

1. Multimodal mobility infrastructure
2. Refurbishment, remanufacturing, and repair infrastructure

These selected opportunities highlight especially attractive areas that can help address both the short- and long-term goals of the public and private sectors. They offer solutions to key challenges created by the pandemic, but also: meet governmental priorities for economic recovery (e.g. stimulating growth and innovation, creating jobs, meeting Sustainable Development Goals (SDGs) and climate targets; offering circular economy growth potential (e.g. driven by innovation, policies, and evolving customer preferences); and helping reduce the risk of future shocks (e.g. those relating to climate change and biodiversity loss).
Multimodal mobility infrastructure for a more interconnected, less congested, and cleaner transport system

The past couple of years have seen a rapid growth and integration of shared multimodal mobility solutions—a trend set to disrupt the transport industry. The pandemic has now severely impacted this sector, but some changes are believed to be temporary. Multimodal integration of active, shared, electric, and autonomous (micro)mobility could rebound post Covid-19, as the crisis fades and sanitation practices are implemented.

Multimodal mobility systems bring attractive economic benefits through the increased use of assets and the optimisation of transport systems. Investments directed towards multimodal mobility infrastructure offer the opportunity for the system-level integration of different modes of transport—such as cycling, public transport, ride-sharing, and car-sharing—that would let people seamlessly shift between personal, shared, and public transportation. The benefits of such systems were discussed in the Ellen MacArthur Foundation’s 2015 study, Growth Within: a circular economy vision for a competitive Europe. The impact of shared multimodal systems within Europe that made use of autonomous cars and vehicles—designed to be silent, durable, non-polluting, and renewable energy-powered—was explored. The findings showed that such systems could reduce household costs by 70% within Europe by 2050, while offering cost-effective solutions to low-income groups. When applied in a country such as China, as much as USD 1.6 trillion in benefits in 2030 was estimated i.e. assuming 42% of all car kilometres were made by shared vehicles.

From an environmental perspective, multimodal systems can also play a pivotal role in lowering greenhouse gas (GHG) emissions and meeting climate targets. As an example, a shared multimodal system for passenger cars that are designed for durability, could reduce global CO₂ emissions by 70% or 0.4 billion tonnes of CO₂ in 2040. For citizens, this means cities would become healthier places in which to live.

When active mobility is integrated within multimodal systems, it has the potential to stimulate the economy, boost physical activity, and limit air pollution. Since the start of the pandemic, active mobility—such as cycling and walking—has increased. Investments in shared multimodal infrastructure can help reap the benefits of people being more active by ensuring the integration of cycle lanes and other infrastructure to support the use of bikes (e.g. more parking spots, and electric bike charging stations). Active mobility has seen an increase in bike sharing in China—the country first hit by Covid-19—rising by 150% immediately post lockdown. Governments are acknowledging the need for increasing funding for active mobility infrastructure. Europe is already seeing a rise in schemes and investments to support cycling and walking, as governments look to protect their transport systems, boost public health, and capitalize on clean-air gains. Cycling, in fact, offers the best return on investment of all transport e.g. GBP 5.50 per GBP 1 spent within the UK. As such, a golden age of cycling may be upon us.

Despite the effect of Covid-19 on the sale of cars, the popularity of EVs continues to grow. According to the International Energy Agency, the number of EVs on the road is expected to reach almost 10 million this year, as sales of electric cars continue to increase, counteracting the declining trend in sales of combustion engine cars. According to Forbes, the need to tackle climate change and local air quality will keep the EV market on course for growth. As such, maintaining long-term low-carbon policies would help ensure that by 2040, over half of passenger cars sold worldwide will be electric.

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2 Data includes the impact of employing vehicles in multimodal systems that are designed for durability and reuse. Ellen MacArthur Foundation, completing the picture—how the circular economy tackles climate change (2019)
China has in fact already started strengthening their EV market during the pandemic. To support the wider adoption of EV, others are pushing for a coordinated private–public partnership: the Green-Car New Deal. This investment fund would aim to accelerate the shift towards large-scale EV use by, for example, investing in the roll out of EV charging infrastructure (amongst other infrastructure), while saving existing jobs and creating new ones.

It is expected that the pre-Covid-19 increase in car sharing will pick up again post the pandemic, shaping a mobility future that is cost-effective and accessible. In a circular economy, multimodal mobility systems embrace car sharing to enable maximum vehicle usage and occupancy rates. They leverage circular design to help keep materials in use by ensuring cars are designed for durability, modularity, and reuse. These opportunities pre-existed the pandemic and were on track to disrupt and transform the automotive industry. As customer preferences started shifting towards service-based solutions, a global car sharing market size exceeding USD 2.5 billion was established in 2019. It was estimated to grow at 24% annually between 2020 and 2026. In countries such as China, the central government and local municipalities have issued multiple policies to encourage the growth of car sharing, while in India, the National Electric Mobility Mission Plan 2020 was set up to encourage the development of EVs, with an aim of having 5–10% (6–7 million) of vehicles on the road electric-powered by 2020.

However, the car sharing sector has been severely hit by the pandemic with some businesses possibly not surviving the upheaval. Nevertheless, studies have pointed out that “many of the changes in the modal mix experienced today are temporary and that shared-mobility solutions, including public transit, will rebound and continue to capture increased market share.” In the meantime, car sharing businesses such as Zipcar are finding creative solutions by, for example, offering exclusive vehicle use for several days at a time. In Japan, the largest ‘used’ car dealer, Idom, launched a USD 280 monthly subscription service from February this year, and orders have doubled in just two months. This is a relatively new trend in Japan that has been gaining traction since the start of the pandemic, possibly indicating a shift within society increasingly opting for access over ownership. Similarly, German start-up Cluno, termed the ‘Netflix of car subscriptions’ has seen a 53% rise to its service, despite massive economic uncertainty. Subscription services have therefore been said to be currently filling the needs that fall between car ownership and car rental or sharing. Momentum also continues to be generated through different means as the forthcoming Comprehensive European Strategy on Sustainable and Smart Mobility looks into enhancing synergies with the circular economy transition—with a key focus on stimulating the use of product-as-a-service solutions within transport systems.

Multimodal shared transport will also require investment within digital infrastructure to help integrate all modes of transport, as well as help citizens navigate the options. Digital user apps—when fully integrated—could, for example, help citizens to better connect seamlessly to multimodal transport, to better plan and optimise their journeys, and to avoid congestion. As remote working, e-commerce, and home delivery have become trends that may stay with us post pandemic, digital solutions could further help optimise logistics and support the consolidation of freight services and reverse logistics.
Refurbishment, remanufacturing, and recycling infrastructure for material circulation and effective use of resources

By enabling the circulation of high-value components and materials, investments in refurbishment, remanufacturing, and recycling infrastructure offer attractive economic opportunities that not only help deliver a competitive and resilient economic recovery from the Covid-19 crisis, but also help tackle global environmental challenges.

An attractive, yet still under-valued, investment opportunity exists in facilities that refurbish, remanufacture, and recycle car parts. Investing in such facilities plays a critical role in ensuring that cars—designed for durability and reuse and often used within service-business models—can be disassembled and repaired e.g. multimodal shared mobility systems employing cars that are easy to maintain and reuse to maximise their returns. Such investments have to be done in parallel with the creation of markets for end-of-life parts (based on standardised quality measures for parts). This is an essential step in ensuring that demand is created for high-quality refurbished, remanufactured, and repaired car parts.

Refurbishment, remanufacturing, and recycling activities offer a strong economic case and job creation potential, when cars are designed for disassembly and reuse. In a post-pandemic world, with a possible rebound in car sharing services, such reuse activities can present a strong economic case for companies working in this space. Remanufactured car parts are, for example, cheaper than newly manufactured parts. The process allows the total value of the materials to be recovered, while reducing the need for virgin, non-renewable resources, and energy. In the United States, such remanufacturing activities have already been passed into law through, for example, the implementation of the Federal Vehicle Repair Cost Savings Act of 2015, where all federal vehicles in the United States are encouraged to make use of remanufactured parts during their use phase.23

The remanufacturing of vehicle parts can also create high quality jobs. It can, for example, increase skilled labour requirements by up to 120%.24 For the remanufacturing industry as a whole, conservative estimates show that with reduced input costs and increased labour spend, there can still be up to a 50% increase in gross profit, offering a competitive advantage.25

Remanufacturing activities can also bring substantial environmental benefits and opportunities to increase resilience. Renault has, for example, demonstrated that vehicles can be designed to be 85% recyclable and 95% recoverable.26 43% of its engines can be remanufactured at its Choisy-le-Roi factory.27 The remanufacturing process has led to savings of at least 80% in energy, water, and chemicals.28 Customers benefit from all of these advances by being offered a ‘good-as-new’ warranty for a 30–50% lower price compared to new replacement parts.29 Furthermore, with more localised refurbishment and remanufacturing activities, supply chains are shortened. Flexibility is being generated as components and parts can also be obtained from customers and reintroduced in production. This offers the potential to increase the resilience of supply chains to external shocks—a topic that has now become more critical than ever.

Investment opportunities also exist in the setting-up of recycling facilities that keep high-value materials in circulation—a shift that is increasingly being supported by policy. Such infrastructure can help ensure that cars designed for disassembly and
recyclability can, in fact, be recycled and treated with minimal material and quality loss. Such investments will be needed, considering the way in which policies in Europe are heading. The European End-of-Life Vehicles Directive, for example, has already set a target of 95% recyclability per vehicle per year.30 Rules are also being considered around mandatory recycled content and improving recycling efficiency. The aim is to ensure that upstream designs and downstream end-of-life processes are better aligned, strengthening the market for secondary materials and components.

As the shift towards EVs picks up speed, investing in remanufacturing and recycling infrastructure will also play a critical role in ensuring the longevity and reuse of EVs and their respective batteries. As an example, used EV batteries, whose charge capacity has become too low for automotive use, can be given a second life for approximately ten more years in mobile applications or stationary energy battery storage systems.31 When it comes to battery recycling, the current recycling rates are around 50%, but with a new process by Fortum and Crisolteq they reach up to 80%, and metals are kept in circulation.32 Increasing regulation on this subject can already be seen. The European Circular Economy Action Plan is, for example, aiming to establish a new regulatory framework around batteries that facilitates the increased: reuse (rechargeability) of batteries, recovery of valuable materials, recycling of batteries, and use of recycled content.33 This builds on the strategic action plan for the European Battery Alliance that was developed in 2018 and which had the ambition to establish a competitive and sustainable battery manufacturing industry in Europe that operates within the context of a circular economy.34
While the pandemic may have brought mobility to a near standstill, it has offered an opportunity to reignite a journey towards interconnectedness, value creation, and healthier environments. Multimodal transport systems—supported by durability and zero emission designs—contribute to this journey by enhancing connectivity and accessibility between different forms of transport, while also ensuring a cleaner, safer, and seamless experience. Supported by physical and digital infrastructure, citizens can be better connected to travel options, while vehicle parts and materials are kept in circulation, shaping a more competitive and resilient future.
Endnotes

2. World Trade Organization, *Trade falls steeply in first half of 2020* (22nd June 2020); World Trade Organization, *WTO sees 9% global trade decline in 2009 as recession strikes* (23rd March 2009)
13. Forbes, *Global pandemic won’t stop the switch to electric cars* (30th June 2020)
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