
# REBUILDING SMART MOBILITY: SHARED, SAFE AND PROFITABLE

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## CHALLENGES FACING SMART MOBILITY

When trying to get from point A to point B in the city, consumers enjoy a number of alternatives, with the past 10 years seeing the global rollout of numerous smart, shared mobility modes. From ridehailing to e-bikes and scooters, smart mobility platforms have been able to leverage ubiquitous smartphone ownership, frictionless payment methods, and location intelligence to rapidly scale the adoption of shared mobility services. In addition to providing greater convenience for consumers, shared smart mobility modes provide city governments with another tool to address longstanding issues of congestion—ushering consumers out of privately owned vehicles and into higher-utilization shared assets, making better use of the limited space available in most urban centers.

After years of growth and accelerating investment, the smart mobility paradigm came to a grinding halt in 2020 due to the COVID-19 pandemic. Much of the impact was unavoidable, with restrictions on personal mobility combined with a particular fear of shared spaces, creating a perfect storm for smart mobility companies. There is now growing momentum behind a renaissance in car ownership, as evidenced by the increase in used car prices and the sudden surge of 18–24-year-olds engaging with used car marketplaces, posing a long-term risk to the potential societal benefit of smart mobility platforms. Beyond the shock effect of the pandemic, the COVID-19 impact has brought into sharp relief the difficulties involved in developing scalable, profitable smart mobility operations, with many micromobility startups and ridehailing platforms coming under scrutiny even before the onset of this latest crisis.

The future success of smart mobility operations, irrespective of the mobility mode, will depend on proper optimization of fleet-based assets and maximizing utilization through alternative use cases in the short term, while also ensuring the fleet management can accommodate future requirements such as public transit integration and fleet electrification. The foundation of this asset optimization strategy will be a series of location-based services enabled by fresh and detailed digital map content. This whitepaper will consider how location intelligence, which has been a key factor in the successful rollout of smart mobility operations so far, can be leveraged to rebuild the smart mobility market in a safe, sustainable, and profitable way.

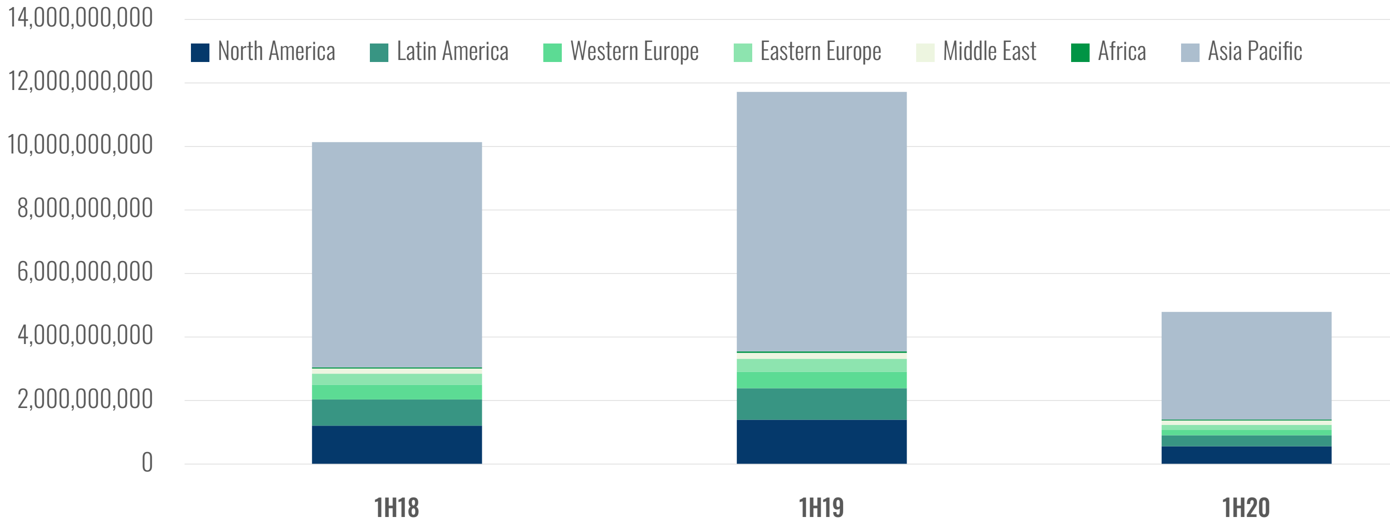
## MAXIMIZING ASSET UTILIZATION

An essential component in a successful fleet operation is maximizing the utilization of assets, and smart mobility platforms are no exception. Maximizing utilization rates in the core mobility use case is enabled by location intelligence services such as routing and asset tracking—in particular, optimizing the position of fixed assets to achieve as close to continuous use as possible. This entails the use of data analytics with location context to understand personal transit patterns over time, so that assets such as bikes and scooters can be best positioned to enable these trips. This process of relocating assets is a significant cost factor to micromobility fleet operators; therefore, these operators need to optimize the routing of their support vehicles when repositioning their mobility modes. Regarding ridehailing operations, ABI Research's analysis of the cost dynamics of the ridehailing market have indicated that utilization rates of around 70% would be required to enable mobility services that rival car ownership in terms of cost per mile. Outside of driverless operation, this level of operation, equivalent to continuous operation of 18 hours, is clearly not feasible.

Therefore, the key to maximizing the utilization of the mobility mode is to repurpose the same asset in support of multiple revenue-generating applications. A popular example is the food delivery use case, which multiple ridehailing operators had already begun adopting pre-COVID in order to boost revenues. For example, the Q419 growth rate of Uber Eats gross bookings outperformed that of rides by a factor of 4. The COVID-19 pandemic added greater urgency to pursuing and deploying new use cases, with the pivot to food and goods delivery providing a vital revenue lifeline. Grab, a major ridehailing operator in the ASEAN region, was able to temporarily transfer 150,000 of their drivers to their delivery business, and permanently expanded their GrabMart grocery delivery service from 2 to 8 countries.

***Figure 1: Global Ridehailing Trips 1H2018 to 1H2020***

*(Source: ABI Research)*




As critical as these new use cases will prove in the short term (while the demand for personal mobility remains subdued), the ability to enable multiple use cases will be the key to maximizing the utilization of mobility assets. These use cases are built on many of the same location intelligence and mapping assets that underpin the core ridehailing use case, such as positioning, tracking, optimized routing, and live map content including live traffic and parking. As numerous ridehailing operators clamber to enter the space, leveraging live map content to ensure reliable and timely delivery, as well as optimized routing to minimize delivery costs to the consumer, will be key in transforming what has been an emergency pivot to prop up revenues into a scalable multiple use case mobility platform.

## PUBLIC TRANSIT INTEGRATION

Smart mobility has the potential to meet the objectives of both consumers seeking convenient A-to-B transit as well as city or municipal governments looking to address issues of congestion and pollution. Shared use of cars through the ridehailing paradigm could reduce the number of vehicles needed to satisfy personal transit needs. Similarly, micromobility modes such as e-bikes and e-scooters can minimize the role of larger, congesting vehicles and enable shorter journeys, while also providing a boost for active transportation.

As significant as the potential is, deployments of smart mobility modes have generated friction with the existing mix of mobility modes. The most visible impact has been the introduction of micromobility modes occupying space in city streets. A less visible, but more significant impact has been the cannibalization of public transit by the introduction of ridehailing services. A 2020 study by the Singapore-MIT Alliance for Research and Technology analyzing ridehailing data in Chengud, China found that 33.1% of trips cannibalized public transit, with the figure rising to 40% in peak hours.

Public transit services are typically publicly operated, or at least heavily subsidized. Predefined and non-responsive transit schedules feature a small number of profitable routes which are required to offset losses from a larger number of unprofitable routes operating in underserved areas. Dynamic and responsive ridehailing services have gained the most traction in these profitable route zones, leaving public transit to operate unprofitable routes in underserved areas.

The deployment of smart mobility services without considering the existing mix of public transit services creates unnecessary friction points and can cause city governments to view smart mobility platforms as a hinderance to achieving their societal objectives, rather than an enabling partner. Critically, consumers are left with a fragmented mess of siloed mobility options, complicating the task of identifying the best mode or modes to complete their journey.

Again, location intelligence can play an important role in improving the consumer experience by fostering better integration among all the mobility modes available in the city, including public transit, ridehailing, micromobility modes, and even personal vehicle use. Multi-modal journey planning and navigation can enable consumers to plan journeys and use all the mobility modes that best serve their needs. Consumers entering an urban area in their private vehicles could be navigated to a train station, with the option to use a micromobility formfactor to cover their "last-mile" needs. This multi-modal routing capability will be built upon accurate and dynamic map content including live traffic, as well as positioning and tracking of all mobility modes involved in the journey, including public transit modes. The advantages to the consumer are obvious, and the integration of private vehicle options into multi-modal routing can increase consumer engagement with smart mobility modes.

Regarding the more pressing issue of how to satisfy the mobility needs of a city, and how this task can be fulfilled by a combination of public transit and smart mobility platform operators, location intelligence platforms once again provide a means of cooperation and engagement between public transit and smart mobility platform operators, better fulfilling the task of satisfying the mobility needs of a city. Data analytics (to identify and understand the mobility patterns within the city) can help public transit operators update their fixed routes, while also supporting micromobility operators to optimally position their assets to provide last-mile support and connections between fixed transit stations.

Location intelligence can also foster greater cooperation between the on-demand mobility provided by ridehailing services and the fixed schedule mobility provided by public transit companies. Closer engagement between public transit companies and ridehailing operators could see the former focus on delivering high-occupancy "trunk routes" with smaller ridehailing vehicles providing vital links to underserved areas, based on a revenue-sharing business model. Enabling such an unprecedented level of cooperation between scheduled and on-demand mobility will require data analytics to allow for optimized scheduling of fixed transit routes, and open data exchange between the public transit operator and smart mobility platforms to enable smooth journey planning and engagement for the consumer.

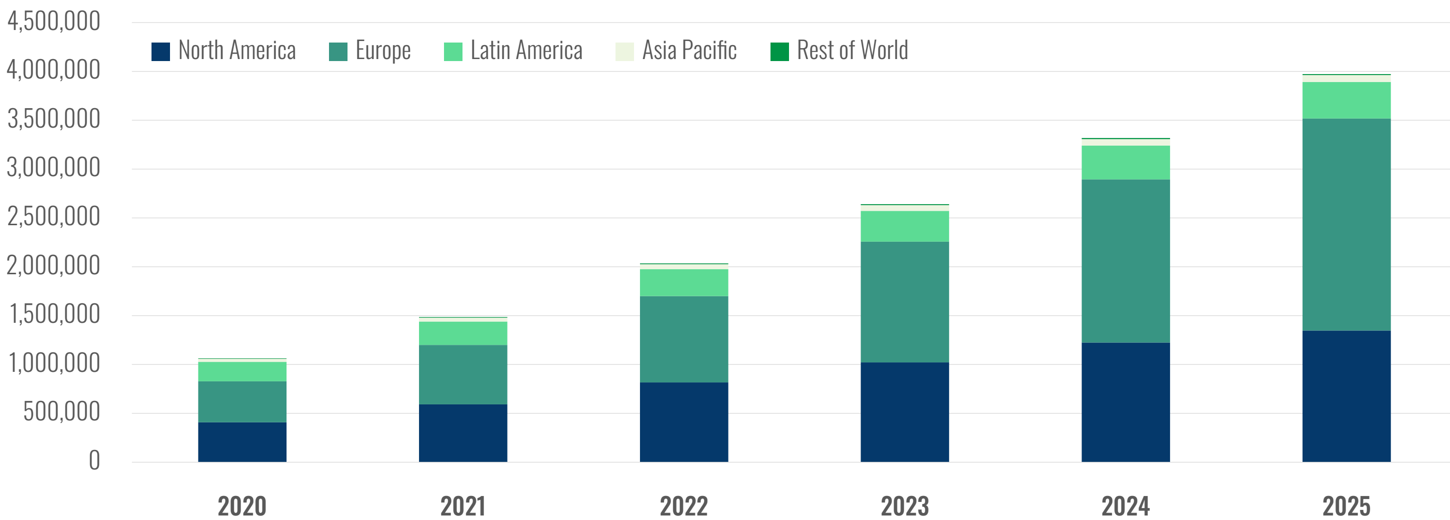
Ultimately, the rebuilding of smart mobility to meet the challenges of the next 5 years must take into account the objectives and concerns of the city government stakeholder. Successful implementations will leverage location intelligence to properly integrate smart mobility services with a wider mobility ecosystem, including everything from public transit to private vehicle use.

## ELECTRIFYING THE FLEET

A further challenge facing the smart mobility industry as it picks up the pieces and heads into the next decade is electrification. Regulator activity to reduce congestion and control emissions in densely populated urban centers is set to intensify over the coming years, with low emissions zones and no-go areas for internal combustion engine (ICE) vehicles expected to become the norm. Therefore, in order to continue delivering their services in the future, smart mobility operators must be able to successfully transition to an electric vehicle (EV) fleet, as well as optimize their routing, fleet management, and infrastructure investment to reflect the new powertrain. Failing to properly manage the transition could see smart mobility platforms outmaneuvered by competitors.

***Figure 2: Installed Base of Shared Electric Mobility Scooters Global Forecasts, 2020–2025***

*(Source: ABI Research)*




Location intelligence can play a vital role to support decision-making within smart mobility fleet operators when first adding EV modes their fleets. Understanding transit demand patterns can help optimize the chosen EV's specifications, in particular battery capacity. This can also support infrastructure planners to optimally position fixed assets such as charging docks to wireless charger "power snacking" areas, which is of particular value to operators of electrified micromobility fleets. Map layers detailing the boundaries of any special low emissions or EV-only zones can also help smart mobility fleet operators to determine the proper pace and scale of EV in response to a changing regulatory landscape.

While location intelligence is valuable in the strategic planning phase of electric mobility, it is essential to the operation of electrified smart mobility. On top of the location-based services and accurate and dynamic map data discussed above, EV operations must be optimized while adapting to new constraints. First and foremost, operators must ensure a smooth and uninterrupted journey experience for the consumer, on par with any mobility experience previously based on ICE powertrains. This requires specific routing and journey-planning services, taking into account road geometries, the live traffic situation, weather, etc. to make optimal use of the range within the mobility mode. Failing to deliver on the consumer's journey is not an option.

Efficient and sustainable delivery of EV-based smart mobility will depend on the correct balancing of charging time and uptime, ensuring that the electric miles required by the entire fleet to meet the mobility needs of customers can be ensured in the most cost-effective way. While consumers owning EVs can resort to simple charging behaviors, such as filling the battery to full capacity every night, EV fleet operations must make more efficient use of charging sessions, as well as routing between charging sessions and journey fulfillment. Location intelligence once again plays a key role, with insights into mobility demand patterns, charging infrastructure location, real-time charging infrastructure availability, and dynamic electricity pricing information needed to adopt the optimal fleet charging strategy. Location intelligence will also play a key role in allocating the right vehicle for the right trip, dispatching the vehicle with the optimal available charge for the journey. As running out of range mid-journey is unacceptable, the biggest consequence of a sub-optimal charging strategy will be the purchase of an excess number of electrified mobility modes to deliver on the required number of trips. Consider the lessons that can be learned from Uber and the ridehailing paradigm—a key factor in the success of this platform was efficiency and optimization. The ability to deliver on consumers' mobility needs while extracting every last routing efficiency and minimizing deadhead trips allowed ridehailing platforms to outperform legacy competitors and gain a significant share of the overall mobility mix. The same will hold true of electrified mobility: it will be those platforms that make the best use of the electric miles at their disposal that will be able to outperform competitors.

## CONCLUSIONS

The recent history of smart mobility has shown that no smart mobility initiative is a guaranteed success. The sight of discarded scooters and bikes, along with the withdrawal of services from some cities quickly after launch, illustrate the importance of maximizing every possible efficiency in the operation of a smart mobility service. A critical component, both in developing and operating a smart mobility service, will be location intelligence—a combination of digital map content and location services specifically developed to address the challenges of delivering profitable mobility services.

As smart mobility emerges from its most challenging chapter, there are opportunities to rebuild the smart mobility market in a way that is better suited to the challenges ahead. Rich, detailed, and fresh map content can underpin data analytics designed to understand mobility trends (to optimize the positioning of fixed assets) and repositioning of mobility modes to meet consumer needs more efficiently. Location intelligence services can further enhance efficiency, delivering a dynamic routing service that is responsive to changing traffic situations, and that minimizes the number of deadhead trips.

Strategically, the reemergence of smart mobility from the COVID crisis gives smart mobility operators the opportunity to reposition their services as a complement to public transit, rather than a destructive competitor. Multi-modal routing services will be essential to integrating smart mobility options (including micromobility modes) with public transit routes, delivering a smooth experience for the end user. Data exchange environments between public transit operators and smart mobility modes will also allow for the optimal positioning of smart mobility services around fixed routes. Smart mobility operators can further build cooperation with city governments by supporting electrification objectives, with location intelligence enabling the most efficient use of electric miles to meet mobility demand while remaining profitable.

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