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Build Up or Sprawl Out: A case for Urban Mobility

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Disruptive technologies have drastically changed the way people move in cities across the globe. Urban populations accustomed to on-demand mobility services, rideshare, trip planning, and ticketing apps that reflect the latest advances in mobile communications, cashless payments and remote monitoring increasingly depend upon the flexibility and convenience afforded by smart urban mobility when moving from point A to point B.

But with over half of the world's population currently residing in urban areas, the demand for road space far exceeds the supply, resulting in historic levels of congestion throughout the United States and Europe. In fact, the global urban population grew 152 percent from 2.7 billion to 4.1 billion between 1997 and 2017 and data predicts that by 2050 some two-thirds of the world's population will reside in urban areas. Cities are agents of economic growth and social change, but it is the responsibility of industry to develop innovative, financially and environmentally sustainable solutions capable of supporting existing numbers and scaling to accommodate growing urban populations.

In 2018, American drivers incurred \$87 billion in congestion costs and spent on average 97 hours in traffic, while the American Transportation Research Institute estimated the total cost of congestion in the freight sector to be \$74.5 billion annually, \$66.1 billion of which was lost in urban areas. Boston, Massachusetts ranked number one among the most congested cities in the United States in 2018. On average, drivers spent some 164 hours in traffic and lost about \$2,291 in productivity. Moreover, nearly 70 percent of greenhouse gas emissions from the regional transportation come from the use of personal vehicles. While Boston must confront unique challenges posed by age and density, other cities that previously ranked ahead of Boston have found success in implementing sustainable solutions aimed at alleviating congestion.



In 2018, Seattle, Washington implemented a Road Usage Charge Pilot Project that would explore a smarter approach to revenue collection. Together with Intelligent Mechatronic Systems (IMS), A-to-Be delivered a back-office platform capable of analyzing road-side data to inform new funding methods for infrastructure management and investment. Our product (MoveBeyond™) utilizes satellite-based and smartphone alternatives to collect data capable of informing and implementing new funding methods and infrastructure management and investment.

While congestion is in many ways indicative of a city's economic vitality and desirability, the absence of smart policies in the face of growing urban populations can result in an environment of frustration and lost opportunities harmful to the overall growth of the city.

Confronted with sprawling masses of people occupying sidewalks, subway cars and busses, longer lines at retail stores, and growing waitlists at restaurants, young families increasingly opt to build a home outside the city center. Urban sprawl, however, costs the United States around \$1 trillion per year and incurs additional infrastructure and public service costs of up to 40 percent. If cities want to retain talent that attracts business and generates revenue, they must prioritize innovation through public-private partnerships. The Netherlands, for example, used A-to-Be solutions to implement congestion pricing in Rotterdam. The governing entity can leverage dynamic pricing and incentive planning to better control, identify, charge, and enforce vehicular traffic within city limits. Project results have been above expectations with more than 5,000 participants and a 42% peak hour travel reduction among participants.

Investment in seamless mobility yields significant dividends beyond economic growth. Road transportation currently accounts for 80 percent of CO2 emissions in the United States. Cities that invest in sustainable and efficient solutions that level road demand to reduce the number of cars on the road stand to reduce greenhouse gas emissions by 3.7 Gt CO2 per year by 2030 and generate savings of up to \$17 trillion USD by 2050.

The propensity for urban mobility to foster innovation, yield significant revenue returns and clean up our environment will position major metropolitan cities worldwide in a way that allows for the adaptation of greater levels of seamless solutions, such as mobility-as-a-service. Assets, such as storage and maintenance facilities for shared autonomous fleets, fast-charging infrastructure, and dedicated AV lanes equipped with vehicle-to-infrastructure communications and IT systems, will be required to power urban mobility. To reach the levels of autonomy that experts anticipate, government, industry and the public must collaboratively address their unique urban congestion problems and invest in financially sustainable and environmentally friendly mobility solutions.