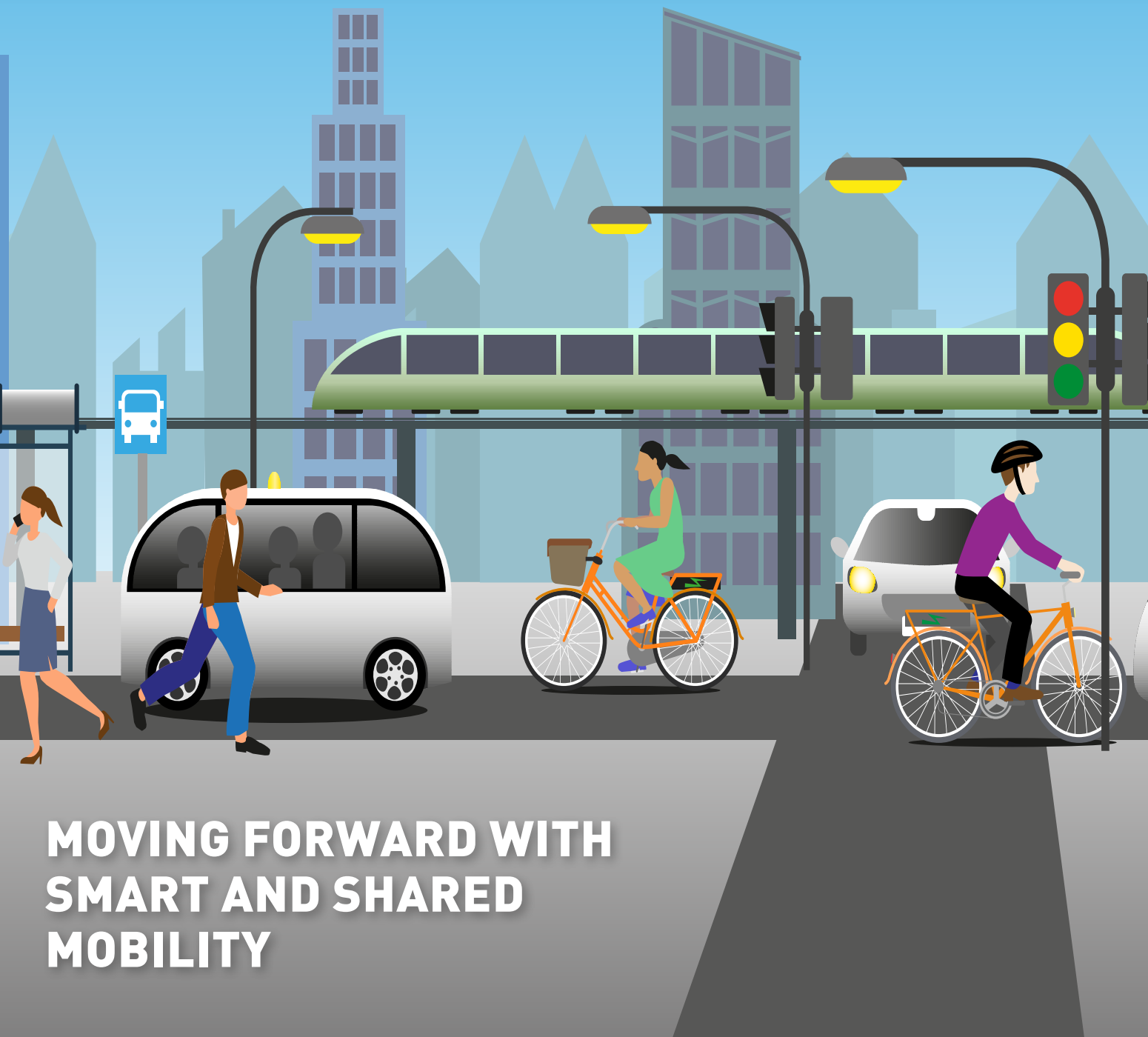


Telematics Wire

Technology Driven | Futuristic Vehicle



**MOVING FORWARD WITH
SMART AND SHARED
MOBILITY**

World's first truly scalable IoT Connectivity as a Service (CaaS) solution



Technology for the Connected Tomorrow



eSIM Integrated Smart Modules



LTE/LPWAN Connectivity



Connectivity - Module Management Cloud Platform

Cavli's eSIM integrated IoT modules



C10AM



CAT 1 2G

Regions: APAC, EU, MEA



C1RM



NB-IoT 2G

Regions: APAC, EU, MEA



C42QM



LTE CAT-M NB-IoT 2G

Regions: Global



C100AM



CAT 4 3G 2G

Regions: APAC, EU, MEA

EMAIL US FOR MORE INFORMATION
sales@cavliwireless.com



Cavli Hubble is the proprietary Connectivity as a Service (CaaS) cloud platform from Cavli Wireless for global cellular data subscription, eSIM and smart module management, enabling IoT solution makers to build and deploy easily scalable global wireless IoT solutions.

8

LTE-M*

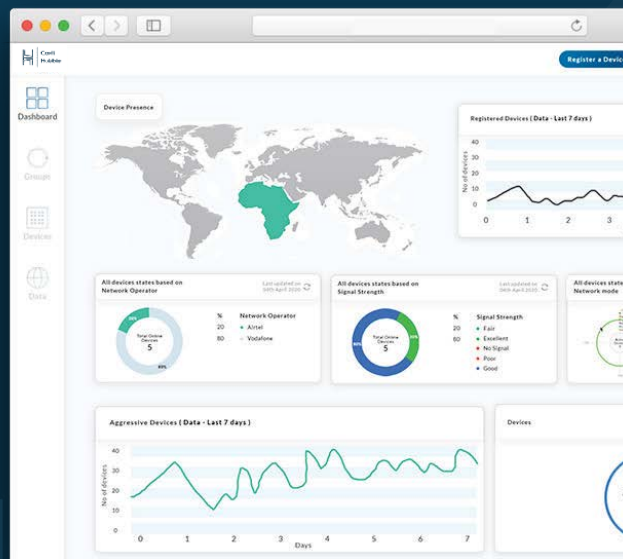
160

LTE/3G/2G*

26

NB IoT*

*Number of Local networks



177 Park Avenue, Suite 200,
Downtown San Jose, CA,
USA



www.cavliwireless.com



www.cavlihubble.io

QUECTEL, BUILDING A SMARTER WORLD



RG500Q 5G LGA Module

3GPP R15, 5G NR NSA/SA, Sub-6GHz
LTE Cat 12 or above
PCIe 3.0 interface
USB 3.1 interface
RGMII interface
Embedded GNSS
Target Region: APAC, EMEA, NA



Quectel L89 GNSS Module

Support IRNSS L5 band
Internal L1 and L5 antennas
GPS/GLONASS/Galileo available
Built-in LNAs for better sensitivity
AIS-140 compliant



RM500Q 5G M.2 Module

3GPP R15, 5G NR NSA/SA, Sub-6GHz
LTE Cat 22
PCIe 3.0 interface
USB 3.1 interface
RGMII interface
Embedded GNSS/eSIM
Target Region: Global



Quectel Automotive Module AG35

Multi-mode LTE Cat 4 module backward compatible with 2G/3G networks
Ideal for automotive premarket applications with IATF 16949:2016 requirement
Wide operation temperature range (-40°C to +85°C)
Automotive quality processes (PPAP, 8D, DFMEA, PFMEA...)
Excellent EMC/ESD protection ensures great robustness even in harsh environments
Multi-constellation GNSS receiver available

Quectel Wireless Solutions is the leading global supplier of IoT modules which cover 5G, LTE, LTE-A, LPWA, Android Smart, C-V2X, GSM/GPRS, UMTS/HSPA(+) and GNSS technologies. As a professional IoT technology developer and cellular module supplier, Quectel is able to provide one-stop service for IoT cellular modules. We estimate that globally more than 100 million devices have at least one Quectel module inside, or, as we call, have been Accelerated by Quectel.

CONTENTS

VOLUME : 01 ISSUE : 03



14 AUTOMAKERS VIEW

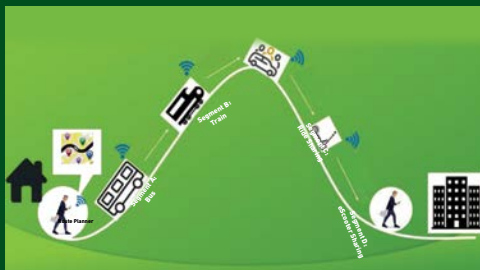
EV Journey of India

Mahesh Babu
MD & CEO
Mahindra Electric Mobility Ltd

SMART & SHARED MOBILITY SPECIAL

06 Mobility Sector Rejig - Future of Shared and Smart Mobility

Tapan Trivedi
NISSAN Europe



32 Yulu Connects the Dots in Public Mobility

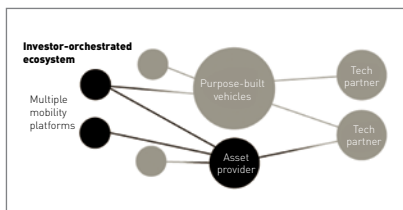
Amit Gupta, Co-founder & CEO, Yulu



INDUSTRY INSIGHTS

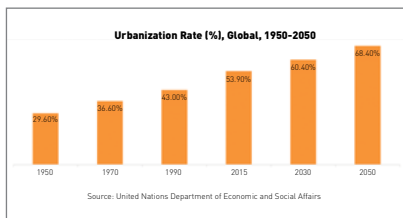
16 Shared Mobility in the COVID Spin

Vadiraj Aralappanavar, ONN Bikes



26 Intelligent Tech Platforms for Smart City and Smart Citizenship

Domenico Mangiacapra, Claudia Damari,
Henshin Group Ltd



40 Zero to Sixty at the Speed of Thought - AI in Connected Vehicles

Richard Foster-Fletcher
NeuralPath.io



44 Connected Two Wheelers and Smart Possible Use Cases

Prakash AK, Varroc



ANALYTICS

22 Shared Mobility: A COVID-19 Recovery Roadmap

Ben Lundin, Derek Viita
Strategy Analytics



48 NEWS

CEO & Editor

Maneesh Prasad
maneesh.prasad@telematicswire.net

Deputy CEO

Anuj Sinha
M: +91 87440 88838
anuj.sinha@telematicswire.net

Director

Lt. Col. M C Verma [Retd.]

GM- Corporate Communication

Yashi Mittal
M: +91 98103 40678
mgr_corpcomm@telematicswire.net

DGM- Corporate Sales

Poonam Mahajan
M: +91 9810341272
mgr_corpsales@telematicswire.net

Editorial Team Member

Richa Tyagi

Web Developer

Neha Nagar

Designer

Bishwajeet Kumar Singh

Publication Address

Telematics Wire Pvt. Ltd.
D-98 2nd Floor, Noida Sec-63
Uttar Pradesh-201301
Email: info@telematicswire.net

Printed and Published by

Maneesh Prasad on behalf of
Telematics Wire Pvt. Ltd.

Telematics Wire Pvt. Ltd.

D-98, 2nd Floor, Noida Sec-63
Uttar Pradesh-201301
Email: info@telematicswire.net

Disclaimer

Telematics Wire Pvt. Ltd. does not necessarily subscribe to the views expressed in the publication. All views expressed in this issue are those of the contributors.

Please Note: No material may be reproduced in whole or part without permission of Telematics Wire Pvt. Ltd.

Copyright 2020, Telematics Wire Pvt. Ltd.
All rights reserved.

At the outset, we at Telematics Wire are thankful to our readers, for sharing their views on the articles, columns and news published in our magazine. We have been receiving suggestions and ideas on what kind of articles and technical stories should be published. These suggestions are important for Telematics Wire monthly magazine. In addition to general appreciation and encouragement, one of the suggestions, which is common amongst many, is to have first hand updates and articles based on the usage of vehicle telematics from different regions, different user organisations, government & private industry and more.

Over the last couple of months in our context in India we have seen the call for “atmanirbhar bharat”, or an initiative to make India self-reliant. To some it may appear rhetoric, to others it may appear to be a journey. A journey of continued process of unshackling and encouraging innovations and entrepreneurship, creating an enabling ecosystem and a supportive domestic market. This journey is also debatable topic for critics and perhaps some pessimists. Let's take two cases over here- Israel and China.

Israel has been hot-bed for startup innovation and many of them getting global attention and also big-ticket acquisition. Mobileye, Innviz, Argus Cybersecurity, Otonomo Technologies, Altair, Waze, Valens Semiconductor, Moovit, Arbe Robotics, Nexar, Autofleet are some of the names making rounds in automotive world. Going by a 2017 report published by Roland Berger, “Israel with a population of just eight million, was home to more than 6,000 startups. In the same year Israeli startups raised US\$ 5.2 billion in venture capital, compared to US\$ 4.9 billion raised in Germany (which has ten times the population) and just US\$ 3.1 billion in France. In addition, foreign and local companies spent US\$ 23 billion to acquire 112 Israeli tech companies in 2017”.

Next, let's look at automotive startups in China. Xpeng Motors(2014), Byton(2017), Nio(2014), Car Inc(2007), Contemporary Amperex Technology, CATL(2011), Baidu(2000) etc are names worth taking note of. Few amongst these are already making impact globally in automotive domain, like CATL with its global dominance in EV battery and Baidu continuously improving its self-driving vehicle are force to reckon today. CATL has market value of CNY475 billion or approximately US\$ 68 Billion which is more than our local indigenous automotive comprising of Tata Motors, Mahindra & Mahindra, Ashok Leyland, Bajaj Auto and few more put together.

To our understanding Israeli startup ecosystem owes to (1) Setting up of technology centres as early as 1974 by Intel (2) Innovation Lab which is true to its name (3) high tech diaspora (2) quality talent pool of engineers and graduates and perhaps(not verified) indigenous push for defence equipment in Israel. All these has set the wheel of technological innovation rolling. On the other hand, China has been a classic case of grooming its own home grown technology products and services through protected market, suitable funding and export incentive. Export incentive has been kind of Chinese government paying out of their pocket to get companies bringing dollars from International market.

According to an article published(Sept'19) in Observer Research Foundation by Dr. Sabrina Korreck, Indian startup ecosystem has evolved dynamically since early 2000. Bangalore followed by Mumbai, Delhi NCR and some other cities have emerged as startup hubs. The growing middle class and its gradual evolution towards high income middle class; consistently increasing broadband penetration; government/political will and changing perception towards startups are enabling the ecosystem. On the flip side, digital divide, taking product to market and low willingness to pay from customers are some of the challenges. StartupBlink, which ranks startup ecosystem, puts India at 23rd position in 2020 out of 100 countries. India, which has third largest ecosystem, is ranked even behind emerging ecosystems such as Estonia, Lithuania, Brazil, Denmark etc. The ranking is led by the US, the UK and Israel.

If we go by what some of the industry professional have to say about “atmanirbhar bharat”, without being either critic or pessimistic; their suggestion to the decision and policy makers is that the call for “atmanirbhar bharat” should be effected through a systemic change where the “me too” mindset do not dampen purchase of new product developed. Innovation Labs should be evaluated based on their outcome, rather than just being a display by government(both centre and state) of having done something to encourage startups. Department of Science and Technology, which funds many research projects, can be transparent and should not be reinventing the wheel again and again. The outcome of research should be made available for all in public domain.

We would like to learn more from experts and industry professionals about the developments in this context at ground level. Do let us know your views about government support or initiative to develop supportive ecosystem for technology and products development.



MANEESH PRASAD

CEO & EDITOR

[maneesh.prasad@](mailto:maneesh.prasad@telematicswire.net)

[telematicswire.net](mailto:maneesh.prasad@telematicswire.net)

+91-9810346117

Maneesh .

MOBILITY SECTOR REJIG - FUTURE OF SHARED AND SMART MOBILITY

 **TAPAN TRIVEDI**
NISSAN EUROPE

Since 2010, according to McKinsey, investments in mobility companies have reached \$84 Billion in the US, \$51 Billion in China and \$34 Billion in the UK. This is driven by huge growth potential presented by increasing passenger miles, new transportation modes (e.g. bike and e-scooter rentals) and evolving customers' travel needs. The mobility sector as a whole is undergoing significant changes. Particularly, the road transport that makes up roughly 3/4th of total miles travelled has been at the forefront of the changes. This article broadly covers new mobility methods, mainly shared and smart mobility. It elucidates their scope along with other newly introduced mobility concepts and shows comparison of value proposition with other travel modes. Besides, the article explains the impact that the factors both external and internal to the industry are having on shared and smart mobility. Finally, the article touches upon the key success factors and examples of possible new revenue models for actors in the newly developing ecosystem.

So many new mobility terms!

Over the last decade many new terms such as shared mobility, future mobility, clean mobility, micro mobility and smart mobility have been coined to refer to specific travel means. They are not mutually exclusive and boundaries are often very blurred.

- **Shared mobility** refers to mobility that involves sharing of resources (vehicle space or the vehicle itself)
- **Future mobility** usually refers to connectivity, electrification and autonomous driving
- **Clean mobility** refers to electrified mobility solutions that have low or no emissions
- **Micro mobility** refers to using light vehicles for short distances, particularly meant for travel within cities. These vehicles run on small batteries and operate at lower speeds (usually less than 25 km/h); examples include e-bikes and e-scooters.
- **Smart mobility** refers to a solution that makes door-to-door commute seamless and efficient for customers. Some

features of smart mobility solutions include providing recommendations on the best itinerary that meets the customer's travel needs, suggesting alternate itineraries in case of a disruption en-route or a sudden change in customer's plans, and facilitating travel bookings.

Focusing on shared and smart mobility, let's look at the below diagram in which a commuter's travel from home to office is broken down into 4 segments:

- Segment A: Bus
- Segment B: Train
- Segment C: Ride sharing
- Segment D: e-Scooter sharing

Each segment on its own belongs to the shared mobility group.

Smart mobility enhances the door-to-door travel experience, taking into account the commuter's preference for cost, time and convenience. For example, using the customer's preference, it would calculate the most economical itinerary with fewer number of stops, less waiting time between each segment as well as convenient pick-up and drop-off points for both ride-sharing and e-scooter hire. Furthermore, as the smart mobility concept develops with the right players, we can imagine a customer buying a single ticket with a valid access code across all four travel segments, instead of paying separately for four trips.

Usually travellers are not very rigid regarding the means of travel, and their travel preference can vary based on the purpose of trips, and their personal circumstance and commitments. The traveller's choice for travel mode typically hinges on one or more of the following:

- cost,
- travel time,
- convenience, and
- emissions (as customers are becoming increasingly sensitive towards environmental issues)

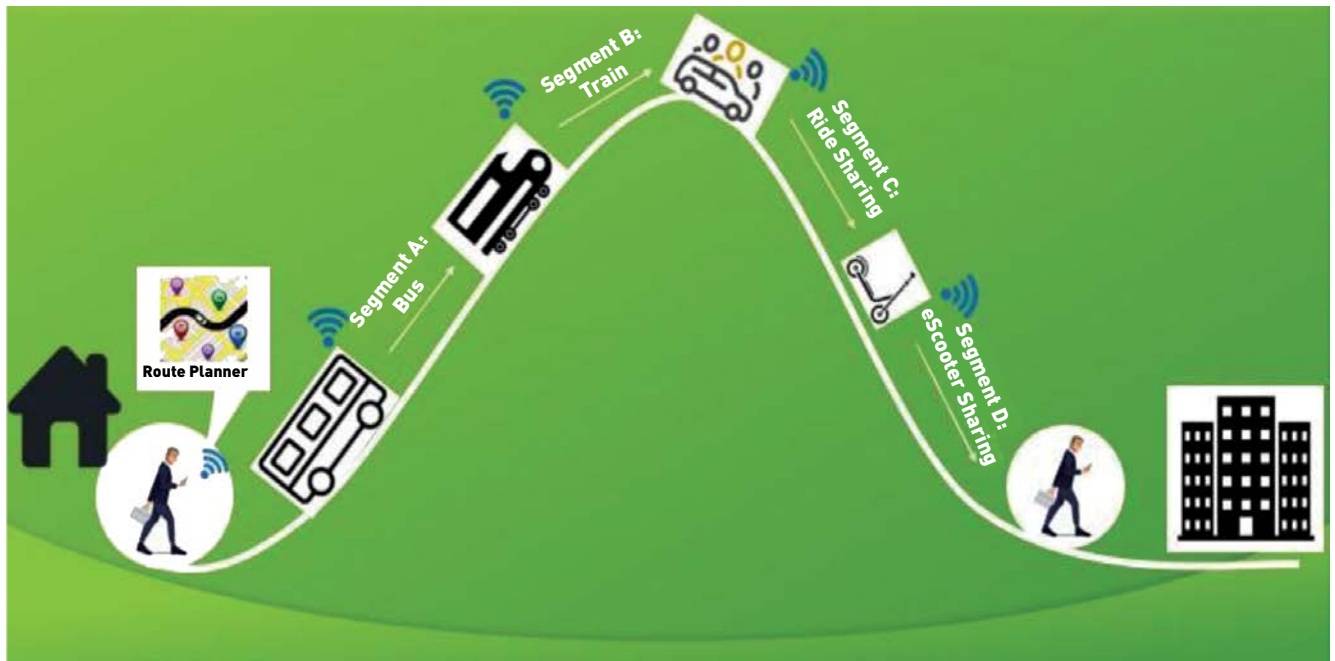


Figure 1: Segmenting a commuter's travel

Personal example of give & take with different mobility options

To give you an image of diversity in travel options, let me share some data on each of the above criteria from my approximately 60 x 1,300 km round trips between Toulouse (southern city in France) and Paris over a period of 18 months. As shown in the graph below, I chose from 5 travel options, and below is a comparison of their key characteristics:

- cost of trip: I earned 27 € when I used my car and offered ride with fellow passengers, and I spent 150 € when I took train
- time of trip ranged between 3 hours to 7 hours

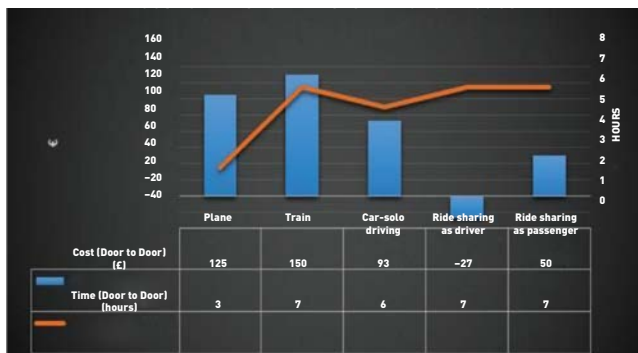


Figure 2: Cost and Time comparisons for different travel modes

From a convenience point of view, each travel method had a different set of pros and cons as shown in table 1.

Finally, as considerations for CO₂ emissions are increasing, the below graph shows emission efficiencies across all travel modes.

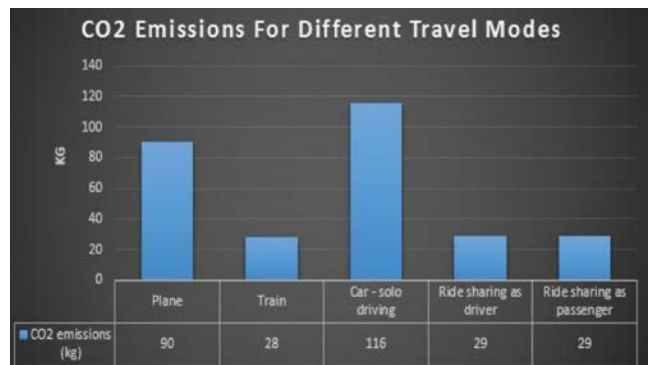


Figure 3: Emission efficiencies across travel modes

External Forces Affecting the Mobility Sector

The Mobility sector has been under a lot of scrutiny from industry and non-industry players alike, as well as environmental groups, regulators, and ministries of industry, economy and environment. The below factors that are currently shaping the mobility sector directly or indirectly affect smart and shared mobility:

Increasing amount of travel: Between 2010 and 2020, total vehicle miles travelled globally increased by 10% to 3.25 Trillion miles. This trend will continue as transportation becomes more affordable, accessible and fit to more diverse purposes. Besides, in emerging economies such as India, China and Africa, travel needs will increase proportionately to the growth of middle class and their discretionary spending.

Regulations: In Europe, the eCall regulation is ensuring that all newly homologated models of passenger cars from April 2018 support connectivity. The emissions regulation that has exposed the industry to up to 34 Billion € in penalties is driving uptake of electric cars. While these regulations have

Convenience				
Plane	Train	Car – solo driving	Ride sharing as a driver	Ride sharing as passenger
Positive: short travel time Negatives: queues & waiting time arranging drop-off and pick-up	Positive: comfort ability to work on PC Negatives: can become boring arranging drop-off and pick-up	Positive: flexibility Negatives: can become boring cost of maintenance	Positive: company of fellow passengers Negatives: experience anxiety may require driving out of the way for pick-ups and drop-offs cost of maintenance	Positive: options with travel start time, and best suited pick-up / drop-off points Negatives: experience anxiety arranging drop-off & pick-up

Table 1: Pros and Cons for different travel modes

been big disrupters, smart and shared mobility will greatly benefit from them as both connectivity and electric cars fit very well with their value propositions.

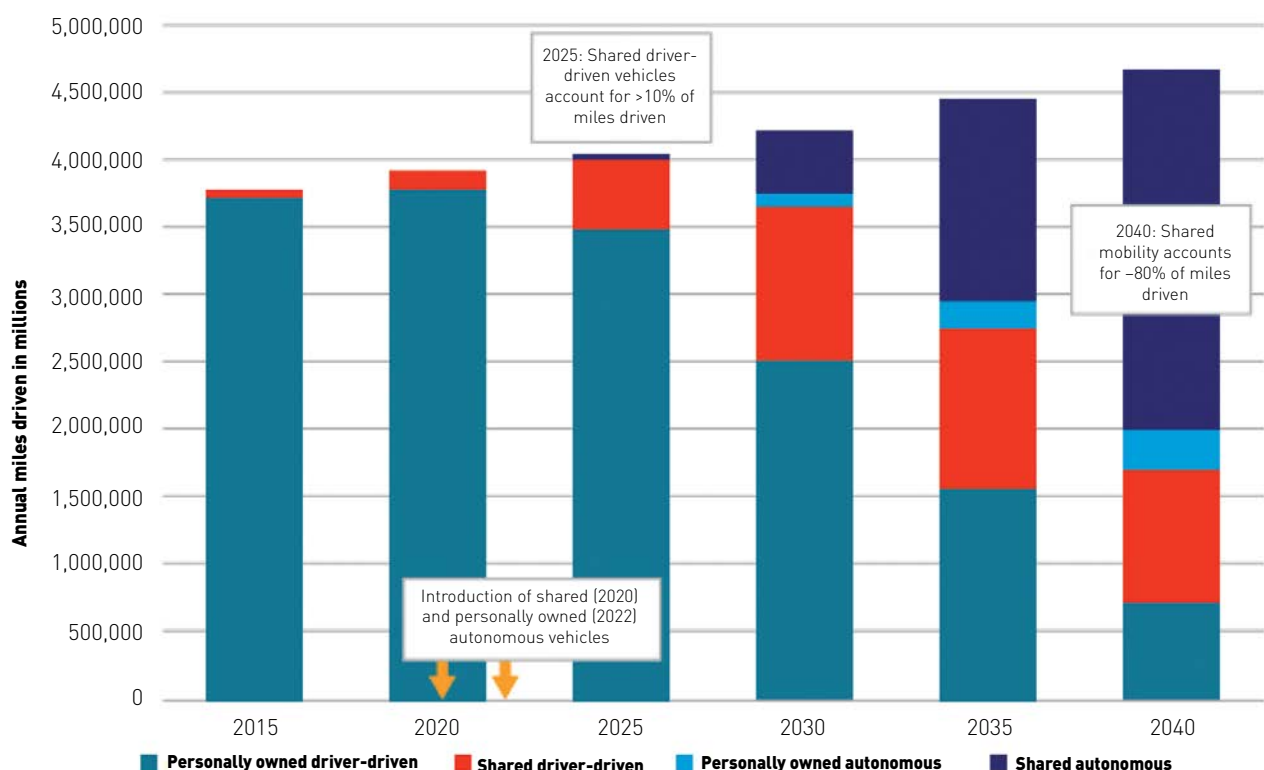
Socio-economic dimension: Shared mobility and smart mobility solutions promise efficient commute. With low travel cost, they will be favourable solutions from customers' economic consideration. Meanwhile, as customers are becoming sensitive to emissions and climate change issues, they are increasingly willing to decrease their CO₂ footprints. As shared mobility options offer low emission commute, they resonate well with customers' social responsibility viewpoint.

Innovations: There is a tremendous momentum in the industry today. On one hand advances in areas such as battery

technology for electric vehicles, vehicle efficiency, connectivity, autonomous driving and IS applications, to name the few, are pushing the limits and opening new opportunities. And on other hand new business ideas with innovative business models and value propositions are making it possible to realise commercial application of new technology to monetise them. Applying focus on both technological advances and business solutions is the key to supporting shared mobility.

Effect of COVID-19

Mobility service, just like many other sectors, has taken a hit with many businesses affected, investments dried up and progress stalled. However, I am optimistic about the future and when



Source: Deloitte analysis based on publicly available information. See appendix for data sources

Figure 4: Deloitte forecast for mobility

Graphic: Deloitte University Press | DUPress.com



ADVANCED TELEMATICS MANUFACTURER



**OWN
PRODUCTION**



**IN-HOUSE
DEVELOPMENT**



**SUPPORT
24/7**



'World's first' Bluetooth wireless fuel level sensor helps fleet managers remotely monitor fuel used by vehicles.

+7 495 108 68 33

INFO@FMETER.RU

+7 916 907 47 78 (WhatsApp, Telegram)

WWW.FMETER.RU/EN/





These are still early days for Shared Mobility, and a real ramp-up will begin from the middle of the next decade

things return to normal, the activities will quickly pick up. This sector with its high growth potential and governments' support will again start to attract investors, new businesses and jobs. Governments in the EU and the UK are banking heavily on the mobility sector, especially green mobility, to accelerate economic recovery and develop alternate transportation means to achieve the necessary social distancing in public transportation and control risks of a new outbreak. The French government announced an €8 Billion investment in e-mobility to boost the sector and create new jobs. The UK government announced a £2B recovery package for the transport sector that will promote active mobility and micro-mobility services. The British government also legalised e-scooter rentals from the 4th July.

Shared mobility that requires sharing of space such as ride sharing will continue to face uncertainty in the short term. Meanwhile shared mobility that involves sharing of devices or vehicles is certainly getting a big boost as a result of the pandemic.

Future of shared mobility in changing industry dynamics

Forecasts on total miles driven using shared mobility differ greatly from one study to another. However, I particularly subscribe to the graph (Figure 4) from Deloitte for the US market. As shown fully autonomous vehicles introduction and continuous growth in annual miles travelled will contribute greatly to shared mobility.

Also, as indicated, these are still early days for

Shared Mobility, and a real ramp-up will begin from the middle of the next decade.

Meanwhile, the strong undercurrents such as accelerating convergence among mobility, technology and energy industries, emerging ecosystems with new entrants and new offers, and shifting of value proposition are rejigging the mobility sector.

As shared mobility grows in coming years, each of its segments such as ride-sharing, ride sourcing, vehicle rental and vehicle sharing will further expand, and new segments will be created. In turn customer base will expand and customer needs will become more diverse. Consequently, service providers will evolve in two areas:

1. Specialist service providers that will concentrate on specific mobility segments, and
2. Generalist mobility service providers (Smart Mobility) that will offer efficient itinerary to customers looking for multi-stop and/or multi-segment travel.

Success Factors for Mobility Service Providers

There are some key factors that Mobility Service Providers must offer to guarantee success. These include:

- itinerary recommendations that are most relevant in-line with customers' sensitivity for cost, travel time, convenience and CO₂ footprint.
- Non-intrusive and easy-to-use experience with good aesthetics

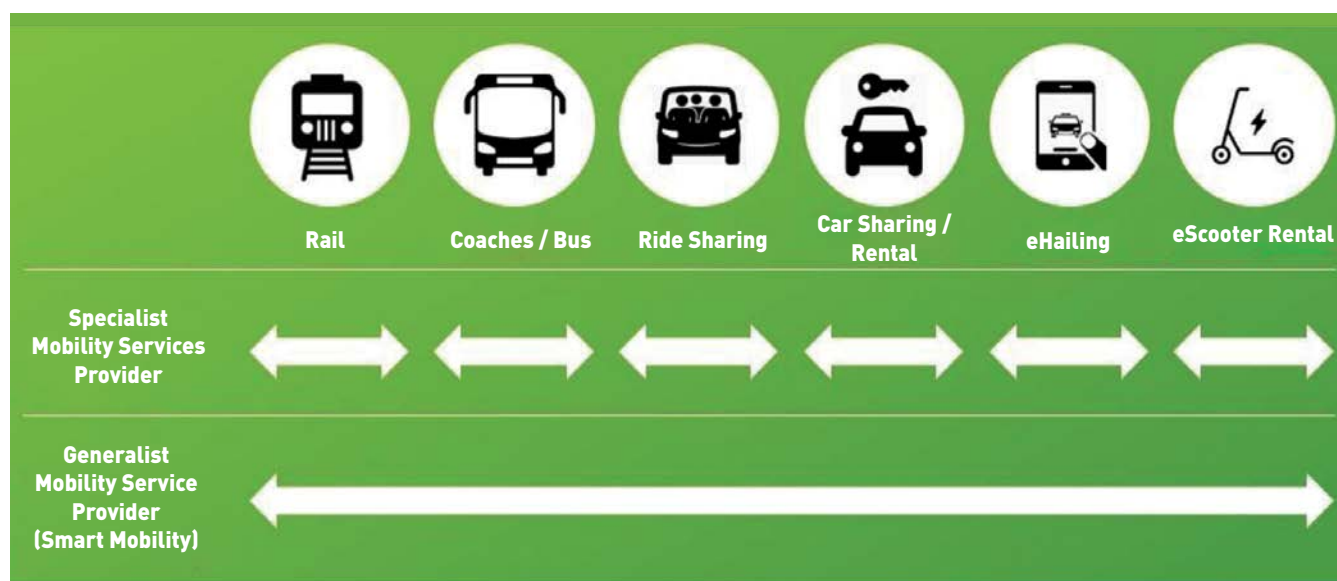


Figure 5: Specialist and Generalist Mobility Service Providers

Customer support must be good and responsive, especially in events of travel disruptions, processing refund claims and other travel related enquiries.

Sophisticated back-end systems with intelligent algorithms that are able to efficiently consume and process large volumes of data is another must. The quality of real time information has a direct impact on both revenue and cost as customers use them to make their travel decisions, and business processes use them to evaluate parameters such as journey time, passenger volume, time of the day, fleet in service and last price to adjust fleet availability and price.

Finally, partnerships with different players within the ecosystems will play an important role. For instance mobility services with EVs and e-scooters, will need efficient integration with:

- vehicles to check vehicle health in real time,
- vehicle dealerships to efficiently bring broken vehicles back in operations,
- charging stations to check availability and health of chargers
- utility companies to optimise charging cost by timing recharging of vehicles and feeding electricity back to grid
- other partners to offer further added value to customer and generate additional revenues such as advertisement

For generalist mobility service providers in context of smart mobility, partnerships are critical. As smart mobility promises seamless travel to customers in multi-segment / multi-stop journey, the transition between services providers also has to be seamless. Then, in terms of revenue streams, the service provider may want to develop (i) revenues from commission, (ii) revenues from reselling discounted spaces bought in bulk from operators, and (iii) revenues from advertising. Considering these factors, success of partnerships will be depend on the right level of service level

agreement and a wide scope of commercial arrangements.

Conclusion

The next decade in the mobility sector will be as exciting as it promises. Many factors as indicated in this paper and summarised below will play an important role in reshaping it:

- **Factors external to industry:** increasing travel needs, regulations, technology, change in customers' travel behaviour & expectation, new entrants and even COVID-19 pandemic are expected to have an impact on the future of mobility
- **Factors internal to industry:** new entrants, evolving ecosystems, business models and value propositions will continue to disrupt the industry in the years to come.

The reorganisation in the industry will continue in the first half of the next year and the second half will see the industry settle down with new normal – offers, value chain and new companies. There will be winners and losers but along the course the sector will attract investors, start-ups and create many opportunities.

References:

- <https://www.advisorperspectives.com/dshort/updates/2020/07/08/vehicle-miles-traveled-another-look-at-our-evolving-behavior>
- <https://www.bloomberg.com/news/articles/2019-06-26/europe-s-tough-new-emissions-rules-come-with-39-billion-threat>
- https://www2.deloitte.com/content/dam/insights/us/articles/3367_Future-of-mobility-whats-next/DUP_Future-of-mobility-whats-next.pdf
- <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/moving-forward-how-covid-19-will-affect-mobility-in-the-united-kingdom>



As shared mobility grows in coming years, each of its segments such as ride-sharing, ride sourcing, vehicle rental and vehicle sharing will further expand, and new segments will be created

AUTHOR



TAPAN TRIVEDI

Section Manager –Product Planning Organisation
NISSAN Europe

Tapan Trivedi, manager in Product Planning, is responsible for vehicle specifications of all Nissan models produced in Europe. In his previous role, Tapan was responsible for connected car program's profitability and competitiveness. In that role he studied new business opportunities, developed business models, managed costs and guided the company's strategy with connected cars. Tapan has MBA from HEC Paris and Masters in Technology from ISEP, Paris

COVID-19 HAS RESHAPED THE SHARED MOBILITY INDUSTRY

 **TUSHAR BHAGAT**

UFFIZIO INDIA SOFTWARE PVT LTD

Mobility connects the world. Period.

In the early 2000s, the world saw a transformational face of the automotive industry in the form of Shared Mobility. It changed the whole landscape of the transportation industry for good.

Shared mobility simply means the shared use of transportation modes that commonly include, Carpool, Bikepool, Peer to peer rideshare, On-demand ride services and so on. Ola, Uber, Vogo, Bounce, Rapido, and Yulu are some of the major shared mobility players.

The skyrocketing popularity of Shared Mobility

The convenience, sustainability and affordability became the prime reasons for the worldwide acceptance and exponential growth of this sector.

The industry trend shows that shared mobility has become the first choice over public transit for urban dwellers. Not only has it decreased overcrowding of roads but have given a better sustainable and eco-friendly transport option. As per What next? 2017 issues, by 2030, only 32% of cars will be owned by private owners and the rest will be sold for mobility services.

With technology advancements, the shared mobility sector has gained better efficiency in sharing assets easily. Telematics plays a major role in streamlining its services and adding innovation and better functionalities for greater user experiences. From dockless mobility to offering last mile and first mile solutions, real-time user connectivity to driver behaviour analysis and theft prevention, with telematics the

shared mobility has transformed into smart mobility.

“As per the market analysis, it is predicted that the shared mobility sector will see an annual growth of 28% from the year 2015 to 2030.”

But then the pandemic happened! Like any other industry, COVID-19 crisis disrupted shared mobility enormously.

Effect of Pandemic on shared mobility in a snapshot

70 to 90 per cent dip in Public-transit ridership across the world.

- Ride hailing are experiencing declines of up to 60 to 70 per cent.
- a scooter-sharing start-up laid off over 30 to 40 per cent of its workforce.
- Preference for taxis and car-hailing services went down by 15% post the COVID-19 crisis.
- With decreased public movement, mandatory social distancing, and the whole world going virtual, shared mobility has lost its demand and is expected to stay at this state for a while now.
- People and businesses have adapted themselves to this new normal, of course, there isn't any other way. The same applies to shared mobility players. Those who adapt, innovate, strategize and implement would win.

The quick action plan adopted by major shared mobility players

Recovery of the normalcy is not an easy path. But it is important to start with a better plan that ensures economic growth without the widespread of the pandemic. Major shared mobility players across the world have started their operations while following the strict WHO guidelines. Some of the implemented features include:

- Temperature screening stations to check the signs of fever in passengers boarding.

- Wearing masks
- Regular disinfection of the vehicle
- Switching of ACs
- Using protective shields
- Maintaining physical distance with the driver by sitting at the rear seats
- Contactless payment

These measures have become mandatory to minimise the risk of infection. The key here is to enhance the passengers' confidence by ensuring their safety.

Future of Shared Mobility in the Pandemic era

Well, the future is unpredictable. But there ought to be an action plan.

Mobility players across the globe are focussing more of the safety standards to protect their customers and employees. Here are some real-life examples:

Ride-hailing companies like Uber and Lyft have removed the carpool option from their apps and made it mandatory for the drivers to sanitize the surfaces for 15 minutes before a new passenger enters.

A scooter-sharing company has mounted electric displays on the scooter that would show the last disinfection done.


Uber India has expanded its realm by starting dedicated rentals for corporates and e-commerce deliveries.

Ola emergency service, launched by Ola for those who need to be rushed to the hospital in case of a medical emergency.

Scooter sharing platforms Vogo, Bounce and Yulu have moved to increase their long-term two-wheeler subscriptions.

Bike taxi app Rapido has started transporting packages.

With this, it becomes clear that COVID-19 demands for changed business behaviour. It demands businesses to be flexible and up-to-date. Shared mobility players will have to diversify their business to survive.

The challenges are real, the impact is drastic. Getting back to normalcy may take time, so it becomes crucial to adapt to this “new normal”. 

AUTHOR



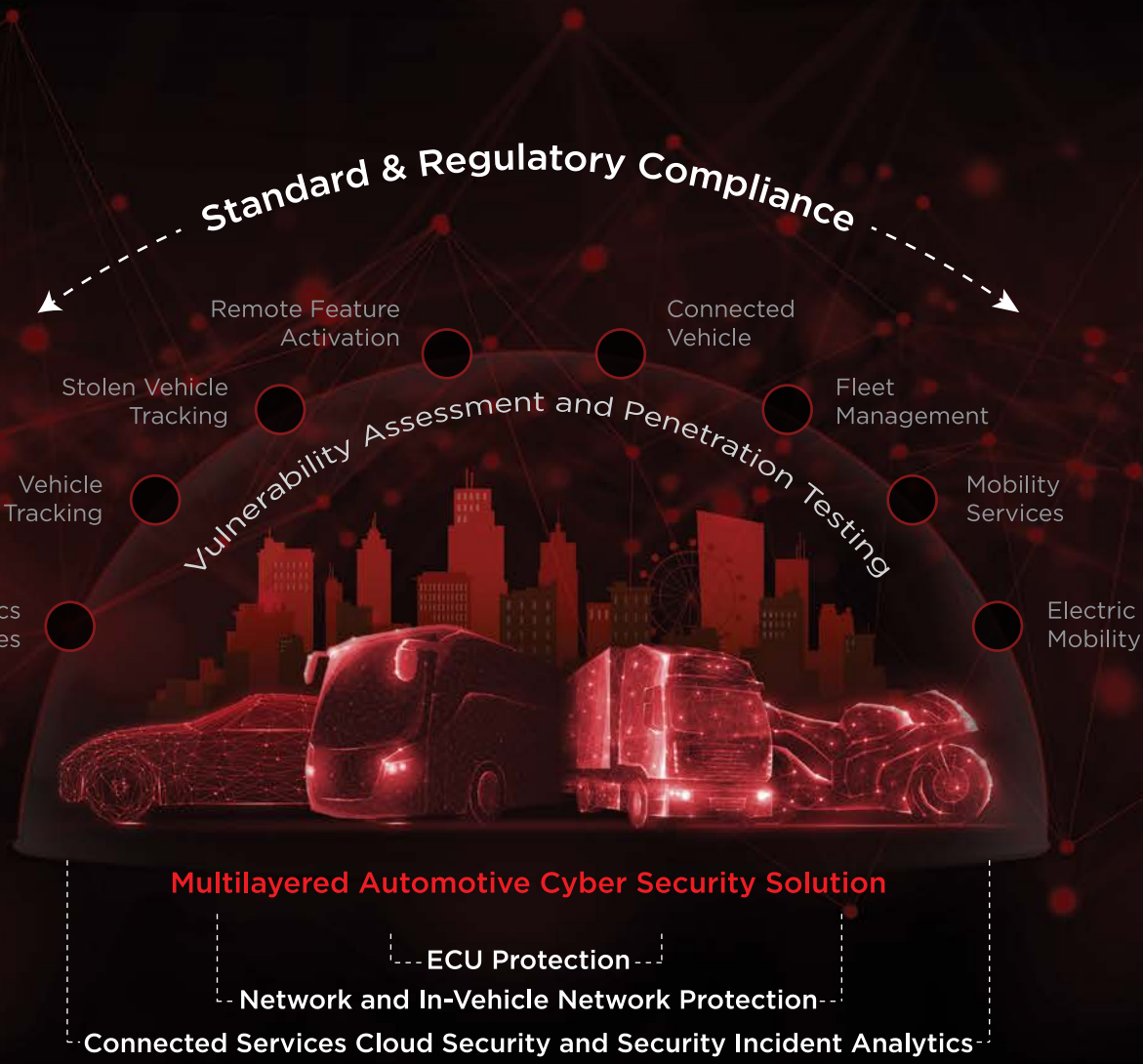
TUSHAR BHAGAT

Director
Uffizio India
Software Pvt Ltd



SECURE
THINGS

The Preferred Partner of Automotive Manufacturers in India for Cyber Security



PRODUCTS AND SERVICES

- Advanced Network Protection for Connected Vehicles (IP, Cellular)
- AI based Comprehensive Vehicle Network Intrusion Detection & Prevention System (CAN, Ethernet)
- Advanced ECU Protection (Telematics, Infotainment, Gateway etc.)
- Highly Secure OTA update for efficient and cost effective deployment
- Security Assessment & Penetration Testing for entire Vehicle and Ecosystem
- ISO 26262 (Cyber Security Provisions) & ISO 21434 Compliance

Recognized as one of the 20 Most Promising
AUTOMOTIVE TECH Solutions Provider 2019 by CIOReviewIndia

EV JOURNEY OF INDIA



Mahesh Babu is currently the Managing Director & Chief Executive Officer of Mahindra Electric. He is a Fulbright Scholar and has completed his Leadership in Management from Tepper School of Business, Carnegie Mellon University, Pittsburgh, and holds a post graduate degree in Engineering from BITS, Pilani.

Under his leadership, Mahindra Electric has launched four new electric vehicles, and the mobility platform NEMO, which stands for Next-Generation Mobility. He has been instrumental in shaping the electric mobility solutions of the future, through path breaking initiatives in the commercial fleet space and by expanding the electric portfolio from 48V till 650V drivetrains.

Electric vehicle is the focus of mobility transformation which is being co-driven by connectivity, autonomy and shared. Mahesh Babu in our last conference, Connected Vehicle 2020, held in March '20 at Bengaluru, had talked about the need and importance of sustainable mobility. During his leadership address he said, "It is important that we look at the energy needs of future mobility, which is clean and efficient. Moving a billion people, has to be a multimodal transport, where you get down from metro and use electric three wheeler, which too can be shared, to reach destination".

Recently, Telematics Wire got in touch with him to get his views on electric vehicle in India, mentioned in following section.

MAHESH BABU

MD & CEO

MAHINDRA ELECTRIC MOBILITY LTD

Would you like to summarise the journey of Mahindra Electric so far

Over the last decade Mahindra Electric has moved on from being a vehicles manufacturer to a complete EV technology solutions provider. Our focus and aim is to bring affordable e-mobility solutions to the masses at the same time making India a global hub for developing and manufacturing of electric vehicles. We have an experience of over 230 million electric kilometres on Indian roads that has helped us in understanding the economics of EVs better.

Mahindra's EV journey began almost 20 years back with the launch of Bijlee electric three-wheeler and today we are the pioneers in EV technology and offer the best connected mobility solutions, last/first mile mobility solutions, and electric fleet management solutions.

What is your view about standardisation of charging infrastructure in India?

Standardization of Charging Infra is a work in progress as the technology is still evolving. For the mature products like 4W - a certain level of standardization has been reached. For e.g. AC - Type 2 is coming up as the standard and for DC - Most of the current and upcoming High Voltage vehicles are going for CCS. For Low Voltage vehicles - DC 001 (Bharat standard) is the Fast charging standard. For segments which are still scaling up and evolving like the e 2W and 3W, there is no standardization as such and most OEM's are going with own solutions at the moment. As the market evolves there might be a standardization in this space as well.

What is your view about charging infrastructure in India?

India has a very unique EV mobility scenario as compared with the rest of the world, where our electrification is driven to a large extent by 3W and 2W followed by commercial 4W. Therefore India's charging infrastructure also would be unique in catering to this mobility scenario. We feel a large segment of India's EV fleets charging needs would be catered to by intelligent, connected and safe AC charging solutions which would have to be scaled by distributed, entrepreneurship models. Specific use cases like 4W Fleet operations and intercity travel would demand for DC Fast charging solutions. Battery swapping could also be an interesting model for 2 and 3W provided the scalability and economic viability are proved out. Therefore charging infrastructure in India is a very different and unique scenario.

Is there a possibility of seeing charging point mushrooming across the country on the lines of PCOs for telecom in 90s.


Ideally such a model would be great for charging as it would help our large upcoming population of e 2W and 3W find a charging point wherever they go and at the same time provide a means of additional revenue and entrepreneurship for small and medium businesses across the country. With suitable charging solutions that are intelligent, connected, economical and safe - such a model can be made possible and scaled rapidly.

With so many players in EV segment, do you think there is need for some caution? Do you anticipate mergers or acquisition of startups in EV segment?


Electric mobility bring in opportunities in product manufacturing, charging infrastructure, shared mobility segment and services. Today, start-ups have the option to cater to all three opportunity even as new business models like second-life battery and other models begin to emerge. The electric vehicle segment will redefine and streamline operations and businesses. It will make the world simpler and there will be a lot more consolidation. Every company today wants to venture or invest in EVs which will give start-ups wings to fly.

Do you think Indian automotive could be overwhelmed or uprooted by Chinese automotive players in coming decade? What caution if any, needs to be exercised at policy maker's level?

India has a strong and stable policy in FAME and Phased Manufacturing Program that has the potential for India to become a hub for electric vehicles. Mahindra Electric has been consistently investing in localization of EV components and as a matter of fact, every component of our Treo range of electric three-wheeler (except cell) is made-in-India. Various state governments have also announced EV policies that offers fiscal and non-fiscal benefits to EV buyers. Unlike many other global countries, India is a unique market dominated by two/three-wheelers which will head India's transition towards e-mobility. □



**WE FEEL A LARGE
SEGMENT OF INDIA'S EV
FLEETS CHARGING NEEDS
WOULD BE CATERED
TO BY INTELLIGENT,
CONNECTED AND SAFE
AC CHARGING SOLUTIONS
WHICH WOULD HAVE TO BE
SCALED BY DISTRIBUTED,
ENTREPRENEURSHIP
MODELS**



SHARED MOBILITY IN THE COVID SPIN

VADIRAJ ARALAPPANAVAR

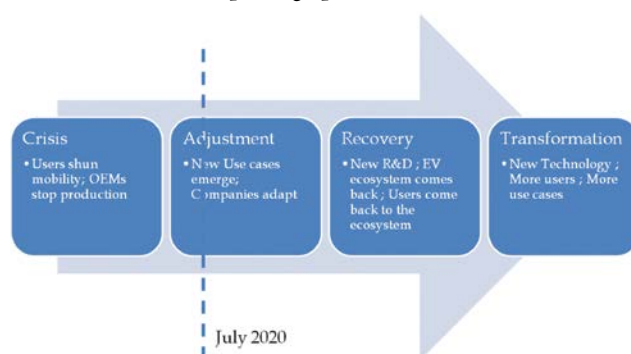
ONN BIKES

COVID hits Shared Mobility

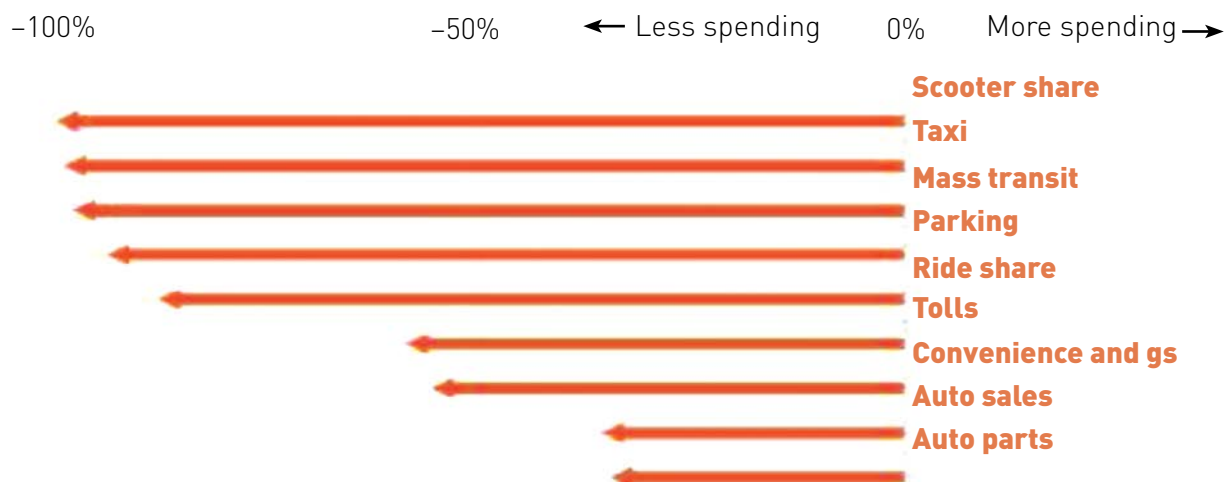
As the COVID-19 pandemic swept across the world, shared mobility startups along with almost all shared-economy businesses took a significant hit. As populations stayed home, mobility across the board ground to a halt and experienced adverse effects of the global lockdown. At the same time, this was also a time for many businesses offering mobility services to adapt to find viable solutions to adapt to the new market. All the companies started looking at providing value to meet the needs of a more conservative and cautious consumer market.

The statistics from US show the effect of the pandemic on the shared mobility ecosystem.

We are in the 'Adjustment phase', where companies are adapting to the newer use cases of consumer behavior in the limited demand that's picking up.



US consumer transportation spending fell sharply in April change in spending from 2019 for the week ending April 1



Change in spending from 2019 for the week ending April 1

Reference: CBInsights

Stages of Shared Mobility recovery

The below pictures depicts the different stages towards the COVID revival and where we stand at the current context.

Some of the behavior changes can be seen from the below statistics from China.

ADVANCED DRIVER ASSISTANCE SYSTEM

A smart move
towards
**Zero Road
Accidents**

ANS

**Forward Collision
Warning (FCW)**

Advanced Driver Monitoring



Closed-eyes
Detection



Yawning
Detection



Smoking
Detection



Calling
Detection

**Headway
Monitoring
Warning (HMW)**

**Lane Departure
Warning (LDW)**



ANS IT INDIA PVT. LTD.

+91 70463 54345

operations@ansitindia.com

www.ansitindia.com



India Context

As markets reopened and partial restrictions were lifted, many commuters found themselves wary of using public transport. User trends are also showing a shift in preference to finding reliable personal mobility. There is evidence that the number of users who are attempting to solve their mobility needs by looking for two-wheelers have shown upward trends. At the same time they're also seeking out more affordable ownership avenues like loans, and second-hand ownership. Yet the choices before most users seemed to be limited. As millions of people turned away from their previous dependence on alternative transportation modes, they were left with few choices:

1. Two-wheeler ownership, which would tie them into hefty down-payments and EMIs, while also needing credit checks, documentation, maintenance, and taking on additional commitments including insurance and taxes. This isn't ideal considering the limited financial stability many working professionals are experiencing during what experts agree is an economic downturn.

To expect individual consumers to take on more debt and long-term commitments while the market is dealing with job-losses and consumer spending in most areas has shrunk, makes the appeal of ownership an even more impractical solution for millions.

2. Second-hand/pre-owned vehicles already account for a large volume

of use today, but happen largely with cash-based transactions and operate with a persistent need for the buyer to evaluate the quality of vehicles before being purchased.

Even in this scenario, any consumer today would be hard pressed to have the immediate liquidity needed to purchase the vehicle, but also the added maintenance costs involved with a used vehicle.

3. Ride-sharing and bike taxi services will also be challenging because they're inherently exposing users into contact with strangers which they would ideally like to avoid. Plus, since these services still haven't reached critical mass, and are still mostly unpredictable, they also cannot be expected to scale to meet the demands of mass mobility like private two-wheelers are able to solve.

COVID Driven Use cases

Towards the new use cases, technology companies have started offering the new services such as

Hourly / Daily Bookings: The most popular service that mimics the initial use-case of most users who use shared mobility intermittently,

Monthly Subscriptions: Service to solve mobility for everyday needs for extended periods of time

These plans allow users to experience the same joys of ownership without the added costs of insurance, maintenance, and hefty payments while also offering them the advantages of switching to

another bike as per their needs or even flexibly changing their plans to suit the extent of their anticipated use.

This plan was growing in popularity until the lockdown began but has gradually begun picking up again as offices reopen and users are cautiously pick up plans to meet their requirements without getting straddled with down-payments and insurance/maintenance costs

Rent-to-Own: Rent-to-own plan allows users to pick from any of the existing bikes, but without the hassles of extensive documentation, credit checks or even any down-payments. Anyone can almost instantly pick-up any scooter/motorcycle of their choosing and rent it monthly for a chosen term, at the end of which the vehicle ownership is transferred to the user. Plans typically offer either a 12 or 18-month term, allowing users to rent today and own tomorrow.

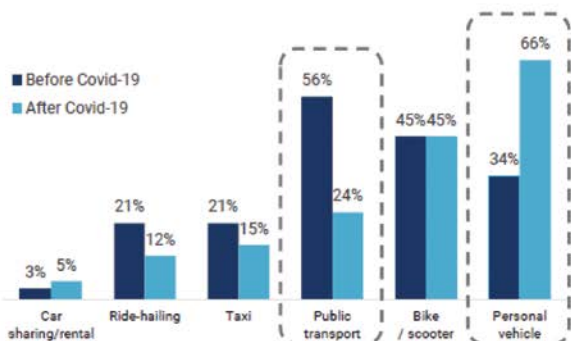
Surging demand for ecommerce and delivery

Companies are repurposing their fleets to take care of the surge in demand for home delivery of essentials and other products.

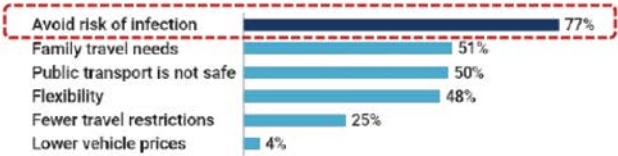
Technology Levers

Electrification, Battery Infrastructure
Falling battery costs and lower maintenance costs will spur the adoption in the recovery phase' This will be further propelled by the interest from larger corporations and energy, oil companies as they prepare for the future ahead with EV.

Chinese consumers' preferred mode of transport



Reasons for new car purchases in China



Reference: CBInsights

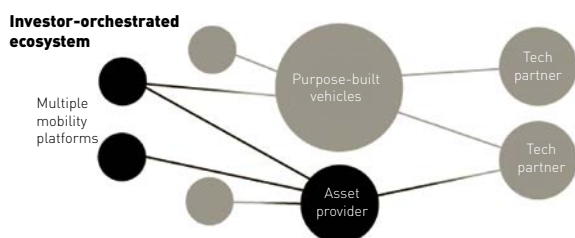
Connectivity

Connectivity technology will drive use cases around hardware connectivity, personal connectivity, safety, individual preferences and personalisations.

Autonomous

While self driving technology requires higher investment, there will be different use cases that will drive the demand of this technology.

It is envisaged that the ecosystem will grow based on collaborations across mobility platforms providers, OEMs, technology providers, Asset providers.



Reference: McKinsey

Future Ahead – Shared Mobility for 2 Wheeler

A number of startups are working on shared vehicle networks, vehicle design, and charging infrastructure for bicycles, scooters, mopeds, and other compact vehicles apart from them trying to take the advantage of the whole EV technology benefits.

As per World Bank data, 850 million of Indian are below the age of 35 and since young people are usually quicker to adopt new trends and are less likely to own a car, implying a likelihood of adopting new mobility options.

By 2030, Morgan Stanley expects shared miles to reach 35 per cent of all the miles travelled in India and this will further increase to 50 per cent by 2040.

Post 2030, it also expects this trend of shared mobility to partly replace individual car ownership while app-based taxi services will mainly replace public transport rather than personal car usage. India had 257 billion miles driven in 2017, and of that, 10 per cent were shared (includes traditional taxis and app-based plays), and it is believed that it can rise to 35 percent by 2030 implying 18 percent CAGR based on Morgan Stanley estimates.

While there is lot of negativity is around the shared mobility sector, but the critical analysis of the data suggests that the future ahead for the shared mobility startups is rosy. □

AUTHOR



VADIRAJ ARALAPPANAVAR
Chief Product Officer
ONN Bikes

The Future of shared and connected mobility

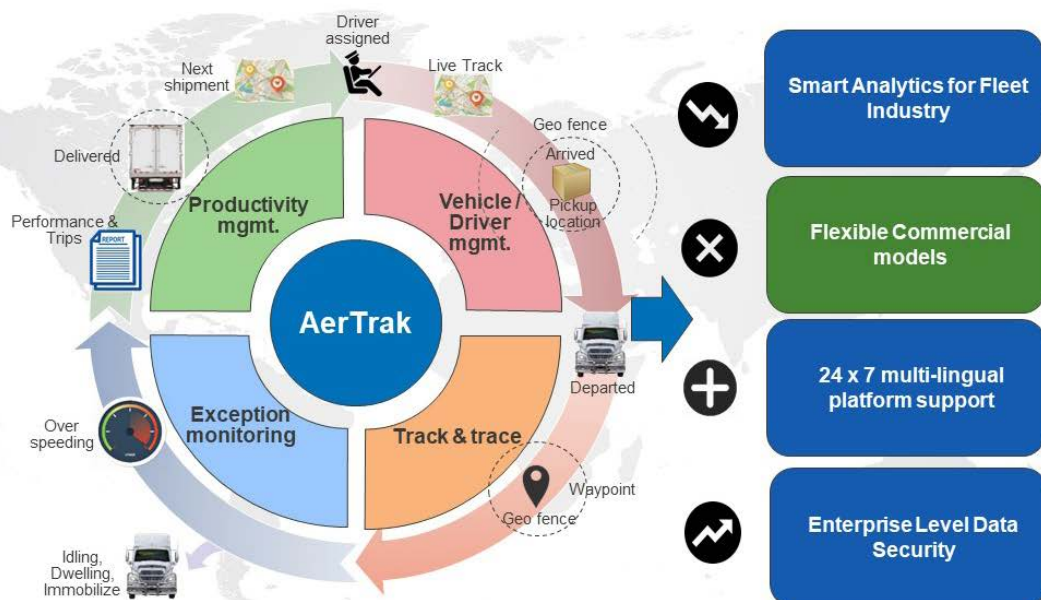
SAMEER MAHAPATRA
AERIS COMMUNICATIONS

India is at an intonation point in the advancement of its mobility system framework. As the second most populated nation, India has a chance to reclassify individual versatility and set a model for different countries. India can build up a shared mobility framework that makes benefits for the entirety of its residents by utilizing local qualities in information, availability, and business enterprise.

According to a report by Prescient & Strategic Intelligence, the Indian shared mobility market was valued at \$630.7 million, in 2018, which is expected to surpass \$3,466.7 million by 2024, with a CAGR of 27.6% during the forecast period (2019–2024).

As per a NITI Aayog report, India could save 64 percent of energy demand for road transport and 37 percent of carbon emissions by 2030 by pursuing a shared, electric and connected mobility future. To understand a shared mobility future, some current patterns need to be observed like the Indian urban areas are currently seeing expanding responsibility for private vehicles and are diminishing the utilisation of open and non-mechanized vehicle. These patterns have suggestions on India's vitality utilization, vitality security, economy, contamination, blockage, wellbeing, and security. Moreover, private vehicle use has noteworthy ramifications ashore necessities for leaving in Delhi, for instance, leaving represents 8–10% of the accessible land pool. A transition to shared mobility can help address these growing challenges. This shift will enable efficient asset utilization by transitioning from a model of ownership of private assets to usership of shared assets. Shared mobility has the potential to displace private vehicle ownership, which is typically costly, inequitable, and inefficient in comparison. This could unlock a transportation future that is more affordable, reliable, clean, and efficient.

What does this Smart Platform do ?



© 2020 Aeris Communications, Inc. All Rights Reserved | Proprietary and Company Confidential

Smart and shared mobility allows the movement of both goods and people which leads to better fleet utilisation-allowing more passengers and goods to travel in the same vehicle/vehicle kilometre travelled. On a global scale, the trend of car-sharing and shared mobility in whole is increasing steeply and is exhibiting significant growth. Carsharing compliments public transportation and ride sourcing, effectively serving different mobility requirements. Ubiquitous availability of and access to vehicles, real-time information availability, competitive pricing structures, and availability of multiple options for vehicle types, can enhance the usability and attractiveness of carsharing.

Harping upon the growth of shared mobility in India and around the globe, many car sharing companies have enhanced their business in the country to reduce urban traffic congestion and simultaneously contribute to the betterment of the environment. Numerous startups emerged in the online and mobile app space and individuals started pooling their own cars as a gesture to curb congestion in cities. Despite its relatively short existence, shared micro-mobility services have made a significant impact on the urban commuting landscape i.e., mopeds and bikes have also always been a prime way of commuting and with the onset of shared telematics mobility many

local startups have ventured into this space across the country.

Dockless micro-mobility (whether its e-scooters or other short-distance shared vehicles, such as bikes) utilizes GPS technology and other smart features powered by the Internet of Things (IoT).

The growing shared mobility ecosystem has the potential to create new jobs as the mobility system shifts from product-centric to service-centric. A shared mobility future will require infrastructure, technological, and operational developments, which will drive employment in these sectors.

An efficient transportation needs to be in place for the country for a well-functioning ecosystem for shared mobility. This is a foreseeable future for India and the transition would be easy if the transportation system is more efficient, cleaner, and meets the needs of its growing population. In working towards the goal of shared mobility, India will set itself up for clean, liveable cities and set an example for other nations of how to sustainably meet the transportation needs of a growing global population. □

AUTHOR



SAMEER MAHAPATRA

Vice President and Country Sales Head-India & SAARC
Aeris Communications

Sameer Mahapatra is the Vice President and Country Sales Head-India & SAARC at Aeris Communications. He is an experienced leader with a demonstrated history of working in the telecommunications industry for the last 20 years.

TRACK YOUR FLEET WITH ADVANCED SAFETY & SECURITY



BUY
ONLINE
₹1899

- | | | | |
|---|--|---|---|
|  REAL TIME
GPS TRACKER |  GEO-FENCE
NOTIFICATION |  OVER
SPEEDING
ALERTS |  FUEL
MONITORING* |
|  90 DAYS
TRIP REPORTS |  NEAREST
VEHICLE
LOCATOR |  FREE
FMS |  AIS 140* |

*Extra Charges Apply.

www.TrakNTell.com/truck



— TO KNOW MORE —
CALL : 8010-80-8010



Designed in India, manufactured in India #MakeInIndia
Trak N Tell™ is a registered trademark
of Bits N Bytes Soft Private Limited



Shared Mobility: A COVID-19 Recovery Roadmap

BEN LUNDIN, DEREK VIITA
STRATEGY ANALYTICS

Riding a wave of technological innovation over much of the last decade, new and emerging forms of mobility have made life easier for travellers all across the world.

Ride hailing companies like Didi, Uber, Lyft, and Bolt have transferred the painstaking process of hailing a cab from out on the street to the tip of a finger on a mobile device, generating more than \$29 billion in revenue across 110 countries in 2019 alone ⁽¹⁾. Car sharing companies like Zipcar, Getaround, and Turo, along with vehicle subscription services like Access by BMW, Porsche Passport, and Audi Select have reconstructed what it means to be a vehicle owner, paving the way for new, cheaper, and communal forms of car ownership. Two wheeled vehicle sharing companies like Mobike, Bird, and Lime

now claim prime sidewalk real estate across the world, having introduced fun, first- and last-mile mobility options to commuters and tourists across the world.

These new modes of transportation have collectively made day-to-day mobility overall more convenient, less costly, and more accessible to a wider subset of the population. They have sparked a technological revolution, forever altering the way we navigate our city's streets.

But as it turns out, many of these new mobility alternatives were built on shaky foundations, leading to a retrenchment of new mobility initiatives throughout 2019 and into early 2020.

The ride hailing industry, propped up by financial support from the private capital markets, is a money pit, as many of the world's leading providers hemorrhage high volumes of cash in the face of cutthroat

competition over customer acquisition and driver retention. Simultaneously, threats from regulators continue to pile up across the globe (especially in North America ⁽²⁾ and Europe ⁽³⁾), affecting the growth prospects of even the strongest ride hailing operators.

The \$4 billion car sharing industry ⁽⁴⁾ has had equivalent struggles. Led by automotive OEMs like GM, Daimler, and BMW, many operators have seen their investments and pilot programs go sour (another North American issue ⁽⁵⁾) due to generally low consumer interest, low margins, complicated fleet management issues, and high price points; the vehicle subscription business is no different.

Even the seemingly omnipresent two-wheeled vehicle sharing industry has felt the recent mobility malaise, as many operators over-deployed masses of



free-floating shared vehicles into already saturated markets, failing to adequately match supply with demand.

To add fuel to the fire, despite all of these mobility alternatives touting themselves as viable alternatives to personal vehicle ownership, consumers still haven't shown a willingness to scrap their cars. In fact, Strategy Analytics research has found that in many segments, use of these new mobility services actually increases the likelihood of an imminent car purchase⁽⁶⁾. And even tech-savvy millennial travellers still prefer personal cars for a variety of journeys. They perceive this mode as the safest, most cost-effective, and most convenient for many types of trips, from commuting to errands to vacations and more. In other words: Mobility services are not replacing the privately owned car, they are just augmenting it.

Even though many mobility services faced challenging macro-level headwinds, most were not quite facing an existential threat. Ride hailing companies like Grab and Gojek shifted their focus away from ride hailing and more toward financial services; while Uber and Yandex.Taxi shifted to food and grocery delivery. Car sharing companies like BMW-Daimler's Share Now and Avis' Zipcar scaled down their services by abandoning entire markets, focusing more so on particularly profitable cities over others. The challenges of 2019 forced many operators to rethink their business models to become leaner and more diversified, foregoing short-term profits in the name of long term gain.

But now, confronting a pandemic the likes of which no one could have anticipated, the mobility retrenchment of 2019 and early 2020 looks like nothing in comparison to the extinction-level event on the immediate horizon.

The COVID-19 pandemic has laid bare the fragile nature of the entire on-demand mobility industry, putting the past decade of mobility innovation in harm's way. In fact, the era of new mobility may be fading in the rear view mirror as many overleveraged companies struggle with decreasing ridership and cash flows, debt financing issues, and an overall lack of new investment.

During the peak of the COVID-19



pandemic, ride hailing companies like Uber⁽⁷⁾, Lyft⁽⁸⁾, and Yandex.Taxi⁽⁹⁾ all reported monthly ride volume declines of up to 70, 80 or even 90% in some of the major cities in which they operate. Car sharing companies like Volkswagen's WeShare have delayed global expansion efforts⁽¹⁰⁾. Two wheeled mobility companies like Lime have even seen their valuations plummet nearly 80% from year-ago levels⁽¹¹⁾. This has forced companies to pare down operations, abandon certain markets, or diversify their revenue streams even more.

Uber, one of the global barometers used to gauge the health of the entire mobility market, announced just last week⁽¹²⁾ that it expected to generate only 50% of its revenue from ride hailing moving forward, perhaps an ominous sign for the long term health and vitality of the ride hailing sector, one of mobility's largest stalwarts. Consumers ought to prepare their goodbyes to the cheap rides they have grown so accustomed to over the past decade, as fewer drivers on the road may lead to longer waits and higher prices down the line.

But although the outlook is stormy in the near term for mobility service providers of all stripes, silver linings can still be found.

Ongoing or upcoming economic

downturns are leading consumers to reconsider how they travel, and more fundamentally, how they spend money. Strategy Analytics' research has found that many consumers are cancelling or postponing several types of major purchases, including cars⁽¹³⁾.

Additionally: Once travellers are in the mobility service ecosystem, they tend to be mostly (though not always) satisfied with the services they use. Strategy Analytics research has found that some services have a large percentage of promoters⁽¹⁴⁾.

But on the other hand: The personally owned vehicle has the upper hand over shared transport from a "perceived-risk" perspective, and this will remain the case for the foreseeable future. Consumers now perceive the personally owned vehicle as not only more convenient for most journey types, but now as cleaner and safer. At least 40% of consumers in key Western markets intend to use car rental, ride-hailing, public transit, or car clubs less often in the wake of the pandemic. And over one-third of consumers plan to use their owned car more often⁽¹⁵⁾.

COVID-19 and the associated lockdowns have limited human movement, and as such have negatively impacted privately owned car usage in certain markets. But it has struck an even more significant blow to mobility service providers and transit operators. Public transit, car rental, ride-hailing, and especially car clubs, all face significant uphill battles for ridership after the pandemic⁽¹⁶⁾.

Given these sentiments, it is becoming clear that as huge as COVID-19's effects have been on car-buying, the new perceived risks of shared spaces will prevent mobility services from immediately capitalizing. And if a mobility service provider does not have a visible plan in place to meet the end user on their terms, the human impact COVID-19 is having on demand can lead to a service's demise.

So, given this new "ground truth" for mobility services, and the decreasing funds available for MaaS startups to flood markets with supply, providers must think more tactically. Part of this requires renewed focus on the consumer, with

thought toward what a traveler needs to feel safe.

Many mobility providers have trumpeted “renewed cleaning procedures” as a way of enticing travelers back to using shared transport. But in practice, these public relations efforts can only go so far. Providers must consider a number of factors from traveler-outward.

First, providers must consider which travelers they are targeting in the first place.

Next, providers must consider why their chosen segment travels from place to place. For example: With white-collar offices largely closed in several Western markets, commutes will not be a normal travel-related use case within some consumer segments for some time.

Finally: For a given user group, providers must consider what a “safe” transport mode looks and feels like in a post-COVID era. For example: Recent Strategy Analytics research ⁽¹⁷⁾ in the UK and US has found that though those surveyed viewed driver/passenger partitions as strongly desirable for ride-hailing, respondents saw them as less necessary in privately owned cars for personal use, which is likely to only be occupied by trusted members of a family or common household. Respondents also showed interest in advanced air

filtration and movable seating. But requiring a mask for all users of a service has more mixed support.

The ongoing pandemic has radically altered the present and future of many different fields. It could be argued that, other than medicine, the vertical that has been most profoundly affected is transportation. The pandemic has forced citizens and governments worldwide to re-think why people move from place to place. And more importantly, it has forced many to reconsider how people move from place to place, in a mode and manner that is clean, fast, and most importantly safe.

As massive of an effect COVID-19 is having on consumer behavior in all verticals and all levels (from purchase choice, to product/service choice, on down to HMI interactions), some things remain constant. Even through the pandemic, we still see echoes from previous Strategy Analytics research on transport choice and purchase decision-making.

- Final landed cost to the consumer will remain the most important factor for cars and mobility services, even more during the ongoing and potentially worsening economic downturn.
- Products and services, especially remote experiences and travel-

related services, must be usable and useful for the context.

- Consumers must feel safe and comfortable using the product or service. Safety and comfort is associated with clean air and surfaces. And additional measures such as health screening and driver/passenger partitions should be considered best practices.

Stakeholders in all verticals, but especially shared mobility, should explore what the concepts of “clean,” “sanitized,” and “safe” mean to their target segments. And more importantly, how they communicate those concepts to hesitant end users, in meaningful ways beyond platitude-filled press releases.

References:

<https://www.strategyanalytics.com>

⁽¹⁾Automotive Connected Mobility - Global Ride Hailing Market Overview & Forecast Report H1 2020

⁽²⁾North American Mobility Services: The Regulatory Environment

⁽³⁾Connected Mobility in Europe: A Closer Look at the Regulatory Environment

⁽⁴⁾Automotive Connected Mobility - Global Car Sharing Market Overview & Forecast Report - H2 2019

⁽⁵⁾The U.S. B2C Car Sharing Market - Can Operators Actually Thrive?

⁽⁶⁾The Persistent Link Between Mobility Services and Car Buying

⁽¹³⁾Car Drivers Worldwide Have Mixed Feelings on Timelines for COVID-19 Recovery

⁽¹⁴⁾MaaS Usage, Satisfaction, and Why One Does Not Lead to the Other


^{(15),(16),(17)}Cars in the Time of COVID-19: Consumers Weigh In

⁽⁷⁾Uber Q1 2020, Event on 24

⁽⁸⁾Lyft First Quarter 2020, Lyft

⁽¹⁰⁾Carsharing: WeShare postpones expansion, Teller Report

⁽¹¹⁾Uber in Talks to Lead \$170 Million Lime Investment at Lower Valuation, The Information

⁽¹²⁾Uber CEO Dara Khosrowshahi says ride-hailing will make up only 50% of the company’s business moving forward as food delivery growth surges, Business Insider 

AUTHORS



BEN LUNDIN

Industry Analyst, Strategy Analytics

Ben Lundin, Industry Analyst in the Automotive Connected Mobility service (ACM), covers market drivers, industry activity and platform deployment for mobility service providers. Before joining Strategy Analytics, Ben was a member of the research practice at public relations firm Global Strategy Group and was a business development coordinator at the Carnegie Endowment for International Peace, both in Washington D.C.



DEREK VIITA

Senior Analyst, Strategy Analytics

As Senior Analyst for the In-Vehicle UX service, Derek Viita provides consumer-focused insights on every detail of car and mobility-related experiences. Areas of expertise include mobile and integrated HMI, automated driving systems, driver distraction, and transport choice factors. Derek has over a decade of experience advising companies and government agencies on end-user problems and solutions in the automotive and wireless spaces.

REDEFINE FLEET PERFORMANCE

Monitor, Benchmark and Conduct Predictive Maintenance



Active Fault Code
(DTC) Monitoring



Enhance Overall
Profitability



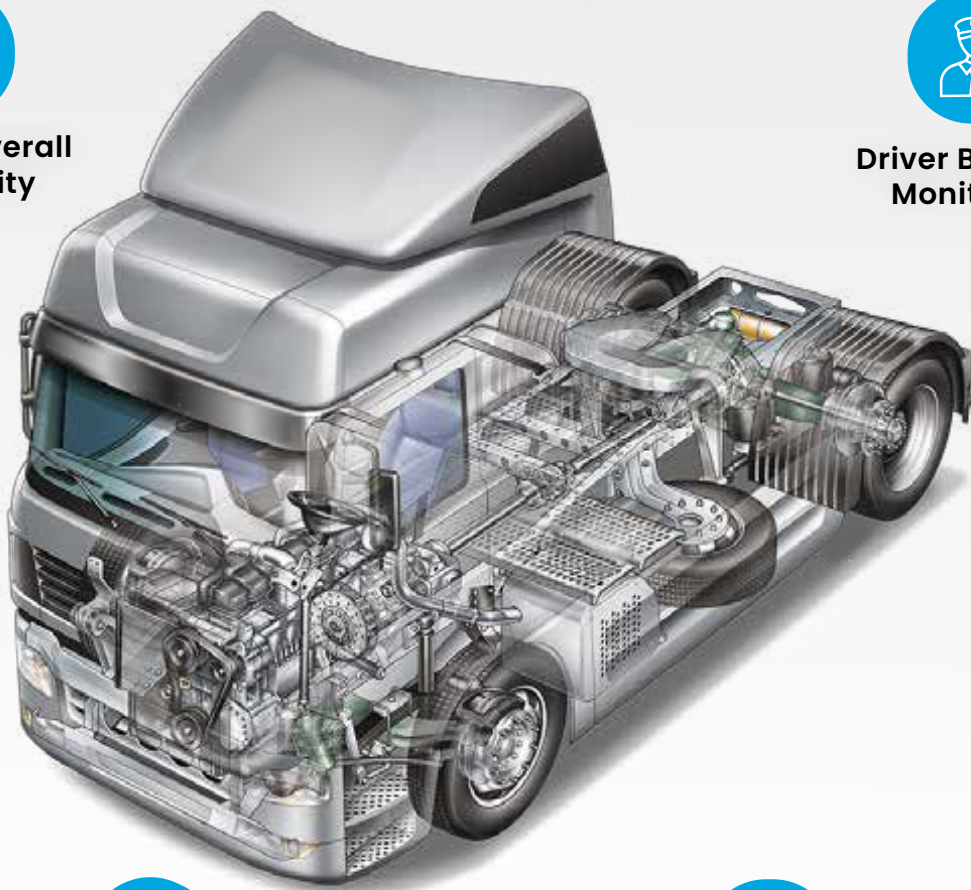
Driver Behavior
Monitoring



Increased
Asset Life



Reduced
Operational
Losses



Realtime Fuel
Theft Monitoring



Predictive
Maintenance



INTANGLES
A DIGITAL TWIN COMPANY

To know more, contact us on

8088 865 865

intouch@intangles.ai | www.intangles.ai



INTELLIGENT TECH PLATFORMS FOR SMART CITY AND SMART CITIZENSHIP

 **DOMENICO MANGIACAPRA, CLAUDIA DAMARI**
HENSHIN GROUP LTD

The global trend of urbanization

As the World Population Prospects 2019 elaborated by United Nations clearly shows, projections illustrate that urbanization, combined with the overall growth of the world's population, could add another 2.5 billion people to urban areas by 2050, with close to 90% of this increase taking place in Asia and Africa.

There is a sequence of numbers that may help us better understand the extent of the epochal change that we are experiencing: 2, 50, 75 and 80.

Nowadays, cities cover approximately 2% of the Earth's surface, host 50% of the global population, represent 75% of the energy consumed and 80% of the carbon dioxide emitted. It follows that if we want to achieve the climate targets on the scale of the whole planet, we have to change our cities.

So cities are evolving faster than ever. The effects of these structural transformations are evident: denser populations, increased traffic congestion, related air and noise pollution, progressive reduction of urban spaces, higher levels of stress perceived in people's lives.

The demographic size of the city is obviously a crucial factor. As we learn from the history of

the evolution of city, it is the quantity that has contributed to develop the idea of quality and functions specialization: inventions and facilities were created precisely out of the need to provide for the survival of a considerable number of more and more people.

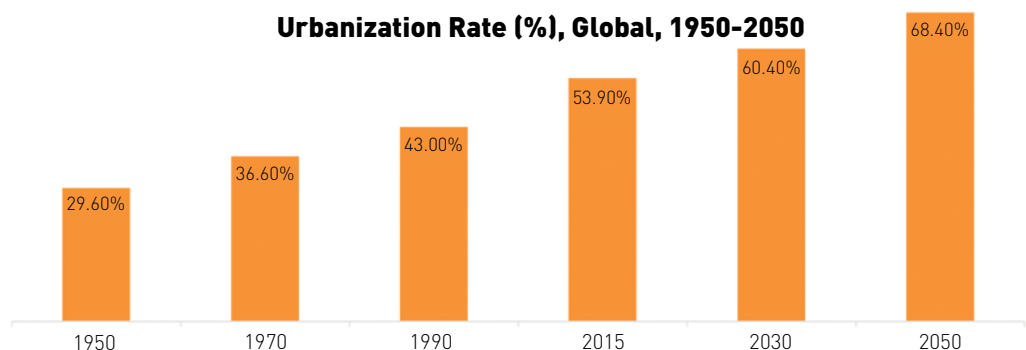
This happened with the great amount of systems composing the network infrastructure which are well known to everyone: from construction of the Roman aqueducts, roads sidewalks and bridges (i.e. the mobility infrastructures), means of transport, sewers, electricity, water, heat, communication system, parks, buildings, restaurants, shops, museums, up to contemporary factories. The functionality of an ecosystem is highly dependent on the connection and integration of all these multiple systems.

In this regard, the idea of a city at the service of the citizen able to offer him ever greater facilities for carrying out his daily life has always been a Leitmotiv in the history of the evolution of the city. To some way, the evolution of cities has always been a history of smart cities, namely, cities intelligent because able to satisfy citizens' needs.



Smart city is based on the interdependence between three fundamental dimensions- the social actor, the physical space, and the network infrastructure

Urbanization Rate (%), Global, 1950-2050



Source: United Nations Department of Economic and Social Affairs

The smart city, then, as the urban environment that aims to ensure the wellbeing of its citizens, guaranteeing safety, continuity, accessibility, practicality, and economy. It is an intelligent city but also reliable and welcoming.

The philosophy of the Smart City: a “dance of interacting parts”

Smart city future takes on a broader meaning: smart is generally understood as synonymous with technologically advanced, that is, it concerns the use all digital technologies, especially the Internet of Things, big data, and

Information and communication technologies (ICT) to improve urban life.

The smart city therefore is based on the interdependence between three fundamental dimensions: the social actor, the physical space, and the network infrastructure.

From this point of view, the introduction and pervasiveness of the new digital technologies is such as to generate a highly complex urban ecosystem that requires collaboration between different disciplines starting from those focused on space (architecture, urban planning), on technology (engineering informatics and electronics), and on social relations (human sciences in general).

What characterizes the current smart city philosophy from that of the past is the time factor.

Advanced digital technologies, using communication flows and a distributed and shared IT infrastructure, can in fact help us to quickly find answers to our manifest needs (requests) – and latent ones through pragmatic solutions, or the services provision. The process time, i.e. the processing time of a certain input in a precise output, is decreasing more and more until it reaches almost simultaneity.

This is made possible because every modern system is composed of many sensors to observe the environment (collecting data) and actuators to influence this environment. For the first time in history, according to the IoT (Internet of Things) paradigm, homes, buildings, applications, all kind of vehicles, smart phones and any other technological devices are starting to dialogue with us thanks to the complex sensors and connectivity apparatus, allowing moreover remote monitoring and control.

The billions of big data collected can now be processed in real time, analyzed, and then transformed into useful information that may influence the way citizens, local governments and third parties make decisions.

What are the benefits of being smart?

The advantages of a smart city – which clearly include different aspects of the urban environment (i.e. social, environmental, economic, and cultural dimension) – are developed through enabling technologies are the improvement of the wellbeing of people and communities and therefore the increase in their “livability” rate. It is clear that the effectiveness of a smart city can be measured in terms of how well connected these three different dimensions are.

Juniper Research, starting from the definition of smart city as “an urban ecosystem the places emphasis on the use of digital technology, shared knowledge and cohesive processes to underpin citizen benefits in vector such as mobility, public safety, health and productivity” has conducted an interesting study across the globe and elaborated four key indices with the goal of evaluating how they might deliver positive citizen outcomes in terms of time and quality of life. These four indices are the following: mobility, healthcare, public safety and productivity.

From our point of view, there two challenge questions underlying these findings that we are going to argue in this article are the following:

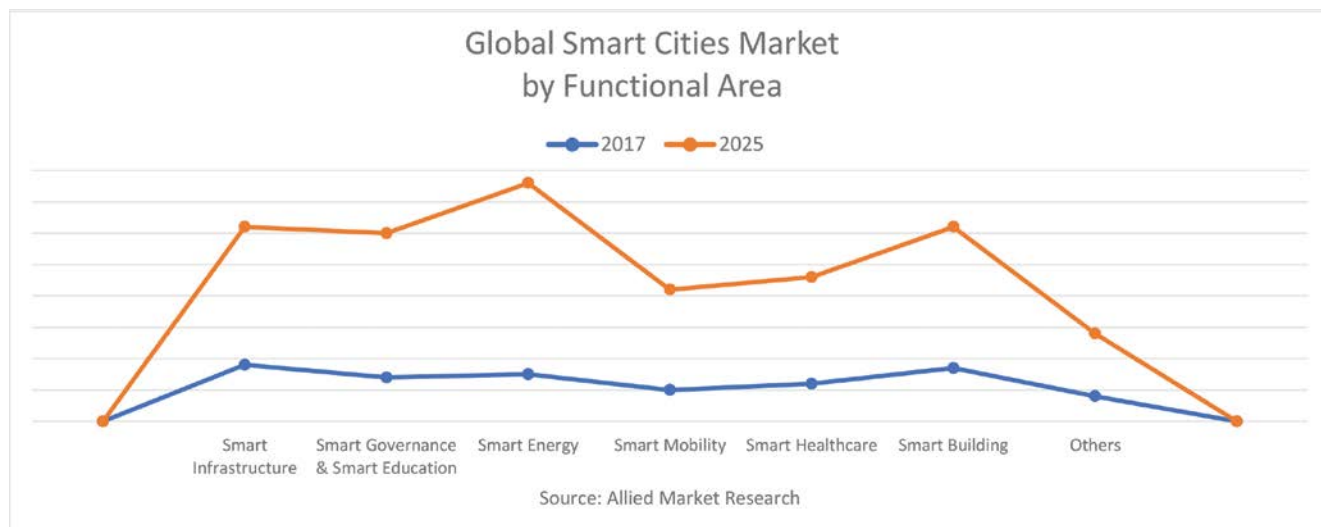
How can the smart city be at the service of the citizen and therefore contribute to individual and collective wellbeing? How to ensure smart cities may benefit to major part of population?

To improve the quality of life of smart cities inhabitants, to make our urban spaces more sustainable, healthier, safer and pleasant places to live in and to it is necessary to adopt a holistic approach able to focus on interconnections (i.e. the hubs) amongst the single systems involved in the smart city – as mentioned above – and emphasize the idea that all actions have an effect, and these effects are exponentiated by the network infrastructure.

Embracing a holistic paradigm should lead us to conceive the urban environment as a “meta platform”, in which citizens, municipalities and companies may act and interact with each other through smart platforms.

As the graph below illustrates, smart cities will contribute to the development of new marketplaces for most part of services.

As supported by above data, smart city platforms dealing with any single segment are called to play a crucial role. For instance, smart energy is expected to be one of the most lucrative segments: electric cars are becoming the mobile storage component of the energy system



infrastructure, balancing, in case of a large fleet, the gap between demand and offer of energy.

The profound structural changes that are impacting the mobility scenario

Nowadays, mobility is the most intensive technology in the ecosystem of a smart city.

Mobility is a fundamental human right and a clear indicator of social development, not only of individuals but of society. Modern society greatly depends on mobility which is an essential factor for both society and human development.

Mobility has today become a key factor in the sustainable and economic development of urban areas: more than 60% of all travel is made within urban environments, whereas the total sum of urban kilometers is expected to triple by the end of the year 2050.

Transportation technology and social trends – autonomous driving, connectivity, the electrification of vehicles and on-demand mobility services (o shared mobility), as defined by the acronym ACES – are changing the way people and goods move from point to another one, then creating a new business ecosystem.

These disruptive forces are affecting our everyday lives by offering several travel options, greener, cheaper, safer, and more focused on user needs.

Automation technologies are playing wider and more crucial roles in the lives of a large part of the world's population. Industrial systems and processes are also becoming increasingly automated as well as soon automobiles will be driven and controlled in the main by remote. Thanks to Internet connection and the opportunities offered by cloud-based data and

smartphones, our everyday activities are also becoming more automated in industrialized countries, constantly supported by computer assistants finding information, scheduling meetings, booking services, and resolving conflicts, etc.

Mobility Platforms Dynamics

The stream is now towards the convergence of few high-tech mobility platforms to operate transversally and universally.

The graph below better shows how the mobility market is evolving. From the bottom there is an increasing offer of market services and from the top an increasing demand of appropriate and selected data. All the flow of services and data will pass through new mobility platforms.

We think that the starting point of the smart city future is the Smart Transport or Smart Mobility and all the services around it.

As the image below explains, the old approach was based on single petal captive solutions not interconnected with each other.

In our view to respond effectively to the emerging challenges and opportunities arising from the philosophy of the smart city and the holistic paradigm there is need to develop a new disruptive approach based on an integrated multi petal formula, stressing on the complex interconnections (i.e. the hubs) and on fully integration with the several entities that gravitate around the mobility horizon. Based on this new approach it is possible to integrate different stakeholders, including the human and non-human. In this regard, it is interesting to note that this new approach applied to smart mobility platforms allows to include both physical users, local communities and virtual users and



TS 101 BASIC

@ ₹ 1300/-



Different variant
available with
CAN & for EV



www.itriangle.in

**LARGEST INDIAN
MANUFACTURER
OF VEHICLE
TELEMATICS
DEVICES**



BHARAT 101

with **IRNSS**



INDIA'S
FIRST
AIS140
CERTIFIED
DEVICE

EMPANELLED WITH:

MOTOR VEHICLE DEPARTMENT - KERALA, DEPARTMENT OF MINES & GEOLOGY - ODISHA, DEPARTMENT OF MINES & GEOLOGY - ANDHRA PRADESH, DEPARTMENT OF TRANSPORT A & N - ISLANDS, DEPARTMENT OF TRANSPORT - CHHATTISGARH, DEPARTMENT OF TRANSPORT - HIMACHAL PRADESH, DEPARTMENT OF MINES & GEOLOGY - JHARKHAND, DEPARTMENT OF TRANSPORT MAHARASHTRA, DEPARTMENT OF TRANSPORT - DELHI, DEPARTMENT OF TRANSPORT - UTTARAKHAND

HIGHLIGHTED FEATURES

- ◉ DRIVING BEHAVIOR
- ◉ EMBEDDED SIM PROVISION
(ALONG WITH STANDARD MICRO-SIM SLOT)
- ◉ GPS AND GLONASS 1 GALILIO
(FOR SUPERIOR LOCATION)
- ◉ IP65 ENCLOSURE
(ROBUST DEVICE FOR DUST & WATER RESISTANCE)
- ◉ FREE LIFE TIME DEVICE
MAINTENANCE SERVER ACCESS
- ◉ FOTA / COTA
- ◉ MULTIPLE IGNITION SOURCES
- ◉ 600 MAH INTERNAL BATTERY
- ◉ IP67 RATING
(ROBUST DEVICE FOR DUST & WATER RESISTANCE)
- ◉ ALL PARAMETER CONFIGURATION
THROUGH OTA, SMS & USB
- ◉ MAIN BATTERY REMOVAL ALERT
- ◉ 1 RS232, 1 USB PORT
- ◉ MOTION SENSOR,
ACCELEROMETER, GYROSCOPE
- ◉ 850MAH INTERNAL BATTERY
- ◉ 2 ANALOG INPUTS,
4 DIGITAL INPUTS & 2 DIGITAL OUTPUTS
- ◉ DATA STORAGE WITH STORAGE
CAPACITY OF 41000 RECORDS)
- ◉ REMOTE HEALTH CHECKING /
DIAGNOSTICS THROUGH SMS
- ◉ LOW POWER CONSUMPTION
& POWER OPTIMIZATION



**GENUINELY !!
MADE IN INDIA**

**VEHICLE TELEMATICS
....REFINED & REDEFINED**

Note: We pursue a policy of continuous research & product development. Specifications and features are subjected to change without Prior notice.

CONTACT: SAISHA SHASHANK SACHIN
PHONE: +91-8884414611 / +91-9739974445 / +91-9513992362
EMAIL: SALES@ITRIANGLE.IN

Corporate Office: iTriangle Infotech Pvt. Ltd. 803/A (803/A-1-3), 76th 'A' Cross, West of Chord Road, 6th Block Rajaji Nagar, Bengaluru, 560010,

communities (i.e. online), and therefore to provide for the resolution of specific problems for individual users and the design of complex systems for a specific group of users.

As result of this global development trend, mobility platforms will be the hub of the IoT and of the service providers in the Smart City. To become its hub, we believe that mobility platforms must be open source: only in this way shared and free knowledge will be the boost of sustainable growth to a better and more equal society. The competitiveness of the open source platforms enables these to promptly intercept the ever growing, fast and dynamic needs that develop throughout the urban space or in some limited parts of it in order to make the platform

MOBILITY IS A FUNDAMENTAL HUMAN RIGHT AND A CLEAR INDICATOR OF SOCIAL DEVELOPMENT, NOT ONLY OF INDIVIDUALS BUT OF SOCIETY

increasingly differentiated and organically interconnected with respect to general and particular needs.

We are in the condition of pointing out a relevant assumption: it is not only citizens who shape technology (i.e. mobility platforms), but technology can shape citizens and the multiple interactions that happen in their network. It is evident that the relationship between the human and non-human entities composing a complex ecosystem is always dynamic, not only linear but dialectical one.

The Innovation Recipe

When it comes to innovation, we realize that there are critical ingredients that are needed.

The first ingredient for IT companies around the world that aim to innovate is to develop mobility platforms designed to be flexible, easily integrable and highly scalable.

In this regard, integration shall cover mobility systems, energy infrastructure systems and residential and business buildings.

Within the scenario of the current mobility platforms available on the market, what clearly emerges is a second essential ingredient: the

need to take a step towards greater and systemic integration of all person-centered services. Though most IT players seem to agree on this awareness, most of the cutting-edge platforms are still today car-centric rather than user-centric. City inhabitants are requiring more and more access to multi-mode transportation (car, bike, scooter, train, plane) while only paying by minute and/or a flat rate for the whole package. This emerging and growing need of an urban mobility seamless and smooth imply the growing necessity to cooperate more closely with other mobility providers and all other vendors providing person-centered services.

The realization of the full integration of the wide set of systems involved in the smart city – such as Mobility, Healthcare, Domotics, Safety, Education, Leisure Time, etc. – is therefore an obligatory step to more sustainable quality of life.

In this theoretical framework, it appears evident the third basic ingredient: car as the hub of the rational organization of daily activities and services delivery.

We believe that only those platforms built on holistic approach may transform the car in the hub of all person-centered services.

The development of Smart Citizenship

New emerging technologies and consumer trends are affecting all industries and economy sectors. Automation technologies are playing wider and more crucial roles in the lives of a large part of the world's population. Industrial systems and processes as well as our everyday life will be becoming increasingly automated. The effects of this epochal change will be most evident when self-driving cars will start running our streets.

There is crucial point, however, that is often overlooked.

Smart homes, smart buildings, smart grid, smart mobility, smart security, industrial automation are not enough alone to improve quality of life in cities. Technology does not have to be self-referential. Unlike, we believe that “smartness” does not have to be only related to the use of technology. In our view, “being smart” must refer to citizens' participation and engagement and how their attitudes concerning the urban environment may change.

For this reason, to make our cities more sustainable and ethical-oriented, it is necessary to promote a culture fully oriented towards smart citizenship in which the citizen is able to understand the usefulness of the large amount of

information collected by means of the smartphone. Understanding and sharing this kind information may therefore generate benefits and advantages in carrying out its daily activities.

Citizens can be truly smart only if the so-called user-generated content can be processed, analyzed, shared and made available to the community and to the single user in the form of additional information available at hand which will expand the basic knowledge background and, therefore, may change the way we make decisions.

Citizenship empowerment is a dynamic process whereby citizens get increasingly be engaged with the services offered by the urban environment. This process between the city, including the service suppliers, and its citizens is dialectical process because it is based both on constant updates of the data collected and shared and on users' action. These two dimensions exchange feedback almost in real time, changing one another.

Intelligent tech platforms entirely user-centric and focused on individual and community wellbeing become the basic infrastructure for the making our cities and their citizens authentically smart.

These mobility platforms shall enable private companies (supplying services to the person) to provide municipalities with innovative solutions for better governance able to satisfy citizens' needs and requests, always growing and dynamic.

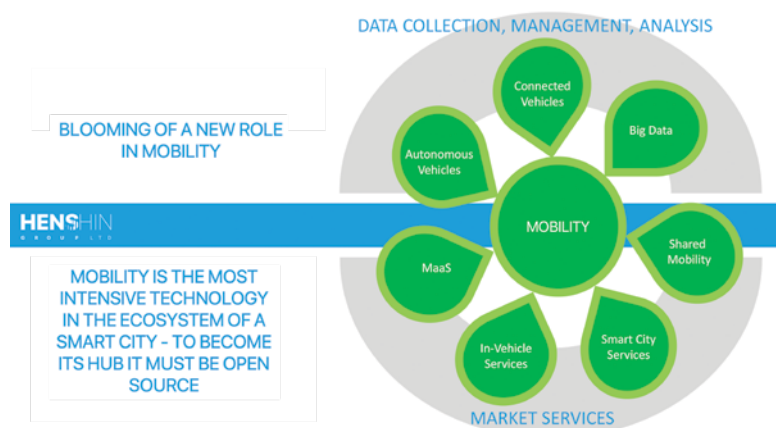
Two essential requirements of mobility platforms: open source and grounded on reliability standards

AS stated before, we believe that mobility platforms must be open source. Only in this way shared and free knowledge will be the boost of sustainable growth to a better and more ethical society.

In recent years open source software (OSS) has received great attention amongst software users. Despite the phenomenal success of open source software, the reliability and security of OSS is often questioned as these are thought to be exposed to more potential threats than proprietary software.

Because most automotive manufacturers agree that a lack of scale and common standards make it harder for the benefits of blockchain to be realized, in 2017 they decided to found MOBI.

MOBI (Mobility Open Blockchain Initiative) is a member-led auto industry consortium of car manufacturers, mobility, energy and infrastructure



providers (among the founding members we can see BMW, Renault, GM, and Ford) working “to make transportation greener, more efficient, and more affordable, using blockchain and related technologies”.

MOBI's mission is to promote high industry standards for smart mobility blockchain adoption and share industry best practices through research, education, innovation platforms, colloquiums, and working groups around the world.

The first project has been the creation of a Vehicle Identity Standard (VID) – essentially a blockchain-based passport for each vehicle that consist of a digital ledger of its history. Unlike paper vehicle ID documents, a blockchain-based one cannot be lost, left incomplete or invented.

The benefits of creating this kind of international standards will clearly fall not only on automotive industry in general, but also on consumers, communities, local administration, and companies. □

AUTHORS



DOMENICO MANGIACAPRA

President, Henshin Group Ltd



CLAUDIA DAMARI

External Relations, Henshin Group Ltd

Domenico Mangiacapra has been working for many years around new tech mobility platforms. Currently he is President and Strategic Development Manager of Henshin Group, a tech company dealing with the development of an Open Source Mobility Platform designed to be the Hub of IoT in the Smart City.

Claudia Damari has extensive teaching experience and commitment to academic life and research in Italy and U.S. She also worked on projects on human mobility in the field of social research and scientific cooperation at both the theoretical and empirical level in Italy and Israel. Currently, she is External Relations at Henshin Group.

YULU CONNECTS THE DOTS IN PUBLIC MOBILITY

With an aim to address the rising air pollution and traffic congestion in India, Yulu was founded in 2017 by serial entrepreneur Amit Gupta, who had earlier co-founded India's first profitable unicorn InMobi. Yulu provides an eco-friendly UMaaS - Urban Mobility as a Service which is an affordable, sharable and scalable solution commute option for the first mile, last mile, and short distance commute. Below are the excerpts of talk which Telematics Wire had with Amit Gupta recently-

Can you give a brief update about Yulu.

With more than 16,000 eco-friendly vehicles and 2 million users, Yulu runs India's largest EV led micro-mobility platform. Yulu's mission is to create sustainable cities of tomorrow by revolutionizing the way people commute through its specially designed human and battery-powered vehicles and technologies like IoT, ML & AI. Yulu runs its operations currently in 6 major Indian cities - Bangalore, New Delhi, Mumbai, Ahmedabad, Pune and Bhubaneswar. As pioneers in this space, Yulu has influenced several policies for micro-mobility in India by working closely with policy-makers at the city as well as at the national levels.

What has been the driver in growth of Yulu's shared micro-mobility in India?

"Yulu Miracle" is a unique battery operated, lightweight, easy to ride, 2 wheeler that has no legal requirement for the helmet, registration plate or driving license. It has enabled individuals to switch to a more efficient commute option at pocket-friendly prices and zero carbon footprint.

Yulu has developed a vertical stack needed to run its EV fleet. From design and ownership of the assets to charging the batteries to on-ground operations, Yulu has little dependence on external factors.

- Yulu has solved the chicken & egg problem faced by the Electric Vehicle ecosystem in India, where the lack of charging infrastructure influences the advent of EVs, and vice versa. Yulu has created a unique battery-swapping

network by placing its proprietary IoT enabled charging box (Yulu Max) at hundreds of mom-n-pop stores across its operational areas.

- Unlike China, Indian cities don't have the infrastructure for parking of shared mobility vehicles. Yulu has solved this problem by working with Cities, Corporates and Citizens who have given access to prime real estate to create Yulu Zones. Most of these spots have been given to Yulu in kind to help build sustainable mobility for the cities in a collaborative manner
- Frugal Capex of the Miracle, combined with its cluster-based setup and efficient & tech-enabled operations, has led to profitable unit economics. Yulu has the best contribution margin rate in the industry, even when compared to micro-mobility peers globally. In a steady-state, this profitability will further improve with economies of scale.

**MOST CONSUMERS
INHERENTLY
CONSIDER
PLATFORMS SUCH AS
YULU TO BE A SAFE
COMMUTE OPTION IN
THE CITY**

How do you ensure safety of your Move/Miracle, both at Yulu zone and also when someone is using it to ride to destination?

Yulu vehicles have a theft rate of less than 1% which is significantly lower than global ride-sharing platforms. This is attributable to Yulu's operational model of drop off at designated Yulu Zones and as the Yulu vehicles are designed specifically for shared mobility it has no "standard" parts, which could be used in other bikes in the market, there is no economic value for someone stealing them. We also have human network of local-informers and "well-wishers" who update us in case of any potential abuse or theft incident. Additionally, Yulu has deployed a team of "bike-marshals" who ensure strong consequence-management actions when they catch someone doing wrong with its fleet. We have a penalty system for users who abuse the vehicles or for non compliance with our riding policy while riding.

Yulu Miracle has been built keeping in mind the convenience of users on Indian roads, ease of maintenance for the on-ground Ops team and durability to be used in a shared mobility model. The minimal use of plastic parts and regular proactive maintenance activities have ensured that the Miracles are in good working conditions at all times

How many Yulu Zones are there in metros and what are your plans to scale it up in coming years?

Yulu has developed a holistic ecosystem for ride-sharing, by collaborating with OEMs, multiple corporates, co-working spaces,

co-living spaces, government authorities, and metro authorities, to provide end to end mobility solutions to citizens across locations. Currently operating in 80 Pincodes with 2500 Yulu Zones, Yulu plans to expand to a fleet of 100K EVs across 5-7 major cities in India by Dec 2021.

In the long run, Yulu aims to be present in 100+ cities to become the most dominant micro-mobility player in India by using a combination of a company-owned - company- operated, as well as franchisee-owned.

Has the Covid19 pandemic affected the micro-mobility business?

It is worth noting that when the Indian government started advocating social distancing in late February, traffic on the roads reduced by almost 90%, while we saw only a 10% – 15% drop in daily Yulu rides. This indicates that most consumers inherently consider platforms such as Yulu to be a safe commute option in the city. We did our bit by regularly sanitizing Yulu vehicles across cities to ensure that every Yulu ride was safe.

During the nation wide lockdown, Yulu stepped up to support home delivery of essential goods. We partnered with several e-commerce and hyper-local delivery segments to ensure the supply of essential goods to the citizens who are stranded in their homes during the COVID-19 lockdown. Yulu enabled the delivery of everyday essentials for companies such as BigBasket, Licious, Dunzo, Medlife, Lalamove, AutoBrix, etc. We utilized our manpower and fleet of e- vehicles- Miracle, to fulfill the delivery of essential needs arising due to nationwide lockdown.

Post the lockdown we resumed our regular operations witnessing a huge surge in demand and to make the life of daily commuters easier during this time of the lockdown, we have introduced the Long Term Rental plan also.

What has been the response to the safe and sanitized commute solution for your users?

As we transcend towards the new normal, there is a surge in the demand of solo and sanitized mobility solutions. Yulu is uniquely positioned for micro-mobility. As we operate with single-passenger vehicles with natural social distance and minimal



human interaction while commuting. We are witnessing a V shape recovery with 1.6X growth in the percentage of new users and a 50% increase in the distance, as well as usage time.

One of the biggest advantages that Yulu Miracle has over other rental bikes is its small form factor and citizens' safety is Yulu's topmost priority hence, we follow a Technology-Assisted Sanitization where our vehicles are sanitized several times in a day through a WHO-recommended sanitizer and the last sanitized timestamp is shown to our users on the app.

Can you share more about the IoT technology in Move/Miracle?

Yulu uses IoT, Machine learning and Artificial Intelligence to deliver a seamless experience via a user-friendly app. Using IoT as the backbone of operations, the vehicles can be rented seamlessly on a pay-per-use basis. Users can book a ride via the iOS or Android app and the smart bikes can be unlocked via QR codes. Yulu operates on a 'virtual docking' method, where Yulu vehicles can be picked up or returned by users from its network of preferred parking spots called Yulu Zones. □

THE IMPORTANCE OF FUNCTIONAL SAFETY

▲ JP SINGH

LATTICE SEMICONDUCTOR



Functional safety has always existed. However, with more human-machine interactions and the implementation of autonomous technology into machinery on our factory floors and cars, it has morphed into a specialized technical field and engineering discipline. Functional safety is about safe machinery and vehicle performance, without causing any risks to human life. When you examine old cars and factories with large open (and dangerous) lathe machines and compare them to the modern cars equipped with automatic brakes, radars and safety saws that will shut down in nanoseconds (if not picoseconds), it's clear that we have made tremendous progress. As machinery and cars continue to evolve, so does the complexity level of functional safety. The autonomous robots on the factory floor are expected to operate correctly, even under unintended use. Lack of safeguards can be expensive in terms of damage to machinery and even dangerous for human operators.

The exact definition according to the

specification for Industrial Functional Safety Standard (IEC 61508) is "... part of the overall safety relating to the EUC and the EUC control system which depends on the correct functioning of the E/E/PE safety-related systems, other technology safety-related systems and external risk reduction facilities ...". Equipment under control, or EUC, refers to the machine or a car in question and E/E/PE refers to electrical, electronic or programmable electronics which is essentially what a modern machine is. Functional safety is part of the overall safety of the system (machine or car) as well as individual components used in the system which are also expected to perform the function they were designed for.

What Systems Does Functional Safety Cover?

The idea of functional safety applies only to active systems. The front door lock on a house provides safety, however it is not actively avoiding any failures. A door is

an example of passive safety. Functional safety covers an active system that has safety mechanisms in place. These mechanisms are activities or technical solutions to detect, avoid and control these failures or mitigate their harmful effects. Many of these are also achieved by implementing a function, element or other redundant technologies; like built-in sensors in an autonomous robot in fulfillment centers that detects and avoids objects while moving large items. The safety mechanism is either able to switch or maintain the item in a safe state (like an assembly robot on standby and, if needed, shutdown, if it detects an object is blocking its path) or able to alert the driver to take control of the effect of the failure (like an autonomous car driving on an icy road). If at any time these machines fail to perform the intended function, there could be damages.

Safety Integrity Levels

The safety integrity level (SIL) is defined

as a relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction. In simple terms, SIL is a measurement of performance required for a safety instrumented function (SIF).

The systems covered under functional safety are designed to automatically prevent dangerous failures or to control them when they occur. It helps us to design a system that can execute specific functions correctly, even under non-intended use (or sometimes even misuse). Manufacturers are required to identify potential unintended behaviors of the system that could lead to a hazardous event, and perform risk assessments.

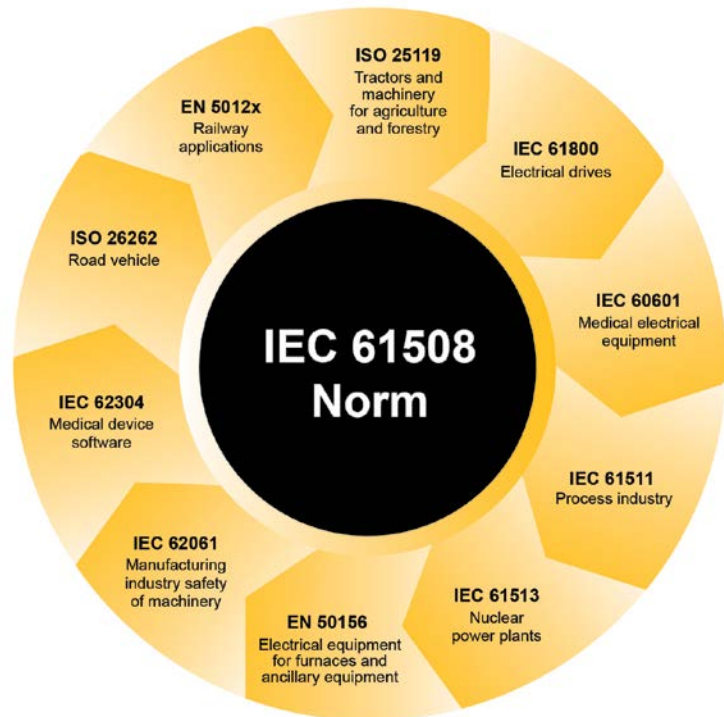
The risks associated with the systems are referred to as safety integrity levels (SIL) for industrial applications, or automotive safety integrity levels (ASIL) for automotive applications. These help assess the severity of the risk or hazard associated with the system. Each SIL and ASIL have a level; the higher the level, the lower the risk.

The table below shows the probability of failure on demand (PFD) and risk reduction factor (RRF) of low demand operation for different SILs (as covered in IEC 61508) and ASILs (as covered under ISO 26262).

The aim of functional safety is to bring risk down to a tolerable level and to reduce its negative impact.

Something that I hear often is the zero risk device; however, there is no such thing as zero risk. Risks can be reduced, but can never be completely eliminated. Each system manufacturer communicates a clear, comprehensive and defensible argument (supported by evidence) that the system is acceptably safe to operate in a particular context. This may include references to safety requirements and supporting evidence for an argument that describes how the safety requirements have been interpreted, allocated, decomposed, etc., and fulfilled as shown by the supporting evidence.

SIL	ASIL	PFD	RRF
1	A	0.1-0.01	10-100
2	B/C	0.001-0.0001	1000-10,000
3	D	0.001-0.0001	1000-10,000
4		0.0001-0.00001	10,000-100,000



IEC 61508 and ISO 26262 Standards

Functional safety standards such as IEC 61508, Industrial Functional Safety and ISO 26262, and Road Vehicles Functional Safety provide guidelines for the system manufacturers. The original IEC 61508 series is the international standard for safety related systems. ISO 26262 is an adaptation of this standard for road vehicles or automotive systems. These standards supports the assessment of risks to minimize failures in systems irrespective of where and how they are used.

IEC 61508 sets out requirements for ensuring that systems are designed, implemented, operated and maintained to provide the required safety integrity level (SIL). Each of these standards are divided into a number of sections, also known as the parts framework.

These standards consist of seven parts:

- IEC 61508-1, General requirements
- IEC 61508-2, Requirements for

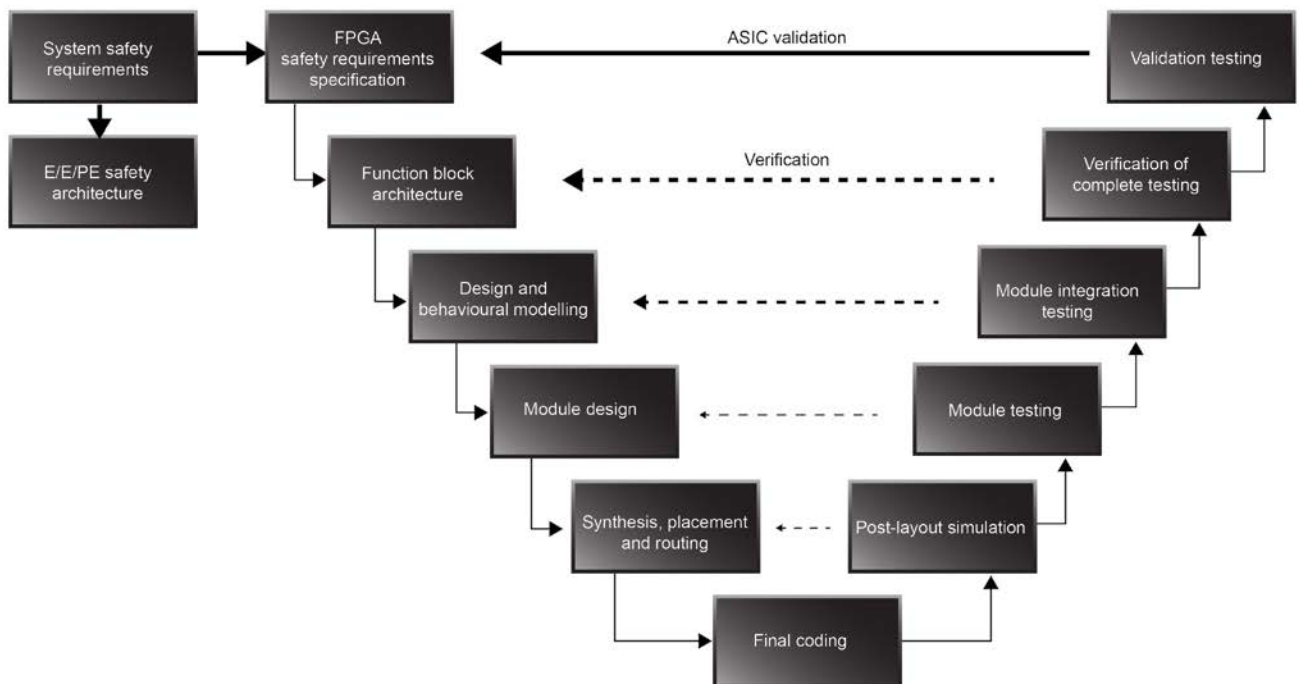
electrical/electronic/programmable electronic safety-related systems

- IEC 61508-3, Software requirements
- IEC 61508-4, Definitions and abbreviations
- IEC 61508-5, Examples of methods for the determination of safety integrity levels
- IEC 61508-6, Guidelines on the application of IEC 61508-2 and IEC 61508-3
- IEC 61508-7, Overview of techniques and measures

These frameworks provide guidance for system manufacturers to consider safety from the very beginning when the system requirements are being considered. The diagram below from Lattice's Diamond Functional Safety Manual shows how functional safety is adapted for an FPGA design during planning (requirements), designing (architecture, modelling, and FPGA development), testing, verification and validating stages. It covers the process flow for manufacturers who develop products using FPGAs for safety critical applications.

Systems Approach to Functional Safety

We talked about the electrical, electronic or programmable electronics (E/E/PE)



systems. These include everything – sensors, control logic, communication systems or network, actuators, including any critical actions of an autonomous system or a human operator. These safety-related systems that would have used electro-mechanical technology or solid-state electronics now use programmable electronics instead. Devices such as programmable controllers, programmable logic controllers (PLCs) and digital communication systems (e.g. bus systems) are part of this trend. Even ASSPs in this space are being replaced by combinations of FPGAs and processors. FPGAs, specifically, offer the flexibility to manage implemented system functions – testing, verifying and validating the functions including allowing designers to update functions or algorithms implemented in them.

Many of the enabling technologies,

such as processors and sensors, are increasingly being integrated into more reliable and secure systems. The lower costs and flexibility of programmable devices are enabling the implementation of intelligence capabilities into systems at the edge in a secure, safe and contained way.

The concept of functional safety applies to everyday life and every industry you can think of. In our cars, functional safety ensures that airbags instantly deploy only during impact and not while driving. Also, the fuel injector system control ensures that the car only accelerates when a command is given. Brake systems activate when required. In a modern vehicle, functional safety ensures the correct operation of all automotive electronics including control software. When you travel by train, functional safety is at work to

ensure that the doors close before the train starts moving and that they don't open while in motion. You may have heard that air travel is the safest mode of transportation – and that is due to the fact that the aviation industry is among the safest in the world. Think of an automated flight control system that controls the pitch, roll and yaw of the aircraft, including heading and altitude. In case of an emergency, the system alerts the pilots, who are trained to take over control.

Conclusion

During the last decade, functional safety has becoming increasingly important as it has essentially become a requirement for every manufacturer. With even more cohesive integration of software and hardware systems, we are already seeing an increasing dependence on these standards to cover such systems. With all the advancements, I feel that we are still in infancy when it comes to functional safety; think of the amount of safety systems in place in an autonomous cars and a companion robot. Functional safety is going to explode just like those science fiction stories we have grown up with.

So, next time when you get in an elevator or drive your car, stop and think how much effort was put into making this product safe for human interaction. □

AUTHOR



JP SINGH

Marketing Manager – Automotive, Lattice Semiconductor

JP Singh is Automotive Marketing Manager at Lattice Semiconductor where he manages global marketing and business development for the automotive segment. Mr. Singh has over 20 years of experience in the semiconductor industry. As an application engineer in his prior role, he brings 15 years of system-level design experience to bear on solving complex problems through the use of Lattice's award-winning, low power FPGAs. Mr. Singh received his MSEE from the University of Wisconsin-Milwaukee, Marketing Strategy Diploma from Cornell University, and Design Thinking Diploma from MIT.

High Performance Automotive Test Solutions

Test and Measurement Solutions for the Connected Car

Ensuring Connectivity...



- ⊕ **WIRELESS CONNECTIVITY**
5G, LTE, 2G, 3G, Bluetooth, Wi-Fi
- ⊕ **SAFETY AND DRIVER AIDS**
RADAR, GNSS, e Call, ERA-GLONASS, TPMS, RKE, NG-eCall
- ⊕ **IN-VEHICLE NETWORKS**
Antennas, Connectors, RF Cables, Ethernet, Optical Fibre
- ⊕ **INTELLIGENT TRANSPORT SYSTEMS**
V2X, DSRC, 802.11p
- ⊕ **ELECTROMAGNETIC INTERFERENCE**
OTA, EMC, EMI, Interference Hunting



Write to us : ACIN-sales@anritsu.com for demo and application discussion

CYBER SECURITY ECOSYSTEM IN THE WORLD OF IOT & SHARED MOBILITY

PART-2: DATA SECURITY\PRIVACY\LEGAL IMPACT

MIKE LEOW
IAPP, SINGAPORE

ASHUTOSH PRADHAN
TCS- INDIA

ANIKET KULKARNI
GRAB GROUP R&D, SINGAPORE

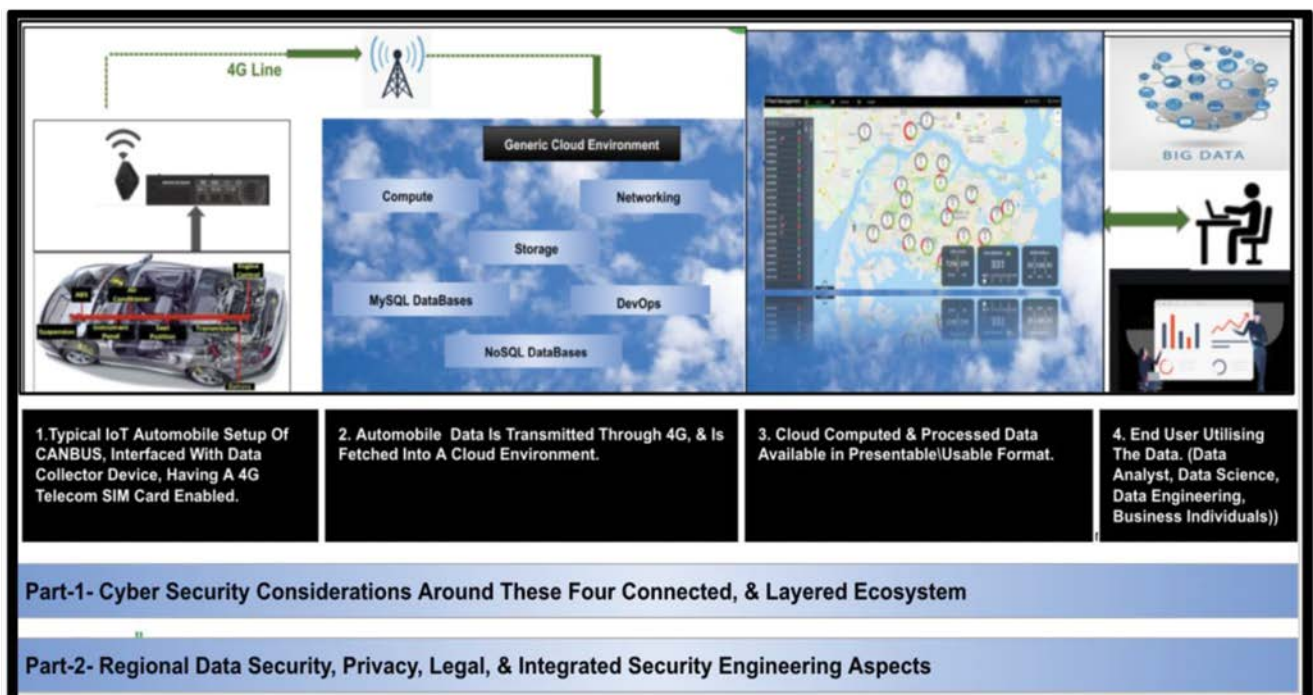
Glad to connect back with you folks after the first part of our article which you can find here: [http://www.telematicswire.net/magazine/2020/june/\(Page 37\38\)](http://www.telematicswire.net/magazine/2020/june/(Page%2037\38)). After gauging the fine traction of the CyberSecurity technical landscape let us get this as a part-2 article that will focus on such data breach regional aspects\considerations of the Data Security, Privacy, and legal across the globe. Let us deep dive with the below flow and understand it better from Mike Leow, & Ashutosh Pradhan.

As an automobile manufacturing organization, are we collecting customer's data with Consent? Or it is without Consent? Data protection/Privacy legal requirements begin with the collection of personal data from the user. One of the key rights, when an organization can do so, is by getting consent from the data subject. To obtain meaningful consent, the org must clearly define the purposes of the use of the personal data collected. Usually, it describes how the data subject's personal data will be used, transferred, and stored. So in part 1 of the article, the personal data of the vehicle user and relevant "transaction data" will be collected and the organization collecting it should provide details on how these data will be used. And whether the data will be transferred from one organization to another in order to perform the necessary activities. Eventually, the organization would need to store the data in some repositories, with sole ownership to protect it. In the absence of consent, the org then has to rely on a legal

basis to collect this information. These legal bases would vary from country to country too. Take for example a delivery truck that may have installed a tracking device to prevent theft or a public bus for safety reasons installed a tracking device. Thus, do consult your local counsel if you choose to use the personal data of your data subjects without consent.

If Data is breached, any Legal\Privacy oriented Impact on an organization Globally? This is an interesting fact to consider and have as much granular look as we can. So let us try to focus region-specific in this quick following snippet.

South East Asian (SEA) countries. The Data protection/Privacy regulations in South East Asia countries like Malaysia, the Philippines, and Singapore are comprehensive. This means, these countries have clear rules around the collection of consent in relation to the personal data, it will also include rules around the use, storage, protection, transfer limitation, and retention limitation just to name a few common obligations. Some even have mandatory breach notification within 72 hours which mirrored the EU GDPR. Thailand has its comprehensive data protection law enacted but will be enforced in May 2021. Indonesia and Vietnam have started drafting their respective data protection laws too. Countries like Brunei, Cambodia, East Timor, Laos, and Myanmar may not have known comprehensive Data Protection regulations, but they do have some sectoral laws that relate to personal data. Thus, it is important to get in touch with the



local legal adviser to get some advice around laws that will impact personal data. Some of these laws that may involve personal data are the Civil code, Post & Telecommunication Act, Banking law, and Electronic Data Act. Penalties in South East Asia include jail terms up to 6 years in addition to financial penalties, stop orders, and directions. So far the highest financial penalty issued by the regulator is about USD 700,000 in this region. However, the perpetrator of these cyber incidents was usually charged under the Computer Misuse Act or other similar Criminal Acts.

European Union (EU). Europe is strictly expected to adhere to the “General Data Protection Regulation (GDPR), which is a legal framework that sets guidelines for the collection and processing of personal information from individuals who live in, EU. Fines of up to 4% of annual global turnover. Previously fines were limited in size and impact. GDPR fines will apply to both controllers and processors. Increased territorial scope- GDPR will apply to all companies processing the personal data of data subjects residing in the EU, regardless of the company’s location. Non-EU “established” organizations that target or monitor EU Data Subjects -Where no EU presence exists, GDPR will still apply whenever: 1. An EU resident’s personal data is processed in connection with goods/services offered to him/her 2. The behavior of individuals within the EU is “monitored”.

The US at a federal and state level. There is no single overarching data privacy legislation in the U.S. The country follows a sectoral approach to data privacy, relying on a patchwork of sector-specific laws and state laws. In fact, the U.S. relies on a “combination of legislation, regulation and self-regulation” rather than government intervention alone. There are approximately 20 industry- or sector-specific federal laws, and more than 100 privacy laws at the state level (in fact, there are 25 privacy-related laws in California alone). Some states are more active than others. California, for example, has a long story of adopting privacy-forward legislation. The California Consumer Privacy Act (CCPA), gives residents of California four rights that give them more power over their personal data: right to notice, right to access, right to opt-in (or out), and right to equal services. Any organization that collects the personal data of California residents, not just businesses located in the state, must comply with CCPA. The law applies to every company processing the personal information of California residents. There also includes a fine: 1. In the case of a suit filed by consumers: \$100-750 per resident and incident in the case of data breaches or data theft if data was not properly protected. 2. In the case of a suit by the State Attorney General: \$2,500 per violation and up to \$7,500 per intentional violation of privacy.

Australia Privacy\Legal Considerations. Privacy Principles (APP) in Australia, is a collection of 13 principles guiding the handling of personal information. According to that, you must manage personal information transparently. This means, having a clear and up-to-

date Privacy Policy about how you manage personal information. According to Australian law, need is to detail why and how you collect personal information, the consequences for not providing personal information, how individuals can access and correct their own information, and how individuals can complain about a breach of the principles. The Information Privacy Act includes a set of Territory Privacy Principles (TPPs) that cover the collection, use, disclosure, storage, access to, and correction of, personal information. The TPPs are similar to the Australian Privacy Principles. Most states and territories in Australia (except Western Australia and South Australia) have their own data protection legislation applicable to state government agencies and private businesses that interact with state government agencies.

New Zealand Privacy\Legal Considerations. New Zealand’s new Privacy Bill is set to replace the outdated Privacy Act that was passed 25 years ago, the New Zealand Herald reports. The new bill will implement recommendations from the Law Commission issued in 2011, and also would give more power to privacy commissioners. Unfortunately, the Bill doesn’t address its application to overseas businesses that collect data on New Zealanders. This may be something that the Select Committee will consider to specify. Penalties for any person that commits any data security offenses will be liable for a fine of up to \$10,000.

India Personal Data Protection. India has no specific legislation on privacy and data protection. Instead, India’s data privacy legislation is made up of several different laws and acts. At this time, both the Information Technology Act (No. 21 of 2000) and the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules (Privacy Rules 2011) contain specific provisions to protect personal data and other data privacy requirements. India is currently in the midst of drafting one single, comprehensive piece of legislation for data privacy, titled the Indian Personal Data Protection Bill 2018. India’s new privacy law is one of the more controversial ones. Experts accuse the draft of many shortcomings and disputable clauses. The draft bill includes both civil and criminal penalties. It establishes two categories of strong civil penalties, 1. The first category permits penalties up to five crore rupees (app. \$730,000 USD) or two percent of the company’s gross revenue from the last financial year, whichever is higher. 2. The second category includes penalties up to fifteen crore rupees (approximately \$2.2M USD) or four percent of the company’s total gross revenue from the last financial year, whichever is higher.

Well, the topic is going to be a never-ending story. Also, the views and opinions expressed in this article belong solely to the author’s knowledge, and not to any of the employers. Hopefully, this was a great two parts end to end snippet covering the technological CyberSecurity landscape providing a tail end essence of Data security\legal\privacy regional angles. □

AUTHORS



MIKE LEOW

Asia Advisory Board at IAPP - International Association of Privacy Professionals, Ex-Grab, Ex-GovTech, Singapore



ASHUTOSH PRADHAN

Legal Counsel Expert, TCS- India



ANIKET KULKARNI

Head\Director of Engineering, Cyber Security Initiatives, Grab Group R&D, Singapore

ZERO TO SIXTY AT THE SPEED OF THOUGHT - AI IN CONNECTED VEHICLES

 **RICHARD FOSTER-FLETCHER**

NEURALPATH.IO

Zero to Sixty at the Speed of Thought

The SAE (Society of Automotive Engineers) identifies six levels of driving automation, from 0 to 5. A zero-level car has basic safety features - automatic emergency brakes, blind spot warnings and such. At this level, control is never taken away from the driver, and assistance is provided only at critical moments. A level 5 vehicle is one that can drive itself in all conditions, and never expects a “driver” to take over. There is, effectively, no human driver. The car may not even have pedals or a steering wheel.

Estimates put the Level 5 Automotive AI market at between 12 and 16 Billion USD by 2025.

Connected and Autonomous - Cars that Think

To understand the relationship between automotive and AI, we need to understand what it means for them to be Connected and Autonomous. A connected vehicle can communicate with other vehicles, road infrastructure, the cloud, or even with pedestrians through their electronic devices. It constantly collects and analyses data to gather information about the world around it and to make real-time autonomous decisions that pilot the car and avoid hazards.

Many vehicles are already connected in a variety of ways. For example, GPS systems collect traffic information via cellular networks, which are then streamed to the driver, a sudden impact can trigger an alert to the police and many cars have ‘black boxes’ installed by insurers to upload data about driving routes, distances driven and driving style.

Putting AI in the Driver’s Seat

Imagine having access to a car that will drop you off to work, then drive itself home or to serve someone else. It could pick up the kids from school without

you worrying about who is driving your children. Imagine never having to worry about where you parked because the car will drive itself to you. You could save a fortune in parking. It wouldn’t be a stretch to imagine living in central London and parking your car out of town overnight, so long as you didn’t mind waiting for your car to come back to you the next day.

There are other benefits too, and not all of them involve taking control away from the driver. For example, an AI-based car interior monitoring system developed by Bosch promises to identify fatigued or distracted drivers and warn them. Volkswagen has teamed up with Microsoft to explore the use of AI in predictive maintenance. In fact, a whole subset of vehicular AI is dedicated to human-machine interactions using gestures, eyeball tracking and in the like. Systems that identify the driver and automatically adjust seat position, mirror angle and music selection also fall within the realm of automotive AI.

However, there is no denying that it is the promise of self-driving, autonomously controlled cars that have the industry the most excited. The clear market leader is Tesla as they have by far the most real-world miles recorded using computer vision, stored in the cloud and processed in deep learning models. But others believe that they can still have a piece of the market and Mercedes Benz is working with Nvidia to create a whole new AI infrastructure for vehicles - one that will be constantly upgraded with updates and whose primary function is to automate driving on regular routes.

It’s Going to be a Bumpy Ride

For a car to drive itself, it must perform a staggeringly large number of calculations, but simply having the ability to calculate is not enough. It also needs to



There is no denying that it is the promise of self-driving, autonomously controlled cars that have the industry the most excited



have deep experience to draw from. Only when it can match the current data with past experiences can an AI become at or near human-level. The problem is, in order to do that, it needs time and the scope to make mistakes. Unfortunately, machines making mistakes is just not something we as a society are equipped to handle.

In December 2018, a self-driven vehicle from Uber fatally struck a 49-year old woman in an accident that was a perfect storm of mistakes and lack of attention. This one accident was enough to shelve Uber's entire self-driving program for nearly a year, with the company mulling over whether it should continue the program at all.

In a far less grim but equally relevant incident, a viral video showed a newly introduced AI-based feature on a Tesla mistake a Burger King sign for a stop sign. While some have argued that this is part of the learning process, and that once the system had the data it would not make the same mistake, it only reinforces the argument – what happens when machines mess up?

Machine Failure, or Human Error?

Of course, accidents happen every day on the road. Some due to driver neglect, some due to malfunctioning cars, and some due to sheer bad luck. However, the fact that an ostensibly “thinking” machine did this, because the vehicle cameras saw the victim but flagged her as a false positive - didn't do anything to

quell the public perception of AI being unpredictable.

AI will make mistakes. And ironically, those mistakes will mostly happen due to human error rather than anything to do with the “artificial” part of its intelligence. For example, in the case of the Uber accident, there was a driver who was supposed to take over, but they weren't paying attention at that moment. Accidents like these are horrible, and they lead to thorny questions of accountability which need to be answered. The fact remains that in most such cases it is a lack of human foresight and action that caused them. But there remains this nagging idea that a human mind behind the wheel will have a level of empathy that a machine simply will not.

A Closed System on an Open Road

One core problem we face when trying to create AI that can drive is that driving is essentially an open system. What this means is that there is an infinite number of permutations and combinations that can occur on the road. However, the number of situations you can train an AI for is limited. Yes, that limit is incredibly high, higher than the number of atoms in the universe, but it is still a finite number. The threat of probability presenting something the data hasn't prepared the software for is always just a bit higher.

The Signal's Yellow

One way to feed more data into the

system without putting actual cars on the road is to train the AI through simulations. That's exactly what Google is doing with Waymo. It recently announced that the AI has driven 10 billion miles in simulation. That's over four hundred thousand times around the earth. Unfortunately, a simulation is still not the real thing, and many experts feel that a simulation simply cannot replicate the fringe incidents that can happen on actual roads. After all, driving along the same stretch of simulation over and over again can rack up the miles, but it doesn't teach the AI much.

The problem is that much like the physical car needs fuel, AI needs data. What we don't yet understand exactly is how much data is needed, and what the right mix is between simulated and real world. How much data does a computer need to accurately work out if it is seeing a person or a picture of a person painted on the side of a wall? How much data does it need to understand that a mother with a baby is less likely to jump a red light than a teenager? We don't know yet.

What we do know is that the system will never be a perfect system, there will never be no accidents. What we need is to get to a point where the ratio of accidents by autonomous vehicles is significantly lower than the accidents by human drivers. But that assumes that we will ever be comfortable with AI causing some road deaths and currently the answer seems to be a clear ‘no we aren't’. □

AUTHOR



RICHARD FOSTER-FLETCHER

Digital Leader and
Author
NeuralPath.io

Richard is an Artificial Intelligence (AI) Influencer, Interviewer and Podcast Host. Founder of NeuralPath.io AI Advisory Practice and MKAI Expert Forums. A graduate of the MIT AI Strategy Course and a Wiley published author on the Future of AI. Formally with Oracle, Richard is on Open University Advisory Boards for ethical AI projects and a visiting lecturer in AI for Cranfield School of Management.

4 PILLARS IN SHARED MOBILITY (ESPECIALLY) AFTER COVID-19

 **BIANCA BARBU**
CANGO

Is shared mobility going to survive after Covid-19? Are there going to be any changes? Will shared mobility providers going to finally embrace an advanced telematics solution? The future is here and we should be more prepared than ever. Are we ready to take action so the future will not surprise us again?

The pandemic of Covid-19 shut everybody inside and forced us to move on with our lives in a way in which we did not even think about it before. Though times are showing what is more creative from people or.... the opposite. What about industries? What about business? What about all the companies involved in mobility. For sure, the worldwide lockdown made a strong mark between public transportation and private transportation, between own and shared, between new vehicles and the present ones.

At the end of 2019 the studies and the forecasts had some numbers which were easily deleted or contradicted at the beginning of 2020. We can say there was a period in which the statistics went crazy. Nobody knew what to believe some actions that were taken affected some businesses and industries on a long term.

If in the past years, we were talking about efficiency or fleet management having in mind some ideas, for sure after COVID-19 period the mobility market is reevaluated and new objectives are set.

How is the new vehicle market evolving in the near future?

The acquisition of electrical vehicles

will face an increase comparison of traditional ones?

Will car sharing, car rental and ride hailing vertical still have a future?

For all the answers to these questions it is easy to look in the past and see what we have not done yet. Only in this way, we will be prepared for the future and we will have to ability to face any challenge that might appear including from technological point of view.

Efficiency

By the time the acquisition of new vehicles will decrease efficiency will become the main aspect in fleet management and mobility. Everybody will try to maintain the presents fleets as healthy as possible and being efficient will have new connotation in the future. It is important to take care of what we have and to do as much as possible to manage the new challenges with the present resources. Is it possible? Did the companies and providers rethink their strategy in the past 3 months? Being efficient is being smart in choosing quality solution.

Prediction

A good strategy helps you to have half of the objective solved. Preparation is one of the aspect but after gathering the information the analysis takes the most important place. What would be prediction without Machine Learning or Artificial Intelligence algorithms? Can we predict something if the data are not accurate? Are able or ready to have all the things in one place without buying anything new and just analyze what we have right now? Making decision is on maybe the hardest part in mobility. Taking actions is probably even harder. That is why only having the full picture we can do that.

Maintenance

Advanced telematics solution remain the first layer of any mobility project. Even if we are talking about public transportation, taxi, car sharing or even autonomous driving, telematics at its finest is the best approach for it. In order to avoid extra costs with replacement of components and to reduce downtime when the vehicle is staying in a workshop, maintenance is the key to efficiency and maximizing the profit. To maintain means to take action before a DTC will happen. Are we ready for this? Are we going to replace a vehicle component if we knew before that in a certain number of days will broke and can cause many other failure processes inside the vehicle? Predictive maintenance concept will get more and more popularity in the near future.

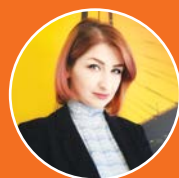
Management and Action

100% problem localization in a subsystem makes place for next actions. Sometimes the decision are based only related to the price paid in the present in order to minimize the present expenses without thinking of the future needs or having in mind future updates.

An advanced telematics solution not only that should be seen as an investment but offer also the possibility to be update at minimum costs. Making a comparison with consumers goods it is time to change the vision an approach when it comes to fleet management and mobility. If we have the latest version of smartphone because offers us the possibility to stay connected with the present why not treat the fleets with same responsibility and install a high-end telematics solution?

Advanced telematics solutions represents the key for the future challenges in the mobility market and offers the possibility to always be ready in prepared for the latest developments in the industry. □

AUTHOR



BIANCA BARBU
CMO
CANGO

COMPLETE MODULAR SOLUTION FOR DIGITAL FLEET CONTROL

Real-time
vehicle tracking

Driving style
monitoring

Advanced
fuel analytics



OMNICOMM enables remote monitoring of high-value commercial assets to transform your business.

**WANT TO SEE HOW OMNICOMM
CAN WORK FOR YOU?**

www.omnicomm-world.com | toll free number +91 888 0770770

Connected Two Wheelers and Smart Possible Use Cases

PRAKASH AK
VARROC

The two-wheeler market in India is forecasted to expand at a CAGR of 7.3% and reach a sales volume of 24.9 million units by 2024. The impact of existing pandemic on this equation will have to be seen. India also witnesses very high rate of death due to two-wheeler accidents. As per Govt survey 47,600 people died due to two-wheeler accidents on Indian roads in 2018. This also has a strong correlation with increasing sales of vehicles. Almost a 46% increase in accidental deaths compared to the figure in 2013 as against 20% increase in sales for the same period. Riding two-wheelers is already considered risky, which gets aided by the road conditions in our country. These conditions present a tremendous opportunity to reverse the accidental death rate by taking advantage of connectivity solutions in two-wheelers.

Major trends in automotive besides electrification and autonomous driving are connectivity and digitalization using IoT. As the automotive industry veers towards digitalization, vehicle telematics solutions are transforming connected two-wheelers (2W) from concept to reality. While modern commercial and passenger vehicles are already integrated with mainstream telematics and driver assistance features, the current wave of digital connectivity is now rapidly progressing into the 2W category as well. The number of smartphone users in India is expected to increase to 859 million by 2022 from 468 million in 2017. As per recent Govt regulations, all two-wheeler above 125 cc now come with ABS and all two-wheelers are BS VI compliant after 1st April 2020. These regulations along with electrification

will introduce electronics into two-wheelers more than ever before. The advancement in network technologies to 5G will bring lots of opportunity to introduce new use cases into the two-wheelers addressing rider safety and comfort.

This article explores some use cases based on certain assumptions such as availability of electronics and CAN communication network in the vehicle.

Possible Use Cases of Connected Two-Wheelers

Millions of vehicles and fleets across the world connected with telematics devices can form an internet of vehicles collecting huge data from various parts of the country. This coupled with smartphones connectivity can bring various use cases such as

- Road & vehicle condition monitoring
- Driver behavior analysis
- SOS calls, smart helmets, and theft protection
- Vehicle Prognostics and Health management (PHM)

Monitoring the condition of roads and the vehicle is an important aspect of road safety, as deteriorating or damaged roads hold safety risk for two-wheeler riders, while poorly maintained vehicle can result in abrupt breakdown leaving the rider stranded at worst possible times and places. Road condition monitoring can notify riders of slippery roads, dangerous curves, potholes and even roads under repair. These use cases can be made possible by monitoring data from different connected vehicles plying on these roads and classifying the information using Artificial Intelligence/Machine Learning methods.

Another use case can be made from analyzing driver behavior while riding two-wheelers. This could be of great use for insurance companies, fleet owners, OEMs, policy makers as well as end users. For example, Varroc's CarIQ platform provides key analytics around driver behavior and risk identification. India has very low adoption of 2W insurance despite being mandatory and cheap. Continuous interactions through connected platforms like CarIQ, one can see major benefits for this area. Telematics devices along with smartphone



Major trends in automotive besides electrification and autonomous driving are connectivity and digitalization using IoT



Varroc Segmented Connected Instrument Cluster with Turn-by-Turn Navigation

connectivity bring tremendous opportunity for bike sharing start-ups in our crowded cities. Ride sharing companies, rental services and even insurance companies can benefit from varying their charges based on driver behavior scores. As number of electric or IC engine two-wheelers grow on roads, the role of driver behavior analysis becomes more important in making infrastructure changes to avoid fatal accidents.

Helmets are another area where a lot of smart use cases such as taking calls, rider-to-rider connectivity, virtual displays, and accident detection are possible. Helmets can be made smarter by connecting them with the vehicle, with smartphones or between helmets using telematics devices, mobile network and IoT. They can be programmed to make SOS calls for timely medical assistance by detecting an accident, thus saving many lives. The challenge here is to avoid false positives, which would need extensive data collection and validation using AI/ML. Theft detection is another straightforward use case possible with telematics and smartphone connectivity.

Vehicle Prognostic and Health Management involves monitoring the health of different vital components of a vehicle using all the electronics and data collection points. There are numerous use cases such as monitoring engine health, tyre pressure, battery health, service reminder etc., which can help keep the vehicle in good shape and avoid untimely breakdowns.

Use Cases to Address E-mobility Challenges

Battery charging time and battery range are the key challenges to be addressed for wide adoption of e-mobility in the country. On the other hand, increasing number of e-vehicles on the road will also demand increased load on our power grids. The cost of charging e-vehicles will depend on parameters such as time and speed of charging (fast/slow). Slow charging vehicles during non-peak hours can be cheaper than fast charging during peak hours. Users should be able to plan to charge their vehicles based on available rates and charging speeds. This problem can be solved with



Varroc Segmented Connected Instrument Cluster with Turn-by-Turn Navigation

telematics quite effectively by providing information about the charging stations, tariffs, availability of fast charging or swapping of battery stations based on user's route or proximity to the station. It is also important to know the State of Charge (SoC) of battery to let users find nearest charging/swapping stations. This means Battery Management System (BMS) should be connected to a telematics device, know the SoC and other related parameters such as State of Health (SoH) of the battery to take full potential of the complete system.

Technology to Realize these Use Cases

Making the data available: Potential of integrating telematics in instrumentation cluster/ connectivity ECU with smart phone is quite possible. A major chunk of this data can be also derived from various ECUs such as ABS and EFI in IC engine vehicles and Vehicle Control Unit, traction motor controller, BMS, and other sensors in case of e-vehicles.

Collecting the data: Careful planning is needed to collect the meaningful data and filtering it to develop smart algorithms to address different use cases. The collected data should be classified as two sets, one for training or developing

the algorithms and the other one for the validation of the use case. Data at different driving scenarios, capturing variations on load, ageing factors and other noise factors are to be considered to gain enough confidence during the validation. One can also explore good simulation tools to gather such data and a mixture of simulation and real-world validation can also be used.

Use Case Implementation: Once we have the right set of data for developing algorithms to predict these use cases and validation, many different approaches can be tried to implement them. There are different ways to arrive at algorithms based on AI, ML, statistical, and identification techniques to solve many of these problems. Clustering techniques were used for driving style recognition and K-means clustering for specific individual driver identification and road condition monitoring. Hidden Markov Models and Bayesian techniques are also applied in driver behavior analysis. It is also possible to use different Artificial Neural Network models to use the data effectively and predict driver behavior.

A pattern recognition system on a smartphone is also capable of detecting road conditions using accelerometer and Global Positioning System (GPS) readings. This can be accomplished through spectral analysis of tri-axis acceleration signals to retrieve trustworthy road surface anomaly information.

Many of these algorithms have already been proven in passenger cars and we believe adapting them for two-wheelers has the potential to make them safer and bring down the accidental death rate drastically. ■

AUTHOR



Prakash AK

Vice President, R&D Electrical-Electronics division
Varroc

Prakash AK is the Vice President and head of R&D for Electrical-Electronics division at Varroc. He comes with more than 26 years of experience in leading Research & Development, bringing positive change and improving organic business growth at organizations such as

Eaton and Hella.

Developing talent and technology in the areas of global mega trends in Automotive such as e-mobility, connectivity and autonomous driving/ADAS are some of his areas of expertise.

SMART mobility to define the New Normal!

 GAUTAM SHIVASWAMY

MAINI GROUP

India is reeling under the clutches of Covid19 pandemic and the automotive industry has been one of the hardest hit with shrinking sales. The shared mobility sector which had been the sunshine sector in the recent years churning out a number of invested startups like Bounce, Vogo, Dunzo etc. have been grappling with cash leading to layoffs. Some have gone ahead and started selling their fleet vehicles to generate the much needed cash! As much as this paints a grim picture of the shared mobility sector, not all is lost and there are “new & emergent ideas” that can and have already started to define the new normal in the post Covid world. However this necessitates #FutureOfMobility defined by Connected, Autonomous, Shared and Electric (CASE) to embrace SMART in each aspect of its definition. Most firms working in technologies related to CASE find the shared mobility sector as the lowest hanging fruit for technology adoption as it has a direct relevance to increasing operational efficiencies.

Shared mobility is broadly categorized under - ride hailing & ride sharing. Home grown ride hailing unicorn Ola is the market leader under ride hailing whereas ride sharing can be further categorized into bike sharing popularised by Bounce and car sharing by ZoomCar, Revv [Self-drive] and Quickride, BlaBlaCar [Car Pooling]. Millennials have binged on ride sharing platforms given their limited affinity towards owning assets but rather on utilizing shared assets for point to point intra-city mobility. No wonder this space is teeming with startups with millennials at the helm of affairs! Lastly there is shared mobility for last mile delivery - extremely relevant today & in the near future due the pandemic. One can see the two wheeler fleets of Bounce & Vogo being efficiently cross utilized for last mile delivery for eCommerce and food delivery. Increasingly these firms and

many others have been trying to electrify their fleets and importantly for the right reasons! Let's investigate further!

The fundamental requirement for being SMART is to go digital or electric in mobility terms. Electric vehicles are a default choice for faster & wider adoption of telematics. It is not just about the ease of integration of telematics systems on EVs but also the lower complexity and costs when compared to an ICE (Internal Combustion Engine) vehicle. What is the measure of disruption here? Advanced vehicle functionality data which were available only on high end luxury cars are now made available on electric two wheelers at one tenths of the cost. Companies like Ather are revolutionizing the consumption of two wheelers leveraging the data available on telematic systems. This brings in a tremendous dimension of providing access to contemporary/leading innovations to everyone! Including the lower most economic strata of our society thereby allowing a large chunk of our population to benefit from the technology!

In EVs all pertinent data, core to the functionality of the vehicle are available on the CAN Bus and CAN Data loggers with GPS and GPRS/ 4G LTE can be used to upload the data real time on private clouds for computing. It is important to note that key EV components like motor, controller & batteries have the requisite sensors built in like speed, temperature, position & voltage sensors. These enable continuous, realtime and online monitoring of performance as well as health parameters centrally. This amalgamation of electric mobility and telematics can be termed as “SMART mobility” which is referred interchangeably as ‘Advanced Telematics’ here.

What does this mean to an end user of SMART mobility? What does this mean to a Fleet Operator or a company involved in logistics or last mile delivery? How

can each of these stakeholders benefit by using ‘Advanced Telematics’ in their business operations. Let us delve deeper!

Who is the end user of an Advanced Telematic system and how does he/she benefit?

Fleet Operator/Delivery Company

The prominent end user who can benefit from an Advanced Telematics system is the Fleet Operator or a Last-mile Delivery Company. Fuel pilferaging is one of the most common problems faced by Fleet Operators. Fuel cost & driver salary form the largest chunk of their working capital requirement. A SMART Electric Vehicle with telematics built in is a natural right fit here since fuel is the electric charge! The smart systems can log minute by minute data of the electric charge being consumed for charging the batteries thereby providing the exact cost of charge or fuel to the Fleet Operator.

Another interesting dimension from the adoption of SMART electric vehicles, is that Fleet Operators or Last-mile Delivery Companies are able to project their variable costs much more accurately. This is because International Oil prices fluctuate more than the Electricity Tariffs within the country. Adding to this is the rupee dollar currency variation which has a significant bearing on the oil price for consumers in India. Companies are hence able to arrive at better estimates of their 3 to 5 year business projections by having fixed or stable operating costs providing the much needed clarity for investment decisions by their boards.

The third aspect is on the driver's riding pattern and on road behaviour which can be easily monitored by Fleet Operators to validate he/she is adhering to the safety protocols - speed limits, lane changing etc that indicate rash driving. There are means to remotely control speed limits or lock vehicles in situations of over abuse. Lastly,

the GPS system enables Last-mile Delivery Companies to track riders adhering to optimized delivery route plans shared to help improve the On-time delivery (OTD) metrics agreed with the customer.

The battery discharge rate is a great proxy for building analytical models of riding behavior and developing mechanisms to improve. In all, these provide for the critical metrics required by a Fleet Operator or Last-mile Delivery Company operating in the shared mobility ecosystem to maximize efficiency, reduce delivery lead times and fuel expenses. The “new normal” specifically calls for preserving cash being critical for survival.

The other end user is the rider or driver himself

Drivers/riders form the second set of stakeholders who benefit from Advanced Telematics. Here is a great example, warranting a specific mention of Sun Mobility, their Smart batteries come built in with all these Advanced Telematics. These swappable batteries are interoperable on two wheelers and three wheelers. Sun Mobility also provides a rider App where every rider can access real time information such as “State of Charge (SOC)” and “Distance to Empty (DTE)” thereby gathering real time information on how many kilometers they can drive as of that moment and location. In parallel, the app also suggests the nearest swap stations and their locations for swapping discharged batteries along with the navigation support using Google Maps API. These metrics provide much needed confidence to the driver assuaging the fears of range anxiety. This is another solid example of how tech based EV companies are leveraging Advanced Telematics and building their business models around them.

What more can Advanced Telematics offer?

As we drill down the cost of delivery to the last atom, we see new areas where Advanced Telematics can play a key role. One such area is “Arbitrage of shared space!” eCommerce firms and Grocery Retail firms such as Amazon, BigBasket, etc. are flourishing by the day. Operational effectiveness is the key to lowering delivery costs to the firms as well as what they load to the end consumers.

We seldom see last mile delivery vehicles - two wheelers and 4 wheeled pickup trucks being used sub optimally in terms of utilizing the volumetric space available for the delivery run. Shared space arbitrage takes into consideration key parameters such as route plan, space requirement & agreed delivery timelines for each package and provides the right vehicle & route for delivering the package. This means a small package can be delivered in a big truck and vice versa based on the right fit!

This calls for a paradigm shift in the way Last-mile Delivery Companies can charge eCommerce firms based on the volumetric space utilized irrespective of whether it was delivered in a two wheeler or a three wheeler or a four wheeler i.e. being agnostic to a vehicle platform. This concept shares glimpses of how “Mobility as a service” can be best served by means of Advanced Telematics - which in this case calls for sensors that can measure volumetric space available in real time for route planners to allocate vehicles.

What lies in the future!

One aspect of #Futureofmobility we typically give a miss in contemporary dialogues is “Autonomous Vehicles”. Commercialization of 2D/3D Lidars and high end automotive cameras has provided the much needed fillip for scaling up of commercially viable Autonomous solutions.

What is the play for Advanced Telematics here?

Vehicle manufacturers (OEMs) typically specify the measures for achieving longer vehicle life, lower maintenance cost and overall lower total cost of ownership. People however, rarely adhere to these measures by abusing vehicle speed limits, harsh acceleration & braking, not following

regular maintenance or service schedules etc. thereby mismanaging their assets. An autonomous vehicle's performance can be tailored to the specifications set by the OEM to extract the best possible utility thereby reducing the total cost of ownership for a person or entity.

Summing up!

We have looked at quite a few areas in the Shared Mobility ecosystem that can benefit from the tremendous potential of Advanced Telematics; starting from reducing the operating costs for Fleet Operators, increasing the productivity of drivers/ riders to Space optimization for Last-mile Delivery. With the World moving towards reaping the benefits of Advanced Telematics driven Shared Mobility ecosystem, it's time for India to take up the reins and steer through this disruptive concept. India & Indians make a strong case for adopting SMART!

Indians in the last decade have illustrated to the world their adeptness in embracing new technologies and innovations. India has generated a number of unicorns in eCommerce, ride sharing, fintech and edutech sectors besides others. India being one amongst the top 5 automotive markets in the world has the requisite capabilities, investments & resources to be a great breeding ground for development & manufacturing of Advanced Telematics and allied components & sub-assemblies that define SMART systems. The opportunity provided by the pandemic with strong sentiments towards localization and Government's push towards a self-reliant or “Atmanirbhar” India calls for reinventing ourselves individually as well as a community. I strongly believe we can lead the world in SMART mobility by leveraging our domestic demand and frugal “price sensitive” innovations! 🇮🇳

AUTHOR



GAUTAM SHIVASWAMY

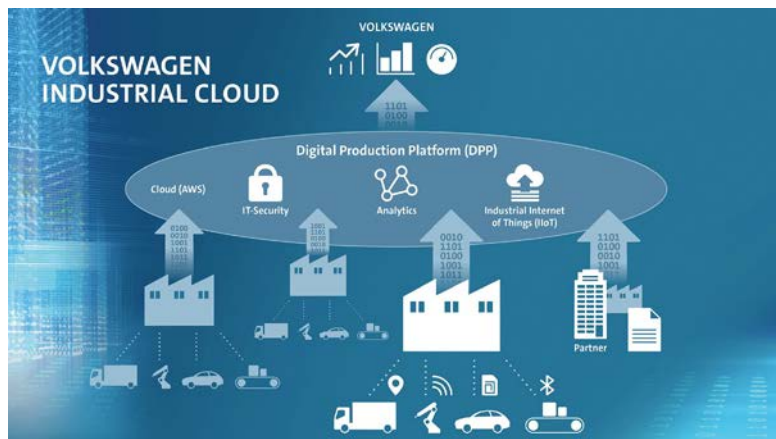
EA to Chairman, Maini Group

Gautam works as Executive Assistant to Chairman, Maini Group. He works on various new and Strategic initiatives within the Group. He leads Business Development & Strategy for Virya Mobility 5.0 a new EV Startup under Maini Group focussing on Vehicle Integration, Powertrain Development & Charging Solutions.

Volkswagen to open industrial cloud for its partners

Last year Volkswagen had launched its industrial cloud to integrate 122 manufacturing units across the worldwide. The industrial cloud which was hosted in AWS platform and implemented by Siemens, is now being extended to its 1500+ suppliers and partners. A glimpse of scale of operations which will move to industrial cloud globally- the group manufacturing units uses 200 million parts per day, which is transported by 18000 trucks and 7700 ships.

Volkswagen, with Amazon Web Services (AWS) and integration partner Siemens, is opening up the Industrial Cloud to other manufacturing and technology companies. Partner companies will connect with Volkswagen plants through this industrial cloud. They may also contribute their own software applications for optimizing production processes to the Industrial Cloud. This way, a rapidly growing range of industrial software applications for Volkswagen's plants are going to be created. Each location will be ready to obtain



applications for its machinery, tools, and equipment direct from the Industrial Cloud to optimize production (app store approach).

Nihar Patel, Executive Vice President New Business Development at Volkswagen AG, in an interview with Sarah Cooper, General Manager of IoT Solutions at Amazon Web Services, highlighted the benefits- "The data that we integrate with the Industrial Cloud creates more efficiency through intelligent algorithms and software applications. For example, one of the eleven pioneering partners has developed an algorithm that uses artificial intelligence to optimize the use of driverless transport systems. Another company has an application that can be used to simulate the maintenance intervals of machines. The examples show: As the number of partners grows, so does the range of solutions our plants can draw on. The Industrial Cloud is not a closed club. We are open to cooperation – with our suppliers and any other company that wants to contribute solutions and/or consume them."



TuSimple adds logistics operators to its autonomous freight network

TuSimple is teaming up with logistics operators to scale up its delivery business; as it lays the groundwork for a planned coast-to-coast(United States) autonomous freight network. It plans to double the number of its weekly freight runs. It

transports cargo for companies like- U.S. Xpress Enterprises Inc. and United Parcel Service Inc., which last year took a minority stake in the startup. It has also started working with grocery and food-service distributor McLane Company Inc. The startup is hauling goods and using space at some of the Berkshire Hathaway Inc.-owned company's facilities as freight terminals, as part of its campaign to create a nationwide network of shipping lanes served by autonomous trucks.

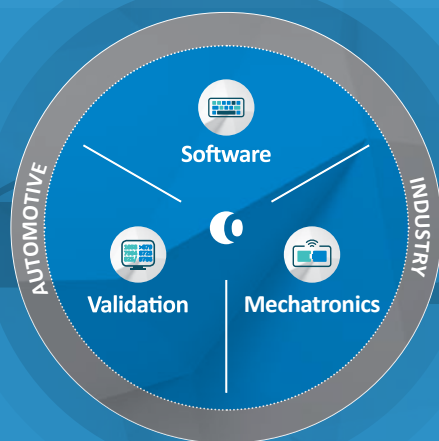
TuSimple plans to pilot fully autonomous driverless service next year, and aims to expand those operations nationwide in 2023 and 2024 with the help of technology it is developing with ZF Friedrichshafen AG.

Digitalization and software to drive Continental

Continental CEO Dr. Elmar Degenhart at company's 2020 Annual Shareholders' Meeting, which was held virtually in Hanover on 14th July 2020, talked about the future growth areas for the company. According to him, Continental is concentrating on three areas of technology: digitalization; assisted and automated driving, with autonomous driving based on this concept; and emission-free drive systems.



EC.MOBILITY



Robotics **Digitalization**

Mobile Machinery
Infotainment
Machine learning
Car2Car
Machine learning
Active Safety
Car2X
Autonomous driving
ADAS
Diagnostics
Data Security
Internet of Things
Telematics
Safety
Connectivity
Sensor Technology
Electromobility
Measurement Technology
Industry 4.0
Big Data

WHERE INNOVATION DRIVES DEVELOPMENT

www.ec-mobility.biz

SHARED MOBILITY, WHERE'S INDIA AT

RAJAT GUPTA
THE SMART CUBE

The last two decades have seen rapid urbanization led change in lifestyle in Indian cities, with private vehicle ownership being a requisite status symbol. Rising incomes and lack of public transport kept putting more private vehicles on the roads with cities such as Bengaluru, New Delhi, and Mumbai now among the top 10 most congested cities in the world.

Congested roads, long daily travels, and low vehicles per head, amidst rising disposable income and smartphone penetration make for a perfect recipe for shared mobility uptake – catching the eye (and billions of dollars) of global shared mobility investors.

Few years back Uber and Ola emerged on our smartphones and changed the rules of mobility. The millennials took an immediate liking to it, of course those 'free rides' and deep discounts were the catalyst (bargain hunting is a constant among Indian generations!) – a viable alternative to private vehicle ownership was born.

So how strong is this demand for shared mobility?

According to a Morgan Stanley report, by 2030, 1 in every 3 miles travelled on Indian roads will be via shared mobility, rising by more than three-fold vs. the current levels.

A survey by McKinsey showcased that 78% Indians (vs. 53% global average) were willing to give up their private car for cost effective shared mobility.

Moreover, millennials around the world have showcased an increasing preference for shared mobility vs. private vehicles, a trend that is likely to be magnified in India with its 400 million millennials (half of country's active workforce).

This high growth potential has led foreign investors to place their big bets for APAC's shared mobility on India, particularly after China proved to be a tough nut to crack for them.

Are Factors Driving the Indian Shared Mobility Distinct?

The sharp uptake of shared mobility has been global, however, the demand drivers and challenges in Asian countries such as India are pretty distinct vs. the Western world, we have a look at some below:

Players Adopting Varied Business Models and Offerings, Who Will Win?

Once Ola and Uber established a large active consumer base for app-based shared mobility, many specialist/niche

players have started emerging in this space over the past couple of years.

Now, with PE investors putting a plug on cash burns, deep discounts have become a thing of the past with shared mobility players in India trying to gain the competitive edge by either serving the right niche or expanding operations to become a one-stop-shop.

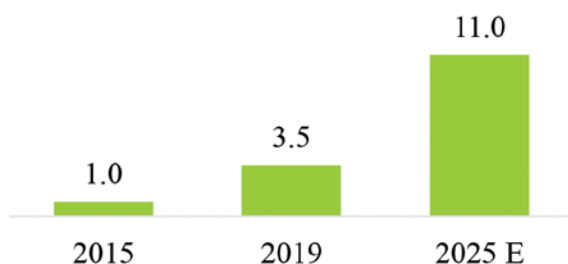
No deep discounts anymore! – so what's the plan?

Large players such as Ola and Uber control lion's share of the market and are now moving towards positioning themselves as MaaS providers, whilst specialist players such as Yulu are looking to carve out a small market for themselves, serving just the first or last mile of the journey.

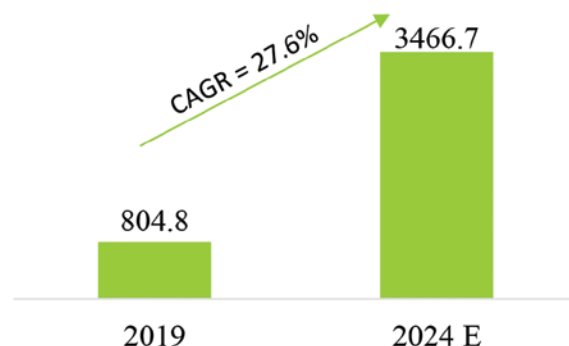
Moreover, Ola and Uber are now channelizing their funds to move from passenger travel to delivering goods as well, with a view to create an integrated mobility platform.

Some recent reports suggest that car-based ride hailing's new demand has been flattening lately; investors' keenness to invest in emerging mobility segments such as Micromobility also suggests that stakeholders are looking at new avenues for exponential growth. □

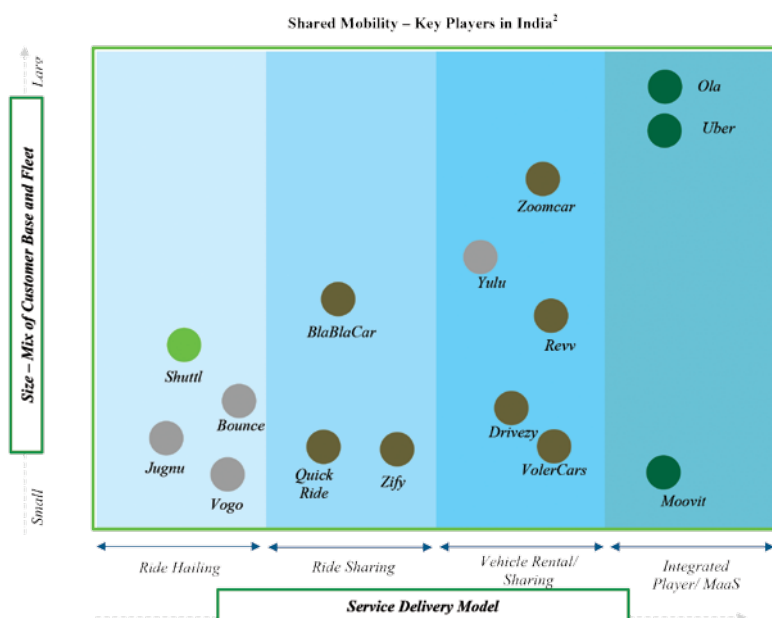
Daily Number of Shared Rides in India (Million)



Shared Mobility Market Size in India by Value (\$ Million)¹



Factor	US and EU	India	Details
Price Sensitivity	Medium	High	Demand for mobility in India is highly price elastic, Shuttl's success has showcased that riders are accepting of waiting time and point pick-up and drop if the service is priced lower
Reliance or Scope for Micromobility	Low	Very High	Two-thirds of all work-related trips in India are short (<5km) – an ideal distance for Micromobility – unlike Western countries, use of 2-wheelers is widespread in India, with low upfront investment and short payback period making it a potential growth juggernaut
Customized Solutions for Each City	Medium	High	Language, terrain, road network, and public transport vary significantly across Indian cities – calling for highly customized mobility solutions – for example, New Delhi's extensive metro network is ripe for uptake of point-to-point services such as Yulu; European cities typically have several common features (such as strong local rail network)
OEMs Active in Shared Mobility	High	Low	Unlike Europe and US wherein OEMs have poured billions into shared mobility, India's leading OEMs have been coy, barring an odd deal between Hyundai-Ola and Maruti Suzuki's small investment in setting up a R&D unit for this space
Role of EVs and AVs	Very High	Low	The developed countries have been gung-ho about how EVs and robotaxis will give shared mobility the cost advantage vs. private cars, however, India's inadequate infrastructure and investment in EV and abundant manpower make these two phenomena less irrelevant, at least in the medium term
Uniform Govt. Policy and Support	Medium	Low	As many European and South-east Asian cities are working with various private stakeholders including mobility players to develop Smart Cities, the Indian government has been muted in providing policy or funding to support shared mobility uptake – on the contrary, many Indian cities have cited ride hailing and related services as 'illegal', bowing to the pressure of the strong local taxi unions



References:

<https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/aces-2019-survey-can-established-auto-manufacturers-meet-customer-expectations-for-aces>

<https://www.financialexpress.com/economy/india-to-be-shared-mobility-leader-by-2030-says-morgan-stanley-report/1191572/>

<https://auto.economictimes.indiatimes.com/news/industry/in-india-17-cars-would-be-sold-to-fleet-owners-and-taxi-operators-by-2025-mckinsey/71032683>

<https://www2.deloitte.com/content/dam/Deloitte/in/Documents/consumer-business/in-consumer-global-automotive-india-final-noexp.pdf>

<https://www.sharedmobility.news/india-shared-mobility-market/>

AUTHOR



RAJAT GUPTA

Manager, The Smart Cube
Shared Mobility | 5G |
AV/EVs

Helping clients across the globe find answers and opportunities in the fast-changing location intelligence, shared economy, automotive, and 5G technology space.

GNSS receiver accuracy: Closing the gap between the datasheet and reality

But, why is there a gap in the first place? Here are some of the top reasons, and a new feature to further improve performance.

 **BERND HEIDTMANN**
U-BLOX

You're designing a mass-market OBD dongle for consumer vehicles with a built-in latest-gen multiband, multi-constellation GNSS receiver. Its datasheet promises two-meter CEP68 position accuracy, which means that 68 percent of its measurements are within 2.0 meters of its true position. You plug in the receiver under the dashboard and take your test vehicle for a spin, anxious to see how well the position it reports lines up with the roads on Google Maps. And, lo and behold, it doesn't. At least not all the time. What did you do wrong? Or is the datasheet deliberately misleading?

Why we test using a best-case scenario

In fact, there's a reason why a GNSS receiver's performance on the datasheet tends to be better than its performance when deployed in a real-world application, and there's nothing shady about it. When we evaluate our GNSS receivers, we do everything we can to ensure that the performance and, in particular, any errors we observe are due to the GNSS receiver itself. After all, you expect the values in the datasheet to reflect the performance of the GNSS receiver and not to be tainted by sub-optimal testing conditions.

That's why, to avoid any contaminating influences, we go out of our way to optimize our entire experimental setup. The result is a best-case scenario that

is well beyond what you would find in commercial vehicles with built in GNSS receivers, let alone in vehicles equipped with an aftermarket positioning device.

To determine the value we put in the datasheet, we record and average a day's worth of static position readings, made under favorable weather conditions. Although this clearly doesn't represent the most common GNSS use cases, it offers the most accurate measure of the receiver's performance.

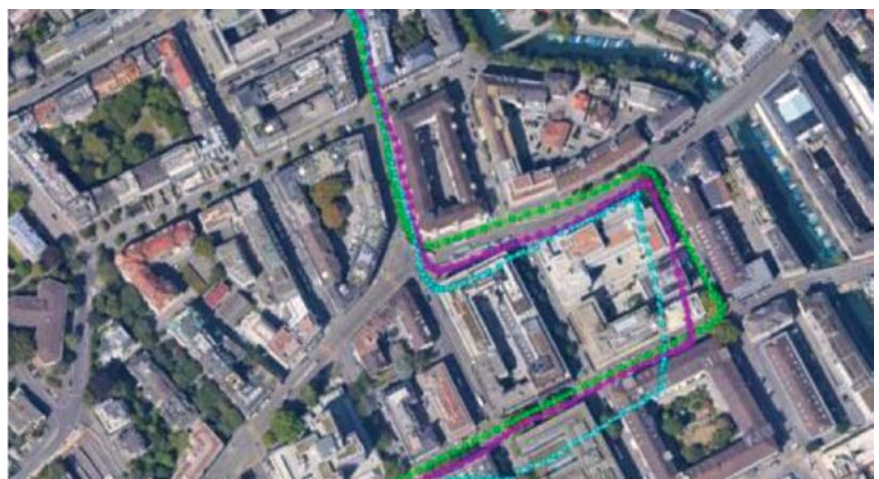
Additionally, we test the performance of our receivers on the road to assess their accuracy in a more dynamic setting. In these tests, we position a high-grade GNSS antenna on a flat and carefully dimensioned ground plate in the middle of the car's roof and only use the highest quality RF cables with low attenuation

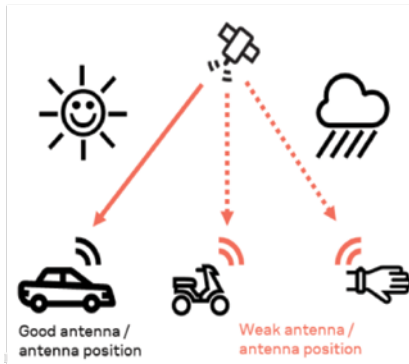
to relay the satellite signals to the GNSS receiver, located inside the vehicle.

With this high-end setup, we drive our test vehicle for hundreds if not thousands of kilometers in a variety of urban and peri-urban environments to collect GNSS signal measurements, which we analyze and compare in the lab to a "truth" reading obtained using a very high-end (and expensive) PVT setup. While any imperfections in our setup may still contaminate the accuracy values we report to our customers, we will have done everything in our power to quash them out in our tests.

The many constraints of real-world applications

Back to the OBD dongle. In all likelihood, it uses a built-in, passive





GNSS antenna with limited gain. Obviously, when in action, it will be anything but static. Rather than being located on the car's roof, in direct line of sight of orbiting satellites, its standard-grade antenna will probably be stashed away somewhere beneath the dashboard, forcing the already weak satellite signals to penetrate additional layers of metal and plastic (as well as, perhaps, a thick cloud cover) before they are picked up by the device. Furthermore, due to cost constraints, the wiring used to connect the GNSS antenna and the receiver is unlikely to be as high-end as the wiring we used in our test setup.

Now that you are armed with a better understanding of why it is unrealistic to expect the actual performance of a GNSS receiver to match the performance reported in the datasheet, you might be wondering: Given the real-world constraints that your product is subject to, what can you do to improve performance without breaking the bank? It's a concern that we've taken very seriously, and it's why we added a new feature to the u-blox M9 GNSS receiver platform: weak signal compensation.



	Datasheet	Real world	
	Premium antenna	In-car antenna	Car rooftop antenna
Static position accuracy (2D CEP68)	2 m		
Dynamic position accuracy (2D CEP68)		~15 m	~1.5 m
Dynamic speed accuracy (2D CEP68)	0.05 m/s @ 30 m/s, rural, clear sky	~0.8 m/s	~0.1 m/s

Performance test in dynamic scenario with a weak antenna setup

To assess the performance of our latest generation of standard precision (single band) GNSS receivers, we ran a series of tests in which we mimicked weak signal conditions that are common in real-world applications by mounting the GNSS antenna inside the vehicle in between the front seats.

In the table below, we compare its performance in terms of accuracy and speed with the performance of the rooftop antenna and the datasheet figures. The difference is significant (and because

Comparing apples with apples (and giving them an extra shine)


Hopefully this blog post will have helped to clarify why, in most real world scenarios, GNSS receives fail to live up to the accuracies reported on the datasheet. Using a high-end test setup to qualify receiver accuracy is a standard practice in the industry. Far from being misleading, it lets you compare apples with apples when sourcing the hardware you need for your solutions.

By improving position and speed accuracies by over 25 percent in real-world scenarios, u-blox M9's unique

	Indoor antenna	Indoor antenna with weak signal compensation	Improvement
Dynamic position accuracy (2D CEP68)	~15 m	~11 m	> 25%
Dynamic speed accuracy (2D CEP68)	~0.8 m/s	~0.5 m/s	> 35%

of a statistical fluke, our dynamic position accuracy actually beat the datasheet value).

Then we compared the performance of the "real-world" scenario, which consisted of a drive in and around Zürich, Switzerland, both with and without weak signal compensation. Whereas signal attenuation hardly impacts the performance of GNSS receivers with a rooftop-mounted antenna, whether in urban or peri-urban scenarios, it considerably improves the position and speed accuracies measured using GNSS receivers with in-car antennas, as the table below shows.

weak signal compensation feature will help you push your application's performance closer to the datasheet values. To learn more about how weak signal compensation can improve the performance of your product, contact your nearest sales representative or field application engineer. 

AUTHOR

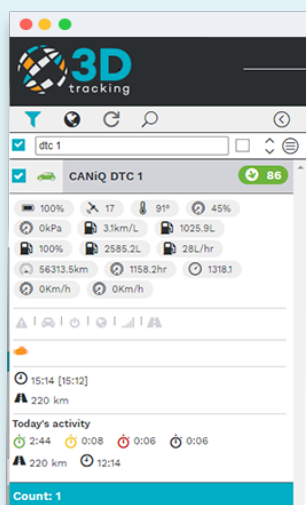


BERND HEIDTMANN
Product Manager,
Product Strategy
for Standard
Precision GNSS
u-blox

OCTO Smart KeyLess gets updated features

OCTO Telematics launched key less solution in 2017, and going by recent update it has about 400,000 users. It is now offering updated features to its Smart KeyLess solution. It allows users to benefit from over the air update(OTA).

Smart Keyless solution can be installed in less than 15 minutes, by connecting the OCTO telematic device to the vehicle's OBD socket and linking it to an OCTO SmartKey. This smart key then replaces the factory keys originally furnished with the vehicle with all security and convenience functions, both electronic and mechanical. With OCTO KeyLess comes a dedicated smartphone application that permits users to unlock and lock the car doors with none other types of contact with the car. Additionally, the fleet manager is able to manage the vehicle remotely, and benefit from fleet telematics features offered by OCTO.



3Dtracking integrates Diagnostic Trouble Codes

3Dtracking, has announced the addition of real-time Diagnostic Trouble Codes (DTCs) to its management service platform. The addition of DTC warnings now gives fleet managers an instant view into the health of their vehicles. These DTCs generated when a vehicle's on-board diagnostics system (CANBUS) picks up a problem, are displayed via a warning light or another indicator on the vehicle's instrument panel. For fleet managers, this integration can provide immediate business value through: (1) Proactive maintenance and scheduling (2) Prevention of dangerous accidents, e.g. warning of potential brake failures. (3) Tracking ongoing vehicle issues

Anritsu launches Portable 400G Network Tester MT1040A

Anritsu Corporation has launched the sales of its Network Master Pro MT1040A for 400G networks on July 22, 2020. Supporting 400G Ethernet, is a new battery-powered tester with directly mounted QFSP-DD optical modules. It also has a simultaneously installable 10M-to-100G interface for access, metro, mobile fronthaul/backhaul, and data-center transmission quality tests (BER, throughput, frame loss, and latency measurements), while the easy-to-use GUI, remote-control-over-network option, and auto-test functions add-up to a tester with unparalleled measurement efficiency. The 400G Network Master Pro MT1040A is a portable tester for evaluating the communications quality of networks operating at speeds from 10 Mbps to 400 Gbps.

XCAT LiDAR sensors launched



XAOS MOTORS, headquartered in KOREA, has launched XCAT LiDAR Sensor, which can be used in self-driving vehicles. MEMS LiDAR Sensor XCAT has the ability to scan over 300 meters. It can safely cope with high-speed driving. XCAT is designed for mass production, and OEMs can adopt high-performance 3D LiDARs at a low cost. XCAT LiDAR provides high-resolution 3D information to significantly improve the functionality and reliability of ADAS. XAOS Motors has its own 3D viewer software, which is now available with XCAT LiDAR.

EB GUIDE adds support for Raspberry Pi

Elektrobit announced new features and capabilities for EB GUIDE. Users of Raspberry Pi, can now use software development kit (SDK) for Raspberry Pi in EB GUIDE.

EB GUIDE toolchain incorporates a complete suite of products that enables carmakers, automotive suppliers, and software developers to design, test, and deploy advanced human-machine interfaces on any device including vehicle head units, heads-up displays and instrument clusters. It enables advanced graphics, plus voice-, touch screen, and gesture-based controls. EB GUIDE has been used to develop the HMI systems in more than 50 million cars on the road. Additional enhancements in the new release include a new namespace structure, a new tag filtering system for easier handling of large amounts of data, the ability to export languages and skin settings, and improved access to tutorials, extensions, and examples.

Callcomm

TRACK | ANALYZE | OPTIMIZE




Decrease Fuel
Theft by up to

90%

Reduce Fuel
Cost up to

15%

 Call Us Anytime
+91 9989094607

 Email Us
callcommcba@gmail.com



Uber acquires public transportation software company Routematch

Uber has announced acquisition of Routematch, a software provider serving more than 500 transit agency partners in urban, suburban, and rural communities around the world.

This acquisition brings together Uber's expertise in on-demand global mobility technologies with Routematch's capabilities across paratransit, payments, fixed-route tools, and trip planning services. Both companies believe it will create new innovations that make it easier for agencies to provide the right transportation solutions to their riders, through an expanded suite of technologies.

Uber buy Postmates delivery service for \$ 2.65billion

Uber has reached an agreement with Postmates to acquire it for US\$2.65Billion. Postmates, an upstart delivery service, has grown substantially since it was founded 9 years ago and was last valued by investors to be worth over \$2.4 billion. This deal will strengthen Uber's food-delivery business, Uber Eats, which would help to compensate for the lost revenue the company is experiencing from its core ride-hailing model due to Covid-19.

This deal, many believe is a "lifeline" for Postmates which has recently struggled to compete with larger competitors such as DoorDash and GrubHub. It has been rumored that Postmates was looking for a potential sale deal for over a year now, even holding sales talks with both DoorDash and GrubHub recently. While GrubHub didn't strike a deal with Postmates or Uber, they were recently acquired by Just Eats, an Amsterdam-based food delivery service, for \$7.3 billion. This acquisition formed the largest online food-delivery platform outside of China. While Uber Eats revenue is up 53% from last year, the company wants to achieve market domination and securing a deal with Postmates will get them one step closer.

LeddarTech acquires VayaVision



LeddarTech last month acquired sensor fusion and perception software company VayaVision. This acquisition fits with LeddarTech's strategy to deliver an end-to-end ADAS and AD sensor fusion and perception stack product that is adaptable, flexible, and scalable to its customers.

VayaVision, founded in 2016 by Dr Nehmadi Youval and Ronny Cohen and based in Israel, has been working in the field of sensor fusion and perception, providing autonomy solutions to leading players in the automotive industry addressing use cases from L2 to L5 ADAS and Autonomous Driving.

The Alliance Innovation Lab to collaborate with Cybellum on cybersecurity

The Alliance Innovation Lab at Tel Aviv, supported by Renault-Nissan-Mitsubishi will be working with Cybellum, a startup in automotive cybersecurity. This strategic partnership has been announced following a successful proof-of-concept by Cybellum. Under this cooperation Alliance Innovation Lab and Cybellum will cooperate to build cybersecurity technologies to be implemented in the automotive market. This cooperation will focus on vehicle-level risk assessment, taking into account the architecture of the vehicle model and the automated assessment of a vehicle's complex mesh of software and hardware.

Velodyne announces agreement with Hesai Photonics, to drop legal proceedings

Velodyne Lidar, Inc. announced a long-term global licensing agreement with Hesai Photonics Technology Co., Ltd. encompassing 360° surround-view lidar sensors. As a result of this agreement, Velodyne and Hesai have agreed to dismiss current legal proceedings in the U.S., Germany, and China that exist between the two companies.

Mobileye and WILLER partner on mobility solutions for Japan, Southeast Asia

Mobileye, and WILLER, one of the large transport operators in Japan, Taiwan and the Southeast Asian region, announced a collaboration to launch an autonomous robotaxi service in Japan and markets across Southeast Asia, including Taiwan. Beginning in Japan, the companies will collaborate on the testing and deployment of autonomous transportation solutions based on Mobileye's automated vehicle (AV) technology.

Together, Mobileye and WILLER are seeking to commercialize self-driving taxis and autonomous on-demand shared shuttles in Japan. The two companies aim to begin testing robotaxis on public roads in Japan in 2021, with plans to launch fully self-driving ride-hailing and ride-sharing mobility services in 2023, while exploring opportunities for similar services in Taiwan and other Southeast Asian markets.



Kyra Solutions uses HPE Edgeline for its V2X solution

Kyra Solutions, Inc. partners with Hewlett Packard Enterprise (HPE) to improve traffic safety by delivering its enhanced V2X (vehicle-to-everything) data exchange platform, called IntelliExchange™, to enable edge-driven actionable insights. The solution uses the HPE Edgeline Converged Edge Systems, which are designed to securely power intelligence on the roadway.

Through its partnership with HPE, Kyra will accelerate its connected vehicle program. By leveraging the HPE Edgeline Converged Edge Systems, Kyra enables real-time processing for IntelliExchange™ to collect and analyze vehicle data and send alerts in milliseconds. This live data management ensures instant alerts and warnings to transportation management centers (TMC), emergency responders, and drivers nearby about critical situations such as wrong way driving, disabled vehicle, sudden traffic congestion, workers' presence in construction zone, to name a few.

ublox partners with Cohda Wireless on V2X solution

ublox has partnered with Cohda Wireless to produce V2X solution for transport market. Cohda's V2X software stack will support the ublox V2X chip UBX-P3 for connectivity based on DSRC/802.11p standards. The ublox UBX-P3 chip, which enables wireless vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, has now been enhanced with Cohda's hardware-agnostic software applications, which are widely deployed in the industry, providing 360° awareness and detecting hidden threats beyond anything a driver or on-board sensors can see.

Swift Navigation and Savari Partner to bring precise positioning services to V2X application

Savari, Inc. will now be using Swift Navigation's Skylark™ positioning service and Starling® positioning engine. Savari's V2X software stack will benefit from improved centimetre level accuracy. This will open new scopes in automotive safety applications and traffic management and enhance Advanced Driver Assistance Systems, and autonomous driving.

The Savari and Swift technology integration brings real-time corrections to the onboard V2X unit, using PC5 or DSRC, to enhance position accuracy capabilities. hidden threats beyond anything a driver or on-board sensors can see.





Ampere acquires 74% stake in E-Rickshaw Company Bestway

Ampere Vehicles, a wholly-owned electric mobility subsidiary of Greaves Cotton Ltd., announced the acquisition of Noida based electric 3-wheeler company Bestway Agencies Pvt. Ltd.(BAPL) which sells electric rickshaws under the popular ELE brand with 74% stake in the company, subject to customary closing conditions.

With this acquisition, Ampere will also be able to offer a complete product portfolio to its B2B customers who have requirements for electric three wheelers for people and cargo mobility.

Tata Motors Fleet Edge for fleet management

Tata Motors announced launch of Tata Motors Fleet Edge – a connected vehicle solution that enables fleet management, with informed decision making.



Fleet Edge processes data generated by the Telematics Control Unit (TCU) and provide insights for track and trace, vehicle health,

driving behaviour, real-time fuel efficiency and fuel loss alert. Customers will also be able to track the due date of the important vehicle documents. These insights will be available to customers through a interface on Tata Motors Fleet Edge portal. Fleet Edge is also accessible on smartphones via an app, on real time basis.

The Fleet Edge solution will be relevant for entire medium and heavy commercial vehicles from Tata Motors trucks and buses. It will also be available for select range of intermediate & light commercial vehicle and small commercial vehicle models.

The BSVI range of Tata Motors connected trucks comes with embedded SIM. The telematics control unit used in Fleet Edge is AIS 140 compliant, as mandated by the Government of India, with safety and security functions including the emergency buttons and vehicle location tracking communication to Government-authorised backend servers.

Battery swapping facility at IOC service station



Shri VP Singh Badnore, Hon'ble Governor of Punjab & Administrator of UT-Chandigarh and Shri Dharmendra Pradhan, Union Minister of Petroleum and Natural Gas and Steel, jointly inaugurated a state-of-the-art battery swapping station for electric vehicles at service station of Indian Oil Corporation's (IndianOil) in Chandigarh, through a virtual event held on 26th June'20. Indian Oil has partnered with Sun Mobility to set up battery-swapping stations called

Quick Interchange station (QIS) at select fuel stations in identified cities.

Sanjiv Singh, Chairman, IndianOil Corporation(IOC), said the Battery swapping technology offers the best alternative to slow charging and helps the drivers make optimum use of the operational hours. He further adds the battery swapping model is initially targeted at the commercial vehicles such as electric autos, rickshaws and electric two-wheelers and EVs that are either factory fitted or retrofitted.

Any EV can drive into IOC's QIS pumps, insert fully discharged battery into a dispensing station and get a fully charged one in just 1-2 minutes, he said. All three/four batteries of EVs can be replaced with fully charged ones at the QIS. At the end of the process, a bill for charging the batteries will be generated. The Pilot QIS has a touch screen for swapping preloaded cards, and an electricity sub-meter. These QIS will play a pivotal role in providing an alternative energy solution to the 3-wheeler segment, he said.



0.05°
ATTITUDE

0.02°
HEADING

1 cm
POSITION

The Smallest RTK GNSS/ INS for Robust Real-Time Navigation

NEW ELLIPSE-D

- » Quad constellations and Dual-frequency
- » Fusion with Pulse or CAN OBDII Odometer
- » Fast Initialization



Ellipse-D
RTK Dual Antenna



Ellipse-N
RTK Single Antenna



OEM
RTK Best-in-class SWaP-C

Yulu raises ₹300 million from US based Rocketship.VC



Yulu in July 2020 received funding of ₹300 million from Rocketship.VC. Yulu provides a smart rental platform for bicycles and electric bikes through a mobile app. According to Yulu, this investment will be

used to strengthen its platform and technology solutions that will enable it to scale services across India rapidly. So far, Yulu has raised more than ₹1.5 billion in funding from key investors like Bajaj Auto Ltd, Blume Ventures, 3one4 Capital, Wavemaker, and now US-based Rocketship.

India plans incentives to double auto exports in the next five years

India is making up an incentive program for the autos sector for doubling exports of vehicles and components in coming five years. The Department of Heavy Industries (DHI) has been on the lookout for feedback from auto industry groups on the initial proposal, which suggests giving incentives over five years to extend local production and procurement for export.

This is a part of India's effort to make 'champion' sectors to stimulate investment, generate jobs and boost manufacturing, and comes amid calls by Prime Minister Narendra Modi to be self-reliant as a nation.

India's auto sector exports achieved \$27 billion in the financial year ending March 2019, led by companies including Ford Motor, Hyundai Motor, Maruti Suzuki, Volkswagen and Bosch, which analysts say stand to gain the most.

The initial scheme has been made to incentivize large companies and successfully benefit smaller players in the supply chain, making the auto sector more competitive overall. To be eligible, automakers must have revenues of a minimum of 100 billion rupees (\$1.3 billion) and an operating profit of at least 10 billion rupees (\$131 million) in three of the last five years, they must also have earnings from outside India and commit to spending on research.

The terms for auto components makers are equivalent except that the revenue and profit thresholds are lower, at 20 billion rupees, and 2 billion rupees, respectively.

One proposal is to possess a production-linked incentive in during which companies will get benefits like the space between the factory and point of sale to catch up on for higher warehousing and logistics costs, another proposal is to give incentives to increase the production of specific car models but only if 80% of them are exported.

Kerala empanels eight companies for setting up EV charging stations

The Kerala State Electricity Board (KSEB) has disclosed the list of selected bidders that intend to set up electric vehicle (EV) charging stations for commercial operations at specified locations in the state. Last year, KSEB had invited bids from interested parties to set up EV charging stations across the state. Kerala was one of the first states to start focusing on the promotion of electric mobility. In 2018, the state government had then chalked out a roadmap for an Electric Vehicle Policy.

Noida to have 162 public EV charging stations

Energy Efficiency Services Limited (EESL), under the Ministry of Power, has made an agreement with the New Okhla Industrial Development Authority (Noida) to promote electric vehicles (EVs) and install public EV charging stations and related infrastructure. EESL will make an upfront investment on services pertaining to the agreement and the operation and maintenance of public charging infrastructure. Noida Authority will provide space for the charging infrastructure. Noida authority has sanctioned 162 public EV charging stations comprising 54 Bharat DC001 (15kW) and 108 122kW (50kW CCS2+50kW CHAdeMO+22kW Type2) fast chargers under the second phase of FAME India Scheme. EESL has been chosen for the deployment of public charging stations in NOIDA City. So far, EESL has installed 20 EV chargers, of these 13 are commissioned and seven are under commissioning.



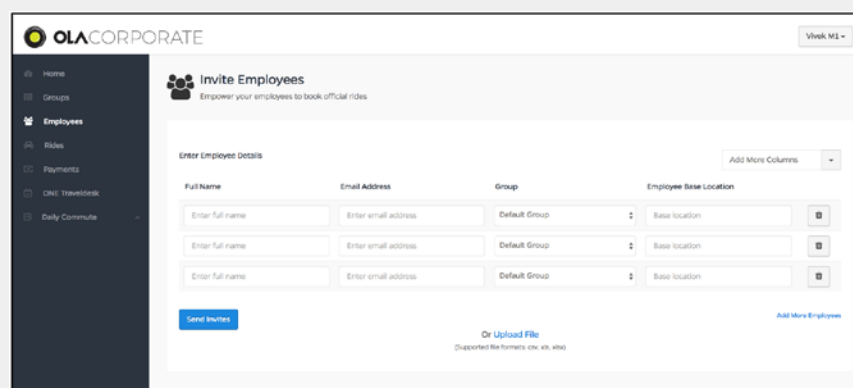
DC fast charger for New Delhi

ABB India Limited, installed its first Public DC fast charger in New Delhi with EV Motors India, the major charge point operator for BSES Yamuna Power Limited. The Terra54 CJG charging station, which caters to multiple charging protocols of CCS2, CHadeMO and AC Type 2. The Terra54 is a cloud-connected charger that will be linked through Open Charge Point Protocol (OCPP) 1.6 to EV Motors' backend office. Passengers will be able to charge their cars in about 40-50 minutes from 0 to 80%. All ABB chargers come with connected services, which help customers easily connect their chargers to different software systems like back-offices, payment platforms, Energy Management Online Solutions and smart remote diagnostics which ensures significant uptime value.

Eicher launches Connected Commercial Vehicle

VE Commercial Vehicles Limited (VECV) announced connected vehicles across its entire product portfolio, powered by their connected vehicle solution – Eicher LIVE. From 1st August 2020 onwards, the trucks and buses built on the EUTECH6 platform will be equipped with pre-fitted hardware that would enable them to be completely connected while on the road. This solution will help extract maximum possible fuel efficiency with savings of up to 10% in fuel costs. With improved infrastructure and the advanced commercial vehicles in the BSVI range, it's possible to run more. Connected Eicher Trucks & Buses will have intelligent features that will enable three key benefits for the customer including fuel-efficient operations, superior uptime enabled by Eicher Uptime Centre support, and segment-specific benefits such as enhanced logistical efficiency in eCommerce & passenger safety in buses.

Eicher's telematics system is integrated with the vehicle's electronics. With the new emissions era of BSVI, the telematics system leverages the several sensors fitted in the vehicle and converts the large amounts of data to enable deeper insights. On one end, it is connected to the CAN, the electronics backbone of the truck and hence has access to vehicle data generated by sensors, ECUs, and any exceptions through fault codes. On the other side, it's connected with Eicher's unique support solutions, such as Uptime Centre, Fuel Management services and segment-specific solutions.



Ola takes enterprise solution 'Ola Corporate' to the international market

Mobility platform Ola is rolling out enterprise mobility solution 'Ola Corporate' across global markets, the company announced on 21st July'20. It will be rolling out the enterprise offering to customers across Australia,

New Zealand, and the United Kingdom.

The solution was first introduced in the Indian market and had garnered 10,000 corporate users in the country. The users have seen a reduction in travel expenses by up to 25 percent, due to the platform's centralized billing system, which eliminates the need for paper-based reimbursement.

Ola Corporate will also offer a range of safety features under its Ride Safe initiative and will follow in-class hygiene and sanitisation protocols for safer mobility amid the pandemic.

Enterprise users can manage payments from their company's centralised account. Customers can operate the service through a new, personalised dashboard where they can add and manage employees. Employees can then book their own rides similar to how they would for personal trips. They can distinguish the trip as a work trip by tagging the ride as an Ola Corporate trip.

Project ASLAN- an open source self-driving software platform



Project ASLAN launched an open-source self-driving software platform. It offers real-world self-driving capability validated by public highway trials also as complete simulation capability for users without access to driverless vehicle hardware.

Engineers can freely download the software at project-aslan.org. The tooling has been “designed

by engineers for engineers”, says Project ASLAN. It also offers video tutorials and quick start guides, so users can easily install and run an autonomous vehicle or a simulation in under a half-hour.

ASLAN is powered by the ROS framework, which has been employed in many robotics solutions for varying applications,

having assembled an estimated user community of up to 16,000 automotive and self-driving engineers and developers who already use ROS.

Project ASLAN aims to enhance safety while increasing affordability & accessibility of transport networks.

The objective behind Project ASLAN is to specialize in the facility of engineering collaboration to enable fast deployment of self-driving solutions. The group welcomes new startups and individuals who share ASLAN's ambition as the promise of autonomous vehicles has been unfulfilled for too long, said by Mike Potts, CEO of StreetDrone, one among founder members of Project ASLAN.

Autware Foundation- an open source initiative for autonomous vehicle



Autware Foundation founded in 2018, is a non-profit organization, which supports open-source projects enabling autonomous vehicle, jointly initiated by Apex.AI, Inc. Linaro/96Boards, and Tier IV, Inc. Its projects/activities are grouped under- Autware.AI, Autware.AUTO, and Autware.IO.

Autware.AI- It is assisted by the autonomous driving open source community with 2300+ stars on GitHub and 500+ accounts on Slack. It is being used by 100+ companies in 20+ countries.

Autware.AUTO- It is a project assisted by the Autware Foundation. It is a clean slate rewrite of Autware. It applies best-in-class software engineering practices which include pulling request reviews, pulls request builds, comprehensive documentation, 100% code coverage, a coding style guide, and a defined development and release process, all managed by an open-source community manager.

Autware.IO- It provides a heterogeneous hardware reference platform with tools, unified interface design, and test framework. It enables the integration of member company's solutions onto platforms that support the Autware.AUTO and Autware.AI software stack. Examples of Autware.IO projects are simulators, device drivers for sensors, by-wire controllers for vehicles, and hardware-independent programs for SoC boards.

Autware started as a project 2015 by Shinpei Kato from TierIV, at Nagoya University. Later Shinpei Kato along with University of Tokyo, Jan Becker from Apex.AI and Stanford University, and Yang Zhang from Linaro/96Boards and the Chinese Academy of Sciences AI Institute formed the founding Board of Directors for the Autware Foundation. Some of its founding members are- ARM, AutoCare, AutonomouStuff, eSOL, Huawei/HiSilicon, Intel Labs, Kalray, LG Electronics, Nagoya University, Open Robotics (OSRF), Parkopedia, RoboSense, SEMI Japan, SiFive/ RISC-V Foundation, StreetDrone, Toyota Research Institute-Advanced Development (TRI-AD), Velodyne LiDAR, and Xilinx.

Continental collaborate with universities to research on AI for automated driving






Continental is continuing the series of its PRORETA research projects, together with Technical University (TU) Darmstadt, the University of Bremen (Germany) and TU Iași (Romania). PRORETA 5 is dedicated to one of the most challenging tasks for automated driving: recognizing complex traffic situations in inner cities and how algorithms from sensor data can deduce the correct driving decisions in these situations. At an unregulated intersection, for example, it is a challenge to correctly interpret all objects related to the intended direction of travel – including their direction of movement, intention and priority – without human intervention. Artificial Intelligence (AI) plays a key role in this. AI methods are to be tested when the implementation of traditional approaches becomes too complex or reaches its limits.



Advanced
Fuel
monitoring system



Benefits

-  Analyse fuel thefts in your fleet and act quickly on them.
-  Get a complete action plan on how to reduce fuel cost and optimise fleet efficiency.
-  Monitor fuel analytics for your fleet of any size with ease and confidence.
-  Get notified immediately on any unusual activity like fuel theft, AC misuse, unwanted idling etc. in your fleet.
-  Get various summary reports and detailed reports for your fleet's fuel usage.

Works with



**Movable
&
Immovable Objects**



**Inbuilt Fuel Sensors
&
No Fuel Sensors**



**Single Fuel Tank
&
Multiple Fuel Tanks
Monitoring**



ZED-F9P

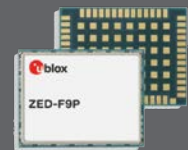
Multi-band receiver delivers centimeter-level accuracy in seconds



Highlights

Multi-band receiver delivers centimeter-level accuracy in seconds

- Concurrent reception of GPS, GLONASS, Galileo and BeiDou
- Multi-band RTK with fast convergence times and reliable performance
- High update rate for highly dynamic applications
- Centimeter accuracy in a small and energy efficient module
- Easy integration of RTK for fast time-to-market



Easy integration of RTK

Integrated RTK

- No third party SW integration on host required
- No resources (RAM, MIPS) required on host
- No license fee or NRE for the host SW

Multi-band in module

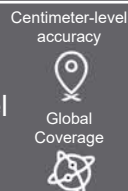
- Integrated HPG multi-band RF chain with guaranteed performance
- Little design effort, no design risk



- Quick to market
- No technology risk
- Low engineering cost
- Low capital investment
- Future proof
- Reduced supplier base

Navigation applications are demanding higher accuracy to increase productivity

- With high availability
- In all environments
- At sensible cost level
- Easy to integrate
- Globally deployable



u-blox Singapore Pte. Ltd.

DBS House-26, Cunningham Road, Bangalore - 560052

Ph. No. - +91-80405092, Mob. No.: +91-9945329985 | E-mail: info_in@u-blox.com