

July - Aug 2018

# SMART AUTOMOTIVE

RNI No: UPENG/2015/63476 ISSN 2454-8561

Autonomous Vehicles • Connected Vehicles • Cybersecurity • Safety • Infotainment

MIT CSAIL's MapLite based autonomous vehicle  
used no prior 3D maps, only GPS and LiDAR



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Email: [info@telematicswire.net](mailto:info@telematicswire.net)

### Printed and Published by

Maneesh Prasad on behalf of

Telematics Wire Pvt. Ltd.

Telematics Wire Pvt. Ltd.

D-98, 2<sup>nd</sup> Floor, Noida Sec-63

Uttar Pradesh-201301

Email: [info@telematicswire.net](mailto:info@telematicswire.net)

### Printed at

M/s Creative Offset Press,

131 FIE, Patparganj, Industrial Area, Delhi-110092

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RNI No. UPENG/2015/63476

## Smart Vs Managed

A section of vehicle telematics industry continues its struggle to prepone the newly notified AIS 140 implementation date- 1st April 2019(Earlier it was 1st April 2018). With the assistance of leading industry body- ACMA (Automotive Components Manufacturers Association), the industry members have approached the Ministry of Road Transport & Highways(MoRTH, the Gazette notification issuing ministry). The officials at MoRTH have given a patient hearing and have assured of necessary steps. While there are numerous workshops and seminars, nowadays which fills up our calendar, I have not seen government agencies associated with AIS 140 calling for any such workshop or roundtable for thread-bare discussion on what has been the reason behind rescheduling its implementation date. Many of the forums where we have seen this issue being raised, had participation of MoRTH representative. But I wonder if they would be able to push their views upwards. The authorities who matter are beyond the reach of common industry folks in many such platforms, but we are hopeful on something constructive emerging out of this.

EESL, Energy Efficiency Services Ltd has been in news recently for assisting the government in its resolve for implementing increased usage of electric vehicle. The move to purchase electric vehicle for government use, to begin with, is a good initiative. But all this forward looking steps seems to have boomeranged when news appeared of government officials avoiding using these electric vehicles, which were recently purchased under EESL supervision from TATA and Mahindra. Culprit being the range of 80-82 Kms which these vehicles could run in a single recharge.

“According to a senior industry executive, these two models have limited range. Their battery packs are of 17 kilowatt (kW), while the global standard is 27-35kW.”(livemint.com)

Unless the decision making process is accommodative of views beyond their own self and is made transparent, we will keep facing such speed breakers. There is a good probability that the learnings for EESL with regards to drafting the specifications of eVehicles to be purchased maybe forgotten and we will be looking at repeat of such incident in future again, where new technology or new product may be blamed; and no one would be responsible for the cost of opportunity lost.

Autonomous vehicles for public transport, goods transport and shared mobility are making waves globally. More and more test projects are being announced in different countries. Governments are taking participation in incubating these futuristic transport by joining hands with industry to help the autonomous vehicle take baby steps. We often wonder, if are we super smart? Are we deliberately letting other economies test the technology? Are we avoiding the cost of new and evolving technology absorption? Are we going to wait for the technology to mature, thereafter we will swiftly move in to capitalise it. Or, are we knowingly oblivious to the development outside India?

## Sync up

In this issue we have tried to cover some of the alliances and association which have been formed to help industry collaborate on specific verticals (pg 16-17). A trend which is being assisted by the need to have “community learning” and “collective approach” for the benefit of industry segment at large. We in India too need such platform. An initiative has been taken up to form a not-for-profit “DRIFT Alliance”. One of the objective being fostering industry-industry collaboration in given vertical segments, while industry-government interface will also be an important and continued activity under this ‘alliance’.

On the technology horizon Dynamic Vixels, iDAR (pg. 8) and autonomous vehicle driving without a high resolution map(pg. 12) of the given area made headlines. AI, sensors and battery technology seems to be dominating the developments in automotive.

In the age of microblogging and digital information explosion, we often wonder how relevant is the magazine like Smart Automotive?



**Maneesh Prasad**

CEO & Editor



# Can Vehicle Data Analytics Support STU Operations?

India has got sizable transport sector which caters to the needs of over a billion people and contributes significantly to the nation's GDP. India is also experiencing rapid urbanization which has put a significant pressure on the transport sector and especially on the public transport system. There is also a cogent change in the public transit, the travel behavior and transportation preferences of modern city dwellers. All these circumstances have created a challenging situation for the transportation planners as they try to build efficient, safe, and sustainable state run public transportation systems.

## Public Perception of STUs

The State Transport Undertakings suffer from perception problem and rightly so, it is a known thing that travelling by public transport vehicles in India is not a pleasant experience, they are opted for only when there are no other viable options available.

They perpetually suffer from lack of funds which act as an impediment for their recovery. Most of the STUs are unprofitable and according to government records the combined net loss of around fifty STUs across the country is in thousands of Crores. There are myriads of problems which are responsible for their poor financial performance, these are poor vehicle productivity and operational efficiency on account of old fleets, low fuel efficiency, high staff-to-bus ratio, fare concessions, poor occupancy ratio and high operation and maintenance costs.

The STUs are in desperate need of fresh ideas that can turn them around, application of data analytics can be one such idea. With data analytics, the authorities can generate more precise understanding of the customer demand on different routes. They can map customer journeys to improve the planning on the present and future routes, this can come handy for STUs that cannot have profitability as the



sole motive to run their buses and have provide services even where it is not economically viable. Data analytics can help to cut down the losses by optimally planning the services according to variation in demand.

## Data Analytics for Decisions Making - A Global Trend

It is said the first step to solving a problem is to measure it, therefore at the heart of all these challenges is the need for good data. Data insights enables understanding of the travel pattern information quickly and comprehensively and thus aid in tackling issues like traffic congestion, lack of parking etc. The data can be analyzed to find out the current, usage trends as well as predict the future patterns and thus determine where and when there is need to expand capacity, add new routes, make investments etc. Modern transportation and mobility is unimaginable without data insights.

With the emerging concept of smart city infrastructure, Mobility as a Service etc has made data insights indispensable, the companies and agencies now acknowledge that to remain relevant, access to real time data is a must. Data analytics is playing an important role in managing public transport issues in many countries. Israel has introduced

a 13-mile fast lane which uses a toll system that calculates fees based on traffic at the time of travel using data analysis. Tram system in Melbourne, Australia is using big data and ad hoc analysis to automatically reconfigure routes in response to sudden problems or challenges, such as a major city event or natural disaster. The data is also being used in preventive maintenance. Sao Paulo, Brazil is another city which is using data insights to improve the management of its bus fleet, optimizing its operations, providing added vehicles where there is demand and finding out most efficient routes.

## Data Analytics can be the Way Forward

By leveraging data analytics authorities can use preventive maintenance tools predict optimal maintenance requirements of the fleets. Using the sensors installed on the equipment can be analyzed to predict upcoming faults at the individual component levels such as brakes, gears etc and thus, authorities can schedule maintenance of the equipment precisely at the right time which can increase the equipment life. These small savings enabled by this cumulatively can have big impact on the profitability.

With the intimate understanding of customers using analytics authorities can offer personalized experience to each rider improves customer satisfaction and helps increase the ridership along with new developing new revenue sources by providing targeted services. Another reason behind the below par performance of the STUs is the prevailing corruption right from the lowest to the highest level. Real time data monitoring and sharing can help bringing in much needed transparency in the graft stricken STUs along with improving the efficiency.

### **Situation of STUs in India**

Considering the points made above, back home in India, the situation is appalling. In STUs the data is being recorded manually for each delivery or supply and digitized in a computer manually, there is no automated system. In absence of which there is a big chance of manipulation and inaccurate entry of data. Moreover, the data re-authentication is extremely difficult and has a cost beyond justification. It also does not render itself to any meaningful analysis.

In regards to data generated by vehicles, timeliness is also a key factor. Even when STUs generate data on a daily and real-time basis, no published data is being made available in the public domain for a long period of time. Delay takes place due to the process of data gathering, collection, sharing, audit and then there are forums, committees, which check and publish the data.

The process and timeline of system becomes so long that it takes about 1.5 years or so to get it into the public domain and even the systems and operational managers/decision makers do not get it in a timely manner. This defeats the very purpose of capturing data and at best, it is just a historical record keeping only for all practical purposes. Ideally, any data which is being recorded today should become available after 3-6 months and it should be published in the public domain within that time period.

There are also issues like at the national level as of now there is no integrated

solution and presently, STUs are operating only the 10% of total buses operating in India i.e. around 1.5 lakh buses. Which limits the data collection to only to these 1.5 lakhs buses and data from rest of the buses doesn't get collected anywhere. There are also state carriages like Gramin Sewa, and no such data is available for them.

It seems there are such resources are available to STUs for such a compilation and analysis of data and no one is even asking for it. And even if there might have been some compilations done in a traditional or automated manner over these years, no one knows what the learnings have been.

The system across the public transport in general and in STUs is sluggish in responding to and is not designed to lead the challenges which are faced by public transport in recent times. The Government of India in recent years has introduced/trying to introduce new technologies and devices by bringing amendments to existing acts AIS 140, State Emergency Response System, and installing CCTVs and Panic Buttons. Under the circumstances, even if the plans are implemented what will happen with the data that would be generated is well understood. Policy not backed by monitoring and enforcement is at best a policy for records and arguments. It has very low relevance for the people for whom it is meant.

### **Conclusion**

If STUs are able to improve the overall service, or operational efficiency while bringing the technology to the decision-making level, a remarkable change can be witnessed in the system. Moreover, they can enhance their manpower capacity building by skilling them or providing them training. After all, it's all about analyzing internal problems; technology is automatic. Once a technologically-driven approach is implemented in the process of gathering, management, and analysis of data, STUs can reap the full benefits of the data generated by public transport.

There has to be a centralized agency duly enabled technologically for collecting the data online across the STUs and be able to subject it to data

analytics with embedded AI to refine the outcomes, predictions and patterns. Talking about data system, in big STUs, handling and processing data manually is very difficult, some of the STUs are trying to customize the software solutions suiting to their needs. If all the STUs would be able to implement this, a large number of fleets will be covered, which in turn will result in efficiency improvement.

There are legislative issues, institutional and physical problems. While we have no control over legislative issues, most of the institutional issues can be sorted out at their own level or within the district administration level. In fact, when the government gives subsidies for public transport vehicles, it should be controlled by SLA (service-level agreement), which would give some parameters. On that basis only, subsidies should be linked to SLA otherwise subsidies will not yield desired results.

It is pertinent to mention a recent bold initiative of Government of India to bring talent from the industry into the government sector by direct recruitment at senior levels. In a similar but in an unorthodox approach, government could consider handing over few STUs on experimental basis for a period of 3-5 years to the industry under an appropriate SLA.

BI (business intelligence) could be the key to bring change in public transportation system. Every route is being identified whether it's loss making or not but there is no scientific way of analyzing such data. It can analyze data which is not only current but also related legacy data which can tell a lot more about the performance or behavior of any activity/operations which further enables to initiate appropriate actions.

There should also be effective sharing of transport data among all the stakeholders – transport operators, system providers and citizens alike. This will help to speed up the development of practical solutions and help us improving the efficiency and efficacy of public transportation systems.



# Dynamic Vixels, Next Generation of Artificial Perception

**A**Eye has introduced a new sensor data type called “Dynamic Vixels”, which are designed to more intelligently acquire and adapt data for the company’s iDAR (Intelligent Detection and Ranging) perception system.

In simple terms Dynamic Vixels combine pixels from digital 2D cameras with voxels from AEye’s Agile 3D LiDAR (Light Detection and Ranging) sensor into a single super-resolution sensor data type.

Real-time integration of all the data captured in pixels and voxels is combined into a data type that can be dynamically controlled and optimized by artificial perception systems at the point of data acquisition.

AEye had last year built iDAR, which is a new kind of hybrid sensor that gives the autonomous cars a human-like view of the surroundings. The device uses a solid-state lidar, a low-light camera, and chips to run embedded artificial-intelligence algorithms that can reprogram how the hardware is being used in the real time. That allows the system to prioritize where it’s looking in order to give vehicles a more refined view of the world.

The company claims “Dynamic vixels” further strengthens its biomimicry approach to visual perception, essentially enabling vehicles to see and perceive more like humans to better evaluate potential driving hazards and adapt to changing conditions.

Dynamic Vixels create content that inherits both the ability to evaluate a scene using the entire existing library of 2D computer vision algorithms as well as capture 3D and 4D data concerning not only location and intensity but also deeper insights such as the velocity of objects.

As a core data element for a scalable, integrated system, Dynamic Vixels will enable iDAR to act reflexively to deliver more accurate, longer range and more intelligent information faster. Dynamic Vixels can also be encrypted.

Simply put, this new way of collecting and inspecting data using at the edge-processing of the iDAR system enables the autonomous vehicle to more intelligently assess and respond to situational changes within a frame, thereby increasing the safety and efficiency of the overall system.

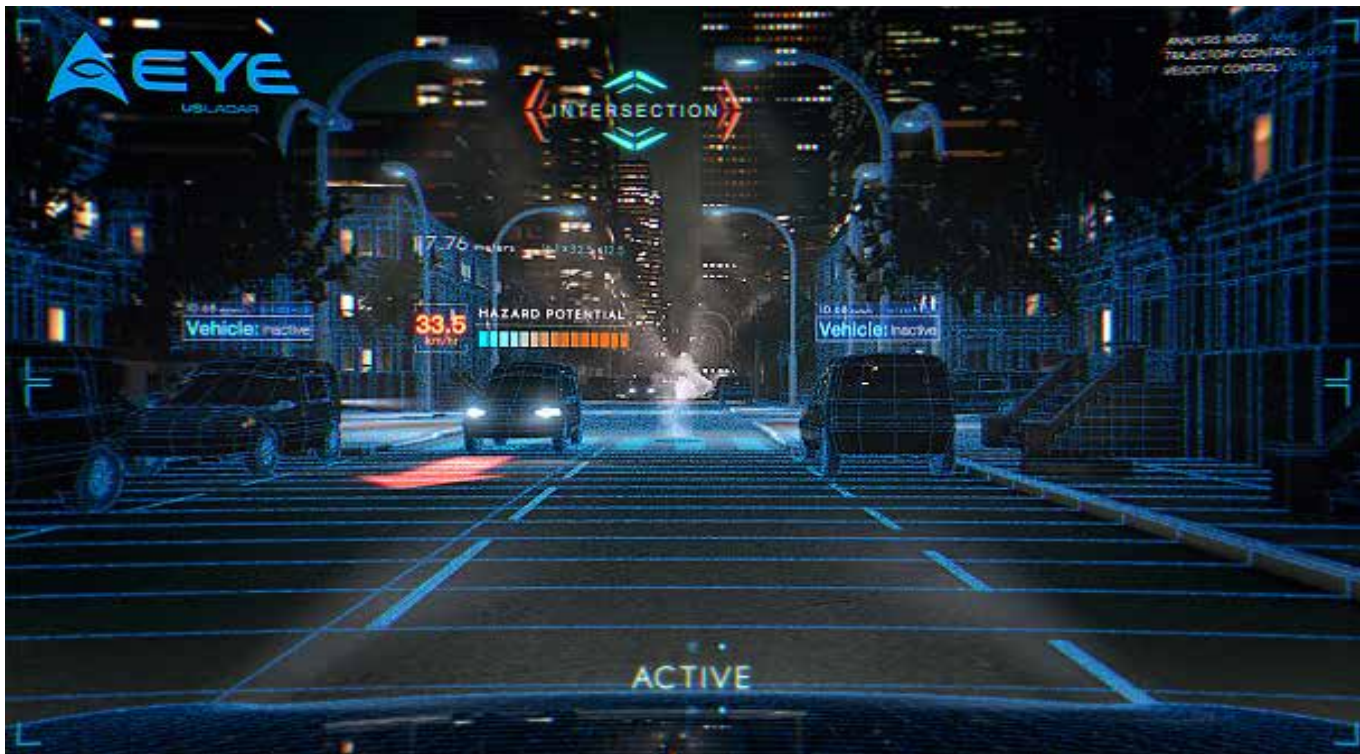
Now iDAR can identify objects and differentiate objects of the same color

which can be leveraged to detect changing weather and automatically increase power during fog, rain, or snow.

iDAR’s heightened sensory perception allows autonomous vehicles to determine contextual changes, such as in the case of a child’s facial direction, which can be identified to calculate the probability of the child stepping out onto the street, enabling the car to prepare for the likelihood of a halted stop.

The iDAR perception system includes inventions covered by recently awarded foundational patents, including 71 intellectual property claims on the definition, data structure and evaluation methods of dynamic Vixels. These patented inventions contribute to significant performance benefits, including a 16x greater coverage, 10x faster frame rate, and 7-10x more relevant information that boosts object classification accuracy while using 8-10x less power.

AEye’s first iDAR-based product, the AE100 artificial perception system, will be available this summer to OEMs and Tier 1s launching autonomous vehicle initiatives.



(iDAR point cloud on the left and camera image on the right: iDAR’s Dynamic Vixels uniquely enable a vehicle to identify the color of a stop light, find road markings, and read signage - challenges unachievable for LiDAR-only solutions.)





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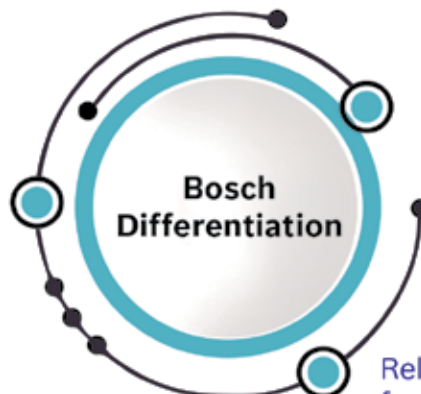
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# Increased Options for Public Transport within the Sharing Economy



**Brian Smith**

*General Manager, Strategic Relationships  
Intelematics Australia*

With over 20 years of experience in product development, management, and marketing, Brian Smith contributes to building strong relationships with OEMs and Auto Clubs both in Australia and worldwide.

**C**ontinued investments into autonomous vehicles have far-reaching consequences. With most cars projected to be fully automated in the next 20 years, the networked driverless car is no longer a fantasy rather an option that provides both the public and private sector with great opportunities to build and improve transport infrastructure.

According to a Deloitte report, 'The rise of mobility as a service 2017', up to 80 percent of travel in urban areas will be in shared autonomous vehicles by 2040. Industry experts expect that this will have positive impacts on traffic congestion and road safety.

The ongoing development of automated cars is driving interest in disruptive

Mobility-as-a-Service (MaaS) models. For example, Singapore has already begun testing the use of driverless taxis, while Uber has been running trials of driverless vehicles in Pittsburgh, in the United States. MaaS is defined as a scenario in which transport users subscribe or pay-as-they-go to gain access to public and private transport when and how they need it. MaaS is expected to lead to a drop in private car ownership rates.

Those who choose to adopt MaaS will be able to avoid many of the costs that come with car ownership and maintenance. This allows for more rational and sustainable decisions regarding the use of public and private transport as the full proportioned cost, both purchase (capital) and running (operating), is built into every journey.

A major issue with the current private ownership model is that the capital cost (the purchase price of the car) is seen as a sunk cost (a cost that has already been incurred). Whilst the cost of an individual car trip is thought of as only the direct additional expenses covering fuel consumed, parking and a small amount for additional costs like tyres, and servicing. This means that each extra journey in a private car is usually viewed by the owner as costing much less

than the true fully apportioned cost. As a result, many people believe that taking their car seems measurably cheaper than the train, tram or bus.

The alternative to MaaS is privately owned driverless vehicles, which raises many questions as to how a city would function if this were to become the norm. Two simple examples being, if you want a quick snack or are just popping out to pick up some dry cleaning or purchase groceries, why bother parking, just have the car circle the block until you are ready to move on, or chauffeuring children, which would no longer impose a personal time cost on parents, potentially increasing this activity significantly with impacts on not only congestion but health, environment and other factors.

This has been described as the heaven or hell scenario, shared autonomous vehicles, with reduced cost and congestion could be heaven, private autonomous vehicles, with dramatically increased congestion possibilities, could be hell.

## The move towards MaaS models

Streaming services such as Spotify and Netflix have transformed the way people consume and pay for media and provide a







guide to how transportation models in the future may operate. The shift towards the MaaS model may be led by the success of digital disrupters in the sharing economy such as Uber and GoGet, where people can hire cars, including from their neighbours, on a per-hour or per-day basis. These ideas are expanding globally with new services emerging every day.

Trip planning apps, such as Google Maps, Whim and TripGo, which help users compare different transport options for getting to their destinations are becoming commonplace. MaaS is a natural progression of this and involves providing all transport and payment options including public and private in the one platform so that transport users can seamlessly plan and pay for their trip.

In other words, rather than having to find, book and pay for each transportation mode separately, MaaS lets transport users plan and book door-to-door journeys using a single payment system. MaaS can determine the best transport modes to use through the use of telematics to monitor transport network conditions in real-time and define user preferences around travel time, convenience and cost based on data analysis. A common payment system across all transport modes also allows for variable incentives and pricing. An example could be using public transport in peak hours allows lower cost road tolls outside peak hours.

*“Widespread adoption of the MaaS model could turn the notion of public transport being only a provider of mass transit on its head as those individual transit options typically deemed private, will be available on the same payment platform as a traditional public modes of transportation.”*

### Exploring MaaS in practice

Imagine a scenario where your public transport payment system, such as Opal (Sydney) or Myki (Melbourne) is extended to include car sharing options such as Uber or GoGet? Public transport users pay a monthly service fee which automatically gives them access to a multitude of public transport options including traditional train, tram, bus and ferry options, as well as taxis and car sharing. Alternatively, existing payment systems such as credit or debit cards could also offer MaaS services by creating partnerships with transport operators.

Road users may never need to own their own car. Theoretically, driverless cars would pick people up from their homes and drop them at their destination without having to park somewhere for the majority of the day, adding to the traffic congestion associated with searching for a parking spot. In this scenario many public and private car parks could then potentially be freed up to use as community or commercial space.

Telematics functions, such as real-time data analytics on user travel across

transportation networks could also be used to determine demand and supply to help inform infrastructure planning decisions. Cars can be parked where they are next most likely to be needed, not where their last journey ended.

The future of public transport is one that is constantly evolving as the digital landscape continues to develop and transform. Public transport has traditionally been mass transport, trains, trams and buses. In future public transport may well be as much about personal, individual and small group, transport as mass transport. These can be unified via MaaS to provide an integrated origin to destination journey involving a mix of transport modes.

As we move closer to this (not-so) futuristic scenario, there is great potential for the further integration of telematics technology into everyday life and specifically into everyday personal transportation. While the use of black box telemetry is still relatively new and primarily used in premium vehicles, in order to make this connected MaaS scenario a reality it will need to become a lot more commonplace, and this transformation has commenced.

This connected transportation scenario also increases the potential for the use of telematics technology to be utilised in providing real-time traffic updates to the chosen mode of transport (public or private) in order to provide a seamless and more efficient travel experience for the user. In Australia a number of organisations are developing the building blocks of MaaS, these include existing public transport operators, auto clubs such as the RACV, connected mobility operators such as Intelematics Australia, SkedGo – a travel planning app developer and MaaS Australia.

As telematics technology becomes further integrated into society, MaaS will provide a means of transportation that is unmatched in its efficiency and scope. MaaS does not have to be for everyone, nor will it suddenly appear fully formed. It will continue to evolve and develop over time and for the immediate future at least, sitting alongside private ownership. MaaS and private car ownership are not mutually exclusive, but a future with autonomous (driverless) vehicles and only private car ownership is probably unsustainable.

# Autonomous Cars to Drive on Roads without 3-D Maps

Self-driving cars hold promise to revolutionize our world by changing the very way we commute but there are factors that put limitations on scope of its wide scale adoption. Self-driving vehicles can operate in a very limited area as they require hand-labeled 3-D maps, we can see companies like Waymo, Uber etc spend hours labeling the exact 3-D positions of lanes, curbs, off-ramps, and stop signs before testing their autonomous vehicles.

This criteria also puts a question mark on the deployment of self-driving cars on country roads as these roads do not possess reliable lane markings also they are sparsely connected, cover vast areas and are prone to changes with conditions.

In this line MIT Computer Science and Artificial Intelligence Laboratory has developed a framework, named MapLite, that allows self-driving cars to drive on roads without 3-D maps. The framework uses crowdsourced topological map, open street map (OSM), with a local perception system for navigating individual road

segments. It relies on the fact that although GPS data is not precise enough for autonomous driving, it is precise enough to enable topological localization, and consequently can be augmented with local perception to solve the full autonomous navigation problem.

MapLite uses 3D LiDAR sensors to robustly track road boundaries and estimate the road surface edges without any assumptions about road markings and only a very loose prior knowledge about the road geometry. The individual road boundary detections is then fused together with the vehicle odometry, in a probabilistic framework.

The full perception system runs on a standard PC at 5Hz and can reliably detect the road up to 35m in advance, which means that it can enable the car to travel at speeds well exceeding 30m/s (67mph). The speed can be much increased if the method was parallelized and implemented on a GPU.

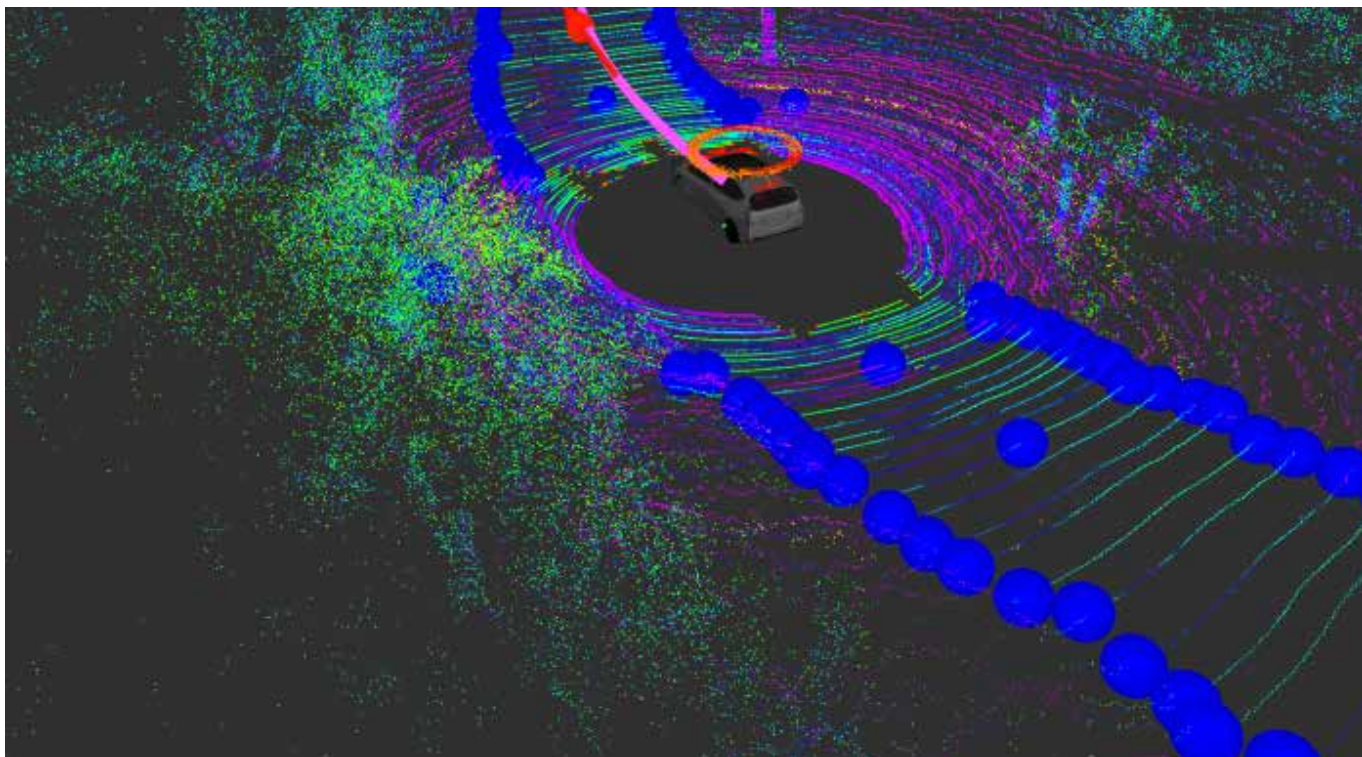
The system works by first choosing a “local navigation goal” within the sensor view of the vehicle as a waypoint leading to the global goal. The local perception system

then generates a feasible trajectory in the vehicle frame to reach the waypoint while abiding by the rules of the road for the segment being traversed.

These trajectories are updated to remain in the local frame using the vehicle’s odometry and the associated uncertainty based on the least-squares residual and a recursive filtering approach, which allows the vehicle to navigate road networks reliably, and at high speed, without detailed prior maps.

MapLite differs from other map-less driving approaches that rely more on machine learning by training on data from one set of roads and then being tested on other ones. This minimalist approach to mapping enables autonomous driving on country roads using local appearance and semantic features.

MapLite still has some limitations as it isn’t yet reliable enough for mountain roads, since it doesn’t account for dramatic changes in elevation. The team is working to expand the variety of roads that the vehicle can handle.

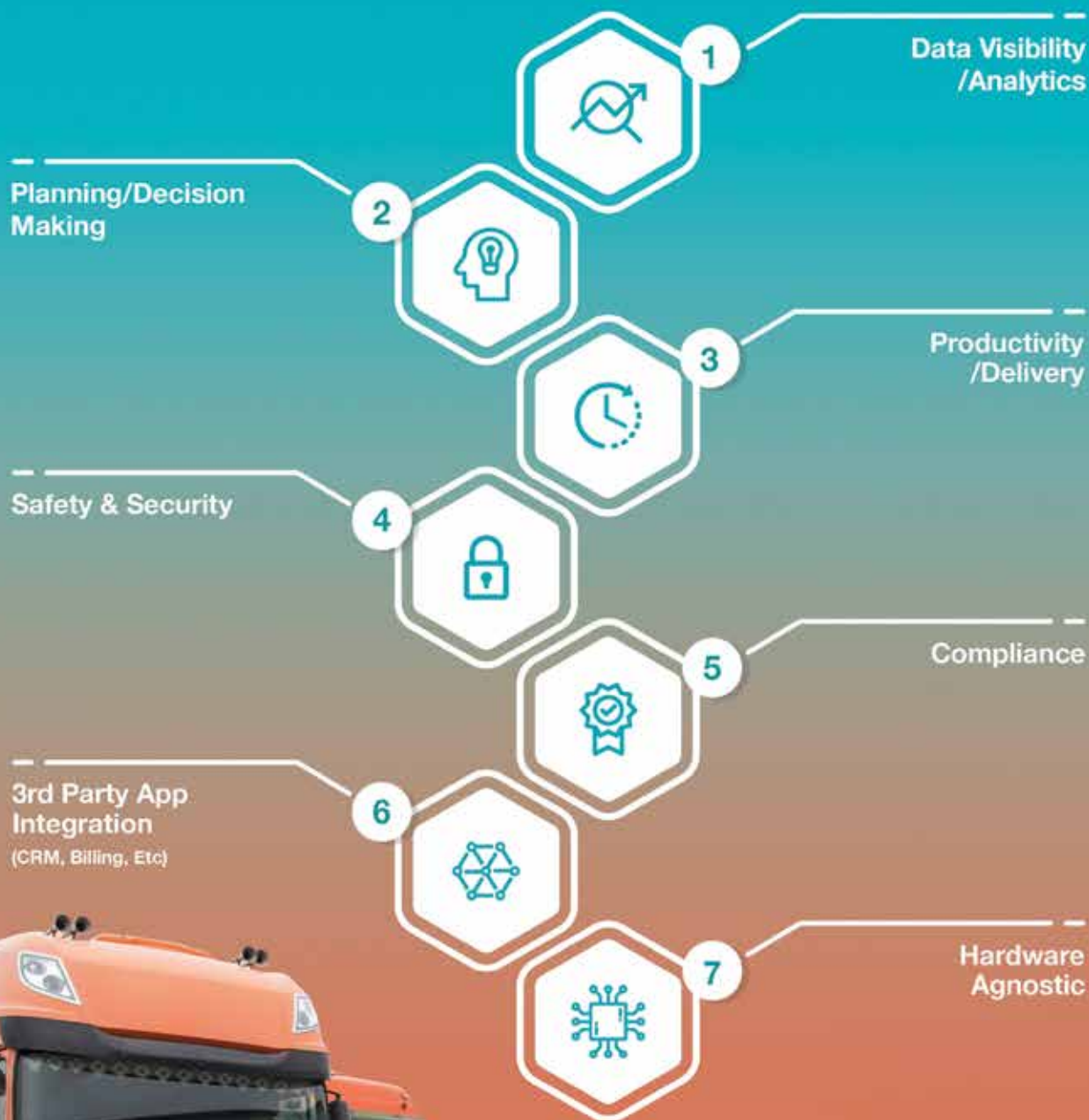


(MapLite uses perception sensors to plan a safe path, including LIDAR to determine the approximate location of the edges of the road.)

Image Courtesy: CSAIL



# IoT Fleet Management Solution



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# Are We Ready to Hit The Road With Connected Cars?



**Sudhir Tangri**  
Country General Manager &  
Vice President  
Keysight Technologies

Sudhir Tangri has led major business transformation programs across multiple business leadership roles. He has been in the Test & Measurement & Telecommunications Software & Semiconductor industry for over 20 years.

**B**y 2025, every car on the road will be “connected” in some way. The connected car combines the vehicle, communications, and the Internet of Things. Given the mission-critical safety requirements of modern vehicles and the need for interchangeable multi-vendor components to work together reliably, designers face more challenges than ever before.

Self-driving cars are a technological advancement causing widespread wonder and they are getting closer and closer to becoming a viable method of transportation. Self-driving cars, are purely analytical, relying on cameras, radar, and other sensors to navigate. It sounds really fun, but that is where the security issue comes in. Once hackers get into the

internet-connected car, they could disable the air bags, brakes, door locks and even steal the vehicle. Since these cars have multiple connection points, there are even more entry points for hackers.

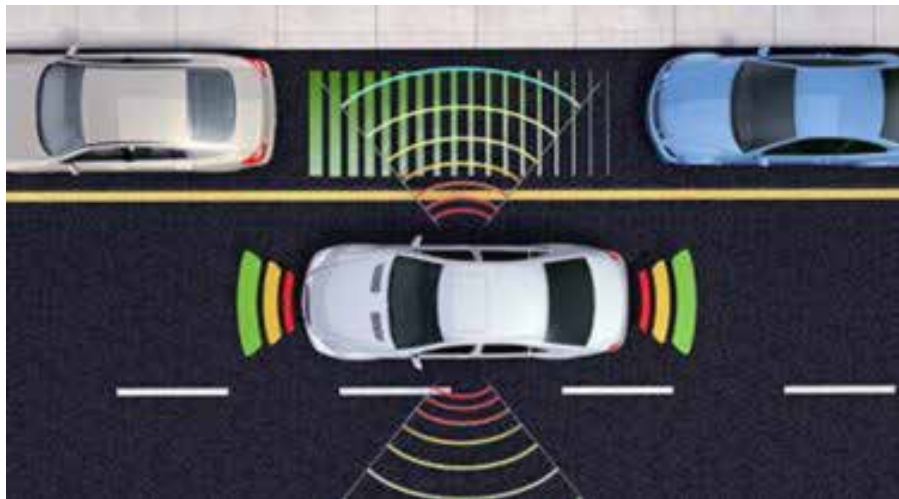
None of these hacks have yet been demonstrated with regular vehicles on the road. But they show how cyber security is becoming a big challenge to the automobile industry, especially as vehicles incorporate more and more driverless technology. One of the best ways to protect connected cars from this growing threat is by building security into the design of the vehicles. This means, for example, ensuring that there are no conflicts, errors or misconfigurations in individual components. Fully assembled cars should be tested more rigorously to ensure that the final product lives up against security hacks, using methods such as penetration testing, whereby systems are purposefully attacked to expose flaws. This in turn would mean better tools and standards that would force everyone in the industry to factor in security right from the start.

Applying radar technologies to advanced automotive helps drivers to avoid potential risks from other vehicles, pedestrians and objects on roads and makes self-driving cars possible. The major applications of

automotive radars are advanced emergency braking, blind spot monitoring, lane change assist, adaptive cruise control, parking assist, front and rear cross traffic alert, stop-and-go, and more. Hence, Keysight provides various automotive radar solutions from design simulation to signal generation and analysis tools.

From the technology point of view, radar technology has been widely used mostly in the aerospace and defense industry earlier and during World War II, so it's not brand new technology. Even for automotive radar research, the first projects happened in the 1970's – that's a long time ago. However, widespread application of radar technologies in the automotive consumer market is fast growing these days. It started with high-end passenger cars, but these days, more and more trucks and low-end passenger cars have automotive radar sensors mostly for better safety as well as more convenience (eg: Stop & Go at the traffic jam).

Automotive radar detects distance (range) and motion, including velocity and angle. Radar systems have several benefits. They work in almost every condition, use reflected radio waves to detect the obstacle behind other obstacles, and have fewer signal processing requirements. On the other hand, there are some limitations.





For instance, radar cannot interpret what the obstacles are (eg: human, dog, another car, paper box, or even if it's a huge heavy refrigerator dropped on the highway). It simply detects the presence of an object without providing information what it is. This is a key reason why radar may not be able to provide enough data characterization to enable a full autonomous driving system due to limited information about the detected obstacles.

As each sensing technology has pros and cons, the industry currently can't just depend on a single sensing technology for autonomous driving research. However, radar technology plays more roles in Advanced Driver Assistance System (ADAS), which is already currently a tangible way to save more lives by using technology to mitigate human driver errors. It is a good bridging platform before fully autonomous driving cars come into real-life. Applications of ADAS include radar-based emergency braking systems, forward collision warning, blind spot detection, rear collision warning system, adaptive cruise control, and many more applications that help enable safer driving.

Connected cars are typically equipped with wireless access and WLAN. This allows the car to communicate via the internet with other devices, both inside and outside the vehicle, and with other vehicles and nearby infrastructure nodes. Connected cars share information on road and traffic conditions to allow nearby cars to take appropriate action. Many refer to this as V2X or "vehicle to anything" communications. Some of the wireless technologies used include cellular, LTE, LTE-Advanced, WLAN, Bluetooth, and near-field communication (NFC). 5G will also be used.

Though self-driven cars are something that we cannot ignore, as it is the next big thing, we should be prepared for it with the right support infrastructure. Technology giants, carmakers, startups and ride-hailing firms are already engaging themselves in a furious battle to dominate this emerging industry. Probably we will have to do multiple test drives before we hit the road with this one!

# Vision Zero Network

The Vision Zero Network is a collaborative campaign helping communities reach their goals of Vision Zero i.e. eliminating all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all.



Image Courtesy: Vision Zero Network

It is a nonprofit project and engages in defining, building momentum, and advancing Vision Zero in communities across the U.S. The Network convenes leaders in the realms of public health, transportation planning & engineering, policy, law enforcement, community advocacy, and the private sector to develop and share promising strategies and to support strong, distributed leadership that make Vision Zero a reality. Some of its important works include.

- ▶ Helping to grow the number of U.S. communities committing to Vision Zero from just two to more than 30 today;
- ▶ Establishing expectations for the necessary strategies that lead to a successful Vision Zero commitment;
- ▶ Sharing policies and actions that support core principles of Vision Zero, such as managing speed and centering equity and inclusiveness;
- ▶ Offering peer exchange opportunities among recognized Vision Zero communities to share successful strategies, techniques, and resources as well as guidance on challenges that arise;
- ▶ Developing practical resources for Vision Zero leaders, such as Guidelines for an Effective Vision Zero Action Plan, Moving from Vision to Action, and Equity Strategies for Vision Zero Practitioners;
- ▶ Meeting directly with city staff and community members in existing and emerging Vision Zero communities to support their efforts;

- ▶ Providing a voice for Vision Zero at the national level, including as a Steering Group member of the U.S. Department of Transportation's Road to Zero Coalition, which has set the first-ever goal of zero traffic deaths nationwide by 2050; and
- ▶ Partnering with national organizations to affect policy change on core issues such as speed management.

AT&T and Fleet Complete are teaming up as a charter business member of the Vision Zero Network that helps communities eliminate traffic fatalities and severe injuries through connected vehicle solutions.

With telematics, predictive analytics and near real-time traffic data, AT&T and Fleet Complete will help cities reach their goals of zero traffic deaths and debilitating injuries among drivers, pedestrians, bikers, and transit users.

The companies will provide technological capabilities and performance metrics to drive the initiative through connected vehicle solutions that can help address aggressive driving patterns quickly and efficiently.

The AT&T Fleet Complete comprehensive telematics platform will help enable strategies to mitigate dangerous driving behaviors through the Vision Zero Network for the state, county, and city departments, including First Response teams and Government agencies.

The solution combines safety technologies with detailed reporting in near real time on speeding, harsh braking, fast acceleration, cornering and crash detection. Moreover, its enhanced predictive analytics will help identify potential unsafe patterns and risks associated with aggressive driving. The platform also delivers:

- ▶ In-cab coaching through advanced driver assistance system (ADAS); and
- ▶ Proactive vehicle maintenance alerts with detailed engine data.

Metropolises like Los Angeles, San Francisco, Chicago and New York, among many others, have already begun blazing the path for Vision Zero by engaging key city agencies such as Police, Transportation and Public Health, to drive this initiative.

# Blockchain in Transport Alliance (BiTA)

A consortium Blockchain in Transport Alliance (BiTA) is working to apply blockchain to the trucking industry. Blockchain based on distributed ledger technology facilitates recording transactions and tracking assets in a network. The alliance claims that this technology can help solve some of the most intransigent problems in the industry.

Many companies across the trucking supply chain, like UPS, Salesforce, McCleod

Software, DAT, Don Hummer Trucking, have joined BiTA, and there are about 1,000 more applicants.

BiTA aims to create a common framework to spur the development of blockchain applications for logistics management, asset tracking, transaction processing and more.

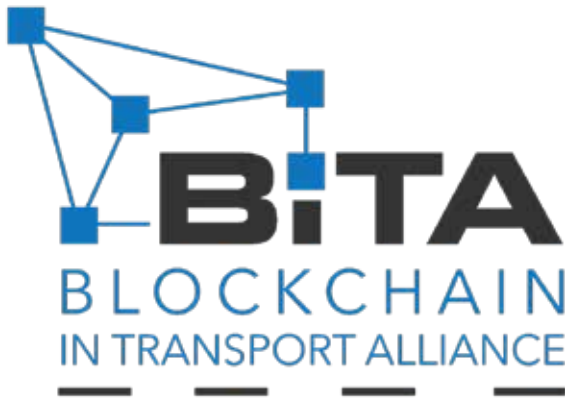
Trucking is considered an inefficient industry as manufacturers have a hard time finding trucks to transport their goods at the same time truckers drive more than

30 billion miles with partial or empty truckloads. It is claimed that blockchain could make the entire trucking supply chain more efficient.

Blockchain also ensures security of data and non centralized control as the 'blocks' are linked and secured by cryptography ensuring blockchain cannot be modified or corrupted. As the ledger is distributed, there is no single central authority that's in charge of certifying the information.

For blockchain to be implemented all players must agree on how to characterize their data the BiTA is working on the standardization of data. It is also working with the influential leaders in transportation, finance and technology to build the first set of transportation industry-specific blockchain standards.

BiTA standards will offer greater insights, visibility and efficiencies across all areas of transportation. Some areas BiTA standards will address include Smart contracts, Freight payments, Asset maintenance, Ownership history etc.



## eSync Alliance aims to provide standardized and interoperable OTA and diagnostic-data solutions

The automotive industry today is going through a transitory phase where there is an increased role of software in every part of the vehicles. A number of companies are adding autonomous and connectivity features in their cars. But with these advancements there has also been a rise in the complexity in the designing of the cars engendering threats of security breaches and hacking. The need for OTA updates and diagnostics are becoming indispensable in this scenario but only a small number of proprietary solutions are available in the market that have too narrow a scope.

The eSync Alliance aims to address this by creating a community of companies that cooperate to provide standardized and interoperable OTA and diagnostic-data solutions. It is fostering a complete ecosystem of OEMs, Tier 1s and Technology

providers working cooperatively to provide eSync compliant components.

The alliance is designed to support full vehicle OTA solutions as well as vehicle diagnostics and telematics data-management with end-to-end security hence reducing the time and risks of developing and deploying fully connected cars.

To be marked eSync Compliant the companies need to meet the program

requirements, which include criteria for conformance to APIs and specific features. The compliant mark ensures a common OTA data path reaching all the different electronic devices in the car, streamlining integration and testing efforts.

eSync is also agnostic to OS and in-vehicle network and scales from the smallest sensor or body control module through infotainment to autonomous driving.

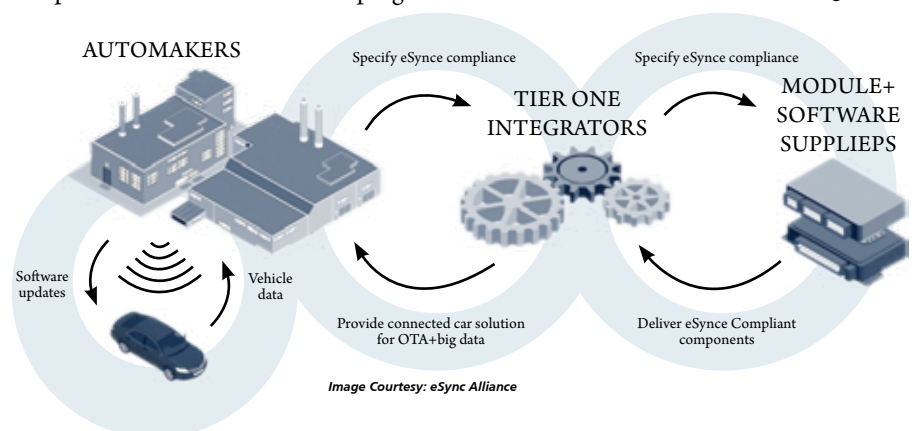


Image Courtesy: eSync Alliance



# MOBI, the Mobility Open Blockchain Initiative

Several automakers and technology companies have joined hands to form a consortium to explore blockchain and its role in reinventing mobility and addressing industry shifts. Some prominent names being BMW, Bosch, Ford, General Motors, Groupe Renault, IBM, ZF etc.

Named MOBI, the Mobility Open Blockchain Initiative, the consortium seeks to foster an ecosystem where businesses and consumers have security and sovereignty over their driving data, manage ride share and car share transactions

Working in a consortium allows MOBI and partners aim to create transparency and trust among users, reduce risk of fraud, and

reduce frictions and transaction costs in mobility, such as fees or surcharges applied by third parties.

Through an open-source approach to blockchain software tools and standards, the MOBI consortium hopes to stimulate more rapid and scalable adoption of the technology by other companies developing autonomous vehicle and mobility services.

MOBI's approach to ecosystem development is open and inclusive, inviting stakeholders from across the entire mobility value chain this includes automakers, public transportation, toll road providers, other forms of transportation, technology firms, blockchain firms, academic institutions, startup innovators, and regulatory bodies

across the globe – all designed to further the MOBI's mission.

Initially, MOBI will be working with its partners on projects related to:

- ▶ Vehicle identity, history and data tracking
- ▶ Supply chain tracking, transparency, and efficiency
- ▶ Autonomous machine and vehicle payments
- ▶ Secure mobility ecosystem commerce
- ▶ Data markets for autonomous and human driving
- ▶ Car sharing and ride hailing
- ▶ Usage-based mobility pricing for vehicles, insurance, energy, congestion, pollution, infrastructure, etc.

## FASTR

With Automotive sector undergoing dramatic transformation of software content, connectivity, infotainment services and autonomy there are also threats emerging related to cybersecurity.

In this front, FASTR is an attempt to marshal collaboration among the vanguard of the world's leading R&D organizations for security of self-driving vehicles working to reduce attack surfaces and harden cybersecurity capabilities.



FASTR was founded by Aeris, Intel and Uber in 2016 as a neutral nonprofit research consortium bringing together the full cast of contributors-- OEMs, Transportation network companies, Automotive supply chain providers (Tier 1s and Tier 2s), Autonomous vehicle specialists, SoC providers and hardware and software suppliers, Specialist automotive security companies, Academics, researchers and hackers -- to the organically secure vehicle of the future.

It works with the understanding that automotive security is not a problem that can be solved by a single organization and the magnitude and scope of the emerging challenges demand industry-wide response.

The inclusive consortium provides the neutral and open environment through which the increasingly diverse automotive ecosystem can proactively collaborate within a system-of-systems perspective.

Recently, it has joined hands with GENIVI Alliance.

## OmniAir Consortium

OmniAir Consortium, an industry association promoting interoperability and certification for connected vehicles, ITS, and transportation payment systems. It was founded over 10 years ago and its members are Connected Vehicle, Intelligent Transportation Systems (ITS) and Road Tolling technology device manufacturers, ITS deployers, testing laboratories and other stakeholders, all promoting the proliferation of certified, interoperable devices.

The consortium of public agencies, private companies, research institutions, and independent test labs provides the opportunity for members to work collaboratively to develop and vote on requirements for national certification programs.

In the field of connected vehicles, the consortium develops testing and certification programs for vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), and vehicle-to-everything (V2X) devices as part of its mission to promote a robust, secure communications system for cooperative driving. The consortium in this light is playing an important role.

In October last year the consortium had launched the world's first vehicle-to-everything (V2X) device certification program for the connected vehicle market. Recently, BlackBerry joined the consortium and announced that it will work with other members to help with testing, certification, and deployment. The companies like Panasonic, Qualcomm, Savari, Toyota, Siemens, NXP, LG, Visteon, Aptiv, Denso are associated with the consortium in some or other form.

# Connected Cars Fuelling The Need For Application Performance Monitoring



**Simon Horrocks**

*Regional VP Australia and New Zealand  
AppDynamics*

Simon has spent over 30 years in IT, mostly at start up and early stage organisations. He has founded the European and Asia Pacific territories for several US-based technology firms. Simon holds an MBA from Deakin University and is a regular speaker at Asia Pacific technology events.

The connected car market is predicted to be worth \$USD219 billion by 2025, with the Asia-Pacific region projected to be the largest market for connected cars in this time frame. What's more, digitally connected roads will soon become a reality in Australia, with reports indicating that the Victorian capital of Melbourne, Australia's second largest city, will have a majority of its roads digitally connected within 10 years, while toll road operator, Transurban has offered funding to a local Australian startup to develop "smart" roads. The advancements in connected cars and roads will herald a new era in transportation data monitoring and capture. Connectivity will therefore become the driving force behind the automotive industry.

So it then becomes apparent that car vendors must fast become software companies – but the transition from pure hardware vendors to software companies isn't as easy as simply deciding to do so, it's incredibly difficult and requires a completely new set of skills. A recent report by the Victorian Automobile Chamber of Commerce revealed that as electric, autonomous, and connected vehicle technologies grow in popularity, the industry will experience a need for "significant upskilling", leading to the creation of new jobs. It also comes with a need for critical reassessment of the monitoring and capturing of all this new data. As cars become increasingly connected to networks via built-in connectivity, new challengers will enter the market to uproot traditional car brands, meaning that manufacturers must re-focus on a car's performance and reliability in the realm of software and connected services.

Lending to the already difficult transition from being simply a car manufacturer to also a software company, is the current state of software in cars. Currently, car applications are typically connected to multiple third-party services such as messaging applications and weather applications, as well as hardware such as smartphones and smartwatches that must be integrated and compatible. Whilst most modern cars manufactured after the late 90s come built with computer systems and sensors that can monitor diagnostics such as engine performance, most cars lack any way to monitor the customer experience for the driver or passengers -and considering the average connected car has approximately twice as many lines of code as the Large Hadron Collider, there's a lot to monitor and even more to deliver on when it comes to the technology behind connected cars.

## Connected cars driving demand for application monitoring

From built-in safety features and entertainment, to navigation systems and

insurance telematics, beyond ensuring people can travel smoothly from point A to B, car manufacturers are now tasked with providing a great digital experience. Whilst it's all well and good providing these services upfront, the nature of integrated systems and need for constant application updates make compatibility issues inevitable. In order to avoid incompatibilities in the connected car environment, all parties involved – from application development, to software, hardware, automotive mechanics, and third party partners – must ensure they have visibility of their applications down to the base code levels at all times. When something does go wrong and an application begins to behave abnormally in a connected car, identifying the root cause is imperative for fast remedy.

With application performance monitoring, operations teams can pick up on compatibility obstacles or software bugs instantly, and send fixes to these applications through automated online systems that can provide updates "over the air." This provides a significant point of difference from a feature point of view for car manufacturers looking to develop a competitive advantage in application performance. As the world becomes increasingly connected, those manufacturers, such as Tesla that offer constant application updates to improve performance and offer new features such as self-driving capabilities will stand out from the pack.

## Cars as Personal, Mobile Hubs

Being able to view complex ecosystems of applications and monitor their performance has a two-pronged benefit for the connected car industry: firstly, any bugs within the applications can be updated well before a consumer is even aware of any issue. Secondly, the analytics gleaned from such monitoring allows developers to understand how applications are used by different drivers, sending useful information to car manufacturers and



technology partners to ensure a highly-personalised in-car experience.

For many, a car is more than just a means of getting from A to B – it is an extension of their identity and individuality. The most rudimentary features of any connected car, such as access to hands-free mobile, built-in GPS systems and infotainment for music and audio-visual, are now a part of any car-buyers' expectations. Application performance monitoring will be the next frontier to the personalisation customers are craving. Personalisation will also be the one core aspect car manufacturers need to stand out in an increasingly crowded market.

Since the automotive sector either needs to either develop its own technology to meet buyers' demands, or look to broker

partnerships with technology vendors who can provide the hardware and software needed, monitoring for data, issues, and compatibility will make or break success in these complicated networks.

#### **A new safety frontier**

New features made possible by connected cars, such as lane assist and automated emergency braking are some of the core ways application performance monitoring can be applied to enhance the autonomous car experience and ensure greater safety. With legislation regularly being reviewed surrounding safety requirements within cars, and particularly with the rise of driverless cars, it is imperative that any glitches and security breaches of these safety systems are addressed immediately. Any neglect or incidences should not

be tolerated and could have disastrous impacts.

To have the most efficient, modern safety feature in a connected car, they must be designed as embedded systems, which contain the hardware, software, and connectivity features in one unit. This way, manufacturers can have the assurance that safety features within vehicles can be easily activated when needed. The use of firewalls can also add to the confidence that any glitch or bug contained in one service or application do not place other essential mechanisms at risk.

As automobile manufacturers, suppliers, and technology partners jostle for market share in this burgeoning industry, it is essential that application performance monitoring is not neglected. ■■

## **BMW i launches factory-fitted, fully integrated inductive charging facility**

BMW i has launched what it claims world first in the form of a factory-fitted, fully integrated inductive charging facility for the high-voltage battery in a plug-in hybrid vehicle. Production will start in July.

As part of the BMW Group's NUMBER ONE > NEXT strategy, the company has developed groundbreaking charging technology that greatly enhances the ease of use and everyday practicality of electrified vehicles.

BMW Wireless Charging option can be ordered now as a leasing-option for the BMW 530e iPerformance. The product offer starts with Germany, subsequently followed by the UK, the US, Japan and China.

BMW Wireless Charging enables electric energy from the mains supply to be transmitted to a vehicle's high-voltage battery without any cables – when the vehicle is positioned over a base pad. This can be installed in the garage, for example, and the charging process started as soon as the vehicle has been parked in position (without any further input from the driver).

BMW Wireless Charging employs the same inductive charging technology

already widely used for supplying power to devices such as mobile phones and electric toothbrushes to now also recharge the high-voltage batteries in electrified vehicles.

BMW Wireless Charging consists of a Inductive Charging Station (GroundPad) and a secondary vehicle component (CarPad) fixed to the underside of the vehicle.

The contactless transfer of energy between the GroundPad and CarPad is conducted over a distance of around eight centimetres. The GroundPad generates a magnetic field. In the CarPad an electric current is induced, which then charges the high-voltage battery.

The system has a charging power of 3.2 kW, enabling the high-voltage batteries on board the BMW 530e iPerformance to be fully charged in around three-and-a-half hours. And with an efficiency rate of around 85 per cent, charging with the BMW Wireless Charging system is very efficient, too.

BMW Wireless Charging also helps the driver to manoeuvre into the correct parking position. Via a WiFi connection a communication between the charging station and vehicle is being established.

An overhead view of the car and its surroundings then appears in the Control Display with coloured lines that help guide the driver while parking. A graphic icon shows when the correct parking position for inductive charging has been reached. This can deviate from the optimum position by up to seven centimetres longitudinally and up to 14 centimetres laterally.

The launch of this technology sees the BMW Group move another step closer to an infrastructure that will make charging the battery of an electrified vehicle even simpler than refuelling a car with a conventional engine.

The company is also one of the co-founders of the IONITY joint venture, the BMW Group is currently teaming up with other carmakers to set up a Europe-wide fast-charging network with up to 350kW charging power for electric vehicles that should boast around 400 stations by 2020.

In addition, the ChargeNow service, originally launched by BMW I, now offers access to more than 130,000 aggregated charging points in 32 countries. It is the largest global network of its kind.

# The Road to Zero Coalition, a report laying out strategies to end roadway deaths in the U.S. by 2050

**T**he Road to Zero Coalition, managed by the National Safety Council, recently released a report laying out strategies to end roadway deaths in the U.S. by 2050. Road to Zero Coalition represent a variety of stakeholders in traffic safety—professional engineering and planning organizations, public-sector organizations, safety advocates, vehicle manufacturers, technology developers, public health, emergency medical and trauma organizations, and law enforcement and judicial system representatives.

The Coalition, in the report written by the RAND Corporation, a nonprofit, nonpartisan research institution, identifies reasons for the accidents occurring on our streets and proposes measures that can help reduce this. The report identifies the current vehicle and roadway designs as the first reason behind requires drivers to be constantly alert and vigilant but eventually drivers get distracted or impaired which creates misalignment between human behavior and system design leading to crashes.

It also points out to absence of safety features in cars—seat belts, airbags, improved door locks—and roadside safety hardware, such as breakaway sign poles as another cause. The third cause behind the fatalities and deaths due to crashes according to the report is the absence of emergency medical personnel capabilities, and inability to reach an appropriate trauma center.

The report intends to inform and help coordinate future efforts in traffic safety across multiple stakeholders and lays down into three key points:

- Double Down on What Works.
- Accelerate Advanced Technology.
- Prioritize Safety.

The report says reducing roadway deaths to zero in 30 years is feasible and a situation can be reached by 2050 where not a single person in America dies in a traffic crash by the use of technology, innovation in road design, innovative financial products, efficient emergency response systems and creating a safety culture.

It proposes high level of vehicle automation—self-driven or human-driven— and wide

use of technologies such as automatic braking, warning systems for drivers about objects in their blind spots, automated parking system, lane keeping etc. The report suggests that automated vehicles are not likely to reach their full potential by 2050, but they are very likely to provide a significant safety benefit. Further it says, in the longer term, when vehicles with high levels of automation are fully developed, self-driving systems promise to have a tremendous impact on safety.

Next it suggests the crashes can be reduced by innovative road design ie roadways designed to reduce speed in safety critical areas and lessen the chances of the most severe crash types, such as head-on collisions, while allowing faster travel in areas that are safer and where there are few potential conflicts among vehicles or between vehicles and pedestrians or cyclists.

The categorization of the road areas according to risks can be done by collecting and analyzing detailed data. It also talks about techniques that would be entirely performance-based, resulting in more innovative configurations leading to improved safety. Techniques like physical separation of opposing traffic lanes, safer pavements that eliminate edge drop-offs, and surfaces that help prevent skidding can also bring down the rate of fatalities.

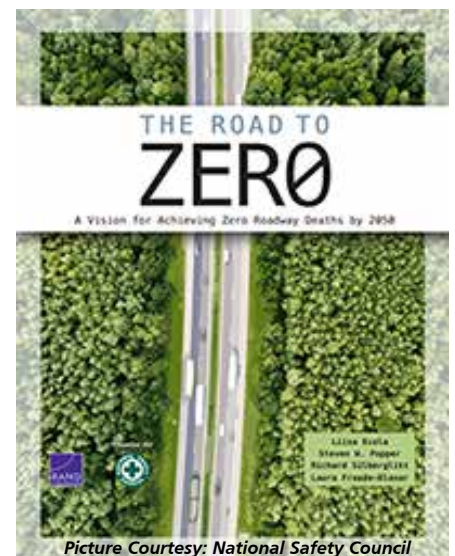
It says that the rural areas witness more traffic accidents than the urban areas this safety gap between rural and urban areas if not closed, by the use of technology, it can be narrowed down. For this it would require investments in trauma care, and emergency response, with enhanced connectivity for faster crash notification, improved injury prediction, better communication more-effective emergency medical care etc.

These steps also need to be backed by policy changes that protect the most-vulnerable road users and incentivize safe driving and adoption of advanced safety technology. Here insurance companies and innovative finance methods, such as social impact bonds that pay investors for positive outcomes and create opportunities for large-scale renewal and improvement projects, can come into play by incentivizing the use of automated vehicles, especially by high-risk drivers.

There also needs to be development of mobility service, some cities and companies that manage a variety of mobility options through a single account—“mobility services”—can make it easy to get around without having to drive, and they can also be early adopters of advanced safety technology.

Efforts should be made to create a “safety culture”, says the report, that emphasizes the value of safety in every decision made by every person. Safety has to become a shared responsibility among those who use the system and those who design and operate the system.

The report argues eliminating roadway deaths can lift quality of life in on an individual level as well as at the broader level, by reducing the financial effects and saving time.



Pointing out the urgency the reports states that roadway deaths are moving in the wrong direction and a troubling reversal in previous progress is being witnessed. Young people, men and pedestrians are being affected disproportionately, there it requires strong leadership from safety-minded policymakers at the local, state, and federal levels to adopt laws, regulations, and funding for effective policies.

Although the report is directed towards the conditions in USA, the report has several takeaway points for a country like India which also is battling huge number of deaths and economic losses due to road fatalities.



# AWare ecosystem

**R**enovo has developed OS, built specifically for automated mobility named AWARE platform. Its abstraction layers give automated driving system hardware and software developers a universal interface that lets each manufacturer design a single component that can work in many highly automated vehicles, as opposed to a custom part for each make and model of vehicle.

It provides interfaces for advanced self-driving software with an ecosystem of partners and technology to help speed development. It is vehicle agnostic and ensures cross-platform portability.

Companies like Samsung, Verizon, Velodyne LiDAR, INRIX, Argus Cyber Security etc are working with Renovo to develop and deploy safe HAVs at greater scale by fostering innovation, collaboration, and interoperability among the companies that provide the necessary hardware, software and services.

This month several other companies like CARMERA, Civil Maps, Metamoto, understand.ai and Bestmile also joined the AWARE ecosystem.

CARMERA is a real-time, street-level intelligence platform for automated vehicles. It crowdsources map data from a vehicle-based sensor network, with Renovo as a partner, it can now deliver

mapping services to AWARE-powered fleets while gathering updated map data at the same time. High-definition 3D mapping technology is vital to the success of any AMaaS deployment. CARMERA's maps are continually updated, allowing automated vehicles to localize positions in the world with centimeter accuracy. The constant updating also powers intelligent path planning decisions ahead of time, optimizing for navigation efficiency, pedestrian safety and passenger experience.

Civil Maps has also teamed up with Renovo to provide highly automated vehicle makers and technology providers with seamless access to Civil Maps' vehicular cognition stack. Through this technical collaboration, self-driving systems and other automotive modules that integrate with Renovo's AWARE-- the first OS built specifically for automated mobility-- will be immediately compatible with several key aspects of Civil Maps' platform, a lightweight, highly scalable solution to HD map creation, usage and continental-scale crowdsourcing.

Moving forward, the two companies will work together to standardize abstraction layers that sit between Civil Maps' mapping and localization systems and OEM sensor configurations, decision engines, human machine interfaces (HMIs), and control systems. This collaboration will result in a universal interface, architected by Renovo, that will provide plug-and-play

compatibility with Civil Maps' vehicular cognition stack for all other modules in the fast-growing AWARE ecosystem, thereby providing significant time and cost savings for developers.

Bestmile has also joined mobility operating system (OS) maker Renovo's AWARE Ecosystem. Bestmile is a mobility services platform used to operate, manage, and optimize highly automated vehicle fleets.

The integration of Bestmile's Mobility Services Platform makes highly automated vehicles using Renovo's AWARE OS "fleet ready," as Bestmile's technology enables automated vehicles to work together as intelligent fleets, delivering on-demand services with automated dispatching, traveler communication, route optimization, pooling, and energy and maintenance management.

Thus Bestmile's platform can be used to deploy, manage and optimize automated mobility on demand "robotaxi" services using these vehicles regardless of type or the automated driving system used.

Metamoto, a Silicon Valley startup offering scalable simulation solutions for autonomous vehicles is another company to join the AWARE ecosystem of Renovo, a mobility software technology company.

Automated Mobility fleet deployments built using Renovo's AWARE OS now have access to Metamoto's Simulation as a Service offering for highly automated vehicles. Metamoto's simulation system technology allows Automated Mobility companies and engineers to conduct millions of simulations daily in a risk-free environment. Metamoto's cloud-based simulation tools accelerate feedback cycles for autonomous system training, testing, debugging and validation workflows.

Understand.ai is another company which has joined AWARE ecosystem. Now understand.ai technology is available to companies using the AWARE OS and can be integrated directly into the AWARE data processing pipeline, ensuring that data captured by vehicle fleets can be anonymized in compliance with GDPR.



Image Courtesy: Renovo Motors Inc

# Transforming the Transportation and Logistics Sector With Enterprise Mobility Solutions



**Nandakumar Somasundaram**

CEO

NDOT Technologies

Being the firm believer of the intelligent transportation system, Nandakumar Somasundaram, has envisioned to built tech tornadoes to disrupt the industry.

**T**ransportation drives economic growth and is an ever-evolving industry where things are happening in large scale. Changing customer needs push transportation companies to be more proactive in delivering services whether it may an on-demand or cargo carrier.

Being in the field for over a decade, NDOT has diagnosed the necessities of the transportation sector and comes up with a solution that can vamp up the business activities while simplifying and streamlining the processes. It is possible only with the implementation of integrated management system through which a proper channeling of the communications can happen among staff, customers, and other sources involved. Since the industry has taken its digital journey that will continue to accelerate in the forthcoming era with the advent of new technologies, NDOT has stepped in with the transformational ideologies.

## NDOT: The Revolutionizer of the Transportation Industry

If technology drives the future of transportation, NDOT would be the revolutionizer of the sect. It has taken a mission to help organizations grow highly productive and be customer-centric by enabling access to information. The development of an integrated global economy activates the necessity of the businesses to reach even distant locations and set selling points at different regions; the trend has grown bigger over years with the corroboration of technological advancements. While solving plenty of issues in the present-day business, enterprise mobility becomes the need of the hour. We have involved hub of resources in the process of developing efficient tools and put them on research to innovate ways to improve the different facets of the transportation business with the high-end technology.

While addressing the key challenges in the industry, NDOT has projected enterprise mobility solutions to reduce downtime and operating costs, increase productivity and optimize business processes, enhance operational efficiency, and let the mobility define the way the transportation companies deliver services. It is not only a management software but also a complete mobility solution that would meet the

critical standards of the industry by being adhered to the values of the organizations. This well-equipped software is designed to ease the trivial processes and simplify the complexities involved in dispatching, tracking, and delivering.

Our transportation software is crafted to suit the orientation of transportation business and its needs. Therefore, they can get connected seamlessly and fill the communication gap and logical distances with effectively integrated technology support that will ultimately pave way for businesses to grow phenomenally. By means of our futuristic solutions, we aim to provide an end-to-end solution that best suits the needs of transportation business and their diversified requirements.

## Mobility Solution for On-demand Transportation

Transportation has undergone a severe transformation in the recent years, especially the taxi industry. The advent of taxi applications brings tremendous changes in the sector and helps many industry giants make money and gain popularity all over the world. Such big players become the nightmare for the small-scale investors and put the start-ups in jeopardy. As a means to help such fledging enterprises, NDOT has begotten the TaxiMobility. The process of developing this innovative mobility solution has been initiated with the clear





understanding of the taxi market. With a lot of researches and efforts to study the pain points of the taxi companies/aggregators, NDOT has provided the taxi businesses with an all-in-one management software that can revolutionize the way they were doing business earlier. Being an integral part of taxi business, this taxi management software plays a greater role in transforming the entire industry with its easiness and simplicity.

TaxiMobility is a complete mobility solution for transportation companies that move people with the supportive, feature-rich applications for drivers and passengers. This comprehensive taxi management software is designed to support not only taxi services but also services such as bus charter, corporate shuttle, NEMT, or anything that moves people from place to place. It would not be an exaggeration to say that NDOT's TaxiMobility has elevated many taxi start-ups who were going invisible in front of the big players in the field. Anyone who wants to excel in taxi business or has an idea to start a taxi aggregation, TaxiMobility would be the right destination to reach out for all the taxi-related management tools.

### **Integrated System for Fleet Management and Maintenance**

Transportation decides the growth of the nation. After globalization, the necessity of transportation has grown greatly. NDOT's vision to transform the entire industry did not let them stop with the TaxiMobility that paves the way to facilitate the fleet management companies with CerebroX, a comprehensive fleet management and maintenance software, which is an exclusive suite of innovative tools to track, dispatch, and manage fleet operations. This mobility solution for logistics and carrier enterprises has been designed to equip them with a weapon to have a better control over

dispatching, live tracking, delivering, fuel analytics, and maintenance management.

The extensive team of CerebroX has understood the scope of the product in the market and has incorporated Big Data, Internet of Things (IoT), and Artificial intelligence as a way to equip the product with connected intelligence. Such trending technologies can predict future sales or demand, forecast traffic and weather, diagnose fleet issues in advance, schedule maintenance, and many more. Thereby, it enables the business operators to get detailed analytics on business operations identifying crucial issues and relevant information to handle critical situations and take informed decisions.

To reduce operational costs and increase the efficiency of the fleet, this solution has been developed that can help logistics and transportation companies to track, assets, manage inventory, optimize delivery routes and schedules, and reduce risk factors associated with fleet management. By that way, CerebroX supports business owners in fleet operations and management with tools for dispatching and scheduling, GPS tracking, route planning and optimization, rates and quotes management, load optimization, monitoring driver behavior, and fuel management; and in end-to-end fleet maintenance management with tools for scheduling preventive maintenance and predicting maintenance tasks.

NDOT's fleet management software, CerebroX, is an intensive assemblage of innovation, technology, and convenience that has been coded with connected intelligence for fleet managing companies to stay on track of all their business activities. It is basically to reform the sector the way it drives before and support the organizations in helping them manage business proceedings and maintain their assets eminently.

*“Speed and reliability matter when it comes to transportation that is geographically dispersed and faces unprecedented challenges”*

### **Advantageous Implementation of Connected Intelligence**

NDOT's two brainchilds have been strategized with the implementation of the connected intelligence backed by the most trending technologies of the era such as IoT, Artificial Intelligence, and Big Data. Big Data has a bigger purpose in the technology world with which a lot can be made. We have equipped our mobility solutions with tools that can activate the data derived from various business activities to bring better outcomes. In the same way, IoT has also been incorporated to help on-demand transportation and fleet management companies connect, communicate, and collaborate and achieve desired business results and improvise the fleet management system. AI has been used to initiate prediction, forecasts, and improved decision-making process, and enrich and augment the competencies and experience.

### **NDOT, the Technocrat for Transporters**

Since its inception in 2008, NDOT has established a stronghold in the transportation domain. Our enterprise mobility solutions are exclusively made for transportation business (whether it may be an on-demand or cargo carrier service) to achieve their objective in a proficient manner. With the innovative features, NDOT has reformed the different aspects of the sector, while equipping the industry players with high-end mobility software. Through the accumulation of TaxiMobility and CerebroX, we are leveraging tech solutions with the hope to enhance the intended portfolio to improve fleet-related business proceedings.



# Telematics: The Next Frontier of Trucking



**A Sreerama Rao**

*Senior Vice President-Sales, Marketing,  
Aftermarket-Volvo trucks  
VE Commercial Vehicles Ltd.*

An engineer by qualification, Sreerama Rao has 23 years of entrepreneurial and professional experience. He has been associated with the organization since 2002.

**T**he biggest developments in technology have probably been in communications, and trucking is no exception. The way trucks and drivers manage their fleet is undergoing a sea change, and it is only going to scale up further in the years to come.

Until recently, infrastructure investment and lack of customer demand sidelined telematics from the broader picture. With mobile technology and smart phones inbuilt internet and GPS facilities having penetrated the length and breadth of India, telematics revolution is gradually making its presence felt. The ease of collecting vehicle and driver data on the phone, is proving to be a game-changer for fleet management. And this has been possible only through telematics technology and the usefulness of this system. In the last few years, vehicle telematics has revolutionized the whole scenario of fleet transport with a new set of innovations. It is shaping the

future of the trucking industry, taking efficiencies and hence, profitability to new levels. The benefits are multifold. It allows constant access to the truck, including monitoring vehicle location and also travel duration. This wireless communication has also made it possible for fleet owners and also drivers to deliver better performance. It takes the estimate and guesswork out of the situation through constant two-way communication. It delivers information to optimize vehicle utilization. Telematics technology improves maintenance and repairs, alerting owners when the service is due. It also improves communication and navigation and hence, fuel efficiencies. Fuel savings have been found to increase. All this data is valuable to fleets as it helps with reduced downtime.

## The Road Ahead

Telematics is becoming an important aspect of the industry and it could soon become the standard norm / default setting for heavy trucks. It is important not only for the health and performance of the trucks, but also ensuring well-being and efficiencies of the business.

This disruptive wireless communication is a fast growing segment. According to a study, the telematics market is estimated to be worth \$39 billion, and is expected to grow at 18% rate by 2022. Major chunk of this pie is going to be dominated by commercial vehicles. And countries like India and China, which are large CV markets, will drive this growth. India, is actually one of the fastest growing telematics markets and the installations in CV is expected to grow to 9.3% in 2023 ( from 2.4 % in 2016) as per a research conducted by Frost and Sullivan.

One of the biggest benefits is also towards safety on the road. These analytics help fleet owners keep track and get insights on driver behaviour and performance. Any damage or loss of trucks due to accidents and thefts are also alerted to the owner.

The growth of telematics, globally, has been in the logistics and supply chain segment in domains such as- information, navigation, safety, and remote diagnostics. Automotive companies have integrated telematics to

monitor vehicle performance and ensure vehicle and passenger security.

## The India Scenario

In India, the main drivers of the commercial vehicle telematics market have been increasing fuel prices that have compelled the fleet operators to opt for telematics. Telematics offers fleet management solutions which will play a significant role in reducing fuel costs by cutting down empty runs, thereby reducing overall vehicle downtime. Other factors that influence the demand of vehicle telematics are the safety and security issues. Road safety and proper traffic management is a huge concern in India and telematics offers efficient solutions in this sphere – such as thorough driver risk assessment technology and driver ratings. Analysis of real-life driving behavior, driving patterns, live alerts and warnings can be produced in case of any violation of safe driving practices, such as over speeding, hurried braking, seat-belt use, indicator use, checking blind spots, engine revving, wrong gear selection and rash acceleration.

Telematics transmits real time data generated by the vehicle to the back-end server which is then converted to meaningful information and reports. This data can be fuel related, distance travelled, error codes, driving pattern etc. Integration of telematics can convert a normal vehicle into an intelligent version with a few cutting-edge features such as fuel management, GPS navigation, vehicle tracking, automatic driving assistance systems support, triggering alerts in case of unauthorized interference, remote service support, SOS transmission of diagnostics information during emergency and other related features. CV manufacturers in India have over a period of time also started to realize that telematics is not just about monitoring, but also about achieving transparency in business processes and efficiency. Remote diagnosis & assistance can help owners in getting improved uptime/turn-around time, while CV manufacturers will benefit by reduced warranty costs through preventive actions, and enhanced customer satisfaction.





Eicher has pioneered the use of intelligent technologies in trucks and tippers to bring a significant improvement in quality, efficiency and productivity operations. Eicher is one of the first players to introduce the Fuel Coaching system in their Pro Series trucks which enables the driver to improve his driving and achieve better fuel efficiency. Eicher Live, a telematics enabled advanced fleet management is a “Live Hub” of real-time communication and actions by customers, dealers and Eicher. It allows the management of truck fleets by monitoring their movement, fuel consumption and maintenance needs. It enables proactive maintenance of the truck. Eicher Live offers granular views at the level of a driver, a vehicle and a time span. It’s a real time dashboard of the fleet, tracking the most important factors. . Together with the fully equipped Eicher service network, this ensures preventive and corrective maintenance of the truck, thus delivering superior uptime.

Telematics does play a crucial role for commercial fleet operators as it will also make legal process more hassle-free as there would be more chances of the said events being recorded in the form of images or

electronics transmissions. It also helps in lowering the vehicle insurance premium. For instance, telematics in vehicles tracks vehicular thefts. Current technologies available are expected to prevent theft of vehicles but very few have solutions that can report theft automatically. This can be done by a vehicle telematics solution. Also, the use of telematics will lower accident probability, leading to reduced insurance premium. Some leading FIs in India (e.g. ICICI) have already started evaluating the telematics factor in deciding insurance premium.

#### **A tool for driver engagement**

Drivers’ community is an important and critical element of CV industry and telematics can help to achieve greater harmony between drivers and owners by increased drivers’ engagement, reliable data for performance based incentives, and enabling safety and infotainment needs of driver. The increasing penetration of affordable smart mobile devices is also helping in increasing telematics’ reach as the service providers are integrating the offering on mobile platforms for providing information and data on the move.

What is seen as a hurdle is the high cost

“ India still has a long way to go in adoption of vehicle telematics. While India is a fast growing market ”

involved in telematics. Another challenge occurs from the low range utilization of telematics technologies and technical unawareness among consumers. However, the application of telematics and data analytics in the logistics space presents a massive opportunity for higher revenues and operational profits for fleet operators. As competition intensifies, advanced telematics will be a key enabler for sustainability in trucking, and a business imperative to maintain a competitive edge. The coming years will witness the rise of the connected ecosystem, which will be enable fleet operators and external stakeholders such as governments, insurance companies etc., for efficient operations.

# With Restrictions Easing, Automakers Head Towards China

China recently made an announcement to lift its longstanding restrictions on foreign ownership for manufacturers of electric cars. The country will be gradually phasing out of all restrictions on foreign ownership in the automobile industry.

According to the rules at present foreign automakers have to establish 50/50 joint ventures with Chinese companies in order to produce and sell cars in China. It is being reported that ownership caps on commercial vehicles, such as buses or delivery trucks, manufacturers will be lifted by 2020, with passenger car makers following in 2022.

China is the world's biggest car market, and plans to phase out fossil fuel powered cars in long-term and in the medium term has set up strict quotas for electric and plug-in hybrid cars that are likely to come into effect from 2019. Under the quotas, the government would require 10% of manufacturers' output and sales to be clean vehicles in 2019, and 12% in 2020.

These policy changes have made China the hotbed of electric vehicles and number of automakers are strategizing to get their share in this expanding market. Automakers like Ford, General Motors, BMW, Volkswagen, Toyota, Fiat Chrysler, Renault and others have entered into partnerships with Chinese manufacturers. Success in the country considered critical by the major automakers.

Toyota Motor is considering selling locally designed and manufactured all-electric vehicle models in China. Toyota has also got joint ventures with the local manufacturers namely, China FAW Group Corp and Guangzhou Automobile Group. The company plans to use these joint ventures to manufacture and sell EV in the country. The Japanese company will also launch EV models designed in the home country.

Volkswagen has also announced that the company will be investing \$12 billion in China for the development of electric vehicles in the country. The company aims to make the investments by 2025 and produce 40 local models.

Recently, Tesla entered into an agreement with Shanghai government to open a manufacturing facility in the trade-free

zone of the city. The agreement allows Tesla to own an entire factory instead of getting into partnership with any local manufacturer, this will help the automaker to cut down the cost of manufacturing and sell cars at cheaper rates.

German automaker Daimler also entered into an agreement with BAIC Motor to

Shanghai which should be ready to deliver battery packs by next year.

The Swedish automaker Volvo and its Chinese parent Zhejiang Geely Holding also have formed a joint venture to support Polestar-- Volvo's electric car brand-- and will be investing US\$755 million into high-performance electric cars. They will jointly



*Chinese President Xi Jinping had hinted restrictions would be eased (Naohiko Hatta/AP)*

jointly invest five billion RMB for Battery Electric Vehicles (BEVs) and battery localization. Daimler is carrying out with its plans to be 'electric offensive' and globally, more than ten new Mercedes-Benz electric passenger cars are scheduled to be launched by 2022. Ten billion euros will be invested in the expansion of the electric fleet over the next years, and the new electric vehicles will be produced within Mercedes-Benz Cars production network, with plants on four continents. Overall, Daimler is investing around one billion euros in the global production of batteries, estimating that by 2025 electric vehicles will account for between 15 and 25 percent of the total unit sales of Mercedes-Benz. In this light, China can be a big market for the company.

General Motors has also announced that the company will start production of a pure-electric model in China within two years. GM, one of the largest automakers in the Chinese market, plans to launch at least 10 "new energy vehicles" by 2020. To support the growth of its NEV line-up, GM has built a battery assembly plant in

set up a manufacturing facility for Polestar in Sichuan.

Recently, Ford has signed a Memorandum of Understanding with Anhui Zotye Automobile Co., Ltd., a major manufacturer of zero-emission all-electric vehicles in China. The goal of the MoU is to explore the establishment of a joint venture for the development, production, marketing and servicing of a new line of all-electric passenger vehicles in China.

Ford expects the market for NEVs in China to grow to six million units per year by 2025, of which approximately 4 million vehicles will be all-electric. Zotye Auto is a pioneer in the Chinese all-electric vehicle segment and was one of the first automakers to produce all-electric passenger vehicles in the country. It is the market leader in China's all-electric small vehicle segment. Zotye sold more than 16,000 all-electric vehicles through July this year, representing a growth of 56 percent year-over-year. Vehicles produced would be sold under an indigenous brand owned by the new joint venture.





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## Mahindra signs MOUs with Govt of Maharashtra for electric vehicle manufacture and deployment

Mahindra & Mahindra has signed two Memoranda of Understanding (MoUs) with the Government of Maharashtra (GoM), to further its next phase of expansion in electric vehicles (EVs) and achieve its vision of becoming completely electric ready.

This is in line with the Government's pursuit for rapid adoption of EVs for private use as well as public (shared mobility).

Under the aegis of the first MoU the company will make efforts to become fully electric ready by further investing in its Chakan plant for manufacture of EVs, e-motor, controller, battery pack and other electric vehicle components for multiple mobility applications related to battery pack assembly of EVs.

As part of this expansion plan, the company will invest an additional Rs. 500 crore. The second MoU underlines the intent to explore a strategic alliance to enable Mahindra to deploy EVs across key cities in Maharashtra. Towards this, both the company and the Government will work closely with various fleet partners, taxi aggregators, logistics companies, amongst others to deploy 1,000 electric cars over the next 1 year.

The first deployment of EVs, as part of the MoU, will see 25 e2oPlus vehicles ported on the Zoomcar platform in Mumbai, on the occasion of World Environment Day. The range of applications for the deployment of these EVs across the key cities of the state will include employee transport between office and home for corporates, taxi hailing, ride sharing and self-drive car rental amongst others.

The company will also liaison with technology partners for motor controller, power electronics, battery pack, drivetrain and other parts and components, which are currently being imported. The company will supply EV battery pack, motors and controllers, power electronics, battery pack, drivetrain, other parts/components of EVs, battery assembly and electric vehicles to MVML and M&M plants and other Group companies as well as to other customers.

The Mahindra Group has been at the forefront of promoting electrical mobility and this strategic alliance with the state Government will bring in a paradigm shift in passenger commuting and considerably mitigate air pollution.

The Government of Maharashtra has conferred the status of 'Pioneer Mega Project' to this proposed expansion.

## NissanConnect gets more features

Nissan India has introduced more advanced and intelligent version of NissanConnect. The company has added 18 features in this new version based on its key pillars control, convenience, safety & security and social sharing.

NissanConnect now has 50+ features which will address the rising concerns regarding the safety & security of car users along with the control & well-being of the vehicle.

Some the key features which it offers are SoS, Track & Trace, Tow-Away Alert, Vehicle low battery Alert, Automated Impact Alert including Harsh Acceleration Alert, Sudden Turn Alert and Sudden Brake Alert Curfew Alert and Geofencing with multiple entry/exit provide robust safety & security solution to the vehicle.



Image Courtesy: NissanConnect

The features like Idling Run Time, Smart Drive Score, Quick Reference Videos and Intelligent Route Guidance give a superior fuel efficient driving experience with a close check on the health of the vehicle. In addition, the 'Way to My Car' feature is convenient and helps save time on searching for one's car at the parking lot. It also allows customers to reach out to the Nissan call centre and dealerships to access services like service booking and Roadside Assistance (RSA) at the touch of a button.

NissanConnect is a factory fitted Connected Car Technology solution with an embedded Telematics Control Unit which is paired with an inbuilt SIM for every car and operates on a dedicated server for safe & secured data. It is developed specifically for the Indian market by Renault Nissan Technology Business Centre India (RNTBCI) and was launched in 2017.

This more advanced and intelligent NissanConnect comes at zero subscription charges for three years and is available across the Nissan range of cars – Micra, Sunny and Terrano.

## Continental and IIT-M join hands on 'Project NeuroMotive' for better road safety

Continental and IIT-Madras have signed a MoU for advanced research in machine learning, according to a report by The Hindu Business Line.

Bio-inspired neural networks help solve problems on the basis of biological knowledge about how the human brain learns and processes information and thus have become increasingly important for industries and businesses.

IIT-Madras will contribute to Continental's ADAS (Advanced Driver Assistance Systems) business.

The collaboration is code-named Project NeuroMotive and will aid Continental's long-term strategy for 'Vision Zero' – a future with zero accidents – through innovations and ongoing improvement of components and systems making a decisive contribution to greater road safety.



Alexander Klotz (left), Head of Technical Centre India (TCI), in-house R&D centre, Continental and Ravindra Gettu, Dean (Industrial Consultancy and Sponsored Research), IIT-M, exchange an MoU in Chennai  
Image Courtesy: Continental



# Mahindra Electric to pilot India's first integrated sustainable mobility ecosystem

Mahindra Electric has inked a memorandum of understanding (MoU) with Auroville, an experimental township established in 1968 in Tamil Nadu, to pilot India's first integrated sustainable mobility ecosystem for a community.



Mahesh Babu, CEO, Mahindra Electric and Minhaj Ameen, Coordinator, Integrated Transport Services, Auroville, at the MoU signing ceremony  
Image Courtesy: Mahindra

This unique ecosystem will be an extension to Auroville's several e-mobility initiatives over the last few decades. This is aligned with its endeavour to encourage lifestyle choices in quiet mobility, optimal sharing

of resources and reduced carbon footprint, hop-on-hop-off shuttles and smart parking. Under the aegis of the MoU, the two parties will work with IISc (Indian Institute of Science), Puducherry Smart City Development Limited, GoGreen BOV, and numerous initiatives at Auroville itself to develop a holistic ecosystem encompassing Mahindra's electric vehicles, smart parking systems, charging infrastructure and its software integration platform NEMO.

It also aims to enable mobility models like ride sharing, ride hailing, self-drive rentals etc. The Town Planner, PSCDL, supported by the French Government, will also play a key role in this initiative. Mahindra Electric also unveiled its energy storage solution which will play a key role in enabling the ecosystem including charging infrastructure, EV parking, and an EV Support Centre. It will also help harness renewable power, thus becoming an end to end green solution.

## ABB's Terra HP Fast Charger- 200 Km in 8 min

ABB has launched e-vehicle charger at Hannover Messe. This launch of e-vehicle charger named 'Terra HP fast charger'.

The charger operates at powers of up to 350 kilowatts and adds up to 200 kilometers of range to an electric vehicle in just 8 minutes, which makes it ideally suited for use at

ABB chargers are being installed around the world, and they have recently been selected for use by Electrify America, the biggest electric vehicle infrastructure project to date in the United States. With more than 6,500 DC fast charging stations installed in 60 countries, ABB is emerging as a leader in DC fast charging. ABB has also got partnership with Formula E, the world's first fully electric international FIA motorsport series.



Image Courtesy: ABB

highway rest stops and petrol stations. It is being reported that it is almost three times faster than Tesla's Supercharger charging stations.

ABB has also recently installed Terra 53 fast charging station for electric vehicles at office of the Indian government's premier policy think tank in the heart of New Delhi. ABB's 50kW fast charging station can provide a full charge to an electric vehicle in 30 minutes. It would be interesting to know if these 350 KW ultra fast chargers can find application in India in coming years. The company also had last year placed a bid to set up 4,500 charging stations for electric vehicles in the country.

## Quick Takeaway

- ▶ Five new members join Automotive Grade Linux (AGL)
- ▶ Daimler, Audi and Volvo have adopted Alibaba Group's voice-activated assistant Tmall Genie
- ▶ HOZON Auto Autonomous Vehicle Research Center officially opened in the United States
- ▶ Hyundai has formed a strategic partnership with leading Chinese AI startup DeepGlint
- ▶ Local Motors is partnering with Robotic Research on Olli
- ▶ DENSO takes equity stake in On The Road Co.
- ▶ CarBlock, blockchain-based transportation solution partners with "nonda"
- ▶ 5aWaycare and Waze sign partnership on two-way data sharing
- ▶ Volkswagen in talks to manage Didi fleet, co-develop self-driving cars
- ▶ Avis Budget Group partners with Groupe PSA to bring Connected Cars
- ▶ May Mobility to demo Self-Driving Shuttle at Urban Land Institute
- ▶ TOYOTA with TCEU to bring advanced mobility services to the European market
- ▶ Aptiv launches a fleet of autonomous vehicles on the Lyft network
- ▶ The Toyota Research Institute (TRI) constructing a closed-course test facility in Michigan to develop automated vehicle technology
- ▶ Siemens enters into partnership with American Center for Mobility
- ▶ Volvo Cars and Volvo Trucks will share real-time data to expand coverage of the companies' connected safety technology
- ▶ The installed base of active cargo tracking units will reach 8.9 million by 2022: Berg Insights
- ▶ Volvo Cars working with Google to embed Google Assistant, Google Play Store and Google Maps in its Sensus infotainment system
- ▶ Drive.ai announces a pilot program to bring an on-demand self-driving car service to Frisco, Texas in July 2018
- ▶ A new AAA survey shows that 20 percent or 50 million Americans will likely go electric for their next vehicle purchase
- ▶ Spirent Communications and Cohda Wireless announces their partnership to support the testing of WAVE-DSRC vehicle-to-everything (V2X) devices

## DRIVEN Consortium Demonstrates the capabilities of its fleet of autonomous vehicles to interact and 'talk' to each other

DRIVEN, a consortium led by Oxbotica Ltd.; the other partners being Oxford Robotics Institute, insurer XL Catlin, Nominet, Telefonica, the Transport Research Laboratory, UKAEA's RACE facility, Oxfordshire County Council, Transport for London and Westbourne Communications.

The consortium has received over £8m in funding from the Government's CCAV (Centre for Connected and Autonomous Vehicles) £13m investment in this area.

It is an ambitious project that aims to deploy a fleet of Level 4 autonomous vehicles-- a level at which vehicle has the capability of driving itself most of the time

without any human input. -- in urban areas and on motorways, culminating in multiple end-to-end journeys between London and Oxford in 2019.

DRIVEN's fleet of vehicles are currently conducting urban trials around the streets of Oxford. By Q3 2018 consortium aims to increase its fleet to six and start wide-area road testing by late-summer 2018 across a range of environments including low-speed urban and higher speed long distance motorway driving.

By 2019, the consortium plans to develop a risk assessment tool that automatically processes a range of data from both the vehicle and external sources that surround it.

## Waymo adding 62000 self driving FCA Minivans to its fleet, also in talks with Uber over collaboration

Uber is in talks with Waymo to have the latter's self-driving cars added to its platform. Uber CEO Dara Khosrowshahi while talking at a conference gave out this information.

It is not long ago that the companies were embroiled in a legal battle over the allegations that Uber had stolen trade secrets from Waymo to build its own self-driving technology.

It is being speculated that Uber through this move is trying to get over the negative perceptions it has garnered after one of its self-driving cars was an accident in Arizona killing a pedestrian. The ride hailing firm hereafter has suspended its testing of self-driving cars.

That fact that Waymo among the all the developers of self-driving technology is

considered to be most dependable having covered over five million miles with its autonomous test vehicles might be the reason Uber is trying to get it inboard to tackle the negative publicity it has got.

It would be interesting to know how Waymo responds to this offer, as it is known that the company plans to launch its own self-driving taxi service Waymo recently announced that it is ramping up its partnership with Fiat Chrysler and will add up to 62,000 Pacifica Hybrid minivans to its fleet over time. This follows announcement by the company earlier this year that it would add "thousands" of new FCA minivans.

FCA US and Waymo also announced that they are beginning discussions about the use of Waymo self-driving technology, including potentially through licensing, in a FCA-manufactured vehicle available to retail customers. To date, FCA has delivered 600 Pacifica Hybrid minivans to Waymo. This move by the company indicates the pace of the company's plan to launch its own ride hailing service with self-driving cars. At present the company is testing its self-driving ride hailing service, but it is expected that it will be to the public in the Arizona city by the end of this year.



Image Courtesy: Waymo

## Jaguar Land Rover working on a project to develop off-road self-driving SUVs

Jaguar Land Rover is working on a project to develop off-road self-driving SUVs. It is working on a 30 month collaborative project named CORTEX, which was launched in March 2018 to support the development and delivery of self-driving vehicles in the UK. It is a £3.7m project exploring all-terrain, all-weather autonomous capability.

The 'CORTEX' project aims to take self-driving cars off-road, ensuring they are fully capable in any weather condition: dirt, rain, ice, snow or fog. As part of the project, a '5D' technique combining acoustic, video, radar, light detection and distance sensing (LiDAR) data live in real-time is being engineered.



Jaguar Land Rover is developing autonomous cars capable of all-terrain, off-road driving in any weather condition  
Image Courtesy: JLR

Access to this combined data improves the awareness of the environment the car is in. Machine-learning enables the self-driving car to behave in an increasingly sophisticated way, allowing it to handle any weather condition on any terrain.

The project brings together leading technology and automotive expertise as well as academia to deliver highly capable self-driving vehicles like the University of Birmingham and Myrtle AI, and machine learning experts. It is jointly funded by government and industry. The competition was delivered by the UK's innovation agency, Innovate UK.

The company is developing fully- and semi-automated vehicle technologies, offering customers a choice of the level of automation, while maintaining an enjoyable and safe driving experience. This project forms part of the company's vision to make the self-driving car viable in the widest range of real-life, on- and off-road driving environments and weather.





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# Panasonic, Qualcomm and Ford work together on First U.S. Deployment for C-V2X Vehicle Communications in Colorado

Panasonic, Qualcomm Technologies, and Ford have announced a strategic collaboration to deploy Cellular Vehicle-to-Everything (C-V2X) technologies in

development efforts to help deploy the technology, and to assess C-V2X capabilities this summer on select roadways throughout Panasonic's CityNOW headquarters

The transit authority's existing fleet of Ford utility vehicles will be equipped with C-V2X devices utilizing Ficos's CarCom platform to enable vehicle-to-vehicle (V2V)

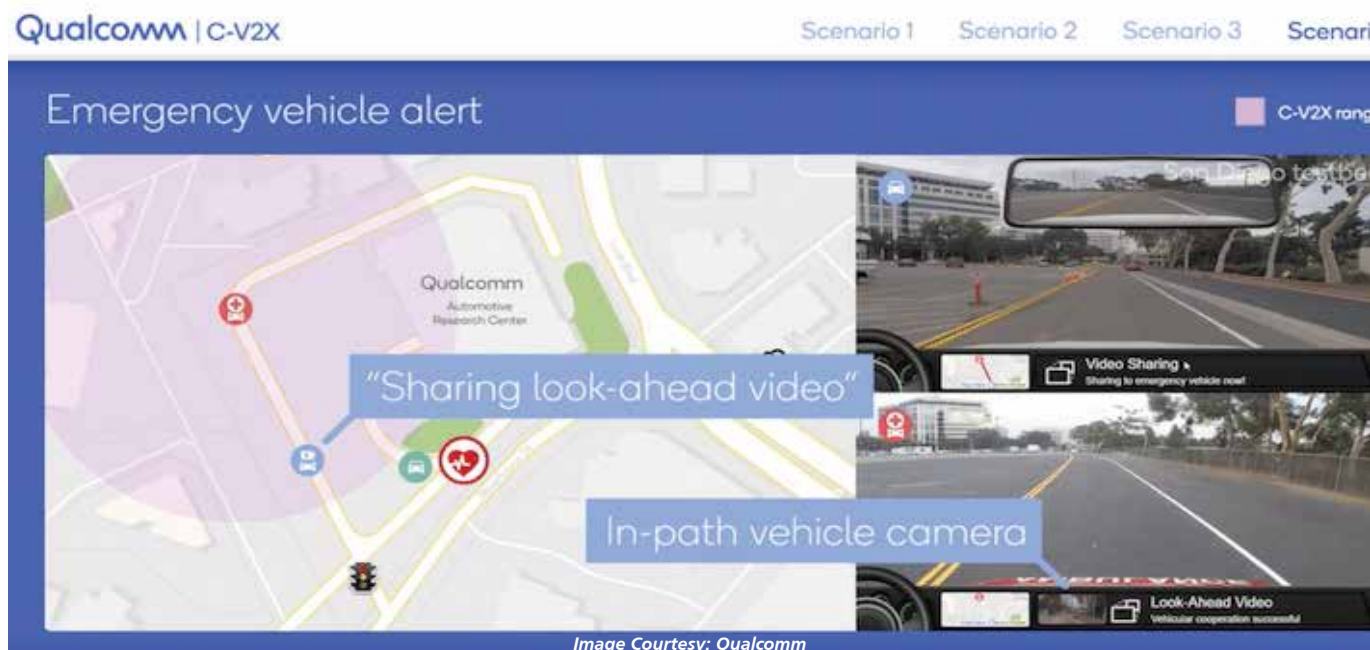


Image Courtesy: Qualcomm

Colorado. According to the Press Release by the companies, this is the first U.S. deployment of C-V2X technology and is an extension of a previously announced partnership between the Colorado Department of Transportation (CDOT) and Panasonic to integrate connected vehicle technology in the state of Colorado. The companies will join advanced

in Denver, which will be followed by deployment in select areas along the I-70 Mountain Corridor later in the year.

Panasonic will work with Kapsch TrafficCom in CDOT's V2X development program, in which Kapsch TrafficCom will provide roadside units (RSUs), as well as with Ficos to provide C-V2X onboard units (OBUs).

and vehicle-to-infrastructure (V2I) direct communications.

Panasonic's connected vehicle data platform will collect and disseminate C-V2X data to provide roadway operators with improved situational awareness and a new ability to send safety critical information directly to vehicles.

## Veoneer demonstrates secure exchange of data between vehicles and infrastructure within a geofenced traffic zone

In 2017, the Swedish government initiated a project to create safer, more climate-smart cities using geofencing technology. The participants in the project, led by the Swedish Transport Administration, include the City of Gothenburg, the City of Stockholm, Veoneer, Scania, Volvo Cars and Volvo Group.

Veoneer, recently in Stockholm, Sweden, demonstrated secure exchange of data between vehicles and digital traffic infrastructure within a geofenced traffic zone.

Geofencing refers to a geographic zone where the entry, speed and fuel use of connected vehicles can be controlled digitally. Trucks, buses and cars were



Image Courtesy: Autoliv

showcasing the geofencing technology, an important step toward creating a connected transport system with digital infrastructure and shared interfaces.

Geofencing can also play a role in ensuring that cities are better equipped to deal with hostile vehicle attacks. It is considered a tangible step toward smart cities and a crucial part of Intelligent Transport Systems. As cars become autonomous, the technology in the vehicles will need to be complemented with geofencing infrastructure.



# Iteris and Siemens demonstrate V2X Connected Vehicle Technology in Detroit

Iteris has showcased its pedestrian detection technology with Siemens Intelligent Traffic Systems.

The demonstration highlighted how Iteris' PedTrax video detection capabilities working with Siemens' latest V2X solution improves pedestrian safety by detecting their presence at a crosswalk and transmitting an advance warning to drivers approaching the intersection.



*Pedestrian Safety Demonstration Will Feature Seamless Integration of Iteris Pedestrian Detection Technology in a Vehicle-to-Infrastructure Application*

*Image Courtesy: Business Wire*

PedTrax is a computer vision technology that automates measurement of both the count, direction and speed of pedestrians in crosswalks to provide insights on levels of street life. The data and analytics supplied by PedTrax can inform agencies where roadway operations should be made more pedestrian- or bicycle-friendly, contributing to safer and more livable communities.

Siemens Sitraffic ESCoS roadside unit (RSU) played a key role in the demonstration with accurate communication of the pedestrian detection to oncoming vehicles equipped with onboard units receiving a dedicated short-range communications signal, and produces a video and audio warning in the vehicles.

ESCoS is a secure, cooperative technology for communication between all kinds of vehicles and the infrastructure. Sitraffic ESCoS Road Side Units provide key data for a more precise picture of the current traffic situation, enabling more efficient traffic control, a significant reduction in accident numbers and an even greater cut in emissions than possible up to now.

## Huawei unveils Ocean Connect IoT Platform

Huawei has released the OceanConnect IoT (Internet of Vehicles) Platform at CEBIT 2018. As the "digital engine" of intelligent and connected vehicles, this platform provides four key enablers for the transformation of manufacturers.



*Ma Haixu, President of Huawei Cloud Core Network*  
*Image Courtesy: Huawei*

Huawei is also working with PSA Group and has rolled out the what it claims world's largest OEM Connected Vehicle project to date. The first automobile model, DS 7 CROSSBACK, was developed on Huawei's OceanConnect IoT Platform, and has been released in China and Europe.

Huawei has also commenced strategic cooperation and joint innovation with China FAW Group and Guangzhou Automobile Group.

### Quick Takeaway

- ▶ BYTON's first series of production vehicles to feature BlackBerry QNX technology
- ▶ Magna and May Mobility join hands to build, deploy and scale Self-Driving Shuttles
- ▶ BMW starts cooperation with TTTech Auto for developing automated driving functions at the highest safety level
- ▶ Waze integrating Anodot's real-time anomaly detection platform across its system
- ▶ Launched TomTom navigation app that can be mirrored to Toyota vehicles
- ▶ The BMW Group and CRITICAL Software to form JV
- ▶ Gemalto is providing the data security and encryption technology to Faraday Future
- ▶ Toyota to invest US\$1 Billion in Grab, an o2o platform
- ▶ Michigan DOT utilizing INRIX traffic services to monitor, measure and manage the state's road network
- ▶ CarSmartt partners with Archer Robotics and Aitheon Blockchain to develop Self Driving Cars fleet for delivering packages
- ▶ Nuance Communications collaborated with Daimler AG to develop and power the Mercedes-Benz User Experience (MBUX) multimedia system
- ▶ NXP and Baidu partner to secure the IoT in China
- ▶ Honda and General Motors partner on Next Gen Battery Development
- ▶ The mass-production of its self-driving vehicles will start in July, says Baidu
- ▶ Soft Bank Vision Fund to invest \$2.25 Billion in GM Cruise
- ▶ Octo Telematics selected as the telematics provider of choice for CAA MyPace™, a pay-as-you-go (PAYG) insurance program
- ▶ CarBlock signs major partnership with MOBI
- ▶ Hyundai has formed a strategic partnership with leading Chinese AI startup DeepGlint
- ▶ Geotab acquires Fleet Carma
- ▶ Turo Go allows guests to locate, book and unlock cars using its app
- ▶ HERE Mobility opens their Mobility Market place in London
- ▶ BYTON raises \$500 Million to further expand development of a line of Smart Connected Vehicles
- ▶ Volkswagen chooses carVertical to partner in the development of blockchain-based applications
- ▶ Abalta Technologies, Airbiquity, Bose, EPAM Systems, HERE, Integrated Computer Solutions and Sitech Electric Automotive join Automotive Grade Linux
- ▶ Prognostics and OTA Updates have potential to save Ridesharing Providers US\$3.9 Billion in 2028, says report

## VIA Technologies showcases its Edge AI systems for the Automotive and other segments

VIA Technologies showcased its family of high-performance Edge AI systems for the Automotive, Enterprise IoT, and Smart City segments at its global headquarters and highlighted its core facial and object recognition, 360-degree surround view, and ADAS (Advanced Driver Assistance System) technology platforms that are accelerating the development and deployment of groundbreaking real-world applications by customers in world markets.

The Edge AI systems are powered by SoC platforms, including the Qualcomm® Snapdragon™ 820E Embedded Platform and NVIDIA Jetson TX2 module, and deliver the optimum blend of compute, graphics, and connectivity for the target AI application scenarios.

Computer Vision technology platforms enable a diverse array of intelligent video AI applications including:

- Emotion, age and gender detection and people counting and tracking for security, surveillance, and customer engagement applications
- Real-time 360° in-vehicle monitoring and recording for up to six individual HD camera streams for tracking driver behavior and boosting awareness of road conditions
- Lane Departure Warning, Forward Collision Warning, Blind Spot Detection, Pedestrian Detection, Vehicle Detection, Speed Limit Detection, and Rear-end Collision Avoidance for enhancing vehicle safety

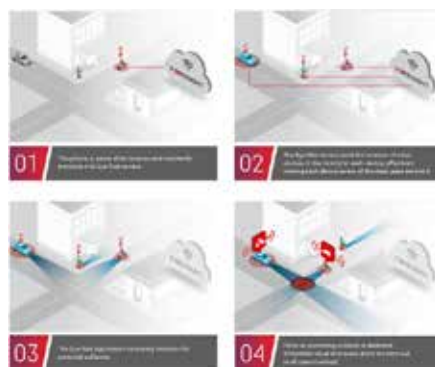


Image Courtesy: VIA Technologies

## Eye-Net™

In the first part of the trial, several accident-simulated scenarios including vehicles and/or a pedestrian were performed. In all cases, the parties were using the Eye-Net™ application installed on their cellular phones and received real-time alerts in order to prevent a collision.

The second part of the trial tested the integration of the Eye-Net™ system with NoTraffic's smart infrastructure system in accident-simulated scenarios where only one of the vehicles involved was connected to the Eye-Net™ system. NoTraffic's system, which was installed at the intersection,



Working of Eye-Net accident prevention solution  
Image Courtesy: Foresight

identified the non-connected driver or pedestrian using a smart sensor, and

## Karamba Security collaborates with Micron for enhanced Automotive Cybersecurity

Automotive cybersecurity company Karamba Security has announced that it is working with semiconductor vendor Micron Technology to leverage the Micron® Authentia™ security architecture in Karamba's Electronic Control Unit (ECU) hardening and CAN Bus encryption software.



Micron's Authentia™ Technology provides protection for the lowest layers of IoT device software, starting with the boot process.

It utilizes existing standard flash memory sockets to enable system developers to harden system level security without adding additional hardware components, leading to a more affordable and robust IoT solution.

A wide range of IoT end-points and edge devices that use standard flash memory chips can be enhanced for improved system level cyber security, more pervasive zero touch onboarding deployments, and future device management capabilities using this combined approach.

This collaboration results in higher level of security and resiliency while maintaining 100 percent of Karamba's software real-time prevention capabilities against zero-day exploits. It also ensures Zero false positives i.e. no lengthy process of detect-investigate-respond for critical attacks.

transmitted the information to the driver using the Eye-Net™ system, in order to prevent a collision.

During the trial, the information was streamed in real time to the control center onsite and displayed the location and time of occurrence of the simulated collisions on a map, as well as the classification of the road users involved.

Supervision was provided by BWR (Blue and White Robotics) as part of the Ashdod Smart Mobility Living Lab project, and the trial was carried out with the support of the Ministry of Transport and the Ayalon Highway company as part of the national plan to promote smart transportation.



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## Argus Cyber Security, and Phantom Auto partners to ensure the security of teleoperation safety technology in vehicles

Cybersecurity challenges in the automotive sector are becoming increasingly significant as AVs become a reality and as the number of heterogeneous applications and services that run on AVs or interact with them grows, including teleoperation safety technologies. Argus Cyber Security, and Phantom Auto,

driverless testing, and (2) a certification that AVs meet appropriate and applicable current industry standards to help defend against, detect, and respond to cyber-attacks, unauthorized intrusions, or false vehicle control commands.

By using Phantom Auto's teleoperation



Phantom Auto helps self-driving cars get out of tricky situations on the road

Image Courtesy: Phantom Auto

have partnered to ensure the security of teleoperation safety technology in vehicles. Argus Connectivity Protection, integrated in Phantom Auto's teleoperation safety technology, will detect and block attacks in real-time and prevent them from proliferating to the in-vehicle network.

In addressing this issue, the California Department of Motor Vehicles mandates: (1) the use of remote operation for

safety technology, driverless AVs will have a highly-trained human in the loop, who can safely drive the AV in the event the vehicle cannot safely operate. But the connectivity that enables this comes with inherent cyber risks, therefore the company is partnering with Argus to ensure the highest level of protection for our teleoperation safety technology by partnering with Argus.

## Volkswagen in talks to manage Didi fleet, co-develop self-driving cars

Volkswagen AG is in talks with China's Didi Chuxing to manage part of the ride-hailing company's fleet of cars and help develop "purpose-built" vehicles for Didi's services, according to a report by Reuters.

The companies are expected to form a joint venture and a deal may be signed between the companies soon. Volkswagen will also initially manage a fleet of about 100,000 new vehicles for Didi, of which two-thirds will be Volkswagen Group cars, the report says.



Image Courtesy: Didi Chuxing

The German automaker will also jointly buy some new cars with Didi. The two companies will also design and develop dedicated vehicles eventually.

## Volkswagen chooses carVertical to partner in the development of blockchain-based applications

Volkswagen has chosen carVertical to partner in the development of blockchain-based applications. carVertical is automotive ICO which was granted a ticket to Volkswagen Future Mobility Incubator in Dresden, as the company became the winner of manufacturer's pitch competition.



carVertical was granted a ticket to Volkswagen Future Mobility Incubator in Dresden  
Image Courtesy: carVertical

carVertical gained a strong boost to their development activities after raising \$20 million in funds back in January 2018. Company's roadmap includes various applications based on decentralised vehicle history registry. The first application is the platform of vehicle history reports, which is set to debut later on this month.

carVertical's initiative to build global and tamper-proof vehicle history registry is supported by European Union.

carVertical will begin work in Die Gläserne Manufaktur (VW's innovation hub) in Dresden (Germany) in September 2018. The incubation program includes financial support of €15,000. In connection with the program, Die Gläserne Manufaktur also offers the assistance of mentors and coaches, an attractive working environment at the facility, high-quality IT infrastructure, contacts with Volkswagen research and development employees and decision-makers, professional advice by Sächsische Aufbaubank (SAB), close proximity to the start-up scene and both financial and personnel support from the City of Dresden. The expected outcome is the joint development of blockchain-based solutions. That would enhance Volkswagen's presence as the leader for future mobility applications and provide carVertical with valuable resources and expertise.



# Honda and General Motors partner on Next Gen Battery Development

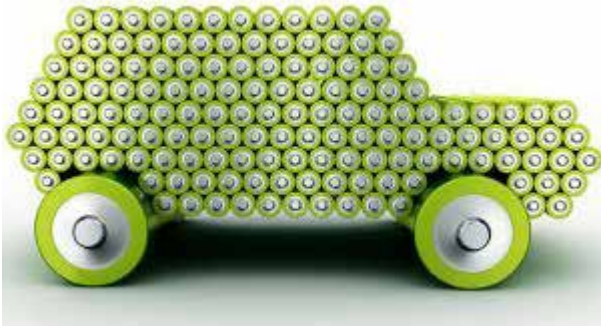
General Motors and Honda announced an agreement for new advanced chemistry battery components, including the cell and

module, to accelerate both companies' plans for all-electric vehicles. The next-generation battery will deliver higher energy density, smaller packaging and faster charging capabilities for both companies' future products, mainly for the North American market.

Under the agreement, the companies will collaborate based on GM's next generation battery system with the intent for Honda to source the battery

modules from GM. The collaboration will support each company's respective and distinct vehicles. The combined scale and global manufacturing efficiencies will ultimately provide greater value to customers.

GM and Honda already have a proven relationship around electrification, having formed the industry's first manufacturing joint venture to produce an advanced hydrogen fuel cell system in the 2020 timeframe. The integrated development teams are working to deliver a more affordable commercial solution for fuel cell and hydrogen storage systems.



## TRAXEE fleet management system

WABCO, has announced the launch of TRAXEE, its new Fleet Management System (FMS), which is designed to meet the specific needs of operators of small to medium-size commercial fleets.

TRAXEE FMS offers smaller fleet operators several business-critical functions without incurring large capital investment or management overhead expenses. Launched as a scalable and rapid pay-back solution, TRAXEE enables operators to better coordinate fleet capacity, manage driver activity and improve administrative efficiency. The system also provides real-time status updates on individual trucks and drivers while helping to address tachograph legal compliance requirements across Europe and Turkey.



TRAXEE provides real-time status updates on individual trucks and driver

Image Courtesy: WABCO

The TRAXEE application can be operated on desktop computers as well as a broad range of mobile devices. TRAXEE's on-board unit can be quickly installed in every truck with captured data streamed directly to the fleet manager to support real-time operating decisions.

Supplied fully equipped with GPS as standard, TRAXEE is also capable of pinpointing the precise location of the truck. The onboard unit can also connect to the truck's digital tachograph and Controller Area Network (CAN bus) system. This gives the fleet manager real-time insight into driving and resting periods as well as key performance data, including fuel consumption and ECO-reporting. TRAXEE also enhances fleet agility and customer communication, including the ability to provide accurate delivery status information and a range of automated alerts and notifications.

WABCO will leverage its extensive distributor and service network to support the product's launch throughout Europe, the Middle East and Turkey from early July, 2018.

## Intangles releases Digital Twinning (DT) solution

Intangles has released Digital Twinning (DT) solution using Hybrid Analytics in Vehicle Life Cycle Management. Through digital twinning, Intangles creates virtual sensors for automobile components, thus predicting performance and failures, which are generally too late to detect or lead to vehicle breakdown.



Image Courtesy: Intangles

Intangles has deployed its Digital Twinning solution, Ingenious, to help manage the Life Cycle of Vehicles by predicting and interrogating data from vehicles.

Combining Deep Learning with Physics-based modeling, Ingenious predicts component-level failures by analyzing sensor data. The data gathered through their proprietary hardware feeds into the Physics + Deep Learning-based model, which transforms the data into a much higher realm where certain target features allow the algorithms to predict the health of the vehicle under.

## ParkWhiz acquires Tel Aviv-based CodiPark

ParkWhiz has acquired CodiPark, a Tel Aviv-based company known for solutions that deliver a friction-free parking experience. With the acquisition, ParkWhiz will add drive-up mobile payments to its Parking Platform, which powers numerous third party mobile apps, as well as its own

traffic at a gate while fumbling for a credit card or cash.

The company is working collaboratively with parking access control systems and parking operators to offer drivers more seamless ingress and egress options via mobile devices and connected vehicles. The



Image Courtesy: CodiPark

ParkWhiz and BestParking brands.

In addition to having the option of pre-booking parking, consumers will now also be able to simply drive up to a lot or garage, pull a ticket and pay by scanning it in whichever ParkWhiz-powered app they are using. Payment and validation are managed without ever visiting a kiosk, or blocking

acquisition is part of a broader strategy by ParkWhiz aimed at solving the last mile of connected and autonomous mobility.

With the acquisition, ParkWhiz will maintain an office in Tel Aviv--a city known as a global connected mobility hub with specific heritage in wireless communications and navigation--to continue to develop new mobility solutions for its partners.

## Omnitracs Verisk to provide a New Risk Management Solution to customers

Omnitracs has announced a strategic alliance with Verisk on insurance data analytics services.

With this alliance the Omnitracs customers now have option to transfer their fleet driving data, collected by their Omnitracs telematics platform, into the Verisk Data Exchange – the platform that helps commercial lines insurers better manage risk while allowing fleet operators to optimize safety and minimize operational costs.

By doing so, Omnitracs customers will gain access to fleet insurance services

and operational safety feedback through analytics which they may choose, at their discretion, to make available to insurers, providing fleet managers with complete control of their data.

Thus this alliance enables Omnitracs to bring its customers additional opportunities to create operational efficiencies and maximize savings.

Omnitracs is the first large fleet commercial telematics service provider to align with Verisk.

## Affectiva and Wind River join hands to advance connected car technologies

Affectiva and Wind River, are joining hands to advance connected car technologies. It is known that Affectiva, is an Artificial Emotional Intelligence (Emotion AI) company and Wind River, a leader in delivering software for the Internet of Things (IoT) and connected vehicles.



Image Courtesy: Affectiva

Under the collaboration Affectiva Automotive AI in-cabin AI sensing solution has undergone a testing and validation process with Wind River Helix Cockpit, a comprehensive consolidated compute platform that allows car makers to successfully deliver next-generation features that are production grade while ensuring high standards of safety, security, and quality. Car-makers can use Helix Cockpit, part of the Wind River Helix Chassis portfolio of automotive software products, to deliver rich in-cabin experiences and seamlessly extend their digital lifestyles into connected vehicles.

Affectiva Automotive AI measures facial expressions and emotions such as joy, anger and surprise, as well as vocal expressions of anger, arousal and laughter, in real-time. The solution, which runs on embedded and mobile devices, also provides key indicators of drowsiness such as yawning, eye closure and blink rates. Affectiva is collaborating with leading OEMs, Tier 1 suppliers and technology companies like Wind River to bring its solution to production vehicles.

The combined technologies would allow original equipment manufacturers (OEMs) and Tier 1 suppliers to differentiate their brands by building advanced driver monitoring systems (DMS) and better in-cabin experiences that make driving safer and more enjoyable.

The collaboration would also allow automakers to deploy Affectiva's Emotion AI technology quickly and inexpensively on a consolidated compute platform. Affectiva can identify, from face and voice, complex and nuanced emotional and cognitive states of a vehicle's occupants across the entire autonomous vehicle spectrum.



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## Cadillac to expand Super Cruise across entire lineup

Cadillac is expanding the rollout of Super Cruise its true hands-free driver assistance feature for the freeway. Super Cruise will be available on all Cadillac models, with the rollout beginning in 2020.

After 2020, Super Cruise will make its introduction in other General Motors brands. Cadillac also plans to offer V2X communications in a high-volume crossover by 2023 and eventually expand the technology across Cadillac's portfolio.



Mark Reuss at the reveal of the Cadillac XT5  
Image Courtesy: GM

The Super Cruise driver assistance feature is made possible by precision LiDAR map data, high precision GPS, a state-of-the-art driver attention system and a network of camera and radar sensors. It requires an active OnStar service plan with emergency services to function. Customers can drive hands-free on more than 130,000 miles of limited-access freeways in the U.S. and Canada. The driver attention system helps to keep drivers engaged and detects when drivers need to pay more attention to the road. Even while using Super Cruise, drivers must always pay attention and not use a handheld device.

## Volkswagen tests quantum computing in battery research

Volkswagen experts have succeeded in simulating industrially relevant molecules using a quantum computer. This is especially important for the development of high-performance electric vehicle batteries.

The experts have successfully simulated molecules such as lithium-hydrogen and carbon chains. Now they are working on more complex chemical compounds. In the long term, they want to simulate the chemical structure of a complete electric vehicle battery on a quantum computer.

Their objective is to develop a "tailor-made battery", a configurable chemical blueprint that is ready for production. Volkswagen presented its research work connected with quantum computing at the CEBIT technology show. Highly specialized IT experts from Volkswagen, including data

## Magna to form JVs with BJEV to engineer and build premium Electric Vehicles for customers in China

Magna plans to form two new joint ventures with Beijing Electric Vehicle Co. Ltd (BJEV), a subsidiary of the BAIC Group for electric cars, for complete vehicle manufacturing as well as engineering of electric vehicles. The companies recently signed the term sheets for the new joint ventures. The engineering and manufacturing joint ventures are expected to take over an existing BAIC manufacturing facility in Zhenjiang, Jiangsu Province, where the first production vehicles are planned for 2020. The plant has the capacity to build up to 180,000 vehicles per year. The joint ventures will also be set up to offer engineering and complete vehicle manufacturing capacity to other potential customers.



The Zhenjiang facility where Magna and BJEV plan to engineer and build electric vehicles for the Chinese market  
Image Courtesy: Magna

scientists, computer linguists and software engineers, are working together at the IT labs in San Francisco and Munich to develop the potential of quantum computers for applications which will be beneficial for the company.



Volkswagen experts want to simulate the chemistry of vehicle batteries on a quantum computer  
Image Courtesy: Volkswagen

## ZF and Mobileye team up to provide new camera technology for automated driving

ZF, a supplier of automotive cameras has teamed up with Mobileye to launch the S-Cam4 family of advanced cameras in 2018.

The S-Cam4 camera family includes a single lens, mono-camera designed to help meet updated test protocols such as EuroNCAP-- a European car safety performance assessment programme—pedestrian triggered automatic emergency braking (AEB) including a crossing bicycle AEB test.



Image Courtesy: ZF

The camera family also includes a three lens TriCam4 version to support advanced semi-automated driving functions, adding a telephoto lens for improved long-distance sensing capabilities and a fish-eye lens for improved short-range sensing with a wider field of view.

## Magna to form JVs with BJEV to engineer and build premium Electric Vehicles for customers in China

Magna plans to form two new joint ventures with Beijing Electric Vehicle Co. Ltd (BJEV), a subsidiary of the BAIC Group for electric cars, for complete vehicle manufacturing as well as engineering of electric vehicles. The companies recently signed the term sheets for the new joint ventures. The engineering and manufacturing joint ventures are expected to take over an existing BAIC manufacturing facility in Zhenjiang, Jiangsu Province, where the first production vehicles are planned for 2020. The plant has the capacity to build up to 180,000 vehicles per year. The joint ventures will also be set up to offer engineering and complete vehicle manufacturing capacity to other potential customers.



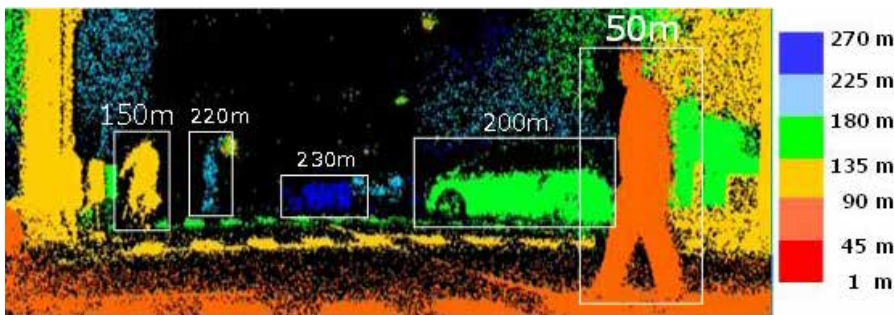
## Panasonic introduces long-range TOF Image Sensor

Panasonic Corporation has developed a time-of-flight (TOF) image sensor which is capable of capturing range imaging of objects up to 250 m even at night with poor visibility and can be applied in a variety of fields including automotive range imaging and wide-area surveillance in the dark.

Conventional camera technologies such as stereo cameras have an issue of degraded recognition accuracy at night. On the other hand, LiDAR that employs infrared light can be used at night; however, its low resolution makes it hard to identify small objects, which can cause missed detection.

**This development has been realized on the basis of the following technologies:**

- APD pixel technology: The area of APD pixels is significantly reduced while the multiplication performance is maintained through the lamination of the multiplier that amplifies photoelectrons and the electron storage that retains electrons.
- Long-range measurement imaging technology: Each pixel is equipped with an integration circuit that counts the number of detected photons that have arrived at the photodetector. Even a weak single-photon level reflection light is reliably captured to achieve high-density range images.



Range image obtained at night by the TOF image sensor  
Image Courtesy: Panasonic

## nuTonomy to expand testing on Boston streets

nuTonomy has been authorized to expand testing on City of Boston streets city-wide. It is known that nuTonomy is a subsidiary Aptiv and a leader in the development of autonomous vehicle software.

After almost two years of testing autonomous vehicles on public roadways in Singapore nuTonomy was allowed to test its vehicles in Boston. The testing safety protocols stipulated by both the City of Boston and the Commonwealth of Massachusetts, are as follows:

- The vehicles must operate within the legal speed limit at all times.
- In all cases while testing, a professionally trained safety driver is behind the wheel prepared to take over as necessary.
- The company will have continue to supply quarterly reports to the City and to update the Boston Transportation

Department each time it begins operating in a new neighborhood of Boston.

- The authorities have allowed testing in both day and nighttime hours, and during some inclement weather, such as light precipitation, fog, and low temperatures. City of Boston is working on creating a policy on the operation of autonomous vehicles known as Go Boston 2030 Transportation Plan.



Image Courtesy: Aptiv

## Mercedes-Benz Vans is using AGL as a foundation for a new onboard operating system for its commercial vehicles.

Automotive Grade Linux (AGL) has announced that Mercedes-Benz Vans is using AGL as a foundation for a new onboard operating system for its commercial vehicles. Mercedes-Benz Vans is working on a strategic future initiative, adVANCE, which aims evolving from a manufacturer of vans into a provider of holistic transport solutions. In order to bring these new commercial solutions to life, Mercedes-Benz Vans is developing a next-generation onboard operating system using Automotive Grade Linux (AGL). The open source AGL platform provides Mercedes-Benz Vans with the flexibility to rapidly create tailored solutions for customers, including adding and connecting any kind of IoT components to the vehicle. The new AGL-based operating system will debut on various Mercedes-Benz Vans prototype projects later this year.

## BMW Connected joins forces with Baidu Internet of Vehicles on home-to-vehicle cooperation

BMW Connected and Baidu Internet of Vehicles have signed an agreement on a home-to-vehicle cooperation. This cooperation will further expand the application of BMW Connected and enable customers to access vehicle information by voice control and operate relevant functions easily from their home. The voice control function can be activated simply using certain wake-up words.



Image Courtesy: BMW Blog

BMW is working on a strategy called "In China, for China" R&D strategy, according to which the company has been actively building and integrating China's digital ecosystem. The cooperation between BMW Connected and Baidu Internet of Vehicles is in line with this strategy.

# City Link



Launched by Puneet Prakash along with his co-founder R. Jayakumar, City Link aims to create value for anybody who moves cargo using trucks within the city. Having diverse portfolios including large enterprises and small and medium-sized enterprises (SMEs), traders like timber merchants, glass merchants etc. and finally individuals, the startup is dedicated to building a defined marketplace for intra-city on-demand trucking.

## Introducing the founding team

Puneet – an engineering graduate who has been a logistics professional for the last 20 years. He has built a successful warehousing and distribution biz. in the last assignment.

R. Jayakumar- Puneet's mentor and his last boss, who built a startup in 1986 (when expressions like Startup, VCs were unheard of). He quit his job when he was 38 and built

founding team intends to fill this void.

## Moving forward

At City Link, the initial days were focused around building company's on-demand platform and onboarding supply. Alongside, the team commenced servicing enterprises for their within city transport requirements. Coming from the domain, the founding team could ramp up this side of business quickly which also helped develop some self-sustenance over the near term.

## The journey so far

Giving credit to his team, Puneet says that the entire team has done fairly well in order to achieve the desired goals. The startup has grown at a fast clip and most importantly in a sustainable way. Having said that not everything went right for them as the dynamic team had its fair share of misjudgements and miscalculations.

our customers who believed in us and risked their precious wares with a startup team," says Puneet.

## Business model

With the business attaining some scale, Puneet believes the company's model is established and as long as a customer is willing to write a cheque, their services are accepted. He feels the time is now ripe to look for growth capital to take this to the next level. The team shall be commencing its pursuit on this side very soon.

At City Link, the team is building a tech enabled within city trucking company, serving a broad user base from large enterprises to SMEs to individuals. The biz. model is centred around the customer engagement types:

### Planned demand

A business proposition for customers who are mainly large enterprises and are in need of large number of trucks. Supply is mostly aggregated and very rarely owned. The extent of asset engagement in a day determines the sales price. The cost price is accordingly fixed with the platform retaining the spread.

### On demand

Addressing the as-and-when requirement usually from SMEs and individuals. The vehicles are completely aggregated to cater to an entire city demand. Plan based fares per trip. Platform retains a percentage commission and the balance fare goes to the vendor partner.

With clear problem statements as above, the company has used technology, uniquely, to

- match demand/supply pockets
- enhance asset utilization and delivery efficiency
- provide real time visibility
- optimize route/load carrying
- make an erstwhile manual system completely automated and intelligent

## Future plans

Currently in 3 cities, the company has plans to spread to at least 12 by 2022 clocking more than 1.5-2 lakh trips a month.

"In the process we would be tech enabling a wide spectrum of users (large enterprises, SMEs, Individuals) with a frictionless, convenient and seamless movement of goods, using AI and machine learning to optimize vehicle turnaround time, cost, availability and utilization," explains Puneet.



Figure 1: (L to R) R. Jayakumar and Puneet Prakash

a large logistics enterprise in 30 years; built 8 enterprises in logistics domain, divested in 3, failed in 1. Now, he is the prime investor, co-founder and biz. mentor at City Link.

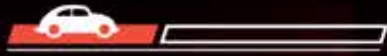
## The Genesis

The in-city trucking opportunity is worth US \$8-10B and dominated by a highly fragmented vendor base, generally unorganized with vehicle ownership averaging 1 to 3. This results in challenges on vehicle aggregation, visibility, reliability & transparency on the demand side and asset utilization, demand visibility & unstable revenue streams on the supply side. While there are established brands for inter-city movements, this is completely missing in the intra city space. With City Link, the

However, given the leadership's diverse experience, they failed fast and course corrected quickly.

"It's been exciting, to be honest. The challenges on the fronts mentioned spiced up the game indeed, and thrill lay in surmounting and overcoming all such obstacles that come our way. Again, I attribute our success thus far to the collective resolve of the leadership team. Each of us bring unique skill sets to the table. I'm quite certain that this journey or for that matter any other would be fraught with risks, disputes, confrontations, however what matters is how as a team we stand up to it and I'm quite proud on how we have fared all along. Not to take the credit away from





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