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THE GROWTH OF THE CONNECTED VEHICLE DATA MARKET – THE IMPLICATIONS OF PERSONAL DATA AND EMERGING US LEGISLATION

04

Benefits & opportunities for key stakeholder groups

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04 | BENEFITS & OPPORTUNITIES FOR KEY STAKEHOLDER GROUPS

The third report in this series explores the benefits and opportunities the connected car market presents to key stakeholders. This data-driven innovation has the power to unlock huge economic potential, driving performance and efficiency gains across the board and creating new ways to engage with customers.

The data is of benefit to the entire ecosystem, from vehicle servicing to roadside assistance. There is now huge potential for manufacturers to nurture relationships with customers in a way that has never been possible before, using the new datasets to target marketing of specific services and provide a greater after-sales experience.

Key Findings	Connected car data-driven innovation can unlock great economic potential in this market – driving performance and efficiency gains in design, production and service delivery, and new forms of consumer service and engagement that open up entirely new market value. These innovations can bring benefits and opportunities to all participants and stakeholders in the market: ○ Individuals: bringing greater convenience and value in car ownership and journey efficiency, and reducing car ownership and transport costs. ○ Public Services: using data on vehicle journeys to help plan, and manage transport infrastructure. Supporting emergency services and law enforcement, ensuring appropriate level of response and effective intervention in control of a vehicle when required. ○ OEMs and Automotive Service Providers: use of connected car data to advance OEMs' design and manufacturing efficiency, transform after-sales product support costs, and create new, deeper consumer relationships – strengthening brand loyalty and creating opportunity for major new service revenue streams Enabling improved and expanded service offerings based on access to connected car data for a range of service providers in the ecosystem including vehicle servicing; dealerships, fuel and EV providers; roadside assistance ○ Financial Service Providers: for insurers, the use of connected car data for enhanced underwriting, Usage Based Insurance and enhanced claims analysis. For Banks, Lenders and Lease Providers – improved asset valuation. ○ Other businesses: ▪ Vehicle Fleet Management - improved operations and reduced costs ▪ Telecommunications Providers: a projected 40-fold increase in wireless network traffic and new services to connected car ecosystem players e.g. data acquisition and storage, analytics, data brokerage.

	▪ Parking Providers: more efficient use of resources and better planning of future capacity. ▪ Retailers, restaurants, hotels and other geo-centric businesses: better targeting of marketing messages and planning of new facilities.

The five stakeholder groups identified through our research can secure benefits from connected vehicles in addition to the societal benefits described above. This section examines the benefits and opportunities for each of the five key Stakeholder groups in the market:

- Individuals
- Public Services
- OEMs and Automotive Service Providers
- Financial Service Providers
- Other Businesses

1.1. Individuals

The benefits to individuals were principally in the areas of:

- Safety
- Environment
- Convenience & Value
- Cost savings

Safety benefits are addressed in Section 2.1. and Environmental benefits are addressed in Section 2.2

Key topics in the other two categories were:

Convenience & Value

- Vehicle Support
  - Evidence-based notification of issues requiring attention (Predictive Maintenance) e.g. service due, component wear, reducing time off the road to correct problems as service centres can be notified of details and parts ordered in advance.
  - Analytics applications can access vehicle status/performance data from vehicles of a given year / model and combine it with warranty repair trends. Enabling he service provider to advise the driver/owner on any preventative action required.
  - Remote diagnosis and repair of an increasing proportion of vehicle issues, negating the need to visit a dealership or service centre.
- Real-time Geolocation-based Services
  - Continuously updated maps, active and dynamic route planning (traffic avoidance, instant notification of accidents ahead, etc.).
  - Current parking or POI information, petrol/gas station proximity and fuel availability, etc.
  - Geolocation data or other motoring related information can be combined with datasets related to other aspects of people's lives to provide better targeting of services in-car (taking into account non-motoring preferences). For example, both Toyota and GM allow control of some vehicle functions via home hub services such as Amazon Alexa and Google Home.

    "… connected cars can exchange data with a smart home hub so lighting or heating can be switched on when the car nears home, or data can be shared with payment mechanisms so that cars can act as an electronic wallet, automating the payment of road tolls, fuel purchases or other motoring related expenses."

    "… if I rent a car, I go through this awful dance where I have to sign off that I really do have car insurance and it's from this company…. that should be linked so that the rental agency knows automatically that I'm covered by Liberty Mutual. And if I'm then in an accident, the insurance company should be automatically informed and can represent me, which is what I paid them for."

    "…all these benefits should be private and shared only under the driver's control and direction"

    Doc Searls, Berkman Klein Center, Harvard University
- Integrated Payments and eCommerce Capabilities
  - Based on the combination of connected car data with wider personal datasets, allowing automatic payment for road tolls, fuel and other motoring related expenses or enabling shopping via the in-car display.

Individuals continued	○ GMs Marketplace, introduced in 2017, is now available in c. 3 million Chevrolet, Buick, Cadillac and GMC cars. Using their touchscreen, drivers can place for food and drink from selected merchants, pay for fuel, or make restaurant reservations, without having to leave the car. ○ Similarly, Fiat Chrysler plans to deploy a new mobile wallet in the 2020 Chrysler, Dodge, Jeep and Ram vehicles equipped with connected services. This "Uconnect Market Platform" can be updated over-the-air and can be used to order food, make reservations and pay for fuel or parking. • Personalised In-Car Experience ○ Driver / passenger personalised settings and preferences, including infotainment preferences, journey plans, driving position and climate control. ○ Ability for the user to port between vehicles • Other features include remote operation (e.g. unlock, start, reverse out of a parking bay)
	Cost savings • Enhanced monitoring of key service items, increasing the time between service visits. • Reduction in fuel costs resulting from reduced journey times (improved navigation) and more economical driving behaviour (comparison to an ideal profile). • Insurance premium reductions, either enabled by improved safety or by improved propositions based on driving behaviour.

1.2. Public Services Public Services are key beneficiaries of the societal benefit areas set out in Section 2. Further benefits for Public Sector organisations are set out here.	**Urban Planners, Municipal Authorities and Highway Agencies** • Data on vehicle journeys (journeys start/endpoints, journey times, traffic hotspots, accident blackspots, etc.) can help urban planners and municipal authorities with a range of decisions e.g. location of new residential and industrial or business developments, public transport infrastructure, timing of roadworks and where to focus increases in urban road capacity. • Similar data can provide highway authorities with insights helping to inform (very expensive and potentially highly disruptive) investment decisions on road infrastructure. • Movement data can also assist authorities with disaster planning and disaster response in the event of roads becoming inaccessible due to fire or flood or large numbers of vehicles needing to be re-routed as a result of natural disasters.
	Emergency Services & Law Enforcement • For the emergency services, real-time data on the number of cars and number of passengers involved in accidents enables better matching of ambulances or fire trucks to crash sites. This data can be shared and updated by first responders to incidents so that the all relevant resources (hospitals, law enforcement, traffic redirection) can be aligned where necessary. • Connected car data is already enabling stolen vehicle tracking and recovery e.g. once a driver reports a stolen vehicle to GM's OnStar service, advisors can use GPS technology designed to locate the vehicle, alert law enforcement authorities, and in some cases, remotely slow down the vehicle. With Remote Ignition Block, OnStar can also remotely prevent a thief from restarting a stolen vehicle. Some sensors (dashcams, internal cameras) could evolve to support the identification of vehicle thieves.

1.3. OEMs and Automotive Service Providers The benefits and opportunities highlighted for OEMs and Automotive Service Providers fall into seven categories:	**OEMs – Improving Design and Manufacturing Process Efficiency** • OEMs can use connected car data to improve the design and optimise manufacturing processes both internally and throughout the supply chain - significantly improving the efficiency and reducing the cost of their operation. • Connected car data can have a significant impact in 'closed-loop manufacturing' (which uses structured processes and continuous data flow that starts with R&D, moves through design and prototyping, production, aftermarket services and circles back to R&D) by providing rich insights into how the car is being used, how it is performing and issues with its systems or components that might need replacement or re-design.
	OEMs – Post-sale Operational Cost Reduction • The opportunity to reduce after-sales costs associated with fault identification and repair was cited by many interviewees as the most significant tangible benefit to OEMs.

OEMs and Automotive Service Providers
Continued

- Connected car data can bring huge benefits to the recall and defect correction processes. The data can increase significantly the efficiency of fault diagnosis and the development and delivery of the most effective response.

> *"The Business case for adding the telematics capability was predicated on the ROI achievable via leverage of the data. It was a walk in the park – mainly because of the operational benefits of remote diagnostics and OTA servicing in our business model, where we want to avoid the need for cars to physically visit a dealer."*
>
> David Green Lynk & Co.

- An ever-increasing number of vehicle operations are controlled or enabled by embedded software – from operation of precipitation and light sensors through infotainment to core engine/gearbox/braking system management. The forecast value of this software will rise to c. 30% of the total vehicle value by 2030 (McKinsey). Over-The-Air (OTA) servicing using the connected car infrastructure can play a major part in cost-effectively managing and maintaining these vital systems.
- These remote diagnostic and service solutions could provide the cornerstone of an ongoing relationship with the driver that engenders trust, loyalty and influences future buying behaviour.

> *"Diagnosis and maintenance - ultimately including OTA maintenance - is one of the biggest areas that answer the key consumer question "What does this do for me" that will motivate individuals to part with their data."*
>
> Jessika Lora, CEO & Founder, CarForce.io

Example Uses of OTA Capability

- Issuing new services or upgrades remotely e.g. BMW recently released an upgrade to some models that introduced an Intelligent Personal Assistant – *"whose range of intelligent functions can now be expanded automatically and conveniently over the air".* Other OEMs offering similar updates include Volvo and Ford.
- Applying core performance upgrades e.g. in 2018, in response to a critical review by Consumer Reports, Tesla issued an OTA upgrade to the braking system on its Model 3 that reduced the braking distance from 60mph by ~20 feet. Tesla leads in this space currently, and regularly issues OTA vehicle updates.

Challenges to Widespread Implementation of OTA Fixes and Upgrades

There are a number of challenges to be address in the development of OTA solutions:

- The question of whether customer consent is required before issuing a fix or upgrade, and whether customers are able to reject a change (if so, with what consequences e.g. if it is a safety upgrade). This may be part of the contract of sale for the vehicle, or addressed more frequently and dynamically as part of a wider consent model for connected car data enables services.
- There are typically robust 'type approval' regulations for vehicles, whereby a new model must undergo and pass stringent tests before being deemed fit for sale. Once type-approved, key vehicle components or systems may not be changed unless there is a new, or updated type approval. Rigorous testing will be required before OTA changes are made to safety critical or core operational systems in the vehicle.

OEMs and Automotive Service Providers Continued

OEMs – New Revenue Opportunities

- In addition to operational benefit from connected car data, there is huge opportunity in its wider commercial use. New direct revenue opportunities are available by:
  - Using data to enable new paid-for data-driven services to drivers, vehicle owners or other stakeholders. For example, GM OnStar In-Vehicle Safety and Security services and BMW Connected.Drive value added services are both available to drivers for a variable monthly fee, depending on the range of services taken.
  - Selling connected car data directly to 3rd parties e.g. for marketing analysis or research purposes, or to enable value added services such as real-time traffic information.
- New indirect revenue opportunities are available by making connected car data available via partners or data marketplaces, and receiving a share of any revenue generated by 3rd parties using the data to provide new services to drivers, owners or other market players.
- Leveraging non-personal and anonymised datasets is relatively low risk as it largely avoids the legislative and associated challenges related to the use of PII (see Section 4). However, participants in the research felt that OEMs need to be mindful of not missing key opportunities by avoiding the use of PII – as this creates a gap that others may be prepared to fill.

> *"A big part of the reason that these data experiences have not flourished already isn't because of a lack of data. It's because of a concern for potential legal exposure and liability. Any time we see these sort of bottlenecks, it does create a big open opportunity for third parties to come in and innovate… to use the data, take the time to go out and seek the express consent from the consumers and take on that risk."*
>
> Jessika Lora, CEO & Founder, CarForce.io

OEMs - Deeper Customer Engagement

- Connected car is a key opportunity to strengthen an OEM's relationship with the driver by providing in-life upgrades, service notifications, novel features and subscription-based services e.g. at GM, via the services enabled by OnStar

> *"The connected car must be considered a 'living product', that continues to evolve during its lifetime with the customer"*
>
> Franck Louis Victor, Renault-Nissan-Mitsubishi Alliance

Vehicle Servicing Providers – Improved Servicing Offers

- 3rd party businesses will be able to offer a range of services to drivers using connected vehicle data around engine, other systems and component diagnostics. These can be made available in ways that drive competition, improve efficiency and encourage innovation.
- For example, Carforce collects this data remotely via the OBD port and apply their own analyses to fault codes and related data – the output is provided to independent dealers, enabling them to offer improved service offerings (including predictive maintenance) to consumers and businesses e.g. Fleet Managers.
- Use of the data can also reduce the number of cars brought in for unnecessary servicing and repair/fault resolution.

Dealerships – Deeper Customer Engagement

- Dealerships will be able to develop and offer additional services to consumers, either via the in-car technology platform (if access is granted) or via brought-in platforms (e.g. smartphones) to deepen customer relationships and engender loyalty.

Fuel and EV Charging Providers – Proactive and Adaptive Offers

OEMs and Automotive Service Providers Continued	• Access to car route data (e.g. volume of cars passing by, number of cars stopping at competitor's stations) supports better decision-making on where to site new gas or EV charging stations and enables adaptive and dynamic pricing strategies. • With access to in-car data (e.g. fuel/battery levels, planned journey information) fuel or EV charging stations will able to offer targeted, dynamically priced services to approaching vehicles. Some aspects of this can already be seen in platforms such as Waze, where gas stations, EV charging points and other retailers/service providers are able to advertise and promote offers to nearby vehicles.
	Roadside Assistance Providers – Proactive and Efficient Repairs and Recovery • As well as being notified of breakdowns automatically (bCalls), or potentially being able to identify and proactively resolve problems before they happen (in the same way as OEMs or 3rd party service providers), the ability to access diagnostic data prior to arriving at the vehicle should enable swifter resolution. • In the event of advance data indicating an irresolvable problem, it should also lead to more appropriate response – sending a tow truck to recover the vehicle in the first instance rather than an engineer in a van.

1.4. Financial Services Providers	**Insurers – Enhanced Underwriting, Usage Based Insurance Offers and Enhanced Claims Analysis**
	• Access to driver behaviour data enables insurers to price risk more accurately and develop innovative products, such as pay as you drive or insurance pricing that adjusts to reflect driving behaviour.
	• Other connected car data can help evaluate claims and identify potential fraud e.g.
	  ○ Dashcam or reversing camera data can show the cause of collisions
	  ○ Claims for whiplash can be informed by Event Data Recorder (EDR) information on the severity of the collision
	  ○ Data on driver behaviour, vehicle status and environmental condition can all inform the evaluation of claims e.g. was the driver exceeding the speed limit prior to an accident
	  ○ Collision impact data can make claims processing more automated with less need for damage assessment to be undertaken by a human e.g. automatically writing off a vehicle involved in an impact beyond specified g-force parameters.

	Banks, Lenders and Lease Providers – Improved Asset Valuation • For banks and other vehicle loan providers, connected car data can provide insight into how the asset against which the loan is secured is being treated and maintained. This enables them to accurately estimate how much of the loan could be recovered should the owner default on payments and adjust risk provisions and future loan offers accordingly. • Vehicle leasing providers can use this information to better estimate residual values at the end of a lease, enabling refunds/extra charges or bespoke pricing on subsequent leases. Leasing providers (and fleet managers) will also be able to determine whether certain lease restrictions are being breached and take appropriate action.

1.5. Other Businesses	**Vehicle Fleet Management - Improved Operations and Reduced Costs** • Businesses operating vehicle fleets will benefit from access to richer data that identifies ways to reduce vehicle maintenance costs. Connected vehicle data will significantly improve on the telematics that is already in commercial fleets by allowing this to be done more proactively and dynamically (real-time). • There are also significant benefits for haulage fleet operators, courier companies and others who can extend current telematics analysis to further optimise route planning and timing taking account of historical and real-time traffic patterns, environmental conditions, etc.
	Telecoms Providers • Telecoms is an industry set to be impacted massively from increased connected car data: • A projected 40-fold increase in wireless network traffic will require investment in infrastructure capacity and create opportunities for new revenue streams from the

	connected car ecosystem e.g. data acquisition and storage, analytics, data brokerage, or data monetisation more generally.
	Parking Providers • Parking providers can use traffic data in conjunction with their own information on parking space availability (from cameras, IoT sensors, etc.) to enable dynamic pricing, more efficient use of resources and better planning of future capacity.

	Retailers, Hospitality and Other Businesses
	• Leverage of connected car data will enable many types of business to enhance existing services and offer new value, for example:
	  ○ Retailers, restaurants, hotels and other geo-centric business will be able to target marketing messages more accurately and dynamically e.g. precision targeting of both new prospects and existing customers with offers either when a journey is planned or as drivers approach one of their outlets.
	  ○ As with gas stations, route data analysis will also support better decisions on where to locate new sites.
	• This is exemplified by Waze, which offers personalised advertising e.g. about local amenities, when it detects that the car has been stationary for more than 3 seconds.
	  ○ Media and infotainment providers will also be able to provide more targeted content to drivers and passengers, delivering greater engagement. This will become increasingly important as the level of vehicle automation increases and less is required of drivers, meaning they have more time to consume rich media.

Conclusion

Connected car data brings numerous benefits to key stakeholder groups. These vary from improving road safety and emergency services response times to driving significant cost savings and facilitating stronger customer relationships.

The opportunities and benefits presented by this growing market are far reaching and it is not only road users, connected vehicle owners and companies involved in the automotive ecosystem that are positively impacted by the new datasets. Many other businesses and service providers can use connected car data to drive efficiencies and explore previously untapped potential. These include insurance services, telecoms companies, parking providers, hospitality services, media and retail; all of whom can use the new data to make informed business decisions and offer a greater customer experience.

In the next report we will examine the key issues of consumer trust in the use of connected vehicle data, and how the industry must comply with important data regulations.