

**2018
EDITION**

**Free
abstract**

The reference
report for
commercial fleet
telematics, fuel, toll,
diagnostics &
insurance services

CONNECTED FLEET SERVICES Global Study



***Big data for big trucks:
digitalising mobility
services***

ABOUT PTOLEMUS CONSULTING GROUP



from Ptolemy, the Egyptian savant who built the 1st map of the world

PTOLEMUS is the first international strategy consulting & research firm specialised in the connected vehicle and the Internet of Things (IoT).

We help our clients apply strategic analysis to this fast-moving ecosystem, across all its industries (automotive, insurance, assistance, fleet management, road charging, mobile telecoms, etc.) and on an international basis.

PTOLEMUS, founded by Frederic Bruneteau, operates worldwide and is present in 9 countries: Belgium, Canada, France, Germany, Italy, Russia, South Africa, the UK and the US.

PTOLEMUS has performed nearly 100 consulting assignments related to connected and autonomous vehicles.

For any enquiry, please send a message to contact@ptolemus.com

Our consulting services

Strategy definition

Investment assistance

Innovation management

Procurement strategy

Business development

Deployment

Our fields of expertise

Mobility services	Car pooling Car sharing Smart parking	Multimodal mobility Ride hailing	Road side assistance Tax refund
Vehicle services & telematics	bCall eCall FMS SVT / SVR	Tracking VRM In-car Wi-Fi Fuel cards	Parking Navigation Speed cameras Traffic information
Usage-based charging	Car As A Service Electronic Toll Collection	Mobility-as-a-Service Road charging	UBI / PAYD Vehicle rental Vehicle leasing
Vehicle data & analytics	AI CAN-bus Crowd-sourcing Data protection	Driving behaviour OBD Predictive analytics	Remote diagnostics xFCD
Vehicle automation	ADAS	Autonomous cars	Autonomous trucks
Enabling technologies	Positioning (GNSS / WiFi / cellular)	M2M / connectivity Smartphones	Telematic devices V2X

YOUR PTOLEMUS CONTACTS

BRUSSELS

Frederic Bruneteau, Managing Director

+32 487 96 19 02

fbruneteau@ptolemus.com

PARIS

Matthieu Noël, Manager

+33 6 13 34 70 56

mnoel@ptolemus.com

LONDON

Thomas Hallauer, Research Director

+44 7973 889 392

thallauer@ptolemus.com

DUSSELDORF

Dr. Arno Wilfert, Associate Partner

+49 151 140 15 795

awilfert@ptolemus.com

MILAN

Sergio Tusa, Associate Partner

+39 33 51 02 19 95

stusa@ptolemus.com

TORONTO

JD Hassan, Associate Partner

+1 416 996 6124

jdhasan@ptolemus.com

MOSCOW

Denis Gavrilov, Associate Partner

+7 903 1552683

dgavrilov@ptolemus.com

And follow PTOLEMUS on Twitter: **@PTOLEMUS**

THE 6 AUTHORS OF THIS REPORT

Frederic Bruneteau, Managing Director, Brussels

MS, Management, HEC Paris and CEMS Master, University of Cologne



Mr. Bruneteau has accumulated over 20 years of experience including 17 years of experience of the mobility domain and 14 years of strategic and financial advisory for company such as **Arthur D. Little, BNP Paribas, SFR Vodafone and TomTom.**

He has become **one of the world's foremost experts in the field of telematics**, quoted by publications such as *The Wall Street Journal*, *The Economist* and the *Financial Times*. He has spoken at more than 50 international conferences on the subject.

Within PTOLEMUS, he has **led 70 assignments** related to **connected & autonomous mobility** for leaders such as Aioi Nissay Dowa, Allianz, Astrata, AXA, BP, Bridgestone, CNES, ENI, Fleet Complete, Generali, HERE, Kapsch, Liberty Mutual, Michelin, Octo Telematics, Pioneer, Qualcomm, Telit, Thales Alenia Space, Toyota and WEX.

He has completed 30 projects related to fleet management such as:

- Helped Investcorp in the **due diligence of Arvento**, the largest fleet TSP in Turkey;
- **Appraised the EU fleet telematics management market** for a \$40 billion hedge fund,
- **For a large TSP, assessed the Benelux light vehicle fleet telematics market**,
- Helped a data vehicle provider define its **fleet telematics strategy, business plan and device sourcing**,
- Designed the **pan-European pricing strategy of a provider of services to fleets** including telematics management, fuel card services and electronic tolling,
- Assisted Disruptive Capital Finance in its acquisition of **Tracker UK**, a supplier of stolen vehicle recovery and fleet management services and its merger with **Lysanda**, a fleet telematics provider.

Frederic performed a complete review of this report.

Thomas Hallauer, Research Director, London

BA, International Business, South Bank University, London



Thomas Hallauer has gained 15 years of strategy, research and marketing experience in the domain of telematics and location-based services from companies such as **Admiral, DriveFactor, Liberty Mutual, Michelin, Mobile Devices, Octo Telematics and Wunelli.**

He is expert at highlighting new trends, unearthing profitable niches and marketing new products and services notably in the automotive, motor insurance, LBS, navigation and positioning industries.

Before PTOLEMUS, Thomas held management responsibilities with **Mobile Devices**, a leading provider of telematics technology platform and devices and with **TU Automotive**.

Thomas is the lead author of the ETC Global Study, the most thorough review of the Electronic Toll Collection and Road Charging market published in May 2015.

Thomas also reviewed and published the **Connected Insurance Analytics Report** and the **UBI Global Study 2013 and 2016**, interviewing dozens of insurance companies.

Thomas led the research, writing and publishing of this report.

Justin Hamilton, Consultant, London

BA, Politics, Univ. of East Anglia and M.Litt. International Relations, University of St Andrews



Justin has more than 5 years of experience within the transportation, mobility and road user charging market. He conducts quantitative and qualitative analysis of global trends and developments in mobility, electronic road pricing and intelligent transport solutions.

Before joining PTOLEMUS, Justin launched Road User Charging Magazine and is frequently published in journals such as *Thinking Highways*, *Tolling Review* and *Tolltrans*. He regularly speaks at events such as the *ITS World Congress* and *Connected Fleets USA*.

His recent projects include:

- For a major provider of intelligent transports systems, contributed to the definition of its **European fleet services strategy and go-to-market plan**,
- An **in-depth review of the US fleet services market** and key trends impacting it for a fuel card provider,
- For one of the world's largest roadside assistance companies, investigated **new digital assistance models** and analysed their breakthrough impact on the value chain,
- The writing of our UBI Global Study 2016, the reference research on the connected insurance market, quoted by *Fortune*, the *Financial Times*, *Corriere della Serra*, etc.
- A **global analysis of the car sharing, car pooling, car leasing and car rental markets** for our recently published Connected Mobility Forecast 2016.

Justin is the main author of this report.

As such he investigated the Total Cost of Ownership (TCO) and the use of fleet services globally. He interviewed a very large number of fleet operators (Albert Schuck, Betz International, Kühne & Nagel, SIG Distribution, Travis Perkins and Whitbread) and suppliers such as ABAX, Masternaut, MIX Telematics, Navistar, Telogis, TomTom, Scania, Stoneridge, etc.

Matthieu Noël, Manager, Paris

MS Automotive Engineering & Project Management, ESTACA, Paris and MS Marketing, HEC, Paris



Matthieu Noël has gained **7 years of consulting experience in the mobility domain** advising numerous clients such as **Admiral, Airbiquity, Allianz, BMW, Egis, Faurecia, HERE, Macif, Matmut, Michelin, Mondial Assistance, Octo Telematics, PSA Peugeot-Citroën, Renault-Nissan and Vodafone Automotive.**

He holds expert knowledge of domains such as remote diagnostics, PAYD/PHYD, connected vehicle data & analytics, OBD dongles, vehicle repair and maintenance, fleet telematics, fuel card services, ETC, autonomous vehicles, etc.

He led or participated in **more than 20 consulting assignments, including many in the fleet management domain such as:**

- For **Euromaster**, evaluated the interest of telematics & scheduling solutions for its fleet of repair trucks,
- For a **major road operator**, built its marketing & pricing strategy to launch a wide range of fleet services across Europe including fleet telematics, ETC and tax refund,
- For an **automotive data aggregator**, defined its future connected vehicle data strategy and 5-year business plan to enter the fleet telematics market,
- For **BMW**, built a new marketing strategy to improve the fleet sales performance in France,
- **For a leading automotive OEM, defined a new business model of its electric vehicles offer in Europe.**

Matthieu regularly speaks and moderates panels on automotive, mobility and telematics services at conferences.

For this report, Matthieu contributed to the building of our fleet telematics and fuel cards market forecasts globally.

Philippe Brousse, Consultant, Brussels

MSc Eng., ENSIMAG & MS Strategy ESSEC, Paris



Philippe has gained 3 years of experience in strategy and market research for companies such as **Danlaw, Europ Assistance, the European Commission, Kapsch, Octo Telematics, Safran Morpho and WEX.**

He has performed multiple assignments in connected fleet services such as:

- The definition of a global payment provider's connected services strategy for the consumer market,
- The building of the US fleet services strategy & business plan for a major player,
- An assessment of the Benelux fleet telematics market for a North American TSP,
- The evaluation of the EU fleet telematics management market for a hedge fund,

As part of our Connected Mobility Forecast, he conducted the analysis and 5-year forecasts of the markets for fleet management worldwide.

For this report, Philippe contributed to the building of our bottom-up market forecasts of the Fleet Telematics markets globally.

Tong Wang, Business Analyst, Paris

Master in International Business, Grenoble School of Management; BA in International Business, University of Nottingham Ningbo China (Zhejiang, China)



Tong Wang has experience in strategy and management consulting in China. She notably assisted a French IT company that provides **IoT solutions to enter the Chinese market** and contributed to redefining the **business strategy of a listed Chinese retail group**.

She holds experience in **market research and data analysis**. Tong conducted a survey, collected and analysed data about the retail industry in China to design a business model.

She is fluent in English and Chinese and also has proficiency in French. With an international business education background and overseas experiences, she is good at collaborating with teams with international profiles to deliver global market insights.

For this report, Tong led the telematics market and fleet cost analysis of the Chinese market. She also interviewed a number of actors in fleet management in and outside China in order to build their company profiles.

FOREWORD

As we had already predicted several years ago, the combined positioning and connectivity of vehicles to the Internet would not let the industries that supply them and the related services untouched.

Commercial vehicle OEMs, oil majors, tyre suppliers, telematics providers, toll operators... All of them are facing the need to reinvent the way they provide services to fleets by leveraging data, integrating with partners and breaking the silos they were operating in. Over the last 18 months, we have seen an acceleration in the number and the scale of partnerships, mergers, investments and acquisitions aimed at bringing previously disparate fleet management services together.



The prize to be had by making the right move? **Complete control of the total cost of fleet operation (TCO). Beyond this, the complete reengineering of the supply value chain and the fleets' operational models.**

The level of activity in the fleet market in the last 18 months is impressive:

- **DKV, T-Systems and Daimler's** joint launch of Toll4Europe, a pan-European tolling payments provider,
- Navistar's launch of its own telematics platform, *OnCommand Connection*,
- TomTom Telematics' **data sharing partnership** with BP,
- US fuel card giant **Fleetcor's** acquisition of Brazilian tolling payment provider Sem Parar and European TSP Masternaut,
- Michelin's acquisition of **NexTraq**, the US Telematics Service Provider,
- WEX' acquisition of **EFS**, the fuel card provider to over-the-road (OTR) truck fleets,
- Fuel card giants UTA and Total's **own brand entry into the EU electronic tolling market**,
- Fuel card issuer **Eurovag's acquisition of Czech telematics service provider Princip**,
- Tier-1 supplier and diagnostics provider **WABCO's acquisition of TSPs** Transics (Europe) and AssetTrackr (India) and partnership with G7 (China),
- Chinese TSP **Sinoiov's** partnership with fuel card issuer Sinopec,
- **Joint partnership between BMW, DriveNow and Total** on vehicle based fuel payments,
- **Partnership between Shell, Jaguar, PayPal and Apple Pay** on vehicle-based fuel payments,
- Allstar and Masternaut's **launch of a co-branded fuel card and telematics** package,
- EU fuel card issuer LogPay's joint venture with **Volkswagen** on toll and fuel payments,
- **PSA Groupe's** collaboration with TomTom Telematics and Masternaut,
- **Daimler Fleetboard's** partnership with UTA,

- General Motor's **OnStar data sharing** partnership with TSP **Spireon**,
- Japan's electronic tolling 2.0 additional services and data analytics launch.



Yet it has not been plain sailing for all. Fleetcor's divestment of NexTraq has demonstrated that **acquiring competencies across different fleet management silos is not enough on its own to ensure commercial success.**

As we explore throughout this report, the value of the data being generated by each service must be fully understood and organised. Simply layering complimentary data sets or **delivering raw data to fleets is no longer enough** to generate value, let alone additional revenues.

Until recently, OEMs have played a very small role in the delivery of fleet services beyond the sale, financing and maintenance of the vehicle. As of today, **OEMs across all regions are positioning themselves as holistic providers of fleet, driver and expense management services.** Some have chosen to partner with best-in-class aftermarket suppliers. Others are choosing to do it alone.

This report is the first to provide a strategic, global, cross-industry analysis of the new challenges faced by commercial vehicle fleets and their suppliers.

In more than 650 pages, it responds to a number of key questions:

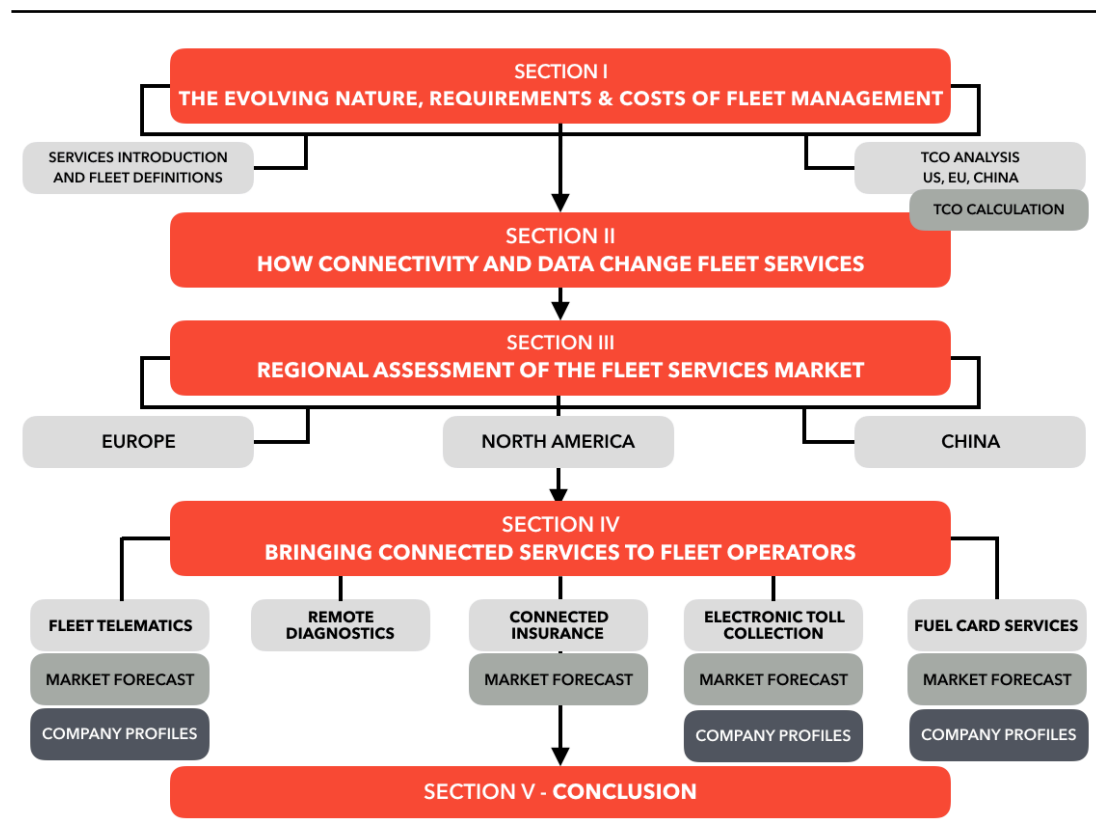
- **How will the cost optimisation, mobility and management needs of fleets evolve** in the next 5-10 years?
- Will **fleet operators** actually look for a single provider of service to reduce their TCO?
- What will be the **role of van and truck manufacturers** in the provision of fleet services?
- How will **fuel card issuers**, leverage their newly gained access to fuel, fleet & toll data?
- How will the ETC (Electronic Toll Collection) market evolve and where will the **next truck toll schemes** emerge?
- What will it take for **connected fleet insurance to become a popular** service?
- Will these initial **cross-silos partnerships provide tomorrow's template** for fleet management business development?
- **How big are the opportunities** in the fleet telematics, fuel card, tolling and connected insurance market - in volume and revenue?

Our ultimate objectives: help fleet suppliers reinvent the way they provide services and guide all fleet owners into this changing landscape.

To answer these questions, and many more, we have researched and forecast 5 vertical markets that are critical to fleet needs: fuel card services, electronic toll collection, fleet telematics, remote diagnostics and insurance.

We explain in the next chart the methodology and key outputs of this report.

Structure of the Connected Fleet Services Global Study 2018



Source: PTOLEMUS

Our methodology has included:

- **Interviewing** a very large number of **fleets** in different industries,
- **Interviewing** all leading **suppliers** as well as disruptive **start-ups** throughout the fleet market place,
- **Recording all the offers** available in each market and building 4 bottom-up forecasts,
- Exploring the pros and cons of each approach with **multiple supporting case studies** and results from our extensive primary research,
- **Leveraging our skills in forecasting and analysis** to construct the most comprehensive and insightful report on connected fleet services available today.

This report leverages:

- **18 months of dedicated desk research of the fleet market on a global basis,**
- **Analysis and peer review** by a team of experts,
- **The insights from over 100 consulting assignments** on fleet telematics, fuel card services, roadside assistance, electronic tolling, data analytics and connected insurance,
- **Interviews with over 70 executives** from across the fleet landscape including fleet operators and fleet owners,
- **A review of mergers, acquisitions** and strategic undertakings by relevant companies,
- **Rankings of suppliers in 3 domains:** fuel card, telematics and toll services.

It has been a pleasure for us to write this report. We hope that you will enjoy reading it. If your company plays a role in this business and has not been mentioned in our report, please let us know so that we can update it in the coming months. Please send your comments to thomas@ptolemus.com.

Sincerely,

Frederic Bruneteau
Managing Director



This report bridges the gaps and examines the links between connected fleet services

EXECUTIVE SUMMARY

This year **Amazon's market capitalisation overtook \$500 billion**, proving how integrated logistics combined with a smooth web experience were key to meeting customer needs. Amazing if you think that **this giant does not even operate its own fleet of vehicles!**



Maybe there is a reason for that. While **commercial transport** is a critical component of our globalised economy, **it is lagging behind in the race towards digitalisation and Big Data.**

Most containers are still not tracked. Most databases are not connected to each other. **And all commercial fleet managers are still inundated with paperwork!** Every day, to streamline their operations and costs, they attempt to best leverage their drivers and optimise their moving assets and 4 critical costs: maintenance, fuel, insurance and road tolls.

The suppliers offering these still typically provide their solutions in individual silos. Each of them offers a fleet dashboard, resulting in the operator looking at multiple screens and databases to understand the state of its vehicles.

This is changing fast, as we will describe in this report. In our view, **fleet managers will increasingly move towards a unified sourcing of fleet services.** With one objective: operate their fleets in a smooth and unified manner, a bit more like Amazon.



Fuel card services

- Fuel cards represent the largest of the 5 sectors assessed in this report with supplier **revenues in Europe and North America estimated to grow to \$22 billion by 2025**
- With **66 million fuel cards across Europe and North America in 2017**, fuel card issuers offer wide payment network footprints and have often become the **most important fleet relationship**
- However, it is also the market with the **slowest predicted growth, at 2% CAGR**, due to fierce competition, disruptive new entrants and the effects of fleet efficiency initiatives such as platooning, freight sharing and electrification
- Fuel card issuers will be forced to either steal market share from competitors or **branch out into neighbouring fleet services** in order to deliver growth
- **Fleetcor's** divestment of **NexTraq** has forced other fuel card issuers to re-assess their strategic approach towards telematics, but does not mean there are not clear benefits of combining the two services
- The growing intensity of the competition in the fleet market will force fuel card issuers to develop **payment services that match those on offer to consumers**
- New payment devices such as smartphones and driver-specific reward schemes could represent the key to **unlocking the small fleet market**

Fleet telematics services

- By 2025, the commercial fleet telematics market will approach **100 million units installed globally**
- Fleet telematics **ARPU's and service models will be challenged** by the entry of OEMs and suppliers from neighbouring markets such as fuel card issuers and ETC providers
- High levels of organic growth has created **telematics giants**, from Arvento to Verizon, who will increasingly compete in a single global market
- Increasingly TSPs will move to become **integrated suppliers** combining multiple fleet services. This is already started by companies such as Geotab and TomTom.
- The **explosive growth of fleet management software dashboards and data aggregators** such as Fleetio, Chevin and GAC Technology has made clear that fleets are looking for actionable insights, rather than just data reporting
- Without delivering clear analysis and data-driven insights, telematics service providers are under threat of becoming **commoditised data generators**
- **OEMs will continue to rapidly expand their in-house telematics platforms** and are beginning to appeal to mixed fleets
- **In our view, the fleet telematics market faces the highest threat of disruption** due to new market entrants and rapidly evolving business models

Electronic toll collection (ETC)

- In 2025, **120 million commercial vehicles will be equipped with ETC**, representing a **10% annual growth rate**
- The total length of **tolled roads applicable to HGV in Europe could rise by almost 50% by 2025** due to an expansion of existing schemes and the introduction of new national programmes
- As a result, **Heavy Goods Vehicles** (trucks over 3.5 tons) **will account for 71% of the global commercial vehicle ETC revenue**
- The technology is changing. **We expect that all new electronic tolling systems for trucks in Europe will be satellite-based**, facilitating their integration with other services.
- In the US, **integration between the \$6.3 billion electronic tolling market** and other fleet services is largely non-existent despite significant opportunities
- Full integration between ETC payments and other fleet services such as fuel cards and HoS (Hours of Service) reporting has already propelled **China above the US as the single largest market for commercial vehicle ETC in the world** - by 2025 revenues will almost match those of all European schemes combined
- Revenues in emerging markets such as **Indonesia, Philippines and South Korea** will rise significantly as governments increasingly rely on ETC to support new road building programmes

Connected fleet insurance

- **For the last 5 years, commercial motor insurance worldwide has been losing money** with a combined ratio between 108 and 110!
- Yet, **risk management programmes are still at the R&D stage** in the commercial line
- Regulations in Europe and the US give no choice; **fleet operators are responsible for their driver's behaviour**, whether they know about it or not!
- Many partnerships between TSPs, leasers, brokers and fuel card providers already exist but the **opportunity to monetise the relationship is generally unexploited**
- The value of telematics data to the risk sector will come from **changing driver behaviour, not just reporting it** - without driver training, TSPs cannot change the risk profile of their fleet customers

One thing brings them together: data

- **OEM-developed fleet services remain in their infancy** compared to the aftermarket
- At the same time, the vast majority of fleet service providers are **failing to fully utilise the data available to them**
- Sharing/combining data between OEMs and aftermarket providers can **enhance the product offering of all service providers**
- 2 clear models - **open loop and closed loop** - have emerged with regard to OEMs' use and application of fleet data
- The OEM data clouds will need to be connected to competing, sector-focused "neutral" servers, to ensure **many-to-many service provision**
- It's not (only) about accessing Big Data! Simply **combining data is not enough** to deliver increased revenues in today's market
- Data analytics capabilities and the **delivery of actionable insights** to the fleet will determine the winners and losers in the future fleet services ecosystem
- **Remote vehicle diagnostics will be the next battlefield** as OEMs take more control of the data distribution
- Other key data sets will become valuable commodities, including **crash data, driver behaviour data and fuel transaction data**
- **Driving behaviour data represents the single most valuable dataset** across each of the 5 connected service providers we have assessed, yet it is not being utilised to its full potential

The Connected Fleet Services Global Study in numbers

- 650 pages
- 300 graphs
- 50+ case studies
- 45 company profiles
- 4 market forecasts (fleet telematics, fuel cards, electronic tolling and connected fleet insurance)
- 150 TSPs ranked by volume worldwide

FOOD FOR THOUGHT

"We will still focus on eCall and bCall, but expanding our offering means we can deliver a complementary group of services for manufacturers and their customers. By using a rich variety of information we have the opportunity to ultimately offer predictive maintenance."



Glenn Renwick, CEO,
Progressive

"The application of telematics for commercial vehicles, to improve segmentation and effectively underwrite and price small fleets, is a space where we are enthusiastic about playing in the future."



Lee Taylor,
chief sales
officer for
Allianz
Worldwide
Partners

"We know the future is embedded,"

"Daimler is today facing an exceptional challenge: we are more successful than ever before but our business is changing like never before"



Dr Dieter Zetsche,
Chairman, Daimler AG

"The DKV BOX EUROPE even has everything required to cope with future tasks, such as providing further value-added services, including comprehensive vehicle data analyses"



Gertjan Breij,
MD, DKV



Andrés Irlando,
CEO, Verizon
Telematics

"I believe the auto industry will change more in the next five to 10 years than it has in the last 50."



Mary Barra, CEO,
General Motors



Jason Krajewski,
manager, Daimler
Trucks North America

DTNA is currently evaluating machine learning systems such as IBM's Watson to apply artificial intelligence tools to the number crunching

The combined data and analytics that customers will be able to benefit from [our partnership with Masternaut] will provide a 360 degree view of fuel spending and usage

"For goods transportation, which could travel primarily on highways, there's a good and compelling use case there, too. Either of those two might be the first ones you see."



John Krafcik,
CEO, Waymo

"Telematics and fleet management services are a rapidly growing category worldwide and an important area of Michelin Group's overall business plans"

Tony Murtagh, Fuel Card and Corporate Payments, FLEETCOR



Ralph Dimenna,
COO, Michelin
Americas Truck
Tires



Pascal Le Merle,
Renault

Renault is able to deliver more vehicle data to insurers than any aftermarket players.

TABLE OF CONTENTS

I. THE EVOLVING NATURE, REQUIREMENTS & COSTS OF THE FLEET MARKET

A. Introduction and definitions

1. The fleet segments we focus on in this report
2. We segment the fleet market along five lines
3. What constitutes fleet management today?
4. How fleet services are used across vertical markets

B. Mapping the total cost of ownership (TCO) across fleets

1. Identifying the total cost of operation across the CRT/OTR and maintenance & utilities segments
2. The TCO for HGVs and LCVs in Europe
3. TCO calculation for Class 1-5 and 6-8 vehicles in the US
4. The cost of operating LCVs and HGVs in China

II. HOW CONNECTIVITY & DATA CHANGE FLEET SERVICES

A. The era of mass connectivity and big data among fleets

B. OEMs' diverging approach to fleet services

1. Open loop services model
2. Closed loop services model

C. The growing commercial power of data integration and analytics

D. How data is driving the evolution of fleet services

III. REGIONAL ASSESSMENT OF THE FLEET SERVICE MARKET

A. EUROPE

1. Examination of current market conditions
2. Cost of fleet telematics
3. Key market drivers in fleet services provision
4. Service index and maturity scale
5. Key stakeholders and landscape evolution

6. The role of the OEMs in building fleet services

B. NORTH AMERICA

1. Examination of current market conditions
2. Key market drivers and regulatory issues
3. Key stakeholders and landscape evolution
4. The role of OEMs in developing fleet services

C. CHINA

1. Examination of key market drivers
2. Offering, Stakeholders & landscape evolution
3. Role of OEMs in building fleet services

IV. BRINGING NEW SERVICES TO FLEET OPERATORS

A. The golden era of fleet telematics

1. Background and recent market developments
2. Service integration and new players entering the market
3. Value chain
4. Systems architecture and data requirements
5. Typical devices in use
6. Delivery recommendations
7. Template graph from Fuel card slides - led by TCO split per region
8. Fleet telematics global forecast

B. Using vehicle data to reduce spend on maintenance and breakdowns

1. The benefits and opportunities of remote diagnostics service
2. Remote diagnostics solutions for light commercial vehicles
3. Remote diagnostics solutions for heavy commercial vehicles
4. The impacts of OBD dongles on vehicle safety
5. The value chain of remote diagnostics
6. Systems architecture & data requirements

C. The struggling growth of connected fleet insurance

1. Background & recent market developments
2. Technology trends and devices used in the truck sector impacting safety
3. The connected insurance value chain
4. Systems architecture & data requirements
5. Integration with other services

6. Forecasting the Connected Insurance market in LCVs and HGVs
7. Delivery recommendations

D. Electronic toll collection moves out of the shadows

1. Background & recent market developments including key geographic markets
2. Value chain
3. Systems architecture & data requirements (including certification requirements for new drivers, etc.)
4. Typical devices in use including data generated/functionalities, unit costs, etc.
5. Level of existing integration with other fleet services
6. Recommendations on how to deliver service i.e. is this a host service or an API?
7. TAM, ARPU, costs and growth forecasts

E. Fuel cards: the sleeping giants of fleet services

1. Background and recent market developments
2. The fuel card value chain
3. Systems architecture, data requirements and typical devices in use
4. Integration with other services
5. Level of existing integration with other fleet services
6. Growth forecast for fuel card services

V. CONCLUSIONS

VI. COMPANY PROFILES

LIST OF FIGURES

Fig 1a.1: A brief timeline of the evolution of fleet services

Fig 1a.2: Evolution of commercial vehicles in use in Europe (million)

Fig 1a.3: Evolution of commercial vehicles in use in the US (million)

Fig 1a.4: Evolution of commercial vehicles in use in the US (million)

Fig 1a.5: Total penetration of telematics fleet management systems (LCVs and HGVs - average per region) in 2017

Fig 1a.6: The matrix of the four toll system types

Fig 1a.7: Penetration of fuel cards in markets around Europe and North America

Fig 1a.8: How fleet services are used across vertical markets

Fig 1b.1: The 9 dimensions of total cost of ownership

Fig 2.1: Devices and technologies able to deliver connected vehicle services

Fig 2.2: Static and dynamic data categories

Fig 2.3: Data generating devices on Otto's driverless truck

Fig 2.4: OEM installed devices

Fig 2.5: Data generated by event data recorder (EDR) devices

Fig 2.6: Aftermarket installed devices

Fig 2.7: The evolution of electronic tolling devices for HGVs in Europe

Fig 2.8: Moving towards new connected services

Fig 2.9: OEM data sharing and fleet service models

Fig 2.10: OnStar's partner application platform

Fig 2.11: BMW's ConnectedDrive service portfolio

Fig 2.12: Vehicles in use equipped with embedded connectivity (millions) and penetration in the total parc (%)

Fig 2.13: Creating value for fleets through data integration

Fig 2.14: Creating value for fleets through advanced analytics

Fig 2.15: Data used to power basic fleet services

Fig 2.16: Additional/enhanced data used to power best in class services

Fig 2.17: Individual growth in importance of data sets across basic and best in class services

Fig 2.18: Accumulated growth in importance of data sets across basic and best in class services

Fig 3a.1: Largest European markets by vehicle type in use (million units - 2016)

Fig 3a.2: TCO composition and related hypothesis for HGVs and LCVs in Europe

Fig 3a.3: Main figures assessing European TSP market

Fig 3a.4 : FMS volumes by device in LCV and HGV segments in Europe (million units)

Fig 3a.5: FMS volumes by distribution channel in Europe (million units)

Fig 3a.6: Penetration of fleet telematics in Europe (% total LCVs in use)

Fig 3a.7: Penetration of fleet telematics in Europe (% total HGVs in use)

Fig 3a.8: Factors impacting ARPU

Fig 3a.9: Segment breakdown and offers of seven selected TSPs

Fig 3a.10 : Comparison between offers from Fleetmatics and TomTom Telematics

Fig 3a.11: Comparison between offers from ABAX and Quartix

Fig 3a.12: Comparison between ABAX and Quartix offer and strategy

Fig 3a.13: Typical pricing strategies in fleet telematics services

Fig 3a.14: Regulatory and technology drivers impact and relevance

Fig 3a.15: An example of a Portable Emissions Measurement System

Fig 3a.16: Penetration of electricity and other alternative fuels in EU28

Fig 3a.17: Example of features of fleet telematics applied to trailers

Fig 3a.18: Forecast on commercial vehicles in use and quantities shipped, 2015-2030

Fig 3a.19: Profits and age of selected emerging and well-established companies

Fig 3a.20: Milestones of the tachograph regulations in Europe

Fig 3a.21: Comparison between Analogue, Digital and Smart Digital tachograph capabilities

Fig 3a.22: Services and features offered by eight companies active in fleet telematics

Fig 3a.23: Fleet telematics features' relevance in ability to address TCO components

Fig 3a.24: Top 10 FMS providers in Europe per # active units

Fig 3a.25: SWOT analysis of OEMs in telematics fleet management provision

Fig 3b.1: Total number of commercial vehicles in use across North America (millions)

Fig 3b.2: Total commercial vehicles by fleet size - USA, 2016 (millions)

Fig 3b.3: Largest cellular carriers in the US by number of post-paid contracts (millions)

Fig 3b.4: Annual data costs for connected service providers in US and Europe (\$)

Fig 3b.5: Penetration of key services among all commercial vehicles in North America

Fig 3b.6: Annual ARPU to service provider for key fleet services - class 6-8 trucks, US (\$)*

Fig 3b.7: Annual ARPU to service provider for key fleet services - class 1-5 trucks, US (\$)*

Fig 3b.8: Potential ADAS sensors on a class 8 truck

Fig 3b.9: Vehicles equipped with OEM connectivity and penetration in total parc (US, millions, %)

Fig 3b.10: Evaluation of services based on importance & frequency of use - heavy trucks

Fig 3b.11: Evaluation of services based on importance & frequency of use - light trucks

Fig 3b.12: Influences on fuel efficiency (%) and level of control

Fig 3b.13: ELD mandate timeline

Fig 3b.14: Parties responsible for EMV card fraud

Fig 3b.15: Major telematics acquisitions and investments by US companies - 2016/17

Fig 3b.16: Comparison of services offered by US based TSPs

Fig 3b.17: Sales of light duty trucks in the US by brand, 2016

Fig 3b.18: Sales of heavy duty trucks in the US by brand, 2016

Fig 3b.19: Heavy truck OEM telematics platforms and partners in the US and Europe

Fig 3c.1: Number of HGVs & LCVs on the road forecast in China 2012-2020 (in millions)

Fig 3c.2: National Commercial Vehicle Management Platform

Fig 3c.3: Comparison between Tachographs / Vehicle Terminals

Fig 3c.4: TCO components in LCVs and HGVs in China

Fig 3c.5: Gasoline price in China 1996-2017

Fig 3c.6: Consumer spending in China 2006-2016 (CNY in billion)

Fig 3c.7: IC cards launched in Guangxi road transport IC card pilot project

Fig 3c.8: Key market drivers of fleet telematics market

Fig 3c.9: Fleet telematics service offerings comparison between major TSPs in China

Fig 3c.10: Chinese tachograph service providers ranking by connected units (2017)

Fig 3c.11: Typical pricing model of Chinese fleet service providers

Fig 3c.12: Chinese Property insurance company market share

Fig 3c.13: Cross-silo partnerships in China

Fig 3c.14: Chinese truck OEM-developed telematics systems

Fig 3c.15: iFoton fleet manager's & driver's mobile app interface

Fig 4a.1: TSPs with more than 250,000 active units

Fig 4a.2: Driving the fleet telematics market: EUROPE xxx

Fig 4a.3: Driving the telematics market: USA xxx

Fig 4a.4: Driving the telematics market: South Africa

Fig 4a.5: Driving the telematics market: LATAM

Fig 4a.6: Data transmission via SINIAV

Fig 4a.7: Driver concerns regarding telematics data

Fig 4a.8: Driver acceptance of driving data collection

Fig 4a.9: TSPs can be in receipt of huge amounts of data from various devices

Fig 4a.10: Fleet telematics services offered by leading ecosystem players

Fig 4a.11: OEMs are increasingly building their own telematics platforms

Fig 4a.12: Fleet services offered by auto clubs and roadside assistance providers

Fig 4a.13: Auto clubs membership (millions) and estimated split

Fig 4a.14: GNSS equipped tolling devices on the European market

Fig 4a.15: Telematics devices are already making waves in the ETC market

Fig 4a.16: The data hub/clearing house systems architecture

Fig 4a.17: Data access framework under the ATG clearing house model

Fig 4a.18: The fleet telematics value chain and example players

Fig 4a.19: The fleet telematics value chain consists of 5 key groups

Fig 4a.20: Example of an HGV CAN bus architecture

Fig 4a.21: Fleet telematics systems architecture

Fig 4a.22: Data generated by a typical fleet TSP

- Fig 4a.23: Devices used to deliver fleet telematics services (1)*
- Fig 4a.24: Devices used to deliver fleet telematics services (2)*
- Fig 4a.25: Smartphones are highly sophisticated connected devices*
- Fig 4a.26: Standalone smartphone solutions have tended to focus on specific use cases*
- Fig 4a.27: Comparison between entry and enterprise level smartphone solutions in Europe*
- Fig 4a.28: A combination of devices will be needed to power future telematics solutions*
- Fig 4a.29: Static and dynamic data categories*
- Fig 4a.30: Importance of data sets for basic and best in class fleet telematics services*
- Fig 4a.31: Importance of data when delivering basic fleet telematics*
- Fig 4a.32: Importance of data when delivering best in class fleet telematics*
- Fig 4a.33: Growth in importance of data sets when moving from basic to best in class telematics*
- Fig 4a.34: Macro economic market drivers: GDP forecast (worldwide, in tn US\$) and crude oil price (worldwide, current US\$ per barrel)*
- Fig 4a.35: Commercial vehicles sales* (worldwide, million)*
- Fig 4a.36: Commercial vehicle sales by type and by region (worldwide, % volumes)*
- Fig 4a.37: Commercial vehicles in use in five regions worldwide (2016)*
- Fig 4a.38: Total addressable market for telematics FMS (commercial vehicles in use in millions)*
- Fig 4a.39: Largest leasing companies in Europe by car volumes*
- Fig 4a.40: Total number of commercial cars equipped with fleet telematics, World and Europe (million)*
- Fig 4a.41: Car sharing volumes in Europe (cars shared) and car sharing registered users for four of the largest brands (million users)*
- Fig 4a.42: Total number of LCVs equipped with fleet telematics (million)*
- Fig 4a.43: Total number of HGVs equipped with fleet telematics in the world and in Europe (million)*
- Fig 4a.44: Global penetration of telematics fleet management systems per vehicle type*
- Fig 4a.45: TSP revenues on all fleet telematics (US\$ million)*
- Fig 4a.46: TSP revenues and volumes of vehicles using telematics in the US and Europe (US\$ million)*
- Fig 4a.47: TSP revenues on commercial car fleet telematics (US\$ million)*
- Fig 4a.48: TSP revenues on fleet telematics in LCVs (US\$ million)*
- Fig 4a.49: TSP revenues on fleet telematics in HGVs (US\$ million)*
- Fig 4a.50: Mix of technologies used in commercial cars and LCVs (%)*
- Fig 4a.51: Mix of technologies used in trucks (%)*
- Fig 4a.52: Fleet telematics distribution mix in trucks and vans (%)*
-
- Fig 4b.1: Share of the TCO taken by Diagnostics for HGVs in Europe*
- Fig 4b.2: Vehicle maintenance is a TCO component that can be improved effectively by telematics*

Fig 4b.3: Large fleets now use diagnostics on operational, economic and sustainability grounds

Fig 4b.4: Standardising vehicle diagnostics has already taken 30 years

Fig 4b.5: Main OBD protocols and their pinout combinations

Fig 4b.6: The services delivered by using the vehicle OBD port

Fig 4b.7: Delphi Connect solution description

Fig 4b.8: CAN data is what makes diagnostics and maintenance services best in class

Fig 4b.9: Installing and using CANcliQ

Fig 4b.10: TSPs maturity in CANbus data integration is a key competitive differentiator

Fig 4b.11: Components causing warranty cases in 2014, in % of all analysed warranty case in the US

Fig 4b.12: The first requirements for OBD for HGV were introduced in the Europe and North America

Fig 4b.13: FMS interface standardised output data

Fig 4b.14: Services provided as standard with one-year free subscription on all 2017 model-year Hino trucks (in red)

Fig 4b.15: xxx

Fig 4c.1: Volume of LCVs and HGVs in use for key markets worldwide

Fig 4c.2: UK commercial motor insurance: average claims costs history

Fig 4c.3: Commercial Lines - Index Inflation-Adjusted Premiums and Loss Trends - US

Fig 4c.4: US Commercial automobile combined ratio for Third Party Liability (TPL) and comprehensive

Fig 4c.5: Total loss adjusted vehicle value - US, Q1 2016

Fig 4c.6: Different fleets represent different types of risk

Fig 4c.7: Impact of telematics on selected fleets' claims frequency and fuel consumption

Fig 4c.8: Whiplash claims as a percentage of bodily injury claims in Europe

Fig 4c.9: The pioneers of connected fleet line insurance and their telematics partners

Fig 4c.10: The new wave of partnerships defining connected insurance

Fig 4c.11: Devices in use in fleets produce increasingly complex data

Fig 4c.12: Split of causality in crashes involving trucks

Fig 4c.13: The Automated Driving Insurer Group is taking steps to define AVs' insurance coverage

Fig 4c.14: Some aftermarket ADAS systems are merged into a dash cam solution

Fig 4c.15: 3 Other drivers that will promote camera adoption

Fig 4c.16: The ATG Risk Solution clearinghouse model

Fig 4c.17: Example of speed limit assistance and speed limiters (left)

Fig 4c.18: Devices ability to deliver connected insurance services

Fig 4c.19: The connected fleet insurance value chain

Fig 4c.20: Value added services that can be provided by leasing companies

Fig 4c.21: Lex Autolease's relationship with its partners and the potential subsequent partnerships

Fig 4c.22: FNOL management structure in the partnership between a TSP and a broker

Fig 4c.23: The connected fleet insurance value chain

Fig 4c.24: Players integrating part of the connected fleet insurance value chain

Fig 4c.25: High level architecture for connected fleet insurance service provision

Fig 4c.26: Connected Fleet Insurance relevant data available from different devices

Fig 4c.27: Connected Insurance enabled by the different levels of fleet data

Fig 4c.28: In the Try Before You Buy app model

Fig 4c.29: In the risk assistance model

Fig 4c.30: In the claims management model

Fig 4c.31: In the Risk management model

Fig 4c.32: Insurance, telematics and fuel services platforms complimentary

Fig 4c.33: The different types of connected insurance programmes

Fig 4c.34: Commercial vehicles in use in Europe (million units)

Fig 4c.35: Vehicles in use equipped with OEM connectivity and penetration in total market (US, millions, %)

Fig 4c.36: Total commercial vehicles with connected insurance coverage (million units)

Fig 4c.37: Commercial vehicles with connected insurance coverage in Europe (million units)

Fig 4c.38: Global connected insurance adoption (%)

Fig 4c.39: Active standalone UBI policies for CCs, LCVs and HGVs (million units)

Fig 4c.40: Connected insurance based on aftermarket fleet management (million units)

Fig 4c.41: Connected insurance based on aftermarket fleet management in Europe (million)

Fig 4c.42: Connected insurance based on in-line fitted solutions (million units)

Fig 4c.43: Connected Insurance policies active in each vehicle type (million units)

Fig 4c.44: Connected Insurance evolution per vehicle type (million units)

Fig 4c.45: Connected Insurance written premiums, all vehicles combined (million)

Fig 4c.46: Connected Insurance written premiums, all vehicles combined in Europe (million)

Fig 4c.47: Commercial vehicle gains from Connected Insurance in Europe (left, in Euro) and North America (right, in US Dollar)

Fig 4d.1: HGV applicable tolling schemes across Europe

Fig 4d.2: HGV applicable tolling schemes in place across Europe

Fig 4d.3: Technologies in use for HGV (>3.5t) tolling in Europe (2017) 1

Fig 4d.4: GNSS based tolling schemes in Europe

Fig 4d.5: Proportion of foreign registered trucks on the road

Fig 4d.6: LKW MAUT total revenues (€bn)

Fig 4d.7: LKW MAUT timeline and related events

- Fig 4d.8: Total number of registered OBUs in Germany (000s)*
- Fig 4d.9: Breakdown of German HGV traffic by country of origin (%)*
- Fig 4d.10: Groups positioned as ETC service providers*
- Fig 4d.11: Details and stats on current EETS providers*
- Fig 4d.12: The ETC landscape in the United States and number of issued tags*
- Fig 4d.14: The extent of road user charging in the US, end 2017*
- Fig 4d.15: The ETC value chain - individual silos and examples of active players*
- Fig 4d.16: Cross-silo blocks in the ETC value chain*
- Fig 4d.17: Electronic toll collection systems architecture*
- Fig 4d.18: Free flow tolling fixed infrastructure equipment*
- Fig 4d.20: EETS delivery business models*
- Fig 4d.22: Examples of typical technologies in use for ETC*
- Fig 4d.23: Data generation and capabilities across tolling devices*
- Fig 4d.24: The global tolling technology mix*
- Fig 4d.25: Cumulative ETC subscriptions by technology type across all commercial vehicles**
- Fig 4d.26: Comparison of European fuel card issuers' tolling services*
- Fig 4d.27: Comparison between additional services offered by European ETC providers*
- Fig 4d.29: The importance of data sets for standard and best in class ETC services*
- Fig 4d.30 Data generated by standard, non-GNSS electronic tolling*
- Fig 4d.31: Data generated by market leading ETC services*
- Fig 4d.32: Cost of tolls and ARPU for service providers per annum, DSRC & GNSS*
- Fig 4d.33: Cost of tolls and ARPU for service providers per annum, RFID*
- Fig 4d.34: Cumulative number of ETC subscriptions across all commercial vehicles (million)*
- Fig 4d.35: Total revenues generated from ETC (\$ million)*
- Fig 4d.36: Cumulative number of ETC subscriptions among commercial vehicles - EUROPE*
- Fig 4d.37: Total revenues generated from ETC - EUROPE (€ million)*
- Fig 4d.38: Cumulative number of ETC subscriptions among commercial vehicles - AMERICAS (million)*
- Fig 4d.39: Total revenues generated from ETC - AMERICAS (\$ million)*
- Fig 4d.40: Cumulative number of ETC subscriptions among commercial vehicles - ASIA/OCEANIA (million)*
- Fig 4d.41: Total revenues generated from ETC - ASIA-OCEANIA (\$ million)*
-
- Fig 4e.1: Total number of issued fuel cards across Europe and North America 2010 - 2017 (m)*
- Fig 4e.2: The evolution of fuel card services and features*
- Fig 4e.3: Split of issued fuel cards by segment across Europe and North America (m)*
- Fig 4e.4: Estimated total number of cards issued by European fuel card providers (000)*
- Fig 4e.5: Notable partnerships and acquisitions involving fuel card issuers*
- Fig 4e.6: Average diesel prices across Europe, September 2017 (€ per litre)*

- Fig 4e.7: Average gas prices across the US, August 2017 (\$per gallon)*
- Fig 4e.8: Average gas prices across Canada, August 2017 (US\$ per litre)*
- Fig 4a.9: The great 2017 rush towards electrification*
- Fig 4e.10: The costs of re-fuelling electric and gasoline powered cars in the US*
- Fig 4e.11: The fuel card value chain*
- Fig 4e.12: Cross-silo groups in the fuel card value chain*
- Fig 4e.13: The closed loop payments network*
- Fig 4e.14: Transaction data generated at each level*
- Fig 4e.15: DKV's smartphone based payment solution*
- Fig 4e.16: The Shell-Jaguar in-vehicle payment infrastructure*
- Fig 4e.17: The growing links between fuel card and telematics providers*
- Fig 4e.18: 4 of Europe's 8 registered EETS providers are fuel card companies*
- Fig 4e.19: Total's combined fuel, telematics and tax recovery service*
- Fig 4e.20: Proportion of tax recovered and HGV subscriptions in Europe*
- Fig 4e.21: VAT recovery market calculation breakdown*
- Fig 4e.22: The share of tax within the retail price per litre (%)*
- Fig 4e.23: The demand for fast tax recovery services is strong in Europe*
- Fig 4e.24: Total amount of refundable tax for HGVs in Europe (€ millions)*
- Fig 4e.25: Service features and parameters offered by leading payments providers*
- Fig 4e.26: Moving from fuel card to complete fleet management provision*
- Fig 4e.27: Scale of leading fuel card and telematics provides in the US market (000)*
- Fig 4e.28: Scale of leading fuel card and telematics provides in the European market (000)*
- Fig 4e.29: Importance of data across standard and best in class fuel card services*
- Fig 4e.30: Importance of data for the delivery of standard fuel card solutions*
- Fig 4e.31: Importance of data for a best in class fuel card solution*
- Fig 4e.32: Number of issued fuel cards in Europe and North America (millions)*
- Fig 4e.33: Number of issued fuel cards in Europe (millions)*
- Fig 4e.34: Number of fuel cards issued in Europe by vehicle segment (millions)*
- Fig 4e.35: Number of fuel cards issued in North America (millions)*
- Fig 4e.36: Number of fuel cards issued in North America by vehicle segment (millions)*
- Fig 4e.37: Fuel card revenues, excluding additional services (€ millions)*
- Fig 4e.38: Fuel card revenues, excluding additional services in Europe (€ millions)*
- Fig 4e.39: Total fuel purchased with fuel cards (million litres)*
-
- Fig 5.1: Partnership between OEMs and Fleet TSP for service provision*
- Fig 5.2: BMW presenting CarData in November 2017*
- Fig 5.3: Possible interaction between OEM data clouds and service providers (illustrative)*
- Fig 5.4: What data is needed to increase the value of your service*
- Fig 5.5: The importance of total data sets across basic and best-in-class fleet services*
- Fig 5.6: Commercial vehicles in use in Europe (million)*

Fig 5.7: Commercial vehicles in use in North America (million)

Fig 5.8: Commercial vehicles in use in China (million)

Fig 5.8: Fleet telematics suppliers with > 250,000 units tracked

Fig 5.9: Total penetration of telematics fleet management systems (LCVs and HGVs - average per region) in 2017 and 2025

Fig 5.10: Total number of LCVs and HGVs equipped with telematics (million)

Fig 5.11: TPS revenues from fleet telematics on LCVs and HGV (\$ million)

Fig 5.12: A wealth of dataset can be accessed from the vehicles

*Fig 5.14: Trucks and vans with connected insurance coverage:
volumes (million units) and revenues (\$ million)*

Fig 5.15: Cumulative number of ETC subscriptions (million) and total revenues generated (\$ million) on all commercial vehicles

Fig 5.16: GNSS tolling schemes in Europe 2018 and 2025

Fig 5.17: Cumulative number of ETC subscriptions among commercial vehicles - EUROPE (million)

Fig 5.18: Cumulative number of ETC subscriptions (million) and total revenues generated (\$ million) on all commercial vehicles

Fig 5.19: Fuel card issuers' evolution has been based on cross-silo partnerships

Fig 5.18: Fuel Cards companies investing in Fleet Telematics (examples)

Fig: 5.19: Number of active fuel cards, Europe & NA (millions)

Fig: 5.20: Fuel card revenues, excluding additional services, Europe & NA

LIST OF PROFILED COMPANIES

As an appendix to this report, we have assessed a total of 44 companies, consisting of:

- **15 fuel card issuers (FCIs)** across Europe and North America,
- **22 telematics service providers (TSPs)** operating across Europe, North America, South Africa, Latin America and China,
- **8 electronic toll collection (ETC) service providers** delivering cross-border services across the world's largest single market; Europe.

For each of the suppliers listed in the table below, we have examined their core strategies and market activities with regards to the delivery of fleet management services and their partnerships with other fleet service providers.

Fuel card issuers	Telematics service providers (TSPs)	Electronic toll collection service providers
               	                     	        

LIST OF COMPANIES MENTIONED IN THE STUDY

During the last 18 months, PTOLEMUS research team has conducted **phone or face-to-face interviews with over 70 companies** including Betz International, BP, Cartrack, CSI Mexico, DKV, Kapsch, Kuehne + Nagel, Fleetcor, Fleetio, Gurtam, Masternaut, Microlise, Mix Telematics, Navistar International, Ocean, Omnitracs, Orix, Scania, SIG Distribution, Sygic, Telepass, Telogis, TomTom, Total, WEX, Whitbread and many more.

We listed below **some of the 360 organisations we mentioned in the Connected Fleet Services Global Study**.

In this list we have used the abbreviations below:

NGO	Non-Governmental Organisations
OEM	Vehicle manufacturers
RSA	Road Side Assistance
TSP	Telematics Service Provider
TTP	Telematics Technology Provider

Company	Type	Company	Type
AJG	Broker	Masternaut	TSP
AA	RSA	Meridian Global Services	Tax refund/recovery
ABAX	TSP	Michelin	TTP/TSP
Abertis	Road operator	Microlise	TSP
Abertis/Emovis	Toll operator	Microlise	TSP/TSP
Agip	Oil company	Midas	Repair & Maintenance
Aioi Nissay Dowa Insurer	Insurer	MilesSmith	Broker
Airmax	TSP	MIND Mobility	Leasing/mobility
AIS	TSP	Mix Telematics	TSP
Albert Schuck Transport und Logistik	Fleet	Mobivia Group	Mobility
ALD Automotive	Leasing/mobility	Mojio	TTP/TSP
Allianz	Insurer	Mouchel	Platooning
AllStar	Fuel card issuer	MyLumper	Payments
Allstate	TSP	National General Insurer (GMAC)	Insurer
Alphabet (BMW)	Leasing/mobility	National Safety Council	NGO
Altech Netstar	TSP	Nationwide	Insurer
American Transport Research Institute	NGO	Navistar	OEM
Aral	Fuel card issuer	Neste	Fuel card issuer
Arco	Oil company	Nevada DMV	Government agency
Arriva	Fleet - Public sector	NewMotion	EV charging
Arval	Leasing/mobility	NexTraq	TSP
Arvento	TSP	Nikosax	Tax refund/recovery
AS24	Fuel card issuer	Nissan	OEM

Company	Type	Company	Type
AssetTrackr	TSP	Norauto	Repair & Maintenance
Astrata	TSP	NordTrans Services	Tax refund/recovery
AT&T	Telecom service provider	NordTrans Services	Tax refund/recovery
ATG Risk Solutions	Data hub	Noregon	IoT and analytics companies
Atlantia	Road operator	Nvacom	TSP
Automatic	TTP/ TSP	Octo	TSP
Avis	Rental	Omnitracs	TSP
AVIVA	Insurer	OMV	Fuel card issuer
Aviva	Insurer	Openbay	Repair & Maintenance
Axxes	EETS provider	Orange International M2M Center	TSP
Azuga	TSP	Orange/Ocean	TSP
Azuga (Danlaw)	TSP	ORBCOMM	TSP
Beiben Truck	OEM	Orix	Leasing/mobility
Berlio	Fuel card issuer	Orix Auto Corporation	Leasing/mobility
Betz International	Fleet	Orlen	Fuel card issuer
BigRoad	TSP	Otto	Software
BlaBlaCar	Ride sharing	Overhaul	Tech provider
BMW	OEM	PayPal	Payment proider
Bosch	TSP	Peloton	Automation platform
Bosch China	OEM	Penske Truck Leasing	Leasing/mobility
Box Telematics	TSP	Penske Truck Leasing	Leasing/mobility
Box Telematics	TSP	PeopleNet	TSP
BP	Fuel Card/Oil company	PepsiCo	Fleet
BroBizz	Toll service provider	Petro China	Oil company/Fuel card issuer
BSquare	IoT and analytics companies	PHH Corporation	TSP
BT Fleet	Fleet	PICC	Insurer
Budget	Rental	PingAn	Insurer
C&C Truck	OEM	Plaza Insurer Company	Insurer
Camatics	Insurer	Pointer/ Cellocator	TSP
CAMC	OEM	Pon Automotive	Leasing/mobility
Car2Go Europe	Mobility	Position Logic	Software
Carrot	TSP	Preteckt	IoT and analytics companies
Cartrack	TSP	Princip	TSP
Ccompass	TSP	Progressive	Insurer
CEABS	TSP	PSA	OEM
Chainway ITS	TSP/TSP	PTV Group	Data aggregator/ Analytics
ChargePoint	EV charging	Q1 Energy AG	Energy company
Chevin Fleet Solutions	FMS platform	Q8	Fuel card issuer
Chevron	Oil company	Quartix	Fleet
China Mobile	Telecom service provider	RAC	TSP
Circle K	Fuel card issuer	Redtail Telematics	TTP
Circle K	Fuel card issuer	Remobis Refund Service	Tax refund/recovery
CITGO	Oil company	Repsol	Fuel card issuer

Company	Type	Company	Type
Comdata	Fuel card issuer	Rio	Software provider
Continental	TTP	RoadTrack	TSP
CPIC	Insurer	Routex	Fuel card issuer
Crashboxx	TTP/TSP	Royal MAIL	Fleet
Crown Commercial Service	Fleet	RS installation	Installer
CSI	TSP	RSA	Insurer
DAF	OEM	Ruptela	TTP
DAIMLER	OEM	Ryder	Rental
Daimler Insurance Services	TSP	SafeFleet	TSP
Danlaw	TTP	Safetrack	TSP
Dash	TSP	SAIC-IVECO Hongyan	OEM
DB Schenker	Shipper	Sascar	TSP
DCL	Insurer	Scania	OEM
Dekra	Fleet	Schmitz Cargobull	TSP
Delphi	OEM	Scout	TSP
Desjardins	TSP	Sem Parar	ETC Payments Provider
Detector	TSP	Shanxi Automobile	OEM
DHL	Fleet	Shell	Fuel card issuer/Oil company
Didi Chuxing	Ride hailing	Siemens	TTP
DigiCore / Ctrack	TSP	SIG Distribution	Fleet - construction
Digicore/C-Track	TSP	Sinoiov	TSP
DKV	Fuel card issuer	Sinopec	Fuel card issuer/Oil company
Dongfeng Motor	OEM	Sinotruck	OEM
Donlen	Leasing/mobility	Sixt	Rental
Drivy	Mobility	SMartDriverClub	TSP/TSP
Drust	TTP	SmartWitness	TTP
DRVR	TSP/TSP	Smoove	Mobility
E100	Fuel card issuer	SPEDION	TSP
E6GPS	TSP	Speedway	Oil company
Easytrip	Tax refund/recovery	Spie	fleet
Ebeling Spedition	Fleet - Tax	Spireon	TSP
Eddie Stobart	Fleet	Sprint	Telecom service provider
Edenred	TSP	Squarell	TTP/ TSP
Eerie	Insurer	State Auto Insurer	Insurer
Egis Easytrip Services	TSP	State Farm	Insurer
Emixis	TSP	Statoil	Fuel card issuer/Oil company
Emovis	Road operator	Stoneridge Electronics	Tachograph
ENI	Oil company	Sygic	TSP
Enterprise Truck Rental	Rental	T-Mobile	Telecom service provider
Equity Red Star	Insurer	T-systems	Mobile network operator
Erie Insurer Company	Insurer	TankTaler	TSP
EROAD	TSP/TSP	Tata Motors	OEM
Esso	Oil company	Telefleet	Insurer

Company	Type	Company	Type
ETRANS	TSP	Telenav	Navigation
Europcar	Rental	Telepass	Toll operator
Eurotoll	Toll service provider	Teletrac/Navman Wireless	TSP/TSP
Eurowag	Fuel card issuer	Telogis	TSP
ExxonMobil	Oil company	Tesla	OEM
FAW	OEM	The Floow	TSP
FDE	Tax refund/recovery	The Hartford	Insurer
Finch	Broker	TIP Europe	Fleet
Finder SA	TSP	TIZA	TSP
Fleet complete	TSP	TNT	Fleet
Fleet Minder	TSP	Tollsmart	Tolling
Fleetboard	TSP	TomTom	TSP
Fleetcomplete	TSP	Total	Fuel card issuer/Oil company
Fleetcor	TSP/FCI	Towergate	Insurer
Fleetio	FMS platform	Toyota	OEM
Fleetmatics	TSP	Tracker	TSP
Ford	OEM	Trafficmaster / Eurowatch	TSP
Fortum	EV charging	Trak Global	TSP/TTP
Foton Daimler	OEM	Trakm8	TSP/TTP
Frotcom	TSP	Transics	TSP
Fuel Genie	TSP	Traqueur	TTP/ TSP
fuelGenie	Fuel card issuer	Travelcard	Fuel card issuer
Fuelman	Fuel card issuer	Travelers	Insurer
G7	TSP	Travis Perkins	Fleet - T&L
GAC Technology	FMS platform	Trimble	TSP
Galp	Fuel card issuer	Truck Alliance	Freight-cargo matching platform
Gaz distribution France	fleet	Truckcom	TSP
Gemalto	SIM	Trucks & Trailers Ltd	OEM/Dealer
General Motors	OEM	TSPS	Smart Parking
Geoconcept	TSP	U-Haul	Rental
Georgia Dept. of Economic Development	Government agency	Ubeeqo	Mobility operator
Geotab	TSP	Uber	Ride hailing
Geotab	TSP	Unipart Logistics	Fleet
Godfrey-Morrow	Insurer	UnipoSai	Insurer
Google	IT service provider	Urgent.ly	RSA
GPS Insight	TSP	US Bank	Fuel card issuer
Gurtam	TSP/Integrator	UTA	Fuel card issuer
HDI Gerling	Insurer	Vehcon	TSP
Heetch	Mobility	Veolia	Fleet
Hertz on Demand	Rental	Verisk	TSP
Hino Trucks	OEM	Verizon	TSP/ TTP
HONK	RSA	Vialtis	Fuel card provider/Tax refund/recovery
Idem Telematics	TSP	Viasat Telematics Ltd.	TSP

Company	Type	Company	Type
IMS	TSP	Vinci Group	Road operator
Innovative Software Engineering (ISE)	TSP	Visiontrack	TTP/ TSP
Intact Insurer	Insurer	Volkswagen Truck & Bus	OEM
Intelematics Europe	TSP	Volvo	OEM
Inthinc	TSP	Volvo Construction Equipment	OEM
Invers	TTP	Voyager	Fuel card issuer
Iron Mountain	Fleet	VUM	Insurer
IVECO	OEM	WABCO	TSP
JAC	OEM	Wawa	Oil company
Jaguar Land Rover	OEM	WayzUp	Mobility
JCB	OEM	Wejo	TSP
Katsana	TSP/TSP	WEX	Fuel card issuer
Kore	IoT and analytics companies	Whitbread	Fleet - T&L
Kuehne + Nagel	Fleet - T&L	Willi Betz	Fleet - T&L
Lease Plan	TSP	XEE	TTP/ TSP
Leaseplan	Leasing/mobility	Xerox	Fleet
Lex Autolease	Leasing/mobility	XPO	Fleet
Liberty Mutual	Insurer	Xximo	Fuel card issuer
Locster	TTP	Yunmanman	Freight-cargo matching platform
Lotos	Oil company	Zahlz	Payment provider
Lytix	TSP	Zendrive	TSP
m2m Telefonica	Mobile network operator	Zipcar	Rental
Magneti Marelli	TTP	Zonar	TSP
MAN	OEM	Zubie	TTP/ TSP
Marsh	Broker	Zurich	Insurer

Published in November 2017

© PTOLEMUS
Rue Cervantesstraat 15
1190 Brussels
Belgium
contact@ptolemus.com

Disclosure

The recommendations and opinions expressed in this study reflect PTOLEMUS' independent and objective views. However, PTOLEMUS cannot provide any guarantee as to the accuracy of the information provided or the reliability of its analyses and forecasts.

All rights reserved

All material presented in this report, unless specifically indicated otherwise, is under copyright to PTOLEMUS. None of the material, nor its content, nor any copy of it, may be altered in any way, or transmitted to or distributed to any other party or published, without the prior express written permission of PTOLEMUS. No part of this report may be reproduced, recorded, photocopied, entered into a spreadsheet or an information storage or retrieval system of any kind by any means, electronic, mechanical, or otherwise without the express written authorisation of PTOLEMUS.

The user shall be able to quote facts, figures and analyses contained in the present report within their organisation or publicly provided they quote PTOLEMUS Consulting Group as its exclusive source.
These clauses shall not apply to otherwise publicly available information.

INTERVIEWS

Andrew Dondlinger



Vice President & General Manager, Connected Services

Navistar Inc.



Q. Like many truck vendors, Navistar are facing a growing challenge around product commoditisation, how do you plan to address this and differentiate your brand in the future?

From our perspective, vehicle commoditisation foreshadows the future of trucking, which is really moving towards autonomy for many applications.

When you think about autonomous vehicles in that context, you no longer have to worry about all of the driver-related concerns that you have today, such as drivability and ergonomics. The vehicle becomes a

commodity to move product from point A to point B. While we continue to make sure we have the best product in the market place for a driver, and the best total cost of ownership for the customer, **as trucks move closer towards autonomy, they become commoditised.**

Customers are going to be making decisions on total cost of ownership rather than worrying about how the driver likes the vehicle they are spending all of their time in.

So, we are looking at how we create products and services that **help become the digital backbone of the industry** as vehicles become commoditised. Frankly, the question is, who will be making the vehicles in the future? That could be 10, 20 or 30 years away, but the system we are building is one that is open, so that no matter who is building the vehicles in the future, our system will be the backbone for that.

Q. How would you characterise your 'system' approach?

I would frame it as what we have done with *OnCommand Connection* (OCC) today, which is an open, all makes, advanced remote diagnostics system. The reason we say "open" is that we have invited everyone to come. **We've got 25-plus integrated telematics service provider (TSP) partners who have joined on behalf of their customers.** Additionally, we have our own telematics offering, which we have just launched: *OnCommand Connection Telematics*. These all feed data into OCC, which is the backbone.



The backbone is a diagnostics hub for our customers. Since OCC is all

makes, it doesn't matter which OEM's vehicles are reporting in; it is reporting in on behalf of that customer through their telematics provider of choice.

The reason we see OCC as the service of the future is that as customers move towards vehicles that will likely be autonomous in the future, they won't have to make a choice around which platform they are going to use. They should be able to purchase from any vehicle without the question of whether that vehicle will connect with a platform. That leaves the choice in the customer's hands.

Q: Can you tell us more about *OnCommand Connection* Telematics?

We launched our own telematics solution in July. It has a classical telematics device, which connects to the diagnostic port and feeds data back to the *OnCommand Connection* platform, just like any TSP's system does today. We do, however, send a **higher frequency of data with more data points** than any other TSP does today. As we conducted interviews with our customers, one of the challenges we found was that, depending on the TSP, they would get varying amounts of data, but often

not as much as they were looking for, and often it lacked consistency.

We decided we had to launch a platform that had the highest resolution and frequency of data so that users could run appropriate analytics without large gaps or holes in their data sets.



When we first launched *OnCommand Connection*, **our biggest challenge was getting customers to bring their VINs** (Vehicle Identification Numbers) **into the platform.** So we sat down with them, and what we learned was that they didn't like the concept of a telematics solution that was proprietary. They had put significant dollars into the hardware, and every time they came up for renewal, they were faced with either a small price increase, or they could choose to move to another TSP. The problem is that whether or not they had a remaining book value in the hardware, they still had the cost of acquiring new hardware as the biggest barrier to entry. We

have launched our telematics solution as a universal device, and because it is universal, it allows the customer to move out of their current hardware into our universal hardware without having to do the all-or-nothing approach. Because we have integrations with the TSPs, the customer is able to see their diagnostics data and their telematics data within *OnCommand Connection*, but they can also see their telematics data within their telematics provider portal, because it is being fed by their proprietary hardware.

If the TSP integrates with our open platform, what we call reversing the flow, then they can also ingest the customer's data from our universal platform. So, **the customer can see all of their telematics data within that TSP's platform or portal, even though the data is coming from two different sources.**



Eventually we expect customers to move over completely to our universal device and then have their choice of TSP.

TSPs are becoming Software as a Service (SaaS) providers and eliminating

their dependency on proprietary hardware. That is where we have found our best opportunities with TSPs. Most TSPs who are interested or have already joined our marketplace have stated that they don't want to be in the business of designing, developing, procuring, selling and supporting hardware. We do that now, and as an OEM we are ideally resourced for that.

Q: Can you provide some more detail on how the universal device is able to communicate with multiple TSPs despite potentially proprietary communication protocols?

We think of our hardware like an iPhone or an Android phone. It is still a proprietary piece of hardware, but it is open to anybody who wants to connect apps to it. Our hardware sends the customer's data back to our cloud, and then we have APIs available to those TSPs

who then ingest the customer's data into their system. Our first integration is with a company called **EDULOG in the school bus space**. They were the first company to join our marketplace and eliminate the need for third-party hardware. They have moved to using our device and our *OnCommand Connection* system, whereby their software gets data from our cloud. The data flow is from our telematics device in the customer's vehicle to our OCC cloud. The customer can purchase applications in the marketplace if they want to, but also TSPs can use the APIs we have published to access the customer's data.

The customer can see their data in our *OnCommand* portal, as well as see it in the EDULOG portal.

The benefit is that they are able to use all of the software applications that EDULOG provides.

It is what we call **reversing the flow**. Instead of having the data go to the TSP and then into the *OnCommand Connection* cloud, it now goes to the OnCommand Connection cloud and then to the TSP of their choice.

Q: How do you think the Navistar OnCommand Connection Telematics product compares to established aftermarket players?

I would stratify TSPs into 3 categories: geolocation or geo-tracking, boutique or specialised solutions, and full-service offerings across hardware and software.

As of right now, the first category is going away and being converted into full-service solutions. Looking at the full-service solutions, we are very comparably equipped from a software / service perspective and at a higher value and lower cost than most of them.

Q: Can you give us some examples of the data sets and frequency that will make the difference between a TSP or another OEM and what you are providing?

First of all, our standard device reports back every 30 seconds with a full health report, including geolocation, etc. Most TSPs report between 2 to



5 minute intervals. So, from a **frequency** perspective, **we know that 30 seconds is best in class in the industry.** We have the capability of dialing that down to every 15 seconds, or if we want to go with an even higher frequency, we can eliminate some of the data we are sending with every ping to give high-resolution tracking. If you need to see where that vehicle is now, not where it was 5 minutes ago, we can dial that resolution up to reporting as often as every 7 seconds. This gives you **virtually real-time data.**

On the **resolution** side, the challenge with the TSPs is not their ability to collect the data set, but it comes in their willingness to send the data set. Historically, cellular data was very expensive, and when you look at M2M data costs, they are ridiculously expensive.

We went to two of the major carriers and negotiated exclusive rates with them. That has enabled us to bring the price down while sending more data. Most TSPs will eliminate, filter and just not send a certain amount of data.

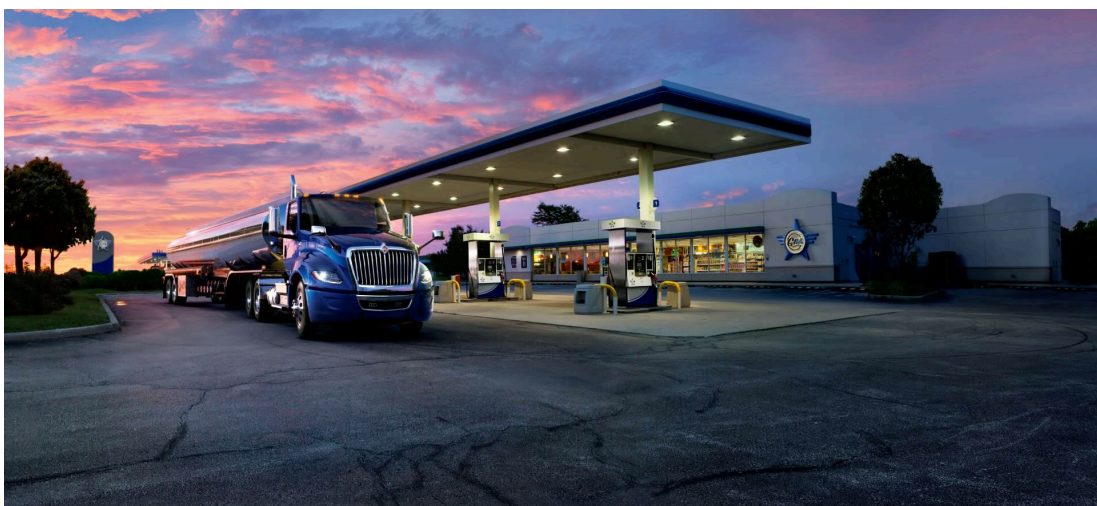
We collect approximately 180 parameters from the engine and CAN-bus and send that every 30 seconds. Most TSPs will send between 10 and 20 parameters at their current frequency, which we know is longer than every 30 seconds.

We have plans to take even more data and pull that across the CAN bus. This will enable the customer to see more parameters than they are seeing today. It's not that other TSPs couldn't collect and send more data, but we also have the diagnostics solution that helps the customer leverage the data.

Q: Over the last few years we have seen the emergence of fleet data integrators such as Chevin and Fleetio offering a single dashboard view of all fleet management related data. Does Navistar have plans to develop a single dashboard solution?

Over time our goal is to integrate partners in the fleet maintenance and management space so that our customers would have access to their data in whichever dashboard they choose. We haven't committed to have a single dashboard portal to provide that information, but certainly we would like to be able to do that sometime in the future.

Right now, our focus is on making our telematics and associated applications the best we can, and providing a marketplace where our customers can acquire the



other products and services that they need to round out their solution.

Q: We have seen car OEMs such as GM, Jaguar and BMW begin to launch embedded payment functions for vehicle related purchases such as fuel. Does Navistar have any plans to develop something similar?

We have certainly looked at that internally, but I would say that **the smartphone is more the universal solution that people are looking for.** When you think about somebody that is on the road, that individual is the one that is consuming. We see the driver as an employee and the driver as a consumer. When you think about the driver as an employee, they already have systems that are required for them to get

paid or to process paperwork.

As a consumer, the driver consumes wherever they happen to be, and generally that consumption will be paid for out of private dollars. So, I see the trends being set by the smartphone providers like Apple Pay, Google Wallet and Samsung Pay as the ones that are going to lead the market, as opposed to the vehicle.

I think that the opportunities are limited, because the vehicle does not go everywhere the person goes. I think phone-based payments will dominate this space because smartphone security measures are getting better and becoming easier to use.

Q: Do you have plans to offer a Navistar branded fuel payment solution?

We are **in discussions with several suppliers of fuel cards at the moment.** We are also talking to insurance companies, tire manufacturers and finding ways to offer the kinds of benefits to smaller fleets that currently only larger fleets benefit from.

We want to give owner operators and small fleets the benefits of aggregated spend. Owner operators and small fleets are at a disadvantage compared to large fleets in terms of fuel spend. So the marketplace is going to offer aggregated spend instruments like fuel cards and insurance solutions, so small fleets can operate at less of a disadvantage.

Interview conducted by Justin Hamilton in October 2017

Thomas Schmidt
Managing Director
TomTom Telematics



Q. Do you see a shift in the way telematics is used and sold today between an emphasis on the vehicles and goods to an emphasis on the drivers?

Since the beginning in 2005, driver services have been our core strategy.

Back then the industry was focused on track and trace something now very much commoditised. What has changed is the range of devices used such as driver terminals, secondary screens, smartphones and tablets. This has brought a wide range of new services.

So rather than talk about a shift, it is more an extension of the driver-related functions and services, as well as an extension in the amount of granularity in the data we collect from the vehicle. Things we could not imagine 10 years ago:

engine management, fuel consumption, deep vehicle analytics, etc.

A good example of the hybrid between driver- and vehicle-related services is advanced driving behaviour. Many TSPs may think an accelerometer is enough to do **driver management**, but much more is possible with **enriched data** such as engine data, RPM, fuel consumption, aggressive driving metrics. These cannot be all taken from a simple acceleration sensor. Enriched data gives a much more holistic view of how the driver operates the vehicle and through that you can really understand how to improve cost management such as fuel efficiency.

Another example is to **combine engine data with map data** to generate better engine and power management, which in turn generates more energy-optimised routing in addition to on-board coaching of the driver. So in these areas, telematics has played a key role.

While OEMs partially implement these techniques, they only focus on the vehicle and cannot integrate the high-level information such as load, route or arrival time. **The aftermarket is where all the different sets of data are combined and harmonised for the benefit of operators.** That includes vehicle data, back-end office based data, navigation and map data, all integrated on a driver display where you can actively influence the driver.



Q. When you look at the cost of operating a fleet, the cost of a vehicle being off road is huge. Why don't players make crash detection a default service?

To detect a crash, you need non-discriminatory access to native vehicle data and agreed upon standards.

Acceleration and GPS data gives you an event that could be a crash but is not fully validated as such. It is dangerous to detect a false positive and even worse to miss a real crash. The question is who takes responsibility over the detection of the crash?

TSPs do not have access to the necessary vehicle data. For example there is no standard interface where a third party could collect airbag deployment. So currently data goes to the operator who then needs to verify with the driver or in some cases the insurer if there was indeed a crash. But if we consider all of the sensors that a car has today, the vehicle can detect even a small crash very clearly. This cannot necessarily be done by an aftermarket black box.



The definition of a crash is also not shared between third parties, there are no standards to define what a crash is and how severe it was, for example, to inform emergency services. So there is a clear need for standards, and these standards also need to be

cross-border. It is the same with eCall. There is no standard interface where a third party can access the trigger data in a non-discriminatory way.

That is why today information about a potential crash is often sent to an insurer or broker, but it is very much up to them to verify it by contacting the driver or the fleet operator. Here the definition of the crash is based on the partnership with the specific company and differs between cases.

The liability linked to send or not send an ambulance can only be cleared by standardised definition of what a crash is. Until then we cannot widen the scope of crash detection beyond single proprietary solution between two partners.

Q. Have you seen this market being disrupted?

I have not seen any major disruption. Rather the technology has gradually improved over time. **Service functions and quality levels are improving, but it is more an evolution than a revolution.**

You do see new players trying to enter the fleet telematics market, but with only limited success. They have tried to experiment with some services but are

only providing basic data such as location, which is already very much commoditised. They are not providing an advanced solution that offers planning, insights and interaction with driver.



While many service providers try to sell fleet telematics systems as a service attached to the vehicle, **we see it more like an ERP software attached to the back office of customers.** This is a radically different approach because **the deep benefits of connected fleet services comes from the overall IT system integrating together.**

Q. Do you see an opportunity to become a payment platform as well?

Wireless operators came to us 10 years ago suggesting that since they had the customer relationships they could combine all the services and provide a single invoice.

It did not work. I don't think a payment provider necessarily needs to provide all services. I believe in collaboration, in

data sharing between systems that are connected with each other via APIs, where customers have the choice of services and providers.

Rather than one provider trying to cover all services each provider should focus on what they are good at. History is littered with companies that have tried to deliver the whole stack.

Q. Do you expect that at some stage, fleet management will be enriched by the data that is generated by the vehicle ADAS systems, such as cameras and radar?

I have big hope that it could, but it's a question of timing. Likely this will not happen soon. OEMs have a growing dataset that they believe is their data, for their own consumption and analytics, and that they can use and monetize. I disagree.

This data belongs to the driver and the customer

True disruption will come if they open the interfaces and provide rich, discrimination-free data. Then we will see services appear that we can't even think of today.

who owns the asset and generates that data. In my view, this is the right of the customer and it should be protected by laws that are still being created.

Q. Do you see a competition coming from the IoT service providers, companies that are more data-centric and could compete with the analytics part of your offering?

If the OEMs shared their data in a non-discriminatory way through a rich API interface thus making available vehicle data in addition to map and location data on a pure software base, that would open fleet management related services to all kinds of developers.

At the moment the software industry is capable to

interact with drivers, but if car data was open, it would also open up possibilities to interact directly with vehicles. OEMs are only defining what they can share based on the defined minimum needs and are prioritising the protection of their data. We also need all the OEMs to work on this, not just a few.

Disruption is when we separate the basic infrastructure from the service supply and give true open-minded access to the service providers.

Controlling the platform means limiting the access to some datasets, controlling who has access to it and restricting above-FMS datasets to their own services. **We also need one or two standards for the applications to be written, not one per manufacturer.**



Interview conducted by Thomas Hallauer in September 2017

Bernie Kavanagh

Senior Vice President & General Manager, Large Fleet
WEX Inc.



Q. Could you please present WEX's position in the fleet market and tell us what is unique about its service proposition to fleets?

We are an industry leader. We have pioneered the closed loop proprietary fuel card network. That in itself differentiates us.

Many of our competitors offer open loop products, i.e. a traditional purchasing card, like a MasterCard, a VISA where the bank may not own the entire chain. So you might have an issuing bank, someone else doing the processing for you, another institution doing the billing, etc.

Whereas in the WEX world, on the fuel card side, it's a closed loop network, which means a proprietary network according to the

specifications we have released to all the merchants that accept our card, so that we control the data. We are the issuer, the processor, we do the billing, we issue the credit, etc. We own the entire chain.

What that allows us to do is to control what data we capture, what to do with it. It allows us to have a more secure network because we're not passing data to anybody else, waiting for it to come back.

So that's what fleets really have come over the years to appreciate.

One of our other lines of business is our Virtual business. We started that back in 2000. Very differently from our competitors who are owned by a bank or use a bank, we own a bank. So we issue through our bank a MasterCard. Most of the issuance is done by our Virtual business. And we would routinely look at that and say: "Is that an opportunity for us to look at the fleet business and maybe migrate there?" Our customers and partners still to this day will tell us that

the value in that closed loop network is worth keeping.



Q. Is the value in the control and the security that you provide? Is security a big issue in the fuel business?

Absolutely, security is a very big issue. And to your point, this is the control piece of that. Most what open loops do is controlled by the MCC (Merchant Category Code) level; For example, if I am Walmart and sell fuel, the MCC code is going to be convenience / chain. So I have to say: I want to allow that. Well, when you have opened that up, could you purchase products inside vs at the station? There are ways that they've found to control that but that's not as clean cut as what we do on our closed loop, which is product type controls. We restrict

everything by the product that's bought.

We allow fuel as a product. So even though service locations and fuelling stations will have a convenience store attached to them, if a fleet says: "I only want driver to buy fuel", the drivers are only going to get fuel.

Q. How large are you in the fleet business today?

We have 10.5 million WEX fuel cards in circulation worldwide. We've got a fleet application in North America. We have a fleet business in Brazil, Australia and in Europe. We process roughly 30-32 million transactions a month. Data is another valuable point. People want to do more and more things with data and we've got a lot of data.

Q. Last year, WEX acquired EFS for \$1.5 billion. How does that position you in the North American Over-The-Road (OTR) / haulage market?



We had a lot of light vehicles and sedans but we didn't have a lot of class-7 and 8s. Those vehicles have

very unique needs, which require specific products. This segment drives a lot of volumes because fuel consumption is 5-6 times more than a light vehicle.

So we started to develop a product to fit that market. The first acquisition that came about was a company called Fleet One. We acquired them, which allowed us to enter the OTR space. And when one year and a half ago, when EFS became available, acquiring them really put us firmly in that OTR space. What that allowed us to do is to offer a true OTR solution.



So we can serve those companies who are just operating the larger vehicles and need advanced functionalities such as cash advance, different pricing schemes (cost off, cost plus, retail minus, etc.) but on a very limited network (7,000 tier-1 truck stops), which is all they need because they travel long distance between cities.

But more importantly, the integration of EFS allows us to take the best of both worlds and combine two

networks into one. Now we will launch a product that truly serves the mixed fleet market. It will be the first with a closed loop-closed loop solution, aggregating two proprietary systems.

Another benefit of the EFS acquisition is their integrated payables division, which does a lot of business in the fleet space.

Q. How do you see the market for fuel card services evolving over the coming years? Will the oil companies fully turn to outsourcing to specialist companies such as WEX and FleetCor?

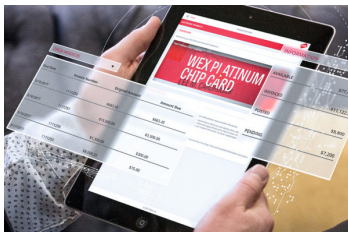
I think you see most oil companies focus on what they're good at, what are their specialties. I don't think that card programmes necessarily need to be their speciality.

To succeed, you need to have the systems in place; you need to build scale. When you've got a partner like WEX who already has the scale and can immediately bring that and drive the operations and the sales, handle the billing and other things, it makes just more sense to partner with somebody.

And oil companies are now focusing back on their core business. I think you're

seeing them even going further that way. The oil companies are getting out of owning the stations. Exxon Mobil made the decision a year ago to leave the gas station business. I think that companies as a whole are specialising in their core business and partnering with those that do the pieces of their business that's core to them. So it creates opportunities for WEX and others to do the processing and run their card programmes for most of the major oil companies.

We have 20-25 oil company partners. Most of the oil companies are with WEX today. There is just a small handful that are not.



Q. Is WEX ready to handle the growing influx of fleet and connected vehicle data?

I think we always want to collect more data. Our partners and customers expect that from us. We've got a very robust dataset on fuelling and fuelling transactions. We partner with lots of outside agencies to obtain more fuelling data. We're kind of the system of

record when it comes to fuelling transactions.

But people are now seeing the need for other pieces of data to tie into that. The fuelling data is for the most part an asset-based piece of data. You're tracking a vehicle, you're tracking a tool. But now people also want to track the driver and monitor the driver safety, the behaviours of the drivers, etc... And those 2 pieces, independent of each other, are very valuable.

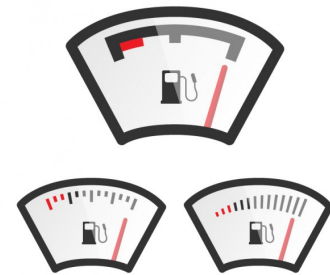
When you're putting them together, you're starting to get a better picture of what happens in the day of the life.

I have got a company, an employee and a company-owned asset working on my behalf. I want to know everything about what's happening so that I can keep them safe, be more efficient, be able to drive more revenues, whatever that role might be.

Those datasets lend itself to the tools that help you manage your fleet better.

Q. What is the share of the fleets that are really tracking their fuel consumption today?

Naturally, by having a universally accepted card, you're going to reduce fuel usage because drivers are not going to have to drive around to find a specific site. That's an immediate benefit.



Created by Freepik

Then through the tools that we make available to the fleet managers and regional employees who may have access to them, a fleet can start to drill down to the next layer: am I buying unauthorised levels of fuel? Premium vs regular? Am I buying high-price fuel vs. low-price fuel, etc.? Those are the datasets that you can start to use with our analytics tools to drive to lower cost fuelling locations and make better purchasing decisions.

Q. Are fleets really doing that?

Most of our fleets will be able to tell you that they've made savings over time using the tools that we make available to them. It varies based on geography. It varies based on industry. Some vehicles have to go where they have to go! We've got fleets that will allow their driver to drive a half mile out of their way to save 3 cents. We have some fleets that say: I do not want you passing a fuelling location without getting gas because it's more important for you to be on the road

and make the delivery. We give them the tools to do both.

So we work with the fleets and with the partners to optimise the fuelling experience.

Q. Concretely, as a fleet manager, what kind of tools do you give me to optimise my fuel consumption?

We start off with basic levels of consumption: usage, trends, when they're buying, where they're buying. Then we'll drill down a bit deeper to say: within a given geography, how did you buy against that area? Within a 3 mile radius where you were buying, did you buy at below average or above average prices? And we give them a scorecard based on that.



Then we give them tools to say: instead of going to this location, you could go to that station over here and save 6 cents a gallon. Here's the potential saving you could make. And then we benchmark that and track it each month. And we show them how they're doing against their projected savings.

Q. How can WEX future proof itself against the growing threat of service integration by fleet Telematics Service Providers? In your view, does the rapid growth of fleet telematics providers such as Verizon, Geotab, and TomTom represent a threat or an opportunity to WEX?

I think a lot of it is driven by customer needs and what relationships they have. We're doing a lot of integration with some of these partners today. In some cases, we will send them data and they can become the system of record for certain reports that the customer might want to see. In other cases, we will take their data in and integrate it with other pieces of data that we have access to. It really comes down to the customer need: what is it that they want to see and who can deliver that?

If everything is being driven by your fuel usage and the telematics information is an added benefit to that, then we'll control that data. If they're driving all their decisions based on the location information, then the fuel feeds into that. The important thing is to have that 2-way conversation going through the data exchange.

Q. Is there a big appetite for the combination of fuel and telematics data today?

Absolutely, that's becoming a huge need in the market place. We started a couple of years ago with just a very simple report that we called the Fuel Guard report. It basically said: here's a fuelling transaction that occurred at that location. At the exact same time, this was the vehicle's location. If the two of them didn't match up, you might want to look into it.



This seems like a very basic report. But now we're starting to see that that information is used in many other different ways. They're starting to look at fuel consumption for those who are harsh braking. At locations: why have you gone off your route? You should have bought your fuel here and staid on your route. There are lots of ways to integrate that data.

And they're just two pieces of it. There is a lot of data that customers are asking for and at some point in

time, somebody is going to need to be that repository of much more data than just fuel and telematics.

Q. You're specifically in charge of large fleets for WEX. Do you see fleet managers really doing that or are they still struggling?

A little bit of both. Some have the time and are utilising it. But what's happening now is: it used to be: I want all the data. Then just tell me what were the exceptions within the data. Now it's being driven more towards being more predictive and more prescriptive. Now they want me to tell them what they don't know. You have my data, you see these behaviours and what the trends are. Tell me what I should do and what I shouldn't do. And tell me how I'm doing against that.

Q. We have already seen new players such as Apple Pay and PayPal move into consumer fuel payments - could these players represent a threat to WEX in the future?

No, not necessarily. It may be more of a partnership opportunity as they start to get more involved in other aspects of the business.



Created by Vectorpocket - Freepik.com

For example, we've been able to use a device like the one designed by Square to help out some emergency fuelling partners. You can imagine the scene: there is a hurricane coming in and you've got a number of mobile fuelling trucks set up on the side of a parking lot and they want to make sure they know who's getting fuel at that location. They're going to need a way to capture that information. So now with an iPad and a Square device, we've programmed it so that they can accept a WEX card. They're going to swipe that WEX card in the vehicle and capture all that data.

So it's not necessarily a threat as much as an opportunity for us to integrate with them and potentially share customers.

I think that they've got the awareness of the market. A lot of what happens in the

commercial space is being driven by consumer experience. So people want to have that same customer experience. In some ways, it pushes us to develop different applications that are more consumer-like: mobile apps and ways to pay with a mobile device, etc.

Q. In the long run, will we see smartphone payments become a viable long-term alternative or addition to existing fuel cards?

I think that down the road everybody probably assumes that we end up in a card-less society. You will have some sort of a device that will host all of this information. However between here and there, the road can be quite long and winding. You need to have other players involved to make that happen. I need to have a Point of Sale device

that is activated by that mobile device and can transmit that data to me. So there's a lot of work that needs to be done, even if you just think of the fuelling locations. There are 160,000 locations across the country that need to have some sort of upgrades to their current POS devices to allow these transactions to occur.

And we'll get there. You need to have all pieces coming to play. It's like the EMV, the standard for chip-enabled cards. We've all been to these retail locations with the sign up that says: "Swipe your card" because they don't have a chip reader yet.

Q. Does WEX have to move beyond payments in order to secure its position in the future connected car landscape?

Vehicles will always need to be fuelled. That may be through traditional gas and diesel, alternative fuels, electricity. We will need some mechanisms to activate, capture, bill and report those transactions.

If you think about the connected car world, there are probably a lot of integration points that we explore today to see how the payment mechanism is tied to the vehicle. The OTR market is somewhat advanced. They have some

of the tier-1 truck shops that as you drive through the line use RFID to import information from your vehicle and activate the pump for you. It knows the controls you're allowed. You just walk off with your truck and you're done. So it has got all the information. But this is a very isolated example.

It is very different to pull up to a fuelling location that has 12 pumps all in 20 feet off you. Which pump are you going to turn on? What data are you going to capture?

But we know that things will change with technology and we will figure out a way to do that. At some point, it may just be right in the vehicle. And there's also the opportunity to tie the vehicle to a mobile device.

If I want to spend something else than the vehicle's fuel, I may want my phone to pay for it too. And what I want as an employee and a fleet manager is that to be integrated altogether.

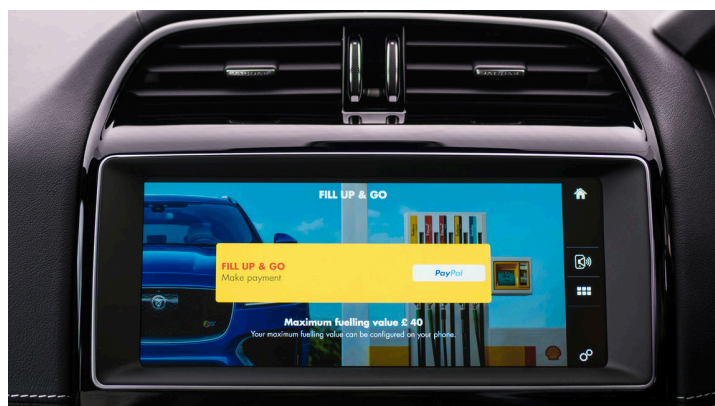
Q. Do you expect the future of fuel cards to be in mobile payment or in embedded vehicle payment?

I think you will get both. It's going to take a lot of time to change to just one solution.

Think about the day when you used to go through a toll booth and you handed somebody money. Then we moved to the basket where you threw the cash in. And we moved to E-ZPass. But there are still toll booths that have all three of them!

If you think about that, if you think about the replacement cycle of vehicles, if you think about the replacement cycle of POS devices, you're 10-15 years out before we'll be at the point there's a critical mass to move to just one solution.

Interview conducted by Frederic Bruneteau in October 2017



In that interim period, you might have some vehicles that may issue payments, some mobile devices that issue payments and you may still have a card as a backup ! Because the device may not be able to register, you may not have cell coverage... I think there will be a slow migration.

In the end, there will still be a need to track the asset. So there's still a benefit to connect to the vehicle. Same for diagnostics. So it might go the other way where all my address book is in my dash. So why wouldn't my payments be there as well? All my rules? So the car could have access to the phone's payment solution. The car becomes the gateway.

Q. What is WEX's fleet strategy in Europe and in Asia? Do you actually have a fleet strategy there?

In these regions, a lot of what we do is following our customers. We are fortunate enough to have a database of more than 300,000 customers. A lot of them have presence in other countries.

Our presence there has been largely opportunistic. An opportunity presents itself and we acquire a fuel card company. A lot of that

has been through partnerships.

In Australia, we bought a fuel card company that was very similar to ours. It's a closed loop, proprietary card accepted network. In Europe it was through a partnership. We acquired the Esso portfolio and we built it out that way.

What we are seeing now is that a lot of our customers, which are multinationals, are saying: "Ideally, I'd like one solution". However, they realise there won't just be one solution around the world. Just because of different regulatory issues, different pricing schemes.

Q. Does this demand come from oil companies or from fleets?

We're getting it more from the customers. If I manage a fleet and I have presence in 15 different countries, I have a global fleet manager that oversees it all. It would be nice if they had one resource. So the question becomes: what does that resource look like? One platform where all that information resides on. You have in-country solutions that meet the needs in that individual region. Is it one universally accepted card that knows currency conversions and interchanges?

At the end of the day, people would like to deal with one partner: one point of contact, one company that they deal with and that handle their global needs.

Q. Who would be the leader in the relationship with the fleet, you or the fleet management company?

Obviously a partner will have more presence than an individual customer. A fleet is just one entity whereas a fleet management partner might have 20 or 300 accounts in a given region. Most of the FMCs are globalising. They're all faced with the same requests that we have. I'd like to have somebody to handle all my vehicle needs. But a tyre here may not be the same as a tyre in Australia or in Singapore. But I want to have a company that I can call and say: just help me with this.

So when they look to globalise, they look to their partnerships and most of them use us for fuel. And they say: what is your presence and what can you do to help us in our partnership? There have been opportunities where we partner in other countries with our existing US partners. There have been opportunities where they say: "This is where

we're going. Here's our roadmap over the next 3 years. Tell me where you can match up with."

Q. Shell just acquired NewMotion, a network of 30,000 EV charging points in Europe. This comes after the partnership between US Bank/Voyager with ChargePoint to make its fuel card compatible with its 42,000 charging spots in North America. Is the future electric for WEX too?

We are in the electric space today. We've got acceptance at a number of charging stations including ChargePoint. We continue to build out that network.



We've got customers and partners who have electric vehicles and need to have charging facilities. We do business with the Federal Government and the Department of Energy is a customer of ours and we've got a huge push. The GSA (General Services Organisation) also has got a huge push for EVs. A lot of the needs are related to the infrastructure: where can you find these charging locations? What's the charge time? What's the battery life? I think our role is to allow people to get the charge reported back and settled. We help companies establish where they should put charging stations based on where we know our customers have EVs.

We've had conversations with these stakeholders, the same way we have had these with alternative fuels such as CNG (Compressed Natural Gas). The charging stations represent an interesting dilemma in that it's probably not going to be your traditional gas station that will put a charging station and have vehicles there 30 minutes or an hour! It's going to be somewhere else.

But again it's important that the cards are accepted there. We're doing a lot of work with the charging stations on mobile and RFID technologies because a lot of the home charging points don't have card readers on them. So you want to capture that information using your mobile device.

There are only around 2 million vehicles worldwide now but 2016 had the highest number of new sold EVs: 6 or 700,000! It's really starting to peak up. But 2 million represents maybe 2% of the entire vehicle population.

Q. Is the value chain the same as in fuel?

The value chain is certainly different in that we're not trying to find the best charging rates for fleets the way we would with fuel. Now it is just about getting the network set up. That's what our value proposition is today. Very much the way it was 30 years ago when we started WEX.

First we want to help vehicles get a charge and then we'll try and optimise that experience.

REPORT SAMPLE - SECTION EXCERPTS

Please note that several figures have been replaced with XXX. They are available in the Full Study.

A. Introduction and definitions

1. The 5 core connected fleet management services

The purpose of this study is to provide a thorough overview of the changes which are taking place in the way connected fleet services are being delivered across five key segments:



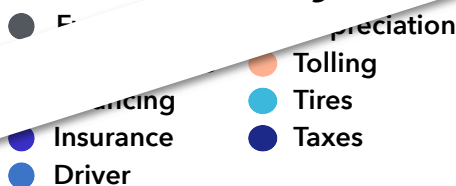
As well as analysing market trends and market movements affecting each individual market in detail, we will examine how these services are becoming increasingly intertwined and connected.

These 5 services - fleet telematics, connected insurance, ETC and fuel cards - we have built a bottom-up, **10-year global market forecast** with clear outputs providing:

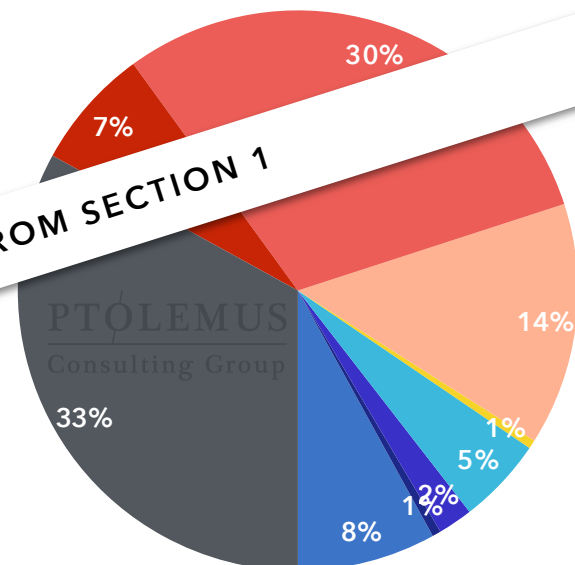
- **Subscriber volumes by country, region and vehicle segment,**
- **A breakdown between technologies used** (where applicable),
- A breakdown between **aftermarket and OEM volumes** (where applicable).
- **Revenues by country, region and vehicle segment** (light commercial vehicles, heavy goods vehicles),

Furthermore, we have calculated the TCO (total cost of operations for light and heavy commercial vehicles across Europe, China and the United States. An example for China is presented below:

Annual TCO calculation for HGV >14t China



SAMPLE FROM SECTION 1



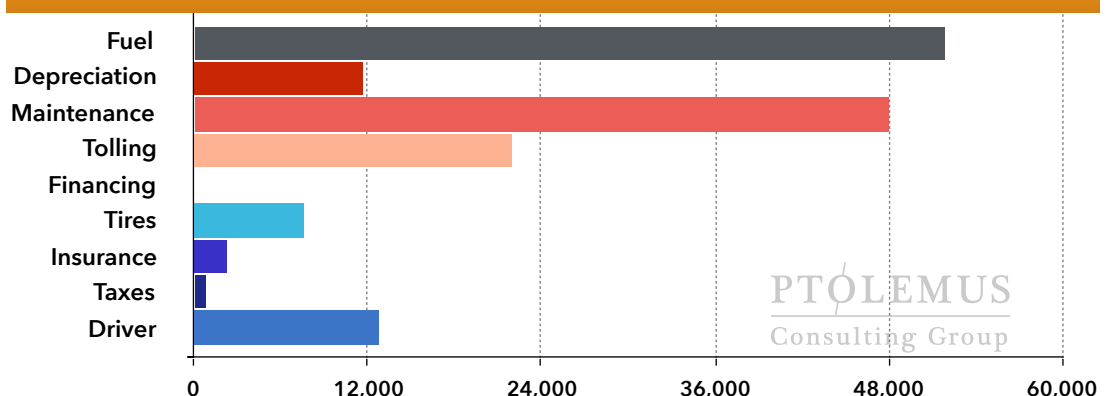
Hypothesis:

- Class 8 HGV truck >14 tonnes driven for 150,000 km per year
- Straight line depreciation over 6 years
- Financing based on 3-year loans with monthly payments covering 70% of vehicle cost at annual rate of 4.5%
- Diesel price \$0.96 per litre

Analysis

- Road tolling represents a significant cost in China due to the extent of the network, which runs to over 160,000km
- Lower driver costs than other regions such as Europe and North America reflect the country's overall low labour cost, although wage inflation is increasing
- **Maintenance and fuel costs are high in proportion** to the total cost due to heavy usage of the vehicles and the high cost of parts
- **Annual mileage ranges from 100,000 to over 200,000 km and daily driving hours can easily exceed 10 hours**
- The fuel consumption per 100 km in China is however comparable to the rest of the world

Annual costs (\$)



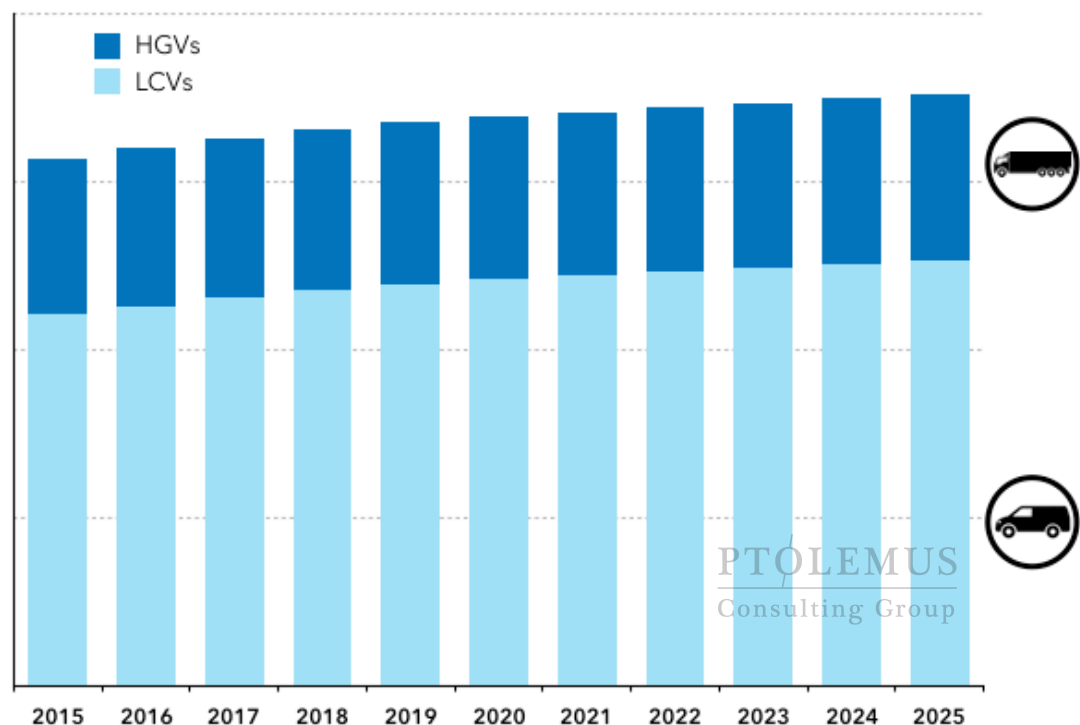
Supporting each forecast is a foundation of the number of commercial vehicles in use today and through to 2025.

In 2016, HGVs and LCVs accounted for xxx% of all commercial vehicles in Europe; approximately xxx million vehicles. Truck sales in Europe, at around xxxx million per year, are expected to remain at this level over the coming years.

We anticipate that this market share will decrease due, in part, to the rise in leased and company cars. This rise can be explained in part by the attractive, complete mobility solutions on the market from providers such as Alphabet and LeasePlan. Equally, the steep rise in mobility solutions such as car sharing and ride hailing will also contribute to this. For example, by 2020, we estimate that almost xxx cars will be shared in Europe. This will continue to rise.

The number of HGVs will remain broadly steady, with a slight decline in the longer term, while the number of LCVs will increase due to macro trends effecting goods distribution and the explosive growth in home and urban deliveries coming from online retailers such as Amazon and Rakuten.

The evolution of commercial vehicles in use in Europe (million)



Source: PTOLEMUS

2. Key trends and market developments

a. Fuel card issuers

Fuel cards represent one of the most well-established and mature fleet services in the developed markets of Europe and North America. Across both of these markets, oil companies still dominate the fuel card landscape due to their extensive own-brand and partner networks. Nonetheless, **the rapid growth of new, non-oil, players such as WEX, Fleetcor, UTA and DKV has signalled a retreat by some oil companies**, which have chosen to partner and white label their fuel card services, rather than continue to supply + directly.

While the number of fuel cards in circulation across each vehicle type is broadly similar (see Fig 4e.3), this reflects a **disproportionately high penetration among HGVs** and a much lower penetration among LCVs and passenger cars. Indeed, the proportion of HGV fleets utilising fuel cards is far higher than in other vehicle types. The number of individual companies using a fuel card service we assess in this study is also far fewer than either telematics or diagnostics or insurance - meaning that fuel card issuers (FCIs), on average, have a larger footprint than even the largest telematics service providers in the fleet market.

There are many FCIs in the value chain as both oil producers, retailers and fuel card issuers. This has resulted in a complex network of sales, billing and acceptance agreements, whereby many direct competitors accept each other's fuel cards at their own point of sale. In Europe, for example, oil giants **Shell, Total and Esso (ExxonMobil)** each accept one another's branded fuel cards across their entire retail network. FCIs in all markets have continued to press ahead with acceptance network expansion.

In Europe, the euroShell card boasts one of the largest acceptance networks, although this pales in comparison to WEX's network of 160,000 accepting locations across the US.



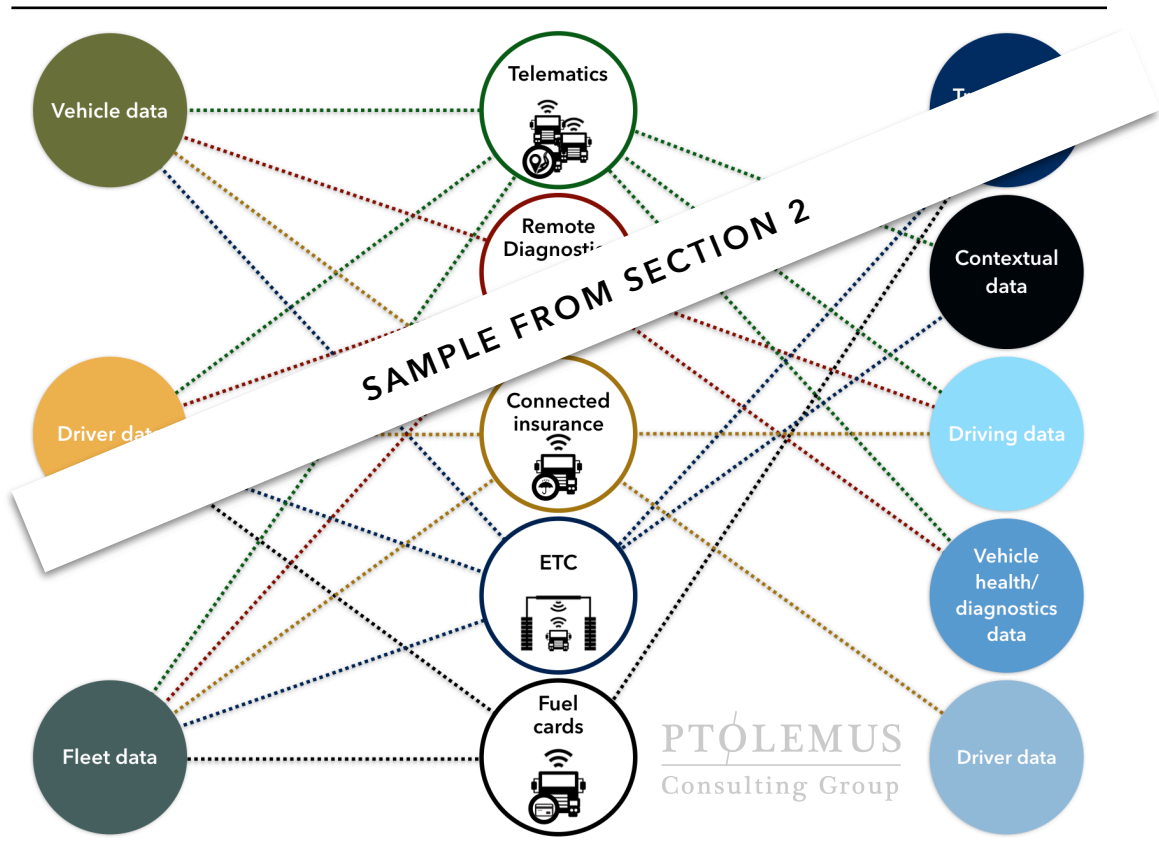
The euroShell card is accepted at more than 27,000 sites across 30 European countries

3. How data is driving the evolution of fleet services

Each of the 5 services we have chosen to examine in-depth throughout this study relies on a range of complimentary data sets, which can be packaged into the 8 categories we outlined above. Each of these 8 categories contains a selection of individual data sets which are combined to power each connected service.

Below, we have identified the individual data categories which are required to deliver a basic version of each service.

Data sets used to power basic fleet services



Source: PTOLEMUS

In Section II, we have completed a thorough analysis of **how these existing data sets generated in isolation by each service can be further enriched** by partnering with other service providers. Through **sharing of complimentary data sets** we clearly demonstrate how, by forming strong partnerships, previously disparate service providers can **increase both their ARPU and the stickiness (retention) of their brand**.

4. Market forecasts

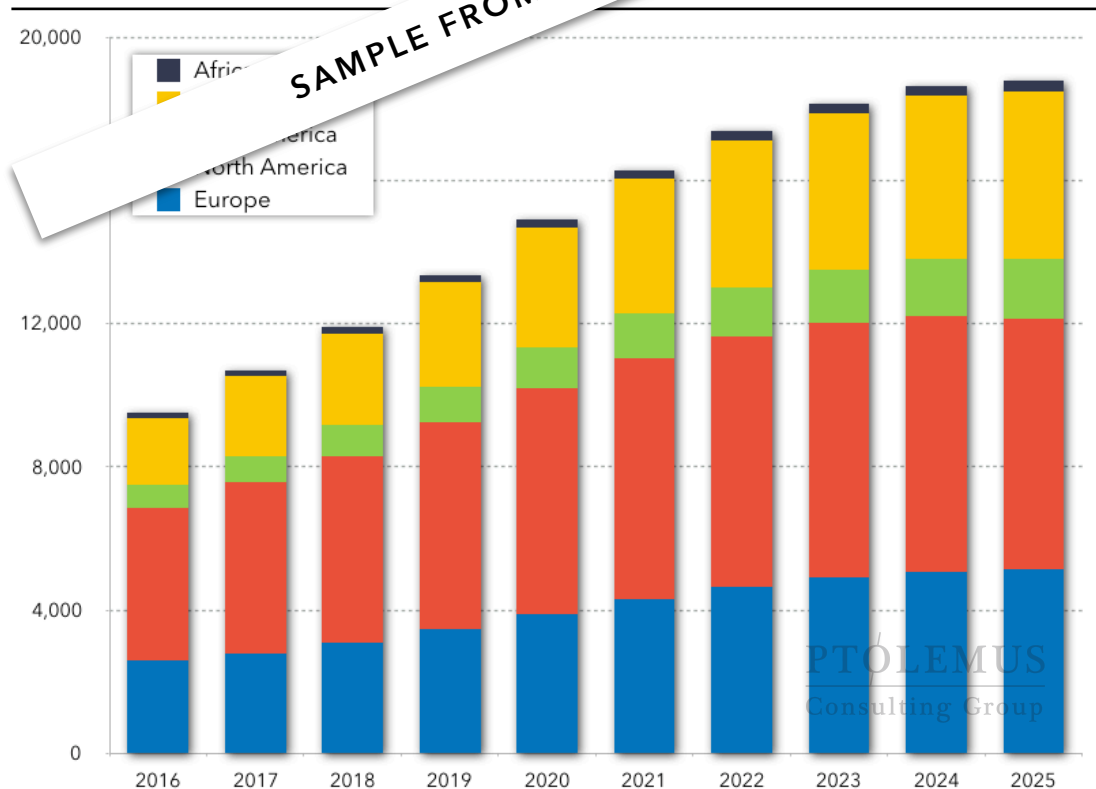
Fleet telematics

The global fleet telematics market will grow from US\$xxx billion to US\$xxx billion in the next five years. Worldwide, the largest market for fleet telematics is **North America**, which is **estimated at US\$xxx billion and is expected to reach US\$xxx billion by 2025**.

The growth in revenues available to TSPs is primarily due to the **greater penetration among HGVs**, which typically pay a **higher subscription fee** than LCVs and commercial cars.

In Europe, the Northern, Central and Eastern countries generate... as the five Western European countries. France, Germany, Italy... together will extend their lead after 2021.

TSP revenues on all fleet telematics (in millions of USD)



Source: PTOLEMUS

The shape of the overall revenue forecast is linked to the following trends:

- **Lower hardware costs**, driven by regulatory mandates and increased volumes and by OEMs active promotion of their connected services packages with competitive prices, such as Navistar's \$25/month offer.

- Fleet telematics **will not switch to smartphone data collection** like many other connected vehicle services, due to the need to connect to the CAN-bus and because operators use mixed fleets.
- **Reducing data costs**, due to the higher capacity and improved spectrum efficiency of new 4G and 5G cellular networks.
- **Lower growth in the volumes of vehicles on the road** after 2020, linked to efficiency gains, platooning, freight sharing and competition from other transport modes.
- **Resilient ARPU** - Despite lower costs, the extension of features and quality improvements will slow its natural decrease.

Comparison of volumes and revenues by vehicle segment

In terms of segmentation, the revenues are relatively parallel to the volume of vehicles in each category. HGVs and LCVs together represent xxx% of the market revenues, but this is changing. Specifically, the role of commercial cars in Europe is growing rapidly - both in volumes and revenues.

TSP revenues and volumes of vehicles using telematics in the US and Europe (US\$ million)



Source: PTOLEMUS

Premiums generated by connected insurance

While the benefits of using telematics extend beyond the insurance cover, the impact telematics can have on the premium depends on a series of factors. Most importantly, it can be nil if the fleet data proves that it is a relatively higher risk than the average.

Connected insurance written premiums (million)

Connected insurance premiums generated - LCV Connected insurance premiums generated - HGV



Source: PTOLEMUS

Today the share of insurance carriers offering risk management programmes is very low. We counted less than xxx in Europe, and **only xxx% of these used the data gathered to affect premiums**.

On average, the fleets using risk management programmes **start with higher than average premiums** and work towards reaching the industry's local average. It also means that the average premiums of the fleets using connected insurance could be higher.

The trend for premium taxes will continue as the economies in Europe and the US continue to grow. New taxes are added to the premiums and - most importantly - **risks are increasing for the better in the near term**. In fact, premiums are still predicted to grow until 2025, when the penetration of ADAS and (to a lesser extent) connected insurance start making a difference to safety.

In China, premiums have been falling while the number of insureds has been growing steadily. With the reform, more people will be insured with more than the minimum MTPL coverage, boosting the overall premiums generated.

Fig 4c.46: Connected insurance written premiums, all vehicles combined in Europe (million)

a. New partners and new services in tolling

For many years, there has been a clear strategy among oil companies and fuel card specialists to re-sell additional services and take transactions-based fees. In Europe, companies such as **Shell**, **UTA** and **DKV** have re-sold toll services from specialists such as **Telepass** and **Axxès** with the cost of the service ensuring that their customers are able to access relevant services. Whether the service is ultimately delivered by the fuel card company or the specialist is irrelevant.

In the US, WEX has pursued a similar approach with regards to telematics by partnering with market leaders such as **GPS Insight** and **Geotab** to re-sell their telematics solutions.

SAMPLE FROM SECTION 4E

Example of partnerships and acquisitions involving fuel card issuers



Source: PTOLEMUS

More recently, FCIs have extended this approach to enable them to bring new features to the market faster and more successfully. Equally, **the emphasis has shifted from partnering to direct investments and acquisitions**, led by M&A hungry providers such as Fleetcor, who have acquired companies specialising in ETC, telematics, digital security and commercial payments over the past 3 years alone.

Across all markets, there has been a strong focus among fuel card issuers to enhance security and improve the payments features of the core product in tandem with increasing the breadth of other services offered. In order to achieve this, oil companies and specialist FCIs have engaged with a range of specific technology providers and digital experts in order to deliver a more robust payment service.

The move towards integration of chip and pin within fuel cards has come, for many, as a result of partnering with companies such as **Gemalto**, who are able to bring highly secure chip & pin and contactless cards to the market for **Total/AS24** in a much faster time than if they have opted to develop the capability alone.

To enhance its account payable (AP) capabilities, Fleetcor finalised the acquisition of international AP payments supplier **Cambridge** in August 2017 for an undisclosed sum. This came in the wake of prior movements into the Brazilian ETC and European telematics markets through the acquisition of **Sem Parar** and a minority investment in **Masternaut** respectively.

The ubiquity of smartphones, not only as a personal communication device, but as a tool for fleets, is already changing the way fleet service providers deliver their products and solutions. For fuel card issuers, this has meant engaging or indeed acquiring specialists such as **Telenav**, which was purchased by Fleetcor in 2013.

The **DKV**, **Daimler** and **T-systems** alliance has enabled them to leapfrog many competitors in the European ETC market, including specialist/pure play providers. As we shall explore later in this section, the combination of all 3 companies adds strength to each, as well as much increased bargaining power with toll operators who typically act as the gatekeepers for tolling services.

As we explore in detail in Section xxx (China), the link between fuel card companies and telematics providers has not followed the same path as in Europe and in North America. In this case, while there are noticeable partnerships, such as between **Sinopec** and **Sinoiov**, the emphasis has been placed on delivering access for fuel card customers to popular freight matching platforms, rather than creating a direct link between transaction and vehicle location data. **In the case of Sinopec and Sinoiov, the desire is to bring new services to their customers, rather than enhancing their own.**



Finally, Eastern European FCI **Eurowag** acquired Czech TSP **Princip** in early 2017 as a means to enter the telematics market directly as well as potentially bringing expertise in telematics devices which could be applied to ETC at a later date.

2. Examination of current market conditions in ETC

Road tolling exists in one form or another in almost every single country in the world. According to our estimates, **in 2016, approximately €170 billion** was collected worldwide by road tolling operators with an option to pay either in cash and/or with an electronic device.

In **Europe**, Austria, Belgium, Switzerland, Germany, France, Czech Republic, Slovakia, Bulgaria, Slovenia, Hungary, Russia, Norway, Poland, Portugal, Greece, Serbia, Denmark and Turkey all have a dedicated scheme in place (or in development in the case of Poland, Czech Republic and Bulgaria) to charge trucks to drive across some or all of their toll roads. With the exceptions of Germany and Russia, all of the above countries currently levy the charge on all vehicles over 3.5 tonnes. At the end of 2017, European schemes collected almost €xxx billion in revenues.

In **North America**, France, Spain, Portugal, Italy, Ireland, Croatia, Greece, Serbia, Denmark and Turkey have extensive tolled networks with specific fees levied for heavier vehicles.

In **North America**, despite, proportionally, having far fewer tolled roads than most European countries and no dedicated scheme for HGVs, more than \$xxx billion is generated annually. Over \$xxx billion is collected each year in the US alone - over xxx% of which is paid via an RFID (Radio Frequency Identification) device subscription.



The Golden Gate Bridge toll can now only be paid electronically - A single journey by a truck with 7 axles or more can cost above \$50!

Due to a pre-existing vast network of cash payment toll roads, **China** has rapidly become the largest single market in the world for electronic toll collection. Total tolling payments stand above €xxx billion per year; more and more of which are being settled via a DSRC (Dedicated Short Range Communication) device.

In May 2017, it was announced that **India** would become the first country in the world to require the sale of ETC devices (in this case an RFID tag) with every new vehicle.

In October 2017, BMW Japan became the first OEM in the country to pre-install (DSRC) ETC devices in all new vehicles sold. **Japan now has almost xxx million ETC units in circulation.**

At the end of 2017, Indonesia, Malaysia, Cambodia, Sri Lanka, the Philippines and Thailand all have significant plans in place to expand either existing electronic tolling road networks or contact new ones. In 2020, Singapore will become the first country in the world to use GNSS/GPS positioning to levy tolling charges on all vehicles.



China is moving fast to replace manual toll booths to reduce chronic traffic jams around tolling stations

Across **Latin America**, Mexico, Brazil, Chile all have extensive ETC networks and **joint revenues approaching €xxx billion**. Countries such as Argentina, Uruguay and Colombia also have tolled roads in operation.

In **Africa**, the continent's biggest economy, South Africa, has a modest network of ETC-only road tolls, alongside Morocco, which also has an ETC network in place. Countries ranging from Kenya to Ghana are also in the process of introducing tolling as a means to finance current and future road building programmes.

Yet, despite a booming global market and revenues which dwarf many other vehicle, let alone commercial vehicle, services, **electronic tolling is often a forgotten or even entirely absent aspect of fleet management**. This is particularly the case across North America and countries such as the UK, Australia, Turkey and India, where road tolls are (currently) relatively sparse and all too easily viewed as a troublesome, occasional expense.

Indeed, in almost all regions of the world, despite representing a daily experience for many fleet operators and commercial vehicle drivers, **toll payments have not yet become a fully integrated fleet management solution in the same way as fuel**. Europe and China are perhaps notable exceptions, as we shall now explore further.

ETC in Europe

In keeping with the theme of this report, we have chosen to focus disproportionately on the HGV (>3.5 tonnes) specific tolling schemes in Europe such as Germany's LKW Maut, Belgium's Viapass, Poland's ViaTOLL and Austria's GO MAUT. This is primarily because these are targeted specifically at commercial vehicles and are far more likely to be based on GNSS technology, rather than the DSRC variant which is applied to all vehicles in

This is the end of the Connected Fleet Services Global Study free abstract.

To enquire about the Full Study, simply email thomas@ptolemus.com

The full 650-page report includes the following sections.

I. THE EVOLVING NATURE, REQUIREMENTS & COSTS OF THE FLEET MARKET

A. Introduction and definitions

1. The fleet segments we focus on in this report
2. We segment the fleet market along five lines
3. What constitutes fleet management today?
4. How fleet services are used across vertical markets

B. Mapping the total cost of ownership (TCO) across fleets

1. Identifying the total cost of operation across the CRT/OTR and maintenance & utilities segments
2. The TCO for HGVs and LCVs in Europe
3. TCO calculation for Class 1-5 and 6-8 vehicles in the US
4. The cost of operating LCVs and HGVs in China

II. HOW CONNECTIVITY & DATA CHANGE FLEET SERVICES

A. The era of mass connectivity and big data among fleets

B. OEMs' diverging approach to fleet services

1. Open loop services model
2. Closed loop services model

C. The growing commercial power of data integration and analytics

D. How data is driving the evolution of fleet services

III. REGIONAL ASSESSMENT OF THE FLEET SERVICE MARKET

A. EUROPE

1. Examination of current market conditions
2. Cost of fleet telematics
3. Key market drivers in fleet services provision
4. Service index and maturity scale
5. Key stakeholders and landscape evolution
6. The role of the OEMs in building fleet services

B. NORTH AMERICA

1. Examination of current market conditions
2. Key market drivers and regulatory issues
3. Key stakeholders and landscape evolution
4. The role of OEMs in developing fleet services

C. CHINA

1. Examination of key market drivers
2. Offering, Stakeholders & landscape evolution
3. Role of OEMs in building fleet services

IV. BRINGING NEW SERVICES TO FLEET OPERATORS

A. The golden era of fleet telematics

4. Background and recent market developments
5. Service integration and new players entering the market
6. Value chain
7. Systems architecture and data requirements
8. Typical devices in use
9. Delivery recommendations
10. Template graph from Fuel card slides - led by TCO split per region
11. Fleet telematics global forecast

B. Using vehicle data to reduce spend on maintenance and breakdowns

1. The benefits and opportunities of remote diagnostics service
2. Remote diagnostics solutions for light commercial vehicles
3. Remote diagnostics solutions for heavy commercial vehicles
4. The impacts of OBD dongles on vehicle safety
5. The value chain of remote diagnostics
6. Systems architecture & data requirements

C. The struggling growth of connected fleet insurance

1. Background & recent market developments
2. Technology trends and devices used in the truck sector impacting safety
3. The connected insurance value chain
4. Systems architecture & data requirements
5. Integration with other services
6. Forecasting the Connected Insurance market in LCVs and HGVs
7. Delivery recommendations

D. Electronic toll collection moves out of the shadows

1. Background & recent market developments including key geographic markets
2. Value chain
3. Systems architecture & data requirements (including certification requirements for new drivers, etc.)
4. Typical devices in use including data generated/functionalities, unit costs, etc.
5. Level of existing integration with other fleet services
6. Recommendations on how to deliver service i.e. is this a host service or an API?
7. TAM, ARPU, costs and growth forecasts

E. Fuel cards: the sleeping giants of fleet services

1. Background and recent market developments
2. The fuel card value chain
3. Systems architecture, data requirements and typical devices in use
4. Integration with other services
5. Level of existing integration with other fleet services
6. Growth forecast for fuel card services

V. CONCLUSIONS

VI. COMPANY PROFILES

To read the full study, please visit www.ptolemus.com

or contact thomas@PTOLEMUS.com