



A BRIEF GUIDE TO **THE HISTORY OF TELEMATICS**





INTRODUCTION

Let's drive business
telematics.tomtom.com

The speed with which telematics has evolved since its beginnings in the 1960s is nothing short of astonishing. Today we perhaps take for granted that we can send each other our locations with a simple cell phone message or that an electronic device guides us from door to door if we require the need. In the modern age where you can check petrol prices of the nearest gas stations using your car's very own Wi-Fi hotspot, can you imagine that even as recently as fifteen years ago, it was commonplace to use paper maps?

What began with the development of a basic global positioning system has evolved into a broad, sophisticated spectrum covering numerous interconnected fields, from road safety and transportation to telecommunications and more.

Telematics has without doubt become an indispensable element in our everyday lives. In this brief guide to the history of telematics, you will learn about how it came into existence, its evolution since the 1960s to the present day, and what we might expect in coming years.

THE ORIGINS OF TELEMATICS



THE 1960s AND 1970s

During the Cold War in the mid-1960s the United States Navy developed a Global Positioning System (GPS) with the use of six satellites orbiting the poles to track submarines carrying nuclear weapons¹. This new technology gave rise to what we now call telematics.

As the 1970s progressed, Telematics advanced further. In 1978, the world's very first GPS satellite launched, called NAVSTAR 1². The next ten years would see many more such satellites built and launched.

There are now dozens of GPS satellites orbiting earth. We now use GPS on a daily basis, with our cell phones and sat-nav systems. In order to determine your own location, your device uses at least three GPS satellites³.

The term 'telematics' also came into existence in 1978 as a result of a French government report on the computerisation of society, or as it was called in the report, 'télématique'⁴.

**THE TERM
TELEMATICS COMES
FROM THE FRENCH
TÉLÉMATIQUE -
A COMPOUND OF
TÉLÉCOMMUNICATION
AND INFORMATIQUE**



TELEMATICS OPENS UP TO PUBLIC USE

THE 1980s

The US government had no plans to extend its GPS technology to the public, but changed its view in 1983 in the aftermath of a tragic airplane disaster, which led to 269 fatalities. The decision to open GPS to civilians was intended to help avert miscommunications in the future that may contribute to accidents and disasters⁵.

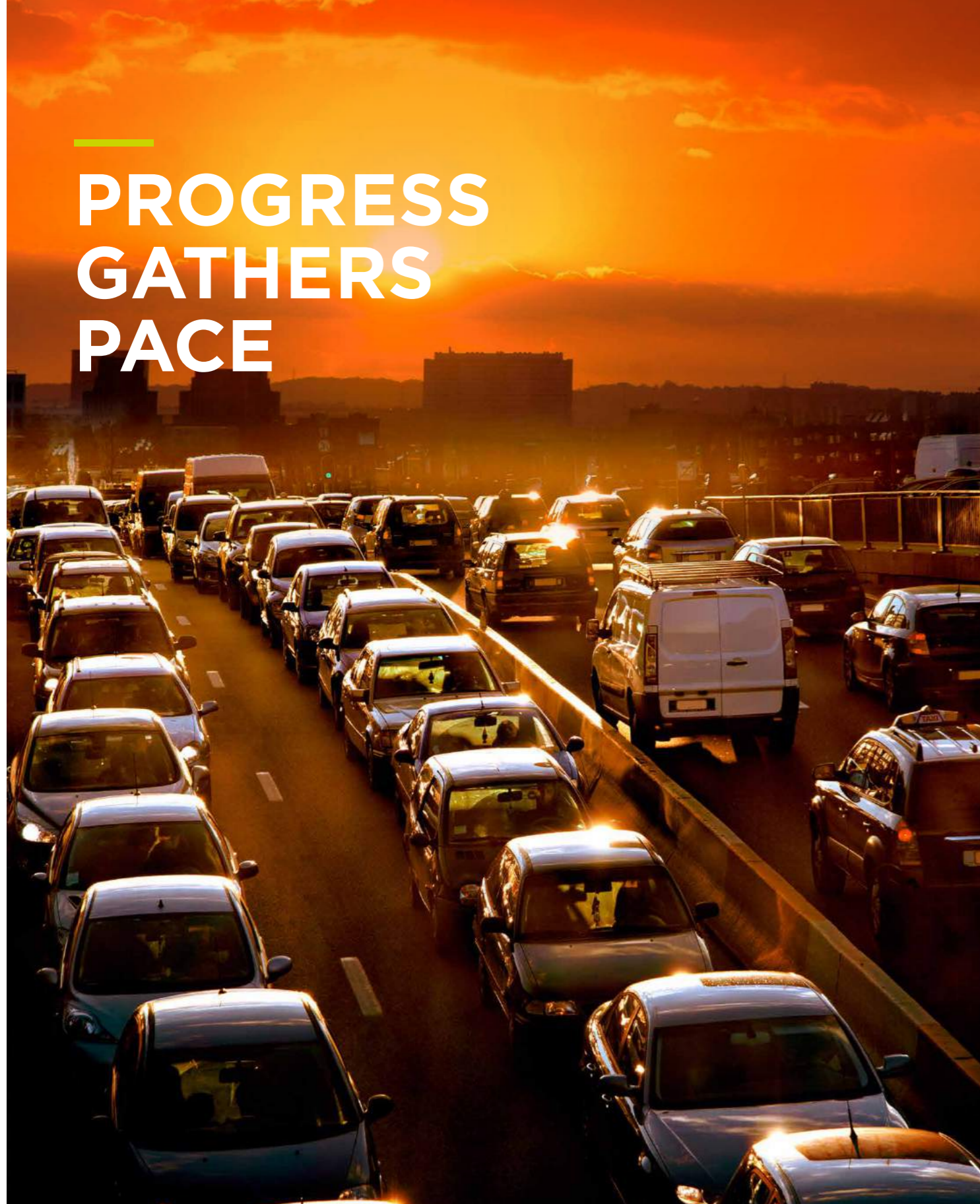
DID YOU KNOW?
GPS SATELLITES
CIRCLE THE EARTH
TWO TIMES A DAY
AT A HEIGHT OF
20,200 KM⁶

1984 is one of the most important years in the early history of telematics due to a resolution that the European Parliament passed to promote road safety. This resolution was so important because it ushered in a wave of research studies, which led to the creation of a programme called DRIVE. Running until 1992, DRIVE was devoted to research on how to use telematics for road safety, greater levels of efficiency, and reducing environmental impact⁷.

The world's first car navigation system for consumers was launched in the United States in 1985. CEO of Etak, Stanley Honey, conceived the idea and led his engineering team in its creation. For its time this was a landmark achievement and huge step forward in the growth and use of GPS on a mass scale⁸.

**THE ETAK
NAVIGATOR**
USED AN 8088
MICROPROCESSOR,
256 KILOBYTES
OF RAM, AND A
HIGH-SPEED TAPE
DRIVE TO READ
DIGITAL MAPS
STORED ON
3.5MB TAPES

PROGRESS GATHERS PACE



THE 1990s

In the 1990s, two important trends emerged for telematics. One, there was a push towards improving vehicle safety equipment, including features such as mandatory airbags and daytime running lights. Two, advancements in electronics, communication, GPS, and cellular technology came sharply into focus.

To begin the decade, Pioneer Electronics followed Etak's lead in 1990 with the release of the first consumer car navigation systems to use CD-ROM maps and Global Positioning System (GPS) satellites to fix a location⁹.

In 1991, TomTom was founded in the Netherlands. Originally called Palmtop Software, TomTom would go on to become one of the world's leading telematics companies, operating in over 50 countries around the world.

Once the DRIVE programme concluded in 1992, the European Union signed a new treaty that would focus on telematics development, believing that superior transportation and logistics networks would increase its competitiveness with the rest of the world and lead to economic prosperity. With this backing at international level and the public adoption of GPS gathering pace, the telematics revolution was now unstoppable.

Then President Clinton signed a directive making GPS an international utility in 1996. This directive meant that private citizens and businesses would be able to use GPS free of charge.

Fleet management started to become more of a pressing need for organizations as telematics advanced into the 1990s. It was a mere matter of

**FOUNDED IN 1991
IN THE NETHERLANDS,
TOMTOM HAS
OVER 25 YEARS
OF EXPERIENCE
IN DEVELOPING
SOFTWARE AND
NAVIGATION
TECHNOLOGIES
THAT POWER
OVER HUNDREDS
OF MILLIONS OF
APPLICATIONS ACROSS
THE GLOBE**

time before the need for fleet management would grow to the point where it would require constant attention and considerable resources. And so it proved. In 1997 Johnson & Johnson appointed Theresa Ragozine as the first person to have global fleet responsibility, in the role of worldwide commodity manager. At the time, the company had a global fleet of 33,000 vehicles¹⁰.

In the late 1990s, the first vehicle tracking systems started to emerge, using hardware connected to vehicles, which connected to software installed on computers via local servers. Historical data was retrieved from the servers and customers had to pay a fee for every single real time update!

To close a decade of huge progress in telematics, Datafactory launched WEBFLEET, one of the very first web-based telematics interfaces with plug and play hardware in the vehicle.

INTO THE NEW MILLENNIUM

2000 AND UP

Telematics really kicked into a different gear in the first decade of the 21st century, with technological advancements moving thick and fast. In the first few years of the new millennium, web-based fleet management systems were hosted remotely, with data viewable in real time. But without broadband, updating maps took half a day and page loads were painfully slow, with positions updating once every 30 minutes at best.

In the early to mid-2000s, fleet management company GE developed a driver communications platform to enable updates including vehicle delivery timeline, vehicle registration requirements, and outstanding maintenance requirements¹¹. But still, it was based on push notifications, or more specifically, text messages.

In 2001, Datafactory's WEBFLEET, Blaupunkt and Siemens joined forces to launch one of the first connected navigation systems that integrated tracking with two-way driver communication and navigation.

TomTom launched the world's first mass market consumer GPS satellite navigation device (sat-nav) in 2004. This development would change how people across the world navigate when driving. In 2005, the first modern satellite started to transmit a second civilian signal, which greatly improved GPS performance. In the same year, TomTom acquired one of the leading providers of fleet management solutions, Datafactory. This acquisition allowed TomTom to combine Datafactory's WEBFLEET technology with its own, helping establish TomTom as a leader in the telematics field.

THE TOMTOM NAVIGATOR WAS LAUNCHED IN 2004, FEATURING VOICE- GUIDED NAVIGATION, ON-SCREEN ICONS AND A CHOICE OF 2D OR 3D MAP PRESENTATION

Towards the end of the decade, the combination of the global recession in the aftermath of the Global Financial Crisis 07/08, rising global fuel prices and new EU legislation to meet new CO2 targets sharpened the focus on reducing fuel consumption and enhancing driver safety.

In addition, many other value-added tools were developed and introduced to the market, leading to more efficient fleet management processes. These include the first GSM & GPS systems on the market; Bluetooth hands-free voice gateways with advanced voice integration features; integrated GSM phone with Bluetooth; multimedia handset integration; and fully integrated mobile navigation that uses a vehicle's GSM system¹².

Other new functionalities that appeared in the market in the late 2000s, and that would go on to be implemented on large scale, included driver behaviour monitoring, dashboard-style reporting and the first basic integration with workflow systems.

DRIVER BEHAVIOUR MONITORING, WORK-FLOW INTEGRATION AND REPORTING WERE INTRODUCED TOWARDS THE END OF THE 2000s

In 2008, TomTom launched HD Traffic, a service providing drivers with in-depth traffic data in real time, including traffic jams, road works and speed camera information.

Entering into the new decade, TomTom and other fleet management system companies began rolling out a range of driver support and productivity applications for mobile devices.

ADVANCING AT LIGHT SPEED

THE 2010s AND BEYOND

With the rise of the software-as-a-service (SaaS) trend, the current state of telematics began to take shape from 2010 onwards. Platforms like TomTom Telematics' WEBFLEET began to deliver all services through the cloud at super-fast speeds. Vehicle positions now updated every few seconds and systems provided feedback alerts on driving performance direct to the driver in real time.

In a huge step forward for telematics in Europe, the European Union launched a \$5 billion satellite navigation project called Galileo this decade³. A primary motivation for developing Galileo was to remove Europe's dependence on the United States' GPS, Russia's GLONASS and China's BeiDou, and improve GPS coverage in the North of Europe.

In the last few years, notably from 2015, trucking has continued to adopt telematics solutions at the pace of 20 to 25% every year¹⁴. As of 2017, many cars come out of the factory already equipped with more than 100 sensors that create a constant stream of data¹⁵. Measuring data points like location, performance, physical parameters and driving behavior, often several times per second, the amount of data generated by these sensors is immense.

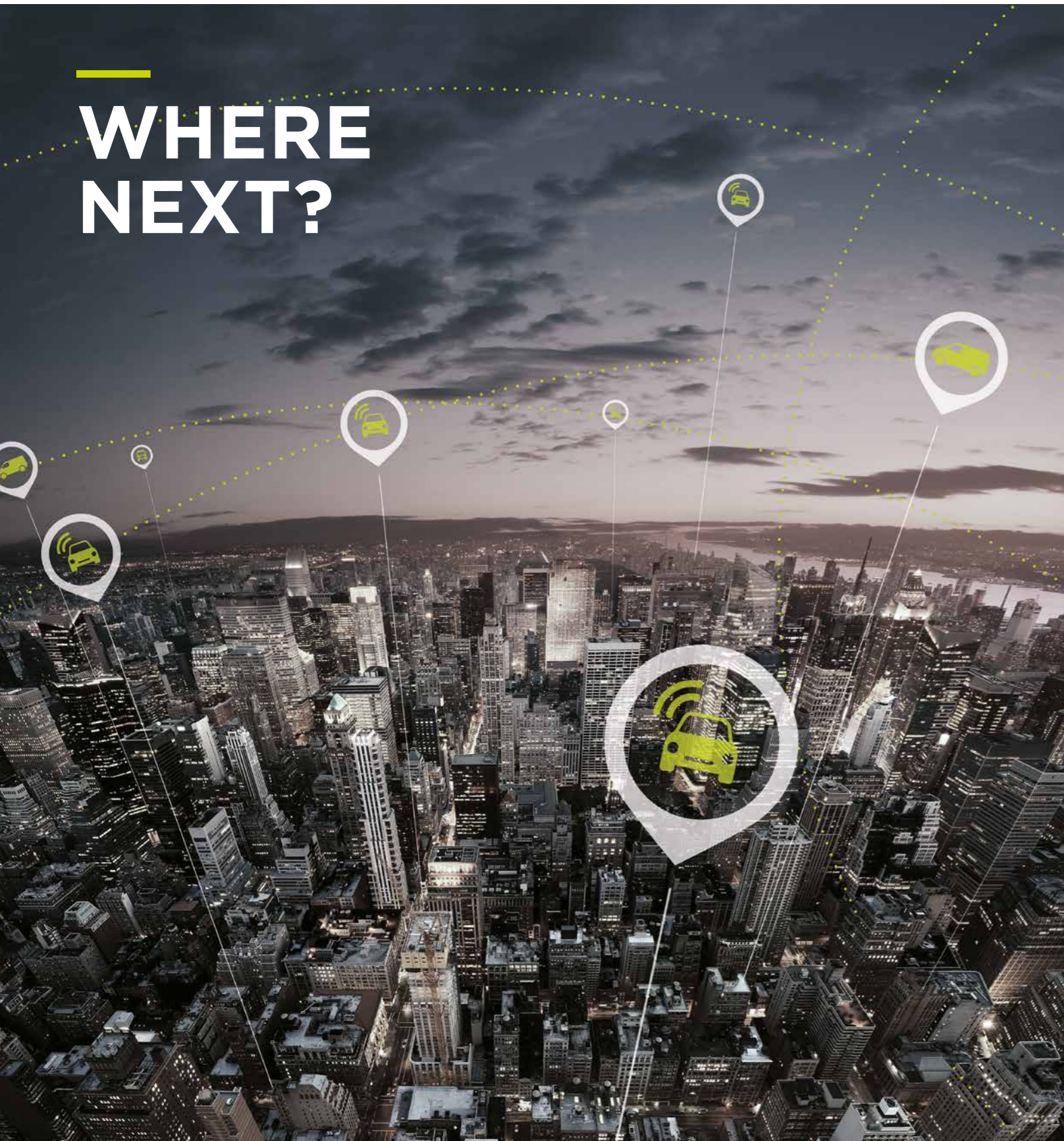
DID YOU KNOW?
THE 'CONNECTIVITY
MARKET' IS WORTH
\$3.5 BILLION
ANNUALLY.

In 2010 and 2011, the first smartphone applications that combined with telematics were released to market. These apps now help fleet managers monitor vehicles remotely and support drivers with routine administrative tasks, such as meeting legal mileage registration obligations.

With common application program interface (API) protocols and the rise of collaborative technology, full connectivity arrived in 2014. This development provides greater efficiency in business, connecting the back office, the vehicle and the driver, and machine-to-machine systems became commonplace.

DID YOU KNOW?
CONNECTED CARS
CAN NOW CREATE
UP TO 25 GIGABYTES
OF DATA PER HOUR.
ABOUT 30 HOURS OF
HD VIDEO PLAYBACK
AND MORE THAN A
MONTH'S WORTH
OF 24-HOURS DAILY
MUSIC STREAMING!¹⁶

WHERE NEXT?



THE FUTURE OF TELEMATICS

Fleet management solutions like WEBFLEET, by TomTom Telematics, give drivers direct insight into driving behavior. This empowers teams to drive more responsibly and to contribute towards slashing their respective company's fuel, maintenance and insurance costs.

This is not the only way in which telematics bridges the gap between managers at the office and drivers on the road, helping them collaborate and work better as a team. Advanced vehicle tracking can help drivers justify time, mileage and the locations they visit to inform their management, enhance their clients' experience or accurately report to the tax office.

Telematics solutions, which are typically made of a central console like WEBFLEET and dozens – or thousands – of devices installed on a fleet's vehicles, provide managers with deep insights into the performance of their fleet via clear dashboards and extensive reporting. This in turn helps them reduce total cost of ownership by analyzing vehicle utilization, driving behavior and vehicle health.

Since 2006, TomTom Telematics also offers an API for third-party companies to create innovative services and finely tuned business processes that help companies make the most of their investment in customer service, planning, dispatch or finance solutions by integrating WEBFLEET into their applications – and those of their end customers.

From the first GPS system created by the US military over fifty years ago to the modern world, in which 'big data', automation and machine learning have allowed us to enjoy a technological disruption, telematics has become both incredibly sophisticated and indispensable to modern society. But, we may well look back on today's technology - what many of us now view in disbelief at its capabilities - the same way we now look back (rather smugly!) on the state of telematics in its first few decades.

The speed of technological change is staggering, and we have only begun to scratch the surface of robotics, automation and machine learning. By 2025 the vast majority of cars are predicted to come with ready-integrated telematics systems and by 2030¹⁷ many vehicles on the road will be self-driving¹⁸. If the history of telematics is anything to go by, we can be sure that there will be some surprising and groundbreaking changes too.

DID YOU KNOW?
IT'S ESTIMATED
THAT THERE WILL
BE OVER 22 MILLION
SELF-DRIVING CARS
ON THE ROAD
BY 2025?¹⁹

SOURCES

- 1 NASA (2012) "Global Positioning System History" https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html
- 2 Telematics4me (2017) "The History of Telematics" <https://telematics.route4me.com/blog/the-history-of-telematics>
- 3 Telematics.com (2013) "Telematics History and Future Predictions" <https://www.telematics.com/telematics-history-future-predictions/>
- 4 Globaltelematics.com (2013) "The Meaning of Telematics" <http://www.globaltelematics.com/telematics.htm>
- 5 Telematics4me (2017) "The History of Telematics" <https://telematics.route4me.com/blog/the-history-of-telematics>
- 6 <https://www.geotab.com/blog/gps-satellites/>
- 7 Telematics.com (2013) "Telematics History and Future Predictions" <https://www.telematics.com/telematics-history-future-predictions/>
- 8 Twice.com (2014) "Navigating the History of Navigation, Telematics" <https://www.twice.com/blog/navigating-history-navigation-telematics-54217>
- 9 Twice.com (2014) "Navigating the History of Navigation, Telematics" <https://www.twice.com/blog/navigating-history-navigation-telematics-54217>
- 10 Business Fleet (2017) "The Origin and History of Global Fleet Management" www.businessfleet.com/blog/market-trends/story/2017/06/the-origin-and-history-of-global-fleet-management.aspx
- 11 Automotive Fleet (2013) "The History of Computers in Fleet Management" <http://www.automotive-fleet.com/channel/leasing/article/story/2013/01/the-history-of-computers-in-fleet-management/page/2.aspx>
- 12 Telematics.com (2013) "Telematics History and Future Predictions" <https://www.telematics.com/telematics-history-future-predictions/>
- 13 CNET (2010) "Celebrating 10 years of GPS for the masses" <https://www.cnet.com/news/celebrating-10-years-of-gps-for-the-masses/>
- 14 Fleet Owner (2015) "Telematics will change trucks and trucking" <http://www.fleetowner.com/technology/telematics-will-change-trucks-and-trucking>
- 15 Statista (2017) "Big Data on Wheels" <https://www.statista.com/chart/8018/connected-car-data-generation/>
- 16 Statista (2017) "Big Data on Wheels" <https://www.statista.com/chart/8018/connected-car-data-generation/>
- 17 Ernst and Young (2013) "The quest for telematics 4.0" [http://www.ey.com/Publication/vwLUAssets/The_quest_for_Telematics_4.0/\\$File/The_quest_for_Telematics_4_0.pdf](http://www.ey.com/Publication/vwLUAssets/The_quest_for_Telematics_4.0/$File/The_quest_for_Telematics_4_0.pdf)
- 18 KPMG (2015) "The Future Of The Car Report" <https://assets.kpmg.com/content/dam/kpmg/pdf/2015/12/the-future-of-the-car-report.pdf>
- 19 Juniper Research (2016) "ON TRACK WITH SELF-DRIVING VEHICLES 2.0" <https://www.juniperresearch.com/document-library/white-papers/on-track-with-self-driving-vehicles-2-0>

LEARN MORE

GPS History (NASA) https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html

<https://spaceplace.nasa.gov/gps/en/>

Galileo European GPS (GSA) <https://www.gsa.europa.eu/european-gnss/galileo/galileo-european-global-satellite-based-navigation-system>

More information from TomTom Telematics

TomTom's History <http://corporate.tomtom.com/history.cfm>

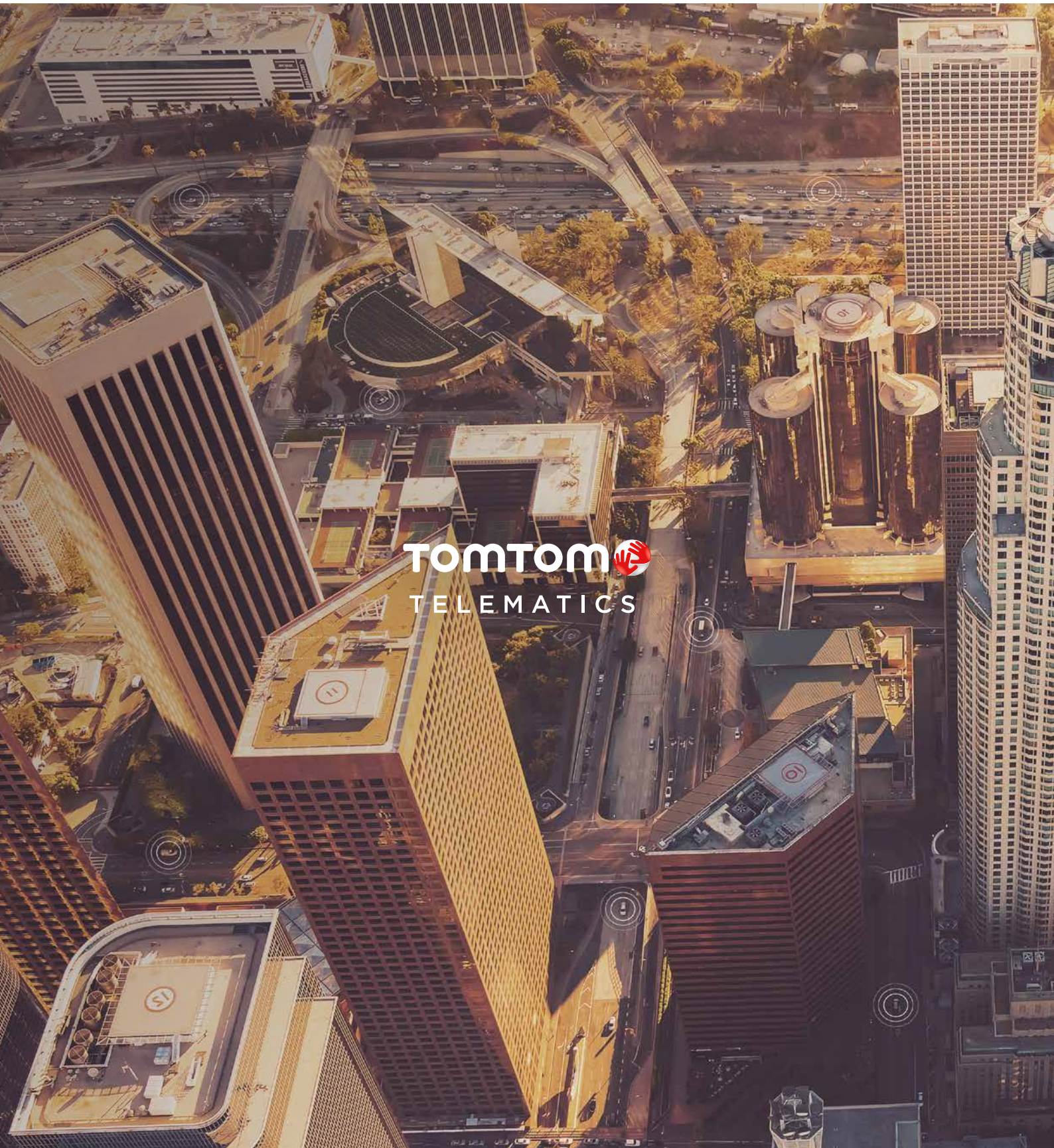
Fleet Sustainability https://telematics.tomtom.com/en_gb/webfleet/blog/fleet-sustainability/

Tax Compliance https://telematics.tomtom.com/en_gb/webfleet/blog/hmrc-tax-compliance/

Connected Cars https://telematics.tomtom.com/en_gb/webfleet/blog/connected-car-hype/

Connected Trucks https://telematics.tomtom.com/en_gb/webfleet/blog/connected-world-truck/

The future of connected vehicle innovation https://telematics.tomtom.com/en_gb/webfleet/blog/the-future-of-connected-vehicle-innovation/



TomTom
TELEMATICS