TomTom Company profile

At TomTom our mission is to make technology so easy to use, that everyone can benefit from it. We invented the easy to use navigation device, helping millions of people to get where they want to be. Today, we continue to simplify the complex, making technology more accessible for everyone.

We have four customer facing business units: Consumer, Telematics, Automotive and Licensing. We make easy to use navigation devices, sport watches and action cameras for consumers. We enable businesses to easily improve vehicle performance and increase overall fleet efficiency with our Telematics solutions. And our world leading real-time map platform is powering innovative location based services and making automated driving a reality for the Automotive industry.

Founded in 1991 and headquartered in Amsterdam, we have 4,200 employees worldwide and sell our products in over 46 countries. Find out more at automotive.tomtom.com
Harold Goddijn
CEO TomTom

Car Manufacturers (OEMs) must be able to provide connected entertainment and navigation systems that match the expectations of drivers. This requires in-vehicle Infotainment (IVI) systems that work across the multiple brands, models and geographies covered by leading car manufacturers. Moreover, these systems must meet stringent demands for cost, speed, quality and simplicity.

I firmly believe that TomTom is the ideal partner to meet these expectations.

This is because TomTom has developed a range of components that help OEMs and their Tier 1 suppliers to rapidly integrate world-class navigation solutions into their IVI systems. These components include high quality, real-time maps as well as navigation software and traffic services – everything and more that you expect from TomTom, the world leader in navigation.

The result is a Connected Navigation System that is sophisticated and effective – easy to integrate with any in-car infotainment strategy and vision. We believe that technology is an enabler to create successful and competitive IVI systems; everything is possible. Success will depend on collaboration between suppliers and customers, and the open sharing of knowledge and skills.

Within this context, TomTom believes in the value of partnerships. We have unique insight, developed over many years, into what drivers really want. And our modular, class-leading components are specifically designed to help OEMs, their Tier 1 suppliers, and application developers to create great products.
TomTom is the trusted partner for the automotive industry

With the launch of the TomTom “GO” Portable Navigation Device ten years ago, we made navigation technology accessible to everyone. Today, close to 800 million people rely on TomTom technology to get where they want to be. With the unmatched quality of our map content, traffic information and routes, we are the trusted travel companion for millions of drivers. Over the years, we have helped them to navigate over 170 billion miles.

The TomTom brand has become synonymous with award-winning ease of use. Today, we keep on innovating in the field of navigation, across all relevant end-user “platforms”: automotive in-dash head-unit systems, on-dash PNDs, smartphone apps and web applications. Our unrivaled knowledge and innovation come together in our Connected Navigation System (CNS) which enables carmakers to offer their end users a world-class navigation experience.

TomTom and the connected, self-driving car

End-users are accustomed to rapidly evolving consumer electronics and connected devices such as smartphones. They also expect their car to become connected, to access and enjoy all these exciting new developments while on the move. TomTom meets this demand by offering a complete navigation experience, both in and outside the car, connected to cloud-based services. This makes the entire journey informative, enjoyable and less stressful, from planning the trip to finding their parking space and walking to the final destination.

Cars are also increasingly packed with systems for advanced driver assistance (ADAS), leading to highly (HAD) or even fully automated driving. These systems need accurate maps and real-time data to be able to “see” beyond the reach of the car’s sensors. TomTom’s connected navigation components are ideally suited to fulfill these needs of the self-driving car.

TomTom Connected Navigation: a complete range of navigation components

TomTom creates all the necessary navigation components: real-time maps, navigation software and connected services. These components are available separately, or pre-integrated in a complete Connected Navigation System. These components are market-tested, configurable and upgradable. This gives OEMs and Tier1s the best of both worlds in terms of flexibility, cost-effectiveness, modularity and time-to-market.

TomTom components are easily integrated, based on open industry standards and interact through well-defined application programming interfaces (APIs). This significantly reduces investments in development, testing and validation. And it means car manufacturers can offer best-in-class, feature-rich and future-proof systems that meet rapidly changing requirements and product strategies.

Installed in millions of cars

These great car brands already integrate TomTom navigation components:
Always up-to-date with TomTom Maps

With more than 25 years of experience, TomTom offers the world’s most extensive digital map database with navigable coverage for more than 120 countries and over 20 territories, encompassing more than 4 billion people and more than 40 million km worldwide.

Real-Time Maps

Every year about 15% of roads change – speed limits are updated, new businesses need to be listed, new streets are built and streets are renamed. Ensuring that the map keeps up with these ongoing changes is an incredible challenge. TomTom relies on intelligent mapmaking, we invented and perfected a highly efficient hybrid approach that combines professional mapmaking methods with community input, resulting in a map that is highly accurate and up-to-date.

With TomTom Real-Time Maps we ensure people always have the latest map in their car. We apply the following closed loop 3 step method that boasts high quality, high efficiency and fast cycle times. It follows three steps:

1. Reality Change
2. Processing
3. Incremental Updates Delivery

In order to detect changes in the real world we use a variety of different sources. Traditional sources like journalistic data from the public sector and our mobile mapping vans are combined with GPS-based community input. Hundreds of millions of users both actively (more than 200,000 map edit reports monthly) and passively (12 trillion data points and growing) share map feedback with us every day.

Via our state-of-the-art, transactional mapmaking platform, we quickly validate and merge map changes back into the map. Once a map edit is detected, that piece of map is verified and the change is made to the affected part of the map. Once the change is validated, the piece is checked back in and merged with the complete map. After a quality control check, we publish the incremental map updates.

Finally, our mapmaking platform enables us to deliver ‘real-time’ map updates to customers via fast and frictionless map distribution mechanisms. We distribute map changes to our customers incrementally or via full updates. Incremental map updates can be sent over the air, in the background, ensuring end users always drive with the latest map available.

This closed loop goes on continuously, and more importantly it gets faster and faster. This is how we deliver industry leading, accurate, and up-to-date maps.

TomTom uses the Navigation Data Standard (NDS) to deliver incremental real-time map updates

TomTom leads the industry with new map delivery formats that are not only incremental map update capable but are also fast, efficient and easy to use. As an industry leader in Navigation Data Standard (NDS), TomTom offers modular, plug-and-play maps ready for use in NDS software applications. Some of the key benefits of NDS maps are:

- The ability to deliver incremental map updates
- Flexible content management, resulting in lower storage costs
- Faster time-to-market due to shorter map compilation throughout the time
- Simpler and faster map compilation with visibility on quality

For non-NDS platforms TomTom offers MultiNet-R - the next generation of MultiNet. This format delivers all of the high quality content layers of the TomTom map database in a single and easy-to-use intermediate format data model. Our Map Content API provides streaming maps with total flexibility and access to the fastest possible map changes.
TomTom maps enable highly automated driving

TomTom maps power industry-leading applications and are ready to bring you closer to the future. As the automotive industry evolves in the field of Highly Automated Driving (HAD), we at TomTom are moving forward in the same direction with new solutions for the maps of tomorrow. In order to make a vehicle drive automatically, it must be able to access the most precise and up-to-date map data that will help the car sense the environment and navigate without any human input. TomTom provides highly detailed lane-level accuracy and richly attributed HAD Maps. Combined with our positioning content, live services and a feedback loop that keeps our real-time maps up-to-date, we offer a number of critical components to enable Highly Automated Driving.

As a pioneer in HAD maps we have successfully completed industry’s first, near real-time HAD content-updating project with a major OEM, using in-vehicle instrumentation and NDS maps on public roads. In addition, our precise gradient, height and curvature data already support next-generation ADAS systems such as predictive powertrain control for trucks. Because these vehicles have access to TomTom maps, they are automatically aware of the upcoming route and can therefore adjust the powertrain ‘predictively’, allowing them to improve safety, efficiency and comfort of the driving experience. For data analysis and development projects we provide a fully-compliant ADASIS v2 toolkit.
TomTom Navigation: get there faster

TomTom is a world leader in navigation software development, with more than 10 years of experience. Every day millions of users rely on TomTom products. For the Automotive industry, TomTom offers modular navigation software components that enable OEMs to bring a customised, upgradeable and seamless connected navigation experience to end users.

NavKit is the core software component, enabling OEMs and Tier-1 suppliers to develop embedded navigation applications. NavKit is built on years of experience, market-tested in our consumer products, and continuously enhanced through regular releases. Many independent tests have proven that NavKit delivers the fastest routes and most reliable ETAs. NavKit provides rich navigation features, such as routing, guidance, search, map matching and map rendering.

The modular architecture with off-the-shelf functions reduces investment and risks for OEM development projects. NavKit runs on any hardware or Operating System. It works with the TomTom map format and standard NDS maps, giving OEMs greater flexibility on maps configuration.

NavApp is TomTom’s Android-based reference application built around NavKit. It provides a map-centric and intuitive user experience, including the User Interface (UI) that is used on TomTom’s latest portable navigation devices. NavApp reduces cost and time-to-market because it is a complete, pre-integrated application.

If OEMs want to give NavApp a specific flavor, they can skin the UI to make it distinctive and unique. Alternatively, OEMs can choose to develop a fully customised end-user experience based on the NavKit interfaces, using NavApp as a reference.
Connected Navigation Experience

In today’s connected world, consumers expect to be connected, wherever, whenever. Consumers also expect their car to become connected and be a part of their digital life. OEMs can meet these expectations by using TomTom’s components to deliver a connected navigation experience that goes beyond the car and its in-dash system. For example, pre-trip planning on a website, departure warnings on a wearable device and last-mile navigation on a mobile phone can all be synchronised with the in-car navigation system.

Navigation Portal
TomTom’s Navigation Portal helps OEMs to connect to their customers even before they get into their car. It enables drivers to plan and personalise their journey from the comfort of their home or office. The navigation portal is white-label and can be integrated into an OEM-branded website with other features.

Companion App
With the goal to give the end-user a personalised journey and strengthen OEM brand image, TomTom delivers Companion App components for Android and iOS. It allows OEMs to stay connected to their customers beyond the in-car experience and delivers the most-asked features, such as departure warnings and last-mile navigation.

Online Navigation Services
TomTom offers cloud-based services to power off-board and hybrid navigation solutions, be it in the car, on a portal or in a companion app. Being server-based, the system is always up-to-date and not limited by hardware or storage constraints, enabling OEMs to offer the most future-proof and cost-effective solutions to their customers.

- **Online Routing** relies on years of experience in navigation and uses the same proven technology as NavKit to provide the fastest routes.
- **Online Search** gives remote access to the most up-to-date and complete set of addresses and POIs in 134 countries.
- **Online Maps** uses TomTom’s latest NDS map to provide rendered map tiles to any application.
- **NavCloud** offers convenient and automatic synchronisation of personal navigation data across devices. This cloud-based synching & sharing service enables drivers to access their favorite locations and routes on whatever device: a smartphone, laptop, tablet or the car in-dash system.
Connected Services

In order to provide a great navigation experience, OEMs need to give end users access to real-time information. Our range of connected driver-centric services truly enhances customer experience.

**TomTom Traffic – Global leader in traffic information**

TomTom has a unique knowledge and insight into the traffic flow and incident data around the world. We have defined traffic information as we know it today. Our traffic service minimises OEM and vendor system requirements in terms of bandwidth consumption, processing power and memory while giving drivers:

- Highly accurate information for traffic jams, weather-related delays and road blocks
- High update frequency, resulting in a low latency of jam information
- Highest road coverage with real-time jam information

TomTom collects over 400 million GPS traces daily from our unmatched global community and a wide range of 3rd party data used in our fusion engine to deliver real-time traffic information. TomTom Traffic is delivered via a technology based on TPEG over IP. TPEG is a widely adopted industry standard for delivering traffic information and other driver relevant services. It enables us to provide TomTom Traffic as a service to automotive in-dash devices developed by other Tier 1 suppliers. For location referencing, TomTom has developed and pioneered the open standard OpenLR that enables us to provide traffic information on any stretch of road, not just main roads, and on any map.

**TomTom Speed Cameras**

This service delivers real-time positions of mobile and fixed speed cameras. This helps our users to save money and drive safer and more relaxed. The mobile speed cameras are based on reports from our user community and various other sources, processed 24/7 by our fusion engine. The positions of fixed speed cameras are continuously verified by our moderation team.

Fixed and mobile cameras can be delivered as a real-time Speed Camera Service, either as a Bulk Feed or as a Hosted Service, similar to a TPEG over IP service. Fixed speed cameras can also be delivered as a POI set with the map for preloading onto devices. TomTom is 100% compliant with each country’s legal framework.

**TomTom Speed Cameras service currently available in 51 countries**

**Travel services**

In addition to the existing proprietary connected services, we partner with the best content providers of the following driver-centric services:

- **Parking** informs drivers of available on-street and off-street parking spaces as they approach a destination
- **Fuel** informs drivers of the available fuel stations and the price of each available fuel type
- **EV Station** is a service for Electrical Vehicles that informs drivers of the available charging stations and, if applicable, allows drivers to book them
- **Weather** provides live weather reports, for the end destination or any point along the route, and can be fused in TomTom Traffic enabling faster and safer routing.

We are also able to integrate any other type of service, even if it is not directly driver-centric. For instance, we could integrate a news info service if requested by an OEM.
Award-winning User Experience

TomTom user interface is intuitive and easy-to-use.

Due to a very strong in-house UX team, TomTom is known worldwide for giving end users a well-designed interface that reduces driver workload and stress. From early conceptual exploration to the detailed interaction specification, the end user is central to the process. All TomTom products feature an attractive, user-centric design that promotes ease of use and minimises interaction for common tasks. The delivery of relevant information at the right time empowers drivers to make meaningful decisions.

Today, over 800 million people use TomTom every day to help them get to where they want to be.

Cars and customers are not all alike, then why should you experience in-car navigation in the same way everywhere? We at TomTom bring different solutions to OEMs in the field of User Experience for their IVI systems in three different options:

1. **TomTom Reference UI:** already meeting the needs of millions
   - Designed by a dedicated UX team with years of experience
   - Short time-to-market – already implemented on millions of PNDs
   - Low integration costs – already made to work together with TomTom Navkit

2. **Skinned TomTom Reference UI:** same interface – different experience
   If project timelines or development resources are short, but still there is a need for customisation, simply skin a TomTom Reference UI.

3. **Fully Customised UI:** Empowering your brand experience
   Thanks to NavKit's modularity there is no need to modify the core of navigation engine when developing a Fully Customised UI tailored to your special needs. With TomTom Professional Services, we can also support, or even execute this customisation.

TomTom Cockpit Concept: User Experience exploration with a strong focus on safety and usability.
End users tend to keep their car for a long time. In Western Europe car ownership duration is about 13 years. During that very long period, your customers should be able to update their devices with freshest maps and newly released software. At the same time, users should be able to subscribe to different services, in case of changing ownership throughout the lifetime of the vehicle. Therefore, in order to meet the needs of end users, we at TomTom created a white label web shop. Our solution is scalable from a brandable user portal (map downloads only) to a full-fledge e-commerce portal (payment and delivery of a map or a service).

To satisfy OEM’s specific requirements, the store allows total brand customisation of the portal. The WebShop can also be connected to the CRM back-end of an OEM as well as to any other system.

TomTom is a top navigation brand which represents a high level of customer recognition. When licensing TomTom technologies to OEMs or Tier1s, the right to use the TomTom Brand or Trademark is granted for their external communication as well as User Interface. In the context of cross-branding, OEMs can significantly leverage on the reputation of TomTom components.

**TomTom co-branding and trademark approach**

There is also a possibility to license our award-winning UI components such as the route bar. Specifically for this purpose, we have created Branding Guidelines for TomTom Traffic and other assets, such as Map Navigation and Online Search, these guidelines ensure a correct usage of TomTom trademarks and trade names in co-branded materials.
TomTom Professional Services

Integrating connected navigation components in your IVI system is easier and more effective when you do it with the navigation expert - TomTom. Our Professional Services unit is a dedicated project organisation with intimate knowledge of TomTom assets and extensive experience in automotive projects.

TomTom Professional Services can assist you in:
- Tailoring the standard TomTom components (e.g. skinning the UI)
- Custom engineering of additional components if needed
- Integrating the components to work as one system
- Delivering to agreed specifications, timelines, quality levels and KPIs

Whether you choose TomTom for a part or the full scope of a project, we will provide you with high-quality, reliable solutions through our delivery model:

TomTom Components → Custom Engineering → Integration → Delivery

The TomTom Professional Services way of working incorporates a high degree of customer interaction. Deliveries are frequent and timely, leading to lower costs, higher output, less risk, higher quality and optimised business value creation.

Why TomTom Professional Services?
- We have an intimate knowledge of TomTom assets
- We have vast Automotive experience
- We demonstrate a state-of-the-art way of working
- We operate in world class development centres
- We provide our services globally

Developer.tomtom.com
TomTom is an innovation software company at heart. We are striving to foster an open source environment that allows every developer to create great applications. To pursue this goal, we have made available a number of tools such as: APIs for routing and map tiles, sample code, use cases, and general technical support.

For more detailed information please follow developer.tomtom.com
Would like to know more about TomTom Navigation Components?
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