



TomTom Capturing the Megatrends

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List of MAIN speakers	Company	Job title
Antoine Saucier	TomTom	Automotive Managing Director

Capturing the Megatrends Slide #1

Antoine Saucier

Automotive Managing Director

Good afternoon. Welcome back. My name is Antoine Saucier. I'm running the automotive business at TomTom. I want to give an overview of where we are today, but also how we see the market megatrends as a great opportunity for TomTom in the automotive business.

TomTom Automotive product portfolio Slide #2

It starts with our product portfolio. You've heard about some map software and services already this morning. Yes, we're a map company, our transactional map making process produces a navigation map, high definition maps, but also ADAS maps that are increasingly relevant in the automotive business. We are leading in navigation software with more than 25 years of experience in the user experience and ease of use.

And traffic is definitely our leading product. We're leading on the markets in automotive with traffic information. But that is basically us being a big data company processing massive amounts of data and that capacity also works with our products than traffic and that is recognised across our industry.

Automotive revenue driven by innovation Slide #3

How did we start? Basically we introduced, back in 2009, a product that dramatically changed the landscape of navigation in automotive. Based on the contract with Renault signed in 2007, Geneva 2009, we introduced this Carminat TomTom product, a TomTom product below €500, best in class in terms of navigation features and completely changing the game in terms of in-car navigation take rates.

If you look at where we are today with some of our biggest customers the take rate is between 50% up to 80% depending on the car lines. By that time you were talking more 5% and 15%. So we completely changed the game by introducing this innovation. We continued in 2010 by connecting those devices, actually providing the same device but with a SIM card in it and introducing real-time traffic information in the automotive industry. That also was a starting point. We became the market leader that we are today in traffic information.

We also introduced first electrical vehicle navigation. That was in the Renault Zoe, one of the very first EV car being produced at mass market size and we launched more recently ADAS based level two system in a couple of cars but also trucks.

We also expanded on geographical coverage. And so what we announced this year with the MG in India with this Hector car, is actually the first navigation system for us in India and they also take us to

other regions. So altogether technology coverage and user experience has been one of the major drivers for our development in the business.

Key automotive megatrends providing further opportunities Slide #4

That growth of the automotive business is also supported by the now well-known CASE, megatrends. So connected, automated, shared, and electrified. Connectivity is an interesting topic. You could say today in Europe all the cars are connected. They all have eCall. Now eCall is a connectivity that is only activated either if you crash or if you pressed this little red button. If you think about connected services, how can we update our software? How can we update our Maps? This type of connectivity is not going to solve the problem. So what this connectivity is about is really bringing decent data exchange in the car, allowing for software updates for real-time maps access, but also to get data back from the sensors being increasingly included in cars. And since this connectivity is also a cost, trying to monetise what comes out of this connectivity to compromise, compensate for some of that connectivity costs.

In automated driving, obviously ADAS and HD content is getting market attention. We also see safety services being now requested. So what is the connectivity coverage of this or that particular location? Can we offer connectivity type of map? Or can we think about what is called road clearance, which is a service that would tell OEMs, 'Well in this particular location autonomous driving is allowed or you should put this feature on hold because of weather condition, accident, animals or any other hazards.'

We also strongly believe in the value of bridging over time the ADAS and AD space and the navigation space. If you look at how our business develops today, we're basically talking to different engineering teams. Navigation is more in the infotainment engineering department at our customers. ADAS and AD is more managed by chassis control. Ultimately, if you talk about user experience, how do you bring this technology into cars so that people understand it, use it, are delighted with it? It means that you merge the navigation content with the map and you're able to represent your ADAS features or your AD functions at the same location, the same style as you represent navigation.

Finally, electrification, a very good case for us as well because EV cars bring a lot of advantage, but they also bring range anxiety. Range anxiety is a problem that location technology can really help to solve and that is because we know about the map – I'll come back to that – but we can bring electrical vehicle services; we can deal with charging stations, and over time organise that not only you know where the charging station is, but when you reach that charging station, it is available because you've booked it in advance and the transaction can also be taken into account by the car.

CASE megatrends boost navigation take rate Slide #5

Those trends can dramatically boost the navigation take rates in automotive. If you look at what has happened in the previous years, we've been growing steadily but slowly from 29, 30 and plus. If we would project that trend towards 2030, we would be around 45%. We strongly believe that whether it's the connectivity, moving towards more automated driving cars, shared mobility or electrification; all those trends generate a real use of in-car navigation. A real demand for something. Some system that addresses those features in a proper way and that can really boost the take rate in navigation.

Market shift due to customer expectations Slide #6

Now this will only happen if the expected user experience from the drivers, from the end users, as Harold mentioned already this morning, is taken into account and is actually addressed. I think we are at a turning point today where most of the in-car systems have limitations because the software is not decoupled from the hardware.

Therefore, it is outdated when it's launched. Not easy to update. Map is not online and also not easy to update. Ultimately, the resulting customer experience is not at the expected level. That generates reactions from some of the OEMs. You've seen bigger screen coming up, different layouts, vertical screen or horizontal screen. I could say Byton is going horizontal and vertical, in all directions, or a Daimler trying to better integrate the cluster display together with the central stack. But ultimately what is beyond that? So how can we help those OEMs is more behind the screen and is in helping them in bringing the connectivity, connecting actually those devices; developing the software more independently from the hardware and moving into navigation as a service much more than navigation as a product that would be developed exactly at the same pace as the car is being developed and not updated after its delivery. Fundamental change is really in this software decoupling from the rest of the car and updates through connectivity.

Our value proposition for carmakers and drivers Slide #7

So how can we deliver that ourselves to OEMs? How can we support this transition? Well, first of all, it's in the navigation, right? So what we call best in class navigation is not only what I already mentioned. So software: fresh software from the start and update ability, but it's also getting data on the actual usage. That was also something that we've demonstrated in Frankfurt Motor Show together with Microsoft, getting data from the actual usage. What are the features that ultimately drivers are using? How many clicks are they pressing on the screen? How far do they go? When do they drop this or that feature? What is the pattern that they have in their behaviour? Learning all of that can dramatically change the view we have on how navigation works. How do we want to bring this or that feature back in the car?

Autonomous driving: So ADAS or AD also needs to be better integrated into that experience. We're ideally positioned to deliver that. EV: I'll come back on that later on, but I think that's also a very good case. Also connected to the digital life, I was talking to Chris last night. He was telling me how he implemented Alexa in his car, so I was very interested. I thought this would be a fantastic software experience.

It ended up ordering a small Alexa box on the web, plugging that on the cigarette lighter or the USB plug, then bridging it to your smartphone, Chris, correct? To get connectivity, then bridging this device to the car through Bluetooth to get the sounds over the speakers. Now I thought there must be value in having Alexa in your car. If you want to go through all of that process, and that is what Chris explained as well, that whilst of that is done, he has access to everything in his house and his life that is Alexa connected. So there is real value in bringing Alexa in the user experience of the overall infotainment. It changes the feature in terms of voice recognition and so forth, but definitely the value is not there in terms of how do you install that in your car at the moment, but that tells us there is market demand that needs to be taken into account and addressed in the way we develop our product.

And overall, whether it's voice recognition, destination entry, digital life integration, ADAS or AD integration, it is all about the user experience. And it only works if you move from the current on-board to more online, more connected. And by the way, you don't want to address Alexa only, because then if you're a Google home customer, you're not satisfied either. So it means that we are able to have our software evolving and taking into account all those different offers from end users.

Connected services expected to grow further with TomTom leading the market Slide #8

Now if we zoom into some of those opportunity and I'll start here with the connected services. We've been very successful in that space. I mentioned already traffic information. You see a fantastic growth forecast here. I think navigation system without proper traffic information in the future will not survive and therefore you see a strong growth for traffic.

You also see that the number of services that will be integrated in the packages that we deliver is increasing. And where we started with traffic, we quickly also introduced speedcam parking. I think today we're looking for parking spots, but tomorrow we're going to look for parking plugs rather. And that continues. ADAS and AD also requires more hazard warnings. Weather is also important in certain conditions.

At the moment, you go into EV but also parking it is the same space we're interested in. How do I make sure from user experience point of view that my charging station is available or my parking spot is available? Therefore, we talk about the capacity to book those things and then to pay for them, and just making everything smooth along the experience for the drivers.

So the level of services is increasing, but also the number of services that are in these packages.

Safe and comfortable autonomous driving experience Slide #9

On AD, we've been also quite successful. I think you've heard a couple of things on the strength of our match. I think that also has played a role in the businesses that we've won on the HD map market. It's a new space. There is no legacy. There's no existing market share, so we see our customers deep diving in the technology and then making their choice and a significant portion of them have decided to go for TomTom. I think that's the best proof of the quality of our technology. It is true for HD. It is also true for ADAS, as an extension. ADAS attributes have been in our maps for a while, but they are increasingly being used by customers in an ADAS context, and that can be driven by new features coming in, but also Euro NCAP in Europe is driving for speed limits and speed AS system is driving increasing adoption of ADAS data and also Europe is talking about regulation around those intelligent speed assist system. That is a very good opportunity for us.

We also expand our portfolio of services. I mentioned that already. That's the road check or road clearance type of product. And again, we strongly believe in ultimately the demerge of navigation and ADAS AD features into one customer experience.

Efficiency and comfort for electric vehicle drivers Slide #10

Moving towards EV. This is where our complete portfolio completely fits the market. It starts with maps, of course. You drive your EV on roads; you want to know where the charging stations are, but we will also use the consumption model coming from the car and therefore we need curvature and slopes or gradients from the map. So there's a lot of map data that has a specific use in the EV space.

Charging Station: I think we have still 23 different types of plugs worldwide, so making sure that you have the right charging station is an important point. Availability of that particular plug is also crucial if at the end you reach the station with a low level of battery and again you want to be able to book. You want to make sure the station is going to be available and you're going to charge safely.

On the software side, we're looking at what is called multi-stop routing. So I think this example, to drive from Amsterdam maybe to Nice or Marseille. Quite a drive. There's a bit of strategy to decide where do you want to stop. How long are you going to stay? And that depends on what is your battery year type. What is the best consumption charging cycles that you want to follow? So there's a lot of interaction between the OEM on the other consumption model side, but also the configuration of your journey. So what is your destination? Also, temperature will have to be taken into account if you need climate control or heating, or not. And also at some point your digital life is going to come in. If you prefer to stop at some friend's location instead of spending an hour or so in a service station.

So all of that comes together again in the resulting driving experiences in those electrical vehicle cars. Removing the range anxiety from customers.

And finally, this EV experience isn't only limited to the in-car, right? Most of your trips, you prepare them. You want to check before you depart. You want to make sure your car has enough battery to reach your destination. All of that should happen on your smartphone or on your laptop screen and nobody understands anymore that there is a clear separation between what happens in your car and what happens in the rest of your digital life. So as you can see, EV is a fantastic use case for the complete integration of our product portfolio, but also to push OEMs to better consider the integration between smartphone an in-car experience. And that's also where TomTom can support. Ultimately it should look like this:

Safely connected to driver's digital life Slide #11

And last, but not least, is the digital life part. So I already mentioned the example of Chris. I think that is something where we need to help OEMs to open up and make sure whatever is your digital life content: if I'm a Deezer user, I want to get in my car, be able to use that without having to do all sorts of clicks and plugs and things that are amendatory today. Voice, I think, is also a fantastic example and use case for us to get OEMs to change. They've been trying to get voice recognition working in cars. It has never really been amazing as an embedded feature. It completely changes when you move to online. And the result of that is the Alexa and others are obviously looking into what's happening in the automotive.

And again, you cannot be exclusive to one or the other. You want to be able to address that whatever your user is using. I think that's part of what we need to support as well.

Business update Slide #12

In terms of business updates: In the past a month, we've been announcing quite a bit of news. Navigation we launched with Jeep, Renault and Nissan brands. I was talking about 2009. That was the first Clio for us to go with our navigation. 2019, ten years later, the new Clio is also introduced also in Geneva and still with TomTom data in it. So I think that's quite impressive. Our customers, they tend to stick to our technology, continue to trust our teams and our capability to move them to the future with their customers.

We also introduced IQ maps. In India already mentioned that IQ maps basically make sure you drive the freshest map available wherever you go and if you're in India it's quite a big amount of data. So you don't want to have the full of India updated every time but just the portion of that map that are of interest to you and that is what IQ maps is delivering. We are also preparing a big launch for a big OEM in North America. I think what you've seen is over the years, we've completely changed our game in North America. We're delivering Nissan, we're delivering Subaru. We're launching with another OEM, so our business in the US has dramatically changed.

Connected services: Volkswagen renewed our agreement. Together with them, MG I already mentioned. We won a couple of a major deals, so traffic has been a fantastic door opener for us in the automotive industry and continues to drive discussions, but we also deliver those services as part of the full package.

EV, as I mentioned, we pioneered that technology with Zoe and Renault. We've extended that to Nissan Leaf. So I think with that, in terms of volume segment, we're definitely leaders. BMW also trust us to deliver online this type of service to their cars. Also routing.

And for Jeep, they introduced a hybrid versions of Renegade and Compass and those are powered by TomTom technology.

In the automated driving space. It's been mentioned already, we've won multiple OEMs. Again, I think technology and trust have been the key driver for those decisions at OEM. We've launched AutoStream. I think Willem tell you everything about what that technology is about. But basically how do we distribute HD maps into cars.

And with our ADAS map we're already in business and our customer base is growing fast. We have now more than 1 million cars and trucks driving around on an ADAS map from TomTom.

Thank you Slide #13

I think that's it for me. What you can see is that through our portfolio, our capability to bridge together navigation which has been our world for a very long time now and ADAS and HD features that are now fast developing, we're best position as a company to help customers going through this transition from on-boards to online, securing that they can deliver the user experience that customers expect. Thank you.