



A fresh perspective on mobility and logistics

European Truck Platooning Challenge 2016



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‘Innovative mobility: learning by doing’

Looking at developments in the car industry, we are clearly on the cusp of a new era. In particular this involves the rapid development of innovative mobility with self-driving vehicles, smart trucks and cooperative driving. In this regard the next two decades will see more advances than the previous century, with a major impact on society.

Transport will be easier, cleaner and safer. There will also be social changes: a renewed deployment of travel time, reduced demand for parking and increased mobility for the elderly and disabled.

In this transitional phase, it is crucial for government and the car industry to start an international dialogue. Joint action now is essential for European partners to benefit from self-driving vehicles and smart trucks.

Truck industries, research institutes and governmentals need to act as pioneers - together. Issues here include different standards country by country, while we have to learn from cross border initiatives, like the European Truck Platooning Challenge 2016.

My message is *Learning by doing*. Learning steadily, by experimentation and by the international exchange of the maximum possible knowledge and practical experience, at all levels.

We have recently created legislative scope for large-scale testing of self-driving vehicles on Dutch roads. The Netherlands now offers an international testing ground for innovative mobility. Applications for cars and trucks will be warmly welcomed.

Mrs. drs. M.H. Schultz van Haegen
Minister of Infrastructure and the Environment
The Netherlands

EUROPEAN TRUCK PLATOONING CHALLENGE 2016

European Truck Platooning Challenge 2016

During its Presidency of the European Union in 2016, the Netherlands will initiate a European Truck Platooning Challenge. This will involve various brands of automated trucks driving in columns (platooning), on public roads from several European cities to the Netherlands. Main European ITS corridors could be used like for instance the Nordic Way and Rotterdam-Frankfurt-Vienna. The aim of the Challenge is to bring platooning one step closer to implementation, indeed we believe that truck platooning can become a reality in Europe in the near future.

At the same time, realisation will depend on bringing together member states and private parties with a view to crossing borders while harmonising policies and technical issues. Close cooperation between significant partners in the truck industry, logistics services, research institutes and governmentals can realise the 'big picture'. Truck platooning will become routine.

The Netherlands would like to make this close cooperation happen.



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‘Dutch initiative for smart mobility’

The Netherlands will hold the presidency of the Council of the European Union from 1st January to 1st July 2016. This will give us the opportunity to position key issues high on the European agenda – issues that are of importance both to this country and to the European community.

Smart mobility is such a key issue and represents frontline policy for the Dutch minister of Infrastructure and the Environment. The ministry’s Directorate General for Public Works and Water Management is keen to promote this development. We aim to take a leading position in intelligent mobility by investing in cooperation and clustering governmental and market forces.

New forms of mobility spell important new chances. Intelligent mobility leads to more efficient and effective road use with fewer tailbacks and accidents. It is a fact that 90 percent of traffic accidents are due to human error. Smart mobility can also add to the social factor – and may eventually make it easier for elderly people to become road users, while offering new ways to improve service to individual travellers and road users alike.

The transport sector in particular stands to benefit from intelligent mobility in terms of safety, economy and efficiency. Automated vehicles and truck platooning are areas of new mobility that deserve further development.

This also requires cooperation between the automotive industry, research institutes, the political community and governmentals. The Netherlands has considerable experience around

Intelligent Transport Systems. Other parties are also well on the way. The ICT and telecom sectors are intensely involved in smart driving. As leaders in innovation European truck manufacturers are also ahead in the field of truck platooning. With this in mind the Netherlands proactively seeks cooperation towards smart mobility and the introduction of automated and connecting cars and trucks.

The EU Presidency in 2016 offers opportunities to put smart mobility high on the political agenda. We approach this in two ways. At the European level we are working towards long-term vision on automated driving. This includes making clear what steps and joint steps will be needed. We are also taking the initiative to organise a European Truck Platooning Challenge in spring 2016.

We aim to drive with between two and three automated trucks along several corridors, from the production sites of European truck manufacturers to the Netherlands. The aim is to demonstrate that truck platooning, across borders, on public roads, is a reality in 2016. Our wish is that this will be the first step towards more cross border testing, and bring deployment one step closer to reality.

But why are we in such a rush, and why are we so motivated? Because truck platooning has a lot of potential benefits for society. Further joint investment in this will mark another step towards a safe, innovative and economically robust and accessible Europe.

Jan Hendrik Dronkers
Director General Rijkswaterstaat

Our ambitions on automated driving

The Netherlands welcomes the rapid development of automated and connected driving. Over the next twenty years, the automotive industry is likely to make greater progress than in the past one hundred. In many ways, we live in an era of great opportunities to improve traffic flows and to make transport safer, cleaner, and easier. For instance, about 90% of all traffic deaths are the consequence of human shortcomings. Grouping trucks into platoons leads to a 5 to 15% decrease in fuel use. These societal, economic and environmental benefits of smart mobility developments match with Dutch policy ambitions.

Large-scale testing

The Netherlands takes a pragmatic *learning by doing* approach. To this end a legal framework has been created to test autonomous vehicles on public roads. This legislation came into force in July 2015, opening up opportunities for large-scale testing, both on highways and in urban areas.

Key is that the Netherlands Vehicle Authority (RDW) was granted the authority to permit the usage of vehicles with innovative automated elements. Although assessment criteria and implementation legislation was developed for the new technologies clustered in automated and connected vehicles. Hence, we do not believe in a 'one size fits all' approach. Customized experiments and continuous learning processes are needed here.

These developments are in full swing, thanks to the joint effort of knowledge institutes, industry and government. In February 2015, Scania and TLN already demonstrated platooning trucks on Dutch public roads, and in March this year, DAF Trucks and

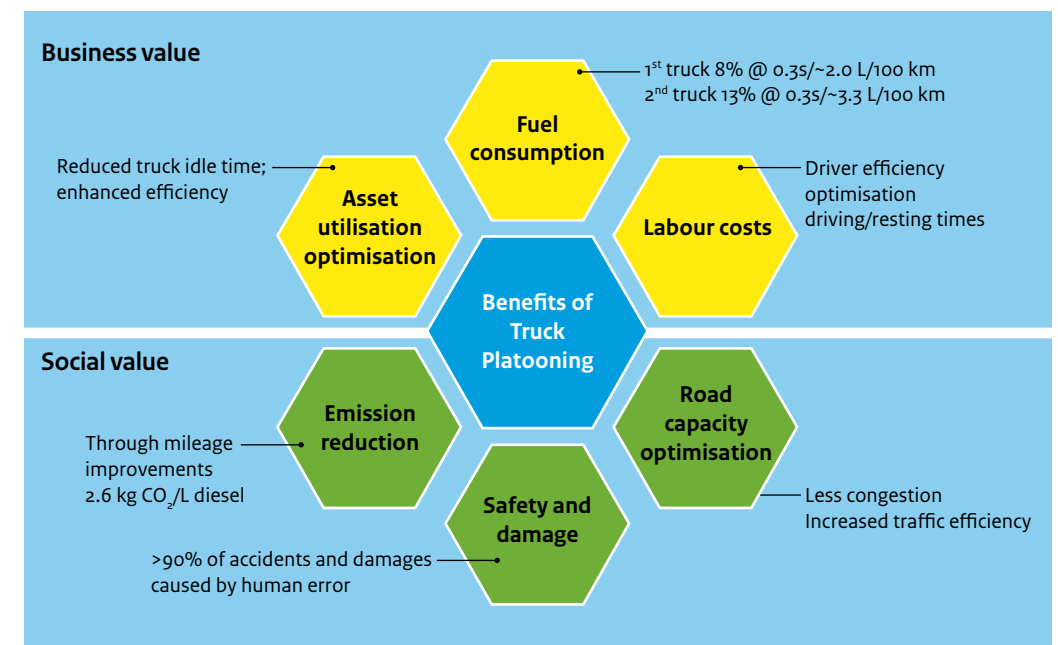
TNO demonstrated their platooning project called EcoTwin. Both cases are successful examples of the Netherlands as a testing ground.

Dutch EU presidency in 2016

The Netherlands will make smart mobility the central theme of the Informal Transport Council during the 2016 EU Presidency. This reflects the belief that real progress demands far more intensive international cooperation between the European Commission, EU member states and industry. In line with this ambition of supporting progress in this field, the Netherlands not only changed national legislation to facilitate testing on public roads, but also wants to contribute to this European level.

European cooperation on this theme is important for several reasons. Each country seeks answers to complex issues around the consequences of autonomous and cooperative driving; these include

liability, privacy, and safety. When it comes to legislation, this approach will prevent countries from creating a patchwork of rules and regulations, which could hinder manufacturers and road users to invest in automated and connected vehicles. Compatibility of safety requirements, liability issues, and communication systems and services among European countries are a must for a smooth market introduction and for making potential benefits a reality. And so, in order to stimulate these developments and maintain their competitiveness, European countries need to pursue a joint and coordinated approach. This will pave the way for a shared vision on the developments of automated and connective driving across the EU, followed by concrete steps. While this early stage of innovative technologies offers considerable opportunities, we will have to work together to force compatible legislations, from country to country, on such issues as distances between vehicles in platoons.



Benefits of platooning

Source: TNO WhitePaper: Janssen R. e.a., Truck Platooning Driving The Future of Transportation, February 2015, www.tno.nl.

For this purpose, the Netherlands will initiate an ongoing dialogue between member states, European Commission, industry and knowledge institutes, for which the Dutch Presidency in 2016 will only be the start.

Truck Platooning Challenge

To support this dialogue and cooperation, the Netherlands will initiate a European Truck Platooning Challenge whereby various brands of automated trucks will drive in columns (platooning) on public roads from various European cities to the Netherlands. We aim for this Challenge to bring platooning one step closer to implementation. We believe that truck platooning can become a reality in the near future. However, to realise this, it is important to bring governments and other parties together in order to cross borders and make policies on legal and technical issues compatible. This can be accomplished via close cooperation between significant partners in the truck industry, logistics service providers, research institutes and governmentals: so that truck platooning becomes routine. The Netherlands is poised to facilitate this close cooperation and will set the first step during the Dutch Presidency.



How we organise the Challenge

We are creating a first! Hence, this Challenge requires a new methodology. Rather than a mapped out route with a detailed schedule this will be a voyage of discovery. With no precise *rendezvous* point we set the direction and set off together. Rather than fixing everything before we start we mutually exchange thought and action. This is *learning by doing*, as called for by the Dutch minister of Infrastructure and the Environment. Always alert for the need to assess or fine-tune, and always with the 'the journey is the destination' mindset.

This is a motivator for active participation by all parties involved. Meanwhile, given the absence of a blueprint, these are our basic principles:

- The end result is the starting point, namely an operational Platooning Challenge. Taking this as a basis to think back about everything that needs to happen. We get insights into the critical path.
- Focus on the shared goal. Think from the social, not the institutional angle. Government needs to be organised around issues rather than vice versa.
- Value creation in terms of citizen and entrepreneur. The outcome is what matters, what do these parties feel?
- Go forward on the basis of your own responsibility: everyone accepts their role and responsibility, and contributes to cooperation but always in mutual cohesion.
- Link innovation to the business model. No solo innovation or improvement but the introduction of fundamental change linked to the organisational approach.
- Maximise the 'show it' factor and minimise use of paper.
- Build a bridge while walking across it. Take a see-feel-change approach with a substantially reduced time to market. Experimentation must be feasible.

Knowledge sharing

With an eye to properly embedding acquired know-how with the various stakeholders the Truck Platooning Challenge in spring 2016 could be complemented with a congress to present the findings and experience gained. With sufficient interest from the participants this could become an annual event – for instance in the country holding the EU presidency.

Open for testing

Since 1 July 2015 new regulations permit the large-scale testing of automated vehicles on the public highway in the Netherlands. For more information or to enter see pages 28-31.

Truck platooning: opportunity for Europe

Truck platooning comprises a number of trucks equipped with state-of-the-art driving support systems – one closely following the other. This forms a platoon with the trucks driven by smart technology, and mutually communicating. Truck platooning is innovative and full of promise and potential for the transport sector. With the following trucks braking immediately, with zero reaction time, platooning can improve traffic safety. Platooning is also a cost-saver as the trucks drive close together at a constant speed. This means lower fuel consumption and less CO₂ emissions. And, lastly, platooning efficiently boosts traffic flows thereby reducing tail-backs. Meanwhile the short distance between vehicles means less space taken up on the road. At the same time the impact of truck platooning goes far beyond the transport sector. Automated driving and smart mobility also offer realistic chances to optimise the labour market, logistics and industry.

Opportunity for Europe

Truck platooning is a great opportunity for Europe. Worldwide, the European truck industry leads the field in terms of smart driving. ICT and telecom sectors are also ready for the next step in smart mobility. Together, the EU member states could give European truck platooning a boost. To this end, EU member states are now invited to:

- grant permission for truck platooning through their national road authorities
- implement innovations that improve safety, efficiency and the environment
- enable this boost to the position of the European truck industry
- which could create new jobs and economic growth in the traffic and transport sector
- enable the market introduction of automated trucks through a coordinated approach
- seize the momentum; time for action.



Two business cases: the benefits

Scheduled platooning for inter-DC retail transports

On behalf of its client, a major retailer, Peter Appel Transport trucks around 100 shipments a day from the company's central distribution centre (DC) to its four regional distribution centres. These DC-to-DC flows are ideal candidates for scheduled platooning. On one route – from the central to the regional distribution centre – 70% of the distance can be platooned. The distance is around 123 kms one-way. Peter Appel Transport estimates that 70% of that distance, approximately 86 kms, is driven on major roads with cruise control engaged. This would be ideal for truck platooning. Peter Appel Transport notes that platooning would initially only be with trusted partners, i.e. other logistics service providers. Scheduling these platoons would be feasible, as the retailer is already building a Retail Control Tower, jointly with its logistics service providers and software partners. All relevant order data and transport assignments would be aggregated here. Even so, an important trade-off has to be considered between the benefits of platooning and the impact on DC operations. For example, it is quite normal to balance out shipments over a day. This prevents distribution centres and warehouses getting swamped by a mass of shipments at the same time. However, to form a platoon, transport planners need to synchronise shipments. This can hamper warehouse operations and efficiency and must be offset against the potential benefits of driving in a platoon, with a view to avoiding local sub-optimisation.



Peter Appel Transport

Crossborder inter-auction transports

On a daily basis a large volume of flowers and plants are shipped between a number of auction sites. De Winter Logistics is one of the logistics service providers here. The company drives almost 200 kms over Dutch provincial roads and highways, and 3 kms over the German border. This is an attractive situation for platooning. And, as De Winter Logistics handles a substantial number of these consignments every day, a large number of platoons could be formed. De Winter Logistics carries out these inter-auction shipments with tractor-trailer combinations and some LHV (Longer Heavy Vehicles)-combinations, as most driving is over LHV-approved roads. Truck platooning is fine on the main highway section. However, the platoon may have to be disconnected at the German border if required by German law. This would already lead to fuel consumption improvements in the guarded platoon and follower resting scenarios. If drivers of Following Vehicles were allowed to rest in the cab on the move, De Winter Logistics could improve turnaround times and effective driving time. Benefits would be even greater in the 'single driver platoon' scenario, where there is no driver in the following vehicle whereby there are savings in both fuel and labour cost.



De Winter Logistics

ITS-Corridors

ITS Corridors are sections of highways with connecting services enabling electronic communication between vehicle and infrastructure (V2I). V2I allows amongst others warnings of dangerous road situations. ITS corridors relate to the European Commission-led policy by supporting development of ITS on Ten-T corridors via specific funding (Connecting Europe facilities – CEF).

ITS and the Challenge

These types of services allow the deployment of specific automated functions, including lateral control, that request interaction between road and truck. The choice of routes will be made in agreement between national authorities and the truck companies. The Rotterdam-Frankfurt-Vienna corridor and the Nordic Way corridor (Sweden, Denmark, Finland) are currently under consideration.

More info on ITS-corridors, see www.ec.europa.eu

Time to market

We can detect three main development paths for truck platooning (see next page) that signal the breadth of potential platooning applications: 1) a growth in infrastructure usage, 2) platoon formation, and 3) level of automation. These development paths indicate how platooning can be deployed in our society.

Infrastructure usage requirements: from closed areas to public main roads

First and foremost truck platooning technology must prove to be safe and reliable. The best place to test this is on non-public road networks, before platooning can be upscaled to the public road network.

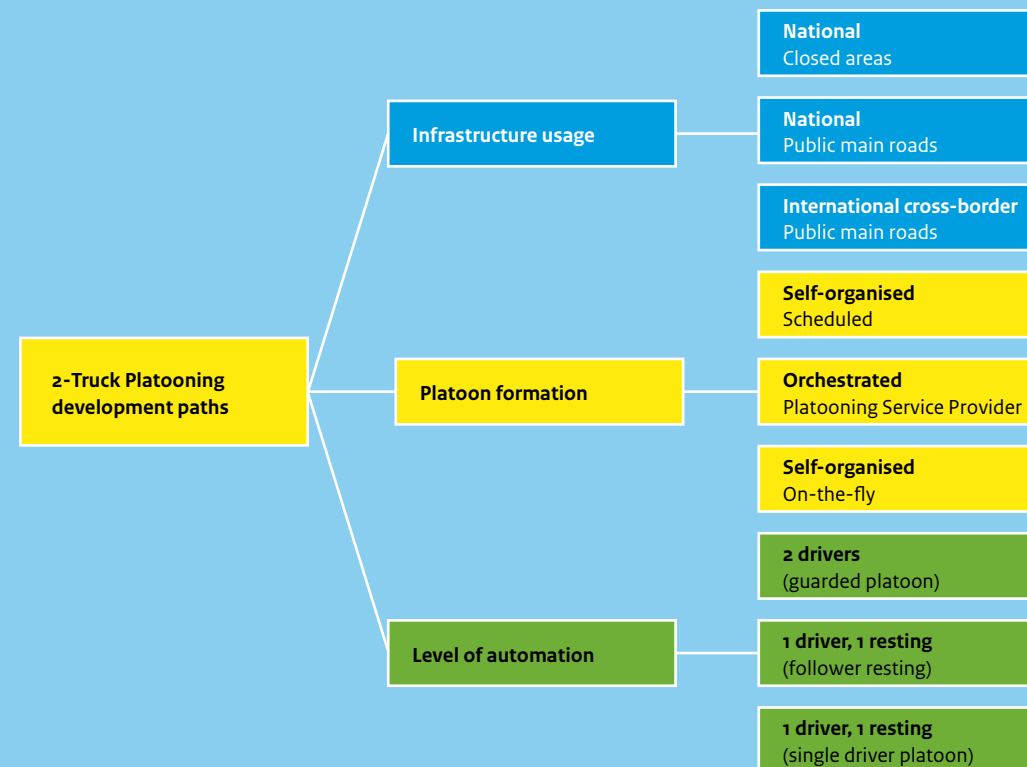
Platoon formation: from schedules to on-the-fly platooning

Who takes care of forming the platoon? In the first development phases a limited number of vehicles will have been equipped with platooning technology and devices, and widespread market penetration will still be limited. In later stages, platoons might be formed dynamically on-the-fly. Or even by means of a specialized Platooning Service Provider.

Level of automation: from two drivers to one driver

The ultimate stage of automated driving could be to let technology take full control of all vehicles, without driver involvement. This is still some decades in the future, and the first step is to have a platoon of two vehicles with active drivers.

Development paths for Truck Platooning





Deployment issues

Automated and connected driving is a hot issue, with technology on the cusp of a breakthrough. Logically this demands that automated driving is introduced in practice. This requires cooperation between market parties, knowledge institutions, logistics service providers and governments. All too often introduction of innovations happens at the national level with time subsequently being lost dealing with issues around harmonization and standardisation. The European Truck Platooning Challenge and the route to realisation of cross border transportation with truck platoons in the near future, offer windows to reach workable agreements in advance.

Removing barriers

Work on amassing knowledge around harmonization and standardisation is ongoing at many locations. Alongside effective monitoring of the developments the plan here is also to remove barriers standing in the way of making truck platooning operational. Mutual recognition of entrance procedures, driver requirements and infrastructural conditions depends on countries and parties empathizing, without building national walls.

All parties involved are interdependent when it comes to removing barriers. The national vehicle authorities in various countries are unaware of their opposite numbers' mutual requirements. Road management and admission of vehicles differ from country to country. Road characteristics, including lines, cloverleaf junctions and radius of curvature may differ. Road managers are often unaware of truck manufacturers' knowledge in this area. It is precisely the sharing of this knowledge between all parties that will make cross border transportation with truck platooning possible.

Knowledge themes

In concrete terms there are a number of major knowledge issues around automated and connected driving:

Legal: What is the juridical situation in the event of accidents with automated trucks on automatic pilot? How do the new regulations deal with this? What changes to the law and regulations have already been made, and what need to be made? Issues in this area cover: admittance to the highway, liability insurance, privacy and rules of the road.

Technical: Will we get computers on wheels or trucks with embedded computers? Today's automated truck already has a minimum of 70 CPUs built in. That is more than the NASA rocket that took Neil Armstrong to the moon. Automated vehicles feature dozens of cameras and sensors. The drivers have smartphones, trucks are connected to the cloud for tracking & tracing. Increasingly, vehicles communicate mutually and with the infrastructure. The first cars have already been hacked via the network and data confidentiality is a hot topic. Issues in this area cover: architecture, standardisation, (cyber)security and data development.

Impact: The upmarch of automated driving will have a major impact on the entire mobility system in terms of safety, environment and traffic flow. And to take another example, fewer fines will be handed out as vehicles will automatically comply with the speed limit. A vehicle which is able to drive in all scenarios,

will feature more complex equipment than a vehicle which is dependent on the route or infrastructure. Several types of vehicle on the road is less safe than driving with a single type. Issues in this area cover: (digital) infrastructure, traffic flow and safety.

Human factors: Routine communication between cars and their drivers is via red lights and bleeps, but there is much room for improvement here. And so, mobility also involves human behaviour and experience. To take some examples, what do we judge to be driving safely/unsafely, fast, too slowly, aggressively, considerably? Looking ahead, will we be able to select the style of driving for our automatic pilot for a journey from A to B? How will road users or pedestrians react to an automated vehicle without a driver? Issues in this area cover: human machine interaction, user behaviour, acceptance and mandatory driving skills.

Deployment: What does the upmarch of automated driving mean in terms of income and earn back models? In terms of changes, what impact will automated driving have on the automotive sector, public transport, taxi businesses and the Driver Licensing Centre (CBR)? Insurers and repair operations will need to take a fresh look at costs and income. How will this take shape in Europe? What will be the government's role during the transition period? Issues in this area cover: forward reconnaissance and transition paths, business models, cooperation and initiatives abroad.



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The exemption process in the Netherlands

The Netherlands seeks to create a climate that encourages the further development of self-driving vehicles. This will include large-scale testing of self-driving vehicles on the public road. Together with the Netherlands Vehicle Authority (RDW), minister of Infrastructure and the Environment, Melanie Schultz van Haegen, has prepared regulations that make this legally feasible. The new legislation for automated driving on the public roads came into force on 1 July 2015.

The Netherlands as testbed

The new legislation, the high- and diffused road network and the clustering of technological expertise in the Netherlands make the country an ideal testbed for self-driving vehicles. The same applies to the testing of new forms of technology whereby cars communicate with each other and with the infrastructure. The Netherlands is home to excellent facilities like the RDW test centre, the automotive cluster in Helmond, the DITCM (Dutch Integrated Test site for Cooperative Mobility) and the ITS corridor currently under development with Germany and Austria. This corridor is being readied for testing of cooperative intelligent systems and automated driving. The Netherlands can point to many examples of governmentals, the business community and knowledge institutes jointly yielding breakthroughs. The Dutch Automated Vehicle Initiative (DAVI) demonstration in 2013 was a good example.

How the Dutch exemption process works

The Netherlands Vehicle Authority evaluates test applications in three stages:

1. written evaluation, roughly comprising an overview of changes to the vehicle, and the impact these have on safety, and counter measures;
2. functionality testing (at a closed facility), of aspects the applicant seeks to test on public roads: the 'happy flow test';
3. a stress test at a closed facility. This tests system robustness, both in technical and functional terms.

If this phase is completed successfully, consideration will be given – in consultation with the road manager(s) – as to suitable locations to be opened up and under what circumstances. This may involve recommendations from knowledge institutes like the Road Safety Research Institute (SWOV) or cyber security experts. The exemption lists all relevant circumstances together with the licensed drivers, the duration of the exemption and the vehicles.

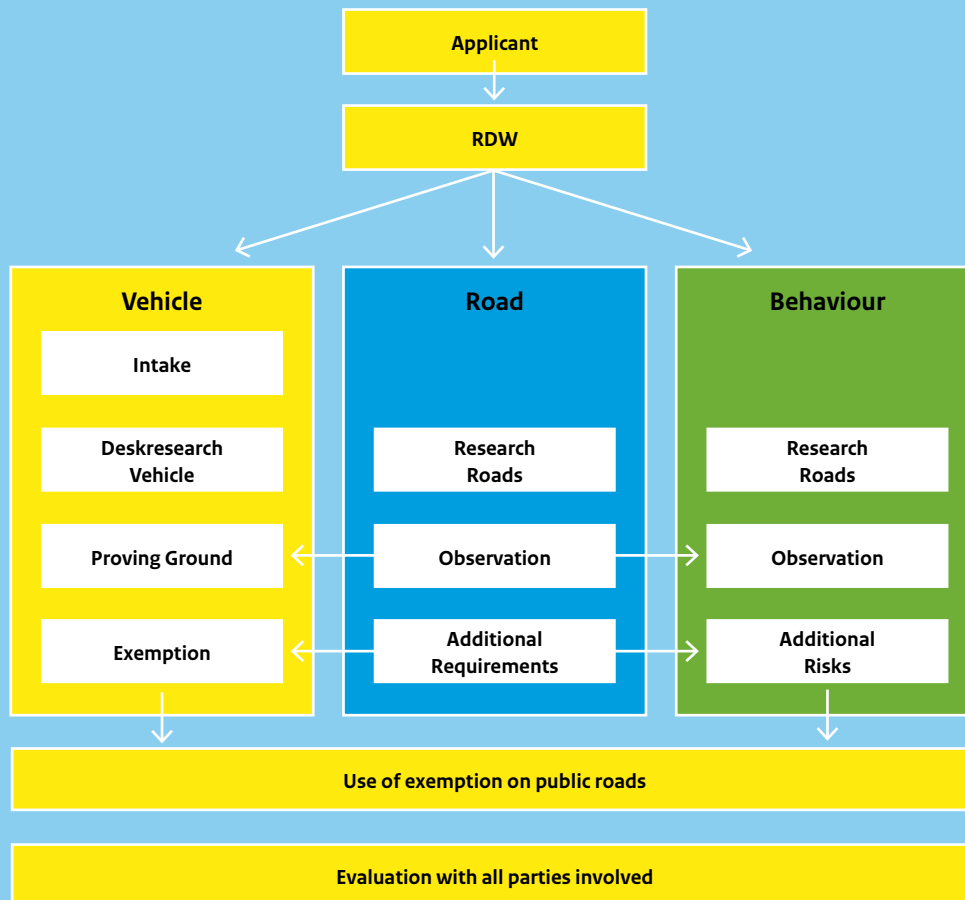
Self-testing!

The Dutch principle is learning by doing. This means that the transport and automotive sectors can actually start practical testing here and now. Applications for cars as well as trucks are more than welcome. For applications see the RDW website. The RDW is empowered to allow vehicles with innovative automated elements on public roads. First, test applicants need to show that the test will be carried out safely. To this end they must submit an application, to be evaluated by the RDW.



Source: Siebe Swart fotografie

Exemption process



What do we want to demonstrate?

That safe truck platooning is feasible, now. Manufacturers have plenty of experience of driver assistance systems, many of which are not yet certified for use on public roads. The Challenge looks to demonstrate systems that will make traffic safer and more efficient, right away.

What is the Netherlands doing?

The Netherlands has considerable experience in the field of automated vehicles, including truck platoons, and the necessary legislation is in force. Applications can be submitted via the Netherlands Vehicle Authority (RDW) website where a team of vehicle, road and behaviour specialists are ready to advise. The Netherlands is committed to creating an optimum corridor and straightforward but safe access. With the high quality Dutch infrastructure, in principle, no specific modifications for the Challenge are envisaged. Depending on the robustness of the driver assistance system, an experienced driver will be requested to take part. Following the demonstration, manufacturers will be cordially invited to extend their access. Currently, hauliers have been invited to transport their 'commercial' freight using truck platoons.

Applications for testing

Join us and apply for testing with automated driving on open roads. Let's make international automated truck platoons a fact in the near future. Together, we can take the next step forward in innovative mobility in Europe. Submit test applications at: www.rdw.nl/ITS



‘RDW’s expertise enables development of standards in innovative automotive technology’

RDW is the Netherlands Vehicle Authority. We provide ECE (Economic Commission for Europe), EU and national approvals for vehicles and vehicle parts. We supervise and enforce regulations required by international law and maintain an extensive data registration system that provides all kinds of information. Self-evidently, we issue all necessary vehicle registration and driving licence documentation.

RDW is an independent, internationally leading partner for all clients intending to launch automotive products on the European and ECE market. We act on behalf of the Ministry of Infrastructure and the Environment. By participating in European and ECE deliberations on directives and regulations we consistently take part in developments in the area of vehicle technology. We aim to contribute to innovations in the automotive industry that make mobility safer. To this end we were very closely involved in realising recent Dutch legislation enabling large-scale testing of automated driving on public roads. RDW is proud to be part of this unique initiative. We cordially invite your test-application.

The Netherlands Vehicle Authority, RDW, offers an excellent bridgehead from a compact country into the European and ECE market.

Ab van Ravestein
Managing Director RDW



Trucks you can trust

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Meet our partners!

The European Truck Platooning Challenge 2016 aims to combine as many forces as possible to realise truck platooning in the near future. We will do this by creating a European partnership between truck manufacturers, logistics service providers, research institutes and governments – and by sharing knowledge and experience around truck platooning.

Right across Europe we have contacted and briefed the directorates of relevant ministries, road managers and vehicle authorities on the European Truck Platooning Challenge 2016 – and our intention to go ahead together with the development of innovative mobility. Several partners have already said that they would get involved.

Industry

All European truck manufacturers strongly support the European Truck Platooning Challenge 2016. This is a unique opportunity to accelerate the implementation process both in the medium and long-terms. Bringing together member states and the industry to provide safe platooning, on open roads and cross borders, is unique. We are in close consultation with six truck manufacturers, namely:



DAIMLER AG

DAIMLER

IVECO

IVECO

MAN SE



Scania AB



VOLVO Trucks

VOLVO

ACEA

The European Association des Constructeurs Européens d'Automobiles (ACEA) is the main lobbying and standards group of the automobile industry in the European Union.



European Automobile Manufacturers Association

CLEPA

CLEPA, the European association of automotive suppliers, supports the EU truck platooning challenge as they support sustainable mobility worldwide.



CEDR

The Conference of European Directors of Roads (CEDR) is a platform for cooperation and promotion of improvements to the road system and its infrastructure. Their 27 member states and their road authorities have the opportunity to seize the future of smart mobility. Groundwork for the future evolution of infrastructure schemes should start now.



Connekt

Connekt is an independent network of corporates, governmentals and knowledge institutes who pool their strengths to arrive at a sustainable improvement of mobility in the Netherlands.



RDW

RDW, the Netherlands Vehicle Authority, looks forward to the Harmonising rules like the exemption procedures will be a

major outcome from the Challenge.



RDW

TNO

TNO has over 3000 professionals who put their knowledge and experience to work in creating smart solutions to complex issues. For example on the topic of Mobility TNO creates breakthroughs through technological innovation, influencing of human behaviour, and more intelligent organisation for safer, cleaner and more reliable mobility.

TNO

TLN

Transport en Logistiek Nederland (TLN) is the Dutch association for transport operators and logistic service providers. TLN is the largest and most prominent lobby organisation in the Dutch road transport and logistics industry.



The Port of Rotterdam

The Port of Rotterdam Authority creates significant economic and social value by realising sustainable growth in this world-class port, together with clients and stakeholders.



How platooning works



Truck manufacturer Scania scored a first in the Netherlands with a convoy of (semi)-automated driving trucks. Research institute TNO and truck manufacturer DAF recently completed their first EcoTwin test phase. This is how platooning works!

Scania

An increasing number of partners are interested in taking part in a test project with self-driving trucks on the public road. Scania successfully performed the kick off. Three platooned Scania Streamline trucks drove along the A28 starting from the Scania manufacturing plant at Zwolle. There was considerable interest from the media and MEPs in this automated truck platooning, under the watchful eye of minister Melanie Schultz van Haegen. The electronically connected trucks drove in a close column, with no problems. When the first truck braked, the next two responded identically. This was enabled by Wi-Fi technology in the first truck, which automatically controlled braking, acceleration and steering for the following trucks.

Reduced fuel consumption

One benefit of this formula for platooning, based on Adaptive Cruise Control, is a significant saving on fuel. "With two seconds in between you are already looking at five percent savings in diesel per truck and with half a second ten percent-plus

savings are possible. This is substantial particularly if you consider that fuel makes up 27 percent of total costs for a transport company," says Lars-Gunnar Hedström, head of product development at Scania. According to Hedström another benefit of platooning is reduced traffic congestion. "With trucks driving close together there is more space for cars on the road. This means improved traffic flows and fewer tailbacks."

Fully automated trucks

Actually, the drivers of the three Scania trucks which left the manufacturers' production site, were still doing the steering themselves. However, braking and acceleration went via the first truck. Eventually the idea is for all trucks to be fully self-driving.

Hands-free

Following in-depth testing, the Netherlands Vehicle Authority (RDW) granted exemption for this pilot project, which closely involved Transport Logistics Netherlands (TLN) and the Netherlands Organisation for Applied Scientific Research (TNO),

alongside Scania. Ensuring road safety was an important criterion here. TLN sees major benefits in platooning. According to Chair Arthur van Dijk: "It's not just about fuel savings and related CO₂ emissions, but also about improved road safety. At the same time it makes the driver's job more attractive, particularly if you are driving hands-free in the future."

EcoTwin project: Combined Automated acceleration/ braking with steering

TNO views the European Challenge as a significant preamble for steps required for large-scale practical testing over the next several years. Hence, in the near future truck platooning will become a routine and accepted given on Dutch highways and major arterial roads. The challenge we face is absolutely safe and robustly automated and cooperative driving in every possible weather and traffic scenario.

Fresh opportunities for the logistics sector

A large number of complex issues arise here. Not just technological issues, but also legislative, in terms of liability and of human behaviour. And so, TNO does not see platooning primarily as a technical challenge but rather as a means to enable innovation in logistics in the Netherlands. This formula for the clean, safe and efficient organisation of road transport will hone our competitive edge. 'To this end we are also detailing new business cases with logistics parties, as truck platooning offers the sector a whole mass of fresh opportunities', according to TNO Programme Manager Automated driving, Bastiaan Krosse.

Automated braking, throttle and steering

In early 2015 TNO rounded off the initial phase of a five-year programme to ensure the success of truck platooning. Together, TNO and DAF had two trucks driving nose to tail on a closed-off part of the public road, fully automated and mutually communicating. As soon as the first truck accelerated or braked, the second - following closely behind – automatically did the same. A new aspect of this EcoTwin test was that, for the first time, steering was also automated.

Deploying big data

Step for step, over the next several years, we will be bringing truck platooning nearer and nearer. The first EcoTwin challenge involved a test under controlled conditions. During successive steps complexity and hence, desired functionality will

increase apace; one could think of two or more connected trucks capable of anticipating unforeseen events. With this in mind TNO will be proactively collecting, processing and analysing data by trucks. This will enable us to recognise and understand and adequately respond to every possible situation on the road.

The European Truck Platooning Challenge 2016 is an important step towards large-scale pilot projects designed to accelerate this process. In this context TNO views national and international cooperation between governmentals, the business community and knowledge intitutes as essential.





‘Together for added value’

What an honour to lead implementation of the EU Truck Platooning Challenge 2016. A splendid challenge to take steps together. Extraordinary steps. Because this is more than a technical project. This project is also about attitude and behaviour. About refining behaviour: from I to we, from solo to together, from threat to opportunity. Together for added value. In the school of William Shakespeare: *To be a bit better, be competitive. To improve exponentially, be cooperative.* President Harry S. Truman summed it up: ‘It’s amazing what you can accomplish if you don’t care who gets the credit’. That’s the way I would reap the rewards of a promising innovation, called automated and connected driving in cars and trucks.

We use the Truck Platooning Challenge to show Europe how serious we are. That we are working hard to put automated driving high on the European agenda. That we are working hard to truly enable automated driving on open roads, to enable all connected innovations and to integrate this on a daily basis. Simply because we believe. Because we want to contribute to the MAAS concept: Mobility As A Service, in the spirit of other disruptive developments.

I am convinced that this Platooning Challenge is the next step on the way to make truck platooning becomes routine in the near future. And more than that, I hope and trust that a joint effort between ourselves, the political community, governmentals, industry, knowledge institutes and common interest groupings – aided by innovative ITS technology – will succeed in creating new benefits for society.

Dirk-Jan de Bruijn

Programme director EU Truck Platooning Challenge 2016

Join the European initiative

We need partners to realise the Challenge. To this end we call on European governments, industries and knowledge institutes to join us. We are going to use the EU presidency to give automated driving a platform for the next steps in Europe. Between two or three self-driving trucks will drive as a platoon from several European cities to the Netherlands. They will be travelling on public roads, and crossing borders. Realising this unique ambition requires steps to be taken today. With this in mind we ask European governments, industries and knowledge institutes to get involved with the European Truck Platooning Challenge in 2016.

Why join the European Truck Platooning Challenge 2016?

EU member states could give European Truck Platooning a joint boost. The more time we invest in cooperation at the start of this road to innovation, the less time we will have to devote later on to fine-tuning, harmonization and standardisation. To this end, EU member states are invited, right now, to:

- grant permission for truck platooning on their roads
 - implement services on their corridors that improve safety, efficiency and the environment
 - boost the position of the European truck industry
 - create economic growth in the traffic and transport sector
 - enable the market introduction of automated trucks through a coordinated approach
 - seize the momentum; time for action.
- The shared goal is to show that truck platooning is safe, right now. It is the first step towards a new form of mobility that could well become a reality in near future.



Facts & Figures

Economic and health value of truck platooning

There is a range of ancillary benefits of truck platooning influencing many aspects of economy and health:

Economic growth

- Boost for high-end manufacturing (BV Nederland, OEMs and suppliers)
- Rise in high-end services (transport sector and drivers)
- Increased competitive muscle vis-à-vis surrounding countries
- Added value in products from truck manufacturers and their suppliers
- More jobs around product development and suppliers from the automotive industry in the Netherlands
- New types of service providers for the logistics sector
- Competitive advantages for first movers (image)

Driver health

- Higher profile due to automation of standard driving tasks

Annual business results in two business cases

Parameters	Peter Appel Transport	De Winter Logistics
Number of trucks used for platooning	35	44
Number of km per year per truck platooning	77,500	44,000
Number of man-hours	169,500	246,800

Business Case - per year¹

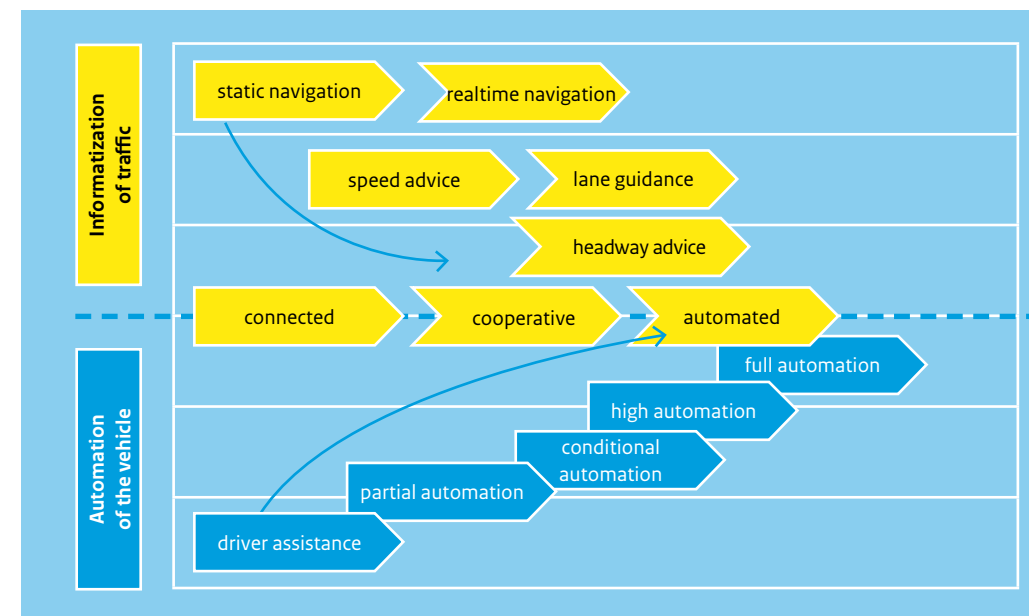
Case	Scenario	Total benefits	Total Costs	Profits	Profits per truck
Peter Appel Transport (PAT)	A: 2dr	492,000	28,400	463,500	13,200
De Winter Logistics (DWL)	A: 2dr	572,000	32,400	539,600	12,300

Note, these numbers are rounded off in hundreds (oo).

¹ Source: TNO WhitePaper: Janssen R. e.a., Truck Platooning Driving The Future of Transportation, February 2015, www.tno.nl.

Increasing autonomy

In future vehicles will gradually get smarter, and increasingly autonomous. This innovation will run simultaneously with the development of burgeoning communication between vehicles on the road and roadside installations.





More info

Although innovative mobility is a relatively new knowledge domain it has been researched for some years now by bodies and institutes around the world. Check the links for more information on Intelligent Transport Systems (ITS) and the impact on mobility, transport, logistics, technology, industry, employment and society.

Websites

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Report

TNO WhitePaper: Janssen R. e.a., Truck Platooning Driving The Future of Transportation, February 2015, www.tno.nl

Colofon

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Disclaimer. The Dutch government cannot be held responsible for any inaccuracies in this booklet.



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