

Airport Line and International connections



The Netherlands are a dynamic country in an ever-changing world. Let's make the Netherlands a lot more beautiful and accessible again?

This folder discusses a number of IC lines at the national level in addition to the international IC-lines to Belgium and Germany. Attention is also paid to accessibility and the associated opportunities for the region, city and the five international airports. It is also discussed how the train can enter the network of an airline, whereby the train will take over a number of airlines while this train also fulfills its utility function.



Introduction

Besides eating, drinking, sleeping, connection with each other is a basic necessity of life. Only with connection is there social interaction, the future for us humans is guaranteed, we can share knowledge and skills and become stronger together. Travel connects, feeds curiosity, enriches knowledge and social cohesion. People are naturally very curious and have a natural need to discover, which results in travel. Travel requires infrastructure. Various physical connections are possible, but each form of connection and the associated transport has its own characteristics, possibilities and limitations. The common denominator is that every form of transport ensures that people and businesses are connected to each other. As a result, people are able to function optimally, thereby strengthening knowledge, skills and the social cohesion between people together.

Our modern way of life gives us a comfortable and luxurious lifestyle that allows us to further develop and discover ourselves. This way of life or style also creates the necessary issues that do require an answer or action. Contemporary forms of mobility not only provide convenience, comfort and opportunity, but also have their costs. From a global perspective, there are shifts in geopolitical and geo-economic relationships and climate responsibility (CO₂ emissions, PFAS and global warming). Furthermore, from the point of view of automobility, there are challenges in the areas of particulate matter, energy, livability and accessibility. In and around the cities we have to deal with traffic jams and the use of space for road infrastructure and parking. However, building more roads will not solve congestion either because congestion is a communication and behavioral problem. Looking from public transport, we see a system that does not meet the requirements of the mobilist regarding availability in time and location, comfort, convenience and competitive travel time. Yet public transport is a best choice for mobility to achieve environmental goals. If you design public transportation well, you can give regions and cities the means to differentiate, compete and specialize, but most importantly, as a whole, form a metropolis that can handle and participate in economic and geopolitical shifts. In the whole of public transport, rail and air have an important role. In the cities, in addition to public transportation, walking and cycling is of course an important contribution.

The question now is how to organize public transport so that people can and want to use it. Public transportation is a mechanism in which the various modalities from airplane to railbound vehicles, bus and cab together are a way to connect people. Of course, we can elaborate on all forms.

This handout looks at how, in the vision of Stichting Freedom of Mobility (FROM), today's railroads can be transformed from an Iron Age system to one that is future-oriented. From this vision we look at the role of the Intercity and the opportunities for:

- National train transportation
- International railservices
- Schiphol and the airports of Eelde, Rotterdam-The Hague, Eindhoven and Maastricht-Aachen
- KLM and other airlines that are part of the infrastructure of the Netherlands
- City, region and country
- Stations
- Vehicles
- The Dutch and European manufacturing, construction and knowledge industries



Photos: Stichting Freedom Of Mobility

National Rail Services

Photos: Stichting Freedom Of Mobility

The Netherlands has a fairly dense rail network that is very well used in capacity. It is one of the busiest in the world. Coverage and interconnections are best in the Randstad, but reasonable to inadequate in the outer provinces, so that journey times by train cannot compete with those by car. Of the five and soon to be six international airports, only Schiphol has a connection to the main rail network and indirectly to the HSL south. The other airports have no connection, so they have no major landside hinterland connection, but also no connection to each other so that the airports, through communicating vessels, cannot cooperate and become interesting to network airlines and low-cost airlines.

The intercity train in its current form has to share its infrastructure with the local train, the high-speed train, freight and work trains. This limits its average speed and frequencies cannot be increased very much. Where frequencies are increased, this is at the expense of the capacity of freight trains and local trains or stopping times of local trains at stations. Program High-Frequency Rail (PHS) therefore works in part.

The Netherlands has one high-speed line "HSL Zuid" which uses the existing tracks between Amsterdam CS and Schiphol Airport and Rotterdam CS and Rotterdam Lombardijen. The high-speed train then mixes with the conventional Intercity and local trains and freight train. This according to the French model 1. In the event of a calamity or disruption due to main-

tenance, there is immediately a complete breakdown in which the entire train service must stop or is severely disrupted 2. If public transport by rail is to be a solution to improving accessibility and thus a solution to environmental issues, quality of life and available space, then the railroads will have to undergo a complete overhaul. Of course there are small improvements today, but these are local and not based on the big picture. The question, then, is whether these local improvements will really make us better off.

The Freedom of Mobility Foundation wants to unbundle the busy rail network in which Intercity, local train and freight trains will each run/levitate on their own infrastructure. The current track will remain of value and will be used for the conventional InterRegioTrain and freight trains. The intercity will get an entirely new infrastructure based on maglev technology. We opt by separating the different services for the Japanese model 3 where the Shinkansen is separate from the conventional stop and freight trains. The new Intercity, due to its characteristics, has opportunities for the interconnections of cities, regions and airports, as well as international train transportation and network companies such as KLM.

The French model is a choice where the high speed train will only run outside the cities on its own rail network. If the frequencies are low then this is an excellent solution. In the Netherlands, however, the frequencies of the various train services are extremely high and the French model creates enormous limitations.

Because the **timetable** is quite complex due to mixed train services, travel information, when available, will also be complex. Alternative transport will usually be a coach that can only get going reasonably late. Besides, coaches have restrictions for disabled people or taking bicycles. This is not a desirable solution for the public transport and rail product and can be much simpler and better.

The Japanese model is one in which the Shinkansen high-speed train runs on entirely separate infrastructure from the slower regional and interregional traffic. Despite the fact that the rail infrastructure does not intersect anywhere, they do meet at the major stations so the two systems do complement and reinforce each other. Especially with high frequency service and much higher average speeds, this is a better option for Freedom of Mobility Foundation. Especially if simplicity and reliability of the rail system is a must.

International Rail Services



International train traffic is provided by the high-speed trains, Thalys, ICE, ICBrussels and the IC Berlin where the last three of these trains can be used as a domestic service as well, thus fulfilling their utility task. The Thalys and the Eurostar are a niche for a certain target group.

Trains are a national issue. After all, tax money is involved with the infrastructure and people need to be able to use them on a daily basis. Because the infrastructure of trains weaves through cities and regions, these regions and cities also want the benefits in addition to the disadvantages of noise, particulates and taking up space. The trains therefore have to stop to serve the cities and regions. In the case of international trains, this applies to both countries. The question is therefore whether and how two or more national interests can be united in an international line. In the Netherlands, many trains run on the same track. Trains that have a national interest and utility task take priority over trains that have a niche task. In the Netherlands, the IC and stopping train frequencies are already high and the freight trains also have to pass through them. Does the Dutch railroad have enough (residual) capacity left to accommodate

an international train? Another question is whether the train is capable of entering the network of an airline. Trains should then be able to move quickly between airports, and these trains should be able to carry air cargo in addition to passengers, just like a passenger plane. Only then can trains take over airlines. In the (Inter)national line network that the foundation has in mind, it is demonstrated that an IC train based on the Transrapid 09 is able to unite its own national utility task with an international line whereby the travel times can compete with the airplane. Because it also calls at airports, this international train can also enter the network of an airline. Because the train is now able to take over an airplane this can have positive consequences for the amount of airplane movements and thus the reduction of fine dust and noise.

The high speed train

The high-speed train was created in the Netherlands based on the French ideology. A separate high-speed line joins the existing track outside the city to the city centers. The high speed train needs its own heavy infrastructure because of its high speed, but it also needs a distance to get up to speed.

In the Netherlands, this means passing many cities, regions and even airports to reach a speed of 300km/hour. The high speed train is not able to directly connect the political center of the Netherlands The Hague with the political center of Europe and Belgium, Brussels. If you also have to make reservations for this high speed train and make the ticket price significantly higher then it is not interesting for domestic service. Therefore, the high speed train does not meet the requirement of making the best use of taxpayers' money and strengthening the city and region. The high speed train is a niche that goes from its own infrastructure to shared infrastructure within the cities and thus hinders the domestic train and thus hinders the utility task. This train runs in the remaining capacity of the rail infrastructure. In addition, it makes the high speed train unreliable in the timetable. While a high speed train is faster than a conventional train, this train is not faster than an airplane so it cannot compete with it. Also, the infra will not connect all international airports which is also a requirement of an airline. Another limitation of a high speed train is that it cannot carry air cargo. Airlines will

Photos: Stichting Freedom Of Mobility



Photo: Stichting Freedom Of Mobility

therefore continue to use aircraft to fully utilize their network.

The IC Berlin

The IC Berlin is an international train that runs in both the Netherlands and Germany in the train path of a domestic IC where the regions and cities are served and connected with it. Because you don't have to make reservations for this train either, people can use it on a daily basis. It therefore fulfills

the utility function and investments in infra are justifiable or acceptable. What the IC Berlin again does not do is connect the political center of the Netherlands, The Hague with the political center of Germany. The IC Berlin also does not serve the international airports and travel times are way too long. It does not fit in the network of an airline company and it is not an alternative for the private car.

The night train and the luxury train

The night train is a luxury train that runs mainly in the evening and night when there is much more capacity on the track. After all, there are fewer IC and stopping trains. At night there is a lot of maintenance on the railroad network. This causes longer travel times and detours and makes the schedule unreliable. The night train also does not call at all regions and cities. Therefore it does not meet its utility function. It also does not call at airports, so travel times between them become far too long and additionally it cannot carry air cargo. The overnight train is a nice addition in the range of all forms of international transport with its own customers. It is certainly not an alternative to plane and car.



Photos: Stichting Freedom Of Mobility

Schiphol and the other international airports

As a main port, Schiphol is the most important airport in the Netherlands. It has a hub function for flag carrier KLM and Skyteam. Furthermore, it is the international connection of flag carriers from other countries and Schiphol has an important share in the network of many airlines for passengers and cargo. The airport is open 24/7 to handle everything properly.

The other airports Eelde, Rotterdam-The Hague, Eindhoven and Maastricht-Aachen are well connected to airside via the approach and departure flight routes (SIDs standard Instrument departure and STARs standard Arrival Routes) to the airways and have the approach facilities such as ILS (Instrument Landing System) to carry out guaranteed flight operations in almost any weather. The mentioned airports do not handle mainport-related traffic but are good for Defense, cargo, low-cost airlines and charters. Because the airports' landside accessibility is primarily car-oriented, they are invisible and do not have a large hinterland. Because of this imbalance, these airports are missing out on an enormous capacity potential.

Because they are not connected to the main rail network, the five airports Schiphol, Eelde, Rotterdam-The Hague, Eindhoven and Maastricht-Aachen cannot reinforce each other in capacity. In addition, they cannot act as each other's backup in the event of an emergency, an accident or due to weather conditions.

If the airports are linked, Eelde can focus more on flights to the north and Eindhoven and Maastricht more on flights to the south and east. If an aircraft has to divert to one of these airports, the flight can be handled there without passengers having to go to hotels. Crew, passengers and

cargo can then easily and quickly go to the alternate airport and the aircraft can fly from the alternate airport back to the destination according to its schedule. In addition, charters no longer have to pick up passengers at multiple airports to then fly to the destination. Low-cost airlines and airlines that do not fit the KLM network can now also depart from and arrive at Dutch airports more easily because they have a guaranteed visibly large hinterland.

On the landside, airports are designed too much from the perspective of car accessibility. Schiphol does have a reasonable public transport network, but this is mainly during the day. In the early morning, late evening and at night the airport is not or hardly accessible. The many roads and parking lots that are necessary for the accessibility are at the expense of greenery and the many cars cause many emissions. By designing the airport and using it as a public transport or mobility hub, where public transport and rail are further scaled up and the car has to become less dominant, the airport can do with much less asphalt. More greenery can be applied so that the aviation sector can contribute to achieving the environmental targets.

There are also opportunities for airports if they further embrace the train. This brochure is about the intercity, but airports must also fully commit to regional accessibility with metro systems that connect outlying areas, with city districts and city centers. For Schiphol, at the regional level, this includes extending the North-South line through Amstelveen.

To significantly improve the performance of airports and thus their capacity, the Freedom of Mobility Foundation proposes the Airport Line.

With the **Airport Line**, all airports can serve as an **Alternate** from which travelers can continue their journey on the IC. This avoids hotel costs or staff having to stay on duty much longer. For an aircraft, the Alternate can also be a new departure location.



Although **Lelystad Airport** is prepared for international air traffic, on landside it does not meet the accessibility requirements to serve a large hinterland. Also, on the landward side the airport is enclosed between various cities and nature areas. On the airside, the airport and its air zones (CTR) must squeeze in between all the other air zones. The airspace with all its entrances and exits and airways and military zones is already limited. Further divisions will make the scarcity of airways even worse and prevent any aircraft from operating optimally, causing the necessary environmental and economical damage. Lelystad Airport must therefore remain an airport for small aviation only.

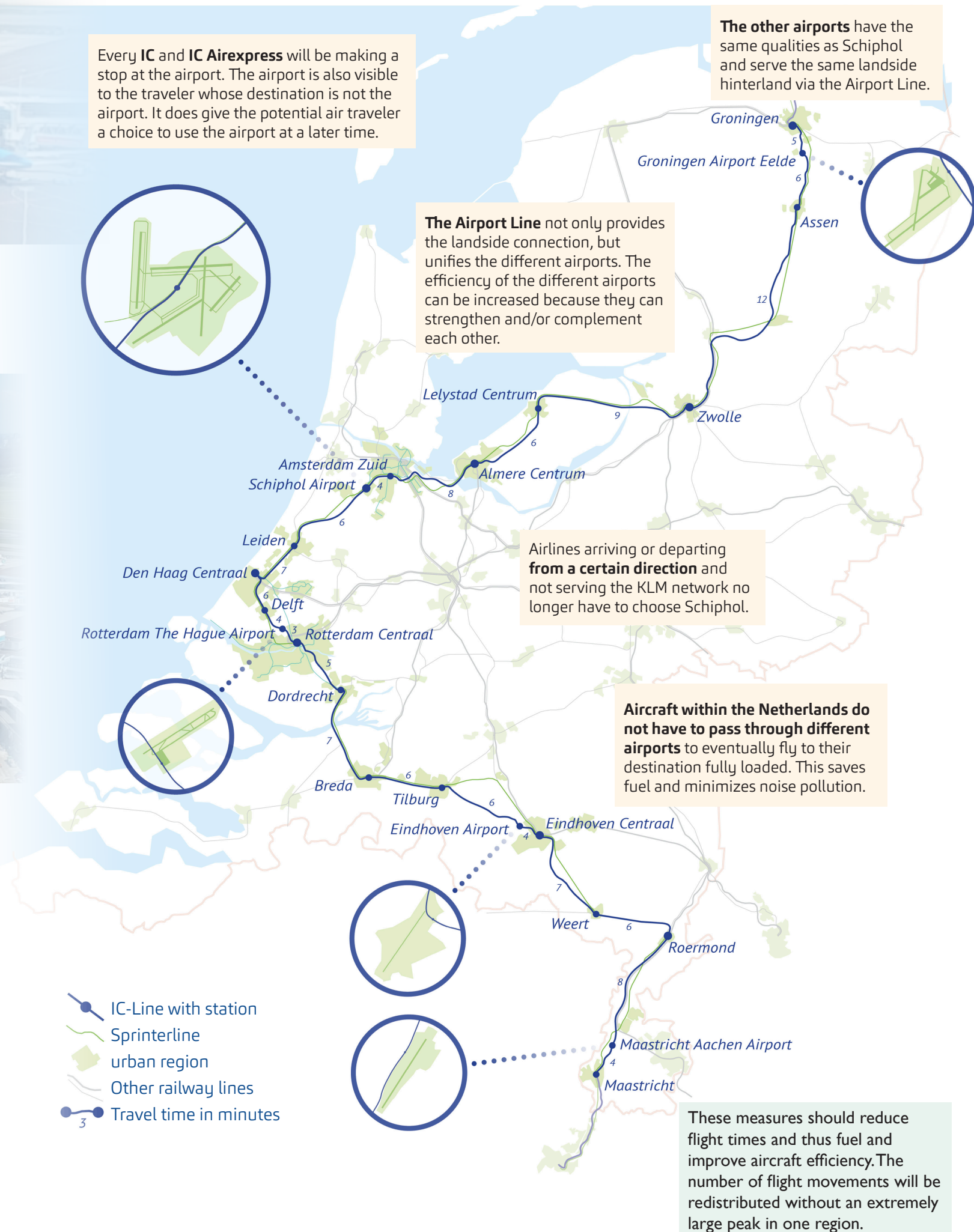
Every **IC** and **IC Airexpress** will be making a stop at the airport. The airport is also visible to the traveler whose destination is not the airport. It does give the potential air traveler a choice to use the airport at a later time.

The other airports have the same qualities as Schiphol and serve the same landside hinterland via the Airport Line.

The **Airport Line** not only provides the landside connection, but unifies the different airports. The efficiency of the different airports can be increased because they can strengthen and/or complement each other.

Airlines arriving or departing from a certain direction and not serving the KLM network no longer have to choose Schiphol.

Aircraft within the Netherlands do not have to pass through different airports to eventually fly to their destination fully loaded. This saves fuel and minimizes noise pollution.



The KLM Network and The International IC-Connections

As an airline, KLM is the infrastructure from the Netherlands to the world and vice versa. It is also a national flag, a home and represents the Netherlands. KLM, along with Air France and Skyteam, has significant value through this task and function. Nevertheless, KLM along with other airlines has an important responsibility for its own sector (in terms of sustainability) and for the environment. There must be a natural balance between business and the environment. As a network airline, KLM's home market with the Netherlands is too small. To fill the intercontinental flights, airlines are needed from Europe to the Schiphol hub. However, a number of air routes can be replaced by trains. These trains offer KLM and Schiphol an enormous passenger potential which no airline could achieve. You can read more about how this is possible in this chapter.

KLM has a schedule with seven peaks where its aircraft connect with each other. Because aviation benefits from fuel-efficient and quieter aircraft, KLM itself is also promoting sustainable fuels, among other measures. In addition to other fuels, better engines and aerodynamics, an airline also benefits from good train connections. In the (Inter)national line network that Stichting

Freedom Of Mobility envisions, it is shown that an IC train based on the Transrapid 09 is able to unite its own national utility task with an international connection where travel times can compete with the airplane. Because it also serves the airports this international train can also serve the network of an airline. Because the train is now able to take over an airplane this can have positive

consequences for the amount of airplane movements and thus the reduction of fine dust and noise.

Because many more regions and cities are now connected, airlines like KLM can serve many more passengers from the Netherlands, Germany and Belgium with one transfer.



Within an airline's network, **connection to a good rail network towards Belgium and Germany** offers enormous potential for passengers to be connected to the world with a single transfer.

The city, region, province and country

Every city and region has its own character and specialisation and is shaped further by the way we move around. This is precisely where solutions can be found, which in the opinion of Stichting Freedom of Mobility mainly consist of the combination of public transport, cycling and walking and the way in which living, working and recreation are situated near stations and stops. In the opinion of Stichting Freedom of Mobility, public transportation therefore falls within the domain of spatial planning.

From the perspective of spatial planning, infrastructure and its vehicles are not an aim, but a means to achieve goals. If we look at the Intercity Line network based on the Transrapid maglev we see that travel times between cities and regions have been significantly reduced. The cities and regions are all served, which means that the cities and regions are given the means to further develop, specialize and compete with other cities. This is in contrast to a traditional high-speed train that skips cities to avoid losing speed. It is important that every city and region can participate so that the Netherlands as a

country can become a stronger entity. Only the Transrapid IC is able to densify and thus form a metropolis while preserving greenery and nature. By densifying in this way the division between the Randstad and the other provinces disappears.

The metropolis of the Netherlands stands strong through knowledge and skill in a world with ever-changing geopolitical and geoeconomic relations. Because the cities and regions are now connected easier and faster and at any time of day via the Intercity, among others, the accessibility is guaranteed and the city also has a means to improve the quality of life. There is less dependence on the car and road safety is improved.

The IC based on the Transrapid 09 is an electrically powered vehicle that gets its energy inductively. This means that the train has no friction. As a result, both the infra and the vehicles are less maintenance prone and more energy efficient than a regular train. Also, no particulate matter is created. For the inner city and region, this has, besides less noise pollution, a positive impact on the quality of life.



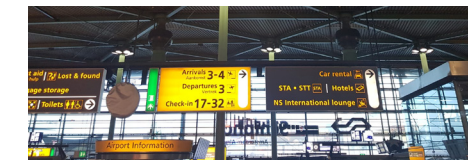
Multimodal Junctions

According to the Kennisinstituut voor Mobiliteitsbeleid (Knowledge Institute for Mobility Policy), mobility hubs are physical links between modes of transport that can serve as focal points for spatial development in addition to their mobility function. With this definition, the hub can be a goal. For Stichting Freedom of Mobility, the mobility hub is a multimodal junction which does always have a purpose and where you can live, work, recreate and/or engage in socialising.

A multimodal hub is the flagship of a city and region and its public transport system. In addition, it is the gateway where all roads lead to. Like a church or marketplace, the multimodal hub stands in the middle of society. Furthermore, it can serve as a distribution center where one can transfer goods from trains to small (E-)vehicles and vice versa. And it is an energy hub where (E-)vehicles can be recharged. The airport,

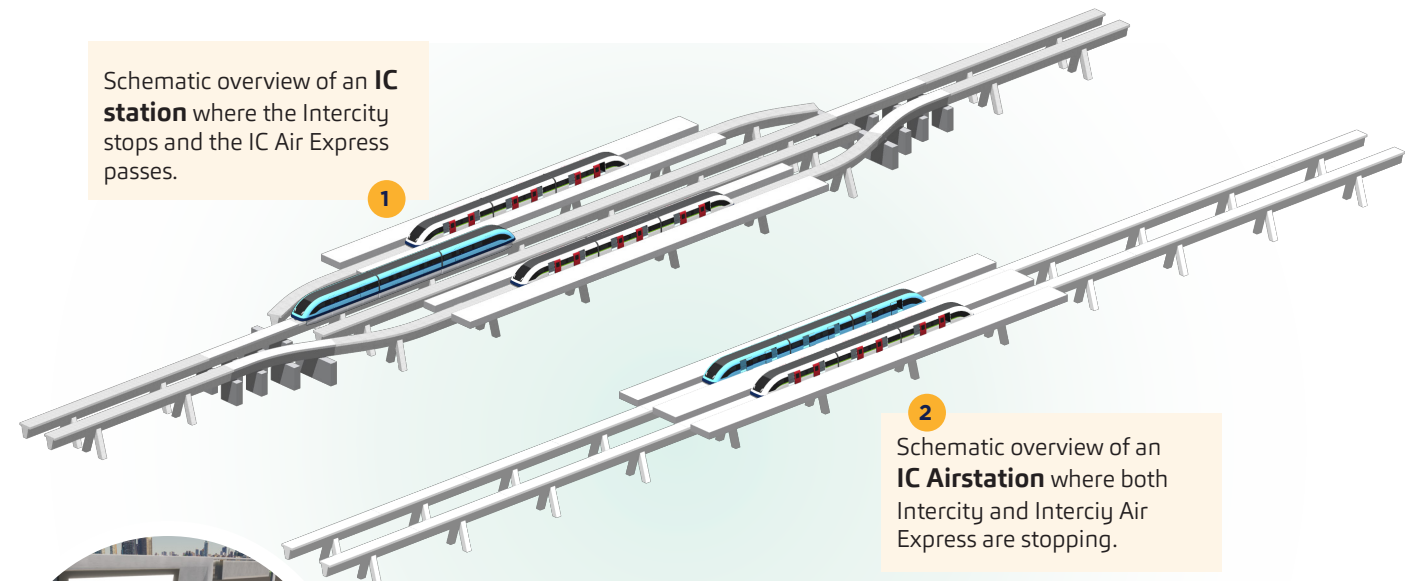
like the station in the city, is a public transport hub from where the plane is the connection to the world. The only other difference is that one cannot live at the airport.

Platforms at airport stations not only need to be accessible to passengers, but also to air cargo containers. This is because an aircraft carries cargo in addition to passengers. Airside and landside should be connected for all these transport flows.



In the Netherlands, travelers will not naturally get on and off a train in an orderly fashion. In addition, Stichting Freedom of Mobility also seeks to make it easy to carry bicycles, mobility scooters and other small personal vehicles in addition to bicycle containers and even airplane containers. Easy and quick entry and exit is achieved by applying the Spanish method at stations. The Spanish method is that both sides of a train will have a platform. One for boarding and one of getting out of the train.

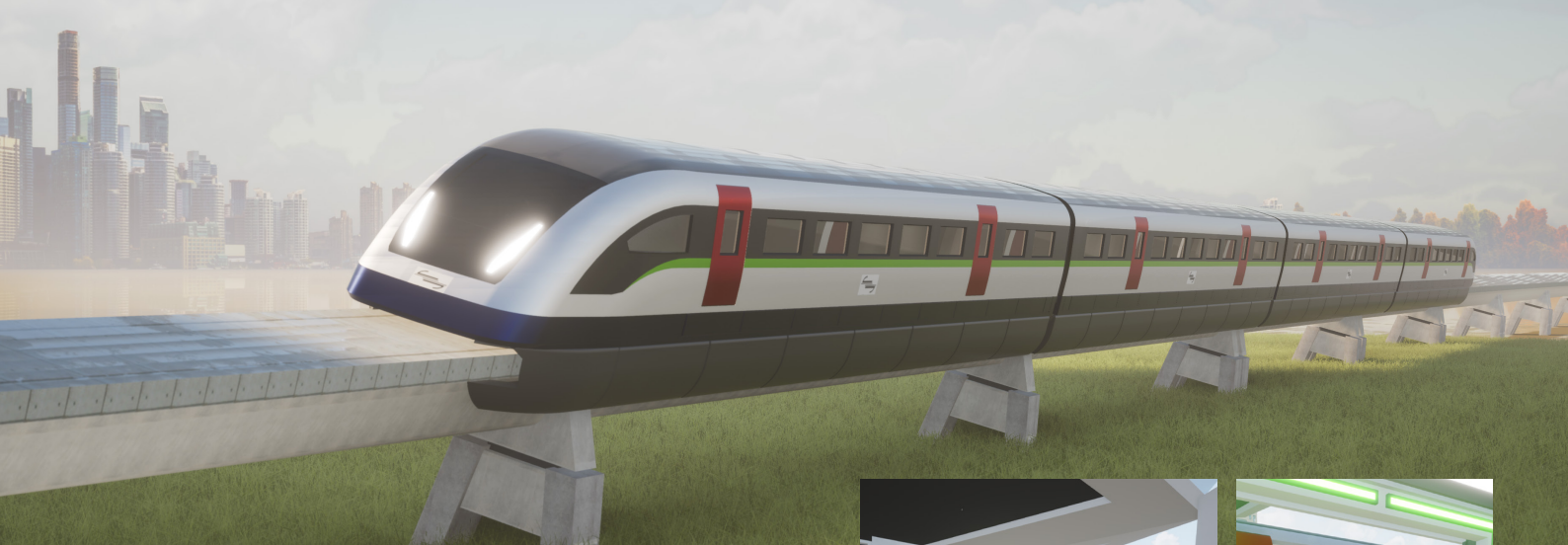
Schematic overview of an IC station where the Intercity stops and the IC Air Express passes.



Schematic overview of an IC Airstation where both Intercity and Intercity Air Express are stopping.

Stichting Freedom of Mobility also proposes to transport air cargo on the Transrapid maglev train. This would also require connecting the luggage and cargo basement to the platforms. Possibly ThyssenKrupp's horizontal elevator based on maglev technology could be an option for achieving this.





The Dutch, German and European manufacturing, construction and knowledge industry

Vehicles

In essence, electric trains and magnetic levitation trains are the same. An electric motor works because current passes through wire windings resulting in a magnetic field. The repulsive and attractive properties of a magnetic field cause a wheel to turn, thus propelling the train. In a magnetic levitation train, no wheel is set in motion, but an entire vehicle. A maglev train rests and moves via a magnetic field.

There are two types of maglev trains. A maglev train based on a repulsive force of the magnetic field (such as the JRmaglev in Japan). In addition, magnetic trains have been developed that operate on the basis of an attracting force of this magnetic field (like the German Transrapid).

The Transrapid

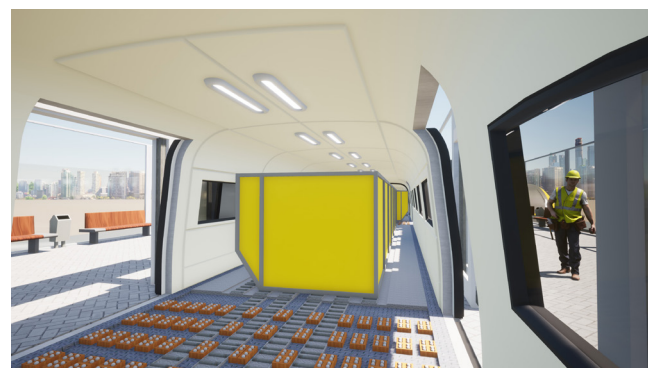
Stichting Freedom of Mobility opts for the German Transrapid 09. This train operates with a magnetic field lower than the one in a microwave oven, has no wheels and causes no friction, particulate matter or wear and tear. The track is also easier to fit into the landscape. The vehicles have wide doors, level entry and are fully autonomous. Passengers can work and/or socialise in comfortable seats with plenty of personal space. There are separate areas for aircraft and bicycle containers and areas where, bicycles and other personal vehicles can be parked. Despite the high investment costs, Stichting Freedom Of Mobility foresees a break even point in favour of this technology.



Level entry and exit.



Plenty of personal space and comfortable seats.



Designated sections for aircraft containers.



Bike containers from bike to train and vice versa.



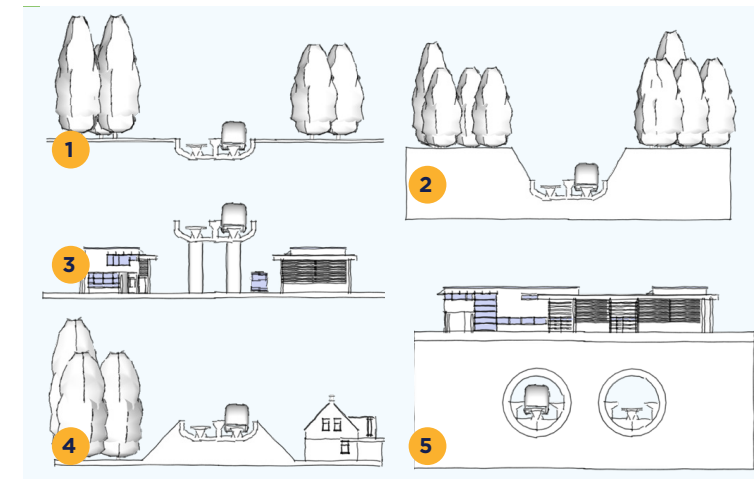
German companies have developed the Transrapid. However, as it goes with any development, this process will continue. In China the development has continued, resulting in the CRRC 600. The Transrapid 09 is a vehicle with the latest European technical developments. This vehicle can also be made more energy efficient, lighter and faster. Stichting Freedom of Mobility recognises opportunities for the Dutch, German and European industries. Daf and VDL, for example, can build the bodywork. Fokker has experience with aviation and

aircraft construction. This is very useful for the production of magnetic levitation trains, because they can then be built as light as possible. A conventional train must not become too light, because otherwise the wheels will no longer be able to move off the rails, but a magnetic train must be as light as possible.

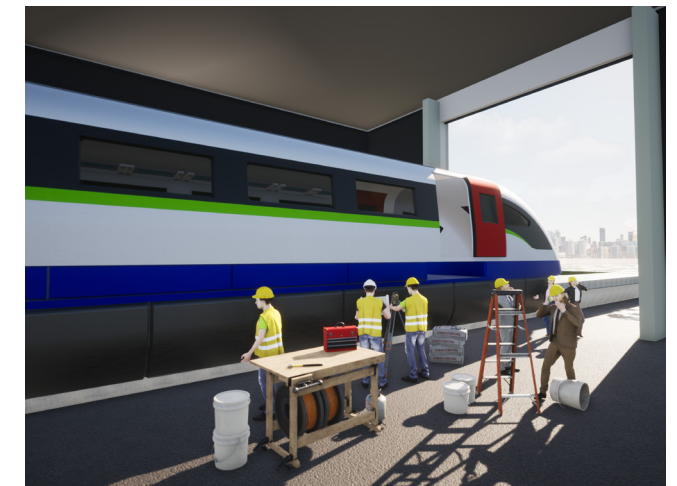
Building stations and infrastructure, redeveloping cities with housing, facilities and recreation and possibly demolishing or reducing roads and parking spaces,

offers opportunities for the city and region to become more beautiful and improve accessibility but also for the construction industry to acquire new orders.

The development of a high-quality public transport system of which the IC-Maglev is a part also requires new knowledge or the upgrading of existing knowledge. We also see opportunities for universities to offer students the opportunity to further explore and solve problems.



Flora, fauna and the quality of life must be taken into account when **constructing or integrating the infrastructure**, both inside and outside urban areas. The infra can be constructed at **ground level** 1, but also **underground** 2 or **elevated** 3. It can also be done on a **dike** 4 and the infra can also be built in a **tunnel** 5. The infra will always intersect with other traffic on a different level. This improves safety and reliability.



Afterword

The Netherlands is a dynamic country. In the past, the Dutch have made the impossible possible by creating more safe (agricultural) land. The instruments to make this possible were developed from scratch. If we look around us, we as the Dutch can proudly conclude that our labor against water has ensured that everything is in order. Most houses are in fine shape. The roads are in good condition and the gardens are tidy. Yet we cannot be resting.

In a dynamic world, geopolitical and geoeconomic relations, climate, the environment and, on a national level, housing shortages, traffic jams, space usage due to the many parking spaces, particulate matter and quality of life will force us to remain alert.

The fact that many raw materials will not last forever means we must be careful, even if we are feeling rich. People have a permanent need to discover and connect, to be somewhere physically. This will not be able to be replaced by the internet. We have the means to continue to do this in the future, but the means must be used in the right way. You don't use an airplane for a flight from Amsterdam to Paris or Brussels and why use a car when we are able to bring living, working and recreation much closer together by rail or other public transport routes to make a fifteen-minute city possible by walking or cycling?

Stichting Freedom of Mobility has its own

vision that looks at these developments and how this will guarantee mobility in the future.

In this, the foundation sees opportunities for public transport, whether or not in combination with bicycles, LEVs and walking. Stichting Freedom of Mobility is currently working on and expanding two of its own projects. The first is the Almere-Utrecht-Breda line and the second one is the Airport line and the in this international rail connections.

Geographically, the Netherlands is in the corner of Europe. Through the various lines towards the East and South, the Netherlands is connected to the European railroad network.

At the moment, the government mainly wants to hold on to what is available. Eventually you run into barriers. That does not create opportunities for the city, region or country and for your knowledge and skills.

The network we have in mind is such that regions are optimally connected, airports make better use of their capacity and knowledge and expertise can be brought together.

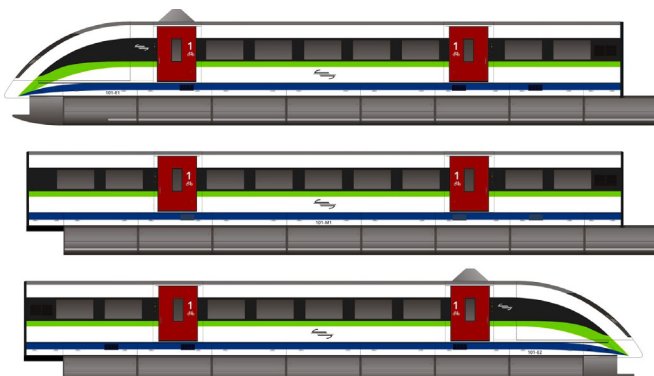
In the past we made the impossible possible by developing instruments and knowledge. Now we have the knowledge and skills and even money. We will have to start building again a Netherlands that can participate internationally and globally.

Stichting Freedom of Mobility aims to build a Transrapid 09 maglev train and further develop a Transrapid 10. This will require the construction of a factory and a new test track with an accompanying information and recreation center. The only condition is that the test track is part of the future route.

Stichting Freedom of Mobility would like to invite cities and provinces to think about and decide on this. The IC based on a renewed Transrapid 09 is the golden egg that brings the Netherlands and Europe closer together. Connecting is the basis for a small country to achieve big goals.

Freedom of Mobility Foundation has a vision of future mobility for both goods and people through public transport and cycling. We look at all types of public transport. If this brochure appeals to you and if you have any comments, please let us know. If you want to support us financially that is also possible. The foundation has an *ANBI-status. For more information please see colophon.

** An ANBI is an institution with a public benefit purpose. An institution can only be an ANBI if it dedicates at least 90% of its resources to the public good.*



Drawing: Kenji Eiler

Colofon:

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