



# **Workshop urban node Mannheim**

## **Summary report on outcomes and conclusions**

**Wednesday 11 July 2018**

**MAFINEX-Technologiezentrum Mannheim (Room C4)**

**Julius-Hatry-Straße 1, 68163 Mannheim, Germany**

Version: 1.0

Date: 08.08.2018

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 769458

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# 1 Introduction

On the 11<sup>th</sup> of July the Vital Nodes workshop in the urban node Mannheim took place as part of the Coordination and Support Action (CSA) Vital Nodes, executed under the European Commission's Horizon 2020 programme. Vital Nodes aims at enabling efficient, sustainable freight delivery across the TEN-T urban nodes (metropolitan areas), by bringing together existing European, national and regional networks of experts and professionals. Vital Nodes will deliver evidence-based recommendations for effective and sustainable integration of the nodes into the TEN-T network corridors, addressing specifically the multi- and intermodal connection between long-distance and last-mile freight logistics. Addressing funding needs (for infrastructure and spatial developments), updating and redefining guidelines for infrastructure investments and funding instruments on European infrastructure. Improving the performance of the urban nodes throughout the entire TEN-T network, it will also support the deployment of innovations in the urban nodes, while establishing a long-lasting European expert network.

About 10 professionals of the fields of freight and logistics, infrastructure planning, spatial planning from governmental organisations, companies and knowledge institutes gathered for the workshop. They discussed the challenges and opportunities for the urban node Mannheim in relation to the city initiatives and the European TEN-T corridors. The City of Mannheim hosted the workshop as the local partner.

## 1.1 Goals of the Vital Nodes workshop Mannheim

In order to address the right challenges and formulate most efficient recommendations, the workshop in urban node Mannheim aimed to:

- Reach a mutual agreement on the fingerprint Mannheim (typology, position of the urban node Mannheim / facts and figures of the node);
- Agree on a unified understanding on key challenges of the urban node Mannheim;
- Explore and discuss possible impacts, barriers and solutions for the challenges (on the EU TEN-T core network corridors);
- Open up the mind-set: thinking on different scales (cross-border/TEN-T corridor, regional/functional area level, local/city level) and dimension, adaptively: balancing choices between short term actions and long term objectives;
- Discuss good practices from Mannheim.

## 1.2 Outcomes

The workshop in Mannheim identified or reconfirmed the following Key challenges

- Renovation of road bridges – Rhine bridges Mannheim-Ludwigshafen;
- Dealing with connectivity and capacity problems;
- Rail noise;
- Connecting to the Chinese Silk Road from Chongqing to Duisburg to also have benefits

- Redevelopment of former US army areas

Take-aways/lessons learned are among others:

- Opportunity of logistics. Concepts of bundling transport flows (micro/midi hubs, logistic park) reduce the amount of transport flows and contribute to environmental goals;
- Multimodal connectivity is important;
- The maintenance task on Rhine bridges might have a major impact on the surrounding during the building period as the bridges will need to be closed: shifting transport flows, (large) detours also for slow traffic and moving companies/people;
- Value of regional planning governance and collaboration to develop a truly regional node;
- Urban node and corridor perspective on TEN-T network; focus on the network and corridors, but also on the urban nodes and the smaller nodes which are not located on corridors as these are often very important. Pay more attention to the situations in the urban nodes.
- (International) alignment of regulations is important to improve freight/passenger transport and to increase capacity.

## 1.3 Follow-up

### Validation

Following the outcomes of the workshop the challenges and the (impact of) solutions need to be validated by the stakeholders related to the specific urban node.

### First recommendations to the European Commission

Based on the outcomes of this Vital Nodes workshop in Mannheim and the eight other workshops of the first phase of the project, first recommendations to the European Commission will be drafted this autumn.

### Second phase of the Vital Nodes project

In autumn 2018 the second phase of the Vital Nodes project will start. This phase will consist of thematic sessions, each with additional urban nodes involved, aiming for further deployment of possible solutions in different 'typologies' of urban nodes.

### Expert pool

Currently the Vital Nodes consortium is developing an expert pool. The expert pool will bring together knowledge from different fields of expertise, related to the development of urban nodes. It will help cooperation between long distance freight and last mile delivery and stimulate knowledge exchange between different urban nodes throughout Europe

### Knowledge exchange and updates

The project shares outcomes and updates regularly via the website [www.vitalnodes.eu](http://www.vitalnodes.eu) and newsletter.

### Policy dialogue

The project plans a policy dialogue for autumn. There, the discussion between the urban nodes and the European Commission will be facilitated according to the themes of the Vital Nodes project.

## 1.4 Introduction by Mr. Specht, first deputy mayor of Mannheim

The workshop was opened by Mr Specht, first deputy Mayor of Mannheim. Mr Specht expressed his gratitude that Mannheim and the Rhein-Neckar region could participate in the Vital Nodes project . As node on different TEN-T corridors Mannheim considers itself very important. Mannheim is for example the port of the Stuttgart region. On the other side Mannheim and its neighbouring cities Ludwigshafen and Heidelberg, which can be seen as one node, face traffic challenges on the local, regional and TEN-T level. Mr Specht mentions for example a traffic problem around Heidelberg, which also influences the network around Mannheim and the surrounding area.

Mr Specht mentioned also that Mannheim is part of several EU meetings to get visibility on Mannheim, such as meetings from the EGTC with the TEN-T coordinator of the Rhine-Alpine corridor, a meeting on the 30<sup>th</sup> of January 2017 on urban nodes and regions of the Rhine-Alpine core network corridor with the EGTC and with EU coordinator Mr Pawel Wojciechowski and a meeting on the 4<sup>th</sup> of December 2017, also with Mr Wojciechowski, on rail noise on the Rhine-Alpine corridor as rail noise is a problem in Mannheim and the region. Besides, Mr. Specht is vice-chair of the EUROCITIES Mobility Forum. Mannheim will be visible on EU level, showing their problems and asking the EC to help them and the other urban nodes.

Mr Specht summed up some developments in the urban node Mannheim, such as

- The planned bicycle highway between Ludwigshafen, Mannheim and Heidelberg. Mr Specht was very Impressed by the bicycle highway between the Dutch cities Nijmegen and Arnhem.
- The New Silk Road. A few days before this workshop Mannheim had a meeting with a Chinese delegation from Chongqing to discuss a direct rail connection between Chongqing and Mannheim.
- The Modellstadt Mannheim. The national government suggest Mannheim to become a model city for air pollution reduction (particularly NOx emissions) and thus work to solve transport problems by taking local measures.

Mr Specht concluded by stating his hopes of Vital Nodes giving the urban node Mannheim and its regional area visibility at the European Commission (EC). Besides he emphasised the need for the EC to focus more on the urban nodes. In the last few years the EC invested a lot in the TEN-T corridors, but the remaining bottlenecks are in and around the urban nodes. Helping the urban nodes would be very helpful for the overall corridor development.

## 2 Typology and identified challenges of Mannheim

To get a clear understanding on the status of an urban node a so-called 'fingerprint' is developed for all urban nodes within Vital Nodes. It includes the characteristics of the node based on facts and figures (secondary data and stakeholder input) and resulting challenges of the urban node Mannheim. This fingerprint was used as a starting point of the workshop discussion (see attachment 1). Also information from the preparatory meeting for the workshop and the discussions during the workshop form input for the typology of Mannheim.

### 2.1 Characteristics of the urban node Mannheim

The Vital Nodes project team gave a presentation about the Mannheim Fingerprint, followed by a brief analysis based on facts and figures and developments in city and region. An analysis based on facts, policy documents and figures and developments on the three scale levels. A complete overview of this analysis can be found in the fingerprint (attachment 1).

#### 2.1.1 Local level

- The urban node Mannheim lies in the southern part of Germany, in the State (Bundesland) Baden-Württemberg.
- Mannheim has 305.780 inhabitants and is located at the junction of the rivers Rhine and Neckar.
- Mannheim is for passenger transport the most important node in the surrounding, but for freight it is closely connected to Heidelberg and Ludwigshafen.
- The city is part of the economic heartland of Europe and offers space to many manufacturing and trade companies such as John Deere, Siemens, Roche, Evobus, etc.
- Mannheim has been a transport hub for ages with rail and waterborne transport. It has a very old transport policy (1868, Mannheim Transport Policy), which guaranteed free navigation on the Rhine.
- Mannheim has a major marshalling yard, largest in Germany after Maschen near Hamburg. This yard plays an important role in rail freight traffic all around Europe. At the 200 hectare marshalling yard, 550 employees process 5300 cars on more than 240 kilo metres rail track and 575 points every day.
- Mannheim is an important rail dot in the passenger rail transport network.
- Mannheim has the second largest inland port of Germany. The port covers 1131 hectare and processes more 6.9 million tons of goods per year and serves the waterborne transport via the rivers Rhein and Neckar.
- The last transport mode is by road. Via five motorways (A5, A6, A61, A65 and A67) you can connect to Mannheim (see also: attachment 2, 3 and 4).
- This forms Mannheim an important intermodal hub.
- The downside of rail is the rail noise and rail capacity problem Mannheim has.

## 2.1.2 Regional level (functional urban area)

- The urban node Mannheim should be taken broader and include Ludwigshafen and Heidelberg as being the urban node Mannheim-Ludwigshafen-Heidelberg.
- The strong connection between these three cities, makes from Mannheim a network focussed city (polycentric)
- Problems in one of these cities influence the network in the others. Heidelberg transport goods for example by road.
- Mannheim is an important node in relation to Frankfurt am Main, Stuttgart and Karlsruhe for freight as well as passengers.
- Mannheim lies within the Metropolregion Rhein-Neckar. This Metropolregion was set up due to the many interactions between these cities and the fact these cities and tertiary hubs are spread across three different states. The Metropolregion coordinates between the Bundesländer Baden-Württemberg, Rheinland-Pfalz and Hessen and the cities included in the Metropolregion.
- The Metropolregion is responsible for the regional development and creates regional plans and visions. The region encloses an area with more than 2,35 million inhabitants and many knowledge institutes are based in this area, such as Heidelberg University or the Technical University Kaiserslautern
- The institutes have formed the Upper Rhine Valley Network of Universities, meaning students can have lectures on different locations/institutes resulting in many commuting travellers.
- The Metropolregion is one of Germany's driving economic areas. Many large global players, such as BASF, are located within the region and have their headquarters there.
- The BASF has its own station for passenger trains.
- Due to connectivity and capacity constraints the manufacturing industry is partly shifted to the midsized cities, such as Weinheim (Freudenberg) and Walldorf (SAP). They are spread out over the region, resulting in increased commuting flows putting a strain on already congested infrastructure.





### 2.1.3 Corridor level

- The region is located in the centre of the European transportation network, with the motorways A5/A67 north-south, the A6 east-west (Paris-Prague) and a large rail network that serves both important cross border passenger traffic (EC/ICE) as well as (intermodal) freight trains from a.o. the Northern seaports towards the South of Germany, the Alps and Italy. Besides, it is located at the rivers Rhine and Neckar with the Mannheim/Ludwigshafen harbour
- The urban node Mannheim is located on three TEN-T corridors: Rhine-Alpine, Rhine-Danube, Atlantic corridor.
- It covers different modes of transport, both rail, shipping and road.
- The main roads are the motorways A6 Paris-Prague and the A5/A67 north-south.
- Mannheim is part of an extensive railway network, connecting Mannheim to many (inter)national locations for both freight as (high-speed) passenger transport.
- Mannheim has a major inland port as it forms a transfer-port and serves as main inland port for the Stuttgart region via the Neckar. Multimodality is very important in Mannheim. Freight from for example Stuttgart will be reloaded on larger vessels or freight trains in Mannheim. Besides, Mannheim forms the hinterland for Rotterdam, Antwerp and Genova. A new corridor could be the New Silk Road from Duisburg to Chongqing, China. Mannheim tries to connect to this route.

### 2.1.4 Current developments of Mannheim

#### Railway capacity expansion

The expansion of railway capacity in and around Mannheim is listed among the major projects in the Bundesverkehrswegeplan 2030 (German federal traffic planning plan). The project aims to increase the capacity of the Rhine route which is part of the Rhine-Alpine Corridor for both, passenger and freight trains and speed-up passenger rail. The planned project consists of an new high-speed rail track between Frankfurt am Main and Mannheim, connecting to the Mannheim-Stuttgart track built in the 1991 and some freight tracks to connect the Mannheim shunting yard.

#### SDG strategy 2030

Mannheim is working on a 2030 strategy for the United Nation's 17 Sustainable Development Goals (SDGs). It presents itself as a Modellstadt for the implementation of the UN global sustainable development goals.

Also on the national level Mannheim is seen as a Modellstadt (model city). Mannheim gains budget from the German federal government out of the package for air cleaning. Mannheim has set up a plan to develop the public transport system in close cooperation with transport companies. This budget is to invest in the public transport, improving this public transport and promoting the shift from car use to public transport. With local measures the amount of NOx can be reduced. This may reduce the road capacity.



## Redevelopment former US army areas

Around the City of Mannheim there are a few former US army areas. For the Benjamin Franklin area a redevelopment plan is set up by the company MVRDV, transforming the area in a multifunctional area (housing, leisure activities, work, etc.). This plan focusses on residential development. Also for other military areas development plans are set up (such as the Green Logistic Park).

Location of US army areas around Mannheim, which are part of the redevelopment projects (Konversion Mannheim).



Source: [https://www.mz.de/nachrichten/mannheim\\_artikel,-Mannheim-Konversion-in-Mannheim-500-Hektar-fuer-die-Stadtentwicklung-\\_arid,142545.html](https://www.mz.de/nachrichten/mannheim_artikel,-Mannheim-Konversion-in-Mannheim-500-Hektar-fuer-die-Stadtentwicklung-_arid,142545.html)

## Cable car connection Gartenschau

Mannheim will host the biennial federal horticulture show Bundesgartenschau in 2023. One of the ideas for the Bundesgartenschau is to build a cable car from the Gartenschau location to the city centre and possibly further connected to Ludwigshafen. The cable car shall improve the public transport system.

## Connection to the silk road - Chongqing

In the beginning of July 2018 a Chinese delegation visited the City of Mannheim. The participants of this meeting discussed the implementation of a direct cargo connection between Mannheim and Chongqing, linking Mannheim to the New Silk Road. This new route can increase the freight transport from Mannheim and gives perspectives for companies as BASF, with plants in both China and Ludwigshafen. The New Silk Road might form a new corridor for Mannheim.

### 2.1.5 What is an urban node?

According to the workshop participants an urban node is an important dot on the network. According to the participants an urban node may differ for freight and passengers, as for example Mannheim is the urban node for passengers, while for freight the urban node is larger (Mannheim – Ludwigshafen – Heidelberg). The way infrastructure and spatial planning are organized are decisive for how the corridor and the total network will work. The node forms the core of the overall European transport network. As is mentioned during the workshop, a node does not end at the border of a city. The node is sized by its daily urban system (passenger flows) and its functional urban area (freight flows). This means, according

to the participants, that the rural area of a node is also very important. These are areas where commuters live or where companies shift to.

### 3 Challenges

During the workshop the challenges of Mannheim were discussed.

#### **Renovation of land bridges - Rhine bridges in Mannheim/Ludwigshafen**

There are two bridges crossing the Rhine connecting the cities of Mannheim and Ludwigshafen. Both bridges are in poor condition of which the northern one is more serious. For the northern bridge the connected elevated road in Ludwigshafen is planned to be demolished shortly. The City of Ludwigshafen decided to bringing the elevated road back to street level. Closing the northern bridge means traffic will need to use the southern bridge during the construction period, which might cause congestion. The southern bridge has static problems. These lead to axle load restrictions until this problem is solved. Each day more than 900 trucks cross the Rhine to Mannheim. A part of these is from the company BASF.

The BASF has different entrances to their plant. Most of the transport flows enter the plant via gate 15 in the north. These flows use the highway A6, which also crosses the Rhine. From a BASF perspective closing the northern Rhine bridge means increasing traffic flows on the highway and thus increased congestion. This results in a less accessible entrance of BASF. The BASF commissioned a study to the impact of closing the Rhine bridges on the total network. The results will be published after summer 2018. Based on this study BASF aims to create a future proof solution for their company, as the bridges themselves should be renovated in the near future. The BASF has looked into different options.

The issues BASF foresees for their company (increasing congestion on the A6) is not only an issue for BASF. This increasing congestions will also influence (international) long-distance traffic. The A6 connects Paris with Prague and is part of the Atlantic corridor (Mannheim to Paris), while it is also part of the Rhine-Alpine corridor.

#### **Major maintenance task for bridges in general**

One of the participants mentioned the maintenance of bridges in Mannheim is not a stand alone problem. Along the Rhine many bridges need to be renovated or replaced. For cities, commuters, companies and freight transport the closure of bridges will give problems. Companies will shift their plants, commuters will shift to other towns or should take a detour. Most challenging is how to deal with slow traffic (cyclists, pedestrians, agricultural vehicles, etc.). The participants discussed the importance of aligning construction works, while the TEN-T corridors are mainly focussed on expanding and improving the corridor, without to much focus on maintenance. While maintenance along the corridor can have a huge influence on the working of the corridors as is also explained above for the bridges in Mannheim/Ludwigshafen

## Dealing with connectivity and capacity problems

Connectivity is very important for Mannheim, the Metropolregion Rhein-Neckar and for the TEN-T corridors. On the local scale is the connection between Mannheim and Ludwigshafen by crossing the Rhine important. But also within the region for all commuter flows and on the (inter)national scale for the companies and long distance transport. Less possibilities to cross the Rhine and many current and future construction projects on the bridges will make the Rhine a bigger barrier.

Also on rail the capacity is low. Cargo trains, regional trains and long distance (ICE) trains use common tracks around Mannheim. To reduce the travel time between Frankfurt am Main and Mannheim and to increase the capacity, a new track is foreseen by the federal transport development plan. However, in the plans, the high speed track ends in the north of Mannheim and connects there to existing tracks to Mannheim Hbf (for passengers) and to the marhalling yard (for freight). After the upgrading the Eastern Riedbahn can be used by additional local passenger trains and as a detour by a part of the freight trains. But it is not foreseen as the regular way for high speed trains which shall run over Mannheim Hbf. The Eastern Riedbahn is not the detour for high speed trains.. From the Mannheim perspective it is necessary to have a new track for high-speed that is connected to Mannheim Hbf station. They prefer to also have more capacity for rail freight with lines connected to the Rangierbahnhof (marshalling yard). Besides, the extra capacity should be available for passenger and freight transport. DB Netz is currently undertaking a study on the future of the Mannheim railway hub.

Rail freight is on the Rhine-Alpine corridor – most of the time – a long-distance mode. Currently there are capacity issues in the north between the Rhein/Main and Rhein/Neckar, including the nodes Frankfurt am Main and Mannheim and there are issues in the south between Karlsruhe and Basel. Thus these are issues which directly impact the performance of the mode 'rail' at the local level (node Mannheim) and at the corridor level. For long distance rail freight (corridor level) as well as the companies in Mannheim that are connected by rail, it is important that the rail capacity increases.

For inland shipping the port of Mannheim is important as it is a transshipment port. It connects Rotterdam/Antwerp, Stuttgart and Basel. If the water levels in the rivers is low, there should be an alternative transport mode. In general this is rail, however rail has capacity issues so this problem should be solved by using road meaning increasing traffic intensities on road causing congestions. This will influence all levels

## Rail Noise

Currently many train tracks near Mannheim lie close to residential buildings. Trains on these tracks cause noise nuisance, to a large extend due to the braking systems they are equipped with. Preventing against rail noise can be done by placing noise reducing screens. However, inhabitants are against high screens in front of their houses. There is also resistance against reopening the second track of the eastern Riedbahn as the traffic increase will lead to extra rail noise. Tunnelling the new rail track might be a solution, but might be not feasible.

Deutsche Bahn and other railway companies are investing in a new brake systems for their trains, reducing the noise, but it takes time before all trains are equipped with this system. Other forwarders did not promise to replace their brakes by noise reducing ones. Possibly the Swiss intention to obligate

railway undertakings to have low noise braking systems will help Mannheim and the rest of the corridor. During the workshop was mentioned that rail noise is high prioritized on the agenda for the Rhine-Alpine corridor.

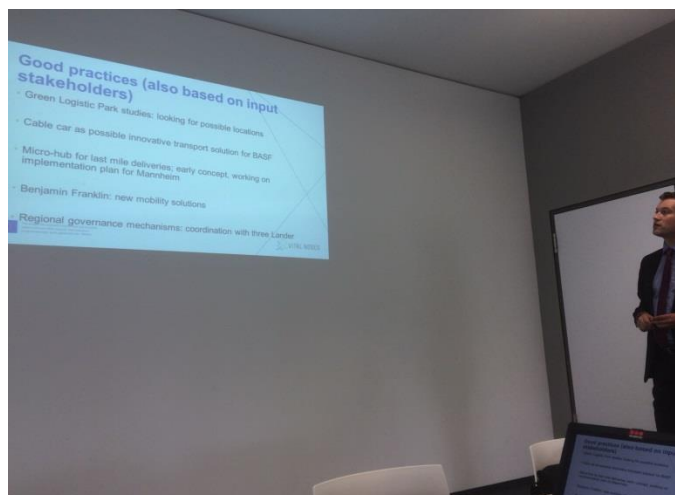
### **Connecting to the Chinese Silk Road from Chongqing to Duisburg to also have benefits**

The New Silk Road is connecting the city of Chongqing in China with Duisburg. The city council of Mannheim is trying to connect Mannheim with Chongqing as well, by having a direct train link. For this rail capacity is needed. Mannheim would have advantages from a direct link. Trains are not crossing through Mannheim, but Mannheim will be the final destination for some trains.

### **Challenges of brownfield redevelopment of former US Army areas**

In the surrounding of Mannheim different US Army areas are located. For these areas plans are created. Two of these plans, the Green Logistic Park and the Blue Village Franklin, will be explained further in the 'Good Practices' section. To realize these plans Mannheim should overcome and deal with some issues:

- Delays in withdrawing US army activities;
- Dealing with ideas, such as using areas as refugee camp, from the Bundesländer level (Baden-Württemberg);
- In the current set-up for the Green Logistic Park a successful business model remains out of reach (sizing of the terminal, convincing companies, one company for last-mile transport);
- Alignment of all different US Army area projects (Turley, Taylor, Franklin, Spinelli, Coleman, Hammonds, Stem Barracks and Rheinau Kaserne) and related building logistics.





Source: Stadt Mannheim

## Good practices and opportunities identified

### 4.1 Good practices

#### Green Logistic Park

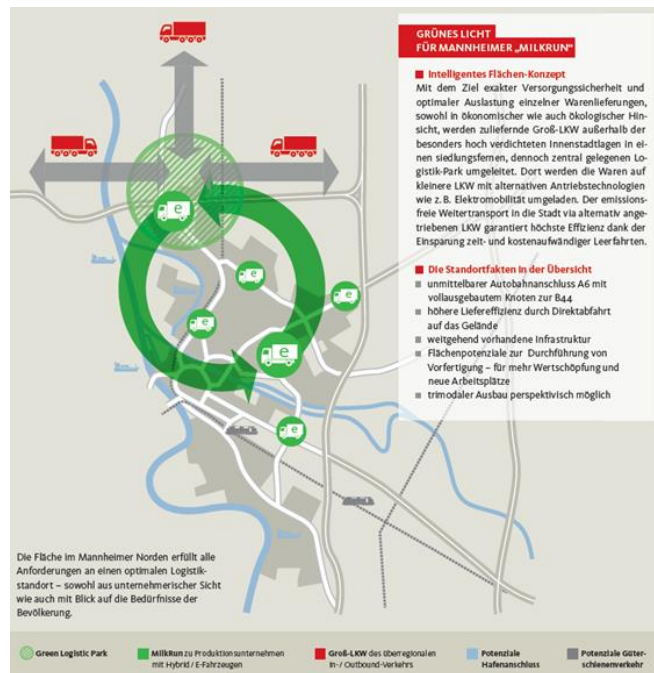
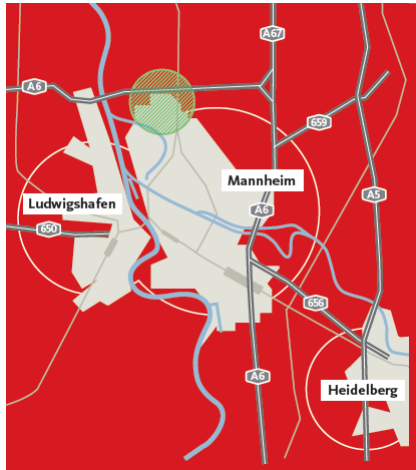
One of the good practices from the city of Mannheim is the Green Logistic Park (in concept). The concept of the logistic park is to create a terminal system at the Coleman Barracks to consolidate all goods at one point. The location is near the A6 in the north of Mannheim, close to the A67. Via road goods can be transported to the terminal with the current large trucks, which forms a transshipment location to factories and costumers in Mannheim. Shipping the goods to the factories is planned to be done by a combined (electric) shuttle in the future. In this way the number of (large) trucks crossing the city could be reduced. Besides, the exhaust of emission will be reduced as electric trucks/shuttles will connect the city centre and factories with the logistic-hub.

Although the concept is good, the intended location is not available (yet) and previous implementations failed in Mannheim.

#### *Dresden (D) – CarGo tram VW*

A good example for the Green Logistic Park is the CarGo tram of Volkswagen in Dresden. Automotive parts are collected at the Friedrichstadt freight terminal and transported to the factory (5.5 km). To reduce the amount of trucks crossing the city centre of Dresden to the VW factory, the CarGo tram is introduced. The tram runs three times a day and shows the idea of the Green Logistic Park in operation.





Source: [https://www.mannheim.de/sites/default/files/page/61020/flyer\\_glp.pdf](https://www.mannheim.de/sites/default/files/page/61020/flyer_glp.pdf)

Source: [https://www.mannheim.de/sites/default/files/page/61020/flyer\\_glp.pdf](https://www.mannheim.de/sites/default/files/page/61020/flyer_glp.pdf)

### *Vienna (AT) - Wien Süd as joint multimodal cargo terminal*

A good example, identical to the Green Logistic Park, is the Wien Süd cargo terminal. Considering the concentration of intermodal goods traffic in and around Vienna a multifunctional cargo terminal, the RRT Wien Süd, has been built at the southern city border of Vienna - at the interface of a rail line and the S1 highway. The cargo center is jointly developed by Vienna, Lower Austria and the Chamber of Commerce. The RRT Wien Süd serves as a major freight hub in the region. The terminal's capacity might experience a further stage of expansion in a second step.

### **Micro-hub for last-mile deliveries – parcel delivery point**

The concept of the Green Logistic Park can also be used on a smaller scale. At the location of an underpass the city of Mannheim has the plan to build a parcel delivery point. A possible good location might be under the flyover at the Parkring (B7/B44, northern Rhine bridge), close to the city and the port. Collecting parcels at one central point and combining the last-mile transport of these parcels to the final destination with for example the current flows (for example people collect their parcels before taking the bus/tram) or just to combine the parcels at one point and transport it the last mile by a shuttle, reduces the former transport flows (e.g. each parcel is delivered by another truck, having lots of flows through the city). Thus, this combination (parcel collection point + bundled last mile) can also contribute to environmental challenges cities have

### *Gothenburg (SE) – ElectriCity*

A good example of such a parcel collection point is the ElectriCity project in Gothenburg. At the end/starting stop of the bus route 55 in the port area of Gothenburg a parcel collection point is realised. This is a solution for the last-mile transport of parcels since commuters (for example port employees)

can pick up their parcels on a central point along their route and take the bus, reducing the amount of trips for parcel delivery in the city.

### Vienna (AT) - Micro and midi hubs

Setting up a network of micro and midi hubs as in Vienna could be an interesting option for Mannheim. Vienna is looking for possibilities to develop micro hubs (100 – 150 m<sup>2</sup>) and midi hubs (1,000 m<sup>2</sup>) in the city. Perhaps Vienna's main terminals Wien-Süd and Hafen Freudenau offer opportunities for connecting long-distance and last-mile freight logistics. At the moment it is easier to find locations for the smaller

micro hubs than for midi hubs, as empty shop space can be transformed into micro hubs. Rail access to midi hubs is much more difficult and expensive to realize so the choice was made for trucks delivery in order to get a realistic business case. Besides, in brownfield development a combination of housing, work and micro/midi hubs will be kept in mind in Vienna.



### Mobility concept Blue Village Franklin

For the former US army base Benjamin Franklin a transition to a housing area is foreseen. It is called the 'Blue Village Franklin' and forms a 'model project' for sustainable spatial planning and mobility. The area is parallel to the B38, connecting to the highways A6 and A659. For this area spatial planning and mobility go hand in hand. The mobility plan is based on three pillars:

- An access and road network which deals with various mobility modes and treats equal (focus on people);
- Well-organized public transport (low-emission);
- Additional a sharing system for bicycles and cars, autonomous driving and attractive services. One of these services is the mobility-app to make a multimodal transport approachable. This app shows personal mobility advices and for the inhabitants of this area mobility offers are available. This idea has some concepts of Mobility as a Service (concept of regional transport association Verkehrsverbund Rhein-Neckar (VRN)).



## **Regional governance mechanisms**

Mannheim (Baden-Württemberg) is located at the junction of three Länder (Baden-Württemberg, Hessen and Rheinland-Pfalz) and has strong relations with cities in the other Länder. To facilitate this, the Metropolregion Rhein-Neckar is set up. The Metropolregion focusses on regional economic development and is installed by instigation of the ministers for Regional Planning of the three relevant Bundesländer. The Metropolregion is responsible for the regional plans, such as the spatial plan for the area covered by the Metropolregion Rhein-Neckar. This ensures collaboration within the region and coordination amongst the different members (cities) of the region.

## **Bicycle highway (Radschnellweg) Mannheim – Heidelberg**

Another good practice to improve air quality and connectivity and to contribute to the capacity problems of roads and public transport, is the plan for a bicycle highway between Mannheim and Heidelberg. This highway will be one of the first ones for bicycles in Baden-Württemberg. In the core area of the Rhein-Neckar region it is a major challenge for the infrastructure to transport all commuters. The aim of the bicycle highway is to reduce the traffic intensity on the main transport routes. It is seen as an innovative traffic concept. Similar to this idea is the already existing bicycle highway between Arnhem and Nijmegen in the Netherlands. Aim of this highway was also to give a fast, healthy, alternative to the congested roads.

## **Cable car as innovative transport solution for BASF**

BASF, one of the biggest chemical producing companies of the world, is located on the western riverbank of the Rhine in Ludwigshafen. However, it has also a plant on the eastern side of the river, next to the port area of Mannheim. To reduce their transport to the port by trucks crossing the Rhine via the current bridges, they thought about an innovative transport solution: connecting their plants by a cable car. There are some issues for doing this: freight crosses the Rhine while ships are passing through the Rhine, meaning safety related issues. Although they are now looking at other alternatives, the idea of shifting from conventional transports by many trucks to other modes, reducing traffic on roads, is perceived interesting.

## 4.2 Opportunities identified

From the discussions, different opportunities are identified:

### 4.2.1 Green Logistic Park / micro & midi hubs

The concept of the Green Logistic Park and the parcel collection point are interesting. Large areas of Mannheim will be redeveloped (US army bases). This is an opportunity to develop improved freight delivery with micro/midi hubs. The Blue Village Franklin for example, focusses on multimodal 'personal optimized transport' concepts, creating micro hub at the entrance of this village, close to the B38 and to the modalities available in this village (as for example the ElectriCity concept of Gothenburg).

Besides, closing the Rhine bridges for maintenance can give an impulse for city logistics and the Green Logistic Park concept. The city will be less accessible and freight transports will need to take a detour. Mannheim should ensure the city will not become a big congested area. This moment could be an opportunity to stimulate ideas to reduce transports through the city. An idea could be creating several micro distribution hubs in the surrounding area, using their Green Logistic Park concept. Possibly a hub can be build close to the Rangierbahnhof. Freight enters the city by train and the last-mile transport can be done by shuttles.

### 4.2.2 Optimisation of transport by individual companies: the case of BASF

BASF is a large shipper in the region. Because of the capacity constraints experienced by the company and the role the company wants to play in the region BASF is optimising its own logistics. Examples include different planning to allow trucks to drive to the factory gates at night and the development of their own intermodal tank container to replace current tank cars and reduce traffic movements.

The results of the BASF study to changing transport flows after closing the Rhine bridges will be published when the study is finalised (after summer) and will be available for everyone. The City of Mannheim can use the results of this analysis in their consideration of taking additional measures and creating detours, preventing (increasing) traffic jams around Mannheim. Besides alternatives for employees could be offered as introducing company buses that stop on different places, pick up employees and bring them to the company. This will reduce the amount of car trips to the company. Another suggestion is shifting working hours. For example in Rotterdam different neighbouring companies have shifted their work time tables a little bit. Before, the work shifts in these companies ended at more or less the same time causing a high traffic intensity at one time.

### 4.2.3 Bundesgartenschau 2023

One of the ideas that was put forward was to build a cable car from the Gartenschau location to the city centre of Mannheim and possibly further crossing the Rhine, connecting with Ludwigshafen. The connection with Ludwigshafen improves the current public transport system by providing additional options and makes the network for slow traffic less vulnerable.

### 4.2.4 Metropolregion Rhein-Neckar



The planning procedures in Mannheim show the success of the Metropolregion concept, which deviated some planning authority to the regional level, fostering cooperation between the different stakeholder that would be otherwise not only separate local authorities but also subject to different planning on a state level. While the Metropolregion cannot solve this issue entirely, the structure has been developing since the 70s, indicating remarkable results that are of great impact for the development of the urban node.

Developing the Metropolregion further in terms of sustainable urban freight planning could add additional value for the development of the urban node.

#### 4.2.5 International cooperation and regulations

Some issues cannot be solved by an urban node, but are in need of discussion on the international (EU) level. Cooperating and coordinating on the international level by forming coherent regulations on topics as rail/road capacity (detours), noise and timetables might be necessary.

##### *Rail/road capacity - Detours*

The motorway A5 (Frankfurt-Heidelberg-Karlsruhe-Basel) is located close to the French border. In cases of major road works, accidents etc. on the motorway A5 or on the rail tracks to Basel, the motor way to Basel at the French side of the border might be a logic and possible detour as regulations are adapted. Currently, this detour is not possible for the rail freight corridor, since drivers need special training for the French route and not all railway engines can run under the French electrification system.

##### *Rail noise*

Rail noise is a problem in Germany. The new brake systems by DB and the future Swiss regulations obliging silent brake systems for all trains can also reduce the rail noise in Mannheim. But the rail noise problem is wider than Mannheim and Germany, so international regulations might be of help in order to facilitate/stimulate change.

##### *Alignment*

International alignment of regulations, systems and time-tables is necessary. Reducing time means that international freight/passenger rail connections could be drive faster to their destination. Due to problems in international alignment of time-tables etc., trains have to wait at the border or have a longer stops on stations in between. Besides there are differences in regulations, trainings, systems (ECTS, ERMTS) and types of electrification.

The examples above show that cross-border and/or EU collaboration, coordination and alignment could be very helpful in optimizing the corridors.

## 5 Lessons learned

During the Mannheim workshop several challenges and solutions have been discussed related to the European transport network (investments), regional development policy, frameworks and research. Based on the Mannheim experiences, some building blocks (lessons learned) have been assembled. This chapter can be seen as input from Mannheim for the recommendations to the EC.

### 5.1 Transport and technical issues

- *Vulnerability of the network.* Currently there are only two inner-city bridges crossing the Rhine, connecting Mannheim on the East and Ludwigshafen on the West. Major maintenance and construction works on bridges and roads in the upcoming years influence the traffic flows in Mannheim, for example the closure of the Rhine bridges. Occasional discharge of water of the rivers is too low meaning low water levels and low vertical clearance (bridges), might reduce the alternatives to transport freight further, as the rail capacity is already constraint.
- *Multimodal connectivity is very important.* For Mannheim, as node at the centre of Europe and crossing point of three corridors and with many large manufacturing companies, connectivity is key. The city should be easily connected with the region and the rest of Europe by road, water and rail. It is important to have redundant options to back up a failure of transport modes (accident on road or rail or low water level in the rivers). These back-ups are also important for companies and commuters in case of closure of important infrastructure (Rhine bridges) due to maintenance works.
- *Opportunity of logistics.* Logistics can add value to the City of Mannheim (Logistic Oriented Development). Good initiatives such as the Green Logistic Park concept and the parcel collection point under the flyover (as a possible example) can add value. Bundling freight on a central point, can contribute to the reduction of freight transports through the city and to improving liveability in the city. Besides, the rail and waterborne transport are very important in and around Mannheim. New projects, such as the new rail track Frankfurt am Main – Mannheim/Stuttgart, should – from a Mannheim perspective - be connected to Mannheim Hbf for passenger trains and to the marshalling yard (Rangierbahnhof) for a freight capacity increase .

### 5.2 Governance

- *Urban node and corridor perspective on the TEN-T network.* The urban node Mannheim is well aware of its central location on the European corridors. For Mannheim transport and logistics are important for already a long time. This means Mannheim is focussed on the (inter)national / corridor perspective. However, Mannheim believes the importance of the urban nodes should be more visible on the corridor and EU level as the EU is focussing mostly on the core network (corridors). Besides, the smaller nodes which are not located on the European core network corridors are often of big importance for freight and logistics as well as for passenger transport.

This can be by taking their share in transport flows, but also as a matter of origin and destination for the bigger flows. The EU should pay more attention to the situations in the urban nodes.

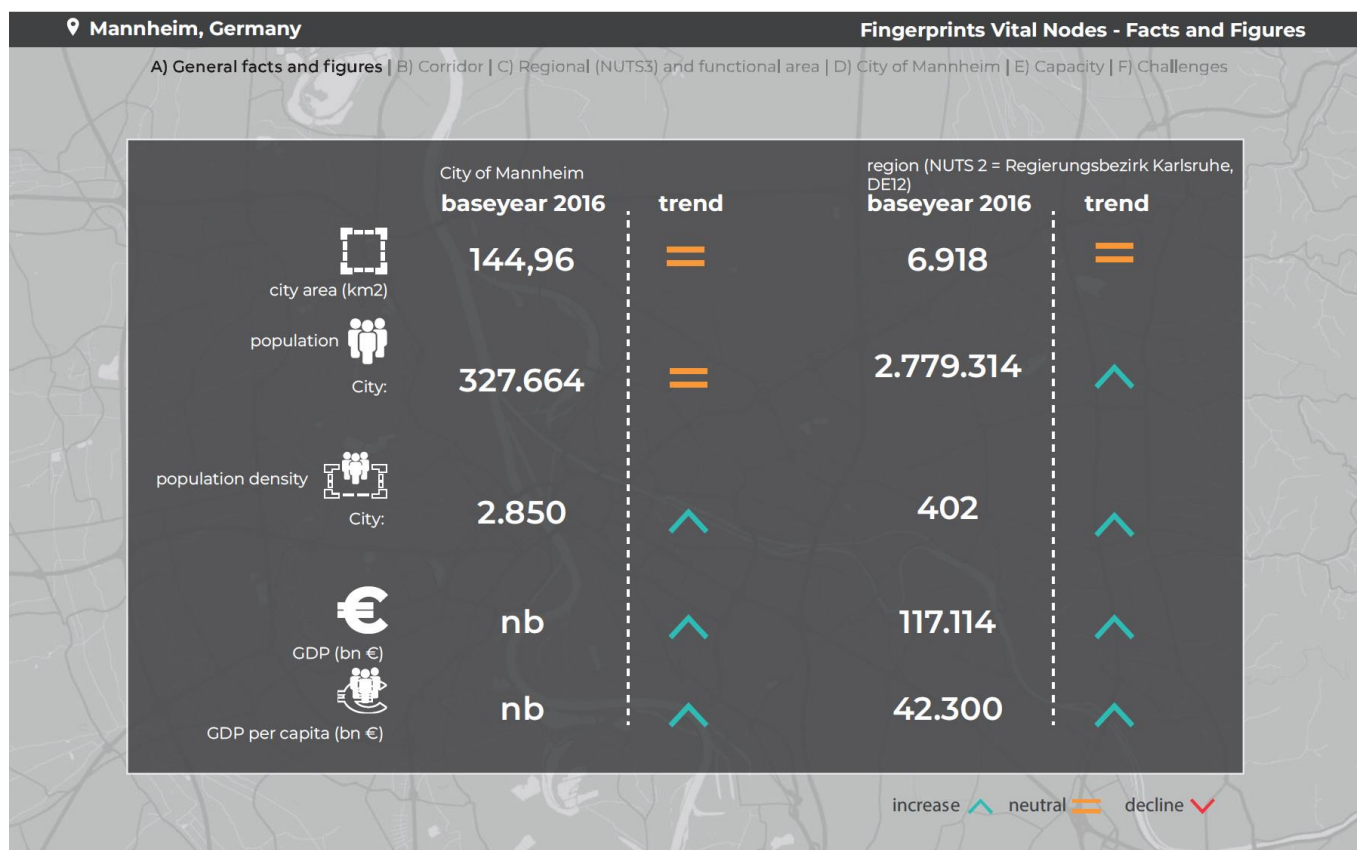
- *Metropolregion Rhein-Neckar:* Heidelberg, Mannheim and Ludwigshafen as well as the surrounding smaller towns have successfully established regional planning governance embodied in the Metropolregion Rhein-Neckar. Many challenges and solutions were discussed keeping the regional level in mind. This enables Mannheim to develop a truly regional node, which is critical to connect the hinterland of the node, particularly for nodes in smaller cities with a strong polycentric regions. The Rhein-Neckar model might be a good practise to replicate in other urban nodes, also because the model overcame state borders, which could be up scaled to national borders.
- *Difference in FUA statistics.* The FUA for an urban node is not identical for freight and passenger traffic. Mannheim is for example the most important node for passenger traffic, but for freight they form a combined node with Heidelberg and Ludwigshafen. The current definition of regions (NUTS 3) is too small to define the functional urban area of Mannheim. This shows the differences between the world of spatial planning and logistics, not necessarily covering the same regional areas. Besides, not all data is covered by the NUTS statistics, meaning there could be transport flows while not mentioned in NUTS.
- *Hindrance by international regulations and international cooperation.* Cooperation on international level and EU regulations seems necessary to solve rail noise problems, to arrange detours, to connect different (electrification) systems and to align timetables for trains.
- *Future EU CEF funding.* The EU has invested a lot in the TEN-T corridors. But the bottlenecks are currently in (and around) the nodes. A multimodal, well-functioning, node is very important, for the local, regional as well as corridor level. The nodes form the core of a network, they ensure whether the total network will function properly. For this reason the future EU CEF funding should focus more on the nodes and smaller projects on the local/regional level, besides funding on corridor and national level.

# Attachments

1. **Fingerprint urban node Mannheim (info graphic)**
2. **Good practices with validation of scores**
3. **Map corridor level**
4. **Map regional / urban node level**
5. **Map city level**
6. **List of participants Mannheim workshop**
7. **Programme workshop urban node Mannheim**



## 1. Fingerprint urban node Mannheim (info graphic)

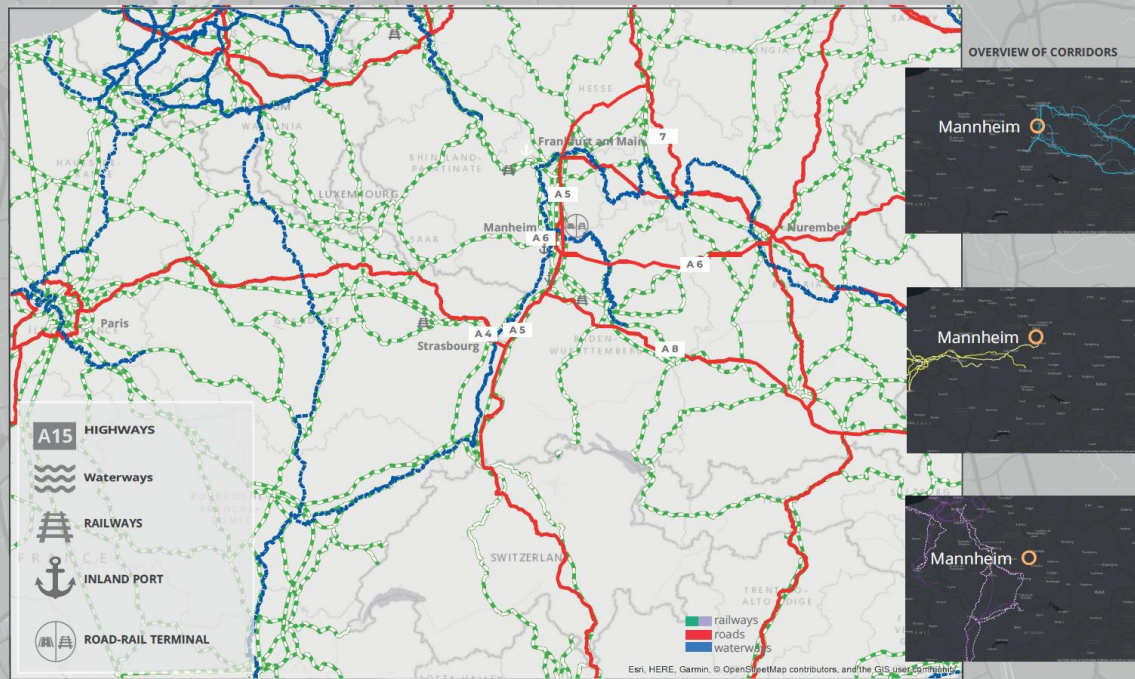




📍 **Mannheim, Germany**

**Fingerprints Vital Nodes - Facts and Figures**

A) General facts and figures | **B) Corridor** | C) Regional (NUTS3) and functional area | D) City of Mannheim | E) Capacity | F) Challenges



📍 **Mannheim, Germany**

**Fingerprints Vital Nodes - Facts and Figures**

A) General facts and figures | B) Corridor | C) **Regional (NUTS3) and functional area** | D) City of Mannheim | E) Capacity | F) Challenges

**IMPORTANT CHARACTERISTICS:**

As Mannheim is located close to the border of Baden Württemberg with the states of Hessen and Rheinland Pfalz policy coordination on this level is essential as well as with the neighbour city of Ludwigshafen to successfully tackle joint challenges.

**INDICATIVE FUA**



FREIGHT INFRASTRUCTURE baseyear 2016				
	Number	ha	mton	TEU
Road-Rail terminal	1 =	119 ^	^	100.000 ^
Air terminal	0 =	0 ^	0 ^	na ^
Trimodal terminal	2+2* ^	1+11 ^	1,1 ^	117.000 ^

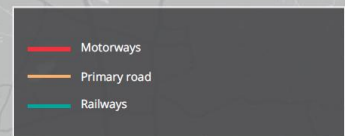
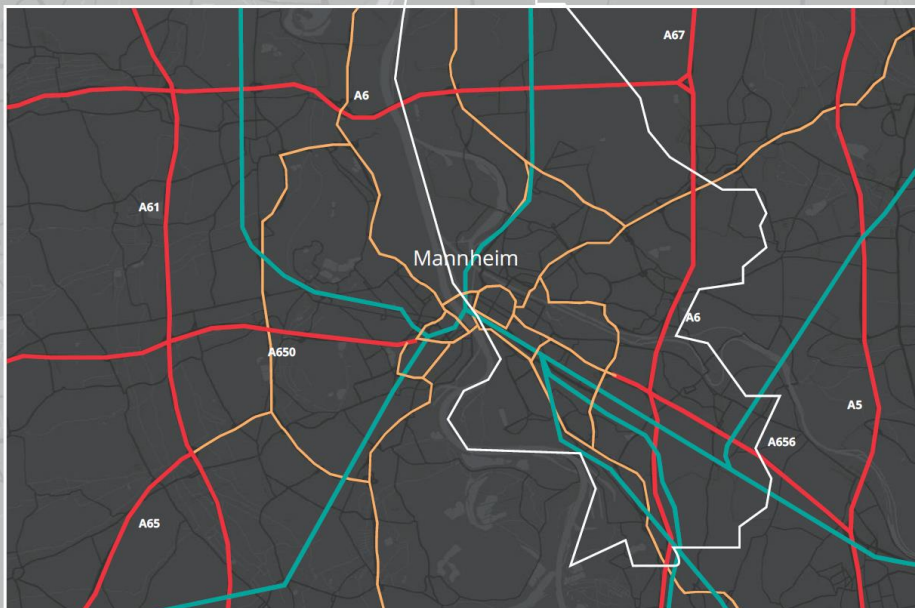
\*2+2 = Four inland terminals, of which two trimodal (Marshalling yard is no terminal (with for instance loading of containers or trailers) as such so not included)

increase ^ neutral = decline v

📍 Mannheim, Germany

Fingerprints Vital Nodes - Facts and Figures

A) General facts and figures | B) Corridor | C) Regional (NUTS3) and functional area | D) City of Mannheim | E) Capacity | F) Challenges



📍 **Mannheim, Germany**

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**CAPACITY RAIL**

Expansion of railway capacity in- and around Mannheim is listed among the major



**CAPACITY WATER**

No major capacity issues observed



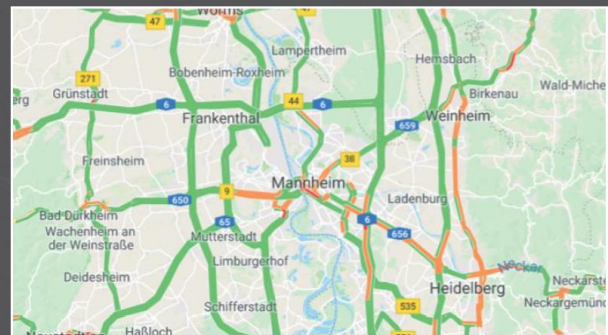
**CAPACITY AVIATION**

Mannheim City Airport sees no major air freight movement



**CAPACITY ROAD**

Average intensity road on evening peak:

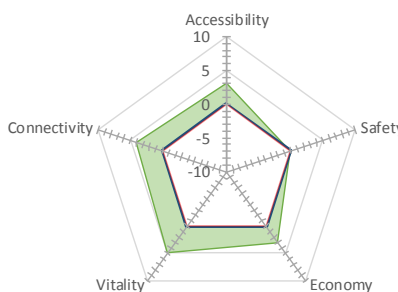




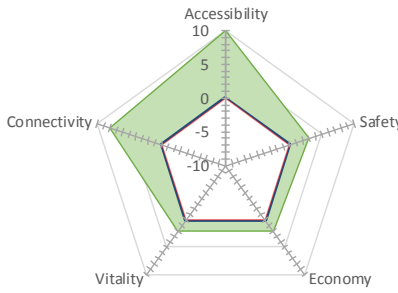
## CHALLENGES

- Renovation and maintenance of land bridges Rhine bridges in Mannheim/Ludwigshafen.
- Dealing with connectivity and capacity problems
- Rail Noise
- Connecting to the Chinese Silk Road from Chongqing to Duisburg
- Challenges of brownfield redevelopment of former US Army areas

## 2. Good practices with validation of scores

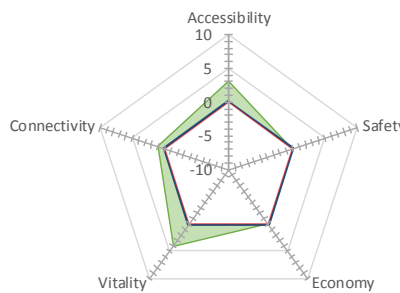
Solutions name	Green Logistics Park	
Type of solution	Adding a terminal	
Node	Mannheim	
Link or contact	n.a.	
Investment costs	n.a.	
Description	The concept of the logistic park is to create a terminal system to consolidate all goods at one point. The size of the terminal depends on the number of companies and numbers of goods and is flexible. In the surrounding of Mannheim there are some US military bases that could be used for such developments. One of these bases (Coleman barracks) is located around the A6 in the north of Mannheim, close to the A67. Via road goods can be transported to the terminal with the current large trucks, which forms a transshipment location to factories and costumers in Mannheim. Shipping the goods to the factories is planned to be done by a combined (electric) shuttle in the future. In this way the number of (large) trucks crossing the city will be reduced. Besides, the exhaust of emission will be reduced as electric trucks/shuttles will connect the city centre and factories with the logistic-hub. Although the concept is good, the intended location is not available (yet).	
Impact overview		
Impact criteria	Questions	Answer
A Accessibility	The solution impacts the chosen modality of the flows	1
	The solution impacts the route of the flows	1
	The solution impacts the volume of the flows	0
	The solution impacts the timing of the flows	0
	The solution impacts the available infrastructure capacity	1
B Safety	The solution impacts the number of pedestrian casualties	0
	The solution impacts the number of cyclist casualties	0
	The solution impacts the number of motorised vehicle casualties	0
	The solution impacts the external safety of dangerous goods transport	0
	The solution impacts the external safety of warehousing operations	0
C Economy	The solution impacts the attractiveness of the local scale (city) of the Node for investments (value captur	1
	The solution impacts the attractiveness of the FUA from logistics perspective of the Node for investmen	1
	The solution impacts the price of living in urban areas (socio economic)	0
	The solution impacts synergies with other sectors	1
	The solution impacts the GDP	0
D Vitality	The solution impacts the air quality	1
	The solution impacts the noise levels	1
	The solution impacts health of citizens	1
	The solution impacts the ease of moving in the city for citizens	1
	The solution impacts the quality of living	1
E Connectivity	The solution impacts the connection between the city and the functional urban area from a mobility p	1
	The solution impacts the connection between the city and the functional area from a logistics perspec	1
	The solution impacts the connection with other Nodes on the Corridor	0
	The solution impacts the connection with other TEN-T Corridors	1
	The solution impacts the connection with the comprehensive network	1

2 strong positive impact 1 Positive impact 0 No substantial impact -1 Negative impact -2 strong negative impact

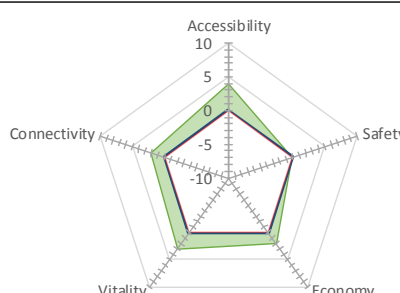
Solutions name	BASF factory logistics around Ludwigshafen/Mannheim		
Type of solution	Optimizing infrastructure		
Node	Mannheim		
Link or contact	<a href="https://www.basf.com/de/de/company/about-us/sites/ludwigshafen/the-site/news-and-media/news-releases/2017/05/p-17-183">https://www.basf.com/de/de/company/about-us/sites/ludwigshafen/the-site/news-and-media/news-releases/2017/05/p-17-183</a>		
Investment costs	n.a.		
Description	BASF operates a major site in Ludwigshafen (adjacent Mannheim). This facility generates major economic spinoff for the wider region but also major traffic flows. Although already 70% of all volumes on the Ludwigshafen site is transported via Rail and IWT further improvements are made by BASF. Currently 2100 trucks visit the factory site each day. Both night deliveries from a consolidation hub to the factory site are researched as well as improvements on site. Among the major innovations is a special BASF intermodal tankcontainer BT-C with a 66 tonnes capacity to replace the current tank cars and special AGV's to more efficiently transport these containers within the factory.		
Impact overview			
<b>Impact criteria</b>	<b>Questions</b>	<b>Answer</b>	
<b>A Accessibility</b>	The solution impacts the chosen modality of the flows	2	
	The solution impacts the route of the flows	2	
	The solution impacts the volume of the flows	2	
	The solution impacts the timing of the flows	2	
	The solution impacts the available infrastructure capacity	2	
<b>B Safety</b>	The solution impacts the number of pedestrian casualties	0	
	The solution impacts the number of cyclist casualties	0	
	The solution impacts the number of motorised vehicle casualties	0	
	The solution impacts the external safety of dangerous goods transport	2	
	The solution impacts the external safety of warehousing operations	1	
<b>C Economy</b>	The solution impacts the attractiveness of the local scale (city) of the Node for investments (value capture)	0	
	The solution impacts the attractiveness of the FUA from logistics perspective of the Node for investment	0	
	The solution impacts the price of living in urban areas (socio economic)	0	
	The solution impacts synergies with other sectors	1	
	The solution impacts the GDP	1	
<b>D Vitality</b>	The solution impacts the air quality	0	
	The solution impacts the noise levels	0	
	The solution impacts health of citizens	1	
	The solution impacts the ease of moving in the city for citizens	1	
	The solution impacts the quality of living	0	
<b>E Connectivity</b>	The solution impacts the connection between the city and the functional urban area from a mobility perspective	0	
	The solution impacts the connection between the city and the functional area from a logistics perspective	2	
	The solution impacts the connection with other Nodes on the Corridor	2	
	The solution impacts the connection with other TEN-T Corridors	2	
	The solution impacts the connection with the comprehensive network	2	

2 strong positive impact 1 Positive impact 0 No substantial impact -1 Negative impact -2 strong negative impact

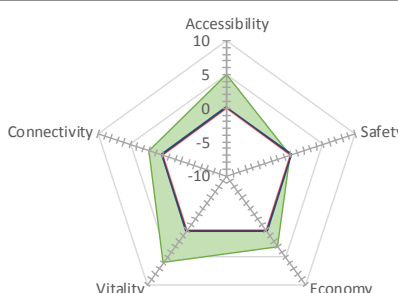


Solutions name	Bicycle highway	
Type of solution	Adding infrastructure	
Node	Mannheim	
Link or contact	n.a.	
Investment costs	n.a.	
Description	A solution to improve air quality and connectivity and to contribute to the capacity problems on the roads and in the public transport, is the plan for a bicycle highway between Mannheim and Heidelberg. This highway will be one of the first ones for bicycles in Baden-Württemberg. In the core area of the Rhein-Neckar region it is a major challenge for the infrastructure to transport all commuters. The aim of the bicycle highway is to reduce the traffic intensity on the main transport routes. It is seen as an innovative traffic concept. Identical to this idea is the already existing bicycle highway between Arnhem and Nijmegen in the Netherlands. Aim of this highway was also to give a fast, healthy, alternative to connecting in the traffic jams.	
Impact overview		
Impact criteria	Questions	Answer
A Accessibility	The solution impacts the chosen modality of the flows	1
	The solution impacts the route of the flows	0
	The solution impacts the volume of the flows	1
	The solution impacts the timing of the flows	0
	The solution impacts the available infrastructure capacity	1
B Safety	The solution impacts the number of pedestrian casualties	0
	The solution impacts the number of cyclist casualties	0
	The solution impacts the number of motorised vehicle casualties	0
	The solution impacts the external safety of dangerous goods transport	0
	The solution impacts the external safety of warehousing operations	0
C Economy	The solution impacts the attractiveness of the local scale (city) of the Node for investments (value captur	0
	The solution impacts the attractiveness of the FUA from logistics perspective of the Node for investment:	0
	The solution impacts the price of living in urban areas (socio economic)	0
	The solution impacts synergies with other sectors	0
	The solution impacts the GDP	0
D Vitality	The solution impacts the air quality	1
	The solution impacts the noise levels	0
	The solution impacts health of citizens	1
	The solution impacts the ease of moving in the city for citizens	1
	The solution impacts the quality of living	1
E Connectivity	The solution impacts the connection between the city and the functional urban area from a mobility p	1
	The solution impacts the connection between the city and the functional area from a logistics perspec	0
	The solution impacts the connection with other Nodes on the Corridor	0
	The solution impacts the connection with other TEN-T Corridors	0
	The solution impacts the connection with the comprehensive network	0

2 strong positive impact 1 Positive impact 0 No substantial impact -1 Negative impact -2 strong negative impact

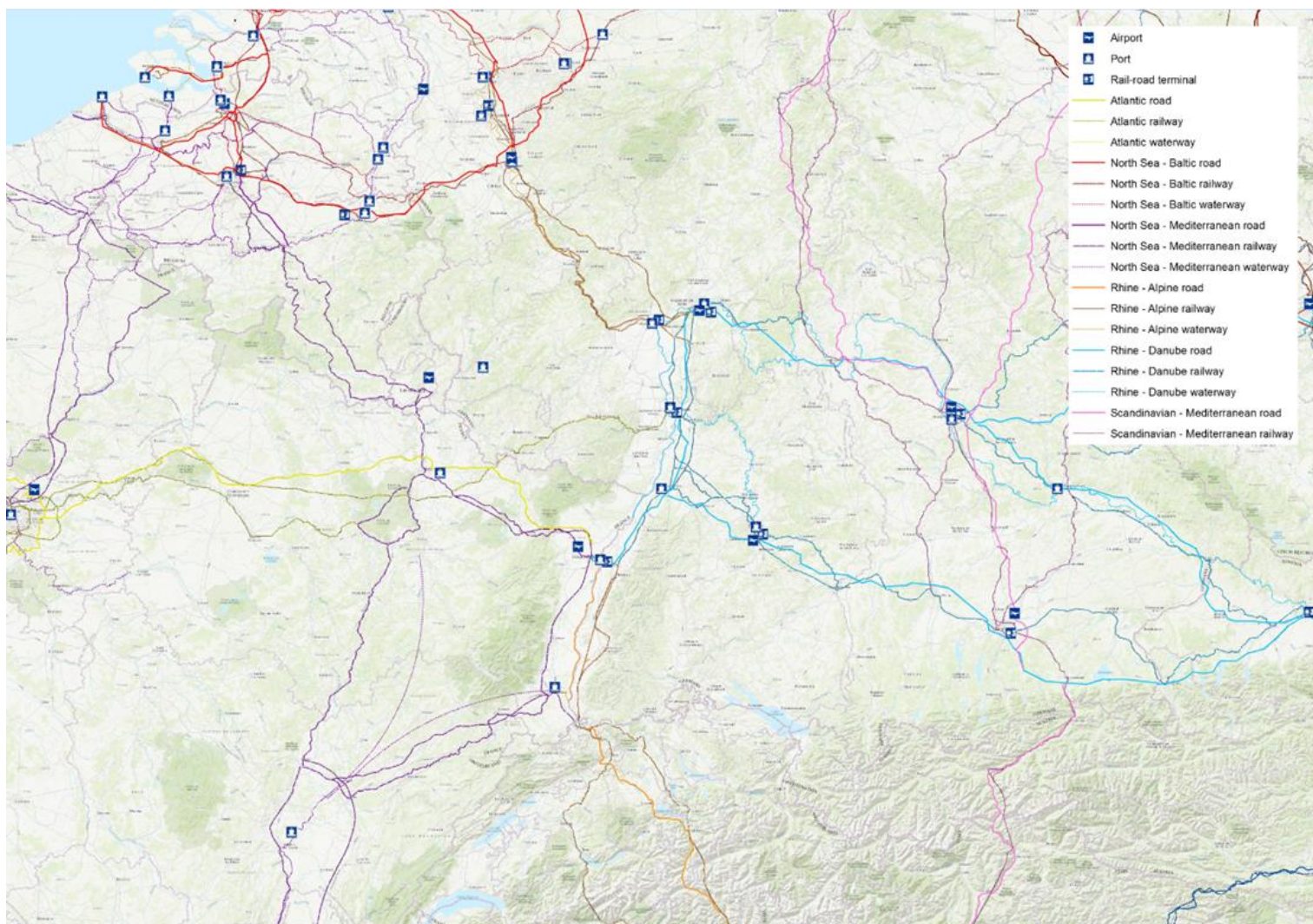
Solutions name	BASF cable car	
Type of solution	Adding a mode	
Node	Mannheim	
Link or contact		
Investment costs	n.a.	
Description	BASF, one of the biggest chemical producing companies of the world, is located on the western riverbank of the Rhine in Ludwigshafen. However, it has also a plant on the eastern side of the river, next to the port area of Mannheim. To reduce their transport to the port by trucks crossing the Rhine via the current bridges, they thought about an innovative transport solution: connecting their plants by a cable car. There are some issues for doing this: freight crosses the Rhine while ships are passing through the Rhine, meaning safety related issues. Although they are now looking at other alternatives, the idea of shifting from conventional transports by many trucks to other modes, reducing traffic on roads, is perceived interesting. One of the ideas that was put forward was to build a cable car from the Gartenschau location to the city centre of Mannheim and possibly further crossing	
Impact overview		
Impact criteria	Questions	Answer
<b>A Accessibility</b>	The solution impacts the chosen modality of the flows	1
	The solution impacts the route of the flows	1
	The solution impacts the volume of the flows	1
	The solution impacts the timing of the flows	0
	The solution impacts the available infrastructure capacity	1
<b>B Safety</b>	The solution impacts the number of pedestrian casualties	0
	The solution impacts the number of cyclist casualties	0
	The solution impacts the number of motorised vehicle casualties	0
	The solution impacts the external safety of dangerous goods transport	0
	The solution impacts the external safety of warehousing operations	0
<b>C Economy</b>	The solution impacts the attractiveness of the local scale (city) of the Node for investments (value capture)	1
	The solution impacts the attractiveness of the FUA from logistics perspective of the Node for investment	1
	The solution impacts the price of living in urban areas (socio economic)	0
	The solution impacts synergies with other sectors	0
	The solution impacts the GDP	0
<b>D Vitality</b>	The solution impacts the air quality	2
	The solution impacts the noise levels	0
	The solution impacts health of citizens	1
	The solution impacts the ease of moving in the city for citizens	0
	The solution impacts the quality of living	0
<b>E Connectivity</b>	The solution impacts the connection between the city and the functional urban area from a mobility perspective	0
	The solution impacts the connection between the city and the functional area from a logistics perspective	2
	The solution impacts the connection with other Nodes on the Corridor	0
	The solution impacts the connection with other TEN-T Corridors	0
	The solution impacts the connection with the comprehensive network	0

2 strong positive impact 1 Positive impact 0 No substantial impact -1 Negative impact -2 strong negative impact

Solutions name	Spatial concept Blue village Franklin	
Type of solution	Spatial planning	
Node	Mannheim	
Link or contact	n.a.	
Investment costs	n.a.	
Description	<p>In the surrounding of Mannheim different US Army areas are located. Mannheim has different plans for these areas. For the Benjamin Franklin area a housing area is foreseen. It is called the ‘Blue Village Franklin’ and forms a ‘model project’ for sustainable spatial planning and mobility. The area is parallel to the B38, connecting to the highways A6 and A659. For this area spatial planning and mobility go hand in hand. The mobility plan is based on three pillars:</p> <ul style="list-style-type: none"><li>- An access and road network which deals with various mobility modes and treats equal (focus on people);</li><li>- Well-organized public transport (low-emission);</li><li>- Additional a sharing system for bicycles and cars, autonomous driving and attractive services. One of these services is the mobility-app to make a multimodal transport approachable. This app shows personal mobility advices and for the inhabitants of this area mobility offers are available. This idea has some concepts of Mobility as a Service.</li></ul>	
Impact overview		
Impact criteria	Questions	Answer
A Accessibility	The solution impacts the chosen modality of the flows	1
	The solution impacts the route of the flows	1
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	The solution impacts the timing of the flows	1
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B Safety	The solution impacts the number of pedestrian casualties	0
	The solution impacts the number of cyclist casualties	0
	The solution impacts the number of motorised vehicle casualties	0
	The solution impacts the external safety of dangerous goods transport	0
	The solution impacts the external safety of warehousing operations	0
C Economy	The solution impacts the attractiveness of the local scale (city) of the Node for investments (value captur	1
	The solution impacts the attractiveness of the FUA from logistics perspective of the Node for investmen	0
	The solution impacts the price of living in urban areas (socio economic)	0
	The solution impacts synergies with other sectors	2
	The solution impacts the GDP	0
D Vitality	The solution impacts the air quality	1
	The solution impacts the noise levels	1
	The solution impacts health of citizens	1
	The solution impacts the ease of moving in the city for citizens	2
	The solution impacts the quality of living	1
E Connectivity	The solution impacts the connection between the city and the functional urban area from a mobility p	2
	The solution impacts the connection between the city and the functional area from a logistics perspec	0
	The solution impacts the connection with other Nodes on the Corridor	0
	The solution impacts the connection with other TEN-T Corridors	0
	The solution impacts the connection with the comprehensive network	0

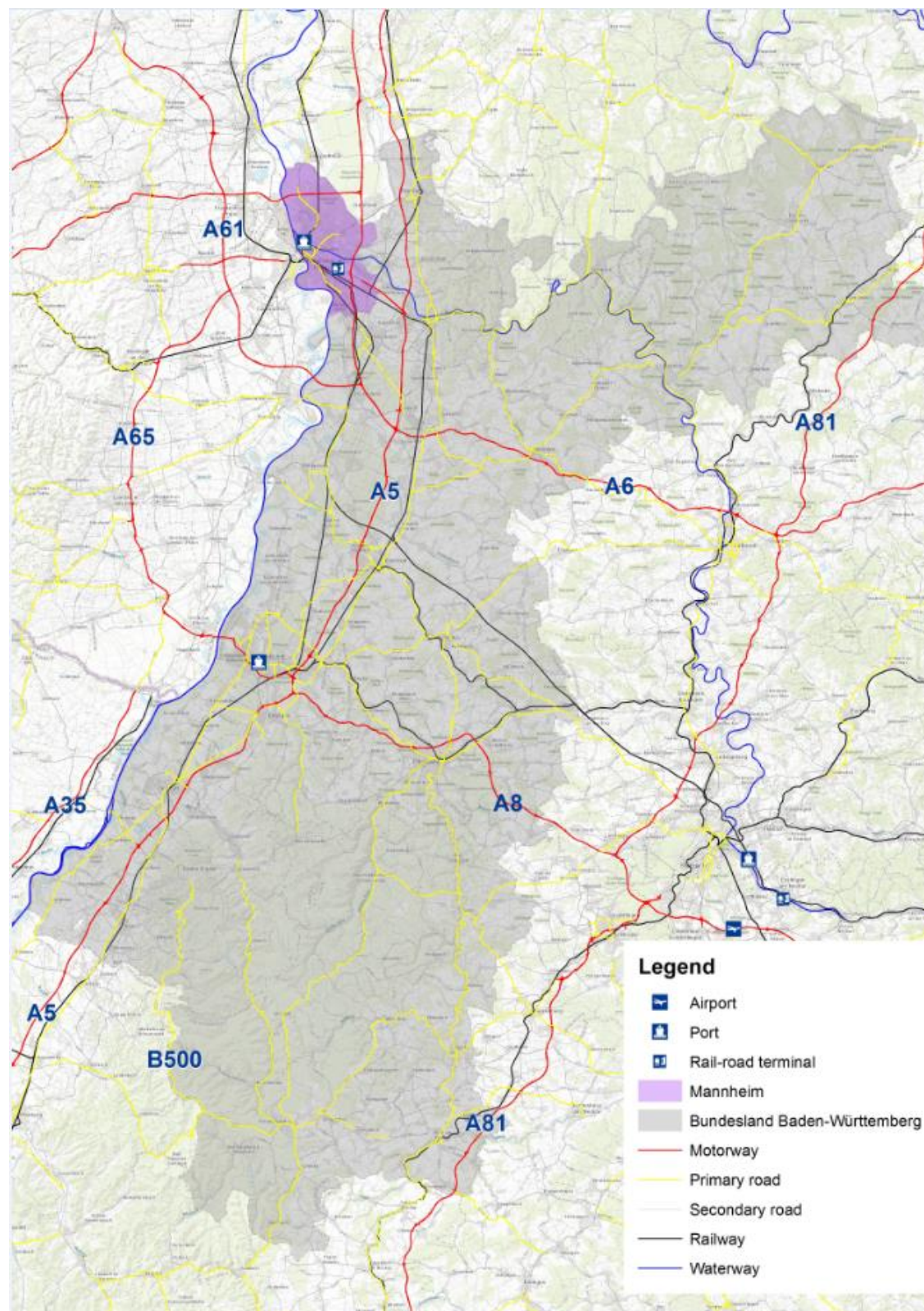
2 strong positive impact 1 Positive impact 0 No substantial impact -1 Negative impact -2 strong negative impact

### 3. Map corridor level

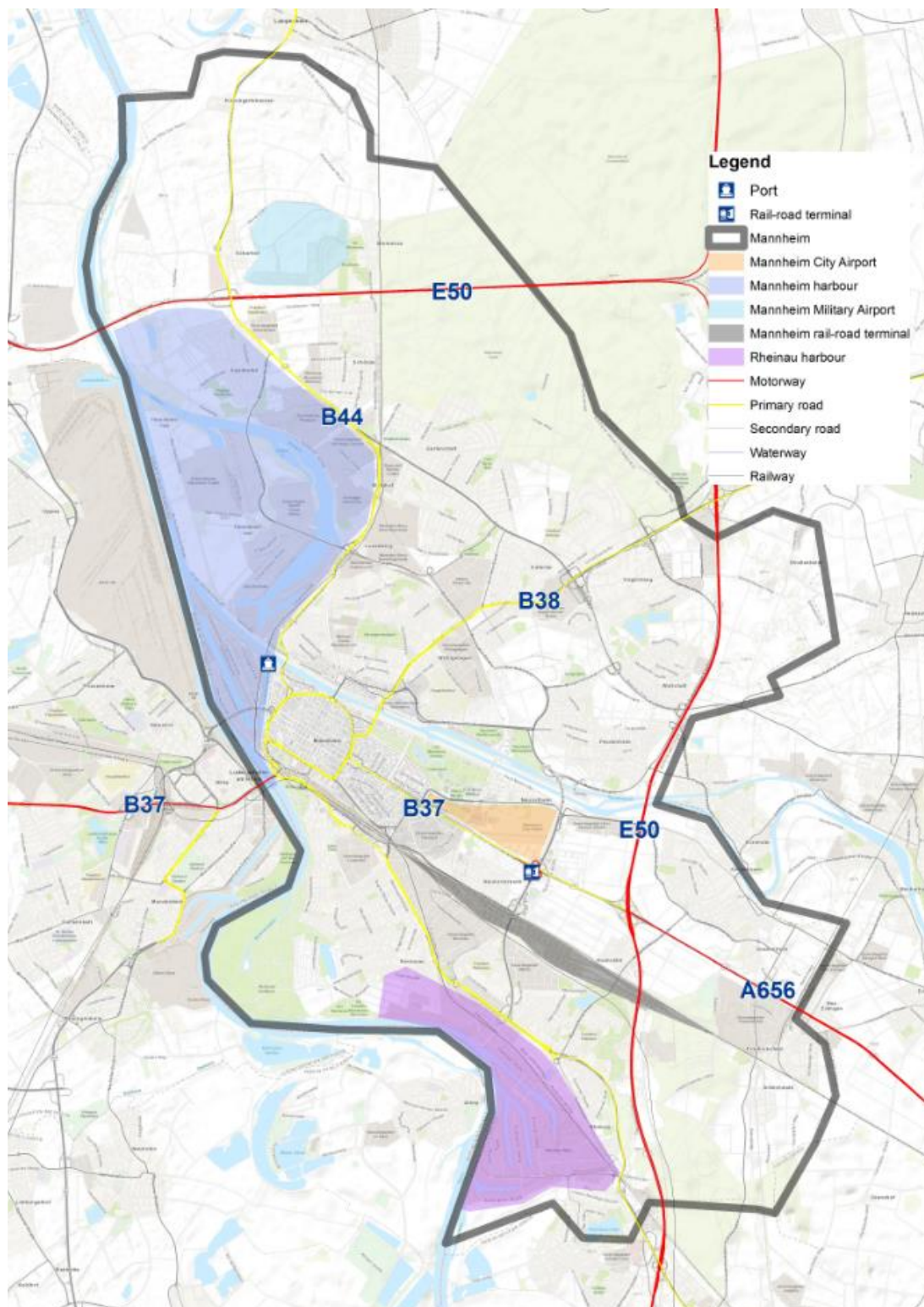




#### 4. Map regional / urban node level



## 5. Map city level





## 6. List of participants Mannheim workshop

Representative/Person		
Last name	First name	Stakeholder/organisation
Specht	Christian	Stadt Mannheim
Hofen-Stein	Alexandre	Stadt Mannheim
Pins	Georg	Stadt Mannheim
Castell		Hafen Mannheim
Satzinger	Thomas	Verband Region Rhein-Neckar
Schröder	Michael	DHWB Mannheim
Saalbach	Jörg	EGTC (also part of the Vital Nodes consortium)
Eberhard	Ulrich	BASF
Bross	Dagmar	Industrie und Handelskammer
Vital Nodes Consortium:		
Linssen	Raymond	Rijkswaterstaat
Linden, van der	Kevin	Rijkswaterstaat
Meijlof	Steven	Rijkswaterstaat
Jong, de	Onno	Ecorys
Arnd	Michel	Polis



## 7. Programme workshop urban node Mannheim

09.20 – 09.30	Welcome
09.30 – 10.00	<b>Moderator:</b>  Start, welcome and introduction round - Welcome - Short introduction to the Vital Nodes project, including goal of the Vital Nodes project and goal of this workshop - Programme workshop
10.00 – 10.15	Presentation “Fingerprint Mannheim” - Facts and Figures - Challenges and barriers
10.15 – 10.30	Break
10.30 – 12.00	Working on Mannheim’s challenges - Interactive discussion on the challenges of the urban node Mannheim
12.00 – 12.30	Lunch
12.30 – 13.15	Working on Mannheim’s challenges - Interactive discussion on solutions, drivers & barriers and possible impacts
13.15 – 13.50	What is the added value for Europe, what do we need and what can we recommend? - Interactive discussion on “Integrating urban node Mannheim in the TEN-T network”
13.50 – 14.00	Wrap up by the moderator and follow-up
14.00 –	Informal networking