

Spoorzone Delft

Programme of Requirements

On the road to the decision paper

2002 November 26 Th

On the road to the Decision Paper

Programme of Requirements

Visualisation of models in Decision Paper Area Development Spoorzone

1. Introduction

June 28th 2002 the Steering Committee Spoorzone Delft has decided to examine more closely four models of railway tunnels. According to the “Procesovereenkomst” (Process Agreement) undersigned by the public parties and to the Starting Paper of the Plan Study approved by the Steering Committee, November 29th 2002, a decision will be taken of the Program of Requirement regarding the different tunnel models.

For each of the models the following aspects will be studied:

1. The vertical and horizontal alignment of the railway infrastructure
2. The location and functioning of the public transport transfer junction (railway station, bus, tramway, bicycle, pedestrians)
3. The costs of the (railway) infrastructure (railway tunnel, station, public transport transfer junction, bicycle parking, etc.)
4. The real estate programme (volume of the programme in the sense of housing, offices, etc.)
5. Main urban structure (connection of the area with surroundings, building masses, locations of functions)
6. Visualisation of the quality of the development possibilities in the Spoorzone by prof. Joan Busquets
7. Fixing of the real estate proceeds potential
8. Calculation of the costs of building site preparation and public space construction
9. Design of the integral exploitation of the area development (railway infrastructure and area development)
10. Conclusions and advice

In the current Programme of Requirements, both the process towards the elaboration of the Decision Paper and the programmatic conditions applicable to the different models will be formulated.

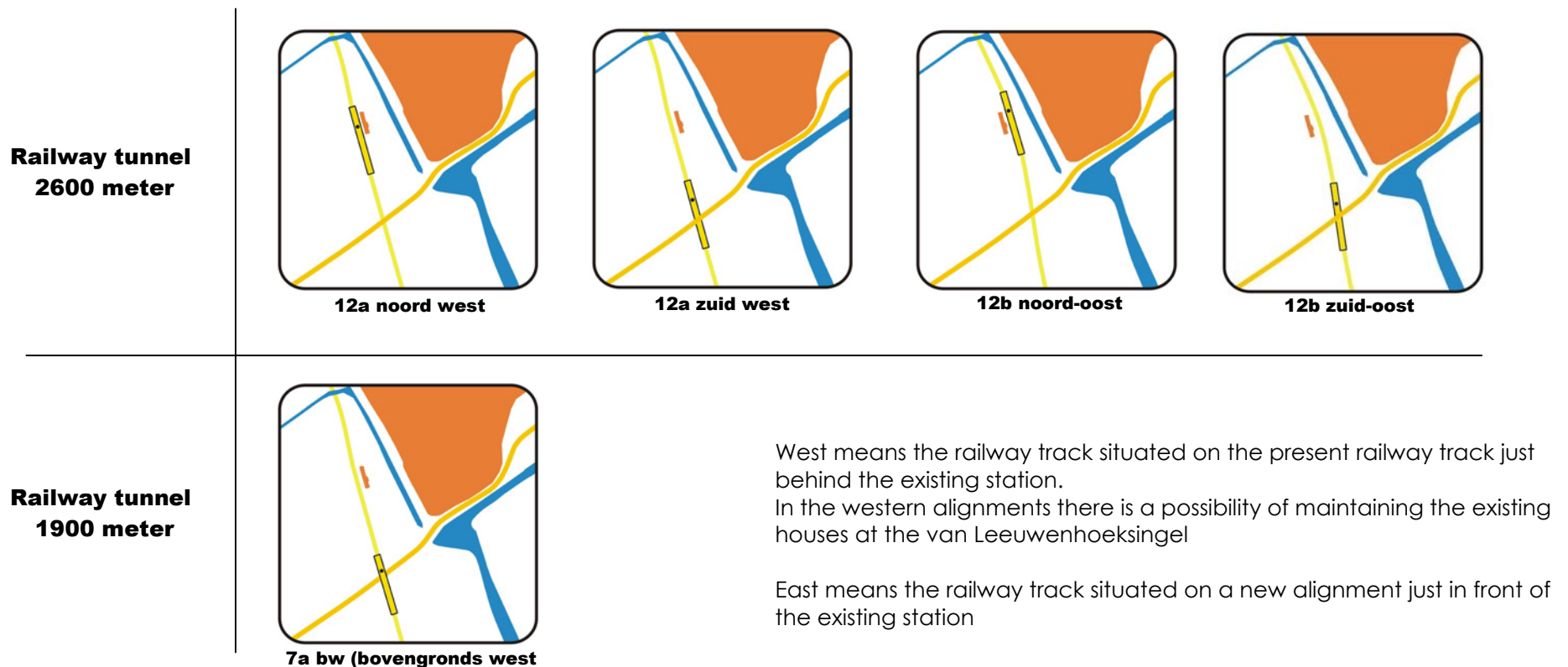
This document starts with the explanation of the planning and the moments of formal decision. The involvement of all participants will be stressed, both of public parties – Ministry of Transport, Public Works and Water Management, Ministry of Housing, Spatial Planning and Environment, the Province of Zuid-Holland, the regional authority Haaglanden and the Municipality of Delft – and of the directly involved inhabitants of the City of Delft.

2. Process and Planning the decision

It is an open door stating this is a complex process. It is complex for the large interconnection of varied data – technology, urban quality, costs, inhabitant's interests – and the necessity of decision-making using actual knowledge for a project that will define the face of (the geographical heart of) Delft for the coming 100 years. Criteria like "sustainable and future fastness" are the most important while selecting the alignment of the railway track (tunnel) and the urban design. Without any doubt, aspects like costs and proceeds will also play an important role. In this phase Railinfrabeheer studies three tunnel models with several Public transfer junctions (PTJ).

1. A 2,600 meters long tunnel on an easterly alignment (model 12b in the "Trechternotitie") with a north or south Public transfer junction.
2. A 2,600 meters long tunnel on a western alignment (mostly under the actual railway tracks, model 12a in the "Trechternotitie") with a north or south Public transfer junction.
3. A 1,900 meters long tunnel on a western alignment (mostly under the actual railway tracks, model 7a in the "Trechternotitie") with a Public transfer junctions on top of the Irenetunnel.

That leads us to the five next models for the Railway track and Public Transfer Junctions:



What will be dealt with in the Decision Paper?

One of next models will be selected in the decision paper.

Tracé	Stationslocatie	Woningen VLS*
2600 meter west	Noord	Behoud
		Sloop
	Zuid	Behoud
		Sloop
2600 m. oost	Noord	
	Zuid	
1900 m. west	Op Irenetunnel	Behoud
		Sloop

* Van Leeuwenhoeksingel

In the Decision Paper Railinfrabeheer will propose which model serves best the railway interests.

Not only the vertical and horizontal alignments of the railway tunnel are investigated, also the costs of every model are estimated.

In the mean time, the Municipality of Delft asked Joan Busquets to investigate and visualise the urban quality possibilities of each of the tunnel models. He will elaborate an urban design on main lines for each of the possible tunnel solutions under study by Railinfrabeheer and visualise the differences in urban quality for each of those tunnel models. Busquets will elaborate these plans using a programme of requirements fixed by the Municipality of Delft. Further on in this Paper the requirements are included. The requirements deal with the dimensions of the streets and the routes for public transport services to connect the public transport transfer junction with the city and with the volume of offices, housing and other functions to be built in the Spoorzone.

The costs related to Busquets' plans would be estimated as well as the expected proceeds from the building sites for offices and houses. Railinfrabeheer will make both a design and a costs estimate for the railway tunnel and the public transport transfer junction for each of the models.

This all will show the economic feasibility of the models by comparing all costs and proceeds added to the subsidies which are placed in disposition by the Ministry of Transport, Public Works and Water Management, Ministry of Housing, Spatial Planning and Environment, the Province of Zuid-Holland, the regional authority Haaglanden and the Municipality of Delft.

If the cost estimates do not balance with the proceeds and subsidies, all parties involved have to investigate together the way of closing this financial gap, as is stated in the so-called "Procesovereenkomst".

In the Decision Paper will be defined who can manage best the different costs and risks. This includes Delft's wish to co-operate with NS Vastgoed and Ballast Nedam for the real estate development, depending on an agreement with both private parties to be worked out later on main features (first agreement including the most important financial parameters).

Finally, in the Decision Paper the results of the Environmental Impact Assessment (an independent investigation into the most environmental friendly model) will be included.

Summary:

In this Program of Requirement and later on in the Decision Paper, all-important data will be presented in an interrelated way and conclusions will be drawn regarding the preferred railway tunnel model and urban development of the Spoorzone.

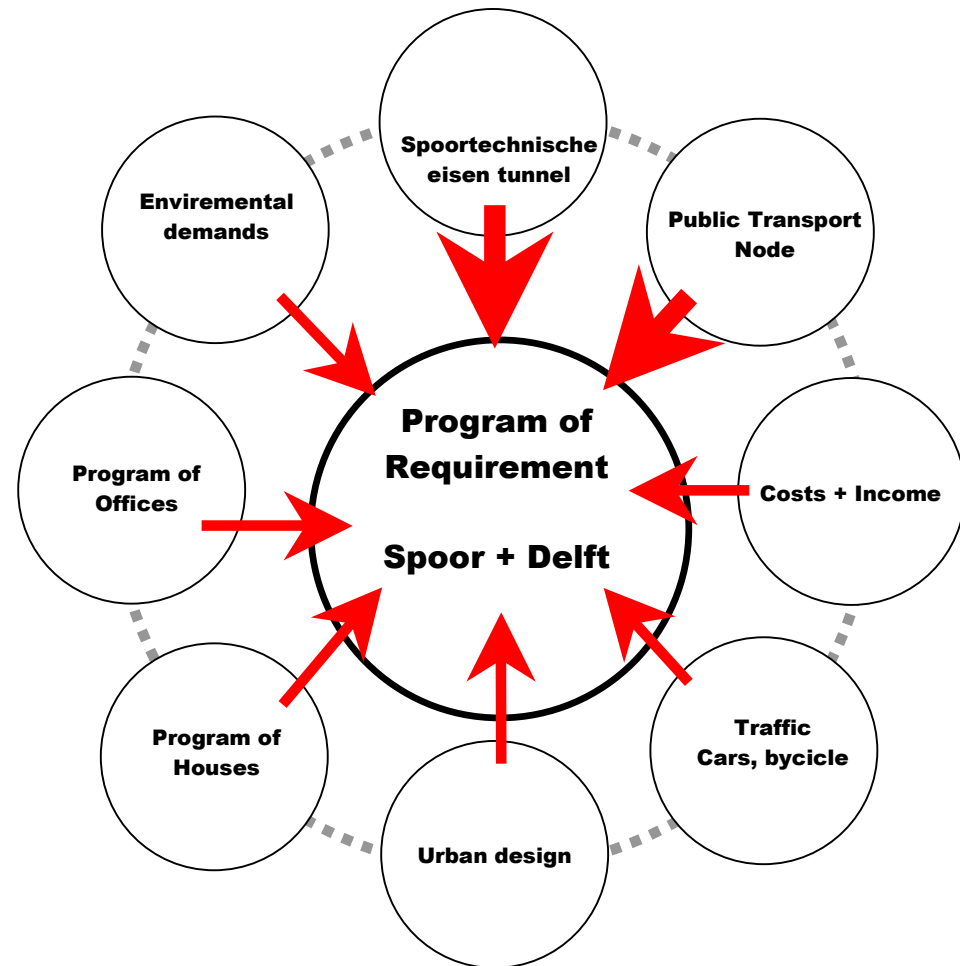
In the work process replacing the actual railway viaduct by a tunnel and the subsequent redevelopment of the Spoorzone, the coming months are decisive for the feasibility of the project as a whole.

In the Program of Requirement all the different conclusions of the studies are integrated in one Program. The different studies are included to give the elements of the requirements a better understanding. They are not a part of decision of the Program of Requirement.

In the Decision Paper all public parties involved will advise to both the Ministry of Transport, Public Works and Water Management and the Ministry of Housing, Spatial Planning and Environment which of the models for the new railway alignment will be nominated for an administrative "Projectbesluit".

All parties have the intention to decide if and when the railway viaduct will disappear.

It is expected that this decision will be made in the start of April/May 2003.



Moments of decision-making

The preparations of the decision include meetings of the official project team, the "Platform Spoor" (composed of bearers of local interests), de City Council Committee on Sustainability and the Steering Committee Spoorzone Delft during the months of November 2002, January and March 2003. These meetings are indicated in blue in the following planning sheet.

At that moment in November no discussions will be made between the different models.

In November a resolution about the proposed selection will be discussed based on data on the railway alignment, the location and type of (railway) station, bus stops, tramway routes, building programme, a visualisation of urban possibilities by Busquets, the costs and proceeds. This resolution will be discussed with representatives of city groups of interest in Delft, the City Council Committee and the Steering Committee including all public parties. All questions and remarks will be incorporated in the final version of the Decision Paper.

On the next page the timetable is presented

2003

oktober

november

december

januari

februari

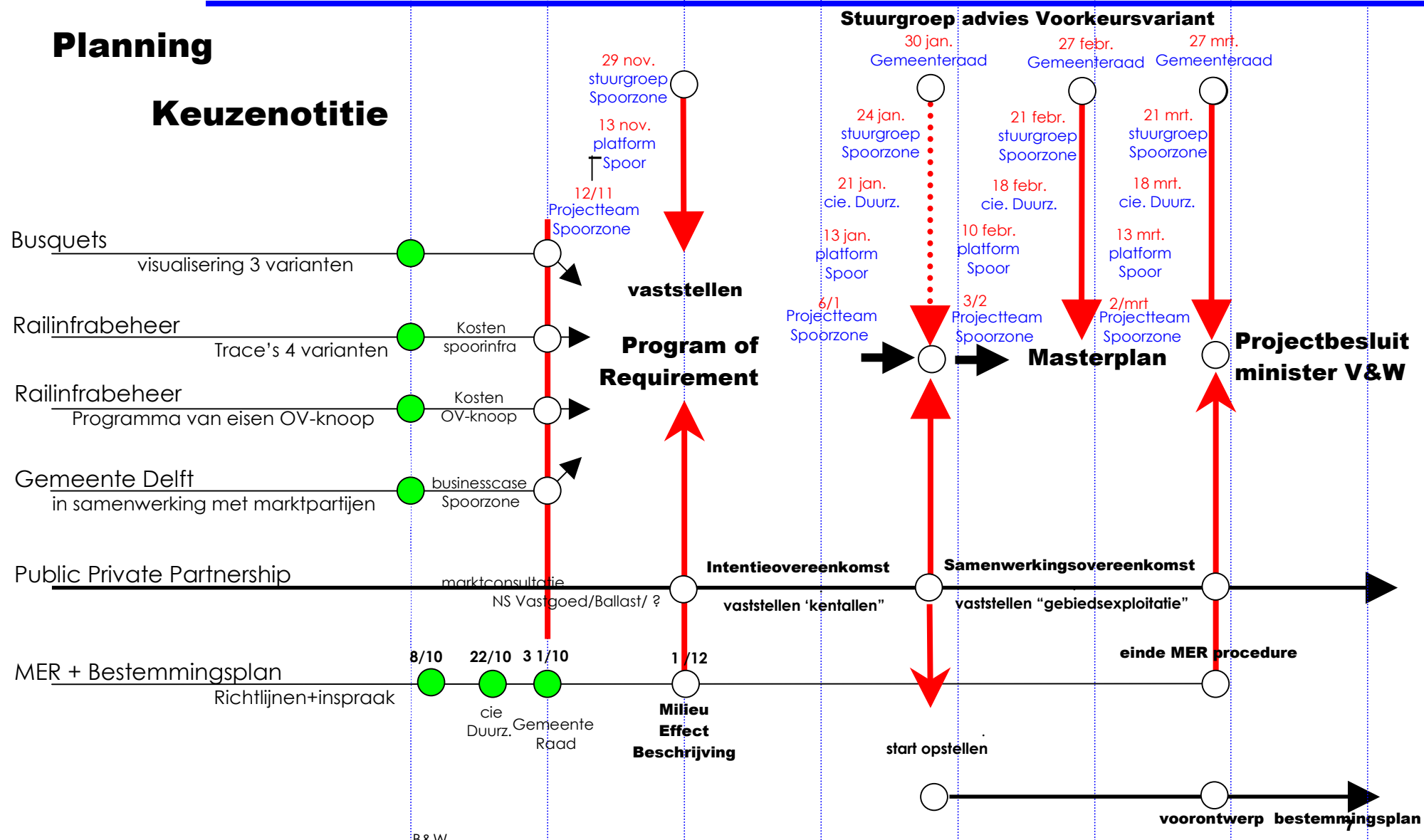
maart

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mei

Planning

Keuzenotitie



In January 2003, the Decision Paper will be discussed in the same way culminating, for the sake of the Municipality of Delft, in a formal decision by the City Council January 30th.

After that decision can be given full clarity about the necessity for demolishing the buildings along Van Leeuwenhoeksingel and Houttuinen. From that moment onwards an urban master plan suiting the preferred tunnel model and the "Projectbesluit" to be taken by the minister of Transport, will be prepared.

In March the master plan will be discussed in all groups, while the City Council will decide upon the master plan in its meeting on the 27th of March.

The official 'Projectbesluit' by the minister is expected in the start of April.

3. The location of the railway infrastructure (horizontal and vertical alignment)

Railinfrabeheer is examining three possible railway models. The horizontal and vertical alignments are optimised from a point of view of an efficient rail infrastructure. The latest drawings are, for interested people, to be consulted in the office of the Spoorzone area, at Westvest 41 Delft

4. The situation and possible Public Transport transfer junction

Assigned by Railinfrabeheer, the Dutch architect Benthem Crouwel has studied five functional transfer junctions. Benthem Crouwel has presented the results to Joan Busquets and he will, considering all demands, translate these functional models into an urban design.

The functional results of the Benthem Crouwel study is, for interested people, to be consulted in the office of the Spoorzone area, at Westvest 41 Delft

5. Real estate programme (housing and offices programme)

Kolpron Consultants and Jones Lang & Lasalle Consultants were asked to conduct market surveys for the demands for offices and houses in the Spoorzone until the year 2015.

Market demand for Offices

Jones as "moderate in quantity and fairly high in quality" has typified the market perspective. So, yearly about 3.000 m² of offices can be built to meet the market demand that is locally oriented. Qualitatively speaking for the local market the top segment and for the regional market the upper part of the middle segment is to be set.

From a spatial point of view, chances are restricted to an office environment of a limited scale – 50,000 m² (including the 25.000 m² of the public office of the municipality of Delft).

It is advised to develop flexible building concepts of about 4,000 m² each in 5 to 7 floors.

It is advised to develop a building of 4,000 to 5,000 m² accepting the market risks.

The critical mass for an office environment is estimated at about 25,000 m² in the first phase.

The conclusion of Jones Lang and LaSalle is that in a realistic scenario for the PTD-area an office environment is possible with a volume of about 40,000 m². The market can absorb from the year 2007 onwards yearly about 3,000 m² of offices.

The study of LaSalle Jones is, for interested people, to be consulted in the office of the Spoorzone area, at Westvest 41 Delft

Market for houses

Kolpron Consultants has carried out a market research into the demand for houses taking into account the typology and the yearly sales. . Generally speaking, the Delft' market is willingly for a great variety of apartments and 'ground bound houses. The requirements of the housing programme are written down for each sub area in the Spoorzone.

Parking capacity

The development of the offices, the residential houses and the park and ride function of the PT Transfer junction, requires a lot of parking places.

The policy of the City of Delft is to create as much parking places as possible and affordable, and to meet the minimum requirement The programme is 1,3 till 1,8 places for each residential house and one parking place for each 100m² floor space office-square.

For park and Ride the minimum requirement are 300 places.

So, in the area south of the Bolwerk with a total program of 250.000-m² bv.o, at least 2880 places have to be created (500 for the offices, 2080 for the residential houses and 300 P+R). The maximum amount in that case is 3680 places (500 for the offices, 2880 for the residential houses and 300 P+R).

In the Phoenixstreet another 450 parking places have to be created to replace the actual parking places under the viaduct.

Most of the parking places will be in parking garages, because there will be no space in the open air. These parking places should be located as close as possible to and preferably underneath the related functions. Moreover, the costs for these places must be charged fully to the future users. Near the station an underground parking garage in 3 levels can be constructed making the station and this garage in one building process. In this way, taking into account the depth of the tunnel, three levels with 700 parking places each can be achieved. On top of the parking garage houses and/or offices can be constructed.

Overall real estate program

The conclusion with regard to market demand for real estate in the Spoorzone indicates that there is a great demand for high priced housing projects and only a small demand for offices.

In co-ordination with market parties and based on these studies, the Municipality of Delft formulated a real estate programme suiting the scenario with a 2,600 meters long railway tunnel. The main features of this programme are:

1. 50,000-m² gross floor space for offices, of which 25,000 m² will be developed by the Municipality of Delft in behalf of a new City Hall. The delivery of the new City Hall is due 2008. The other offices destined for the market will be offered in phases of about 5,000 m² per year.

2. A minimum of 200.000 m² of residential houses. With a mean size of 125-m² floor-space for each house, that will lead to at least 1600 houses. The major part in the market sector in the middle and top segment.
The Municipality of Delft wishes to develop also about 150 houses in the social sector.
3. It is desired to develop at least 25% "ground bound" houses. The rest will be apartments. The total program – ground bounded houses and apartments - has an average floor space of 125 m².
The car parking must be designed in constructed solutions. For houses applies a norm of 1.3 till 1,8 parking place per house in lockable parking garages exclusively for house owners. These parking places should be situated as close as possible to the houses, preferably directly beneath the houses.
The number of parking places in the area south of the Bolwerk is 2880 till 3680 places. A double use of a part of the parking places will be investigated.
4. In the Spoorzone area, connected to the current station building from the 19th century, a middle sized, meeting rooms, bar and restaurant.

Phoenixstreet

No additional real estate will be constructed in the Phoenixstreet.

Only public space has to be refurbished after the construction of the railway tunnel. Here the vertical alignment of the railway tunnel has a relation with the need for water storage at the historic side of the Phoenixstreet, the possibility of planting trees on top of the tunnel and the access to the existing buildings and to the new parking garages.

6. Infrastructural connection/communication

The Spoorzone area should be accessible by car, public transport, bicycle and for pedestrians. It deals with a very central area in Delft, where the railway station will be located. Also, the Spoorzone will be part of the inner city centre.

Successively are formulated the requirements for car traffic, public transport and other traffic.

Car

The specialist consultant agency AGV from Nieuwegein and the Municipality of Delft investigated the traffic intensities of motor vehicles on the main connecting streets for the year 2015. The most crowded street is the Westlandseweg, on which will pass in that year about 30,000 vehicles a day, of which 2.400 in the most crowded rush hour,

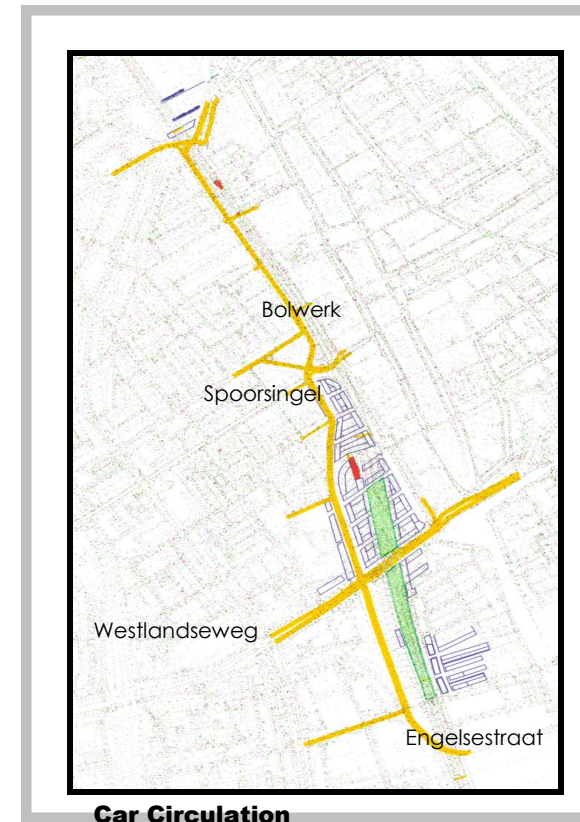
The Westlandseweg is the only east-west connection in the direct neighbourhood of the inner city centre. Besides, along this connection are located the new Zuidpoort shopping centre, the future Spoorzone with the railway station. The profile of the street has to be one with two lanes for each direction.

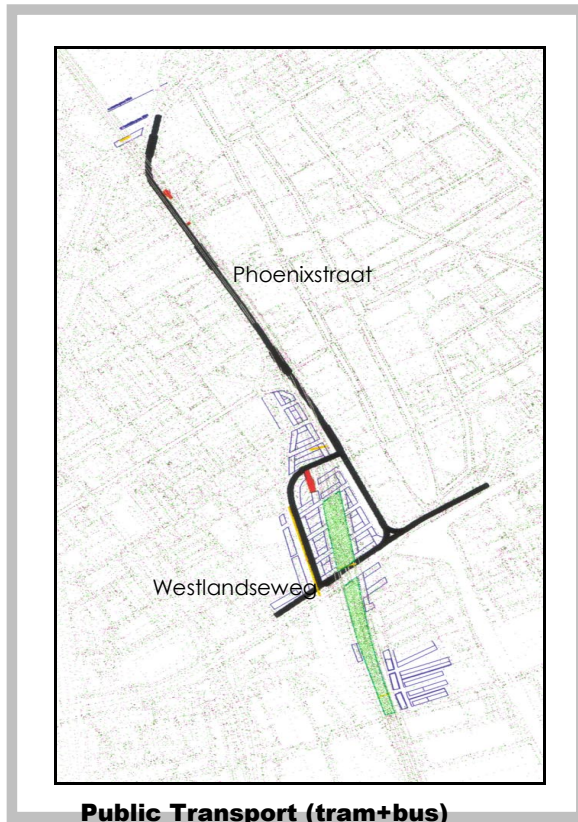
The inner city ring is located on the western side of the Spoorzone from the Bolwerk to the Westlandseweg, where a one level crossing connects the city ring to the area south of the Westlandseweg.

The Irene Tunnel will be removed during the construction of the railway tunnel and the Westlandseweg will be reconstructed at surface level.

The profiles of the most important roads – Phoenixstreet, Westvest, Westlandseweg and Spoorsingel have been drawn on scale.

The car traffic from the north, with no destination in the inner city, will as much as possible be advised to take a different route. The purpose of those measurements is to reduce the car traffic on the routes to the inner city.





The main bicycle routes in and into the Spoorzone area in the north-south direction are located along the Phoenixstraat and Westvest and on or along the new Westsingel. In the east-west direction, the main routes lie along the Westlandseweg and along the Abtswoudseweg.

Also the Barbarasteeg is important for bicycles, but the physical conditions do not offer much comfort. An alternative east west connection has to be constructed in the future, between Binnenwatersloot and Zuidwal.

The main walking routes go from the station towards the inner city centre in the direction of the Binnenwatersloot. There is an urgent want to redesign and refurnish this route, which is not very attractive now.

Public transport

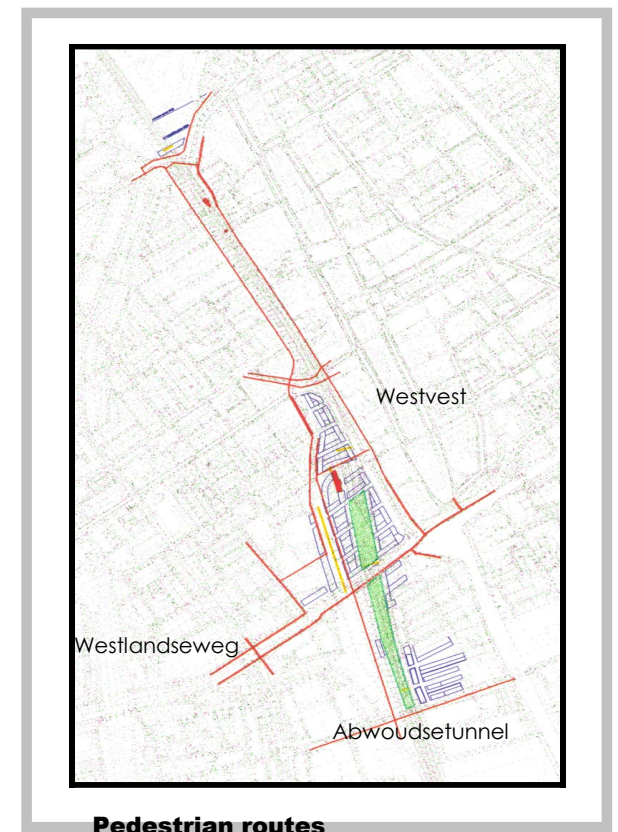
So far, we expect that both the tramway - line 1 and line 19 – and the bus remain where they go now: Phoenixstraat and Westvest.

That already makes a difference with the actual situation because the on going motor traffic no longer makes use of the Westvest, but will be diverted to the new north-south bound Westsingel.

At the south side, a future tramway line 37 is taken into account. Most probably, this line will first be exploited as a bus line.

Pedestrian routes

As in many inner city centres a dense network of bicycle and pedestrian connections exists. Along all or on all streets and communication routes cycling is possible.



7. Environmental requirements

Environment deals with:

- Requirements norms on external safety, vibrations, noise, air quality regarding the railway both in the tunnel and on the ground level.
- The urban design has to deal with requirements with regard to noise and air quality in relation to traffic. Also introduces contours concerning noise and air quality.
- The urban design has to deal with the need for water storage to be created in the area. The urban design has to deal with the policy to create an ecological main and green structure
- Dutch policy with regard to sustainability and energy savings.

Water

The local water authority (Hoogheemraadschap van Delfland) postulated requirements on the capacity of the rainwater storage, to be introduced in the area. Actually, a shortage of storage capacity has been calculated. For the standard (urban) situation, with about a 50% hardened surface, applies a total storage capacity of 325 m³ per hectare in surface water bodies. For the "boezem" water surface (Westsingelgracht and the new canal to be introduced in the Phoenixstraat) applies that the water storage can be realized by a maximum water level rise of 20 cm. For other surface water (at polder level) applies that the storage capacity depends from the actual situation in the different polders, but a minimum water level rise of 30 cm is realistic. For a wadi does not exist a simple calculation rule.

Taking the water storage requirement into account, the following water surfaces has to be created in the Spoorzone:

Open tunnel end north:	< 0.130 has.	(Voordijkhoornse Polder)
Boezem area:	1.375 has.	(Delflands Boezem)
Emplacement area north:	< 0.475 has.	(Hoge Abtswoudse Polder)
Emplacement area south:	< 1.500 has.	(Hoge Abtswoudse Polder)
Irene Boulevard:	< 0.190 has.	(Hoge Abtswoudse Polder)
Open tunnel end south:	< 0.130 has.	(Lage Abtswoudse Polder)

So, in total a maximum of 3.8 hectares of water surface for storage purposes is required in the Spoorzone to apply to the requirements of the Hoogheemraadschap.

Other possible solutions exist in obtaining permission to introduce surface water for storage at some distance from the Spoorzone (although within the same polder). Using the VDD area is then a conceivable option.

It is proposed to provide the following solutions:

1. Open tunnel end north, including the track extension at de DSM plant area (a total area of 1.2 has. so a need for 1,300 m² surface water): introduce water bodies in or near the Agneta Park.
2. The part from Wateringsevest-Phoenixstraat-Houttuinen-PTD within the Boezem area (12.9 ha's. so a need for the storage of 4,200 m³).
Solution:

The Westsingelgracht offers $7,250 \text{ m}^2 \times 0.20 = 1,450 \text{ m}^3$, consequently the new canal in the Phoenixstraat has to offer $2,750 \text{ m}^3$, which requires a surface of 1.375 ha's. leading to a **canal with a minimal width of 8 meters**.

3. The Irene Boulevard counts 1.75 ha's. And needs a storage of 570 m^3 in a surface of minimally 0.19 ha's. This can be found including it in the storage capacity for the Westerkwartier area, or including it in the capacity for the area south of Irene Boulevard.
4. The area south of the Irene Boulevard is vast and counts 14 ha's, which introduces a storage need of $4,550 \text{ m}^3$. This requires about 1.5 ha's. surface water: to be solved by wadi, a large water body next to the Delft Instruments buildings and canals in the streets.
5. Open tunnel end south: again a need for storage of $1,300 \text{ m}^3$, to be solved by replacing and widening of the ditches along the railway track.

In the plan area north of the Westelandseweg/Irene Boulevard the requirement can be met by introducing a new canal in the Phoenixstraat, which will belong to the Boezem area.

At the south side, the urban design will need a "water rich" environment. The projected park might be used to locate a wadi.

It will be very difficult to accommodate the whole $325 \text{ m}^3/\text{ha}$ of water storage. The best will be done to accommodate as much as possible, regarding other requirements.

Ecology

It is Delft policy to strengthen the Ecological Main Structure - both wet and dry - in the urban design of the Spoorzone. So, the Spoorzone has to be connected with other centre areas via ecological connections. Opportunities present themselves by interconnecting the canal structure and by lines of trees with undergrowth along the main streets.

Sustainable building and energy

In the set up of the urban plan take into account as much as possible introduction of sunlight, daylight and flexibility.

A dense design of plot distribution, especially in the near surroundings of the public transport node will influence the use of cars strongly.

The use of the heating residue of the process of DSM will be investigated.

External safety, Noise, Vibrations, Air Quality and Environmental Zoning

Both for the railway infrastructure and the motorcar infrastructure many rules and regulations play an important role.

The most crucial refer to external safety and noise pollution.

The external safety regulations are in a development stage and not yet very concrete at this moment. Railinfrabeheer conducts a study on (external) safety and vibrations of/in the tunnel and the railway tracks on ground level. Also the requirements to be applied to the buildings on top of or directly next to the tunnel are studied. The figures below are primarily and can be changed after the results of the studies.

For the moment concerning the (external and internal) safety the following conditions are applied:

1. Within a zone of 10 meters on both sides of the extremities of the railway track, there is a need for special and costly measures to permit buildings.

- Houses directly on top of the railway tunnel are permitted, when a 'between-floors' is introduced just as external building measures.
2. Along a railway track on ground level within a zone of 30 meters on both sides of the extremities of the railway track, no so-called sensitive destinations (houses) can be introduced.

Noise

While locating noise sensitive functions (houses) in the neighbourhood of the railway tracks and along the main traffic streets for car traffic, the requirements of the Noise Pollution Act must be met.

This Act presents a complex set of noise norms and calculation rules.

The most important conditions for the Spoorzone have been investigated and are the following:

1. Distance from residential houses to the railway tracks on ground level, taking into account the maximum possibilities for exemption the Province permits.

The following table presents the distances within which no houses can be erected, measured from the extremity of the tracks.

Taking into account the possibility for exemption up to 65 dBA, without a screen within a zone of 100 meters no houses can be built.

With a for instance, 2 meter high screen as close as possible to the railway tracks with a length of several hundreds of meters, the same exemption allows erecting houses at 30 meters from the tracks. Calculating with a railway track width of 40 meters this comes down to a zone of 240 meters wide without and 100 meters wide with noise screen, where no housing is permitted.

Limit to use	Without screen	With screen
57 dB	300 m	85 m
60 dB	190 m	58 m
65 dB	100 m	30 m
70 dB	50 m	25 m

Table distance railway track - houses

* Table calculated by Municipality of Delft

2. Distance from houses to Westlandseweg and Westsingel (car traffic), taking into account the maximum possibilities for exemption the Province permits. The maximum exemption is 65dBA.
Whether houses can be built depends most of all on the number of motorcars and of the height where the noise is measured.

In the following table per floor (height) the noise is indicated for three traffic intensities. In the year 2015 on the Westlandseweg 30,000 motorcars will pass by per 24 hours.

24 hours intensity	Westlandseweg		
	20.000	25.000	30.000
Hoogte woonlaag			
1,7 (begane grond)	63,9	64,8	65,6
4,5 (1 ^{ste} verdieping)	64,2	65,1	65,9
7,3 (2 ^{de} verdieping)	64,1	65,0	65,8
10,1 (3 ^{de} verdieping)	63,8	64,7	65,6

Table distance traffic - houses along the Westlandseweg

* Table calculated by Municipality of Delft

Just only along the Westlandseweg, it is not possible - even when the maximum exemption is granted - to build houses. Along the other communication streets, if a certain distances are observed, this is possible.

Vibrations

In all buildings directly on top of or next to the railway tunnel vibrations will be traceable. With special, costly measures, these can largely be taken away. These measures are that specific that they have to be designed specially adapted to the situation. The most secure and safe and also cheapest method to avoid trouble with vibrations caused by the railway track, is not constructing on top of the tunnel alignment. Only for offices, which can be build directly with the construction of the railway tunnel, it is possible to build on top of the tunnel.

Railinfrabeheer conducts studies on the effects of vibrations in all tunnel models.

The first results give an optimistic feeling that building on top of the railway tunnel is possible with measurements against the vibrations. The costs of those measurements are indicated as the same costs as made for fundament constructions.

We expect that the conclusions have no impact of the horizontal or vertical alignment of the railway track.

8. Plan economic conditions

Costs and risks must be controllable, both for the construction of the railway tunnel and for the real estate development. Also the proceeds from the commercial functions should be estimated with realistic market expectancy.

Costs of the railway alignment

Railinfrabeheer will calculate the costs of the railway infrastructure for each of the models under study.

From their point of view, they will seek a design as sober and efficient possible for just the four tracks of the railway passing through Delft. This means that Railinfrabeheer seeks the shortest possible tunnel, just below ground level. This all should result in the lowest possible costs for constructing the tunnel. In the programme of requirements it is necessary to find an optimum between the requirements of the railway tunnel and the demands of the urban development of the Spoorzone.

So, the top of the railway tunnel can be as high as possible in the vertical alignment with regard to the requirements on water storage, safety and vibration (according the existing buildings). All measures needed for the construction of the railway tunnel and the ground level alignment will be added to the railway infrastructure costs. Counter balancing these costs stand the subsidies of the Ministry of Transport, Public Works and Water Management, the regional authority (stadsgewest) Haaglanden and the Municipality of Delft.

The Public Transport transfer junction

Railinfrabeheer will calculate the costs of the public transport junction after Busquets has translated the functional models into urban designs.

Real Estate

Together with the construction of the railway tunnel the whole area of the Spoorzone will be redeveloped. All costs related to this urban development will be taken into account in this exploitation. Counter balancing these costs stand the proceeds from the commercial real estate development and the subsidies from the Ministry of Housing, Spatial Planning and Environment and the Municipality of Delft.

Area development

The construction of the railway tunnel and the real estate development are interconnected and make an integrated area development project Spoorzone. For all models costs and proceeds of railway tunnel and urban development will be calculated, leading to the best (cheapest) model from the plan economic point of view. This doesn't automatically mean that it will be the model with the least infrastructure investment, when higher real estate yields or government subsidies counter balance higher infrastructure costs.

In the Decision Paper the following aspects will be put forward:

1. Calculation of the railway infrastructure costs for the models under study
2. Fixing of the proceeds potential by the real estate market parties
3. Calculation of the area development costs
4. Integral set up for area exploitation (infrastructure + area development)
5. Subsidies from public parties
6. Possible financial contributions from the real estate to the costs of railway infrastructure

On the basis of these calculations public parties can come to conclusions about the financial and economic feasibility of the investigated models.

9. Main urban structure (building masses, function mix)

Given the conditions for urban development, the main objective of the whole project is formulated: the removal of the environmental pollution produced by the actual railway track (viaduct).

This actual pollution does not permit the development of housing in the Spoorzone area and makes that the area is not an attractive zone next to the inner city centre.



The main goal of the urban development is to solve these liveability problems and to link directly the Spoorzone to the inner city centre of Delft. . Other goals are to erect of a number of different functions – housing, offices, hotel, station, etc. -, to create a high quality urban environment within a limited building height, that is related to the scale of the Delft inner city centre.

In the picture on this page the maximum building heights in the several areas are presented.

For all models under study, prof. Busquets has to visualize, the position of the PT transfer junction, the location of the different functions, street profiles, building masses and building heights.

Building masses

Using the building heights as fixed by the municipality of Delft a programme as large as possible is located in the Spoorzone area. The reason is the fact that this is a unique possibility for the city of Delft to develop a new railway station area directly next to the inner city, giving the opportunity to as much as possible houses and offices to make use of the public transport facilities and the inner city (economic) services. Further, this is caused by plan economic reasons. De Municipality of Delft received from the minister of Transport, Public Works and Water Management the instruction to contribute to the construction costs of the railway tunnel from the proceeds of the real estate development. This requires maximizing the proceeds of commercial real estate.

Naturally, this has to be realised within the parameters and conditions, along the lines of an urban plan, made by Joan Busquets.

The real estate programme of about 250.000 m² till 300,000-m² gross floor space leads to a dense use of the area with respect of the quality of the public space.

Public space

To achieve a new identity and quality of the environment comparable with the historic inner city, it is desirable that there will be an public urban space of a certain volume giving the new development to the north and the south of the Westlandseweg a qualitative atmosphere.

Building on top of the railway track

Railinfrabeheer has studied the possibility and risks of building offices and houses on the top of the railway tunnel. This study is not completed yet but the first results say that it is possible when measurements are taken to avoid external safety and vibrations. Practically, the first floor on top of the tunnel cannot be used for residential functions. The extra costs for measurements to be taken seem to be negligible, because about the same as normal for piling foundations.

Van Leeuwenhoeksingel

The existing residential houses in the Van Leeuwenhoeksingel can only be maintained in case of railway tunnel models with a western horizontal alignment.

It will be investigated what the consequences and the effects of quality of the urban space and building masses are by maintaining these houses.

Regarding all the requirements the next table can be made (in Dutch):

Het programma van eisen van de modellen op 1 A4

Phoenixstraat (in alle modellen)

1. De bovenkant van de treintunnel kan zo hoog mogelijk liggen ten opzichte van het maaiveld rekening houdend met de noodzaak van waterberging aan de historische zijde van de Phoenixstraat, de mogelijkheid van het planten van bomen en de ontsluiting van de gebouwen en parkeergarages aan de Phoenixstraat
2. Een aantal van 450 parkeerplaatsen in de Phoenixstraat ter vervanging van het parkeren onder het spoorviaduct

Model 7 west Tunnel 1900 meter



7 bovengronds west

1. Een 1900 meter lange 4 sporige tunnel- west tracé, ontwerpsnelheid tracé 140 km/uur,
2. Tunnel in de Phoenixstraat, de rest een bovengronds 4- sporig tracé t/m station Delft- Zuid
3. De hoogte van de bovenkant van de treintunnel zo hoog mogelijk rekening houdend met veiligheid/trillingshinder van de bebouwing
4. De OV-knoop in zuidelijke ligging met bovengrondse eilandperrons op de Irenetunnel
5. De Stationshal ter hoogte van Irenetunnel op -4 meter onder het spoor en op een verlaagd maaiveld
6. Het verleggen van de trambanen door het stationsgebied; het autoverkeer blijft op de Westvest
7. Het overbouwen met vastgoed van het bovengrondse spoortracé ten noorden van de Westlandse weg
8. Een vastgoedprogramma met 50.000 m2 bvo kantoren + zo dicht mogelijk bij het aantal van 200.000m2 woningen waarvan 150 woningen in de sociale sector
9. Ten zuiden van het Bolwerk enkele duizenden parkeerplaatsen (aantal afhankelijk van programma) in gebouwde garages;
10. Geen woonbebouwing langs Westlandseweg (geluidhinder) en in de eerste bouwlaag op tunnel (veiligheid),
11. Een waterbergingscapaciteit die zo dicht mogelijk ligt bij de norm van 325/m3 van het Hoogheemraadschap Delftland
12. De Mogelijkheid tot al dan niet handhaven panden van Leeuwenhoeksingel

Model 12 west Tunnel 2600 meter



12 zuid west 12 noord west

1. Een 2600 meter lange 4 sporige tunnel- west tracé, ontwerpsnelheid tracé 140 km/uur,
2. Tunnel in Phoenixstraat tunnel, Stationsgebied, Emplacementsterrein, de rest bovengronds 4- sporig tracé t/m station Delft- Zuid
3. De hoogte van de bovenkant van de treintunnel zo hoog mogelijk rekening houdend met veiligheid en trillingshinder
4. De OV-knoop ter hoogte van de Westlandseweg of in de omgeving van het huidige stationsgebouw
5. De Stationshal bovengronds met ondergrondse eilandperrons van 340 meter lengte (kantperrons bij noordelijke ligging)
6. Het handhaven van de trambanen op de Westvest; het autoverkeer wordt verplaatst naar de Spoorsingel /verlengde Coenderstraat
7. De mogelijkheid tot het bouwen op de spoortunnel met maatregelen tegen trillingen en een functie loze tussenverdieping (wel parkeren)
8. Een vastgoedprogramma van 50.000 m2 bvo kantoren + 200.000m2 woningen 1600 stuks) waarvan 150 woningen in de sociale sector
9. Ten zuiden van het Bolwerk 2880 tot 3680 parkeerplaatsen in gebouwde garages en/of half verdiept
10. Geen woonbebouwing langs Westlandseweg (geluidhinder) en in de eerste bouwlaag op tunnel (veiligheid),
11. Een waterbergingscapaciteit die zo dicht mogelijk ligt bij de norm van 325/m3 van het Hoogheemraadschap Delftland
12. De mogelijkheid tot al dan niet handhaven panden van Leeuwenhoeksingel

Model 12 oost Tunnel 2600 meter



12 zuid oost 12 noord oost

1. Een 2600 meter 4 sporige tunnel- oost tracé, ontwerpsnelheid tracé 160 km/uur,
2. Tunnel in Phoenixstraat tunnel, Stationsgebied, Emplacementsterrein, de rest bovengronds 4- sporig tracé t/m station Delft- Zuid
3. De hoogte van de bovenkant van de treintunnel zo hoog mogelijk rekening houdend met veiligheid en trillingshinder
4. De OV-knoop ter hoogte van de Westlandseweg of in de omgeving van het huidige stationsgebouw
5. De stationshal bovengronds met ondergrondse eilandperrons van 340 meter lengte
6. Het handhaven van de trambanen op de Westvest; het autoverkeer wordt verplaatst naar de Spoorsingel /verlengde Coenderstraat
7. De mogelijkheid tot het bouwen op de spoortunnel met maatregelen tegen trillingen en een functie loze tussenverdieping (wel parkeren)
8. Een vastgoedprogramma van 50.000 m2 bvo kantoren + 200.000m2 woningen 1600 stuks) waarvan 150 woningen in de sociale sector
9. Ten zuiden van het Bolwerk 2880 tot 3680 parkeerplaatsen in gebouwde garages en/of half verdiept
10. Geen woonbebouwing langs Westlandseweg (geluidhinder) en in de eerste bouwlaag op tunnel (veiligheid),
11. Een waterbergingscapaciteit die zo dicht mogelijk ligt bij de norm van 325/m3 van het Hoogheemraadschap Delftland

Finally

It is now in the hand of prof. Joan Busquets how he translates all of these demands to an urban plan that is unique for the city and Delft. I hope that he can find an urban vision of the Spoorzone area with the 'patin' of the inner city of Delft.

Kor Buitendijk

with contributions of
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