



# City Fringes Twente





# City Fringes Twente

**PlanB**

Wierc Berkuens, Daniel Bours, Li Chen, Martijn Haag,  
Maarten Hermus, Hao Hu, Nienke Voskuilen, Gerben Willems

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## Introduction

### General introduction

The Region Twente observed a stagnating growth of the number of inhabitants. They expect, starting in 2020, a stagnation on 625.000 inhabitants. Nevertheless, the number of households will keep on growing. They expect a total of 285.000 households by the year 2030. They expect that the need for locations to expand will decline due to these demographical changes (presentation Region Twente, 8 December 2009). This causes the edges of cities to change from a transitory state to a more definitive one. As a result, thought must be given to a new definition and function for these city fringes.

There are some demands stated by a number of different agencies for new meanings of the city fringes. The ministry of VROM tries to defer the cluttering ('verrommeling') ([www.vrom.nl](http://www.vrom.nl)), and the ministry of LNV wants adequate nature in and around the city ([www.minlnv.nl](http://www.minlnv.nl)).

Within the region, there is already a lot of attention paid to the city fringes. Examples are the projects about 'Rondje Enschede' ([www.enschede.nl](http://www.enschede.nl)) and 'The Green Gateway', or in Dutch, 'De Groene Poort' ([www.groene-poort.nl](http://www.groene-poort.nl)). The Twickel-foundation tries to achieve nice green city fringes where the Twickel estate borders the cities ([provincie.overijssel.nl](http://provincie.overijssel.nl)).

Because lots of parties have an interest in changes in the meaning and function of the city-borders, the Twente-region has asked us to create a vision on the future developments of the city fringes in the urban network of Twente. We were also asked to translate this vision in a strategy on a long term scale, and in starting points, options and possible actions for the short term scale. The long term scale goes until 2030 and thus covers about 20 years. The short term scale consists of four years.



## About the process

### Methods/ Approaches

In order to reach the final products, we were inspired by two planning approaches; the scenario approach and the strategic choice approach (SCA).

The scenario approach tries to form a good view on how the region might develop by studying independent developments and the developing of imaginable future scenarios. With this information, long-term visions and strategies can be developed (Carsjens *et al*, 2009).

The SCA method aims at mapping the existing problems and possible ways to cope with them. In the end, this overview is used to determine the most desirable short-term options and actions (Friend, Hickling, 2005, Carsjens *et al*, 2009). Normally, this approach makes use of direct contact with and input from stakeholders. Since this is not possible during this process, we will try to fill this gap ourselves by using our knowledge of interests within the region to make sure the stakeholders are still represented, even though not present.

Because we have looked at the short-term as well as the long-term, we have combined the insight in these two different methods in order to reach good final products. We have tried to bear in mind the strategy on a long term when making choices for the short-term, and vice versa.

### Steps

Our workplan (Workplan City Fringes Twente) contains nineteen steps. We have executed these steps in the numbered sequence. So, we take the first step first, after that the second, the third and so on until nineteen. In our workplan we have described the way we had to execute the steps as well. These descriptions have helped us to reach our results. In this report we have tried to follow these steps as good as possible. To improve the readability of this report we have added a paragraph 'about the step' on every step.



## Phases

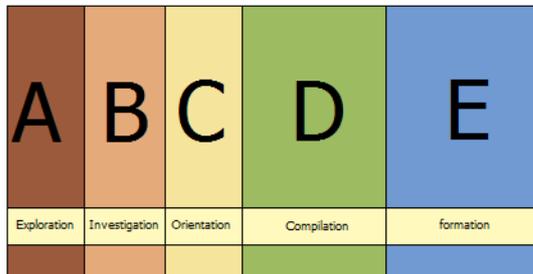


Figure 1: phases of the workplan

To reach a better overview of the whole process, we have divided the nineteen steps in five phases (see figure 1). These are: Exploration (part A), Investigation (part B), Orientation (part C), Compilation (part D) and Formation (part E).

In the Exploration phase we have executed steps to explore the planning-area, both in a spatial and in a physical way. In the Investigation phase we have performed a more in-depth investigation. Then we also investigated the trends we can not influence, the so called 'driving forces'. In the third phase of the Orientation, we orientated on the consequences of those driving forces, and on the most important areas to decide on. In the Compilation-phase, next to last, we compiled and collected the different possible decisions. In the last phase, the Formulation, we formulated the final plans and policies. At the end of this phase, we combined these final plans and policies in one big integrated plan.

All the steps are very intricately interconnected through input and output connections. We have made a scheme with the flow of information between the different steps (see appendix II). We also made this scheme with as background the phases, each given their own background colour(see figure 2).

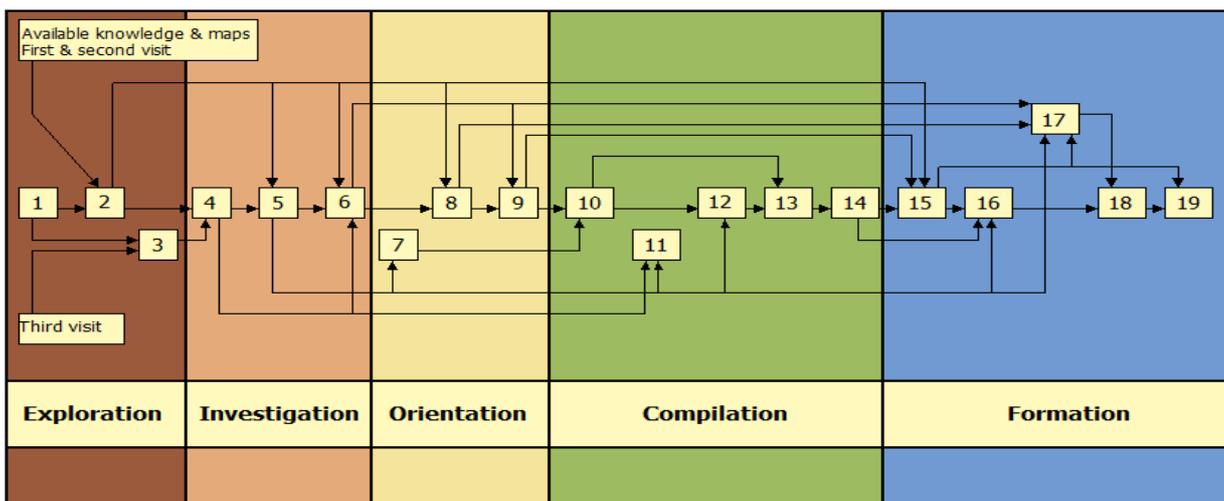


Figure 2: Flowchart



## Results of the Exploration

### Fuzzy planning task

In the first step of the workplan we have to come up with a fuzzy planning task. The main input for this was the introduction to the assignment, provided by the Kennispoort Twente, combined with visits to some of the projects in the city fringes. During the presentation it became clear what the most important trends in the area are so that we can react on these trends. This step is important because it is the first step that will help to come up with the results that are asked from us.

We formulated the fuzzy planning task as: To improve the connection between the cities and the rural area and to create a smoother transition. From the fuzzy planning task it becomes clear that we focus on the city fringes. The fuzzy planning task represents the question that we got from the region and it is also about the area where we can find the trends that are described during the presentation. The trends are that there will be a stagnating growth of people and that because of this the demand for housing also stagnates.

### Present situation

After formulating the fuzzy planning task we started with exploring the location. Given the planning task, it became clear which aspects to focus on. For the location exploration we used several maps, information from the internet and the visits to Twente, where we also talked with different experts. We combined this with the knowledge we already had of the area to create a global overview of the spatial organization and trends in the area. This provided continuous input throughout the entire process.



We started with making a map and a poster for the present situation. In the beginning of this course we had some excursions to the region of Twente, we also visited some areas in the region. By these excursions and presentations we get an image of the region and what the inhabitants think that is important in the region. Also in this region there are a lot of stakeholders with different opinions how the area should be. In this part of the report we will show what kind of information we have used to get an image of the area without reflecting on all information that we have found and used. In our case it isn't useful and takes also too much time to study all information that there is available. For this project we need to have a good image from the area, the cities and villages and also the present situation for the areas that we have chosen for making small scale maps. We made small scale maps for the external scenarios and also for the vision and policy scenarios.

### **Nature**

Typical for this region is the small scale landscape with a lot of hedges around the agricultural areas. In the area there is mostly a sandy ground where you can find vegetation adapted to these circumstances, like oaks and birches. There is a plan for the ecological main structure to make a green gate between Almelo and Hengelo to strengthen the Ecological Main Structure.

### **Mobility**

In the area there are different highways (A1 and the A35), There are different plans to solve the problems with traffic jams in the area. An example of this is to improve the highway (A1) by solving the traffic bottleneck by the Ikea and also improve the capacity from 2x2 to 2x3 driving lanes. There is also a network for the public transport. They are working on an upgrade on the area of the train station of Hengelo. There are two different railways in the area which go on to Germany, these railways are used for public transport and transport of goods.

Another important way for transport is the Twente canal. The Twente canal becomes more important for the transport of goods, They get 11 million subsidy to make the canal deeper. Hengelo has the most important harbour of the region.



### **Agriculture**

In this region the biggest agricultural sector is that one with livestock (graasdieren). You can also see this in the landscape, most agricultural parcels are used for producing grass or maize. In the region there is a stronger trend of side activities than intensification. You can find several local shops by the farms where they sell their own products and local products, there is also a trend of health care farms this is in some cases not a side activity anymore but the main form of income. In Almelo we heard from an expert that there are less side activities because the farmers have to invest too much for it and don't earn enough money with it, for them it is more interesting to invest in agricultural activities. There are more successors for the farms in this region than the trend is nationally.

### **Recreation**

In the area are lots of opportunities for route bound recreation. In a lot of cases, these routes lead to curiosities or place bound recreation. For example to a wooden shoes factory. There are also possibilities for water bound recreation. For this there are different areas with water for recreation. There is a big one near Oldenzaal called 'het Hulsbeek' and one near Enschede and Hengelo called 'het Rutbeek'. These lakes give opportunities for swimming, sailing, fishing and other forms of water recreation. In the rural area there are quite a lot of camping sites and bed and breakfast but in the urban area there are much less possibilities for staying in the area for the night.

### **Expanding areas**

For the residential areas there are some recent developments in the area for new residential areas. For example areas in the cities like "het Roombeek" in Enschede. In this area there is a whole new area being developed because the existing neighborhood was demolished through the fireworks disaster. There are also new areas planned such as for Enschede the neighborhood "het Brunnink" and "het Vaneker".

In the other cities there are similar developments. In Hengelo construction is started on a very large industrial area for most logistic companies who need large parcels. This is one important development for the region and we use this area therefore for our small scale focus.



### **Estates, landowners**

In the area there are different estates, one of them is the estate Twickel. The estates try to maintain the landscape, including the historical buildings. They also try to minimize urban influences and expansion into the estates. A problem is that Hengelo and also Delden want to expand and this is in conflict with the ideas of the estate Twickel.

There are also some important land owners in the area, one of them is Jan Boomkamp. He owns a lot of land in the area especially near Borne, this influences the kind of agriculture in the area therefore the municipality decided that they don't want any new horticulture on the arable land near Borne.

Near Almelo there's a ground owner namely the Count of Almelo. He wants to keep the area like it is and therefore it is difficult for Almelo to expand in the eastern part of the municipality.

### **University Twente**

One important institute is the University Twente, it is a technical university and provides several benefits to the region. It attracts companies to the region and it is good for the image of the region. It is also included in the goals of the region regarding 'Innovation and technology'.

## **Stakeholders**

It is also important to know what the people and organizations in the area strive for, this is important for defining the focused planning task, furthermore it is important to involve the stakeholders in an early phase. We selected the stakeholders by making a list of stakeholders with their goals, means and position in relation to the fuzzy planning task. After this we select the stakeholders that have the biggest influence or are important in relation with the planning task



We came up with a list of five stakeholders which are in our opinion the most important ones in relation to the planning task:

Stakeholders	Means	goals	position
Landscape Overijssel	<ul style="list-style-type: none"> <li>• Expertise</li> <li>• Funds from government</li> <li>• Support from civilians</li> </ul>	<ul style="list-style-type: none"> <li>• Create ecological main structure</li> <li>• Advise to farmers</li> <li>• Recreation in the areas</li> </ul>	+
Farmers, Ground-owners	<ul style="list-style-type: none"> <li>• Landownership</li> <li>• Landscape maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Profit</li> <li>• Continuation</li> <li>• Expanding</li> </ul>	-
Neighborhood association	<ul style="list-style-type: none"> <li>• Contact with municipalities</li> <li>• Protest</li> <li>• Claims</li> </ul>	<ul style="list-style-type: none"> <li>• More local services</li> </ul>	+
Municipalities	<ul style="list-style-type: none"> <li>• Landownership</li> <li>• Development plan (bestemmingsplan)</li> <li>• Subsidy</li> <li>• Knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Make profit or minimize losses</li> <li>• Sustainable development</li> <li>• Attracting tourist, recreation</li> <li>• Make the urban areas more attractive</li> </ul>	+
Estates	<ul style="list-style-type: none"> <li>• Landownership</li> <li>• Lobbying</li> <li>• Nature values</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain the estates</li> <li>• Stop rat-run traffic (sluipverkeer)</li> <li>• Traditional landscape development</li> </ul>	+



Probably it is clear which kind of means and goals the different stakeholders have, The position is sometimes more debatable. For the Landscape Overijssel it is clear that they are positive in relation to the planning task, they probably get the chance to attract more recreants to the areas and people will give more support to this organization. For the farmers it is in the first case a threat to have new developments in the area especially for the farmers near the city border. When later on the plans are developed it could also give a chance to them because there will be more recreants in the area, what can be a reason to start with side activities. This can lead to new forms of income. For the neighborhood organization it is clear that they are happy with it because city fringes become probably more attractive. The municipality is also happy with it because they get a better transition zone and this will lead to an more attractive municipality. On the other hand the border of the city becomes more firm and trough this it will be more difficult to expand. For this reason the estates are positive about the planning task.



## Results of the Investigation

### Step: 4

### Focused planning task

#### About the step

The first step of the investigation phase is the focused planning task. Therefore we used the fuzzy planning task, location exploration and the goals of stakeholders. This step is needed for a clear definition about the planning task unlike the fuzzy planning task which does not include the boundaries of the planning task. The fuzzy planning task will provide details about the situation and trends in the Twente Region and it will give an answer to the question what city fringes exactly are.

#### The planning task

The Region Twente expects input and ideas for developing the urban fringes in Twente, in the form of a spatial plan with both a short term and long term aspect. Such a plan cannot be created without extensive research and exploration of both the present and possible, probable and desirable futures. As such, creating the actual plan will only be a small part of the planning process. The actual task we put ourselves to is:

“To find out where the city fringes will be in 2030, what their type and strength of relationship will be, and to develop a strategy to improve the urban-rural relationships these city fringes sustain, where this is desired.”

This definition of the planning task stresses that this is as much an investigation as a plan, and that we focus our effort on long term results and consequences.



## Demographic consequences

Additionally to this planning task, the Region Twente gave us detailed information in demographic developments, which can be translated into spatial requirements that should be incorporated into the planning task. As such, in the coming twenty years (2010-2030), roughly 10.000 additional residences are required, obviously depending on the form these residences will take. This is a critical precondition, and thought should be given to the location, space and form of these residences.

Alongside the development of the focused planning task is an ongoing investigation of the spatial organization and it's developments of Twente. These two processes are more or less simultaneously, as each provides input for the other. For organizing this investigation, we separated the group, and have each member become knowledgeable in one field, in order to be able to inform the rest of the group about his or her field.

This resulted in the following division in expertise:

- Urban expansion and current quality of living on the edges of the cities (Gerben)
- Nature development and maintenance (Sufficient knowledge provided by Landscape Overijssel and other stakeholders/experts)
- Economic situation and development of agriculture and agribusiness (Martijn)
- Spatial distribution of recreation and tourism (Wierc)
- Mobility and traffic (Daniel)
- Forms of industry and business (Maarten)
- Types of activities within the transition area (Li and Hao)
- Time frame and workplan of our planning process (Nienke)



### **What are city fringes?**

The meaning and purpose of city fringes can be expressed through the connectivity between urban and rural area they provide. A low connectivity results in a weak relationship, while a high connectivity may lead to a strong relationship with a high amount of interaction. The strength of the relationship reflects the value people place on the city fringe. Also of importance is the type of relationship that exists within a specific city fringe. A division can be made between recreational, commuting and economic relationship, though multiple can exist in the same city fringe. Combining the type of relationship with the existing land use in that particular city fringe leads to different levels of strength of the relationship.

### **Types of relationships**

Recreational relationships are created by people living in the city and desiring to recreate in the surrounding rural area, as well as people from outside the city entering the city as part of a recreational activity. For this relationships, city fringes can be divided in Industrial, Business area and Residential. Commuting relationships are created by people living outside the city working in the city and vice versa. These relationships care little for the land use, and only about the network in the region. The city fringe is often a critical part of this network, as the urban and rural areas often have their own network and connections between these two networks vary in frequency and quality. Economic relationships are created by companies positioned in the cities that have business in the rural area, either by processing agricultural products or by providing specialized services to farmers. These companies can be grouped by the term 'Agribusiness', which also results in a fourth type of city fringe.



### **Network of the city fringe**

The network of the city fringe is not an actual city fringe itself, but rather part of it, while at the same time the city fringe is part of the network. The cause of this paradox is twofold. This is because the network is not an actual land use type and functions on a different scale. Even within the network there are different levels of scale, as the motorway network is national while the network of a village is local. A division can also be made between rural and urban network. The urban network is much more dense, but the main difference is the function. The rural network is often designed for low intensities of traffic, with a high amount of agricultural traffic, while the urban network has a focus on personal cars, bicycles and pedestrians, which often stay within the urban area. The demand for a connection between these two networks depends on the activities that make use of both networks (a good example would be route-bound recreation). This demand defines which frequency and type of connection would be desirable, and thus whether the current network in a city fringe functions well.

### **Industrial city fringe**

Industrial city fringes have very little interaction, as there's no interest from the industrial area for the rural area and vice versa. Roads connecting rural and urban area through these city fringes are generally unattractive and thus not used for recreation. These roads are often also designed for shipping cargo, which likely results in unsafe situations for pedestrians and cyclists. They are also oriented on the highways which results in less connections to the rural network.



### **Business area city fringe**

There are two kinds of business area city fringes. So called green business parks have a stronger relationship with the rural area they border and can sustain a recreational corridor. This does not necessarily mean that the urban network and the rural network are well connected here, as these business parks are green in their image, but still are more part of the urban environment than the rural. Where these connections between the networks are in place, good possibilities to enter and leave the rural area exist for recreational and commuting traffic. This also counts for 'grey' business parks, though their environment often still function as threshold for route-bound recreation.

'grey' business parks have a much weaker relationship, resembling more the industrial city fringe. These types of land use provide a barrier for entering the rural area as part of a recreational activity, though much lower than industrial areas.

### **Residential city fringe**

Residential city fringes depend strongly on the amount of paths and roads into the rural area. Also of importance, as far as recreation goes, is the width of the fringe. A wide city fringe has a smooth transition from mainly residential to mainly agricultural function. In the middle both activities will be present, giving recreationists the perception of being in the rural area before having fully left the city. These city fringes also tend to have a good connection between both networks, as each is present within the area. A narrow city fringe has a very clear border and thus needs paths and roads to create a strong connection. The connection of a narrow city fringe has the same boundaries of strength and weakness but relies more on the roads between the two networks to provide this connection, as the wide city fringe also relies strongly on the visual aspect.



### **Agribusiness city fringe**

Agribusiness city fringes rely on the capacity for cargo transport of the roads leading into the rural area. This means that quality and size of the roads, specifically those of the rural network, become more important. This is different from the business relationship, which relies on the connectivity for personal cars. Additionally, this leads to a very wide definition of the city fringe, as the need for quality and width does not end at the border of the built area. For cyclists and hikers this city fringe is often troublesome because of the dangers that cargo transport and agricultural traffic cause. It also provides a recreational barrier similar to that of an industrial or business area city fringe.

## **Step: 5**

### **Decision areas, uncertainties, preconditions and goals**

#### **About the step**

This step is the second step of the investigation phase, and is about identifying the decision areas, uncertainties, preconditions and goals related to area and the involved problems which is part of the strategic choice approach. The aim of this step is to place this information in the context of the planning task. The decision areas are a way to describe a problem situation and when people have to choose between different actions. The goals give an indication of the opinions of the stakeholders. The uncertainties and preconditions will narrow down the possibilities of different choices. Uncertainties will contribute to the contingency plan of the commitment package.



### Decision Areas

These are the eight decision areas we have chosen. In step 7, in which the decision links have to be executed, the decision areas are more explained in detail due the addition of decision questions.

- Barriers
- Roads & Connectivity
- The Green Gateway
- Locations of new facilities
- City Centres
- Bought grounds
- Space for working areas
- Ugly industry
- Green areas
- Recreation in agricultural areas
- Urban development
- Impact of tourism

### Uncertainties

Here you can find an investigation of the different uncertainties. For step 17, called the uncertainty analysis, these uncertainties are used as input.

- The impact of the development of the airport Twente
- Availability successors for farms
- Expansion space for farms
- Profitability of farming
- Cooperation of shopkeepers to improve tourism
- Influences of activities across the borders of the estates
- Space for recreation
- Traffic safety



### Preconditions

Here below the preconditions are listed. None of them will be directly used as input for the following steps.

- Decreasing population growth
- Agriculture is part of the ecology
- Farms require intensification or scale enlargement or side activities to stay profitable
- Limited funds for landscape maintenance
- There is a high density of farms
- Large amounts of private landownership by NGO's
- High demand of ground
- Good cooperation between Landscape Overijssel, farmers and municipalities
- Inhabitants find the landscape of their surroundings important
- Estates are important to maintain natural areas and rare species

### Goals

Here below you can find the goals which are the desires of the Region Twente and the stakeholders. These will be used as input for forming a vision and the policy scenario's.

- No additional infrastructural barriers through the estates
- Improve and add ecological connections
- Maintain the rural landscape
- Keep farming profitable
- More facilities
- Improve traffic safety
- More housing for starters
- Beautiful environment
- Maintain the current size of the estates
- Improve tourism
- Improve the connection with the rest of the country
- Improve cooperation between parties for landscape maintenance
- Develop the train station area of Hengelo
- Improve sustainability
- Improve utility and value of (ground)water
- Improve ecological quality
- Redistribute agricultural parcels to improve efficiency



## Step: 6

## Identification of driving forces

### About the step

In step 6 we tried to investigate some driving forces and gave a description for it. These driving forces are useful because these are some developments in the Region Twente which can not be influenced by policies. These are national/ EU policy related to city fringes, Economic future of agriculture, Succession of farms, Changing ground prices, Speculation on spatial developments, Demographic changes in population size, Demographic changes in living pattern, Climate change, Macro-economic development, Recreational patterns and Budget of municipalities. These driving forces are explained using a definition. The next step is to give the boundaries where we try to give the opposite possibilities in which directions the future can go. These boundaries are needed in step 17 for the uncertainty analysis. The boundaries are really useful because uncertainties can cause unwanted surprises during or after the execution of the plan.

The first driving force is National/EU policy dealing with interaction between urban and rural. This is a driving force because national or EU policy can't be influenced by regional policy and plans, but the opposite is possible.

The economic future of agriculture is a driving force strong related to another driving force: the succession of farms. The last one will have an impact on the influence on the landscape and on the agricultural competition position of the Netherlands and employment.

Changing ground prices is also a driving force which can be defined as the fluctuation in the ground prices compared to other regions. This can be influenced by another driving force, namely the speculation on spatial developments. The impact of these two driving forces are a strong influence on opportunities for agriculture and business, as well as urban and nature development.

Demographic changes in population size of the Region Twente and the demographic changes in living pattern and especially changes in the size of households are the next two driving forces. The impact of those two on the city fringes are a strong influence on urbanization, economy, traffic and recreation.



Climate change, defined as the change in temperature and weather will have a strong influence on water management, agriculture, recreation and can not be influenced on regional scale at all.

Macro-economic development is another driving force. This encompasses the developments of the global economy which can have a very strong influence on the local economy, and with it urban developments and traffic.

The recreational patterns are about time and space distribution of spare time and recreational preferences which impact on traffic, as well as recreational business.

The budget of municipalities is about the amount of money available for the transition areas. It will have a strong influence on the execution of all projects in the transition area and the quality of the results.

In step 8 the driving forces with the highest impact will be chosen from the impact-uncertainty matrix. Based on the two driving forces with both the highest uncertainty and the highest impact, four external scenarios can be constructed in step 9.

### Driving forces

- National/EU policy related to city fringes  
Definition: Policy from the EU and/or national government dealing with interaction between urban and rural.  
Boundaries: No interaction – merge of urban and rural  
Impact: Influence on regional policy and plans
- Economic future of agriculture  
Definition: agricultural competition position of the Netherlands  
Boundaries: no supply to the international market – competing globally  
Impact: Very strong influence on the landscape, as well as the economy and employment
- Succession of farms  
Definition: the change farmers will find successors for their farms  
Boundaries: no successors – sufficient successors  
Impact: influence on the landscape and the economy.



- Changing ground prices  
Definition: fluctuation in the ground prices compared to other regions  
Boundaries: Stays low – grows due to increased urban activity  
Impact: Strong influence on opportunities for agriculture and business, as well as urban and nature development
- Speculation on spatial developments  
Definition: Impact of speculators on ground prices  
Boundaries: No impact – high ground prices for all urban developments  
Impact: strong influence on urban developments
- Demographic changes in population size  
Definition: size of the population of Twente  
Boundaries: no further growth – small growth  
Impact: strong influence on urbanization, economy, traffic and recreation
- Demographic changes in living pattern  
Definition: size of households  
Boundaries: average of 1.5 pph – 3 pph  
Impact: influence on urbanization
- Climate change  
Definition: change in temperature and weather  
Boundaries: small change – dramatic change  
Impact: Strong influence on water management, agriculture, recreation
- Macro-economic development  
Definition: developments of the global economy  
Boundaries: recession – small growth (compared to pre-crisis)  
Impact: Very strong influence on the local economy, and with it urban developments and traffic
- Recreational patterns  
Definition: time and space distribution of spare time and recreational preferences  
Boundaries: clustering of activity – homogenous spread of activity.  
Impact: strong influence on traffic, as well as recreational business.



- Budget of municipalities  
Definition: amount of money available for the transition areas  
Boundaries: negative budget (losses on previous projects) – sufficient funding for a quality transition area  
Impact: strong influence on the execution of all projects in the transition area and the quality of the results.

### **Impact Uncertainty matrix**

The impact-uncertainty matrix is the way to combine key factors and driving forces in a clear, legible format. The matrix ranks the forces on a simple 'high-medium-low' rating system. We determined the prioritization by having discussion within the group and then we put the eleven driving forces into the Matrix. After that we got the following results as represented in the impact-uncertainty matrix.



Uncertainty			High	Impact	
Low	Medium	High			
- Demographic changes in population size	- Changing ground prices	- Budget of municipalities - Economic future of agriculture			Medium
- Demographic changes in living pattern	- Macro-economic development - Recreational patterns	- Speculation on spatial developments - Climate change			Low
- Succession of farms		- National/EU policy related to city fringes			

<i>Degree of uncertainty</i>			<i>Level of impact</i>
Low	Medium	High	
<b>Critical planning issues</b> Highly relevant and fairly predictable (can often be based on existing projections). Should be taken into account in <i>all</i> scenarios.	<b>Important scenario drivers</b> Extremely important and fairly certain. Should be used to differentiate scenarios. Should be based on projections but potential discontinuities also should be investigated.	<b>Critical scenario drivers</b> Factors and forces essential for success and highly unpredictable. Should be used to differentiate scenario plots and trigger exit strategies.	
<b>Important planning issues</b> Relevant and very predictable. Should be figured into most scenarios.	<b>Important planning issues</b> Relevant and somewhat predictable. Should be present in most scenarios.	<b>Important scenario drivers</b> Relevant issues that are highly uncertain. Plausible, significant shifts in these forces should be used to differentiate scenario plots.	Med
<b>Monitorable issues</b> Related to the decision focus but not critical. Should be compared to projections as scenario is implemented.	<b>Monitorable issues</b> Related but not crucial to the decision focus. Should be monitored for unexpected changes.	<b>Issues to monitor and reassess impact</b> Highly unpredictable forces that do not have an immediate impact on the decision focus. Should be closely monitored.	Low



## Results of the Orientation

### Step: 7

### Decision links

#### About the step

In this step we have reformulated the decision areas as questions. And we have connected the decision areas to each other, these connections are called 'decision links'. Decision areas are interconnected when decisions on the one influence (the decision possibilities of) the other. Depending on the impact of the influences, the connection can be strong or weak. We have used our knowledge about decisions, the region Twente and this decision links to analyze all possible connections.

It is important to analyze this connectedness because it is important to know what is related to each other. This knowledge is, later on in the process, used as input information (Decision focus).

#### Decision questions

In this step, the different decision areas which are determined from step 5, are linked to each other and are reformulated as questions. In the decision links model the strong relationships and influences between two decision areas are indicated by a red line and the weaker relationships with a thinner blue line. For instance there is a red line between barriers consisted of infrastructure and EMS constructed by the Green Gate Barriers because there is a lot of struggle and opposite goals between these two.

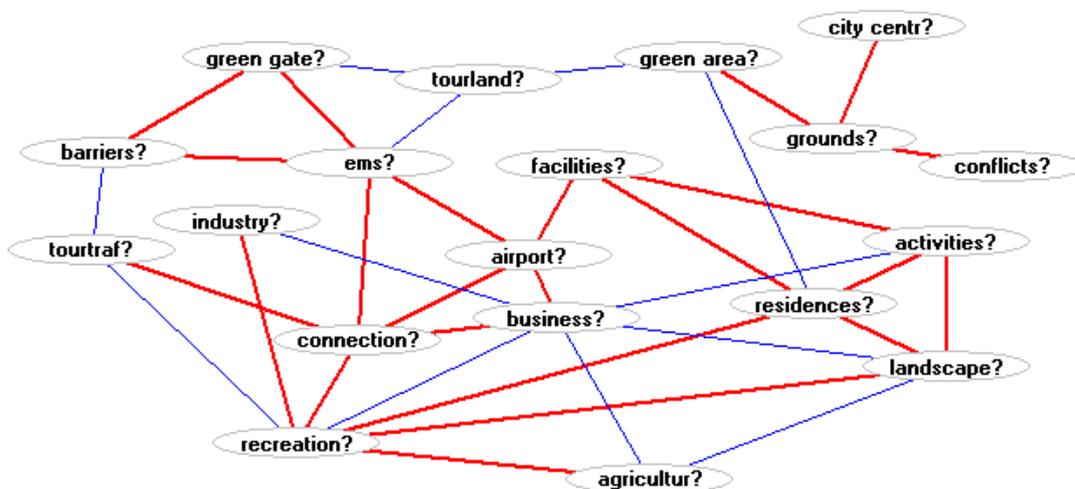


1. Barriers:  
To what extent can/will we create passages across current infrastructural barriers (highways, railroads, etc)?
2. Roads & Connectivity:  
To what extent will we need to upgrade and/or add new roads to improve/maintain the connectivity?
3. Airport Twente:  
Do we need Airport Twente? If not, what should be done with the area?
4. The Green Gateway:  
How much will we facilitate the goals of the Green Gateway?
5. Locations of new facilities:  
How to distribute new facilities in the city fringes?
6. City Centers:  
How to develop the city centers?
7. Bought grounds  
What to do with grounds the municipalities and project developers already bought
8. Business areas:  
How to implement (agri)business/industry areas?
9. Ugly industry  
Can we make industrial areas more attractive?
10. Green areas:  
Should we create more green areas for the inhabitants?
11. Recreation in agricultural areas:  
How to improve recreation in the rural area?
12. Urban development:  
How to deal with urban-rural conflicts in city expansion areas?
13. Tourism and landscape:  
How to minimize the pressure on the landscape from increasing numbers of tourists?
14. Tourism and traffic:  
How to minimize the pressure on traffic from increasing numbers of tourists?
15. Activities in the urban fringe:  
What kind of activities should take place within the urban fringe?
16. Landscape of the city fringes:  
What kind of landscape for the city fringe would be preferable?
17. Role of the EMS:  
How to execute the EMS-policy in the region?
18. Residences in the city fringes:  
What kind of residences should be placed on the city fringes?
19. Changing agriculture:  
To what extent do we stimulate/allow intensification and side activities for farmers?



## Decision links

It is important to analyze this connectedness because it is important to know what is related to each other. This information is, later on in the process, used as input information in step 10, called the problem focus. We have to define the problems we have to deal with more in detail. Selecting the decisions is necessary for defining what kind of decisions have to be made. Furthermore, it is relevant to define the most interrelated decision areas that stick closely to the planning task of the city fringes. These are the steps about Roads & Connectivity, Business areas, Recreation in agricultural areas, Residences in the city fringes and Changing agriculture.



## Step: 8

## Boundaries of driving forces

### About the step

For this step the Impact-Uncertainty matrix of step 6 is useful to identify the boundaries of the driving forces. The most interesting driving forces are those positioned in the matrix with a high impact and especially the ones with a high uncertainty that are hard to predict. The description of the range of these driving forces gives an idea of the possible consequences of these driving forces. So these opposite directions here indicate the boundaries of the driving forces. Knowledge about these (possible) consequences is needed to start making external scenarios (next step) out of it.



## Boundaries

The two driving forces EU protectionism and Economic development have the highest impact and are very difficult to predict. The description of the range of these driving forces gives an idea of the possible consequences of these driving forces.

For the two driving forces we made a description of what we mean by a certain driving force. The driving force about the EU protectionism is about on which way the EU policy protect the market of agricultural products inside the European Union. For this we chose two opposite boundaries, these are an open market and a protected market. The protected market will be more then it is on this moment in the Netherlands. There will be a lot of subsidies for European products and for countries outside the EU high import taxes for their products. The open market is what there is except for the future, there will be free trade for all products outside the EU.

The driving force of economic development is about the way the economy will develop in the economy. Here for there are two boundaries formulated, one of them is a weak economy and the other one is the opposite namely a strong economy. By the boundary of the weak economy there will be a stagnating economy and a consequence of this will be that there is a lo of unemployment in the region and also that there is less investments through the companies in new industrial area's and business districts. The different companies don't make investments in knowledge and technical improvement. Also the inhabitants will have a stagnating GDP and also more sparing with their money. When there is a strong economy there will be a blooming economy and trough that less unemployment. The companies will invest in new industrial and business districts. There also will be large investments in knowledge and technical improvement. The inhabitants will have a growing GDP and have a lot of money they can spent.

In the schemes beneath there is a short description of what the driving forces mean and what the impact is of the boundaries.



### ***EU protectionism***

**Definition:** EU policy on protecting the market of agricultural products inside the European Union

**Boundaries:** open market (free trade for all products from outside the EU) – protected market (a lot of subsidies for European products and high import taxes for non-European products)

**Impact:** Large impact of the kind of agriculture in the future and thereby the kind of landscape of the future.

### ***Economic development***

**Definition:** The global economy development in the future

**Boundaries:** weak economy (stagnating economy, ongoing unemployment in the area and no new industrial areas. Stagnating GDP) – strong economy (blooming economy, less unemployment in the area and new industrial areas and business districts. Growing GDP)

**Impact:** Large impact on the city fringes because the impact for the development on industrial areas and residential areas is high. Recreation development will also be dependent on the economic growth because it is influenced by peoples prosperity.

## **Step: 9**

### **External scenarios**

#### **About the step**

For this step the driving forces and their boundaries have to be identified in order to accomplish this step. The outcome is a matrix filled with four superficial external scenarios. The four external scenarios reveal four different future environments and are based on the two driving forces with both the highest uncertainty and the highest impact. Within this framework lie the possible developments for the driving forces and their spatial consequences, which we can foresee at this moment. Choosing two opposite scenarios will be sufficient, because this describes both the high-situations and both the low situations. These two external scenarios are more explained in detail in a written document and are presented in maps.



## The scenarios

High economic development

Low EU protectionism	<ul style="list-style-type: none"> <li>• Intensive agriculture</li> <li>• Extensive recreation</li> <li>• High ground prize</li> <li>• Small transition area</li> </ul>	<ul style="list-style-type: none"> <li>• Airport will be important</li> <li>• High ground prize</li> <li>• Multifunctional intensive land use</li> <li>• Big transition area</li> </ul>	High EU protectionism
	<ul style="list-style-type: none"> <li>• Agricultural side activities</li> <li>• Ground prizes are low</li> <li>• Small transition area</li> <li>• Extensive recreation</li> <li>• Less succession of farms</li> </ul>	<ul style="list-style-type: none"> <li>• Very big transition areas</li> <li>• Ground prices are medium</li> <li>• Intensive recreation</li> <li>• Agricultural side activities</li> </ul>	

Low economic development

### Scenario 1 High - High

High economic development – High protectionism for the agricultural sector

#### Main points:

- City expansion (industrial and residential)
- Agricultural intensification
- More living space
- Higher recreational demands
- Less recreational opportunities
- High technological development
- Traffic intensification



## Story

This scenario shows the results of a growing economy where the protective measures for the agricultural sector remain intact. This means that most agricultural production will be intended for the European or national market. This leads to a very favorable situation for agricultural production and many farmers can be expected to seek means to improve their production through intensification, scale enhancement and technological innovation. In the other economic sectors, agribusiness will thrive in the more rural areas of the Netherlands, such as Twente.

The increased prosperity will lead to higher demands for living space and recreational facilities. This is one of the main conflict zones in this scenario, as these land uses will compete with the economic and agricultural developments. As the agricultural intensification makes the rural landscape less attractive, opportunities for recreation decrease. This means that route-bound recreation will diminish while location-bound recreation will greatly increase.

A growing economy is often accompanied by increasing traffic. As a changing pattern in recreation will promote more car use, traffic can be expected to increase further. Of course, the level of this increase will be strongly dependant on the distance between residential areas and recreational facilities.

## Scenario 2 High - Low

High economic development – Low protectionism for the agricultural sector

### Main points:

- city expansion
- agricultural side-activities
- expansion of some farms
- more living space and industrial areas
- high recreation demands
- high recreation opportunities
- traffic intensification



### story

This scenario describes the result of the developments of a decrease in protectionism for the agricultural sector and a blooming economy. These developments lead to a competitive open world market, which benefits internationally oriented (agricultural) companies. Companies which are not internationally oriented have less knowledge of the workings of the world market, and thus can be expected to decline, unless they successfully adapt. Companies which have relied on subsidiaries for survival will likely disappear altogether.

As such, agricultural production will decrease, which also has consequences for related industries and the employment in these sectors. While some farms may be able to stay afloat by increasing the scale, mechanization and intensity of their production. Most farmers, however, will be forced to either end their business or find other means of income. Many can be expected to exploit the blooming economy through it's resulting increase in recreational demands. They will offer recreational side activities or even make it their main income. Additionally, they might apply for different subsidiaries, specifically for landscape and nature conservation.

Others, unable or unwilling to change, will be forced to end their business. This makes ground available for urban expansion or those few farmers that expand their business, depending on the distance to the cities.

Outside the agricultural sector, the economic situation is much less grim. Especially the tertiary sector can be expected to benefit from the combination of open market and economic growth. Employment in this sector can be expected in increase, though whether this will make up for the loss in the agricultural sector depends on the relative importance of those sectors within a region. For Twente, the cities will likely see an improve in employment, while the rural area will see a decrease. This may stimulate urbanization, but an increase in commuting traffic is more likely.



These developments will result in an increase in living standards within the city, as well as increasing demands for recreational possibilities. These demands will partially be met by the aforementioned farmers, starting recreational side activities. As such, the main economic focus of the region can be expected to shift from agriculture to recreation and, due to the presence of institutes of higher learning, knowledge.

These economic changes can have far-reaching consequences. As often witnessed in situations of increasing economic freedom, individualism becomes a more prominent cultural feature. Freedom and development of the individual become important for people, whether this refers to their financial situations or other activities, often conducted in spare time. Thus, recreation, with the aspects of quality, quantity and variation, becomes more important to people. At the same time, deterioration of the agricultural sector may diminish the quality of the landscape, which will increase its value. This also means that outdoor recreation will increase in popularity, as long as measures to maintain the landscape are successful.

Policy will focus on maintaining the economic momentum, improving the recreational possibilities in the region (as this will be part of the economy) and meeting the demands for landscape and nature conservation. This last part will likely be done by means of subsidiaries for land owners, which many struggling farmers will eagerly make use of. Additionally, the urbanization also needs to be facilitated to some degree, though this will cause conflicts with the high value placed on landscape. Cities will expand with some new residential and business areas.

A very big challenge for politicians will be the infrastructure. The increasing traffic from the growing economy and recreation will put a large strain on the network, which created a demand for improving and expanding the infrastructural network. At the same time, increasing value on landscape and nature will create resistance against expansion of the network. A likely development will be that the network will be expanded anyway, but there will also be more money available for ecological corridors and passages.



The transition area will also be a conflict area, because of the need for urban expansion. A likely way to solve this problem, as well as facilitate the higher living standards and satisfy the landscape enthusiasts is to give new urban areas, both business and residential, a green image and a smooth transition into the rural area. Because of the economic developments, the expectations for new industrial and agribusiness areas are much lower, and many municipalities will simply prefer to develop green business areas.

### **Scenario 3 Low - Low**

Low economic development – Low protectionism for the agricultural sector

#### **Main points**

- Agricultural side activities
- Less employment
- More route-bound recreation
- No city expansion

#### **Story**

This scenario shows the consequences of the depression of economic development in the region with low protectionism for the agriculture market which means that the European and International market will not widely open for the agriculture production.

Therefore the farmers will have to seek for other measures for continuing their “business”. Instead of the traditional agriculture production, a lots of agriculture side activities, which include farm stores, small hotels as well as some recreational places, will arise on the former farm lands; and instead of the location bound recreation, routes bound recreation will be stimulated in the rural areas.

Under the low economic situation, many of the corporations in the region closed their doors to new employees, thus a there will be less employment opportunities in the region than that before.

Furthermore due to the finance problems, the municipalities and most of the project developers will not be capable to purchase additional lands in the transitional areas or those beyond for building constructions. Consequently, there will be no city expansions in Region Twente.



### Scenario 4 Low - High

Low economic development – High protectionism for the agricultural sector

#### Main points

- Agricultural intensification
- Less employment
- Lower GDP
- More route bound recreation
- No city expansion
- Less traffic

#### story

This scenario describes the situation when the protectionism for the agricultural sector stays equal or increases, and the economic development is very low.

The farmers will get money from the government and can sell their products cheaper. This will help to maintain the position of Dutch agrarian products on the world market. At the same time all other branches will get difficulties to survive, because of the poor economic situation.

The highly protected agricultural sector will be profitable enough to scale up and invest in expansion. This leads to bigger, more intensive, farms, that use the newest technologies. These technologies can be improved by cooperation between farmers and research by universities. This means that the universities of Twente (technology) and Wageningen (agricultural knowledge) get possibilities to grow. Cooperation between these universities and the farmers will result in more agrarian machines and computers, used for production. When work will be taken over by machines, jobs will be lost.

The growing farms will put more and more environmental pressure on the landscape, because they want to scale up. When we do nothing against it, the typical small scale landscape will make way for a large scaled landscape without hedgerows (in Dutch: 'houtwallen') and small forests. These developments are not good for the ecologic situation of the region and will make the agricultural area less attractive for recreation as well.



The general economic situation in the Netherlands will be poor. This will result in a lower production. This leads to a lower GDP (Gross Domestic Product: the world market value of all goods and services produced in a country, in one year). This will weaken the Dutch situation on a European and global scale. These developments will lead to financial problems for many branches. On its turn, this will lead to a lower employment and less growth of business and industry areas.

The low employment will decrease the purchasing power (the ability to purchase goods and services) of the residents, which will lead to changes in their pattern of spending. People will spend less money on recreation, try to find a cheaper house and reduce their consumption. The recreational opportunities will decrease because people spend less money on them. New houses will be smaller, and on less ground, because that is cheaper. Other consequences of a lower employment are that people move away to find a job somewhere else and that people want to be better educated.

Because people still want to recreate, but do not want to spend money on it, the route bound recreation will increase. But at the same time, the rural area will get less attractive for recreation because of the intensive farms. This leads to a higher recreational use of the small areas that are still attractive. Because of the poor economic situation, the municipalities will have less money to spend on recreation as well. This will lead to a higher amount of initiative from local business.

Because of the economic situation, little to no city expansion will take place. This will lead to a more permanent city fringe, that can be used as a buffer against the negative impact of the intensive agricultural land use. The unattractive rural area will cause a focus shift on the inner city as well.

Finally, there will be less traffic, because people have no need to travel anymore. This will lead to less cars and vehicles, less traffic jams and less need to construct new or upgrade old roads. There will be more bikes and pedestrians on the street, and investments on the public transport can be sensible. Only the rural, agrarian infrastructure, will be improved, to optimize the production.



## Results of the Compilation

### Step: 10

### Problem focus

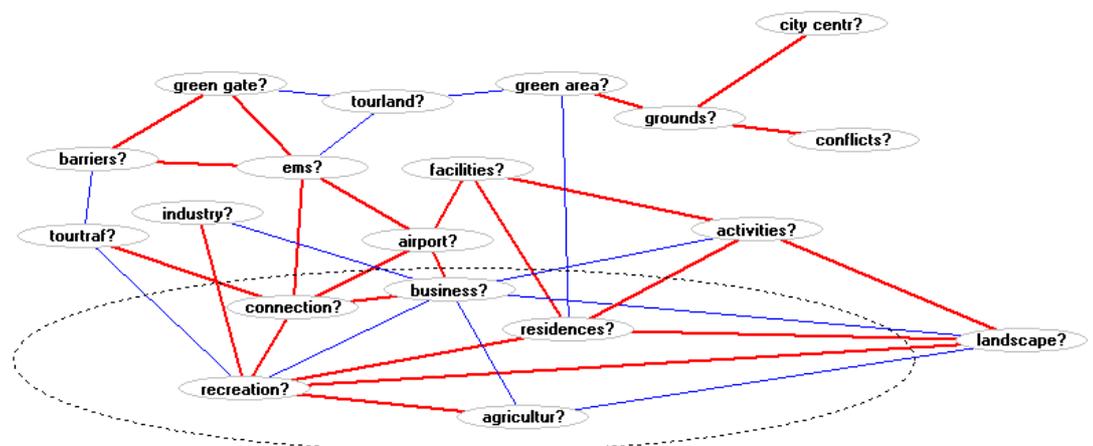
#### About the step

The problem focus can be any subset of the decision areas in a decision graph for closer examination. In this step we reformulate the decision links and select five decision areas as our focused decision area which are highly interrelated and also closely related to our task. The narrower focus will make the following step easier and clearer.

#### Problem focus

The problem focus consists of:

- Roads & Connectivity:  
To what extent will we need to upgrade and/or add new roads to improve/maintain the connectivity?
- Business areas:  
How to implement (agri)business/industry areas?
- Recreation in agricultural areas:  
How to improve recreation in the rural area?
- Residences in the city fringes:  
What kind of residences should be placed on the city fringes?
- Changing agriculture:  
To what extent do we stimulate/allow intensification and side activities for farmers?





## Step: 11

## Visions

### About the step

Visions are needed for exploring good directions for the future. A vision is created keeping the strengths and weaknesses of the region in mind, this to stay realistic. The visions are not hampered by the different measures that would have to be taken to accomplish that vision. Creating the visions is a creative process that is also influenced by our knowledge of the region we gained during the entire process. The vision is more or less a package of goals that would be good for a large part of the stakeholders.

Two visions were created that both explore different directions. The difference in direction is important because it could be that certain visions only do well when certain developments in the driving forces take place.

### Visions

We have concluded following aspects that are in line with the wishes of the region and the stakeholders: *urban development, rural development, productions (agriculture, industries and etc), tourism, transitional city fringe, buffer city fringe as well as open and closed landscape*, which are relatively weakly connected to those above. Finally those aspects were classified into two groups according to the contrast characteristics as the backbones of two (opposite) visions for the desirable futures of Twente, namely "*Urban Development and Production*", which is strongly focused on city expansion both for industries and residential areas as well as rapid economy developments (knowledge, high technology and research and agriculture production); and "*Rural Development and Tourism*", which is focused on recreational developments (nature, route-bound, facilities and etc) and small green landscapes in and even beyond the city fringes for tourism.



## Vision 24/7 Twente

### Main points of the vision

- Strong economy
  - knowledge, high technology, research and education
  - agribusiness
  - transport/logistics to other countries (especially North Germany)
- Enough industrial area
- Enough agricultural production
- Agribusiness
- Enough residential area
- Big transition area
- Facilities
- Enough infrastructure
- Good connection between airport and cities
- Another recreation pattern without that much nature
- More public transport
- Good connectivity between cities
- International cooperation
- Competing with other regions
- Technological advancement
- Educational development

### Story

According to the wishes or goals of the Region Twente in 2030 the region will be the second biggest economic region behind the Randstad. This economic position can be reached by combining the different strong points of the region, like the location and the low population density. The region is located at the border of the economic transition area of the Randstad. So this region is more close to the Randstad located than other regions in the Netherlands, like the north and the south. This region is also located very close to Germany, this enhances a market with a lot of international import and export cooperation. Because the Weeze airport in the south and the transport business near Venlo provide already good connections between the Randstad (port of Rotterdam) and the Ruhr-area, this region can provide a good connection to the north of Germany (Osnabruck, Bremen, Hannover and Hamburg).



The low population density gives enough possibilities to develop a solid intensive agriculture and agribusiness. The agriculture and agribusiness will be focused on livestock, dairy and orchard production. The agriculture and agribusiness can be combined with the new high technology and knowledge that can be created by the technologic university. The high technologic knowledge can be improved by research and education, which creates possibilities for a cooperation between business and the university. When the connections with the Randstad and Germany are strong enough, there will be possibilities for cooperation between more universities as well.

These developments require a good network of infrastructure and public transport, and also a good connection between the cities and Airport Twente. Secondly there will be a lot of new jobs being created, which leads to a bigger demand of residential opportunities.

Due to the economic growth and the production function of the agriculture, the cities have to be attractive places. This can be reached by the 'green finger theory' and by creating big green city fringes with a low residential density. These city fringes form the spatial transition area between the rural and urban areas and have to be more small scaled and multifunctional than the rural agricultural production areas that are outside these city fringes. These small scaled landscapes are less production orientated, consist of hedgerows (in Dutch: 'houtwallen') and small forests, and can be used for a lot of different activities such as different forms of recreation like cycling and hiking, as well as living and working, though in a low density.

Due to these progressive developments, people will have higher desires for quality of life. This stimulates a high demand for new forms of recreation, so this will create more forms of recreation and nature will no longer be the only or dominant recreational destination, although parts of it will still be valuable and maintained for recreation and tourism industries. Especially in the city fringes there will be more facilities for visitors and tourists in the tertiary industry, like hotels and restaurants. There will be also more facilities in the quaternary industry, like schools, education, office buildings, services, information technology and research institutes.



## Vision Twente, land of scapes

### Main points of the vision

- More hotels, camping sites, hostels
- Lot of space for route bound recreation
- More Social cultural facilities in good condition
- Transition-areas built for recreation
- Recreation for different target groups
- Farms with recreational side activities
- Local shops, local products
- Small scale landscape
- Nature development for better recreation
- Safe passages over railroads and highways
- Good public transport
- Good connection with Randstad so residents can also work outside the region
- Business districts become green

### Story

Twente has an attractive small scale landscape, where scattered farms and nature merge in enclosed fields. Some larger plains, as well as forests and heath fields create a lot of variation in the landscape, giving tourists many opportunities to explore the area and making every location different.

At the same time the cities provide many facilities, and the city centers host many cafes and restaurants, creating lively cities in a beautiful environment.

All of this means that Twente has a very strong recreational potential, which is currently barely untapped. As such, it should be possible to develop Twente into a thriving tourism region. Therefore the development of hotels, camping sites and hostels will be promoted and stimulated. Farmers will receive subsidies for recreational side activities, which will open up a whole new world of opportunities for them. Combined, these developments will strengthen each other and thereby help fulfil Twente's potential.



Another important aspect to facilitate tourism is the accessibility of the region. A good connection with the rest of the Netherlands is critical, as well as the networks for cars, bicycles, hikers and even horses within the region. At the same time, these excellent connections will allow people living in the area to remain there, even when finding a job outside the region. This means that some upgrades will be required, though care should be taken that the different networks do not interfere with each other.

The transition areas will be some of the most important locations of the region, as they are critical and bringing the landscape and the facilities together. Transition areas should be attractive and green, provide connections from rural to urban area and be part of both. This means that they should contain local shops and facilities, as well as nature and (route-bound) recreation.

In the end, many changes will be necessary, but the result will be worth it. Not only will Twente be an attractive place to live and work, the increase in tourism should also provide a boost to the economy, which reduces the need for unattractive industrial areas. This, in turn, helps in making the region attractive. Of course, it is unrealistic to assume that the entire region can live on the tourism sector, so some other sectors will still need to be facilitated. Twente has a location that would be suitable for the transport sector, but this will crowd the roads with trucks, and thus, this sector shouldn't grow too large. Much more attractive, and also a viable option, would be the knowledge sector. This sector has very little landscape interference, and may even contribute to it. The growing Twente University already is the core of this sector, which means that the region has potential here.

Not only the economy will benefit. Maintaining nature is important to attract tourists. This means that an investment in nature will be both an ecological and economic investment. Connecting nature areas will be important for both animals and tourists. As such, current projects like the Green Gateway will be expanded, and combined with new projects to create a well connected natural area.



Farmers in Twente are currently in a difficult position. Traditional agriculture struggles with diminishing profits, and the landscape limits their opportunities for technological innovation. Increasing the scale of farming is not desirable, since it will ruin this landscape, but still the farms are the creators of the landscape. This means that the farms should stay, though their means of income should change. As such, the promotion and possibly subsidizing of creating recreational side activities and nature maintenance is an ideal solution to this dilemma as it solves both the problems of income and landscape.

Realizing this vision will require the correct political and cultural environment. The ideal situation would be a social democratic climate, as it creates good opportunities for developing recreation in the region of Twente. Private entrepreneurs that want to start a business in the recreational sector will get support from Twente. Environmental legislation will force the agricultural sector to develop more side activities instead of intensifying. These side activities can be related to nature development, landscape maintenance and recreation. The knowledge economy will also get opportunities to grow since there will be more money from the government for education.

## **Step: 12**

### **Decision options**

#### **About the step**

The decision options are going to be used to explore the alternatives within the problem focus and indicate the range of possible actions or options within a decision area. The options have to fit in the goals of the in the goals and two visions for the long term. It is also necessary to check whether the options are mutually exclusive, which means that if one option that not ruled another option, can be replaced by a mixed use option.

#### **Decision options**

From Step 10 we get the problem focus which includes five decision areas ( Roads & Connectivity, Business areas, Recreation in agricultural areas, Residences in the city fringes and Changing agriculture). We need to find the alternatives within this problem focus in this step.



## Roads & Connectivity

To what extent will we need to upgrade and/or add new roads to improve/maintain the connectivity? We created three options.

- No upgrading and improve public transport, intended for recreation traffic this means we'll not change the current situations of the infrastructure only improve the public transport to meet the increasing demand for traffic. And this option will do no harm to the existent landscapes.
- Small upgrade, personal cars and public transport, intended for work and living traffic. The purpose of this option is going to improve the road and public transport mainly used for recreation and inhabitants' requirement for working and living especially in rush hours.
- Large upgrade: cargo and personal cars, less improvements on public transport intended for transport traffic. This option intend to give a comprehensive upgrade of infrastructures to prevent potential traffic pressure brought by increasing economy and the airport.

## Business areas

How to implement business (including agribusiness and industry) areas?

- One option is focus on landscape implementation which means the new business area will be green and attractive consequently the cost of building such a business area will be much higher than the normal ones.
- The other option is focus on economic locations which means saving money and make large profits is the priority.
- And the renovation is the last option. It limit the development of business areas within the urban areas to protect the current landscapes outside the city.

## Recreation in agricultural areas

To what extent do we improve recreation in the rural area? No recreation at all is not realistic so we give two different levels of options, the light version and the full package.

- Light version is about improve cycling/ hiking routes as well as traffic safety and accessibility, agricultural side activities on initiative of farmers.
- Besides light version Full package also offers subsidized agricultural side activities recreational facilities, landscape maintenance, advertising.



### Residences in the city fringes

What kind of residences should be placed in the city fringes.

- Green area with scattered houses, estates and agricultural buildings which will maximally maintain the landscapes. This area will be attractive for recreation and tourism.
- Villas, the environment looks pleasant and also profitable to the developers.
- Vinex, less attractive but may solve the large demands for houses.

### Changing agriculture

We also created three options to decide intensification or side activities for farmers in the transition area.

- First one is total intensification this is good for agriculture sector and the economy of this region but of course it will lead to an unpleasant environment nearby.
- Side activities with subsidized landscape and nature maintenance will be attractive for tourism but also cost much more than intensive agriculture.
- Mixture of intensification and side activities is the combination of both kind of agricultural activities. Also the consequences will be in the middle.

## Step: 13

### Option graph

#### About the step

The option graph provides a quick overview which allows you to see the (in)compatibility between each option in each other decision area to each option of another decision area within the problem focus. This indicates also indirectly the option bars, which are a representation for two options from different decision areas that are incompatible with each other. The compatible links are called decision links.





*Full Package for Recreation* will be incompatible for *Economy Business* and *Total Intensive Agriculture* since the environment there will not be nice for recreation and tourism. The *Light Version* and *Side Activities Agriculture* also don't make a good pair, otherwise the large investments in the *Side Activities* could be a waste when *Light Version* can not bring enough income. The *Economy Business* doesn't fit the situation of *Side Activities Agriculture* for same reason.

The *Economy Business* areas are not attractive enough. And its atmosphere is totally different from the *Green Residential Area*. It could be ridiculous to put them together.

At last total *Intensive Agriculture* is incompatible for *Landscape Business* and all kinds of residential areas. The area could be very unattractive and also produce unpleasant smell every day. It won't be wise to make a linkage between these areas.

## Step: 14

### Decision scheme

#### About the step

The decision scheme describes any combination of options which is feasible in the sense that it does not violate any of the option bars included in the decision problem. No decisions are made at this time, it is only an exploration of the options that are open. These explorations help for getting a realistic view on what possible solutions there are. So the aim is not to provide a framework for analysing contingencies and probabilities, but to display all available decision schemes for further examination. This means that no decision are made at this time, it is only an exploration of the options that are open.



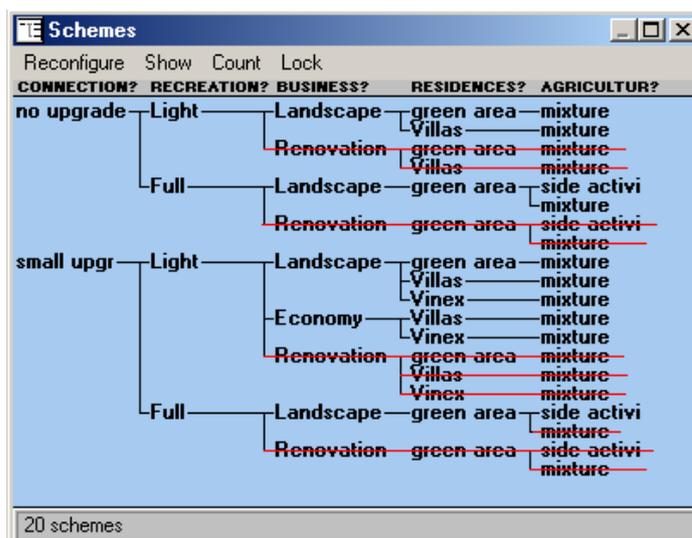
## The scheme

From Step 13 we get an option bar with all incompatible relationship represented. The various feasible combinations of options from the five selected decision areas are built up by proceeding through a systematic branching process. The combinations are presented in the form of a tree-like display which in this process it is automatically formulated by the software STRAD 2. This is so called option tree.

We got 20 schemes in total which means a lot of work in the following steps therefore we decided to re-examine the option tree in order to find out if there are incompatible relationships left or if there are overlapping options.

We decide to skip the combination of Small Upgrade of Transportation, Full Package for Recreation, Landscape Business Area, Green residential area and Mixture Agriculture. Full package for Recreation means we focus on recreation and tourism while *Landscape Business Area* and *Green residential area* all contribute a lot to the attractiveness of the region for tourism purposes. But the part of intensive agriculture of the *Mixture Agriculture* undoubtedly has a negative impact on the environment. The scenery of intensive agriculture area would not be attractive, and also the smell from that area would not be nice as well.

At last we removed all the schemes related to Renovation for Business Area because we found there is no difference between the branches of Renovation Business and Landscape Business. To reduce the workload and speed up the procedure we decided to skip them and compare the difference between Landscape Business and Renovation areas separately.





## Results of the Formation

### Step: 15

### Policy scenarios

#### About the step

In the policy scenarios we describe how the visions should be accomplished under the circumstances determined in the external scenarios. Some visions are more likely to be reached than other taking the those circumstances into account. Solutions and measures can be anything from changes in legislation and regional policy to spatial plans like building a new road.

First the *strengths* and *weaknesses* of the present situation of Region Twente were defined based on the confrontations with the desirable futures (visions), during which each vision was analyzed upon either of the two most important external scenarios ( "*High Economy Climate and Low Protectionism*" and "*Low Economic Climate and High Protectionism*" ) that were created in former steps. The *opportunities* and *threats* that were brought up in the external scenarios for the region for reaching the desirable future. Concerned responses (strategies) towards the results of *SWOT* analysis (*Strengths, Weaknesses, opportunities and threats*) were formulated (each vision was attached with two sets of external scenarios).

#### Outcomes of SWOT analysis

##### Urban development and production

For achieving a future with highly urban development and production, the region has a lot of potential. The University of Twente, as the biggest scientific institution in the region, provides excellent opportunities for international cooperation, which would stimulate rapid development of the region. Good infrastructure networks in urban areas offer unique foundation for business, tourism transportation on national and international level. Geographically, the region Twente is suitable for implementing the concept of Green Fingers, which can shape an attractive transition area. Where possible new estates should be included in the residential areas.



However, there is a lack of infrastructure for agriculture, this limits the access to the rural area. The estates in the city fringes limit the space for urban expansion. Moreover, the importance of small landscape in the transition areas reduces the opportunities for agricultural production.

Looking at the different possible external scenarios, different threats and opportunities for the region emerge. With the expectations of an excellent economic climate and low protectionism for the local agriculture market, the municipalities and project developers will have sufficient finances for investing in urban developments outside the urban centers. In the meanwhile there will also be lots of recreational possibilities. This means that the transition area will expand and become smooth. And of course new infrastructure will be constructed for the increasing traffic flows. Although there are great possibilities, the accompanying threats should be given great attention. Due to the low protectionism, the intensive agriculture will be changed into agricultural companies with side activities. Technological and educational developments as well as recreational developments will be expanded outside the city. This would also limit the space for agricultural production.

With the prospect of a bad economic climate and high protectionism for the agricultural developments will continue to be successful for agri-business, which would lead to a boom for the economy of the region. But due to the bad economic situation, the city will not be able to expand because of the decreasing demand for living space and because of the lack of job opportunities. The combination of large amounts of intensive agriculture in the rural area with the urban expansion will result in a small buffer transition area as city fringe.

### **Tourism and rural development**

Twente has an attractive landscape, making the region very suitable for tourism. The small scale landscape, large amounts of nature areas and possibilities for water recreation result in an area which is very suitable for outdoor recreation. The recreational network (cycling, hiking, etc) provide easy access to the rural area. At the same time, other land uses also develop. The University Twente will grow, and get a stronger influence in the region.



One of the main problems arising is the conflict between urban developments such as infrastructure and business districts. This causes damage to the rural landscapes and creates barriers for nature and recreation. Another problem is that the region has a fairly isolated location within the country, though connections are good compared to the northeast.

In the prospect of a good economic climate and weak protectionism for the agricultural sector, the region holds a lot of opportunities for economic developments in terms of side activities, knowledge, tourism and recreation

### **Scenario 1**

24/7 in a low economy, high protectionism situation.

This policy scenario presents the difficulties that come with attempting to stimulate the economy, while in a situation of economic depression. Some opportunities are created by the strong economic protection of the agricultural sector, allowing it to grow despite the depression.

Economically, the location of the region is also very good, because Twente is situated on the border of the economic transition area of the Randstad and very close to Germany. This position, in combination with the canals and the mobility in the region form a good chance to create a strong transport (transfer) business on locations near cities and highways / canals. In order to make this business successful, improvements on the connection with Germany will be required. The railroad into Germany is not designed for intensive use, and the canal doesn't cross the border at all, which means most transport will be going by road. This may cause congestion, which makes other modes of transport more attractive, hence the importance of upgrading those modes.

Agriculture currently has relatively little economic significance. Intensification is hampered by the small scale landscape, and currently develops more in the direction of side activities. In order to stimulate agricultural production, this trend will need to change, mainly by reducing the limitations on intensification. This means that sacrifices on landscape maintenance will have to be made.



The presence of the university can be used to create an attractive location for a knowledge sector. These firms will be looking for an attractive, yet visible location. Stimulating this sector can also result in improved accessibility to technology in the other economic sectors. This is especially important for creating a more technologically advanced agricultural sector.

The region also has very strong green structures. The most well known of them is the small scaled landscape in the south and around the cities, but also the green lungs of Almelo and the green fingers in the other cities offer many possibilities to create attractive green cities. Attractiveness of both city and surroundings is important to stimulate tertiary and quaternary economic sectors and draw higher educated residents and more importantly, prevents many of those educated at the university from leaving. While this will not net instant improvements, it is important for the long term.

The developments of the external scenario present a situation of a troublesome economy, combined with strong protectionism of the agricultural sector, which adds a whole lot of complications. This does not mean that the idea of economic stimulation should be forsaken. In fact, it might even be an even more important goal to pursue. According to Keynesian economics, stimulating the economy is exactly what should be done in this situation.

The tertiary and quaternary sectors (in this case, logistics and knowledge) will feel the depression very strongly, while effects on the agriculture should be limited. Logistics and knowledge are very dependant on other economic sectors to require transport or research. This means that the logistics sector is almost impossible to stimulate directly. Through the agricultural sector, it is still possible, though. The agricultural sector is by definition one that is hardly influenced by macro-economic trends, as food is a basic necessity. Combined with a strong protectionism policy, this scenario presents a perfect opportunity to stimulate the economy through agricultural production. The protection allows and encourages farmers to intensify their production. Creating a thriving agricultural sector will stimulate related sectors as well. Through it, agribusiness can be drawn to the region. This, in turn means that the university and knowledge sector can provide a meaningful contribution as well. And, of course, a strong increase in production results in an increased need for transportation.



Of course, it's not as simple as investing in the agriculture. The other sectors won't be drawn unless the right conditions are created. All of these sectors will need space, but the specific demands vary. As mentioned before, the knowledge sector values image and visibility, while the logistics sector places strong demands on infrastructure. Ironically, given the low overall economic situation, traffic intensity will be rather low, which means that much less infrastructure upgrades are required to facilitate this than otherwise would be the case.

While it is possible to stimulate the economy during the presented depression, this is not without downsides. It is important to be aware that agriculture will become the cornerstone of the economy, which results in a strong dependence on protection measures. Another problem is the resulting spatial consequences. The economic developments will put a large strain on the city fringes. The logistics sector will need locations on the borders of the cities with good connections to the main infrastructure. The ideal agribusiness location would probably be between the agriculture itself and the transportation, creating a production chain of production – processing – distribution. It should be noted that agribusiness is a wide definition and not all of it involved in processing. The knowledge sector is the exception that does not require a place within the city fringe. The conditions of attractive and especially visible can be created better in the city than on the edge of it. The economic depression likely causes some vacancy of older business areas. This vacancy can be filled by the knowledge sectors once these areas are renovated.

Still, a growth of business areas in the city fringe is inevitable, and as mentioned before, there are economic reasons to keep the cities attractive. One way of doing this is by making the new business areas green and attractive, though this is expensive and thus not financially possible in the current scenario. Another way is by expanding the already present green fingers. This creates more spatial city fringes, which means that the negative impact from the new business areas is diminished. This does mean that the city fringes will require more space, which means that less is available for intensive agriculture. Though, since highly intensive agriculture is hardly attractive, some kind of buffer zone will be required anyways.



Despite the macro-economic situation, creating a strong economy is still a viable goal, though with the weak point of depending on protectionism. Changes, mainly sacrifices to the landscape will be many, as the small scale rural landscape makes place for intensive large scale production. As such, the landscape will be preserved in the city fringes, and cities will contain a lot of green, to keep them attractive.

## Scenario 2

Twente, land of scapes in a low economy, high protectionism situation.

This policy scenario deals with the challenge of turning Twente into a attractive touristic region, despite the problematic economy and the increasing intensification of the agriculture. Keeping Twente attractive is key but at the same time, a few other economic activities should be stimulated as well.

The present situation makes a policy focused on tourism and knowledge economy very feasible. The landscape is attractive, as well as valued highly by inhabitants, and there are many recreational possibilities. Multiple organizations already work on maintaining the landscape, and the region currently has a trend in the agriculture favoring side activities over intensification. This means that little (additional) policy is required, short of limiting urban expansion, which is a rather easy thing to do for a municipality with the will to do so. This will is often lacking though, as municipalities view business areas as a greater economic boon to their town then landscape and the corresponding tourism and recreation. This means that either this mindset needs to change, or direction needs to be given through regional or provincial planning.



The university is also doing well, which is the key reason for opting for a knowledge economy. Though the university will attract related firms, working in sectors like education, advice and R&D, having the university alone is not enough. Other important factors for such companies are location, image and accessibility. Location means space, which conflicts with the attempt to reduce urban expansion. The best way to solve this would be to use old business areas, which have fallen out of use, and renovate them for their new function. This not only removes the need for urban expansion, it also helps to create more attractive cities, which is an important part of this vision. The fact that image also is an important factor for these companies only enhances this. When renovation proves impossible or unrealistic, some new business areas will be required, which is best done with a mind for landscape implementation, both for the image of the companies as well as maintaining the landscape.

The last obstacle from the present situation is the infrastructure. On one hand, it needs to facilitate the knowledge economy, as well as the tourism, and on the other hand adding new barriers in the landscape should be prevented. As such, a few wide motorways leading to the cities (where, assumable, most of the knowledge economy takes place), with sufficient places to cross them, are more preferable than an extensive network of highways.

The two driving forces of the scenario lead to two main problems for the vision of tourism and rural development. The first, low economy, leads to a decline in spending on recreation and tourism, as well as the value of recreational areas in the minds of people. It also results in a smaller budget for developing Twente into a touristic region. The second, high protectionism, leads to a production-oriented agriculture, rather than the desired recreation-oriented agriculture, which leads to a reduction in recreational facilities and a less attractive landscape.



A bad economic situation is often devastating for the quaternary sector as companies, trying to stay afloat, will cut costs that do not directly return the investment. At the same time, the primary sector will do relatively well, since the demand for food will hardly diminish, and protective policy keeps the prices high. This means that untapping Twente's agricultural production and developing the agribusiness sector might be a better choice of economy, though such developments are in strong contrast with the goal of tourism development.

On the other hand, the declining economy also means that people will choose cheaper locations for tourism, which often translates into locations closer to home. This means that developing Twente into a touristic region can still be successful, if it manages to be competitive in both attractiveness and price. Being competitive in price can be resolved by offering cheap forms of recreation, like route-bound recreation. Income can be derived from the related spending of tourists on supplies and rent. The challenge lies in keeping and making the area attractive, especially when also developing the agriculture. Spatial separation is a viable option for any new agribusiness locations, as they can be placed on locations that already are unattractive, such as between infrastructural barriers. Such locations are plentiful in the region, so hiding these business parks shouldn't be too hard. This means that for large parts, change in the city fringes will be limited. Since most tourists will be staying in the cities, the city fringes are critical for connecting these cities with the urban areas. The infrastructure in the city fringes should be designed for tourists entering and leaving the rural area.

The same strategy cannot be applied to the agriculture itself, though a set of mitigating measures can be applied to reduce the negative impact on the landscape. First, effort should be made to regulate the expansion of farms to keep as many of the hedgerows as possible. Though the total amount will obviously decline, the pattern may be more important than the quantity. Second, architectural restrictions can be applied to the agricultural buildings, which will probably grow in size.



Large does not equal ugly, however, though it will be if no thought is given to aesthetics. Third, emissions such as noise and smell should be minimized. This is more of a technical, as opposed to a spatial, measure. It should also be noted that beauty is defined in the mind of the viewer, which means that this definition can be influenced. Combining the three mitigating measures with a marketing campaign can tip the scales in favor of Twente's new landscape.

In the end, the agriculture may become the distinguishing feature of Twente, resulting in a unique half-open landscape and turning Twente into an important touristic region within the Netherlands, though reaching such a situation will not be easy.

### Scenario 3

Twente, land of scapes in a high economy, low protectionism situation.

While in the other policy scenarios, attractiveness has importance, here it is the key concept and applies to the entire spatial organization, rather than specific aspects. First and foremost will be the recreational attractiveness, though combining this with economic attractiveness is the main challenge.

Twente is known for its attractive small scale rural landscape, which draws some tourists, though much less than its potential, and tourism is currently not one of its key features. Relatively little measures are required to change this though. Current trends in agriculture favor side activities over intensification, and there is a high level of landscape and nature maintenance, especially in the form of estates. What is lacking is the awareness of Twente's touristic potential, not only outside Twente's borders, but also within. The first needs to change in order to attract more tourists to the region. The second needs to change in order to create the facilities that tourists will expect to be present



A larger challenge is the infrastructure, as there are two sides to this coin. A good infrastructure network makes the region more accessible, which is an obvious advantage to attract tourists. Once they are in the region, and seek to explore it, the main infrastructure they used to enter the region becomes an obstacle, limiting the recreational possibilities. The good news here is that the main infrastructure is very clustered, which makes the barriers stronger (though whether it's a motorway or motorway plus railroad matters little, as both are impassable), but less frequent. This means that passages across these barriers can largely remove this problem.

Though Twente's touristic potential is strong, it is unlikely (and inadvisable to assume) that it can be the main economic driver of the region. Other economic sectors should not be ignored, though care should be taken to prevent conflicts with the tourism sector. Industrial areas should be spatially separated from recreational areas, though many forms of business can coexist with tourism, as long as the creation of the stereotypical grey and unattractive business areas is prevented. Ideally, industrial and business areas can be placed along the main infrastructure, providing them good access to it, while minimizing their impact on the landscape.

The external scenario provides an excellent economic situation, and due to the lack of market protection, extra incentive for farmers to choose the path of side activities over intensification. A strong economy is important for tourism, as it is only for those with the luxury to afford it. It also means that other economic sectors will develop and grow. That means that it might not be possible to concentrate business and industry around main infrastructure and otherwise less touristic locations. This means that preventing conflict with tourism cannot be done spatially. Given the good economy, there should be few financial complications with making any new (and possibly old) business areas green and well implemented into the landscape. Since this is difficult to do for heavy industry, there would be little place for it, and the focus will be on types of business that can benefit from an attractive location an obvious example would be tourism and recreation related firms.



Another economic sector which can benefit from such locations, and certainly has a place in Twente as well, is the knowledge sector. As a sector that, like tourism, is largely influenced by macro-economic developments, the external scenario gives a strong opportunity for economic development here as well.

All of this is likely to greatly increase the amount of traffic in Twente and in order to maintain a good connection, both for tourism and business, it is vital to improve the network, either by upgrading or new connections. Given the consequences for tourism, upgrading would be preferred. Another matter here is the kinds of business Twente should attract. Tourism and knowledge have been mentioned, as well as some criteria regarding conflicts with recreation. Since the expected traffic intensification, an additional criterion could be the limited use of the motorways, which would exclude for example the transport sector.

Another result of a strong economy is that people will be able to invest in increasing their living space. Since Twente should be an attractive region to live, work and recreate, this needs to be facilitated to some degree. This means that more residential space will be required in the city fringe, though this is not necessarily a bad thing. As already explained, there will be additional business areas in the city fringe. Such areas often create a barrier for recreation between urban and rural areas. This residential trend can be used to draw these business areas more into the city and create a residential city fringe.

Both the present situation and the external scenario provide many opportunities to improve tourism, as well as the overall attractiveness of Twente. Still, carefulness is advised when it comes to industry and business, as these, while necessary, easily conflict with such goals. Another difficult matter is the infrastructure, where balance should be found between (inter)national connections and local connections.



#### Scenario 4

24/7 Twente in a high economy, low protectionism situation.

The focus of this policy scenario lies on the development of three economic sectors: agriculture (including agribusiness), knowledge and logistics, of which the first will be the most challenging. At the same time, the challenge of attractive cities and space for recreation is tackled.

Twente currently has a couple of economic sectors which have a strong growth potential. The location between the Randstad and Germany, in particular the city of Hamburg makes it very important for transport and logistics. At the same time the growing university stimulates growth in the quaternary sector. Together with the agricultural sector, they can provide Twente with a strong economic growth.

At the moment, this growth is being limited by certain other factors. The agriculture is struggling with limited opportunities for expansion and intensification. This barrier can be fairly easily removed, though it will require some sacrifices to the rural landscape like the removal of many hedgerows.

The possibilities for growth are also limited for the logistics sector. While the current connections to Germany are sufficient for the current amount of traffic and transport, increasing this transport will require some upgrades to the infrastructure. The motorway already has a connection to the German motorway 30, providing an excellent connection with northern Germany, though connection with the southern part of that country could be improved. The motorway A35 ends at Enschede and continues as a highway into Germany, providing a connection to the German motorway 31, even continuing all the way to the motorway 54. Upgrading this highway would result in a direct motorway connection between Twente and Münster. It should be noted though, that the Dutch traffic to southern Germany is usually moving through the Arnhem-Nijmegen region. Other opportunities for improvements are the railroad and the canal. The current railroad connection at Enchede is not designed for intensive cargo transport, and would require an upgrade. It might even be possible to connect the twente canal with the Dortmund-Ems canal in Germany, though this will require a very large effort on the German side of the border.



The scenario presents very good opportunities for economic development, which enhances all the economic strengths of the region, but also increases the need for change, in order to facilitate the economic growth. Space will be required for additional business areas and infrastructure. This is mostly the case for the knowledge and logistics sectors. The agriculture sector will be struggling, as the removal of protectionist measures opens the market for cheaply produced agricultural goods from outside the EU. Technological innovation and intensification will be

prerequisites for a competitive agricultural sector. This will require large amounts of investment, which means that not all farmers will be able to follow this trend. The larger and more intensive farms can be expected to grow, while the smaller farms will diminish and either disappear or find other means of income. This does not have to be problematic, though. The blooming economy will result in increasing demands in recreation, and the smaller farms, often located near the cities, can be stimulated to shift from intensification to side activities.

As often when an economy is rapidly growing, other land uses diminish. Space will be required for the growing logistics and knowledge sectors. The first will primarily require space near the main infrastructure (motorway, railroad, canal). The latter is less place-bound, though a location in the vicinity of the university would be preferred. The logistics sector can also benefit greatly from the Airport. While there are doubts about the success of an airport in Twente, the future described in the scenario, combined with the development of the logistics sector, can turn it into a success. Development of the airport and growth of the logistics sector will enhance each other, which means that many logistics company will choose the airport as location over the aforementioned conventional infrastructure.

In the rural area, intensive agriculture will also diminish the landscape. However, this development takes place outside the city fringes, which separates it spatially from the urban expansion. This still means it puts an extra strain on the city fringes, though, as these will be less recreation in the rural area, which is diverted to the city fringes. Additionally, the agribusiness still needs a place. Perhaps the most sensible solution would be to locate this sector within the rural area, near the farms, which are part of the same production line. This will reduce traffic in the urban area and gives a little more space there.



In order to avoid a lot of conflict between the need for recreation and the urban developments, these developments can be concentrated in areas within the city fringes that already are less attractive. In Twente, such areas are often created by a large amount of infrastructural barriers, making such locations ideal for the logistics sector. The knowledge sector is harder to separate spatially, though this is also less necessary. This is the economic sector that often cares the most about landscape implementation, sustainability and the like, which means that knowledge sector areas often are not unattractive. This means that the areas surrounding the cities will be the most attractive, and thus can be expected to be the main area for outdoor recreation. The cities and city fringes will be the most important areas for most inhabitants of Twente, so they should be well connected. The urban development also presents the threat of having unattractive city growth. An interesting way of achieving this is the green finger concept. This creates a strong connection between urban and surrounding rural areas, as well as keeping the cities green and attractive.

## Step: 16

### Evaluation framework

#### About the step

In this step, the decision schemes that were framed in step 14 were evaluated and ranked through MCA (Multi-Criteria Analysis). For the assessment, three comparison areas (assessment criteria), namely *Pressure on the Ecological Main Structure*, *Cost for the developments (investments and profits)*, *Recreational Value of the Attractiveness of the City Fringes* with their own boundaries of influence, were defined based upon the goals of the region and stakeholders' as well as upon the policy scenarios.



## **Explanations of the Comparison Areas**

### **Pressure on the Ecological Main Structure**

We considered that Ecological Main Structure is one of the most important elements within Region Twente, especially to the city fringes. Because the developments of the city fringes as well as those beyond them would to more or less degree influence the quality of the EMS. Thus we see the pressure that the developments in the city fringe brings to the EMS as an important criterion.

### **Cost for the developments (investments and profits)**

The cost for the developments is an obviously important element in this case as well as any other case. Here the cost includes not only the investments which should be put in the developments, such as infrastructure construction, residential areas expansion, green area creation etc, but also the benefits that the developments in the city fringes would bring to the regions should be estimated, for example the investments placed on villa residential areas and its profits to the developers.

### **Recreational Value of the Attractiveness of the City Fringes**

Not only developing, but also keeping the city fringes attractive is a fairly important task. According to the wishes of the region and stakeholders as well as the visions, recreational activities are highly advocated in the future developments in the city fringes due to the excellent nature condition around them.





(Ranking order)

1. The scheme consists of agricultural *side activities*, large amount green areas in residential areas, *renovated* industries, *full* creation package and *small* upgrade of infrastructure.
2. The scheme consists of agricultural *side activities*, large amount *green* areas in residential areas, green *landscape* oriented business districts, *full* recreation package and *no* upgrade of infrastructure.
3. The scheme consists of *mixed* agricultural developments (production and side activity), large amount *green* areas in residential areas, green landscape oriented business districts, *light* recreation package and *no* upgrade of infrastructure.
4. The scheme consists of *mixed* agricultural developments (production and side activity), *villas* residential areas, green *landscape* oriented business districts, *light* recreation package and *no* upgrade of infrastructure.
5. The scheme consists of *mixed* agricultural developments (production and side activity), large amount *green* areas in residential areas, green *landscape* oriented business districts, *full* recreation package and *no* upgrade of infrastructure.

The explanation of each component of the scheme can be referred to the step decision options.

## Step: 17

## Uncertainty analysis

### About the step

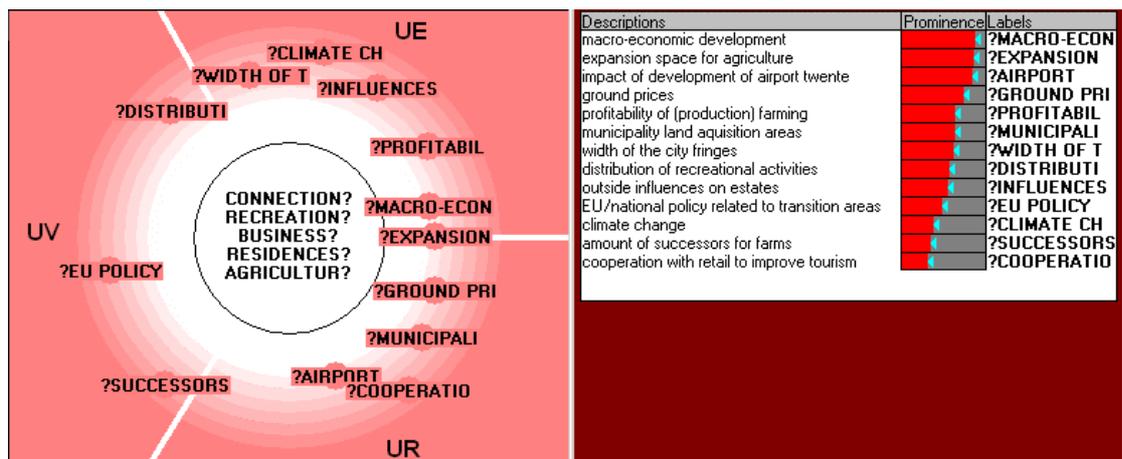
In this step we aim at solve the uncertainties mentioned in former steps. All the uncertainties are categorized into 3 columns UV ( uncertainties about guiding values), UE ( uncertainties about the working environment ) and UR (uncertainties about related decisions). Meanwhile they were also arranged by the levels of relevance to Problem Focus. The most related ones are chosen as the uncertainty focus. A series of strategies respond to these uncertainties in order to prevent from arising unpredictable problems as far as possible in the future.



## Uncertainties

For the uncertainty focus we choose five uncertainties. These five are chosen because they implement the most important land uses in the transition area, agriculture and recreation. An other very uncertain factor is the size of city expansion in the region. For that we looked at the uncertainties that lies behind the expansion will of the city's. In our opinion that uncertainties are the macro-economic development and the development of airport Twente. Macro-economic is a general factor that is globally important for the growth of companies and thereby the space that they need. In the region the airport Twente is an extra uncertainty because it is not certain how much impact it will have on the region economics. The municipality land acquisition areas are in our opinion important because it can make a big difference to the region how the municipalities are going to develop this region. By putting it with the five most important uncertainties we want to show that this is an important uncertainty.

The uncertainty analysis is made to get a clearer idea about the uncertainties. Just a list of uncertainties is very limited but by categorizing and making an uncertainty focus the uncertainties become more clear. Thereby it is easier and more exact in the way that we implement them in the commitment package.





#### Uncertainty focus:

1. Macro-economic development:  
Flexible planning, because it is difficult to investigate. Keep options open for different economic sectors to maintain economic flexibility.
2. Impact of development of airport Twente:  
Integrated plan between municipalities of Twente to equalize costs and profits of the airport, as well as to deal with negative impacts together and decide on possibilities for growth.  
Investigate the effects of the airport on (which) living areas, recreation and nature.
3. Profitability of farming:  
Investigate trends in prices of agricultural products, production costs and influences of European protectionism, as well as the opportunities for intensification and different forms of income.
4. Municipality land acquisition areas  
Find ways to develop these areas in a purposeful and valuable way. When business areas don't do well, change the plan. Organize between the municipalities where and in what quantity business areas can still be developed. Improve the connection of residential areas that would otherwise be cut off by business districts by developing new residential areas or improving current living space instead of building business areas.
5. Distribution of recreational activities  
Investigate developments of the spread in time and space of recreational demands and activities.



## Step: 18

## Commitment package

### About the step

In this step, we have created a commitment package for guiding and advising Region Twente and the stakeholders about which actions (*immediate actions*) should be taken immediately in the light of different decision areas. The explorations and the investigations as well as the estimated time durations that should be done before making choices were explained in the *Exploration* column. Also the commitment package provides a guiding line about the choices or decisions should be made in the future actions after the explorations.

For the uncertainties that might occur in the future within some choices that could not be absolutely made, some contingency actions (*contingency planning*) were placed afterwards. However, these guiding actions will ultimately be integrated with the long-term strategies from the policy scenarios in order to frame the final recommendation set to Region Twente.

### The commitment package

The commitment package is the final product of the strategic choice approach and the choice of what to implement is very complex. Most of the immediate decisions are made because they are a logical follow-up from the decision options. Roads and connectivity should be investigated more. In all decision options new business areas should be implemented in the landscape and this can be an immediate action. Then it is logical that route-bound recreation can be developed relatively cheap. More investments can be done when an investigation is done. Demands on new residences in the city fringes should be investigated because it is important that the right type and quantity of houses is created. Green area housing and villas are most preferable because that derived from our decision options. For the transition area it is an immediate action to start with promoting side activities for farmers. This is because in the decision options, at least a mixture of agriculture is preferable. There should be an investigation in trends of prices to decide on the degree of the agricultural side activities in the transition area.



The commitment package is made to collect all the data from the strategic choice approach and combine them. Hereby there is an overview of results and immediate or future decisions can be made. The most important is the combination of the uncertainty focus with the decision options. By doing this the right decisions can be made with keeping in mind the uncertainties.



	Immediate decisions		future decision space	
Decision areas	Actions	Explorations	Deferred choices	Contingency planning
Roads & Connectivity	Route bound recreation is always important. Improving traffic safety and maintaining a well connected recreation network need to be taken into consideration when upgrading or constructing new roads. Ensure a good connection to the airport, which means upgrading roads where necessary and possibly adding new ones.	The airport may have a large impact on the amounts of traffic. Investigating the size of this impact will help with improving/maintaining a good connectivity within the region, as well as with the rest of the country. (2-3 years) Investigate possibilities and means of combining current and new infrastructure with the Green Gateway and the EMS policy. (2-3 years, though some decisions regarding the Green Gateway can be made before total completion, which means that action can be taken earlier)	Decide on the necessity of upgrades to the main infrastructure, depending on information about the impact of the airport and developed business areas	
Business areas	Enforce a landscape implementation design on new business areas. Where possible, renovate old business areas with an attractive design.	Explore how to use the bought ground of the municipalities wisely taking into consideration economic development. (0.5-1 year) Explore how business areas can enhance the landscape, rather then diminish it. (2-3 months)	Decide on the new land use for the bought ground of the municipalities	If faced with growing demands for houses and/or living space, the bought ground can be used for residential areas. When the airport proves successful and attracts more business to the area, these locations can still have their originally intended use. In a situation of growing tourism, the best solution could be to revert these areas back to attractive rural area, possibly with increased facilities.
Recreation in rural areas	Intensify the route bound recreation network around the cities. Continue promoting the touristic value of the region.	Investigate developments of the spread in time and space of recreational demands and activities. (monitoring)	Intensity and types of the new recreation depend on the demands and possibilities. It is important to take both into consideration when deciding on policy to improve/facilitate recreation	
Residences in the city fringes	New residences should have a strict policy on landscape fitting architecture and environment.	Investigate the (changing) demands on types and size of houses. (2-3 months)	Decide on types and quantity of new residential areas.	The type of residential area can be divided into green area, extensive villa district or intensive vinex district, or a deliberate choice for combinations. Given the impact on the city fringes, the first two would be more preferable.
Changing agriculture	Stimulate recreational side activities and landscape maintenance for farmers within the city fringes and EMS areas to improve attractiveness, facilities and ecological value.	Investigate trends in prices of agricultural products, production costs and influences of European protectionism, as well as the opportunities for intensification and different forms of income. (2-3 months)	Decide on locations and possible subsidies for different agricultural activities.	If tourism in the region is thriving, additional investments should be made in side activities and nature maintenance, while intensification should be discouraged.



## Step: 19

## Integrated plan

### About the step

In this step we combined the long term and the short term results. We put actions from the long term in the matrix with the short term results, whenever there was much overlap between the long term results for different policy scenarios. This leads to an integrated strategy set, which is the combination of the achievements of scenario approach and strategic choice approach to recommend Region Twente on how to deal with the developments of the city fringes. In this step, we have extracted the strategy sets separately from the policy scenarios and combined them with the short-term actions provided by the commitment package in terms of different decision areas. For some contradictory actions between "short-term" and "long term", we had reconsidered and reframed. Then the matched long-term strategies from different policy scenarios were combined with the contingency plans in the commitment package, which recognizes that it will often be important to prepare in some way for particular contingencies of a foreseeable kind. This could have a crucial effect on future decisions - including possibilities that particular assumptions which seem to offer a firm basis for proceeding in present circumstances might be overturned by subsequent events (J. Friend, Hickling, 2005 p61-p63). A, in the form of "if ,then". Then there will be a more comprehensive and more flexible action option package for Region Twente to cope with different uncertain futures based on different possibilities on external tendencies and various kinds of emergencies.



### **Actions on city fringes**

We first listed the actions for the long term and tried to match the actions with the different kinds of possible city fringes. In the focused planning task these types of city fringe are further explained. We also mentioned the scenario and vision that were used for making the package.

For the long term always take into consideration the visions and developments when considering measures from these four packages. These packages are made with two different visions and four different possible future developments in mind. Use the descriptions of the visions and external scenarios when working with these measures. It is recommendable to explore the visions even further, using own insights and ideals. Developing a detailed vision also helps with making decisions in the future.

For almost every decision area every policy scenario has an solution. This solution is made with a certain way of developments of important driving forces in mind. Therefore the solutions can be quite extreme and diverse. So it is not for us to make the decisions. The expectations for the economic development and the amount of protectionism for the agrarian sector should be taken into consideration when using the policy scenarios for long term planning. These decisions are for the municipalities of the region Twente to make.

Always take into consideration the visions and developments when considering measures from these four packages. These packages are made with two different visions and four different possible future developments in mind. Use the descriptions of the visions and external scenarios when working with these measures. It is recommendable to explore the visions even further, using own insights and ideals. Developing a detailed vision also helps with making decisions in the future. One can expect that the truth lies in the middle, since the scenarios explored extremes.



## **Long term 1: (High Protectionism - Low Economy → Twente, Land of Scapes**

### **Network of the city fringe:**

none

### **Industrial city fringe:**

none

### **Business area city fringe:**

Stimulate and support the branches that still have possibilities, like the protected agriculture and the agribusiness. Other good branches to stimulate are that ones that are flexible enough to recover after the 'crisis', like the transport business, the university and other research institutions.

### **Residential city fringe:**

The density of the city will be higher. To compensate for this higher density new parks and green inside the existing cities should be developed. The green finger concept can also be applied.

### **Agricultural city fringe:**

Do not authorize intensification of agriculture inside the city fringes, agricultural side activities are not subsidized because there is no money due to the low economy.

Maintain and develop some main small scaled areas, these will be located around the cities (in the city fringe), estates and the Ecological Main Structure (EMS / EHS). The other parts of the existing small scale landscape will be less protected, and can be used by farmers who want to scale up.



## Long term 2 (Low Protectionism - High Economy → 24/7 Twente)

### **Network of the city fringe:**

If the pressure from traffic congestions increases, investments in upgrading and new infrastructure are needed. If infrastructure divides the urban areas from the recreation areas, there should be looked out for locations for bridges and/or tunnels to establish a good connection between the areas.

Public transportation should be stimulated within the transition areas instead of the private cars.

For protecting important nature and recreation areas, cars should be forbidden to enter those areas, other means of transport should be facilitated. Cycling and walking should be encouraged and well facilitated for visitors in the area. The region should decentralize the power to the concerned departments or agencies on arranging tourism activities (facilities, identifying tourism destinations, relevant restriction and etc.)

### **Industrial city fringe:**

If heavy industry which would have huge environmental damage wants to come to the region or wants to expand, it should be located far away from the identified tourism spots, and nature conservation areas and agriculture areas. It is preferable to keep this industry at bay, green businesses or green industry is preferred. Industrial areas should be hidden from the visible rural landscape by creating green barriers. If heavy industry continues damaging the environment and is not able to be changed into a more environmental friendly industry that can be better fitted in into the landscape, then those industries should be forced to move out of the region by funding compensations. If the appearance of the business areas are out of the line with the attractive landscape

**Business area city fringe:**

If the appearance of the business areas are out of the line with the attractive landscape surrounding them, then it is important to make them attractive by creating new attractive green landscape near them or even rearranging the area, if possible. The business developments should also be constrained by relevant laws in the respects of locations, size, types, encouraging tourism and recreation oriented business. Yearly taxes for business developments should be considered to be investments put in tourism industries.

**Residential city fringe:**

If the cities continue to expand, it is necessary to carry out relevant legislations on restricting the pace of city expansion in terms of number, size, boundaries, or even land price in order to slow it down.

**Agribusiness city fringe:**

none

**Long term 3 (Low Protectionism - Low Economy → 24/7 Twente)****Network of the city fringe:**

In order to make the transport sector successful, improvements on the connection with Germany will be required. The railroad into Germany is not designed for intensive use, and the canal doesn't cross the border at all, which means most transport will be going by road. This may cause congestion, which makes other modes of transport more attractive, hence the importance of upgrading those modes.

**Industrial city fringe:**

none

**Business area city fringe:**

Stimulate knowledge sector

**Residential city fringe:**

Attractiveness of both city and surroundings is important to stimulate tertiary and quaternary economic sectors and draw higher educated residents and more importantly, the attractiveness prevents many of those educated at the university from leaving.

**Agricultural city fringe:**

Reduce the limitations on intensification. This means that sacrifices on landscape maintenance will have to be made.

**Long term 4 (High Protectionism - High Economy → Twente, Land of Scapes)****Network of the city fringe:**

The infrastructure in the city fringes should be designed for tourists entering and leaving the rural area.

Industrial city fringe:

**Business area city fringe:**

Use old business areas, which have fallen out of use, and renovate them for their new function

**Residential city fringe: -****Agribusiness city fringe:**

Spatial separation is a viable option for any new agribusiness locations, as they can be placed on locations that already are unattractive, such as between infrastructural barriers.

Regulate the expansion of farms to keep as many of the hedgerows as possible. Architectural restrictions can be applied to the agricultural buildings, which will probably grow in size.

Emissions such as noise and smell should be minimized

**Contingency planning**

The contingency planning is a complex table. It is the combination of the commitment package and the policy scenario's. We try to divide the goals of the policy scenario's in to the decision area's of the commitment package. Because then it is possible to compare the both and see what the differences are. We implemented all four policy scenario's because then it shows all boundaries of the external scenarios. This is useful because then the region Twente knows what the boundaries of the possible futures are. The contingency plan shows the short term actions, explorations, choices, contingency plans, decision options, uncertainties and general actions. The general actions is new and derived from similarities between the commitment package contingency plan and the policy scenarios. These general actions are actions that can be taken in account and can be taken immediately when possible because they are in all possibilities good.



### **Short term actions**

From the policy scenarios we derived all corresponding actions. These general actions can be seen as the immediate decision actions from the commitment package because these actions are present in all policy scenarios. These actions should be executed in the short term future just like the commitment package from step 18.

### **General actions derived from the policy scenarios**

- Use the small scale landscape, a present strength, in the transition area for recreation
- Protect the Green Gate from new urban expansion
- Make strict regulations for new housing area's in the transition area
- Intensify agriculture outside the transition area and the EMS (Ecological main structure)
- Support the university of Twente and other educational/innovative organizations
- Subsidize route bound recreation in the transition area
- Support agribusiness in the region to develop strong economic sectors
- Make region based decisions together with all municipalities



### Uncertainty focus

The uncertainty focus is also part of the contingency plan because the uncertainties, especially the uncertainty focus, have to be taken in consideration with every decision made.

- Macro-economic development:
- Flexible planning, because it is difficult to investigate. Keep options open for different economic sectors to maintain economic flexibility.
- Impact of development of airport Twente:
- Integrated plan between municipalities of Twente to equalize costs and profits of the airport, as well as to deal with negative impacts together and decide on possibilities for growth.  
Investigate the effects of the airport on (which) living areas, recreation and nature.
- Profitability of farming:
- Investigate trends in prices of agricultural products, production costs and influences of European protectionism, as well as the opportunities for intensification and different forms of income.
- Municipality land acquisition areas
- Find ways to develop these areas in a purposeful and valuable way. When business areas don't do well, change the plan. Organize between the municipalities where and in what quantity business areas can still be developed. Improve the connection of residential areas that would otherwise be cut off by business districts by developing new residential areas or improving current living space instead of building business areas.
- Distribution of recreational activities
- Investigate developments of the spread in time and space of recreational demands and activities.



## Final advice

Twente is a beautiful region with possibilities. To make use of these possibilities certain decisions have to be made. A vision and taking calculated risks is what is needed for Twente to make the first steps towards a new future.

The future is difficult to predict, so an exploration of future developments in different directions was made. It is unlikely that any of future scenarios will take place exactly as we described. In our research we explored the boundaries for visions and scenarios. What is actually going to happen probably lies within those boundaries.

Our research gives directions for dealing with all kinds of uncertainties. We did this in seven weeks time. We could not take everything in consideration. Something that is probably impossible anyway. But it does mean we made decisions in the process so we could focus on aspects that according to us could be interesting to investigate.

The plans we made for the short term and long term should not be used as blueprint. This because everything keeps changing, and also because own insights in certain issues should not be neglected.

Long term planning is more about directions, and directions can be set with clear visions. The more support from the residents of Twente there is, the better. This because it prevents that visions change with every election. Communication with the stakeholders in the area is important for this support.

For the short term plans we have had contact with stakeholders. This contact was short, but long enough to determine what their goals, uncertainties, and ideas are. After that we have kept this in mind working to the end result. This has resulted in probable solutions that are in our eyes realistic. Also for the short term and on a local scale, even more so than with the long term, good communication with the stakeholders in the area is important.

We hope this first exploration forms a good basis for further research and discussion.



## Epilogue

The process of coming to the final products was very complex. This is because such a large area is involved and the term 'city edge' is very fuzzy. We tried to define it as good as possible. Even though we cannot say that everything is taken into account. We had to make choices what to use and what not to use in the process. For example the two main driving forces we used are not all the driving forces in the region. But we tried to take the most important information and work with that. We think that we produced a product that is a good contribution to the process of getting to a plan for the city edges.

We could not have made the products without all help we got. We especially want to thank the teachers of this class and the large diversity of civil servants, policy makers, organizations and citizens that helped us.

Wierc Berkvens, Daniel Bours, Li Chen, Martijn Haag, Maarten Hermus, Hao Hu, Nienke Voskuilen and Gerben Willems



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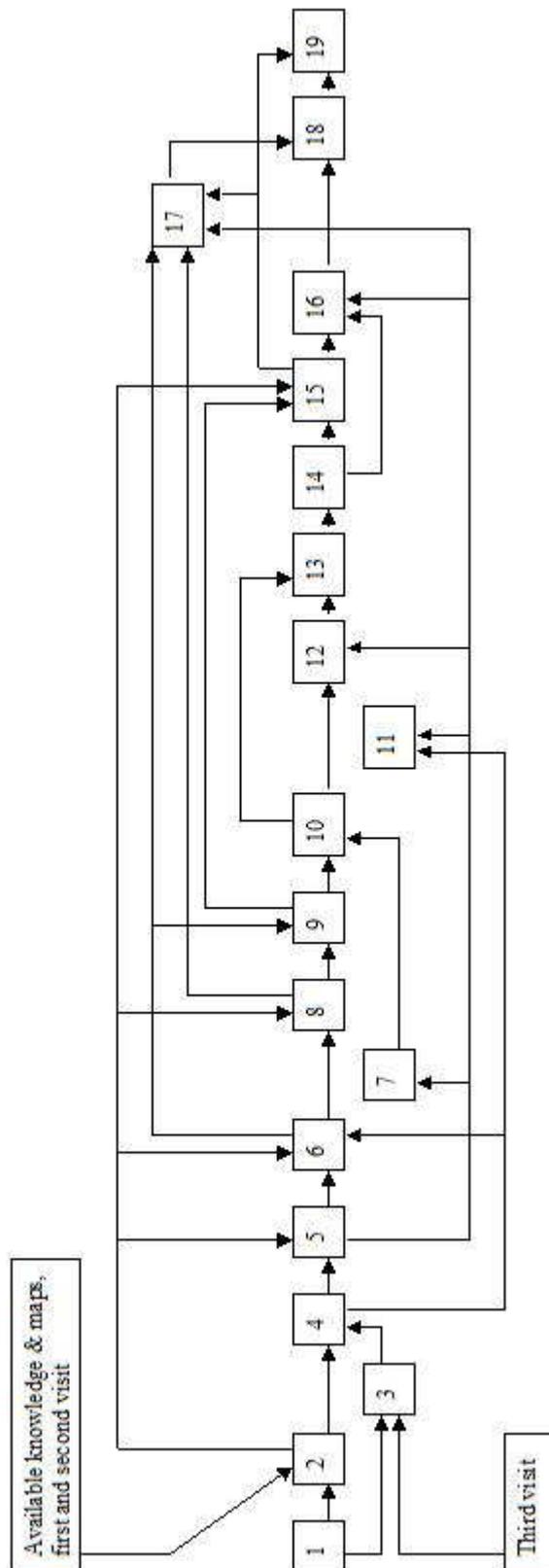
## Appendix I: Timeframe

This is our time frame. This time frame is a so called 'living document', that means that it can be changed when necessary. The abbreviation 'WP', means WorkPlan. This refers to this workplan. The abbreviation *S*, used as (*Snumber*), means Step *number*. This refers to the steps in this workplan.

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Introduction and present situation (S2)	Fuzzy planning task and discuss WP (S1+WP)	Preparation visit, and discuss WP with supervisors (S2&WP)	Visit to Twente meeting with experts (S2)	preparation visit discuss and writing WP (S3)
Week 2	Visit to Twente meeting with stakeholders (S3)	Work out the excursions (S2&3) location exploration (S2) discuss written WP	Location exploration (S2) discuss WP with supervisors	Location exploration and focused planning task (S2&4)	Focused planning task (S4)
Week 3	Decision areas, goals, uncertainties, preconditions (S5) discuss improved WP	Identification driving forces (S6)	Decision links (S7)	Boundaries of driving forces (S8)	Start with external scenarios (S9)
Week 4		Finishing external scenarios (S9)	Problem focus (S10)	Starting with visions (S11)	
Week 5	Finishing visions (S11)	Decision options (S12)	Option graph (S13)	Decision scheme (S14)	Starting with policy scenarios (S15)
Week 6	Policy scenarios (S15)	Evaluation framework (S16)	Uncertainty analysis (S17)	Commitment package (S18)	
Week 7	Integrated plan (S19)			Preparing presentation	
Week 8	Finishing preparing presentation	Visit to Region Twente to present the final products.			

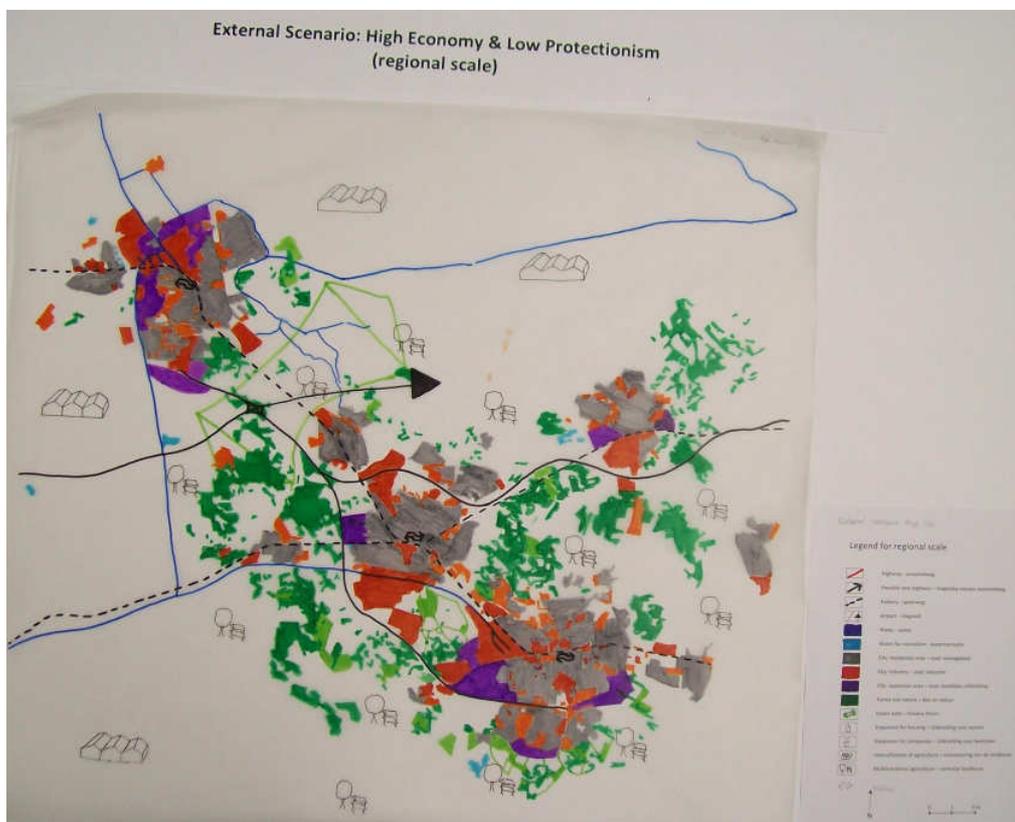
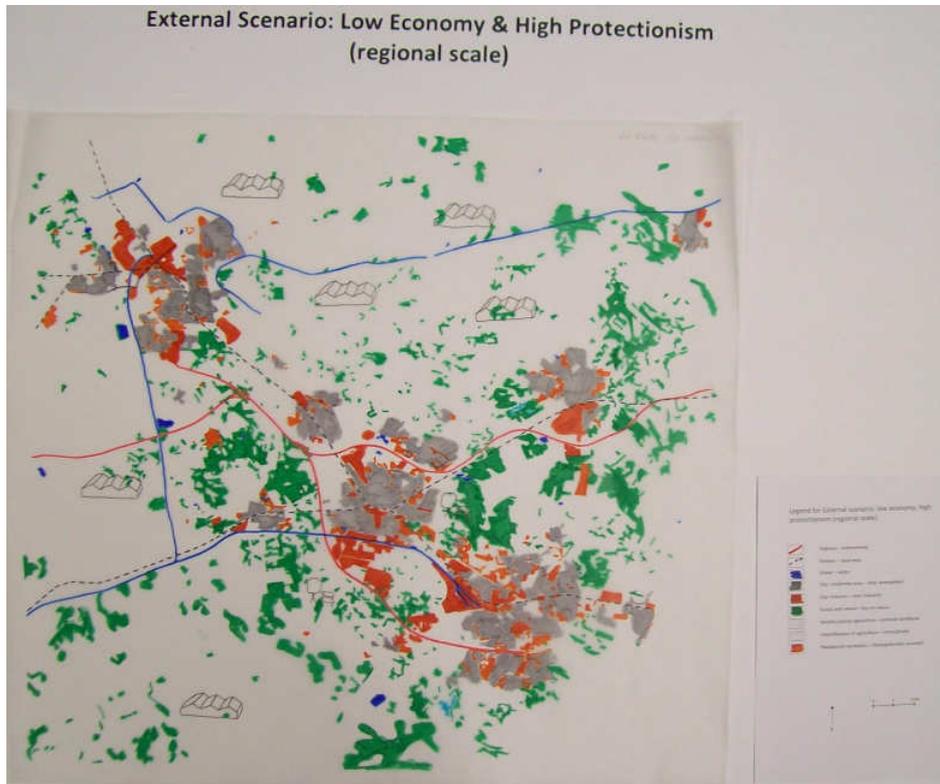


## Appendix II: Flowchart





## Appendix III: Maps





External Scenario: Low Economy & High Protectionism  
(local scale)



External Scenario: Low Economy & High Protectionism  
(local scale)







