BA Course Design Project B3
Civil Engineering/UT
(Course 192211351, 8 ECTS)

Applying the Revitaplan Triangle Framework in the Case Upgrading and Revitalizing Utrecht Central Station Area

Content

1 Introduction

This report presents the results of applying the Revitaplan triangle in the Bachelor course Design Project B3. This third-year course is the final design project of the Bachelor Civil Engineering program and also part of the pre-master program for students from polytechnic universities starting the Master Construction Engineering and Management at Twente University. The major learning goals of this course are:

- Using knowledge, skills and insights of previous civil engineering courses in a coherent way.
- Designing an urban plan including an argumentation for the design choices made and methods used.
- Making an integral trade-off between the different interests of the major actors involved.

The teaching case of the Design Project B3 course deals with the upgrading and revitalizing of Utrecht Central Station area. Robert Oosterwegel and Stephan de Bruin, project leaders of this revitalization project and employed by the municipality of Utrecht were involved in the development and execution of this teaching case. For the past two years, four student cohorts have been applying the Revitaplan triangle framework in this case. The pilot of this course started with a group of seven Civil Engineering students in September-November 2013. Subsequently, 43 students attended the course in February-April 2014, 45 students in September-November 2014, and 55 students in February-March 2015.

In this report, characteristics of the Revitaplan triangle framework are presented first. Next, challenges of renovating and revitalizing Dutch inner cities are discussed followed by a description of the case Utrecht station area. Subsequently, the student assignment, applying the Revitaplan triangle framework in the Utrecht case, and the results of this assignment are presented. Finally, some conclusions are drawn.

2 The Revitaplan triangle framework

To support planners to account for the democratic stakeholder environment and the existing institutional frameworks during designing the future of an area the Revitaplan triangle framework is developed (see Figure 1). The objective of this framework is to increase understanding about how designing plans, managing stakeholders and managing public processes relate to each other. The edges of the triangle represent the three functions of modern urban planning: the connections and relations among urban design, stakeholder management, and public process management. This section will describe each of these relations in more detail.

The interaction between stakeholders and urban design: Each specific design needs to account specifically for the respective, often conflicting, needs of the different stakeholders. Vice versa each newly developed planning scenario needs to be proposed to stakeholders to build a new consensus. Additionally, while the planning process is continuing new stakeholders might emerge with new needs to account for.

The interaction between urban design and public process: Public institutions restrict what is possible during the redevelopment of an urban plan. Using procedures and regulations, they also define and structure the planning and transformation processes formally. At the same time, different plans for a specific transformation require that planners account for different public processes and institutions.

The interaction between public process and stakeholders: To be able to actively participate in the planning effort all these actors need to be aware of the processes, institutions and regulations that they have to follow and that have to be followed by the other actors. Institutions and regulations should transparently be shared within the stakeholder network. At the same time, the regulations and processes planners need to follow always also define which stakeholders need to be engaged at certain stages of a revitalization project.

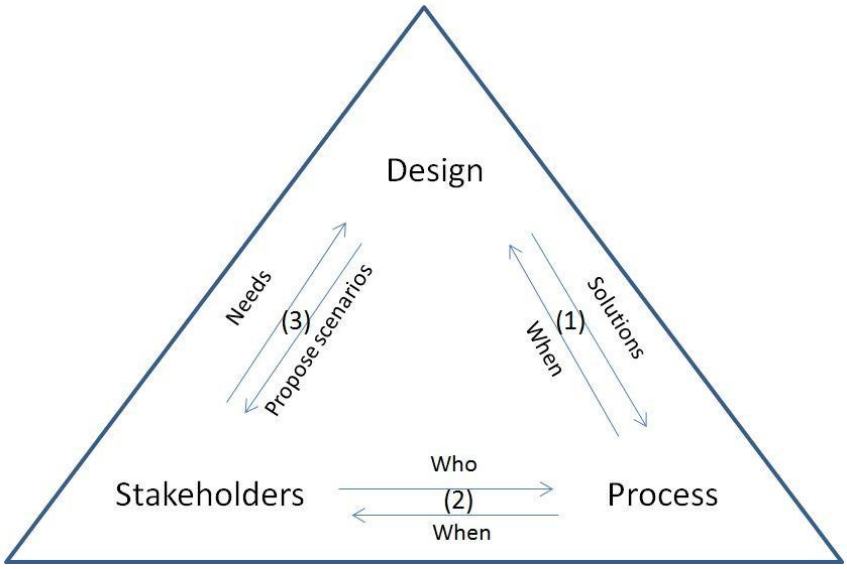

Figure 1 The Revitaplan triangle combining the three functions of modern urban planning.

3 Inner city projects in the Netherlands

Several Dutch cities are renovating and revitalizing their innercities and apply policies of the central government to the local context (i.e. KEI and NCIS (2012) for an overview of recent developments and a description of urban polities of the past 60 years). Municipalities try to keep their unique character and increase their attractiveness for inhabitants, visitors and firms (see www.platform31.nl, www.habiforum.nl and www.vng.nl for examples of urban renewal). Looking at these inner city projects, on one hand municipalities have to deal with the goals and plans of the central and provincial government, on the other hand with interests of the local population and actors involved (Ministerie van Infrastructuur en Milieu (2011). To reach policy goals, in several Dutch cities a number of construction projects are concentrated on a limited surface around central station areas.

Central and local government, the local population and other actors involved determine how the often very complex inner city projects are executed. The economic situation plays an important role too. The accessibility, quality of life, and safety for all parties involved in a city are affected for a long time by inner-city construction projects. Many activities have to take place on a limited surface resulting in a tension between building activities and other urban functions.

As representative of the population and because of the great public attention for quality of life the municipality has a clear interest in a good management of inner-city construction projects. In addition, the municipality is not only representative of the public interest but also sponsor and/or client of a number of the projects. This dual role has led municipalities to give high priority to inner-city management. The municipal

government can by legislation and regulations, but also, and above all, through collaboration with the main actors reduce the inconvenience of inner-city projects. Coordination of activities and clarity about responsibilities are of great importance. In addition, clear communication to citizens and other stakeholders is important.

4 The Utrecht station area as urban challenge

The Utrecht station area is an urban development project which aims to make this area safer and more liveable and to facilitate the growth of the city. The city is doubled in the last 50 years, with the growth that mainly has been realized on the west side of the station while much employment is located on the east side of the station. The ultimate goal of this urban development project is a new city center by building a new railway station and to integrate the eastern and western parts of the center of Utrecht (see Wikipedia http://www.cu2030.nl/en Approach Stationgebied (Utrecht)).

The so-called Utrecht Station Area Master plan (2003) and the Addendum Master plan (2005) were worked out in a large number of (partly interdependent) projects that are carried out in different phases (see www.cu2030.nl for a list of all projects) in the coming decade. Due to progressive insight, but also by the current economic situation, the projects develop in several cases different than expected.

Figure 2 Utrecht Station Planning Area Master Plan (based on map www.cu2030.nl)

For the implementation of the Master plan, the municipality set up the Project Organization for the Station area (POS). POS works closely with Corio (the project

developer of the shopping center Hoog Catherijne), Dutch Railways (NS), Dutch Railway Authority (ProRail) and the Exhibition Center (Jaarbeurs). On behalf of the municipality's POS is point of contact for all parties and client for a several municipality projects. POS is also responsible for management of the public space and communicates with all parties concerned to maintain and create support.

The plan area in the teaching case focuses on a new square (Jaarbeursplein) west of the station with its adjoining offices, the Beatrix Theatre building, a new City Hall, a casino, a hotel, and multiplex cinema. Below the new square a car park with 800 to 1000 spots is planned (including a water storage solution). The goal is to use the new west station square as events' venue several times a year. The developer of the new west station square and the new car park is the municipality of Utrecht. The municipality now has both the preliminary design for the square and the car park below it as the urban development plan for new buildings in the area. Whether these plans will be implemented is currently under discussion, particularly because of the current economic situation.

The realization, renovation and upgrading of building and infrastructure in a busy city like Utrecht has impact on many parties. Preparing and realizing projects cannot without involvement of a large number of stakeholders. The municipality of Utrecht is aware of the fact that involvement of stakeholders contributes to a succesful redevelopment of the station area and recognizes the added value of local knowledge. Adequate interaction with stakeholders is seen as a prerequisite for a successful project.

5 The assignment

The Utrecht station area is undergoing a complex and unique transformation process. Such a process in an existing urban area touches the interests of a large number of parties such as local residents, companies, users, and citizens, operators. Successful implementation requires therefore a process of interaction and collaboration between a large number of parties, both within and outside the project organization. Applying the Revitaplan triangle framework was translated into the following assignment:

- Indicate in which way the interests and positions of the main actors and the existing plans and procedures for this plan area affect the final design. Use the results of the stakeholders' management analysis and information about existing plans and procedures.
- Develop an integral plan and design for the plan area of the west station square (including a detailed plan for the construction and design of the car park Jaarbeursplein and a water storage solution) given the boundary conditions, procedures and regulations and interests and positions of the main actors.

First of all, major regulations and procedures affecting plan and design changes/alternatives have to determined and confronted with the changes/alternatives proposed by the student groups.

Secondly, given a final proposed plan and design for the plan area, an overview has to be provided of all the steps that must be satisfied for the construction and design of the car park and the water storage solution. Measures required limiting disruption and hindrance as a consequence of construction activities and (temporary) traffic measures have to be presented too.

Third, it has to be shown which actors are involved in the design process. All relevant stakeholders in the proposed plan and design changes/alternatives have to be

determined. It has to be shown which stakeholders may affect the proposed design alternatives and who are affected by these alternatives. The effects of the proposed plans on the urban environment, the interests of the various actors involved, resources these parties have and to what extent these actors will support the purpose and content of the proposed plan and design changes will be analyzed.

Finally, a detailed plan is made describing when which actors have to be involved in which way in the design process. Specifically for the construction of the parking garage, a stakeholder management plan is set up. This plan describes how, when and why which actors have to be involved in the different stages of designing and revitalizing the Jaarbeursplein and the construction of the car park.

6 Applying the Revitaplan triangle in the teaching case

In this section, it is shown how the student groups applied the Revitaplan triangle framework in the case of the Utrecht station area. In the course, each student group plays the role of an engineering consulting firm asked to advise the municipality of Utrecht. A student group consists of 4 to 6 students.

In the first week of the course the basic concepts to be used, including the Revitaplan triangle framework, are explained in several lectures. At the end of the first course week each student groups delivers a project approach. In the project approach it is described how the group wants to come up to the end product. What strategy/methodology will be used, what is the vision of the consulting firm, which task distribution is there within the project team, what does the planning look like, etc.?

After three weeks the student group gives the client insight in the current situation of the plan area. The report has to include at least the following components:

- Analysis of the existing plans and procedures with regard to the design of the public space in the plan area;
- Interests and positions of the main actors and their relevant properties who may be affected by your proposed plan changes and/or alternatives;
- Requirements, wishes, and boundary conditions.

After six weeks the student group delivers a plan and design for the plan area and the steps that must be satisfied for the construction and design of the car park and the water storage solution. Finally, a report is delivered including the final plan.

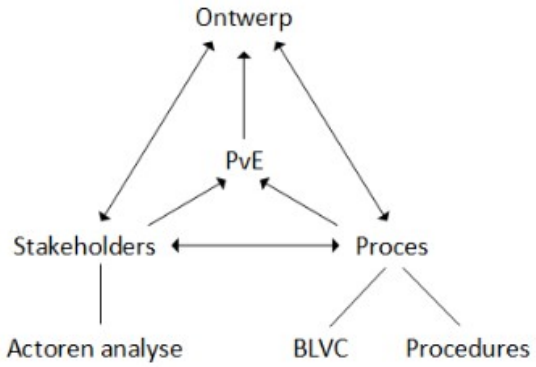

Figure 3 Example of the applying the Rivataplan Triangle

In the next subsections, the different components of the Revitaplan triangle and their interrelations will be discussed based on the analyses made by the student groups. First the focus will be on the process including the most relevant procedures and the so-called BLVC plans. Second, attention is devoted to the relevant stakeholders in the plan area. Both components are for most students major factors determining the final design for the plan area.

6.1 Relevant procedures

Existing plans and procedures may affect the design or planning or staging. Students selected most relevant plans and procedures for the plan area of the teaching case. Most student groups mentioned the following procedures:

- Zoning plan procedures (*bestemmingsplan procedures*): the zoning plan is important for determining what should be built on a particular location. In the Netherlands, setting a new zoning plan is done in a number of phases. The total duration of this procedure is at least 31 weeks.
- Public participation procedures on various types of plans: a public participation procedure makes it possible for the citizen to express its views. This view will then be processed by the relevant public authority. The length of time varies from project to project by project.
- Building permits (*omgevingsvergunning procedures*): this license is a combination of a demolition permit and building permit, and an environmental permit. The entire procedure takes at least three months.
- Public procurement procedures: this procedure provides the steps that determines who may carry out the project. The time needed for this procedure varies but is at least 52 days.
- Communication procedures: in order to keep stakeholders up to date of the developments it is necessary to inform them. Communication procedures are used and are relevant throughout the project.
- Environmental impact assessment: an environmental impact assessment is mandatory for large building projects and provides the assessment of the environmental effects of a project. This report is important for deciding whether a project is being carried out.

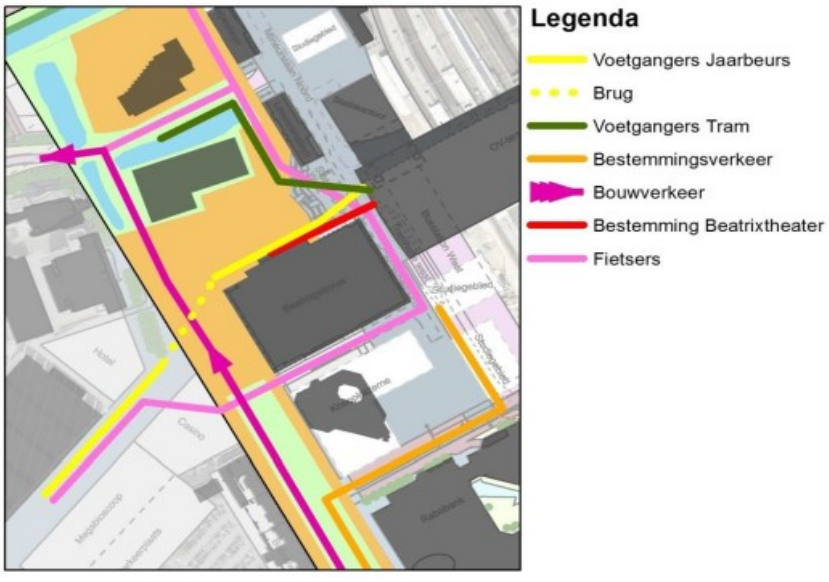

Figure 4 Alternative routing for different traffic flows during construction at the Jaarbeursplein

Because there is a wide range of procedures, some student groups identified procedures perceived as most important for a particular stage of the building process. Procedures are categorized into procedures influencing design, procedures relevant for the realization of a building (during the construction of the project(s)) and operational procedures (needed to meet certain standards during the use of a built object). The following examples are given:

- The setting of the maximum height of buildings based on the *Hoogbouwvisie* of the municipality of Utrecht affects the *design* of the buildings.
- Regulations are set to minimize noise, to prevent all types of pollution, to protect the environment and to ensure accessibility to the plan area. These procedures affect the *realization* phase. Major stakeholders are the local residents.
- During the design phase procedures on fire safety, accessibility for physically disables, the energy index (environmental procedure) and the parking standard are taken into account (ASU). These procedures are necessary to meet certain standards during the *use* phase of a building.

Table 1 shows the relationship between relevant procedures in different stages of the building process with corresponding stakeholder' interests and design requirements.

Soort procedure	Onderwerp	Belanghebbende	Belang	Eis
Ontwerp-procedure	Hoogbouwvisie	Gemeente Utrecht	Behoud culturele waarde binnenstad.	De maximale hoogte voor gebouwen op het noordelijk deel Kruisvaartkwartier is vastgesteld op negentig meter hoogte.
Procedure gericht op realisatie-fase	Geluidhinder	Omwonenden, omliggende organisaties.	In rust kunnen leven.	Wet geluidhinder (Overheid, 1979)
	Milieuhinder	Milieuorganisaties, overheids-instanties	Leven in een schone omgeving.	Wet milieuhinder (Overheid, 1979)
Opera-tionele procedure	Brandveiligheid	Brandweer, overheids-instanties, bewoners, omwonenden,	Veilig wonen, werken en recreëren.	Bouwbesluit 2012 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012)

Table 1 Relationship between procedures, interests and design requirements

Another import aspect of planning of the revitalization of the plan area is the so-called BLVC plan. BLVC stands for:

- Bereikbaarheid (accessibility)
- Leefbaarheid (quality of life)
- Veiligheid (Safety)
- Communicatie (Communication)

BLVC plans are required by the local government and necessary to get permission for starting construction projects. Part of the accessibility plan is the alternative routings planned during construction. Figure 4 shows an example made by a student group.

Important part of the BLVC plan is also a plan how to inform, communicate and participate with actors during the different stages of the revitalization process: planning, design and construction (see Table 2 for an example).

Actor	**Wijze van informeren/participeren**		
	Planfase	***Ontwerpfase***	***Uitvoeringsfase***
NS	(Wekelijks) overleg tijdens alle fases tussen het projectteam voor de parkeergarage en de NS. Dit overleg zal ingepast kunnen worden in de overleggen die plaatsvinden over de integrale gebiedsontwikkeling.		
Gemeente Utrecht	Wekelijkse vergadering met afdelingen binnen de gemeente Utrecht die betrokken zijn bij het project. Zodoende kan informatievoorziening en coproductie van plannen en ontwerp plaatsvinden.		
NH-Hotel, Beatrixtheater, de Jaarbeurs	Participatie door middel van overleg, daarnaast ook mee laten denken over mogelijke opties en advies vragen.		Informatievoorziening door middel van wekelijks overleg.
Fietsers en voetgangers	Geen informatievoorziening of participatie		Informatievoorziening door middel van visuele aanduidingen, zoals borden en spandoeken. Daarnaast informatie-voorziening door website en social media.
Provincie Utrecht en gemeenteraad Utrecht	Maandelijkse informatievoorziening door middel van overleg over de voortgang van het project.		
Bewoners aanliggende wijken	Informatievoorziening door middel van flyers, website, social media en nieuwsbrieven. Daarnaast zullen informatieavonden georganiseerd worden om bewoners in te lichten over de plannen en ontwerpen en om ze actief te betrekken bij deze plannen.		Informatievoorziening door de weekkrant die opgericht zal worden voor de bewoners en tevens social media en website.

Table 2 Part of a communication and participation plan.

6.2 Relevant stakeholders

The development of this area has a local, regional and national significance. As shown in Table 1, several procedures correspond with the interests of different stakeholders involved in the revitalization of the Utrecht station area. An analysis of the level of power and interest of the most important stakeholders is made by student groups on two scales:

- the larger plan area around Utrecht Central Station (see Figure 5);
- the Jaarsbeursplein area (the west station square of Utrecht Central Station) including the construction (see Figure 6).

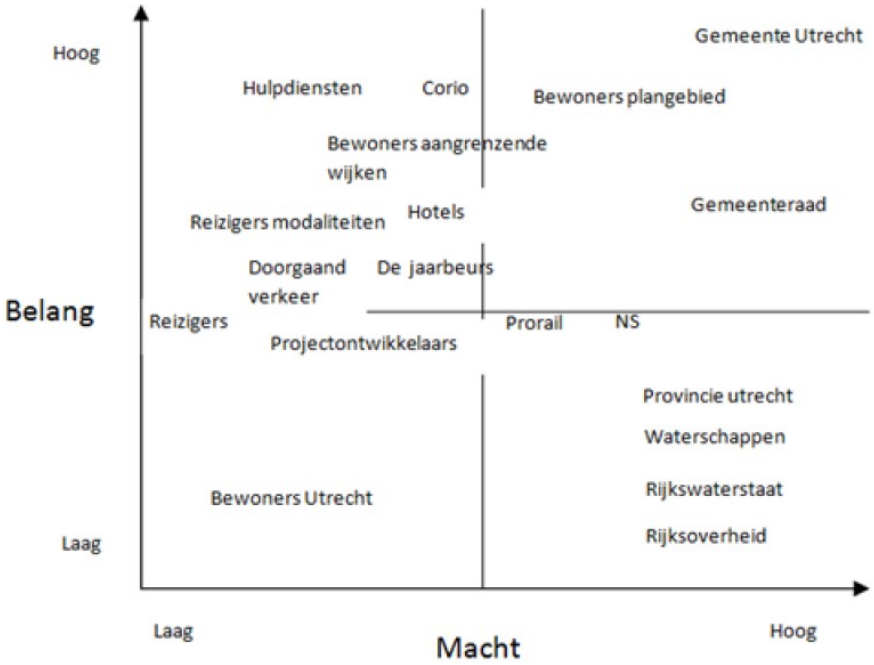

Figure 5 A power-interest diagram of the most important actors of the plan area around Utrecht Central Station.

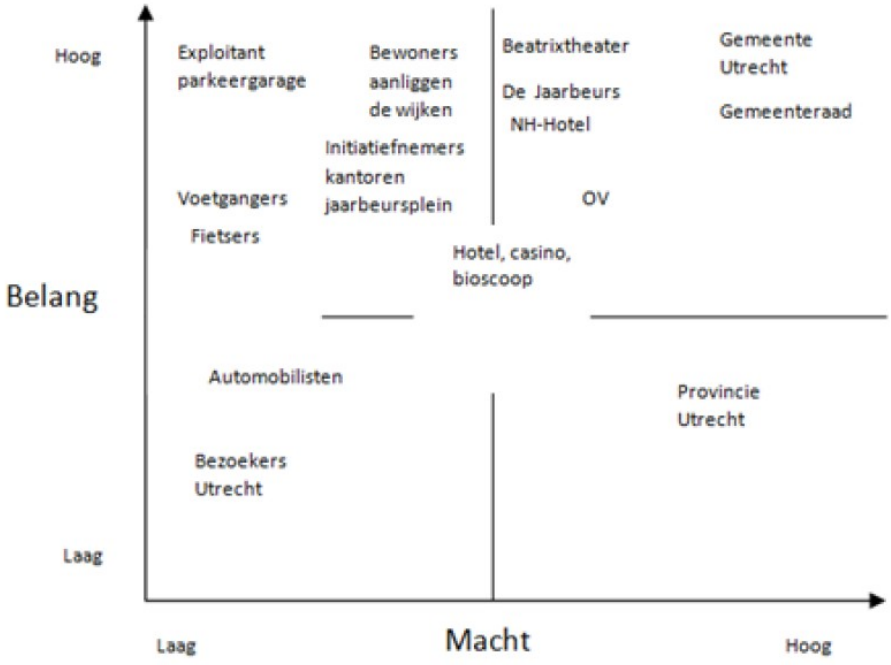

Figure 6 A power-interest diagram of the most important actors of the Jaarsbeursplein area.

For each of the most important stakeholders, its task and position, perception of the consequence of the revitalization plan, source of power and its dependence on other actors are analyzed (part of this analysis is shown in Table 3). Based on this analysis, specifications, conditions and requirements for the different stakeholders can be deduced.

Actor	Taak en positie	Belang	Perceptie	Machtsbron	Afhankelijkheid
Ambulan-cediensten V B	Verantwoor-delijk voor de acute zorgverlening in het gebied.	Een snelle doeltreffende zorgverlening binnen het gebied	Negatief. Tijdens het project zullen locaties minder goed bereikbaar zijn en wordt zorgver-lening bemoeilijkt. Na afronding van het project zal de houding van de ambulance-diensten neutraal zijn.	Vaardigheden, functiemacht, blokkademacht	Laag, ambulancediensten zullen weinig tot geen invloed hebben op het ontwerp en daarom is POS hier niet sterk van afhankelijk.
Beatrix-theater V B	Verantwoor-delijk voor het beheer en exploitatie van het Beatrixtheater	Optimale locatie, exploitatie en aanzien Bea-trixtheater door milieu verantwoord ondernemen. (Beatrixtheat er Utrecht, sd)	Het Beatrixtheater zal de uitvoering van het project als negatief ervaren, vanwege overlast op het Jaarbeursplein. Na voltooiing zal de perceptie positief zijn. Het project zal meer bedrijvigheid, parkeerplaatsen en aanzien opleveren.	Kapitaal, eigendom, relaties, positie in besluitvor-ming, produc-tiemacht	Laag, het Beatrixtheater zal weinig invloed hebben op het ontwerp, waardoor POS er vrijwel niet van afhankelijk is.
Bewoners plangebied V B	Bewoners van de wijken in het plangebied.	Woonkwali-teit behouden of verbeteren en zo min mogelijk overlast.	Bij de uitvoering van het project zal de perceptie van de bewoners negatief zijn, vanwege de overlast die veroorzaakt wordt. Na afronding van het project zullen zij echter positief zijn, vanwege de gebiedsverbetering.	Relaties, positie in besluitvor-ming, identiteit, diffuse macht	Middel, de bewoners van het plangebied zullen vanwege hun positie in het project een invloed hebben op het draagvlak van het project. Hierdoor zijn zij een actor waarvan POS in redelijke mate afhankelijk is voor het slagen van het project.

Table 3 Part of an actor analysis: task and position, interest, perception, source of power and dependency.

Student groups also focus on actors only relevant for construction and use of the car park. For each actor it is analyzed what the specific requirements and needs are related to construction of a new car park below Jaarsbeursplein (see Table 4). These needs and requirements are the basic input for the preliminary design.

Actors	Needs/Requirements
Pressure groups	Design with a short lead time.
Archaeologists	At an archaeological find the building should shut down and the find be secured. Exploring more of archaeological value.
Disabled	Car park easily accessible for people with reduced mobility. Elevator present.
Utilities	Take account of cables and pipes.
Corio (project developer shopping center) Owners real estate Jaarbeurs Employees working in the plan area Entrepreneurs within planning area	Ample parking. No inconvenience during construction. Exits near shopping center, offices or Jaarbeurs.
Future operators and investors	Lead time as short as possible. Ample parking. Take into account future construction activities near the car park.

Construction firms	Realizable design. Space for building and storing equipment and materials.
Aid workers	Safe design. Access for emergency services.
Local residents	No inconvenience during construction. Lead time as short as possible.
Local traffic motorized	Easy to reach. Sufficient parking spaces.
City Council	Comply with legal requirements. Costs as low as possible. Ample parking. No inconvenience during construction.

Table 4 Relevant actors, needs and requirements for construction and use of the car park

6.3 Design variants

Based on relevant procedures and the requirements of the major stakeholders (including the procedures of the several governmental institutions) design plans for the whole plan area around Utrecht Central Station and for the Jaarbeursplein including the new car park are made that best meets these requirements. Requirements of the stakeholders who have most power are especially taken into account.

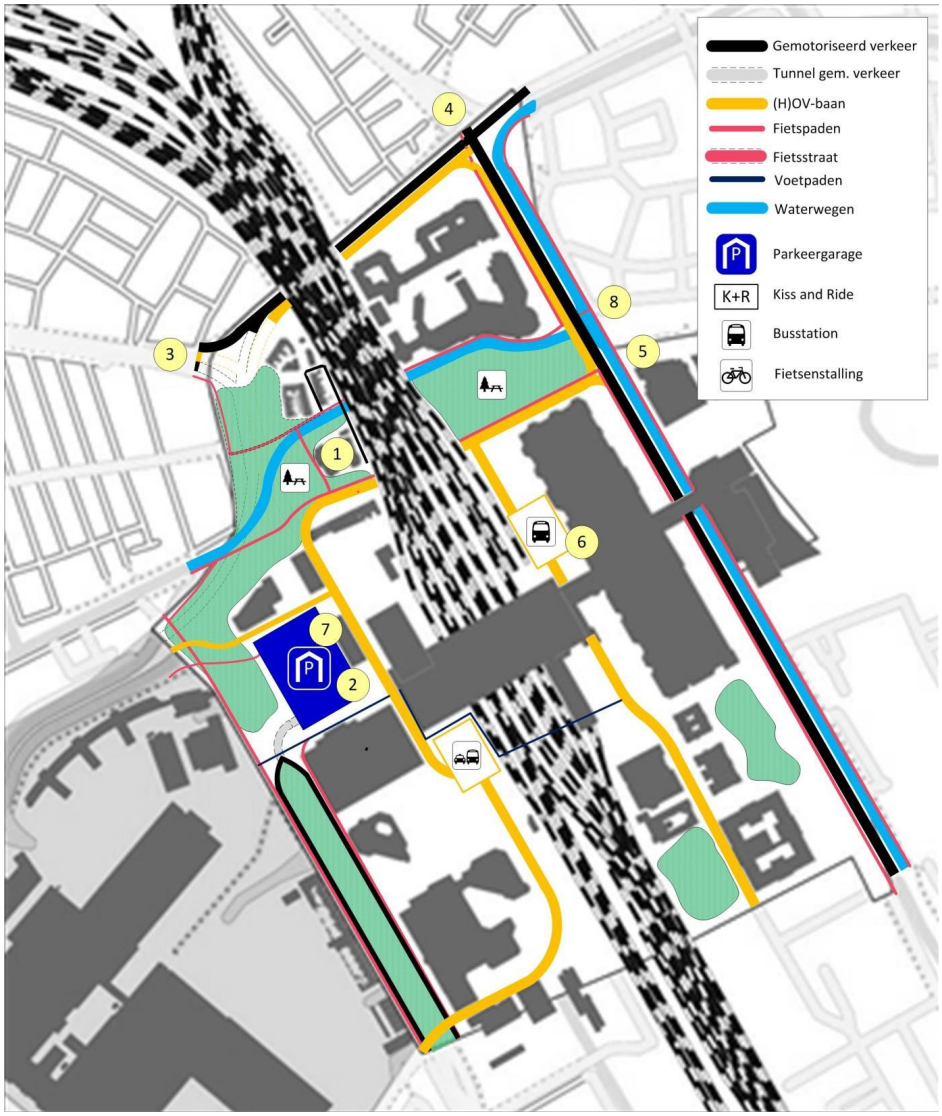

Figure 7 Design plan for Utrecht Central Station area

On the scale of the Utrecht Central Station area students groups have been asked to make alternative plans and select the optimal one based on a multi-criteria analysis (see for example Table 5). For all student groups, each plan has a different focus based on different needs of different stakeholders. In certain plans, cost-efficiency determines the revitalization process, in other plans the focus is on sustainability and/or green facilities. Figure 7 provides an example of a design plan focused on realizing green facilities.

Criterium	Weging	Efficiëntie	Ontvlechting	Groen
Leefbaarheid	10	0	0	2
Overlast	7	0	-1	-2
Bereikbaarheid gemotoriseerd verkeer	7	0	2	0
Bereikbaarheid langzaam verkeer	7	-1	0	2
Bereikbaarheid OV	7	-1	2	1
Esthetiek	4	-1	0	2
Kosten	10	2	-2	-1
Bevaarbaarheid grachten	3	-1	2	0
Bergingscapaciteit	3	1	2	0
Veiligheid	3	-1	2	1
Totaal		-5	19	38

Table 5 Multi-criteria analysis evaluating three design plans

For the Jaarbeursplein student groups also developed different design plans and applied a multi-criteria analysis too.

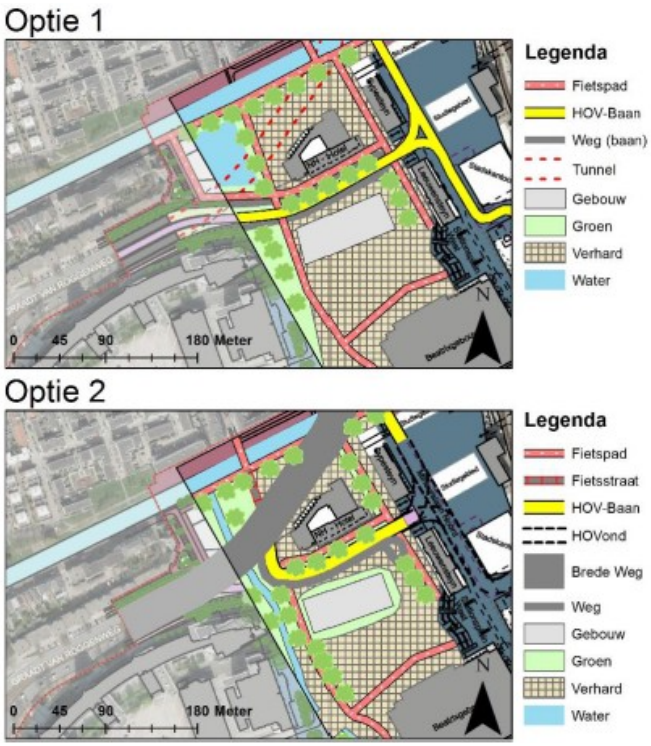

Figure 8 Two design options for the Jaarbeursplein plan area

For the Jaarbeursplein plan area most important requirement is that a square has to be realized where large-scale events can take place.It is also important that the car park, the bicycle parking and the (temporary) bus station are easily accessible for drivers, cyclists and users of public transport. The least possible inconvenience requires that construction time should be as short as possible. Finally, green facilities and water storage capacity have to be realized.

One student group, for example, examined two options for the Jaarbeursplein plan area (see Figure 8). In option 1, the Jaarbeursplein is fully hardened. A tunnel is constructed. Green facilities and water storage capacity are located at the western part of the area. There will be two-way cycle paths. In option 2, the West square is constructed above ground level.

7 Conclusions

This report presents the results of applying the Revitaplan triangle framework in the Bachelor course Design Project B3. The teaching case of this course included the upgrading and revitalizing of the Utrecht Central Station area, the biggest inner city revitalization project of the Netherlands. Students had to apply the Revitaplan triangle framework in this case. Student groups analyzed and discussed connections and relations among urban design, stakeholder management, and public process management.

Most student groups started with the analysis of the interaction between urban design and public process management. They found out that certain procedures in different stages of the building process correspond with several design requirements. Existing plans and procedures affect the design and planning or staging of a revitalization project.

Second, attention was devoted to the interaction between design and most relevant stakeholders in the plan area. Specific design requirements and needs of the major stakeholders were analyzed. Based on the most important procedures and needs and interests of the major stakeholders design plans for the Utrecht Central Station area were developed that best meet these requirements.

Third, students found out that several procedures correspond with the interests of different stakeholders, another interaction of the Revitaplan triangle framework. Interests of users and local residents are integrated in existing regulations and decision procedures. In this way, the government aims to protect these stakeholders.

When looking at Revitaplan Triangle framework it becomes clear that the 'needs', 'who' and ‘when’ come to the fore ward when stakeholder’ interests and procedures are translated into design requirements and the final design.

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