Dear Sir/Madam,

The aspiration of every dynamically developing city is to exploit its potential in such a way as to ensure a high quality of life for its residents, which is affected by, inter alia, an attractive range of cultural, sporting and recreational activities. The quality of life is also reflected in the quality of the space and architecture, which is, in general, the environment we live in. All these elements can be found in Poznan, whose strengths are also academic centres, responsible for educating skilled professionals, and companies that benefit from their knowledge. Finally, the strength and importance of Poznan are testified to by its residents, who have the power to initiate new activities and to change the city.

The document containing the above-mentioned striving for change is the strategic programme “The City by the River” which is part of the Development Strategy for the City of Poznan to 2030. It will serve to enhance the attractiveness of Poznan by restoring the river to the city.

The effective implementation of the objectives of the programme requires the combined involvement of residents and public and private institutions. The precise identification of diverse needs and expectations, and also the identification of ways to satisfy them, are also required. An assessment of the state of flood safety, an analysis of the current methods of land use, and a definition of the role of the River Warta in the urban space, must be included in these elements.

Diagnoses of the current state of the riverside areas and the directions of their future development are contained in the presented document – The Development Strategy for The River Warta in Poznan. It has been developed through the efforts of an international team of experts and residents of the City of Poznan. I thank them for all the work they have done together, which was, without a doubt, a great and exciting challenge.

Just to mention that the preparation of the Strategy required an inventory of a number of documents in the field of spatial planning, legal status, expertise etc, and also an analysis of dozens of visions, concepts and ideas on land development and use of the river, gathered over the years.

These works lasted continuously from January till November 2012. Many assumptions have been changed, due to, among other things, hydrological studies, financial, economic and social analyses. The document which we wish to present includes a final proposal for actions, presented in the form of an implementation plan for the Strategy.

I am convinced that it will meet with your interest. Exploiting the potential of the Warta River is a dream of ours, and of many of Poznan’s residents. Dreams do not come true by themselves – they are fulfilled. The work on the Strategy is the first and most important step to realising a great project, which is restoring the river to the city.

Ryszard Grobelny

Mayor of the City of Poznan
Colophon

The Development Strategy for the River Warta in Poznan
December 2012

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In this introduction to the Development Strategy for The River Warta in Poznan the motive, content and approach to the strategy are briefly explained. This reading guide gives an understanding of how to read this report.
Introduction

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1. Introduction

1.1 THE MOTIVE BEHIND THE STRATEGY

In 2010 the water level of the River Warta rose in Poznan to a dangerously high level. Some areas flooded but widespread flooding, which occurred in several other Polish cities, did not take place. It was a narrow escape.

Since the flooding at the beginning of the previous Century, the civil-engineering approach towards the river development has been adopted in Poznan. At that time it was a responsible decision, but since then the Warta has been canalised, has become an isolated area within the city, and has lost its historical relationship with the city.

The observation of these two aspects of the river (the decreased water safety and the lost relationship with the city) has resulted in the awareness that a Development Strategy for the River Warta in Poznan is needed.

The City of Poznan has acknowledged the need for a strategy for the river by taking up this task in the Strategy for Poznan 2030.

1.2 JOINT INITIATIVE

The Development Strategy for the River Warta in Poznan is part of the implementation of the Strategy for Poznan 2030. The project is a joint initiative of the City of Poznan, the Dutch Governmental Subsidy Programme under ‘Wereldwijd werken met water’, the Dutch consultancy firms KuiperCompagnons (urban planning and design) and DHV (engineering), and SwedeCenter (an investor highly-ambitious internationally and on the Polish market).

The ‘Wereldwijd werken met water’ programme aims to support the Dutch water sector and to contribute to solving the world’s water challenges by applying Dutch expertise and experience in the field of water management. Together with the four partners the subsidy programme has funded the development of this strategy as a demonstration project in which interventions to improve water safety are integrated with interventions to improve the quality of the river zone for the citizens of Poznan.

1.3 THE PROCESS

The Development Strategy is the product of an intensive and interactive process involving experts, stakeholders, the public and politicians. During the process there have been several occasions during which the strategy has been presented to a group of local experts (Advisory Group), and to the public. At these meetings the preliminary ideas and suggestions were tested, and constructive feedback was received. The public presentations and the project website (www.dorzeczni.pl) have created a transparent process for all who are interested.

In a relatively short time many people and groups have participated and become enthusiastic about the adopted methodology and the results of the strategy.

The process started with an inventory and analysis conducted on the most relevant issues concerning the river and the city. The conclusions of the analysis resulted in different alternatives for the strategy. A (socio-economic) assessment of these alternatives resulted in a preferred model, which is the basis for the Development Strategy.

A broad variety of subprojects have been identified that together implement the strategy in Poznan. These subprojects have been assessed on their financial-economic costs and benefits.

For three locations along the River Warta pilot projects have been allocated that have been further detailed. These pilot projects can be regarded as ‘catalyst’ projects to kick-start the development of the river zone.
1.4 READING GUIDE

After a short introduction to the Development Strategy (chapter one), this report continues with a general introduction to the broad context of the river-related challenges of many Polish cities. In this the second chapter a comparison is made with the Dutch situation, and Dutch solutions to these challenges.

In the third chapter the existing situation of the Warta in Poznan is inventoried and challenges and plans are analysed.

The main conclusions of the analysis are worked out and are the basis for three alternatives that are explained in chapter four. In this fourth chapter the three alternatives are also assessed, concluding in a preferred alternative.

In chapter five the Implementation Plan is described, which comprises a variety of subprojects within the preferred alternative.

For three locations (Portowo, Chwaliszewo and Northern Island) the Development Strategy has been further detailed. In chapter six these three pilot projects are described.

The financial-economic assessment of the Development Strategy in the seventh chapter indicates the costs and revenues of the different components of the strategy, to assess its financial-economic feasibility.

After briefly addressing the benefits of the strategy (chapter eight), and the recent events and possibilities for temporary functions (chapter nine), in the final chapter (ten) a glance towards the future is revealed by addressing the steps that need to be taken towards the future development of the river zone in Poznan.
The City of Poznań is the main beneficiary of the project and is represented by the executives of the Poznań City Hall, in particular the representatives of the Real Estate Department acting as the coordinator for the Strategic Programme “River in the City”. The Development Strategy River Warta is the first step towards the implementation of the Strategic Programme “River in the City”, within the framework of the “Development Strategy for the City of Poznań to 2030”.

KuiperCompagnons is a leading international consulting firm specializing in urban planning and design, architecture and landscape. The company is based in Rotterdam (The Netherlands), employs approximately 120 highly qualified specialists and conducts worldwide operations, both in the private and public sectors. The company offers a wide range of services associated with the development projects involving waterfront, riverbank and coastal areas, including identification of the social and environmental effects of their implementation. KuiperCompagnons has designed and managed several waterfront development projects all over the world.

The Dutch DHV company is one of the largest consulting firms worldwide, employing over 4,700 consultants, experts, engineers and technicians from all fields of specialization in 19 countries of the world. In Poland, DHV has been developing as an international consulting and engineering group providing services and proposing sustainable solutions.

SwedeCenter is actively engaged in the investment and development operations on the Polish commercial real estate market. The company entered the Polish market at the beginning of 1990s, together with its parent company Polprop Holding as part of the Inter IKEA Group. In its operations, SwedeCenter follows the principles of sustainable construction.

The Dutch Governmental ‘Partners for Water’ programme was established in 2000 to support the Dutch water sector to capitalise on its technologies and expertise internationally, but also to ensure that Dutch technologies and knowledge contribute to solving world water challenges.
What with the transport on the river?

Is it possible to create a watertaxi transport?

Generally I don’t go to Warta, because simply nothing is happening over there!

Which solution should be a priority?

Are restaurants in the plan?

Small port, seeing city from river point of view, it would be really interesting!

How to restore the old riverbed?

We would like to live by Warta! but we can’t find any appartements!
**Timeline**

**15 SEPTEMBER 2011**

- **DECEMBER 2011**
  - STREET INTERVIEWS
- **6-8 MARCH 2012**
- **22-23 FEBRUARY 2012**
- **INTERVIEW WITH EXPERTS JANUARY 2012**
- **1 APRIL 2012**
- **2-5 APRIL 2012**
  - PUBLIC CONSULTATION
- **23-25 JANUARY 2012**
  - PRESS CONFERENCE
- **28 SEPTEMBER - 30 NOVEMBER 2012**
  - COMPETITION FOR THE NAME OF THE PROJECT
- **2011**
- **7 MAY - 11 JUNE 2012**
- **6 JUNE 2012**
  - CITY BEACH OPENING
- **6-8 MAY 2012**
- **6 JUNE 2012**
  - CITY BEACH OPENING
- **2-5 APRIL 2012**
  - PUBLIC CONSULTATION
- **23-25 JANUARY 2012**
  - PRESS CONFERENCE
- **2011**

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Partnerstwo na Rzecz Warty, zawiązane przez Urząd Miasta Poznania i firmy SwedeCenter, KuiperCompagnons oraz DHV, z okazji zbliżających się Świąt Wielkanocnych, wraz z życzeniami odrodzenia związków rzeki z Poznaniem i jego mieszkańców, ma zaszczyt zaprosić na koncert muzyki pasyjnej:

**Stabat Mater**
– Giovanni Battista Pergolesi

wykonawcy:
- Chór Dziewczęcy Skowronki
- z towarzyszeniem orkiestry instrumentów dawnych
- Collegium Musicum Poznań
- dyrygent – Alicja Szeluga

niedziela, 1 kwietnia 2012 roku

godzina 17:00

Katedra Poznańska na Ostrowie Tumskim

Wstęp wolny
16 JULY 2012 PUBLIC CONSULTATION

500 PARTICIPANTS CANOEING MEETINGS

7 JULY 2012 CITY MARINA OPENING

18-22 JUNE 2012

600 facebook

FAMILY PICNICS

BOOK

16 JULY 2012 PUBLIC CONSULTATION

500 PARTICIPANTS CANOEING MEETINGS

7 JULY 2012 CITY MARINA OPENING
The history of Polish and Dutch river cities is very much alike. Originating from this similar history, also similar problems, opportunities and challenges have been experienced in both countries. But increasing river floods and decreasing the spatial quality of river areas got onto the agenda in the Netherlands some 15 years earlier. The reason for that was two major near-river floods in the 1990’s which would have had catastrophic consequences had they been more severe.

The Dutch created and implemented a methodology which combines interventions to improve river safety with actions to improve the nature and spatial quality of the river areas. The valuable lessons learned in the Netherlands can now be used for similar Polish river cities such as Poznan.
Dutch Solutions To Polish Problems

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2.1 Polish River Cities

Where land meets water attractive places for living arise. Since the beginning of mankind people have been attracted to water as a place for settlement. Rivers, lakes and seas have been used for fisheries, transportation, military defence, and for drinking, cleaning and processing. Even in modern times water attracts people worldwide and it is for this reason that more than two thirds of the world’s cities are located in river deltas.

In Poland many cities also originated alongside rivers. Krakow and Poznan are examples of historic Polish River Cities. Especially the main rivers Wisła, Oder and Warta (with a combined length in Poland of more than 2,500 km), connect many river cities such as Warsaw, Bydgoszcz, Szczecin, Gdansk and Wroclaw.

The presence of a river in a city adds many cultural, historical, natural, social and economic values to that city. Rivers offer great potential for the achievement of urban quality, with all the benefits that come with it. There are many examples of cities with beautiful riverfronts where people live, work and recreate in a pleasant and healthy environment. Cities with a river often have strong identities, partially resulting from the river. Cities with a river are cities with character.
2.2 River Floods and Spatial Development

RIVER FLOODS

During the past decades, but also in recent years, several river floods have occurred in Poland. The often canalised rivers cannot cope with the increasing peak flows of water. With global climate change in mind this is expected to continue. The recent floods (May 2010 and 2011) had great human, environmental and economic consequences. The often occurring dangerous floods created a more negative perception of the river by people in the urbanised areas.

In 2010, after heavy rains in south Poland and in the Czech Republic, the Vistula and the Oder systems were not able to cope with the volume of water. Both rivers flooded the surrounding lands and large landslides occurred in the mountains. Many people lost their homes, farmers lost their crops and cattle, and even human lives were lost. In cities much damage was caused to the urban structure, such as in the Wroclaw flooding in 2008.

It was observed that the peak flows that caused the most damage during these floods were very high and relatively short. This indicates that there are serious problems with the water-absorption capacity of the river beds. This means that not much water is contained in the river beds during the floods. High and short peak flows are caused by a fast discharge of water in the upstream areas, and fast water flow in the downstream areas. The following elements have an influence on the (insufficient) water discharging / water absorption (retention) capacity of the river:

- Vegetation in the river forelands: forests with a high water-retention capacity, versus urbanised / built-up areas. Many forests (/natural areas) have been replaced by built-up (/urbanised) areas which have reduced the retention capacity of the upstream river areas.
- Regulating rivers and streams: the more rivers and streams are regulated (fixed and canalised), the faster the water discharge and the higher the peak flows are in downstream river areas. So-called regulation was probably most popular in Poland after World War II. Currently more than 50% of Polish rivers are regulated. Besides the decreased retention capacity, the condition and maintenance of existing water dams and barrages, and water facilities such as reservoirs, also need attention.

POZNAN

SPATIAL DEVELOPMENT

The spatial development of river areas in many Polish cities bears the consequences of the rather one-dimensional ‘engineering approach’ towards rivers that was dominant during the 20th Century. Within this approach solutions to manage rivers were considered from a more technical, instead of a natural, perspective. In this period in Poland many rivers were canalised and the main goal was to discharge river water as fast as possible towards the sea. Water was seen as an enemy, rather as a friend to people.

The result for the spatial development of the river areas within cities was that the (historical) relationship between the city and its river often got lost. Attractive river areas became isolated and as a result unattractive zones, with poor spatial, socio-economic and natural qualities. Not surprisingly the cities turned their back on these zones.
2.3 Dutch Water History

The Netherlands is on the delta of the rivers Meuse and Rhine. Half the country lies below sea level. The first residents of the low-lying areas already made artificial hills where they would build the church and would be able to flee to in the event of flooding. From the year 1000 the people began building dykes along the coast and along the rivers. Learning from the struggle against the water, the Dutch engineers have nowadays a huge expertise, which is implemented all around the world. The Dutch are world famous for tulips, cheese and dykes. Water management is one of the most important export products of the country.

Over time the dykes were raised and reinforced. Because of the dykes, the rivers could no longer flow freely over the plains. The sand and mud that the rivers brought from the Alps and Germany were sedimented in the riverbanks. The water level rose. At the same time the peat lands were converted into agricultural areas. When a dyke broke, there was extensive damage. But century after century dykes were repaired, raised and reinforced. Around the year 1500, the system of dykes along the rivers was more or less closed.

In the 19th and 20th Centuries the rivers were increasingly channelled. The discharge of the water was improved, and technical interventions guaranteed that the water level would be high enough for shipping. The system seemed to be completed and finished, and the Netherlands was safe behind high, sturdy dykes. But in 1993 and 1995 a disaster almost happened.

1993 & 1995

The Netherlands was safely protected from high water at the seafront. But in 1993 and 1995 the water came from the other side. The water in the rivers rose to dangerous levels due to increased river discharges caused by large volumes of melt and rainwater from the upstream regions. Polders in the Netherlands were evacuated. 250,000 people had to temporarily leave their homes, cattle were taken elsewhere and furniture was stored in the attic. These polders are located in the less-populated parts of the country. If Holland, the western part of the Netherlands, had been endangered, the operation would have been much larger and the stakes much higher.

The near-flooding of 1993 and 1995 made the Dutch aware that action was needed to prevent future disasters.

The increasing effects as a result of global climate change, such as more intensive storms, higher sea levels and higher peak flows in rivers, confirms the Dutch necessity to undertake action to avoid future water problems.
2.4 Dutch Methodology, an Integrated Approach

2.4.1 THE STRATEGIC PROGRAMME “ROOM FOR THE RIVER”

The near-floods of 1993 and 1995 resulted in a drastic review of Dutch policy on water safety. The high population density (491 persons/square kilometre) in the Netherlands imposes pressure on space and the environment which has to be managed carefully. Most economic activity is located in the low-lying regions of the country, well below sea level. Since floods in these regions would cause excessive damage costing more than 100 billion euros, the country has adopted an approach of prevention rather than evacuation and reconstruction. No longer would it be a struggle against water. Dyke reinforcement is not sustainable. Safety arises from cooperating with the water. The river should again be given space to flow freely and the natural balance between river and land restored. The Government instigated a River Delta Plan whose implementation is now almost completed. The new Strategic Programme is named “Room for the River”.

The “old” water management philosophy of building higher dykes is no longer sustainable, since the negative effects (such as building costs, maintenance, instability of dykes and environmental quality) are becoming too large. The new approach to water management is based on a combination of making more space (room) for water (instead of continuing to increase the height and size of the dykes), combined with interventions to improve the spatial quality of the river surroundings. With this combination goals and plans on water safety and also on spatial planning and environmental quality are integrated and strengthen each other.

The “Room for the River” programme introduces nine types of intervention which increase the conveyance of the river to reduce peak water levels. These interventions include placing and moving dykes, depoldering, creating and increasing the depth of flood channels, reducing the height of the groynes, removing obstacles, and constructing a “Green River” which will serve as a flood bypass. In 2015 the total project will be finalised and the Dutch river delta will be able to cope with higher water levels and spatial quality in river areas will be improved.
The environmental issues relate to water safety and also to the quality of the natural and built surroundings of the river. The spatial environment should be beautiful, safe and integrated with the river. The primary design focus is to ‘Design with Nature’. The changing natural conditions are defining, and will keep on defining, our future way of living. Solving the challenges of nature through design will create a solid foundation to improve urban living conditions on the banks of the river.

The implementation of a strategy or plans for a river almost always requires (an initial) financial investment. Without this investment (that in the long term can often be turned into profit) the start-up of the actual implementation is difficult. Spatial interventions that improve living and working conditions will stimulate local entrepreneurship and boost the economy.

From the water point of view the integrated approach gives space to the river to flood (controlled) in times of high-water levels. In general it can be said that the natural characteristics of rivers are stimulated.

Interventions to improve water safety are being used, and combined with plans, to increase the spatial and environmental quality of the surroundings of the rivers. In rural areas this often applies to improvements in nature, ecology and the landscape. In urban areas the spatial quality of residential, commercial or industrial areas, infrastructure, and parks benefit from river-related interventions. Long-neglected city parts are becoming revitalised and vibrant again.

A sustainable integrated Spatial and Water Strategy for a river zone has to successfully address Environment, Economy, Identity, Society and Connectivity issues. A strategy that neglects any one of these aspects is doomed to fail, since, in a complex process like this, an overall consensus is needed from a broad variety of involved stakeholders (represented by these aspects).
A strong identity is important for people to feel attracted to, or to feel home in, a specific place. A recognizable identity (and image) will therefore result in a relationship of inhabitants and visitors with the river. Design interventions that improve the balance between the natural environment and the cultural environment, will be the starting point for creating a new identity for the riverbanks and for the city as a whole.

A natural feature such as a river cannot be claimed by one person or body. It has significance for all people and society as a whole. Therefore the feelings of the general public towards river strategy should be positive. Public participation can contribute to this.

A variety of different values (such as the economy, nature, recreation, tourism, industry) come together in the river zones. Many people feel involved with the river. Because of the combination of the different interests it is important that all the relevant stakeholders feel comfortable with the strategy and plans for the river. Strong interaction and good communication are therefore important aspects of the process.

Connectivity also relates to linking the river zone with the city districts in the vicinity, making the river zone accessible to people and making it part of larger urban, green and water networks.
Sketching room for the Warta River in Poznan
2.4.3 Key Factors for Success

Strategies and plans in which water and spatial planning and design are integrated often require complex processes. Many parties are involved and the stakes are high for nature, the public and the economy. However, a successful strategy or plan for the integration of water and spatial planning and design always has the following three key factors for success.

**SAFETY**

A primary goal is always to create a safe environment. The river has to be brought into balance with nature again. A river is like a living natural organism that needs space to breathe and to manoeuvre. If this space is not given to the river, and it is forced through canals and along barriers, problems occur.

The economic damage caused by river floods can be tremendous. Direct financial losses due to damage to buildings or infrastructure, and also indirect financial losses caused by, for example, the (temporary) malfunction of society, can be a consequence of unsafe river systems.

Ensuring safety will not only result in social acceptance and a sense of urgency, but will also prevent later financial losses that often by far exceed the costs of implementation.

**QUALITY**

A second essential factor for a successful strategy is the realisation of a high-quality (urban) river environment. River zones inside cities are mostly public spaces that add spatial, environmental and socio-economic values and identity to a river city.

A strategy that improves the spatial quality of the city by introducing or revitalising river bank areas, and intensifies the relationship between the river and the city, has great benefits for the city and its people. Attractive places are created where vibrant city life comes into contact with the natural river scenes. City marketing will be strengthened.

Further, quality is an essential aspect for the reason that it is necessary to create public acceptance, and willingness to invest public money in the development.

**FEASIBILITY**

In the past many strategies for river zones in cities have been formulated, and even more plans and designs have been drawn up for these interesting places. But only a limited number of these have actually been realized. The reason for this is often the lack of (financial or social) feasibility of the strategies or plans.

Financial feasibility is needed to make a strategy economically viable; a necessity for realization. The strategies cannot be implemented without the initial financial investments that are almost always needed to start up the process of implementation. Often these initial investments are returned later in the process by increasing economic (e.g. real-estate) values resulting from the implementation of the strategy for the river zone.

Social feasibility is the willingness by the public, politicians and stakeholders to carry out the strategy. People must feel comfortable with the proposed developments. If not, social (or political) acceptance will be fragile and the occurrences of failure will increase.

The adopted integrated approach increases the efficiency and feasibility of developments, because different investments will strengthen each other.

These identified key factors for success are applicable to river-city developments in different nations and contexts. Since the rivers and urban context of many Polish cities face similar challenges and have comparable potential to Dutch cities, the Dutch expertise and recent experience can be applied to the Polish situation. Dutch knowledge can be shared with Poland to contribute to a water-safe and pleasant environment for man and nature.
2.5 Three Dutch Examples

2.5.1 ISLAND VEUR LENT, NIJMEGEN

One of the narrowest bends on the Waal (a branch of the Rhine) is at Nijmegen. On this location the river is just 350 meters wide, while the riverbed immediately upstream and downstream is more than 1000 meters wide. At high-water levels a large volume of water needs to be forced through a narrow bottleneck.

Measures need to be taken to solve this bottleneck situation in the river and to prevent the flooding of the city. The forecast of higher discharges resulting from climate changes put the safety on this location in serious threat. The Government decided to give the Waal more space by relocating the dyke 350 meters inwards to widen the winter bed. In addition a secondary channel will be excavated. It will run parallel to the main river to contribute to the discharge of excess water.

The project is part of the “Room for the River” programme.

The three-kilometer long secondary channel is not connected directly at the upstream end, to ensure that it does not divert too much water from the main river. The water will only flow over a threshold during the high river stages, where more space for the river is needed to prevent flooding. The channel is always filled with water because of the connection downstream. A long peninsular in the river will be created by the excavation of the channel, directly opposite Nijmegen’s historic city centre. It will be connected with both riverbanks by new bridges. Nijmegen plans to extend on the north side of the river. Thus the new island will be located right in the centre of the town. It offers excellent opportunities for nature, recreation or living on the water. A beautiful environment is created for the citizens of Nijmegen.

The implementation of the key factors of success:

Safety

The bottleneck in the river Waal is solved by the creation of a discharge channel that will be used at times of high water levels.

Quality

Environmental, natural and ecological qualities have been improved with the creation of a new island in the river. An attractive new city district for Nijmegen has been created.

Feasibility

Intensive public communication resulted in broad acceptance of the plans, and economic feasibility has been demonstrated.

2.5.2 THE RIVER MARK IN BREDA

The historic city of Breda has 180,000 residents and is located in the south of the Netherlands. It originated in the 13th Century on the spot where two rivers, the Mark and the Aa, came together. These rivers have been used for the transportation of goods and people for many centuries, and have been the main source of water for the city, and of military importance. Not surprisingly, especially the river Mark was an essential part of the historical spatial layout of Breda.

In the 1960’s the revolution of the car created changes in the spatial planning and design of many cities. Within the historic city of Breda space also had to be made available to drive and park more and more automobiles. This resulted in the transformation of many streets, squares and even waters in the city for car use. Because the river Mark had problems with water quality, part of the river was filled in and underground car parking took its place.

From this period onwards a deterioration in the socio-economic structure of this part of the city has been observed. The spatial quality worsened, commercial shops and facilities left and real-estate values went down. Also water problems increased in the city, mainly due to the lack of possibilities for the discharge and retention of rain water.

In the beginning of the 1990’s the city authorities made the decision to reintroduce the River Mark to the city centre. A (bottom up) process was started in which decision makers, stakeholders (including the water board), urban planners and the city’s residents participated. The intensive and interactive process resulted in a broadly accepted and supported plan for the revitalisation of the river Mark in Breda.

The construction started in 2004 and was completed in 2006. Since then Breda has again enjoyed the presence of this water in the city. The spatial quality of the surrounding part of the city improved substantially, enhancing the economic development, social safety and public well-being. Besides this a great contribution was made towards the retention and discharge of excessive rain water.
2.5.3 RIVERSTONE IN RIVER IJssel, RHEDEN

‘RiverStone’ is a raised flood-free terrain that accommodates a former brickworks in the washlands of the river IJssel. The consequence of this high area within the river’s washlands is that it has become a bottleneck in the river in times of high water levels, which has resulted in potential flood problems. Over the years the site and (industrial) buildings of the former brickworks became neglected and deteriorated. The spatial quality of the area decreased and it was inaccessible to the public. A plan was adopted to transform this place from an inaccessible enclave of heavy industry into a high-grade public area. The shape of the flood-free terrain was streamlined in order to increase the flow of the IJssel during high water. A small inner harbour facilitates accessibility across the water and creates opportunities for houses on or along the water. Around the flood-free terrain with residential, commercial and facility purposes, an ecological sensitive area was designated to accommodate specific flora and fauna from the “Natura 2000” perspective.

The Implementation of the key factors of success:

Safety The bottleneck in the river IJssel was solved by partially removing the high terrain and streamlining the remaining part to give space to the river.

Quality The inaccessible, unattractive industrial site was transformed to a pleasant public area with important ecological values.

Feasibility The plan was made feasible by a broad interactive public process, and implementing economic profit-making elements (e.g. residential, commercial).
In order to create an integrated strategy it is important to gain a thorough understanding of all the relevant aspects that are connected with the River Warta and the City of Poznan. In this chapter a quick view is taken on the spatial structure of the city as a whole in relation to the river, before is focused on the project area for the strategy. For this Warta project area a variety of aspects have been inventoried, analyzed and assessed on their importance to the river. Aspects such as water safety, the environment, the economy, identity, society, connectivity and the most relevant policies and previous river plans have been studied to arrive at an integrated approach to the future development of the Warta in Poznan. An approach in which these different aspects strengthen each other in the short as well as in the long term.

The main conclusions are that Poznan has to improve its flood safety to decrease the risk of future floods in the city, and that the city has lost its relationship with the River Warta. Old connections are gone because the river (like many rivers in Poland) has for a long time been approached from a technical and engineering point of view, instead of as a living organism that has tremendous opportunities to offer the city.
## The Poznan Situation

### 3.1 The Spatial Layout of Poznan

### 3.2 The Delineation Project Area

### 3.3 The Analysis Project Area

- 3.3.1 A Smart Analysis for the City and Its Region
- 3.3.2 Water Safety
- 3.3.3 The Environment
- 3.3.4 The Economy
- 3.3.5 Identity
- 3.3.6 Society
- 3.3.7 Connectivity

### 3.4 The Relevant Policies

- 3.4.1 The Development Strategy for the City of Poznan to 2030
- 3.4.2 Water Policy

### 3.5 Previous Plans

### 3.6 Plans for Warta in Poznan

### 3.7 Identified Challenges

### 3.8 The Spatial Framework of Land and Water
The City of Poznan has an unique, distinctive and recognizable spatial layout. The urban area on the city level is divided into four quadrants that are separated by cross-like green structure. The city’s main water body’s system (the Rivers Warta, Cybina and Bogdanka) is at the heart of the ‘green cross’. In the centre of the ‘green cross’ the historic city is located.

The ‘green cross’ is not only a very unique spatial element, it is also very valuable for the city. This spatial structure offers possibilities for many citizens of Poznan to have an urban green area within walking distance of their homes and work.

Also for the flora and fauna, this large green structure that is connected with the city’s surrounding natural and agricultural areas, can be of great importance.

Green Cross of Poznan
The valuable ‘green cross’ structure in the city has great significance for Poznan and therefore should be maintained. To preserve (and improve) this spatial structure it has been incorporated into the delineation of the project area for the development strategy. By including the ‘green cross’ in the delineated project area, the goals and plans for the east-west (non Warta) green zone can also be formulated and the importance of this area for the city underlined.

The emphasis within the development strategy will be on the (north-south) Warta zone of the ‘green cross’.

The north-eastern and the south-western part of the delineated project area is located within direct influence of the river, and is thus part of the delineated area. These two zones are outside the city boundaries of Poznan and therefore the available background information on these areas is limited.

3.2 The Delineation Project Area
3.3 The Analysis Project Area

3.3.1 A SMART ANALYSIS FOR THE CITY AND ITS REGION

A successful development strategy for the River Warta will result from a river strategy that has the following characteristics:

1. **The river being safe;** the chance of (uncontrolled) floodings of Warta is significantly limited;
2. **The river having quality;** the river will be an attractive zone for the citizens of Poznan;
3. **Implementation being feasible;** a strategy is only useful if it is possible to realize it from financial and social points of view.

To achieve these key factors for success a shrewd analysis is required that focusses on the crucial elements of the strategy. The significance of these identified elements are briefly described below and elaborated in the following paragraphs.

The most important element of the strategy is the objective of creating a water-safe environment for Poznan. Floods from the River Warta are to be prevented to avoid economic, social, material and human losses. The ‘water secure’ environment should also take into consideration the prognoses of climate change.

Besides safety the natural, ecological and spatial qualities of the environment are also an essential element in achieving the objectives of the strategy. The river is at the heart of the city and is ideal for connecting the urban spaces and places.

Economic aspects are of special interest for the feasibility of the strategy. Interventions in the river (zone) are often costly and therefore finance needs to be generated. The strategy offers an excellent opportunity to designate potential economically valuable areas that are controlled by the city. Financial investments are required during the entire process. They are of special importance in the first stages, but the high social, environmental, financial and economic revenues will in the long term pay back these efforts.

The River Warta has been an important part of Poznan’s identity for centuries. Improving the strengths and qualities of the river will revitalize the lost identity of the city. Creating a strong and recognizable river zone will increase the attractiveness of the Warta in Poznan, and of Poznan as a City. A strong identity can have a pay-off for the image of Poznan for its own citizens, and for people outside Poznan.

“Livable and loveable” cities can only emerge with a vital society. The human component is essential to the achievement of a sustainable city. Therefore it is an important objective to further increase the overall well-being and living standards of Poznanian society. The River Warta can contribute to this purpose and thus the (potential) link between the river and the public is analyzed.

Connectivity and a good transport system are very important aspects of the sustainable city. Next to that, various connections and relations between the different components of the city are important for the efficient functioning of the city. In every modern city good connectivity and accessibility to the various places and functions are essential to prosperous development. Also connecting the different interests, values and stakeholders is essential to create a strong and feasible strategy.
3.3.2 Water Safety

The River Warta

The River Warta is the 3rd largest river in Poland, with a yearly average river discharge of approximately 100 m³/s. However, seasonal variations in river discharges can be quite large: for example, the difference between the yearly average low discharge (50 m³/s) and the yearly average high discharge (300 m³/s) is approximately 250 m³/s.

As a result of this seasonal variety in river discharge, water levels in Poznań are subject to a large variation as well. According to a statistical analysis at the Rocha Bridge, the yearly range of water levels in Poznań at present is roughly between 1.6 m (during low discharge) and 4.6 m (during high discharge), i.e. a 3 m water level variation. These values characterize the average water levels. However, more extreme water levels, such as in 1947 and 2010 do occur, potentially leading to floods in the near river areas.

Floods in the Poznan area

Historical records of floods in Poznan date back to 1501 A.D. and show that the city has been flooded repeatedly over the years. More than 60 floods were recorded between 1501 and 1925, most of which occurred in the spring time. The biggest flood occurred in the summer of 1736 A.D., when - according to the records - water levels exceeded the level of 11 m.

During the mid-19th Century, new fortifications surrounding the city were built which included two weirs – one in the Warta main channel and one in the Cybina River - to ensure that sufficient water was available for filling the fortress moat. However, these weirs further obstructed the already-constrained river flow, and are therefore considered the primary cause of two major floods in 1888 and 1889, when Stary Rynek (the Old Market) and nearby river districts were flooded. Subsequently, these floods contributed to a growing need for the flood protection of the city.

The flood-protection program

The River Warta at Poznan used to be a braided river with multiple branches and side branches, which changed their course over time. After the floods in the late 19th Century, a regulation project was proposed in 1911 for straightening the river course between Ostrow Tumski and Chwaliszewo. This project was carried out between 1912 and 1924, and laid the foundation for the rebuilding of the Poznan water system which was designed in 1964 and constructed between 1968 and 1972.

The present-day water system is the same as that after the reconstruction in 1972. However, it can be observed that, although the river obstructions have been removed and the river course straightened, the narrow channel at bridge crossings and small floodplains close to the city centre could still be a potential bottleneck during extremely high river stages.

The Present situation and recent floods

In the last decades of the 20th Century after the reconstruction, no major floods occurred in the Poznan area. This decrease in flood frequency is the result of the reconstruction of the Poznan river system and the construction of upstream reservoirs such as Jeziorosko (built in 1986). This change in flood frequency is reflected in the present statistics of flood levels in Poznan.

Nevertheless, extreme floods occurred in Poland in more recent years: especially in 1997 along the Odra River, and in 2011 along the Wisła River. Although the Warta catchment area was not affected by rainfall to such an extreme, the river exceeded the alert stage and some low-lying unprotected areas, including some municipalities surrounding Poznan (Lubon, Komorniki, Puszczykowo and Mosina), were flooded in 2010.

It is therefore important to determine the flood safety level for future developments along the River Warta in Poznan.

The Flood safety level in Poznan

Flood protection structures (e.g. dykes) are generally required to comply with safety standards. In some cases such standards are defined at the national level, and anchored in the legislation (e.g. in the Netherlands) or in national policy (UK, USA, etc). Safety standards usually prescribe safety levels expressed in terms of a Annual Exceedance Probability: a 1-in-100-year safety level means that the structure (e.g. a dyke) has to provide adequate protection during a water level that occurs on average once in 100 years.

The safety level in Poznan is directly related to the height of the dykes (e.g. at Piastowkie): the higher the dyke, the higher the water level to which adequate protection is provided, and thus the lower the annual exceedance probability of flooding it can withstand (a higher flood safety level).

The present safety level in Poznan is not known exactly. According to the statistical analysis from the IMGW, water levels occurring less frequently than 1 in 100 years cause overflowing of the dykes. However, according to the Digital Terrain Model (DTM) data obtained from Central National Geodetic and Cartographic Inventory (CODGiK), the lowest section of the dyke at Osiedle Piastowskie (Piastowskie Housing Estate) is between 7.5 & 8 m. This corresponds to a safety level of approximately 1 in 300 to 500 years. Furthermore, the city centre is protected even better with an estimated safety level of between 500 to 1000 years.

Despite the theoretical high safety level of the city, some weak spots in the flood defences were identified during the 2010 floods. High water caused problems on certain streets (Starolecka, Droga Debińska, Nadwarcianska, and Zagorze on Ostrow Tumski), and some areas adjacent to the river on Warta’s west bank were flooded.
Climate change in Poland

When planning spatial development along the River Warta it is of vital importance to consider long-term natural developments. The Earth’s climate is changing at an increasing rate. Global warming, as signalled in several publications of the Intergovernmental Panel on Climate Change (IPCC), is expected to be followed by changes in the yearly precipitation patterns, giving rise to extreme situations. According to the IPCC, the temperature rise in Poland will cause an increase in winter precipitation, with less snow and more rain, and hydrological projections show that there is a likelihood of increased drought during the summer months. Because less snow and more rain in the winter reduces winter retention (water contained in the snow cover), winter river flows are expected to increase. This may lead to potentially dangerous situations (floods). A trend of increasing winter river flows in Poland has already been observed.

Therefore, although statistically the probability of flooding in Poznan has decreased in the last 30 years compared to the preceding period, flood risks and the influence of climate change in the future should not be ignored. An increase in winter river flows might reduce flood protection levels around Poznan from the estimated 1 in 300-1000 years at present, to e.g. 1 in 100 years in the future. Such a decrease in safety levels makes future improvements to the flood protection system unavoidable.
The green environment in the City of Poznan focuses on the ‘green cross’. This large connected green system is of great value to the city. The rivers Warta (north-south) and Cybina/Bogdanka (east-west) are the blue central back bone of this dominant green structure. At the heart of the green cross is the historic city centre that is surrounded by a ring of parks and greens.

The north-south axis and the east-west axis of the green cross have different characters. The east-west axis comprises urban green areas that are often used for sports and recreation. The north-south axis, however, is not intensively used (except the allotments) and comprises the often neglected ‘no man’s land’ areas. This north-south axis has great natural and recreational potential, since it is connected to the natural (Natura 2000, Ecological Sensitive Areas) surroundings of the city.

In and around the river zone several historical-recreational elements are identified, such as the ring of forts (with green areas surrounding it), the citadel, and green ring around the centre.
Landscape of lakes
Recreative environment

East-West green structure

Nature 2000 protected area (3%)
Potential ecological area (1.5%)
Ecological sensitive area (25%)

North-South green structure

River landscape
Agriculture & natural environment

Ecological potential & protected area

Existing infrastructure bike
Potential connection infrastructure

Morphology

Higher groundlevel
Lower groundlevel

Infrastructure i.r.t. green

Potential 1e green city ring
Potential 2e green city ring

Other green structure
The economic inventory and analysis focuses on possible economic motors in the river zone, and on the areas to be used or avoided to create economic benefits for the city. Potential economic drivers such as revitalization areas of neglected river fronts, institutions such as the Technical University, the Old Gas Factory, the Dalkia area, the Chwalszewo old River bed, the old industrial zone, with their borders directly on the river fronts or in the river zone, or recreational hotspots such as Malta, are mainly located in the central area of the ‘green cross’. The high economic values of the commercial city centre could be linked with these potential economic drivers in the river zone.

In the river area there are several spatial plans which are already fixed or in progress. If the proposed solutions are to be implemented, the existing spatial plans should be adjusted or even cancelled.

Areas that are owned by the city are more likely to result in financial and economic profits for the city if developments take place in these areas. Therefore the ownership situation in the river area has been analyzed and the most suitable areas for developments under the strategy identified to create maximum positive economic results for the city.

The river zone has all the needed ingredients to underline and further develop Poznan’s plans of being a competitive metropolitan know-how city with a strong touristic and cultural resource.

A mix of functions investments could be added along the river zone as valuable extension to the vital urban structure. In connection with this, extra jobs will be created and the varied and strong educational offer strongly promoted.

In Strategy 2030 it is indicated that City of Poznan has the desire to develop the touristic potential of the city. The large river zone of the Warta can play an important role in creating an attractive green area suitable for touristic and recreational development. Also the competitiveness of Poznan in attracting new citizens, businesses and companies can be improved by the strategy, with economic benefits for the city.
Ownership
- City/government ownership (45%)
- Private ownership (55% no influence)

Plans in development
- No influence possible on development (42%)
- Possible influence on development (24%)
- Unknown (35%)
3.3.5 Identity

The zone around the River Warta in Poznan has lost its identity and can be characterized by an empty and long-neglected "no man’s land" in the middle of the city. It is also a monotonous area from south to north. There is not much variety in the image of the river throughout the city. There is, however, a difference between the east and west side: on the east bank the urbanized city borders close to the river and on the west side there is more green space between the river and the city.

Historical studies show that in the past the relationship between the river and the city was closer. People lived together with the river that was an essential part of the identity and image of Poznan. But instead of friends, the river and the city became enemies. Also the historical Royal Route has been lost and unidentifiable in the current urban fabric.

The identity of the river is hidden for Poznan’s citizens. Over the years neighborhoods have turned their back on the river. There take place too few events such as Midsummer Night, when people come to Warta to release their balloons.

Conclusion
Social touristic network

- Royal Imperial Route
- Historical relics
- Universities
- Sport facilities
- Soccer stadium
- Urban farming area
- Touristic attractive route
- Potential historical route

Programmatic map

- Open space / agriculture (36%)
- Forest / nature (18%)
- Housing (21%)
- Industrial (11%)
- Recreation (8%)
- City centre, mix of commercial & housing (5%)

36% 18% 21% 11% 8% 5%
3.3.6 Society

A vital society is a very important factor for the position of every city, nationally and internationally. Living and working in the same city has many benefits for the people, and also their city.

Demographic trends reveal that there is negative migration in Poznan, which means that more people leave the city than come to the city. This trend has negative consequences for local economic development and in reducing tax income for the city.

Green urban areas are of great importance to society. The health and well-being of people increases significantly when more often they get in contact with natural green environments. Therefore attracting citizens to a green area such as the Warta River can have large benefits for society.

Poznan has the ambition to develop itself as a brainport city focused on knowledge and education. An excellent living environment is necessary to attract and keep high educated brainport workers.
3.3.7 Connectivity

In the existing road structure intensive traffic concentrates on inner city roads such as Solna Street. The realization of the 3rd ring would move car traffic outside the city centre, thus creating a pedestrian and slow traffic-orientated central traffic system. Eliminating intensive car traffic would have significant advantages for the inner city’s environment.

The city’s ring-like traffic system crosses the river zone at several locations which offer possibilities for transport hubs where car traffic can be linked to public and water transport. Using the Warta for enhancing the connectivity of the city, will also improve the existing poor accessibility of the river zone. Besides the Wartostrada network there are only a very limited number of connections between the city and the river.

The strong and continuous slow traffic network (bicycle paths and bridges, water taxis, city boulevards, etc.) is not embedded in the city-connections network. The stimulation of sustainable modes of transportation (bicycles, trams, etc.) is very important for the further city functioning. The River Warta is located in the middle of the Old and New Towns. Exploring a strong and varied network of different kinds of slow traffic should be carried out.

Connecting natural areas would increase the total natural network and potential habitats of flora and fauna.
3.4 The Relevant Policies

The analysis of existing policies focuses on the Development Strategy for the City of Poznan to 2030, which has been regarded as the overall vision and strategy of the city. Besides this, special attention has been given to the policy on water. The analysis is based on the documents provided by City of Poznan.

3.4.1 The Development Strategy for the City of Poznan to 2030

The Poznan Strategy 2030 sets out the Vision, Mission, Strategic and Indirect Goals, and Strategic Programs for the city’s development towards 2030. A key factor is that Poznan considers itself as a metropolitan city with a strong economy and high quality of life that bases its development on knowledge.

The Strategic Goals are:

• The development of an innovative economy and an improvement in the city’s investment appeal;
• An increase in the city’s importance as a centre of knowledge, culture, tourism and sports;
• An improvement in the quality of life and the appeal of the city and its architecture;
• The creation of the Poznan Metropolis.

An extension to the Strategic Goals are the Objectives. These focus on more tangible objectives. Examples of Objectives that are (or can be) of importance to the Development Strategy for The River Warta are:

• An improvement in the spatial, infrastructural, legal and administrative conditions for enterprises;
• The achievement of the rank of international centre of culture and tourism by Poznan;
• The enrichment of the sports and recreational facilities for residents and visitors;
• The exposure of and an improvement to the attractiveness of valuable elements of Poznan’s space;
• Functional and spatial transformation and reevaluation and the regeneration of degraded areas;
• An increase in Poznan’s attractiveness as a place to live in.

The Development Strategy for the River Warta is a document which particularises the Development Strategy for the City of Poznan to 2030. Strategic programmes have been commissioned with projects and tasks for one or several areas of the city’s functioning and serve the implementation of Strategic and Indirect Goals. Most important to our project is the Strategic Programme ‘The City by the River’. The aim of this programme is to present the value of the river to the city, increase the value of the land by the Warta River by reclaiming neglected areas along the river, and also to raise the attractiveness of this part of the city for residents, tourists and athletes.

However, besides this Strategic Programme, other programmes will also be addressed by the Development Strategy for the River Warta in Poznan, such as ‘Spaces for Business’, ‘Poznan for Tourists’, ‘Sporting Poznan’, ‘Active recreation in Poznan’, ‘Let’s live in Poznan’, ‘Healthy Poznan’, and ‘Sustainable Transport Development’.

The Development Strategy for the River Warta in Poznan will combine a variety of goals and objectives that are set out in the different Strategic Programmes in the Poznan Strategy 2030.
3.4.2 Water Policy

This paragraph provides a brief description of the most relevant information on policy for The River Warta.

The Water Act (Prawo wodne) defines the general rules for water management, the development and protection of water resources, including prohibitions and restrictions concerning the use of water resources. It also regulates issues related to the ownership of the water and water-covered areas (retention reservoirs, floodplains, etc.).

According to Article 88a of the Water Act, flood protection is the responsibility of the authorities and Local Government (organa administracji rządowej i samorządowej). Flood protection is based on taking into account flood hazard maps (mapy zagrożenia powodziowego), flood-risk maps (mapy ryzyka powodziowego) and flood-risk-management plans (plany zarządzania ryzykiem powodziowym).

The Water Act (following the EU Flood Directive) requires that flood-risk maps are to be prepared for all flood-prone areas in the river catchments. These maps show the extent of flooded areas, water depth and velocity of flow. The National Water Management Authority (KZGW) is in charge of the preparation of flood-risk maps. Article 88d of the Water Act defines the requirements for flood-hazard maps. The maps show the areas where there is the probability of flooding:

1. low: less frequent than once every 500 years, or when there is the possibility of extreme events,
2. medium: once in 100 years,
3. high: once every 10 years,
4. flooding possible between the shore line and the embankment or natural high banks.

In accordance with Article 88 f Section 5 of the Water Act, the areas shown as being at flood hazard on these maps are taken into consideration in spatial planning and in building permits.

The organisation responsible for local water management (including flood protection) is the Regional Water Management Authority (RZGW) in Poznan. RGZW Poznan is the administrator of the river and its tributaries outside the Poznan boundaries. Provincial Management of Drainage, Irrigation and Infrastructure (WZMiUW) is responsible for the maintenance of embankments along the Warta. Within the city’s boundaries, the embankments are managed by City of Poznan.
3.5 Previous Plans

In the past, a large variety of plans for the Warta in Poznan have been prepared. This indicates that there is a strong desire to give the river a more prominent place in the city. All plans add new elements to the thinking about the river area. Some focus on architecture, some on nature and some on the river itself.

The analysis of the broad spectrum of existing plans leads to the conclusion that the vast majority focus on a limited number of aspects that are planned and designed in detail. Many plans offer excellent solutions and ideas. However, they address single problems that are not linked with other issues that are of importance to the river.

This Development Strategy for the River Warta distinguishes itself from the existing plans by its integral approach in which all relevant elements are included in the process. Also connecting and committing stakeholders, experts, politicians, and especially the public, with the plans. This integration of the facets and enthusiasm of many people involved results in an attractive and feasible strategy.
3.6 Plans for Warta in Poznan

The aim of the strategy is that Poznan will better use and take maximum advantage of the extraordinary potential of the Warta in the city. The River Warta can become a driving force for the socio-economic, natural, spatial and touristic development of the city as whole and the river zone in particular.
3.7 Identified Challenges

**Water Safety – Bottlenecks**
For the purpose of this strategy a numerical hydraulic computer model of the the River Warta was prepared with SOBEK software. Based on calculations with this model, it was determined that the discharge of peak flows in the River Warta is critical at the narrow underpasses of Lecha Bridge and Rocha Bridge.

During the hydrological analysis it was found in some reports provided by the City of Poznan that in some places the height of the dykes is also a concern for the flood safety of Poznan. These dyke stretches are being, and/or will have to be, strengthened and raised in the (near) future. Dyke improvement in these locations is already being addressed by the City and is therefore considered beyond the scope if this strategy.

**The Environment – The ‘Green Cross’**
The ‘green cross’ is part of the greater green structure of The Wielkopolska Region, and also very important for creating an attractive and competitive urban living environment in Poznan. The water network of the Warta, Cybina and Bogdanka Rivers are the core of the ‘green cross’. This large green (and blue) structure offers a large variety of possibilities for sports, recreation, nature resulting in a pleasant, healthy and valuable city life in Poznan. The ‘green cross’ can be the natural backbone of the city, connecting all sorts of natural and green areas inside the city. It also connects the inner city green areas to the natural surroundings of Poznan. The east-west orientated green connection of the ‘green cross’ connects the Rusalka Lake (west) with the Malta Lake (east). That can be strengthened by the activating of the Solna Boulevard and Bogdanka River west green wedge -the missing link- and underlining the east green wedge of the Cybina River and Malta. 

**The Environment – The Revitalization of the Urban Environment**
For many decades the River Warta has been perceived as an uninteresting and unattractive part of the city. This has resulted in many areas around the river that have been deserted or neglected. These unattractive urban environments often have great potential for the redevelopment and revitalisation if they are connected to the river zone again. The development strategy for the River Warta can be used for creating opportunities to revitalise these areas and create highly-attractive, exciting, new living and working zones in Poznan.

**Identity – The Warta Separates West And East Poznan**
The River Warta, with its large green zone around it, separates Poznan into east and west sides. The untractive and inaccessible river zone splits the coherence of the city. The green Warta zone has the potential to be used as a connecting element in the city that links a variety of city parts and elements with each other. A network of green spaces, roads, paths, functions etc. can be the central element where east and west meet. Also, the east-west orientated blue-green cross area will support the re-connection of the entire city structure.

**The Economy – A Knowledge-Based Economy**
As stated in the Strategy 2030, Poznan aims to develop itself as a knowledge-based economy. For these kinds of economies it is important to create a modern living environment that offers a broad variety of social, cultural and natural advantages. This appealing living environment is required to attract highly-educated world-class employees for which many cities compete.

**The Economy – Tourism**
Poznan has indicated in Strategy 2030 that it would like to develop its touristic potential. The development of the Warta zone (and the ‘green cross’) can add many elements to the city that are of tourist interest, such as recreational and sports routes, public transport over water, and so on. Reconnecting the river with the city will improve the image of the city. The City of Poznan offers various historical and cultural attractions. The River Warta has an important strategic position joining those together.

**The Environment – The Limited Use Of The River Zone**

**Identity – Restoring The Historical Connection Between The Warta And Poznan And Bringing Back The Historical Island-Urban Fabrics**
Over the years, the historical link between Poznan and the Warta has been lost. In the past there was intense interaction between the river and the city. There were promenades, and commonplace was boating and trade over water. The river and the city ‘lived’ together, depending on each other. The approach towards the river adopted during the last century resulted in a breach in this historical connection. By activating the old Chwaliszewo river arm / bed, the old island structure will become recognisable again, becoming a part of the city identity.

**Identity – The Limited Use Of The River Zone**
The river zone is a large open space in the middle of a densely-populated city. It is remarkable how little this green oasis is used for walking, sporting, culture or other forms of leisure and recreation. For the majority of the year the river zone can be used for all different kind of functions. 
Nowhere in Poznan can the seasons be better experienced than around the River Warta. In the hot summer the river can cool the city in the wet seasons or become an amazing ‘Central River Park’ in the dry summers. In the rainy season, the water levels rise to high levels, in spring the nature awakes, and in winter spectacular ice masses float on the river. Nature’s diversity is shown to the maximum, in the middle of the city.

With the development strategy related to the River Warta in Poznan, the city can identify and promote itself in Poland. Poznan would be the first city with a comparable strategy to improve water safety and integrate urban solutions and at the same time create various benefits for the city and its citizens.

Identity – Poznan As Exemplar City For Connections With The River

Poznan’s Royal Imperial Route plays an important role in the history of Poland. This historic route connected the old town, Chwaliszewo, Ostrow Tumski, Srodka and Malta, but has been lost in the current city’s fabric. The pedestrian route has been taken over by car traffic and new roads. The restoration of this route could bring back this historic relict and would connect the western and eastern side of the centre. The successful reconstruction of the Royal Imperial Route strongly depends on the existing traffic improvements.

Identity – The Historic Royal Imperial Route

Connectivity – Transforming Solna to an Urban Boulevard

Solna Street could be downgraded to an urban boulevard, restoring the historic Royal Imperial Route as a mainly-pedestrian street. Solna Street will become the vital green (now missing) link in the east-west part of the green cross.

Society – Turning Round Demographic Trends

Recent demographic trends reveal that the number of citizens in Poznan is falling. This has negative results for the socio-economic situation in the city, since high-income groups are leaving town. Creating an attractive living environment will have positive effects on the well-being of the citizens, and will prevent people from searching for a better living standard outside Poznan.

Identity – The Diverse Identities Of The Warta

Identity – The Historic Royal Imperial Route

Connectivity – Relocating The Central Ring Road

Relocating the northern part of the central ring road outside the city centre, by closing the missing link of the partly-existing City Ring I (I Rama), will offer many possibilities for the attractiveness of the old city centre and the river zone. Removing the heavy traffic from the centre will create a more pleasant and healthy urban climate, and will make the reconstruction of the Royal Imperial Route and the Old Chwaliszewo river bed possible.

Connectivity – Solna Street as the green connection

The (downgraded) Solna Street can be a connection through the centre between the eastern and western major urban green areas in Poznan. A pedestrian and bicycle route between these main green zones (the ‘Rusalka Lake - Bogdanka River zone’ – ‘Malta Lake - Cybina River zone’) would be created.

Connectivity – the Restoration of the Stubbens Ring

Around the historical city centre, many parks and green zones are located. These remnants of the Stubbens Ring could be connected again to establish one continuous ring park embracing the historic centre.

Connectivity – Linking urban areas with the Warta

The accessibility of the river zone is poor and people from neighbouring city parts are not tempted to visit the river zone. Urban areas could be connected with the river zone to promote interaction and use of the zone by the citizens.

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3.8 The Spatial Framework of Land and Water

The existing situation
The existing water system of the Rivers Warta, Cybina and Bogdanka created Poznans landscape and are at the core of the spatial framework for future developments.

Water solutions
Interventions to improve water safety are a precondition of creating a flood-secure city. These interventions are therefore essential elements in the framework.

East and west green zones
The east (Cybina/Malta) and west (Bogdanka) part of the ‘green cross’ will be protected and will continue to be designated for natural and recreational purposes.

New ring road, Solna street for pedestrians
A new ring road outside the city centre can transform Solna Street into an urban boulevard. This will create a pleasant inner-city environment, restores the Royal Imperial Route and connects the eastern and western green areas of the ‘green cross’.

Green cross with Stubbens Ring
Also the north-south (Warta) part of the ‘green cross’ will be protected as a green zone. An urban park will be created in the centre, and more natural / ecological areas are located towards the environments of the city. The green ring around the historic city centre will underline one of the most valuable spatial entities of the city.

Connections of build-up areas with river
Connections (green, pedestrian, cycling) are made between the built-up areas and Warta to link residential and work areas with the green river zone. These connections will facilitate easy access to the river and improve the interaction of people (and flora / fauna) between the living and working areas and the Warta.

The influence of urban zones on green cross
Different urban zones (re. centre, urban, suburban) result in different characteristics of the adjacent ‘green cross’ (re. city park, urban park, natural park).

Potential development areas
Locations where the main infrastructure and public transport meet are potential development areas.

Spatial framework of land and water
The total of the spatial elements described before add up to a spatial framework for land and water.
Based on the inventory, analysis and identified challenges for Poznan, a broad spatial structure for the global development of the river zone has been prepared. This spatial framework reflects the most important decisions on developments from the land (nature, urban, infrastructure) and the water (river, streams, lakes).

The spatial framework for land and water can be regarded as a guide for the future. Even though the spatial framework gives the most important direction for development, there are different ways of implementing the framework. Within the framework, there is flexibility for a variety of alternatives.

The framework contains the most important elements at the city level for the sustainable development of the river zone in Poznan.
Based on the identified spatial framework of land and water, three fundamentally different alternatives are investigated - one alternative in which the existing approach to the river in the city is continued, and two alternatives in which minimum and maximum integration between the city and the river are explored. A comparison reveals the preferred alternative for the development of the River Warta in Poznan.
4.1 Introduction..................................................................................................................54
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4. The Three Alternatives

4.1 Introduction

The spatial framework sets out the global spatial development of the river zone. But there are different ways to achieve this global development. To explore these possibilities three fundamentally different ways of approaching the river zone are investigated:

- Alternative zero: continuing the autonomous approach to the river in the city.
- Alternative one: minimum integration between the city and the river.
- Alternative two: maximum integration between the city and the river.

In the following paragraphs these alternatives are described and compared.

4.2 Alternative zero: continuing the autonomous approach

In this alternative the existing approach to the river and the urban river zone in the city is continued. This alternative will mainly function as a benchmark with which the other two alternatives can be compared.

4.3 Alternative one: minimum integration between the city and the river

In the past, the city has turned its back on the river. In this alternative, Poznan faces the river again and focuses on the river zone. The urban areas alongside the Warta refocus towards the river, and connections are made between the urban areas behind and the river zone. The city buildings and the open river zone will remain clearly separated. Only the urbanised edge of the city will need revitalisation and repositioning.

The increased interaction between Poznan and the Warta will be mainly based on a strong visual relationship. However, people will be attracted to the green river zone by introducing small-scale interventions such as new pedestrian and bicycle paths and creating socially-safe environments.

The river zone will be of a mainly natural character where people are considered to be recreational visitors.
4.4 Alternative two: maximum integration between the city and the river

Alternative two aims for the maximum integration of the City of Poznan with the Warta River. The city will not only refocus itself towards the river (like in alternative one), but the true spatial and functional integration of the city and the river is proposed in this alternative. Elements of the city (like residential areas) will be introduced into the river zone, and elements of the river (like old river branches) will be introduced into the urban areas of the city. This will create a strong relationship between the city and the river.

The natural morphology of the river is used as an inspiration and guide for re-introducing a true riverscape to Poznan and improving flood safety by creating more ‘room for the river’. New river branches will be created (e.g. Chwaliszewo, Portowo, Lecha Bridge, Ostrow Tumski) to further increase urban qualities. Some of these new river arms will only be flooded at times of high water levels when the extra retention capacity of the river is needed to increase flood safety.

The new water connections will result in new islands. Some of these will be able to be used for urban development (and generate financial profits) and some of them can be allocated to ecological development.

In this alternative the Warta zone is intensively used by the citizens of Poznan. The qualities of the river zone are exploited to the highest level.
### 4.5 Comparison and Assessment of the Alternatives

#### 4.5.1 Introduction on the comparison

The different alternatives are assessed on the basis of the previously identified crucial elements for a successful development strategy (water safety, environment, identity, society, connectivity and economy). Based on the comparison of the alternatives on these crucial elements a well-founded assessment can be conducted to reveal the preferred alternative for the development strategy for the River Warta in Poznan.

#### 4.5.2 Comparison table:

<table>
<thead>
<tr>
<th></th>
<th>Segregating City and River</th>
<th>Integrating City and River</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The water-safety issue is not solved. Existing flooding problems will continue and flood safety is expected to decrease in the future as a result of the forecast higher water levels due to climate change.</td>
<td>The water-safety issue is not solved. Existing flooding problems will continue and flood safety is expected to decrease in the future as a result of the forecast higher water levels due to climate change.</td>
<td>Several new river branches between Portowo and Lecha Bridges, and extra bypasses on Ostrow Tumski Island and Chwałiszewo will be created. Water safety will be increased from Lecha towards the south of Portowo, including in the city centre.</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The urban and natural environment of the river in the city will remain of poor quality.</td>
<td>The revitalisation of the urban edge along the Warta, and of the river zone itself, will improve the urban and natural environmental qualities.</td>
<td>A high-quality urban and natural environment will be created by integrating the city and the river. Opportunities will arise for new city islands, ecological areas and the use of the environment is maximised.</td>
</tr>
<tr>
<td><strong>Identity</strong></td>
<td></td>
<td></td>
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<tr>
<td>The river zone has a monotonous and non-attractive identity which does not contribute to positive image of Poznan.</td>
<td>The identity of the river zone will be strengthened in a positive way. People will more intensely use the zone and Warta will become part of Poznan’s identity and image.</td>
<td>A restored identity is created for Poznan. The River Warta will become a prominent element in the identity of the city and the promotion of its image. The Warta will be a unique selling point for Poznan.</td>
</tr>
<tr>
<td><strong>Society</strong></td>
<td></td>
<td></td>
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<tr>
<td>Due to the poor interaction between people and the river, the public will have very limited benefits from the Warta.</td>
<td>The citizens of Poznan will be able to use and enjoy the river zone more.</td>
<td>The River Warta will become an essential part of the city that adds valuable qualities. People will be able to use and enjoy these qualities to the maximum extent.</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The connectivity of the river zone will remain poor, resulting in limited accessibility.</td>
<td>The river zone will be made accessible by mainly pedestrian and bicycle paths.</td>
<td>The use and connectivity of the Warta will be increased by a variety of (public) transport networks on land and over water.</td>
</tr>
<tr>
<td><strong>Economy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The large green river zone will not contribute to Poznan’s financial and economic future.</td>
<td>The River Warta becomes an attractive zone in the city. The city will gain economic profits from e.g. increasing land values along the river zone and improved city image.</td>
<td>Large financial investments are required but the economic revenues for the city will be much higher.</td>
</tr>
</tbody>
</table>
4.5.3 Assessing the alternatives

<table>
<thead>
<tr>
<th></th>
<th>Segregating City and River</th>
<th>Integrating City and River</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternative zero:</strong></td>
<td>CONTINUING THE AUTONOMOUS APPROACH TO THE RIVER IN THE CITY</td>
<td>Alternative one: MINIMUM INTEGRATION BETWEEN CITY AND RIVER</td>
</tr>
<tr>
<td><strong>Alternative one:</strong></td>
<td>MINIMUM INTEGRATION BETWEEN CITY AND RIVER</td>
<td>Alternative two: MAXIMUM INTEGRATION BETWEEN CITY AND RIVER</td>
</tr>
<tr>
<td><strong>To what extent does the alternative for Warta..</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water Safety</strong></td>
<td>- -</td>
<td>+</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>- -</td>
<td>+</td>
</tr>
<tr>
<td><strong>Identity</strong></td>
<td>- -</td>
<td>+</td>
</tr>
<tr>
<td><strong>Society</strong></td>
<td>- -</td>
<td>+</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>Economy</strong></td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

4.6 Preferred Alternative

Based on the used criteria, the assessment of the alternatives reveals that alternative two (maximum integration between river and city) is the preferred alternative in all respects.

This preferred alternative has been further detailed (on the strategy level) to indicate what kind of functions should be located in which specific places in the river zone to create the desired maximum integration between the river and the city. The proposed function and their location are based on the objectives of the preferred alternative and offer solutions for the earlier-identified challenges for Poznan.
4.6 Preferred Alternative

2012

- The City of Poznan in 2012 is isolated from the river. The river is not managed well, flooding might occur, unattractive and unsafe places are developing, and socio-economic deterioration is a threat.

- The spatial development of river area bear the consequences of the the rather one-dimensional ‘engineering approach’ towards the river that was dominant during the second half of the 20thCentury. The River Warta is canalised.

- Water is seen as an enemy, rather as a friend to people.

- The relationship between the City of Poznan and its river got lost. The city turned its back on the river zones.

- The historic Royal Route is lost and taken over by car traffic.

- There are no cycling routes, paths or attractions, and not even one restaurant.
The presence of the river in the city adds many cultural, historical, natural, social, economic and aesthetic values to that city.

The river offers great potential for the new developments in urban quality with all the benefits that go with it.

The development of the Warta zone is used for the revitalisation of the urban areas.

The beautiful river zone contributes to the attractive environment with positive effects on society.

The River Warta zone has many attractive places and facilities, and is bike and pedestrian-friendly. New connections have been made and the river has very good accessibility.

The historic Royal Imperial Route is strong and connects the new and old city structures - city centre, Chwaliszewo, Ostrow Tumski and Malta Park.

The new living areas are full of life; people are taking advantage of living by the water.

A water taxi is running, for tourists as well for residents, as public transport.
Preferred alternative: Maximum integration River and City

Transport Infrastructure:
- New water transport, stops and marinas
- Bus line, stops, stations
- New bus line, stops
- Tram line, stops, stations
- New tram line, stops
- Train stations
- A2
- Main city roads
- Secondary city roads
- Railway
- Walking/cycling route

2030
The City Center - situation 2030

The historic centre of Poznan is located in the heart of the ‘green cross’. It is in this heart of the river zone where most networks, functions and interests meet. Therefore it is not surprising that a variety of possibilities arise in this area.

This central area can be regarded as the focal point where the impact of the development strategy can be experienced to the fullest extent. East meets west, north meets south, and the highly-urbanised centre integrates with the river’s water.
In the previous chapter the preferred alternative for the Development Strategy for The River Warta was identified. This chapter elaborates on how this alternative can be turned into reality. To realise the plans and goals of the preferred alternative, a comprehensive set of subprojects is launched in the River Zone. The implementation of (a number of) these subprojects will result in achieving the objectives of the Development Strategy.
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5.3 The Combination of subprojects ..........................................88
5.1 The Implementation of the Development Strategy

The Implementation Plan sets out in detail, in a number of strategic objectives (or guiding themes), key targets and projects that together make up the goals and objectives of the Development Strategy.

The Development Strategy is underpinned by six guiding themes. These principles will form the basis for the Implementation plan. The principles are connectivity (divided between car traffic and slow traffic), river safety, living & working (divided in built-up areas and open spaces), tourism & recreation, historical heritage, and landscape & nature.

Each of the guiding themes addresses several projects in the Development Strategy. By selecting several projects for each guiding theme, an integrated, broad, sustainable development of the river area is ensured.

The guiding themes are chosen for their specific importance to the development of the River Warta in Poznan. Their rationale is described below. The prioritising of the subproject should be done in the next phase of the implementation of the Development Strategy.

### Tourism and recreation

The green zone of the River Warta can play an essential role in the touristic and recreational development of the city. The natural, aesthetic and functional benefits of this large natural area in the urban environment can be used for the location of touristic functions and has touristic potential itself as an attractive park zone.

The river zone can also host many recreational functions for the Poznan citizens. For example, these could include playgrounds, sports areas and theatre and music venues.

The river itself can be used for recreation as a boating and canoeing area, or as a swimming location.

### River safety

Flooding of the River Warta can cause much environmental, social, financial and economic damage to the city. Increasing river safety and thus decreasing changes to flooding will contribute to the strength of Poznan, and will prevent damage.

The adopted methodology of giving more “room for the river”, by creating more retention capacity to absorb peak flows in the river, will significantly contribute to safety levels. Several proposed projects in the Implementation Plan will result in an increased river safety.

### Living and working

The Development Strategy aims to improve the existing, and adding to, the high-quality new living and working environment in Poznan. The citizens of Poznan should be the first to benefit from the vicinity of the River Warta. Therefore the Implementation Plan proposes a variety of projects that will contribute to the spatial, functional and aesthetic attractiveness of this large ‘blue-green’ zone in the middle of their city.

Revitalising (often long neglected) built-up areas in and around the river zone will improve the liveliness and attractiveness of Warta. Old industrial areas can be transformed into new beautiful locations to serve a variety of functions and generate revenue.

Open spaces for leisure and recreation are important for the creation of a competitive living and working environment. In the Development Strategy, a network of open spaces along the river is proposed where people can walk, bike, sport and just sit in the grass and enjoy the river.

### Historical heritage

The Development Strategy can be used by Poznan to rediscover and revitalise its rich historical heritage in the Warta zone. The Implementation Plan puts forward projects to reveal and emphasise historical structures, elements, connections, symbols, stories, memories and historical routes.

Bringing back historical river branches and streams will contribute to restoring the historical connection between the river and the city.

### Landscape and nature

The Warta is the heart and soul of Poznan. Instead of the river and the city being enemies who had turned their back on each other for many decades, they will become friends again. The rediscovered friendship between the City of Poznan and The River Warta will result in big benefits for Poznan society and nature.

The extraordinary large green areas in Poznan are safeguarded from undesired developments. They remain green and spacious for the benefit of society and nature. The green river zone connects the natural areas and ecological habitats inside Poznan to the natural surroundings of the city. Migration of flora and fauna is thereby facilitated.

Also inside the city, green connections are made between the residential areas and the river zone. This will foster migration and provide more habitats for (especially) birds and small mammals. It will also create attractive green routes from the residential areas to Warta.
5.2 Overview Subprojects

1. Completing First City Ring
   - Creating extra space for the river (new river channels, new wetlands as water buffers), by connecting existing river arm of old port Staroleka (Portowo)

2. Reorganisation of city centre traffic system
   - Reconnecting historical Royal Imperial Route
   - Improving existing bridges construction: most Przemysla, most Krolowej Jadwigi, most Sw. Rocha, most Lecha
   - Downgrading and reconstruction of the Solna Route
   - Reorganising public transport in the centre in connection with new city centre traffic system

3. Realisation of additional parking places
   - Realisation of the additional river channels
   - Realisation of the additional river channels and connected to these green structures:
     a. Strengthening existing Cybinka stream
     b. Bringing back historical river Bogdanka in the city center by digging out river bed
     c. Revitalisation of the other areas connected with the river:
        a. Revitalisation of River fronts Rataje
        b. Revitalisation of River fronts Szelag
        c. Revitalisation of River fronts Zawady
        d. Revitalisation of River fronts Glowna
        e. Revitalisation of River fronts Naramowice
        f. Revitalisation of River fronts Umultowo
        g. Revitalisation of River fronts Staroleka
        h. Revitalisation of River fronts Debiec
        i. Revitalisation of River fronts Lubon

4. Realisation of new bridges
   - Developing new river channels in Northern Islands
   - Developing new river channel in Chwaliszewo
   - Developing other new river channels
   - Developing new and completing existing pedestrian and cycle routes/network
   - Realising River boulevards
   - Developing new river channel in Chwaliszewo
   - Developing other new river channels

5. Realisation of new and completing existing pedestrian and cycle routes/network
   - Reconnecting the historical Royal Imperial Route
   - Realising new additional urban structures (in relation with the river) by developing diverse characters islands:
     a. Developing city park island
     b. Developing nature island
     c. Developing mix-used island
     d. Developing culture island
     e. Developing other islands

6. Realisation of additional parking places
   - Reorganisation of city centre traffic system
   - Reorganisation of car traffic
   - Reorganisation of slow traffic
   - Revitalisation of old port Staroleka by:
     a. Developing new river channels in Northern Islands
     b. Developing new river channel in Chwaliszewo
     c. Developing other new river channels

7. Extension of the TU area in the relation with Malta
   - Revitalisation of city center by reconstructing the old historical urban morphology of:
     a. Revitalisation of Chwaliszewo
     b. Revitalisation of Srodka
     c. Revitalisation of Stara Gazownia
     d. Revitalisation of Garbary station
     e. Revitalisation of Ostrow Tumski
     f. Revitalisation of River fronts Rataje
     g. Revitalisation of River fronts Szelag
     h. Revitalisation of River fronts Zawady
     i. Revitalisation of River fronts Glowna
     j. Revitalisation of River fronts Umultowo
     k. Revitalisation of River fronts Naramowice
     l. Revitalisation of River fronts Staroleka
     m. Revitalisation of River fronts Debiec
     n. Revitalisation of River fronts Lubon
   - Revitalisation of the center by reconstructing the old historical urban morphology of:
     a. Revitalisation of the TU area in the relation with Malta
     b. Revitalisation of the TU area in the relation with Malta
     c. Revitalisation of the TU area in the relation with Malta
     d. Revitalisation of the TU area in the relation with Malta
     e. Revitalisation of the TU area in the relation with Malta
     f. Revitalisation of the TU area in the relation with Malta
     g. Revitalisation of the TU area in the relation with Malta
     h. Revitalisation of the TU area in the relation with Malta
     i. Revitalisation of the TU area in the relation with Malta
     j. Revitalisation of the TU area in the relation with Malta
     k. Revitalisation of the TU area in the relation with Malta
     l. Revitalisation of the TU area in the relation with Malta
1. Realising the concrete river connected events
   a. Realising bars, cafes, restaurants, beach
   b. Realising calendar of river connected events
2. Realising river related services:
   a. Cooperation with public waterbus/taxi company
   b. Developing TU area
   c. Adding mixed-use functions
3. Providing neighbourhood playgrounds in different city districts connected to the river
4. Organising and realising water transportation system by:
   a. Cooperation with public waterbus/taxi company
   b. Developing infrastructure steps
5. Enriching sport facilities by improving facilities and combining those with additional mixed-use functions:
   a. Organising and realising sport facilities buildings to accommodate new water connected sports (canoe club, yacht club, swimming club etc.)
6. Realising touristic tram
7. Reconnecting the Historical Royal Route
8. Reconnecting the Historical Royal Route (in relation to the traffic) to a boulevard by:
   a. Developing sport city
   b. Strengthening and creating new ecological corridors
   c. Strengthening the first and second ring of forts
9. Realising new significant regional cultural buildings within “Green Cross” border by:
   a. Reorganisation of the street profile (traffic, small architecture)
   b. Strengthening existing green structure (e.g. adding trees)
   c. Adding mixed-use functions
10. Using the potential of the forts for creating new urban spaces
11. Reconnecting the historical Royal Route
12. Regeneration of Solna Street (in relation to the historical heritage and landscape and nature)
13. Activating the Garbary Square by realising new mixed-use functions on the edges of the place.
14. Realising the high quality plaza: pavement, small architecture, green structure, trees
15. Realising new significant regional cultural buildings within “Green Cross” border by:
   a. Reorganisation of the street profile (traffic, small architecture)
   b. Strengthening existing green structure (e.g. adding trees)
   c. Adding mixed-use functions
16. Using the potential of the forts for creating new urban spaces
17. Reconnecting the historical Royal Route
18. Regeneration of Solna Street (in relation to the historical heritage and landscape and nature)
19. Activating the Garbary Square by realising new mixed-use functions on the edges of the place.
20. Realising the high quality plaza: pavement, small architecture, green structure, trees
21. Realising river related services:
   a. Cooperation with public waterbus/taxi company
   b. Developing TU area
   c. Adding mixed-use functions
22. Providing neighbourhood playgrounds in different city districts connected to the river
23. Organising and realising water transportation system by:
   a. Cooperation with public waterbus/taxi company
   b. Developing infrastructure steps
24. Enriching sport facilities by improving facilities and combining those with additional mixed-use functions:
   a. Organising and realising sport facilities buildings to accommodate new water connected sports (canoe club, yacht club, swimming club etc.)
25. Reconnecting the Historical Royal Route
26. Regeneration of Solna Street (in relation to the historical heritage and landscape and nature)
27. Activating the Garbary Square by realising new mixed-use functions on the edges of the place.
28. Realising the high quality plaza: pavement, small architecture, green structure, trees
29. Realising river related services:
   a. Cooperation with public waterbus/taxi company
   b. Developing TU area
   c. Adding mixed-use functions
30. Providing neighbourhood playgrounds in different city districts connected to the river
31. Organising and realising water transportation system by:
   a. Cooperation with public waterbus/taxi company
   b. Developing infrastructure steps
32. Enriching sport facilities by improving facilities and combining those with additional mixed-use functions:
   a. Organising and realising sport facilities buildings to accommodate new water connected sports (canoe club, yacht club, swimming club etc.)
connections
car traffic
Connections - Car traffic

The projects on car traffic connections focus on preventing pollution and disturbing car traffic in the city centre and the Warta areas. Thereby a more attractive city and green centre for Poznan can be created.

1. **Completing the first-city ring**
   Car traffic will be relocated from Solna Street to the connection further to the north. The historic centre and the historic Royal Imperial Route will become areas with pedestrian priority.

2. **The reorganisation of the city-centre traffic system**
   The reorganisation of the city traffic centre can help avoid car traffic. Destination car traffic only should be allowed so as to create an attractive centre for mainly pedestrians and bicycles. Facilitating the public transport system and organising a strong network of parking places around the edges of the city centre will improve the function of the old city.

3. **The provision of additional parking places**
   Additional parking places around the city centre would decrease car traffic. Parking places can be put in place near public-transport hubs, where people can take bus or tram to their destination.
Connections - Slow traffic
The projects on slow traffic connections aim to facilitate and promote especially walking and cycling. These healthy ways of transport are none polluting and create no noise like cars. Thereby an attractive environment in the city centre and Warta zone can be created.

1. Completing the Wartostrada
Completing the Wartostrada project will make the river zone more accessible to the people of Poznan and to visitors. Efficient and attractive cycling routes are an added value to the city.

2. The construction of new and completing existing pedestrian and cycle routes/network
a. Realising new connections through the river
b. Realising River boulevards
Besides the Wartostrada, more cycling routes and pedestrian routes can be put in place to promote these healthy, efficient and cheap modes of transport. They can also be dedicated to recreational and touristic use.

3. The building of new bridges
New pedestrian and cycling bridges will promote awareness of the river zone in the city and will increase the connectivity and accessibility of the river zone.

4. Reconnecting the historic Royal Imperial Route
The churches, plazas and places along the most important historical routes of Poznan can be emphasised again. An attractive route between these places will rediscover this historical asset of the city.

5. Downgrading and reconstructing Solna Street
Solna Street is currently in use as a traffic corridor in the city centre. It is proposed to downgrade the traffic function of Solna Street and transform it into a pleasant and attractive urban boulevard.

6. The reorganisation of public transport in the centre in connection with the new city centre traffic system
Changing the traffic system would require adjustments to be made on the public transport system. This system would for example need to be connected to parking areas outside the city.
5.2 Overview Subprojects - Implementation Plan River Warta Development Strategy

river safety
1. Creating extra space for the river by connecting the existing river arm of the old port Staroleka

2. Improving existing bridge construction: most Przemysla I, most Krolowej Jadwigi, most Sw. Rocha, most Lecha.

3. The creation of the additional river channels connected to the green structure
   a. Developing new river channel in Chwaliszewo
   b. Developing new river channels in Northern Islands
   c. Developing other new river channels

4. Bringing back the historic river Bogdanka

5. Strengthening the existing Cybinka stream by realising along green structure and giving additional space for the water.

**River safety**

The projects to improve the safety of river and streams aims to create more space for the water to absorb peak flows after mainly heavy rains.

1. Creating extra space for the river by connecting existing river arm of old port Staroleka
   Creating an open river arm through the old port of Staroleka will increase the retention capacity of the Warta and improve river safety.

2. Improving existing bridges construction
   Some bridges are bottlenecks in the river that prevent the clear flow of the river, especially in times of peak flows. These bottlenecks need to be resolved by improving bridge structures.

3. The creation of the additional river channels connected to the green structure
   More river channels that can discharge water at times of high water will increase the river safety of Poznan. Therefore more river channels are proposed.

4. Bringing back the historic river Bogdanka
   The historic river Bogdanka is largely underground and is proposed to make it visible and accessible again in the city. It will contribute to attractiveness and ecological development, with overflow areas being created to improve river safety.

5. Strengthening the existing Cybinka
   The Cybinka River will be made more prominent in the city. Ecological development, together with improvements to create more retention space for water, are proposed.
5.2 Overview Subprojects - Implementation Plan River Warta Development Strategy

living and working build-up areas
1. The revitalisation of old port Starolecka by:
   a. Realising new sustainable mixed-use integrated with the river and rest of the city living area Portowo as phase 1
   b. Realising new sustainable mixed-use integrated with the river and rest of the city living area ‘Stomil’ as phase 2

2. The extension of the TU area in connection with Malta

3. Realising new additional urban structures (in relation with the river) by developing diverse characters islands:
   a. Developing city park island
   b. Developing nature island
   c. Developing mixed-use island
   d. Developing culture island
   e. Developing other islands

4. Revitalisation of the center by reconstructing the old historical urban morphology of:
   a. Revitalisation Chwaliszewo
   b. Revitalisation Ostrow Tumski
   c. Revitalisation Stdzieki
   d. Revitalisation Old Gazownia
   e. Revitalisation Hamburg Station
   f. Revitalisation of Atrakcja street

5. Revitalisation of the other areas connected with the river:
   a. Revitalisation River fronts Rataje
   b. Revitalisation River fronts Szelag
   c. Revitalisation River fronts Zawady
   d. Revitalisation River fronts Glowna
   e. Revitalisation River fronts Staroleka
   f. Revitalisation River fronts Selisz
   g. Revitalisation River fronts Marlowo
   h. Revitalisation River fronts Lubon

Living and working - Build-up areas
The projects for living-and-working build-up areas in the Warta zone mainly focus on revitalising neglected build-up areas and generating funds to increase the attractiveness of the Warta zone. New build-up areas along the river can add special new living and working areas for Poznan.

1. The revitalisation of old port Starolecka
The revitalisation of this old port into an attractive living, working and leisure environment will transform a neglected river area into a high-quality area. This development will create a valuable additional living climate to Poznan.

2. The extension of the TU area in connection with Malta
The extension of the TU-related area can be focussed on the River Warta zone and on the Malta zone, instead of an introverted development. By seeking a link with Malta, the qualities of green and the lake can be integrated and used for the TU.

3. Realising new additional urban structures by developing diverse character islands
The city centre has a high potential to create a variety of living and working environments. Different islands can be created, each with their own identity adding a specific quality to Poznan.

4. The revitalisation of the centre by reconstructing the old historical urban morphology
The historical urban morphology of (especially) the centre of Poznan has great potential for attractive urban environments. By reconstructing the historical morphology, this attractiveness can be generated for the city.

5. The revitalisation of other areas connected to the river
Areas and neighbourhoods in the vicinity of the Warta River will be orientated on the river zone to take maximum advantage of this attractive large green zone in the city. Building blocks and architecture will focus on Warta.
5.2 Overview Subprojects - Implementation Plan River Warta Development Strategy

living and working
open spaces
1. Realising boulevards along the river
   a. Developing boulevard along TU campus ‘Warta’
   b. Developing boulevard along Chwaliszewo
   c. Developing boulevard other boulevards

2. Realising river related services:
   a. Realising bars, cafes, restaurants, beach
   b. Realising calendar of river connected events

3. Providing neighbourhood playgrounds in different city districts connected to the river

4. Activating Garbary Square by realising new mixed-use functions on the edges of the plaza. Realising the high quality plaza: pavement, small architecture, green structure, trees

Living and working - Open spaces
The projects for living and working open spaces aim to attract people to the river zone.

1. Creating boulevards along the river
   The creation of public boulevards will give people the opportunity to enjoy the the River Warta and its open space and nature in the city.

2. Installing river-related services
   A (seasonal) programme / calendar with a variety of activities in the Warta zone will intensify the use of this magnificent area in Poznan. Local activities, and also large-scale touristic events, can have their venue in the large open river areas.

3. Providing neighbourhood playgrounds in various city districts connected to the river
   By locating neighbourhood playgrounds near the Warta, the young people of Poznan can be brought in contact with this large natural and healthy environment.

4. Activating Garbary Square
   Bringing back the old river arm of Chwaliszewo will reposition Garbary Square on the River Warta. It will become the prime and most attractive location in Poznan’s city centre. This will bring potential for the development of a vibrant city square that will attract citizens and visitors to the riverside.
tourism and recreation

5.2 Overview Subprojects - Implementation Plan River Warta Development Strategy
1. Realising new significant regional cultural buildings within “Green Cross” border by:
   a. Realising new conference center
   b. Realising other possible cultural buildings

2. Realisation of the marina in Portowo

3. Realisation of the marina in city center

4. Organising and realising water transportation system by:
   a. Cooperation with public waterbus/taxi company
   b. Realising waterbus/taxi stops

5. Enriching sport facilities by improving facilities and combining those with additional mixed-use functions:
   a. Developing sport city
   b. Developing TU area

6. Realising sport facilities buildings to accommodate new water connected sports (canoe club, yacht club, swimming club etc.)

7. Realising touristic tram

8. Replacing datias if needed

Tourism and recreation

The strategic projects on tourism and recreation focus on the development of the overall touristic and recreational potential of the attractive Warta zone. This large green space in the middle of the city is unique and the city can have large benefits from it from the touristic and recreational points of view.

1. Realizing new significant regional cultural buildings within the “green cross”
   The “green cross” has excellent environmental qualities that can be used to increase the identity and image of Poznan. Locating public cultural venues that attract citizens and tourists (e.g. museum, conference centre) within this green zone will make this become a recognisable and highly-appreciated part of Poznan.

2. The construction of a marina in Portowo
   Recreation on and along the river can be increased by implementing the planned marina at the Portowo development. It will stimulate public transport over water and improve opportunities for boating, creating a vibrant recreational use of Warta.

3. The construction of a marina in city centre
   A hot spot for a marina is located in the city centre. Tourists and commuters could use the marina for public and touristic transport, and a city marina would have significant recreational value for Poznan.

4. Organizing and realizing water transportation
   The River Warta has excellent potential to be used for fast, efficient and attractive city transportation. Linking public river transport to the city’s public transport network would create a new asset for Poznan.

5. Improving and combining sports facilities
   A proper sports infrastructure needs to be created to facilitate the use of sports in the “green cross”. This can be created in the most efficient way if combinations are made with other uses and if facilities are shared.

6. Providing sports facilities for water connected sports
   An important part of the strategy to bring back the Warta into the hearts and minds of the citizens of Poznan is increasing the use of the river. Using the river for water-related sports will add a new sporting dimension and possibilities for the city.

7. Installing touristic trams
   A touristic tram will make the green Warta zone accessible to tourists and can attract tourists to visit a variety of interesting touristic hot spots such as the Royal Route, Malta, etc.

8. Relocating allotments if needed
   In case water safety issues require larger river flood plains, relocating the recreational allotments should be considered.
historical heritage
1. Reconnecting the historical Royal Route

2. Regeneration of Solna Street (in relation to the traffic) to a boulevard by:
   a. Reorganisation of the street profile (traffic, small architecture)
   b. Strengthening existing green structure (e.g. adding trees)
   c. Adding mixed-use functions

3. Using the potential of the forts for creating new touristic routes

Historical heritage

The projects of historical heritage aim to protect and revitalise the valuable historical elements within the Warta area. By focussing on the rich history of Poznan, a strong element is added to the identity of the city in general and of the Warta zone in particular.

1. Reconnecting the historic Royal Route
   The Royal Route has a large historical relevance to Poland and Poznan. The introduction and development of car traffic has disconnected the route as such. By reconnecting the route an attractive old and new element is reintroduced to the city.

2. The regeneration of Solna Street
   By downgrading Solna Street from an intensely-used car-traffic connection to a pedestrian-friendly urban boulevard, new possibilities for an attractive urban environment arise. The regeneration of the street towards an attractive strip with commercial functions and facilities will be of added value to the city, and will create a new slow-traffic route from east to west.

3. Using potential of the forts for creating new touristic routes.
   The ring of forts with their green environments, and the green ring around the city centre, can be used for the development of attractive green routes that are in contact with the Warta zone.
5.2 Overview Subprojects - Implementation Plan River Warta Development Strategy

landscape and nature
1. Strengthen the quality of existing "Green Cross" by:
   a. Protecting areas of Natura2000
   b. Strengthening and creating new ecological corridors
   c. Strengthening the first and second ring of forts

2. Realisation of the additional river channels and connected to these green structures:
   a. Developing new river channel in Chwaliszewo
   b. Developing new river channels in Northern Islands
   c. Developing new other river channels

Landscape and nature
The projects on landscape and nature focus on maintaining the natural and ecological qualities of the "green cross" in Poznan.

1. Strengthen the quality of the "green cross"
   The cross-like green structure of Poznan is unique and of high value to the city. The (potential) benefits of this structure are eminent. Therefore the "green cross" is not only protected but also being further developed. It will be the backbone of a natural and ecological network of green zones, inside and outside the city.

2. The completion of additional river channels connected to green structures
   The completion of additional river channels to increase the flood safety of Warta will be linked with the development of existing and new natural zones and corridors.
5.3 The Combination of Subprojects

For the actual implementation of the strategy, several subprojects will be combined to create synergy between the projects and to (for example) share costs. Often these subprojects are interrelated.

Also, the implementation of one subproject brings about new opportunities for another. Like domino pieces, the implementation of one subproject will often result in the next one being implemented.

As an example, the combination of subprojects in the central area of the “green cross” and city centre is presented. Within this area cars are welcome but slow traffic (pedestrians, bicycles) and public transport have priority, to improve the urban environment to the highest standards.

To achieve this, Solna Street will become a modern and high-quality urban boulevard with various dynamic functions and connections. The typical (historical) spatial configuration of urban islands in the Warta can exist again. Solna, with its strong green character, activates the missing linkage between the east & west part of the green cross. The revitalisation of the Old Power Plant island and other islands in the Warta Valley can be successfully achieved by providing the proper accessibility. Relocation of the Garbary Station to the Old Power Plant Island connected strongly with the well-functioning 1st City Ring and water taxi will create the base for the modern Warta hub.
Imaginary view of city center as a result of combination of subprojects
In the previous chapter the implementation plan was described in terms of achieving the goals and objectives of the Development Strategy. The implementation plan consists of a large number of subprojects that each contribute to one of the six guiding themes to achieve the broad integrated development of the river zone in Poznan.

As an example of how the actual implementation of the Development Strategy can take place, for three locations along the River Warta a more detailed study is being conducted to this actual implementation. These three pilot projects show that different subprojects (from the implementation plan) should be integrated on one location for the best sustainable development.
Three Pilot Projects

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Three pilot projects have been assigned in the river zone to give insight and create understanding of how the Development Strategy can be implemented on a specific location. Each of the pilot projects consists of a set of subprojects from the implementation plan, from various guiding themes. An integral approach (from different guiding themes) to the location is advocated to result in a broad integrated and sustainable development of the pilot project location.

The three pilot projects have been selected on their potential for their development and impact on the Warta in Poznan. The three projects are excellent examples of how the Development Strategy can be of tremendous value to the City of Poznan.

The three pilot projects are:

1. **Portowo**

The creation of a new river arm to increase river safety, in combination with the transition of a neglected old industrial estate of a cosmetic and detergent company into an attractive living, working and leisure environment.

2. **Chwaliszewo**

The creation of a new river arm to increase river safety, in combination with the urban redevelopment of the historical part of Poznan’s city centre.

3. **Northern Island**

The creation of several urban islands in the River Warta to increase river safety and to create a variety of new and additional urban environments for Poznan.
6.2 Pilot Project 1 - Portowo

Characteristics

New buildings

Traffic

Green connections

Pilot project 1 area

New water line and shape of new island

Pilot project 1 in Warta River Development Strategy
6.2.1 The existing situation in Portowo

Portowo’s location is the old port of Staroleka which has been abandoned and in decline for many years. This neglected area on the banks of the River Warta is closed to the general public and has a very limited contribution to the City of Poznan.

6.2.2 Plans for the future Portowo

The private developer SwedeCenter has a vision of and plans for the redevelopment of the site into an attractive living, working and leisure environment in harmony with the river. In preparation for these plans industrial buildings and infrastructure have been removed as a first step towards improvement of the area.

The plans are to make Portowo a new highly-attractive publically-accessible urban area for Poznan, with key characteristics that are not yet present in the existing situation of environments in Poznan. The new urban living area has a strong link with the River Warta and improves its natural, ecological and spatial qualities.

A new river arm will create greater flow and retention capacity for Warta, which improves the river safety of Poznan. Increasing Poznan’s flood safety is one of the main priorities of the Portowo development. The proposed marina and urban plan for Portowo will be an impulse to the use and development of the River Warta in Poznan.

As this is a private development, the City of Poznan does not bear the financial consequences of the transition of site. The City of Poznan does, however, have financial-economic benefits from the development. For example taxes and increasing land prices of the surrounding areas financially contribute to the Poznan public.

6.2.3 The Portowo set of subprojects

The set of subprojects from the implementation plan that are integrated in the Portowo pilot project are:

• Constructing a new and completing existing pedestrian and cycle routes/ network;
• Creating extra space for the river by connecting the existing river arm of the old port Starolecka;
• Improving existing bridge construction;
• Revitalising the old port Starolecka;
• Establishing boulevards along the river;
• Installing river-related services;
• Constructing significant new regional cultural buildings within the “green cross”;  
• Constructing a marina in Portowo;
• Organising and setting up water transportation;
• Putting in sports facilities for water-connected sports.

To achieve the goals of the strategy a selection of the above-named subprojects need to be implemented. The more subprojects are implemented, the better the Development Strategy’s goals are achieved. However, it is not a necessity to complete all the subprojects.
6.3 Pilot Project 2 - Chwaliszewo

- New water line
- Shape of the new island
- New retention walls and embankments
- Existing street regeneration
- New bridges
- New buildings
- New situation
6.3.1 The existing Chwaliszewo situation

Chwaliszewo is part of the Poznan’s historical city centre that is located along the River Warta. In the past (until the 1970’s) this part of the city was an island on its own in the river zone. The old river arm that separated Chwaliszewo from the old town was filled in and now is largely in use for car parking.

The strong link between Chwaliszewo and the historical city centre with the River Warta has disappeared. Just as with the historic Royal Route.

6.3.2 Plans for the future Chwaliszewo

Bringing back the old river arm of the Warta will contribute to the river safety of Poznan. This will also create big opportunities for the redevelopment of Chwaliszewo and the banks of the new river arm. A new highly-attractive part of the city centre can be created, and the historic Royal Route can be revitalised.

6.3.3 The Chwaliszewo set of subprojects

The set of subprojects from the implementation plan that are integrated in the Chwaliszewo pilot project are:

- Building new bridges;
- Reconnecting the historic Royal Imperial Route;
- Establishing boulevards along the river;
- Activating Garbary Square;
- Excavating additional river channels connected to green structure;
- Constructing a marina in city centre;
- Installing a touristic tram;
- Reconnecting the historical Royal Imperial Route;
- Excavating additional river channels connected to the green structures.
6.4 Pilot Project 3  
- Northern Island

Existing situation

New water lines

New embankments

Shapes of the new islands

New buildings

Program

Main connections

New bridges

Northern Island

Pilot project 3
6.4.1 Northern Island - the current situation

The third pilot project involves the northern part of the area that is surrounded by Warta’s river arms. This part of the city hosts mainly (former) industrial areas that are often deserted.

6.4.2 Plans for the future Northern Island

Due to the location of the Northern Island - close to the city centre and in the middle of the “green cross” - it has great potential for development into an attractive high-quality urban city area. A new district for Poznan with living, working, and leisure in a highly-exciting and dynamic river landscape.

“Green rivers” are created to establish an environment of several islands. These “green rivers” are under normal circumstances natural green zones that separate the different parts of the Northern Island, and that will fill up with Warta’s water in times of high-water levels. In these times extra discharge and retention capacity is created to improve river safety.

The different islands that are created each have their own character and style. The islands closest to the city centre are the most urban with mixed functions, and the islands away from the centre are more focussed on attractive residential functions in close harmony with the River Warta.

6.4.3 The Northern Island set of subprojects

The set of subprojects from the implementation plan that are integrated into the Northern Island pilot project are:

- Completing the first city ring;
- Realising new additional urban structures by developing diverse character islands;
- Establishing new significant regional cultural buildings within “green cross”;
- Excavating additional river channels connected to green structures.
The Financial Economic Assessment of the Development Strategy

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Financial and economic analyses of the Development Strategy for The River Warta in Poznań were carried out. Both quantitative and qualitative, and also tangible and intangible impacts, were analysed. Investments do bring a lot of qualitative and intangible impacts, which have to be taken into account. These are, inter alia, the enhanced City’s prestige/branding, job creation, increases in tourism, new private capital inflow and the increased accessibility of the City.

The economic analysis (also called socio-economic analysis) includes the indirect benefits from the impact of the investment realisation (like the reduction of travelling time because of new bridge construction). Besides, in economic analyses every benefit generated in the area of impact is taken into account (for example, improving flood safety will bring benefits for the whole city).

The economic feasibility of a project is positive if the benefits generated by the investment are greater than the costs and the opportunity cost of capital (interest generated by risk-free investments, i.e. treasury bonds) in the reference period (30 years). In such a situation, the project is efficient and acceptable from the socio-economic point of view and can be implemented because of the high positive impact on the public.

The financial analysis (from the banker’s point of view) was carried out on a cash-flow basis (real flows of money, like the increase in the amount of local taxes). It deals with the investor in the Development Strategy perspective only. The financial analysis is used to check if the investment is profitable and if it is worth it to invest.

The project is financially feasible when the new revenues generated by the implemented investments are higher than the costs and the opportunity cost of capital in the reference period (30 years). Then, the investment is profitable.

The analyses were prepared for two alternatives of the Development Strategy: Minimum (A1) and Maximum (A2) integration of City and river, and also for three pilot projects, that are included in the whole Development Strategy. These are:

- the Chwaliszewo pilot project;
- the Northern Island pilot project;
- the Portowo pilot project.

It has to be underlined that only alternative 2 (Maximum integration) includes all three pilot projects. Alternative 1 (Minimum integration) includes only the Portowo pilot project, but not the Northern Island and Chwaliszewo pilot projects.

The impact of the investments on the city was evaluated by comparing the “do-nothing case” (the non-investment alternative - NA) with the project: The Development Strategy for The River Warta. The “do-nothing case” (also called the non-investment alternative) means a continuation of the existing situation, meaning that the city will not invest in any of the projects included in the analysed project (in particular, the Warta River will be kept as it is now).

The analyses have been carried out at the quick-scan level. If the results of economic analysis confirm that the project is feasible, it would be recommended to carry out full financial and economic feasibility analyses at a later stage (probably separately for each element of the Development Strategy), including potential PPP financing options and other ways of financing.

The financial and economic analyses are based on the methodology recommended by the European Union Commission, especially: “The Blue Book” (2008) and “Guidance on the methodology for carrying out Cost-Benefit Analysis” (2006 with later changes).

The financial and economic analyses have been prepared in accordance with guidelines, standards and existing law.
## 7.2 Investment and Operating Costs

Taking into account all investment and operating costs (together) in the reference period (30 years), the City will need to cover PLN 2 697 million net in alternative 1 (Minimum integration of the City and the river) and PLN 3 151 million net in alternative 2 (Maximum integration of the City and the river).

Because of the general nature of the general approach of the master plan, the investment costs have been estimated with an accuracy of ±33%.

The costs were estimated by the water, cubature and bridges engineers of DHV POLSKA on the basis of Polish works price bulletins: Sekocenbud and Bistyp.

The overall estimated costs of the investments of Development Strategy, that need to be covered by the City, amount to:

- **PLN 2 241 million net in alternative 1 (Minimum integration of the City and the river).**

  The main part of the investment costs is land acquisition. There are almost 7.3 million m² of land that are planned to be purchased by the City. However, the objective of the City is to prepare and approve appropriate local land-use plans and land preparation. Afterwards, part of the land can be sold to private entities (this is assumed in the Development Strategy). Income from land selling will be an important support for the city budget. Using these funds, many other investments, included in the Development Strategy, can be financed by the City.

  The second most expensive investment is the special-function buildings (probably located in Chwaliszewo, conference centre, opera or other buildings for public use).

- **PLN 2 921 million net in alternative 2 (Maximum integration of the City and the river).**

  In comparison to alternative 1 (Minimum integration), alternative 2 (Maximum integration) assumes the realisation of 3 times more water lines, which is very expensive. Besides, more money will be spent on bridges and less on green parks.

The costs presented above include pilot projects:

- **Chwaliszewo: PLN 427.9 million net.**

  The high level of costs is connected with new water lines. Including retention walls, river embankments and the repositioning of river embankments; the costs stand at ca. PLN 178 million. The investments connected with the river will increase the flood safety of the whole City and will raise the attractiveness of the area.

  The second big share of the costs of the pilot project Chwaliszewo relates to special-function buildings (conference centre, opera or other buildings for public use). The bridges included in the pilot project, are estimated to cost ca. PLN 40 million (4 pedestrian bridges and 1 car bridge).

- **Northern Island: PLN 420.8 million net.**

  The main part of the investment costs is concerned with land acquisition. There are ca. 180 218 m² of land (valued PLN 144 million plus PLN 68 million of existing buildings that need to be bought), that are planned to be purchased by the City. Part of this land, after approving local land-use plans and preparation, will be sold by the City to the private investors. Income from land sales will be a support for the city budget. Using these funds, many other investments, including, for example, in the pilot project, can be financed by the City.

  The second most expensive investments are concerned directly with the river: new water lines, new river embankments. These elements and the raised areas will improve the flood safety in the region.

  About PLN 66 million is going to be spent on improving the traffic infrastructure system in the City. There are new roads, and three car and five pedestrian bridges.

- **Portowo: PLN 0.0 mln net.**

  With regard to Portowo, all the costs are funded by the private investors (SwedeCenter or another private entity).
Because of the fact that Poznan is one of the fastest-developing cities in Poland, it is forecast that the implementation of investments of Development Strategy will result in the inflow of private capital. It is assumed that private entities will invest especially in new buildings. It may be understood that every PLN 1 million spent by the City on the investments will result in private investments, that may be evaluated at PLN 2.8-3 million in the long term (depending on the alternative).

Also all operating costs were calculated. They were estimated on the basis of:

- A survey among engineers in each specialisation – the operating costs of many elements were set using the estimated length of the investment’s life,

- The Blue Book*, which deals with the operational costs of the roads, and car and pedestrian bridges. They are divided into annual maintenance, partial renovation every 5 years and periodic renovation every 10 years.

As far as public investments are concerned, the operating costs are PLN 38.2 million per year, PLN 51.9 million every 5 years and PLN 86.0 million every 10 years in alternative 1 of the Development Strategy. A large part of the estimated operating costs consist of the maintenance of parks and green fields (especially intensive green parks).

The operating costs in alternative 2: Maximum integration of the City and the river are estimated at PLN 25.2 million per year, PLN 29.9 million every 5 years and PLN 64.3 million every 10 years, plus operating costs connected with pilot projects.

The estimated operating costs of the Chwaliszewo pilot project are PLN 17.3 million per year, PLN 19.4 million every 5 years and PLN 22.5 million every 10 years. The operating costs mainly consist of the maintenance of new river lines and pedestrian and car bridges.

The operating costs of the Northern Island pilot project stand at PLN 8.0 million per year, PLN 11.0 million every 5 years and PLN 16.5 million every 10 years. More than half the amount of the operating costs are connected with the maintenance of water investments: new river lines and river embankments. Traffic transport investments (roads, pavements, bridges) also involve high operating costs (especially every 10 years).

The Portowo pilot project does not include any operating costs for the City, because it is assumed that the investments will be covered by private entities.
7.3 Revenues and Benefits

Income from Development Strategy will come in the next 30 years from:

- Increases in income from new local taxes – the construction of new buildings by private entities will increase income from taxes. Using the current property tax rate in Poznan (PLN 0.7 per m² for residential and PLN 21.94 per m² for commercial useable area), the additional income was calculated. The revenues amount to PLN 123 million in alternative 1 and PLN 111 million in alternative 2.

- Increases in land prices – the secondary result of investment realisation is the raising of prices of land owned by the City. Increases in land prices (as the result of raising the attractiveness of the area) are expected to be covered by the Strategy. The income was quantified on the basis of the average price of land in Poznan. The revenues amount to PLN 16 million in alternative 1 and PLN 78 million in alternative 2.

- Land sales – the income result from purchasing the City’s land by private investors that will implement the investments assumed in the Strategy (especially commercial and residential buildings). The objective of the City is to prepare and approve appropriate local land-use plans and land preparation. Afterwards, the land can be sold to the private entities. The average price land in Poznan was taken into account in order to quantify the profits. The total revenues amount to PLN 854 million in alternative 1 and PLN 870 million in alternative 2.

- Rent fees from buildings, realised by the City – the income is connected with the building that is going to be financed by the City – special-purpose buildings (conference centre, opera or other public-use buildings). Taking into account the predicted useable area of the building and the average level of fees, the revenues amount to PLN 265 million in both alternatives.

- Provision of water tram – on the basis of the predicted traffic (the forecast traffic was modelled) and the assumed ticket prices (PLN 3.5 per trip), the income was calculated. It is PLN 7 million in both alternatives.

- Construction of marina – the income from the marina will be generated by the customers. In order to estimate the demand for the investment, similar projects in Poland were analysed, first of all Marina Lad, located on the Warta River in the Great Loop of Wielkopolska and the marina in Lubczyn. On this basis, it is predicted that in 2020 there will be 25 000 customers for the marina in Poznan. The average prices of services (port charges, charters, hotel services, equipment rental, etc.) were taken from similar, existing, projects. The revenues amount to PLN 16 million in both alternatives.

- Residual value - means the value of the investment, funded by the City, at the end of the reference period. The residual value stands for PLN 349 million in alternative 1 and 326 million in alternative 2.

- The implementation of pilot projects – the Portowo, Chwalszewo and Northern Island pilot projects bring in some income, consisting of all or some of the above kinds of revenues. The income from pilot projects amount to PLN 214 million in alternative 2. There is no income from pilot projects in alternative 1. This is because alternative 2 includes the full scope of all pilot projects. In terms of alternative 1, it is assumed that only a few investments located in Chwalszewo and Northern Island will be realised. The revenues from these investments are included in each category of analysed revenues (listed above). The Portowo pilot project is implemented in both alternatives. However, this project does not provide any specific income for the City, because all the investments in this project will be funded by private investors. Some indirect financial effects (like increases in the prices of land owned by the City) are included in the overall revenues, generated by the Strategy.

The total value of revenues amount to PLN 1 630 million in alternative 1: minimum integration of the City and the river and PLN 1 887 million in alternative 2: maximum integration of the City and the river (ca. PLN 250 million more than in variant 1). The income is higher in alternative 2, because it includes more investments that result in increasing land prices (more water lines, more green fields, more pedestrian bridges and the realisation of all pilot projects in the wide scope). It means also higher income from land sales (the prices are higher). However, minimum integration provides slightly higher income from local taxes, because this variant assumes the construction of more buildings.
The benefits of the Development Strategy implementation come from:

- The construction of new roads and car bridges – the benefits were calculated on the basis of the methodology of the “Blue Book”, used in every road investment that is subsidised by EU. Four main benefits were identified: reduction in passengers’ journey time, reduction in vehicle exploitation costs, reduction in car accidents and the number of victims, and reduction in the negative influence on the environment by the vehicles. The benefits result from using new roads and bridges with faster and shorter routes instead of the previous routes (the traffic forecast was modified). The quantification of benefits in PLN was done on the basis of unit costs, included in the “Blue Book”. The benefits from the construction of new roads and car bridges amount to almost PLN 570 million in both alternatives.

- The construction of pedestrian bridges – the main benefit is the reduction in pedestrian travel time. The new bridges will also generate new pedestrian traffic. Similar to benefits from the construction of new roads, the quantification in PLN was done on the basis of the unit costs included in the “Blue Book”. The benefits from the construction of pedestrian bridges amount to PLN 188 million in alternative 1 and PLN 153 million in alternative 2.

- The construction of new buildings – the benefits were quantified as the value of forecast rent fees. The unit costs were assumed on the basis of the average level of rent fees of each type of building area in Poznan. The benefits amount to PLN 123 million in alternative 1 and PLN 111 million in alternative 2.

- Increases in income from new local taxes – described in the part of the text connected with revenues. The benefits amount to PLN 123 million in alternative 1 and PLN 111 million in alternative 2.

- Increase in flood safety - The quantifiable benefits from reduction of flood risk were calculated as the decreasing or even avoiding the need to buying insurance against flood. The average costs of flood insurance stand for 0.5% of land and buildings value. The benefits amount to PLN 81 million in alternative 1 and PLN 880 million in alternative 2.

- Increases in flat prices – as a secondary result of the investment, increased flats prices are expected in the area of the influence of the Strategy. The benefits were quantified on the basis of the average price of flats in Poznan. The benefits amount to PLN 50 million in alternative 1 and PLN 246 million in alternative 2.

- Increases in land prices – as the other secondary result of the investment, increases in land prices are expected in the area covered by the Strategy. The benefits were quantified on the basis of the average price of land in Poznan, taking into account the predicted structure of the kinds of land (recreational, residential and industrial). The benefits amount to PLN 41 million in alternative 1 and PLN 203 million in alternative 2.

- Land sales – the benefits result from the acquisition of land by the private investors that would implement the investments planned in the Strategy (especially commercial and residential buildings). The average price of commercial and residential land in the centre of Poznan was taken into account in order to quantify the profits. The total benefits amount to PLN 2 321 million in alternative 1 and PLN 2 364 million in alternative 2.

- The provision of a water tram – the tram will run across the whole city and will be not only an attraction for tourists, but also a means of transport for the residents of Poznan. Because of this, the investment will bring a reduction in travelling time by the passengers. Some of the people that used to travel by public transport, especially buses, may change their means of transport to the water tram (the traffic forecast was modified). The quantification was carried out in accordance with the unit costs included in the “Blue Book”. The benefits amount to PLN 14 million in both alternatives.

- The construction of the marina – the benefits connected with the development of marina come from the impact of the marina on increasing tourism in Poznan. It is pragmatically assumed that 1.0% of the customers of marina will be new domestic tourists, while 0.5% will be foreign tourists. Using available data from the Polish Central Statistical Office and the Polish Institute of Tourism, the benefits were quantified. The benefits amount to PLN 27 million in both alternatives.

- Adjusted residual value – residual value means the value of the investment at the end of the reference period. The residual value stands at PLN 329 million in alternative 1 and 309 million in alternative 2. The adjustment is used in order to remove the fiscal flows and stands at 0.8.

- The implementation of pilot projects – the Portowo, Chwaliszewo and Northern Island pilot projects will bring a lot of benefits, consisting of all or some of the above kinds of benefits. The benefits from pilot projects amount to PLN 310 million in alternative 1 and PLN 3,298 million in alternative 2. The difference between alternatives is very high. It is because alternative 2 includes the full scope of all pilot projects. In terms of alternative 1, it is assumed that only a few investments located in Chwaliszewo nad Northern Island will be delivered. The benefits from these investments are included in each category of analysed benefits (listed above). The Portowo pilot project is implemented in both alternatives.

The total value of benefits amounts to PLN 12,683 million in alternative 1: minimum integration of the City and the river and PLN 16,577 million in alternative 2: maximum integration of the City and the river (ca. PLN 3.9 bln more than in alternative 1). Comparing the total value of benefits with all investment and operating costs (together) in the reference period of time (30 years), the benefits are 4.7 times and 5.2 times higher in alternative 1 and in alternative 2 respectively.
7.4 Economic Feasibility

For the assumed costs of the investment (for all the entities – not only for the City), the operating costs and revenues of each alternative, an economic analysis was prepared. The results of the economic analysis show that the project is very efficient and reasonable from the socio-economic point of view for each alternative. The overall amount of benefits exceeds the expenditures (capital and operating).

The project will improve the life standard in the City by, inter alia,
• Increasing the flood safety level (new river lines);
• Developing the transport system in the City (car, pedestrian bridges, new road connections – city ring, water tram);
• Increasing the attractiveness of the area (green fields, parks, boulevards, marinas);
• Providing new jobs, increasing tourism and prestige (new buildings, marina)

The investment is economically feasible for each of the analysed alternatives and can be implemented because of the high positive impact on the public.

Because of the significant benefits, the obtained values of the indicators are higher than the minimum values of economic efficiency: economic net present value stands at PLN 4,787 million (alternative 1) and PLN 7,597 million (alternative 2). The investment is economically feasible with the net present value exceeding zero. The payback period amounts to 8 years in variant 1 and 6 years in variant 2.

According to the analysis carried out, alternative 2 should be chosen for implementation.

7.5 Financial Feasibility

Taking into account the whole reference period (30 years), the costs are higher than the potential income by PLN 1,300 million in both variants of the Development Strategy. It means that without subsidies (ie. from the EU), the City will have to cover the indicated amount of money in the period of 30 years. The reason for the unprofitability is high expenditures costs.

This unprofitability is a typical situation in these types of large infrastructure-development projects. The project is provided by public investment and is free of charge.

The negative value of the Financial Net Present Value (FNPV) allows permission to apply for EU funds.

7.6 Conclusions and Recommendations

According to the financial analysis carried out, the project is not profitable (as with almost all large infrastructure development projects of this type). The revenue is lower than the investment and operating costs.

According to the economic analysis carried out, the project is economically feasible in terms of each alternative. The investment should be pursued because it is in the interests of the public and the project will bring it many benefits. Alternative 2 (Maximum integration of the City and the river) is preferred for the public. This alternative is more expensive, but provides higher benefits and net present value.

There are many quantifiable types of revenue that are included in the financial and economic analysis. However, the investments also bring a lot of qualitative and intangible impacts. These are, inter alia, increased prestige/branding, job creation (direct and indirect), increases in tourism, inflow of new capital and the increased accessibility to the City.

According to the economic and financial analysis, any of the alternatives of the Development Strategy could be implemented, but alternative 2 (Maximum integration of the City and the river) is recommended.

All the analysed pilot projects are economically feasible and could be implemented (even separately), because of the high value of the benefits that they bring to the public.

According to the economic and financial analysis, all the pilot projects could be implemented, because of the benefits that they bring to the public.
Benefits of the Development Strategy for Poznan

8
Environment

- Poznan’s flood safety will increase.
- Ecological values in the river zone will increase.
- The green spaces of Poznan will be connected to inner-city green areas.
- Urban parks and green areas will be linked to the Warta green zone.

Economy

- The City of Poznan will be more competitive in attracting investors, businesses etc.
- Land values in the river zone will increase.
- The functionality of the river zone will increase, which will result in economic benefits (e.g. shorter travel times).
- Private investment in the river zone will increase.

Identity

- The identity of the long-neglected river transforms into a highly-attractive area.
- The identity of the City of Poznan as a whole will be strengthened.
- Poznan will be able to identify itself as a pioneer city in Poland in integrated water management.
- Many areas in the vicinity of the river area will be revitalised.

Society

- The strategy will result in increased public use of the river zone.
- Poznan population will benefit from increased flood safety.
- The city life and well-being of the citizens will be improved by improvement in urban quality.
- The citizens of Poznan will take pride in and commit themselves to the implementation of the strategy.

Connectivity

- An extensive communication project will result in the enthusiasm of the public, stakeholders and politicians.
- Many strategies, plans and projects on a variety of subjects will be connected in the integrated strategy.
- The momentum will be created to use the river for (public) transport.
- Several city districts have been connected to the river zone.
Events and Temporary Functions
The Development Strategy for the River Warta presents a long-term vision and strategy. The planning horizon is the year 2030.

To achieve the Strategy’s goals and objectives in the long term, actions are needed in the short term. Already in the past, the River Warta has hosted several events. This is the first and important step towards improve the public awareness of what great possibilities their river has for Poznan’s society.

9.1 Events

Seminar Linked by Water 2012 “Working together on integrated water management”, Warsaw

Opening of the city public beach by Warta River, Poznan

Workshops “River Warta - changes”, Poznan

Grand Prix Poland in Fishing, Poznan
Opening of the city public port by the Warta River, Poznan

Mississippi Blues Warta Festival, Poznan

Family picnics and breakfasts by the Warta River, Poznan

Poznan canoe critical mass event + 32 rallies, River Warta, Poznan

Action-evacuation - charity picnic by the Warta River
9.2 Temporary Functions

Many areas along the River Warta could be better used. The plans proposed in the strategy for these areas are often long-term (e.g. creating new river arms or new residential areas).

Until that time, however, the people of Poznan should be able to make use of the green spaces of the River Warta. This can be achieved by allowing and facilitating temporary functions and actions in the river zone.

An example of such temporary functions on a location that otherwise would remain un-used for a long time is given below for the old river arm south of Chwaliszewo.
Next Steps
Towards the Future

10
Proposals for actions described in Chapters 4-9 are a big challenge for the City of Poznan.

As we stand on the threshold of 2013, we are struggling to manage with the economic situation. We are in the course of massive, capital-intensive infrastructure investments such as the rebuilding of the Rondo Kaponiera. Subsequently, we are trying to carry out further tasks such as upgrading roads and tram lines, and also building council flats and constantly improving the quality of public services.

In 2012, Poznan was a host city of UEFA EURO 2012. We have a modern stadium, a large international airport and will soon have build a modern transport communication centre, combining railways, trams and buses in one place. Thanks to close cooperation with neighbouring municipalities, Poznan is seeking to achieve its metropolitan aspirations.

However, many elements of the urban space still need improvement. In particular, the city needs to place more focus on the river. The River Warta deserves a significant role in the urban fabric. All ideas presented in the Development Strategy for the River Warta have been analysed in terms of their financial and socio-economic implications. Obviously, most of them carry a large expense, with no guarantee of return on investment in the future. Nonetheless, it should be noted that the implementation of any of the proposed strategic alternatives will bring long-term benefits.

At this point a question should be answered: whether the implementation of the Development Strategy for the River Warta is possible, and if so, how to do that.

First of all, the assumptions contained in this document must be implemented in the Development Strategy for the City of Poznan to 2030. For this purpose, the strategic charts for the strategic programme “The City by the River” and other related strategic programmes will be updated.

Secondly, the strategic programme “The City by the River” will be institutionalised. The process of developing the Development Strategy for the River Warta has helped to strengthen cooperation between the Poznan City Hall, the Regional Water Management Board in Poznan and the Marshal Office. We will use this combined energy and allocate tasks in the perspective of the implementation of specific joint projects. The City of Poznan acknowledges the responsibility to be the leader of such a partnership. The universities and the neighbouring municipalities will be invited to cooperate. Thanks to the synergistic effect we can all benefit from the Warta River.

Thirdly, efforts should be made to increase the scale of cooperation with private entities. Due to the limited budget, the City of Poznan is unable to carry out investment projects independently. The involvement of private capital can create new opportunities and facilitate further investment on the Warta River.

Of course, there is also the chance to obtain funds from the European Union. Every effort to obtain these funds from the 2014-2020 perspective and to use them optimally should be made.

Finally, each project proposed in the Development Strategy for The River Warta must be detailed. For this purpose, the methodology for the prioritisation of projects should be developed. By creating a tool that will allow an objective comparison of costs (not only material) and benefits, the implementation process of the chosen strategic alternative will be accelerated.

In addition to the actions mentioned above, an analysis of the possibility of obtaining potential sources of funding should be carried out on a regular basis.

In 2012, the broadly-accepted Development Strategy was established through the cooperation of many professionals, interested parties, stakeholders and the Poznan community. For the next Implementation Phase of the Development Strategy for the River Warta this cooperation will be continued.

Many institutions, companies, and individuals willing to demonstrate their ideas and to support the project team were involved in the process of developing the Development Strategy for the River Warta, in particular the contribution of the Advisory Group members and participants in public consultations should be emphasised.

The meetings on the Development Strategy for the River Warta were attended by representatives of:

- Poznan City Council,
- Poznan City Hall,
- Organisational units: the Municipal Urban Studio, the Municipal Road Authority, the City Transport Authority, the City Green Areas Authority, ,
- Universities: Poznan University of Technology, Adam Mickiewicz University, Poznan University of Economics, Leibniz University Hanover, Poznan University of Life Sciences, Poznan School of Logistics,
- The Marshal Office, The Wielkopolska Voivodeship Office in Poznan,
- The regional Water Management Board, The Institute of Meteorology and Water Management,
- The Provincial Management of Drainage, Irrigation and Infrastructure in Poznan
- Local Governments of Housing Estates,
- Numerous organisations and associations,
- Residents of the City of Poznan and the neighbouring municipalities.