TOWARDS AN OLYMPIC LEGACY FOR ALL

REGENERATION ORIENTED DESIGN PRINCIPES FOR OLYMPIC LEGACY
ENHANCING THE SOCIAL SUSTAINABILITY OF ROTTERDAM SOUTH

PROLOGUE

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otherwise in the captions.

If the Olympic Games weren't organised last summer, it wouldn't be the topic of my graduation project probably. If the Games weren't that monumental, jaw-dropping and impacting everyday life, not only in the host city, but of all spectators worldwide, locked to the television, watching the matches and reflections until deep in the night, it wouldn't be such a hot topic. If I didn't watch most of the matches of the Dutch athletes, wasn't disappointed by the Dutch indoor swimming team for not winning any gold medals, angered by the so-called 'loser flight', or totally cheering about the sensational match of Elis Ligtlee, winning gold on the keirin...Then, I guess, I would do something on urban metabolism, trying to reduce the footprint humans and the city on our planet Earth. If, every 4 years, the Olympic Games wouldn't have been organised and the legacy of the Olympics wouldn't have been managed in such a way, that every time when this event is organized an enormous debate is started about whether 'it is all worth for'. Then, the Olympic Games wouldn't be of my concern at all.

My interest in the topic of the Olympic Games is not based on my own sport achievements, although I like to play volleyball a lot, but is in multiple times more related to that excitement every time it is organised. It is that monumental, jaw-dropping feeling that led me to choose the Olympic Games as graduation project. But only in connotation that there is something seriously wrong. Because my next memory after this momentous action and impressions is one of dead and empty places. I saw simultaneously a beautiful new erected arena in Rio de Janeiro, and at the same time I pictured the image of the derelict ruins of the Beach Volleyball stadium in Athens. It is this imagery contradiction, temporary revived by the organisation of the Games in 2016, and almost childish excitement of seeing very large urban projects, that urged me to take the sustainability of the Olympic urban legacy as focus of concern, imaging it as a more 'useful' contribution to the city and changing the image of the Olympic Games for many around the world. It turned out to be far more complex.

(At moment of writing my father and grandfather are watching the Formula 1 race in Sotchi, Russia. Olav Mol describes the surrounding of the racing track, the 'former' Olympic park, with the 'old' Olympic structures. At moment of writing, the structures are completed 3 years and a couple of months ago. If this time span is enough to call an Olympic venue old, 'the Games' are ridiculous.)

Cover - Accumulation of the seven strategic proposals for implementing the Olympic Games in Rotterdam South in order to create a social sustainable legacy (by author).

Next page left - Opening ceremony at the Olympic Games; prestigous and bombastic in which the host nations emphasize its cultural values and accomplishments. The athletes are introduced and the Olympic flame ignited (https://sports.yahoo.com)

Next page right - Present image of the Peace and Friendship Beachvolleyball venue of the 2004 Olympic Games, Athens; Almost serene (https://www.theguardian.com)

CONTENT

SUMMARY

A problem of Olympic proportions

The image of Olympic Games is mixed. The Games are a celebration, but its organisation and legacy are also seen as a threat to the sustainability of the city. Literature research distinguished three main actors, each with different aims for the organisation of the Olympic Games; The International Olympic committee, the host-city and the citizens of the host-city. Especially the wishes of the citizens is neglected as research showed that they are not empowered to take decisions, but always encounter the negative consequences of these decisions. By researching the potentials for the Olympic legacy to enhance the social sustainability of the host city, an answer to the incorporation of the citizen in the organisation of the Olympic Games is found. In this way the Olympic Games can be of additional value to the city and its inhabitants, targeting the current mixed image. It can also stimulate the embracement of the Olympic Games as tool for urban regeneration as research showed that the overall interest for organising the Olympic Games is declining.

This thesis aims to find design principles that can enhance the social sustainability in the Olympic legacy. For this graduation research the main question is **"How can design principles aiming for urban regeneration within Olympic legacy planning enhance the social sustainability of the city?"** Several sub-questions have to be answered in order to answer the main question. These sub questions research the relation between mega-event planning, Olympic legacy, urban regeneration and social sustainability.
1.   How can Olympic (mega-event) planning and design enhance urban regeneration?
2.   How can urban regeneration enhance social sustainability?
3.   How can social sustainability be enhanced in Olympic planning and design?
The product of this graduation research is a set of these design principles, which derived from a case study to the 2012 Olympic Games in London and choices that are made in a strategy for the Olympic Games in Rotterdam South and a design for an Olympic venue.

Towards a framework for Olympic legacy and social sustainability

By literature research in chapter 2, section 4 of the thesis, components of mega-event planning and design are researched that relate to urban regeneration. From the literature of Vrijaldhoven (2005) eight components can be distinguished. Not all of these components are in the ability of an urban designer to be addressed directly. Because of this limitation, the urban designer can only decide on three components.
•   A strategic location for the Olympic Games, where the investment in the event can create maximum spin-off for urban regeneration projects.
•   The required construction works for both the Olympic Games and the envisioned urban regeneration projects. The large construction projects for the Games should go one-on-one with the required regeneration projects.
•   The impact of the event on the regeneration projects. The construction projects and design choices towards the Olympic Games (construction phase) have a lasting impact for the city after the event (legacy phase). Therefore it is important to think in those two time settings.

Chapter 2, section 5 gives answer to the kind of urban legacies that are created within these components. It distinguished the Olympic Games to create seven kind of legacies.

1.   Sport legacy - i.a. new sport venues and increased sport participation.
2.   Economic legacy - i.a. opportunities for local businesses and attraction of foreign companies.
3.   Infrastructure legacy - i.a. a high quality public transport and improved accessibility.
4.   Information and educational legacy - i.a. tourist centres and education programs.
5.   Public life, pollical an cultural legacy - i.a. new service buildings and shops and local cooperation.
6.   Symbolic, memorial and history legacy - i.a. the creation of landmarks and an intense national pride.

In each of these groups, the legacy can be tangible and non-tangible and can be positive or negative. The outcome of the legacies can be completely different and is based on the location of the event, the context of the site and the constructed projects.

Through literature research in chapter 2, section 5 and 6 the concepts of social sustainability and its relation to urban sustainability are explored and discussed. Social sustainability is one of the three aspects of sustainability, together with economic and environmental sustainability. If the project enhances all three aspects it could be called sustainable. If one of the sustainability aspects is neglected, the project can be either bearable, equitable or viable.

From literature by Colantonio & Dixon (2009) 10 aspects of social sustainability can be witnessed that are affected by urban regeneration. If the project aims to be sustainable, it needs to think about the economic and environmental terms as well. This statement implicates five of these aspects of social sustainability can be used in the research. These five concepts do not only enhance social sustainability, but also economic and environmental aspects of sustainability. Because focussing on one aspect hasn't have the ability to raise the social situation in the neighbourhood, it is important to pursue the enhancement of multiple aspects.
The concepts also correspond with earlier regarded kind of Olympic legacies and form the framework for the Olympic Games to enhance social sustainability.

1)   Education and skills
2)   Employment
3)   Health and safety
4)   Housing and environmental health
5)   Identity

From literature research 16 spatial criteria are proposed that can enhance these five aspects of the social sustainability in urban regeneration. These spatial criteria act on different scales and address each aspect differently. The criteria are used to asses the design for the Olympic park in the case study to the London 2012 Olympic Games.

1)   Meaningful spaces - Making spaces not larger than required by the community
2)   Early provision of basic community services – Make sure enough community services are provided
3)   Public spaces and congregational spaces – Create spaces where inhabitants can meet and interact
4)   Connections to neighbouring communities - Make sure other neighbourhoods are easily accessible
5)   Flexible or adaptable housing and buildings – Incorporate the ability to change the room or building easily to new wishes
6)   Low carbon infrastructure – Make the transition to public infrastructure and slow traffic
7)   People friendly layouts – Ensure the creation of safe and pleasant public space
8)   Car free areas and speed reductions – Facilitate areas where car are prohibited or not dominant
9)   Transport and communication connections – Ensure the ability to communicate and travel to other cities
10)   Third spaces – Provide services to bigger companies in order to attract them
11)   Flexible workspaces – Create places where working abroad is facilitated
12)   Early provision of schools, nursery and childcare – Make sure enough education and healthcare is provided
13)   Meaningful buildings – Make buildings not larger than required by the community
14)   Hyper local information – Create awareness of the space
15)   Distinctive landscaping and architecture – Create identifiable buildings and spaces
16)   Historical development – Build in respect to the history of the site

Social sustainability in the legacy of London 2012

Social sustainability in Olympic legacy is further explored by doing a case study of the Queen Elizabeth Olympic Park of 2012 Olympic Games in London in chapter 3. The second perspective on answering this question comes from a design project to a strategy for the Olympic Games and the design of an Olympic venue in Rotterdam South in chapters 4 till 7.

The case study looked to the location, projects and legacy plans at the Olympic park and assessed these the in-situ design interventions through the spatial criteria for enhancing social sustainability. In this way design principles in the Olympic legacy that enhanced social sustainability are uncovered.
Overall the legacy of the 2012 Olympic Games in London was fruitful to the social sustainability of the city district.

• The location of the Games was used the function as a springboard for development of East London, a very deprived area in London, and a possible connection to the inner city.

• Turning a former industrial site to a lush park, but keeping the former landscape structures of the river.

• All sport venues had a clear destination after the Olympic Games. They were either sold, converted or a new destination was created for the venue.

• A legacy plan was created to facilitate the redevelopment of the Olympic park after the Olympic Games.

There is a critical note to the social sustainability of the 2012 Olympic Games. The inhabitants of neighbourhoods adjacent to the Olympic park are not protected to severe gentrification at the moment and the local businesses did not benefit from the event.

An Olympic Games in Rotterdam South

The design project first looked into a location with maximum social sustainable spin-off if the Olympic Games were organised in the Netherlands. Within chapter 4, through mapping of GIS data an spatial analysis, suitable locations are analysed, based on

proximity of deprived areas, space and accessibility in the cities of Rotterdam and Amsterdam. Both Amsterdam and Rotterdam had suitable locations. From this locations Rotterdam Zuid is the best area to intervene, as it consist of many deprived neighbourhoods, with plenty of space and a major task to increase accessibility. Two areas are suitable to become an Olympic location, as they are scarcely build space. These locations are Varkenoord and Zuiderpark.

From the analysis of historical maps, socio-economic and socio-spatial data in chapter 5, focus areas for improving the social sustainability are discovered. These focus areas are concentrated especially in the neighbourhoods between Varkenoord and Zuiderpark. The social problems of these neighbourhoods are multiple.
•   The low state of education
•   An unsafe and criminal environment
•   A very old building stock
•   An unattractive living environment
•   Severe ethical differences

The Olympic Games are implemented with two diverse programmes at both locations. This is a profitable construction as the 3 kilometre between both locations is an easy to walk. The visitor flow is directed through the city, creating revenue for the local businesses. The requirements of the Olympics to perfect accessibility, an attractive environment and safety are in this way directly used for the regeneration of the neighbourhoods. At the same time, the Olympic Games are used to construct future projects, such as the intercity station. This proposal for two main Olympic locations engages the local environment more than one central park, such as witnessed in London 2012.

From an analysis to the size of the Olympic Games in chapter 5 section 3 it is witnessed that the Olympic programme doesn't fit into the proposed design locations. By creating an excel model with all the hectares of the Olympic programme and all the hectares of functions at Varkenoord and Zuiderpark a optimal match could be created. Out of 4 different settings, the last setting proofed to be the best, as for in this setting the local attached structures, such as community gardens, were most preserved. Non the less it implies i.a. that all industrial sites had to be replaced and that there was not enough parking space on site yet.

Social legacy by seven strategic proposals

The strategy for the Olympic Games in Rotterdam South, chapter 6, is composed out of seven proposals. Each proposal targets a different aspect of the Olympic legacy. Together they enforce the creation of a social sustainable legacy as defined in the theoretical framework.

1)   Social legacy is a future for every Olympic venue. This future can be ensured by assigning every Olympic program to be either permanent, converted or temporary. The use of existing training locations as practice fields and adopting Olympic venues in the top-sport program of the Netherlands reduces unnecessary investment. Much of the Olympic venues become publicly usable.

2)   Social legacy is an infrastructural super grid. This supergrid is supported by the creation of park and rides outside the city district, solving missing links in public transport, create an over encompassing ov-bike network an increasing the amount of modalities at transport nodes. The supergrid increases accessibility of Rotterdam South which stimulates employment opportunities and provides possibilities for inhabitants to use more environmental friendly transport options. By placing new stations deeper into the urban tissue the forced visitor flows boosts the local economy.

3)   Social legacy is a superb routing without obstacles. This super routing is created by redesigning many crossings to pedestrians friendly transitions to other neighbourhoods. These crossings are safe, comfortable and fast through the construction of tunnels, bridges, different pavements, signals and changed street profiles.
4)   Social legacy is an improvement of the neighbourhood physical landscapes. These improvement is enforced by extending the qualities of the landscapes structures. Extension of the boulevard creates an active waterfront, while redesign of the main streets foster the creation of green lanes. These green lanes combine existing parks into a green network across Rotterdam South, that boost the environment, ecology and health of its inhabitants.

5)   Social legacy are initiatives to start moving in the neighbourhood public space. These initiatives are distributed all over Rotterdam South and not confined to Varkenoord or Zuiderpark. The construction of public spaces for sport stimulate the sport participation and health of the inhabitants. Different intensity gradations make it easy to participate. Also is it possible to move between these spaces with relative ease, extending possibilities to start exercising. Important Olympic squares are designed in such a fashion that they are lively even off-events.
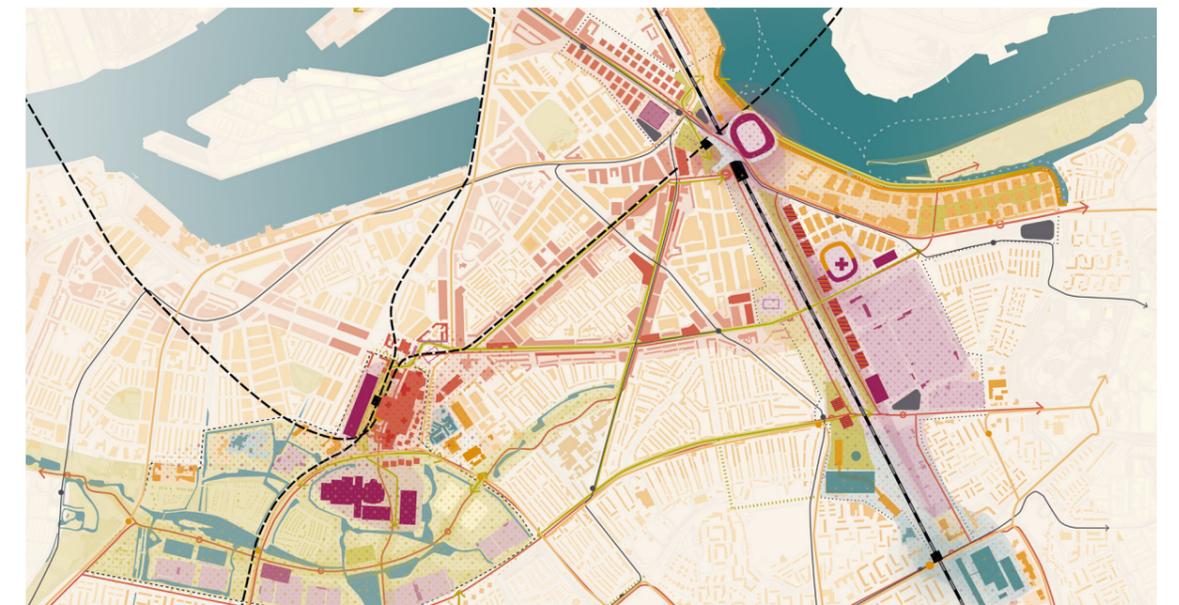
Close-up of the accumulation of the seven strategic proposals for implementating the Olympic Games in Rotterdam South..

6)　　Social legacy is a transformation for commercial to social. This transformation is set up by creating of an employment axis round important transport nodes along the trainline and metro line. A new sport boulevard creates jobs in the sport sector as well as it stimulates the job creation in the healthcare and education sector. Two business districts will capitalize on the international attention created by the Olympic Games. The trickledown effect of these companies create many job opportunities in job segments for lower educated. Small shops are stimulated through forced visitors flows and upgrade of the main streets. Square on intersections of these employment axis provide vital basic services for the citizens.

7)　　Social legacy a future redevelopment of all Olympic sites. The proposal assigns a future identity to segments of the Olympic park through a redevelopment vignette. Each of these vignettes ensures describes the future development to incorporate large structures that contribute to the social sustainability, such as hospitals. It makes sure that the both Olympic sites blend in the urban tissue and stimulate social sustainability ev
en after the event.

Image of Feyenoord City several years after the end of the Olympic Games.

A social legacy for Rotterdam South - a future to Feyenoord city.

One of the vignettes from the seventh proposal is further explored in the chapter 7. Through a design for Varkenoord North, an image towards a new identity as Feyenoord City is made. Within the design these 7 proposals are designed to an increasing detail.

-　　The Olympic stadium will function as a new stadium to FC Feyenoord, within the building the parking lot can also be used off events. The entrances on multiple levels reduce the open space demand around the stadium, better integrating it in its environment. The Olympic hall is partly transformed to accommodate smaller sport and health related functions, such as physiotherapists. The Olympic village is transformed to a housing complex in which several rooms will be combined to one new apartment. Parking lots are already design into the first floors and are opened after the event.

-　　The new intercity station reduces travel times for the 200.000 inhabitants of Rotterdam South with other major cities in the Netherlands. A new metro line has entrances at the intercity station, Olympic stadium and neighbourhood and connects the area with Northern Rotterdam. Park and rides directly on the borders of the side helps to reduce the car flow on

site.
-　　A bridge across the railway combines several public transport stations to a superb transport hub, while, also, forming a major entrance to the neighbourhood and the Olympic stadium. Underneath the bridge a major OV-bike storage is situated. Another crossing underneath the railway is made more easily to approach through a new bike lane.

-　　The Olympic park is constructed through the extension of the park along the Colosseumweg, to the entrance of the urban bridge, the nearby mosque, Olympic hall and nearby park. The opponent side of the railway is redesigned to a lush park as part of the Olympic park and support the construction of the proposed sport Boulevard. The veranda boulevard is extended with multiple side alleys that tie this structure to a network of green lanes and spaces.

-　　The design hosts several public space with each a different capacity to active the inhabitants. The Olympic park is designed as to motivate people to move at very low levels. Several public structures, such as a different texture of the path, a small bridge, step stones, make it exciting to approach the urban environment more actively. The boulevard is constructed with two different height levels. On one level people can stroll along the boulevard. The lower level is a more active waterfront with diverse program, the ability to conduct water sports and exercise. The sport accommodation for athletes in the Olympic park are made publicly available. The Olympic square is designed as elevated rinds that construct podia an spaces to conduct several sports, facilitated by nearby buildings.

-　　Employment opportunities are facilitated by the construction of a business district around the Olympic stadium and Olympic hall, capitalizing the space that is left after the Olympics. This business district does not consist of sole offices, but is also composed of smaller services on ground level and possibly housing or hotels on the higher levels. This mixture creates a lively neighbourhood. One of the nodes is designed as attractive entrance square to the multimodal node, with train station related shops and services and bigger local oriented shops such as a supermarket.

-　　The identity of this vignette is defined as Feyenoord city, the representative image of

Rotterdam Zuid on (inter)national level. It enfolds an mixture of sport and city living. This is facilitated by the construction of towers up to 70 meters, which extend the city centre image of Rotterdam further South. The Olympic stadium and Olympic hall add a significant notion of sport identity to the city scape, fill in the empty spaces which results in a coherent sport-city image. The street patterns of the newly proposed area are based on existing lines within the urban context. The Olympic identity of this place is still represented in the form of ring shaped designs at the Olympic square and of metro stations, bus stations and other daily used public structures. Lightning at night will show these Olympics rings.

Social sustainability within Olympic legacy

Eventually the social sustainability in the Olympic legacy can be enhanced in multiple ways

1.　　First by setting up a strategic location in which the Olympic Games can catalyse the redevelopment of nearby deprived areas. In contrary to the location of the Queen Elizabeth Olympic Park, the option for two main locations and a routing through the in-between deprived neighbourhoods holds more potential its regeneration.

2.　　Within the construction projects of the Olympic Games it is very important to think two designs: what's best for the Olympic Games and what's best for the neighbourhood.

3.　　It is important not to limit the scope of the projects to the Olympic park and transport requirements, but also to look what these projects can do for the neighbourhood and if they can be extended into these neighbourhoods.

4.　　And to look where synergy can be created between the Olympic programme and smaller or larger local employees, especially towards jobs for lower educated.

The specific aspects of social sustainability are each addressed in the strategy and design.

• Housing and environment is enhanced by reconstructing the Olympic village to apartments, adjusting the street profile to accommodate more green, enhancing the physical landscapes of the neighbourhoods and upgrade of many public spaces.

• Safety & Health is enhanced by the redesign of many crossings, activating accommodations in public spaces, making Olympic venues publicly usable as well as providing many more less polluting transport options to use. Air pollution is reduced by increased amount of trees and plants.

• Education is enhanced by the reconstruction of many school squares to accommodate sport utilities , but even more by the creation of the sport boulevard which lead setting up new education directions and the expansion of existing school programs.

• Employment is enhanced by the creation an employment axis, capitalizing on new train stations. the sport boulevard promotes the creation of many different types of jobs which further enhance existing healthcare research and educational programs. Local shops highly benefit from the walking route through the neighbourhoods.

• Identity is enhanced by the post-Olympic development vignettes, which propose an future identity for segments of the Olympic locations, capitalizing on social structures, such as hospitals, schools, parks, community gardens on local scale.

Overarching design principles for social sustainable Olympic legacy

The conclusion to this graduation projects is a set of design principles that are gathered from the case study to the 2012 Olympic in London, from the strategy for Rotterdam South and the design for Varkenoord-North, and collected in a separate book. These principles show the overarching process behind the design interventions that are made. The design principles describe the required transformation in the design of the Olympic programme to enhance the social sustainability aspects of housing and environment, safety & health, education, employment and identity. They are assessed by the spatial criteria for social

sustainability which are set up in the theoretical framework.

First the principle describes an encountered spatial issue within the organisation of the Olympic Games, such as an abundance of parking space, or the lack on integration in the urban tissue, which create threats to the social sustainability on the local scale. In extend of this problem, it describes a configuration to transform the Olympic programme to answer to reduce or solve this problem. The next stage describes the result of the proposed configuration and their ability to enhance the social sustainability.

The conclusion to these 16 design principles is that these principles often combine the Olympic programme with the requirements to transport and environment to directly answer to the context of the Olympic site. It means that the design interventions resulting from the principles is multiple and not fixated, therefore they enhance the social sustainability differently in each edition of the Olympic Games. The design project for Rotterdam South served as a test case for these principles.

Further, these design principles are only a spatial start towards the understanding and the creation of a social sustainable Olympic Games and the incorporation of the citizen as an important actor. The Games shouldn't only appeal towards the wishes of the IOC or the development plans of the host-city, but also provide a platform to opportunities for personal development of the citizen. This means that other components of mega event planning also need to focus on creating this social sustainable Olympic legacy. That is a start for a legacy for all.
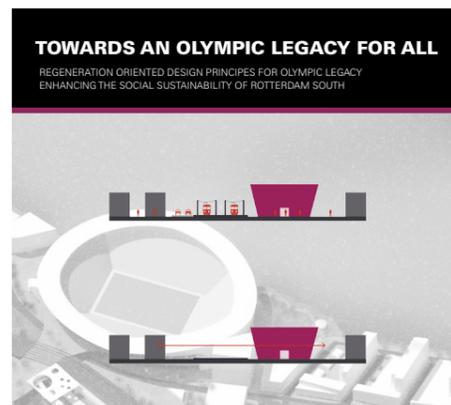
Above - Cover of the second book where all design principles are collected. Richt - image of the Olympic square off-event.

1. - INTRODUCTION TO THE GRADUATION PROJECT

This chapter froms the start of a major adventure. First it explores the problems surrounding the contemporary mixed image of the Olympic Games and defines a major issue in the organisation and legacy of this event. Following the porblem statement, the aim is made to look for possibilities to enhance social sustainability within Olympic legacy. In order to resear. A methodology for the research within this graduation project is made to answer these questions. Las a description of further chapters in the graduation project is given.

1.1 - EXPLORING A PROBLEM OF OLYMPIC PROPORTIONS

In 1976, the City of Montreal hosted the 21st summer Games in the history of the modern Olympic history. This games are generally seen as a huge disaster for the city, country and Olympic spirit. "Over-ambitious construction plans, interwoven with lax project management, worsening economic situation, a period of global inflation and local labour disputes resulted in a poor economic outcome" (Pitts & Liao, 2012, p. 24). Financially, socially and spatially, as it took the city of Montreal decades to repay it's 1,6 billion dollar debt, raising taxes for its inhabitants and resulted in unused and incomplete sport-venues (Chalkey & Essex, 2003) (Gold & Gold, 2008).

Over time the Olympic Games grew in size, spectators, sports, athletes and attendants. Last summer, 2016, the 31st summer Games were held in Rio the Janeiro. Although it has been only a couple of months ago, reports already account of abandoned and demolished Olympic venues, especially on the Olympic site of Barra and the famous Maracanã stadium itself , left to decay, without a direct purpose for the structures after the Games (The Guardian, 2017). In preparation to and during the Olympic Games in Rio, and prior World Championship football 2014, a majority of the 4.6 billion (to 15 billion (Quartz, 2016)) dollar of should have gone into the realization of welfare facilities and programmes, like hospitals or the decrease of segregation in society). According to Vox (2016), around 77,900 inhabitants of the city are displaced to new settlements far away from their original homes.

Though not entirely true and extremely simplified, one can argue that the Olympic movement in the last 40 years didn't learn from their past, creating urban development for temporary glory in a 17-day mega-event instead of looking sustainable Olympic legacy for the city.

1.1.1 - The failure of mega-events

Mega-event planning, within the field of Urbanism, is an extra-ordinary and discussed method for catalysing urban regeneration (Chalkey & Essex, 2003). Urban regeneration can be regarded as "comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change" (Robert & Sykes, 2000, p.10). The Olympic Games are much more than a sporting

event: they have evolved into a tool of urban renewal and a catalyst of substantial urban transformation (Chalkey & Essex 2003). As it assumes that the organisation of a major event and the investment put in developing the site will return in up till this moment hard to measure environmental, economic and social profit, long lasting regeneration projects can be fast tracked towards completion. "Politicians follow 'event strategies', because mega events can also spread a general spirit of optimism, create combined visions, attract exogenous resources and accelerate city development." (Preuss, 2007)

Critics argue that this positive turnover is a matter of perspectives and measurement: An spatial intervention and legacy can be either positive or negative, depending from which actor you emphasize in the project (Chappalet, 2012), as well as an intervention tend to look positive in the first years, though the overall positive legacy is hard to measure over the years (Lei & Spaans, 2009). In contradiction to the possible positive turnover of mega-event planning, these negative outcomes tend to be much more present and emphasized in research.

1.1.2 - Thee major actors in mega-events

Müller (2015) argues that this 'failure' of a mega-event has to do with 7 tendencies in the organisational process, as overpromising of benefits, underestimation of costs, event takeover, public risk-taking, rule of exception, elite capture and event fix (fig. 1). Chalkey an Essex (2003) defined different ways this tendencies during the organisation of the Olympic Games can affect the system of the city. For example local government investment can be diverted from social services and education in order to pay for Olympic-related infrastructure, increasing taxes or disruption and disturbance of existing communities by Olympic-related development and environmental issues by local opposition and perceived threats to the local environment.

From this point of view, the underused, derelict Olympic spaces in the city, are merely a spatial representation of the even larger overarching problems the organisation of the Olympic Games can create.
From Müllers text (2015) there three main actors can be distinguished, which are involved in the process (Figure 4)

Figure 1 - *Olympic site of Barra, Rio de Janeiro, after staging the 2016 Olympic Games, imaging complete emptyness (retrieved from: http://www. orgcharting.com/)*

Figure 2 - *Overview of the power and interests of three main-actors concerned to the organisation of the Olympic Games based on the Olympic Charter (IOC,2016) and newsflashes (VOX,2016).*

HOST CITY REPRESENTATIVES	**INTERNATIONAL OLYMPIC COMMITTEE**	**HOST CITY CITIZENS**
Interest: Maximise global attention, investment and change by organising the Olympic Games	**Interest:** To ensure a smooth and prestigious edition of the Olympic Games and a positive legacy to city development.	**Interest:** Investment related to the Games is used for improving the living conditions within the city and local environment.
Power: Can decide to bid for the Olympic Games.	**Power:** Can decide granting a bidding city the right to orga nize the Olympic Games.	**Power:** Has the right to vote whether to support hosting the Olympic Games.
Has legislative power to decide the location of the Games and the actions required in order to organise it succesfuly.	In charge of the Olympic movement.	Can publicly protest and damage the image of the Games.
Decides what to do with the spatial legacy of the Games.	Defines rules towards traveldistances and housing of the Olympic movement.	Has no legistative power to the organisation and legacy of the Olympic Games.

All three actors have different aims in their support towards the organisation of the Olympic Games, resulting in three different identities of the Olympic Games in essence: The Olympic Games as a commercial enterprise, the Olympic Games as urban remedy and the Olympic Games as social responsibility. The Olympic movement.

In short the IOC wants to create the a beautiful editions of the Games. Or as former presidents of the IOC mentioned after each edition; "These were happy and glorious games" (London, 2012), these were "unforgettable, dream Games" (Athens, 2004) and these were "the best Games ever"(Sydney, 2000) (ABC, 2012). It stimulates to put major effort to the organisation of the Olympics.

Afraid of creating the same economic perspective as the failure of Montreal and image loss of the Olympic Games (in 1977, at last, only one city formally bidding for hosting the 1984 Summer Games) prompted economic reforms in later Games, such as the introduction of a global sponsorship programme and public-private partnerships (Pitts & Liao, 2009). From largely publicly financed Olympiads to a "commercialized franchise stage" within the Olympic model as it is right now (XML, 2012)

More than a lasting improvement to the city it aims for realizing a prestigious event without problems that affect the reputation of the Olympic movement, leaving behind an all-over positive legacy which further enhances the image and popularity of the Olympic Games.

The host city wants to present itself as the perfect host-city (Chalkey & Essex, 1999). This means improving the image & livability of the city to gain prestige and compete among other cities on world stage, for which in return it can attract more foreign investment and strengthen its position, but also to prevent it from depleting vital resources to fund the event. To gain the commission to host the Olympic Games, IOC requirements and aims must be met, meaning large investments in the organisation of infrastructure, facilities, telecommunication, housing & environment, which can be both valuable and destructive to the sustainability of the city.

The citizens hope for a better future. Attending and supporting the Olympic Games means gaining pride and increase your sense of identity as your country wins an Olympic medal, representing the nation and its inhabitants. If the Olympic Games are organized in their home country, this mind switch is strengthened, as it encourage inhabitants to start sporting. The organisation of the Games reduces crime and fosters the overall economy of the city, at least temporary, it can however also raise taxes, displace inhabitants and gentrify the region. So even more than gaining national pride, the citizens of the host-city are also hoping large investments affect daily life positively as it ensures better accessibility to opportunities, housing, increased employment, healthcare and inclusion in society.

1.1.3 - Enhance all actors

In order to undoubtfully support the Olympic Games as possibility for valuable urban regeneration all three main actors need to be addressed. The IOC for commissioning the Games to the host-city in the first place, the host city to become involved in the organisation and execution, spatially, culturally, socially and economically and the inhabitants for their public vote to bid for the event, "In reality, however, the dominant commercial interests of the IOC and its sponsors make you wonder really how social the Games even can be in its current form."(Figure 5) (XML, 2012)

The association between the Olympic Games and the urban development of host cities is mainly observed from two distinct perspectives: global and local (Chen & Spaans 2012, p.100). In his thesis Verhagen (2007) argues that in sustainability the global scale of the Olympic Games are often enhanced by the IOC, but the local scale is in large extent neglected. This is also represented in the aims of the in presenting the best possible image, ensuring future existing by offering a major platform to showcase the host-city and the Games itself (Malfas, 2004).

The interest of the citizens are both on global and local scale oriented, but the sustainability of the local scale is valued higher than the sustainability on global scale. An example of this is the not in my backyard principle; although the construction of a windmill for electricity is an addition to clean energy on a higher scale, residents prefer them not to have them in proximity. The same counts for the Olympic Games.

		IOC	HOST-CITY	CITIZENS
OVERPROMISING OF BENIFITS overestimating positive effects of mega-events (by IOC & host-city)	Misallocation of resources		●	●
	Loss of trust with citizenry	●	●	●
UNDERESTIMATION OF COSTS Actual-Budget is bigger than planned budget (by host-city)	Misallocation of resources		●	●
	Profiteering			●
	Subpar construction quality	●	●	
	Budget shortfalls	●	●	●
EVENT TAKEOVER Event priorities become planning priorities (by host-city)	Events needs displace infrastructure needs		●	●
	Oversized infrastructure		●	●
	Unfinished infrastructure	●	●	●
PUBLIC RISK TAKING Public takes risk for private benefits (by host-city & citizens)	Public funds for limited or no public benefits			●
	Profiteering			●
RULE OF EXCEPTION Suspension of regular rule of law (by host-city)	Displacement			●
	Reduced public oversight		●	●
	Limited public participation			●
ELITE CAPTURE Inequitable distribution of resources (by host-city & citizens)	Spatially uneven urban landscape		●	●
	Gentrification			●
EVENT FIX Mega-events become seemingly quick fixes for major planning challenges (by host-city)	Event determines national priority for funding		●	●
	Bypassing of regular planning proces		●	●
	Waste of resources on event as lever for urban development		●	●

Figure 3 - *During the organisation of a mega events, symptoms as described by Muller (2015) mostly affect the citizens of the host city, while they often don't excersize the power that cause this consequences.*

Spatial issue
Social issue
Financial issue

The position of the host-city is one in between, both concerned with the legacy of a major, well organized event, but also one that is very well profitable for the future of the city and its inhabitants after the event itself. The host city has the large responsibility to be sure "that the execution of the event is of the highest standard, triggers the city's consumption development and produces a positive image. These priorities can sometimes be at the expense of the interests of local communities (Chalkey & Essex, 2003). From this opinion, for its own interest, the interest of the host-city should lie in a successful execution of both the interests of the IOC as well as its citizens.

Applying cities
Candidate cities

12

10

8

Amount of cities

6

4

2

0

???

1980 1984 1988 1992 1996 2000 2004 2008 2012 2016 2020 2024 2028 2032 2036

Years
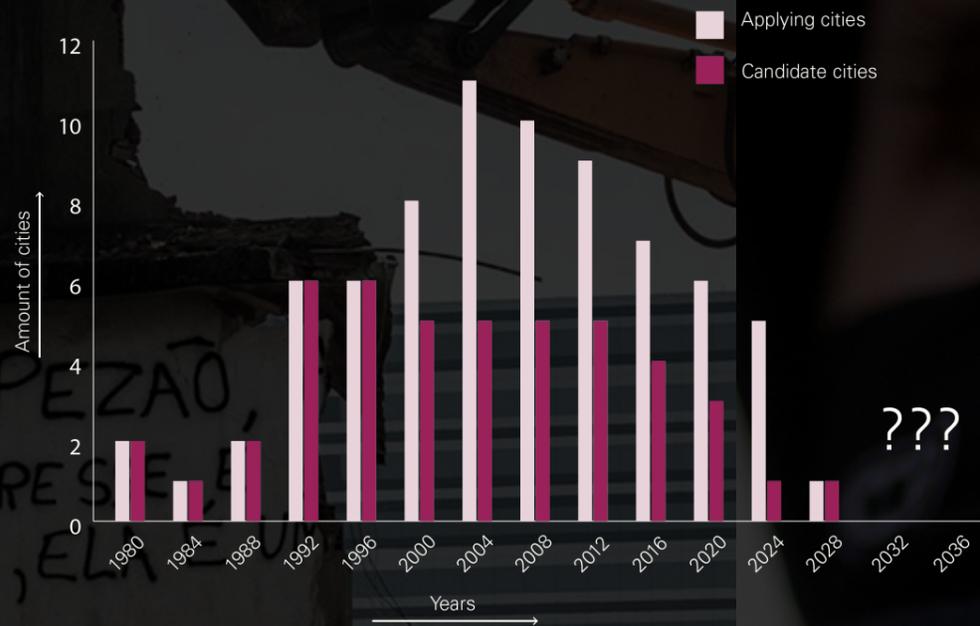
1.1.4 - Revive the interests for organizing the Olympic Games

Over the past Olympic Games editions a decrease in enthusiasm to organize the Olympic Games can be witnessed (Figure 7). A former decrease in interest was a direct result to the major financial disaster of the 1976 Olympics in Montreal, causing fear that the organisation of such an event cause ruin to the economics of the host city.

After major financial reforms and several successful editions such as the 1988 Olympics in Los Angeles and the 1992 Olympics in Barcelona, the interest for hosting the Olympics boomed.

But over the past few decades this interest is decreasing again, up to the point of recently selecting Paris as host-city for the 2024 Olympics and Los Angeles as host-city for the 2028 Olympics. Officially, the completeness of both proposals was the reason to choose both host-cities simultaneously, which is an act that is never witnessed before (NOS, 2017). Unofficially it is worth mentioning that at the point of official election, there was just candidate left, as all other potential host-cities withdrew their bids before officially applying to organize the Olympics (Olympic. org, 2017).

Over the past editions we witnessed increased attention to the social unrest that the organisation of the Olympics can cause in the host-nation. The unrest is caused by the withdrawal of public money from social services such as healthcare and education, to the construction of the Olympics, but also from forced removal from Olympic sites. Past decades we also witnessed that the organisation of the Olympic can severely contribute to a uncontrollable national debt (Brazil and Greece). The negative media attention on the neglect of and protests from the citizens lowers the support to organize the Olympic Games and contribute to the decrease of applicants. Therefore it is highly important for the IOC to, again, make major reforms within the Olympic Games as ormer IOC-representative Camiel Eurlings mentioned.

"Quite a lot of countries pulled out of the organisation of the Olympic Games. For different reasons, but it happened. Therefore we need to reform severely. The Olympic have to be something for the smaller countries, not only the larger ones. The IOC is going for that direction. The host-city and nation shouldn't adapt to the Games, but the Games should adapt to the host-city and nation to the upmost." (NOS, 2017)

Figure 4 - *Back - The neglect of the whishes of the citizens in the Olympic Games can lead to displacement, protest and riots prior to the event.*

Figure 5 - *Front - The last decade the interest in organising the Olympic Games deminished severely.*

1.2 - AIM FOR THE OLYMPIC GAMES AND GRADUATION PROJECT

Previous paragraph showed that there is a need for sustainability in the Olympic Legacy, especially on the local scale, enhancing the need of the citizens of the host city, while preserving the aims of the IOC and the host city as well.

Social sustainability, within the field of sustainability, deals with the needs of the citizens. It ensures the conditions on which a community can maintain and develop themselves. Therefore it should be embedded in the design of any Olympic venue. Economic sustainability and environmental sustainability are related terms, they act as the stones on which social sustainability can develop (Mc Kenzie, 2004).

"The Games can function as an opportunity for job creation, the development and operation of leisure and recreation service opportunities, the upgrading of open spaces, and improved levels of public health and participation in sport. The existing literature is deeply inadequate when it comes to relating social development to spatial planning or urban renewal" (Chen, 2012, p.13)

Therefore, in general, the Olympic Games have to be more aware of the responsibility its legacy has for urban regeneration and the potential this legacy can have for the social sustainability. In this way also the citizens of the host-city will benefit from the organisation of the Games.

By focusing on the principles within the spatial Olympic legacy that enhance social sustainability on the local scale, the importance of the Olympic site and Olympic interventions increases, preventing it for possible decay and forming a sustainable addition to the host city.

The aim of this graduation project is to define the design principles that enable the Olympic legacy to enhance the social sustainability in the urban regeneration of the host city. With this aim the organisation of the Olympic Games can form an contribution to the sustainability of the host city, instead of forming a risk. These design principles are tested in the form of an urban design for the Olympic venues in Rotterdam-South, The Netherlands.

1.3 - MAIN QUESTION AND SUB QUESTIONS

To successfully fulfil the aim enabling the Olympic legacy to enhance to social sustainability in the urban regeneration of the host city within the form of design principles, a main question is defined. The main question of the graduation project is **"How can design principles aiming for urban regeneration within Olympic legacy planning and design enhance the social sustainability of the city?"**

More information should gathered on the subjects of mega-event planning and design, Olympic legacy, urban regeneration and social sustainability to answer the interrelation between each topic. By defining the requirements on which this interrelation can be conducted, a start can be made to create design principles for a social sustainable legacy. These sub-questions are **"How can Olympic planning, design and legacy enhance urban regeneration?"** and **"How does urban regeneration enhance social sustainability?".**

The found interrelations of these first two sub-questions form the input for the third sub-question, which reads " **"How can social sustainability be enhanced in Olympic planning and design?"**

By testing these conditions in research of former Olympic Games and an exploration to future Olympic Games, design principles for social legacy are discovered. The next step is to gather these design principles and forming a foundation that provides answer to the main question of the graduation project.

1.4 - RELEVANCE OF THE PROJECT

1.4.1 - Social relevance

The social relevance of this graduation project lies in the investigation of the possibilities by designing for a social sustainable Olympic Games in the first place. Exploration of the problem showed that the citizen in almost all cases experience the negative consequences of hosting an Olympic Games, while they are not the one in power. Empowering of the citizen within the design process of the Games could be an option, but often these kind of cooperation projects are the first to be cut from the budget (Muller, 2015). Therefore this project aims for the integration of wishes from the IOC, host city and citizen towards the organisation of the Olympic Games with the existing power setting: IOC as commissioner, host-city as decision maker and the citizen passive to the decision making process. Leaving the current power structures in tact will have a positive influence on the implementing the outcomes of this graduation project and smoothing the much required transformation in the organisation of the Olympic Games.

1.4.2 - Scientific relevance

There are several ways this graduation projects adds to the to the knowledge of existing research done to social sustainability of the Olympic Games in general and the theme of social sustainability in general. First the graduation project provides a framework to the assessment of social sustainability in the design, planning and legacy of the Olympic games and other mega-events. During a extensive research period, such an framework wasn't encountered at all. Secondly this graduation projects adds to the extensive body of other TU Delft theses and research on Olympic legacy in relation to urban design, planning and sustainability, which range from possibilities of a sustainable design of the Games on local level by integrating it in the urban tissue (Verhagen, 2007) to hosting an deconcentrated Olympic Games in a polycentric agglomeration (Kirchert & Reinders, 2014). Still, a thesis focussed on social sustainability in Olympic legacy isn't provided yet.

1.5 - RESEARCH METHODOLOGY IN THE GRADUATION PROJECT

This section describes the methods that are used to answer each research question and how this methodology will be able to answer the research questions. The aim of the project is to define design principles that enable the Olympic legacy to enhance the social sustainability in the urban regeneration of the host city.

The methodology of the research can be divided in two processes. The first process a research to explore, frame and test the relation between Olympic planning, design and legacy and social sustainability from a theoretical perspective. The second process is a design project to the planning, design and legacy of a Olympic venue that enhances social sustainability in Rotterdam South.

The first step is a literature research is conducted on the subjects of mega-event planning, Olympic legacy, urban regeneration and social sustainability and the existing relation between these subjects. It will form the theoretical framework.

The research to the individual subjects will reveal the core structure of each subject.

The research to the interrelation between mega-event planning and urban regeneration results in a broad set of areas in which mega-event planning has possibilities for urban regeneration of the host city. The areas are further framed to their applicability within the capabilities of the urban designer.
This selection is used in the research to define the interrelation between Olympic legacy and urban regeneration. This research results in an overview of urban legacies for the regeneration of the host-city.
The selection and deriving legacy overview are used to frame the graduation project and provide an answer to the the first sub-question "How can Olympic planning, design and legacy enhance urban regeneration?"

The research between social sustainability and urban regeneration results in the a set of areas within social sustainability that are affected by urban regeneration. Several of these areas are chosen to frame the research further.
This selection is used in to research for spatial measurements that enhance social sustainability within literature. These social spatial measurements are used for assessing the contribution to social sustainability of Olympic interventions and provide

answer to the second sub-question "How does urban regeneration enhance social sustainability?".

Both a case study and a design project are used to answer the third question "How can social sustainability be enhanced in Olympic planning and design?"

The case study to the 2012 Olympic Games in London is conducted using theoretical framework. It explores the location, construction projects and legacy of the Olympic park. The implementation of the spatial Olympic programme is assessed to the presence of the spatial measurements. Through this assessment, design interventions pop out to be positive to the social sustainability of the site.

The design project for a Olympic venue in Rotterdam South is also constructed using the theoretical framework.

A spatial analysis, combining GIS data and mapping, is used to find a location with the highest impact for the Olympics to contribute to social sustainability. It resulted in Rotterdam South as most suitable location.

Through mapping, data analysis and literature research an insight is created in the social setting of Rotterdam South and which places require focus. The research results in an aim for the Olympic Games to enhance Rotterdam South
Through an excel-model the size and programme of the Olympic Games is determined which is implemented in Rotterdam South.
The combination of both aim and defined Olympic programme result in a programme of requirements.

The requirements are answered by positioning a set of strategic proposals for Rotterdam South. Each strategic intervention is further explained and exemplified by several key construction projects. The last strategic proposal emphasizes the use of development - Vignettes to define the identity of the post-Olympic redevelopment.

The design phase involves a further exploration in the identity of one of these Vignettes. First desk analysis is made to the current identity of the area. Second the strategic proposals are implemented and visualisations of the design for the whole Vignette area and renders of local situations picture the changed situation from the perspective of the inhabitant. The design is assessed to the presence of the spatial measurements.

From both case study and design project, examining existing design intervention and proposing new design interventions, design principles for Olympic design derive. These principles add to an overall set of design principles that encourage social Olympic legacy.

The design principles are gathered in a separate book. This collection of design principles are used to answer the main question "How can design principles aiming for urban regeneration within Olympic legacy planning and design enhance the social sustainability of the city?"

1. RESEARCH AND FRAMING

1st subquestion

LITERATURE TO

urban regeneration by mega-event planning and Olympic legacy

2nd subquestion

LITERATURE TO

social sustainability in urban regeneration and spatial measurements

3rd subquestion

CASE STUDY

to social sustainability in London 2012 Olympic Games

EVALUATION

COMPARISON

between proposed interventions of research and framing and design project

main question

RECOMMENDATIONS

for planning and design for social sustainability in olympic legacy

2. DESIGN PROJECT 3rd subquestion

ANALYSIS

to setting of social sustainability in Rotterdam South

VISION

aim for the Olympic Games in Rotterdam South

FRAMING

Olympic programme to be implemented in Rotterdam South

DESIGN

Vignet Varkenoord - North to future Feyenoord City

STRATEGY

Seven strategic proposals for Olympic programme across Rotterdam South

Figure 6 - *Scheme of the research methodology in the graduation project.*

The thesis is divided into several chapters. Each chapter forms a separate research towards a conclusion for the next chapter and collaborate to answering the sub questions and the main question.

Chapter two contains a research towards the history, organisation and growth of the Olympic Games. It also researches the theory and concepts behind mega-event planning, Olympic legacy, urban regeneration and social sustainability. These sections describe the interrelation between these concepts to set up a theoretical framework for enhancing social sustainability in Olympic legacy. It proposes to look at the location, construction works and impact of the Olympic Games and its possibility to enhance social sustainability within the aspects of housing & environment, education, safety & health, employment and identity. Eventually the chapter ends with the proposition of sixteen spatial criteria to enhance social sustainability in design.

This theoretical framework is used to analyse and assess the social sustainability in the location, projects and legacy of the 2012 Olympic Games in London in chapter three. First it describes the aim of the 2012 Games and the decision for the location. Further the case study looked to the Queen Elizabeth Olympic park prior to the Games, during and after and the projects that took and will take place on site. Eventually the social sustainability of the design interventions are assessed by the spatial criteria, from which design principles to enhance social sustainability in Olympic legacy are uncovered.

The fourth chapter contains a spatial analysis to a location for the Olympic Games in the Netherlands. First requirements to organising the Olympics on national scale are described. After, comparing maps on accessibility, available space and deprived neighbourhoods, a decision to the project location is made. Rotterdam South is chosen as project location this graduation research, with Zuiderpark and Varkenoord as future Olympic areas.

The current social-economic and spatial situation in Rotterdam South and focus areas of a Olympic strategy and design for Rotterdam South are analysed in chapter five. From historical and data analysis the neighbourhoods between Zuiderpark and Varkenoord are assigned as focus area. Next, an overview is given of current future projects in Rotterdam South. Through

an excel-model a research is conducted to the spatial implementation of the Olympic Games. From this three researches, requirements to the strategy and design of the Olympics in Rotterdam South derived. These are collected in a programme of requirements in the last section.

A set of seven strategic proposals for the Olympic Games in Rotterdam South are made accordingly. In chapter six, these seven proposals individually address another part in the organisation of the Olympic Games. The proposals are about 1) a future for the Olympic venues, 2) large scale transport infrastructure, 3) local routing in and between Olympic locations, 4) creation of an attractive environment, 5) motivating initiatives in the public space, 6) creation of employment opportunities and 7) the post-Games re-development of the Olympic sites. For each strategic proposal several exemplifying design interventions are given. These projects propose basic principles, which can form the start for many design projects in Zuiderpark, Varkenoord and the in between area. From this strategic proposals design principles derived.

In chapter 7 describes the design and redevelopment of Varkenoord North to Feyenoord City and the implications of the strategic proposals for the site. The design interventions in Varkenoord North are individually show according to each strategic proposal. Renders visualize and describe the implications of this design for the inhabitants of Rotterdam South. Also from this plan for Varkenoord North several design principles are discovered.

In the last chapter, conclusions are made to the graduation project by answering the main question, following the answering of the sub-questions. Next, a reflection looks back at design decisions within the thesis from multiple perspectives and provides recommendations for future research. Last it reflects on the personal process within this graduation projects as well as the position of this graduation project within the values and methods of the graduation lab and TU Delft.

Supportive documents to research and statements in this thesis are found in the Appendix.

2. - A THEORETICAL FRAMEWORK FOR A SOCIAL SUSTAINABLE OLYMPIC LEGACY

This chapter contains a research towards the history, organisation and growth of the Olympic Games. It also researches the theory and concepts behind mega-event planning, Olympic legacy, urban regeneration and social sustainability. These sections describe the interrelation between these concepts to set up a theoretical framework for enhancing social sustainability in Olympic legacy. It proposes to look at the location, construction works and impact of the Olympic Games and its possibility to enhance social sustainability within the aspects of housing & environment, education, safety & health, employment and identity. Eventually the chapter ends with the proposition of sixteen spatial criteria to enhance social sustainability in design.

The origins of the Olympic Games goes back to ancient Greece. The first edition can be traced back to 776 BC. (IOC, 2017). It is believed, that was held every four years in Olympia, on the peninsula of Peloponnesus, as a combined spectacle of religion and sport in dedication to the 12 Olympian gods, who were believed to reside on the mountain Olympus. Part of the Pan-Hellenic Games, up to twenty different sports were practiced throughout multiple days in order to enforce the relationship between the Greek states. At its height the site of Olympia consisted of a two temples dedicated to Zeus and Hera, his statue is counted as one of the ancient wonders of the world, and a stadium that could accommodate up to 40.000 spectators. In 393 AD, on order of emperor Theodosius of the Roman Empire, the ancient Olympic Games were banned on accuse of paganism.

The modern Olympics aren't situated around one festive, but is a in fact an collection of events organised by one organisation, the IOC (International Olympic Movement), part of the Olympic Movement. The modern Olympics consist of the Summer Olympic Games, Paralympic Games, Winter Olympics Games and Youth Olympic Games (IOC, 2017).

The first Modern Olympic games are initiated in 1896 by Baron Pierre de Coubertin, in Athens were an event to rally mankind together (Malfas, 2004). He claimed that "international sport could foster individual and collective goodwill and even contribute to world peace", with the games as an representation of this ideology, also called 'Olympism'.

Since the first edition in 1896, another 27 Olympic Games are held, with Rio 2016 as most recent four annual celebration, recorded as the 31st Olympiad. This difference is caused by 3 cancelled editions, in 1916 due to the first World war, in 1940 and 1944 due to the second World war. Between 1896 and 2016 the Olympics grew spectacularly, in events, athletes, participating countries, officials, media etc. (Table 1) taking over the position of world largest event from the evenly spectacular World Exposition (Vrijaldhoven, 2007).From just a total of 43 events and 241 athletes from 14 countries up to 306 events, with 11544 athletes form 205 countries (IOC, 2017).

Table 1 - *Growth of Olympic Games compared to size of host-city (amount of inhabitants) from 1896 till 2020.*
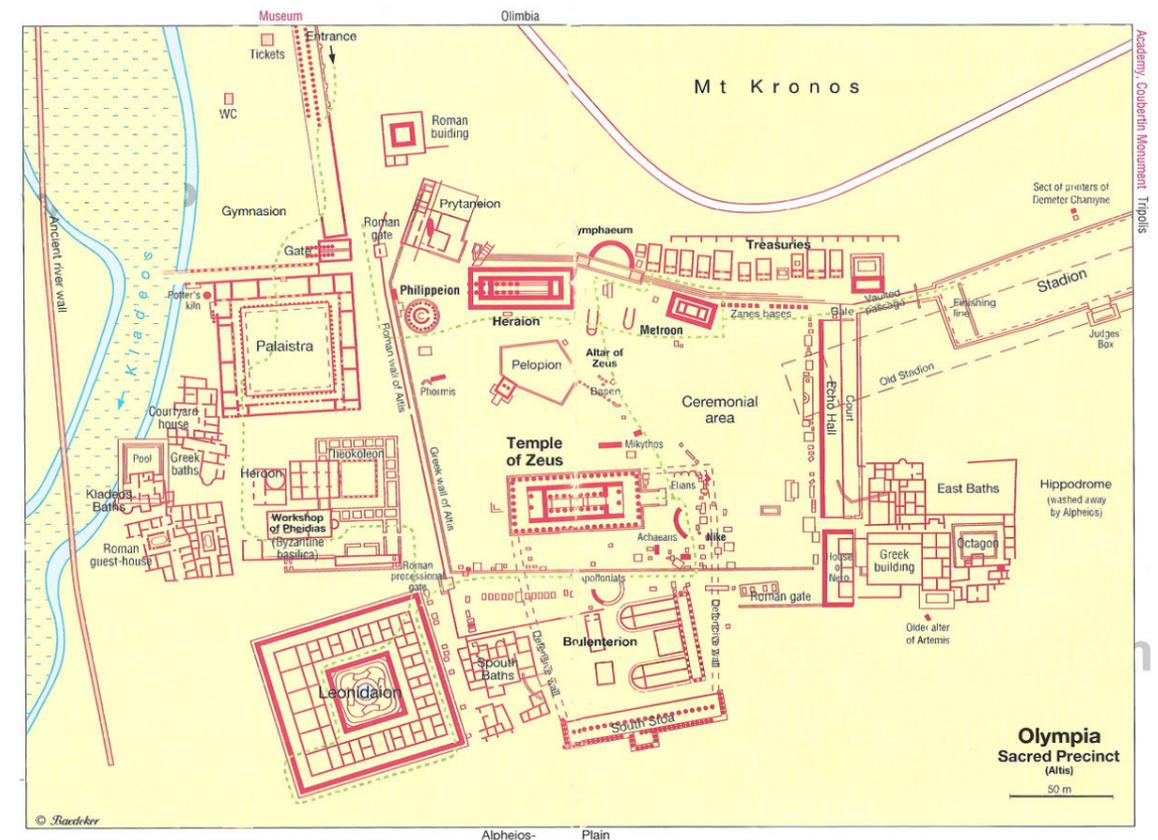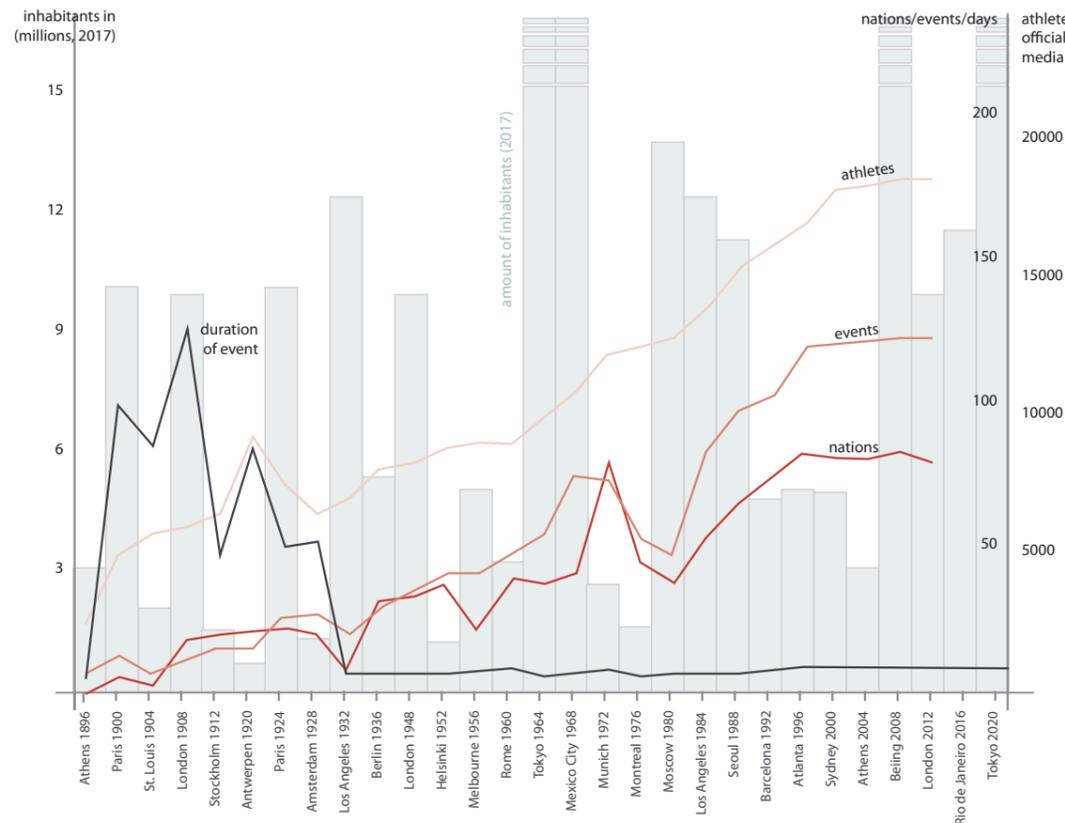
Figure 7 - *Map of Olympia around 300 AD (https://theaugeanstables. wikispaces.com/)*

Figure 9 - *Helenikos stadium during Olympic Games of 1896 (http:// www.mspfound.com)*

Figure 8 - *Baron Pierre de Coubertin, innitiator of the modern Olympic Games (http://www.gettyimages.nl)*
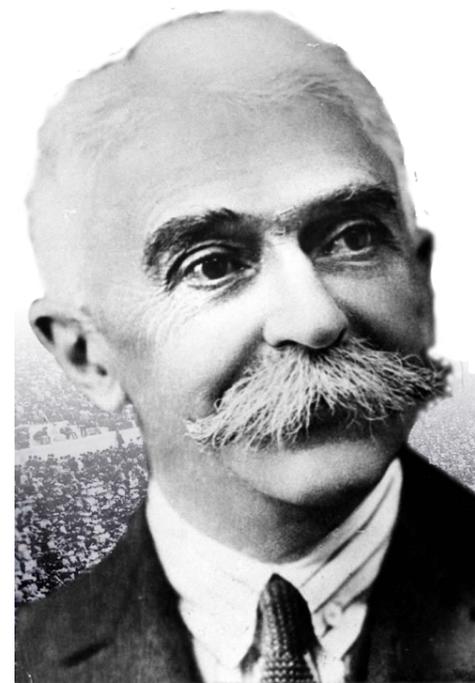
OLYMPISM: "sport, effort and example as the mean to raise the overall standards of humankind. The combina-tion of sport in culture and education, to social responsibility and in respect for ethic principles". (IOC, 2016)

17
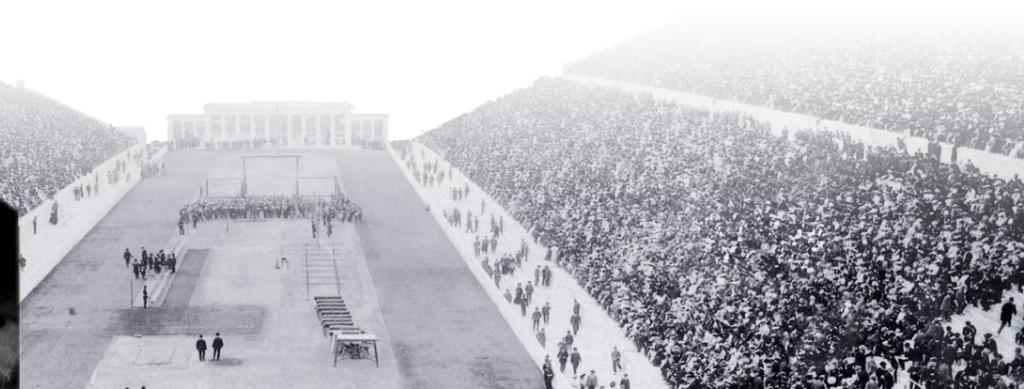
2.2 - THE OLYMPIC PAST: FORMER EDITIONS

1896, ATHENS	1916, WW I	1936, BERLIN	1956, MELBOURNE	1976, MONTREAL	1996, ATLANTA	2016, RIO DE JANEIRO
1900, PARIS	1920, ANTWERP	1940, WW II	1960, ROME	1980, MOSCOW	2000, SYDNEY	2020, TOKYO
1904, ST. LOUIS	1924, PARIS	1944, WW II	1964, TOKYO	1984, LOS ANGELES	2004, ATHENS	2024, PARIS
1908, LONDON	1928, AMSTERDAM	1948, LONDON	1968, MEXICO CITY	1988, SEOUL	2008, BEIJING	2028, LOS ANGELES
1912, STOCKHOLM	1932, LOS ANGELES	1952, HELSINKI	1972, MUNICH	1992, BARCELONA	2012, LONDON	...

Figure 10 - *Worldmap showing all the countries which hosted the Olympic Games, with host-city listed underneath.*

2.3 - THE OLYMPIC PAST: SIZE OF THE GAMES

Growth of the Olympic Games have had tremendous spatial implications. The ever increasing amount of sports requires more venues, the athletes more accommodation, the visitors more space to walk, drive, spectate and enjoy. The space occupied for hosting the Games has grown, up till 960 ha. (Figure 11). With the enlargement of space, the need for purpose of this space is equally enlarged. While the Olympic Games offer a lot of opportunities, when there is no purpose for social sustainability, this growth of the Games is an ever increasing problem.

Faculty of Architecture: 2,3 ha.

Delft city centre: 84 ha.

Rotterdam South: 3082 ha.

Athens 1896: 45 ha.
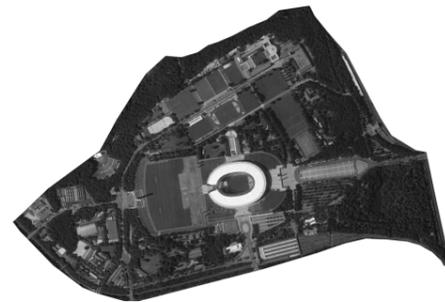
Berlin 1936: 202 ha.
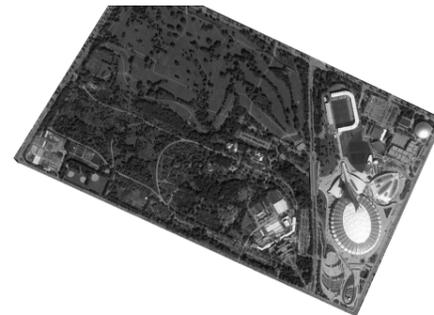
Montreal 1976: 196,5 ha.
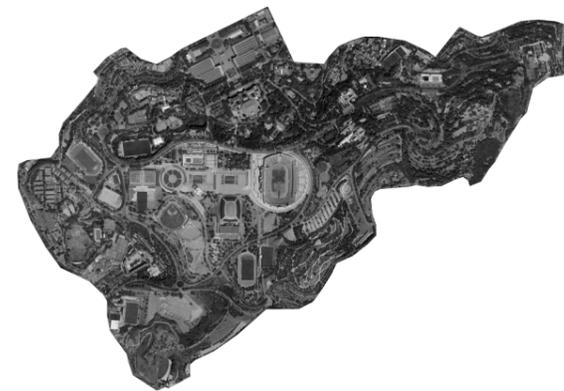
Barcelona 1992: 336 ha.

Beijing 2008: 960 ha.

Figure 11 - *Growth of the main Olympic sites between 1896 & 2008, compared to the faculty of Architecture, Delft and Rotterdam South.*

2.4 - THE ORGANISATION BEHIND THE OLYMPIC GAMES

The IOC (International Olympic Committee) is the over encompassing organisation of all matters related to the Olympic Games. The IOC and subordinate organisations are part of the Olympic movement, which in its turn has the responsibility to ensure the goal "to contribute to building a peaceful and better world by educating youth people through sport practised in accordance with Olympism and its values."(IOC, 2017).

The IOC is head to three constituents of the Olympic movement; 1) the International Sport Federations (IF), 2) the National Olympic Committees (NOC) and the 3) Organising Committee Olympic Games (OCOG).

The IF is responsible for managing and monitor the multiple sports that are affiliated to them and have to assure the integrity of their sports on international level (IOC, 2017). Not all sport federations are recognised by the IOC. The NOC is responsible to promote, develop and protect the values and constitution of the Olympic movement in the respective countries. In the Netherlands, although they are separate organisations , the IF and NOC are represented as a cooperating organisation in the form of NOC*NSF, responsible for supporting and governing a major part of the Dutch sports.

The OCOG is not a permanent committee, but created from out the host-nation NOC to the constitution of the Olympic Games. (IOC, 2017) After the Games the committee is dissolved again. Throughout the organisation to the Olympic Games, many organising committees are created under the executive board of a IOC, NOC and host-city representative. These committees can grow from tens of employees to thousands at the start of the Olympic Games.

The OCOG's have many important tasks to the Olympic Games. Several of the main tasks are to choose the required installations such as competition venues and stadiums, to organize medical services, solve transportation problems, meet mass media demands, lodge athletes, officials and entourage and many more tasks. Together these OCOG's make it possible for the Olympic heart to beat.

Therefore together, the NOC, OCOG's and the host-city representatives are responsible for the organisation and successful execution of a Olympic Games series. Figure 15 shows the organisational structure of the Olympic movement and the responsibilities to the organisation of the Olympic Games in more detail.

In preparation to hosting the Olympic Games, there are 3 election rounds based on the main theme's (Figure 14) (IOC, 2017). The host city will be selected by the IOC members, after deliberate and public evaluation of the final bid by the Olympic Evaluation Commission. After election, the host city and the formed OCOG's have 7 years to complete the 'Olympic task' of realizing the Olympic Games and to the concern of this thesis, a (social) sustainable legacy.

Figure 12 - *Life phases an edition of the Olympic Games, each round has different requirements to which the bidding cities are evaluated.*
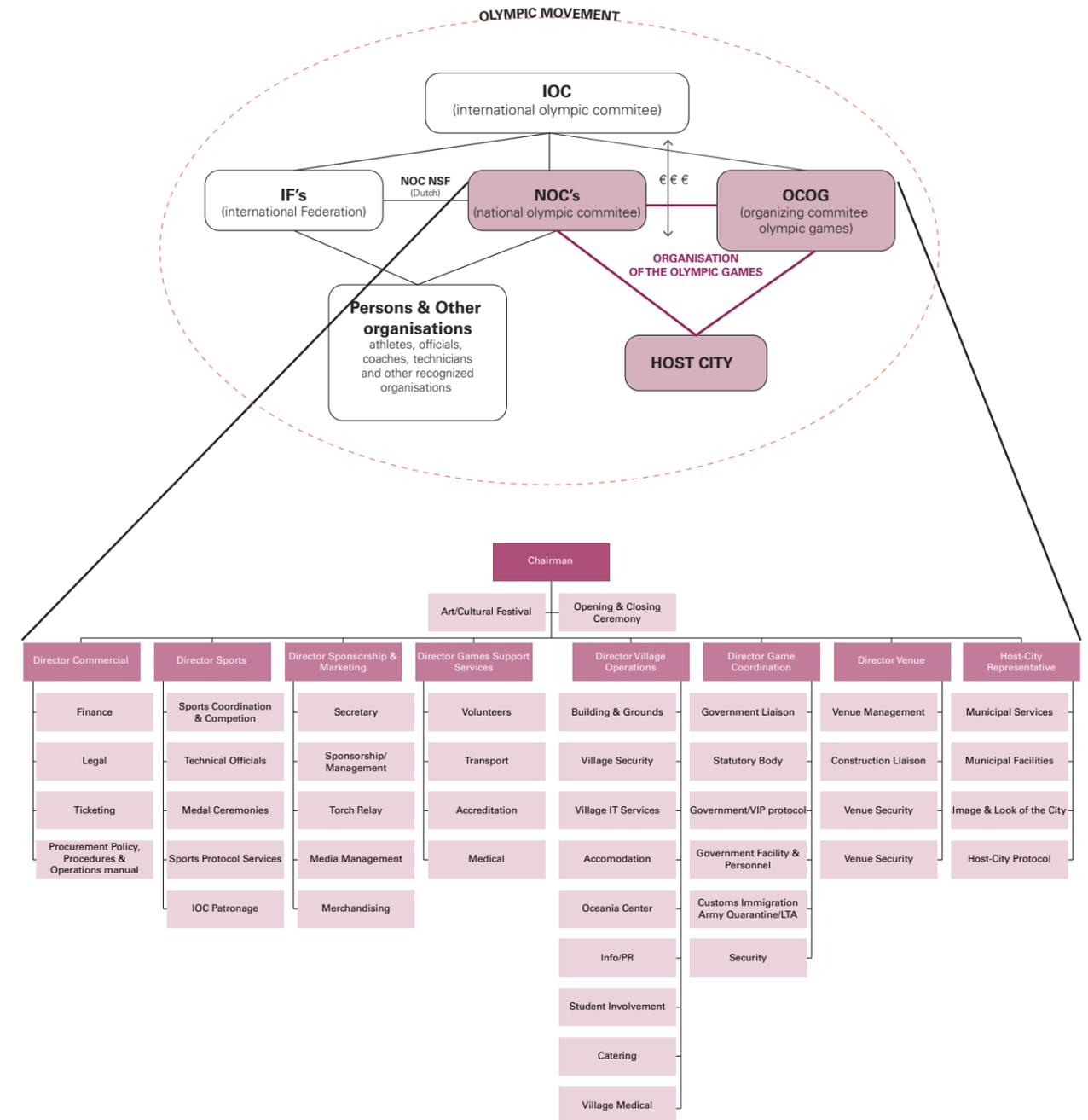

Figure 13 - *Organizing commitee concerned with the realisation of the Olympic Games and relationship to other committees within the Olympic Movement (based on IOC, 2017 & http://www.orgcharting. com/create-organisational-chart-Olympic-games/).*

2.5 - THE PRACTICE OF MEGA-EVENT PLANNING FOR URBAN REGENERATION

This section provides a definition for the theme of mega-event planning, an overview of events that are categorized as a mega-event, the history of mega-event planning and their relative impact on the city. In case of the Olympic Games, an overview of themes are given that are designed for within mega-event planning, what are the costs and it elaborate on the factors on which these differences are caused. Last, from three different authors the capacity of mega-event planning for valuable urban regeneration on the local scale is explained and from here tangible conclusions towards a strategy are drawn.

2.5.1 - A mega-event

In general, an event is an occurrence of some measurement of importance, aimed for a certain goal. The distinction of a mega-event is one of size and purpose. Mega-events, Muller (2015) mentions, can be a festival, political summits, conventions or festival to different authors. Simultaneously, there is no agreement on what the measurement of 'mega' means. In 'What makes an event a mega-event' Müller proposes a classification based on visitor attractiveness, mediate reach, cost and urban transformation. In this framework it is argued that the Olympic Games and other 'mega events' are moving towards the definition of a giga-event, which are events of about at least 3 million sold tickets, more than 2 billion USD dollars generated on broadcasts rights, a total cost of at least 10 billion USD dollars, of which at least 5 billion USD on urban transformation costs. The Olympic Games of London 2012, Rio 2016 and the Football World cup of Rio 2014 are currently the only giga-events yet. The build-up of the total costs in mega-event planning will be further elaborated later on.

Planning for such a mega-event requires a tremendous amount of strategic thinking. "Some cities use global events as a catalyser in a masterplan" (Vrijaldhoven, 2007). It can create chain reactions to other cities as well as only applying for it can already work as a catalyzing method. This is one of the arguments in the creation of the former Dutch bid for the Olympic Games of 2028. "The possible organisation of the Olympic and Paralympic Games function as catalyser and give to our unity and capabilities of spatial planning projects a strong boost" (NOC-NSF, 2009, p. 34) . In all cases a secondary strategic plan is needed to provide for alterations during the process. "A safety plug or back up plan if the application fails is essential in

order to make an urban transformation plan resistant to set-backs" (Vrijaldhoven, 2007). In his research he investigated therefore several main issues that are involved in strategic mega-event planning for city development.

2.5.2 - The use of events

Most suitable for the city

What type of event is most suitable for the city all has to do with the kind of overall city development the host-city wants to achieve. A distinction can be made in three different categories.

A event of variable size
Depending on the size of urban development a city want to achieve, the funds it can acquire, the identity it already has and the image it wants to present itself to other cities, as well as the type of economy it wants to attract, a decision can be made which type of event is most suitable to bid for. This events can be a one day celebrational festival, an intense sport programme of multiple weeks, such as the Olympic Games or longer commitment as Capital of Culture and the World Expo. Some events are also related to the geographical position of the host city, such as the Commonwealth Games, the Asian Games and the Africa Cup. In this thesis, only the applicability of the Olympic Summer Games is researched.

Sequence
To prevent the implementation of an event that doesn't match the capabilities of the city, but even more to set up the conditions and image for a successful bidding of a mega-event, the potential host-city can choose to bid for a sequence of smaller events. But setting up the infrastructure for hosting these events, it can gradually raise the support and infrastructure required for hosting a larger event, with reduced social, economic and environmental risks as stakes are lowered. A famous example of this approach is the process towards the organisation of the Commonwealth Games in Manchester in 2002 (Smith & Fox, 2007). Also the Netherlands aims to raise the image as a country suitable for sport events with the organisation of for example the world championship Hockey. This could be a valuable possibility for developing the city to eventually host the Olympic Games with reduced risks.

Process bid
As mentioned early, a city can already gain advantages of bidding for an event, even when it eventually didn't get the commission to organize it. Bidding for an event, and the related procedure already creates an public attention as well as explores the possibilities for urban development. The strategic plan that is proposed, helps the bidding city to investigate their own development goals and interventions that are required to reach that intentions. Therefore it reinforces the future prospects . Early interventions to the city structure and fast-track of city development projects, to show the event committee that the city is capable of hosting an major event in terms of already present conditions, are an valuable addition. "There are reports that claim that the bidding cities tend to have more economical profit than the actual host city. This is due to the fact of early exploration and expenses in city development, though not the actual expenses of organizing the event. The sum of several millions, required to bid for the Olympic Games is in this light a valuable investment.

Figure 14 - *Distribution of the Olympic venues compared to geographical location, each possessing unique qualities to be enhanced (own image, based on Vrijaldhoven, 2007).*

Strategic location

The location(s) of the event are important to the aims of urban development the host-city wants to achieve as well as the investments it has to make in order to make it representative and well connected to the all vital transport modes, be in just position for future urban expansion of the host-city, as well as available space it has to offer and the scale of influence it tend to achieve.

Environmental conditions
Depending on the eventual goals of overall city development the host-city tend to achieve a location in chosen. In previous Olympic Games, as for example Barcelona, Sydney and London a brownfield or a social-economic deprived neighbourhood is chosen. Brownfields are "a former industrial or commercial site where future use is affected by real or perceived environmental contamination" (Oxford Dictonairy, 2017). Socio-economic deprived areas are relative to other neighbourhoods within the city, scoring lower in a multitude of factors, as education, health, economic wealth and so on. The aim of the host city, by organising the Olympic Games in this specific part of the city, is to raise the conditions for living and usage of this area. In here two tendencies can be distinguished. Either the Olympic Games directly address a socio-economically deprived and/or polluted industrial area in
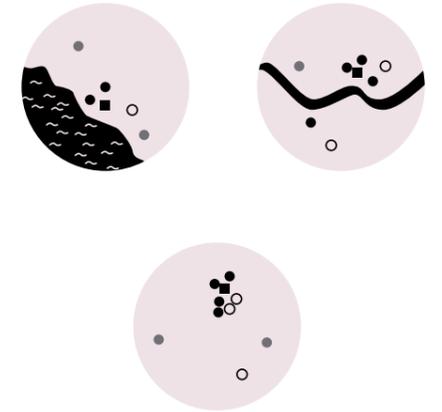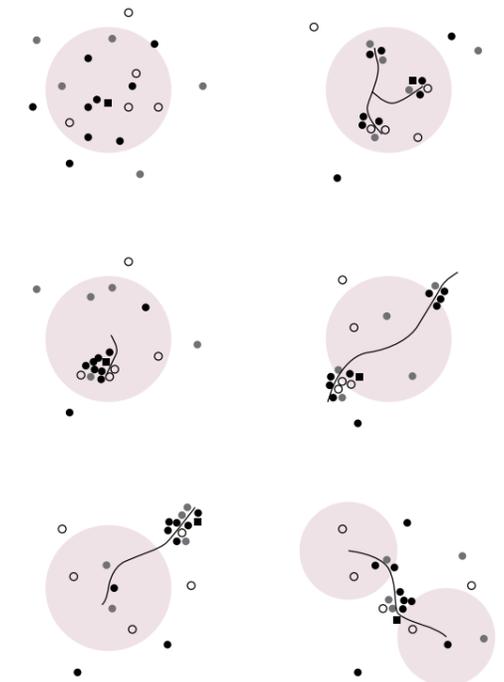
Figure 15 - *Distribution of the Olympic venues compared location in the city, concentrated and deconcentrated (own image, based on Pitss & Liao, 2009).*

order to set up the conditions and interests for further city expansion, addresses and redevelops the area in order to create an positive spillover of economic, environmental and social improvements into an existing part of the city, hoping to lift the image and living conditions of 'that part of the town'.

Infrastructural nodes
Apart from the chosen goal of urban development the host-city tend to achieve, it has to make sure that the location of the Olympic venue is near infrastructural nodes, such as railway stations, public transport by metro, tram or other forms of public transport, as well as in proximity of a highway and a major road and the proximity of an airport that supports international flights. Placement near sufficient transport possibilities or the creation of sufficient transport possibilities to the event site are of great importance to the organisation of the Olympic Games as it has to be able to handle vast amounts of visitors and meet the requirements for in time transport of athletes to and from the Olympic Village to and from the sport venues. The Olympic Games in Atlanta are now infamous for their lack of capable transport infrastructure. Especially facilitating necessary public transport proved to be, by far, not adequate, exemplifying the lack of insight and creation of a negative social image and media coverage (Chalkey & Essex, 2003) (Malfas, 2004)(Gold & Gold, 2008). The requirements concerning this transport will be later on extensively elaborated.

Environmental qualities
Specific environmental settings can provide additional magnificence during the staging of the event. This can be differentiated in geographical qualities as well as urban settings. Placement along the river, a mountain ridge or the coastline as for example the Copa cabana beach as setting for the beach volleyball tournament in Rio 2016 are strategic chosen locations that emphasize the quality of the environment near the host-city. These geographical qualities might be underused or hidden within the city structure. Using the Olympic Games to open up and emphasize these geographical structures, can alter the identity of the city. From a relative unknown city, by restructuring of the coastline for the Olympics of 1992, Barcelona grew into the leisure hotspot of Spain. Depending on the location of the host city, different geographical qualities can be enhanced. There are three different geographical locations in which the host city can be situated (Vrijaldhoven, 2007, p.70)(fig. 1).

Next to geographical qualities, also urban qualities can be emphasized, which means remarkable pieces of architecture or cultural institutes, parks or urban structures as a monumental axis or an internationally famed bridge. Mostly these locations only host temporary venues, because these locations are meant to broadcast the attractiveness of the city, not to redevelop it for sport purposes.
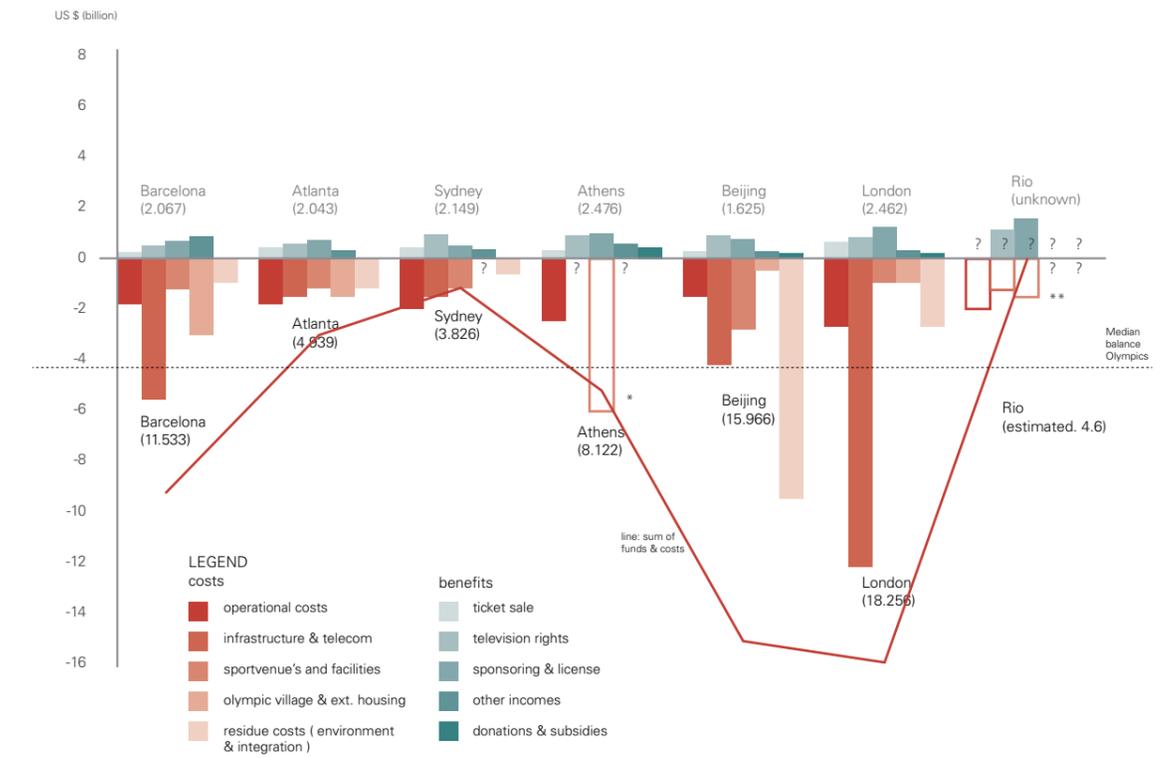
Concentrated, deconcentrated.
While deciding the upon the strategic locations for the event, also there have to be decisions made upon concentrating or deconcentrating the event. Specifically for a multi-sport event as the Olympic Games, this decision is vital. According to Liao & Pitts (2006) 6 types of (de)concentration can be distinguished from the previous editions of the Olympic Games (fig. 2).

"the diagrams show a general tendency from the host cities to organize the venues in more or less compact clustering in one or few clusters. An observation that clearly relates to the IOC's high priorities of the compactness of the Olympic Park, with an argument of minimal transport time and important sponsor interests" (Kirchert & Reinders, 2014, p.15)
Also the notion of the Olympic spirit plays a role into the decision to cluster a majority of the Olympic venues. It is argued that the level of deconcentration reduces the Olympic spirit as the notion of a collective sport event is lost. (Colombo, 2016) This is also an important argument for the IOC to centralize the organisation of the Olympic games.

However, concentration puts a higher emphasis on the space that is available in proximity of the host-city. Hosting a concentrated Olympic Games within the city centre will inevitably lead to demolishment of the existing urban structure. This leads to the loss of any historical notion of the place and attachment on the local scale (Verhagen, 2007). According to ' Schetsboek, ruimte voor Olympische plannen (Boersma and Keijsers, 2008) also the presence of a suitable amount of transport possibilities is important to the choice of centralization as it has to be capable of handling vast amounts of visitors. "The connection to international railways has to be good, as well as it features a strong network of high-quality urban public transport". A location outside of the city offers space for a concentrated event, but requires a large infrastructural investment as the capability of required public transport facilities is often not present yet. The

presence, upgrade and re-use of existing sport venues is the third condition to choose for a (de)centralized model.

Conclusion to type of event

From a point of valuable urban regeneration on local scale, the (de)concentration of the Olympic venues is of high importance. Opposing the idea of a highly centralized Olympic Games as the necessity of creating the Olympic spirit, an decentralized Olympic Games is argued to reduce the environmental impact to the local scale in terms of required open space, which reduces the possibility for demolishment of the urban structure and increases the livability of the Olympic venue as less open space is required fostering integration in the urban structure. It reduces necessity of transport infrastructure and the increases the possibility for re-using as much as possible existing sport venues, which in turn reduces the amount of required funds for the organisation of the event and extends the benefits of hosting the Olympics into the region. Therefore choosing event, location and form is very important

considering the design and strategy of a mega-events and to the Olympic Games.

2.5.3 - Funding

Stakeholders

Except for the three differentiated main actors within mega-event planning related to the Olympic Games, (IOC, host-city, host-city residents), there are a multitude of actors related to the funding of the Olympic games. A large actor group are the main sponsors of the Olympic Games. Involved are also private investors, national governments, attendants of the event and so on. Boersma and Keijsers (2008) provide an overview of the income/funding that is related to the organisation of the Olympic Games since 1992. The revenue from marketing related themes are gathered by the OCOG (Organizing Committees for the Olympic Games) of which 90% is for the benefits for the NOC's/IF's and OCOG's and approximately 10% is for the IOC.

Ticket sale

IOC mentions that the amount of ticket available for the last two Olympic editions are approximately 8.7 and 7.5 million tickets (IOC, 2016)(ANP, 2016). The costs of these tickets during the games in Rio varied between 13 and 1500 euro's. Half of it was approximately 23 euro's, "the organisation calls that payable and wants to persuade the local inhabitants to attend the sport event" (ANP, 2016). Still criticism on the ticket sale focusses on the price of each ticket and amount of tickets distributed to the citizens, which are still too high and too few, excluding possibilities for lower-income inhabitants to attend the event.

Television Rights

Since the introduction of broadcasting the Olympic Games on television, in 1936 in Berlin (IOC, 2016), the revenue from broadcasting rights is ever growing, as the size of the Olympic Games, the amount of sports and the amount of spectators on television are growing (3.6 billion. In 2012 the Games were broadcasted in 220 countries and created an income through broadcasting rights of 2,6 billion euro's.

Sponsoring & License

This is mainly gained from long lasting sponsorship programmes, for example the TOP programme, consisting of 8 main sponsors, and the merchandizing of Olympic related products as souvenirs, dolls but also the use of Olympic marks, imagery and themes to third party companies. The main sponsors of the Olympic movement are among others Mc Donald's and Coca Cola, Samsung & Panasonic. The first two are doubtful sponsors in their relation to sport and a healthy lifestyle. Sponsoring generated an income 1.15 billion euro's for the games of 2012 and licensing gained added approximately 110 million euro's that year.

Other incomes

With this post Boersma and Keijsers (2008) combined the incomes of Olympic Games related cultural programmes, lotteries and advertising and commercial activities outside of Olympic boundaries. It doesn't specifically elaborates about the products or precise programmes concerned with it, though it is imaginable that it relates to buildings as museums and commemorational events that are sometimes related former hosting of the Olympic Games.

Donations & subsidies

Also the theme of donations and subsidies are not further elaborated on, although there are accounts of sponsoring from private investors as well as it is imaginable that the NOC's and IF's receive donation from their native countries.

Destination

In the same figure the destination of the funding can be distinguished. Note that there is a sincere difference in between the funding and the . This has to be compensated somewhere. Since all commercial and institutional funding are displayed, the negative financial saldo is on account of the host city and host-country. This residue costs could affect the prosperity of the host-city and its citizens if this is above the capacity of the initial budget and the possibility to divert it from elsewhere.

Destination of the costs can be divided in the following components. The spatial footprint and implementations of these components will be elaborated further on, as well as it gives a more deliberate description.

Operational costs

This expenditure is concerned with the logistics of the Olympic Games, transfer costs, food packages, security and information, medical help, distributions of the thousands of volunteers and so on. Over the years this seems to be the most steady and predictable costs in relation to the organisation and execution of the Olympic Games. A notion is the increased concern with safety and security, related to the emphasis and threat of terrorism, which increased the operational costs of Athens and London subsequently.

Infrastructure and telecom

To broadcast the Olympic Games to all 220 nations, the telecom system of the host city needs to be perfect (Smith, 2012). The construction of satellite towers, communication systems and media centres are necessary to provide this level of coverage. High quality infrastructure to cover the transport of spectators, athletes, trainers and officials are crucial, but also to provision of electricity, capable sewage systems and water management can be counted to infrastructure. As the amount of visitors grows. Depending presence and location choice of the sport venues, infrastructure can require the biggest investment of all items. It is highly recommended to incorporate the construction of the infrastructure into the development plan of the city.

Sportvenue's and facilities

All sports need to be held in appropriate venue's and a certain amount of spectators will be attracted to these sports. Depending on the kind of sport as well as their popularity, parking, open space, logistics area, warm up field and so on are required. Also park structures and leisure opportunities for visitors of the Olympic Games are part of this item. The architecture of the sport venue plays a major role to the costs. To be representative, exciting constructions and larger than necessary structures are designed by famous architects and erected at quite a risk of overrunning budget estimations. Earlier mentioned Olympic stadium of Montreal is a beautiful example. Also the question if to build new or reuse and upgrade existing sport venues is of importance. Boersma and Keijsers have to add to this statement, that the savings of creating temporary structures "stays limited to a maximum of 30%", though maintenance costs and unnecessary sport accommodations after the event are avoided.

Olympic village & external housing

In general the Olympic Village has to house approximately 18.000 athletes and coaches that attend the Olympic Games. Though later on an investigation of required programme and attendants is executed, the Olympic Village can be divided in several zones. A private residential zone, an international zone. Also the media and officials need to be housed somewhere, this can be either in a media village or in hotels throughout the city, depending on the hotel capacity in proximity of the host city. With the construction of the Olympic village, also other housing programmes can be initiated, as exampled in the construction of the Olympic Village in Barcelona (Lei & Spaans, 2009). If the location of one of the sport venues is too far to meet the requirements of the Olympic games according to transport, an additional village is constructed.

Residue costs (environment & integration)

Concerning the image of the city, the representativeness of the city and the livability and integration of the side, great efforts are made redevelop the environmental conditions of the site and the city. This can be through cleaning of polluted soil, but also non-spatial measurements can be taken. Beijing has put much effort to change the environmental conditions of the city, in order to present and keep a less polluted city. As one of the measurements, the city shot rockets with chemical mixtures that accelerated the creating of rainclouds, cleaning up the smog of the city. For the matter of integration, Verhagen argues, the OCOG can make more effort to integrate the Olympic Games into the local scale.

Conclusion to funding

Differences in the amount of spending on different sections highly depends on the choices that are made in the other subjects of mega-event planning, as well as the interests of the involved stakeholders and the ambitions of the leading political parties within the host-city and the host-county.

In relation to the thesis and to the interests of the citizens of the host-city, the costs of the organizing and construction of the Olympic should be not exceeding premature costs calculations (Muller, 2015), and should be arguably as low as possible if there is no indication it can clearly benefit the local scale as well as the whole city. An elaborate strategy for funding the Games though, is not within the reach of an urban designer, but to the finance departments op the host-city, accountants and financial advisors.

2.5.4 - City Development

Construction works

The amount of construction works depends on the current state of infrastructure and sport accommodations, as well as provision of housing possibilities and the positions of the Olympic venues. The necessity for redevelopment can either result in the demolition, restructuring or construction within the existing urban structure. The following chapter provides a list of as many as related possible construction works that can occur in the preparation to the Olympics. Chalkey & Essex (2003) divided this into the following list:

Sport facilities

Sport stadiums, sport complexes, sport halls, warm up fields, training locations, greenfield, waterbodies, marina's.

Transport

Highways, major roads, railroad tracks, metro lines, tram lines, parking lots, public transport stations, footpaths.

Accommodation

Olympic village, information centre, services, restaurants, hotels

Other physical urban improvements

Olympic park, plaza, landmarks, art sculptures, sewage, telecommunication networks, paths, garden, trees, cultural infrastructure as museums, art galleries, tourism shops, hospitality, national celebration locations.

Impact

The impact of a mega-event can be distinguished in three different phases. The impacts of the event city-development in the organisational process, the impact of the event on the city during the event itself and the impact on city-development after the event, its legacy. The steps made in the organisational process can already influence the legacy of the Olympic Games, as for example a wrong estimation of the initial costs or project delays, increase the spending on the construction works, which has to be compensated inside the project or outside the field of the project. In contrary, high involvement of local authorities in the

decision making process, preserved the social rights of tenants and housing and job opportunities (Chen, 2012, p. 13) Decisions made in the organisational process are irreversibly entangled with the legacy of the event. Though for the sake of clarity, the impact from the legacy of the Olympic Games will be discussed in the next section, as for now only the direct impact of city development in mega-event planning will be investigated.

The impact of construction works in the preparation to the Olympic games and the Olympic structures during the event, mainly affect the local scale physically through three main characteristics.

Displacement

Displacement through Olympic related construction are present in every editions of the Olympic Games, although, depending on the location choice and size of the construction work this amount is variable, as well as is the compensation from the forced displacement. In Beijing there are reports of the displacement of almost 1,5 million inhabitants due to Olympic related construction work. Other editions have caused far less severe displacement, though on a local scale and on the individual, this always raise concerns about

having at least a proper compensation. In London the removal of dozens of allotments within the site of the future Queen Elizabeth Olympic park created fierce resistance.

Gentrification

Gentrification is also a type of displacement, but through the increase of price for provisions. Investment to the redevelopment of deprived neighbourhoods can attract wealthier types of businesses and inhabitants, which in turn increase the overall prices in the area, making it harder for lower-income households to maintain themselves and are eventually forced to live elsewhere. As mentioned early, already bidding for the Olympic Games can draw attention and investment to the bidding city. Securing these rights further boosts the interest of investors, which can lead to early redevelopment and price increase prior to the event. Prior to the Games of 2012, Hackney Wick experienced an increase in investment as numerous cafés were buying out properties to set up new restaurants in proximity of the Olympic site (Cann, 2016).

Exclusion

The construction of specific Olympic Games related structures, as for example enclosed training locations

and Olympic priority lanes on the highway can exclude the athletes, but also the Games itself from the citizens of the host city. Especially when an emphasis is put on showing the best features of the city, An example of this is the construction of a new highway to one of the Olympic venues in Rio de Janeiro (VOX, 2016). By building a sound barrier next to the highway, the government pretends to care for the local residents by preventing to from noise pollution. But instead of the normal translucent glass walls, around the favelas (slums of Rio de Janeiro) the walls are of concrete.

Loss of connection

"Notwithstanding the forced physical dislocation of people from host sites, major events cause social dislocation. Local people may struggle to find meaning, a sense of identity and a sense of connectedness in their own neighbourhoods as spaces are transformed by major events" (Smith, 2010)

Conclusion to construction work and impact

Hosting the Olympic Games requires an enormous effort to construct a variety of structures, which can be distinguished in three different levels. (figures 19-21)
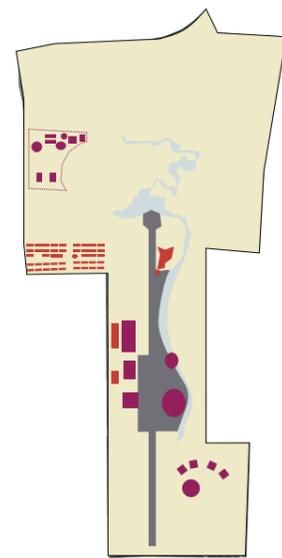
Figure 17 - *Olympic related projects first level (in the Beijing 2008 Olympic park): Olympic park and venues.*
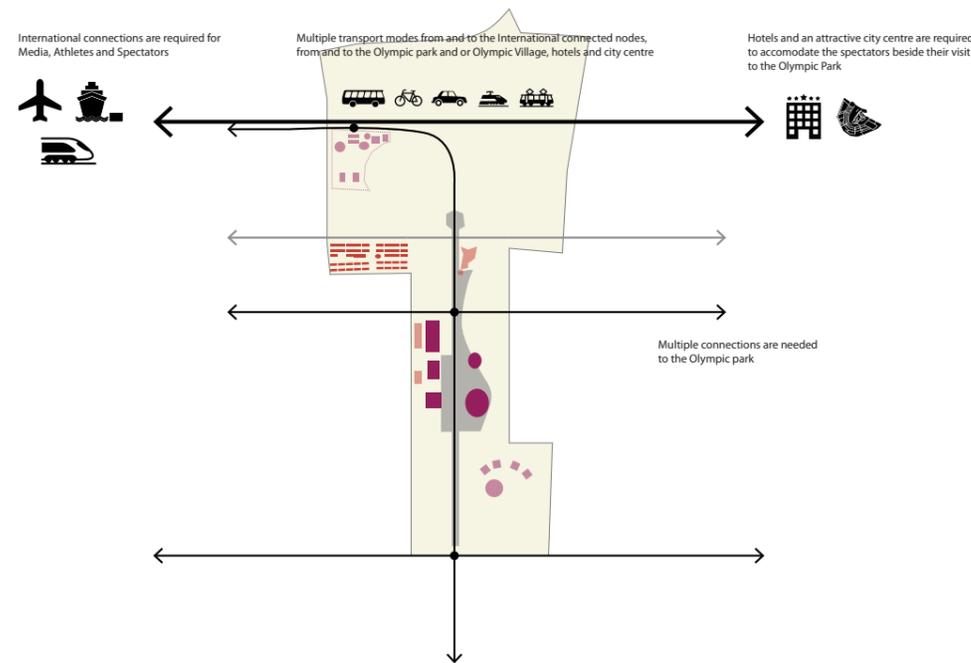
Figure 18 - *Olympic Games related projects second level: Transport infrastructure.*
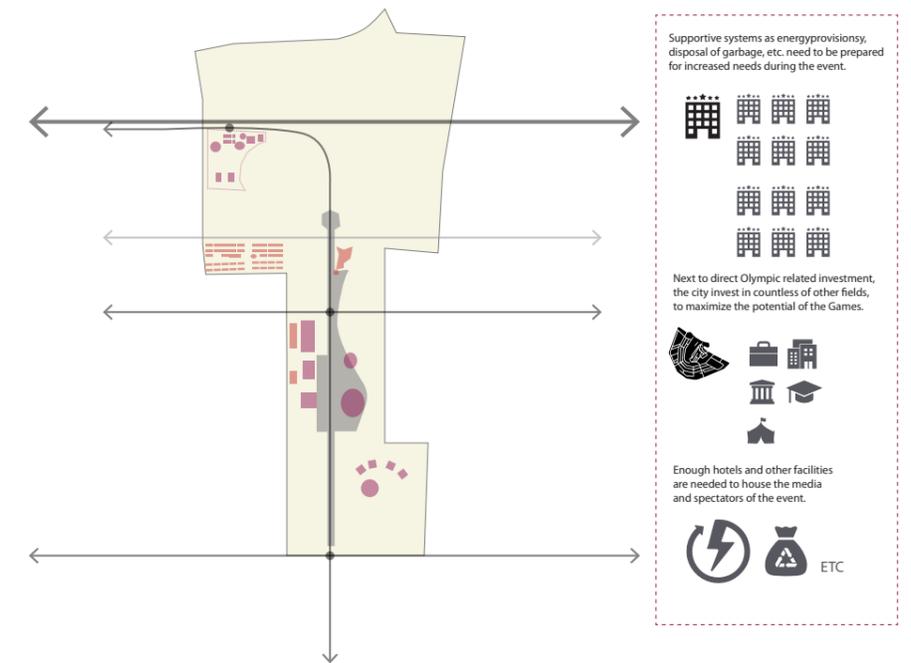
Figure 19 - *Olympic Games related projects second level: Transport infrastructure.*

The first level is the creation of the Olympic park, with accompanying sport venues, often the Olympic village, landmarks and telecommunication related buildings. Also there needs to be plenty of space to create temporary halls to check athletes, tickets to the site, to the venues and to accommodate reporters during the event. These structures are situated around an Olympic Axis, the backbone of the site, between the different sport venues, which is used a main street for visitors.

The second level considers all the means to access the Olympic site and Olympic village from the international connections nodes as well as other sport venues. I consist of multiple public transport modes, as busses, trains, metro, but also carparks, highway construction and slow traffic modes on local scale such as walkways and bike paths. These are constructed in order to transport athletes, officials, press as well as visitors, to their destination in orderly fashion. Depending on the infrastructural capacity of the site and the host-city, the means the city want to achieve, this infrastructural projects often form the most expensive part of organising the Olympic Games.

The third level of construction works encompass all the other required projects that are necessary to hosting an (mega-)event. This means sufficient measurements toward energy-production, waste-management, entertainment, places to sleep and eat. Again, depending on the overall goals of the host-city in organising the Olympic Games, major expenses can be invested into the beautification of the city, realising highly efficient energy-production systems or reinforcing ecological areas.

Olympic related construction works, the structures placed into the build fabric of the host-city, impact the host-city on multiple scale levels as well as in different periods of time. In this chapter, only the impact (legacy) of Olympic related projects, in the pre-event stage (bid and preparation) is regarded. The legacy of these projects after the Games are numerous and are depending on the successfulness of the Games as. The projects types and construction works in advance to the Games set the stepping stones on which the after-event legacy of the Games can be build. This after-event legacy is researched in the next chapter and put into overview.

For this thesis, with the eventual goal of making an urban design for an Olympic venue and research the relationship of the Olympic legacy to enhance the social sustainability of the host-city, the first level and second level of Olympic related construction works is most important. The aim to create a social sustainable legacy, with design of the Olympic programme, applies to both levels. The Olympic park as the mean to go to and make use of its facilities, the infrastructural projects as the mean to reach that place. In order to simulate an feasible edition of the Games, the third level cannot be neglected, though this will not form the core of this research. Hence this overall relationship stresses the importance that designing for the Olympic Games is not an process of putting some programme blocks together, but forms an integrated project without precedents.

2.5.5 - Public Opinion

Image
The Image of the Olympic Games has changed over the course of time and is also depending on the image the host-city wants to proclaim. The following slogans by previous host cities for branding, exemplifying the intentions and emphasis on hosting the Olympic Games. In general the brand of the edition can differ between the proclamation of a type of feeling up to a desired image of the host city, although the branding of the image differs between planning, bid and host-stage (Boersma and Keijsers, 2008). In addition to this, it can be argued to have a certain branding in the legacy phase as well, to keep draw attention to its post use.

Barcelona 1992: Friends forever, drawing attention for Barcelona as a pleasant tourist destination.
Atlanta 1996: The celebration of the century, to proclaim the 100 year existence of the Games and proposing this is the best celebration of the Games yet. (it wasn't).
Sydney 2000: Share the spirit, to convince the world of the pleasant atmosphere in the country.
Athens 2004: Welcome Home, referring the homecoming of the Games to its country of birth.
Beijing 2008: One world, one dream. For the whole world to join the spirit and build a better future for humanity.
London 2012: Inspire a generation. To draw attention to this Olympics had young talent and social change at

the heart of their planning.
Rio de Janeiro 2016: A new world. Emphasizing the concepts of transformation through sport and changing the world for the better. Also it draws attention to the first Olympics on the South-American continent. (COC, 2016)

Era

During the years, public opinions about the goal of hosting the Olympic games has changed as well as the purpose of the host-city for bidding and organizing the event. Chalkey and Essex (2003) distinguishes four eras within the history of the Olympic Games and the impact of them on urban transformation. To this four eras "Phases Five and Six should be added post-2002 to include the environmental, sustainable development and regeneration features of subsequent Games, in particular the planning for Vancouver 2010 and London 2012". (Sadd, 2012) In her doctoral she proposes an altered scheme which incorporates the present situation of Olympic development (fig. 4).

	SUMMER OLYMPICS	WINTER OLYMPICS
PHASE 1	Small scale, poorly organised and not necessarily involving new infrastructure	Minimal infrastructure transformation apart from sports facilties
	1896 1904	1924 1932
PHASE 2	Small scale, better organised and involving construction of purpose built facilities	Emerging infrastructural demands, especially transportation
	1908 1932	1936 1960
PHASE 3	Large scale, well organised and involving construction of purpose built sport facilities with some impact on urban infrastructure	Tool of regional development, especially transportation and Olympic Villages
	1936 1956	1964 1980
PHASE 4	Large scale, well organised and involving construction of purpose built sport facilities with significant impacts on urban infrastructure	Large scale, urban transformation, including multiple Olympic Villages
	1960 1996	1984 1998
PHASE 5	Urban regeneration projects are recognised opportunities within the Olympics and for place image. Scale of developments are in risk for imploding. Legacy planning and community involvement are gaining momentum	Events are used for image transformation, some community involvement, environmental concerns feature significant in planning
	2000 2008	2002 2006
PHASE 6	Less extravagance, collaborative planning and urban regeneration are hosting rationale. Prominent role for environmental issues and legacy planning	Prominent role for environmental issues, especially in mountain regions, colaborative planning essential
	2012 >	2010 >

scale of event   importance of infrastructure   level of organisation   idea behind organisation   sustainability as a important measurement
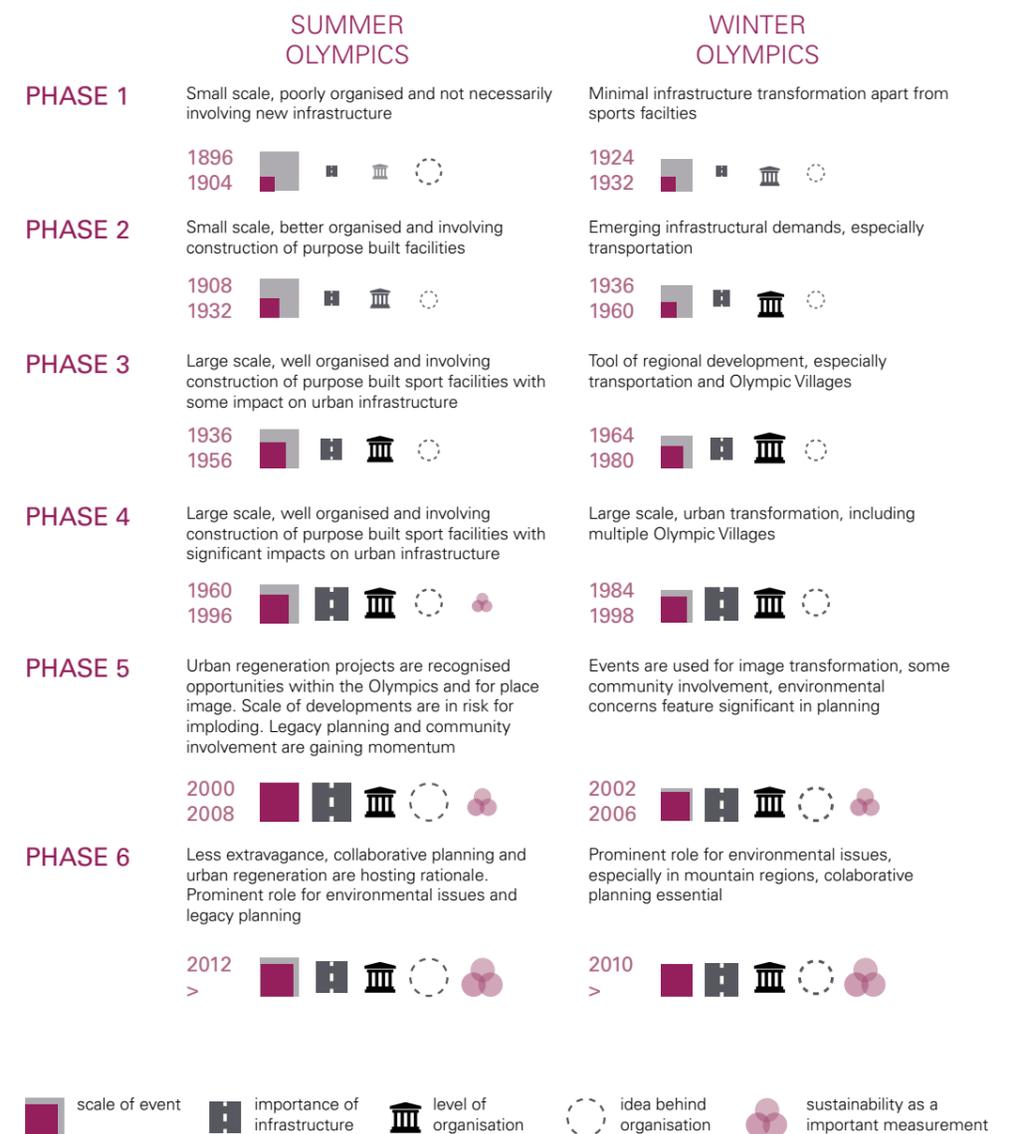
Figure 20 - *Growth of urban regeneration purpose and possibilities by organizing the Games.*

33   34

Kirchert and Reinderts (2014) argue as well that the emphasis of current Olympic Games lie in the creation of a sustainable urban form. XML (2012) proposes, that after another cycle of twenty years, the identity of the Olympic Games shift and therefore the emphasis of future Olympic Games should lie in the possibility to incorporate it in long-term global developments and their future ramifications instead of focussing what the Games mean today.

ONE WORLD • ONE DREAM

BEIJING • PEOPLE'S REPUBLIC OF CHINA
GAMES OF THE XXIX OLYMPIAD

2.4.5.3 - Conclusion to public opinion

The public opinion is very important to the decision to bid for the Olympic Games. In the problem statement it is mentioned that the general image of the Olympic Games is twofold; A celebration and a painful remnant. Therefore it is very important to show an image to the public that the Olympic Games can be sustainable and this remnants are put into good use. Past decades showed a shift from sole city promotion, or testify of the importance of the edition, to the Games as an enterprise to create and enhance sustainability, with large, city wide projects. As contemporary precedents show, this image (Beijing, Rio) isn't always proving its promise yet.

In order to convince the public and the clients, it is very important for an urban designer to show an image of how the Olympic Games could be sustainable in this place. The aim to change the identity of the Olympic Games as a opportunity to enhance the social sustainability of the host-city is therefore leading and should be communicated convincedly, though thinking of slogan and branding the Olympic Games itself is not to the urban designer, but to the department of image branding or promotors of the Games. For the thesis, therefore, the image of the Olympic Games itself is very important, but actual promotion is not within scope and stays within the abilities of the urban designer.

2.5.6 - Conclusion to mega-event planning

Within the field of mega-event planning in relation to urban regeneration, according to Vrijaldhoven (2005), four matters are important.
1) The type of event determines the opportunities which the host-city can enhance in order to reach its development goals. This type of event needs to be in correspondence to the aims of the host-city, as too large can be a dangerous waste of investment as where too small will not be able to catalyse the aimed urban projects. Second to this is the situation within the city, which is crucial to the type of change in the build fabric the host-city tent to achieve.
2) A profitable funding of the event is crucial to its successfulness and the will for future host-cities to bid for the Olympic Games. Therefore it is important to invest wisely, prevent the creation of prestigious buildings or unnecessary projects, while minding the requirements of the funding stakeholders. In previous Olympic Games, regarding from Barcelona 1992 till present, the overall balance between costs and benefits, is negative. This loss is defended by opportunity the Olympic Games can create in ' hard to quantify' outcomes, such as economic attractiveness or social capital (Lei & Spaans, 2009). For the Olympic Games, while enhancing it for extensive urban regeneration, it is hard to maintain an positive balance, though the immeasurable legacy, which serves as an argument to the negative balance, should be very well thought of.
3) City development defines the projects that are required in order to reach the general goal that is aimed by mega-event planning and the potential impact it has throughout time. For the Olympic Games it mentions that there are numerous type of Olympic related projects which can be distinguished in three levels: The Olympic park and venues, the transport infrastructure and the supportive structures. The construction projects set the base on which the after-event legacy can be developed, though it also impacts the host-city, the urban structure and its inhabitants already in the pre-event stage. These 'pre-legacies' impact the after-event legacy by influencing the conditions for development. The violent displacements in anticipation of the 2016 Games in Rio, shed a negative image on and of the Olympic Games, therefore negatively influencing Rio de Janeiro as a stable and prestigious city to settle and invest.
4) As previous example showed, the image that

the mega-event enhance, is very important to the . This image branding and identity of the Olympic Games, changed over the years, from a modest sport celebration with minor urban impact, to a enormous festival, aiming for large scale sustainable development. However, the overall image the Olympic Games want to promote, is the idea of Olympism, of sport as a mean to global social development. Still, neither achieving the aims and image of sustainable development or answering to the fundamental idea of Olympism is often succeeded.
These four topics within mega-event planning needs to be well integrated in order to reach successful urban regeneration.

For the thesis, only the topics which are highly influenced by the urban designer and relate to the research question will be touched upon in the design. These topics are the type of event, meaning the Olympic Games, which should be in an appropriate position within the host-city to reach the aims of creating a design that enhance the social sustainability of the site and reinforce this. This is achieved by design within the first and second level of Olympic

related construction works, namely the Olympic Park and venues and the transport infrastructure required. This design is aimed to create a legacy that enhance the social sustainability of the host-city, specifically on the scale on the neighbourhood, and has to provide an answer how this reinforced social situation can contribute to the sustainability of the site and solves the issue of 'dead empty spaces'. The other topics of funding and image should be considered, though not extensively elaborated and analysed.

2.6 - POTENTIAL FOR URBAN REGENERATION IN THE OLYMPIC LEGACY

In order to research the relationship between Olympic legacy and urban regeneration the definition of Olympic legacy is examined. In the aftermath of the Olympic Games there are either legacy and impacts. The definition of Preuss for legacy is used for the definition of Olympic Legacy. "Legacy and „impact are used interchangeably, „impact within an Olympic context is often employed to denote negative or adverse effects of a policy or programmed on society, the economy or the environment; whereas „legacy is used to describe mainly positive and longer-lasting effects" (Hollins, 2013, p.41). In order to show the positive possibilities of the Olympic Games to foster urban regeneration and eventually can enhance the social sustainability, this section puts an emphasis on the legacies of the Olympics. Eventually A critical note through the attachment of possible impacts of these specific defined legacies, as ones cannot be underestimated.

Preuss (2007) defines the term of legacy as: Irrespective of the time of production and space, legacy is all planned and, unplanned, positive and negative, tangible and intangible structures created for and by a sport

event that remain longer than the event itself. This definition is still a broad classification of what legacy can mean, and it applies for legacy to be both negative and positive. For the sake of clarity, the distinction of Hollins between impact and legacy will be used further on.

There are according to Preuss, there are multiple ways to analyse the Olympic legacy. One of them is measuring the legacy by benchmarking. Based on past experiences from other mega events a forecast of the final legacy is made during the planning stage. This method is used to analyse, through a case study, what the performance of the Olympic Games in London 2012 is on the topic of social sustainability on the local scale.

The themes within legacy of the Olympic Games can be defined in a series of soft structures and hard structures (Preuss, 2007). This classification of the hard structure elements doesn't correspond with the researched construction works in the section about mega event planning, as for example the Olympic village cannot be regarded as a second structure. However, this classification puts forward the soft legacies of the Olympic games. These are very important to bridge the gap between the spatial implementations and the possibility to enhance the social sustainability.

Cashman categorized the legacies of the Olympic Games into six fields, containing both soft and hard legacy structures. This legacy categorization is of greater value as it offers the possibility to relate the planned spatial programme to the legacy and impact it has for the local scale. Based on existing literature and own common sense of experience with the Olympic sites the following (Kirchert & Reinders, 2015, Leopkey, 2012, Gratton & Preuss, 2008, IOC, 2015):

Preuss (2007) also proposes a process of building up a planned event legacy. It emphasizes the importance of taking into account the links between the pre-event measurements, the used structure during the event and the purpose of the structures after the event. This is of great importance in the design of the Olympic Games, to make the link between the former structure and the future use, with or without any alterations.

The relation between Olympic legacy and urban regeneration lies in the possibility of the defined legacies to resolve issues related to economic, physical, social and environmental condition. To further define exactly the target points of this Olympic legacy within its aim for urban regeneration a investigation and definition of social sustainability within urban regeneration is required.

For further use in the thesis, which aims to design for the Olympic legacy, enhancing the social sustainability, it is of importance to make a selection of this multitude of Olympic legacies. A categorization of priorities is made in constructing the focus points of further design.

Figure 24 - *Legacy frame according to Preuss (2007).*

Figure 25 - *Types of legacy and when at in which phase they might occur.*

type of legacy	postive legacy	negative legacy	line of progress
SPORT LEGACY	- High class sport complexes - Training fields for general use - Leisure structures - Increased sportparticipation	- Oversized underused sportstructures - Sole sport oriented program	
ECONOMIC LEGACY	- New sport related contracts - Attraction global oriented coorporates - improved tele - communication - new hotels, & night life program - local business opportunities - international reputation	- Permanent loss of tourists - Interests depend on succesfulness of the event - but a temporary visitors increase - voluntary jobs not permanent	
INFRASTRUCTURE LEGACY	- High quality public transport - Green Olympic park - Improved public spaces - Improved accesibility - Reduced pollution - Increased level of ecology	- Construction of unaccesible infrastructure - Oversized, underused car oriented structures	
INFORMATION AND EDUCATION LEGACY	- Educational programs - Tourist centres - Logistic knowledge - Event management knowledge - Volunteering experience	- Voluntary jobs are not permanent	
PUBLIC LIFE, POLITICS AND CULTURE LEGACY	- New service buildings and shops - High quality housing - Renewed community spirit - Increased safety - Local political cooporation - Inter-regional cooporation - Enhanced cultural status - Increased overall health	- Tax increase - Underestimation of costs - Loss of identity - Repression by security measures - Lack of involvement local stakeholders	
SYMBOLS, MEMORY & HISTORY LEGACY	- Change of the build structure - New logo's, signs and an Olympic identity - Creation of landmarks - Records & publications - Step towards global harmony - Intense national pride	- Change of the build structure - Loss of historic value - Trust and pride depending on succesfulness Games	

2.7 - ASPECTS OF SOCIAL SUSTAINABILITY IN URBAN REGENERATION

To research the relation between social sustainability and urban regeneration the concept of sustainable development is explored. After the current aims of social sustainability in development are elaborated and investigated what the current emerging principles of social sustainability within urban regeneration are. It concludes with a statement about the importance of social sustainability within urban regeneration and how can this can be realized.

2.7.1 - Social sustainability in theory

Social sustainability is embedded within the principle of sustainability, often mentioned as the three overlapping circles of economic, environmental and social sustainability. Sustainable development is achieved by addressing the social, ecological and economic conditions *"The challenge of sustainability is to limit the environmental harm created by human activity while reducing the deprivation and suffering resulting from poverty as well as excess"* (Dillard, Dujon & King, 2009, p. 1) It consists of In opposition of this statement, Phillip Sutton in Mc Kenzie (2004, p. 7-8) states that: *sustainability is not "about" the integration of ecological, social and economic issues, nor is it "about" widespread consultation, nor is it "about" improving quality of life. It's about maintaining or sustaining something. To understand the concept … you need to identify the focus of …concern.* In the case of urban regeneration within Olympic legacy and mega-event planning, the lack of involvement of citizens of the host city proved to be very much of concern.

For social sustainability Magis & Shinn (2009) conclude that in order to achieve social sustainability human beings of every generation should not merely be possible to survive, but also to thrive.

The specific conditions on which these communities can thrive is not very clear, as terminology within social sustainability is vague and overlapping (Dempsey, 2011). In order not to get lost in a multitude of concepts, approaches and explanations, a straight investigation into the measurements of social sustainability that are influenced by urban regeneration is preferred. In "Measuring Socially Sustainable Urban Regeneration in Europe" Colantonio & Dixon (2009) investigate the relationship between social sustainability and urban regeneration. They investigate different strategic plans, implemented in different countries in Europe, and the used policies in their efforts to maintain and

1. - DEMOGRAPHIC CHANGE

by aging, migration and mobility within social classes, the inhabitants composition can change, influencing attractiveness of the area

2. - EDUCATION AND SKILLS

by improving the educational level and skills of the inhabitants, better opportunities for employment can be ensured

3. - EMPLOYEMENT

employment status influences the capability of inhabitants to invest in their house, environment as well as climbing the social ladder

4. - HEALTH & SAFETY

improving the health and safety of the citizens costs of daily care as well as stress levels can be reduced and improves the image of the neighborhood greatly

5. - HOUSING & ENVIRONMENTAL HEALTH

a safe and well designed environment fosters housing prices as well as flexible high quality housing ensures inhabitants satisfaction

6. - IDENTITY, SENSE OF PLACE, CULTURE

a safe and well designed environment fosters housing prices as well as flexible high quality housing ensures inhabitants satisfaction

7. - PARTICIPATION, EMPOWERMENT, ACCES

partipating in neighborhood initiatives, program and offered acces to decision making processes fosters trust and residents satisfaction

8. - SOCIAL CAPITAL

the network of relationships between residents which enable them to function effectively to issues in society and possible threats

9. - SOCIAL MIXING & COHESION

its argued that the creation of a mixture between different social classes fosters knowledge exchange as well as cohesion reduces tensions inbetween groups

10. - WELLBEING, HAPINESS, QUALITY OF LIFE

overall hapiness, created by and integration of previous measurements increases neighborhood satisfaction, reducing risks of protest and voilence

Figure 26 - *10 measurements of social sustainability affected by urban regeneration as devined by Colantonio & Dixon (2009)*

39

foster social sustainability within urban regeneration. They conclude that Urban regeneration can create at potential output in the following social sustainability areas (fig. 1)

They also mention that image and branding are crucial for the social regeneration of city areas.
Neighbourhoods for regeneration are often recipient areas for low-income newcomers to the city, due to affordable rents and lower cost of living. The projects try to improve the image of these places in order to attract new inward oriented investments in social, economic and green infrastructure, as well as middle-high income people.

"Single task ad hoc agencies and public private partnerships (PPPs) are beneficial vehicles to deliver self-sustaining and socially sustainable urban regeneration projects. In addition, a well-resourced and integrated approach to regeneration supported by diversified and continuing funding is crucial to deliver sustainable communities and avoid piecemeal interventions."(Colantonio & Dixon, 2009, p 4).

From this perspective research can be set up; A case study on the social sustainability performance within the urban regeneration caused by the Olympic Games. Both the mega-event planning as well as its final legacy can be assessed to this . Programmes and designs aimed for one of these measurements can be called a principle for social sustainability. In this way a catalogue can be build up. By assessment of their performance, by marking between -2 and 2, a selection can be made between effective and ineffective principles. These principles will be marked on both global and local scale. The sum of these programmes gives an indication to the extend the Olympic Games in London tried to achieve social sustainability.

Figure 27 - *Venn diagram of sustainability principle.*

40

2.7.2 - The use of five social sustainable aspects

Social sustainability is one of the three aspects of sustainability, together with economic and environmental sustainability. The enhancement of all three within a regeneration project is called sustainable. If one of the sustainability aspects is neglected, the project can be either bearable, equitable or viable. If the project aims to be sustainable, it needs to think about the economic and environmental aspects as well.
Within regeneration, Colantonio & Dixon (2009) stated that there are 10 concepts in which urban regeneration can enhance the social sustainability. From these concepts five are chosen as valuable for social sustainable and overall sustainable regeneration as they can be positioned on the intersection of social sustainability with either environmental or economic sustainability (Figure 28).

1. Education and skills
2. Employment
3. Health and safety
4. Housing and environmental health
5. Identity, sense of place and culture

These aspects, that enhance the social sustainability in urban regeneration, are not more than a frame that help defining what can be done to enhance social sustainability and need to be defined further. Next section will research spatial measurements that enhance these five social sustainability aspects.
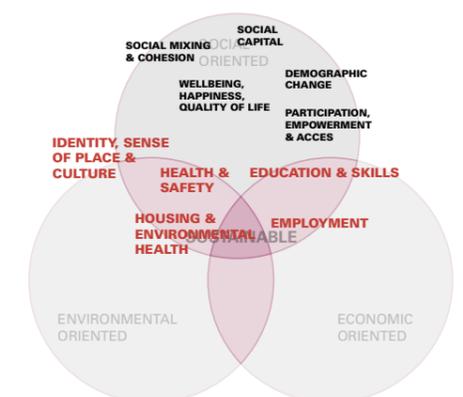
Figure 28 - *Chosen social sustainability aspects (red) projected on the Venn-driagam.*

2.8 - SPATIAL MEASUREMENTS TO ENHANCE SOCIAL SUSTAINABILITY

To define the practical measurements as input for the case study analysis, for urban design it is vital know the spatial conditions on which each of the five social sustainability concepts can thrive. In a collective work 'design for social sustainability', The young foundation, Future Communities and Homes & Communities agency, (Woodcraft, Hackett & Caistor-Arender, 2011) define these spatial measurements. They argue that, in order to reach social sustainability, a multitude of these spatial measurements need to be accomplished. They stress the importance that for social sustainability "Communities need services and support, not just buildings". This means that for a social sustainable design the build environment, consisting buildings, and public space, need to support each other, as well as need to be enhanced by supportive policies. These policies enable the possibilities of the implemented programme. Though Woodcraft, Hackett & Caistor-Arender use a different classification concerning the aims of social sustainability, the spatial measurements are still applicable to the five defined concepts.

2.8.1 - Spatial measures for housing & environment

Meaningful spaces

In order for a space to be not deserted and empty, good thoughts need to be done about the functioning of this space. This means, the present demand to usage of the space forms the parameter for its size. According to Woodcraft et all, these spaces can be filled in by temporary use of green space, community buildings or housing to meet intermediate needs. If these needs are not immediate or in abundance present, it is worthwhile to use programme of smaller scale. Woodcraft et all mentions for example the creation of a community house instead of a larger community centre. At the same time Alexander for example notions that "More than 90 per cent of the people walking about in an ordinary neighbourhood are unhealthy, judged by simple biological criteria. This ill health cannot be cured by hospitals or medicine." and proposes a system of smaller health centres. In short, it means that on every level of time, a function need to be assigned to the space, in order not to be deserted. This can mean intensifying the functional programme of that specific plot or being designed for more than just one purpose.
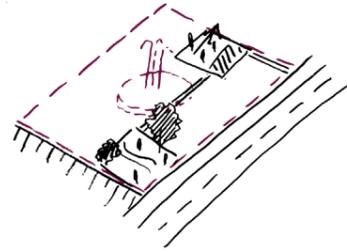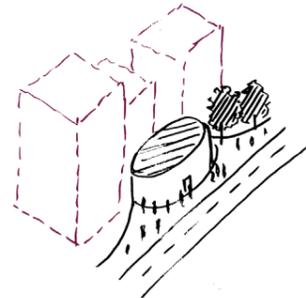

Figure 29 - *Meaningful spaces*

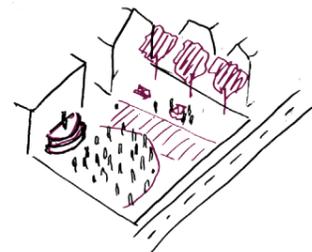**Figure 30 -** *Early provision of basic community services*

Figure 31 - *Public & Congregational spaces*
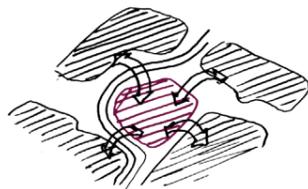

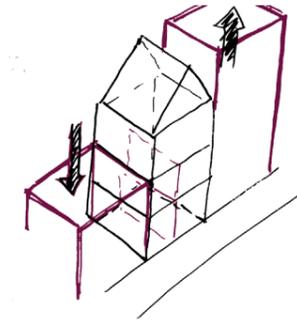**Figure 32 -** *Connections to neighbouring communities*

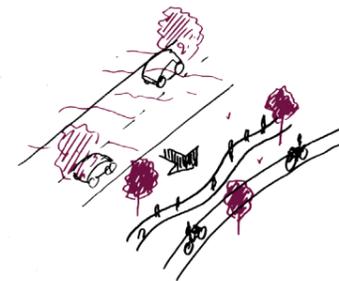**Figure 33 -** *Flexible and adaptable housing and buildings*

Figure 34 - *Low carbon infrastructure*
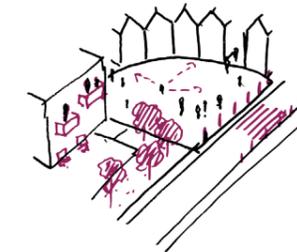
Figure 35 - *People friendly layouts*
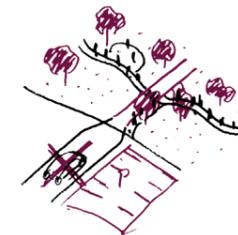
Figure 36 - *Car free areas and speed reductions*

Early provision of basic community services

Together with the provision of new housing, it is important to facilitate services in order to provide in the basic needs of the inhabitants. Considering this services, Woodcraft et all provide the following: shops, community centres, health/wellness, provision, green space. This services can be a temporary provision if permanent is not initially feasible. Permanent provisions will eventually replace the temporary.

Public & congregational spaces

For a well-functioning environment that enhance the social sustainability, it is important to design for spaces where people meet and gather to expose their feelings, talk about events in daily life and take care of each other. "All meaningful social activities, intense, experiences, conversations, and caresses take place when people are standing, sitting, lying down, or walking" (Gehl, 2011, p.72) . All these people need to be attracted by certain accommodation. This can mean an event, but also the presence of shops and other services. They can commute, reside or use the space, and need to be facilitated to do so. For all activities, intense or relaxed, public and congregational spaces need to be designed accordingly.

Connections to neighbouring communities

Connections to neighbouring communities are of vital importance to social sustainability, as it enable and enhances the contact between one and another; By physically enabling people to move to other places, but also socially as it can support the interaction between both neighbourhoods. It defines whether people are able to search for a job outside of the defined area or visit relatives. Contrary, ill-defined connections or a lack of connections at all locks the opportunities of social development and establishing a social sustainable site. According to Stouten (2013, p. 99) 'connections' and 'connectivity' are also seen as vital elements for a sustainable city and preventing exclusion.

Flexible and adaptable housing & buildings

Flexibility in housing stock is necessary within a social sustainable design to meet the continues changing demographics within a neighbourhood. To change function or to adapt to changing income groups is vital to keep a continued occupation of the building. In turn, occupation prevents vandalism and other unwanted activities. Paul Stouten (2012, p.505) mentions "If there is to be any prospect for sustainability it is important that flexibility in the way buildings and floor areas are used does not require radical structural adjustment". Considering the Olympic Games, adaptability of the buildings after the event, is of great importance as the Olympic programme is often too large to suit the demand properly. This tendency results in a limited use of the space, negative balance to keep the venues running and a waste of investment.

2.8.2 - Spatial measures for health & safety

Low carbon infrastructure

Encouraging low carbon infrastructures, such as bicycle and walking infrastructure, will not only improve the environment of the neighbourhood by reducing the total emission of carbon dioxide and other polluting gasses, it also inspires inhabitants to engage in the physical activities of walking and biking. Reduced activity is, together with an unhealthy diet, the great resource of obesities and corresponding diseases. Therefore focusing on low carbon infrastructure not only improves health of environment and inhabitants directly, but also indirectly. Next, bicycle paths and footpaths have another positive feature as the required footprint of for transporting a fixed amount of people is decreased. The amount of space needed to park a single car can accommodate ten bicycles Speck (2012). This means, that bike paths require less space to accommodate more users.

People friendly layouts

People friendly layouts do not only relate to safe use of streets and activity, but also relates to places of residence. First, providing possibilities to travel safe and without considerable disturbances is of great importance. This means that dangerous traffic situations need to be avoided. In order to make this happen, one need to incorporate inhabitants of different ages and different slow traffic mobilities, such as a rollator and scoot mobiles. In relation to spaces it must provide protection against any form of danger and must of a clear layout, without any dark, non-illuminated alleys or blind corners. Jane Jacobs (1961, p.35) mentions

the eyes on the street, the amount of windows and entrances that are located towards the specific space, to be an important gauge of the safety of such a place. "*There must be eyes upon the street, ... The buildings on a street equipped to handle strangers and to insure the safety of both residents and strangers, must be oriented to the street. They cannot turn their backs or blanks sides on it and leave it blind*".

Car free areas and speed reductions

In correspondence with people friendly layouts, car free areas and or speed reductions provide possibilities for a safer use of the area, with a greater pleasure of enjoying the environment without the noise of automobiles, better air quality and lower risks of accidents. The Olympic Games produces an excellent opportunity to create car free areas, and speed reductions as major infrastructure projects are needed to host the event properly. Car park areas form a large part of the Olympic programme. Well situated it can facilitate for park and rides, decreasing pressure on certain parts of the city. In fact, the Olympic park is mostly one big car free area.

2.8.3 - Spatial measures for employment

Transport and communication connections

For the opportunity to attract employment and to reach employment possibilities, a good infrastructure is highly necessary. Considering these interventions, not only a car-based network is vital, but also public transport needs the be promoted for those who aren't able to afford a car. Another argument for public transport is to reduce the parking pressure and therefore increase the attractiveness for visitors and potential clients to these (employment) spaces. Also focus on slow transport networks, as for example walking and bicycling, is vital and of more importance than car-based transport. For the larger scale, connections by tram, metro and train need to be enhanced to ensure a competitive position towards other places in the city and other cities or regions. Stouten (2013, p. 100) mentions that functions or services also disappear because they lack sufficient clients from outside the area. A neighbourhood does not only need networks within the proximity, but does also need well connections with other parts of the region. Good broadband connection and communication systems, are, according to Woodcraft and all, vital to attract employment. The Olympic Games already proofed to be very successful on this point.
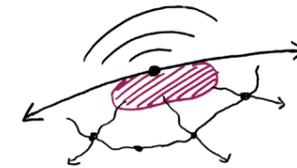
Figure 37 - *Transport and communications connections*
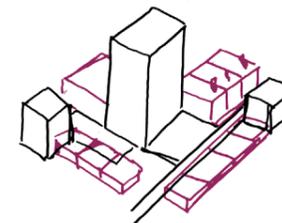
Figure 38 - *Third spaces*
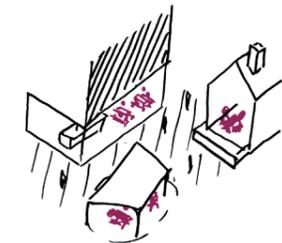
Figure 39 - *Flexible workspaces*
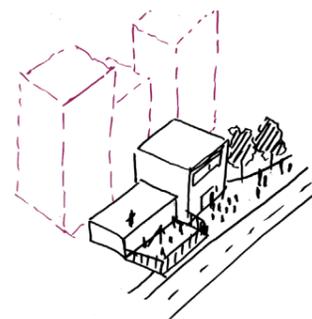
Figure 40 - *Early provision of schools, nursury and childcare*

Third spaces

According to Christopher Alexander in his book "A Pattern language" (1977), to ensure successful employment centres, it is important not only to think about the workspace and the possible type of work itself (low or high educated, local oriented or global oriented), but also facilitate supportive structures to this employment centres. He described the creation of work communities, a highly social interrelated spatial distribution of employment. Alexander describes: "*Build or encourage the formation of work communities —each one a collection of smaller clusters of workplace which have their own courtyards, gathered round a larger common square or common courtyard which contains shops and lunch counters. The total work community should have no more than 10 or 20 workplaces in it*" (Alexander, 1977, p.255).

Flexible workspaces

To be able to work from home or nearby home can enhance the local economy as more time is spend in the local environment and more of the local services will be used. Spaces to do so can be created to facilitate a more local oriented workstyle. Without the need of commuting, more time can be spend to work at projects at home or within the neighbourhood, enforcing the social interaction and cohesion. Next to potential, the Olympics encourage the construction of hotels, event space and shops. In order to be social sustainable these shops need to be flexible and be able to be replaced, especially after the event. Empty shops and buildings highly diminish the environment and therefore possibly needs to be transformed that meet in a way the demand of the neighbourhood, such a housing. Policies should enable such flexibility. Though, these measurements are not related to the direct programme of the Olympic Games. Therefore, although of importance to the legacy of the Games, not a priority.

2.8.4 - Spatial measures for education

Early provision of schools, nursery and childcare
When constructing a living area, the size of a new neighbourhood, early provision of schools, nursery and childcare needs to be available in order to be sustainable. The Olympic Games are often not targeted towards creating a neighbourhood, but are focussed on the provision of a sport event. Creating the possibility and flexibility within the programme of the Olympic Games to transform to early provisions for transformation after, forms a strategy which will enhance the sustainability of the place. It is setting the conditions for development after the Games. Besides only changing the buildings, education and encouragement can also be facilitated by the environment through interactive playgrounds, mini-sport event and educational stands within neighbourhood.

Meaningful buildings
Same as for spaces, buildings should answer to the present needs of the city. For education this means a variety of types of education, but also different levels of education, from high to low education. It is of importance to investigate the present demographics of the neighbourhood and the ability of interventions to support the requested level of education. People with a low-education or immigrant background are often not able to travel far distances due to limited governmental support and a lesser financial position. Therefore, local oriented education institutes should be present, also targeted educating towards jobs that are available in the local environment. Additional education can be provided to broaden the scope of knowledge and improving the situation on the job-market, therefore creating meanwhile buildings. The programme of the Olympic Games can support in this by creating adaptable buildings for other purposes than only sport, meaning more use for the structures.
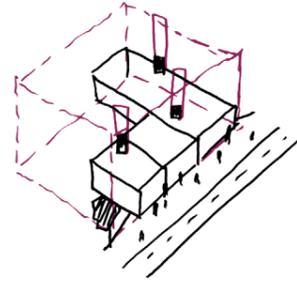
Figure 41 - *Meaningful buildings*

Figure 42 - *Hyper local information*
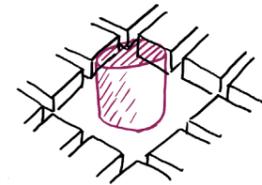
Figure 43 - *Distinctive architecture and landscaping*
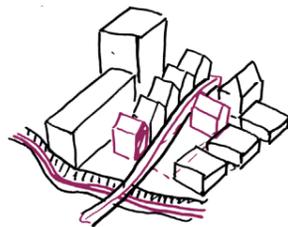
Figure 44 - *Historical development*

2.8.5 - Spatial measures for identity

Hyper local information
In order to inform people about changes within their neighbourhood, a place for information is a relevant feature. Often is mentioned to have a centre with information where plans about construction projects and other events in the neighbourhood are accessible. It is not only a point for information about future projects, but also for gathering information from the residents themselves and enforcing a certain identity. Through slogans and image building a specific identity can be brought upon the local space, such as the presence of the Olympic rings to give the object, space or usage a certain divine stature.

Distinctive architecture, landscaping
The Olympic games form an identity building project par excellence. Through the construction of the Olympic Venues, but also the symbolism through the Olympic Rings and the tower for the Olympic flame, an everlasting identity is persuaded upon the neighbourhood and space. According to Lynch (1960), identity is concerned with the quality of physical objects in the urban environment which can evoke and enhance an convincing image to the observer. This image is formed around a network of landmark, paths, nodes, edges and districts. The identity evoked by the presence of an Olympic venue is highly connected with the contemporary image of the Games.

Historical development
The contemporary socio-spatial and economic situation of the neighbourhood are defined by the developments in the past. Specific typology of neighbourhood, targeted towards a specific income group, enforced by the economic situation . All these events in the past shape the identity of the neighbourhood and its inhabitants at that moment and should contribute to a decision of its future. It takes a while to change the general identity and image of a neighbourhood for spectators. Often only major reconstruction measurements can change this situation (Zwiers, 2017). This major reconstruction projects, like the Olympic Games, are often blamed for neglecting the social-spatial identity. Enhancing historical neighbourhood development, also spatially, is to preserve the identity of the neighbourhood, targeting to reinforce this within a new atmosphere.

	housing & environment	**health & safety**	**employment**	**education**	**identity**
city design	Meaningful spaces		Transport and communications connections		Historical development
neighbourhood design	Connections to neighbouring communities Early provision of basic community services	Car free areas and speed reductions Low carbon infrastructure	Third spaces	Early provision of schools, nursury and childcare	Distinctive architecture and landscaping
local design	Flexible and adaptable housing and buildings Public & Congregational spaces	People friendly layouts	Flexible workspaces	Meaningful buildings	Hyper local information

Figure 45 - *Diagram showing the relation of each criteria to the city scale, neighbourhood scale and local scale.*

2.9 - KNOWLEDGE FROM THE THEORETICAL FRAMEWORK

In the theoretical framework the concepts of mega-event planning, Olympic legacy, urban regeneration and social sustainability are examined. In order to determine a framework in which the Oly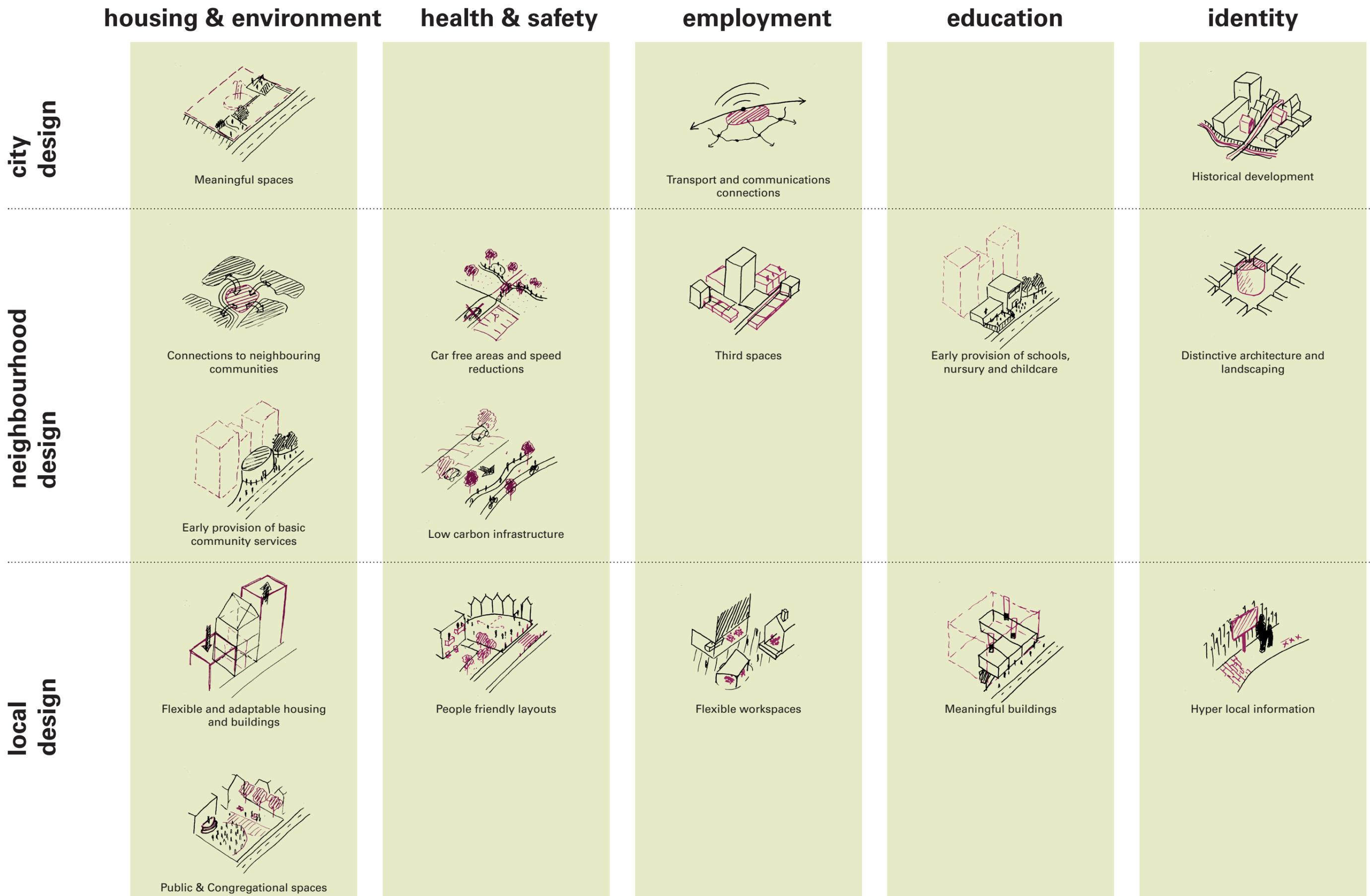mpic legacy can enhance the social sustainability in its purpose to regenerate the city, the spatial measurements in design for social sustainability are explored. This research is backed-up with knowledge from known writers in the practice of Urbanism, as Jane Jacobs and Jan Gehl.

Within mega-event planning it is important to notice that there are two designs to be made. The spatial interventions should be able to accommodate the logistic and environmental challenges of the event and should have clear vision for development after the event. The aim of such a mega-event is to attract attention towards and conciseness around the event-location. This creation of interest should develop the location beyond the event.

In order to successfully regenerate the area through event-planning, Vrijaldhoven (2007) mentioned that there are eight components which should be considered; 1) Type of event, 2) Strategic location, 3) Funding, 4) Destination, 5) Construction works, 6) Impact, 7) Image and 8) Era. For this thesis a selection is made, based on the ability of an Urban designer to influence each of these components. The graduation project will only look at the social sustainability within a strategic location, required construction works and in the impact. This impact, or legacy, of Olympic planning and design can be positive or negative, but also tangible and intangible and resolve around the themes as sport, economic, infrastructure, information and education, public life or history legacy.

Mega-event planning should be organized around a clear social-economic legacy aim which, together with the decision for a strategic location which can use and strengthen the development plans of the city.

Social sustainability is one of the three aspects of sustainability, together with economic and environmental sustainability. If a project enhances all three aspects it could be called sustainable. If one of the sustainability aspects is neglected, the project can be either bearable, equitable or viable. If the project aims to be sustainable, it needs to think about the economic and environmental aspects as well. Colantonio & Dixon (2009) stated there are 10 concepts in which urban regeneration can enhance the social sustainability. From ten, several concepts do not only enhance social sustainability, but also economic and environmental aspects: 1) Education and skills, 2) Employment, 3) Health and safety, 4) Housing and environmental health and 5) Identity. These domains are also defined to be enhanced by the Olympic legacy. Therefore these aspects are very interesting to explore further.

The social sustainability concepts are defined more specifically and spatially, through the adaption of the book "Design for social sustainability" (Woodcraft, Hackett & Caistor-Arender, 2011). It present 16 spatial measures to which social sustainability can be identified within urban design. The ways in which these spatial measures can be designed in the Olympic spatial programme is endless and highly depending on the context of the Olympic venue. Therefore the spatial measures act as assessment criteria for social sustainability to former and proposed design interventions and principles.

Figure 46 - *Dutch women Volleyball team prior Rio 2016 Olympics, finishing 4th, the best result ever of a Dutch women Vollyball team at the Olympic games (https://nos.nl/rio2016/artikel/2121008-volleybalsters-met-goed-gevoel-naar-rio.html).*

3. - ASSESSING SOCIAL SUSTAINABILITY IN THE LONDON 2012 OLYMPIC GAMES

This theoretical framework is used to analyse and assess the social sustainability in the location, projects and legacy of the 2012 Olympic Games in London. This chapter first describes the aim of the 2012 Games and the decision for the location. Further the case study looked to the Queen Elizabeth Olympic park prior to the Games, during and after and the projects that took and will take place on site. Eventually the social sustainability of the design interventions are assessed by the spatial criteria, from which design principles to enhance social sustainability in Olympic legacy are uncovered.

In this section a case study is conducted to understand the relationship between social sustainability and Olympic planning and design from a historic perspective. The goals is to understand the way former Olympic Games took notion of the concept of social sustainability and to which extend they are enhanced in the design of the Olympic park. To do so the location of the Olympic venues will be analysed, as well as the construction works conducted prior and after the event. The final design for the Olympic park will be analysed on the spatial criteria for social sustainability. This analysis reveals design principles the former Olympic Games used for enhancing the social sustainability within their urban regeneration purposes. The case study is conducted on the 2012 Olympic Games in London, branded as 'the Legacy Games'.

According to the Bid book for the 2012 Olympic Games (LOGOC, 2012) there were five main concepts behind the organisation of the Games in London. The motto of the 2012 Games was 'Inspire a generation'.

- Delivering the experience of a lifetime to athletes. This aim is reached though proximity of high-class sport venues and excellent facilities and smooth travel towards other, combined with the cheer of the British crowd. The bid book ensures the Games are possible.

- Leaving a legacy for sport in the UK. Through seven years build up and promotion to the Games, sport participation is developed and high standard sport venues are left behind. The bid book ensures nationwide sport development.

- Benefiting the community though regeneration. By redeveloping the Lower Lea Valley, the Olympic park will become a hub for social and economic change. *"It will become a model of social inclusion, opening up opportunities for education, cultural and skills development and jobs for people across the UK and London, but especially in the Lea Valley and surrounding areas."* The bid book ensures the Games are good for city and especially direct surrounding.

- Supporting the IOC and the Olympic movement. Through the construction of venues near great touristic features the city connects the Games with its own global trademarks, enhancing the image of the Games. The bid book ensures the IOC will benefit for this Games.

- Compact, iconic and well-connected venues. The location of the Olympic park host a perfect connection and has exciting environmental qualities. By connecting the site with other existing and famous venues, the image will be completed under the mantra 'Excellence without extravagance'. The bid book ensures the uniqueness of these Games.

The bid book ensured a succesful edition of the Games, but most of all the Olympic as a important step to the regeneration of the Lower Lea Valley. From the bid book formed the first account of three reports concerning the bidding, planning and delivery of the Games. Directly after the Games, the LOGOC (London Olympic Games Organising Committee) and the ODA (Olympic Delivery Authority) were disbanded and continued in the LLDC (London Legacy Development Corporation).

The LLDC will focus on the redevelopment of the Olympic Park after the Games of 2012. To do so, they set up a Local plan document. This document is further incorporated in the case study as it forms the next level of the Olympic park and to what extend design principles supports this development. The LLDC has the aim to "use the once-in-a-lifetime opportunity of the London 2012 Games and the creation of Queen Elizabeth Olympic Park to develop a dynamic new heart for east London, creating opportunities for local people and driving innovation and growth in London and the UK" (LLDC, 2015). This sentence shows the emphasis London put into the construction a (sustainable) legacy for the Olympic Games and the use of its potential for urban regeneration.

The Olympic Games 2012 started at 27th of July till the 12th of August, followed by the Paralympic Games from 29th of August till 9th of September. The redevelopment of the Queen Elizabeth Olympic park continues till today..

Figure 47 - *Page 64-65 - Queen Elizabeth Olympic Park near completion in 2012, showing the basketball arena, velodrome, hockey stadium and Olympic village in front of the image (retrieved from https://coresites-cdn.factorymedia.com)*

Figure 49 - *Queen Elizabeth Olympic Park at eye level, west of the Veldrome, a high quality leisure park build on the banks of the river Lea.*

Figure 48 - *Former Mayor of London, Boris Johson, Former IOC president Jacques Rogge & Lord Seb Coe, London 2012 chairman, at the closing ceremony of the 2012 Olympic Games (retrieved from: http://www.abc.net.au)*

3.2 - STRATEGIC LOCATION OF LONDON 2012

The Queen Elizabeth Olympic Park is situated in the east part of London, on a former industrial site of the Lower Lea Valley. It host the Olympic Village, Olympic stadium and several other main Olympic venues such as the Velodrome and Aquatic centre. A second cluster is situated near the London City Airport in the Excel building, an enormous convertible event hall at near the River Thames. Several other temporary buildings are built near famous touristic attractions within London, such as Hyde park, the Horse Guard Parade and the mall in front of Buckingham Palace. These places enhance the fame of the Games and the fame of the city on an international stage. Throughout London and the country existing sport venues are used for the Games due to convenience of organising the sport elsewhere than London.

The Olympic Park hosted around 50% of the Olympic sports. A lot of the other sports were located within 10 km distance of the Village or the city centre. Therefore, the Olympic Games were quite centrally located. The Olympic park formed an extension of the Lea Valley Marshlands and was an addition to the green belt of city parks within London. It is almost unique in London as it is not created from the former private gardens of grand palaces or institutions, as most of the city parks in London do.

According to the bid book 97% of all sport venues were accessible within 30 minutes travel distance. This is due to the excellent transport position of the Lowe lea Valley near Stratford station. From this point already 6 underground and Overground lines were connected with every part of the city. The creation of Stratford International and a direct line to the airport made the site even more accessible and transformed the Stratford station to one of the best connected stations in London. . This line reduced travel times from foreign visitors to the site. "For the Games 90 per cent of venues are served by three or more public transport options". Two major park and ride sites (12.000 places) were created.

Legend

- Olympic sports
- Queen Elizabeth Olympic Park
- Olympic spots
- Largest urban parks
- Highways
- Underground & Overground
- Airport

↑N

10 KM CIRCLE

5 KM CIRCLE

CITY CENTRE
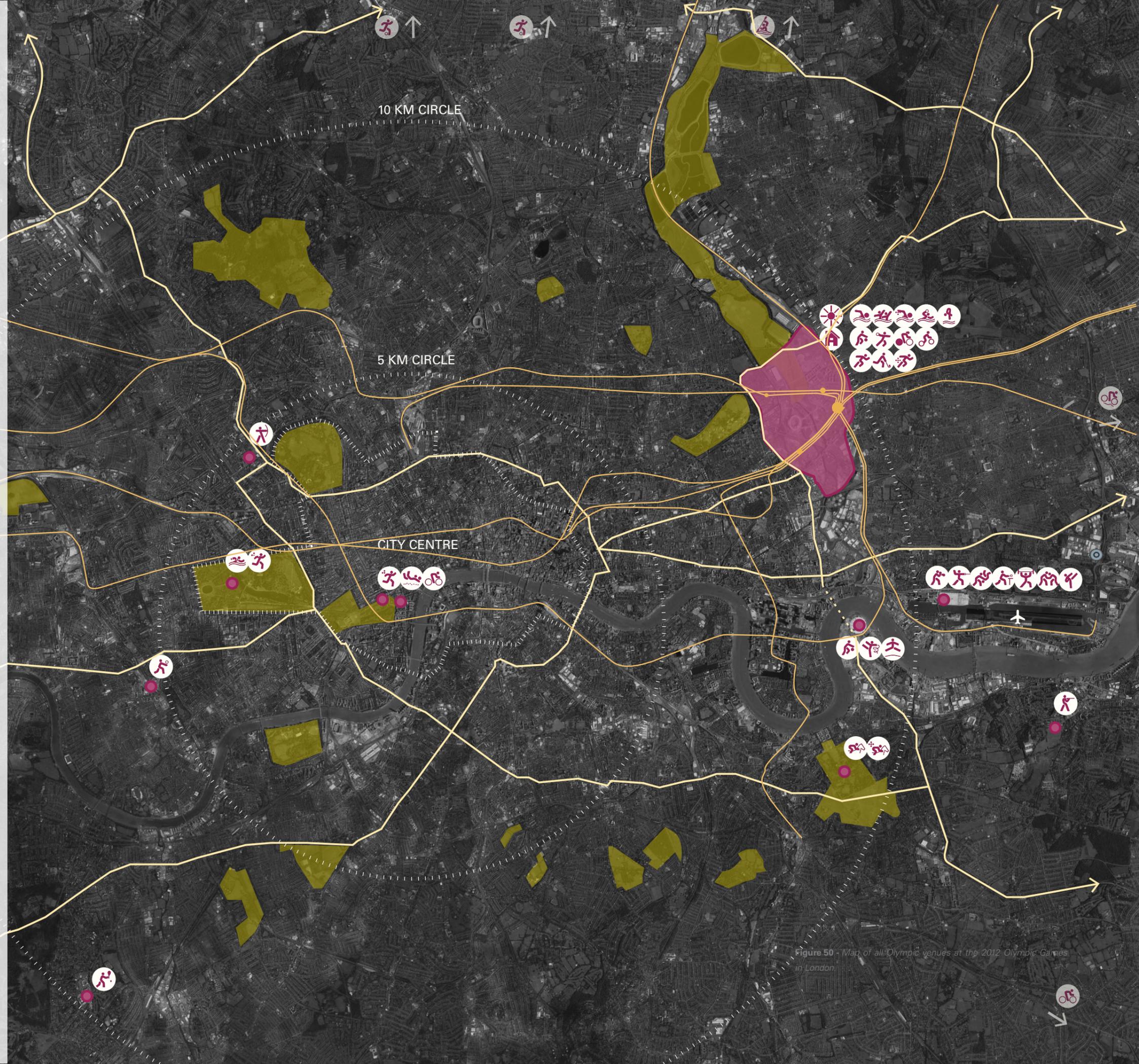
Figure 50 - Map of all Olympic venues at the 2012 Olympic Games in London

The Queen Elizabeth Olympic Park is situated at the former Lower Lea Valley industrial area. This industrial site is developed around the River Lea deep into the urban structure. Currently the area was in decay and many former industrial buildings were occupied by crackers and artists and became very unsafe. At the east side of the Olympic park starts the boroughs of Waltham Forest and Newham, with neighbourhood of Stratford closest to the park. These boroughs are home to the lowest income groups of London, with relative high crime levels, large populations of former immigrants for India, Pakistan and Arabia and is host very few personal development opportunities. It is consisted as one of the most deprived area's in East London and East London one of the most deprived areas in the city of London. From multiple options this area was chosen due to its accessibility, available land and possible impact.

The aim of implementing the Olympic Games at the lower Lea valley was twofold. It is a way to clean and improve the decayed industrial site at the spot, as well as the Olympic Park forms a jump stone towards development and improvement in East London. As mentioned, the LOGOC, ODA and LLDC especially focus on life improvement for the local people. The Olympic Games is a start for the redevelopment within one of the most deprived areas of London. Positioning the park in the middle of the this decayed area is a drastic but effective way to fast-track regeneration.

The city of London has the ambition to develop Stratford centre, around Stratford station and international station, to the fourth financial district of the city. In general, the location of the Games can be considered very much targeted on social sustainability, but do the ambitions not aim for a little too much.

10 KM CIRCLE

5 KM CIRCLE

CITY CENTRE

Legend ↑N

▨ Lowest income grid
⬩ Industrial spaces
⬩ Largest urban parks
⬩ Queen Elizabeth Olympic Park
● Olympic spots
◉ Financial districts
⎯ Highways
⎯ Underground & Overground
✈ Airport
◯ Development purpose
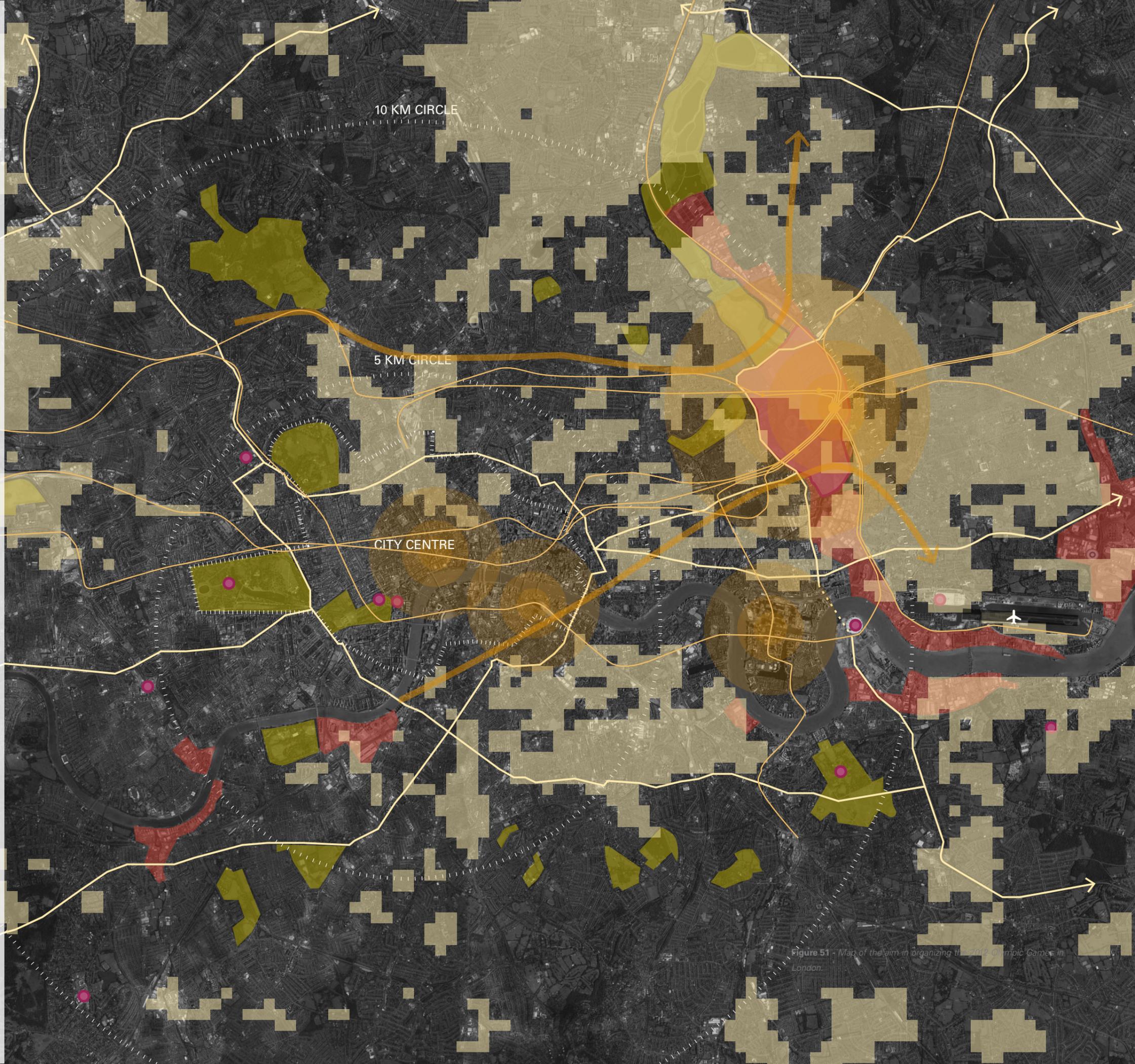➔ Development direction

Figure 51 - Map of the aim in organizing the Olympic Games in London.

The Lower Lea industrial area formerly consisted mostly of industry and was very polluted. Divided over the boroughs of Tower Hamlets, Newham, Hackney and Waltham Forest, the construction of the Olympic park was a multigovernmental exercise. Within the design of the park the geographical morphology of the river Lea and several mayor roads are still visible as they are preserved and enhanced in the design of the Park. No riverbed or branch was adapted. Instead, the design merged into the landscape context of the site.

In the north of the area, different smaller sport venues were situated, mainly a athletics track an some football fields. None of these structures were preserved, though the same site is still in use for multiple sport purposes. From that point north, the Lea Valley marshes start.

In the East of the site, terrain was occupied by the Stratford Rail Lands. The area was a major train depot for trains which weren't in use at that moment, occupying approximately 20 percent of the site. Some of the storage lines are still visible further south and north. This Rail lands meant a huge and hard to cross private area without much occupation and by so a very unsafe spot within the city structure. These Rail lands were the first to be redeveloped into what is now the Stratford centre, Stratford international and the Olympic Village. Stratford centre connects the train stations of Stratford and Stratford international

through a large shopping mall.

Down South the industrial site is alternated by two housing estates, with low rise row house buildings, enclosed by vast amounts of industrial buildings. The quality of living must have been very low on these sites, as it was on an isolated position within an extreme low quality spatial environment.

In the West the area contains the neighbourhoods of Fish Island and Hackney Wick, famous for housing major artist and rebel culture. The river Lee navigation canal has a unique variety of boathouses. Combined with the architecture of industrial warehouses, industrial-age factory halls and unique culture, captured between canal and highway, the area hosted a certain romanticism. For the Games, this area was released from its isolated position by the construction of several bridges to the Olympic park.

The industrial park didn't contain many high quality green spaces. Much of the open land consisted of grass or sand, as is seen in fig. The Greenway is an exception. Build on a former sewage line, it stretches through multiple neighbourhoods for several kilometres from the river Thames, ending west of the Olympic Park. It connects both sides by a bike and footpath. For the Olympic Games this greenway was further improved as an ecological piece of land and valuable slow-traffic connection with the city.

Figure 52 - *Former derelict site of Stratford industrial park, poluted, unattractive and decayed. (reterieved from http://www.constructionphotography.com)*

Legend

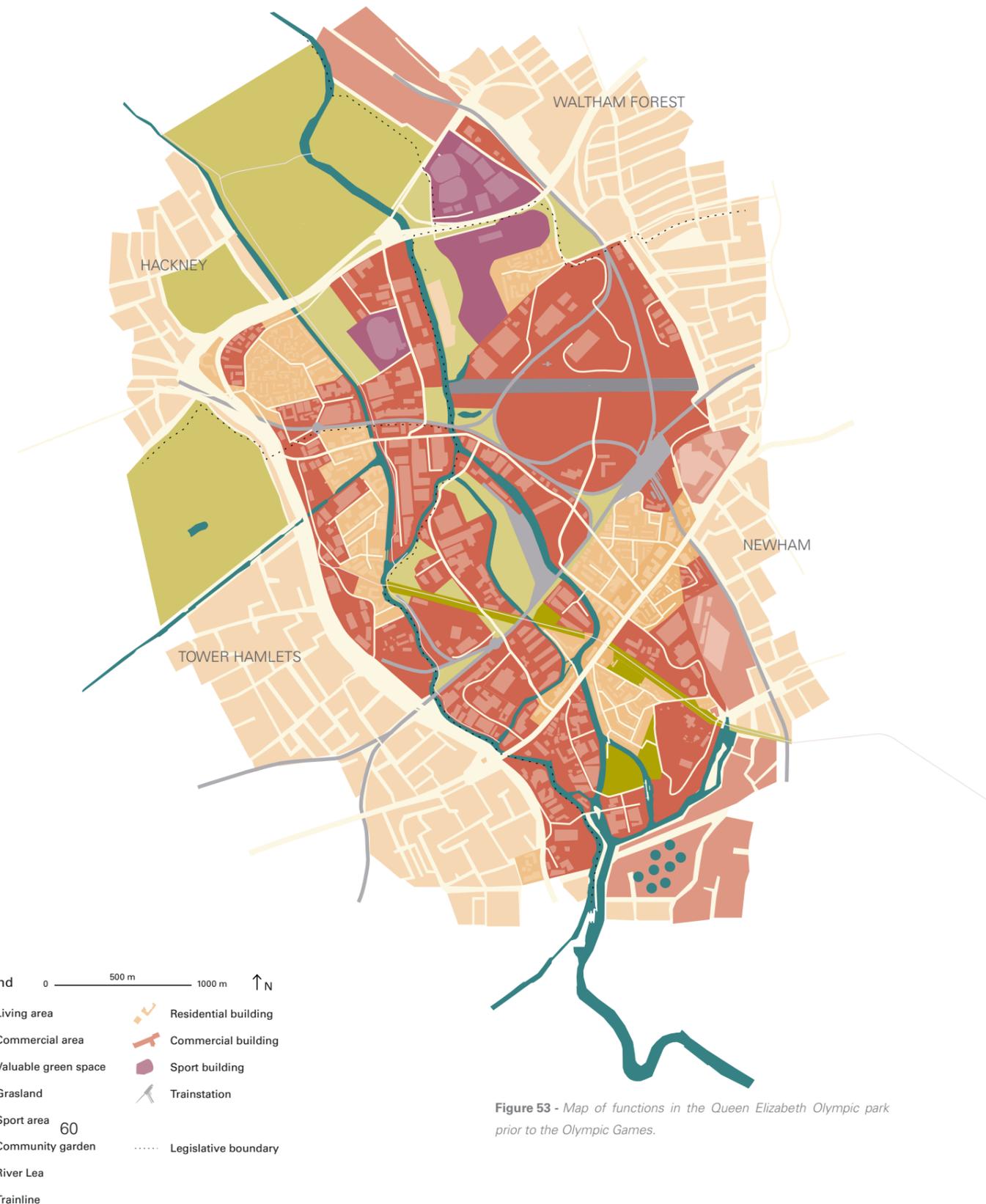|			
	Living area		Residential building
	Commercial area		Commercial building
	Valuable green space		Sport building
	Grasland		Trainstation
	Sport area		
	Community garden		Legislative boundary
	River Lea		
	Trainline		

Figure 53 - *Map of functions in the Queen Elizabeth Olympic park prior to the Olympic Games.*

Olympic Stadium, West Ham United, QEOP

After the games transformed to football stadium. With a flexible lower section it can still be converted to suit athletics. During resizing the stadium, many materials are re-used. Hospitality functions are added after.

Figure 54 - *London Olympic stadium (retrieved from https://populous. com)*

Aquatic centre, near Stratford centre, QEOP

Olympic diving and swimming pool during the Games. After the event the temporary side wings are removed, reducing capacity to 2500. Now useable by the community. Very iconic building within the park.

Figure 56 - *Olympic Aquatic centre (retrieved from http://buildipedia. com)*

Basketball Arena, deconstructed, QEOP
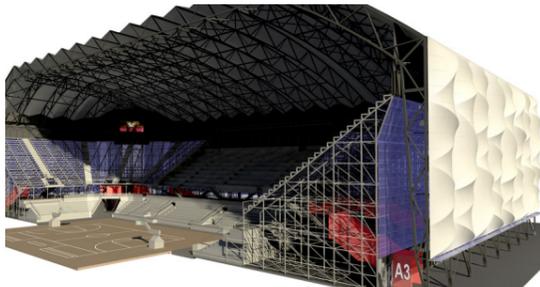
Iconic temporary Olympic venue with distinctive architecture. After the Games the frame is sold and deconstructed. Can be reassembled on another location, without leaving any traces. After the Games there was no request for such a venue within East-London.

Figure 58 - *Basketball arena (retrieved from https://www.detail-online.com)*

Stratford International, Stratford, Newham

Train station created for the Olympic Games. Opposing its name, it doesn't host a direct international train connection. Serves as direct neighbourhood line to the London city airport though.

Figure 55 - *Stratford International station (retrieved from https://populous.com)*

Olympic axis, from south to north in QEOP

The main routing through the Olympic park stretches along the river, hosting multiple side paths. Constructed out of removable plates. After the even these plates are removed and path and bridge size heavily reduced.

Figure 57 - *Olympic Axis (retrieved from https://upload.wikimedia.org)*

Energy centre, near Hackney, QEOP

Biomass powerplant responsible for energy production during the Games and after. Designed with distinctive architectural features related to the historical identity as a former industrial area. Relates very well to Hackney and Fish Island.

Figure 59 - *The energy centre (retrieved from http://babakmalek.com)*

61

62

Legend

Living area	Residential building	Olympic venue
Commercial area	Commercial building	Olympic axis
Valuable green space	Sport building	Control post
Grasland	Trainstation	Restricted area
Sport area		Event space
Community garden	Community area	Parking space
River Lea	Educational building	Boundary Olympic Games
Trainline		

Eton Manor Tennis & Hockey
Velodrome
BMX track
Basketball Arena
Riverbank Arena
Media centre
Olympic village
Stratford International
Stratford Centre
Copper box
International zone
Power plant
Waterpolo Arena
Olympic Stadium
Aquatics centre
Olympic Axis
Practice fields

Figure 60 - *Map of functions in the Queen Elizabeth Olympic park during the Olympic Games.*

After the Olympic Games, the LLDC was formed. The corporation has extended control over the development of the area; not only the former Olympic park but also the neighbourhoods of Stratford, Hackney Wick, Fish Island. Further South the LLDC controls the redevelopment of land in the neighbourhoods of Pudding Mill, Sugar House Lane Bromley by Bow and Carpenters estate.

To guide the redevelopment process, the LLDC published the local plan, an extensive document with the design guidelines for the whole LLDC area as well as every specific neighbourhood. The Local Plan will focus on three keys area's: Park, Place and People (LLDC, 2015).

The objective for the park is a "*successful and accessible park with world- class sporting venues offering leisure space for local people, arenas for thrilling sport, enticing visitor entertainment and a busy programme of sporting, cultural and community events to attract visitors*" (LLDC, 2015).

The place will be "*a new heart for east London, securing investment from across London and beyond, attracting and nurturing talent to create, design and make world-beating 21st-century goods and services, and becoming a place where local residents and new arrivals choose to live, work and enjoy themselves, and where businesses choose to locate and invest*" (LLDC, 2015).

Also the area should provide "*opportunities and transformational change for local people, opening up access to education and jobs, connecting communities and promoting convergence – bridging this gap between east London and the rest of the capital*" (LLDC, 2015).

This aims are reached by large scale redevelopment within the Olympic park and the demolition of many industrial buildings outside the Olympic area. The Olympic axis and hardened surface is decomposed into smaller paths and the in between space is filled in either by housing or high quality park structure.

Stratford centre will be further enhanced as financial district and commercial node of the area, the Olympic structures are turned into use for the community or a new purpose. The south of the LLDC is developed as mainly residential area, with some high towers along the main street and apartments blocks further south. Hackney and Fish island are turned into a mixed use area, persevering the most valuable old warehouses and demolishing part of the other urban structures. Hospitality services, flexible workspaces, residential apartments and cultural facilities are designed to cooperate. Better connections improve the relationship to its surrounding. The North and centre of the park will remain mostly as a unique park and leisure opportunity in the hectic city of London.

The plan is further analysed through the spatial social sustainability criteria

Figure 61 - *Redevelopment plan of the Queen Elizabeth Olympic Park, showing Stratford city and the Olympic stadium (reterieved from https://www.dezeen.com).*

Legend

Living area		Residential building	Legislative boundary
Commercial area		Commercial building	LLDC boundary
Valuable green space		Former Olympic venue	
Grasland		Trainstation	
Sport area	64		
Community garden		Community area	
River Lea		Educational building	
Trainline			

Figure 62 - *Map of functions in the Queen Elizabeth Olympic park after the Olympic Games.*

3.4 - ASSESSING THE SOCIAL LEGACY OF LONDON 2012

Meaningful spaces

Legend   ↑N
— LLDC legislative boundary
— Boundary Olympics 2012
▨ Differently aimed development
◯ Former Olympic program
▱ Removable pathway
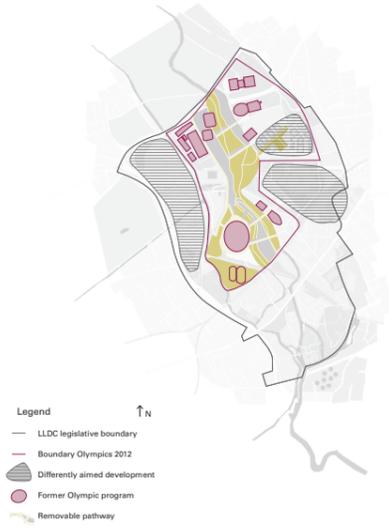
+ Olympic Park very well redeveloped toward a more human sized scale.
+ Stratford Centre, Hackney, East Village are all designed according a specific urban morphology.
+ No big empty spaces left after redevelopment.

Early provision of basic community services

Legend   ↑N
— LLDC legislative boundary
▨ Neighborhood clusters
■ Town centre development
▨ Leisure park development
◻ Existing community center
◻ Allowed place for community center
● Existing place for religion
● Allowed place for religion
★ Sportcentres for the community
● Mooring places
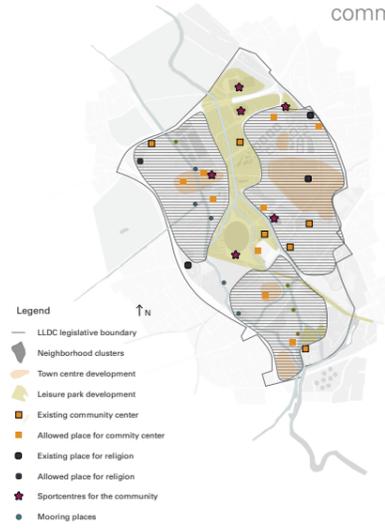
+ Addition of multiple community centres, though not evenly spread through the clusters.
+ Addition of a beautiful park for leisure.
+ Olympic sportfacilities open to the community.
- Lack in provision of cultural services such as a library.

Flexible, adaptable housing and buildings

Legend   ↑N
— LLDC legislative boundary
▨ Transformed to workspaces
▨ Transformed to suit sportdemand
▨ Transformed to housing

+ Multiple ways the venues of the Olympics are converted to a new purpose.
+ Large halls of media centre prove to be very flexible
+ Transformed according new destination for the specific area

Low carbon infrastructure

Legend   ↑N
— LLDC legislative boundary
— Footpath
— Green slow-traffic path
— Bus connections
● Trainstation
→ Metro/Train connection
⇒ Metro/Train connection to airport

+ Olympic park focussed on low carbon infrastructure.
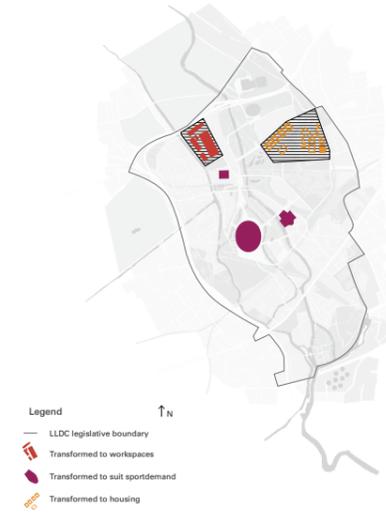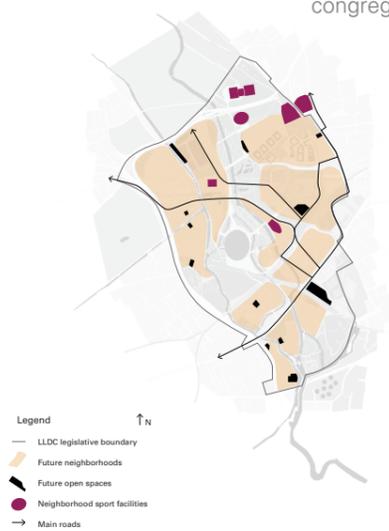+ Supported by multiple public transport options.
- Focus on train and metrolines, but less support from buslines, less flexibility in accisibility locally.
+ Slow traffic path from a abandoned sewage line

Public spaces and congregational spaces

Legend   ↑N
— LLDC legislative boundary
▨ Future neighbourhoods
▨ Future open spaces
● Neighborhood sport facilities
→ Main roads

+ Multiple open spaces in every neigborhood
+ Connected to main roads
+ Creation of a large playground and sport facilities for individual and teamsport in the Nothern part
- No distinctive sport facilities in the Souther erea

Connections to neighbouring communties

Legend   ↑N
— LLDC legislative boundary
— Boundary Olympics 2012
▨ Neighborhoods
◯ Olympic stadium as reference
→ Main roads
— Lesser roads & paths
● Connections within Olympic boundary
● Connections within LLDC boundary

+ Multitude of connections within the Olympic park by new bridges and ongoing roads.
- Fewer convinient connections around LLDC area and across major roads systems

People friendly layouts

Legend   ↑N
— LLDC legislative boundary
▨ Footpath
— Green slow-traffic path
— Conflict of mobilities
▨ Unsafe areas

+ Olympic park host lots of slow traffic paths and is weelchair friendly
- Difficult to cross large infastructure lines, creating a clash of mobilities
- Oustide the LLDC bounrady and within housing estates still very unsafe and no environmental changes.

Car free areas and speed reductions

Legend   ↑N
— LLDC legislative boundary
■ Parking space
▨ Car free area
◯ Former Olympic venues
→ Olympic ring road
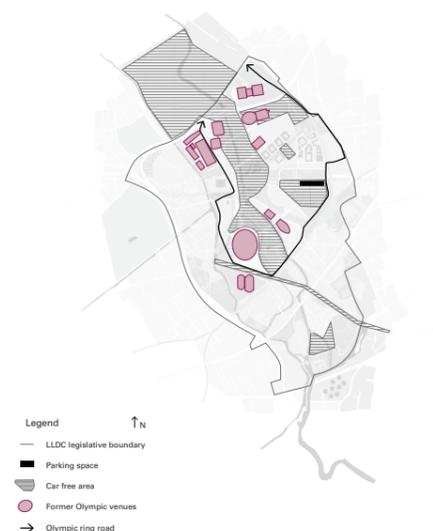
+ Through focus of metrolines and parking spots in straford centre, the Olympic is mainly car free.
+ Olympic ringroad prevented car traffic within.
+ Car free connections through Green walk with other neighbourhoods.

65
66

Transport and communication connections
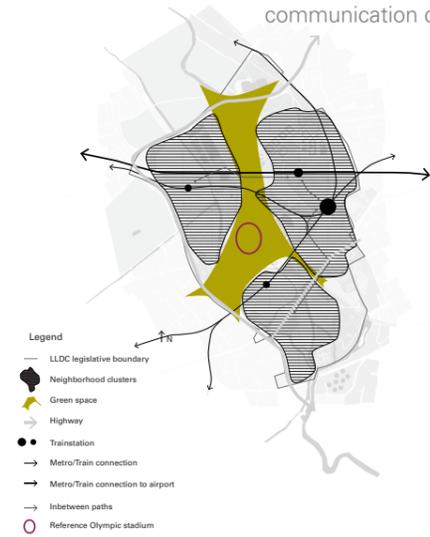
+ Multiple regional connections through metro lines
+ National connections through Stratford international.
+ Neighbourhood clusters are individualy served
+ No need to use the park in commuting

Third spaces

+ Creating of several workspaces and different supporting areas
+ Third spaces, hospitality services are different on both sides, suitable to type of employment (start up and financial cooporations).

Meaninful buildings

+ All buildings had a destination after the event.
+ Multiple ways of transforming the former Olympic venues
+ Variety in purposes for the Olympic venues, often serving the community in various ways.

Hyper local information
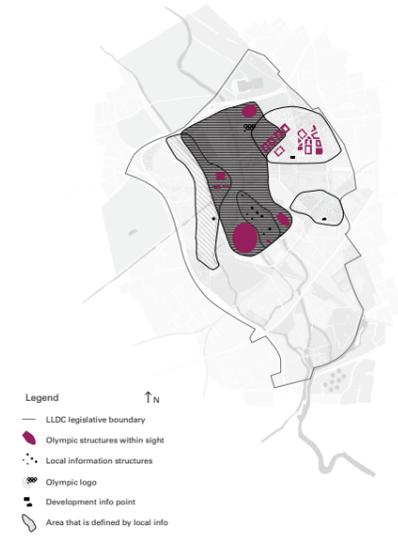
- Just a few local information points & distinctive spots.
+ Historical structures are left to create identity.
+ Different identity areas are created in Olympic park.
+ Artchitecture of some venues form insight to practised sports.

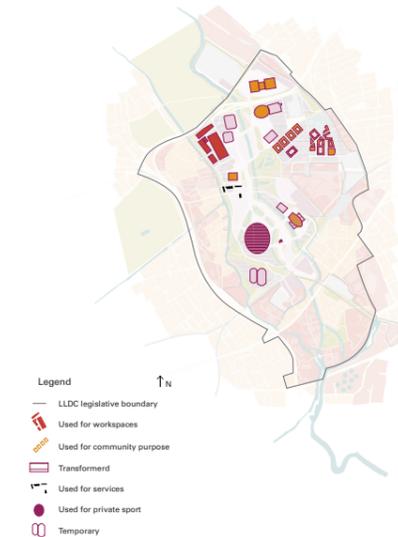## Flexible workspaces

+ Creation of mixed use living area in Hackney, Fish Island and supported by former media centre.
- Very few flexible spaces except for Hackney and Fish Island

Early provision of schools, nursery and childcare
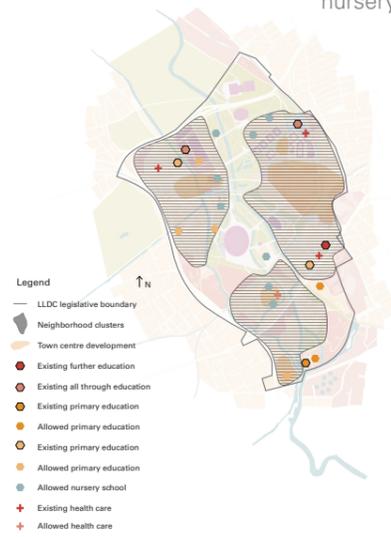
+ Redevelopment incoorporates multiple forms of education and healtcare, distributed evenly.
+ Education and healthcare related to Olympic park, providing safe spaces.
- Initial Olympic programme doesn't support these type of structures.

67

Distinctive architecture and landscaping
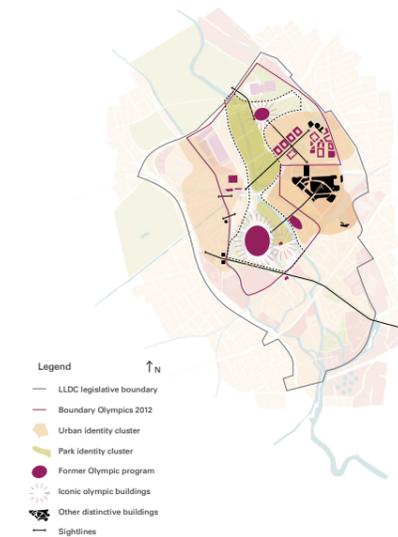
+ Olympic venues are positioned on sightlines and are distinctive in architecture.
+ Entrances to Olympic park are marked distinctively
+ Different identity areas are formed through architecture and landscaping type

Historical development
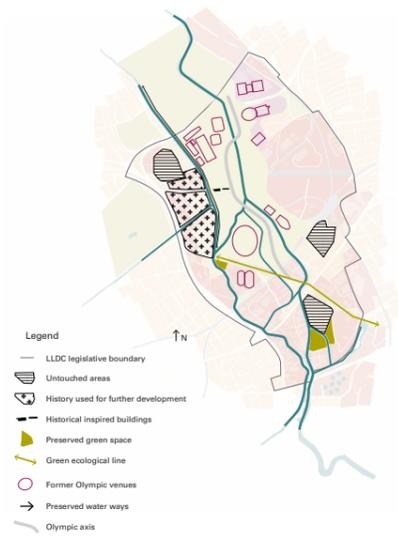
+ preservation of historic Lea river as design guideline.
+ preservation of estates and some histotical architecture.
+ Architecture of power plant relates to former identity.
- Too severe reconstruction (Hackney, Fish Island) or too few reconstruction (estates).

68

3.5 - SOCIAL SUSTAINABILITY IN LONDON 2012

Within this case study the strategic location of the Olympic Games 2012 in London is analysed. The choice for hosting the Games at the Lower Lea Valley is made based on accessibility, available land and socio-economic situation of East London. The Games are a springboard for development at East London and a possible connection to the inner city, by strengthening regional and international accessibility, thorough cleansing of decayed industry and a strong redevelopment plan after the Games, encompassing a larger area than the initial Games itself. In order to be social sustainable, the Olympic Games should have a scope reaching further than the initial Olympic boundaries.

After, the construction works and strategy towards the development of the Olympic park are analysed. Lower Lea valley consisted mainly of industrial area and the Stratford rail lands, having very few connections to the neighbourhoods and hosted several isolated housing estates. These areas are opened up through new bridges and roadways and the industry is too great extend replaced. The few landscape qualities the site hosted are enhanced in the design of the park. After the Games doesn't remain in the same state, but paths are resized and bare open lands are redeveloped to new neighbourhoods or enhances the landscape design of the Olympic park even further. All sport venues of the Olympic Games have a clear destination. The area is divided in different destination zones, to which the Olympic structures should develop alongside.

By analysing the design of the Olympic park and its development plans according the spatial criteria of

social sustainability, the possible social sustainable legacy of the 2012 Games is uncovered. The initial plan for the Olympic Games venues was very well, having a clear destination for every structure, in building, park and housing. The redevelopment plans create 3 neighbourhood clusters each supported by own community services and stations, well connected between each other. Still, at this position the station prevents proper usage of the park in daily life, as commuters don't cross the park in between, but take the under- or Overground instead. The extensive park is created for sole leisure purposes. Still a strong identity is build, embedded in the history of the site, but attached to sport through the many sport venues open to the community, clearly visible through sightlines within the urban structure.

Still, while aiming to create benefits especially for the local people, this well-thought redevelopment plan fails to so. Luckily and unluckily there is a high demand for housing in the Queen Elizabeth Olympic park. This demand ensures successful regeneration and development, though the high demand also increase housing prices. While initially nothing is done to the urban tissue outside the LLDC area, increasing rent prices and living costs drive the former local people out of their neighbourhoods into other deprived areas. The plan neglects the future of the former local inhabitants and moves the social problems away from the site. The proposal, design and re-design of the Olympic park is successful and presumably social sustainable for nearly every point, though not for the local inhabitants. Therefore, as recommendations to the design of the Games in Rotterdam South. Locals first!

Figure 63 - *Redevelopment masterplan of Hackney Wick, preserving former warehouses, (retrieved from http://karakusevic-carson.com)*

Figure 64 - *Development Stratford centre, with a total different identity.*

Legend   ↑N

— LLDC legislative boundary

— Boundary Olympics 2012

Urban identity

Town centre

Neighborhood cluster

Park identity

Park for events

Commercial area

Unpleasant area

Olympic program

Iconic olympic buildings

Sportcentres for the community

Other community facilities

— Bus connections

● Trainstation

→ Metro/Train connection

→ Metro/Train connection to airport

— River Lea
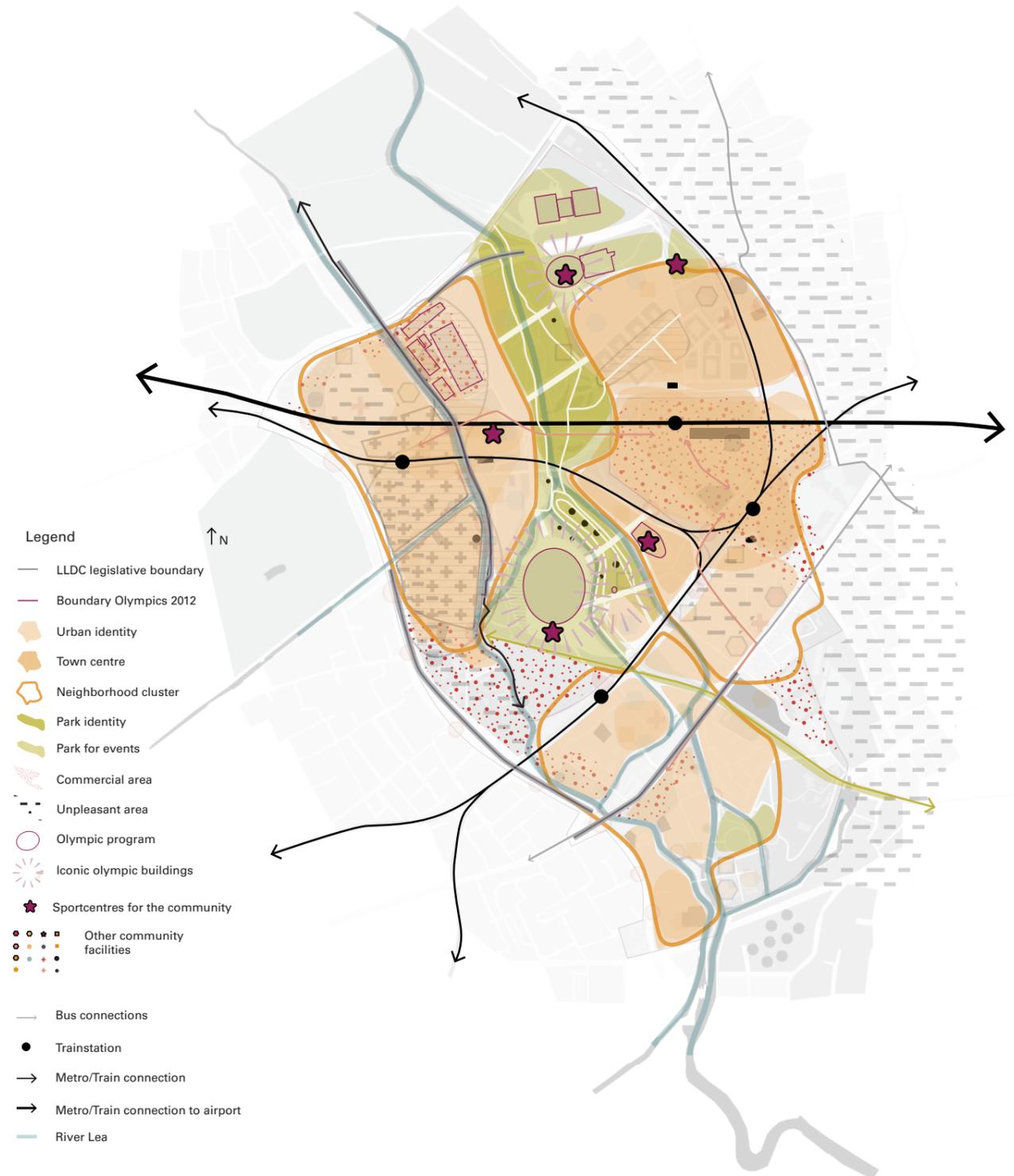
3.6 - KNOWLEDGE FROM THE CASE STUDY

From the case study to the Olympic park of the 2012 Olympic Games in London several recommendations can be given to enhance social sustainability in the planning, design and legacy of the Olympic Games.

The first recommendation is to position the park as springboard for city development. By positioning it in proximity of a social-economic neighbourhood, the Olympic Games can raise the standards for living of nearby inhabitants, but also creating a very interesting living and work environment for others, levering development to neighbourhood around the Olympic park.

The next recommendation would be to focus on public transport and slow traffic as main mobility during the Olympic Games as it can extend transport possibilities which can reduce the amount of people per transport option, in turn reducing size of infrastructure projects.

After it will add more environmental friendly transport options to inhabitants around the Olympic venue.

Each context is unique and therefore the next recommendation is to use this environmental context as a unique design quality to enrich the image and identity of the Olympic site. In this way it will encompass more qualities after the event and is much more relatable to the residents of the host-city as the identity of the place is still captured within the design.

In order not to waste vital investment, resources and valuable space, it is recommended to have a legacy plan and sustainable future for every Olympic venue. Some of the sports are already overrepresented ,or in contrast, lack the amino to be supported after the Games. They should be designed to be downsized or sold after the event.

After the event the large Olympic area should be divided in several zones, each with their different type of development and future identity and designate the Olympic venues accordingly. In this way the Olympic site merge better into the urban fabric, as it can provide valuable post-games services for the local surrounding.

Another recommendation would be to ensure protective policies are applied to the Olympic park and surrounding to prevent extreme gentrification of the Olympic site as witnessed in London.

The last recommendation is to scope beyond the development borders of the Olympic park and to extend positive impact of the Olympic design interventions outside the controlled development

border by organising smaller related events and upgrading public space, create walks and info stands. All these interventions make sure that the Games are not a financial injection at one point, but have the capacity to lift the whole city district a little further.

From this case study the first design principles derived. Each design principle gives answer to a specific Olympic socio-spatial issue encountered when designing for the Olympic Games. These design principles are gathered in the book "Olympic design principles" (IJzerman, 2018). This book will further explain the design principle and to what extend the principle will enhance the social sustainability of the place.
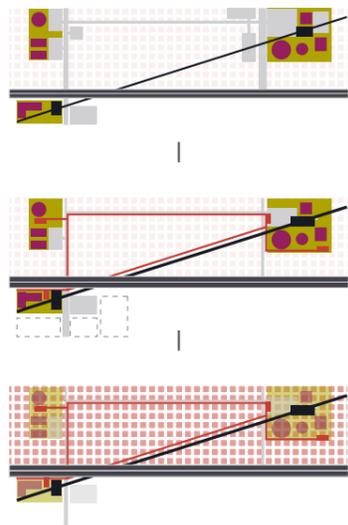
Figure 67 - *Olympic design principle "Visibility of deployed activities".*
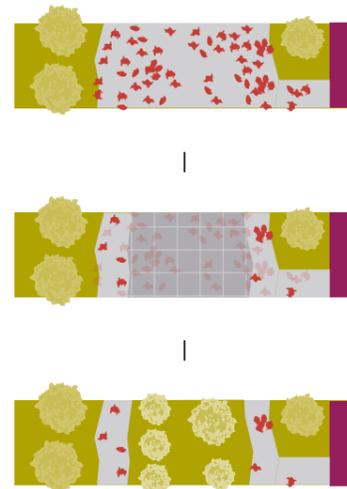
Figure 66 - *Olympic design principle "Carpool to the Olympic venue".*
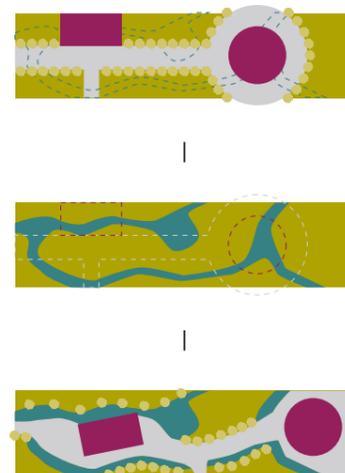
Figure 68 - *Olympic design principle "Space for human scaled development".*
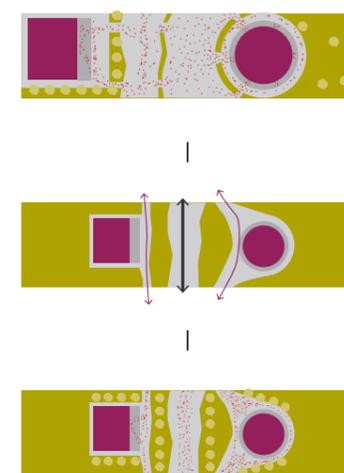
Figure 69 - *Olympic design principle "Environmental systems guiding design".*
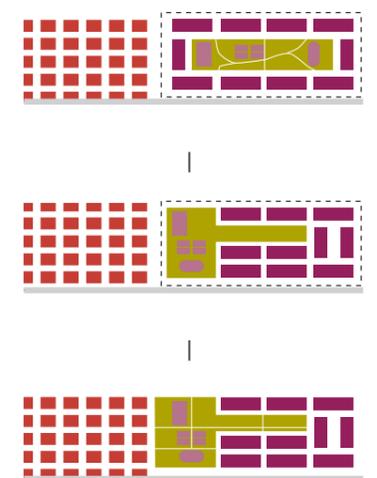
Figure 70 - *Olympic design principle "Attractive space by flow regulation".*

4. - DETERMINATION OF A DESIGN LOCATION

This chapter contains a spatial analysis to a location for the Olympic Games in the Netherlands. First requirements to organising the Olympics on national scale are described. After, comparing maps on accessibility, available space and deprived neighbourhoods, a decision to the project location is made. Rotterdam South is chosen as project location this graduation research, with Zuiderpark and Varkenoord as future Olympic areas.

4.1 - IOC REQUIREMENTS ON NATIONAL SCALE FOR HOSTING THE OLYMPIC GAMES

This section explores several requirements of organising the Olympic Games on national level. The graduation project of Heurkens (2005) already explored this requirements in detail and provided several recommendations to the organisation of the Olympic Games on national scale. Besides this literature analysis, an extensive research is done to the location, re-use of venues and sport schedule is done. Other overviews can be found in Appendix 2.

One of the most important aspects in the decision to assign the Olympic games to a country and for countries where the Olympic Games can be implemented, depends on the accessibility of the proposed locations. The requirements concerning this accessibility are measured from location of the Olympic Village, and can be divided in three categories

To illustrate the implementation of this accessibility requirements, Heurkens made a spatial-analysis study towards the implementation of the Games, based the above demands and on the transport infrastructure situation of 2005. He divided this in a national, Randstad and inter-regional level. He analysed this proposition the proposition of several locations within this different scales as Heurkens concluded, that none of the four biggest cities in the Netherlands (Amsterdam, Rotterdam, the Hague and Utrecht) or a location near the airport of Schiphol would meet the requirements of the IOC concerning the distance at that time.

5% of the activities can be organized outside the Randstad if there is an airport nearby

35% of the activities can be organized inside the Randstad if there would be investments and upgrades of existing infrastructure.

60% of the activities can be organized inside inter-regional scale, if they are collected in a region of heavily cooperating cities.

In this principle the candidate-city for the Olympic Games in 2028 would be either Amsterdam or Rotterdam, based on the study that both cities meet most of the demands concerning the accessibility of the Olympic venues. Regardless the decision which city would be chosen as candidate city, this national representative should be concerned with several additional provisions (Heurkens, 2005).

- Infrastructure: diversity on local (public) transport systems as train, metro and tram

- Support: destination based on sport and congress-demand, a redevelopment of functions

- Capacity: Provision of adequate housing in hotels and ICT.

- Proximity: International accessibility of airport and HSL (high-speed railway)

- Vision: project development targeted towards redevelopment of the area.

These requirements will be used in following chapters and sections to determine a strategic location for the Olympic Games as well as distribute the Olympic sport venues across the Netherlands, host city and the Olympic park.

Target		
Maximum traveltime, from Olympic Village	60	minutes
Maximum traveldistance, 60% of activities	10	kilometer
Maximum traveldistance, 35% of activities	50	kilometer
Maximum traveldistance, 5% of activities	200	kilometer

Table 2 - *Table 3.1 : traveldistance requirements of the IOC according to Heurkens (2005).*

Target	Amount
Athletes & Coaches	9.000 rooms*
Press & media employees	15.000 rooms
Visitors	15.000 rooms
TOTAL HOTELS	**40.000 rooms**

* Based on the current amount of athletes - almost 18.900

Table 3 - *Table 3.2 : accomodation number requirements of the IOC according to Huijsmans (2005).*

TYPE OF EVENT	VENUE	CAPACITY	AREA	D 1	A 2	Y 3	4	5	7	8	9	10	11	12	13	14	15	16	17	18
opening ceremony	Nat. olympic stadium	68.000	Heritage zone	●																
Archery	Dream island arch. field	6.000	Tokyo bay zone		●	●	●													
Athletics	Nat. olympic stadium	68.000	Heritage zone									●	●	●	●	●	●			
Athletics - marathon	unknown	36.000										●								●
Athletics - Race walk	unknown	5.000										●								
Badminton	Mushashino forest cent.	6.000	Heritage zone		●	●	●	●												
Basketball	Saitama Super Arena	22.000	Tokyo bay zone		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Beach volleyball	Shiokaze Park	12.000	Tokyo bay zone		●	●	●	●	●	●	●	●	●							
Boxing	Kokugikan Arena	10.000	Heritage zone		●	●	●	●	●	●	●	●	●	●	●					
Canoe slalom	Canoe Slalom Course	8.000	Tokyo bay zone			●	●	●	●											
Canoe sprint	Sea Forest Waterway	20.000	Tokyo bay zone													●	●			
Cycling - BMX	Olympic BMX course	6.000	Tokyo bay zone														●			
Cycling - mountainbike	Izu m.t.b. course	20.000	Izu																	
Cycling - road race	Imperial Palace Garden	5.000	Heritage zone	●	●															
Cycling - road time trial	Imperial Palace Garden	5.000	Heritage zone							●										
Cycling - track	Izu Velodrome	5.000	Izu									●	●	●	●					
Diving	Olympic Aquatics centre	18.000	Tokyo bay zone		●	●	●	●	●	●	●		●							
Equestrian - dressage	Equestrian Park	unknown	Heritage zone						●					●						
Equestrian - eventing	Sea forest c-c. course	unknown	Tokyo bay zone		●	●	●													
Equestrian - jumping	Equestrian Park	unknown	Heritage zone									●	●		●	●				
Fencing	Makuhari Messe	8.000	Tokyo bay zone	●	●	●	●	●	●	●										
Football	Nat. olympic stadium	68.000	Heritage zone	●	●		●	●		●										
	Tokyo Stadium	50.000	Heritage zone	●	●		●	●		●										
	Int. Stadium Yokohama	72.000	Yokohama	●	●		●								●					
	Sapporo Dome	40.000	Saporo	●		●		●												
	Saitama Stadium 2002	63.700	Saitama	●		●		●												
	Miyagi Stadium	49.000	Miyagi																	
	Nagai Stadium	47.000	Osaka																	
Golf	Kasumigaseki cou. club	30.000	Tokyo bay zone								●	●	●		●	●	●			
Gymnastics - artistic	Olympic gymn. centre	12.000	Tokyo bay zone		●	●	●	●		●	●		●	●						
Gymnastics - rhythmic	Olympic gymn. centre	12.000	Tokyo bay zone														●	●		
Gymnastics - trampolin	Olympic gymn. centre	12.000	Tokyo bay zone										●	●						
Handball	Yoyogi Nat. Gymnasium	12.000	Heritage zone		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hockey	Oi Seaside Park	10.000	Tokyo bay zone		●	●	●	●	●	●	●	●	●	●	●	●	●			
Judo	Nippon Budokan	12.000	Heritage zone	●	●	●	●	●	●	●	●									
Marathon swimming	Odaiba Marine Park	5.000	Tokyo bay zone															●	●	
Modern pentathlon	Tokyo Stadium	50.000	Heritage zone													●	●			
Rowing	Sea Forest Waterway	20.000	Tokyo bay zone		●	●	●	●	●	●										
Rugby	Tokyo Stadium	50.000	Heritage zone			●	●	●												
Sailing	Enoshima yacht harbour	10.000	Tokyo bay zone				●	●	●	●	●	●	●	●	●					
Shooting	Asaka Shooting Range	unknown	Tokyo bay zone	●	●	●	●	●	●	●	●	●	●							
Swimming	Olympic Aquatics centre	18.000	Tokyo bay zone		●	●	●	●	●	●	●	●								
Synchron swimming	Olympic Aquatics centre	18.000	Tokyo bay zone												●	●	●	●		
Table tennis	Tokyo metropol. gymn.	10.000	Heritage zone		●	●	●	●	●	●	●	●	●	●						
Taekwondo	Makuhari Messe	6.000	Tokyo bay zone											●	●	●	●			
Tennis	Ariake Coliseum	20.000	Tokyo bay zone		●	●	●	●	●	●	●	●	●	●						
Triathlon	Odaiba Marine Park	5.000	Tokyo bay zone												●	●				
Volleyball	Ariake Arena	12.000	Tokyo bay zone		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Water polo	Tatsumi int. swim. cent.	unknown	Tokyo bay zone		●	●	●	●	●	●	●	●	●	●						
Weightlifting	Tokyo internat. forum	5.000	Heritage zone	●	●	●	●	●	●	●	●	●								
Wrestling - freestyle	Makuhari Messe	6.000	Tokyo bay zone										●	●	●					
Wrestling - grec-roman	Makuhari Messe	6.000	Tokyo bay zone			●	●	●												
closing ceremony	Nat. olympic stadium	68.000	Heritage zone																	●

LEGEND

New venue - permanent
New venue - temporary
Existing venue - upgrade
Existing venue - no upgrade

● Day of event - no medal awarded
● Day of event - medal awarded
● Day of event - opening/closing

Table 4 - *Overview of Olympic sport venue's of Japan 2020; Current tendency towards re-use of existing venues. See appendix for sport venue overviews and time schedules for 2000-2020.*

4.2 - ANALYSIS OF HOSTING A SOCIAL ORIENTED OLYMPIC GAMES IN AMSTERDAM OR ROTTERDAM REGION

A strategic location is very important to the reaching the aim of successful regeneration by mega-event planning. In order to enhance social sustainability of the site as much as possible, a location has to be chosen for the Olympic to accommodate the most of its transformative potential.

Based on available space, social-economic situation and accessibility of the place a decision is made between the city of Rotterdam and the city of Amsterdam. The data for the maps are retrieved from GIS information, as well as mapping from a satellite image. The problematic neighbourhoods are based on the distinction of the 40 'vogelaarwijken'. These are converted to the restrictive boundaries of each neighbourhood. Some parts of the contained such amount of social-economic and social-spatial issues, that the whole area was marked as problematic. This situation applied to the Westelijke Tuinsteden in Amsterdam and Rotterdam Zuid. The maps give an overview of the places that request a reconsideration of the social unsustainable situation, the offer of space and the place that can provide enough transport possibilities.

For the calculation of accessibility, the following measures are used:

Bus: 350 meter walking distance

Tram: 450 meter walking distance

Metro: 700 meter walking distance

Train: 1000 meter walking distance

Highway exit: 1500 meter driving distance

Rotterdam South is chosen as strategic location for a next Olympic Games. Compared to the Netherlands, education levels, income levels, health levels, employment levels and therefore future perspectives are way lower than average. The combination of high percentage of low-educated and a high-percentage of immigrant residents, form fragile relationship. The accessibility of the place is mainly formed through car oriented infrastructure, with large roads creates separate neighbourhood entities. The train stations doesn't accommodate direct intercity transport. Zuidplein forms the heart of Rotterdam South as bus node and metro station, but is highly outdated. Several governmental regeneration projects, such a Pact on South already failed and proved not extensive enough. NPRZ (National Programme Rotterdam South) is the current regeneration programme in Rotterdam South. By organizing the Olympic Games in Rotterdam south, it is a chance to increase accessibility by public transport, promote the integration of neighbourhoods, increase the environmental quality, increase sport infrastructure and promote employment, healthier lifestyles and an overall identity change for Rotterdam South.

Two locations are chosen, Zuiderpark and Varkenoord, which already accommodate a form of sport infrastructure, have large open spaces and are in proximity of large transport lines of metro and train. Fragile neighbourhoods such as Pendrecht, Hillesluis, Afrikaanderwijk and Tarwewijk. The Olympic Games at these locations form an high overall environmental boost in the first place and a catalyst for redevelopment after the event.
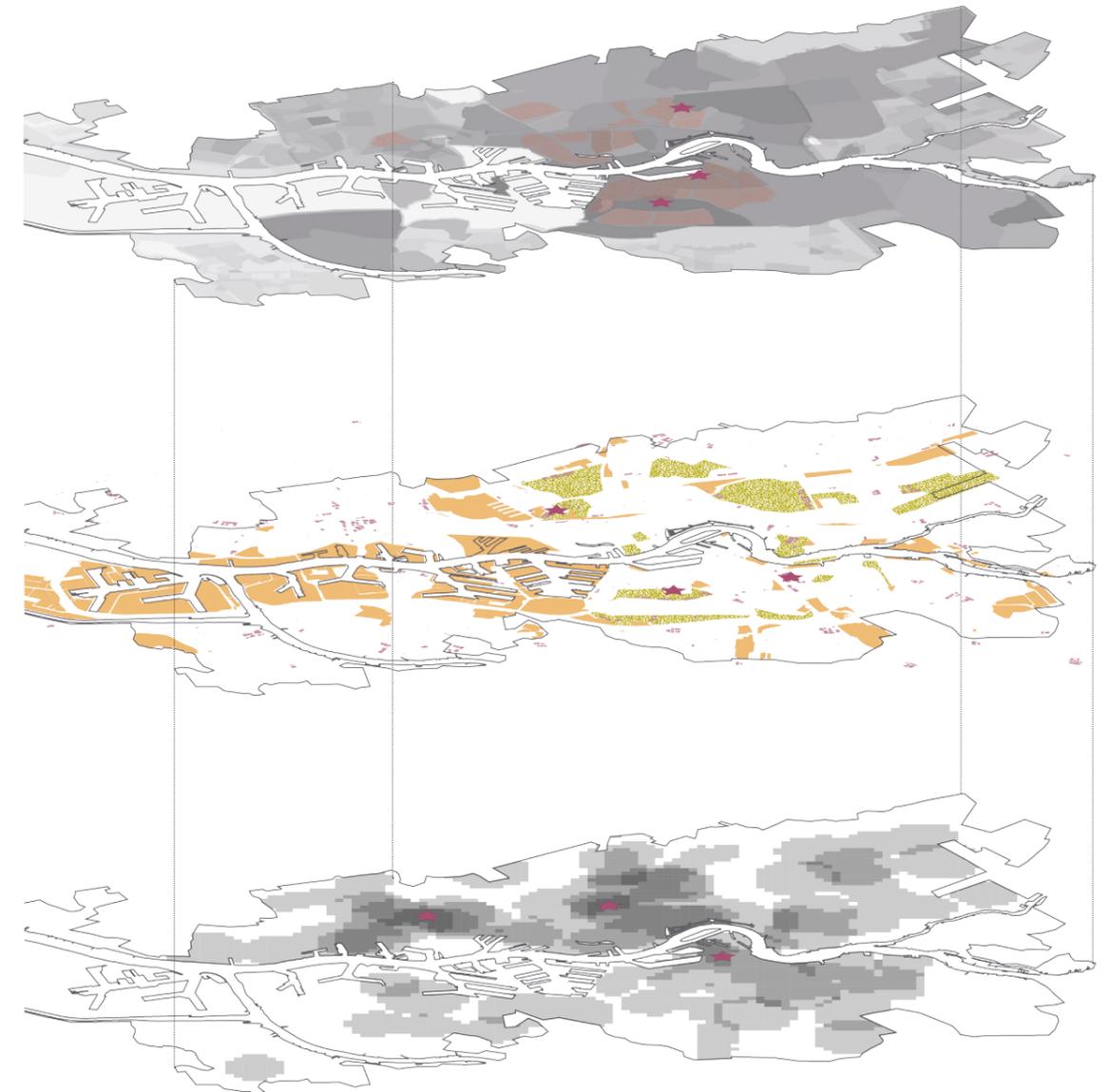
Figure 71 - *Collective map showing the most urgent locations related to health (obesity rate), unemployment, empty stores and the position of the problematic neighbourhoods.*

Figure 72 - *Collective map showing the locations of large green public parks, large sportparks, the key locations for events, the location of industry, covering large relative easy to transform areas.*

Figure 73 - *Collective map showing the infrastructure lines, there action radios and the combination, leading to the positioning of the most accessible points within the urban tissue.*

1.

2.

3.

4.

Figure 74 - *Accumulation of 1) obesity rate, 2) unemployment, 3) empty stores and 4) the position of the problematic neighbourhoods in Amsterdam.*

1.

2.

3.

Figure 75 - *Accumulation of 1) green spaces, 2) industrial spaces and 3) sport complexes in Amsterdam.*

1.

2.

3.

4.

Figure 76 - *Accumulation of 1) accessibility by train, 2) accessibility by metro, 3) accessibility by tram and 4) accessibility by car from the highway in Amsterdam.*

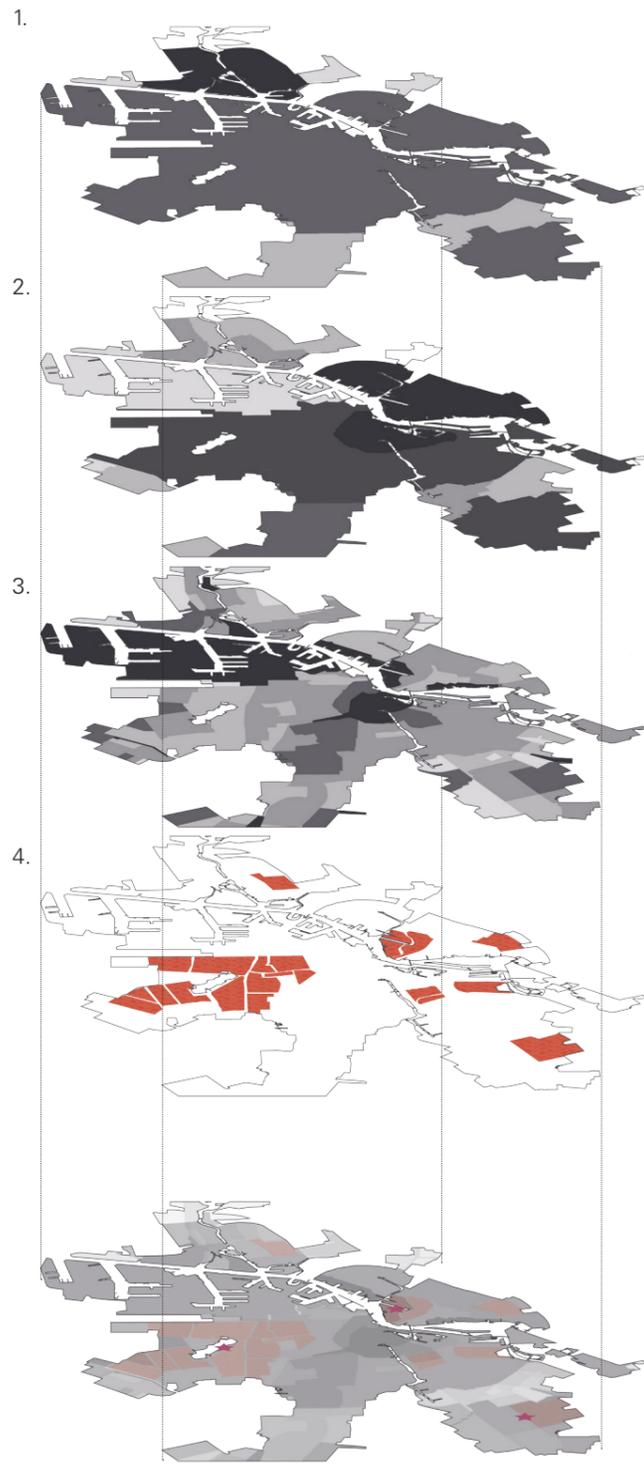**Figure 77 -** *Accumulation of 1) obesity rate, 2) unemployment, 3) empty stores and 4) the position of the problematic neighbourhoods in Rotterdam*
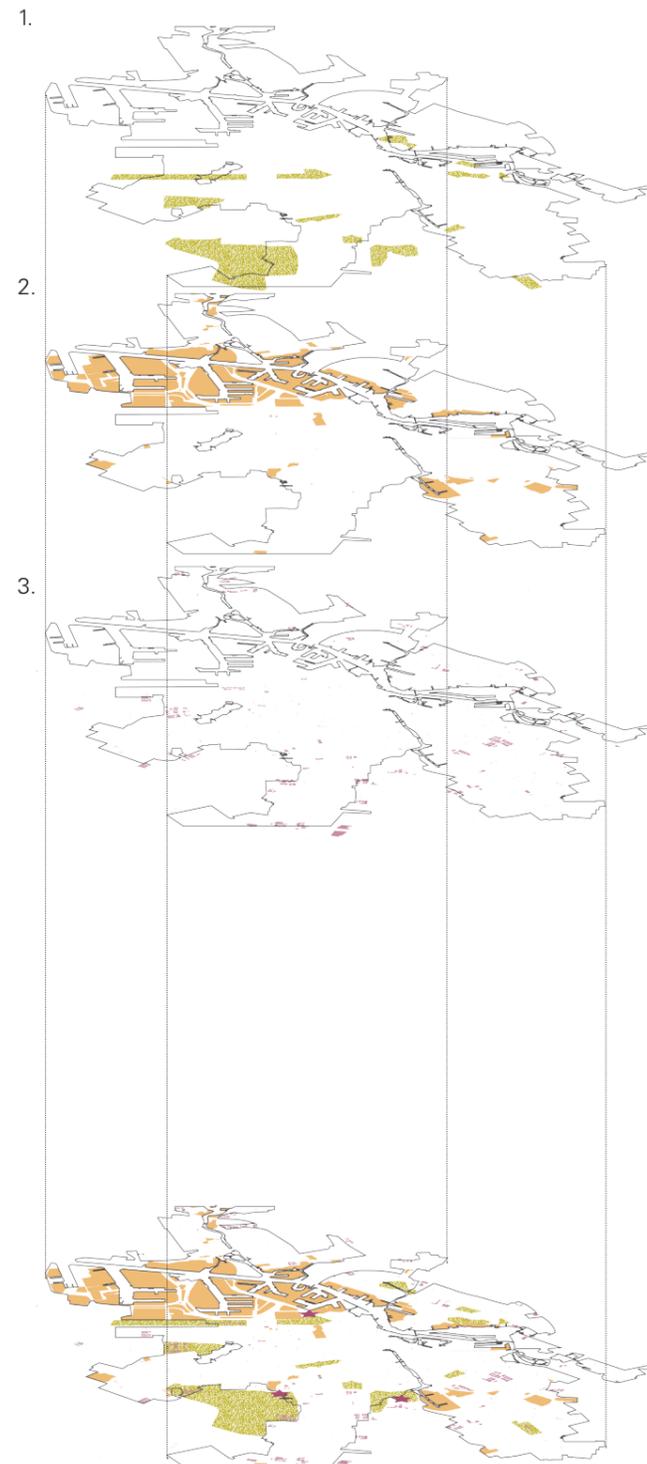
Figure 78 - *Accumulation of 1) green spaces, 2) industrial spaces and 3) sport complexes in Rotterdam*
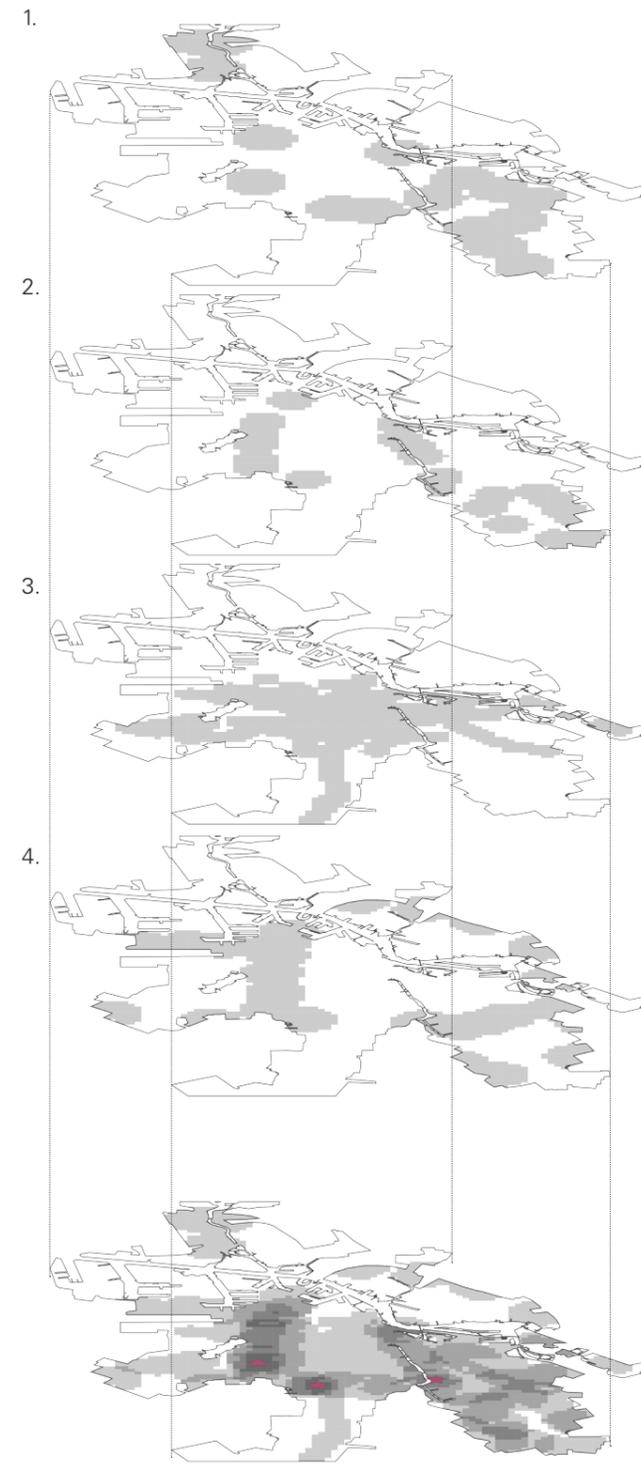
Figure 79 - *Accumulation of 1) accessibility by train, 2) accessibility by metro, 3) accessibility by tram and 4) accessibility by car from the highway in Rotterdam*
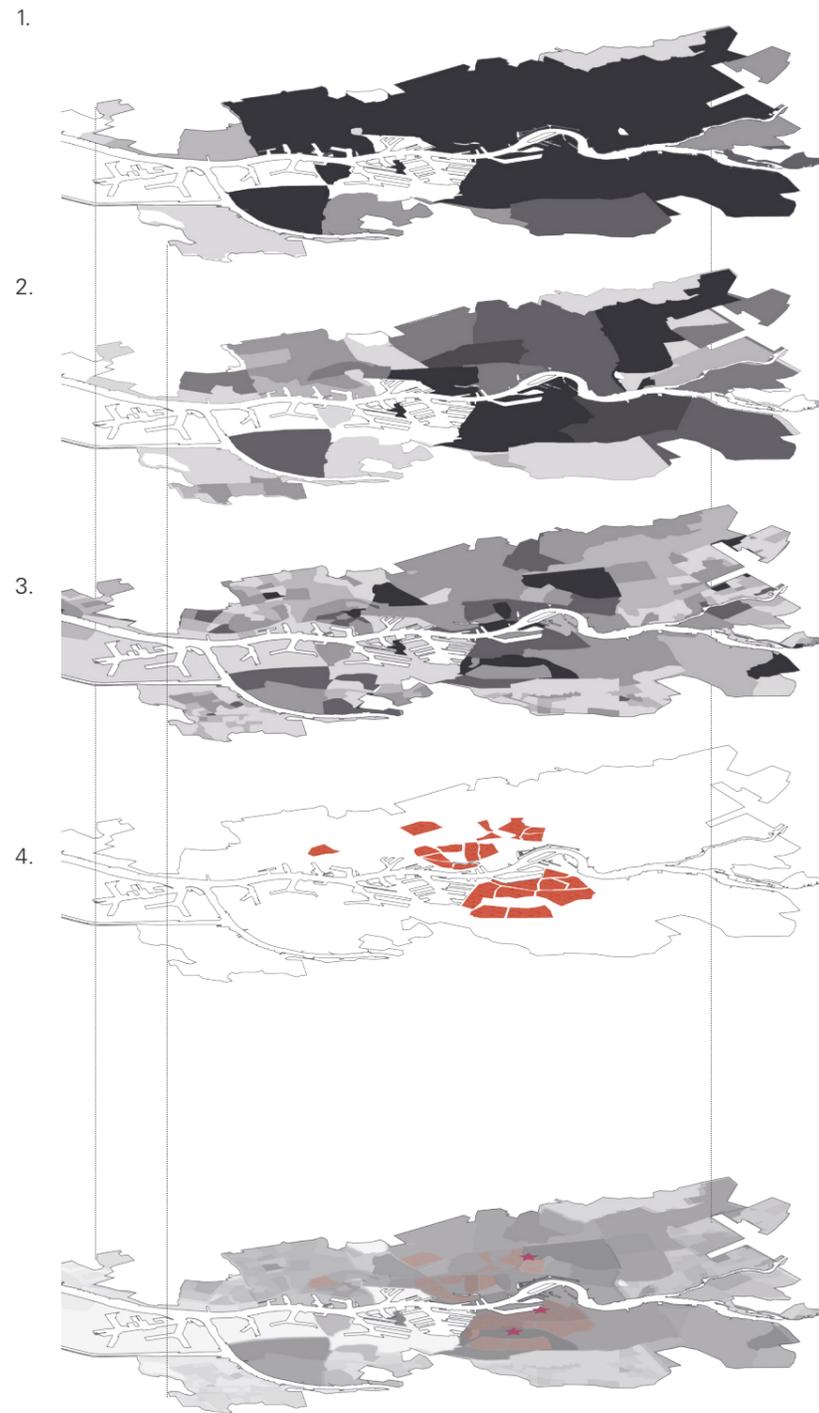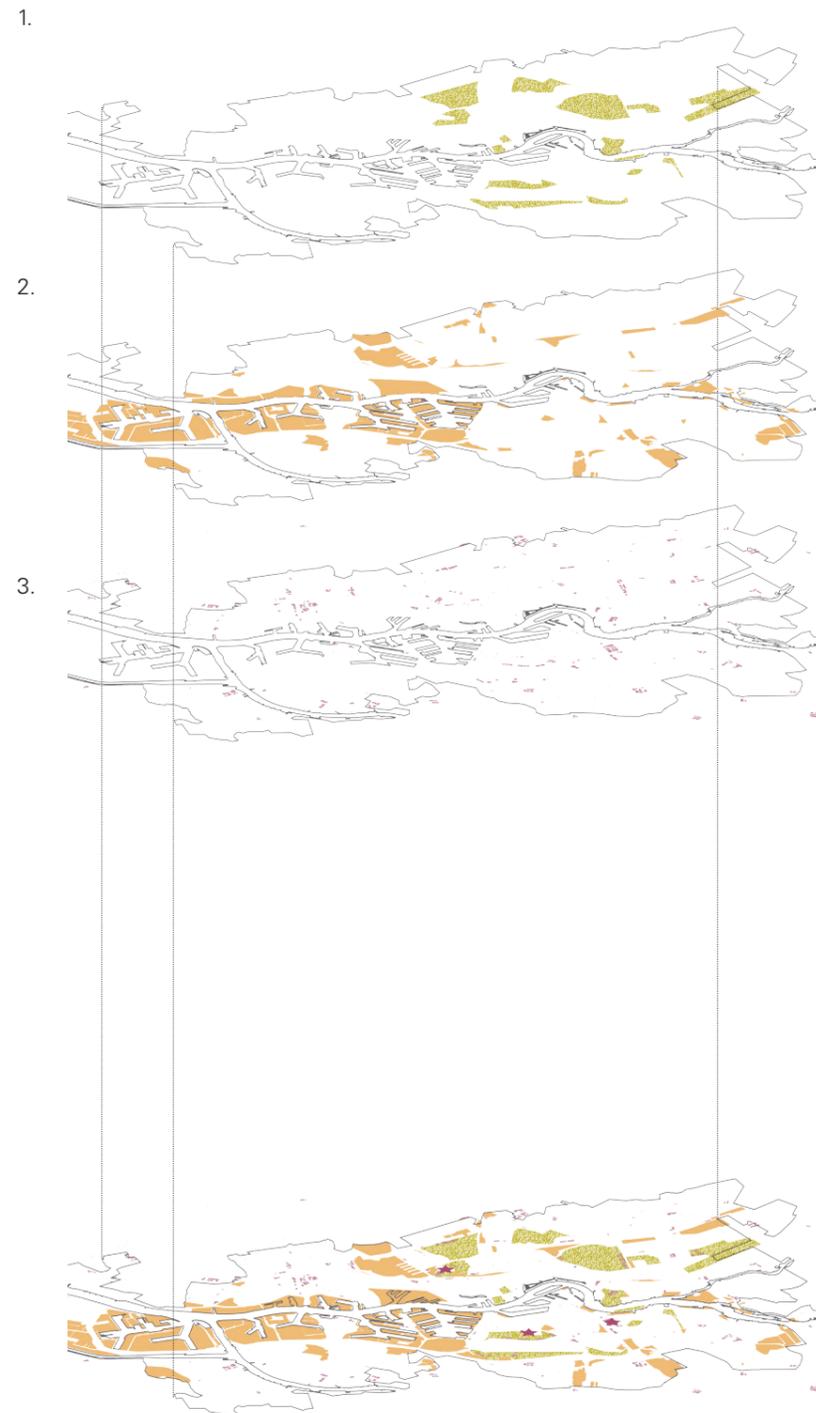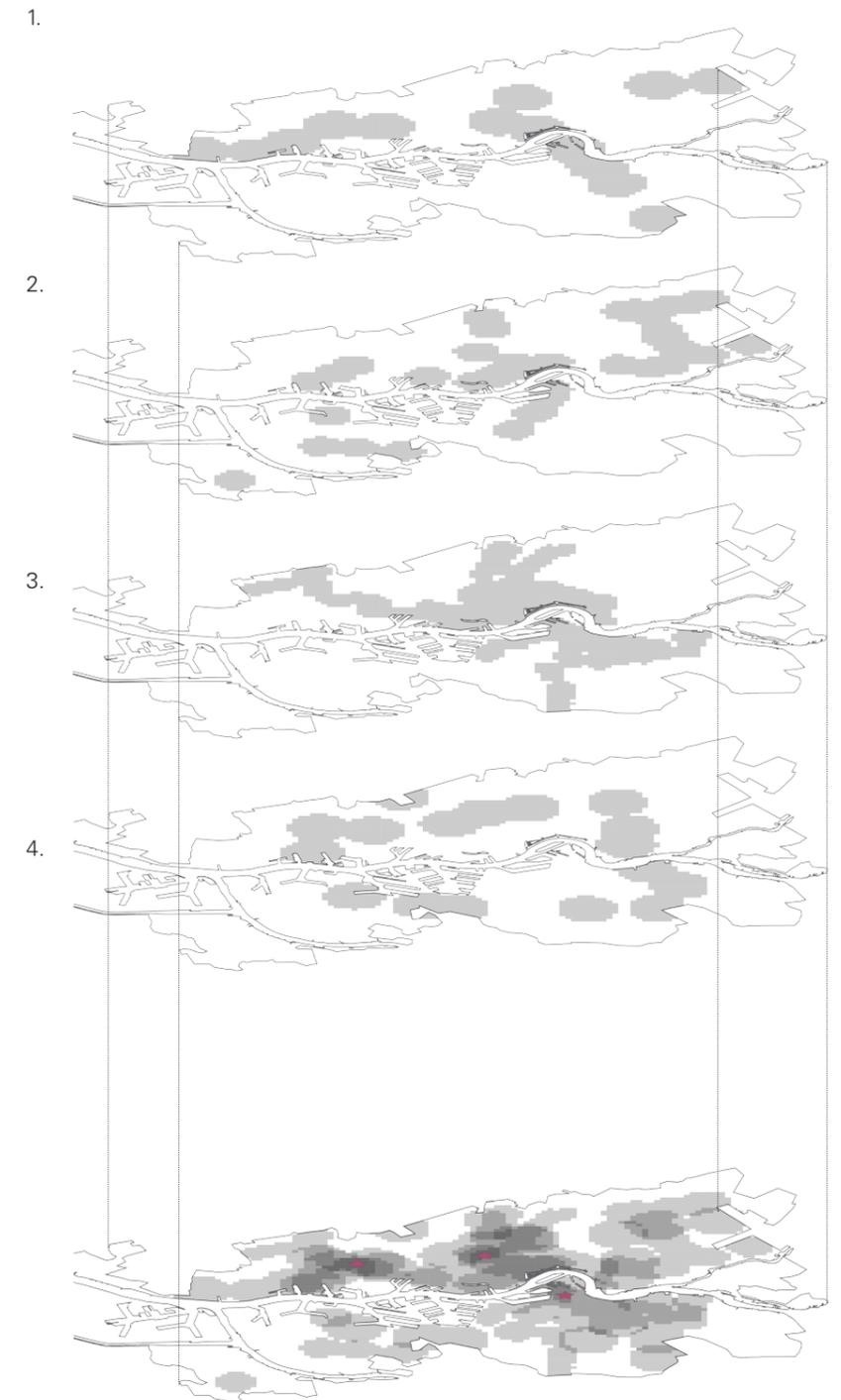
4.3 - POTENTIAL SITES FOR HOSTING A SOCIAL ORIENTED OLYMPIC GAMES IN AMSTERDAM

In Amsterdam five specific areas can be assigned to facilitate the Olympic Games.

1: Buiksloterham: The industrial area of Buiksloterham is now in change as the municipality decided to shift attention to regenerating Amsterdam Noord. The area of Buiksloterham can gain further momentum from the Olympic Games as well as the IJ and the city centre can form a beautiful background.

2: Westelijke Randsteden: The whole area of the Westelijke randsteden is marked as problematic. The possibility to place the Olympic Games within the centre of this location can have an enormous potential for the whole area and its position within the city. For this location, the accessibility of the east side is very well.

3: Zuidas-Bosbaan: This area has already a lot of (inter) national famous sport structures such as the Bosbaan and the 1928 Olympic stadium. Its position next to the Zuid-as, makes it a very interesting spot for investment. But in order to be favourable from a social point of perspective, it should have spill over to the Westelijke randsteden.

4: Amstel Businesspark: This area contains the RAI , an complex with several easy to transform halls. An Olympics at this place could be an example how to turn down the space-usage and the permanency of the Olympic footprint. At the same time there is plenty of space left across the ring road, offering a next possibility for the expansion of Amsterdam.

5: Using the Amsterdam Arena as a home base for a future Olympic Games, the importance of this area a business and event site is could be strengthened. The site offers a large network of infrastructure and a reasonable amount of space. The Bijlmer is (in)famous on international level and could use a severe image boost from the Olympic Games.

Figure 80 - *Overlay of the researched aspects in Amsterdam, schowing the accessibility, multitude of space and concentrations of deprived neighbourhoods.*

LEGEND   A0: 1:5000   N↑

Industrial areas

Green spaces

Sport complexes

Socio-economic deprived neighborhoods

the 'IJ' and other waterbodies

Possible Olympic areas

Possible places for the Olympics

Degree of accesibility by large public transport

Highway

Public transport line

Schiphol airport

83   84
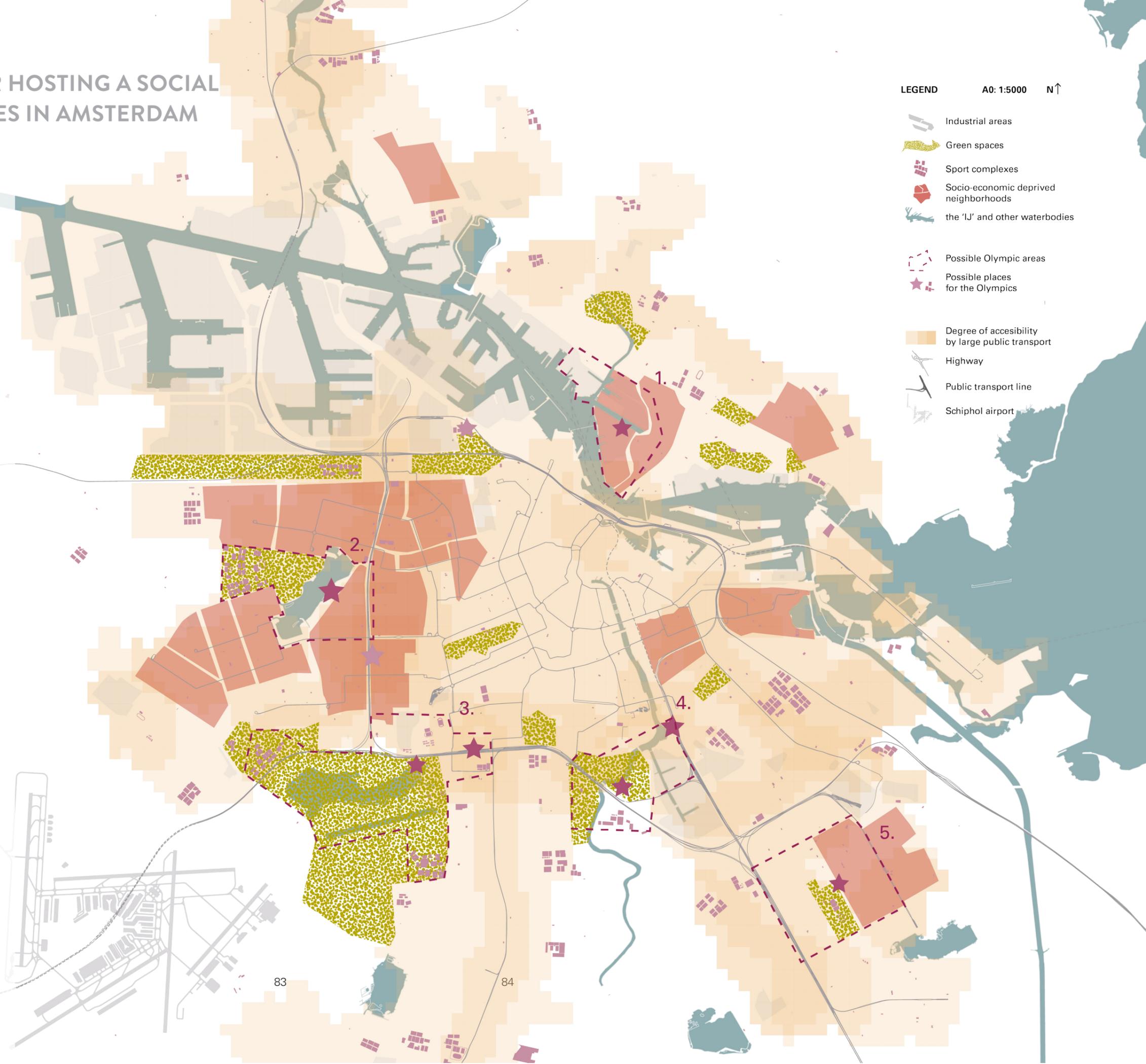
4.4 - POTENTIAL SITES FOR HOSTING A SOCIAL ORIENTED OLYMPIC GAMES IN ROTTERDAM

In Rotterdam three specific areas can be assigned to facilitate the Olympic Games.

1: Prinses Beatrixpark: This location is more oriented towards the cities of Schiedam and Vlaardingen. It is specifically useful as a location due to great accessibility by multiple transport modes. However, there is limited space, fragmented sport infrastructure and it has to cross multiple neighbourhoods that don't require a big investment.

2: Overshie - Bijdorp: This location would be in the middle of several known problematic neighbourhoods, such as Overschie and Rotterdam West . Accessibility is very well since its close to train station Rotterdam Central, as well as airport Rotterdam. Challenges would be the limited size of existing sport structures, the zoo Diergaarde Blijdorp and the construction of a spill-over effect to Rotterdam West.

3: Rotterdam South: The whole area of Rotterdam South , with 200.000 inhabitants, has a very negative image, and many of the neighbourhoods in this part of the city are qualified to be problematic. At the same time Rotterdam South contains Ahoy event hall, the top sport centre and the Kuip stadium. Its transport is mainly focussed on the local bus system, it has only three stop-train stations. The Olympic Games in Rotterdam would mean a tremendous boost and (social) infrastructure for this area.

Resulting, Rotterdam Zuid, with the future Olympic areas of Varkenoord and Zuiderpark is the place that is most suitable to host the Olympic Games if it aims for boosting the social environment. Not only there are already two suitable larger sport complexes and precious space in proximity to degraded neighbourhoods, there is, in terms of increasing accessibility and improving the living conditions of citizens, a lot to win. The next step in to determine the neighbourhoods and the kind of problems which should gain most of the positive spill over of hosting the Olympic Games, the focus points of design.

LEGEND   A0: 1:5000   N↑

- Industrial areas
- Green spaces
- Sport complexes
- Socio-economic deprived neighborhoods
- River Maas and other waterbodies
- Strategic area
- Design locations
- Possible places for the Olympics
- Degree of accesibility by large public transport
- Highway
- Public transport line
- Tram/Metro/Train station
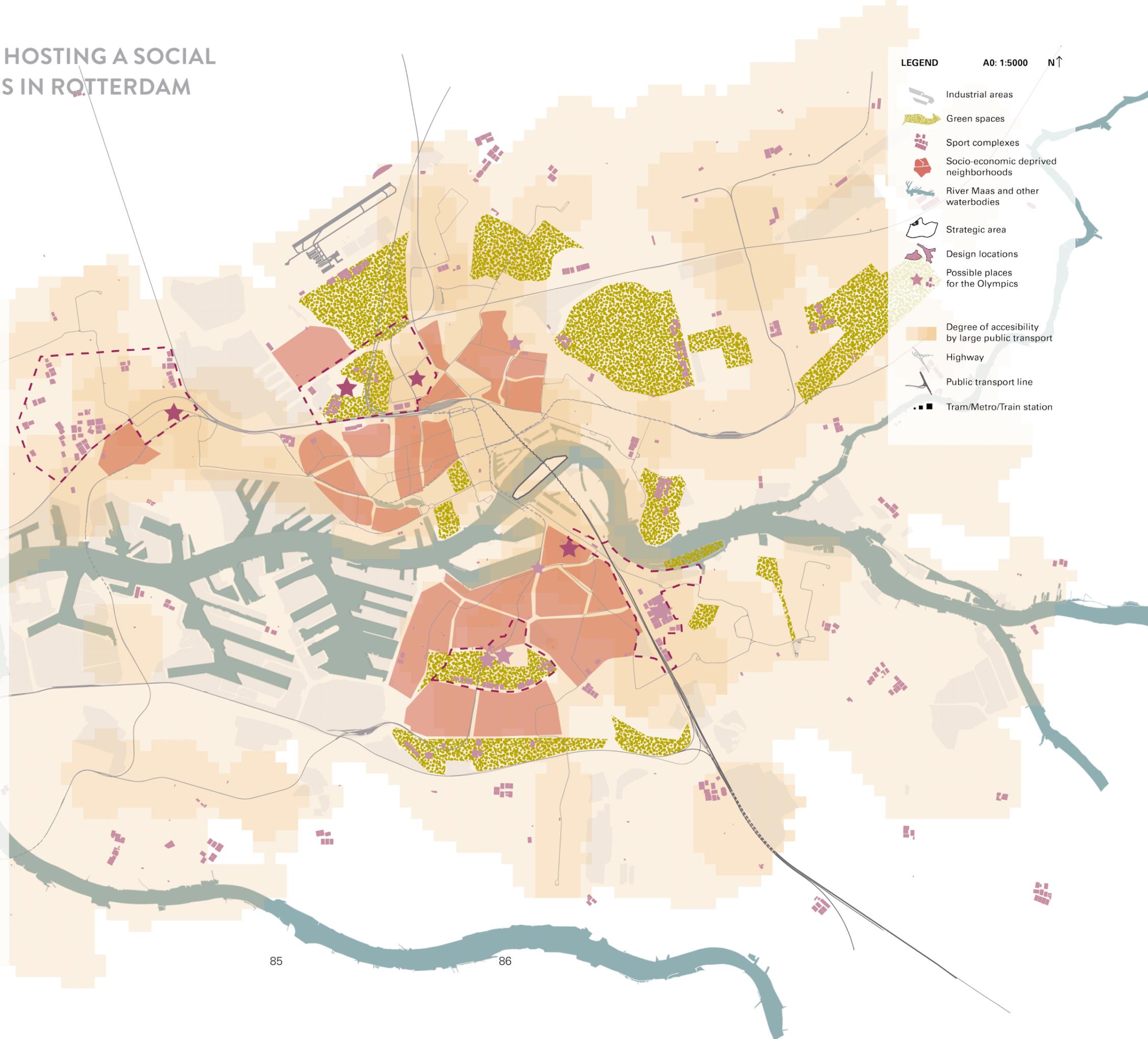
Figure 81 - *Overlay of the researched aspects in Rotterdam, schowing the accessibility, multitude of space and concentrations of deprived neighbourhoods.*

5. - DEFINITION OF A PROGRAMME OF REQUIREMENTS FOR THE OLYMPIC GAMES IN ROTTERDAM SOUTH

The current social-economic and spatial situation in Rotterdam South and focus areas of a Olympic strategy and design for Rotterdam South are analysed in this chapter. From historical and data analysis the neighbourhoods between Zuiderpark and Varkenoord are assigned as focus area. Next, an overview is given of current future projects in Rotterdam South. Through an excel-model a research is conducted to the spatial implementation of the Olympic Games. From this three researches, requirements to the strategy and design of the Olympics in Rotterdam South derived. These are collected in a programme of requirements in the last section.

Figure 82 - *Aerial picture of Rotterdam South around 1930 (retrieved from http://www.rotterdamkaart.nl).*

5.1 - THE SETTING OF SOCIAL SUSTAINABILITY IN ROTTERDAM SOUTH

To get a grip on the degree of social sustainability in Rotterdam South, a historical analysis done. It will explain certain trend and data found later on. It does also reveal a little of the identity of Rotterdam South.

5.1.1 - Historical growth

The historical analysis looked intro the growth of Rotterdam South from 1850 up till today. From this historical analysis several marking events can be defined:

1. Up till 1900 only small villages were settled on the south banks of the river Maas, they formed the prime passage points.
2. Serious development of Rotterdam South started between 1900-1940, as response to the extension and employment possibilities of the harbour.
3. 1900-1940 and 1945-1980 were the form defining for Rotterdam South.
4. The existing forms of Varkenoord is based on the ancient structures of dikes and polders, while the form of Zuiderpark isn't based on any morphological lines, but is at random. However,

the water structures within the park are based on the former road system through the park.
5. From 1980 development was mostly situated at the Kop van Zuid and south o the existing neighbourhoods.
6. The highway was constructed between 1945 and 1980 and also attached to the older neighbourhoods. Car usage grew tremendously, while the older neighbourhoods aren't designed for such a usage.
7. Other neighbourhoods are in return designed with plenty of space for car usage and green structures.
8. Except for the small villages of Ijsselmonde and Oud-Charlois, Rotterdam Zuid misses a clear old centre.

From historical perspective, the building stock of Rotterdam South is highly outdated, concentrated along narrow streets. At the same time, there is no clear historical centre, but only some which were build around the 70's. From this point upgrade of the building stock as well as creating an attractive centre to the city district. The narrow street require a reconfiguration towards the present car usage.

Figure 84 - *Position of design locations in map of Rotterdam South around 1850 (retrieved from http://www.topotijdreis.nl/).*

Figure 83 - *Governmental boundaries of sub-municipalities and neighbourhoods in Rotterdam South.*
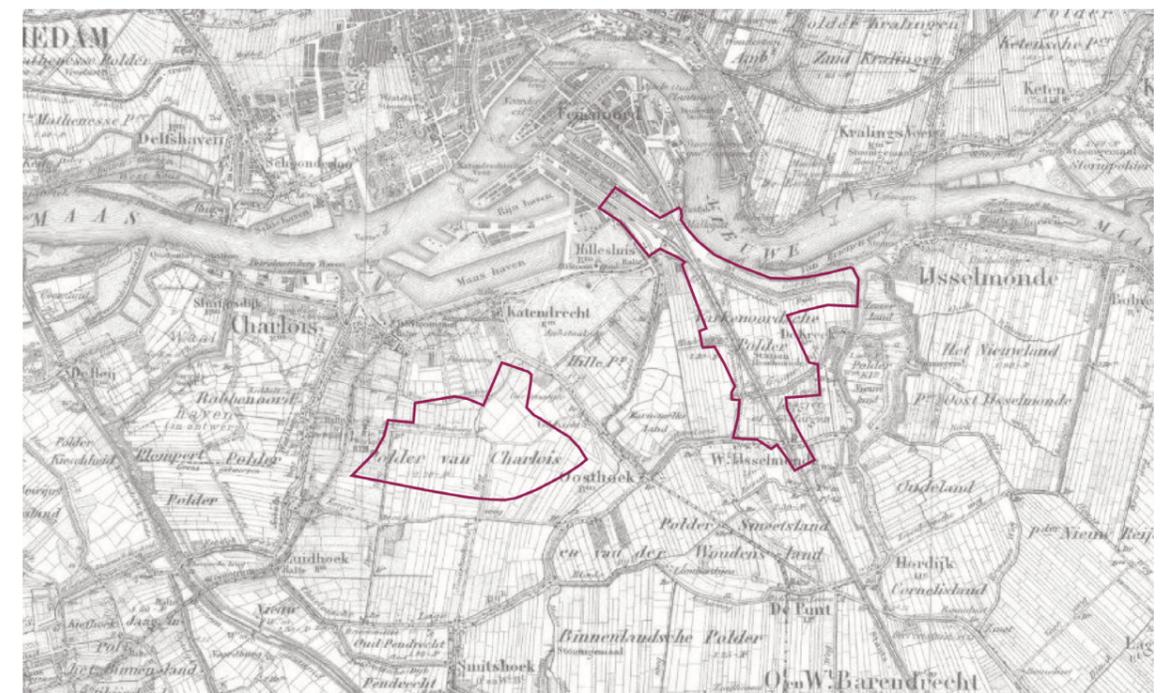
Figure 85 - *Position of design locations in map of Rotterdam South around 1900 (retrieved from http://www.topotijdreis.nl/).*
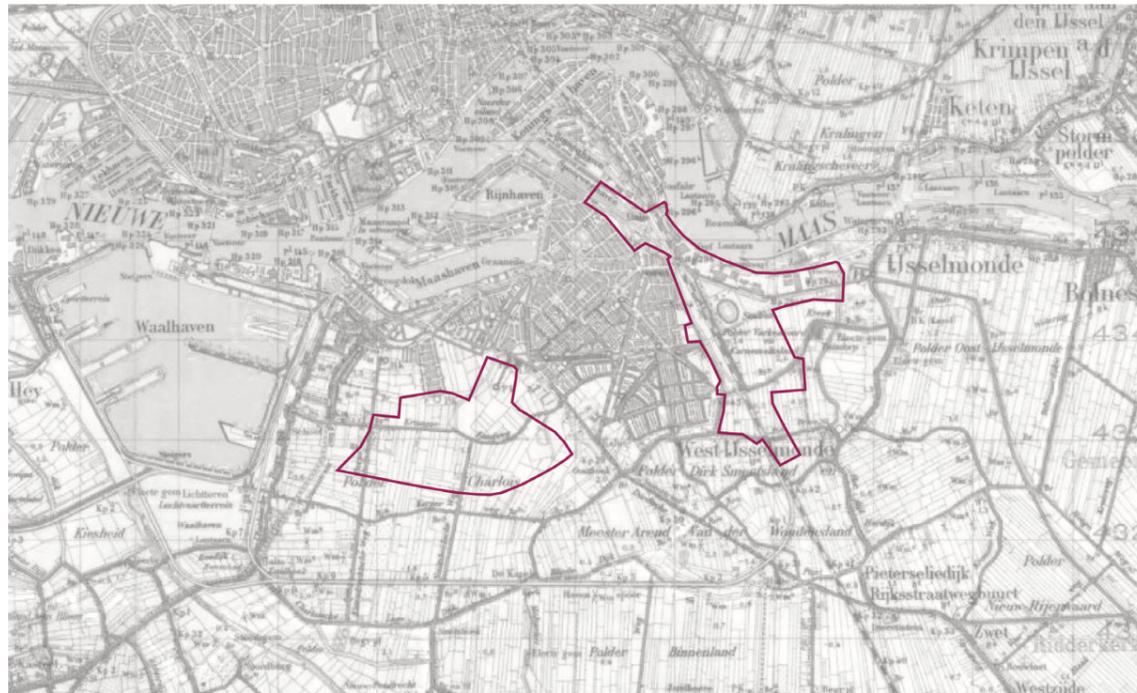
Figure 86 - *Position of design locations in map of Rotterdam South around 1940 (retrieved from http://www.topotijdreis.nl/).*
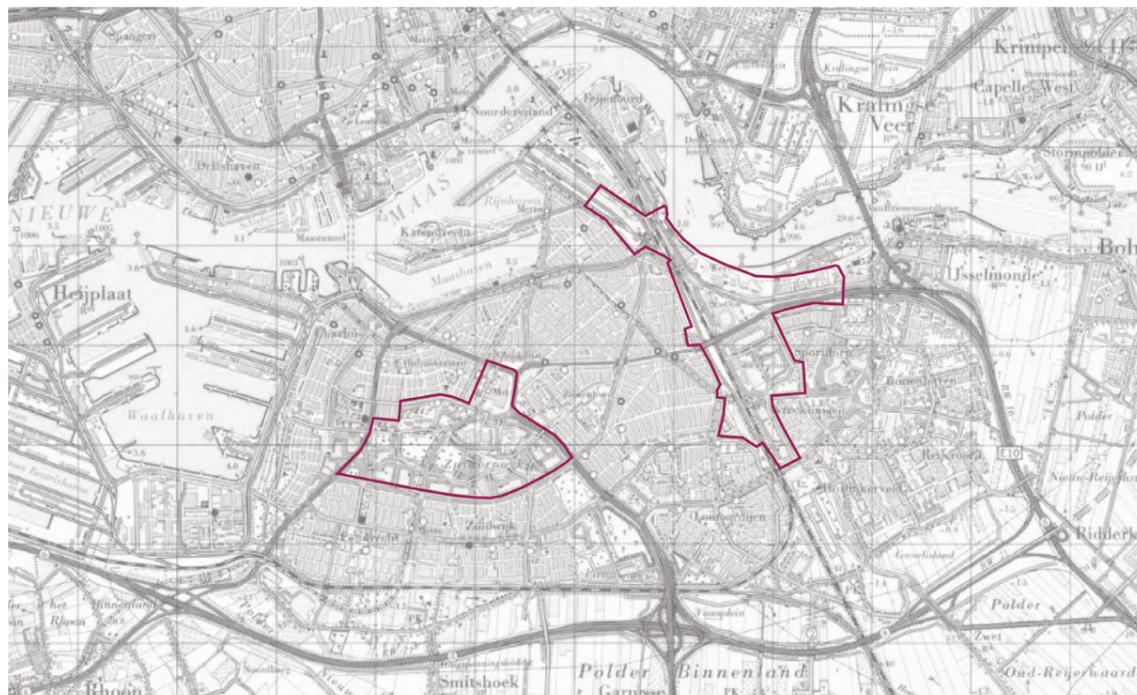
Figure 87 - *Position of design locations in map of Rotterdam South around 1980. The map of 2015 shows the same urban morphology. (retrieved from http://www.topotijdreis.nl/).*

Figure 88 - *next page - Overview of building age of all buildings in Rotterdam South, showing little change since 1980 except for the Kop van Zuid (retrieved from http://code.waag.org/buildings)*
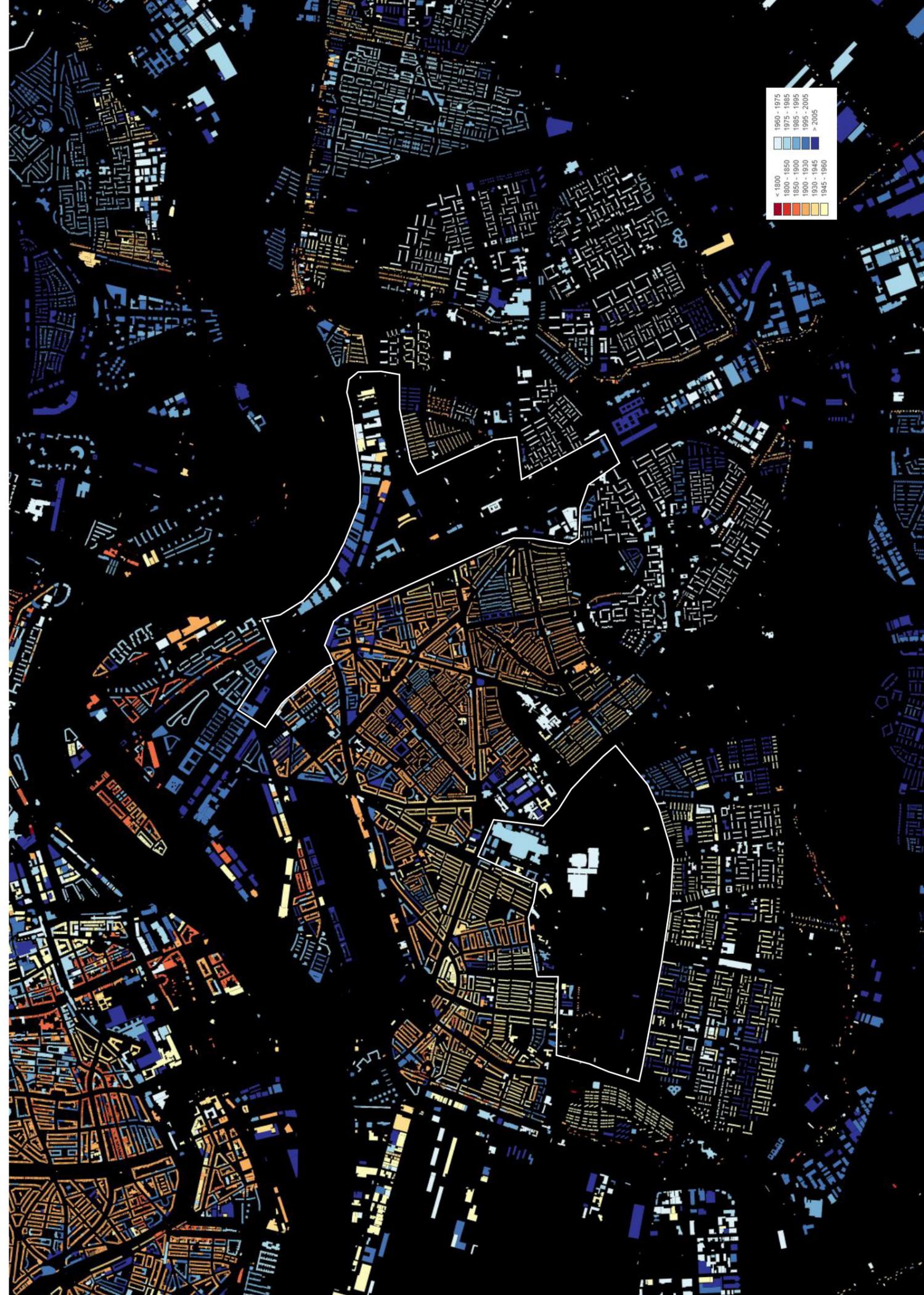
5.1.2 - Socio-economic setting

The determination of the socio-economic situation is based upon several data sets enabled by the municipality of Rotterdam. This data is transformed in charts which enable to compare them. The first chart is the average of Rotterdam. This average is marked as a red line in the following charts. The areas of Charlois, Feijenoord and IJsselmonde have several notable social-economic differences compared to the average of Rotterdam.

1. Percentage 70+ inhabitants is lower than average in Charlois and Feijenoord. Inhabitants live shorter, possibly due to a unhealthy lifestyle.
2. Native groups are a minority in Feijenoord and Charlois. Political choice point out ethnical tensions in whole of Rotterdam South.
3. Skilled labour force is substantially lower than average, as well as usable income.
4. Healthcare and education are important employment sectors to Rotterdam South, sport and recreation isn't.

5. Much of the employment is clustered in relative small companies in Rotterdam South. Attraction bigger companies is much more effective though.
6. Housing stock is old, especially in Feijenoord and Charlois. Large parts haven't been renovated for more than 50 years now.
7. Property value is much lower than average, almost no property in segment above 200.000 euro.

From this analysis it can be witnessed that the socio-economic setting in Rotterdam South is far worse than the average of Rotterdam. Generally, IJsselmonde is better off than Feijenoord and Charlois.

The analysis also points out that there are threats in the lack of education and social tensions among inhabitants of South. But at the same time there are possibilities for employment in the healthcare and education sector as well. In relation to the Olympic Games, employment in sport and recreation could be fostered as well.

Rotterdam harbor - industrial area
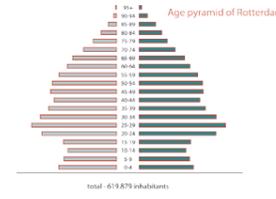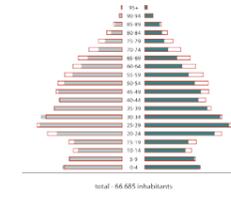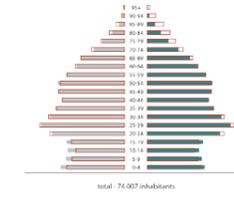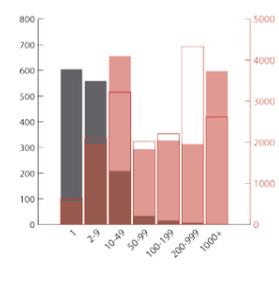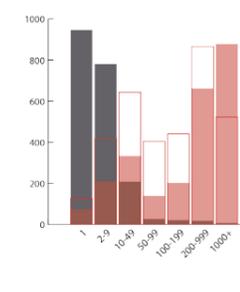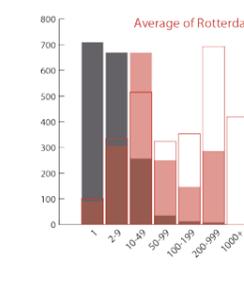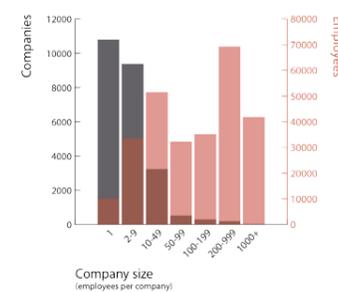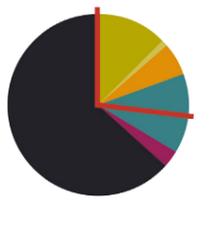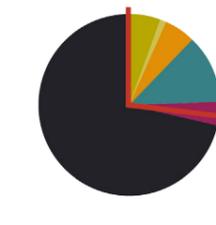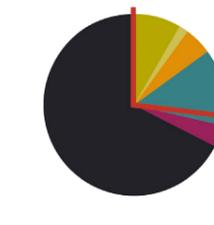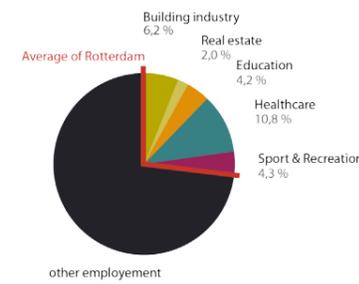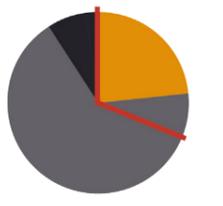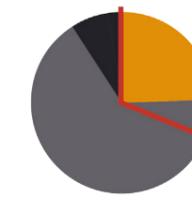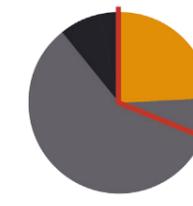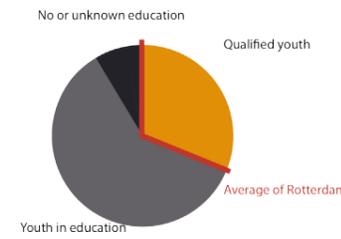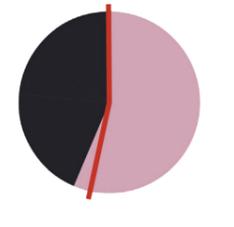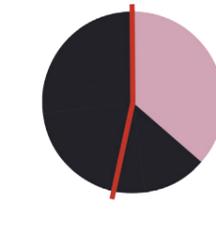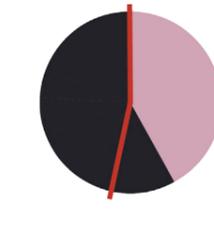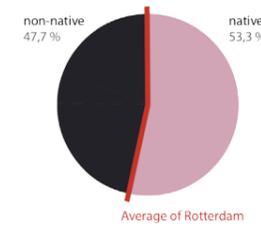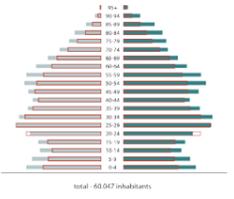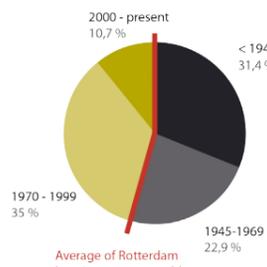
Zuiderpark - city park

International companies at the Kop van Zuid - business district

Kuip & Ahoy - large sport venues

Waalhaven and Hordijk - industrial areas

Zuidplein - city centre

Shops at the main streets - small companies
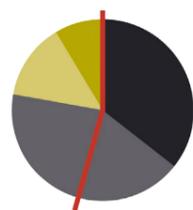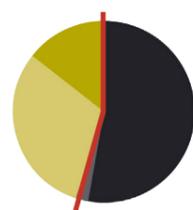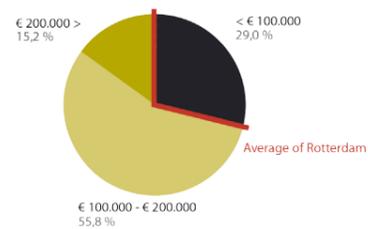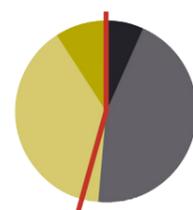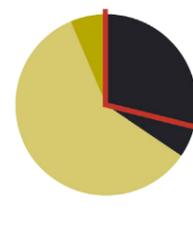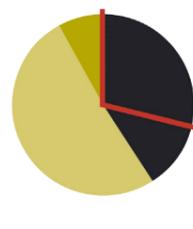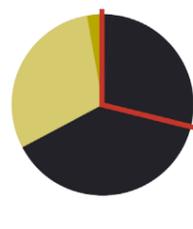
Ikazia, Erasmus, Maasstad hospital - healthcare centres

Figure 89 - *Map of main structures that contribute to social sustainability aspects.*
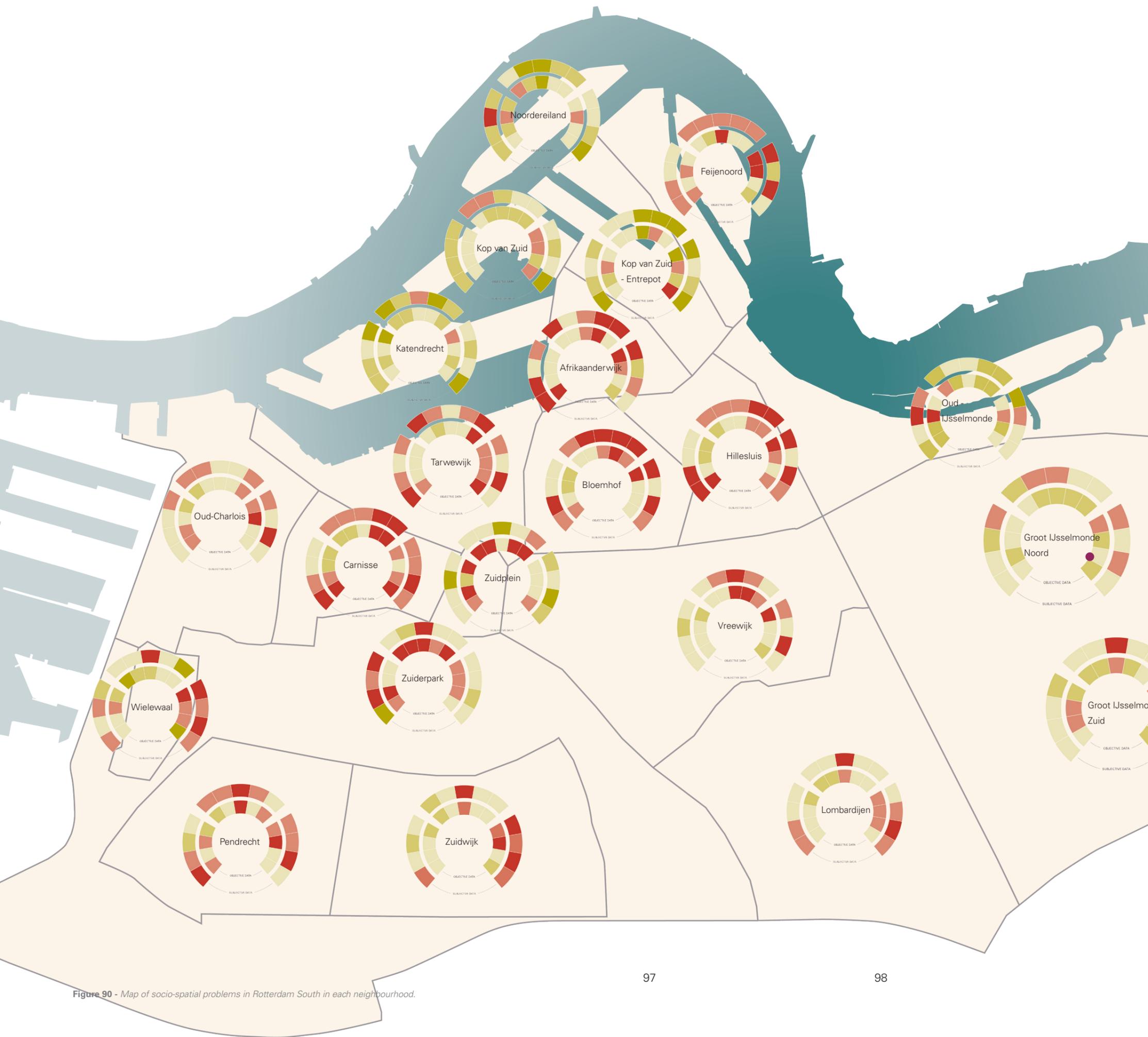
Figure 90 - *Map of socio-spatial problems in Rotterdam South in each neighbourhood.*

Socio-spatial setting

The municipality of Rotterdam created a social profile for each neighbourhood in Rotterdam. The physical index, safety index and social index construct a circular image. The images show objective and subjective observation of the subjects. In this way, priority neighbourhoods and specific socio-spatial issues can be identified.

From this social profile the following conclusions can be drawn.

- In some neighbourhoods there are severe differences in perceived social-spatial situation and the objective measured situation.

- Overall there is an mostly issues with capacity of the labour force, the housing stock and the living environment. Concern about safety revolve about burglary and vandalization of the living environment. At the neighbourhoods of Zuidplein, Zuiderpark and theft and violence are severe safety issues.

- In Feijenoord there is a hard line between the Kop van Zuid and neighbourhoods south of it within the sub-municipality of Feijenoord.

- There are enough provisions in almost all neighbourhoods and no need for more, except for Oud-IJsselmonde, which is very much in need for it.

- For Zuidplein and Zuiderpark the public space is an key issue which should be targeted.

Concluding. Focus points for Vreewijk, Hillesluis and Feijenoord are capacity building, renewal of housing stock as well improvement of living environment.

Public space, overall crime and the state of environment are key-projects for Zuiderpark and Zuidplein.

For IJsselmonde it is important to increase the provisions locally and improve the living environment.
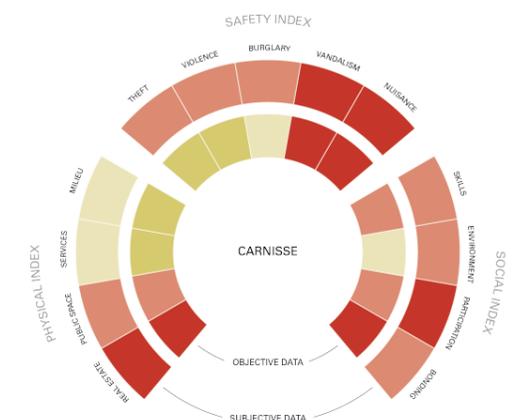
Figure 91 - *Scheme of a 'wijkprofiel' as used by the municipality of Rotterdam, showing the physical index, safety index and social index.*
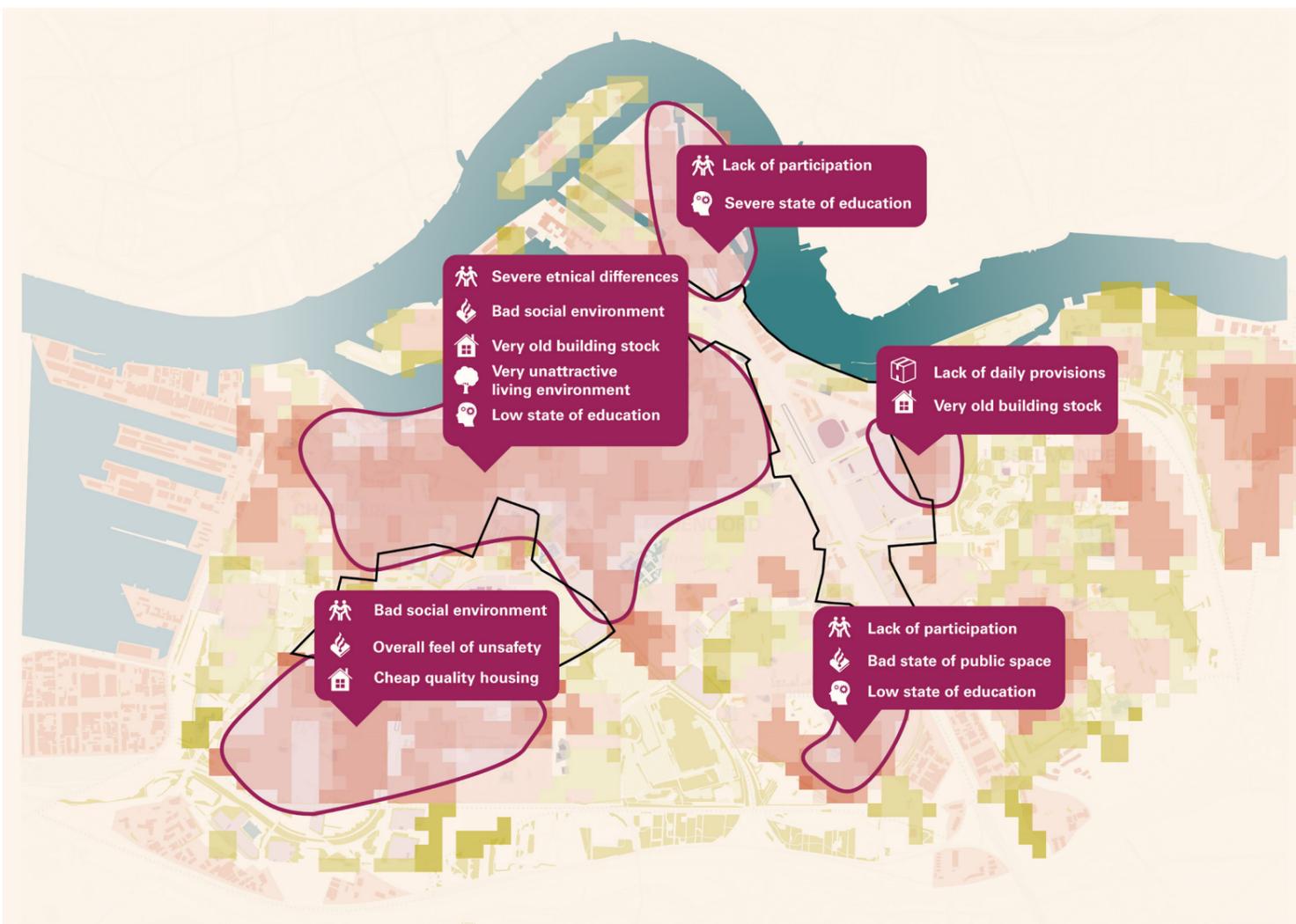
Figure 92 - *Map of focus areas and main issues in relation to the social sustainability in Rotterdam South.*

Figure 93 - *Map of all municipal urban regeneration plans for Rotterdam South..*

5.1.4 - Emerging social wish

Combining the data of the previous sections and the spatial assignment of social-spatial conditions in the Leefbarometer combines to the following map. This map shows the position of the most intense positive and negative social-spatial situations. It show the place and topics that citizens request in order to enhance the social sustainability of Rotterdam South.

Overall, Rotterdam South is not social sustainable at all. Multiple urgent problems can be found at one spot. Overall, for Rotterdam South it is important to increase the skilled labour force, increase life-predictions and improve the living environment severely. This is through public space, but also through a revision of the housing stock.

The attraction of big companies should be promoted, combined with the aim on strengthening the top-employment sectors of healthcare and education, but also sport in Rotterdam South.

Also important, the general acceptance and cooperation between ethnic different group should be promoted. This might be the way to decrease the tensions between all different nationalities that are assembled on this location.

The focus areas for the Olympic Games should be in between both locations as the neighbourhoods of Hillesluis, Bloemhof, Afrikaanderwijk, Vreewijk and Zuidplein contain the most social issues and have, due to its location, the best possibilities to be addressed directly.

5.1.5 - Current and planned projects for regeneration

There are multiple plans for regenerating Rotterdam South. In order to know the request of Rotterdam when hosting the Games, the Nationaal Plan Rotterdam Zuid, Stadsvisie and multiple specific plans are analysed. With the organisation of the Games, these aims should be respected and enhanced. Most important of these plans are the NPRZ and the Stadsvisie. Above map shows this request.

Rotterdam aims to increase living standards by the promotion of three types of cityscapes. The first is a dense cityscape oriented to the river, second a mixed city environment and third a green oriented sub-urban environment. The mixed city environment is focused on, implemented on the areas of Tarwewijk, Oud-charlois, Hillesluis and Afrikaanderwijk. It emphasizes

on redevelopment of the main streets to green corridors and reconstruction of decayed housing.

Employment in healthcare, education and harbour need to be promoted and facilitated through specialized education according to the NPRZ. Further, several active project plans emphasize the reconstruction of Zuidplein, Varkenoord, Zuiderpark and a new metro-line with the other side of the Maas. The Olympic Games will catalyse these development plans.

The NPRZ doesn't address all epicentres of social sustainability problems, as can witnessed on the left page. It neglects the regeneration of Pendrecht, Sportdorp and Lombardijen and focusses only on the northern part of Rotterdam South. Therefore, its contribution to the social sustainability of whole Rotterdam South might be limited.

5.2 - SOCIAL AIM FOR A OLYMPIC GAMES IN ROTTERDAM SOUTH

The historic analysis of Rotterdam South and the comprising analysing of socio-economic and socio-spatial data showed a consistent image of severe problems in many neighbourhoods. These neighbourhoods are specifically concentrated between both Olympic areas as well as the neighbourhoods around Zuiderpark. These problems relate a severe state of the housing stock, ethnical differences, relative low levels of education, unemployment and an overall bad quality of the urban environment.

The municipality has tried several times to regenerate Rotterdam Zuid, but have failed to do so properly. At the moment Rotterdam Zuid is national priority and the National Programme Rotterdam Zuid aims to regenerate the Northern part of Rotterdam Zuid to lift on the developments on the Kop van Zuid. In order to succeed it agreed that a high level of regeneration projects is required to gain that momentum and for the plan to succeed. This national plan is proposed together with some key projects such as Hart van Zuid, Feyenoord city, a new metro line and a greenification of the main streets. Therefore a lot of investment is required.

This investment can be drawn from and for the organisation of the Olympic Games. The Olympic Games can be the opportunity to realise the ambitions of the NPRZ and key projects, but can only do so if the event itself is already designed to meet those ambitions. This means that after the Games, little configuration is needed to realize the ambitions of the NPRZ. In this way, hard to find money is freed to invest in the right projects.

It is clear from the analysis, that the NPRZ is not going to tackle the issues witnessed in the South of Rotterdam South. Therefore the aim for the Olympic Games should go further. It means that the Olympic Games are an overall regenerative project, instead only confined to the north of Rotterdam South. The design of Varkenoord should facilitate to extend the regeneration processes at the Kop van Zuid to the neighbourhoods of Hillesluis, Bloemhof etc. Zuiderpark should be the centre point of social sustainable regeneration of preferably all surrounding neighbourhoods. This means that Zuiderpark must form a central position to the social facilities of Rotterdam South.

Figure 94 - *Map showing the aim of hosting the Olympic Games in Rotterdam South with the purpose for an overall social sustainable regeneration.*

5.3 - DETERMINATION OF THE OLYMPIC PROGRAMME IN ROTTERDAM SOUTH

VARKENOORD, ROTTERDAM SOUTH

olympic site (45 ha.)
CEREMONIES
FOOTBALL
average capacity
is 80.000. Public
transport inter-
nationally connected

8 ha. | 10 ha. | 6 ha. | 5 ha.
2 ha. | 6 ha. | 9 ha.

olympic village (40 ha.)
ACCOMODATION
size of the village is
depending on height

8 stories high (60% cover) | 3 ha.
8 stories high (24 ha.) | 8 stories high 3 ha.

international zone (25 ha.)
ACCOMODATION
MEDIA
size depending on
presence media centre

media 4 ha. | countries 8 ha. | sponsors 8 ha.

public zone (25 ha.)
LEISURE
TRANSPORT
often forms a large
park structure

20 ha.

transport zone (10 ha.)
TRANSPORT
for athletes & logistics

7,5 ha. | 2,5 ha.

total demand: 145 ha.

ZUIDERPARK, ROTTERDAM SOUTH

olympic swimming pool (12 ha.)
SWIMMING
SYNCHRONIZED
WATER POLO
DIVING
50m pool required

1 ha. | 4 ha. | 3 ha. | 2 ha.

velodrome (10,5 ha.)
CYCLING TRACK
often expensive,
with limited return

2 ha. | 0,5 ha. | 4 ha. | 2,4 ha. | 1,6 ha.

small hall (7 ha.)
TEAKWONDO
FENCING
held at different
moments in event

2 ha. | 2,4 ha. | 0,5 h. | 2 ha. | 1,6 ha.

small hall (7 ha.)
BOXING

small hall (7 ha.)
KARATE

multipurpose hall (13 ha.)
MOD. PENTATHLON
GYMN. RYTHMIC
GYMN. ARTISTIC
TRAMPOLINE
held at different
moments in event

2 ha. | 1,0 ha. | 4 ha. | 3,6 ha. | 2,4 ha.

large hall (11 ha.)
VOLLEYBALL

1 ha. | 1 ha. | 4 ha. | 3 ha. | 2 ha.

small stadium (11 ha.)
FIELD HOCKEY
often a seperate
training facility is
present

2 ha. | 1 ha. | 4 ha. | 2,4 ha. | 1,6 ha.

small hall (7 ha.)
JUDO
WRESTLING
held at different
moments in event

small hall (7 ha.)
CLIMBING

small hall (7 ha.)
SKATING

total demand: 99,5 ha.

ROTTERDAM NORTH

small stadium (11 ha.)
ARCHERY
at least 70 meter
free shooting dis-
tance required

greenfield (40 ha.)
THRIATLON
large enclosed
water surface need
to be present

equestrian indoor (15 ha.)
EQUESTRIAN
measurements to
ensure a dry event,
outside also possible

tennis centre (10 ha.)
TENNIS
several stadiums +
training facilities

small stadium (11 ha.)
SOFTBALL
reduced size com-
pared to former
softball Olympics

golf course (80 ha.)
GOLF
18-holes track
required

NETHERLANDS

shooting range (7 ha.)
SHOOTING
Apeldoorn, 't Loo
Palace

wildwater track (6,5 ha.)
CANOE SLALOM
Zoetermeer, Leisure
village

large hall (11 ha.)
BASKETBALL
Amsterdam, RAI

large hall (11 ha.)
HANDBALL
Amsterdam, Sporthallen
Zuid

large hall (11 ha.)
SURFING
Scheveningen, beach

small hall (7 ha.)
WEIGHTLIFTING
Amsterdam, RAI

small hall (7 ha.)
BADMINTON
Almere, Topsport-
centrum

small hall (7 ha.)
TABLE TENNIS
Almere, Topsport-
centrum

small stadium (11 ha.)
RUGBY
Amsterdam, NRCA
stadium

small stadium (11 ha.)
BEACH VOLLEYBAL
Scheveningen, beach

large stadium (13 ha.)
ATHLETICS
Amsterdam, Olympic
Stadium

large stadium (13 ha.)
FOOTBALL
Amsterdam, Arena

large stadium (13 ha.)
FOOTBALL
Utrecht, Galgenwaard

large stadium (13 ha.)
FOOTBALL
Eindhoven, Philips
stadium

large stadium (13 ha.)
FOOTBALL
Arnhem, Gelredome

marina (14 ha.+)
SAILING
Scheveningen, harbor

greenfields (60 ha.)
CYCLING MOUNTAINBIKE
CYCLING BMX
CYCLING ROAD
Valkenburg, surrounding -
road cycling race to
Rotterdam, Erasmusbridge

rowing track (60 ha.)
CANOE SPRINT
ROWING
Bosbaan, Amsterdam

Varkenoord: 216,0 ha.

Zuiderpark area: 274,7 ha.

LEGEND

- stadium
- hall/complex
- training facilties
- square
- public transport
- inner roads (25-40% to parking spots)
- parking spots
- housing
- services
- green space
- water space
- to be build
- need upgrade
- ready to use

Figure 95 - *Scheme with size and programme of all Olympic venues as defined by Twynsta & Gudde (2008), implemented in the context of the Netherlands, Rotterdam and both Olympic locations.*

5.3.1 - Olympic programme in the Netherlands and Rotterdam region

As witnessed, it is not possible to distribute al programme required for the organisation of the Olympic Games within the assigned area. Therefore, a selection of the Olympic programme has to be made. An Olympic sport event should be held at a convenient place, suitable for that specific type of event.

The Netherlands is already home to an abundance of high-quality sport accommodation, from top-sport centres to trainings complexes and from football stadiums to well-maintained tracks for speed cycling. A dense transport network connects cities together and makes them easily accessible; It shouldn't be a problem to organize the game within this tiny country.

According to previous mentioned rules, percentage of the programme should be accessible within a certain distance, namely 10km, 50km and 200km. According to this restrictions and according to suitability of space the convenience of the Olympic event is examined.

Eventually, the programme is distributed within two clusters. A Zuid-As cluster around the former Olympic stadium in Amsterdam and the main programme in the city of Rotterdam. for example, it is more convenient to organize the athletic games within a stadium which is already build for such kind of events and refer to the former Olympic Games of 1928. 70.000 fans that accommodate the new Olympic stadium will be found at football event, not athletics.

Some cities host already highly specific programme with low demands at national level. The wild water track in Zoetermeer is an example as it is the only one in the Benelux. Building a new wild water track would be a waste of investment.

Last, some programme is distributed to landscape features, such as a direct connection to open water and the presence of hills required for mountain biking, The same rule of convenience count for the distribution of the programme within Rotterdam itself; Some places are better suitable to accommodate a certain sport. With this criteria, the Olympic programme is implemented in the context of the Netherlands.

Figure 96 - *Olympic stadium of Amsterdam, used for the 1928 Olympic Games, will now be used for the athletic events (retrieved from http://olympischstadion.nl)*

Figure 97 - *Topsporthal Almere, used for a variety of sports, will be used for the badminton and table tennis events (retrieved from https://media.vergaderlocaties.nl).*

Figure 98 - *Golfbaan De Hooge Rotterdamsche, the only 18 holes golf course in the Netherlands (retrieved from https://dehoogerotterdamsche.nl)*

Figure 99 - *Distribution of sport among the context of the Netherlands and their position to the main international infrastructure.*

5%

35%

60%

LEGEND

- ▨ Territory of The Netherlands
- ≡ Waterbodies
- ⬮ Assigned Olympic Cities
- ⬤ Featured Olympic sports
- ● Olympic areas
- ⭕ Area consisting a certain percentage of Olympic sports (Heurkens, 2005)
- ✦ Relevant highways
- ⊥ Relevant railroad & Highspeed rail
- ✈ Relevant airports

SCALEBAR

0   25   50   100 km

N

Figure 100 - *Distribution of sport among the context of Rotterdam and their position to the main international infrastructure.*

60%

LEGEND

Build area of Rotterdam

Waterbodies

Assigned Olympic Area

Featured Olympic sports

Landmark object

Historical centre

Area consisting 60% of all Olympic sports

Major roads

Railroad & Highspeed rail

Metro lines

Relevant stations (and possible strategic locations of future stations)

SCALEBAR

0   25   50   100 km

N

107

108

5.3.2 - Fitting of the Olympic program in the design locations

Based upon the research done in Schetsboek voor Ruimtelijke plannen (Boersma & Keijsers, 2008) a certain hectare space is requested in order to be sure there will be enough space to implement each component of the Olympic programme. This amount of hectare, proposed for the areas of Varkenoord and Zuiderpark, is 244,5 ha. For the design, a certain solution space (space that can't be designed properly) needs to be incorporated. This will be 5% of the total proposed space.

The proposed design area of Varkenoord and Zuiderpark accommodates a total of 490,7 ha. This means, that, in the case of a tabula rasa, the required space for the reduced Olympic programme would easily fit within the proposed design space. Fortunately, the profession of Urbanism acts within a context of the city, and so, in the context of the design site. Roads can not easily be changed, a school can't be raised to the ground without severe local consequences and transformation of the rail systems affects regional and national economy. Therefore, careful choices need to be done what to maintain of the context and which of the programme can be assigned to receive a touch of 'Olympicness'.

To mediate between "demand and offer" an excel-model is made. Each section of the proposed Olympic programme is expressed in hectares and divided as a separable and editable component. The programme can be divided in percentage of the original requested space, amount of stories and any additional space components such as solution space and space for security measures. All hectares are counted to a total proposed hectares, either for Varkenoord or Zuiderpark.

Contrary, all hectares of each programme component assembled within the design area's of Varkenoord and Zuiderpark are measured and categorized, in terms of industry, railway, green space, special structures such as the Kuip and many more. It provides a possibility to decide about the removal of specific programme categories instead of spatially attached structures.

This model gives you freedom to make vital design decisions without regard for their position. The decision is made upon the question whether a removal is going to increase the social conditions on the site itself and if the removed programme can be situated in proximity. In this way, space is cleared for the Olympic Games, social sustainability is still in mind, and displaced programme is offered a new accommodation, preferably a better one.

With this model, programmatic decisions are fast-tracked, as it isn't necessary to puzzle with blocks programme forms. It is merely a twist of variables, 'buttons' to make a option that fits the interposition between demand and offer. Through this fast way of decision-making, three options were made. These three options ((1) as less as possible changes to the Olympic programme, (2) as less as possible changes to the design areas and (3) as much as possible green structures) are attached to the appendix. In the end the third option is chosen. In this proposal no ridiculous changes to either sides had to be made in order to fit the Olympic programme properly. Next section will explain the motives behind this proposal.

The first major decision is to replace all industry on both sites to the Hordijk industrial area south of IJsselmonde. This spot had good accessibility to the highway and therefore to the regional and national market. The stores will remain in the proximity of their former location.

This industry is mostly car-related and home stores. The home stores must be compensated for the loss of profit, though still get a good spot in return. The proximity of a highway exit will mean an connectivity improvement for most of the companies. Also a chance is offered to replace the old accommodation for a new state of the art store.

Opening up the industrial spots along the water will not only provide valuable space for the Olympic programme, but also creates the possibility to developed the waterfront of the Veranda properly.
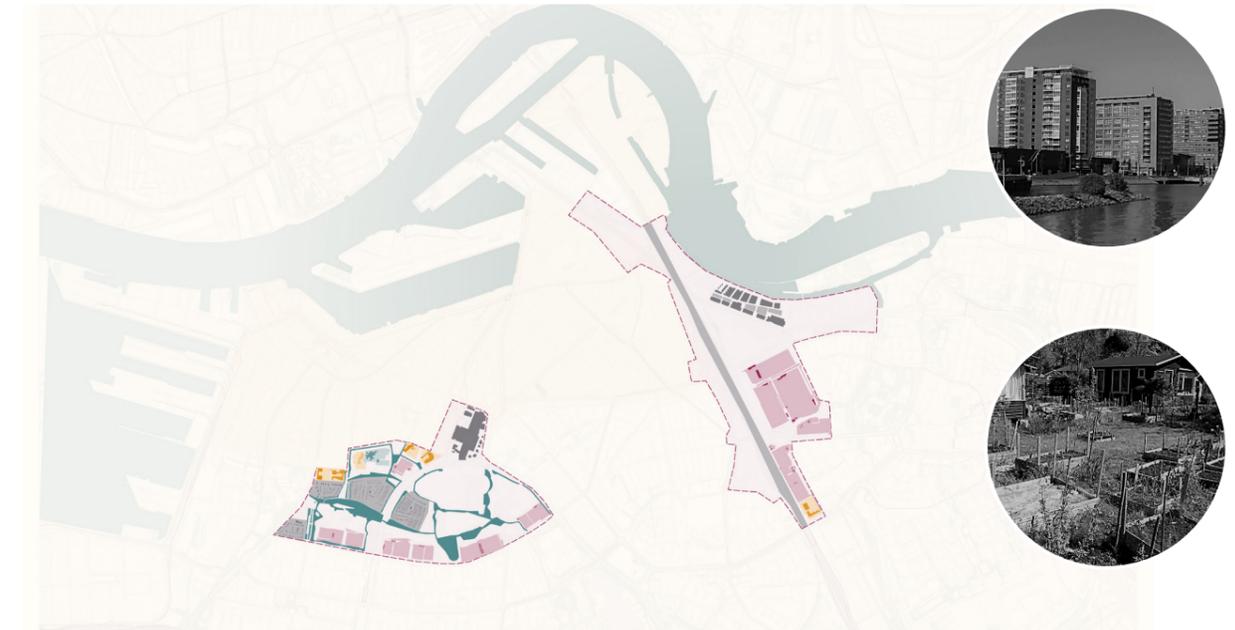
Figure 101 - *Preserved build structures, based on local importance, within Olympic areas.*

Figure 102 - *Used build structures within Olympic area.*

Within the area several places are assigned to be hard to replace, such as sport fields and community gardens. These programmes are highly local attached and require free space in proximity to be replaced. It isn't social sustainable to replace these structures, together with recently constructed housing. This restriction creates again a mismatch between requested Olympic programme and demand.

Figure 103 - *Relocation of industrial structures to industrial further South.*

Size of Olympic programme prior to distribution across Netherlands and Rotterdam — **734 ha.**

Size of Olympic programme after distribution across Netherlands and Rotterdam — **256,7 ha.**

Size of Olympic programme after excel-model configurations (fig.) — **185,4 ha.**

Size of available space after excluding local social programme. — **138 ha.**

Size of available space after excel model configurations (fig.) — **190,2 ha.**

PROGRAMMATIC FIT !

STADIUMS & COMPLEXES / OLYMPIC VILLAGE / PUBLIC TRANSPORT / PARKING / PARK & SQUARES / UNUSABLE DESIGN SPACE

VARKENOORD / ZUIDERPARK

Olympic Games - Program of requirements
Decission model

Table 5 - *Final configuration of the excel-model showing all configurations required to the Olympic programme and available space at Zuiderpark and Varkenoord.*

111   112

5.4 - PROGRAMME OF REQUIREMENTS FOR THE OLYMPIC GAMES IN ROTTERDAM SOUTH

5.4.1 - Social requirements

The aim for the Olympic Games in Rotterdam South is to generate a positive spin-off for the deprived neighbourhoods between Zuiderpark and Varkenoord, namely the neighbourhoods of Hillesluis, Bloemhof, Afrikaanderwijk, Zuidplein and Vreewijk. As the Olympic locations are within walking distance, it is likeable a large visitor flow between both area can be created. At the same time this area is a strategic location near both epicentres. Together with the Olympic locations of Zuiderpark an Vreewijk, these neighbourhoods will be the focus area of the design. Preferably though, the Olympic Games should also create positive legacy for the deprived neighbourhoods, such as Pendrecht, Zuidwijk, Carnisse, Tarwewijk, Lombardijen and Sportdorp. These neighbourhoods are all adjacent to Zuiderpark and Varkenoord.

From the historical, socio-economic and socio-spatial analysis, several major threats to the social sustainability of the focus area derived. The organisation and legacy of the Games should address these threats.

1. Solve severe ethnical differences – Foreign ethnicities form the majority of the population in these neighbourhoods. At the same time, anti-Islamic/ foreigner and pro-Islamic/foreigner parties(PVV and Denk) are the biggest political choices. With the Olympic Games should decrease these ethnical tensions and stimulate cooperation and understanding.

2. Decrease the bad state of social environment –There is an overall feel of unsafety in Rotterdam South, as well as high rates of criminality and vandalism. The unemployment rate in these neighbourhoods is the highest of Rotterdam. The Olympic Games should increase safety on the streets and increase the amount of available jobs, especially for lower educated.

3. Renew parts of the very old building stock. A very large percentage of the building stock within the focus area is build prior to 1945. The Olympic Games should add new and high-quality housing to this building stock and stimulate the renovation of the existing.

4. Make the living environment more attractive – Large street within a limited street profile, dominated by cars make the public space very tense, stressful and unhealthy. The Olympic Games should add more green to the street and promote other transport modes.

5. Low state of education – The percentage of inhabitants with an educational degree is lowest within the city and the percentage of inhabitants that drop out of school is among the highest. The Olympic Games should stimulate the creation of more learning programs and directions within education.

Also in other deprived neighbourhoods some of these demands are present. Therefore the same requirements are present, with the addition that Sportdorp lacks the vital presence of daily provisions such as supermarkets, local shops and a community centre.

5.4.2 - Spatial requirements

This chapter also researched the spatial implementation of the Olympic Games in Rotterdam South, as the initial programme proved to be too large for the available space at Zuiderpark and Varkenoord. Through an excel model decisions on the proposed Olympic programme and available space were made. Within the excel model it is aimed to preserve as many local attached social structures, such as community gardens, and vital large infrastructure, such as roads and railways. The final model had spatial implications for both locations.

1. All community gardens will remain
2. All ground of educational institutes at Zuiderpark will remain
3. All sport complexes remain the same size, except for sport complex IJsselmonde, which is reduced by 20%.
4. All large infrastructure lines will keep the same capacity.
5. All industrial complexes from both locations will be moved to a new industrial area South of the city district.
6. Locate 48.4 hectare of parking space outside Varkenoord and Zuiderpark
7. Olympic village becomes at least 12 stories high on average.
8. Railway lines are reduced by 20%

5.4.3 - Project requirements

The Olympic Games should stimulate the completion of current and proposed projects for Rotterdam Zuid.

1. A new metro line from Kralingse Zoom via Zuidplein to Marconiplein.

2. A new stadium for FC Feyenoord and transformation of the Kuip stadium

3. Upgrade of the Zuidplein and Ahoy area according to Hart van Zuid plan.

4. Diversification of Zuiderpark and the creation of a clear North-South axis.

5. Upgrading housing stock in a large parts of Bloemhof and Hillesluis.

6. Configuration of the main streets to become more green and attractive, with stimulation to local stores.

7. Find a destination for the crossing of the Varkenoordse viaduct and 2e Rosestraat in the Olympic location of Varkenoord

Varkenoord will mostly host permanent and larger Olympic programme

- Olympic stadium + training fields
- Olympic main hall
- Hockey stadium + training fields
- Olympic village + facilities
- Media village + broadcast centre
- Sponsor zone + facilities

Zuiderpark will mostly host smaller and convertible Olympic programme

- Aquatics centre
- Velodrome
- Judo hall
- Taekwondo hall
- Karate hall
- Skating hall
- Climbing hall
- Fencing hall
- Boxing hall

6. - SEVEN PROPOSALS TOWARDS A SOCIAL OLYMPIC LEGACY FOR ROTTERDAM SOUTH

A set of seven strategic proposals for the Olympic Games in Rotterdam South are made accordingly. In this chapter, these seven proposals individually address another part in the organisation of the Olympic Games. The proposals are about 1) a future for the Olympic venues, 2) large scale transport infrastructure, 3) local routing in and between Olympic locations, 4) creation of an attractive environment, 5) motivating initiatives in the public space, 6) creation of employment opportunities and 7) the post-Games re-development of the Olympic sites. For each strategic proposal several exemplifying design interventions are given. These projects propose basic principles, which can form the start for many design projects in Zuiderpark, Varkenoord and the in between area. From this strategic proposals design principles derived.

6.1 - SOCIAL LEGACY IS A FUTURE FOR EVERY OLYMPIC VENUE

One of the most visible representation of a Olympic Games that failed in its contribution to a sustainable legacy is the image of empty stadiums. Often there is no idea what the function of such a stadium is after the event. No clear function, means no usage, means lost investment and maintenance costs. Each Olympic venue must have a clear future.

The proposal emphasizes on the re-use of each of the proposed Olympic venues. Based on the case study to the 2012 Games in London, every Olympic structure has a function after the event. There is a distinction between permanent structures, maintaining their initial programme and functions after the Olympic Games, structures that adapt towards a social purpose, and temporary structures.

Investment in stadiums, complexes and halls can't be spent without some kind of return, therefore every big investment should have some kind of social return and can't be temporary. Except for the largest building of Ahoy, the Olympic stadium and Broadcast centre, all remaining Olympic venues are aimed for public use, placing these structures at the core of sport in daily lives in Rotterdam South. Existing sport complexes are used as training complex for athletes, making use of the facilities already in place. These complexes are returned to normal state after the Olympics.

The main streets in between serve as major routing between both Olympic locations. As visitors on foot and bike will use these routes, purchases are distributed among the smaller shops along this major roads, providing also income in the neighbourhoods from this temporary event.

Based on the redevelopment plans of the NPRZ, areas are assigned to which hotels and accommodation for visitors can be developed. The investment and construction in these areas kickstarts the redevelopment plans of Rotterdam South, right in the core of the most urgent areas.

Well know buildings with a central position to the neighbourhood and identity of Rotterdam South such as the Kuip Stadium and Zuidplein, benefit from a facelift to be representable during the Games and vital to daily life after the Olympics.

LEGEND   A0: 1:5000   N↑

Olympic locations
Temporary structure
Structure to be converted
Permanent structure
Upgraded structure

Performed sports
Opening/closing ceremony
Olympic village
Public zone/International zone/Media zone

Public/visitors area
Athletes area
Private area
Hotel + event areas

Visitors flow
Athletes flow
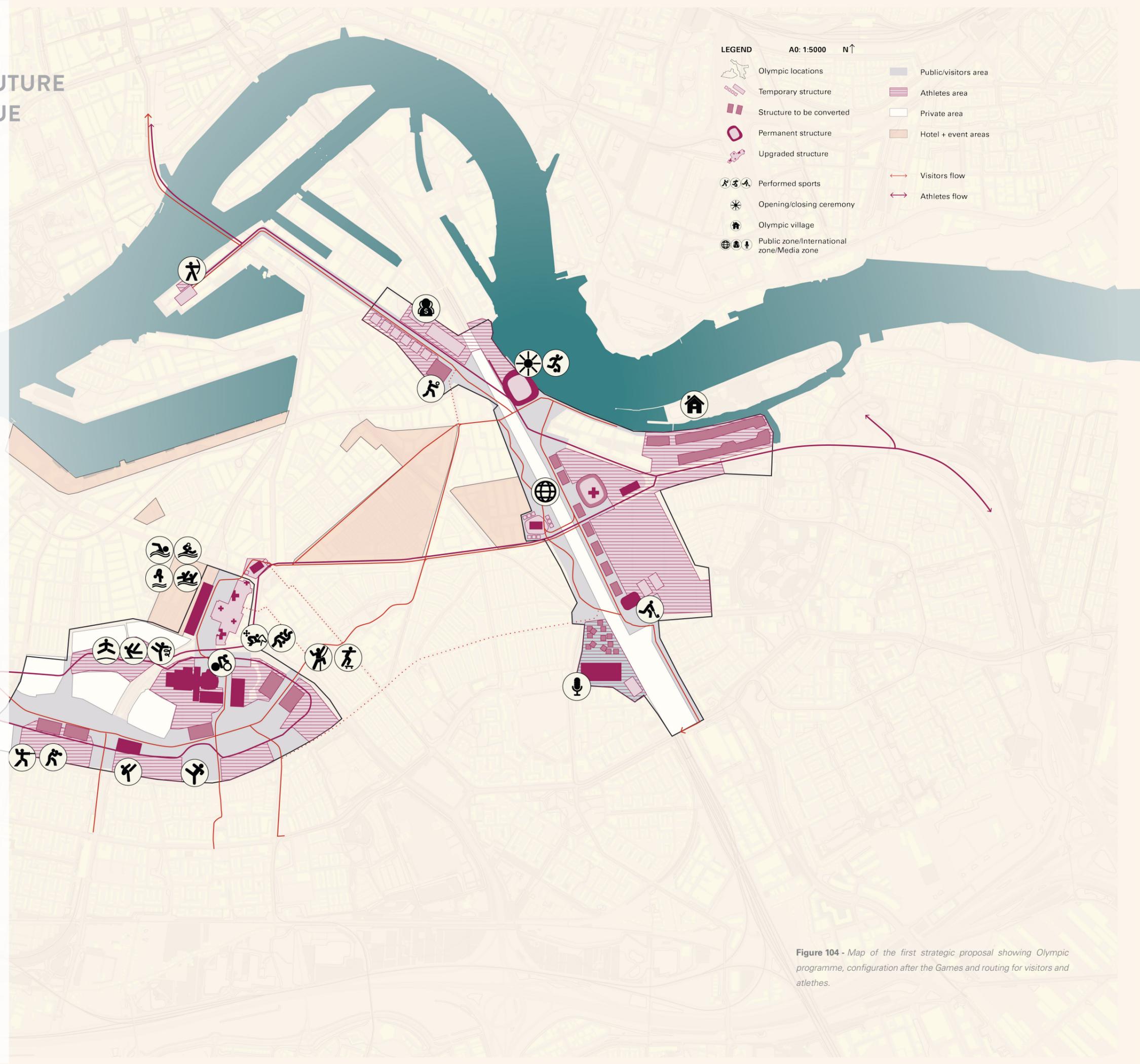
Figure 104 - *Map of the first strategic proposal showing Olympic programme, configuration after the Games and routing for visitors and atlethes.*

The city of Rotterdam aims to be the top sport-city of the Netherlands (Municipality of Rotterdam, 2009). In 2015 Rotterdam was the ranked 11th worldwide in their accomplishments to host major sport events (Rijnmond, 2015). With the organisation of the Olympic Games it surely becomes a even bigger international sport city. But after the event the former Olympic venues contribute to this aim as well. The NOC-NSF set up a programme to facilitate top-sport in the Netherlands, meaning investment in sport with high potentials, but also facilitating accommodation to perform such big accomplishments. Over past years the NOS-NSF set up different NTC's (Nationale Topsport centra) and CTO's (Centra voor Topsport and Onderwijs). In a CTO several sports and accommodations are clustered, a NTC is specific to a sport. These centres offer the best possible equipment to practice a specific sport, but also accommodation, healthcare and education nearby, minimizing time spent on traveling. These centres are backed up by several RTC's, regional trainings centres.

At the moment there are four CTO's and four NTC's in the Netherlands. The CTO's are positioned in Amsterdam, Eindhoven, Heereveen and Papendal. Currently a fifth CTO is set up, called CTO Metropool, combining the Beach-volleyball NTC in Den Haag, the sailing NTC in Den Haag, the RTC's in Dordrecht with the top sport-facilities in Rotterdam. Through the Olympic Games it is an excellent opportunity to harness

this CTO by offering a complementing programme. It is further enhanced by the creation of a sport boulevard between Hockey and Football stadium, capitalizing on sport, healthcare and education facilities existent in Rotterdam south. This means that the remaining Olympic venues boost this CTO ambition, providing a dense and supportive sport programme.
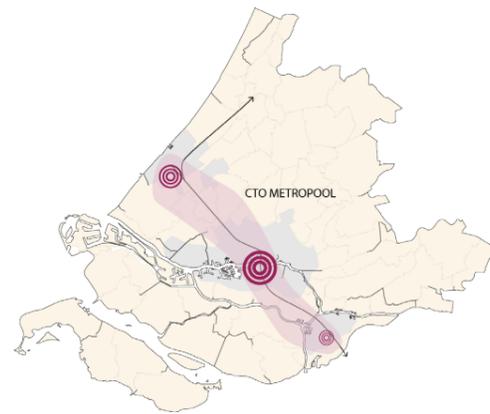
Figure 105 - *Position of Rotterdam South as future main node in the CTO Metropool region*

Figure 106 - *Limited required transformations in programme to transform the Olympic stadium - opening up parking space and the transport system to the public.*
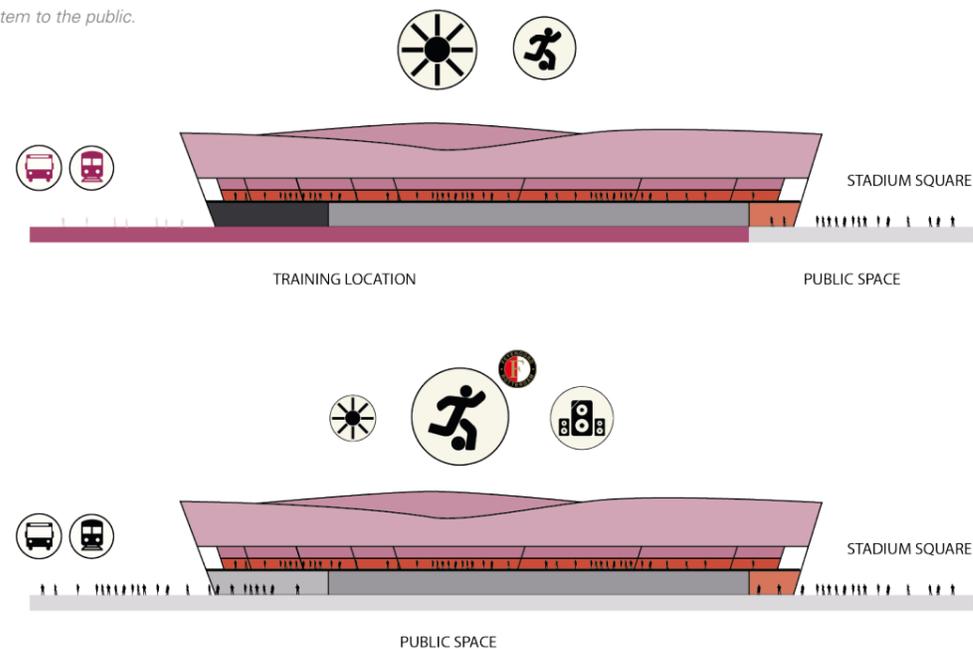
These Olympic venues will not be transformed after the event, meaning that there is a demand for the capacity it can offer. There are just limited venues for which there is such a demand. One of the biggest investments in the Olympic venues though, the Olympic stadium, can be handed over/sold as a new stadium for FC Feyenoord. By designing it as a football stadium, expensive conversions after the event are avoided. Furthermore it entirely contributes to the

ambitions and former plans to create a new football stadium in Rotterdam South. The programme of the Olympic stadium offers precious parking space out of events and new leisure opportunities. To maintain frequent usage it should be designed to handle big music events as well. The new stadium capitalizes on the pillar that Feyenoord has on the identity of South and its inhabitants.

Figure 107 - *Schemes that show how the Olympic programme is transformed an to which extend they can be transformed..*

Permanent Olympic programme
- Olympic stadium
- Hockey stadium
- Ahoy Multisport Hall
- Ahoy existing halls
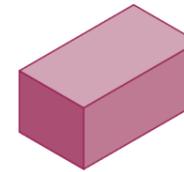
Olympic programme converted from the inside
- Olympic hall
- Broadcast centre
- Olympic village
- Media village
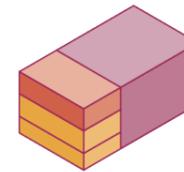
Olympic programme converted from the outside
- Taekwondo hall
- Aquatics centre
- Kuip stadium
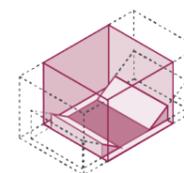
Temporary programme to leisure opportunity
- Climbing hall
- Skating hall
- Olympic p[azas
- Training areas
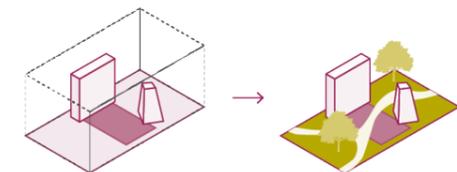
Temporary venue to landscape structure
- Archery range
- Logistic pavilions
- Boxing hall
- Fencing hall
- Karate hall
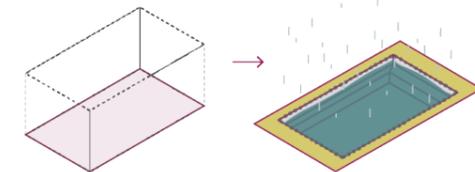
Figure 109 - *Aerial view of HC Feijenoord, at the IJsselmonde sportcomplex, as warming up location during the Olympic Games (retrieved from hcfeijenoord.nl)*

Figure 110 - *Position of a aquatics NTC in the Netherlands and as a swimming pool in Rotterdam.*

Figure 112 - *Occupation of a block in the Olympic village during the Olympic Games*

Figure 113 - *Occupation of a block in the Olympic village after the Olympic Games*

The construction of additional practice and trainings facilities are minimized during the Games, by making use of existing sport complexes near a stadium of hall. The hockey stadium is positioned right next to hockey club Feyenoord, a fast growing sport club which just opened . Their fields can be used for warm-up and practice during the Games. The hockey stadium provides an excellent podium for the sport club to grow and the current complex a contribution for optimizing Hockey within the CTO Metropool programme.

The Olympic aquatic centre enhances existing plans to construct a new swimming pool near Zuidplein. This is part of a bigger reconstruction project called Hart van Zuid, upgrading the urban environment of Zuidplein and Ahoy. A aquatic centre is much larger than a swimming pool, offering a varied programme that suits a much bigger scale. The Olympic venue will partly be converted to serve as a much needed swimming pool for the inhabitants of Rotterdam South, making it publicly accessible, though also offering a bigger programme as a new NTC for aquatic sports next to Eindhoven and Amsterdam.

The Olympic village is a another example of converting a Olympic structure. After the Games the ' village' will be transformed to housing. Meaning several rooms are combined to a house, providing beautiful new homes to live in near important connections roads. It is very important though to elevate the benefits of these new housing opportunities to the citizens of Rotterdam South, meaning strict housing policies for a majority of the blocks. Design principles on the

Olympic village explains this process (IJzerman, 2018). A part of the apartments will remain as accommodation for athletes in the CTO programme, bringing top sport practitioners and future inhabitants towards each other. The first levels of the village offer a diverse programme of shopping, services, but also a lot of parking space. During the Games this parking space is not required and therefore temporary locked.

Figure 114 - *Occupation of the Olympic village after the Olympic Games*

Figure 111 - *Visualtisations of the new Charlois Swimming Pool at Zuidplein by Kraaijvanger Architects. The Olympic Games can enhance this project. (retrieved from http://www.kraaijvanger.nl)*

Programme NTC Aquatics centre after the Olympics

- Swimming: 8 lane, 50*25m Olympic swimming pool (decreased visitors capacity after the games) - open to public + diving tower
Also usable for synchronized swimming as well as diving

- Swimming: 6 lane, 50*15m practive pool (NTC programme)

- Waterpolo: 50*21m swimming pool (NTC programme)

- Waterpolo: adjecent swimming pool - open to public

- Leisure swimming pool - solely for public

- High performance gym

- Medical clinic

- Conference, education and reflection rooms - can be hired

- more high perferomance sport supportive programme

Atlethe accomodation
Residents housing
Parking
Services
Shops
Hopsitality and other functions not already present in the initial design

121

122

6.2 - SOCIAL LEGACY IS AN INFRASTRUCTURAL SUPERGRID

The Olympic Games can't be organized without major investment in the transport infrastructure. Approximately 50.000 visitors should travel from and to the Olympic venues every hour (Huijsman, 2005). These are often the largest investments in the organisation of the Olympic Games and should have a major social return.

Rotterdam South has a major network of car-infrastructure, but misses vital public transport connections, making it overall highly inaccessible. Increased accessibility means increased possibilities for employment, investment and many other opportunities. A transition to a vast public transport system, also means less car-use and improved living conditions through cleaner air, more safety on the streets and an improved image.

The proposal aims for a car-rejective infrastructural supergrid, meaning the creation of park and rides outside the city, near major highway exits, multimodal nodes at core positions in Rotterdam South and around the Olympic areas. The park and rides are connected to this nodes by an extensive network of public transport possibilities such as metro, train, bus and above all a major ov-bike system, creating a superb grid for transport during the Olympic Games and after.

Temporary parking places near these park an rides provide vital parking space during major events and peak hours. Boldly said, due to this supergrid, the car won't be necessary anymore on the streets of Rotterdam South.

For this supergrid to happen new tramlines, stations, bus lines, metro lines and bicycle paths have to be constructed, meaning a lot of investment. Still it will bridge vital links in the transport system, provides new commuting possibilities and an severe overall social improvement to daily use of traffic and the public space.

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- Olympic locations
- Olympic structure
- Public/visitors area
- Athletes area
- **P+R** Park & ride parking lots for visitors Olympic Games
- Permanent Parking lots
- Temporary parking lots
- Car traffic from highway
- Important clusters of different modalities
- Trainline + stations
- Metroline + stations
- Tramline + stations
- Busline + stations
- Bicycle network + OV-bike storage points
- Footpaths to construct

Figure 115 - Map of the second strategic proposal showing the intended infrastructural situation for the Olympic Games, focused on public transport and slow traffic mobilities.

Area	Vignet name	Subnumber	Intervention	onderdeel	onderdeel	Sub onderdeel	Constr-remov	convertion	program legacy	social legacy	type of intervention	Length (m)	Width (m)	Stories (p.)	Size (m2)	Add. Info
0.	Rotterdam Zuid		1 Trainline													
		1.1		Intercity station Zuid	2 platforms		construct	remain	Main station Rotterdam Zuid	Connectivity increase national level	public transport	430	12	1	5160	Fit for international train
		1.2		station Hordijk	1 platform		construct	remain	Station for Hordijk industrial area	Reduces neccesity of car-traffic	public transport	200	12	1	2400	Fit for stoptrain
		1.3		Station Zuid	3 platforms		remove	remain			public transport	320	22	1	7040	
		1.4		Station Kuip	1 platform		remove	remain			public transport	500	12	1	6000	
		1.5		Railway lines tunnel to Kuip	6 lines		convert	remain			public transport	1500	54	1	81000	
		1.6		Lines Intercity station	2 lines		construct	remain			public transport	350	18	1	6300	
		1.7		Railway lines intercity station	4 lines		remove	remain			public transport	350	12	1	4200	
		1.8		Railway lines at Zenobuurt	5 lines		remove	remain			public transport	420	30	1	12600	
			2 Metroline													
		2.1		Metroline Kralingse Zoom - Zuidplein - Marconiplein			construct	remain			public transport	9800	10	1	98000	
		2.2		Metrostation Waalhaven	1 platform		construct	remain			public transport	125	11	1	1375	
		2.3		Metrostation Zuidplein	1 platform		construct	remain			public transport	125	11	1	1375	
		2.4		Metrostation Feyenoord city	1 platform		construct	remain			public transport	125	11	1	1375	
			3 Road													
		3.1		Adjustment Coloseumweg	2 lines		construct	remain			car	350	8	1	2800	reposition for new trainlines
			4 Tramline													
		4.1		Tramline Langehorst - Kromme Zandweg	2 lines		construct	remain			public transport	2900	6	1	17400	
		4.2		Tramstation Larenkamp	1 platform		construct	remain			public transport	70	6	1	420	
		4.3		Tramstation Slinge metro	1 platform		construct	remain			public transport	70	6	1	420	
		4.4		Tramstation Slingedeal	1 platform		construct	remain			public transport	70	6	1	420	
			5 Buslines													
		5.1		Busstation Olympic village	8 spots		construct	convert			public transport	400	3	1	1200	
		5.2		Busstation Kuip	2 spots		construct	remain			public transport	100	3	1	300	
		5.3		Busstation Feyenoord City	3 spots		construct	remain			public transport	150	3	1	450	
		5.4		Busstation Hordijk	3 spots		construct	convert			public transport	150	3	1	450	
		5.5		Busstation Waalhaven	3 spots		construct	convert			public transport	150	3	1	450	
			6 Bicycle network													
		6.1		Groene kruisweg	1 line		construct	remain			bike	115	4	1	460	
		6.2		Zuiderpark West-East	1 line		construct	remain			bike	2000	4	1	8000	
		6.3		Valkeniersweide	1 line		construct	remain			bike	1000	4	1	4000	
		6.4		Groene Hilledijk	1 line		construct	remain			bike	1100	4	1	4400	
		6.5		Slaghekstraat	1 line		construct	remain			bike	300	4	1	1200	
		6.6		Olympiaweg	1 line		construct	remain			bike	50	4	1	200	
		6.7		Hoendiep	1 line		construct	remain			bike	710	4	1	2840	
		6.8		Larenkamp	1 line		construct	remain			bike	570	4	1	2280	
		6.9		Zuiderpark South-North	1 line		construct	remain			bike	910	4	1	3640	
		6.10		Zuidplein	1 line		construct	remain			bike	560	4	1	2240	
		6.11		Strevelsweg	1 line		construct	remain			bike	300	4	1	1200	
		6.12		Lange Hilleweg	1 line		construct	remain			bike	990	4	1	3960	
		6.13		Polderlaan	1 line		construct	remain			bike	390	4	1	1560	
		6.14		spinozaweg	1 line		construct	remain			bike	870	4	1	3480	
			7 Parking													
		7.1		Parking Waalhaven												
		7.1.1			Parking 1		construct	remain			parking	125	100	4	50000	
		7.1.2			Parking 2		construct	remain			parking	140	100	1	14000	
		7.1.3			Parking 3		construct	convert			parking	200	1000	1	200000	
		7.2		Parking Hordijk												
		7.2.1			Parking 1		construct	remain			parking	100	250	2	50000	
		7.2.2			Parking 2		construct	remain			parking	100	120	4	48000	
		7.2.3			Parking 3		construct	remain			parking	100	180	4	72000	
		7.2.4			Parking 4		construct	remain			parking	100	100	1	10000	
		7.2.5			Parking 5		construct	convert			parking	250	20000	1	5000000	
		7.3		Parking Stadionweg												
		7.3.1			parking 1		construct	remain			parking	100	78	3	23400	
		7.3.2			parking 2		construct	remain			parking	50	170	1	8500	
		7.4		Parking Laan op Zuid												
		7.4.1			parking 1		construct	remain			parking	50	125	3	18750	
		7.4.2			parking 2		construct	remain			parking	36,5	75	4	10950	
		7.4.3			parking 3		construct	remain			parking	50	25	3	3750	
			8 Footpaths													
		8.1		Zuidplein	1 line		construct	convert			foot	760	12	1	9120	
		8.2		Strevelsweg	1 line		construct	convert			foot	1900	12	1	22800	
		8.3		Lange Hilleweg	1 line		construct	convert			foot	990	12	1	11880	
		8.4		Polderlaan	1 line		construct	convert			foot	390	12	1	4680	
		8.5		Groene Hilledijk	1 line		construct	convert			foot	1100	12	1	13200	
		8.6		Groene kruisweg	1 line		construct	convert			foot	2600	6	1	15600	
		8.7		Zuiderparkweg	1 line		construct	convert			foot	410	6	1	2460	
		8.8		Aldenkamp	1 line		construct	convert			foot	370	4	1	1480	
		8.9		Hordijk P5-station	1 line		construct	remain		smooth walk to train station	foot	750	4	1	3000	
			9 Tunnels													
		9.1		Zuidplein	2 lines		construct	remain		less car taffic above ground, improved envi	car	1200	10	1	12000	
		9.2		Hordijk	2 lines		construct	remain		connecting two industrial parks	car	180	12	1	2160	

Figure 116 - *Overview of all required infrastructural projects to create the proposed supergrid*

1. Breeweg

2. Stadionviaduct

3. Coen Moulijnweg

4. Rotterdam Station

5. Olympiaweg
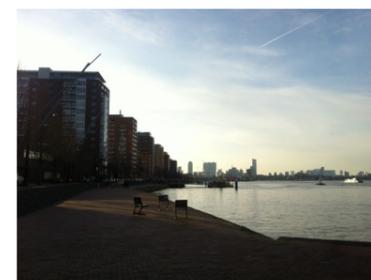
To research the capability of Rotterdam to host a event as the Olympic Games, a field trip is undertaken. The use of public space and transport networks before and after a football match of Feyenoord FC in the Kuip is analysed. In order to host an event as big as the Olympic Games, the spatial environment should accommodate smooth usage and transport. The transport network should be designed for the peak capacity encountered when the match is over and everybody leaves the area. The pictures before the event show that there are clashes between the use of footpath and other mobility forms. As inhabitants of Rotterdam South prefer to walk to the football match, it leads to usability conflicts, especially around the Stadionviaduct; The footpaths are too narrow. Other visitors make good use of the different mobility possibilities provided, the station of Rotterdam Zuid and station Rotterdam directly to the Kuip, as well as tramlines and water taxi. Bicycles aren't used frequently though and cars in abundance. The Olympiaweg is used as a parking lot as official parking lots are filled.

After the football match, the abundance of parked cars leads to a sudden increase of cars on the road. As the figures show, the current road system isn't calculated to the sudden peak-demand. This lead to severe traffic congestions after the football match and stuck cars define the image of Varkenoord and Rotterdam South for hours.

The future Olympic Games do not demand good transport for 50.000 attendants, but 100.000 continuously. The road network is normally suitable to handle all car traffic, but not within peak hours. There are not enough parking lots. During the Games this situation will be even worse. Therefore investment in public transport and provision of additional parking locations is crucial for Rotterdam South during the Olympic Games. Another way is to provide more options for visitors to stay longer at the site, therefore decreasing the sudden pressure on the road system.

Figure 117 - *Pictures of Varkenoord prior to and after a footballmatch at the Kuip stadium.*

Figure 118 - *Map of Varkenoord with Kuip stadium. Transport posibilities are emphasized. (modification of map retrieved from Google Earth Pro).*

6. Stadionweg

7. Stadionweg

8. Korte stadionweg

9. Siem Heidenstraat

5. Piet Smitkade

As witnessed the current infrastructure in Rotterdam Zuid is mostly based upon car-usage. During peak periods the current system in not able to handle the increased amount of visitors to the area. Already from the analysis between Rotterdam and Amsterdam, we witnessed that the accessibility to Rotterdam South is very poor. The possibilities to take public transport are limited. Rotterdam South has a tram-system, a metro-system and some train stations, but in essence these systems are not functionally connected with each other. During the Games increased amount of visitors by car will only increase the current congestions. It the same time there is no will and no space to enlarge the current road system. In order to properly organise the Olympic Games a transition and optimization within the infrastructural field has to be made.

One of the main interventions in the construction of a intercity station. Rotterdam South currently holds 200.000 inhabitants, but has no intercity station, which means that many residents are unable to take a train to other large cities within an acceptable time. The intercity train station is positioned near the biggest venue, the Olympic stadium, which means that large amount of passengers can be handled within limited time. To do so train tracks have to be adjusted and reconstructed, which makes this one of the largest projects of the Olympic proposal. Together with other public transport stations nearby it will form the biggest transport node of Rotterdam South.

Second important proposal is the relocation of many parking spaces in proximity of the sport venues to open areas near highway exits. These park + ride spots are situated in the enhanced industrial areas
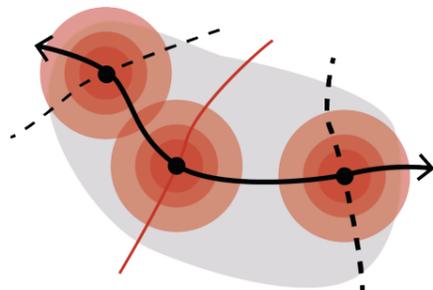
of the Waalhaven and Hordijk, thereby increasing the potential of this employment space. Most of the park and ride parking places are temporary and after the event will be removed. Hordijk will be connected through a new train station to the railway network towards Varkenoord, and Waalhaven by a new metro station to Zuidplein and Zuiderpark.

To connected the areas of Varkenoord & Zuidplein, but more importantly Rotterdam South with Rotterdam North, a second metro line is constructed, running from North-West to North-east, increasing the importance of the Olympic stadium and Zuidplein as transport knot. This line will mean a completion of one of the NPRZ-goals.

But not only large infrastructure systems will be improved; Also a dense network of smaller public transport and slow traffic modes is required. for example; an overall bike system ensures a smooth and fast travel between locations and to both parks from the parking lots. Enhancement of the bike path and aiming towards speed reductions highly benefits the local environment giving it possibilities to move more and safer and therefore becoming more active and healthy.

Finally persistent gaps and endings within the public transport system will be resolved, such as through the construction of a tram track through Zuidwijk and Pendrecht to the tram station at Wielewaal, making it a closed and convenient loop. Another example is the bus line from the highway to the Olympic stadium.

Increased connectivity by adding transport modes at a node

By increasing the amount of transport possibilities at a transport node, the connectivity to and from such a place in increased. This will not only mean that it becomes more easy for inhabitants nearby to reach destinations elsewhere, but also that the node becomes more accessible for visitors from elsewhere. This means a great improvement in the opportunities to developed, for the direct surrounding of the transport node as well as local businesses and last but not least the inhabitants of the place.

Figure 120 - *Increased connectivity by acces to mutliple modalities means new development opportunities*

Less foreign cars in the urban structure

Especially during the Olympic Games but also after the event, cars from outside are prevented to enter the inner city, therefore reducing the environmental pressure and avoiding congestions. This is solved by several large parking spaces near the edge of the Rotterdam South and in proximity to the highway. From this point several transport options transfer visitors to the venue. Consistently lesser amounts of cars within the urban structure, means less air pollution , making it more attractive and healthy to undertake activities in the public space
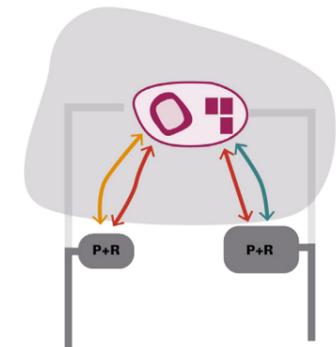
Figure 121 - *During the Olympic Games, cars from outside will be guided to park and rides.*

More profit for local stores by guided visitor flows

During the Olympic Games visitors will travel back and forth between transport nodes. Several transport nodes are not directly connected to the Olympic park. As a result large flows of visitors walk some parts through the neighbourhood, which in return will profit from the additional spending in local stores and shops. This was one of the main critiques at the 2012 Games in London.
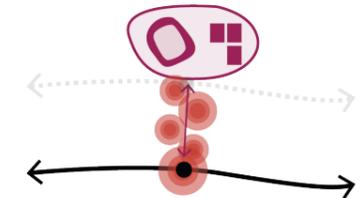
Figure 124 - *Placing transport node some distance from Olympic park creates profitable in between routing for local bussinesses.*

Reduction of car lane width to benefit slow traffic

By narrowing the width of the car lanes in the often cramped street profiles of Rotterdam South, precious space is acquired for visitor flows during the Games, but even more for separate bicycle lanes, broad walkways or even additional streets to the streetscape. The cars are forced to drive at lower speeds, creating a more safe and pleasant street.
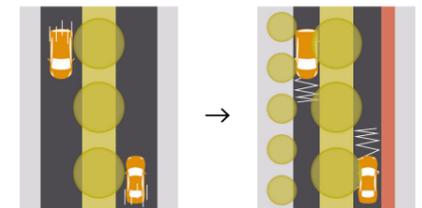
Figure 122 - *Car lanes are narrowed to acceptable widths to open possibilities for bikelanes as well as broadening footpaths.*

Offering more transport possibilities to the inhabitants of Rotterdam South

Instead of being almost dedicated to take the car for daily business, the supergrid offers multiple alternatives which are not only less polluting, but in some cases even more healthy and require less amounts of space. The shown transport knots are just some examples, as there are many more transport nodes which offers increased amounts of transport after possibilities the Olympic Games by imposing the supergrid proposal.
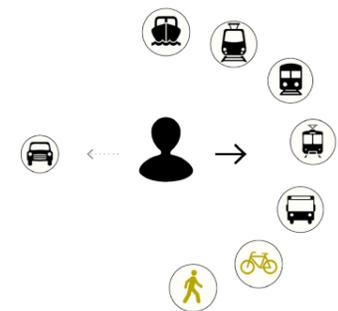
Figure 123 - *Inhabitants are offered many other (more environmental friendly) solutions to taking a car.*
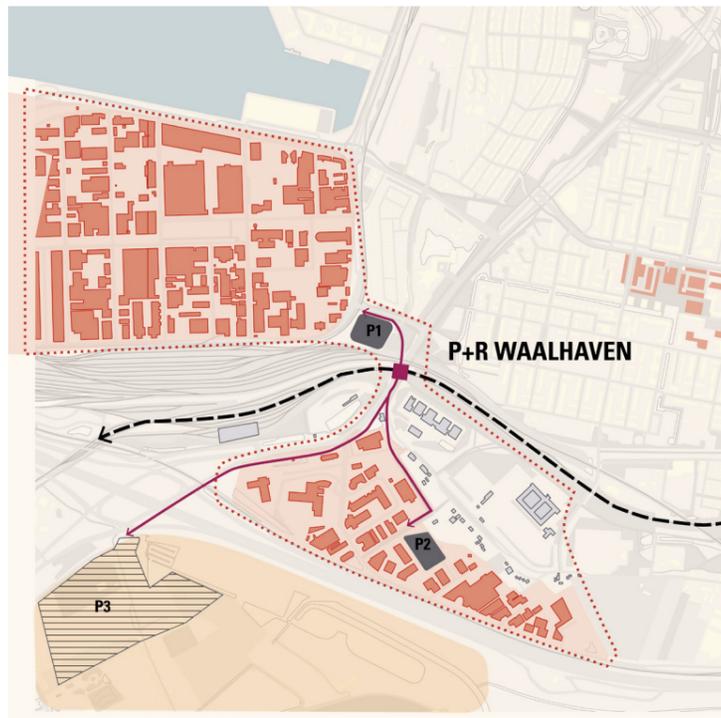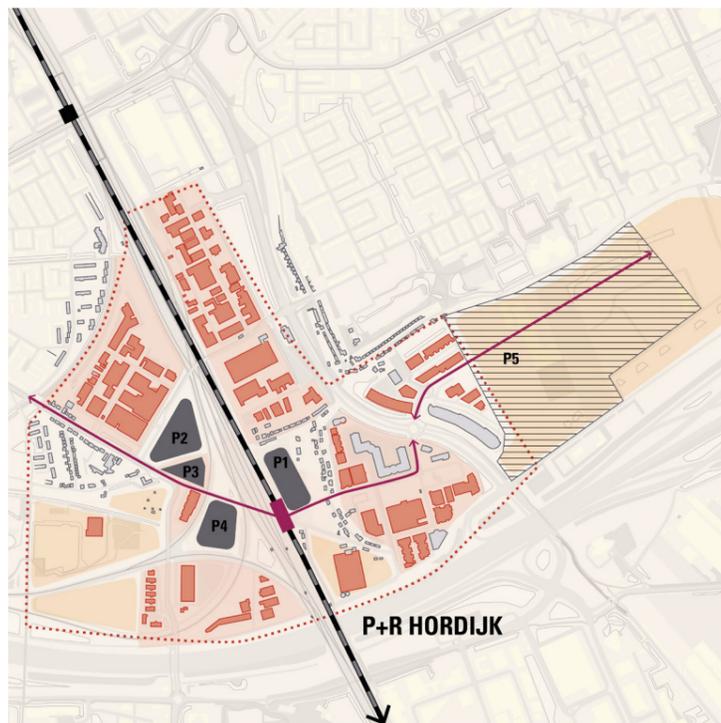
LEGEND   N↑

- Location industrial site
- New station
- Industrial buildings
- Walking route
- P+R Park & ride parking lots for visitors Olympic Games
- Permanent Parking lots
- Temporary parking lots
- Car traffic from highway

←→ Trainline + stations
←•→ Metroline + stations

Large areas of the assigned parking space at both Hordijk and Waalhaven is temporary. Some will remain to benefit the development of both industrial clusters and discharge pressure within the city district.

- 43 ha added industry from relocation
- 1.2 parking lot per 100m2 BVO
- BVO relocated industry +- 75% of total space - 0,75*43 = +- 32.5 ha BVO 325000 * 1.2 /100 = +- 4000 parking lots required for relocated industry.

- To discharge city-district + 5000 permanent parking lots proposed. 4000+5000 = 9000 parking lots total

9000*25m2 per parking lot = 225000m2 = 22.5 Ha parking required.

The permanent parking lots are. Waalhaven P1 = 1,5 ha *4 st = 6 ha. Waalhaven P2 = 1,4 ha * 1 st = 1 ha. Total = 7,4 ha.

Hordijk P1 = 2,5 ha * 2 st = 5 ha. Hordijk P2 = 1,8 ha * 4 st = 7.2 ha. Hordijk P3 opt. = 1 ha * 1 st = 1ha. Hordijk p4 = 1.2 ha * 4 st = 4.8 ha. Total = 18 ha.

Temporary P3 Waalhaven: up to 30 ha
Temporary P5 Hordijk: up to 50 ha

Numbers parking norm and size parking lot retrieved from municipality Rotterdam (2012) and TU Delft.
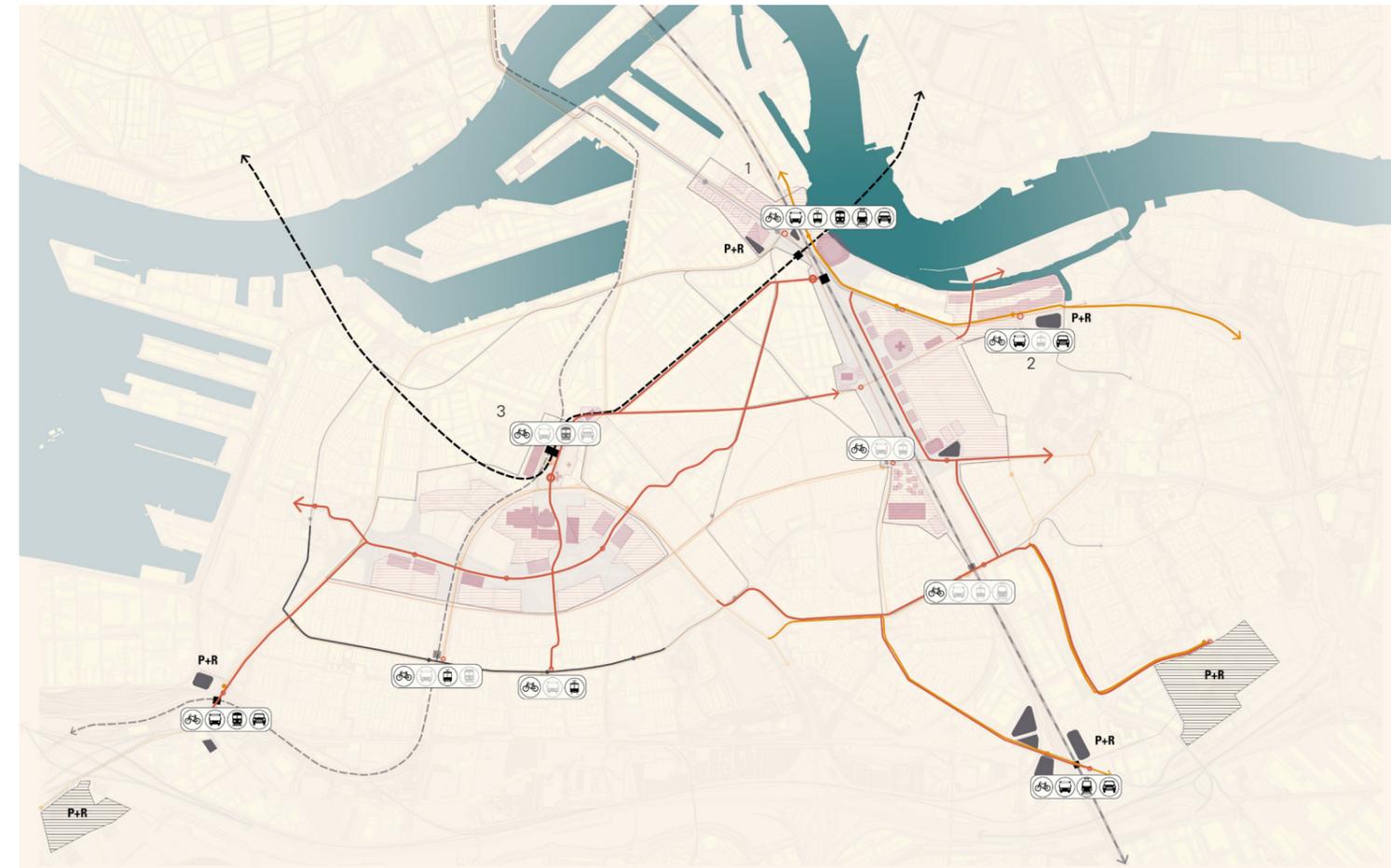
Figure 127 - *Overview of the new infrastructural projects to be completed before the Olympic Games and create a supergrid.*

The above projects will create a supergrid with an increased capacity to transport visitors during the Olympic Games without problems, as well as it provides a substantial increase in public transport capacity for the inhabitants of Rotterdam South. The following list will show the capacity of some points in the supergrid system. Capacity numbers are based on research from Huijsman (2005) and CROW bicycle capacity calculation tool (2016).

1. - Station Zuid near Olympic stadium
3* 2 meter bike path = 3*2000 p.p.h = 6000 p.p.h.
2* 2 car lanes = 2*3000 p.p.h. = 6.000 p.p.h.
2* 2 railway lines = 2*25000 p.p.h. = 50.000 p.p.h.
2* 1 metro line = 2*16000 p.p.h. = 32000 p.p.h.
2* 1 tram line = 2*5000 p.p.h. = 10000 p.p.h.
1* 1 bus lane = 1*9600 p.p.h. = 9600 p.p.h.
Max. capacity to or from site = 113,600 p.p.h.

2. - Park + Ride Sportdorp
2* 2 car lanes = 2*3000 p.p.h. = 6000 p.p.h.
2* 2m bike path = 2*2000 p.p.h. = 4000 p.p.h.
1* 1 tram line = 1*5000 p.p.h. = 5000 p.p.h.
1* 1 bus lane = 1*9600 p.p.h. = 9600 p.p.h.
Max. capacity to or from site = 24,600 p.p.h.

3. - Station Zuidplein - Ahoy
4* 2 meter bike path = 4*2000 p.p.h. = 8000 p.p.h.
3* 2 car lanes = 3*3000 p.p.h. = 9000 p.p.h.
2* 1 bus lane = 2*9600 p.p.h. = 19200 p.p.h.
4* 1 metro line = 4*16000 p.p.h. = 64000 p.p.h.
Max. capacity to or from site = 100,200 p.p.h.

These numbers are for ideal situations and fluent passenger flows with maximum occupation of each transport device. In practice, these numbers will be less, though ample to required capacity during events.

6.3 - SOCIAL LEGACY IS A SUPERB ROUTING WITHOUT OBSTACLES

In, and around the Olympic park it is two weeks of severe rush hour, with large amounts of pedestrians and athletes that have to be guided to their intentional destination. This means a severe disruption of daily traffic, but also major challenges where visitors and daily traffic meet. Congestions can mean dangerous situations and need to be avoided at all time.

It is vital for the Olympic Games that there is a superb routing. Not only from train, metro, tram, bus and bike stations to the Olympic parks, but even more within the Olympic parks and between them. Both Olympic locations are at walking distance of each other and offer different Olympic programmes. This means that many crossings need to be redesigned with a focus on pedestrian use.

The proposal presents an overview of all crossings that need to be redesigned, but puts special emphasis at two major crossings, at Zuidplein to Ahoy and the crossing of the trainline at the new intercity station. The redesign of these crossings provide a safe usage and crossing of major roads, facilitate slow traffic in the construction of earlier proposed supergrid, and initiates inhabitants to take a walk instead of the car.

Two tunnels are needed to ensure a good . The tunnel near Zuidplein is very important at this point, as it not only makes the vital crossings to the Olympic park bearable, but guarantees the traffic flow from North till South during the Olympic Games. Less car lanes at this point highly improves the image of Zuidplein and its central position in Rotterdam South.

LEGEND   A0: 1:5000   N ↑

- Olympic locations
- Public/visitors area
- Athletes area
- ◎ Redesign of most important crossings
- ◎ Redesign of important crossings
- ○ Redesign of less important crossings
- ◀▥▥▶ Tunnel required

- Important clusters of different modalities
- ■ Trainstation
- ■ Metrostation
- • Tramstation
- • Busstation
- ○ OV-bike storage
- → Visitors flow
- ↔ Athletes flow
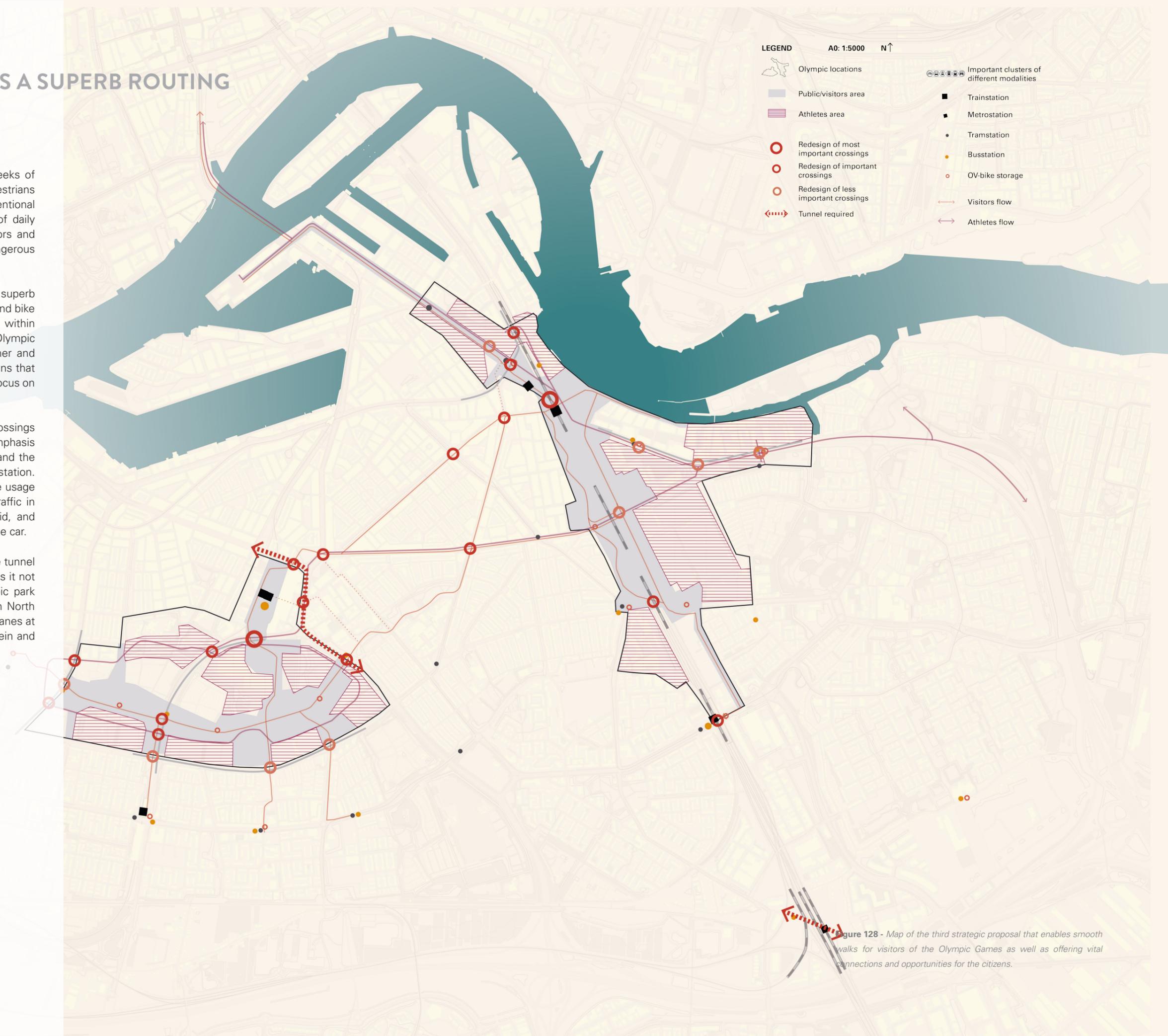
Figure 128 - Map of the third strategic proposal that enables smooth walks for visitors of the Olympic Games as well as offering vital connections and opportunities for the citizens.

In order to create a smooth flow and passage between both Olympic locations, large amounts of crossings need the be redefined, with concern for the use during the Olympics, but certainly for normal usage after in its legacy. The redefinition of the crossing cannot seriously harm the larger traffic flows, as this will lead to increased conjestions. At the same time these crossing must be pleasant for user to cross. This means the crossing must be comfortable, fast, convinient and safe to use. At the ame time these crossings means better connections between neighbourhoods, promoting to walk between different destinations. This can in return further improve the interaction between different neighbourhoods.

The proposal emphasizes on several major construction projects, such as tunneling a part of the Pleinweg. What is now a major six lane roads will be seperated into a road for destination traffic to Zuidplein and other streets, and a tunnel for the main traffic flow of the S103 tunnel from Rotterdam North to the highway. This tunnel is very much

required, as it is nearly impossible to cross right now. At the same time, this project will grealty improve the environment of Zuidplein and makes it a more attractive spot in the city. Furthermore, the creation of the tunnel means that there will be more space above which can be dedicated to knit areas together.

Also this proposal emphasizes on the recornstruction of many crossings. This is either by making completely new crossings (figure 133), redifine an existing crossing without changing the current system too much (figure 135) or rethinking the relation between car, pedestrains, cyclist and other users of the street (figure 137). These configurations of the crossings mean a permanent and lasting change from a car oriented to pedestrian and cyclist oriented system in large parts of Rotterdam South.
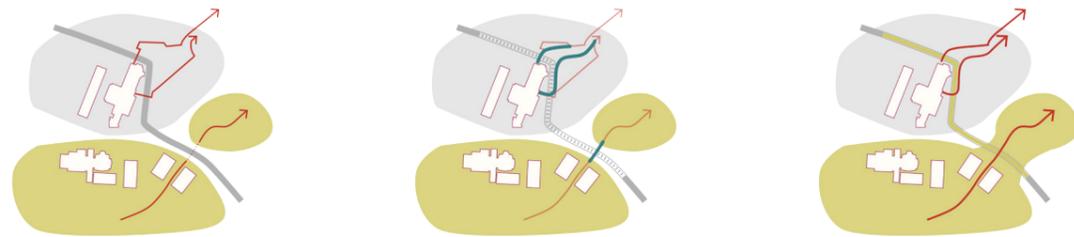
Figure 129 - *Increase permability of the street by guiding major traffic flows thorugh a tunnel*
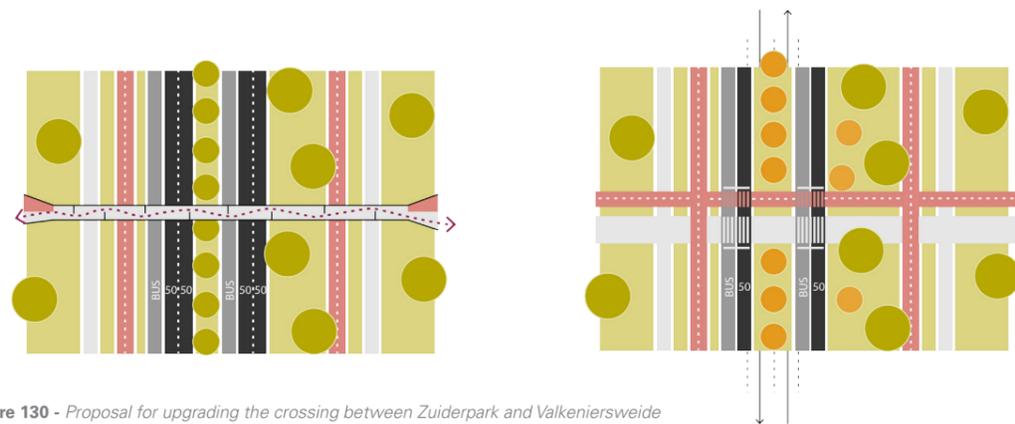
Figure 130 - *Proposal for upgrading the crossing between Zuiderpark and Valkeniersweide*

Figure 131 - *Current situation at Sportdorp - proposed Olympic village*
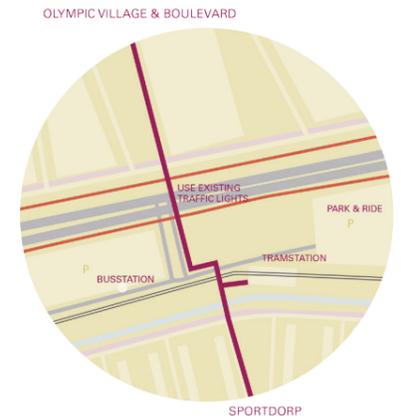
Figure 132 - *Proposal for crossing between Sportdorp and the Olympic Village*

Figure 133 - *Current situation at Zuidplein - Ahoy*
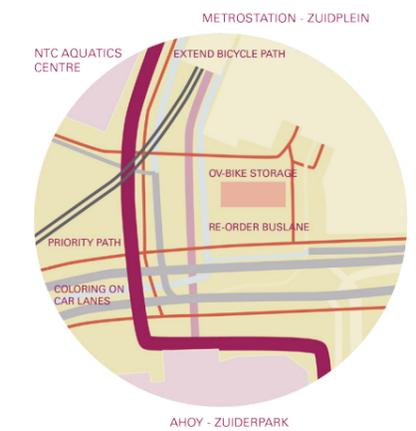
Figure 134 - *Proposal for crossing between Zuidplein - Aquatic centre and Ahoy*
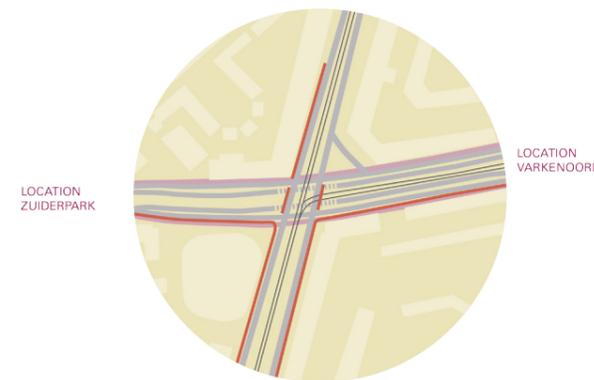
Figure 135 - *Current situation at crossing Groene Hilledijk and Strevelsweg*
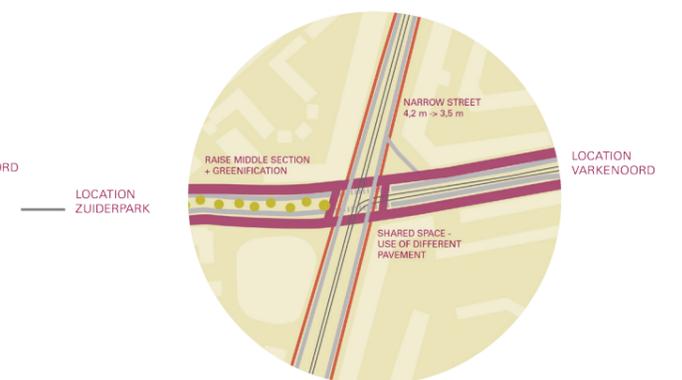
Figure 136 - *Proposal for crossing Groene Hilledijk and Strevelsweg*
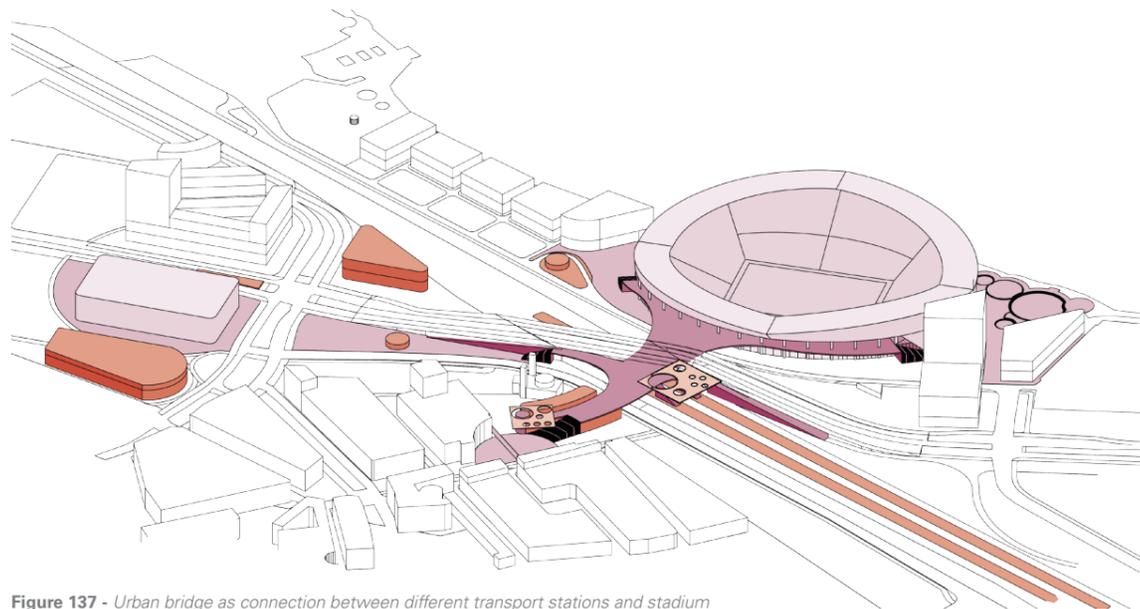
Figure 137 - *Urban bridge as connection between different transport stations and stadium*

On of the most important interventions in the proposal for the Olympic Games in Rotterdam South is the Urban Bridge to the Olympic stadium. This bridge is the direct connection from city area Feijenoord and Charlois to the future Feijenoord stadium. It is arguably the vital connection to a major leisure opportunity for inhabitants of Rotterdam South. More than this the urban bridge acts as the connection between all transport modalities that are combined in this multi-transport knot. From the bridge it is possible to directly walk to the intercity train station, metro station, tram station, bus station or two parking garages,

Seen towards the Olympic stadium, the urban bridge is accessed by a large staircases, escalators or a lift. The beginning of the bridge forms the roof of a large OV-bike points and guarded bicycle shed. A reference to this design could be the Jaarbeurs entrance at Utrecht

Central station. From that point it crosses four major barriers that split up the area between IJsselmonde and Feijenood; The Colosseumweg, the trainline, the Varkenoordse viaduct and the Korte stadionweg. While three of these barrier can easily be bridged, the Varkenoordse viaduct has to be crossed at the same level. This means that many measures have to be taking to ensure that it guarantees as safe passage during and off events. The urban bridge eventually splits up in two and is guided around the stadium. In this way the important passage is part of the stadium itself and the stadium becomes a major point in the routing system as it has become integrated in the daily usage.

Figure 138 - *Section of the proposed urban bridge, from city area Feijenoord to the proposed Feyenoord stadium*
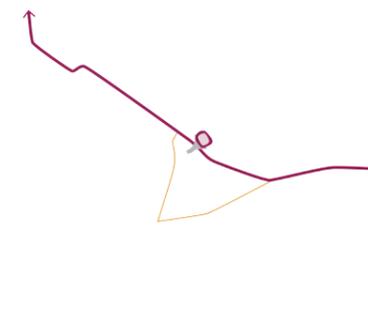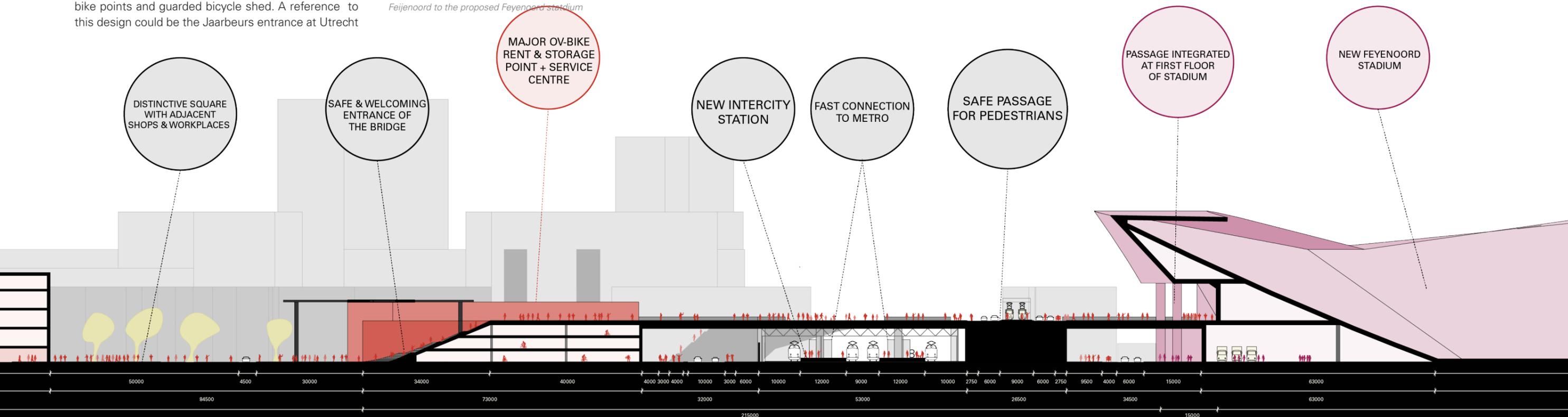
Figure 139 - *Current situation at the Varkenoordse viaduct + alternative routes*
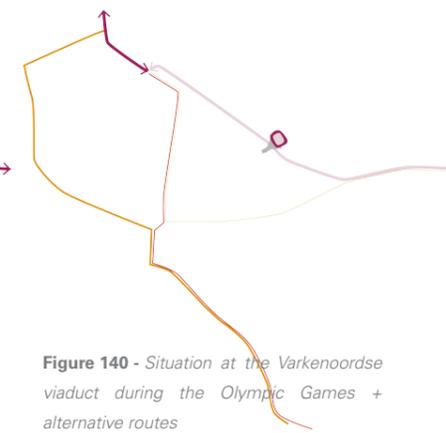
Figure 140 - *Situation at the Varkenoordse viaduct during the Olympic Games + alternative routes*
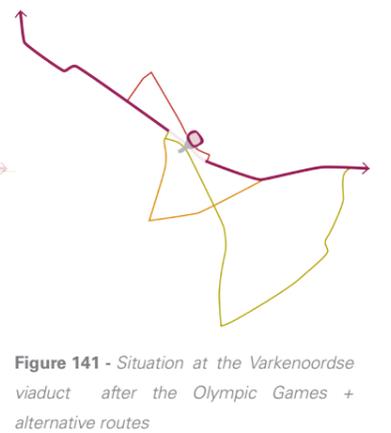
Figure 141 - *Situation at the Varkenoordse viaduct after the Olympic Games + alternative routes*

In order to guarantee a safe passage across the Varkenoordse viaduct, the emphasis should be drawn from the tram and car towards the pedestrians. Not only a traffic lights system will slow down the traffic at this points, additional attention to this passage is made through a large zebra crossing or different road colouring.

These measures are not enough during events, as (especially at the ending of an event) thousands of people will have to cross this passage. By a smart traffic light system the viaduct will be closed of temporary. This will cause some disturbances in the traffic flow from North to the highway, The figure above shows that this disturbance is not crucial as there are several options to take other routes. During the Olympic Games this passage, as well as major parts or the are in between both Olympic locations is preferably closed off to any non-destination traffic and the other major roads handle these temporary changed flows.

Figure 142 - *Crossing at Rotterdam Central station (retrieved from www.werkaandemuur.nl)*

Figure 143 - *A more atrractive crossing (retrieved from www.pinterest.com)*

DISTINCTIVE SQUARE WITH ADJACENT SHOPS & WORKPLACES

SAFE & WELCOMING ENTRANCE OF THE BRIDGE

MAJOR OV-BIKE RENT & STORAGE POINT + SERVICE CENTRE

NEW INTERCITY STATION

FAST CONNECTION TO METRO

SAFE PASSAGE FOR PEDESTRIANS

PASSAGE INTEGRATED AT FIRST FLOOR OF STADIUM

NEW FEYENOORD STADIUM

| 50000 | 4500 | 30000 | 34000 | 40000 | 4000 3000 4000 | 10000 | 3000 6000 | 10000 | 12000 | 9000 | 12000 | 10000 | 2750 6000 | 9000 | 6000 2750 | 9500 | 4000 6000 | 15000 | 63000 |

| 84500 | | 73000 | | 32000 | | 53000 | | 26500 | | 34500 | | 63000 |

215000

15000

6.4 - SOCIAL LEGACY IS AN IMPROVEMENT OF THE NEIGHBOURHOOD PHYSICAL LANDSCAPES

The Olympic Games not only visited by almost 2 million people in two weeks, but is spectated by billions of people worldwide. The city tries to present the best image possible to the city, therefore it is crucial that the Olympic Games are situated in a beautiful environment. The Olympic park are well designed landscapes emphasizing the attractiveness of the city.

Rotterdam South has many unique qualities, such as Zuiderpark, the largest urban park in the Netherlands, a beautiful river, but contrary also cramped streets with a focus on infrastructure and large uninteresting open grasslands. Most of the green spaces are fragmented.

In the proposal the Olympic Games enhances these unique qualities and makes interesting lush green parks from former wastelands. It proposes to extend the boulevard in order to use the quality of the river for the coastline development. According to the plans of the municipality, the Olympic park will be much more differentiated, placing each island with a unique ecological identity.

At strategic points parks are connected through the implementation of high quality green structures, forming much larger parks with an own identity. Along the trainline these interventions will form an attractive Olympic park and turn the trainline into a green highway.

the walking routes are converted to green boulevards between both Olympic parks and are the green fingers into the urban tissue. This is possible as car usage is reduced, offering possibilities to reduce widths of the streets and widening footpaths.

All these measurements connect fragmented green spaces and uninteresting public spaces into a green network, providing Rotterdam South with a very representative urban landscape. Enhanced green structures increase the quality of living, health, reduce air pollution and stimulates housing prices, Also the ecology benefits from a consistent green network.

LEGEND   A0: 1:5000   N

- Olympic locations
- Olympic structure
- Visitor flow
- Additional visitor flow
- Waterfront of Maas River
- Waterfront of Zuiderpark
- Closed park structures (trees)
- Open park structures (grassland + bushes)
- Sportpark structures
- Proposed green structures
- Proposed green mainstreets
- Possible green mainstreet
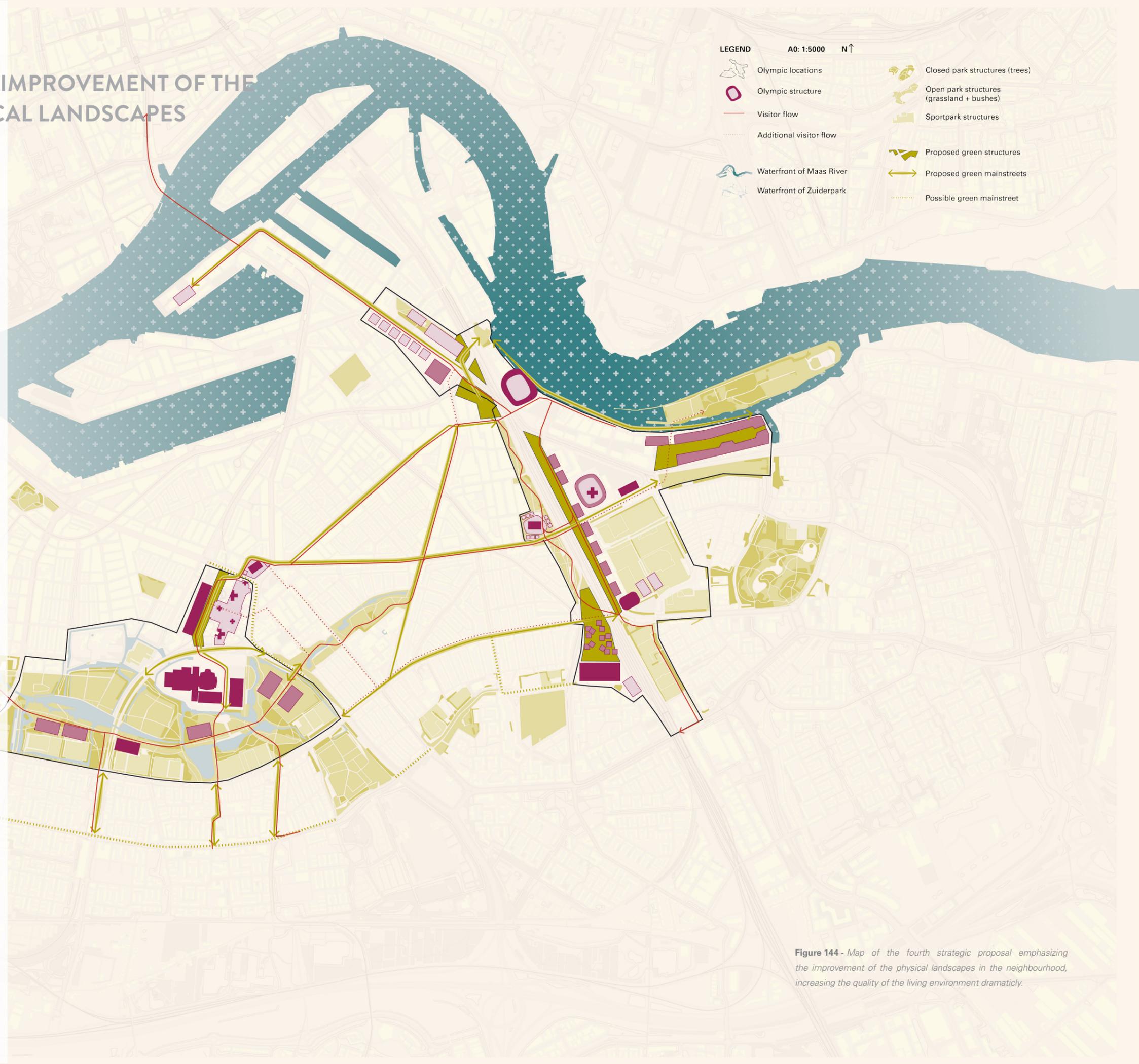
Figure 144 - *Map of the fourth strategic proposal emphasizing the improvement of the physical landscapes in the neighbourhood, increasing the quality of the living environment dramaticly.*

Rotterdam South has many potentials to become an environmental attractive part of the city, but at this moment the green spaces are fragmented or not used to their full potential. By enhancing the natural landscapes on the city, such as the river Maas, Zuiderpark and in between parks, it can become Rotterdam South has some beautiful places to offer.

One of the main interventions to do so is the elongation of the veranda boulevard across its whole length. At the moment it stops quite abruptly, but the construction of the Olympic stadium and the Olympic village gives the chance extend the boulevard. In this way the Veranda becomes an attractive place for leisure to the inhabitants of Rotterdam South.

Along the whole line it acts as a backbone for the city structure with streets perpendicular to it. These streets are important cut-through to other neighbourhoods, making the place easy accessible for everyone.

The profile of the existing Veranda boulevard will be enhanced, though instead of a slope a first level a steep wall is made. In this way there will be more space to walk, plant greenery or position public furniture such as benches.

To make the boulevard an exciting place a modest leisure oriented programme should be placed along the boulevard. This can be in the building adjacent to it, on the boulevard itself or floating in the river Maas. The last option provides the possibilities to make it ever changing and temporary, which could be in turn related to the event that takes place at the moment, such as the Olympic Games.

The extended boulevard is due to its width and length very suitable for jogging. Staircases to the water makes it possible to go rowing, fishing, acces a boat or other leisure activities.

Figure 145 - *Current end of the Veranda boulevard, highly unattractive.*
(retrieved from maps.google.com)

Figure 146 - *View on the extended Veranda boulevard. The Olympic village and stadium complete the image of the riverside.*
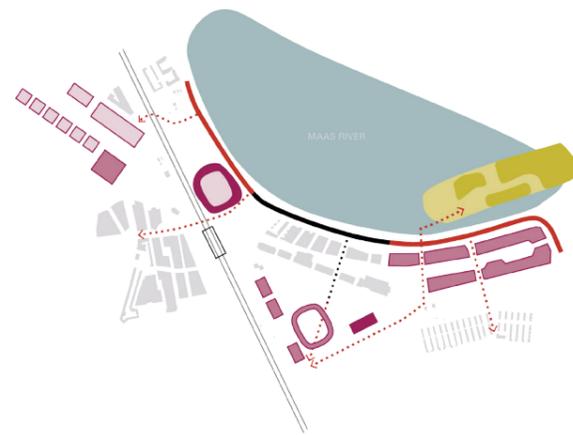
Figure 147 - *Map showing the enhanced sections of the boulevard and perpundicular connecting paths.*
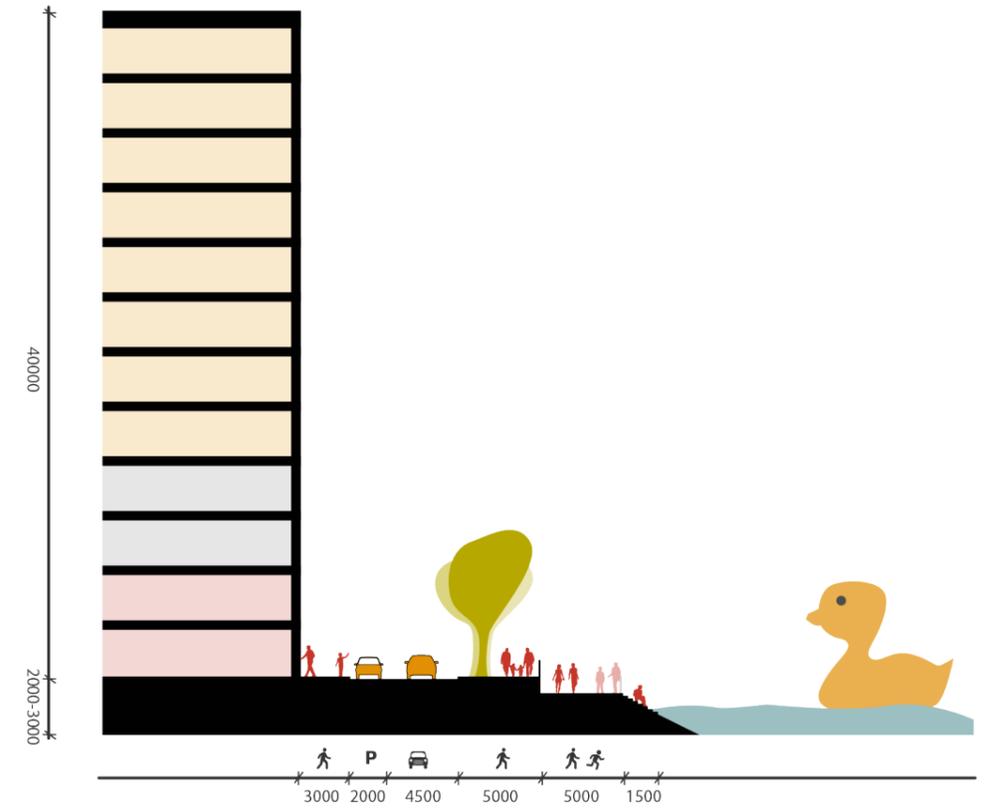
Figure 148 - *Section of the extended boulevard at the Olympic Village.*

OLYMPIC VILLAGE

ENHANCED VERANDA - BOULEVARD

TEMPORARY PROGRAM AT BOULEVARD

KUIP STADIUM

EXISTING VERANDA

OLYMPIC SQUARE

FUTURE FEYENOORD STADIUM

OLYMPIC HALL

LAAN OP ZUID

141
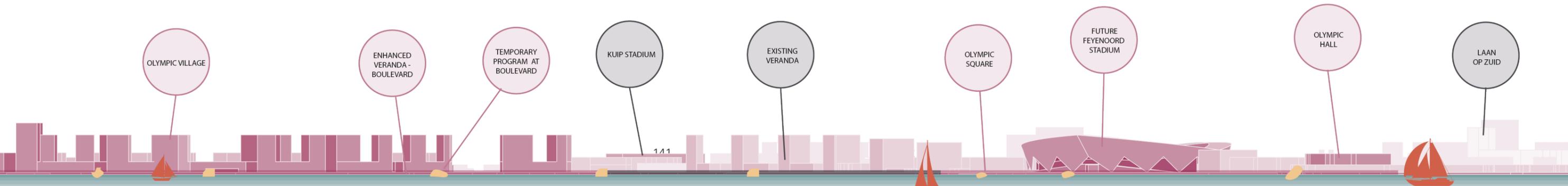
Another major intervention that can be initiated by organising the Olympic Games, is enriching the Zuiderpark, though the creation of several different islands. The Olympic Games imminently requires a major change in the landscape of Zuiderpark. At the moment the critique is focused on the relative ecological and environmental monotony of this enormous urban park (folder).

By placing different types of trees in the landscape the uniqueness of each 'island' is enhanced. Different kind of trees have different kinds of leaves, provides a colourful display in the park. At the same the ecological diversity is enhanced, and this new island identities could be further strengthened by different functions. One of the islands will be transformed into a waterpark, with much more water surface, low reed bushes and willow trees. The increase amounts of surface water also increases the capacity to act as a water storage during heavy rains.

The main streets are transformed into green lanes as much as possible, former the connecting lines in the green network. As example the Polderlaan is transformed first to hold as many visitors as possible, meaning reducing the width of the car lane to open space to extend the sidewalks and the creation of two bike paths on both sides of the street. An additional lane of trees is planted at the sidewalk, making it far more pleasant to walk upon.

The middle of the street can be enhanced as additional footpath, though after the Games this part is further enhanced through replacing parts of the hard surface with soft bushes and flowerbed. This makes the middle section of the street a pleasant recreational path. The additional green further improves the environmental quality of the area. Alter the Olympic Games green lane like streetscapes heavily improve the image of the main streets and the character of Rotterdam South. It forms the basis a more healthy living.

Quercus coccinea splenden

Prunus cerasifera nigra

Prunus cerasifera nigra

Acer zoeschense annae

Salix abla

Prunus yedoensi

Prunus yedoensi

Figure 149 - *Different type of trees are planted on each island. This will increase the diversity in Zuiderpark.*
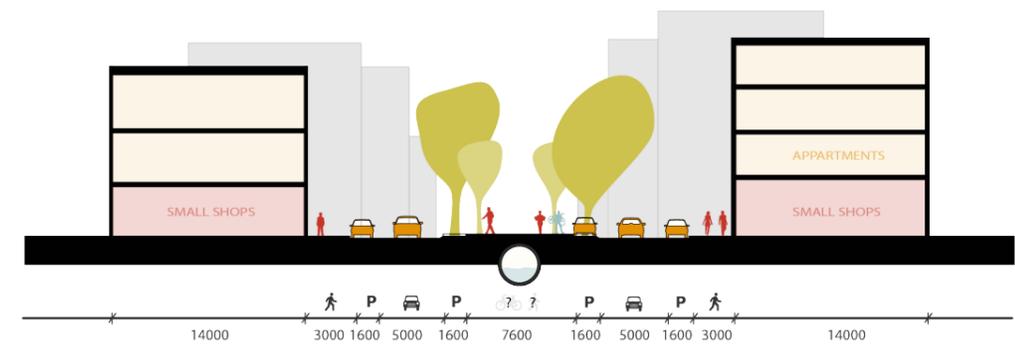
Figure 150 - *Section of the Polderlaan prior to the Olympic Games*
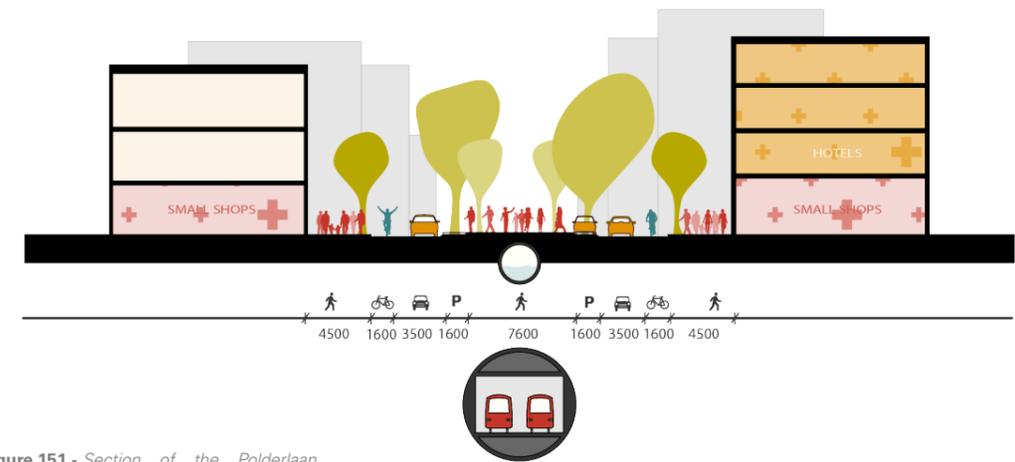
Figure 151 - *Section of the Polderlaan during the Olympic Games.*
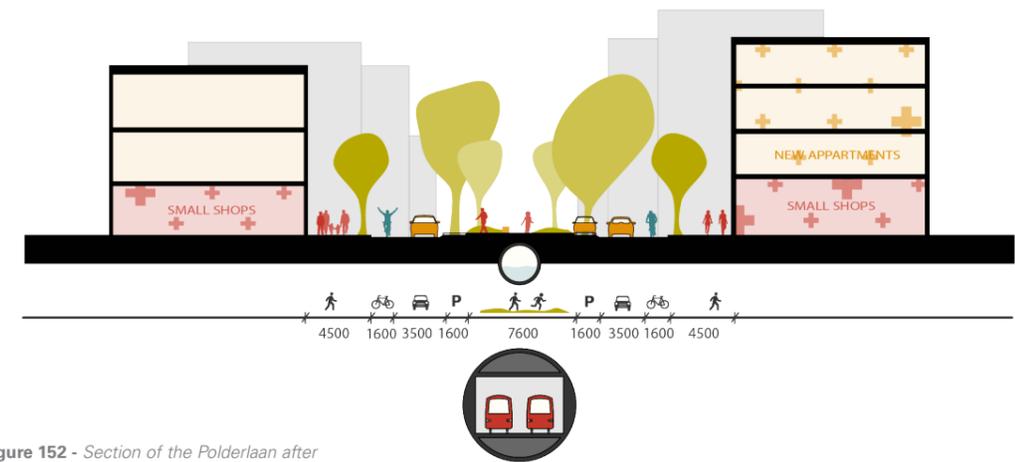
Figure 152 - *Section of the Polderlaan after the Olympic Games.*

143

144

6.5 - SOCIAL LEGACY ARE INITIATIVES TO START MOVING IN THE NEIGHBOURHOOD PUBLIC SPACE

The Olympic Games does only offer large and iconic sport venues, but also motivates people all over the world and especially in the host-city to become more active, dedicate more time to sport and put effort to stay healthy and fit. This is not facilitated by the official sport complexes, but in the public space. Therefore it should be of high importance that, next to the official sport programme, public space is transformed to motivate people to move.

To sport or at least to move and become more aware of the importance to moving should be facilitated as much as possible. It raises health and life expectancy dramatically, reduces the costs for health issues and promotes a more pro-active lifestyle. Health issues such as obesity are major concerns for Rotterdam South.

The proposal offers a set of configurations to the public space in the Olympic locations to facilitate these possibilities to move. For that purpose distinction is made between different types of areas, depending on the intensity and visibility of sport.

During the Olympic Games several special showcase spaces & Olympic plazas are situated along the main routing offering insight in and events related to the Olympic Games. After the event these spaces form motivating reminders of the Olympic Games.

By offering areas with different intensities, relaxed, all round, intense and educative, it is possible for everyone to start practising and moving, whether someone is a child, professional or isn't used to move.

The proposal emphasizes to extend these type of public space configurations beyond the Olympic location boundaries, based on strategic positions near schools, shopping malls and existing parks at the hearts of daily life. In this way the legacy is not confined to the Olympic locations, but as an overall motivating improvement to Rotterdam South.

Visualized are different kind of movement modes, either walking, jogging, running or bicycling. During these proposed forms of exercise different public spaces can be visited, offering possibilities to rest. The proposed route and public spaces must be safely and easily to use in order to motivate inhabitants to make use of these proposals.

LEGEND   A0: 1:5000   N↑

- Olympic locations
- Shops/office related structures
- Education related structures
- Health related structures
- Olympic plaza's
- Relaxed green spaces
- Allround sport spaces
- Educative sport spaces
- Showcase sport spaces
- 1st priority: directly to Olympic walking routes
- 2nd priority: central positions in degraded neighborhoods
- 3rd priority: Urban spaces in non degraded neighborhoods
- Walking route
- Jogging route
- Running route
- Bicycle route

New energy 5,7 KM

Touristic walk 6,6 KM

Quick fit 5 KM

Olympic tour 19 KM

Figure 153 - Map of the fifth strategic proposal proposing not only to upgrade the public space within the Olympic park, but also an overall upgrade of strategic public squares in Rotterdam South.

Figure 154 - *BasketBar in Utrecht Uithof, a combination of bar, skate structure, places to sit and a rooftop basketball field. (retrieved from Archilovers.com)*

Allround spaces

All-round spaces present a variety to practice multiple sports at one location. Often these are large open spaces, with extensive tracks and high-quality objects to perform at high level. These places can be enhanced by leaving parts of a Olympic venue, such as a BMX track, a skatepark or a climbing wall still publicly available, while the 'shell' of the stadium is removed. Combining these sports together make high-quality, creative, motivating and interactive places.`

Figure 156 - *CastleKnock school, Dublin, where a large open space is covered with rings in which kids are open to create own rules and games (retrieved from play-scapes.com)*

Relaxes spaces

Enhancing the existing parks in Rotterdam South, opportunities are enhanced to motivate people to perform small activities. This means the construction of small, challenging objects that require just a little more attention than someone would normally do within a park. Elevated roads, trails, pieces of robes between trees or different materials of footpath. Small changes that make the space a little less common. Still these have to be safe and easy to use, especially to children.

Showcase spaces

These showcase spaces are places at central positions to the neighbourhoods. During the Olympics several events will be held here with the competing athletes, as motivation to the neighbourhood. These can also be places for ceremonial features. The areas need to be severely redesigned and offer a programme of bars, play spaces, sport fields, benches etc. After the Games these places become valuable parts in the lives of inhabitants as it offer combinations for leisure and precious activities.

Figure 155 - *3D Athletics Track in Denmark, adding an additional layer to a common athletics track. (retrieved from pinterest.com)*

Educative spaces

These public spaces are often near schools, either a schoolyard or a square next to it. The Olympic Games should grasp the possibility not only introducing schools to the Olympic programme by lessons, but also by the spatial configuration of the public spaces. Interactive information points, rings, quotes, drawings of their favourite athlete, small tracks, and evoking objects to kids will learn them to play together and start sharing equal values.

Figure 157 - *Reford Gardens, Quebec, offers multiple challanging and interactive ways to enjoy the park (retrieved from refordgardens.com)*

The Olympic Games should do more than only setting up a beautiful Olympic park with some major sport venues. It also should also introduce informal places for sport and movement. Especially in a city district such as Rotterdam South, where obesity levels are on average much higher and living unhealthy is common practice, it is crucial to motivate inhabitants to move, exercise and perform at least one sport. These informal sport places are not confined to the Olympic venues, but imposed all around Rotterdam South. To do so several types of sport spaces are determined, showcase, all-round, educative and relaxed (figures 157-160).

But even more than providing places to exercise, people have to get out of their houses and start to walk in the first place. These motivation can not only be provided through the public space, but also enholds stimilating programmes where people can deserve rewards for their exercise. One of such examples is the Turfly app (Khoo, 2015) where people can conquer territory within their own neighbourhood by running around the space. In order to make it attractive to be, move and eventually exercise outside, the area has to change significantly. By imposing greenification of the main streets, broadening footpaths and making crossings easier, safer and faster, it is already making its way towards a more . In their project "Gezonde verstedelijking" POSAD set up guidelines to make this transition even more healthy and beneficial (POSAD, 2017).

One of the interventions is to transform the proposed ring road in Zuiderpark, meant to transfer athletes around the park during the Games, into a connective running and bicycling track. Along this more than 5 km track, it is possible to perform multiple types of sports and witness varied identities the new Olympic park has to offer. knitting the varied programme of Zuiderpark together. These places of sport can also be used by their direct surrounding and is easily accessible by metro, tram or from the city, ensuring a sustainable and contributed future for this Olympic structure

Figure 158 - *Example of a connective ringstructure around Rooswijk sportpark, Velsen-Noord.*

Figure 159 - *Ring structure connecting several imporant sport and leisure opporunties togerther within Zuiderpark. While running it is a half an hour overview of all qualities Zuiderpark has to offer.*
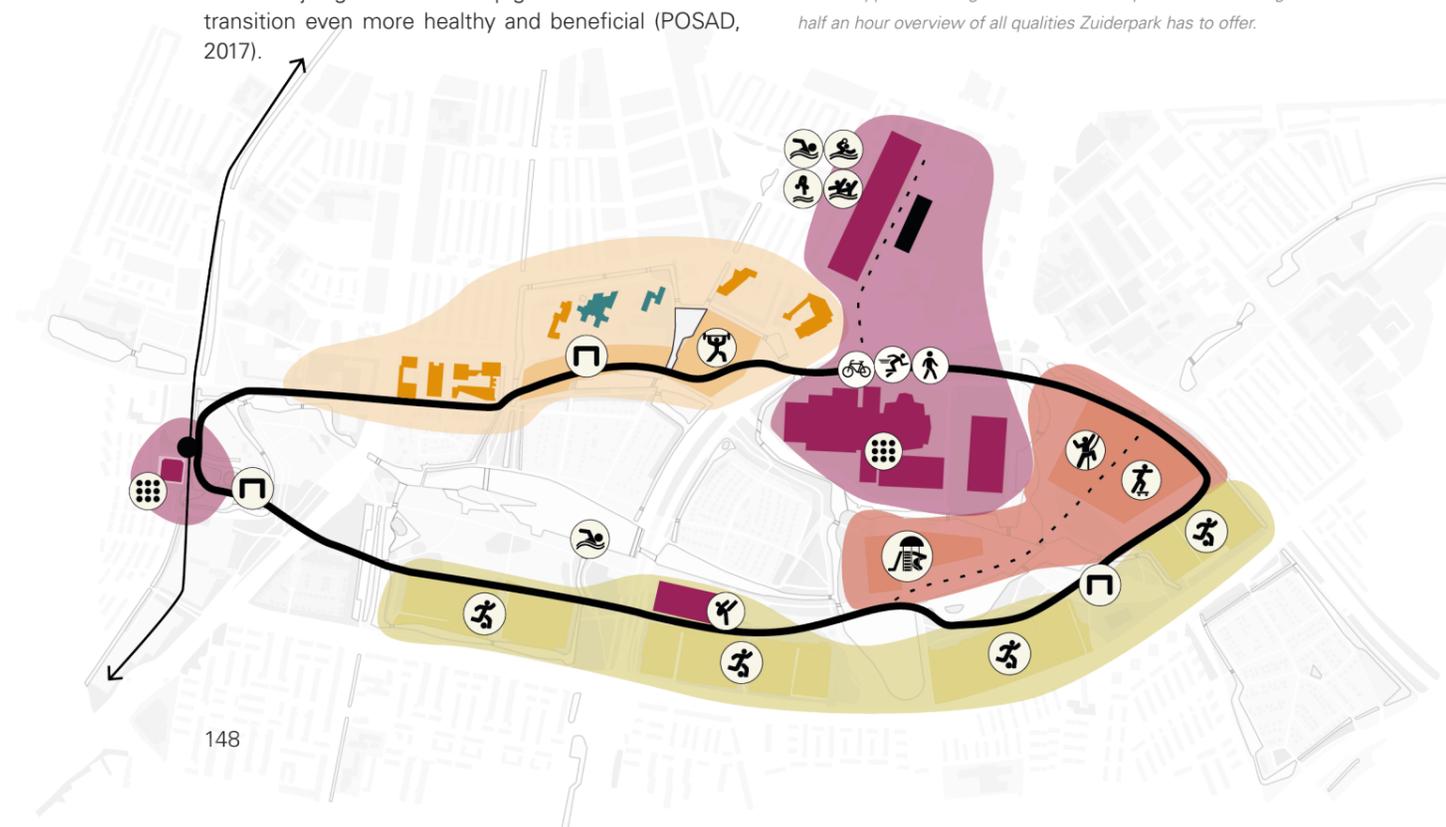
One of the main squares that is entangled with the Olympic Programme is the square in front of the future Olympic/Feyenoord stadium. In order to hold thousands of waiting visitors to the opening and closing ceremony as well to future football events or music concerts, this square is very large and with very mixed occupation. It is very important to make this space not another dead empty space.

The square is positioned at the end of the urban bridge around the stadium, along the water shore of the river and forms a part of the extended Veranda boulevard. The square offers a direct entrance to the stadium and on the other side marked by new realized mixed-use buildings.

To prevent from being empty off events, ring shape structures are carved into the square, creating a square with multiple levels. Within the rings it is possible to play different kind of sports, marked on the ground floor and facilitated by a building next to the square. The largest circle is large enough to host a full Cruyff-court, which is approximately 40 meters. All rings are large enough to play team sports, fostering cooperation and acceptance between the users. The step stones form a stand for spectators to watch the game.

The square is covered with several trees, forming a more safe and intimate environment. Direct access to the River offers possibilities to practice water sport from this point extending the use of this square for Rotterdam South.

During night led-lights underneath the step stones and in the round buildings will light up in the colours of the Olympic rings, making sure that the memories of the Olympic Games that shaped and gave identity to this place will not be forgotten.
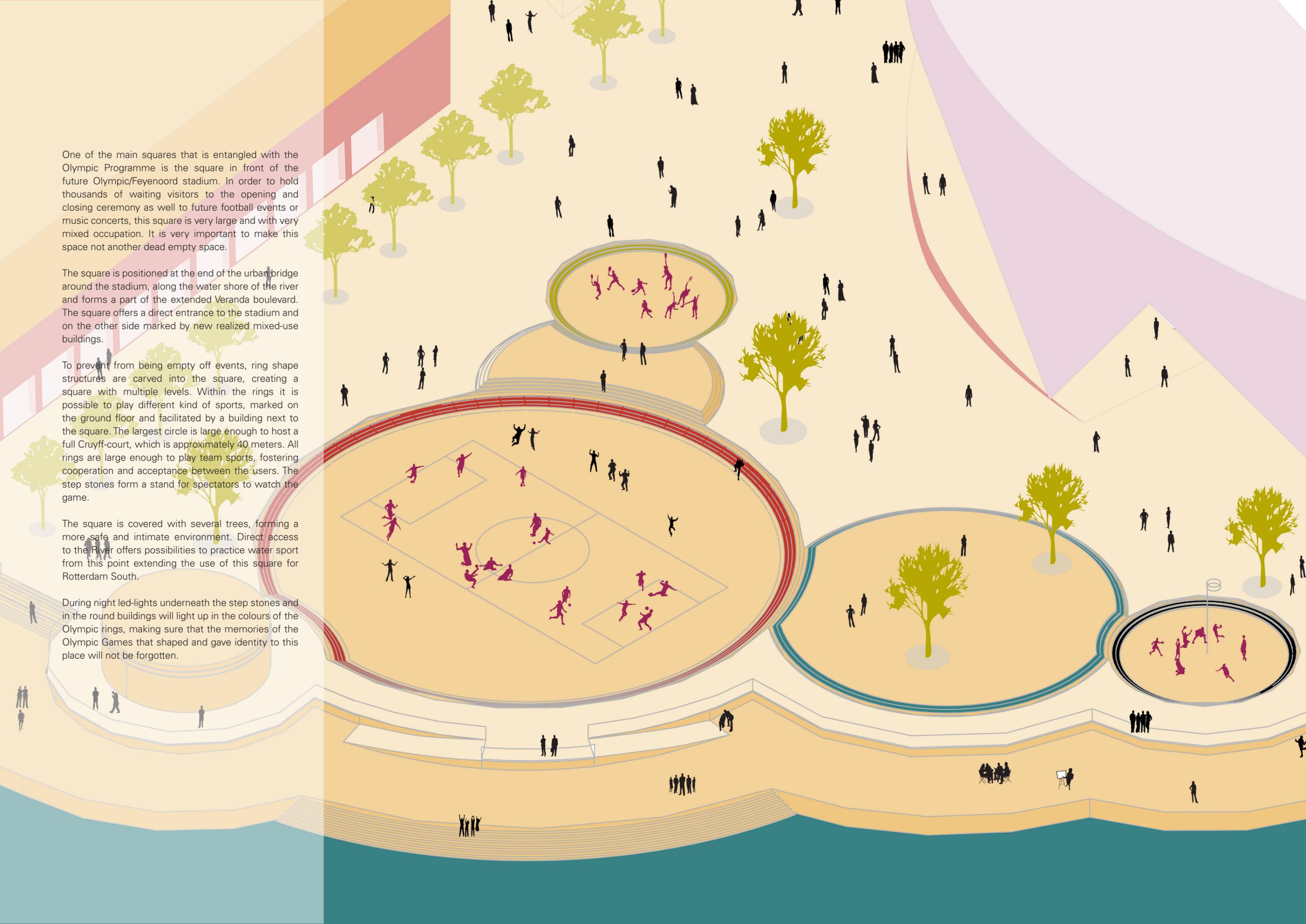
6.6 - SOCIAL LEGACY IS A TRANSFORMATION FROM COMMERCIAL TO SOCIAL

The Olympic Games draw enormous investment to the city and to the organisation, construction and execution of the event at the Olympic venues. Therefore it provides a loads of job opportunities in the construction sector, security sector, hospitality sector in preparation and during the Olympic Games. But this is only a two weeks event, after which these kind of jobs aren't necessary anymore. In this way it is a waste of investment in potential of people and place.

The programme of the Olympic Games must contribute to maintaining or creating vital job opportunities for Rotterdam South, especially for lower or non-educated citizens. Lower unemployment, increased income through work, means more investment in the area and above all, better living conditions.

In this proposal different development areas are distinguished in which the Olympic programme can contribute to increasing employment opportunities for the inhabitants of Rotterdam South. It also emphasizes the reconstruction of several projects meaning construction jobs after the Olympic Games are maintained. The train stations and Zuidplein function as hotspots for future economic development.

Around the multimodal node of the Olympic stadium large commuting flows are still persistent, even outside events. Hospitality services, supermarkets, workshops, bike-rental is all situated around this infrastructure hotspot, providing employment for MBO and lower educated inhabitants.

During the Games the smaller shops along the main commuting routes will heavily profit from the passing visitors and after the Games improved environments of the streetscape improves the attractiveness of the area and improved accessibility of the place.

A sport boulevard is created between the Olympic stadium and the Hockey stadium, backed up by large sport infrastructure and office locations for sponsors of the Olympic Games it requires education and training towards sport specialists, physiotherapists and so on, which in return boost local education institutes.

Around the Maasstad Hospital an healthcare research hub is constructed, enhancing municipal plans as well as making use of the large healthcare sector in Rotterdam South. This construction is beneficial to the neighbouring sport boulevard, as healthcare research can partly be targeted towards sport performance and injuries.
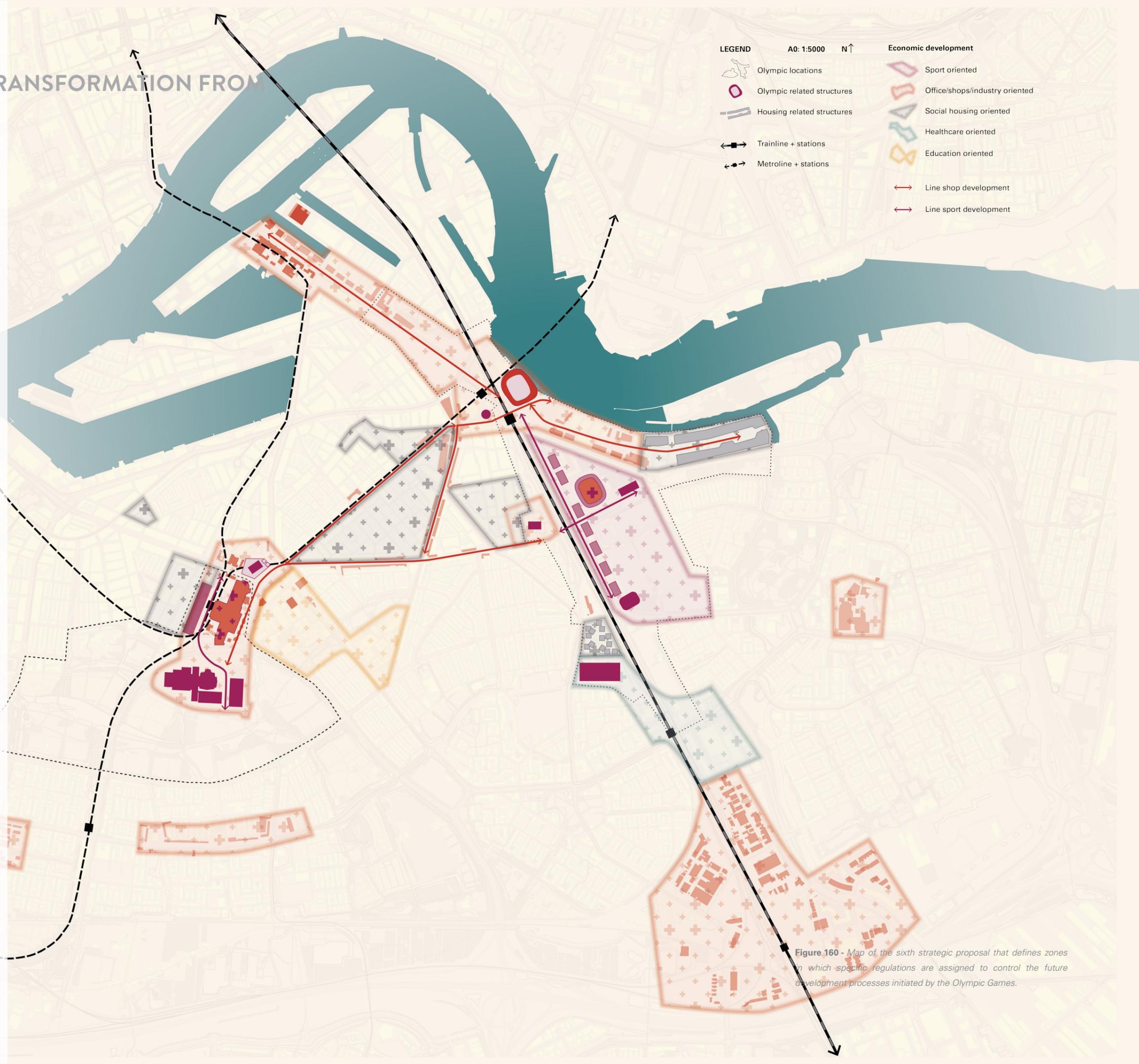
Figure 160 - *Map of the sixth strategic proposal that defines zones in which specific regulations are assigned to control the future development processes initiated by the Olympic Games.*

LEGEND   A0: 1:5000   N↑   Economic development

Olympic locations
Olympic related structures
Housing related structures

Trainline + stations
Metroline + stations

Sport oriented
Office/shops/industry oriented
Social housing oriented
Healthcare oriented
Education oriented

Line shop development
Line sport development

Rotterdam South has currently one of the largest relative unemployment rates in the Netherlands, meaning no substantial income for many residents to enjoy a stable life which gives them possibilities to develop themselves. The levels of education of these residents is also lower than national level, mostly focused on MBO or lower degrees.

The Olympic Games offer a sustainable solution for the residents of the Rotterdam Zuid, as it means not only a major temporary increase in the amount of available jobs during the construction of the Games and while the event lasts. But also a major increase in amounts of jobs after the Olympic Games. For this to happen three kind of areas are created where different type of employment is concentrated.

The first economic interventions the creation of an economic axis along the trainline, in between the city districts of Feijenoord and IJsselmonde. This area is now still underdeveloped, but through the new intercity station and the new train station Hordijk, chances for development are significantly improved. This means that Hordijk can further develop themselves as important industrial area and the area around the intercity station to business hotspot. Capitalizing on already large employment forms, such as healthcare and the building industry. The major drive behind this development is the creation of a sport boulevard as part of the new CTO Metropool. This sport boulevard fosters the development of healthcare research of nearby Maasstad hospital.

The area around Zuidplein will foster from the Olympic games as it receives a major environmental make-over, the tunnel, aquatic centre and upgraded shopping mall increase the interest at this spot. It also fosters from the development around the trainline as trainers, research-assistants, physiotherapist, masons, road makers etc. all have to be educated, which is largely already covered by existing education institutes around Zuidplein.

The shop on the main streets in between both Olympic areas will have a major economic boost during the Olympic Games and have a lasting benefit from the redesigned main streets. All these small shops will need mostly unemployed, cheap employment, providing a valuable start for the youth on the job market. Big (former Olympic) squares act as vocal points that knit this small shop development to the bigger economic backbones of Rotterdam South, creating an interesting offer of smaller and larger companies.

FEIJENOORD

IJSSELMONDE

FEIJENOORD

CHARLOIS

PENDRECHT
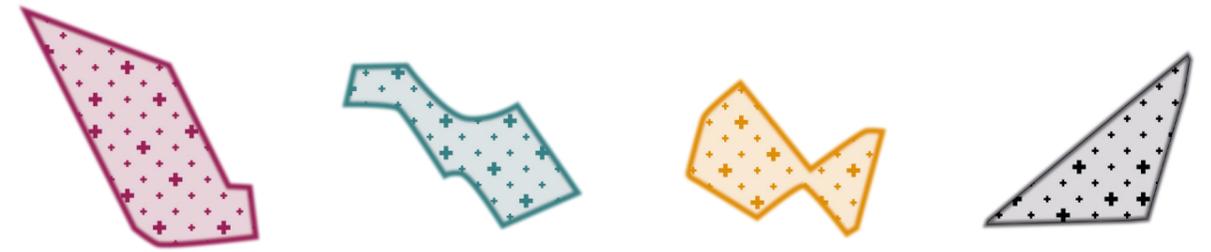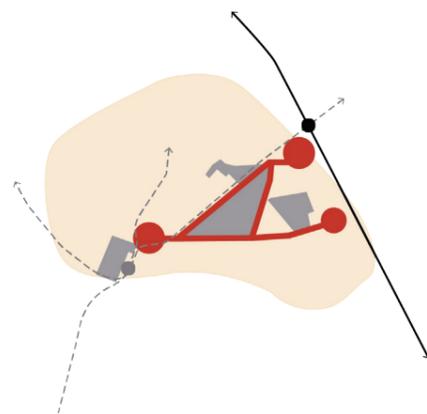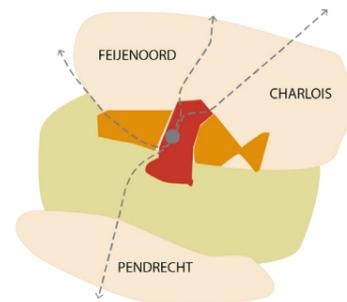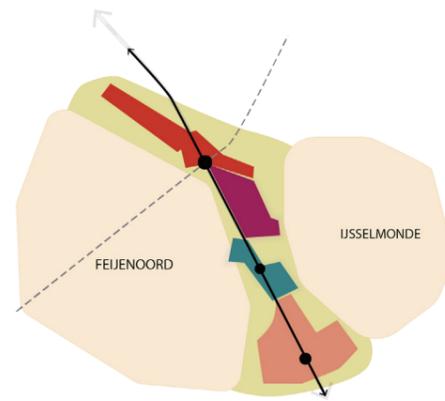
The sport boulevard hosts an interesting mix between large stadiums, existing trains complexes, a nice boulevard park and some educational practices towards the development of top sport at this location. Offers many jobs related to the development of sport and health of its athletes, as well as trainers and guards.

The healthcare research institute optimises the research done at the Maasstad hospital and the wish of the municipality to extend this practice. The creation of the sport boulevard offers a large p[possibility to add research segments to the programme. This requires new space and offers jobs related to research assistant, physio, revalidation etc.

The large MBO-colleges and secondary schools around Zuidplein offer now an educational programme that is aimed at healthcare, construction of buildings, economics and businesses. Through the Games this programme is extended and additional space is required for education related to sport and movement. Requires many new teachers.

Many hotels are required to accommodate the visitors to the Olympic Games. Much of these hotels can be used as a start in redeveloping by municipality assigned areas. After the Games they might be converted to housing purposes. This provides a continuous demand for employees in the building sector.
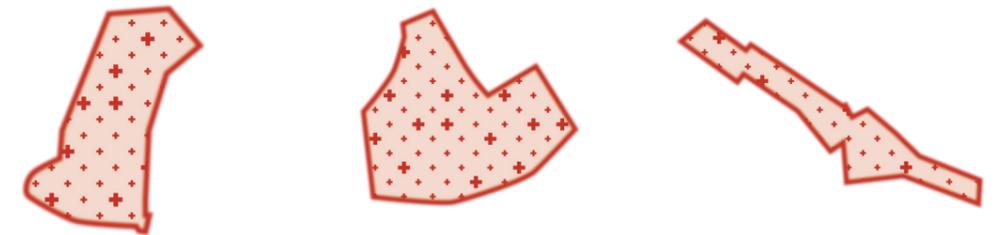
prior to the Games and according the plan of Hart van Zuid, Zuidplein receives a major makeover. The businesses here are fostered by the upgrade of this environment. If they are involved in the construction and redevelopment of the Games, will need a lot of additional employees, trickling down to smaller business at Zuidplein.

Hordijk is already developing as a major industrial area. With a new train station and replacement of industrial buildings from Varkenoord, this area receives a major boost to expand further. This expansion requires new employees in the construction sector, as well as home decoration, car and logistics sectors.

A new business district can be constructed as the development at the Kop van Zuid, a new hyper connected node an the Olympic stadium stimulate interest in the site. This financial centre of Rotterdam South create a lot of employment in itself. Even more important is the trickledown effect of this big companies on smaller companies.
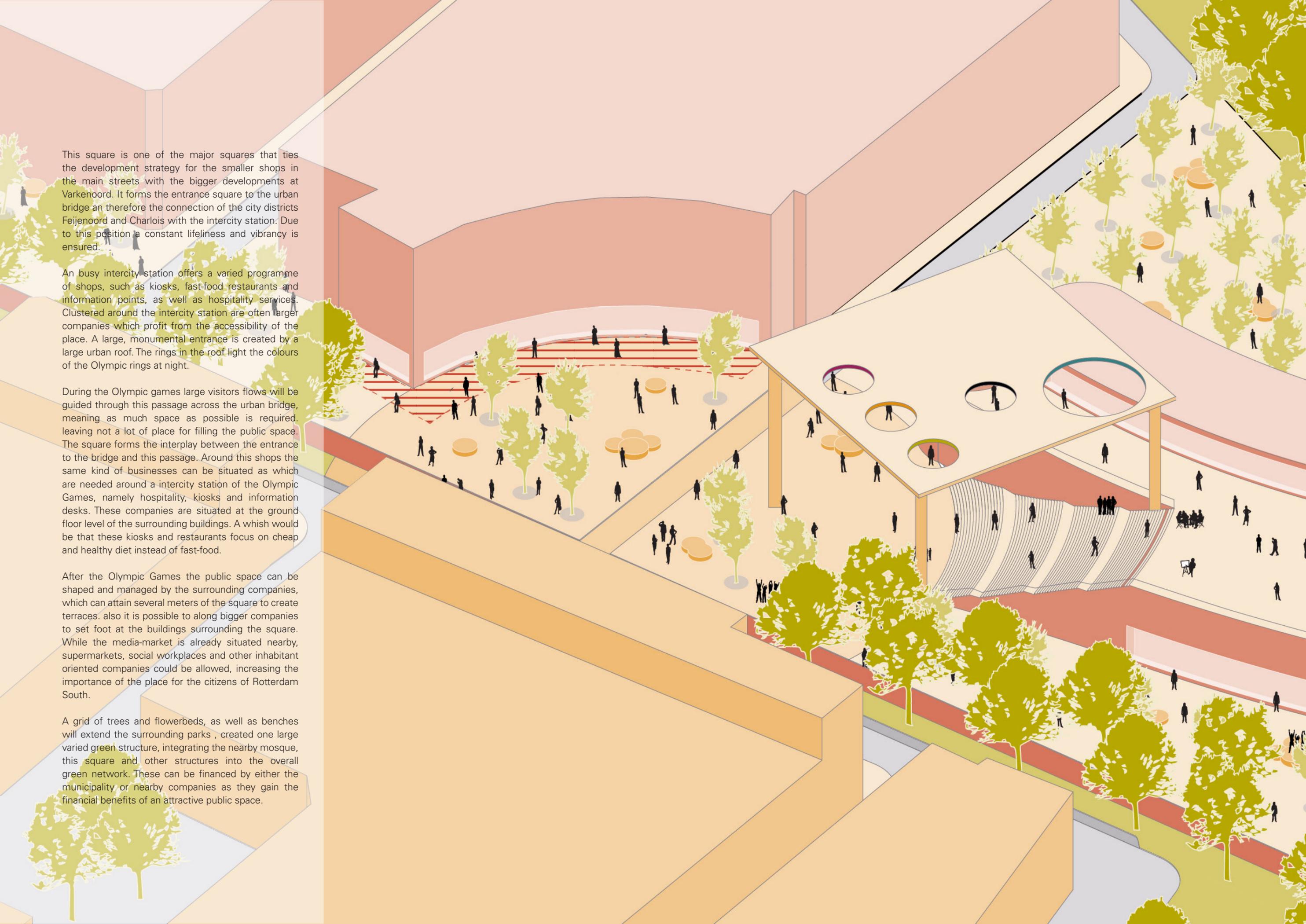
This square is one of the major squares that ties the development strategy for the smaller shops in the main streets with the bigger developments at Varkenoord. It forms the entrance square to the urban bridge an therefore the connection of the city districts Feijenoord and Charlois with the intercity station. Due to this position a constant lifeliness and vibrancy is ensured.

An busy intercity station offers a varied programme of shops, such as kiosks, fast-food restaurants and information points, as well as hospitality services. Clustered around the intercity station are often larger companies which profit from the accessibility of the place. A large, monumental entrance is created by a large urban roof. The rings in the roof light the colours of the Olympic rings at night.

During the Olympic games large visitors flows will be guided through this passage across the urban bridge, meaning as much space as possible is required. leaving not a lot of place for filling the public space. The square forms the interplay between the entrance to the bridge and this passage. Around this shops the same kind of businesses can be situated as which are needed around a intercity station of the Olympic Games, namely hospitality, kiosks and information desks. These companies are situated at the ground floor level of the surrounding buildings. A whish would be that these kiosks and restaurants focus on cheap and healthy diet instead of fast-food.

After the Olympic Games the public space can be shaped and managed by the surrounding companies, which can attain several meters of the square to create terraces. also it is possible to along bigger companies to set foot at the buildings surrounding the square. While the media-market is already situated nearby, supermarkets, social workplaces and other inhabitant oriented companies could be allowed, increasing the importance of the place for the citizens of Rotterdam South.

A grid of trees and flowerbeds, as well as benches will extend the surrounding parks , created one large varied green structure, integrating the nearby mosque, this square and other structures into the overall green network. These can be financed by either the municipality or nearby companies as they gain the financial benefits of an attractive public space.

6.7 - SOCIAL LEGACY IS A FUTURE RE-DEVELOPMENT FOR ALL OLYMPIC SITES

The re-use and definition of the Olympic park is even worse than the re-use of Olympic stadiums and complexes, leaving a massive empty footprint in the urban tissue. London 2012 was the first edition to have a proper legacy plan for redevelopment and re-use of the Olympic park after the Olympics. By setting up different development areas it creates a future for the Olympic park in which it will benefit the city greatly. In return local businesses and inhabitants merely profit from this redevelopment as rental prices sourer and the living costs increase severely.

Being able to stay within the same neighbourhood, having a known environment are crucial to the social sustainability of neighbourhoods. Feeling home and trusted are vital conditions to perceiving life, happiness and motivation to conduct actions. In Rotterdam South identity is a very important part of everyday life as seen negatively in the ethnical tension, but also positively in the love for FC Feyenoord.

Therefore the proposal emphasizes the redevelopment of the Olympic park not based on functions for the city, but to different identities highly related to the social structures present around the Olympic locations. The Olympic Games have major consequences for the identity of the area; It will always be marked as a Olympic site for example. By extending the influence border outside the Olympic location, the neighbourhood is enhanced in the redevelopment of the area. The redevelopment of the proposed areas create a mixture that is highly unique and related to the identity of Rotterdam South, optimized by the Olympic Games.

For every different redevelopment area the proposal present a Vignette, a map with all relevant information related to the Olympic interventions in that area. It defines a clear identity for the redevelopment of the specific Olympic programme and the enhanced social programme around. It further defines the position the legacy of the Olympic Games will have in daily life of the inhabitants of Rotterdam South and the city of Rotterdam.

LEGEND   A0: 1:5000   N↑

Former Olympic locations
Olympic related structres
Sport related structures
Shops/office related structures
Education related structures
Health related structures

01: Feyenoord City
02: Sportboulevard South
03: Olympic park axis
04: Healthcare research hub Rotterdam South
05: Ahoy-Zuidplein - Heart of South
06: Healthcare education hub Rotterdam South
07: North-South connection
08: Sportcluster Zuiderpark
09: Aquapark Zuiderpark
10: The best of old Zuiderpark

Figure 161 - *Map of the seventh strategic proposal showing development Vignettes for the Olympic park in order to enhance the comprising social structures that target towards a social sustainable redevelopment of (Olympic) Zuiderpark and Varkenoord.*

LEGEND — A3: 1:3000 — N ↑

- Development area
- Olympic areas
- Olympic stadium
- Olympic hall
- Olympic village
- Present Kuip stadium
- Topsporthal
- River Maas
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Railway
- Tramlines
- Waterway
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings
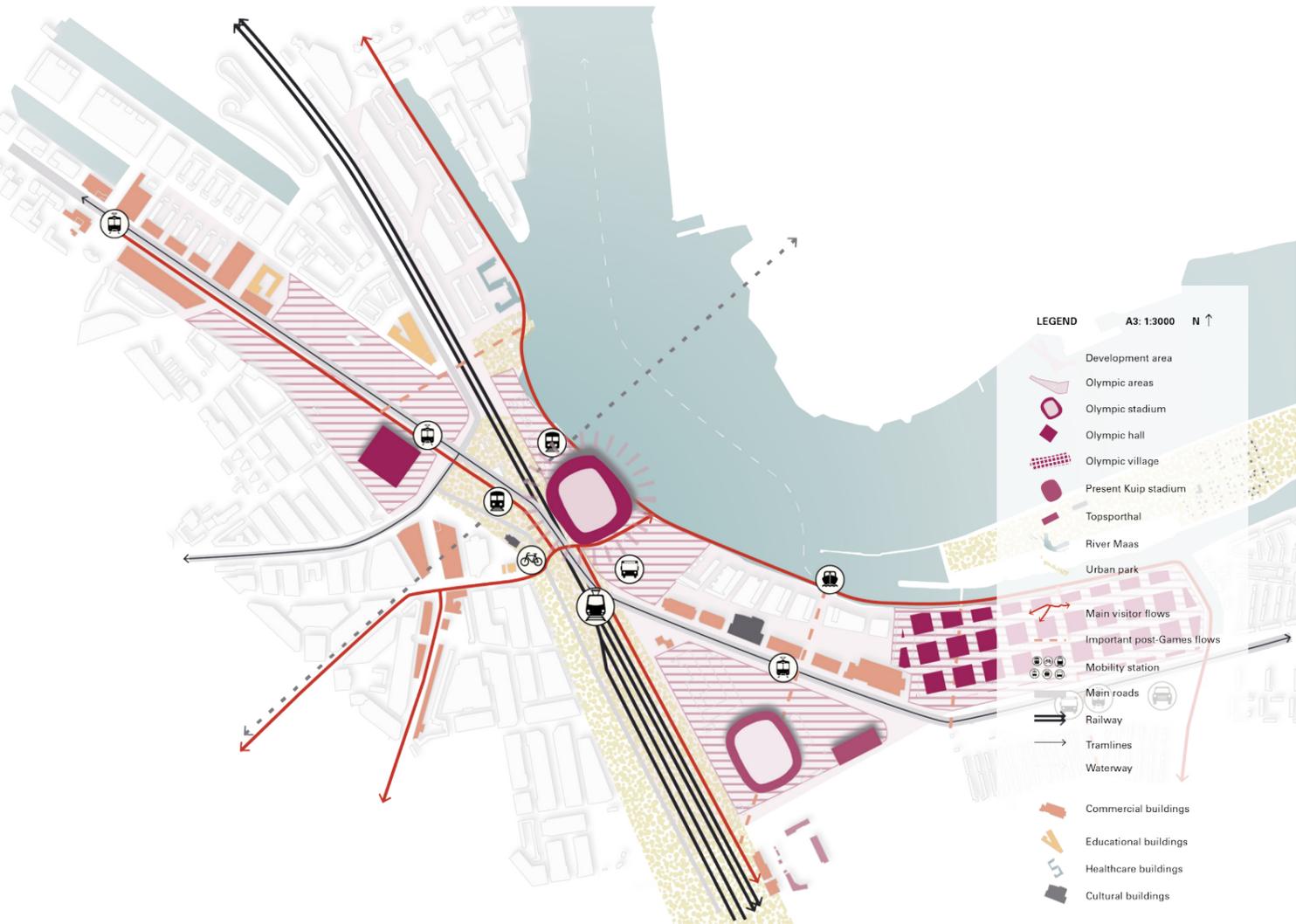
Figure 162 - *Map of Vignette 01 with the central position of the Olympic stadium in future development*

LEGEND — A3: 1:3000 — N ↑

- Development area
- New sport boulevard
- Olympic areas
- Training areas
- Olympic stadium
- Present Kuip stadium
- Topsporthal
- Feyenoord Hockey stadium
- River Maas
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Railway
- Tramlines
- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

Figure 164 - *Map of Vignette 02 with the location of the proposed Sport Boulevard South.*

Feyenoord city should be the connection of Rotterdam South to the developments at the Kop van Zuid. As the name represents it offers a mixture of city scape identity and sport together. This is emphasized by the Olympic stadium that functions as new football stadium for FC Feyenoord. The Olympic hall can be used for large scale indoor events, but transformed and accessible to the neighbourhood as well. The accessibility and pure representation of the Olympic Games on this place makes it a very attractive place to invest. Feyenoord city is the national representation of Rotterdam South, sport minded and part of a great city, increasing its image severely. The trickledown effect of future companies can create many jobs for the inhabitants of Rotterdam South.

Figure 163 - *Representation of how the identity of Feyenoord city could look like - London Stratford (retrieved from LondonTown.com)*

The sport boulevard South stretches from the intercity station and the Olympic stadium to the Hockey stadium and further. It will be a place where the heart of the CTO Metropool cluster will be situated, offering large sport venues, excellent trainings facilities, places for education of athletes and where they can rest. But also it enfolds big stores and companies related to sport, in an exciting and stimulation green and healthy environment. Boulevard South is the platform on which sport - employment - education and development will be connected to a beneficial cooperation. For this to happen it capitalises on existing sport complexes and the spatial legacy of the Olympic sport venues. This could be the most intense sport minded area of the Netherlands.

Figure 165 - *Representation of how the identity of the Sport boulevard could look like - Sportstad Heereveen (retrieved from GrootHereveen.*

LEGEND A3: 1:3000 N ↑

- Development area
- Olympic areas
- Olympic sqaure
- Other Olympic structures
- Green crossings
- River Maas
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Railway
- Tramlines

- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

LEGEND A3: 1:3000 N ↑

- Development area
- Olympic areas
- Olympic media center
- Other Olympic structures
- Healthcare/Education hub
- River Maas
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Railway
- Tramlines

- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

Figure 166 - *Map of Vignette 03 showing the creation of a large park around the railway.*

Figure 168 - *Map of Vignette 04 emphasizing the construction of a medical research hub.*

The Olympic park axis says it all. In acts as the central routing of the Varkenoord Olympic location and ties the Olympic programme together. The existing park will be enhanced and improved by extension across the other side of the railway. It must become the most attractive green park in Rotterdam South next to the Zuiderpark. In order to foster the strategic plans to create large employment possibilities along the trainline it has to offer beautiful and lush landscapes, as well as many opportunities to move through in an interesting way. It has to make forget that large and important infrastructural lines still runs through this park. Multiple enhanced crossings across the railway ties both parts of the Olympic Axis together.

Figure 167 - *Representation of how the identity of the Olympic axis could look like. - Goods line, Sydney (retrieved from Aspectstudios.com)*

Figure 169 - *Representation of how the identity of the healthcare research hub could look like - Owensboro Health system Campus, U.S.*

Healthcare research hub Rotterdam South will elevate the already large healthcare sector at Rotterdam South to new heights. Current development on healthcare infrastructure such as the new Maasstad hospital are enhanced and developed further through the creation of the sport boulevard, adding sport to the research programme. The large flexible spaces of the broadcast centre provide excellent opportunities to be converted into research departments, medicine companies and other healthcare related employers. The urban space should foster a green and sustainable image, with parks that are also accessible to less mobile persons. The identity is one of technology with health and staying healthy as prime image towards the inhabitants of Rotterdam South, an example how to enrich daily life.

LEGEND   A3: 1:3000   N ↑

Development area
Olympic areas
Training areas
Aquatic centre
Renovated Zuidplein centre
Renovated Ahoy centre - Gymnastics & Cycling
M. Pentathlon & Judo hall
Olympic square
Other Olympic structures
Post-Games thematic area
Improved relationship Ahoy & Zuidplein
Zuiderpark waterbodies
Urban park

Main visitor flows
Important post-Games flows
Mobility station
Main roads
Metroline
Tramlines

Sport buildings
Commercial buildings
Educational buildings
Healthcare buildings
Cultural buildings

Figure 170 - *Map of Vignette 05 stretching the importance of a further collaboration of Ahoy and Zuidplein*

The heart of South will be the local centre of Rotterdam South with everything that is required to maintain such a centre for 200.000 inhabitants. The Olympic Games fosters an upgrade of the shopping mall at Zuiderplein and a new connection between Ahoy and Zuidplein fosters corporations between the two largest structures in Rotterdam South. Functions will be developed largely according to plan Hart van Zuid, but should also embodies places to gather and spent day or night time. The multisport-hall can offer itself perfectly for this course. The aquatic centre remains for local usage as well as top sport development and international trainings complex.

Figure 171 - *Representation of how the identity of the heart of South could look like. - Hart van Zuid plans (retrieved from ballast-nedam.com)*

LEGEND   A3: 1:3000   N ↑

Development area
Olympic areas
Skateboard & Climbing halls
Other Olympic structures
Post-Games thematic area
Healthcare/Education hub
Zuiderpark waterbodies
Urban park

Main visitor flows
Important post-Games flows
Mobility station
Main roads
Metroline
Tramlines

Sport buildings
Commercial buildings
Educational buildings
Healthcare buildings
Cultural buildings
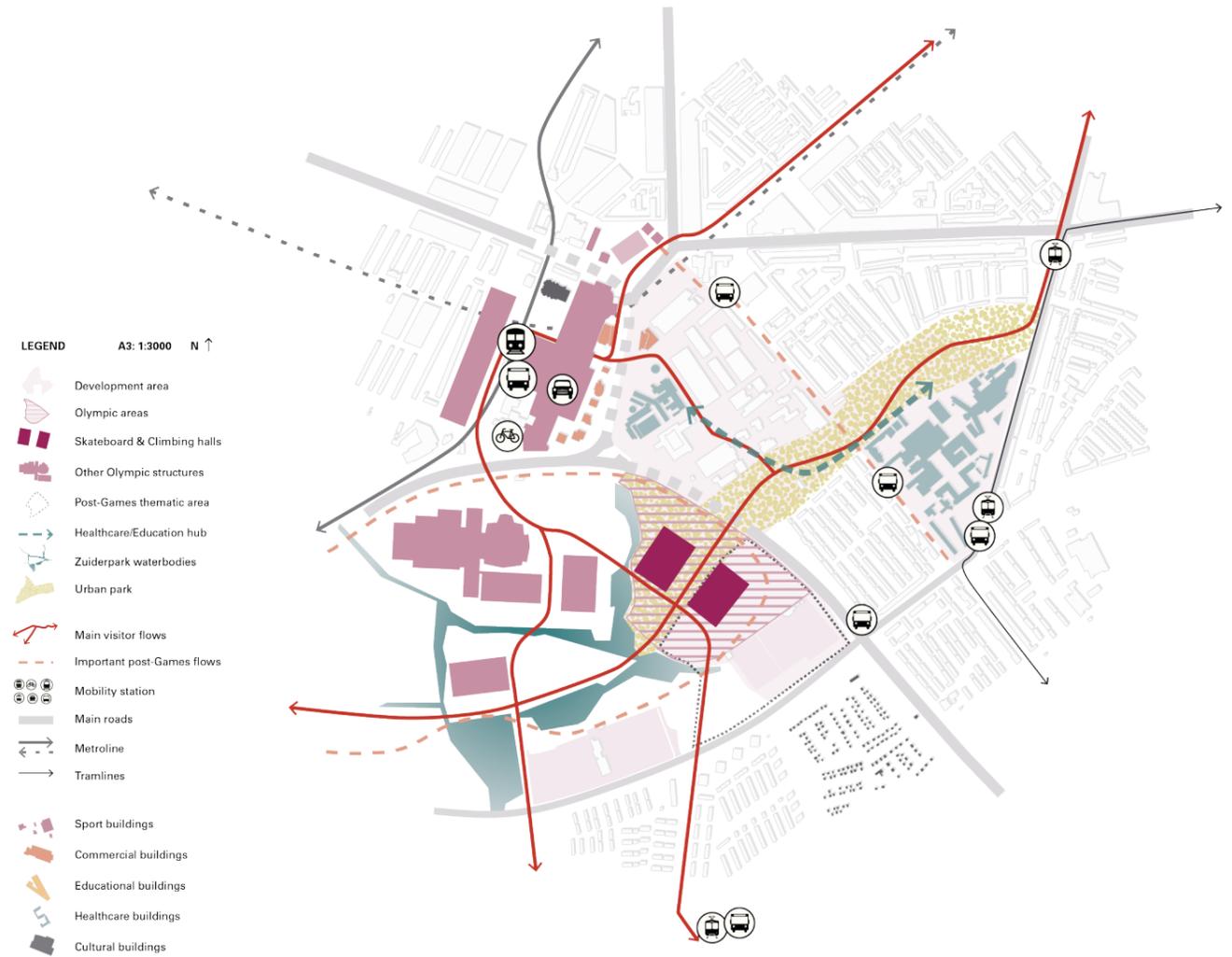
Figure 172 - *Map of Vignette 06 showing the development of a medical education hub.*

The healthcare education hub emphasizes on a healthy cooperation between the large hospitals of Erasmus MC-Daniel de Hoed Hospital and the Ikazia hospital in combination with present colleges such as the Hoornbeeck college. This cooperation, together with the Maasstad research hub foster from an extended educative programs towards healthcare and wellbeing. The park in between can be regarded as an extension of the Zuiderpark and a green finger into the urban structure and should foster the relation between the build structure and the green environment of the park. The area offers productive leisure opportunities targeted towards young age groups. This is enhanced by the creation of a all-round park, with the Olympic climbing and skating structures as prime location to this sport park.

Figure 173 - *Representation of how the identity of the healthcare education hub could look like. - Agro food park - Denmark (retireved from fastcompany.net)*

LEGEND   A3: 1:3000   N ↑

- Development area
- Olympic areas
- Aquatic centre
- Renovated Zuidplein centre
- M. Pentathlon & Judo hall
- Karate hall
- Other Olympic structures
- Post-Games thematic area
- Improved spatial relationship
- View across water
- Zuiderpark waterbodies
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Metroline
- Tramlines
- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

LEGEND   A3: 1:3000   N ↑

- Development area
- Olympic areas
- Taekwondo hall
- Other Olympic structures
- Post-Games thematic area
- Enhanced water storage
- Zuiderpark waterbodies
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Metroline
- Tramlines
- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

Figure 174 - *Map of Vignette 07 showing the connected structures by a north-south axis through Zuiderpark*

The Zuiderpark North-South connection development is not much of a development but a vital lifeline between Zuidplein and the neighbourhoods of Pendrecht and Zuiderpark. It will be developed to a much faster connection between the important regional transport node of Zuidplein and areas South of Zuiderpark. It has to be safe and convenient to use by slow traffic modes such as the bicycle. Connects different elementary schools with colleges around Zuidplein and the playground in the middle of Zuiderpark. Therefore it offers a catalyser to the development of the youth in Rotterdam South, making access to education and cultural facilities as easy as possible.

Figure 175 - *Representation of how the identity of the North-South connection could look like. - Greenway, London (retrieved from urban75.com)*

165
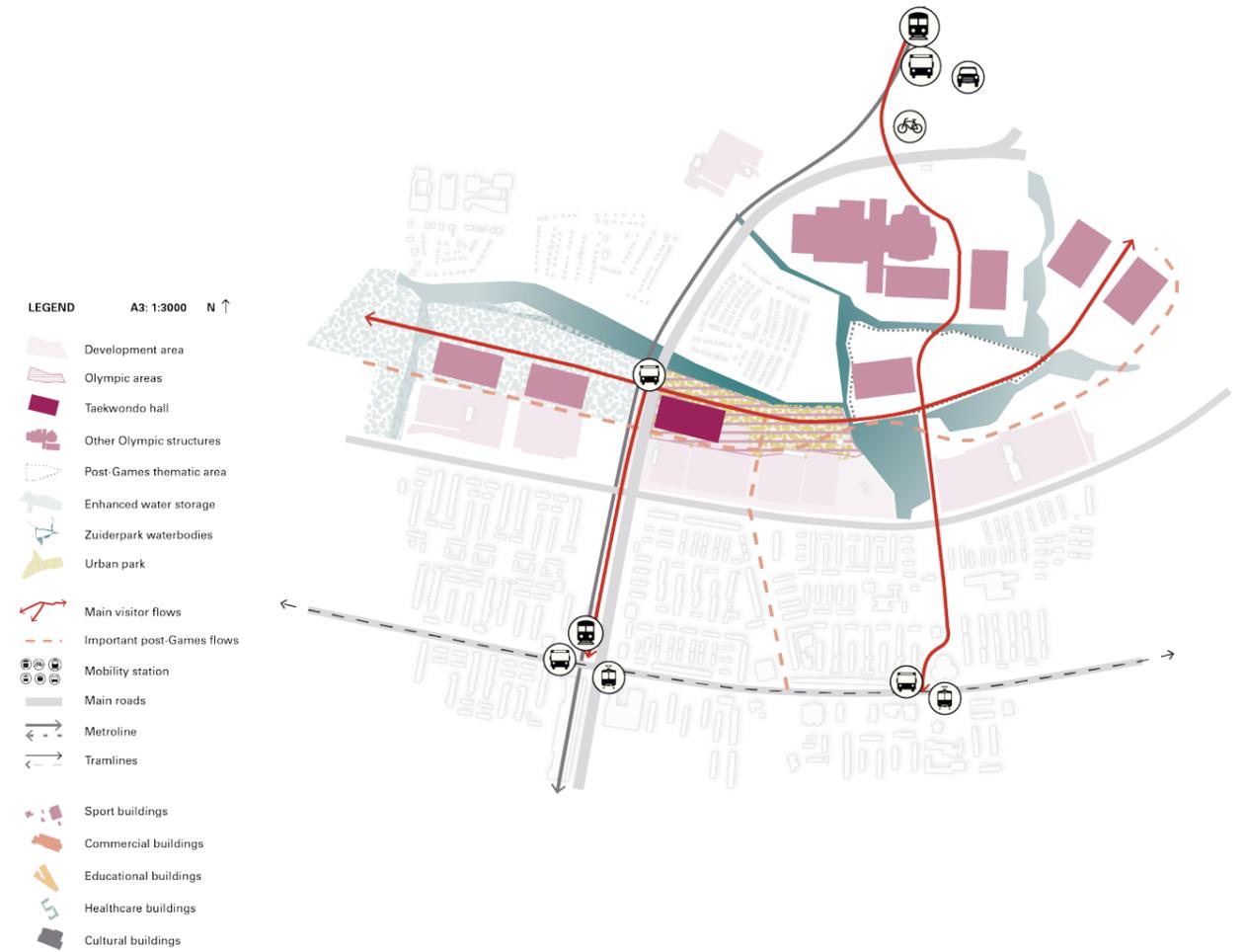
Figure 176 - *Map of Vignette 08 proposes the enhancement of several seperated sportstructures into a attractive sport cluster.*

The Sport cluster Zuiderpark is a collection of several football clubs at the South border of Zuiderpark. With the envisioned practice ring these spaces are connected to each other, combining former separate and rivalling football clubs together, promoting general acceptance between the inhabitants of Rotterdam South. At the same time a diverse sport program is added in the former Olympic Karate hall, making it publicly accessible. This part of Zuiderpark should offer an open and inviting spirit that welcomes the inhabitants to participate in sport. The proposed white flowering trees emphasize the peacefulness of the increased cooperation that is created at this place. It becomes the inviting local sport centre to the neighbourhoods adjacent to Zuiderpark.

Figure 177 - *Representation of how the identity of Sport cluster Zuiderpark could look like - Rooswijk sportpark - Velsen-Noord*

166

LEGEND   A3: 1:3000   N ↑

- Development area
- Olympic areas
- Taekwondo hall
- Other Olympic structures
- Post-Games thematic area
- Enhanced water storage
- Zuiderpark waterbodies
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Metroline
- Tramlines
- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings
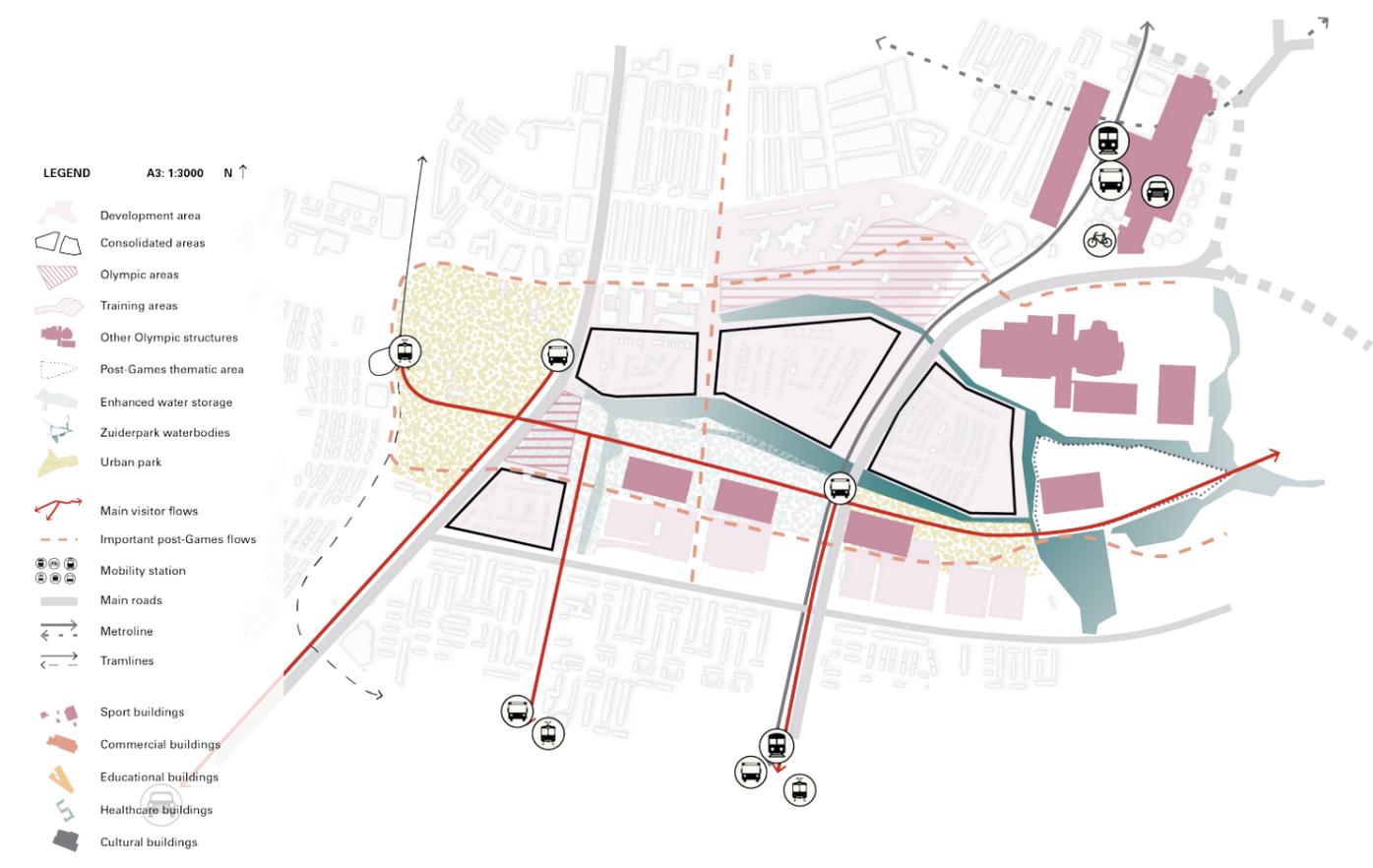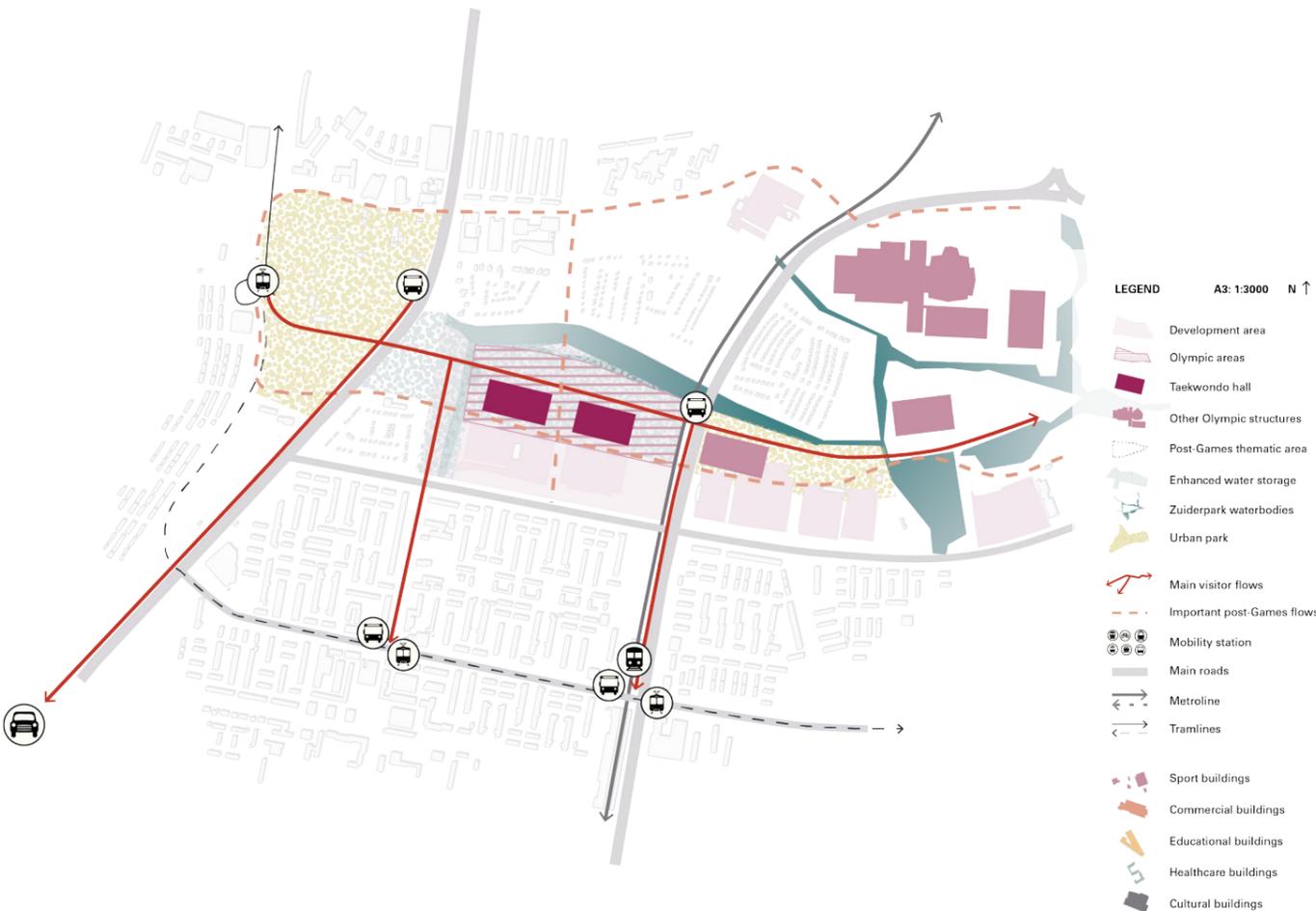
Figure 178 - *Map of Vignette 09 shows the creation of a large auqa-park increasing diversity in Zuiderpark landscape.*

LEGEND   A3: 1:3000   N ↑

- Development area
- Consolidated areas
- Olympic areas
- Training areas
- Other Olympic structures
- Post-Games thematic area
- Enhanced water storage
- Zuiderpark waterbodies
- Urban park
- Main visitor flows
- Important post-Games flows
- Mobility station
- Main roads
- Metroline
- Tramlines
- Sport buildings
- Commercial buildings
- Educational buildings
- Healthcare buildings
- Cultural buildings

Figure 180 - *Map of Vignette 10 aims to preserve but increase embedment of community gardens and schools in the Zuiderpark.*

Aquapark Zuiderpark is the resemblance of Dutch water engineering where it is possible. This little far of region of Zuiderpark is transformed into a waterpark with a different ecological image, as well as many possibilities to interact with water, further strengthening the differentiating the monotonous identity of Zuiderpark . It offers an a valuable addition to the capacity to store water during extensive rains in Rotterdam South. Halls will be converted according to design principle Remnants as serving reminder to water basins in which the former footprint of the hall is still visible. While there is no sport purpose for more halls after the Games, these sites still provide great value for storing water and the and the ecosystem of Rotterdam South.

Figure 179 - *Representation of how the identity of the Aquapark could look like. - De Rietvelden - Vleuterweide (retrieved from vp.nl)*

The best of Zuiderpark is a resemblance of many vital local social places, such as the community gardens and colleges that are present in this West corner of the park. The community gardens will remain, but should provide a better permeability for the surrounding area in order to increase accessibility to Zuiderpark for the neighbourhood. The other areas are optimized in function, such as the creation of an exercise field near the colleges. The Zuiderpark ring is the biggest 'violation' in the preservation of this area, but ties these often enclosed spaces to other places in the park and making accessible and open to the surrounding. This fosters the unity of the new park and the old part of park into a social sustainable construct for Rotterdam South.

Figure 181 - *Representation of how the best of Zuiderpark looks like. - VTV de Zandweg - Zuiderpark (retrieved from vtv-dezandweg.nl)*

6.8 - TOWARDS A SOCIAL LEGACY FOR ROTTERDAM SOUTH

These seven proposals creates an overall strategy for the Olympic Games to enhance the social sustainability of Rotterdam South. A social legacy for the Olympic games is not just finding a solution to transform of make use of the Olympic venues. It is an overall package of reinforcing measurements to ensure that all interventions that are required to the organisation of the Olympic Games are maximized to create a social legacy after the event. These proposals contribute to each other and cannot be implemented separately.

The first proposal is to find a future for every implemented Olympic venue is South. A distinction is made between permanent, to be converted and temporary Olympic venues.

Second is to connect these venues through an upgraded network of public transport and slow traffic modalities. More than ensuring visitors to reach their destination without delays, it offers a possibilities to the economy of Rotterdam South and the transition from a car-based city district to a much more healthy transport climate.

By upgrading the overall infrastructure network, also many crossing have to be redesigned, putting emphasis on a safe, convenient and fast crossings for especially bicyclist and pedestrians. This encourage inhabitants to move and cross streets to other neighbourhoods.

A representative environment is crucial to the Olympic Games and its visitors and demands the creation of a green network throughout the city district. High quality parks are created and connected to foster the ecology, healthy movement and a representative image.

This improved environmental conditions and safer use of the public streets encourage movement and exercise, which is further enhanced by the creation of several showcase, all-round, educative and relaxed public spaces, which can all be used differently.

Employment is further stimulated by the created of three different economic areas, around the trainline, Zuidplein and on the main streets, fostering the employment and education of the residents even after the Olympics.

A set of vignettes determines the identity of areas within the redevelopment of the Olympic locations, ensuring an optimisation within the social legacy of the Olympic Games for Rotterdam South.

LEGEND   A0: 1:5000   N↑

- Olympic locations
- Sport program
- Sport oriented structures
- Economic oriented structures
- Education oriented structures
- Healthcare oriented structures
- Housing oriented structures
- Focus aspect of a development area
- New park
- New green lane
- Permanent Parking lots
- Temporary parking lots
- Trainline + stations
- Metroline + stations
- Tramline + stations
- Busline + stations
- Bicycle network + OV-bike storage points

Figure 182 - *The map shows a overall and strategic plan aimed for social sustainability for Rotterdam South as result of the organisation of the Olympic Games.*

7. - FUTURE SOCIAL LEGACY OF ROTTERDAM SOUTH - THE DESIGN AND PLANNING OF FEYENOORD CITY

This chapter describes the design and redevelopment of Varkenoord North to Feyenoord City and the implications of the strategic proposals for the site. The design interventions in Varkenoord North are individually show according to each strategic proposal. Renders visualize and describe the implications of this design for the inhabitants of Rotterdam South. Also from this plan for Varkenoord North several design principles are discovered.

Olympic stadium

Olympic hall

Olympic village

Post-Olympic construction projects

Transport buildings

Bridge accros multiple infrastructure lines

Stadium square

Entrance square

Existing urban fabric

Figure 183 - *The map shows the overall social aimed strategic plan for Rotterdam South as result of the organisation of the Olympic Games.*

scale 1:7500

0   100   200   500

N

7.2 - THE SOCIAL LEGACY OF THE GAMES AT VARKENOORD NORTH

This section shows the implementation of the seven strategic proposals in the design location for Varkenoord North.

At the moment the image of Varkenoord North is highly dominated by car oriented infrastructure, open grassy fields, the trainline and separate projects (figure). It results in a set of islands without a clear coherence and overall identity. The vignette for Varkenoord-North proposed to transform this part of the Olympic site to the (inter)national representative image of an improved Rotterdam South. Several crucial projects in this location are already discussed within the strategic proposals. Therefore they are not shown again. In addition, the following images show all the proposed transformations to the urban space of Varkenoord-North to guide it towards an attractive business and transport hub, where sport and a city-like image cooperate towards an lasting identity as Feyenoord City.

Figure 184 - *View on parking space near the future Olympic stadium and Stadionweg*

Figure 185 - *View at mosque, Colosseumweg, trainline and Varkenoordse viaduct at the location of the urban bridge,*

2 * NEW PARKING GARAGE
NEW PARK AND RIDE SPOT
NEW TRAM STATION - 3 lines

NEW METROLINE AND STATION
NEW INTERCITY STATION - 4 lines
NEW BIKE STORAGE

AREA IN WHICH VISITING CARS ARE NOT WANTED DURING GAMES

USE OF EXISTING ROADS

NEW PARKING GARAGE
NEW BUS STATION
NEW PARK AND RIDE SPOT
NEW TRAM STATION - 1 line
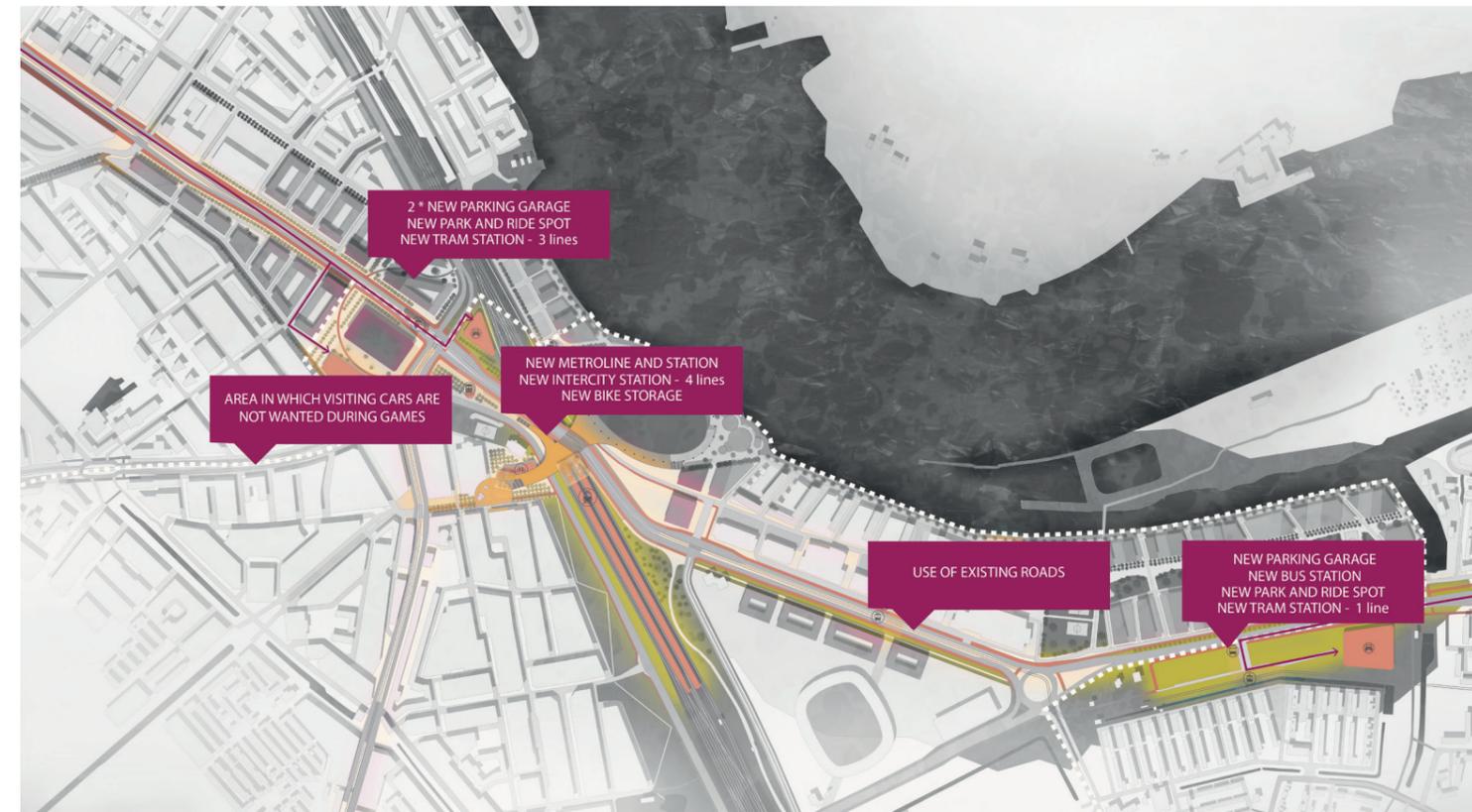
Figure 187 - *Implementation of the strategic proposal "Social legacy is an infrastructural super grid" on the design location of Varkenoord North by setting up multiple nodes with several transport posibilities and capitalizing on existing infrastructure..*

OLYMPIC HALL - converted
SERVICE COMPLEXES - temporary

OLYMPIC STADIUM - permanent
TRAININGSFACILITIES - temporary

OLYMPIC VILLAGE - converted
VILLAGE PARK - permanent

KUIP STADIUM - converted
SPONSOR ZONE - converted
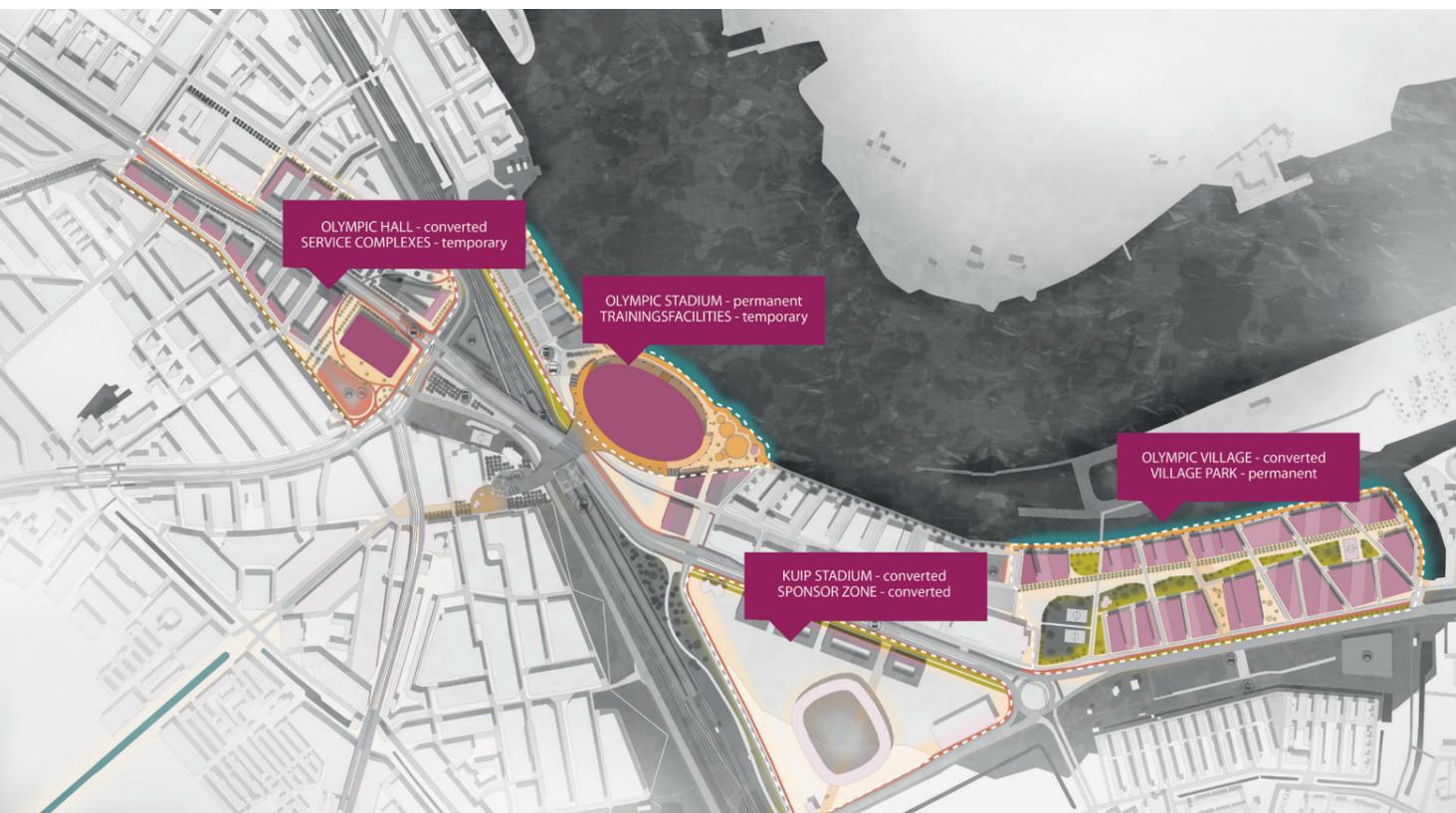
Figure 186 - *Implementation of the strategic proposal "Social legacy is a future for every Olympic venue" on the design location of Varkenoord North through the designation of permanent, converted and temporary Olympic venues.*

175

SMOOTH TRANSITION BETWEEN TUNNEL AND LANGE HILLE DIJK

NEW CROSSING TO OLYMPIC HALL

URBAN BRIDGE BETWEEN STADIUM AND NEIGHBORHOODS
ENTRANCE TO TRAINSTATION AND BRIDGE TO BUS/TRAM/METRO

NEW CROSSING TO OLYMPIC PARK AND SPORT BOULEVARD

TRANSFORMATION OF EXISTING CROSSING

NEW CROSSING BETWEEN OLYMPIC VILLAGE AND SPORTDORP
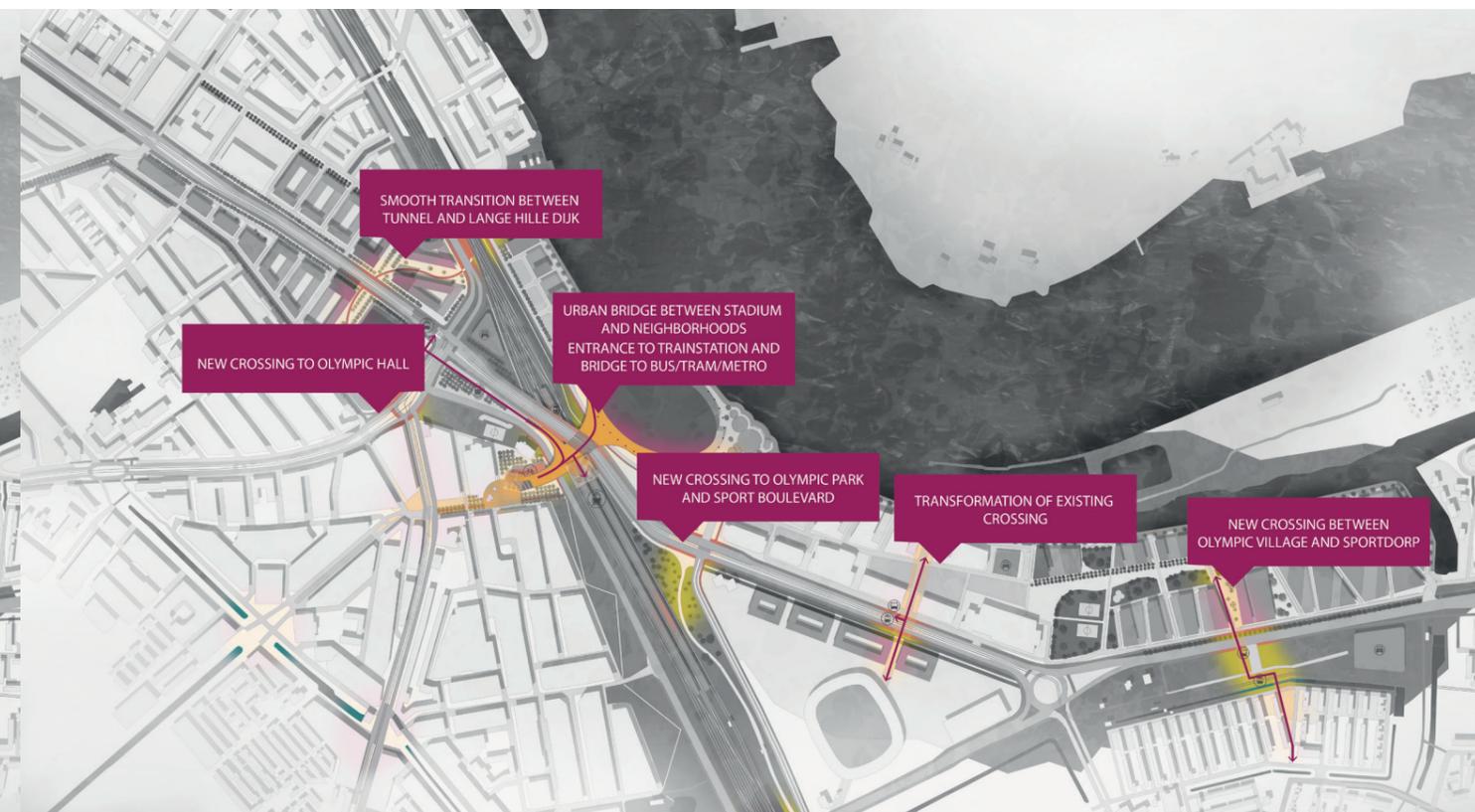
Figure 188 - *Implementation of the strategic proposal "Social legacy is a superb routing without obstacles" on the design location of Varkenoord North through the redesign of several important crossings which secondary connect directly to many transport nodes.*

176
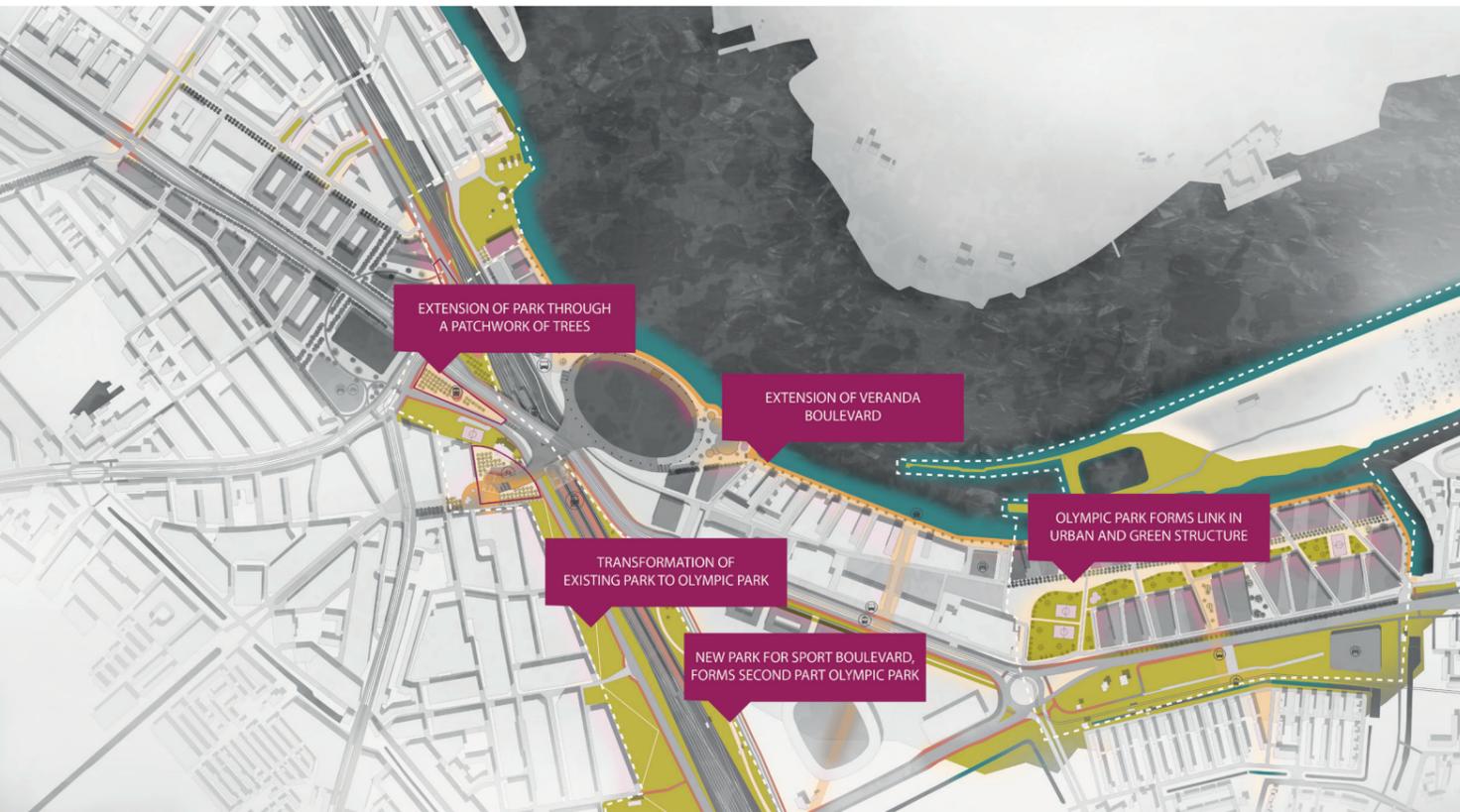
Figure 189 - *Implementation of the strategic proposal "Social legacy is an improvement of the neighbourhood physical landscapes" on the design location of Varkenoord North by creating a green network and several high-quality public parks and leisure spaces.*

Within Figure 189:
- EXTENSION OF PARK THROUGH A PATCHWORK OF TREES
- EXTENSION OF VERANDA BOULEVARD
- OLYMPIC PARK FORMS LINK IN URBAN AND GREEN STRUCTURE
- TRANSFORMATION OF EXISTING PARK TO OLYMPIC PARK
- NEW PARK FOR SPORT BOULEVARD, FORMS SECOND PART OLYMPIC PARK

Figure 191 - *Implementation of the strategic proposal "Social legacy is a transformation for commercial to social" on the design location of Varkenoord North through a new business district and several squares with local oriented shops.*

Within Figure 191:
- MIXED USE BUSINESS DISTRICT AROUND OLYMPIC HALL
- BUSINESS DISTICT AROUND OLYMPIC STADIUM AND INTERCITY STATION
- SQUARE WITH TRAINSTATION SERVICES AND LOCAL ORIENTED SHOPS
- SHOPS IN EXTENSION TO THE VERANDA
- NEW COMMUNITY CENTRE
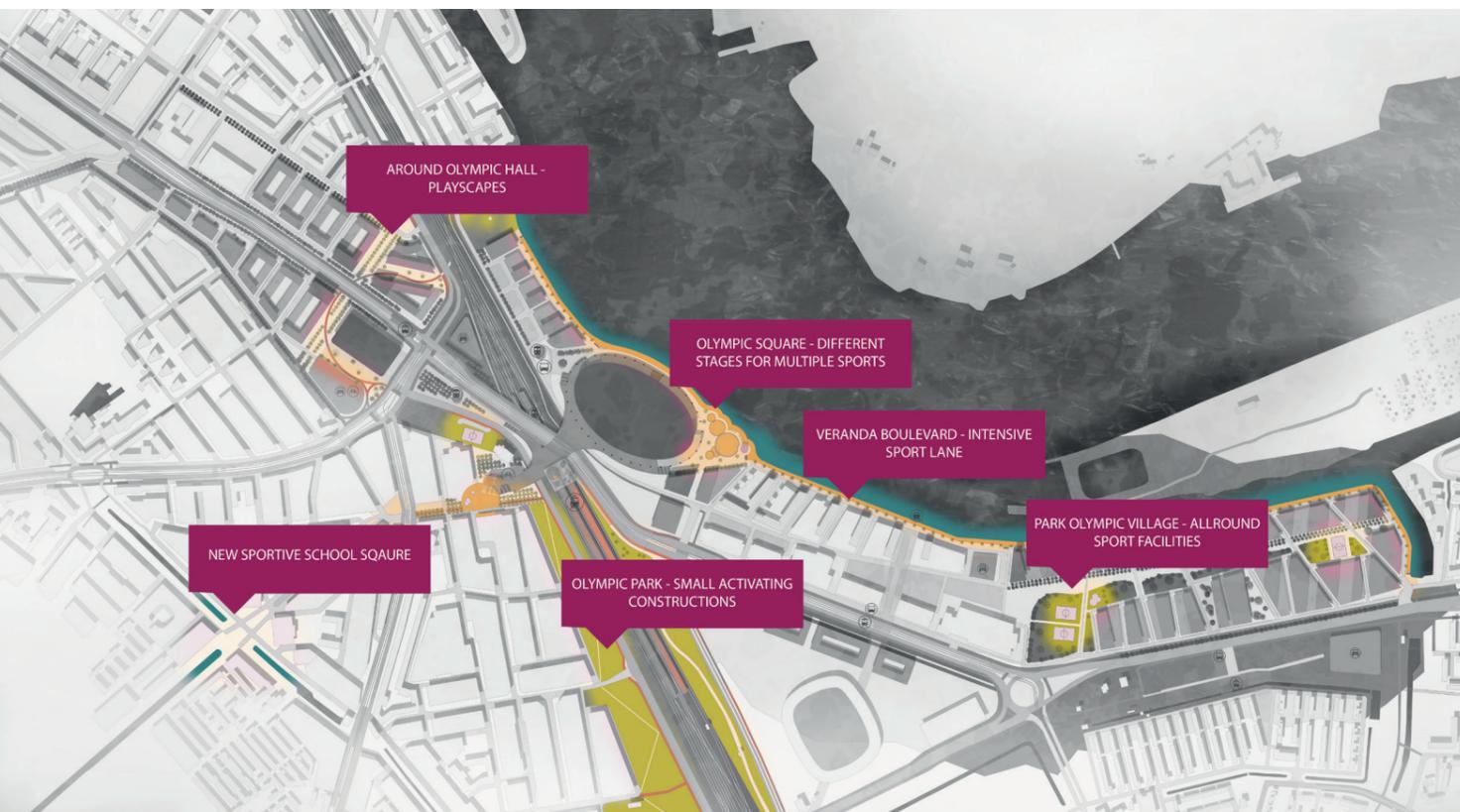
Figure 190 - *Implementation of the strategic proposal "Social legacy are initiatives to start moving in the neighbourhood public space" on the design location of Varkenoord North by designing engaging facilities distributed across the neighbourhoods.*

Within Figure 190:
- AROUND OLYMPIC HALL - PLAYSCAPES
- OLYMPIC SQUARE - DIFFERENT STAGES FOR MULTIPLE SPORTS
- VERANDA BOULEVARD - INTENSIVE SPORT LANE
- PARK OLYMPIC VILLAGE - ALLROUND SPORT FACILITIES
- NEW SPORTIVE SCHOOL SQAURE
- OLYMPIC PARK - SMALL ACTIVATING CONSTRUCTIONS

177
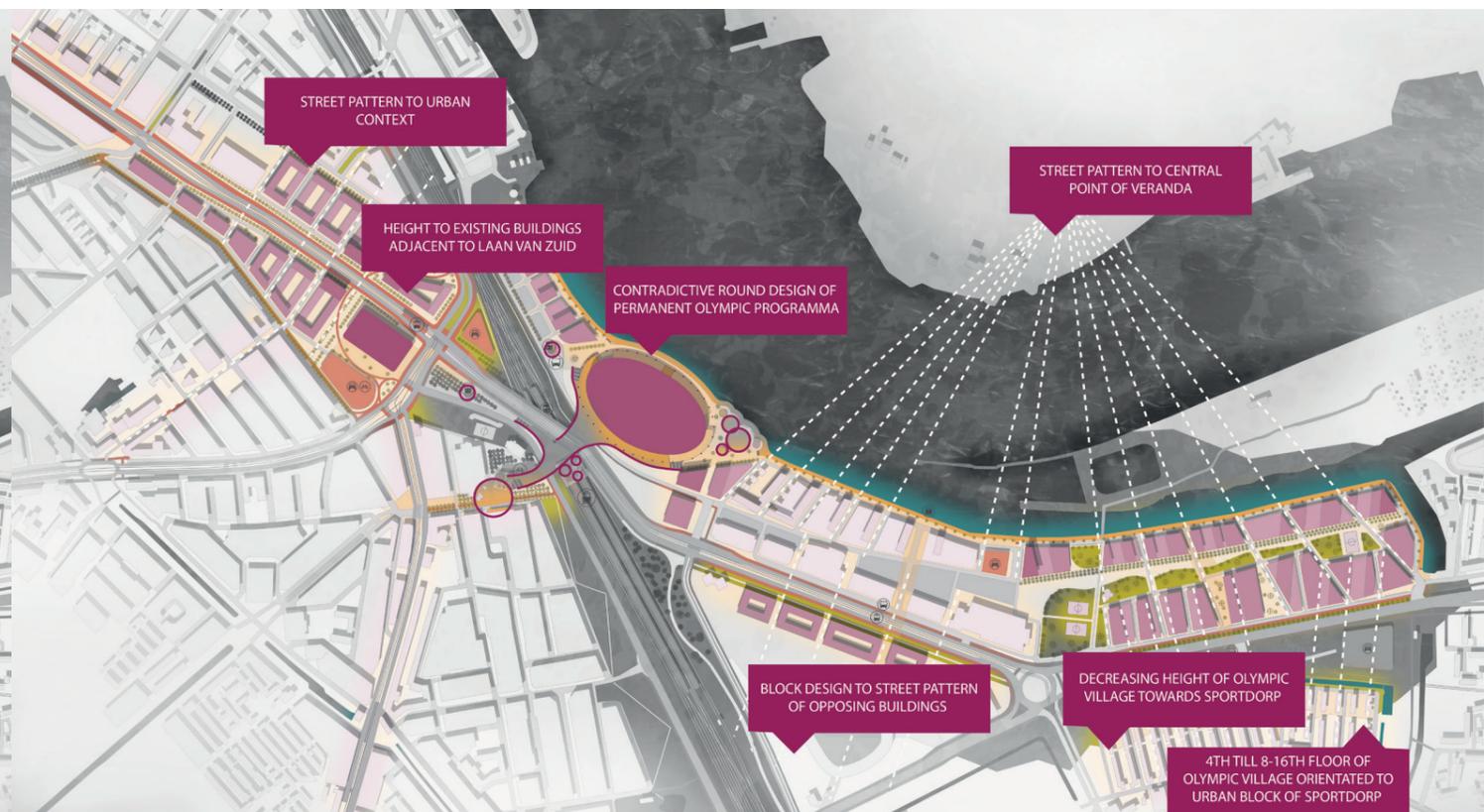
Figure 192 - *Implementation of the strategic proposal "Social legacy a future redevelopment of all Olympic sites" by assigning the spatial structures in which sport and city are enhanced as identity for future Feyenoord City.*

Within Figure 192:
- STREET PATTERN TO URBAN CONTEXT
- HEIGHT TO EXISTING BUILDINGS ADJACENT TO LAAN VAN ZUID
- CONTRADICTIVE ROUND DESIGN OF PERMANENT OLYMPIC PROGRAMMA
- STREET PATTERN TO CENTRAL POINT OF VERANDA
- BLOCK DESIGN TO STREET PATTERN OF OPPOSING BUILDINGS
- DECREASING HEIGHT OF OLYMPIC VILLAGE TOWARDS SPORTDORP
- 4TH TILL 8-16TH FLOOR OF OLYMPIC VILLAGE ORIENTATED TO URBAN BLOCK OF SPORTDORP

178

7.3 - VARKENOORD-NORTH DURING THE OLYMPIC GAMES; THE EPICENTRE

During the Olympic Games, Varkenoord-North will be the epicentre of the Games. It is here that the Games start, the Olympic fire will enlighten the path of every participating athlete and watch over every visitor to the Games. It is the place where the Football players will compete for gold in the Olympic stadium, and where every Volleyball loving entity can watch fourteen days of top sport in the Olympic hall. It is the place where all athletes and coaches sleep, eat and train to give maximum effort when its needed most. It is also the place where hundreds of thousands of visitors will gather during this two week celebration, accessing by train, metro, bus or bike. Stroll along the boulevard, sit at the Olympic square or enjoy the vibrant life in the attractive streets of Rotterdam South.

It is the place which visitors will take with them into their heart, as they travel home. Because Varkenoord North, or better, Feyenoord city, is the place where the Olympic Games end. When the closing ceremony end the Olympics and the Olympic fire is dimmed, Rotterdam South enters a new period.

Because, when the new day starts, and light shines on the Olympic venues, a new platform for regeneration of Rotterdam South is set up. The Olympic stadium is directly used by Feyenoord as their new stadium. Train station Zuid provides great access to many other cities. The Olympic park forms a beautiful leisure area where first dominated by large roads and train lines. The veranda offers the enjoyment of the waterfront Rotterdam deserves.

There are still large open spaces, places where temporary tents provided shelter to many logistic facilities during the Games. But a strong fundament for redevelopment is already created. The streets already form the grid for future development, the train station and metro line the connection to Rotterdam and the Netherland, the Olympic stadium the prestige, and Rotterdam South as an attractive hinterland to settle and invest.

Eventually this image could be the future of Varkenoord North, several years after the Olympic Games. A new identity, with an attractive living, working and sporting environment, especially for the inhabitants of Rotterdam South.

THE URBAN BRIDGE AFTER THE OLYMPICS
a gateway to your football club,
your neighbourhood, your job
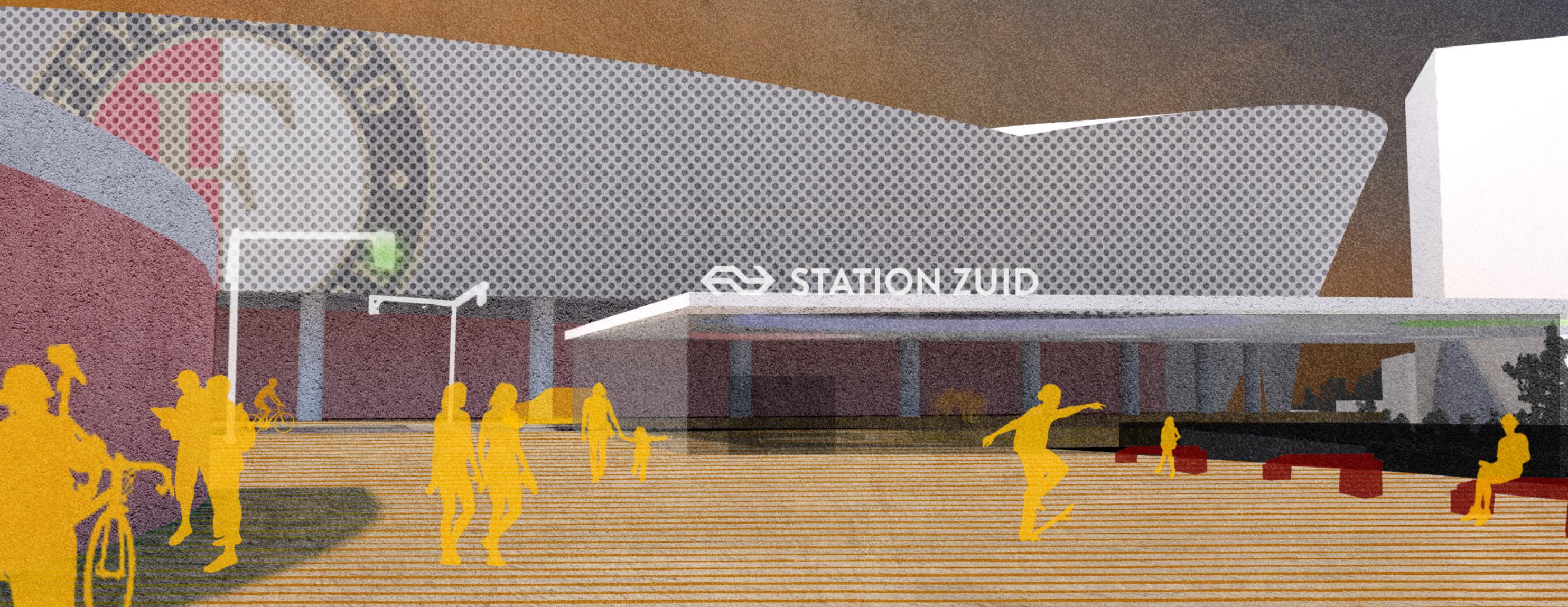
STATION ZUID
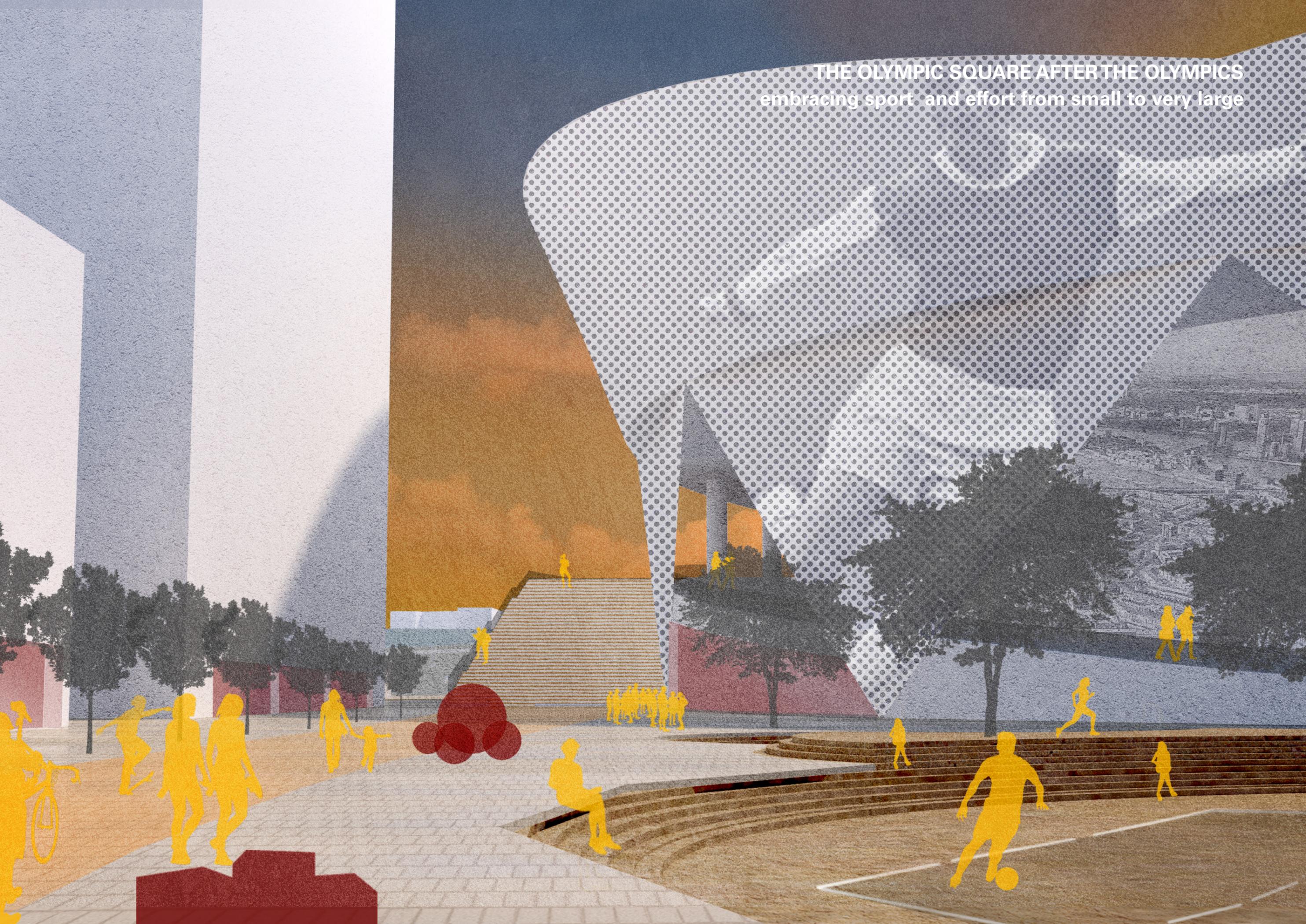
8. - EVALUATION OF THE GRADUATION PROJECT

In this last chapter, conclusions are made to the graduation project by answering the main question, following the answering of the sub-questions. Next, a reflection looks back at design decisions within the thesis from multiple perspectives and provides recommendations for future research. Last it reflects on the personal process within this graduation projects as well as the position of this graduation project within the values and methods of the graduation lab and TU Delft.

8.1 - CONCLUSION TO 'THE GAMES IN ROTTERDAM SOUTH'

The image of Olympic Games is mixed. The Games are a celebration, but its organisation and legacy are also seen as a threat to the sustainability of the city. Literature research distinguished three main actors, each with different aims for the organisation of the Olympic Games; The International Olympic committee, the host-city and the citizens of the host-city. Especially the wishes of the citizens is neglected as research showed that they are not empowered to take decisions, but always encounter the negative consequences of these decisions. By researching the potentials for the Olympic legacy to enhance the social sustainability of the host city, an answer to the incorporation of the citizen in the organisation of the Olympic Games is found. In this way the Olympic Games can be of additional value to the city and its inhabitants, targeting the current mixed image. It can also stimulate the embracement of the Olympic Games as tool for urban regeneration, as research showed that the interest for organising the Olympic Games is declining.

This thesis aims to find design principles that can enhance the social sustainability in the Olympic legacy. For this graduation research the main question is "How can design principles aiming for urban regeneration within Olympic legacy planning enhance the social sustainability of the city?" Several sub-questions have to be answered in order to answer the main question. In this section these sub-questions are answered and discussed first, after which the main question is answered. The product of this graduation research is a set of these design principles, which derived from a case study to the 2012 Olympic Games in London and choices that are made in a strategy for the Olympic Games in Rotterdam South and a design for an Olympic venue.

How can Olympic (mega-event) planning and design enhance urban regeneration?
By literature research components of mega-event planning and design are researched that relate to urban regeneration. From the Eight components can be distinguished, of which three are are in the ability of an urban designer to be addressed directly.

• A strategic location for the Olympic Games, where the investment in the event can create maximum spin-off for urban regeneration projects.

• The required construction works for both the Olympic Games and the envisioned urban regeneration projects. The large construction projects for the Games should go one-on-one with the required regeneration projects.

• The impact of the event on the regeneration projects. The construction projects and design choices towards the Olympic Games (construction phase) have a lasting impact for the city after the event (legacy phase). Therefore it is important to think in two time settings.

Six kind of urban legacies are created within these components, tangible and non-tangible, positive or negative.
1. Sport legacy
2. Economic legacy
3. Infrastructure legacy
4. Information and educational legacy
5. Public life, pollical an cultural legacy
6. Symbolic, memorial and history legacy.

The outcome of the legacies can be completely different and is based on the location of the event, the context of the site and the constructed projects.

How does urban regeneration enhance social sustainability?
Through literature research the concepts of social sustainability and its relation to urban sustainability are explored and discussed. Social sustainability is one of the three aspects of sustainability, together with economic and environmental sustainability. If the project enhances all three aspects it becomes sustainable.

Ten aspects of social sustainability are affected by urban regeneration, of which five can address economic and environmental sustainability as well.
1. Education and skills
2. Employment
3. Health and safety
4. Housing and environmental health
5. Identity

Because focussing on one aspect hasn't have the ability to raise the social situation in the neighbourhood, it is important to pursue the enhancement of multiple aspects. The concepts also correspond with earlier regarded kind of Olympic legacies.

There are multiple ways to address social sustainability spatially. 16 spatial criteria are examined which act on different scales and address each aspect differently.
Meaningful spaces - Making spaces not larger than required by the community

1) Early provision of basic community services – Make sure enough community services are provided
2) Public spaces and congregational spaces – Create spaces where inhabitants can meet and interact
3) Connections to neighbouring communities - Make sure other neighbourhoods are easily accessible
4) Flexible or adaptable housing and buildings – Incorporate the ability to change the room or building easily to new wishes
5) Low carbon infrastructure – Make the transition to public infrastructure and slow traffic
6) People friendly layouts – Ensure the creation of safe and pleasant public space
7) Car free areas and speed reductions – Facilitate areas where car are prohibited or not dominant
8) Transport and communication connections – Ensure the ability to communicate and travel to other cities
9) Third spaces – Provide services to bigger companies in order to attract them
10) Flexible workspaces – Create places where working abroad is facilitated
11) Early provision of schools, nursery and childcare – Make sure enough education and healthcare is provided
12) Meaningful buildings – Make buildings not larger than required by the community
13) Hyper local information – Create awareness of the space
14) Distinctive landscaping and architecture – Create identifiable buildings and spaces
15) Historical development – Build in respect to the history of the site
The criteria are used to assess the design of the Olympic park the case study to the London 2012 Olympic Games.

How can social sustainability be enhanced in Olympic planning and design?
This question is answered from two perspectives; By doing a case study of the Queen Elizabeth Olympic Park of 2012 Olympic Games in London. The second perspective on answering this question comes from a design project to a strategy for the Olympic Games and the design of an Olympic venue in Rotterdam South. The strategy consists of seven proposals, in which each proposal targets a different aspect of the Olympic legacy. Together they enforce the creation of a social sustainable legacy. The design porject explores these 7 proposals to increasing detail in a spatial design for Varkenoord North towards a future identity as Feyenoord city.

According to the case study, strategy and design the social sustainability in the Olympic legacy can be enhanced in multiple ways

1. To decide upon a strategic location in which the Olympic Games can catalyse the redevelopment of nearby deprived areas. In contrary to the location of the Queen Elizabeth Olympic Park, the option for two main locations and a routing through the in-between deprived neighbourhoods holds more potential its regeneration.
2. Within the construction projects of the Olympic Games it is very important to think two designs: what's best for the Olympic Games and what's best for the neighbourhood.
3. It is important not to limit the scope of the projects to the Olympic park and transport requirements, but also to look what these projects can do for the neighbourhood and if they can be extended into these neighbourhoods.
4. And to look where synergy can be created between the Olympic programme and smaller or larger local employees, especially towards jobs for lower educated.
5. To design for a post-Olympic situation, which means a decent vision and plan for the legacy of the main Olympic locations are required.

The specific aspects of social sustainability are each addressed in the strategy and design.

• Housing and environment is enhanced by reconstructing the Olympic village to apartments, adjusting the street profile to accommodate more green, enhancing the physical landscapes of the neighbourhoods and upgrade of many public spaces.

• Safety & Health is enhanced by the redesign of many crossings, activating accomodations in public spaces, making Olympic venues publicly usable as well as providing many more less polluting transport options to use. Air pollution is reduced by increased amount of trees and plants.

• Education is enhanced by the reconstruction of many school squares to accommodate sport utilities , but even more by the creation of the sport boulevard which lead setting up new education directions and the expansion of existing school programs.

• Employment is enhanced by the creation an employment axis, capitalizing on new train stations. the sport boulevard promotes the creation of many different types of jobs which further enhance existing healthcare research and educational programs. Local shops highly benefit from the walking route through the neighbourhoods.

• Identity is enhanced by the post-Olympic development vignettes, which propose an future identity for segments of the Olympic locations, capitalizing on social structures, such as hospitals, schools, parks, community gardens on local scale.

How can design principles aiming for urban regeneration within Olympic legacy planning enhance the social sustainability of the city.

The design principles are gathered from the case study to the 2012 Olympic in London, from the strategy for Rotterdam South and the design for Varkenoord-North, and collected in a separate book. These principles show the overarching process behind the design interventions that are made. The design principles describe the required transformation in the design of the Olympic programme to enhance the social sustainability aspects of housing and environment, safety & health, education, employment or identity.

They are assessed by the spatial criteria for social sustainability which are set up in the theoretical framework.

First the principle describes an encountered spatial issue within the organisation of the Olympic Games, such as an abundance of parking space, or the lack on integration in the urban tissue, which create threats to the social sustainability on the local scale. In extend of this problem, it describes a configuration to transform the Olympic programme to answer to reduce or solve this problem. The next stage describes the result of the proposed configuration and their ability to enhance the social sustainability.

The conclusion to these 16 design principles is that these principles often combine the Olympic programme with the requirements to transport and environment to directly answer to the context of the Olympic site. It also means that the design interventions resulting from the principles are multiple and not fixated, therefore they enhance the social sustainability differently in each edition of the Olympic Games.

Figure 197 - *Image of the design principle "Bridge as connection stadium and city".*

This section reflects on the graduation project by looking at possibilities for further research, as well as limitations to the current implementation of the project.

8.2.1 - Real inclusiveness of the citizen in the decision making around the Olympic Games.

For this graduation project it is chosen to look from a top down approach to the organisation and implementation of the Olympic Games, using the existing structure of NOC, OCOG and host-city. According to several sources (Lei & Spaans, 2009) (Muller, 2015), the inhabitants around the Olympic sites are often consulted. Through committees they can influence the decision making process. However, often these initiatives are the first to be abolished, due to budget or effort (Muller, 2015)

Within the project it is mentioned that there are ten aspects within social sustainability that are affected by urban regeneration. This graduation project researched to possibility of Olympic legacy to enhance five of these aspects. The other five aspects are 1) social mixing and cohesion, 2) social capital, 3) demographic change, 4) participation, empowerment and access, 5) wellbeing, happiness, and quality of life. From this point, in order to enhance social sustainability especially real empowerment and participation of the citizen in the decision making process is interesting.
So, in order to really enhance the citizen in the organisation, and to ensure social sustainability in the legacy of the Olympic Games, citizen need to have a voice. This means a direct 'inhabitant representative' in the executive board of the Olympic Games or the creation of a separate Olympic committee primarily concerned to defend the interests of the citizens. This direct involvement of the citizen in the decision making process could be a real contribution to the organisation of the Olympic Games, encouraging also a bottom-up view to the Olympics and is a real recommendation to further research.

8.2.2 - Transferability of the project and design principles

Within this graduation project it is chosen to design an Olympic venue in the Netherlands. This decision was made due to proximity of the design location, making it easily reachable, as well as the Netherlands initially had the ambition to organize the Olympic Games in 2028, which makes sure there is a lot of research to build upon. The graduation project, the strategy for Rotterdam South, the design of the Olympic venue and the design principles, are all based upon current thoughts and planning and design traditions known within the Netherlands.

The Olympic Games is held every four years in a different city, all around the world. Every nation has a different culture towards planning, design and above all the position of its citizens. Inhabitants of slums in Brazil were not regarded to be in the same position as we look towards inhabitants of problematic neighbourhoods for example. Large scale displacement is not ok to Dutch measures. This will have different consequences for the implementation of the Olympic Games. it is earlier mentioned that mega-events in countries with oppressive regimes are more likely to become over-prestigious projects.

Still, in essence all humans strive for the same values. The strategic proposals for Rotterdam South and the design principles are targeted towards the benefit of the citizens. Therefore, if implemented, they should be of same beneficial effect to citizens in the Netherlands as in any other country. Reducing pollution though planting additional trees at footpaths is equally beneficial to all humans for example. Furthermore, the design principles tend to describe an generic issue in the design of the Olympic Games plus its legacy and propose a social sustainable solution to it. As requirements from the IOC to the Olympic Games are the same to each country, the proposed design principles should be applicable to every edition. Still, it could be very interesting to further explore these cultural differences and its implications for the potential and especially the implementation of the strategic proposals or gathered design principles.

8.2.3 - Need to enhance multiple social sustainability aspects

This graduation project looked at design possibilities to enhance multiple aspects of social sustainability. The need to look at multiple aspects, instead of focusing on one, derived from literature, where it is stated that social sustainability can only be enhanced if multiple aspects were addressed. However, this multiplicity of design directions led to less focus and in depth exploration in the graduation project. Enhancing multiple aspects limited the practicality of design research and made it even more challenging to enhance all subjects within a design for the Olympic Games in Rotterdam South.

A recommendation for further research would be to focus on just one subject. For example, Olympic legacy and its possibility to enhance education is already enough to create a big research or design project. Focusing on one subject should lead to more in-depth and constructive research will arguably lead to a more practical contribution to social sustainability in Olympic legacy.

8.2.4 - The need of event led regeneration

The Olympic Games require a major investment of billion from the national government and the host-city. Partly this investment is supported by sponsors, gifts and subsidies of the IOC, but public money is still required. For the regeneration of Rotterdam South, the organisation of the Olympic Games is required as it forms the possibility for immediate major reconstruction of the city district, but even more, it opens billions of valuable funds, which previous projects and initiatives failed to gain. For the 2012 Olympics, the former mayor of London, characterized the bid as "the only way to get billions of pounds out of the government to develop the East End" (Guardian, 2015). It shows the importance of mega-events for reaching desired

Still, the spatial programme of the Olympic Games was way too big for the city district of Rotterdam South. Therefore, the spatial impact of the Olympics, not only for Rotterdam-South, but for many cities all around the world, is way too large. This could be levered by extending the duration of the event, which reduces the amount of required halls, or reducing the

amount of sports. Since this isn't going to happen soon. Ways to combine sports, decrease the spatial impact of the Games or re-using existing structures to severe measures, can all be possibilities for further research and design.

Also, the decision to of creating two Olympic districts, with a deprived neighbourhood in-between that profits from the created visitors flow, is already an improved of former Olympic implementations. Still the graduation project doesn't feel to be maximizing the potential of organizing the Olympics and using its legacy to regenerate deprived neighbourhoods. Further research to models for maximization of this regeneration potential are largely needed as they form on of the first steps in implementing the Olympics. To maximize at the beginning is a start at maximizing in the final result. Also, it might be very interesting to look at possibilities for multiple smaller events to reach the same result, as a set of events that are targeted towards one sport, gives the possibility to bid for sports that are already represented within the city.

8.3.1 - Reflection on the process

The overall graduation process was "messy". This is an understatement. In fact, the first half a year more time was spend thinking how to do my research (considering on what terms I would do my research, what was my input and what was the output of that research, when I would do my research in the time still left), instead of actually doing research. In this procrastination lies the key to what was going really going on; Trying to find the basis on which to start. But a start in a research project isn't something you just come up with and can grasp without knowing which direction you will look to. The Olympic Games are such a big event, such a broad concept, which such an impact on many fields, even within the field of Urbanism. By continuously reading and finding all exact problems within the organisation and legacy of the Olympics that are related to social sustainability is not possible, especially if social sustainability is still a much debated and fussy concept and there is no clearance what aspects that contribute to social sustainably you would choose. At some point you have to make choices and be consequent to it.

Considering what is most important within my design occurred to be a major inner struggle, as I tend to regard all information and facts as equal. Each story seemed to be relevant and of concern to my graduation project. In this way, focus and being straight to the point is limited. Both Rients and Remon went to great lengths to show me how to focus on the design project, what were the major design interventions, how will they contribute to the social legacy of the Olympic Games and how can you get an overview. This proofs still to be of concern, as I'm still not convinced to which extent all my interventions are of concern and are the major exemplifying project that lead to a social legacy, because they seem to me all of major concern and are all required to reach any level of social sustainability in the legacy of the Olympic Games. At the same time I tried to keep in mind how to present all these 'what could be a intervention', how to keep it in line with what I did before, that it made me reluctant to any decisions and bold statements. In short; It was a lot of how, how, how, without and central why, leading to a lot fussiness and work which could not be used.

Lack of boldness and overall procrastination, not having the discipline to put yourself to the uncomfortable, reluctant to make statements and dive into the deep. These are not qualities of an urban designer, but needs

to be overcome in order to find a way through such complex projects. Mentor Remon mentioned that designing is a unique ability we learn at the faculty of Architecture, by engaging problems to solve them into unexplored territories and solutions. It is an ability to be enhanced, embraced and be proud of.

Therefore, looking back to graduation project, this is definitely not what I consider the best design project, not even one I'm particularly proud of, but this project might be the project that taught me most about myself. I gained many lessons and knowledge about the Olympic games and a design project, but it showed me the most about how I approached design projects; With a reluctance to step into the unknown and actually learn. As a result I gathered information and didn't conclude, I drew beautiful maps without knowing what to draw exactly and made a project without the straightforward, rich body a good project in Urbanism has. It gave me more than a year of agony, stress and neglect to the important. In the end, I realize that this graduation project is too big and isn't something you can go back in time and repair, but you can make the best out of it, and this is what I did.

8.3.2 - The relationship between research and design

Throughout the graduation project there was a continuous quest for 'prove'. Therefore all conducted research targeted on proofing and legitimizing the design, gathering information upon information. The graduation project was initially aimed to be explorative, research by design, but became a very dogmatic exercise, based on program, size and without a lot of reasoning. An increasing detail in analysis of planning and design of the Olympic program is witness of this rigor. The design by research part is much bigger than it originally intended to be, the research by design much smaller.

A design intervention is grounded in the legitimacy of the proposal. A design intervention is grounded in applicability to the posed problem, the applicability on that location and the applicability to the proposed result. My personal belief is that within a design project there should always be a narrative of why, what and how.

The bridge between research and design was the creation of the design principles. The principles are based on an encountered spatial issue in the Olympic program (why), the proposal for adaption of program (what), and the resulting enhancement of social sustainability by that adaption (how). The creation of a separate book with design principles gave me the possibility design more freely. It released the burden of questioning what the design principle will add to the social sustainability within the Olympic program in general and gave room the question what design principle could do for social sustainability of the design location. At the same time the design location of Rotterdam South enriched the proposals, as location specific solutions were required, such as a tunnel near Zuidplein. It shows a location specific variation on how to overcome local barriers, which is very practical for the Olympics, but even more necessary to upgrade the urban environment of Zuidplein and in turn Rotterdam South.

8.3.3 - the relationship between the theme of the graduation lab and the subject

The graduation project is conducted within the graduation lab "Urban transformations and sustainability" in specific the research group of "Design of the Urban Fabric". The graduation lab capitalize on the Dutch approach to Urbanism, focusing on relationships between tangible projects and intangible processes. In current practice all urban proposals should be sustainable. Design of the Urban Fabric focus on the prominent position design research can take in sustainable urbanism (Urban Fabrics, 2017).

The topic of the Olympic Games is very related to the theme, as the Games form a possibility for urban transformation that is almost unmatched. The games are not only a urban transformation project in itself, but even harnessed to catalyse even bigger development plans and new urban transformations. A Olympic venue can be considered to have two separate lives: The life for the Olympic and the life for after the Olympics. Therefore mega-event planning feels as a very specific and special component of urban transformation, as it deals with two different designs, which is expressed in a set of strategic proposals for the Olympic Games in Rotterdam South and an design for the development of Varkenoord North. The focus on inclusiveness of the citizen and social sustainability contributes to sustainability in the spatial design of the mega-events; up till now a troublesome relationship, and therefore this project is very relevant.

8.3.4 - the relationship between the methodical line of the graduation lab and the student

Within design of the Urban Fabric, the creation of design patterns as basis for urban design is promoted. The proposed design principles are used as starting points for design on the specific assigned zones of Varkenoord and Zuiderpark. The proposed principles are based on practical spatial issues the design of the Olympic program, such as the abundance of required parking space. This use of design principles can be considered as variant to the methodological approach of creating design patterns. Still the design principles give answer to many spatial issues and are not composed answering a single design problem. Therefore it is unclear whether the principles can be called a design pattern at all, but more a collection of proposals for design interventions.

The creation of the excel model in order to process data for implementation of the Olympic program in Rotterdam South is not aligned to any design feature at all. Therefore the methodological line of the graduation lab is not very well represented in this graduation project and in the final result of the graduation project.

8.3.5 - The relationship between the project and the wider social context

The research to social sustainability in Olympic legacy and the incorporation of the citizen as main actor to design for was a result of negative media attention to the 2016 Olympic Games in Rio de Janeiro. The Olympic Games are always a hot topic in the media due to its impressive character and Rio de Janeiro proved again that hosting the Olympic Games can also be a threat to the sustainability of the city. For 2024 and 2028 there were only two candidate cities. The will to organize the Games is declining. Over the next years the NOC-NSF and other businesses are researching the possibility of hosting the Olympic Games in the Netherlands in 2032. The quote from former NOC*NSF representative Camiel Eurlings 'the Games should adapt to the city, not the city to the Games' is example for the identity switch the event has to make (NOS, 2017).

In society there is an increasing focus on inclusiveness and sustainability in the field of Urbanism and urban design. Social sustainability is the least researched aspect of sustainability. Event planning and design are well researched topics, though the legacy of an event is already less well defined. Social sustainability in the legacy of event planning is even less defined as it manifest in often hard to measure outcomes (Lei & Spaans, 2009). Except for providing the IOC spatial design principles for future Olympic Games, this graduation project aimed to define a framework for better understanding of social sustainability in event planning and the concept of social sustainability.

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USED SYMBOLS

- ARCHERY
- SHOOTING
- TRAMPOLINE
- GYMNASTICS RYTHMIC
- GYMNASTICS ARTISTIC
- WIEGHTLIFTING
- BOXING
- WRESTLING
- FENCING
- TAEKWONDO
- JUDO
- ATHLETICS
- TRIATHLON
- MODERN PENTATHLON
- EQUESTRIAN

- VOLLEYBALL
- BEACH VOLLEYBAL
- HANDBALL
- FOOTBALL
- BASKETBALL
- TENNIS
- BADMINTON
- TABLE TENNIS
- FIELD HOCKEY
- CYCLING MOUNTAIN BIKE
- CYCLING ROAD
- CYCLING BMX
- CYCLING TRACK
- OLYMPIC VILLAGE
- OPENING / CLOSING CEREMONY

- SWIMMING
- SYNCHRONIZED SWIMMING
- WATER POLO
- DIVING
- SAILING
- CANOE SLALOM
- CANOE SPRINT
- ROWING
- RUGBY
- GOLF
- SOFTBALL (NEW)
- SKATING (NEW)
- KARATE (NEW)
- CLIMBING (NEW)
- SURFING (NEW)

USED TERMINOLOGY

Organisations

IOC – International Olympic Committee

OCOG – Organising committees for the Olympic Games

NOC – National Olympic Committee

NOC*NSF – Nederlands Olympisch Comité en Nederlandse Sport Federatie

LOGOC - London Olympic Games Organising Committee

ODA - Olympic Delivery Authority

LLDC - London Legacy Development Corporation

Planning projects

NPRZ – Nationaal programma Rotterdam Zuid

Other terminology

i.a. – Inter alia – among other things

ACKNOWLEDGEMENTS

1. Can you describe the setup of the Stour Space? What is the thought behind this building and what kind of companies are gathered in here?

Hackney Wick was an former industrial site in the east of London. For over more than 20 years, an active artist community developed in the abandoned post-industrial structures. Many famous artists gathered here as it afforded cheap and large spaces to live in, still in proximity of the centre of London.

The Stour Space is an initiative, started in 2008, to provide a collective space for the artist community, where inhabitants of Hackney Wick and Fish Island can gather, show their work and discuss about their cultural values. One of the aim's is to let the local artist and deprived members of the community to be able "to access training and employment opportunities by the provision of workspace and buildings for use on favourable terms" (Stour Space, 2016). Next to that the Stour Space offers two free exhibition spaces where upcoming local artists can exhibit their work.

The Stour Space is one of the first accountable community centres of England, registered and not reliant on governmental funding. To be able to pay the rent, besides offering contracts for renting out

This paragraph contains an interview with Juliet Can, director of the Stour Space, 7 Roach Rd, Tower Hamlets, London at 1st of December, on the topic of the social sustainability influenced by the legacy of the London 2012 Olympic Games. This interview is held at the Stour Space itself, lasting approximately from 14:30 – 15:45. This interview is NOT RECORDED (on wish of the interviewed), therefore the answer are not the original.

Figure 198 - *The Stour Space seen from the inside of the building and from the new footpath bridge nearby.*
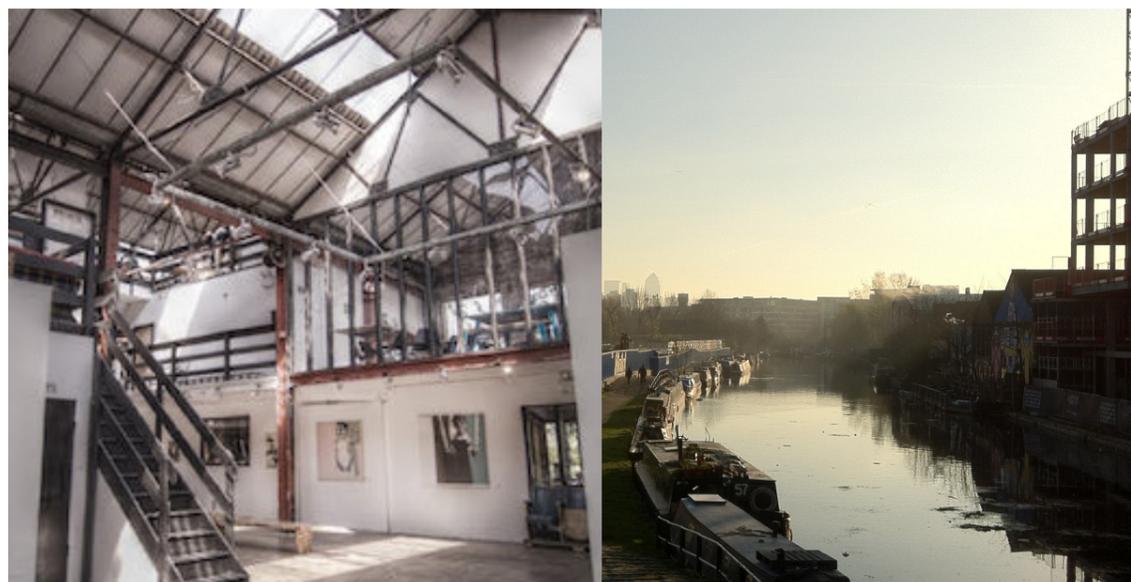
workspaces, it also hosts an café and a shop for artist provisions. Instead of making a financial profit, it pours back the revenue into improving its services and maintenance of the venue. Yet through collaborative use and broad accessibility Stour Space is supported and enhanced by a multitude of individuals, businesses and initiatives, ensuring ongoing sustainability and a positive momentum. (Stour Space, 2016)

2. When did you become involved in the company/when was the Stour Space established?

I became involved with the company from its establishment in 2008. Actually, I literally bumped into Rebecca/Rachel, co-founder of the Stour Space, right in front of this building. First I lived in Stratford, but a couple of years ago I moved to Fish Island, in one of the new apartments that were built over here. Now I'm living 100 meter from my workplace.

Educated to be a consultant, I became voluntarily a consultant to the venue, now responsible for building cross sector relationships with local government, communities and citizens, ensuring partnerships, manage staff and supports with governance for organisational and strategic development (Stour Space, 2016).

3. Do people, working in this building, also live in Fish Island?

That's hard to tell precisely, but approximately 75% of the employees at the Stour Space also live in Fish Island and Hackney Wick. Many of them are artist, which, besides following their passion of artistic expression, work at the Stour Space for an additional income. Next to this, they utilize the space for their own work as well.

One of the companies gathered in this venue, the café, started by our own hands. Later on it was owned and ran by another company, but due to mismanagement, we decided to buy the café back and become owners ourselves again. In this way it provided us an additional income to continue the work and our ideal to provide for the community. Also it shows that model of the Stour Space isn't fixed and has shifted during time in order to continue its existence. So eventually, it is not sure that the future employees of the Stour Space, still will be of the same background as they are now, nor living on Fish Island or Hackney Wick.

4. Is the Stour Space in any way directly affected by the Olympic Games of 2012 (increased amount of visitors, image, more famous, etc.?)

Absolutely. In so many ways, but I think it's better to give you some of the best examples. Back in 2008, when we started, the area wasn't known at all. The only way to get from here to the outside was by one bridge over the slues, from Pudding Mill Lane, from Hackney Wick station or from Stratford. Before the Olympics, Fish Island was literarily an island.
At the same time the plans for the organisation weren't well communicated. We had heard that London had won the bid to organize the Olympics of 2012, and that it was going to be held in East London. But when we started the Stour Space in 2008, we didn't know that the Olympic Park would be next door and the Olympic stadium practically on our doorstep. The communication between the government and organizing committees was, in the beginning, not that extensive.

When we found about the precise plans of the Olympics and that we were in proximity of the Olympic site, we also heard that we had to change the entire building to meet the required rules, as part of a venue that can expect visitors from the Olympic Games. In preparation to the Games, several bridges to Hackney Wick and Fish Island were build and it was promoted an interesting place to visit during the Games.

When it was confirmed that the Olympic Games were held nearby, there was already a weird kind of rent increase. Not much, the prices doubled from 500 to 1000 pounds per month for a whole building, but it was enough to force people out. Half of the artists left the area, leaving behind empty buildings. This stayed for a while, but as the Olympics came to starting, a lot of investment started to take place and people started to visit the area more often. Restaurants, bars, hotspots, even a remake of the Venice beaches; Norman Riviera, was build. But due to some changes in plans, the preparations weren't finished during the Olympics and the area wasn't accessible at all. All the investment, for some up to millions of pounds.., was lost. Forman's Riviera had to close already after 3 days. Also for a short period after the Olympics, the area remained taken from their visitors and times were harsh. Due to the fact we were already an established business, and embedded within the lives of the community, we still

could provide ourselves of some income and we could survive this temporary lack of visitors.

So in a way, the Olympics weren't a blessing immediately. But in a while, after the Olympics, due to better accessibility and improved image of the neighbourhood, the people started to know Hackney Wick and Fish Island. Right now, there are more visitors, but also more residents and consequently more companies are settling to start their business. After a difficult period, the future for the Stour Space looks prosperous.

5.   Is the Stour Space in any way indirectly affected by the Olympic Games, though legacy development?

Absolutely. One of the most important effects of the Olympics was, as I mentioned, the improved accessibility of the area. It meant the Island was opened to the world. With that, the market also got to know Hackney Wick and Fish Island and investment started to flow, subsequently more residents in the area and new developments, which isn't necessarily a bad thing. But it also increased the renting prices dramatically. People first choose the area for its affordable space.. this isn't the case anymore. Since there is no rent regulation or law to protect the residents from rent increase, and the fact there are a lot of people who are willing to pay more for their apartment, the renting princes increased with 200-300% from the Olympics on.

The ironic thing in this process is that the developers in this market related development are using the artist community as a selling point. With the promise of a vibrant, original and cultural, mixed neighbourhood they promote the place an attractive spot to life or invest in, neglecting the fact that their rent increases are forcing the artistic community to move out, selling their property with the promise of an neighbourhood and living quality that doesn't exist anymore. Approximately 50% of the artists that were left, moved away to Berlin or to Sweden, to new hotspots of cultural expression. This tendency goes on and on…

For the Stour space, the increase in rent meant that we had to change our business model several times. The rent of the building increased from 1500 to 7000 pounds per month in the period from 2008 till now, which makes a huge difference and a huge challenge to

provide our self with enough income to be able to stay here and provide the same service to the community.

6.   What are your rights as citizen in this redevelopment process? Are you forced to leave? Does the government/LLDC provides you alternatives?

Yes, we have some rights and laws that protects us, though that isn't enough at this point. Of course.. you have section 106 of the Town and Country planning act from 1990. This section is to secure affordable housing, and to specify the type and timing of this housing; and to secure financial contributions to provide infrastructure or affordable housing (PAS, 2016). It specifies that a certain amount of affordable housing needs to be ensured on the plot to be allowed to develop this piece of land. Also, since a couple of years, the developers have to talk with and inform the existing neighbourhood, formulate their wishes and visions, after they can choose what to do with it. This is helping already a little bit, because it is frustrating the process of the project; It costs the developer money and time to do this obligatory service towards the neighbourhood they are going to invest in. Therefore, although it might be just lip-service to promise they will take care for the community, this act is already a frustrating principle to overcome, and maybe, in some cases it can already help the process as well.
Next; it is possible to protest as group to the owner of the apartments and the rent increase, but in reality this is not do-able due to the regulation constructs around renting out apartments. In the UK it is possible to become owner of the apartment and rent it out, just like in the Netherlands. But mostly there is an agent involved in renting out the apartment; They act as an intermediary in renting an apartment. Therefore, often, you don't know who the owner of the apartment is. Also, it is possible within an apartment block of 400 houses, there would be 400 different owners. Therefore it is very complicated to make a stance against rent increase as a group, and almost useless to do so as well.

What you see a lot is shared ownership development. In fact, this isn't a way of providing social housing, but a renting-ownership construct that let you buy a part of the apartment/plot and rent a part. In this way the rent is reduced, since you are already partly owner of the property. From that point, you are able to buy an additional percentage of the property every

Figure 199 - *The Stour Space seen from outside, in between protest the messages of in favour of and against the construction works raging through contemporary London.*

time, thereby further reducing the rent, until you fully own the apartment/plot and therefore will not be subsequent to the souring rent-increases every year.

Then you have, what they call affordable sale. 15-20% of the building needs to be ' affordable', but in fact this means a small price reduction. On 2000 pounds per month, what makes it a difference if you have to pay 1700 or just 2000? Not a lot..

The Stour space, has, as an assistive community building, the first in the UK, an unique position in this rights, since it can actually buy out it's property, but also buy additional property next to the building, legislated in an contract. This is highly favorable, since when you have plans to extend the building, you don't have to compromise every time and create more social spaces for the community of the surrounding neighbourhoods relatively easy. But the question is: Is the current owner of the plots willing to sell this property if someone, an investor, somewhere in London, is willing to pay a lot more for the property? It is one of the ethical questions involved in this process of development and gentrification.

So we certainly have rights, but practically it isn't possible to use it to its full potential due to legislative

(bureaucratic) reasons. For myself, I witnessed the same process. But, as I said, it is extremely difficult to complain and make a stance against it. It is market regulated, and they are able to put me out, after which I've 3 months to find some space, somewhere else. My rent increased from 600 to 2000 pounds a month over/in a couple of years. At this moment, this means that 60% of my income goes to paying my rent. But living 100 meters from my workspace is ideal and I don't want to move elsewhere at this point. Maybe it will be different in a year, but we'll try to survive as a person and as an enterprise.

What an option could be in this case, is the construct they have embedded in the construction of New Stratford: If there is new development, 5% of the investment has to be given to the purpose of community building or provisions for the community. In this way, funds to invest in the community and better integration in the neighbourhood is guaranteed and could be, for example, used for initiatives as the Stour Space. Contrary to this act, is the fact that the investment is border-controlled, which means that the 5% of the investment isn't border crossing. For the neighbourhood of Stratford, it means, that the community funds are only for New Stratford and none of it is for "Old Stratford", which is the existing and

disadvantaged part of the neighbourhood.

Concluding, in urban practice is often mentioned that there is a cycle in the gentrification process. Run down, polluted, former industrial neighbourhoods attract artists and culture due to cheap housing prices and plenty of space. Due to the presence of an artistic community, the neighbourhood becomes a cultural hotspot and booming. This momentum, of public interest and relative improved safety, provides a possibility
for further investment and construction of high-priced condo's. The artistic community is pushed out due to displacement and increased living costs and move elsewhere. From that point the process starts all over again. In that way, the presence of an cultural community is a part of the gentrification process.

7.   In what way do you feel responsible for this process or is this solely caused by the presence of the Olympic Games? Could it happen elsewhere as well?

In a way…. but the main aim of the Stour space is to provide a space to the community which they have access to opportunities to develop themselves. The Olympics formed, specifically for Fish Island and Hackney Wick an opportunity to redevelop the area, the Olympic Park and change the image of this part of London. But, in this booming city, whether it would have organized an Olympic Games, or not, this development would have seeped through eventually, because there is cheap land and cheap space over here, increasing the overall rent in the neighbourhoods and driving the existing residents out due to unaffordable housing. To develop Fish Island in an more sustainable way, is the challenge to go for..
The Stour space will do what they can to maintain itself and follow the tides, providing an answer to the community as it is right now and will be in the future. Our ideal of providing a place for the community to come together and that helps them to develop themselves will still exist, but maybe, not in a way it intentionally was established for..

Figure 200 - *Fig.7.5 - Image of the detoriated environment of Fish Island consisting of former warehouses and worker class housing, now prone to cracking, artistic extensions and demolision. Extensive regenereation is taking place in the hope for a better future.*

APPENDIX 2 - OLYMPIC PROGRAMME AND TIME SCHEDULES 2000-2020

SYDNEY 2000 OLYMPICS FACT & FIGURES

Day columns (top): 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Day numbers: D1 A2 Y3 4 5 7 8 9 10 11 12 13 14 15 16 17 18

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Olympic stadium	110.000	Olympic park
Archery	Sydney int. archery park	17.500	Olympic park
Athletics	Olympic stadium	110.000	Olympic park
Athletics - marathon	Marathon course	unknown	
Athletics - Race walk	unknown		
Badminton	Dome exhibition compl.	10.000	Olympic park
Basketball	Dome exh/super dome	10.000/18.200	Olympic park
Beach volleyball	Bondi beach	10.000	East centre
Boxing	Sydney conv. & exh. ce.	10.000	Centre
Canoe slalom	Penrith Whitewater stad.	12.500	West periphery
Canoe sprint	Sydney int. regatta cent.	20.000	West periphery
Cycling - mountainbike	West. sydney parklands	20.000	West periphery
Cycling - road race	Centennial parklands	unknown	Centre
Cycling - road time trial	unknown		
Cycling - track	Dunc gray velodrome	3.150	Southwest ph.
Diving	Sydney int. aquatic cent.	10.000	Olympic park
Equestrian - dressage	Syd. int. equestrian cent.	50.000	West periphery
Equestrian - eventing	Syd. int. equestrian cent.	50.000	West periphery
Equestrian - jumping	Syd. int. equestrian cent.	50.000	West periphery
Fencing	Sydney conv. & exh. ce.	10.000	Centre
Football	Olympic stadium	110.000	Olympic park
	Sydney football stadium	43.000	Centre
	Brisbane cricket ground	37.000	Brisbane
	Bruce stadium	25.000	Canberra
	Hindmarsh stadium	20.000	Adelaide
	Melbourne cricket grou.	98.000	Melbourne
Gymnastics - artistic	Sydney super dome	18.200	Olympic park
Gymnastics - rhythmic	Dome exhibition compl.	10.000	Olympic park
Gymnastics - trampolin	Sydney super dome	18.200	Olympic park
Handball	Dome exhibition compl.	10.000	Olympic park
Hockey	State hockey centre	15.000	Olympic park
Judo	Sydney conv. & exh. ce.	9.000	Centre
Modern pentathlon	Dome exh./baseball sta.	10.000/22.000	Olympic park
Rowing	Sydney int. regatta cent.	20.000	West periphery
Sailing	Oly. sailing shore base	10.000	Centre
Shooting	Syd. int. shooting cent.	7.000	West periphery
Swimming	Sydney int. aquatic cent.	10.000	Olympic park
Synchron swimming	Sydney int. aquatic cent.	10.000	Olympic park
Table tennis	State sports centre	5.000	Olympic park
Taekwondo	State sports centre	5.000	Olympic park
Tennis	NSW tennis centre	10.000	Olympic park
Triathlon	Sydney opera house	unknown	Centre
Volleyball	Dome exh./syd. ent. cen.	10.000/11.000	Olympic park
Water polo	Syd. aq. cen/Ryde aqua.	10.000/3.900	Olympic park
Weightlifting	Sydney conv. & exh. ce.	7.500	Centre
Wrestling - freestyle	Sydney conv. & exh. ce.	9.000	Centre
Wrestling - grec-roman	Sydney conv. & exh. ce.	9.000	Centre
closing ceremony	Olympic stadium	110.000	Olympic park

LEGEND
- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- ● Day of event - no medal awarded
- ● Day of event - medal awarded
- ● Day of event - opening/closing

Wikipedia.com
bbc.co.uk

ATHENS 2004 OLYMPICS FACT & FIGURES

Day columns (top): 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Day numbers: D1 A2 Y3 4 5 7 8 9 10 11 12 13 14 15 16 17 18

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Olympic stadium	71.000	Athens compl.
Archery	Panathenaic stadium	7.500	centre
Athletics	Olympic stadium	71.000	Athens compl.
Athletics - marathon	Panathenaic stadium	34.500	centre
Athletics - Race walk	unknown		
Badminton	Goudi olympic hall	8.000	Goudi compl.
Basketball	Nikos Galis/Heleniko ind.	19.250/15.000	Heleniko com.
Beach volleyball	Faliro beach voll. centre	8.000	Faliro coastal
Boxing	Peristeri boxing hall	5.600	West centre
Canoe slalom	Canoe slalom centre	3.150	Heleniko com.
Canoe sprint	Schinias rowing & canoe	14.000	North periph.
Cycling - mountainbike	Parnitha m.t.b. venue	unknown	West periphery
Cycling - road race	Kotzia square	3.150	Centre
Cycling - road time trial	Vouliagmeni centre	3.600	Markop. comp.
Cycling - track	Athens oly. velodrome	3.300	Athens compl.
Diving	Athens aquatic centre	6.200	Athens compl.
Equestrian - dressage	Markopoulo Equ. centre	8.100	Markop. comp.
Equestrian - eventing	Markopoulo Equ. centre	15.000	Markop. comp.
Equestrian - jumping	Markopoulo Equ. centre	10.000	Markop. comp.
Fencing	Fencing hall	8.000	Heleniko com.
Football	Olympic stadium	71.000	Athens compl.
	Kaftanzoglio stadium	27.700	Thessaloniki
	Karaiskakis stadium	33.300	Faliro coastal
	Pampeloponnisiako sta.	23.500	Patras
	Pankritio stadium	26.200	Heraklion
	Panthessaliko stadium	22.700	Volos
Gymnastics - artistic	Nikos Galis indoor hall	19.250	Athens comp.
Gymnastics - rhythmic	Galatsi olympic hall	6.200	North centre
Gymnastics - trampolin	Nikos Galis indoor hall	19.250	Athens comp.
Handball	Faliro sport pav./Hel. ind.	10.000/15.000	Faliro coastal
Hockey	Olympic hockey centre	20.000	Heleniko com.
Judo	Ano Liosia olympic hall	10.000	North centre
Modern pentathlon	Modern pent. centre	10.000	Goudi compl.
Rowing	Schinias rowing & canoe	14.000	North periph.
Sailing	Agios Kosmas sail. cent.	8.000	Heleniko com.
Shooting	Markopoulo shoot. cent.	2.300	Markop. comp.
Swimming	Athens aquatic centre	11.500	Athens compl.
Synchron swimming	Athens aquatic centre	5.300	Athens compl.
Table tennis	Galatsi olympic hall	6.200	North centre
Taekwondo	Faliro sport pavilion	10.000	Faliro coastal
Tennis	Athens oly. tennis cent.	15.000	Athens compl.
Triathlon	Vouliagmeni centre	3.600	Markop. comp.
Volleyball	Piece & friendship stad.	11.500	Faliro coastal
Water polo	Athens aquatic centre	11.500	Athens compl.
Weightlifting	Nikaia weightlifting hall	3.500	West centre
Wrestling - freestyle	Ano Liosia olympic hall	10.000	North centre
Wrestling - grec-roman	Ano Liosia olympic hall	10.000	North centre
closing ceremony	Olympic stadium	71.000	Athens compl.

LEGEND
- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- ● Day of event - no medal awarded
- ● Day of event - medal awarded
- ● Day of event - opening/closing

Wikipedia.com
bbc.co.uk

BEIJING OLYMPICS FACT & FIGURES

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Beijing national stadium	91.000	Olympic green
Archery	Oly. green archery field	5.000	Olympic green
Athletics	Beijing national stadium	91.000	Olympic green
Athletics - marathon	unknown		
Athletics - Race walk	unknown		
Badminton	Beij. uni. of technologie	7.500	Gymnasium
Basketball	Wukesong indoor stad.	18.000	West centre
Beach volleyball	Beach voll. ground	12.000	East centre
Boxing	Workers indoor arena	13.000	East centre
Canoe slalom	Shunyi oly. row-can. park	37.000	Mapozhen
Canoe sprint	Shunyi oly. row-can. park	37.000	Mapozhen
Cycling - BMX	BMX field	4.000	West periphery
Cycling - mountainbike	Laoshan m.bike course	2.000	West periphery
Cycling - road race	Urban roadcycl. course	unknown	Centre
Cycling - road time trial	Urban roadcycl. course	unknown	Centre
Cycling - track	Laoshan velodrome	6.000	West periphery
Diving	Beijing aquatic centre	17.000	Olympic green
Equestrian - dressage	Hong kong venue	18.000	Hong kong
Equestrian - eventing	Hong kong venue	18.000	Hong kong
Equestrian - jumping	Hong kong venue	18.000	Hong kong
Fencing	Oly. green convention c.	5.500	Olympic green
Football	Beijing national stadium	91.000	Olympic green
	Olympic sports centre	36.000	Olympic green
	Workers stadium	70.000	East centre
	Qinhuangdao stadium	33.500	Qinhuangdao
	Shanghai stadium	80.000	Shanghai
	Shenyang stadium	60.000	Shenyang
	Tianjin stadium	60.000	Tianjin
Gymnastics - artistic	Beijing indoor stadium	19.000	Olympic green
Gymnastics - rhythmic	Beij. uni. of technologie	7.500	Universities
Gymnastics - trampolin	Beijing indoor stadium	19.000	Olympic green
Handball	Ol. Gym/indoor stadium	7.000/19.000	Olympic green
Hockey	Oly. green hockey field	17.000	Olympic green
Judo	Beij. science & tech. uni.	8.000	Universities
Marathon swimming	Shunyi oly. row-can. park	37.000	Mapozhen
Modern pentathlon	Sport centre/Convention	36.000/5.000	Olympic green
Rowing	Shunyi oly. row-can. park	37.000	Mapozhen
Sailing	Qingdao sailing centre	unknown	Qingdao
Shooting	Beij. range hall/field	9.000/5.000	West periphery
Swimming	Beijing aquatic centre	17.000	Olympic green
Synchron swimming	Beijing aquatic centre	17.000	Olympic green
Table tennis	Peking university	8.000	Universities
Taekwondo	Beij. science & tech. uni.	8.000	Universities
Tennis	Oly. green tennis centre	17.400	Olympic green
Triathlon	Triathlon venue	10.000	Changpingzhen
Volleyball	Beij. institute of tech.	5.000	Universities
Water polo	Ying Tung natatorium	4.800	Olympic green
Weightlifting	Beihang university	5.400	Universities
Wrestling - freestyle	China agriculture uni.	8.000	Universities
Wrestling - grec-roman	China agriculture uni.	8.000	Universities
closing ceremony	Beijing national stadium	91.000	Olympic green

Day columns across top: DAY 1 2 3 4 5 7 8 9 10 11 12 13 14 15 16 17 18

LEGEND
- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- Day of event - no medal awarded
- Day of event - medal awarded
- Day of event - opening/closing

Wikipedia.com
dailychina.com

LONDON OLYMPICS FACT & FIGURES

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Olympic stadium	80.000	Olympic park
Archery	Lord's cricket ground	6.500	Central zone
Athletics	Olympic stadium	80.000	Olympic park
Athletics - marathon	The mall	5.000 >*	Central zone
Athletics - Race walk	The mall	5.000 >*	Central zone
Badminton	Wembley Arena	6.000	Central zone
Basketball	Basketball/Norwich ar.	12.000/20.000	Olympic/River
Beach volleyball	Horse guard parade	15.000	Central zone
Boxing	Excel	5.000 - 10.000	River zone
Canoe slalom	Lee valley whitewater	12.000	Waltham cross
Canoe sprint	Eton	30.000	Dorney
Cycling - BMX	BMX circuit	6.000	Olympic park
Cycling - mountainbike	Hadleigh farm	20.000	Hadleigh
Cycling - road race	The mall	5.000 >*	Central zone
Cycling - road time trial	The mall	5.000 >*	Central zone
Cycling - track	Velodrome	6.000	Olympic park
Diving	Aquatics centre	17.500	Olympic park
Equestrian - dressage	Greenwich park	23.000	River zone
Equestrian - eventing	Greenwich park	23.000	River zone
Equestrian - jumping	Greenwich park	23.000	River zone
Fencing	Excel	5.000 - 10.000	River zone
Football	City of coventry stadium	32.500	Coventry
	Hampton park	52.000	Glasgow
	Millenium stadium	74.600	Cardiff
	Old trafford	76.000	Manchester
	St James Park	52.400	Newcastle u T
	Wembley stadium	82.000	London
Gymnastics - artistic	North greenwich arena	20.000	River zone
Gymnastics - rhythmic	Wembley arena	6.000	Central zone
Gymnastics - trampolin	North greenwich arena	20.000	River zone
Handball	Copper b./basketball ar.	7.000/12.000	Olympic park
Hockey	Riverbank arena	16.000	Olympic park
Judo	Excel	5.000 - 10.000	River zone
Marathon swimming	Hyde park	3.000	Central zone
Modern pentathlon	Olympic & Grn.wich park	20.000**	Olympic/River
Rowing	Eton	30.000	Dorney
Sailing	Weymouth & Portland	4.600	Isle of Portland
Shooting	Royal artillery barracks	7.500	River zone
Swimming	Aquatics centre	17.500	Olympic park
Synchron swimming	Aquatics centre	17.500	Olympic park
Table tennis	Excel	5.000 - 10.000	River zone
Taekwondo	Excel	5.000 - 10.000	River zone
Tennis	Wimbledon	30.000	Central zone
Triathlon	Hyde park	3.000	Central zone
Volleyball	Earls court	15.000	Central zone
Water polo	Water polo arena	5.000	Olympic park
Weightlifting	Excel	5.000 - 10.000	River zone
Wrestling - freestyle	Excel	5.000 - 10.000	River zone
Wrestling - grec-roman	Excel	5.000 - 10.000	River zone
closing ceremony	Olympic stadium	80.000	Olympic park

Day columns across top: DAY 1 2 3 4 5 7 8 9 10 11 12 13 14 15 16 17 18

LEGEND
- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- Day of event - no medal awarded
- Day of event - medal awarded
- Day of event - opening/closing

Wikipedia.com
Telegraph.co.uk

RIO OLYMPICS FACT & FIGURES

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Maracana stadium	80.000	Maracana
Archery	Sambodromo	36.000	Maracana
Athletics	Olympic stadium	60.000	Maracana
Athletics - marathon	Sambrodomo	36.000	Maracana
Athletics - Race walk	Pontal	5.000	Barra
Badminton	Rio centro - pavilion 4	6.500	Barra
Basketball	Youth Arena/Carioca 1	5.000/16.000	Deodoro/Barra
Beach volleyball	Beach volleyball arena	12.000	Copacabana
Boxing	Rio centro - pavilion 6	9.000	Barra
Canoe slalom	Whitewater stadium	8.000	Deodoro
Canoe sprint	Lagoa stadium	14.000	Copacabana
Cycling - BMX	Olympic BMX centre	6.000	Deodoro
Cycling - mountainbike	Mountain bike centre	5.000	Deodoro
Cycling - road race	Fort copacabana	5.000	Copacabana
Cycling - road time trial	Pontal	5.000	Barra
Cycling - track	Rio Olympic Velodrome	5.000	Barra
Diving	Maria Lenk aquatic cent	6.500	Barra
Equestrian - dressage	Olympic equestrian cent	14.000	Deodoro
Equestrian - eventing	Olympic equestrian cent	14.000	Deodoro
Equestrian - jumping	Olympic equestrian cent	14.000	Deodoro
Fencing	Carioca 3	10.000	Barra
Football	Mineirao	58.000	Belo Horizonto
	Mane Garrincha stadium	69.000	Brasilia
	Amazonia arena	40.500	Manaus
	Maracana	80.000	Maracana
	Olympic stadium	60.000	Maracana
	Fonte Nova arena	58.000	Salvador
	Sao Paolo arena	48.000	Sao Paolo
Golf	Olympic golf course	20.000	Barra
Gymnastics - artistic	Rio olympic arena	12.000	Barra
Gymnastics - rhythmic	Rio olympic arena	12.000	Barra
Gymnastics - trampolin	Rio olympic arena	12.000	Barra
Handball	Future arena	12.000	Barra
Hockey	Olympic hockey centre	15.000	Deodoro
Judo	Carioca 2	10.000	Barra
Marathon swimming	Fort Copacabana	5.000	Copacabana
Modern pentathlon	Youth arena	5.000	Deodoro
Rowing	Lagoa stadium	14.000	Copacabana
Rugby	Deodoro stadium	15.000	Deodoro
Sailing	Marina da Gloria	10.000	Copacabana
Shooting	Olympic shooting cent	2.000	Deodoro
Swimming	Olympic Aquatics stad	15.000	Barra
Synchron swimming	Maria Lenk aquatic cent	6.500	Barra
Table tennis	Rio centro - pavilion 3	7.000	Barra
Taekwondo	Carioca 3	10.000	Barra
Tennis	Olympic tennis centre	19.750	Barra
Triathlon	Fort Copacabana	5.000	Copacabana
Volleyball	Maracanazinho	12.000	Maracana
Water polo	Lenk/Olympic aqua c	6.500/15.000	Maracan/Barra
Weightlifting	Rio centro - pavilion 2	6.500	Barra
Wrestling - freestyle	Carioca 2	10.000	Barra
Wrestling - grec-roman	Carioca 2	10.000	Barra
closing ceremony	Maracana stadium	80.000	Maracana

LEGEND

- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- Day of event - no medal awarded
- Day of event - medal awarded
- Day of event - opening/closing

Wikipedia.com
IOC

TOKYO 2020 OLYMPICS FACT & FIGURES

TYPE OF EVENT	VENUE	CAPACITY	AREA
opening ceremony	Nat. olympic stadium	68.000	Heritage zone
Archery	Dream island arch. field	6.000	Tokyo bay zone
Athletics	Nat. olympic stadium	68.000	Heritage zone
Athletics - marathon	unknown	36.000	
Athletics - Race walk	unknown	5.000	
Badminton	Mushashino forest cent	6.000	Heritage zone
Basketball	Saitama Super Arena	22.000	Tokyo bay zone
Beach volleyball	Shiokaze Park	12.000	Tokyo bay zone
Boxing	Kokugikan Arena	10.000	Heritage zone
Canoe slalom	Canoe Slalom Course	8.000	Tokyo bay zone
Canoe sprint	Sea Forest Waterway	20.000	Tokyo bay zone
Cycling - BMX	Olympic BMX course	6.000	Tokyo bay zone
Cycling - mountainbike	Izu m.t.b. course	20.000	Izu
Cycling - road race	Imperial Palace Garden	5.000	Heritage zone
Cycling - road time trial	Imperial Palace Garden	5.000	Heritage zone
Cycling - track	Izu Velodrome	5.000	Izu
Diving	Olympic Aquatics centre	18.000	Tokyo bay zone
Equestrian - dressage	Equestrian Park	unknown	Heritage zone
Equestrian - eventing	Sea forest c-c. course	unknown	Tokyo bay zone
Equestrian - jumping	Equestrian Park	unknown	Heritage zone
Fencing	Makuhari Messe	8.000	Tokyo bay zone
Football	Nat. olympic stadium	68.000	Heritage zone
	Tokyo Stadium	50.000	Heritage zone
	Int. Stadium Yokohama	72.000	Yokohama
	Sapporo Dome	40.000	Saporro
	Saitama Stadium 2002	63.700	Saitama
	Miyagi Stadium	49.000	Miyagi
	Nagai Stadium	47.000	Osaka
Golf	Kasumigaseki cou. club	30.000	Tokyo bay zone
Gymnastics - artistic	Olympic gymn. centre	12.000	Tokyo bay zone
Gymnastics - rhythmic	Olympic gymn. centre	12.000	Tokyo bay zone
Gymnastics - trampolin	Olympic gymn. centre	12.000	Tokyo bay zone
Handball	Yoyogi Nat. Gymnasium	12.000	Heritage zone
Hockey	Oi Seaside Park	10.000	Tokyo bay zone
Judo	Nippon Budokan	12.000	Heritage zone
Marathon swimming	Odaiba Marine Park	5.000	Tokyo bay zone
Modern pentathlon	Tokyo Stadium	50.000	Heritage zone
Rowing	Sea Forest Waterway	20.000	Tokyo bay zone
Rugby	Tokyo Stadium	50.000	Heritage zone
Sailing	Enoshima yacht harbour	10.000	Tokyo bay zone
Shooting	Asaka Shooting Range	unknown	Tokyo bay zone
Swimming	Olympic Aquatics centre	18.000	Tokyo bay zone
Synchron swimming	Olympic Aquatics centre	18.000	Tokyo bay zone
Table tennis	Tokyo metropol. gymn.	10.000	Heritage zone
Taekwondo	Makuhari Messe	6.000	Tokyo bay zone
Tennis	Ariake Coliseum	20.000	Tokyo bay zone
Triathlon	Odaiba Marine Park	5.000	Tokyo bay zone
Volleyball	Ariake Arena	12.000	Tokyo bay zone
Water polo	Tatsumi int. swim. cent.	unknown	Tokyo bay zone
Weightlifting	Tokyo internat. forum	5.000	Heritage zone
Wrestling - freestyle	Makuhari Messe	6.000	Tokyo bay zone
Wrestling - grec-roman	Makuhari Messe	6.000	Tokyo bay zone
closing ceremony	Nat. olympic stadium	68.000	Heritage zone

LEGEND

- New venue - permanent
- New venue - temporary
- Existing venue - upgrade
- Existing venue - no upgrade
- Day of event - no medal awarded
- Day of event - medal awarded
- Day of event - opening/closing

Wikipedia.com
mapsofworld.com
http://www.insidethegames.biz/articles/1035701/tokyo-20
20-gymnastic-centre-will-no-longer-be-temporary-venue
https://tokyo2020.jp/en/games/venue/olympic/
https://swimswam.com/tokyo-2020-olympic-aquatic-cent
re-hold-20000-spectators/

APPENDIX 3 - SCHEMES OF PROGRAMME DISTRIBUTION ACROSS THE DESIGN LOCATIONS

REQUESTED OLYMPIC PROGRAM
734 ha.

AVAILABLE SPACE
138 ha.

UNUSABLE DESIGN SPACE
5% = 35 ha.
PARK & SQUARES
304 ha.

PARKING
142 ha.

PUBLIC TRANSPORT
22,5 ha.
OLYMPIC VILLAGE
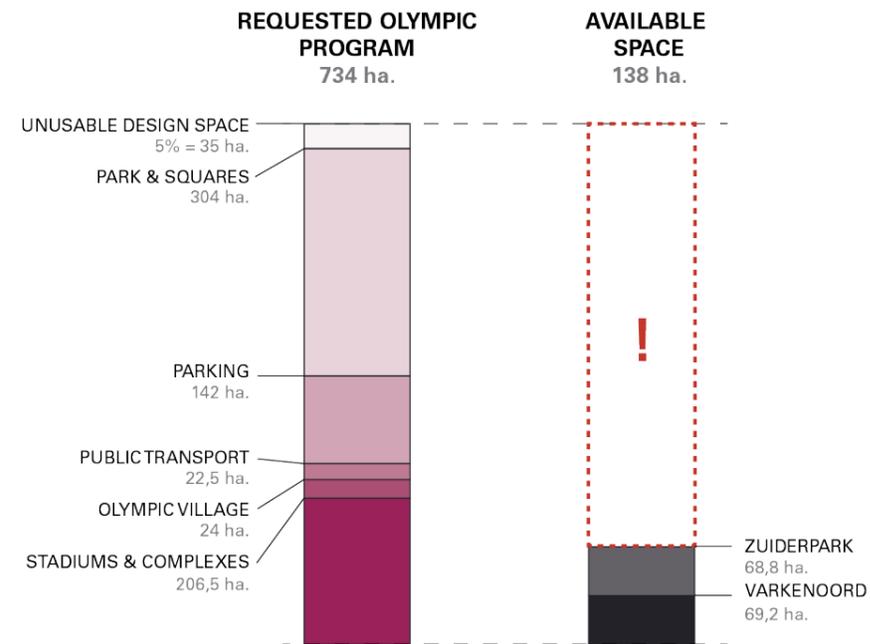24 ha.
STADIUMS & COMPLEXES
206,5 ha.

!

ZUIDERPARK
68,8 ha.
VARKENOORD
69,2 ha.

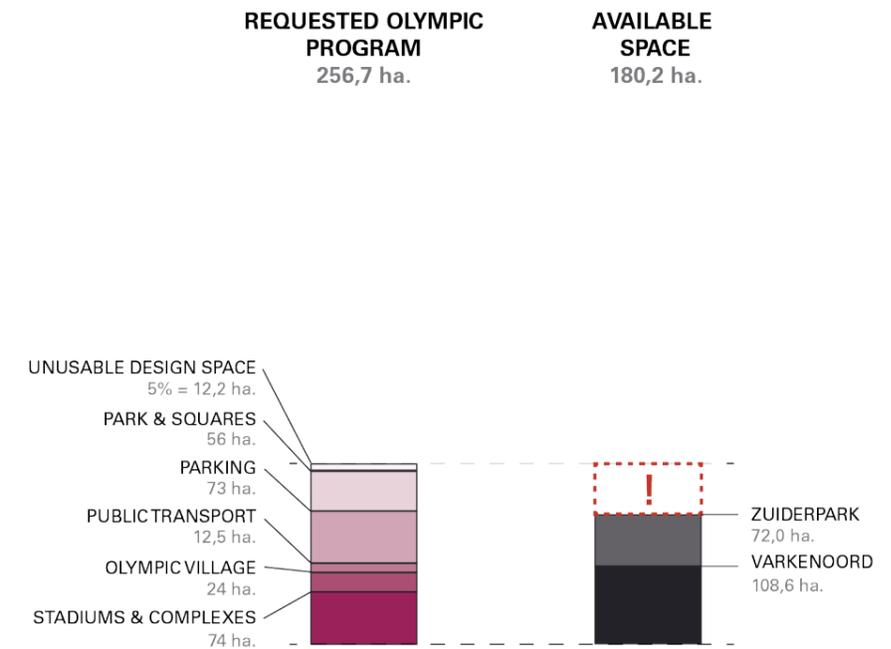**Figure 201 -** *requested Olympic programme compared to available space after assiging usable space withouth compremizing in local social structures.*

REQUESTED OLYMPIC PROGRAM
256,7 ha.

AVAILABLE SPACE
138 ha.

UNUSABLE DESIGN SPACE
5% = 12,2 ha.
PARK & SQUARES
56 ha.
PARKING
73 ha.
PUBLIC TRANSPORT
12,5 ha.
OLYMPIC VILLAGE
24 ha.
STADIUMS & COMPLEXES
74 ha.

!

ZUIDERPARK
68,8 ha.
VARKENOORD
69,2 ha.

Figure 202 - *Requested Olympic programme compared to available space after assigning Olympic programme in the Netherlands and in Rotterdam.*
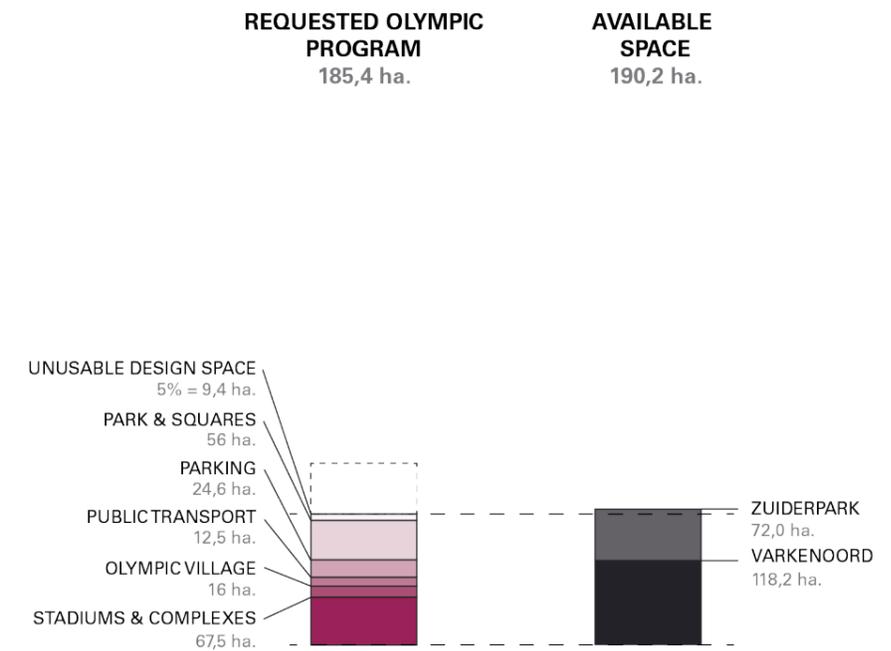
217

REQUESTED OLYMPIC PROGRAM
256,7 ha.

AVAILABLE SPACE
180,2 ha.

UNUSABLE DESIGN SPACE
5% = 12,2 ha.
PARK & SQUARES
56 ha.
PARKING
73 ha.
PUBLIC TRANSPORT
12,5 ha.
OLYMPIC VILLAGE
24 ha.
STADIUMS & COMPLEXES
74 ha.

!

ZUIDERPARK
72,0 ha.
VARKENOORD
108,6 ha.

Figure 203 - *Requested Olympic programme compared to available space after relocation of industrial parks at Varkenoord and Zuiderpark and using parts of the sportcomplexes and railway.*

REQUESTED OLYMPIC PROGRAM
185,4 ha.

AVAILABLE SPACE
190,2 ha.

UNUSABLE DESIGN SPACE
5% = 9,4 ha.
PARK & SQUARES
56 ha.
PARKING
24,6 ha.
PUBLIC TRANSPORT
12,5 ha.
OLYMPIC VILLAGE
16 ha.
STADIUMS & COMPLEXES
67,5 ha.

ZUIDERPARK
72,0 ha.
VARKENOORD
118,2 ha.

Figure 204 - *Requested Olympic programme compared to available space after removing much of the parking space from the Olympic programme*

218
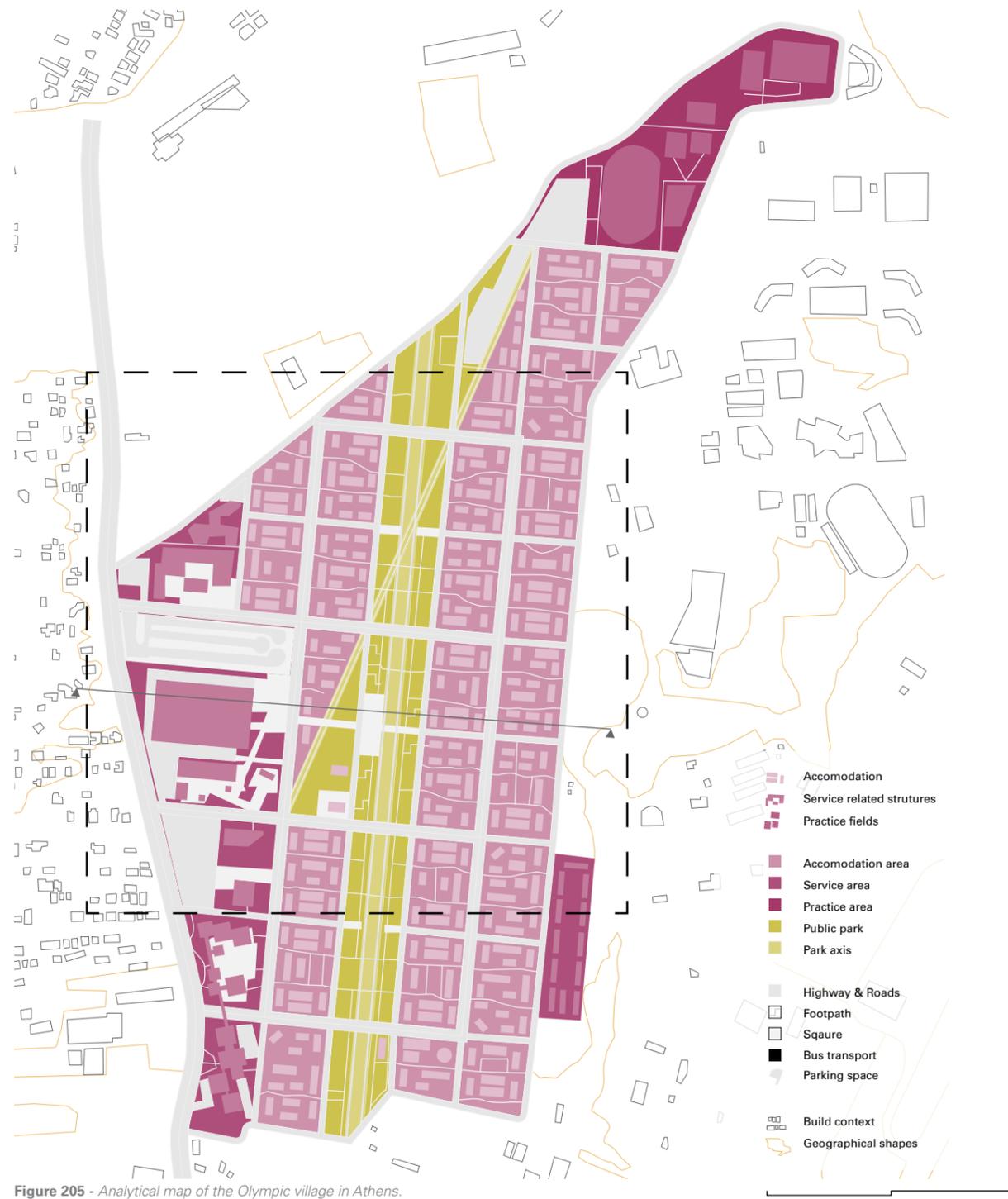
The place where athletes and coaches stay during the event and can be divided in three parts:

- Residential zone (strongly secured, housing and facilities for daily living)
- International zone (able to visit for family and press)
- Public zone (open for public visitors)

In the residential zone it has to host at least 16.000 athletes and coaches, but is, depending on the density of the buildings approximately 1 km2. According to Twynsta & Gudde (2008) the size of the Olympic Village. This 'village' has to be in close proximity to much of the sport venues as it is required that 60% of the venues need to be within 10km distances and within 60 minutes travel time (Heurkens, 2005). In Athens 2004, the Olympic village, almost 2300 housing blocks for 17.600 athletes is transformed to for approximately 10.000 residents. Each blocks at the Olympic village of Athens is dived in 4-5 story's, which makes it 9.200 – 11.500 condos. From this perspective you can argue that each condo house 2 athletes/coaches. Other facilities related to the Olympic village (Athens 2004) (Huijsmans, 2005) are for example:

- Medical facilities
- Administration services
- Sport and recreation facilities
- Library
- Washing space
- Storage
- Restaurant
- Clinic
- Information centre

The international/public zone hosted:
- Shopping mall
- Restaurants
- Administrative centre
- Car rent

This programme may differ for each Olympic Games as Huijsmans took a snapshot of the Olympic Games in Athens, but it can be argued that at least the facilities within the residential zone of the Olympic Village are a fixed statistic. From the 10's of the 21st century a ICT service for mobile phones, laptops and other electronic devices would be an essential edition, as they are highly incorporated in the training procedures of the athletes (cardio meters, watching back trainings, etc.)
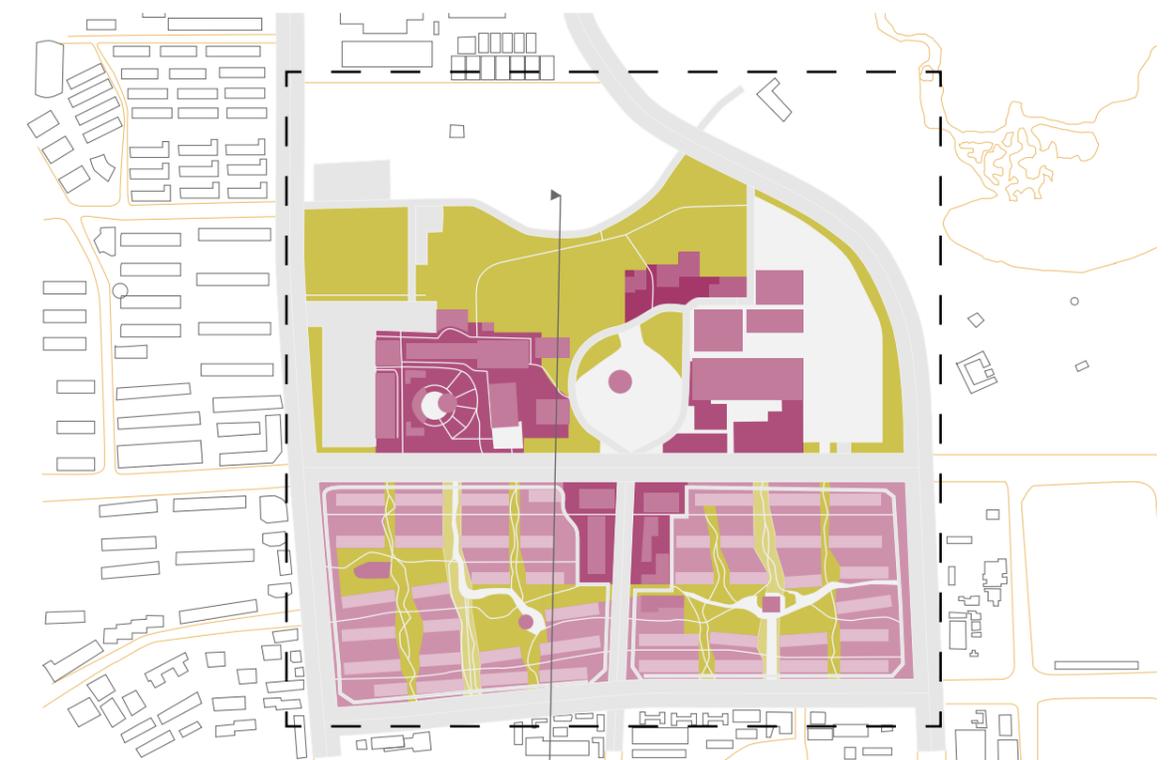

Figure 205 - *Analytical map of the Olympic village in Athens.*

Legend:
- Accomodation
- Service related strutures
- Practice fields
- Accomodation area
- Service area
- Practice area
- Public park
- Park axis
- Highway & Roads
- Footpath
- Sqaure
- Bus transport
- Parking space
- Build context
- Geographical shapes

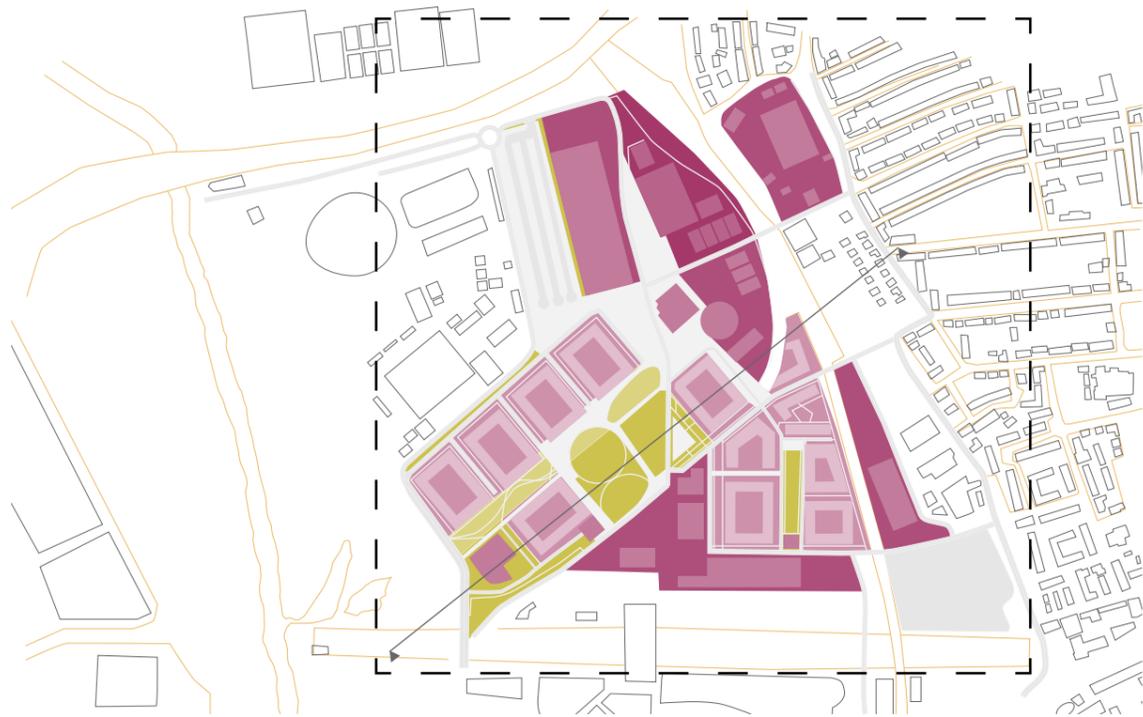**Figure 206 -** *Analytical map of the Olympic village in Beijing.*

Figure 207 - *Analytical map of the Olympic village in London.*

Figure 208 - *Analytical map of the Olympic village in Rio de Janeiro.*

The place where the opening ceremony and closing ceremony will be held. Though often, it is not necessarily the stadium for athletics. In this proposal the Olympic stadium is only the podium for football and the opening and closing ceremony, and post-Olympic configurations to turn it into a football stadium is not desirable

-       Stadium itself (strongly secured, housing and facilities for daily living)

-       Stadium evacuation ring (able to visit for family and press)

-       Stadium square or additional ring outside of the evacuation ring

-       Has to have practice facilities directly next to the stadium for athletes to train prior to a match

-       Has a space for temporary shops and sponsor stands during the event

The Olympic stadium should be in proximity of 15 minutes from the Olympic Village. The Olympic village and the Olympic stadium are therefore often situated at the same Olympic Park.

The design of the Olympic stadiums and the Stadion of New-castle United, UK, are examined to their position in their urban environment and to the transport possibilities around the space.

This analysis, how small it is, greatly helped to understand the relationships between programme size and programme functions, as well as it showed some possible design points to transform the Olympic stadium towards a more social perspective.
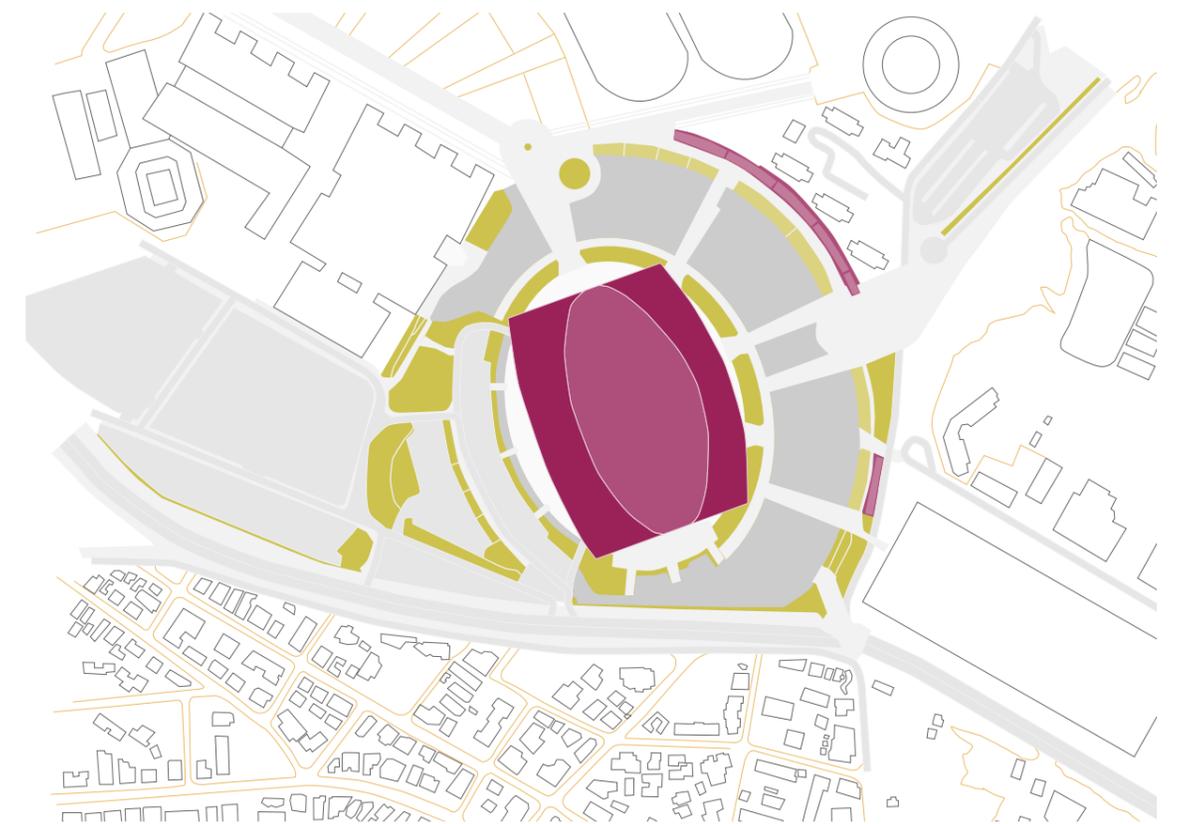

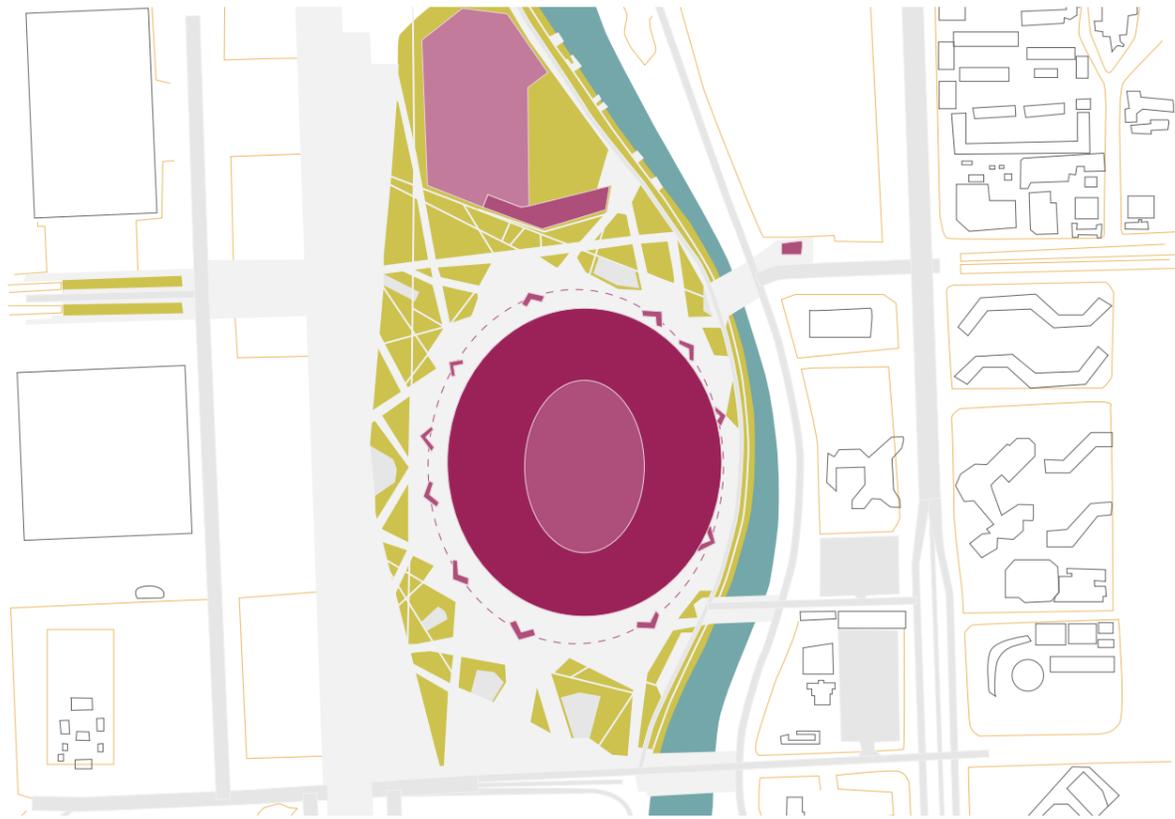Figure 209 - *Analytical map of the Olympic Stadium in Athens.*

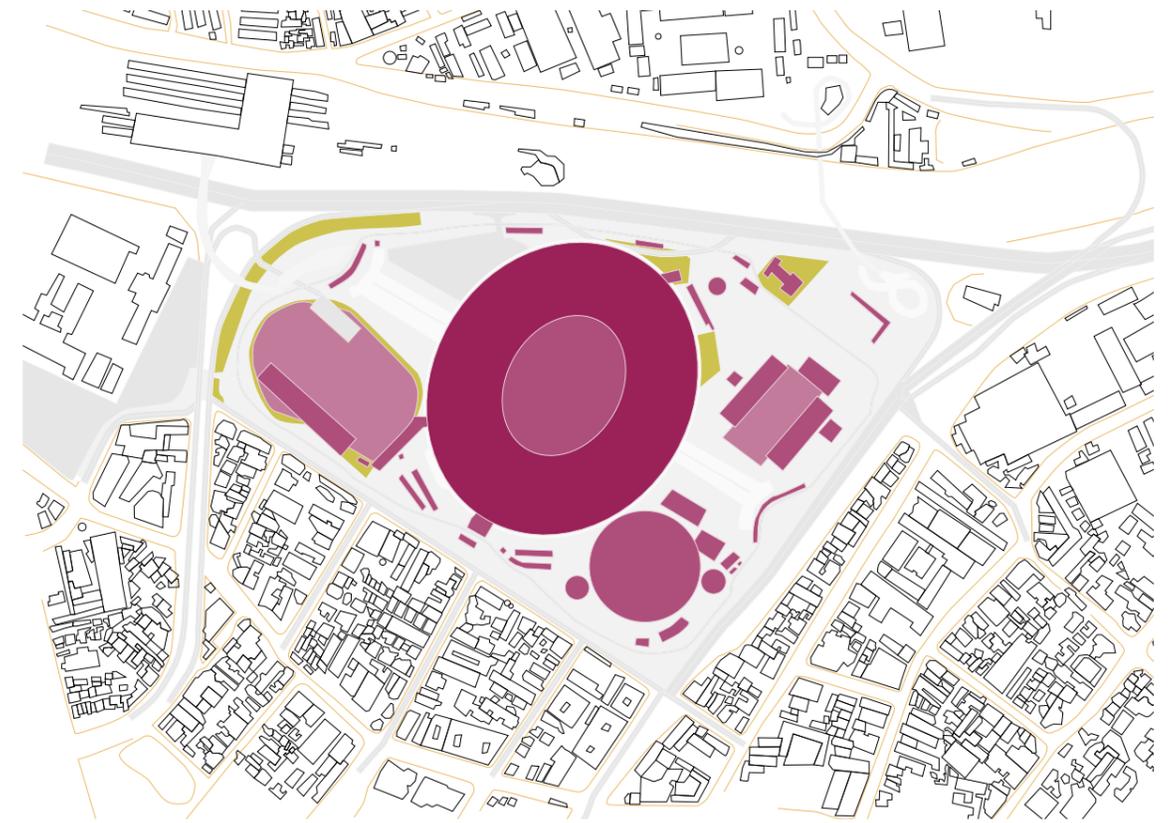Figure 211 - *Analytical map of the Olympic Stadium in Beijing.*

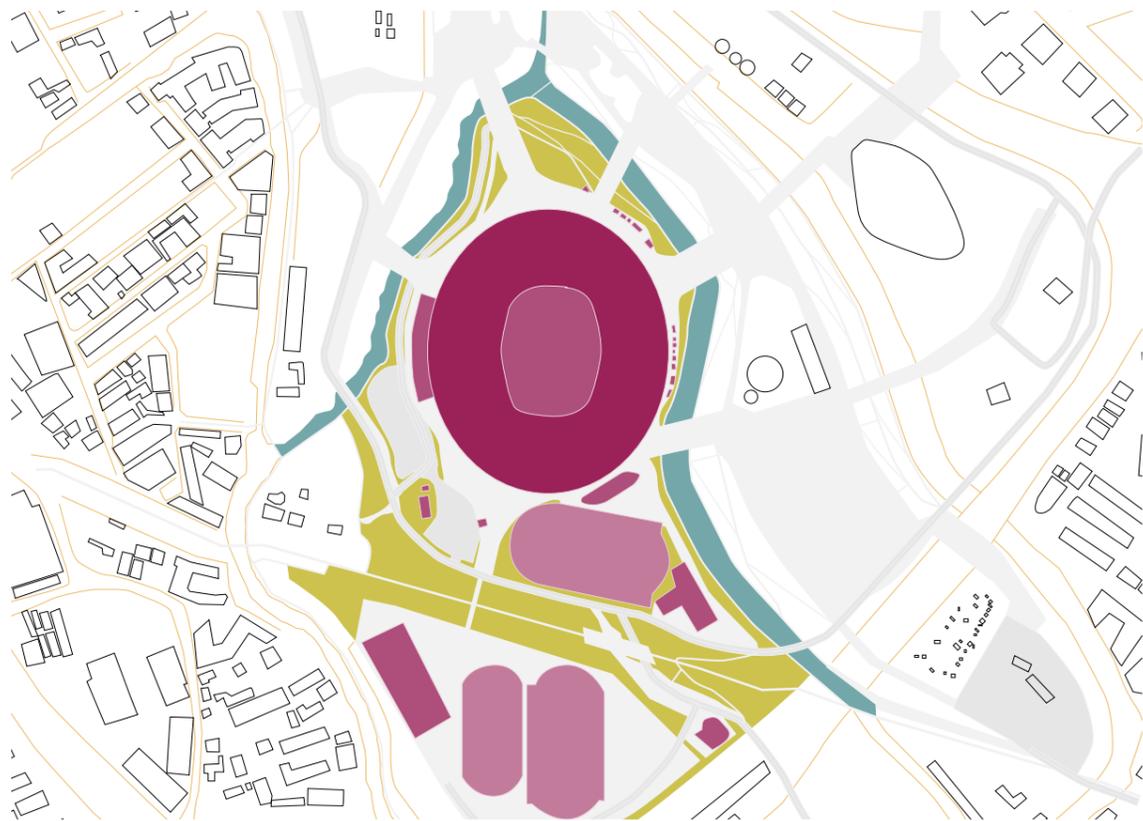Figure 213 - *Analytical map of the Olympic Stadium in Rio de Janeiro.*

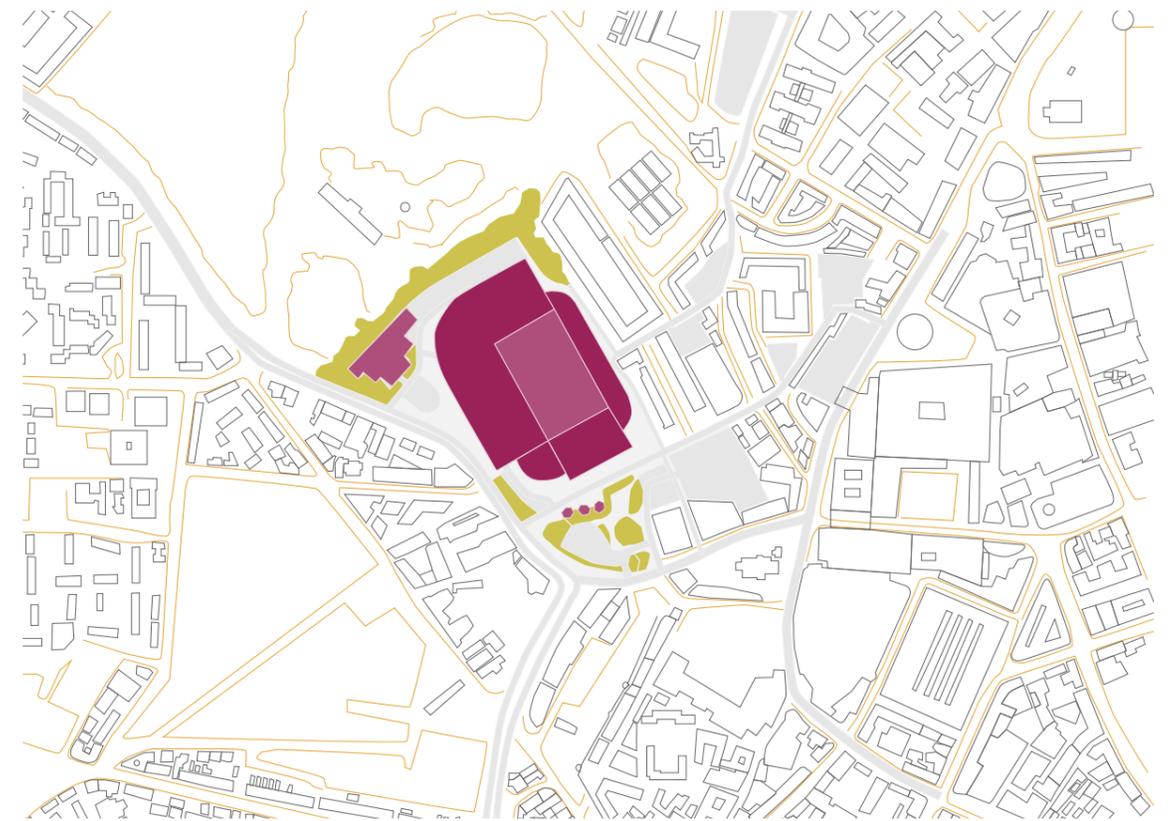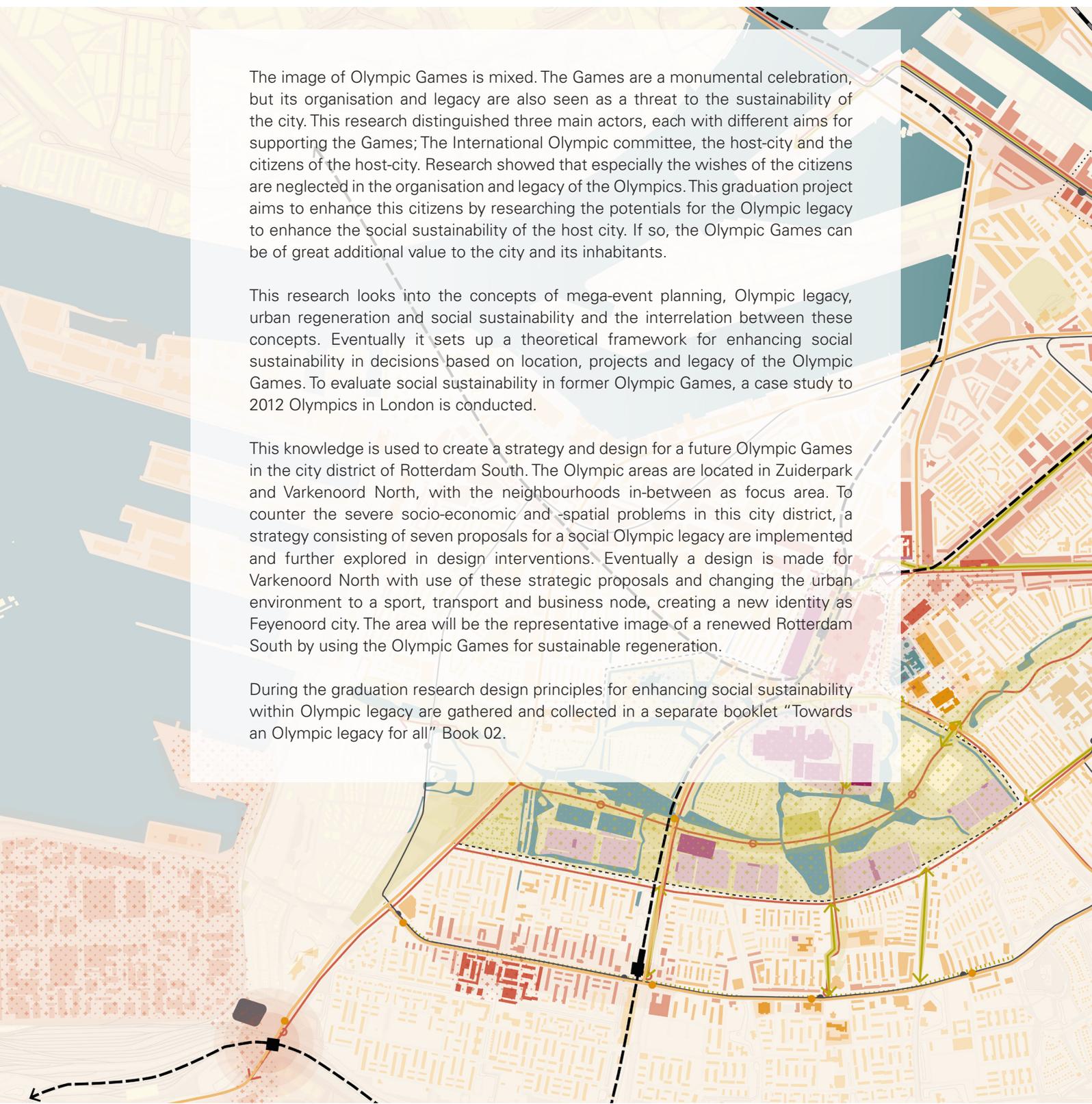Figure 210 - *Analytical map of the Olympic Stadium in London.*

Figure 212 - *Analytical map of the Football Stadium in Newcastle upon Tyne.*

The image of Olympic Games is mixed. The Games are a monumental celebration, but its organisation and legacy are also seen as a threat to the sustainability of the city. This research distinguished three main actors, each with different aims for supporting the Games; The International Olympic committee, the host-city and the citizens of the host-city. Research showed that especially the wishes of the citizens are neglected in the organisation and legacy of the Olympics. This graduation project aims to enhance this citizens by researching the potentials for the Olympic legacy to enhance the social sustainability of the host city. If so, the Olympic Games can be of great additional value to the city and its inhabitants.

This research looks into the concepts of mega-event planning, Olympic legacy, urban regeneration and social sustainability and the interrelation between these concepts. Eventually it sets up a theoretical framework for enhancing social sustainability in decisions based on location, projects and legacy of the Olympic Games. To evaluate social sustainability in former Olympic Games, a case study to 2012 Olympics in London is conducted.

This knowledge is used to create a strategy and design for a future Olympic Games in the city district of Rotterdam South. The Olympic areas are located in Zuiderpark and Varkenoord North, with the neighbourhoods in-between as focus area. To counter the severe socio-economic and -spatial problems in this city district, a strategy consisting of seven proposals for a social Olympic legacy are implemented and further explored in design interventions. Eventually a design is made for Varkenoord North with use of these strategic proposals and changing the urban environment to a sport, transport and business node, creating a new identity as Feyenoord city. The area will be the representative image of a renewed Rotterdam South by using the Olympic Games for sustainable regeneration.

During the graduation research design principles for enhancing social sustainability within Olympic legacy are gathered and collected in a separate booklet "Towards an Olympic legacy for all" Book 02.