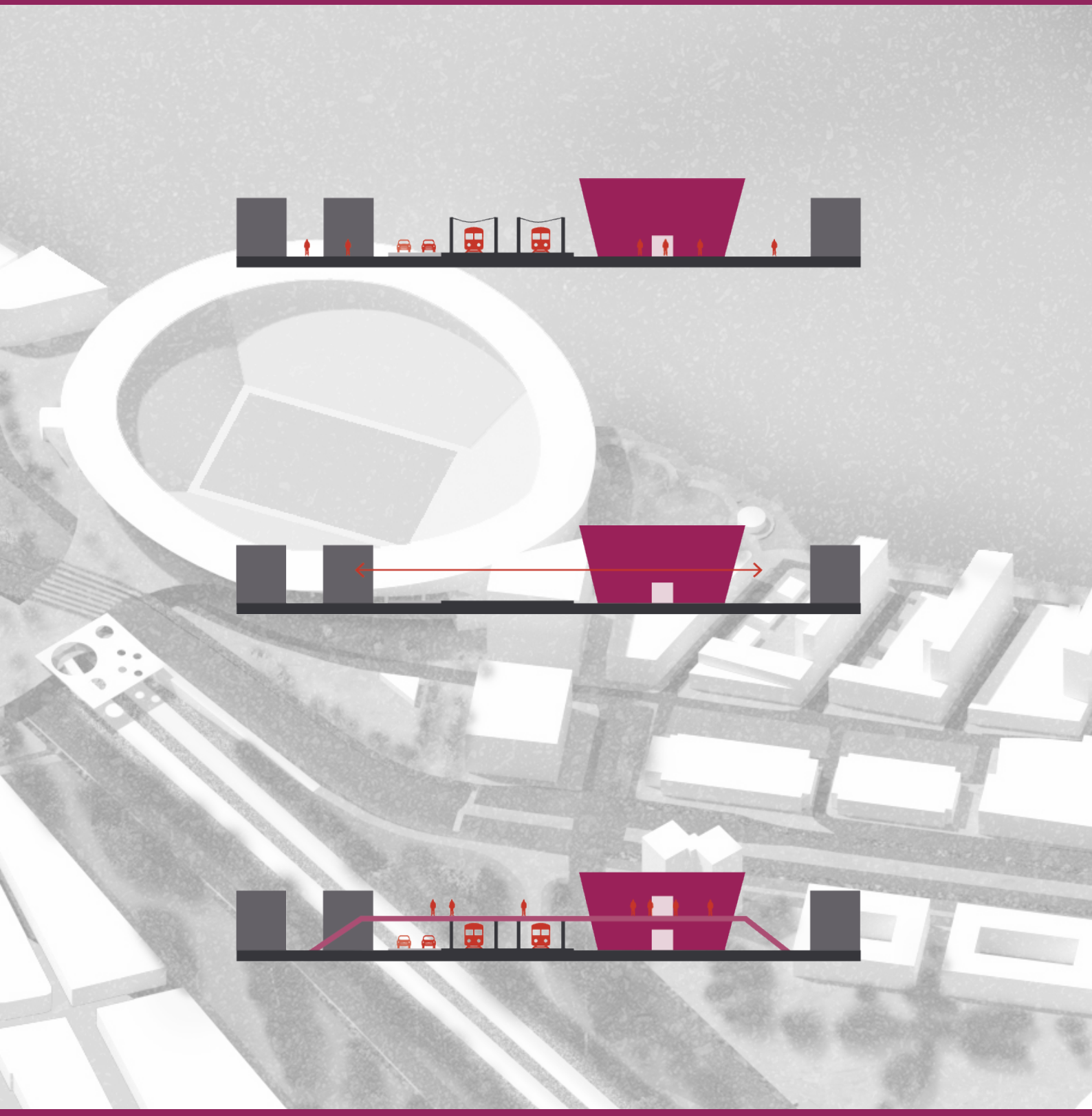
TOWARDS AN OLYMPIC LEGACY FOR ALL

REGENERATION ORIENTED DESIGN PRINCIPES FOR OLYMPIC LEGACY
ENHANCING THE SOCIAL SUSTAINABILITY OF THE HOST CITY



MSC THESIS, TU DELFT
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BOOK 02: DESIGN PRINCIPLES

TOWARDS AN OLYMPIC LEGACY FOR ALL
regeneration oriented design principes for Olympic legacy enhancing the social sustainability of the host city

BOOK 02: DESIGN PRINCIPLES

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Cover - Illustration of design principles "Bridge as connection stadium and city" (front) and "park and ride to the Olympic venue" (back) (by author).

PROLOGUE

Book 02 forms the conclusion to the research and design project and argumentation for several design interventions. Book 01 contains the research and design towards a social sustainability Olympic legacy. When reading the thesis, this collection of papers and drawings will help you through the design for Rotterdam South and Varkenoord-North, as it provides the argumentation for the proposed design interventions. It also forms an overview of all encountered design principles throughout the thesis research, therefore becoming a conclusion in itself. Hopefully this book can be read separately to the main thesis and still provide an engaging insight in the do's and don'ts in urban design for the Olympic Games. The conclusions of this book are aimed to help the IOC and future host-cities to design towards a little more social and citizen oriented Games. The image of the Olympic Games is mixed, a place for celebration during the event and dead silence after. Let's make the Olympic Games a celebration to everyone, towards an Olympic legacy for all.

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

1. - INTRODUCTION TO THE DESIGN PRINCIPLES

1.1 - The Olympic problem

The current image of the Olympic Games is twofold: On one hand it is the biggest and most prestigious sport event in the world; A two week event full of excitement, viewed from all over the world, representing the dream of Olympism "sport, effort and example as the mean to raise the overall standards of humankind"(IOC, 2017). Organizing the Games is very attractive, as it offers enormous international attention and possibilities to enable large funds for construction projects and urban development. However, the Olympic Games has also an image of empty sport venues and wasted investment. It creates dead spaces as the peak demand of the Games doesn't match the after event demand of the city, leaving unoccupied remnants of sport monstrosities. Still, these empty venues need maintenance and investment should be returned, leading to tax-raises for the citizens of the hosting city and burdening possibilities for further development. In the worst cases, the organization of the Olympic Games is blamed to exemplify the downfall of the state (as for Greece, Brazil) (Houthuijs, 2017).

In his paper 'The Mega-Event Syndrome: Why So Much Goes Wrong in Mega-Event Planning and What to Do About It', Muller (2012) argues how tendencies in the organization of mega-events affect the situation after the event, the legacy of the event. From his text three main stakeholder can be distilled regarding the Olympic Games;The International Olympic Committee, the Host-city and the Citizens of the host-city. All three have different aims supporting the organization of the Olympic Games. But while the IOC and the host-city are in power, the citizens are the most affected (Figure 1). This means that those who are most affected by the negative legacy of the Games, are not the ones who can make the decisions.

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.

By enhancing the social sustainability (the concept within the topic of sustainability that engages the "people") the Olympic Games can be researched as a valuable potential to the daily life needs of the host-city citizens.

Therefore the main question of the graduation research is: "How can design principles aiming for urban regeneration within Olympic legacy planning enhance the social sustainability of the city?".

1.2 - Approach of the graduation thesis

The methodology of the graduation project consisted of a 'research and framing' part and a design project. Within research and framing, the concepts of mega-event planning, Olympic legacy, urban regeneration and social sustainability and their interrelations are investigated. The results were further framed to their applicability to the field of Urbanism and concepts of Olympic legacy.

As a result the graduation project looked into the location of the Olympic Games, the construction projects and the created legacy.

The graduation project did so within the social sustainability aspects of 1) Housing & Environment, 2) Safety & Health, 3) Employment, 4) Education and 5) Identity. To this aspects spatial criteria for social sustainable urban design are proposed. The spatial criteria are also enclosed in this volume. These criteria are used to assess the social sustainability in the legacy of the 2012 Olympic Games in London. Out of this case study some of the proposed design principles derive.

The design project explored the social sustainability in the choice of location, required construction projects and future legacy of the Olympic Games for the city district of Rotterdam South. The vision for the Olympic Games on South was to create two Olympic locations (Zuiderpark and Varkenoord) with a strong social spinoff for the in between neighborhoods. Eventually a strategy implemented seven proposals for social legacy in Rotterdam South. The design for a part of the Olympic locations is framed by these strategic proposals towards a new identity as Feyenoord City. The location will be the transport, sport and city hub of Rotterdam South towards a more positive image for the city district.

Figure 1 - *During the organisation of a mega events, symptons as described by Muller (2015) mostly affect the citizens of the host city, while they often don't excersize the power that cause this consequencesv (own image)*

1.3 - Position of this book in the graduation process

This book forms the collection of design principles that derived from different smaller researches in the graduation thesis. It combines results from the case study to London, the strategy for Rotterdam South and the design of Varkenoord-North. This book also acts as a bridge between the theory and design, as it defines the principles which are used for the design. It should be used as an extensive side note to reading the graduation this. The book elaborates the specific social-spatial issues with Olympic design and principles to tackle them. As an extensive accumulation of principles of both theoretical as design research, it is also a conclusion to the main thesis. Together with the main thesis, Book 01 research and design project, this second book can be given to IOC for guidance in future Olympic projects a quest to create additional value to the organisation and legacy of the Olympic Games.

Not all of the proposed design principles are used in the design or will appear in the form as they are exemplified in this book. "Environmental systems guiding design" is exemplified by waterways in London, but can also be exemplified by the system of historical important roads; The context of a project is different every time. Therefore the proposed design principles aim to be generally applicable, to guide future editions of the Olympic Games towards a social sustainable legacy.

1.4 - Chapters in this book

The first chapter of this book gives an overview of the researched spatial criteria for social sustainability. These criteria provide the argument to the social sustainability of the proposed design principles.

The second chapter of this book elaborates about the design principles. Each design intervention is conducted through mentioning the spatial problem with Olympic design, the proposed intervention and the result. As every principle is backed up by examples of the problem and precedents of the proposal, it creates a solid argument. In the third chapter these principles are discussed to their applicability and to which extend they can be categorized. This discussion forms an conclusion to this final part of the graduation research.

2. - SPATIAL CRITERIA FOR SOCIAL SUSTAINABLE DESIGN

Within the main thesis the practical measures that serve as input for the case study analysis are defined., it is vital to know the spatial conditions on which each of the five social sustainability concepts (Housing & Environment, Health & Safety, Employment, Education, Identity) can thrive. This chapter will give an overview of the researched spatial criteria for social sustainability. These criteria provide the argument to the social sustainability of the proposed design principles.

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 measures. They argued that, in order to reach social sustainability, a multitude of their proposed 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 of buildings and public space, needs to support each other.

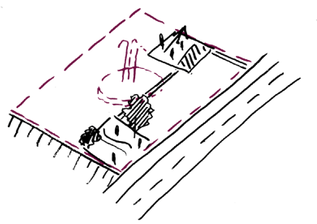


Figure 2 - *Sketch of ' Meaningful spaces' criterium*

2.1 - 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.

HOUSING & ENVIRONMENT

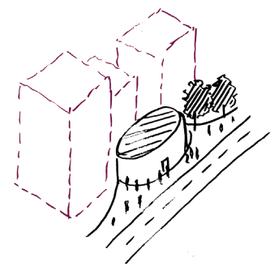


Figure 3 - *Sketch of 'Early provision of basic community services' criterium*

2.2 - 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.

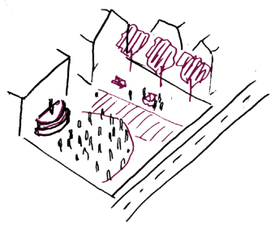


Figure 4 - *Sketch of 'Public & congregational spaces' criterium*

2.3 - 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.

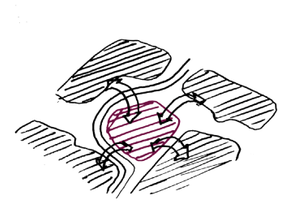


Figure 5 - *Sketch of 'Connections to neighboring communities' criterium*

2.4 - 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.

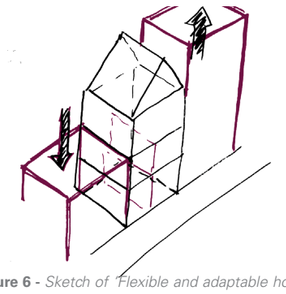


Figure 6 - *Sketch of 'Flexible and adaptable housing & buildings' criterium*

2.5 - 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.

Figure 7 - *Sketch of 'Low carbon infrastructure' criterium*

2.6 - 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.

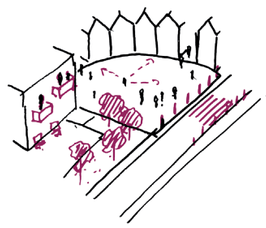


Figure 8 - *Sketch of 'People friendly layouts' criterium*

2.7 - 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*".

HEALTH & SAFETY

Figure 9 - *Sketch of 'Car free areas and speed reductions' criterium*

2.8 - 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.

Figure 10 - *Sketch of 'Transport and communication connections' criterium*

2.9 - 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.

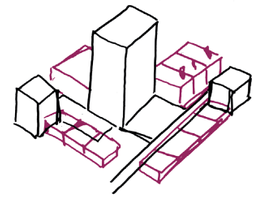


Figure 11 - *Sketch of 'Third spaces' criterium*

2.10 - 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).

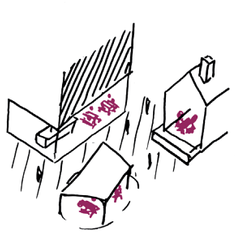


Figure 12 - *Sketch of 'Flexible workspaces' criterium*

2.11 - 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.

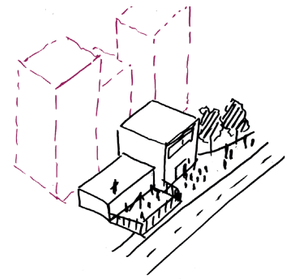


Figure 13 - *Sketch of 'Early provision of schools, nursery and childcare' criterium*

2.12 - 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.

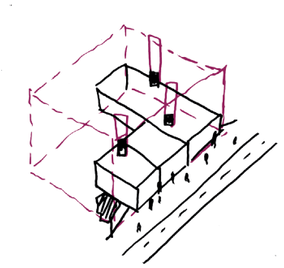


Figure 14 - *Sketch of 'Meaningful buildings' criterium*

2.13 - Meaningful buildings

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.

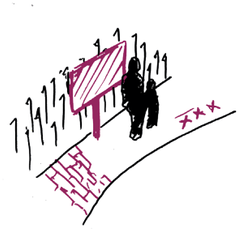


Figure 15 - *Sketch of 'Hyper local information' criterium*

2.14 - 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.

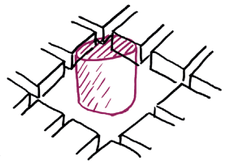


Figure 16 - *Sketch of 'Distinctive architecture, landscaping' criterium*

2.15 - 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.

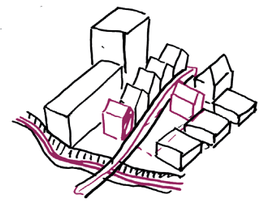


Figure 17 - *Sketch of 'Historical development' criterium*

2.16 - 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.

3. - OLYMPIC DESIGN PRINCIPLES

Through the graduation project design principles for social sustainable Olympic design are gathered. These design principles derive from either the case study on the London 2012 Games, the research on the design of the Olympic Programme, from the strategic proposals for Rotterdam South, from the design of the Games in Varkenoord-North, from some design exercises which are done throughout the year or a general spinoff idea that just might work. These design principles can be regarded as an advise or an logical implementation for the IOC in the aim to design for social sustainability oriented Olympic Games. Also, these design principles are fundament to design interventions for the Olympics in Rotterdam South.

The principles are explained from a spatial issue encountered in the organisation and legacy of the Olympics, supported by an example of the issue. Additionally, the proposed principle will be explained and its implications towards social sustainability and solving the initial problem. To make clear what the intervention might look like, a precedent for each principle is given.
This principle is also illustrated at the right page.

To be at least a little realistic, for each design principle one or more possible downsides are proposed.

For each design principle the relative impact and financial cost is given. This rating will reach from one to five points, either euros of plusses. Depending on length, width, country a design intervention can be more costly or less costly. Depending on a specific context the costs from implementing the design principle will differ. This categorisation doesn't aim for giving exact numbers, but to differentiate the relative cost of an intervention with another intervention. This makes comparison to the most effective principle possible.

Together the design principles form the core of this book and are meant as a reference in designing for an social sustainable Olympic Games.

3.1 - FORM OF STADIUM TO URBAN MORPHOLOGY

Situation
Currently the Olympic stadium doesn't conform to the urban morphology. Often it forms a large circular structure of even height, towering above the city skyline. Consequently this even height causes an equal distribution of visitors at each side when going to or leaving the stadium. If there is enough space, this is causes no problem, though in highly build environments, this form of distribution can cause environmental pressure and noise. Living environments with narrow streets are not capable of handling such amount of visitors.

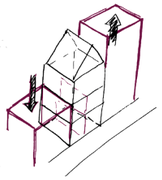
Design principle
Adjust the form of the stadium and space to the urban morphology around the stadium. Higher the stadium and situate more visitors to the side which contains large roads and high rise buildings offering more space. Lower the stadium to the side with narrow streets and low rise housing.

Result
In this way the stadium adapts to the urban functionality by distributing visitors by the capacity of the surrounding. Mentally the stadium also bridges the distinctions between both urban typologies.

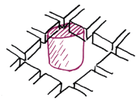
Phase: Construction phase
Costs: ++
Impact: +++
Downsides: Only a logical intervention in densely build urban environments.

Meets the following criteria for social sustainability:

H&E: Meaningful spaces



H&E: Adaptable housing and buildings



ID: Distinctive architecture, landscaping

Precedent
St. James Park Stadium, New Castle.
The higher side of the stadium, capable of hosting more than 50.000 spectators, is situated to the high rise typology on the east side. The lower West side is situated to the old, lower an more narrow constructed city centre.

Figure 18 - *St. James Park stadium, aerial view (retrieved from http://visitingnortheastengland.co.uk)*

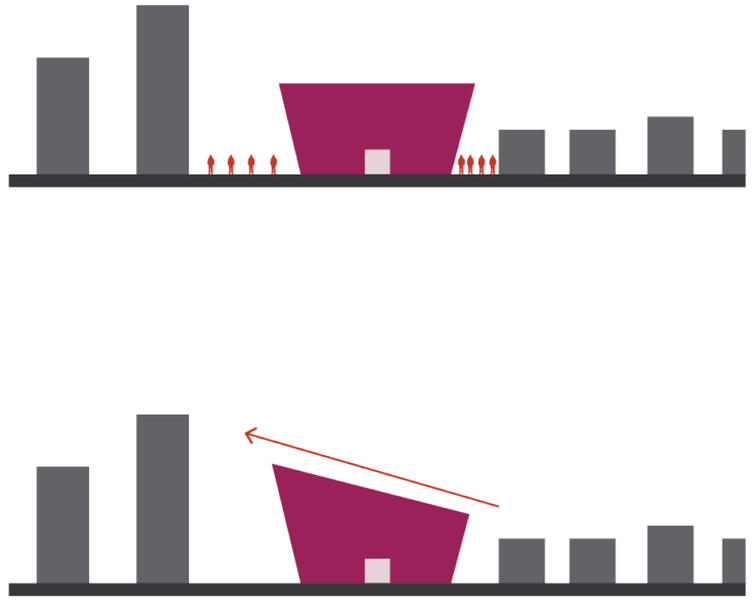


Figure 19 - *Drawn representation of design principle 'Form of stadium to urban morphology'*

3.2 - ADDITIONAL LOGISTIC DECKS

Situation
In order to properly facilitate an event, the stadium needs space for logistics services, as well as it needs space to handle all visitors securely. Often visitors can enter from multiple entrances around the stadium. If these measurements are all positioned on one level, the space needed for proper logistics of goods, athletes, visitors and security is multiplied. This logistic space remains empty at the end of the event.

Design principle
Construct another level (or even more) around the stadium for the routing of visitors. Create clear and controllable entrances to this additional floor.

Result
By constructing an additional level, the amount of visitors on ground level is decreased. In return the additional floor reduces the space needed around the stadium for logistics. Spaces can be separated, used smoother, as well as safety is improved by increased amounts of escape routes. The risk of large empty spaces is reduced and can even be filled in by shops related to event or environment.

Phase: Construction phase
Costs: ++
Impact: +++

Downsides: Area under the raised floor can be an unplaesent and unsafe place. This can be prevented by situating the additional rings inside the facade of the building.

Meets the following criteria for social sustainability:

H&E: Meaningful spaces

H&S: People friendly layouts

Issue
Kuip Stadium, Rotterdam.
One level needs to handle all logistics related to organising an event. Although this space is flexible in organisation, the required space is still tremendously large.

Figure 20 - *Kuip stadium, aireal view (retrieved from http://www.roeldijkstra.nl)*

Precedent
Maracana Stadium, Rio de Janeiro.
The three additional rings, situated inside the facade of the stadium, regulate the flow of almost 80.000 spectators. Several controlled rises are attached around the stadium.

Figure 21 - *Maracana stadium, multiple rings for distributing visitors (retrieved from http://www.gettyimages.nl).*

Figure 22 - *Drawn representation of design principle 'Additional logistic decks'*

3.3 - STADIUM AS MULTIPLE SECTOR CLUSTER

Situation
A stadium is often only used for large events, which leaves it unoccupied for most of the time. If the demand isn't high enough, the stadium isn't profitable enough for urgent maintenance and upkeep. Eventually the lack of maintenance leads to decline. Degraded buildings are even less attractive for usage and valuable investment in a stadium is at risk.

Design principle
Integrating other sectors of employment, education, health care into the building or closely around. Parts of the sectors that are related to sport, is clustered around it. Non-sport related sectors can also be clustered around the stadium.

Result
The integration of other sectors related to sport increase the demand and therefore the usage of the stadium. It also secures the place and the city as a prime spot for sport development. Integration of non-sport related sectors, such as schools, can secure the importance of the public space as well the stadium for the citizens.

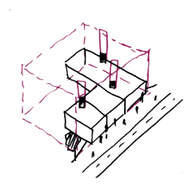
Phase: Construction phase & Short- + Long legacy phase
Costs: ++
Impact: ++++

Downsides: A new spot for sport development can unbalance other sports clusters on national level

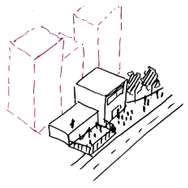
Precedent
AbeLenstra Boulevard, Leeuwarden
The stadium is a part of several sport facilities, sectors related to sports and companies related to sport. This sport cluster created a demand and a healthy image that attracted further investment to the site, from accountant offices, financial corporations to catering. These companies gain interest and profit from the imagery and in return can benefit sport clubs by sponsorship.

Figure 23 - *AbeLenstra boulevard, stadium on the right, with sportcluster "Sportcity" attached to it. On the left emerging offices (retrieved from http://grootheerenveen.nl)*

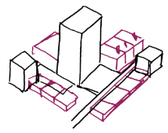
Meets the following criteria for social sustainability:



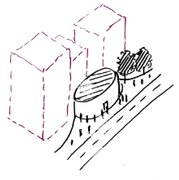
EDU: Meaningful buildings



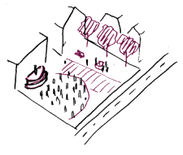
H&E: Early provision of basic community facilities



EMP: Third spaces



EDU: Early provision of schools, nursery and childcare



H&E: Public & congregational spaces

Figure 24 - *Drawn representation of design principle 'Stadium as multiple sector cluster'*

3.4 - PARKING WITHIN A STADIUM

Situation
The Olympic stadium can host up to 100.000 visitors, which can take multiple transport modes. Often a lot of visitors come by car and need a parking space in proximity of the stadium. This creates the need for large amounts of parking spots, which in turn cover much of the space around the stadium. These parking spots are often deserted when there is no event taking place and occupy space which can be used for more social sustainable purposes.

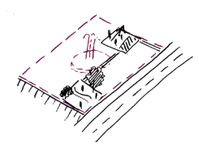
Design principle
Integrate parts of the required parking space into the stadium. The stadium host a large space under the tribunes, which is used for logistics, but a part can also be used to host a parking garage.

Result
By integrating a multiple deck parking space inside the stadium, the amount of ground level parking spaces outside the stadium can be reduced, saving valuable space around the building. Visitors can park their cars even closer to the event and have to walk shorter distances. The issue of an open empty space besides event time, is kept within the building. During this time period, these inside parking spaces can be used to accommodate tourists to the city and create a form of revenue.

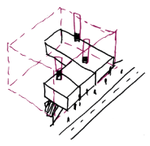
Phase: Construction phase
Costs: +++
Impact: +++++

Downsides: Relative high costs compared to ground level parking spaces

Meets the following criteria for social sustainability:



H&E: Meaningful spaces



EDU: Meaningful buildings

Issue
Bara Olympic area, Rio de Janeiro
The entire west side of the Bara area almost solely consists of one level parking space, covering a large amount of the park. Now the Olympics are over, the asphalt parking spaces remain empty and unattractive.

Figure 25 - *Bara Olympic complex, parking places on the bottom half of the image forming a large part of the complex (retrieved from http://www.orgcharting.com/)*

Precedent
St. James Park Stadium, New Castle.
Together with multiple smaller parking spots throughout the city centre of Newcastle, a parking garage at the back of the stadium, located inside the higher part of the building, offers parking space to a substantial amount of visitors by car. As it reduces ground level parking space, it respects the existence of a large, valuable park within this densely build city structure.

Figure 26 - *St. James park, parking places inside the back of the stadium, integrated within the building (retrieved from http://alamy.com)*

Figure 27 - *Drawn representation of design principle 'Parking within a stadium'*

3.5 - STADIUM AS TRANSPORT HOTSPOT

Situation
In order to facilitate good visitor transport at the Olympic Games, a large public transport node is the bare minimum. This node increases commuting possibilities for inhabitants as well increases accessibility to the area. Still, these transport stations are placed between park and neighborhood. This placement diminishes usage of the park after the event as there is no need to cross the area.

Design principle
Place the important transport node in very proximity of the stadium, even under the building itself. Preferable the international transport node is a train station, usable for international trains and national trains.

Result
By placing the station in very proximity of the stadium, usage of the space around the stadium is guaranteed. It increases the importance of the place in daily activity as well as it increases the changes for development on the spot. The stadium can serve as architectural beacon for the station.

Phase: Construction phase
Costs: ++++
Impact: ++++

Downsides: Infrastructure projects often form the highest expenses for hosting the Olympic Games. This option is only suitable when the transport node doesn't lose its convenience. Only effective when build in densely inhabited environment.

Issue
Stratford International, London
Build for the 2012 Games, Stratford international is very well connected to Stratford station, hosting the trainline to London City Airport, but keeps daily commuters away from the Olympic park as it is situated on the edge of the park.

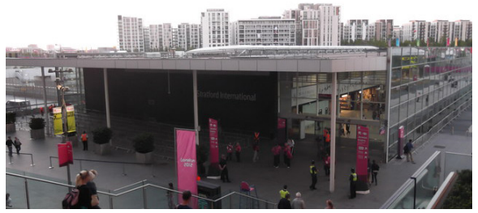
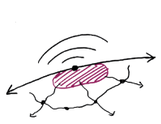


Figure 28 - *Stratford international station with the former Olympic Village in the back, commuters in the front (retrieved from http:/ geograph.org.uk)*

Precedent
Bijlmer Arena station, Amsterdam
As a large station in proximity of the Amsterdam Arena, it not only accommodates the visitors of the Arena, which have to walk a short distance, but also serve the in between shopping centre as well as the surrounding business park and entertainment venues. On larger scale it serves the neighborhoods of Amsterdam Zuid-Oost.

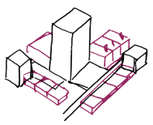
Figure 29 - *Bijlmer Arena station and Amsterdam Arena, in between the shopping strip and around the business park (retrieved from http:// medias.photodeck.com)*

Meets the following criteria for social sustainability:

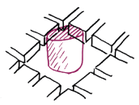


EMP: Transport and communication connections

H&S: Low-carbon infrastructure



EMP: Third spaces



ID: Distinctive architecture, landscaping

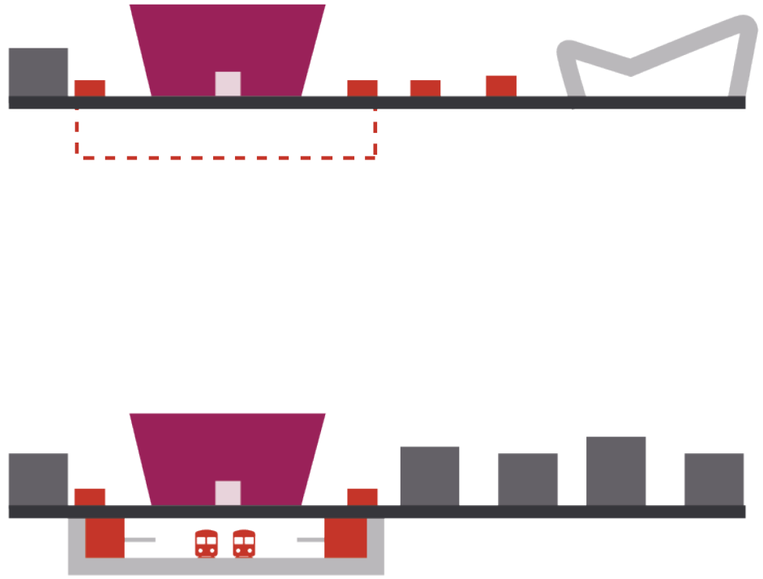


Figure 30 - *Drawn representation of design principle 'Stadium as transport hotspot'*

3.6 - BRIDGE AS CONNECTION STADIUM AND CITY

Situation
In order to handle all increased traffic during the Olympic Games, as well as facilitating Olympic lanes for athletes transport, extensive infrastructure is required. This means extensive highways and multiple track railways. These transport structures reduces the accessibility of the site on local level. Bridges and tunnels for slow traffic are required to overcome these (local) barriers and improve the local routing.

Design principle
Connect a bridge that cross massive infrastructure directly with the stadium, either on ground level or above according to circumstances.

Result
The direct connection between stadium and the bridge crossing large infrastructure, creates direct access to the stadium on local level. After the event, the stadium becomes a part of the daily routing system, facilitating the local connection between both sites. Programme attached to the stadium can make profit out of this important connection/path between neighborhoods.

Phase: Construction phase

Costs: +++
Impact: +++

Downsides: Bound to specific circumstances; The stadium needs to be close to large infrastructure, otherwise this intervention becomes too costly and unnecessary.

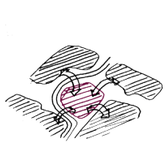
Issue
Bara Olympic complex, Rio de Janeiro
Although multiple bus stations are built on the road, connecting the area on larger scale, the 60 meter wide road can only be crossed each half a kilometre.

Figure 32 - *Construction of the road (retrieved from http://www.metro-magazine.com).*

Precedent
Emirates stadium, London
The Emirates stadium lies just outside the centre of London in between two trainlines to Finsbury Park. The stadium is attached on one side to a major road and two bridges cross the lower train line on the East side. The bridges and the deck around the stadium form a valuable shortcut in between these two lines as well as it serves the stadium highly in case of a football match. Around the stadium are commercial and hospitality spaces as well as several housing complexes (Populous, 2017).

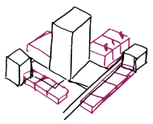
Figure 31 - *Emirates stadium aerial picture, left the two crossing bridges to the stadium deck and the major road to the right (retieved from http://populous.com).*

Meets the following criteria for social sustainability:



H&E: Connections to neighborhoods

H&S: Low-carbon infrastructure



EMP: Third spaces

H&S: Car free areas and speed reductions

Figure 33 - *Drawn representation of design principle 'Bridge as connection stadium and city'*

3.7 - FOOTPRINT AS SERVING REMINDER

Situation
In order to accommodate all sports and disciplines within the Olympics, a multitude of smaller and bigger halls are constructed. Not all should be permanent, as the offer of sport facilities doesn't match the demand within the host-city. Keeping the hall as an permanent structure without occupation is costly and condemned to decay. Making it an temporary structure, the change rises that the place isn't memorized for its Olympic importance and returns to normal without an Olympic thought attached to it.

Design principle
Use the fundament or outer footprint of the temporary hall as an outline of the structure in the public space. This can simply be a line, but also an important structure serving other purposes.

Result
By removing the temporary structure, but keeping the outline, users of the space are reminded of the former presence of the hall and will be kept confronted with the Olympic thought. By making it a structure supportive to other systems, for example a large water square for rainwater storage, makes the hall adaptable and useful structure instead of unnecessary cost.

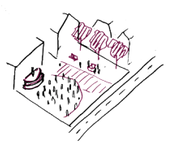
Phase: Construction phase, short legacy phase

Costs: ++
Impact: ++++

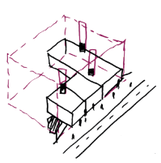
Downsides: The investment in rising a temporary hall needs to be returned one way or another

Meets the following criteria for social sustainability:

H&E: Early provision of basic community facilities

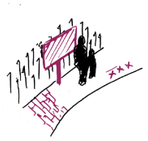


H&E: Public & congregational spaces

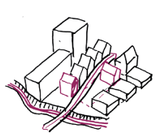


EDU: Meaningful buildings

H&S: People friendly layouts



ID: Hyper local information



ID: Historical development

Idea
Caulfield campus green, Melbourne
Although there are no existing examples found from Olympic halls that are transformed into still recognisable public space, the Caulfield campus green project shows an image of how this could look like. The former hall/stadium would be in this case a much used oval structure, which in turn is still present in the environmental composition. Utilising this space for healthy activity or other public services create a demand as well as a purpose for this place.

Figure 34 - *Caulfield campus green, visualisation of the completed project, a recreation space with right a hard structure for excersition, left a resting place and a terrace (retrieved from tcl.efront-flare.com)*

Figure 35 - *Drawn representation of design principle 'Footprint as serving reminder'*

3.8 - STRUCTURAL REMNANTS AS MULTI-USE SPACE

Situation
In order to accommodate all sports and disciplines within the Olympics, a multitude of smaller and bigger halls are constructed. Not all should be permanent, as the offer of sport facilities doesn't match the demand within the host-city. Keeping the hall as an permanent structure without occupation is costly and condemned to decay. Making it an temporary structure, the change rises that the place isn't memorized for its Olympic importance and returns to normal without an Olympic thought attached to it.

Design principle
Making urban roof though a semi-temporal constructed hall. The walls can be deconstructed until only a roof is present covering a large hardened area used for multiple purposes.

Result
By removing the temporary structure, but keeping the roof, the Olympic thought is still physically present, but is used for other options. The roof forms a protected public area, which can be used for multiple activities; for example markets, playgrounds, temporary parking, sport activities and other smaller scaled events. The large open flexible space makes it possible for temporal shops and structures to be build. The multitude of possibilities for this covered space makes it an important point for the surrounding neighborhoods.

Phase: Construction phase, short legacy phase

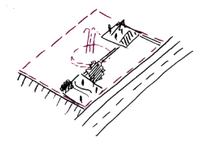
Costs: ++
Impact: ++++

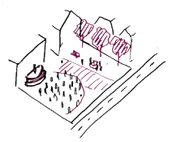
Idea
Marcet del Encants, Barcelona
Although there are no existing examples found from Olympic halls that are transformed into a roofed public space, Marcet del Encants shows an image of how this could look like. Although this structure is only used four times a week for the famous flea market, it shows the proposed principle very well; A large roof above the centre of activity. Its structure is very light and open to the surrounding. Besides the occupation of the flea market, the area could support other events as well.

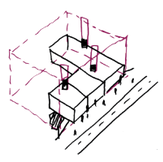
Figure 36 - *Marcet dels Encants, the roof covers the flea market, securing a continious market in every weather (retrieved from http://wwww.guiding-architects.net).*

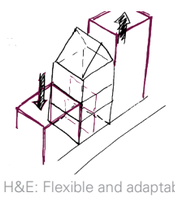
Downsides: The investment of rising a temporary hall needs to be returned one way or another
The structure must not create an dark and unsafe spot; Light is a very important issue.

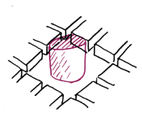
Meets the following criteria for social sustainability:


H&E: Meaningful spaces


H&E: Public & congregational spaces


EDU: Meaningful buildings


H&E: Flexible and adaptable housing & buildings


ID: Distinctive architecture, landscaping

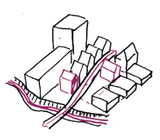

ID: Historical development

Figure 37 - *Drawn representation of design principle 'Structural remnants as multi-use space'*

3.9 - VISIBILITY OF DEPLOYED ACTIVITIES

Situation
In order to accommodate all sports and disciplines within the Olympics, a multitude of smaller and bigger halls are constructed. The structures often stand alone, with blind facades, as block occupying the surrounding space. Through this blind facades it is not possible to view what is going inside the building. Therefore the hall does not attract interest and/or participation from the people outside.

Design principle
Make the facade transparent where possible, but remain the conditions for top sport or try to think of other encouraging ways to attract attention and mental participation from the people on the street.

Result
Making the facade interactive or translucent involves the people on the street by showing what is happening inside. The spectators take active notice of what activity is going on and can be attracted to it, even supported in doing to same. In any case the closed and anonymous block becomes part of the spectators control on the street, increasing a feeling of security.

Phase: Construction phase, short legacy phase

Costs: ++
Impact: +++

Downsides: Chance of extra measurements to be taken in order to secure the right sport conditions inside.

Precedents
Olympic aquatic centre, London
Designed by Zaha Hadid, the swimming pool was transformed after the Olympic Games of 2012; Additional tribunes were removed and a glass facade was created, increasing the dramatic experience of the roof, but also gives an insight in the swimming activities inside the building.

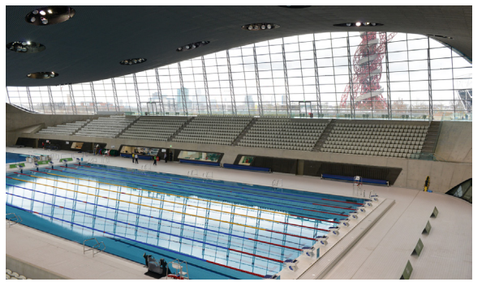


Figure 38 - *Olympic aquatic centre, open to the public everybody can make use of this pool or gazing to it trough the glass facade (retrieved from https://www.standard.co.uk).*

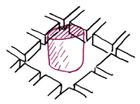
Ziggo Dome, Amsterdam
Designed by Benthem Crouwel, the Ziggo dome is used for music concerts up to 17.000 visitors. Located near other big event venues, such as the Amsterdam Arena, the facade is entirely covert with led-lights to attract attention. These lights act as giant tv-screen giving information about events in the near future.

Figure 39 - *Ziggo Dome, the screen informs visitors by individually lightning one of the 840.000 led lights (retrieved from http://www.guiding-architects.net).*

Meets the following criteria for social sustainability:

H&S: People friendly layouts

ID: Hyper-local information



ID: Distinctive architecture, landscaping

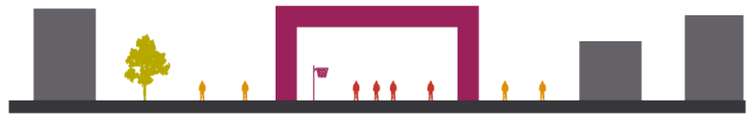


Figure 40 - *Drawn representation of design principle 'Visibility of deployed activities'*

3.10 - PARK AND RIDE TO THE OLYMPIC VENUE

Situation
The Olympic Games are held at multiple venues. Each of the venues host vast parking spaces to accommodate the visitors by car, occupying valuable space. Roads to these venues are enlarged to accommodate the surplus of traffic during the Games. All these car-related interventions act high pressure on the local urban environment. This car-related space is often only necessary during the event.

Design principle
Create a central temporary parking spot outside the density of the city, near the highway and/or an upgraded train station. From this point and between the venues visitors can access the Olympic venues from an extensive network of bike paths and multiple forms of public transport.

Result
Interventions made for public transport and bike paths decrease the environmental pressure around the Olympic venues and serve the city after the event by offering low-carbon infrastructure. Not only the parking spaces are reduced, but also the roads to the events can keep proportional dimensions that suit the demand of the city. The temporal parking spots can be redeveloped to create new neighborhoods with excellent connections to the city.

Phase: Construction phase, short legacy phase: long legacy phase

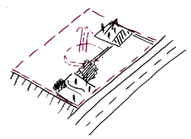
Costs: +++
Impact: +++++

Precedents
Greenway, London
The trajectory of a former sewage pipe is transformed into a walkway/bike path through the city of several kilometres, connecting different neighborhoods as it offers a car free continuous path from the sewage plant near the London City Airport to the Olympic Park. During the event this path was upgraded and used as one of the entrance routes, along its trajectory several temporal parking spaces were located. The greenway is now a valuable ecological, slow traffic strip.

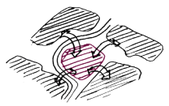
Figure 41 - *Greenway, near the Olympic park, the upgrade added a distinctive bike and footpath as is entirely uninterrupted by roads (retrieved from http://www.urban75.org).*

Downsides: Additional travel time as visitors need to park relatively far away and switch transport module.

Meets the following criteria for social sustainability:

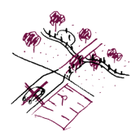


H&E: Meaningful spaces



H&E: Connections to neighboring communities

EMP: Transport and communication connections



H&S: Car free areas and speed reductions

H&S: Low carbon infrastructure

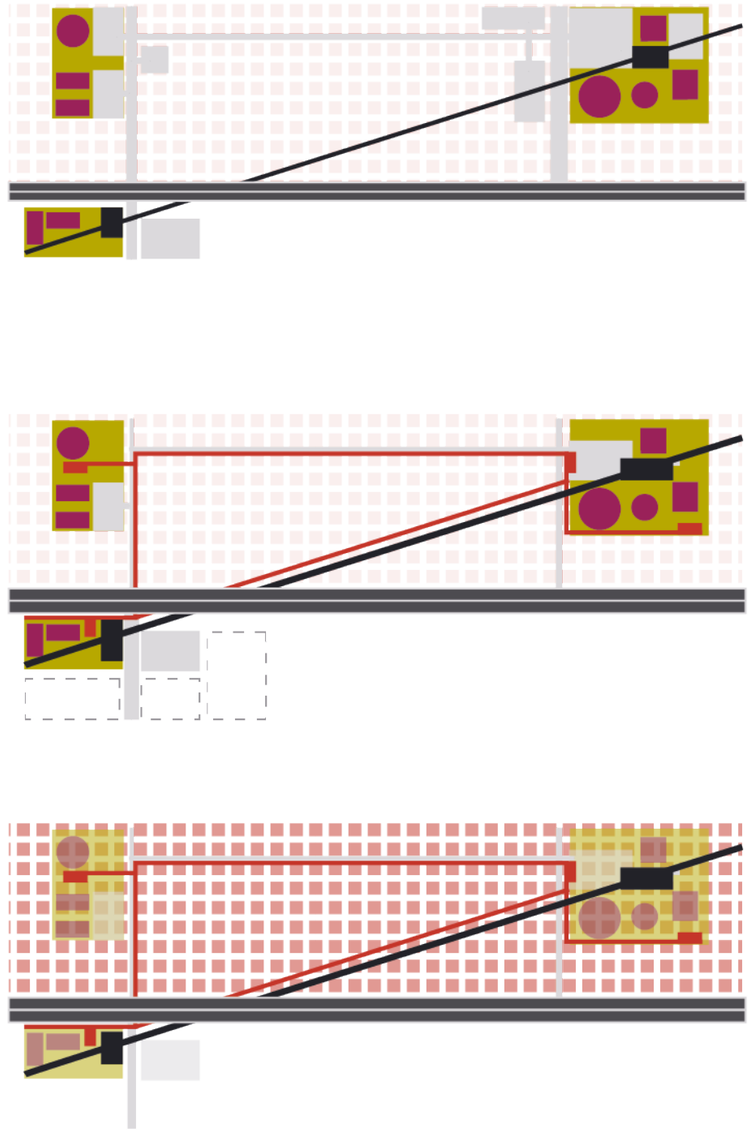


Figure 42 - *Drawn representation of design principle 'Carpool to the Olympic venue'*

3.11 - SPACE FOR HUMAN-SCALED DEVELOPMENT

Situation
In order to distribute all visitors to the Olympic park without any congestions, the paths should be wide enough. The central path, the Olympic axis, is at least 40 meter wide. The more stadiums attached to this axis, the more space is required for visitor flows. After the Games, just a fraction of that amount, will make use of the Olympic axis. This results in enormous amounts of paved surface used by just a few, contributing to a feel of emptiness and desolation. Space which can be used in a better way.

Design principle
A part of the paths should be paved with ease to remove concrete slabs during the event. This temporary pavement should be easily removed and preferable reusable somewhere else.

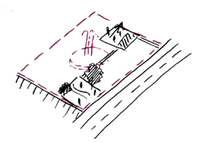
Result
By building the path out of removeable slabs, the paths can be adjusted to the amount of visitors after the event. The newly uncovered area could be developed into a pleasant park or housing, according to the needs of the city. By reducing the width of the path, the feeling of emptiness is tackled.

Phase: Construction phase, short legacy phase: long legacy phase

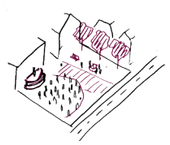
Costs: ++
Impact: ++++

Downsides: Requires redevelopment investments, besides the investment in the construction of the Olympic park itself.

Meets the following criteria for social sustainability:

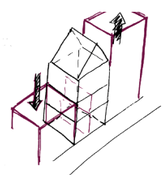


H&E: Meaningful spaces



H&E: Public & congregational spaces

H&S: People friendly layouts



H&E: Flexible and adaptable housing & buildings

Issue
Barra Olympic park, Rio de Janeiro
The Olympic complex of Bara almost entirely consist of hardened & paved surface. In its design it is not planned to remove the Olympic axis, which consist entirely of concrete, not hosting any environmental quality anymore.

Figure 43 - *Barra Olympic park, the Olympic axis in the middle (retrieved from https://architectureofthegames.net).*

Precedent
Queen Elizabeth Olympic park, London
Ironically, a better example how to transform an Olympic park was showed just 4 years prior to the Olympics in Rio de Janeiro. Large parts of the Olympic axis and bridges were easily removed after the Olympic Games in London. In return a lush park in the middle of the metropole was created. Other parts of the axis are developed to living areas.

Figure 44 - *Queen Elizabeth Olympic Park, the Olympic Axis is transformered to an integral, human scaled, part of the park (retrieved from http://www.lda-design.co.uk).*

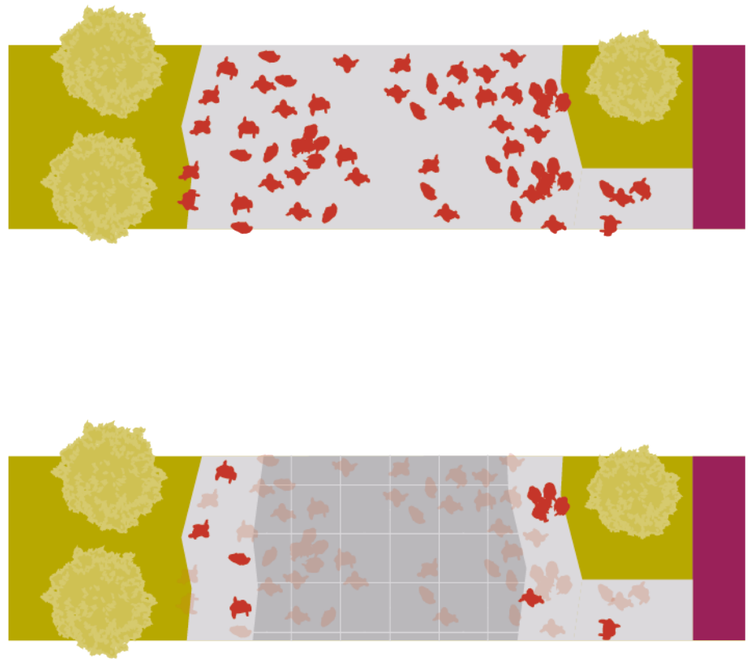


Figure 45 - *Drawn representation of design principle 'Space for human-scaled development'*

3.12 - ENVIRONMENTAL SYSTEMS GUIDING DESIGN

Situation
The construction of the Olympic Games is considered as a prestige project. The architecture and design of the Games is often prone to be a showcase of this prestige and desire to display the might of the nation; Large wide walkways, enormous space occupation, and demolishment of present structures, without regard any historical relevance or quality of the place, neither the wellbeing of its inhabitants.

Design principle
Determine landscapes, environmental structures or buildings to be preserved while constructing the Olympics. The design of the Olympic venue should follow this historical and environmental guidelines.

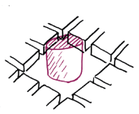
Result
Respecting the environmental context within the design of the Olympic venue not only preserves historical relationships and systems, but also use this specific situation as chance to add unique quality to the Olympic park. The systems can be reinforced, increasing the quality of the environment. The hall will not only to serve its immediate context, but also the host-city, for example water storage or ecological networks.

Phase: Bid phase, Construction phase

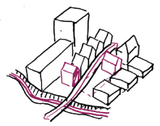
Costs: ++++
Impact: ++++

Downsides: It becomes harder to meet the requirements of the IOC as design space is limited

Meets the following criteria for social sustainability:



ID: Distinctive architecture, landscaping



ID: Historical development

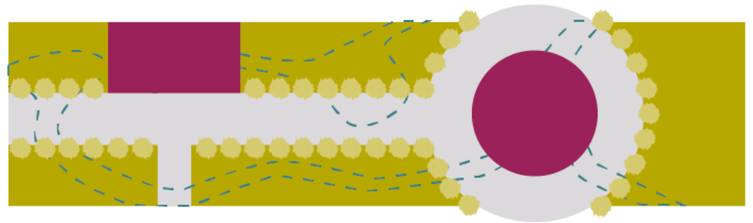
Issue
Olympic park, Beijing
In order to create the Olympic park, the city of Beijing demolished thousands of historical housing, to clear up land for the construction of the park. It consist of a large venue and an artificial park. While almost three times bigger than a normal Olympic park, it neglected historical social and environmental systems severely.

Figure 46 - *Beijing Olympic Park, start of the Olympic axis (retrieved from http://img.timeoutbeijing.com)*

Precedent

Queen Elizabeth Olympic park, London
The Olympic park is situated on a former polluted industrial site. By constructing the venue, the environmental conditions are highly improved as the site turned into an ecological and recreational corridor, the waterways are guidelines for the design. It embraced some historical industrial buildings, but development around the site, threatens the present social situation by gentrification.

Figure 47 - *Queen Elizabeth Olympic Park, area between stadium and aquatics centre with the preserved waterbanks (retrieved from https://www.gardenvisit.com).*



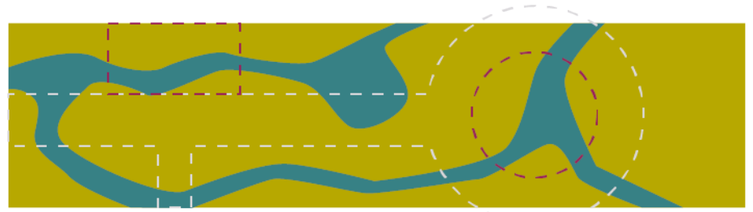


Figure 48 - *Drawn representation of design principle 'Environmental systems guiding design'*

3.13 - ATTRACTIVE SPACE BY FLOW REGULATION

Situation
The Olympic park is a cluster of sport venues and supportive structures. The matches during the Olympic Games attract visitors as well as the presence of the Games itself attract people to the site. Match attendants and day tourists together visit the park and form the main flow within the park. The match attendants need to be separated from the crowd and distributed evenly across the entrances of the sport complex. With more than 100.000 people at the same area, this logistic space covers a large area.

Design principle
Split paths into flows related to visitors attending the match, as well as the main axis and the other purposes. Instead of a large open area, several smaller paths are created.

Result
Smaller paths mean more space for in between landscaping, creating a more human scaled path and enjoyable environment during and after the event. By splitting flows, logistic space can be reduced as visitors are more targeted towards the entrances of the venue. It facilitates to design different destinations for each path.

Phase: Construction phase

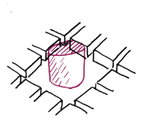
Costs: ++++
Impact: +++

Downsides: Total required area increases, due to in between landscape features, but it adds distinctive quality to the park.

Meets the following criteria for social sustainability:

H&E: Meaningful spaces

H&S: People friendly layouts



ID: Distinctive architecture, landscaping

Issue
Olympic park, Athens
The main axis at Olympic park in Athens is formed by the outer ring around the stadium, from which a large unattractive asphalt open area guides the visitors to several entrances, from which it has to go uphill and another logistic ring. After the event all hardened, open space wasn't of use anymore.

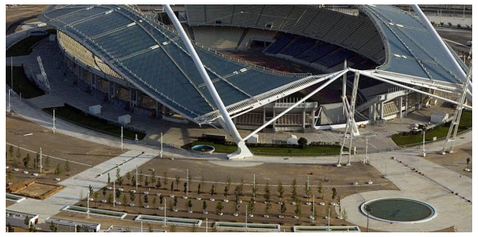


Figure 49 - *Olympic park, rings around the Olympic stadium (retrieved from https://www.olympicgamesathens2004.com).*

Precedent
Queen Elizabeth Olympic park, London
During the Olympic Games, the Olympic axis, guiding the main flow, was supported by several smaller side paths leading to the river Lea. The paths formed two till three supportive systems on each island and are connected by bridges. Each sport complex is supported by its own path from the park entrances. In this way, flows are guided towards their main target.

Figure 50 - *Queen Elizabeth Olympic Park, secondary routes during the Olympic games (retrieved from https://www.gardenvisit.com).*

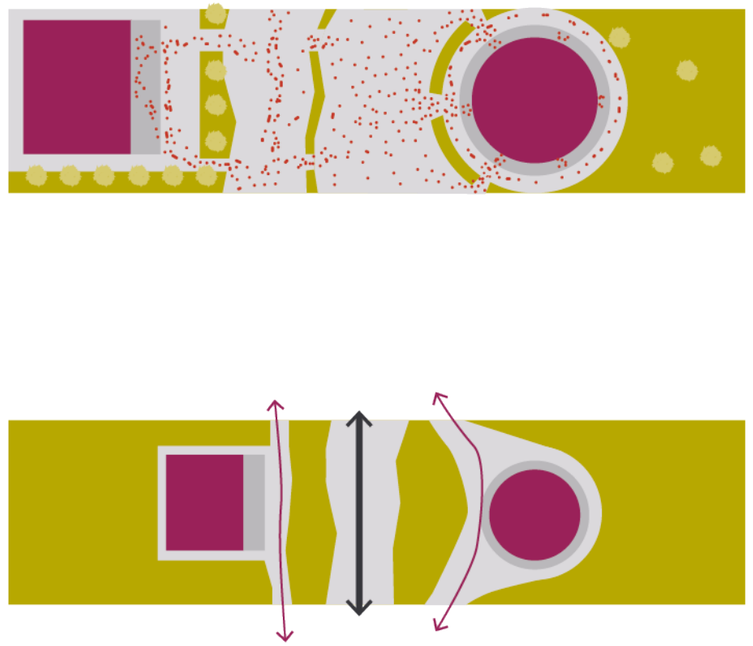


Figure 51 - *Drawn representation of design principle 'Attractive space by flow regulation'*

3.14 - VILLAGE PARK AS NATURAL TRANSITION

Situation
The accommodation of the Olympic village consists of housing blocks for 18.000 attendees, supporting services a park for recreation and training facilities. Often the housing blocks are concentrated around a central park. In this way during the event, every athlete has good access to leisure and training. After the event this enclosed park is a closed entity without convenient connections to its surrounding, Therefore this park and training complex is perceived in ownership by the residents of the village, while meant as a public park.

Design principle
Change the position of the Olympic park to one side of the park, between the Olympic Village and the city structure. After the event the park and training facilities become public space.

Result
By placing the park in between the Olympic Village and the city structure, it connects both sides and creates equal access to leisure and training facilities. During the Games it will be fenced off but after the event it becomes a shared space between the existing city and the newly developed city, instead of an alienated, semi-private space. Creation of accessible recreational green increases the value of the neighborhoods. A new trainings complex can be the drive to increase sport participation within adjacent neighborhoods.

Phase: Construction phase, short legacy phase

Costs: ++
Impact: +++

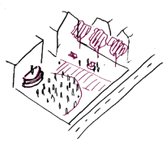
Downsides: Athletes have to walk further to the training and leisure facilities.

Issue
Olympic village, Rio de Janeiro
Build outside the city, near the Olympic park at Barra, the former Olympic Village of Rio de Janeiro 2016, forms an distant entity. It is a small city in itself, on itself, distant within the landscape. The eventual goal is to develop the whole Barra region, but up till now it stays isolated. The beautiful park remains enclosed by the village buildings, hidden from outside and to private use by the residents of the Village.

Figure 52 - *Olympic Village Rio de Janeiro, 20 - storey high buildings surround the park between, the area around the village still remains undeveloped (retrieved from http://www.ctbuh.org)*

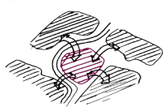
Meets the following criteria for social sustainability:

H&E: Early provision of basic community facilities

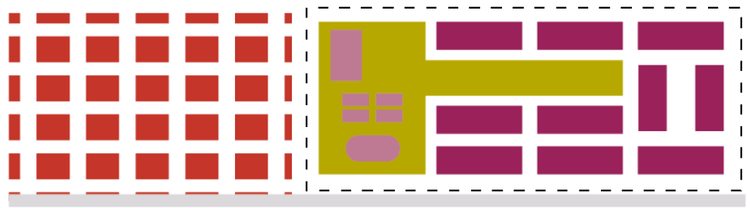


H&E: Public & congregational spaces

H&S: People friendly layouts



H&E: Connections to neighboring communities



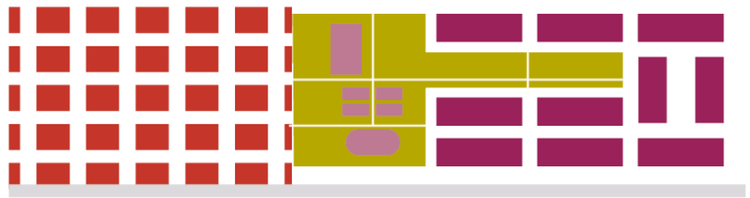


Figure 53 - *Drawn representation of design principle 'Village park as natural transition'*

3.15 - SECURITY INTERVENTIONS THAT CONNECT

Situation
Since the terrorist attack at the Games of 1972 (killing 5 Israelian athletes, 6 coaches and a police member) security is a hot topic at the Olympic Games. Together with the increasing insecurity of society, the IOC demands increasing amounts of security measures. The Olympic Games becomes a fortification during the Games, leaving a footprint to the design. The security area around the Olympic Village isn't of use after the Olympic Games. The security space demands a new destination.

Design principle
Change the area used for security measures to transport oriented interventions, on the local scale as well as the scale of the city.

Result
Protective boundaries, designed to keep people out the village, are now used to let people in. Neighbouring communities can make use of the high-quality services that are provided by the former Olympic Village. This can be stimulated by a bus line or high-speed bike paths, but shouldn't be used for more car-oriented roads. Shops profit from the increased access and image of the place. Inhabitants of the Olympic Village have improved access to the city, which increases their changes to employment, proper education etc.

Phase: Short legacy phase, long legacy phase

Costs: +++
Impact: +++

Downsides: Requires public investment after the Games.

Issue
Olympic village, Rio de Janeiro
Due to prevention against terrorist attacks, it is hard to find examples of security areas and its design within the Olympic Village. Therefore it is hard to indicate what is done to transform this space and also exemplify this design principle. To protect the Olympic village in Rio de Janeiro, except for gates and pavilions where athletes upon entrance is checked, it also had multiple levels of walls, elevating the whole complex from ground level, creating individual islands of security measures. Although a rather elegant solution, it distant the complex from the public space. Also additional fences, keeping a save border, doesn't add to the feeling of being welcome and safety.

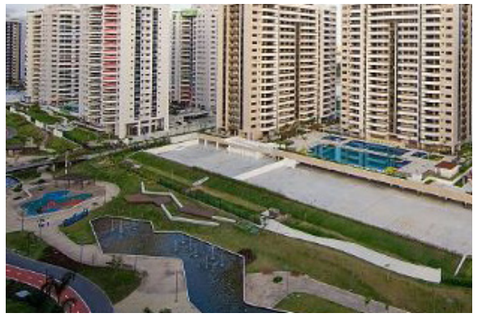
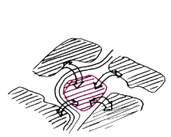


Figure 54 - *Olympic Village Rio de Janeiro, different protective interventions are visible in the middle of the image (retrieved from http://www.gettyimages.nl).*

Meets the following criteria for social sustainability:

H&S: People friendly layouts

EMP: Transport and communication connections



H&E: Connections to neighboring communities

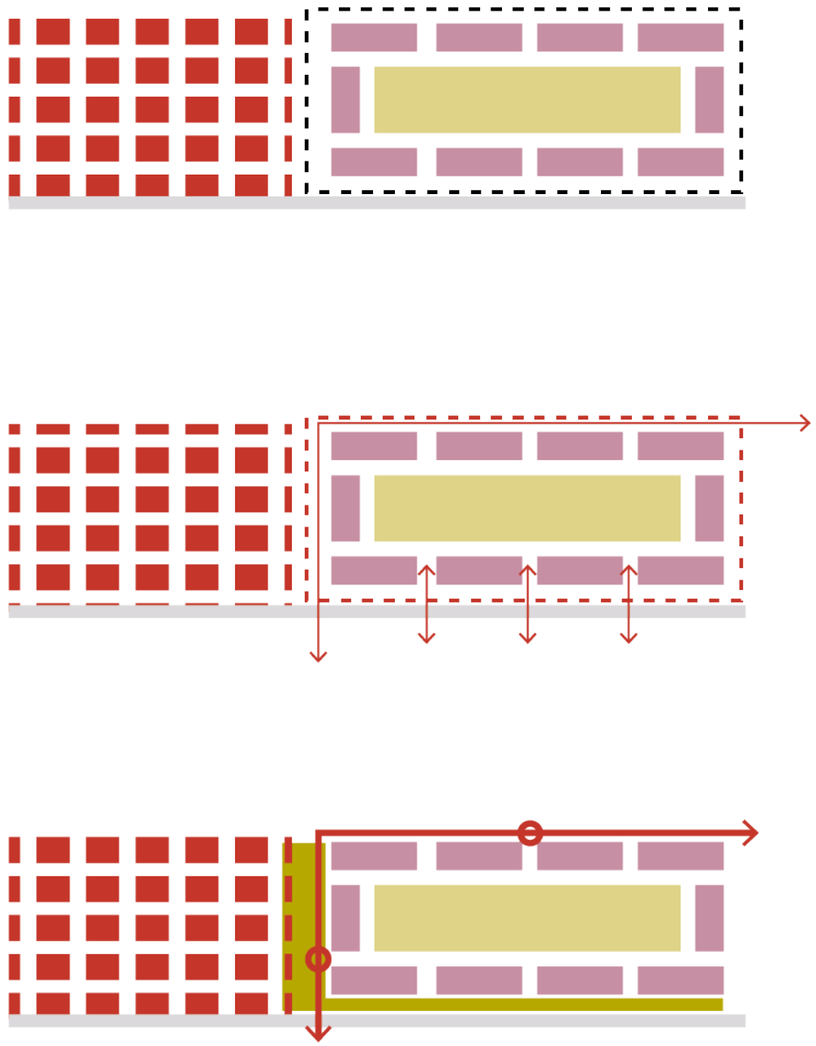


Figure 55 - *Drawn representation of design principle 'Security interventions that connect'*

3.16 - FORM OF VILLAGE TO URBAN TYPOLOGY

Situation
Earlier examples of Olympic Villages showed that the size of the block and the height of the Olympic Village not always correspond with its surrounding. While the Games in itself stand out it as an extraordinary type of planning, the urban structures shouldn't distancing itself from the urban context, same for the village. Often the Olympic Village, due to its enormous request for available space, is more than 10 stories tall. Building this in a lower urban context, physical and mental distancing the complex in the urban environment.

Design principle
Change the blocks size and height of the Olympic Village according to the dimensioning of the surrounding urban typologies. The Olympic village should act as an urban bridge between both sides.

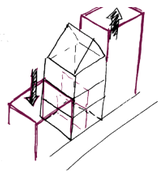
Result
By adopting the urban size of the city context the Olympic Village doesn't distant itself, but blend in daily life after the event. It prolongates the perception of the city, while facilitating a completely new neighborhood. The design becomes cooperating rather than oppressive, shortening the physical and mental distance between new and existing. The principle makes sure that the implications of the urban blocks suit the environment.

Phase: Bid phase, construction phase

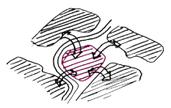
Costs: ++
Impact: +++

Downsides: In urban environments with low typologies, the Olympic village require way more space.

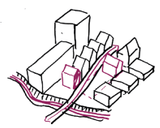
Meets the following criteria for social sustainability:



H&E: Flexible and adaptable housing & buildings



H&E: Connections to neighboring communities



ID: Historical development

Issue
East village, London
Around East village, the former Olympic Village, 3000 additional houses are developed. These projects are growing even higher than the Olympic village. Sharply bounded by borders of property, investment is concentrated on site, but not on the low-rise existing housing of Newham and Stratford. The development creates a sharp contrast between small size town housing and metropolitan high-rise condominiums, physically exacerbating the division between lower and higher income groups.

Figure 56 - *Olympic Village London, the sharp contrast is visible (retrieved from https://upload.wikimedia.org).*

Precedent
Olympic village, Barcelona
For the 1992 Olympics, Barcelona created the Olympic Village as part of the large scale redevelopment of the coastline. It seemingly blends with the urban context by adopting the strict typology of the Cerda-Grid, as well as maintaining the height of the urban block in the city centre. Although the totality of the project is unnoticeable, two tall towers mark the position of the Olympic village along the coastline. The result is an project that is highly part of daily life, while maintaining the perception of a special Olympic place.

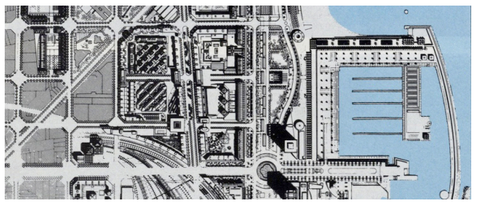


Figure 57 - *Olympic Village Barcelona, the cerda grid is adopted in the design (retrieved from https://static1.squarespace.com).*

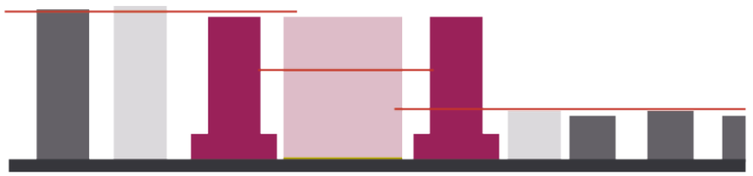


Figure 58 - *Drawn representation of design principle 'Form of village to urban typology'*

3.17 - LANDSCAPE QUALITY USAGE IN DESIGN

Situation
When using the Olympic Games for major urban regeneration in a degraded area, there occurs a twofold issue. On one side the host city want to beautify the Olympic area as much as possible, using the potential of landscape features. On the other side it has to conform the wishes of the IOC to be accessible at all costs. This means excessive roads should be constructed and fixated transport lines. Concrete highways are a major threat to the aesthetics of the landscape and perception of the place, eventually to the degree of calling regeneration successful.

Design principle
Prevent roads and transport infrastructure larger than 4 lanes from sight, either putting it under ground, elevating it. Make it easily to cross and avoid environmental harm by pollution of sight and climate.

Result
By preventing large infrastructure to be in sight clearly add to the perception of the quality of the environment. Making the area accessible by lifting it up or putting it underground also adds to the exchange of people and goods between neighborhoods, as well as it opens up possible landscape features. This additional land can be developed to stimulate employment, education and health. Creating a tunnel also decreases the environmental pollution.

Phase: Bid phase, construction phase

Costs: +++++
Impact: ++++

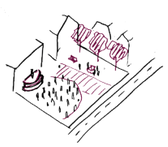
Downsides: Very expensive intervention which can only applied if the place and the whole city clearly benefits.

Precedent
Olympic village, Barcelona
For the Olympic Games in Barcelona, the city developed four venues along a new ring road around the city. With this intervention, the municipality decreased the traffic and air pollution within the city. With the aim of opening up the city to the sea, this ring road was lowered at the coastline. The land above could be developed to a boulevard along a new beachfront. This intervention, through hosting the Olympics, offered Barcelona a stage to present itself as a great touristic destination. The tourism lifted the economy of the city to unprecedented heights.

Figure 59 - *Barcelona beachfront, the ringroad submerges underneath the cultural venue and extends the boulevard (retrieved from https://ritzcarlton-h.assetsadobe.com).*

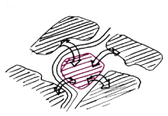
Meets the following criteria for social sustainability:

H&S: People friendly layouts

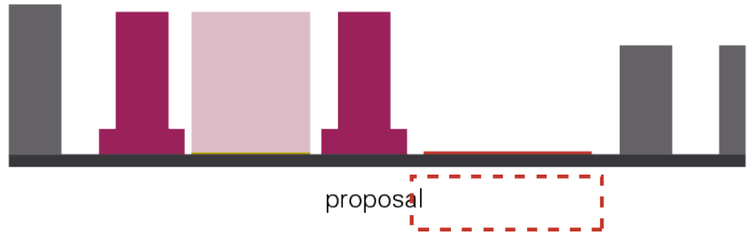


H&E: Public & congregational spaces

EMP: Transport and communication connections



H&E: Connections to neighboring communities



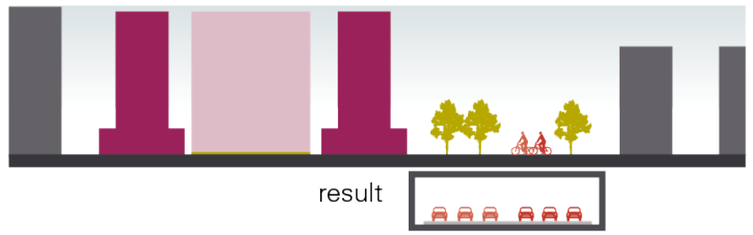


Figure 60 - *Drawn representation of design principle 'Landscape quality usage in design'*

3.18 - OCCUPATION VILLAGE TO SOCIAL-DEMOGRAPHICS

Situation
Almost all Olympic Villages struggled with occupying the apartments after the event or what kind of occupation it attracted. To contribute to an attractive social bid towards the IOC, the Olympic village is proposed to be transformed into mainly social rent housing. Due to regeneration within the area caused by the Olympic, and its initial location, the land prices sky rocket or nobody is interested. Rents soar and become only attractive to middle and high incomes, therefore not reaching its social targets (Barcelona, London), creating gentrification and pushing lower-incomes out of the area. Contrary it could be hard to attract anyone at all (Turin, Athens).

Design principle
Fixate 80 percent of the Olympic village to the social-demographic statistics of neighborhood around the Olympic Village. The other 20 percent will be free to the market.

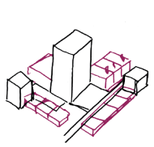
Result
By matching the occupation of the Olympic Village to the social-demographic statistics of the neighborhoods around, ensures there will be an equal distributed offer of high quality housing to the local environment. The 20% is meant to financially profit from the potential of the Games, though it doesn't disturb the precious social condition on site too much. Instead of creating a gentrification overkill, this 20% ensures gradual regeneration.

Phase: Bid phase, short legacy phase & long legacy phase

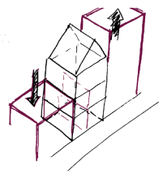
Costs: ++
Impact: ++++

Downsides: Needs active monitoring and control of governmental institutions, against the will of the free market.

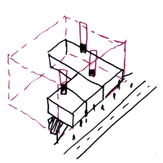
Meets the following criteria for social sustainability:



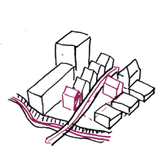
EMP: Third spaces



H&E: Flexible and adaptable housing & buildings



EDU: Meaningful buildings



ID: Historical development

Issue
East village, London
Not only the former Olympic Village, but all 4 boroughs around the Queen Elizabeth Olympic park face major gentrification from the interest created by the Games development. The fourth business park of London is under construction at the park, but is situated within the poorest and ethnically diverse neighborhoods of the city. In 2016 the rent prices in Newham, Hackney, Tower Hamlets and Waltham Forest, rocketed a 64% since 2012. Already in 2012 the Independent quoted: *"Olympic planners have been warned that they risk "a betrayal" of the east London communities if they do not guarantee local people homes in the regenerated Olympic site".*

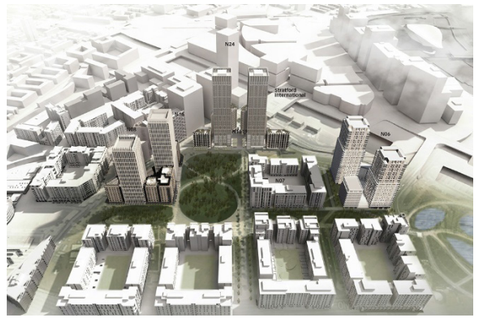


Figure 61 - *Plan of property developer Get LIving London to redevelop East Village (retrieved from https://yonder.e20.org)*

Figure 62 - *Drawn representation of design principle 'Occupation village to social-demographics'*

4. - RECOMMENDATIONS FOR OLYMPIC DESIGN: EVALUATING PROPOSED DESIGN PRINCIPLES

This section compares, concludes and evaluates the usability of the proposed design principles for social sustainability in Olympic design.

4.1 - The principle: a threefold relationship

In this book design principles as spatial modifications to the Olympic spatial programme to enhance social sustainability are researched. Configurations to the stadiums, halls, Olympic park and Olympic village are given, in relation to the use of the transport programme such as bridges, bus lanes, train stations. This relation might be a fundamental part in design of the Olympic Games; The relation between stadium, halls, park and village to their logistic requirements and the context of the city.

An Olympic park needs a large transport node that offers international connections in order to receive all foreign visitors. Organizing the Olympic Games set the requirement to build a large transport node. This transport node also serves the neighborhood, and a fundament to the development of the neighborhood. There is a relation between stadium and transport node and transport node with the neighborhood. But if stadium and transport node are built too far from each other, the relation between transport node and stadium is lost after the Games. The stadium doesn't profit from the transport node potential and development and is only used during large events. Combining transport node and stadium, elevates development potential also to the stadium. The proximity of a major sport venue serves increases potential for further development and therefore increases the relation between stadium, transport node and their relation to the neighborhood. This example shows a tangible relationship between programme, logistic requirements and context.

4.2 - A twofold aim for the design principles

Two general aims can be distinguished within the design principles; Decrease the programmatic space required to organize the Olympic Games and increase the relationship with the neighborhood. This partially has to do with the nature of the design task of the graduation project: Designing an Olympic Venue within the build boundaries of Rotterdam Zuid, an thereby enhancing the conditions of social sustainability of the place.

The result of the design principles showed that these aims can be reached in at least three different ways;

1. By reducing the physical footprint of the venue.
2. increase the strategic importance of the place within daily life.
3. Creating usefulness for the programme itself.

The last can be illustrated by the principle of using "the footprint as serving reminder". Except for mentally reminding the people pass by the place to the glorious event of the Olympic Games, a footprint itself has no role in itself. By using this spatial boundary of the footprint as for example an aquafer, the footprint of the temporary Olympic hall, becomes useful and has valuable addition to the city. At the same time, the interesting results can derive from by combining two interventions.

The principle of "parking inside the stadium" shows this combination. By creating multiple floor parking space inside the façade of the stadium, it reduces the footprint needed for parking space outside the stadium. The same time the parking space can be used, out of event time, to accommodate parking demand of the surrounding, either from inhabitants or tourists.

4.3 - Implementation of design principles

The design principles can also be divided in their period of time in which they function and should be implemented. This is either in

1. bid phase and construction phase aimed at the initial design of the Olympic programme.
2. the legacy phase aimed at (re)development of the Olympic programme.

In the bid phase design guidelines can more easily be transformed and be implemented in the construction phase. Design changes are still possible within construction phase, though it becomes already increasingly harder and more costly. Therefore it is important that design guidelines are mostly fixed to the bid phase. Also, in the bid phase the redevelopment principles should already be implemented. In this way the design accommodates for easy redevelopment and limits the costs to give the Olympic venues a different destination after the event. If this isn't the case, and the design doesn't accommodate easy redevelopment, a lot of work and investment still need to be done, heavily decreasing the change of eventual success.

This is the case of the Olympic Stadium in London, where transformation from a large athletics stadium to a smaller football stadium proved very costly (almost 300 million pounds) (the Guardian, 2015). A solid redevelopment plan should be made, supported by the design prior to the Games, enforced by the design principles aiming for redevelopment.

4.4 - Social sustainability of design principles

From the criteria to which the design principles are observed and measured, it can be learned that the majority of the design principles aim at the social sustainability aspects of Housing & Environment and Identity. These aspects form a part of social sustainability which are already largely incorporated in the Olympic programme. It isn't hard to imagine that the creation of an Olympic venue does affect the identity of that place for example. The identity and name of the Olympic Games will always be attached to the area and will always be remembered for it.

Still, within housing and environment, the design principles aim to preserve the uniqueness of the context and prevent it to become again another major empty Olympic space. For example, the design principle "environmental systems guiding design" searches for ways to intermingle the identity potential of the Games with the historical identity of the place. Also, use the potential of the Olympic Games to regenerate the area to an attractive living environment, with high quality housing, but prevent inhabitants from being priced out and precious environmental systems from being destroyed.

On the social sustainability aspects of Safety and Health, Employment and Education the design principles could still focus much more. In general the Olympic Games doesn't spatially accommodate much of this directly, but is mostly enhanced through programs such as volunteering and lessons at school.

Though, to facilitate top sport an extensive aid programme is required where athletes can be treated for their injuries and doping test places for healthcare are required. Though for inhabitants of a neighbourhood, it doesn't provide the kind of healthcare they initially need, such as for general practitioners. Focus on design principles that aim to turn the spatial programme of the Games to the health and safety of the city is very much required.

For employment and education, the Olympic programme spatially doesn't provide direct solutions, but offers the conditions on which these two aspect can thrive.

The principle of Stadium as a multiple sector cluster shows how the Olympic programme can be a starting position for further development. This development can attract further investment and companies of other sectors, thus generating a lot of employment opportunities.

The same counts for education. The Olympic programme doesn't facilitate the creation of elementary schools, colleges. The relation of the Olympic Games with education relies on the school programmes attached prior to the Games, such as the Olympic Values Education Programme (IOC, 2017) It promotes the Olympic idea of sport as a mean to bring people together, though it doesn't renovate squares throughout the country. The spatial contribution of the existing form of the Olympics is rather limited and can be better. The creation of a sport cluster also attracts sport colleges where talented youth are trained to become the top athletes of tomorrow. In this way, a whole chain can be created, where children from elementary school can be guided towards a future within sport, or at least a more healthy lifestyle.

Still, while the design principles all the aspects of social sustainability, some are more easily addressed than others. Therefore, employment, education and the successfulness of reaching the aim of safety and health, can't rely solely on a design, but is also depended on the success of strategic plans and policies.

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Figure 63 - *Former coach of the Dutch women team Vollyball, Giovanni Guidetti, looking at his tablet for statistics and reference (retrieved from http://www.vizieropvolleybal.nl)*