development of the

Culemborg goods yard

Cape Town, South Africa

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Abstract

The aim of this minor field study was to produce a physical plan of the Culemborg goods yard in Cape Town, South Africa, with a distinct emphasis on sustainability for a middle to low income group. With the use of a Kevin Lynch analysis, a block analysis and analysis by Piet Louw the information that had been collected through inventory and study of previous projects of the site was processed. A SWOT-analysis summarized the analyses and from that a few keywords were derived. The keywords, such as pedestrian friendly, dense, integration, mix use, etc., were used as goals in the drafting of the physical plan for the goods yard. Through this a plan proposal was created for the whole area. The authors chose one area each within the plan to explore more deeply. This resulted in two situation plans, one for 'the activity bridge' and one for 'the centre of Culemborg'.

The sustainability principles were integrated in the work by the knowledge the authors have gained through previous studies. Due to prerequisites of the site explored in the process the target became the middle income group.

Forewords

For this thesis project we were granted a scholarship from the Swedish organization SIDA to conduct what is called a Minor Field Study (MFS) in Cape Town, South Africa. The scholarship is offered for field studies in development countries and usually involves developmental work. This MFS is quite rare because it is not about upgrading a poor area or providing infrastructure in an informal settlement. This is a project in the most central parts of a big city. The problems and the prerequisites are very different in comparison to many MFS, and the complexities are as well.
The thesis is divided into eight different parts. PART 1 is the introductory chapter, which explains why and how we did this work. PART 2 is about the site and its surroundings. In PART 3 the analyses and their outcome are presented, followed by PART 4 which is the plan proposal. PART 5 and 6 each contains the individual work done, in which we explore different areas within the site in greater detail. The summary and conclusions of the collected work are presented in PART 7 and PART 8 contains the references.

This project has been a great challenge, an adventure and a priceless experience! It has been a great journey in so many ways for the both of us and we want to thank everybody who helped us along the way with a special thanks to Nigel Burls and everyone at mlh architects & planners. We could not have done this without your friendly reception in Cape Town and your help, thank you! Thank you Anette and thanks also to our families and friends who supported us during the studies!

//Sandra & Tina

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PART 1 - Introduction

The aim of our thesis and the method used to reach it are described.

Also included is a summary of the South African and Cape Town histories. This has had such an impact on the existing social and physical structures that those who have not been here would find it difficult to understand otherwise. There is also a description of how we experience Cape Town today, to give our personal impressions of the city. Both the history and our impressions provide important background material to many of the conclusions we reached during the work.

Aim

Our aim with this minor field study is to produce a physical plan of the Culemborg goods yard. We will convert a former goods yard in central Cape Town to a combined residential and commercial area with a distinct emphasis on sustainability principles according to the definition of the Brundtland Commission. This area will form an important bridge between the poorer area in the south and the Central Business District (CBD) and provide housing for middle to low income groups. This connection will not only be a physical bridge, but also an economical and social bridge, which will in the long run promote integration.

Method

We begin with an inventory of the site and its surroundings. Simultaneously reading about planning in South Africa, interviews with planners of the city of Cape Town and visits to social housing projects will help us understand the local planning tradition.

Because many planning projects have already been done on this specific site we choose to study the projects to learn what we can from them.

Different analyses of the site and the surroundings provide the background for a shared proposal. When a shared plan for the project site is finished we proceed to our separate parts. The separate parts each concern a smaller area within the shared proposal and are explored on a more detailed level with the larger plan as a common frame.

Why South Africa?

Both of us had (and still have!) a wish to see and exeri-ence something new and we saw the scholarship provided by the Swedish organization SIDA as a chance to do this. Our only criterion, except going to a development country, was that English should be the general language, or at least one of them, and with this we started the search for a local supervisor somewhere in the countries Zambia, Tanzania and South Africa. The replies were few and lingered. When the deadline for handing in the program drew close we finally got a reply.

The private company mlh architects & planners is located in Cape Town, South Africa. They seemed like a very serious company, gave us quick replies and suggestions of local sites to[1] work with. The lack of time together with the reasur-ngly quick answers made the decision easy. We wrote a project program and finished the application forms at the last minute. The happiness was great when we got the reply: we had been granted the Minor Field Study scholarship and were to go to Cape Town at the tip of Africa.

[1]Brundland Commisson, formally the World Commission on Environment and Development (WCED) produced a report in 1987 where sustainble development was defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

About South Africa & Cape Town

Cape Town is the parliamentary capital of the democratic republic of South Africa and is situated in Western Cape province at the southernmost point of Africa. Since 1994 the African National Congress (ANC) is the leading party with no real competition.

Cape Town has a population of 3.1 million in the whole metropolitan region and 2.7 million in the city centre. The mayor, since 2006, Helen Zille since is also the leader of the Democratic Alliance party. She is very popular and was elected mayor of the year in 2008 (Website world mayor, 2008).

History

The first settlers arrived in 1652 to the Cape through the Dutch East Indian Company (Info Please Homepage). The British occupied the Cape Colony in 1792 and it remained a British colony until 1910 when the Union of South Africa was formed. The only province with a non-racial franchise was the Cape but blacks were not allowed in the parliament (South Africa info). When World War II ended in 1945 South Africa became a member of the United Nations, but refused to sign the Universal Declaration of Human Rights (InfoPlease homepage). Decades of apartheid and racial segregation followed and dominated the domestic politics.

The Apartheid politics were enforced through laws created by the white minority government in 1948, but already before this the politics had striven to separate the different races. One of Apartheids worst consequences was that it gave white people the right to claim land as their own, driving away thousands of black and colored people from their homes. The laws of Apartheid divided people into white, black, colored and Indian races determinded residental areas, work opportunities and public facilities like shools, where racially segregated (Struik, 2007).

In 1994 Apartheid came to an end and the democratic Republic of South Africa was formed. Now 15 years have passed, but the racial segregation is still a fact, and people continue to struggle for equal opportunities. Therefore integration is an important question in all fields, including planning.

One part of the township Khayelitsha.

Urban development in Cape Town

The original parts of Cape Town were built by the Dutch East Indian Company in a strict grid pattern of about 80×80 meters. Later the British allowed the city to grow randomly, controlled only by market forces. (Cape Town homepage, 2008)

By the twentieth century it was considered messy and expensive to let the city grow without planning. During the late 1930s housing became a debated problem in Cape Town. The city centre had a slum that was among the worst in South Africa and social activists started to publish articles on the suffering of the poor (Cape Town homepage, 2008). This made town planning up to date again.

At first the garden city-concept had strong influence on town planning in Cape Town but it was quickly followed by the more practical and cost-efficient functional separation. Because of the apartheid politics the modern trend of functional segregation went a step further in South Africa compared to in Europe and in the United States.

During the 1960s black townships were separated from other areas of the city and from each other by strategically located industrial areas with railway lines and roads (Website world mayor, 2008).

In 1937 the decision to reclaim the foreshore was made (Website world mayor, 2008), but in the 1950s and -60s the development of the foreshore was daunted by disagreements about priorities. Among the disagreements was the need to ensure goods traffic flow against the desire of broad boulevards and an open seascape for the 'Gateway to Africa'. The result was a windy city centre with skyscrapers which became almost lifeless in the evenings with few exceptions (Website world mayor, 2008). Later in the 1990's the successful development of the Victoria & Alfred Waterfront, a new public access to the foreshore, attracted new investments to Cape Town. Large hotels were built in the end of 1990s and the Cape Town International Convention Centre opened in 2003 (Cape Town homepage, 2008). The left-over gaps where filled by modern office blocks and finally the city got a foreshore they could be proud of Cape Town homepage, 2008).

Today integration is a big issue in Cape Town. Besides this is the question about access to the waterfront and the development of the foreshore.

Planning instruments

The only legally approved planning instrument for the whole metropolitan region of Cape Town is from 1988 and this was approved during the apartheid regime. Other frameworks have been created to replace the guide plan from 1988, but none of them have been accepted by the whole metropolitan region (Burls, Nigel). During this time 38 municipalities have been merged into one.

The MSDF, Metropolitan Spatial Development Framework, from 2000 is an example of one of the frameworks not accepted. Although the framework is not politically approved, it suggests directions and main focuses for planning in the metropolitan region of Cape Town and planners still partly use it.
The city of Cape Town is clearly divided functionally, economically and racially. This is due to the influence of apartheid politics. The municipality is working for racial and economic integration, but at the same time Gated Communities are being built in the suburbs.
It is clear that the market determines what is built and where to a larger extent than we are used to in Sweden. The lack of planning instruments and economic power in the municipality could be reasons for this.

There are no restrictions or guidelines on sustainable construction. The building tradition is very bad from an energy perspective and we have not seen any inclination of it getting any better.

This is caused by the market forces, a developer only build and sell off. As long as no one intends to own a building for longer time period, the construction won't be improved.

Cape Town today in pictures

Fifteen years after the end of the apartheid regime the economic differences and poverty are still great and unemployment rates are high. About 23% of 44 million South Africans are unemployed (Webpage Stats on line, 2008). Service jobs are created to employ people, but people do not earn much. Examples are the guards who charge you for parking the car or for refueling it at the gas station. In the streets people sell what they can.

Children in Khayelitsha.

West Lake.

Gated communities are being built in the suburbs. High walls and electrical fences are common within the cities. We were told that the middle class is the group that needs most protection of this kind, because unlike the uper class this group can not afford the costs of stolen cars or break-ins.

Types of fencing, the left one from Cape Town and the right from Westlake.

Overall, the fear seems to be greater than warrented by the situation, and huge walls and bars over the windows are common. This stimulates more fear rather than generates a sense of saftey. It has become a vicious cycle. There is hardly any social surveillance and the result of this is more break-ins, which in turn lead to more and higher walls and fences.

The "City Bowl" is the old center of Cape Town. The name comes from the situation; trapped between the Table Mountain and the Atlantic. The city is multifarious. Long Street, where the backpackers and tourists hang out, has a lot of Victorian architecture, mixed with modern high rise office buildings. Here people move at all hours, and traffic jams on Saturday nights are not unusual.

The city bowl.

Long street by day and night.

The traffic is left handed and hectic, making it is a challenge to walk these streets. Everyone appears to own a car, and one seldom sees more than one person in each car at peak commute hours. Our first impression was chaos, but after a few weeks we realized that it is a kind of ordered chaos. Eventually, everyone reaches their destination.

People in Cape Town work to live, compared to Swedes who generally live to work. The atmosphere is relaxed and this probably has something to do with the climate. Long and warm summers with little rainfall.

Work to live?

Traffic in the centre of Cape Town.

Aerial photo: mlh architects & planners

PART 2 - The site

This part presents the project site and the conditions for future planning. It also contains a section detailing what has already/previously been done on the site, the suggestions for its use have not been few.

The features of the Culemborg goods yard raise many complicated questions that are introduced in this part. These include land ownership, the conditions of soil, the service, the connections, the wind, physical barriers and others. All together these issues form a tough challenge.

Nevertheless, the potentials for the site are great and they are illuminated in this part so we can work towards enhancing and strengthening them.

Situation

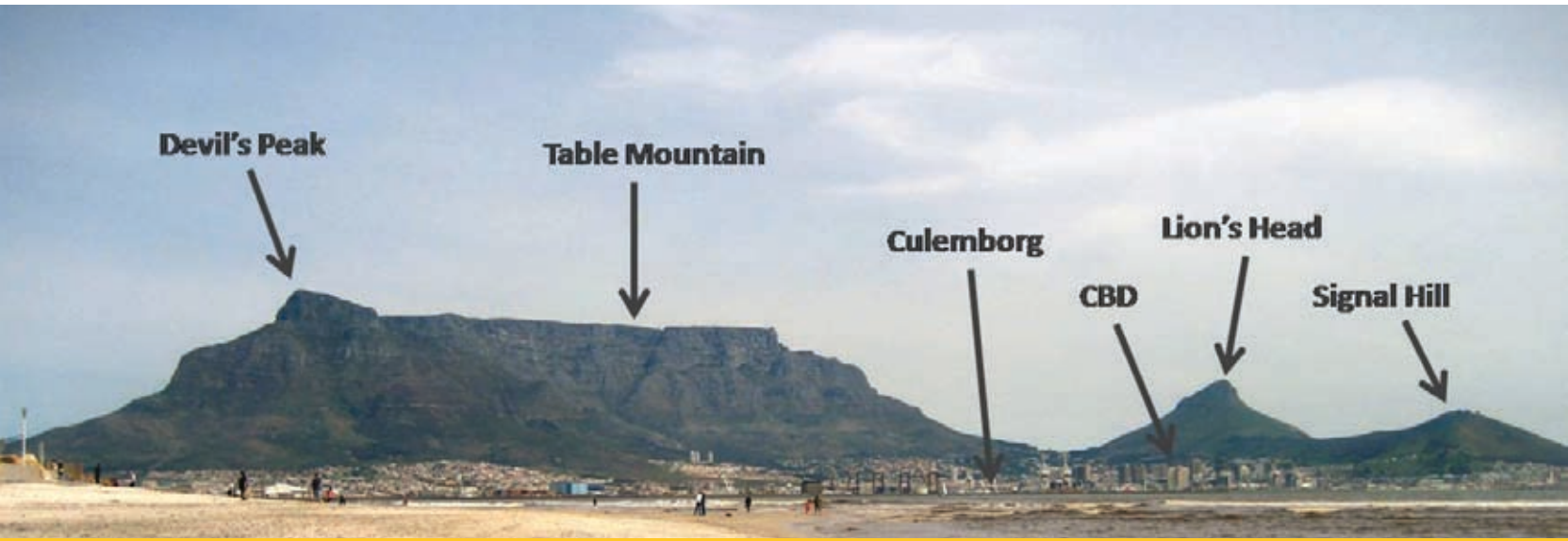
Culemborg is situated very centrally in Cape Town; within what is referred to as “the City Bowl”. It is only about 500m to the central station from the west end of the site and the east part of the Central Business District (CBD) is situated right next to the site.

The project site is approximatley 1.4km long but only o.4km wide and has a total area of 45 hectares. This can be compared in size to 55 soccer fields.

The Culemborg goods yard is trapped between large roads. In the north it borders to the N1 highway and in the west to the elevated N2 (Eastern Boulevard). Along the south side lies the shunting yard and the railway, and to the east the area is cut off by the elevated Lower Church Street.

The situation of Culemborg goods yard, the project site, in Cape Town. Map: mlh architects and planners

The “City Bowl” and the situation of the project site in the bowl.



Surroundings

The Culemborg yard should be considered a part of an area of 300 hectares, which it belongs to. The larger area continues east to Salt River, east of Woodstock, where it turns to the south. The rest of the area is also impressed by industry of mixed types. To the east, and south east, lies Black River Park where mlh planners & architects are working on a plan for mix development.

When one goes further east of Culemborg, the areas become poorer and the closer to the Table Mountain (south) and the city one comes, the areas are richer.

The surroundings. Aerial photo: mlh architects & planners.

Woodstock.

Woodstock

Woodstock, directly south of Culemborg, is a historically mixed-use area that started to develop in the 1860's (Dewar et al, 1977). It is cut off from Culemborg by the railways and the shunting yard, but can be reached from the harbor by the pedestrian bridge over the site. Main Road runs through Woodstock. This was both the main road into the Central Business and a commersial spine, before the N1. The buildings around this road are Victorian style with businesses on street level and housing on second floor and along the cross-streets.

This area is currently undergoing a process of gentrification; the current residents are being pushed away by trading, commercial and business complexes. The residential units that remain are shifting owners, from low income to middle and upper income groups.

The Old Biscuit Mill.

The skyscrapers of the Central Business District.

The Old Biscuit Mill is a good example of what is happening in Woodstock. It's a very popular market every Saturday morning. It is almost excusivley frequented by white middle to upper class people, while the clearly poorer black population of the area is kept outside by guards and gates.

The harbor

To the north of the project site, along the current coastline, lies one of South Africa's most important harbors, Duncan Dock, and the Royal Cape Yacht Club. There are plans to move the Yacht Club closer to the attractive and touristic parts of the Victoria & Alfred's Waterfront, to give more space to the industrial harbor. This would make a connection from the Culemborg site to the harbor less sought for.

A development of the Culemborg site could be competing with the harbor activities, which are in need of more space for shipping agencies, container storage etc.

Central business District (CBD)

The CBD (Central Business District) lies to the west. It is a dense, highly exploited area, with tall buildings that can be seen from the project area. There are mainly workplaces here, commercial services and meeting places. People from all income groups are employed here.

View over the harbor from the pedestrian bridge.

The Motor City

The Motor City, to the west, was the first part of the Culemborg site to be redeveloped in the 1990's (Burls, Nigel). It's a small area with respect to the larger site. One of the buildings was build to host the fencing world championships. It is still there and today it contains show rooms for cars.

The shoreline through history. Map: Harbour View, 2000

Historical background

The whole project site is on reclaimed land. One map shows the old shoreline from 1890s, compared to the shoreline in 1920s and in 1945 when the landfill was completed. Officially, the decision to reclaim the foreshore was made in 1937 (Harbour View, 2000).

The first use of the area was of a military kind and railways were established across the site already in 1860 (City of Cape Town, 1997). After the Second World War it was developed as a central goods yard, but wasn't in use for long because the road based goods distribution took over (Harbour View, 2000).

For most of the time the Culemborg goods yard has been used for storage, shorter leases and has been generally under-utilized. Apparently the current railway platforms have never really been used as intended (Burls, Nigel).

The car dominated MotorCity.

Previous planning

When Cape Town applied for the Olympic Games the site was investigated for the Olympic arena and the Olympic village. It has also been proposed to be the site for a Casino and the 2010 World Cup stadium. But nothing has happened so far.

For many large events, Culemborg has been proposed as a suitable site and most of the plans we have seen have the border along the Old Marine Drive. But with currently rising land value it is possibility that the shunting yard can be removed to a less central situation.

View of CBD, Culemborg and Table Bay from Table Mountain.

Planning context

The current zoning for the Culemborg site admits urban development.

In the spatial plans for Cape Town there is a recurring idea of a green ribbon runing down all the way from the Table Mountain to Trafalgar Park, continuing through Culemborg and finally reaching the waterfront, where a yacht club is currently located. The Muni-SDF describes this as a "key pedestrian link" (Muni-SDF, p. 50). This framework also proposes an idea that "As part of the development of the Culemborg site, the portion of Culemborg Boulevard between Trafalgar Park Public Way and the Cape Town station, [should follow] the alignment of the old coastline, and [be] designed as a 'ceremonial way'" (Muni-SDF, 2000).

The Muni-SDF also put forward the idea that "'writing down' the cost of land in appropriate locations is arguably the most beneficial subsidy the city can provide" when compared to the subsidiaries given to public transport per person.

The Metropolitan Spatial Development Frameworks, MSDF, relevance to Culemborg area promotes the concept of activity corridors with a focus on public and private investments, affordable housing and optimizing the strategically placed and under-utilized land area (City of Cape Town, 1997).

Architect and urban designer Piet Louw has created a vision for the whole foreshore development, presented in "A broader Foreshore Urban Design Framework" 2004.

Current land use & ownership

Today the site is largely under-utilized and partly used as container storage by the harbor. There is a huge building of 66000m2, the PX shed, made of corrugated metal with railway platforms inside that have never been used as they were intended. There are also a number of smaller brick buildings containing small industrial and semi-industrial businesses.

Culemborg goods yard is owned by Transnet but is largely disused despite a number of temporary uses. Transnet is the company behind South Africa's national transport businesses including harbors, railways, and the South African Airlines etc. (Transnet, 2009).

A bus depot and the Culemborg Exhibition Centre operate in the PX shed. In the south western part of the site there is a container yard with container maintenance and a handling office.

The old unused platforms at Culemborg goods yard with Lion's Head in the foundation.

The under-utilized land with the Central Business District and Signal Hill in the background.

Along the N1 there are some small-private-businesses with good commercial situation.

One of the reasons why nothing has happened to this site may be that the owners, Transnet, don't want to hazard the growth of the harbor by exploiting the "backyard" of the harbor (McWitty, Lauryn).

The Culemborg is seen as a suitable site for more storage space, as container yard, shipping agencies, etc. The city of Cape Town doesn't fully agree with this use, but because they're not land owner they don't have much of a say about things.

However, today the city of Cape Town is cooperating with Transnet to see if they can agree on a development plan for the Culemborg site (McWitty, Lauryn).

Ground conditions

As previously mentioned the ground is reclaimed land, but it is also highly contaminated. From previous projects in the surroundings they have learned that one never know what will be found when digging in the area starts sand and clay or industrial and toxic wastes. Therefore, ground sanitation is necessary, whatever is build here.

The site is generally flat, 3.9 meters above sea level at the highest point, but only 1.7 at others (Harbour view, 2000). The water table lies between 1.3 and 2.2 meters below ground level. This can cause problems for basement parking which waterproof construction and constant pump (Harbour view, 2000).

A geotechnical investigation recommended bearing pressure of 150kN/m2, but also that the sites of heavy structures should be investigated in more detail (Harbour view, 2000).

The alignment of the underground storm water culverts. Aerial photo: mlh architects and planners

The hard surfaces prevent rainwater from infiltrating.

Another thing to take into consideration is the storm water culvert that run under the entire site. The capacity has been tested in different calculations but its dimensions probably aren't sufficient to drain the stormwater from the site (Burls, Nigel).

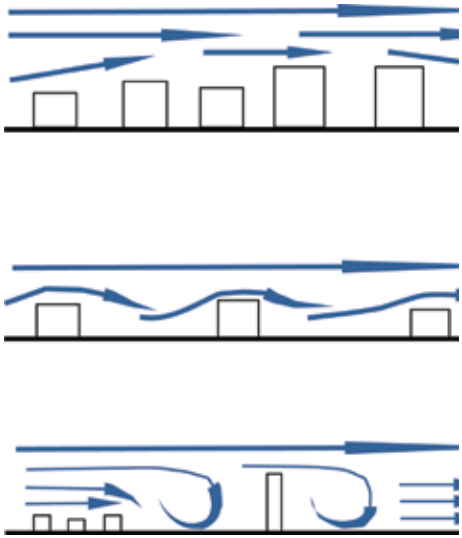
The culvert cannot be built upon. This can be dealt with through the spatial design but must nonetheless be mentioned. However, the issue of the storm water needs to be solved on the site to prevent flooding to minimize the risk of flood and the existing storm water pipe must be extended and upgraded. With global warming and a higher main water level, flooding is a risk that must be taken into consideration.

Sewers will be very expensive to build. The fact that the water table is located at between 1.3 and 2.2 meters below ground level has implications for service reticulation, and "there are no significant sewer mains on the site worth retaining for future development" (Harbour View, 2000). This means that the cost for developing the site rises.

Climate

South Africa has four seasons, but sometimes they can all occur during the period of one day. The weather is highly unpredictable and varies considerably. The summertime is from November to March and the winter time is from July to August.

Wind is the most important of the climate issues. During the summers there are strong southeastern winds, and during winter northwestern winds dominate. The harbor doesn't protect from the wind at all and wrong spatial structure could create wind tunnels. This would enhance the strength of the wind, which during the wrong conditions could make busses blow over. The wind would also cause unnecessary energy and heat losses during the winter, when the wind cools the buildings. On the other hand a sea breeze is appreciated during the summer to cool down both people and buildings. During the larger part of the summer, from November until March, hardly any rain falls in Cape Town and temperatures reach over 30 degrees Celsius.



The illustration shows a general study on how the buildings affect the winddirection (reworked pictures from Urban design, compendium, Liweyn-Davies, 2000)

The diagram shows the primary winddirection at the different seasons.

Access & traffic

Both vehicular and pedestrian access to the site is limited. One can access Culemborg in three ways, but none of these accesses are ultimate. First there is a one-way road from Oswald Pirrow Street which leads under N2 in a loop until it connects back onto Oswald Pirrow. Oswald Pirrow, as well as the N1 and N2, already operate at their capacity during peak commute hours and cannot therefore take more traffic. This connection also has a very dangerous right turn which can and already has caused traffic accidents.

The other access is also under the N2, on Old Marine Drive, but it is a substandard road not high enough for trucks to pass underneath it.

Access into Culemborg underneath the elevated N2.

The red lines are the major roads that surround the project site and the yellow is the approximate alignment of the future BRT system thorugh Culemborg. The light brown area is the present shunting yard which might be relocated in the future and the brown area covers the train tracks. The blue line illustrates where the pedestrian bridge crosses the site.
Aerial photo: mlh arcitects & planners

The third vehicular road is not more than a dirt road under Lower Church Street. This is where the lanes for the Bus Rapid Transit (BRT) system will enter the Culemborg site (see more about public transport in the following part), but there are no plans for a car access this way (Frieslaar, Andre).

There is also a well used pedestrian bridge that connects the Esplanade and Woodstock train stations with the harbor. It is an important link for many, because it's one of the few entrances to the harbor. It crosses over Culemborg but does not offer an entrance to the site. The pedestrian bridge is approximatley 400m long and completley unprotected from strong winds or rain.

The pedestrian bridge over Culemborg.

The dirt road under the Lower Church Street.

The shared taxis on the roof of Cape Town Central station.

Woostock train station.

Public transport

The five main rail commuter services in the metropolitan area pass through the site, some sharing the same tracks (City of Cape Town, 2007). At Esplanade station commuting trains from the southern suburbs stop while trains from the northern suburbs stop at Woodstock station less than 100m away. The stations are both underutilized and inaccessible from the Culemborg area, but it is a potential if the accessibility can be solved. The pedestrian bridge over Culemborg connecting Esplanade station with the harbor can form that access.

Stairs to one of the platforms at Esplanade train station.

Approximatley 34 per cent of the commuters enter Cape Town by train, no growth for this mode of transport is recorded (City of Cape town, 1997).

The current railway lines and stations will be sufficient well beyond the planning horizon of thirty years with the exception the Cape Town station, which is already operating at capacity (City of Cape town, 1997).

There is also a system with mini-buses, also known as shared taxis. This is the most usual and also the cheapest way to get around. We heard the taxis talked of as “undignified” because they don’t run on all hours, only leave when the minibuses are really full and because they compete against each other.

The taxi station is situated on the roof of Cape Town Central station. The idea is good, from here one can reach any part of the metropolitan region, but it can be chaotic to find and get a seat in the right taxi. Traffic jams are part of the daily routine.

We argue that there is also flexibility in the system which public transport generally lacks. Large buses don’t go empty, they can stop everywhere on demand and there is a system of from where they leave and where you can find them. The drawbacks are that you can’t always be sure to catch one on time and that the driving can be unsafe.

Bus Rapid Transit system (BRT)

The City of Cape Town is building a new public transport network called the Bus Rapid Transit (BRT) system. Phase 1 will be finished in time for the 2010 FIFA WorldCup (Frieslaar, Andre).

The thought is that special lanes for buses will allow quick and efficient public transport. The stations will be situated between the bus lanes to allow easy changes between different lines. They will be situated to allow easy changes between modes of transport as well.

Construction of phase 1 has already begun and in March 2009 the construction reaches Culemborg (Frieslaar, Andre). BRT includes bus lanes that cross over the Culemborg site in east-western direction with one station to start with and the possibility for another station if further development calls for it. The first station will be placed to offer good connection to the pedestrian bridge that runs over the Culemborg site. This is a main pedestrian link between the harbor, the Esplanade and Woodstock train stations (see more under Access & traffic).

When fully built approximatley 1500 buses will go in each direction over Culemborg (Frieslaar, Andre).

Due to the development of the BRT a conflict between the minibus Drivers and the government has occurred. The minibus drivers are afraid that they eventually will loose both their business and their living (Cape News, 2008).

Beneath the elevated N2.

Security and health

The highways (N1 and N2), other surrounding roads, the harbor and the railways all cause sound pollution. We haven't seen any measurements of how disturbing this may be, but considering the amount of traffic in the surroundings we judge it to be a big problem.

In addition to the sound pollution there is also a risk of train accidents, both with the public transport trains and the freight trains. We have not been able to find any local directions risk zones like the ones we have in Sweden.

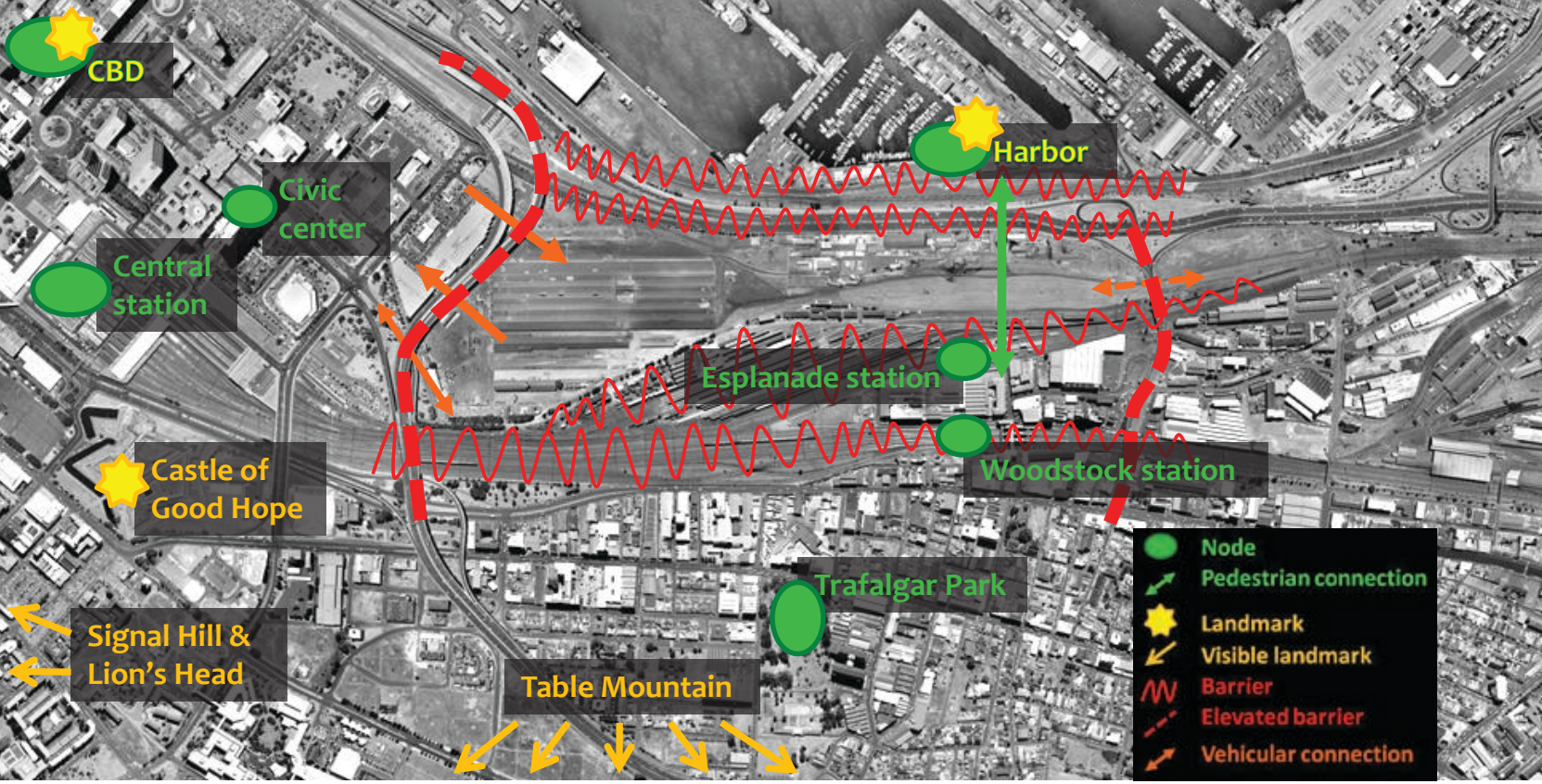
It is restricted how close one can build to the elevated highways though. The required setbacks for new buildings are 10m for the N1 and 5m for the N2 due to the risk of fires (Nigel Burls). The concrete can collapse from the heat caused by a fire too close by. However, thes restrictions mean you still can build under the highways, even if this is not desirable.

PART 3 - Analysis

We have chosen four different analyses to process the information about the site. During one of the visits to the project site we conducted a Kevin Lynch analysis, as a part of the inventory of the site.

In "A broader Foreshore Urban design framework" by architect and urban designer Piet Louw. A lot of work has been done already. We use some of this material, with his permission.

The third analysis is a study of the block sizes and proportions in the areas surrounding Culemborg. The fourth is a SWOT-analysis a summary as of the prerequisites presented in PART 2 and the outcome of the other analyses.



Aerial photo: mlh architects & planners

Kevin Lynch analysis

A Kevin Lynch analysis is a study of the physical situation of the site and is suitable when learning about a new site. The different barriers are presented. In this case the barriers are many and heavy. In the north the N1 highway presents a strong barrier as does the railway in the south.

As the map shows, the barriers are massive and everywhere. The orange arrows illustrate where there are connections beneath the elevated highways in the east and west ends. The elevated highways are a different kind of barrier. The barriers could be seen as assets rather than limitations; they provide a distinction to the site, a clear border that this is a different part of the city, but still offer access, although a bit limited.

The new BRT line does not exist yet, but it will run straight through the project site in east-western direction and provide yet another barrier in this direction with only two vehicular crossings.

Important nodes are the CBD, the harbor and the train stations. Stunning views can be found in almost all directions; the situation within the City Bowl makes it possible to see the surrounding Table Mountain. To the west the skyscrapers of the CBD can be seen and in the north the harbor cranes can be seen, although the sea is not visible from here.

“A broader Foreshore Urban Design Framework” by Piet Louw

An analysis of the Culemborg goods yard in the context of whole Cape Town Metropolitan region has already been made. Architect and urban designer Piet Louw created “A broader Foreshore Urban Design Framework” for the City of Cape Town. We found his work with the analysis excellent, although we does not fully agree with hes conclutions and the plan for the Culemborg site. We believe that we would only present a replica of the analysis if we did the same work ourselves.

One thing that becomes clear when reading this document is that the central parts of Cape Town are totally severed from the sea. Development of the V&A Waterfront has partly brought the city life closer to the water, but the connection between the Waterfront and the CBD is still almost noneexistent.

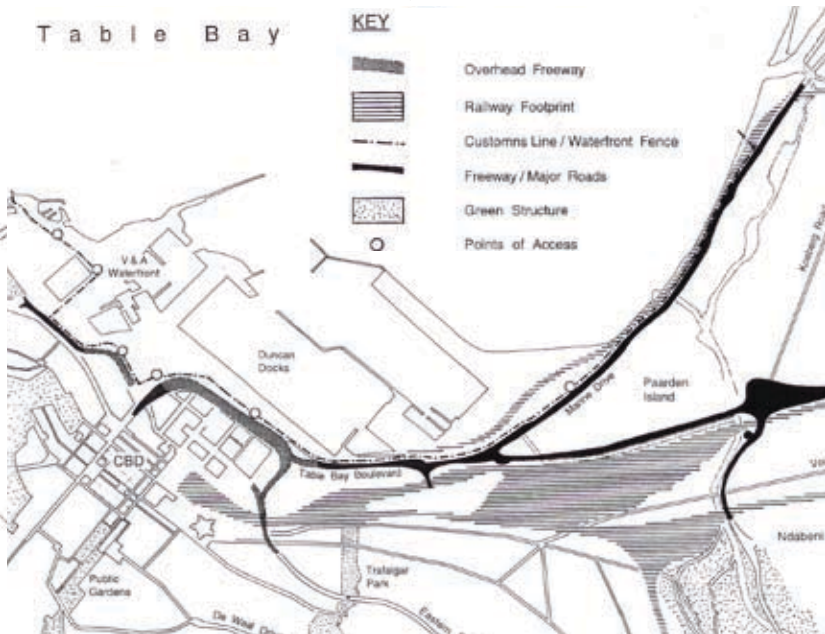
The Metropolitan Problem, Increasing eccentricity from the activity corridors of the sityMap from “A border foreshore framework” : Louw, Piet

This framework proposes a connection to the sea – to bring the city back to the sea, but all development plans so far have to increase the capacity of the freeways to limit congestion during peak commute hours. This is a threat to any idea of a strengthened city-sea connection. Culemborg is separated from the sea by the N1 and from the city by the N2. The picture below simply states the local problem: the dominance of barriers.

Another thing the framework discusses about is the role of the CBD. It’s an important centre, but shouldn’t be seen as the MOST important centre. Activity corridors should connect different mixed used centers, nodes, but today the activity corridors aren’t connected and grow randomly.

The framework also speaks about the need to promote green corridors to shape a cohesive green structure.

Map from “A border foreshore framework” showing the local problem with the dominance of barriers : Louw, Piet



Block analysis

To get an understanding of the dimensions, block sizes and densities in the surrounding areas we conducted a block analysis. It gives a good picture of what parts of Cape Town look like and is a good foundation for us to work from when fitting this site into it's surrounding environment.

We chose four blocks in the surrounding areas and looked at the number of floors, how they are used and the dimensions of the streets surrounding them. The blocks were chosen partly haphazardly, but also with the aim of illustrating the dimensions of different roads – car dominated roads, pedestrian streets and those with heavy through-traffic. The blocks were also chosen because of different sizes and functions as well as their height differances.

CBD 1	CBD 2	Woodstock	East CBD
			
 **Strand St.- Long St.- Riebeek St.**	  **Long street- Longmarket St.- Loop St.- Wale St.**	 **Strand St.- Stalton St.- Wiliam St- Hercules St.**	 **Hertzog Bvd– D F Malan str – Eastern Bvd – Jan Smuts St.**
8-17 floors	2-4 floors	Up to 6 floors	Up to 23 floors
Size: 106x57 meters	Size: 65x62 meters	Size: 105x105 meters	Size: 200x400 meters
Shops on street level, parking house in mid-floors, Few apartments, mostly office space.	Shops, activities all around the block. Apartments/ unused rooms 2nd and 3d floors.	Shops on street level, light industry.	Office buildings, parking houses, few restaurants, bank offices on street level

SWOT analysis

A SWOT analysis is used to sort the Strengths, Weaknesses, Opportunities and Threats of a project into an easily read table. We chose to use this method to summarize the general situation of the Culemborg goods yard. The prerequisites presented in PART 2 and the analyses above are the foundation for this analysis.

The strengths in this SWOT are the conditions in the present situation that give the site advantages. The opportunities are what we see as future strengths that have to be used when developing Culemborg. The weaknesses are current issues within the site that can largely be dealt with through good physical planning, whereas the threats are things that are largely beyond our control.

We have based our subsequent work on this analysis to our spatial plan for the Culemborg goods yard. We have attemped the strengths, take advantage of the opportunities and deal with the weaknesses to avoid the threaths.

STRENGTHS	**WEAKNESSES**
Central Views – harbor/yacht club, TM, CBD Close to motorways and to train stations. Main pedestrian link crossing over Close to Black River Urban Park for recreation Un- / under-utilized	Need for sanitation Storm water pipeline Barriers: Railway, N1, N2 Windy – no protection from winds Sound & air pollution Bad accessibility
OPPORTUNITIES	**THREATS**
BRT system Densification Integration of income groups and races Mix use development Good place for commercial along N1 Table mountain – sea connection Move of shunting yard More efficient land-use	Expensive services Yacht club moves Segregation – gated communities Sprawl – lack of central investments Climate: strong winds and storm water Don’t manage to attract investment Transnet doesn’t give up the land for development Land cost – are high and rising


Marshall

PART 4 - The plan

This part presents our shared plan for the Culemborg goods yard, explain how we adapted the plan to the conditions of the site presented in PART 2. Throughout the drafting process we worked with key words such as pedestrian friendly, integrated functions, public transport, good vehicular and pedestrian connections, personal safety, shelter from the wind and high density. These words were derived from the SWOT analysis presented in PART 3.

It has been a challenge to make it economically feasible to develop this site for middle income housing. A very dense development is required to make this possible. The infrastructure, public services and the ground sanitation will require huge investments. These investments will have to be financed by commercial developments.

After many discussions we reached the conclusion that the shunting yard is so central in Cape Town that eventually the land value will force it to be moved to a less central situation. Therefore our suggestion takes that land in possession as well, but at a later building phase.

Connection to Surroundings

One important intention was to connect the Culemborg site with the street nets of Woodstock and the CBD without creating wind tunnels. At the time of the development the street axis may not be physically connected, but we do not wish to limit the opportunities to connect the different parts of the city in the future. Future development might also lower the railways underground or the elevated highways might be taken away, but today this seems far away in the future.

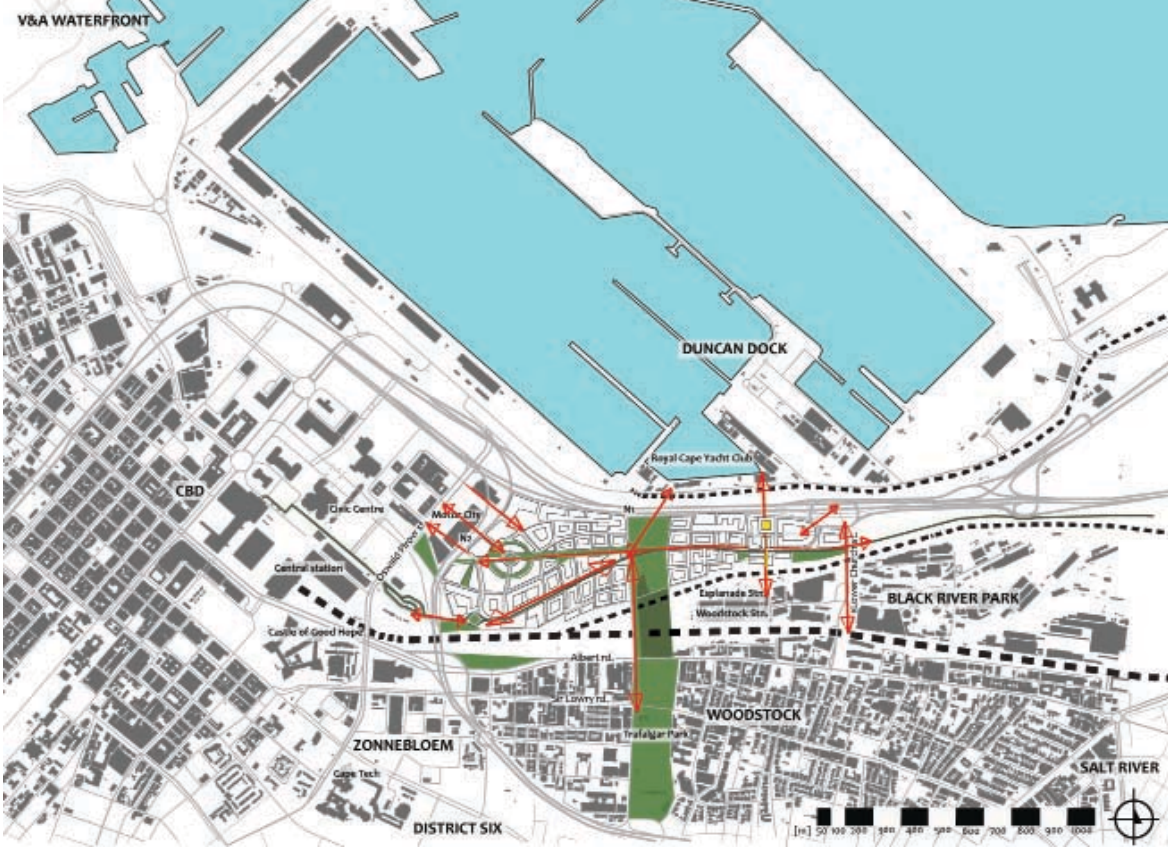
The streets crossing the Motor City from the east CBD are extend into the site, as narrower streets. That provide just enough space for traffic in both directions and parking along the sides. In this part of Culemborg the CBD is continued with high rise office buildings of 15-20 floors that will "build away" the elevated highways and make them seem less big. The high rise buildings will overlook the sea and have the fantastic view of the Table Mountain as well as the CBD.

There are very good locations for advertising along the N1 and N2. Here the noise also restrict the land use; residential use is not suitable this close to the highways. The same goes for the south – along the railways. This is a good place for semi-industrial uses and offices, but the density will be lower to connect to Woodstock in case the railways are lowered underground in the future.

In the East end there is a possibility of provide a new landmark reaching up to 20 floors, or more, marking the beginning of Culemborg and the entrance to the City Bowl of Cape Town along the N1.

The pedestrian bridge from Esplanade station to the harbor will connect with one of the new BRT stations, from now on referred to as East Culemborg. This link is strengthened and will still provide the connection between the harbor and Woodstock, but with the character of a pedestrian street rather than a bridge. The pedestrian bridge will also link to Culemborg compared with the situation today when it only passes over the site. More about the pedestrian bridge and East Culemborg in PART 5- the activity bridge.

The BRT lanes will pass into Culemborg under the elevated Lower Church Street. The bike lane that follows it will provide a bike and pedestrian entrance into Culemborg, although it will not allow car access.



The planning site with the connections to the surroundings, the red arrows illustrates important connections, mainly vehicular but also pedestrian. The map below show the most important parts within the planned site.

Land use

The use of land is to be that offices and commerce imprint the areas along the N1 and the N2. threre will be Light industry along the railway to connect to Woodstock with the same type of activities. The central parts of the site will be imprinted by mixed use, housing, shops and offices. This way the area will never be deserted since people will work there during the days and live there during the nights.

Exploitation

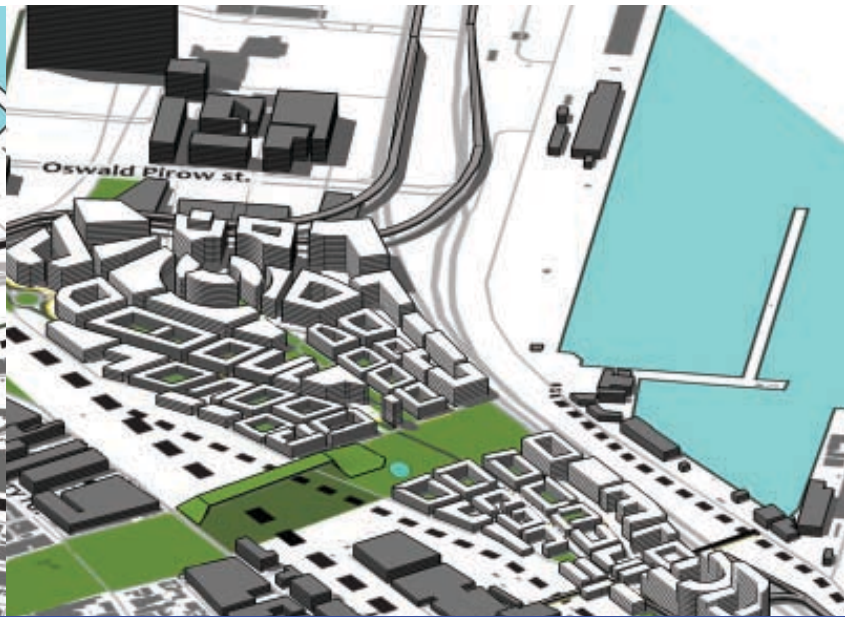
Culemborg has, as mentioned, a total area of approximately 45 hectare. If developed according to the plan Culemborg will have an exploitation number of just about 2.7.

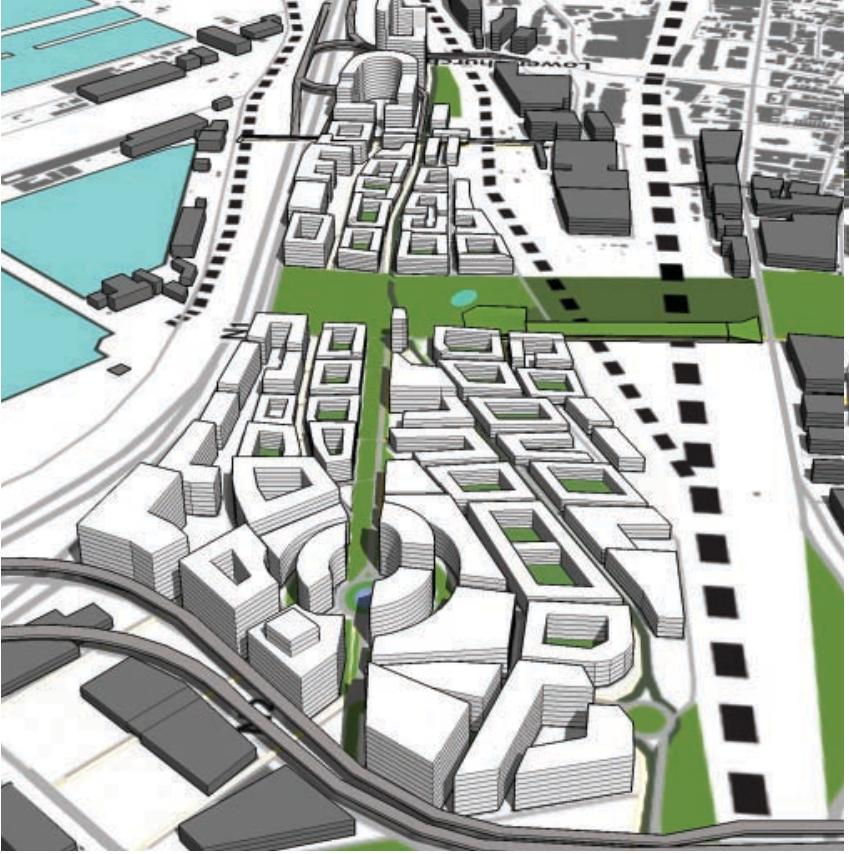
The number of housing units in the site, with a size of 60 square meters, will be about 3450. With a size of 80 square meters approx 2600 housing units can be contained within the area.

The total floor space of offices, parking decks, industries, hotels and other business have an area of almost 98 hectare.

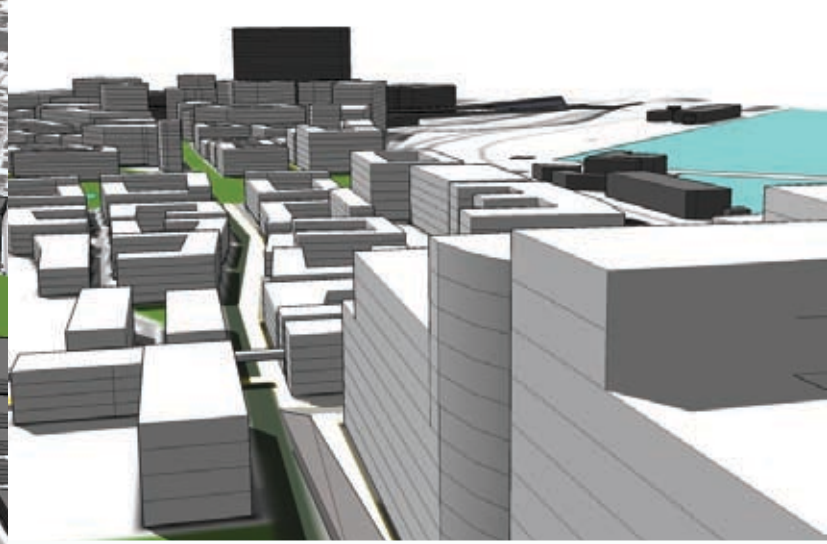
The land use. The brown color shows efficacy, yellow mixed use and the blue small industries. The map shows the green bridge connection as well.

View over the site from the southeast.



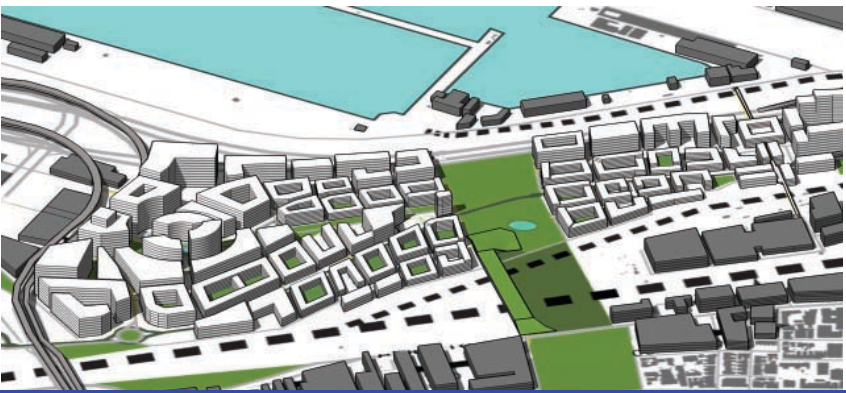


The site from the west.



The site from the east.

The site from the south



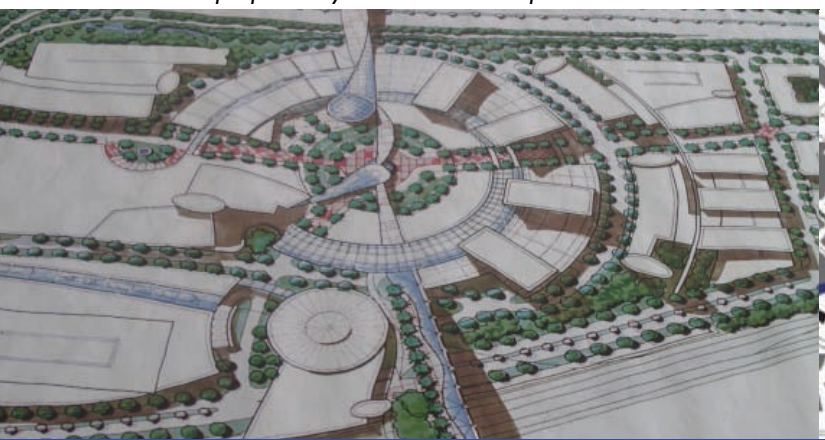
Previous planning

We found the reccurring idea of a green mountain to sea connection so appealing that we decided to keep it in our plan suggestion.

Our first idea was that if it is not possible to make a physical (pedestrian) connection, it might at least be possible to create a visual connection. But we found a way to make a physical connection that could link Culemborg to Woodstock and it turned out that is also solves a part of the access problem. A green bridge will connect Trafalgar Park to the Culemborg site as a part of the green ribbon that stretches from Table Mountain down to the Atlantic Ocean. More about the bridge in PART 6 – the centre .

The idea of a big boulevard has been adapted in this plan, but this is mostly due to the huge storm water culverts located in the area.

One of the previous plans for Culemborg. The picture shows a casino area proposed by mlh arcitects and planners.



Ground conditions

As mentioned the storm water pipe more or less forced us to create a Culemborg Avenue as we choose to call it, because it is not suitable to build on top of it. Therefore it is designed the way it is in the end towards the CBD. More about the Avenue in PART 6.

We did discuss the possibility of underground parking facilities, but quickly decided against it due to the low level over the sea. Parking will have to be solved on ground level on the streets or with parking houses in the dense office areas.

The problem of the reclaimed land and what weight it can carry we judge can be solved with foundation techniques and therefore does not fall within the range of our project.

The stormwater pipe as it runs throut the site with the Avenue on top.

Climate

Because of the strong winds, primarily in south-eastern direction during the summers, we have avoided to place streets in this direction. We have also generally avoided straight streets in this, or any direction close to it. The dense and often narrow streets are also there partly to create comfortable spaces to move through and stay in, partly because of the necessity of a dense structure due to economic reasons.

The summers are hot in Cape Town, even though they're windy. This is enhanced by the general problem of over-heated cities. Because of this we have created room for small green yards within the different blocks.

The yards provide cool, shaded and green barbeque and meeting spaces for the inhabitants. More green space of this kind and less hard surfaces can limit the problem of overheated cities.

The green structure.

Storm water will have to be taken care of within the site. This is done by creating more permeable surfaces in inner yards that let the rainwater infiltrate into the ground. Vegetation absorbs a lot of water as well. Green roofs can be an option, they cool the building during the summer and isolate and keep the heat during winter.

Because of the estimation of a rising sea level, and more storms, the ground floor levels of housing should be placed over the ground, by raising the foundation of the buildings. In case of flooding this would limit the damages on property and make evacuation easier if needed.

Traffic

A traffic circle above the N1 provides an access into Culemborg from both the eastern and western directions of the highway. This road makes a sharp turn as it reaches the Culemborg BRT station. The sharp turn will force the speed down.

It will also be possible to enter Culemborg under the elevated N2 at the west end. Of the three roads reaching into the traffic circle, the middle one is likely to be built at a later stage. This one goes straight through what is the MotorCity today which is an area with space demanding showrooms for cars but provide few workplaces. We see a possibility of better land use in a future when the land value rises.

Until this connection can be created an access further south in the west end will have to do. This will be built at the same time as the BRT and therefore finished by March 2010. A traffic circle will lead one road to the north and one road to the south of the BRT lanes.

The Avenue in the site does not run straight through the site but makes some turns. To prevent the traffic from using Culemborg as a short cut on its way to or from the CBD. Otherwise, and as mentioned, the Avenue has its design from the storm water culvert running through the site.

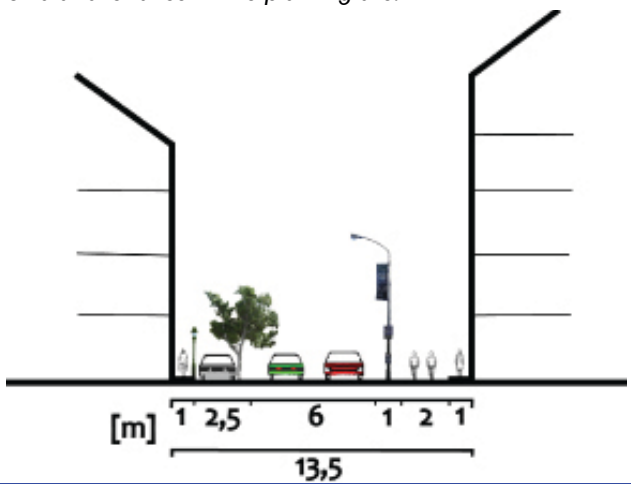
The green bridge will allow vehicular traffic to enter Culemborg from Woodstock. This will be a great asset and a very important link reaching straight into the centre and heart of Culemborg.

The overall street net is designed so that there is no completely straight way through in east-western direction. This is necessary to limit the amount of through traffic at peak commute hours when the surrounding roads are working at their capacity. There is a main road though, the Culemborg Avenue. This is efficient land use because as mentioned a before, it's not possible to build on top of the servitude of the storm water culvert.

The streets will generally be planted with trees and parking will be provided along the streets to keep the speed down and to create lively and safe streets.

There are vehicular crossings over the BRT lanes; one at each of the BRT stations. More is not possible because it would interrupt the traffic too much.

Section of a smaller street in the planning site.



Pedestrians and bikers

Although Cape Town does not have many bikers today, and most people use the car even for short distances, a well developed street net for bikes and pedestrians could provide a possibility for these modes of transport. As more people choose to use public transport due to rising oil prices it will become even more necessary as well as more common.

A green axis will follow along the BRT in east-western direction through the whole area. This will be a nice environment for the bike and pedestrian lane which also follows it. The whole area has a net of pedestrian streets that do not always follow the main roads.

The green bridge and the activity bridge offer two links into Culemborg from Woodstock at about 500 meter distance.

In the west end, pavements follow all three roads under the N2 to allow easy access to the central station and the CBD.

The yellow lines shows the pedestrian and bicycle lanes. The BRT road runs in the midde of the site and is illustrated with dark green colour.

Public transport

The BRT line goes through the site in east-western direction and stops at two stations, East and West Culemborg, about 500 meters apart. The closest BRT station outside the project area is the central station, about 1 km from West Culemborg station. The idea is that when all the phases of the Cape Town BRT system are in operation a bus will pass every 30 seconds at peak commuting hours.

The platforms are placed between the lanes to offer easy changes between the different BRT lines. The station at East Culemborg makes the change from commuting train to BRT simple and fast with the location so close to Esplanade and Woodstock train stations.

Even with the functioning BRT system, the shared taxis will probably operate within the area, at least while the new transit system is not fully built out.

Development phases

Development of the project site should start in the east, where the first BRT station will be ready in 2010. Phase 1A includes the new traffic circle, BRT station, the pedestrian bridge and the blocks surrounding it.

Development of Phase 1B starts in the west end as an extension of the CBD but more dense. The commercial developments provide economic power to manage the necessary infrastructure.

Phase 2 includes the area along the N1with good advertisement potential.

Phase 3 includes the construction of the centre of Culemborg with the West Culemborg BRT station surrounded by offices and housing.

Last, as Phase 4, comes the development of the former shunting yard, all the land south of the BRT and the Culemborg Park with the green bridge.

The development phases. The red color shows phase 1, the orange phase 2, the blue phase 3 and the yellow phase 4.

Security and health

With 6-10 floor buildings along the N1 the noise can be kept outside and a calm and living-friendly environment can be created in the middle of the project area, close to the BRT stations. The residential units are generally lower and at a more human scale to keep the contact with the streets and better possibilities for improved social surveillance.

Housing is not suitable along the railways in the southern part of the project site, and though buildings with other uses shield the more central parts, these are not as high as those along the N1.

Impression of safety?

We wish to create safe streets with less cars and lower speeds. Therefore the amount of parking is limited to 1.2 parking places per housing unit. We believe this is possible because of the excellent public transport and close to services. The residents will mainly park on the streets. For customer orientated uses Parking areas will be provided close to entrances for customer oriented uses. Parking houses will be necessary for the areas with offices. Where possible, parking will be used daily by visitors and workers and nightly by residents. There will be no parking underground due to the ground conditions.

Appreciated greenery.


Cafe
Mozart

PART 5 - The activity bridge

In this part Tina Wagner presents a situation plan of a portion of the project site. This plan is based on certain strengths, opportunities and weaknesses from the SWOT analysis which summarized all the other analyses.

The core idea of this part is to present a proposal for strengthening the pedestrian link which crosses the Culemborg site and connects to the train stations of Esplanade and Woodstock at one end, and the harbor at the other. To do this the opportunities of the BRT system, of integrating income groups and races, and the possibility of mix use development are explored. Mainly three weaknesses are dealt with; the barriers of the railway and the N1, the lack of protection from winds and the general problem of bad accessibility.

The planning site.

The pedestrian bridge today.

Situation plan

The area concerned in this section involves the pedestrian bridge, the East Culemborg BRT station and the block in direct connection to it. The red ellipse in the illustration above roughly shows the area around the pedestrian bridge.

This bridge is one of the few entrances into the harbor where a large amount of people work. Today it is a windy passage without protection against the strong winds and it is a long walk, almost half a kilometer in total.

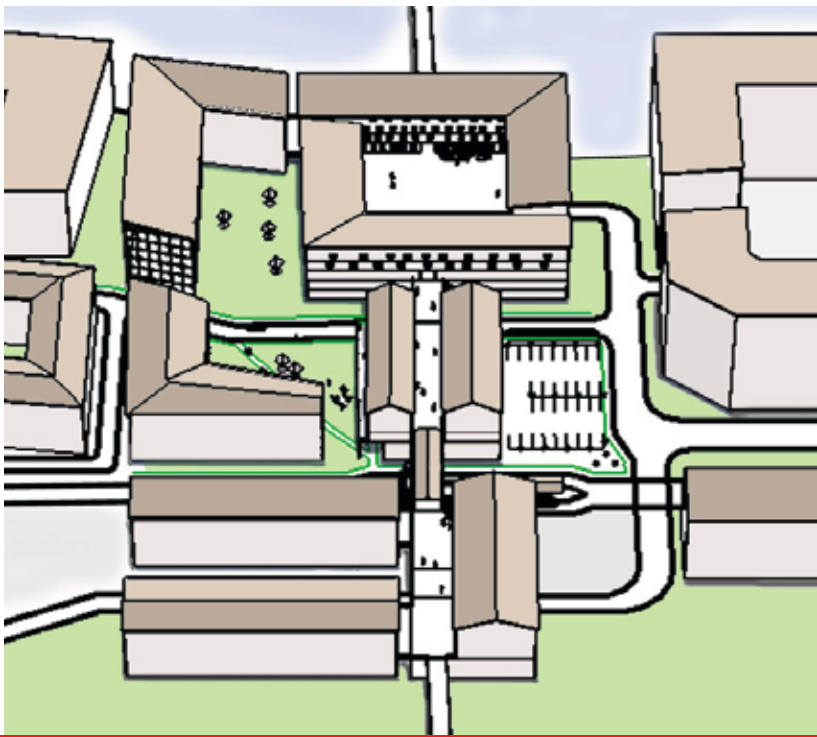
The situation plan shows how the bridge stretches out from Esplanade station in the south. It leads straight between the two buildings in the middle of the site and then into the square in the north. The square is protected from the wind on all four sides and is intended as a market place. The building will contain offices due to proximity to the highway and the sound pollution it causes, but will have doors and windows facing the square with room for cafés etc.

On the ground level, on the west side, green space is created. The building forming the narrow street at bridge level has pillars/columns holding the first two stories.

Opposite, enclosing the green space is a mainly residential building. Housing mixed with offices will make people move in the area at all times.

The office building in the north is a shield to keep the highway noise outside and also encloses the green space.

The situation plan.



The courtyard at bridge level. At the market people can make daily purchases; they pass by on the way to the BRT station or the train stations.

The bridge seen from west. To the right the bridge continues over the Esplanade station and to the left (north) it runs over the N1 and to the harbor.

Climate

Today there is no protected place to wait for the trains. Imagine a broader space, better protected from the climate, and how people could use this then.

By providing better protection from the climate a larger amount of activities could be attracted to the bridge and it could become an interesting, weather protected and safe place for people to move across, instead of the barren place the bridge is today. The suggestion is to protect the bridge by surrounding it with buildings of between 4 and 7 floors on both sides from ground level.

The bridge would become a lively and active passage where people would not mind stopping for a coffee.

The idea is that a bridge can be so much more than just a necessary passage. Even a bridge can offer a protected, but still exciting sensation on the way over it.

To limit problems with rainwater there will be a green space within the area. The city of Cape Town has little green space in between the blocks of the central parts and this make the streets hot and unpleasant during the summer. More greenery would help absorb the heat instead of reflecting it like hard surfaces do. This in turn would deal with the growing problem of heated cities. Trees would provide shade and an environment pleasant for short breaks from work.

The narrow street created at the centre of the bridge will hold small places for business on the bridge level, and housing above. Inspiration is taken from the streets of 'Gamla stan' in Stockholm. The buildings will protect against the strong winds and create a comfortable local climate.

The green space with the balconies that overlook what is going on.

The green space is defined on the southeastern side by a row of columns holding up a balcony that provides shade during the summers and protection from rain in the winter and fall. These have been inspired by the colonial style that is present everywhere in Cape Town. This will be a nice shady place to hide on hot summer days, maybe a café has put out some tables so one could sit and relax on a lunch break.

Due to the little height over sea level it's not suitable to have underground parking anywhere on the project site and this applies to this area as well.

Access

Access is the largest drawback with the 'activity bridge'. It is not the optimal solution for those who cannot climb stairs easily, this is generally a problem in Cape Town. It is partly solved with public elevators. One will access the Easy Culemborg BRT station from the bridge. Elevators will also be found in the office buildings around the courtyard/marketplace, and stairs will be found as well. It is possible to reach the activity bridge in three different places within the site, the entrances from the harbor and by Esplanade station not counted.

View from the BRT station over the path leading to the green space. The columns provide shade on hot sommer days.

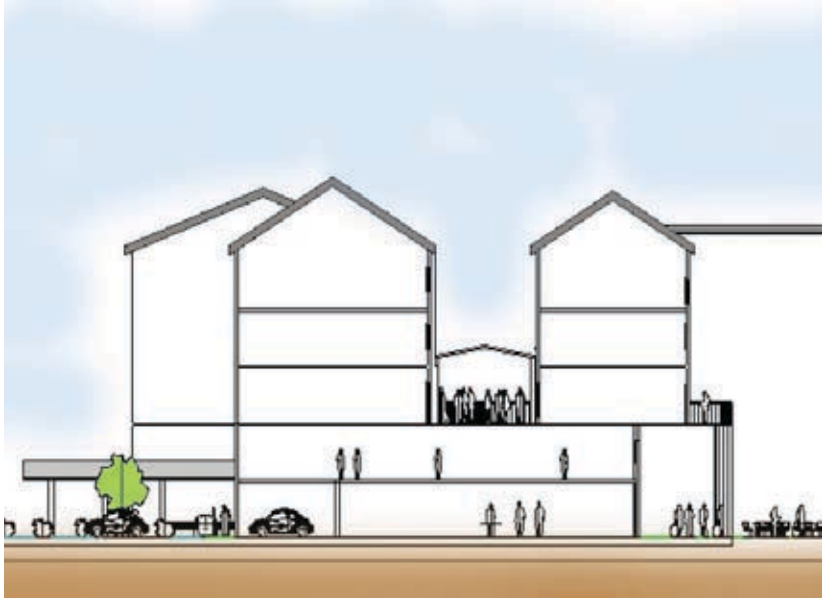
Between the narrow street and the court yard a staircase gives easy access to the green space.

The BRT station seen from the west. There are stairs as well as an elevator to reach the platform where the busses stop.

Traffic

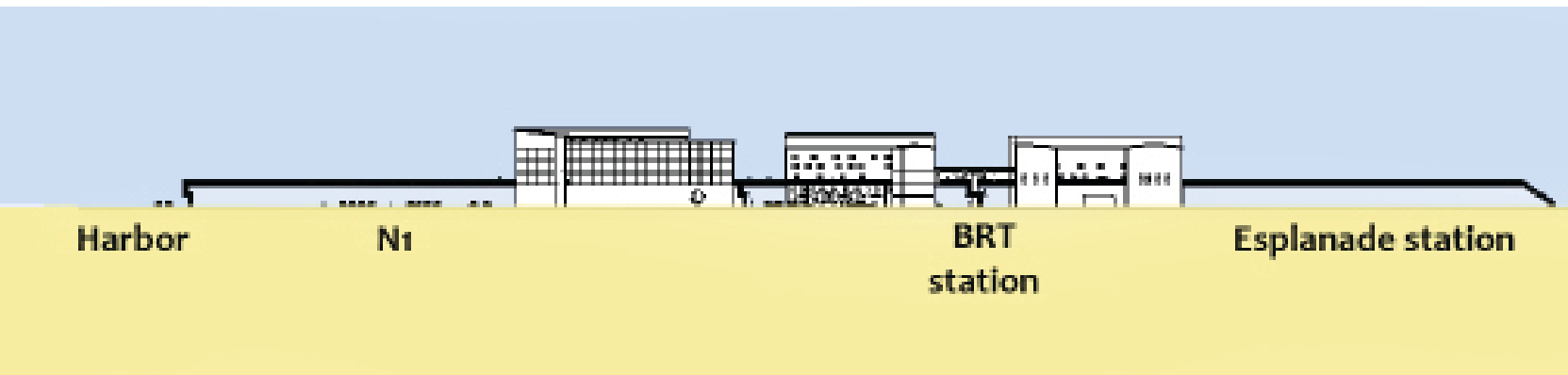
Cars enter the area from the traffic circle above the N1. When turning off from the N1 the area is reached by making a sharp turn, which limits the speed. The reason is also to bring the road away from the BRT lanes, which would otherwise become too wide a space. The shape and the width of the road will help keep the speed down. Placing trees along the road in the green space usually makes drivers go slower because of the feeling that the road is narrower than it really is.

Parking is situated on ground level underneath the square and in the eastern “narrow building”. There is also a parking lot in front of this building. This will be used by workers and visitors in this area.



Room for parking on the backside of one of the buildings facing the activity corridor on the bridge. There are also a few garage places on street level for the residents in the building. But both corners are available for businesses.

There is a parking garage on ground level and second floor beneath the bridge. The roof could let in daylight into the garage and lessen the need for synthetic light.



Public transport

The biggest asset is the public transport. The East Culemborg station will be the first one built in Culemborg and is supposed to stand ready in 2010. The whole area is already a node for change of transport mode with the Esplanade and Woodstock train stations. With the building of the BRT this becomes even stronger. It is important that the new East Culemborg BRT station is easily accessible from the pedestrian bridge.

The core of the idea is that the same people who cross the bridge today will use it tomorrow, but they will enjoy it more. People would be able to run errands on their way between two points, and through this save time and energy. This would encourage the use of public transport.

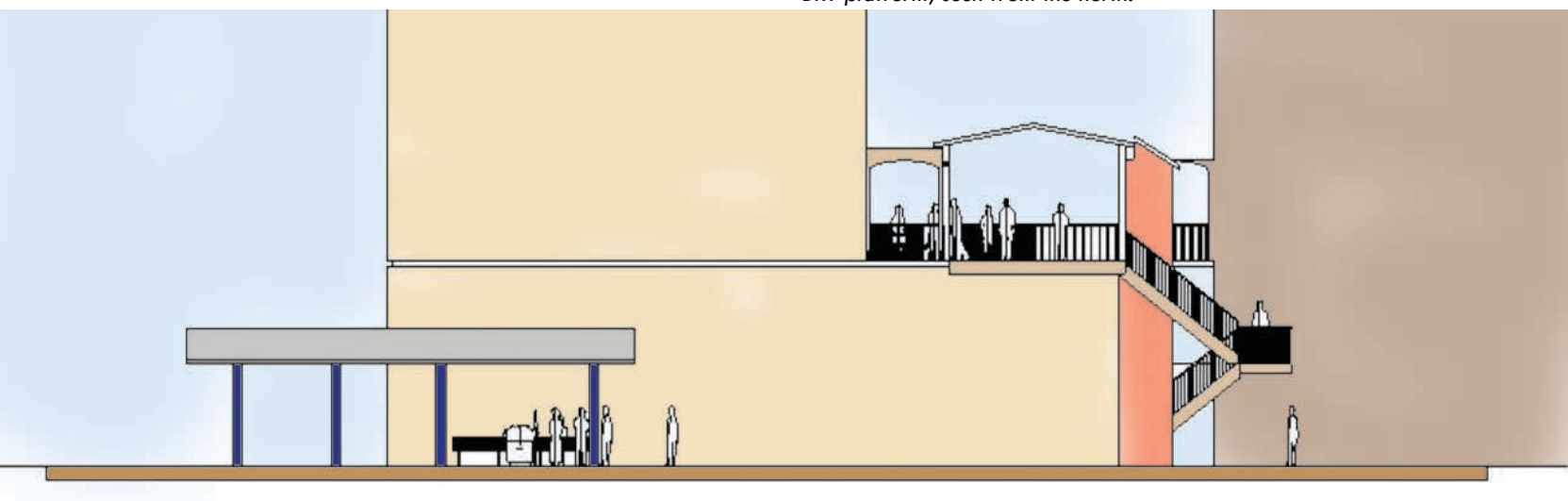
The station will be situated between the bus lanes to make changes between different bus routes as easy as possible. This means that the best way to enter the station is from above. Again, the idea of turning the pedestrian bridge into an activity corridor is supported.

Security & health

Security is a great issue in South Africa. In comparisson to Europe, the walls are high and there are not the same private, semi-private, semi-public and public spaces within the cities that we look for.

The whole bridge is a public street and it will be accessible at all hours of the day to everyone, with no exception.

The section shows the bridge with elevator and stairs down to the BRT platform, seen from the north.



The vault when entering the market place at the north en of the bridge.

This might be an issue for some. The vault on the bridge at the entrance into the market square is not there to keep people out. It is there to create a difference between two spaces of different character. Due to the habit of putting up fences and walls in South Africa it is important to stress the keeping of the opening, otherwise an important access to the harbor would be lost. Instead of trusting the walls, the movement of people at all times; the social surveillance will create a safe space.

It is not suitable to have housing units close to the N1 because of the sound pollution and therefore these are suitable for offices. The buildings along the N1 have the height of 7 floors. In this way the buildings reduce the disturbances from the highway and create a better environment for housing in the middle, closer to the BRT station.

Together the activities on the bridge, the many pedestrian and the bike lanes encourage both workers and those who live in the area to commute. With fewer stops on the way it is easier to convince people to use the public transport. Research has also shown that commuters are in better physical shape because they walk more.

The bike lanes and pedestrian streets are also there to create safe movement paths throughout the area.


Paper Weight
Bargain Books

PART 6 - The centre

The analyses of PART 3 all mention the same problems; the barriers, the problem with personal safety, the risk of segregation and inaccessibility. This part presents a more detailed study of the center of Culemborg and the connections that work towards overcoming the problems of accessibility. Sandra Boström has explored the accessibility around and to the central node of the project site.

This central node is where the Culemborg Avenue, the green bridge from Woodstock and the Bus Rapid Transit system all meet. The West Culemborg BRT station lie between these major connections and will therefore be an important part of the development of the Culemborg goods yard.

The design of these connections is crucial in creating a well integrated, safe, and easy accessible central node. Therefore the planning in this focuses on these links and the centre.

Situation plan

The chosen area includes a part of the Culemborg Avenue and the BRT lanes, the green bridge to Woodstock and the place where all these major connections tie together.

The site, including the links, is about 5 hectares and is located at the centre of Culemborg. In the south it borders on the housing units and small industries in Woodstock. In the north there are more housing units mixed with offices and companies with commercial demand. The Culemborg Park creates a green border in the east and to the west lies the extension of the CBD with mainly offices and commercial uses.

The planning site in the centre of Culemborg

Surroundings

The most important link is the new connection from Culemborg to Woodstock. This is the only direct vehicular link between the two areas. Therefore it becomes very important from an integration perspective and to overcome the physical barriers. It will integrate Culemborg with its surroundings.

The connection to Woodstock is proposed as a green bridge which will served not only a traffic purpose, but to lengthen Trafalgar Park.

The BRT-road runs through the whole of Culemborg and connects to the surroundings and within it as well. There are about 600 meters to the East BRT station and 700 meters to Esplanade and Woodstock station.

From the centre and the station runs a narrow pedestrian and bicycle net to most directions and along all the major roads. These are designed so that they will be as direct as possible, shortcuts instead of adjusted to the car traffic. From the centre to the west CBD it is approximatley 1.5 kilometers.

The density of the site is also adjusted to fit in the context of Culemborg and its surroundings. Lower buildings can be found in the south towards Woodstock and higher ones towards the most west end of the site towards the CBD.

The map shows the central node, marked with a circle, and the connections to and within Culemborg.

A building of 10 stories can be found at the centre by the BRT station. It is logical to make something jump out to mark this area. Buildings of about 6-7 stories can be found by the Culemborg Park to improve the social surveillance and to provide a visual link to the other side with buildings of the same height. The idea with this is to create a feeling of Central Park in New York, but in a much smaller scale.

Ground conditions

The major ground condition that affects this planning site is the storm water pipe that runs through the whole west end of Culemborg. More about how this influenced the planning and the design come under the headline Access & traffic.

As mentioned before, no underground parking or cellars are allowed in the area. Since the proposal is about the links towards the same node, parking will mostly be along the roads, except for the BRT road.

Climate

There are many aspects to take into consideration when it comes to climate. One of the most important things when planning the site is the wind condition. None of the axes run in a southeast-northwest direction. The one axis that runs toward, and ends at, the middle of the square starts in a northeast direction and shifts angle before it ties to the square.

The axis that will be most affected by wind is the Green Bridge. But since it is wide and has no tight streets, tunnels will not occur in the same way as they might along narrow ones with buildings close on both sides.

The sun is often appreciated but in the summer it can be very hot and rather uncomfortable to be outside, unless it is by the sea where you can get the cool breeze and take a swim. The axes are planted with trees that give shade to parked cars, to pedestrians and to other street activities.

On the east half of the square there are trees planted. Places to sit are to be found underneath where people cool down while resting and watching people coming and going from the station and the other roads. This will also be an appreciated area of the square for people to sell their things.

The west half of the square is open space. A part of the building in the most east end is extended, to frame the square and split it from the Avenue. This part of the building covers from the wind and people can sit or linger and watch the square life in the other end without being bothered so much by the wind.

Access & Traffic

As mentioned, this site has high accessibility through strong links and the BRT-station. The centre will be a very important node to make the rest of Culemborg accessible and here people change between modes of transport.

The smaller streets have a width of about 8-12 meters. The other roads are explained in greater detail further ahead.

Square in the CBD.

Acessibility only with a car?

Culemborg Avenue

Culemborg Avenue is the main road through the whole site and in the east connecting it with the CBD and the city centre. Letting the main road run along the BRT will bring a huge road trough Culemborg which would not be very attractive because the scale would be too large and cars would dominate. It would not be a street where people like to walk along, unless they had to.

Culemborg Avenue has a width of 25 meters, due to the storm water culvert beneath it.The total length, from the west side all the way trough the site to the east end, is approximatley 1.7 km.

The avenue is designed so that there is one lane in each direction for cars, each with a width of 3.5 meters. There are parking spaces on both sides and plenty of space for pedestrians, bicycles, street booths and cafés or restaurants to clame a part of the street. This will generate lively street life. People from low income groups will, for example, have space to do their performances and sell their things while people walk by or sit outside at cafés.

The whole Avenue is planted of trees in several lines.

Section of the Avenue.

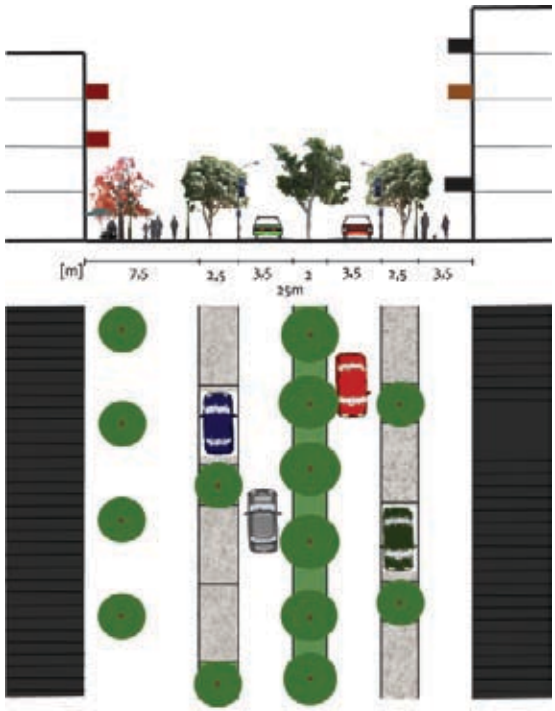
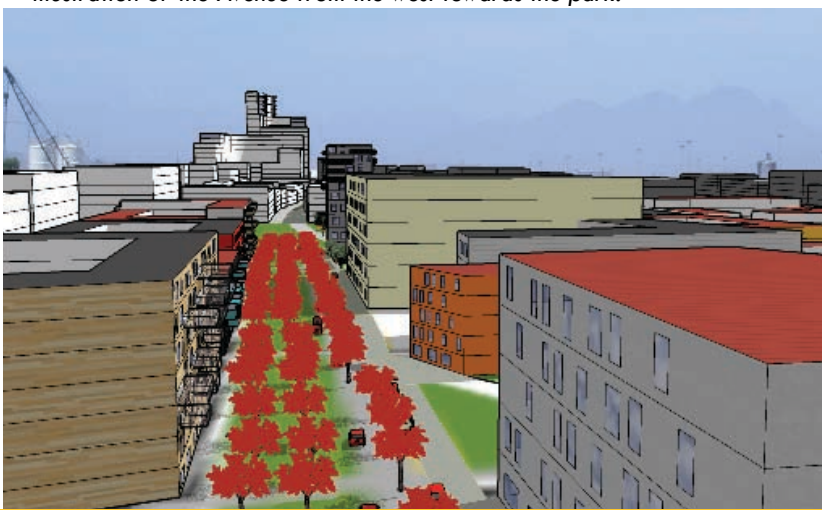


Illustration of the Avenue from the west towards the park.



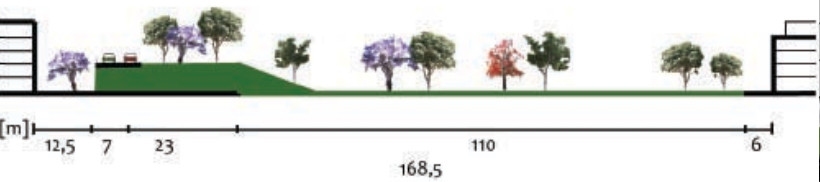
The green bridge

The lack of green areas in the central parts of Cape Town made it important to bring greenery into Culemborg. The connection to Woodstock is designed as a green bridge, to lengthen Trafalgar Park all the way down to the sea. Through this there is not just a physical connection but a visual one as well.

The bridge has a width of about 30 meters, if making it tighter it loses the feeling as the strong green connection it could be. By giving the bridge generous width it will probably become the most obvious green axis in Cape Town, which makes it so important. There is also greenery below the bridge on the east. This greenery has to be well thought through since the multi tracks railroad runs here. One has to be aware of and respect the train traffic so it won't be caused problems.

With the green area closing up on the tracks might give an impression of building the railway away, with the same principal as with the high rise buildings planned by the N2(more about this in Part 4 under "Connection to surroundings". This might hurry the far away future plans of lowering the railway, which of course would improve both the Culemborg and Woodstock areas together with Cape Town's general impression.

Section of the green bridge.



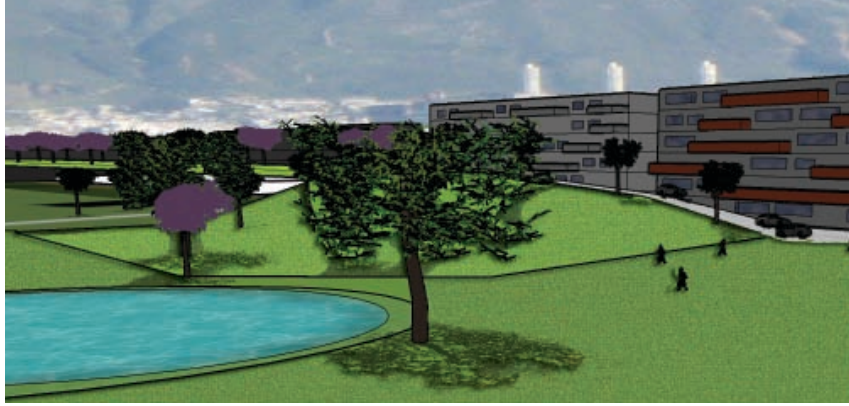
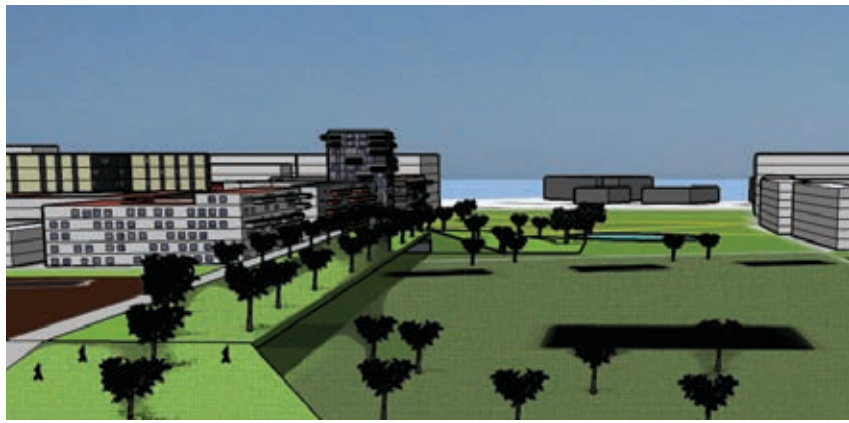
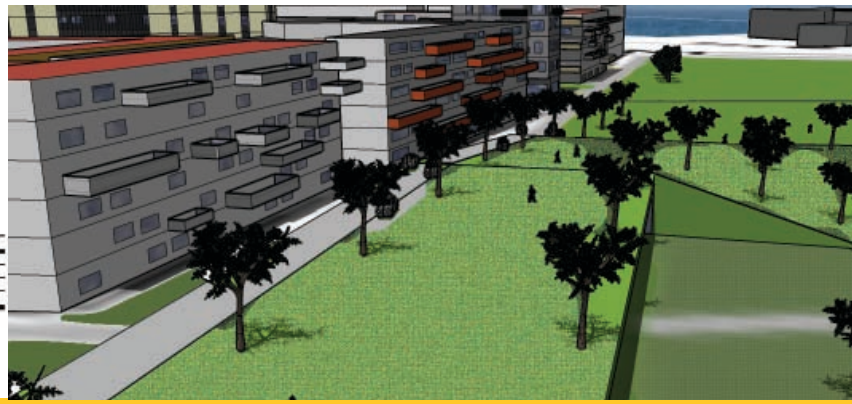


Illustration view of the green bridge from north in Culemborg Park.



The green bridge from Woodstock in the south.

A close up of the green bridge.



Public transport

The BRT-road has a width of 16 meters servitude, and it is for buses only. It is suggested that trees be planted in between the bus lanes. The station will be placed in between as well. A bike lane follows the BRT route through the whole of Culemborg.

Even if there will be a new public transport in Cape Town the shared taxis might still exist, but in less extent. The BRT is seen as a good complement to the taxis. Taxis will perhaps have a route through the site, picking up and dropping off people at the station.

Illustration of the BRT from the West.

Section of the BRT road.

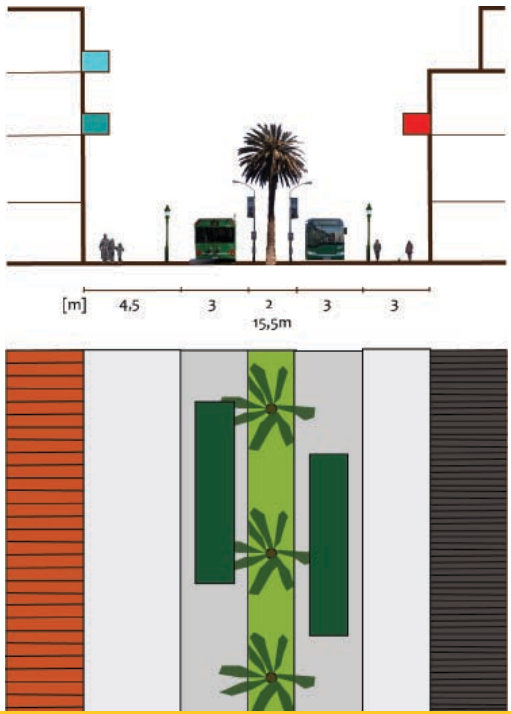


Illustration of the BRT and the Avenue from Culemborg park in the East.

Parking

There will be no underground parking. Instead it will happen mostly along the streets. Parking places along the streets increase the job opportunities, from the none or low income group, because job as parking guards will occur.

Some of the buildings will hold place for car parking. The inner courtyard can be elevated one floor, up to the second floor, the parking places are in the middle while shops and offices still could be in front edges towards the streets. This means that the facade conduce to more lively streets, which would be more enjoyable to move along for pedestriants.

By the BRT station there will be a zone to drop off and pick up people with cars, shared taxis and ordinary taxis. There will be parking places for bicycles by the station as well.

Buildings & blocks

Generally entrances to the buildings will face the streets, even in those blocks that are not enclosed. This will bring more street life and social surveillance to the site. If buildings just contain housing, it might be a good idea to let the base of the house be higher than normal. If it is higher the windows will be harder to reach, brake, enter and the loss of bars will bring more hospitableness to the site. But the most desired scenario is a mixed use.

This way the areas will never be abandoned during the day or nights, which will make it harder to commit crime undetected.

The centre

At the central node, where the major connections meet, one square is proposed but divided into two halves.

One half of the square is open space and on the west side there is a public building of 5 storeys services, such as a library, employment center, city archive, etc. In front of the public building the square is elevated with stairs leading up to an open place in front of the entrance. This elevated place will be a good spot for different events which requiring a stage, for example public speeches and performances.

Illustration of the open part of the square. The public building can be seen in the background

The crowd below, on the square, will get a good view of what is going on.

The other half is planted with trees. Here one can take a rest from the sun while sitting in the shadow or perhaps walk around at the marketplace. When the square and centre is designed like this will increase the cultural diversity by the mixture of people. The BRT Station is located in the centre by the square planted with trees.

The buildings surrounding the square will be used for offices, small shops, and residents on the top floors. One 10 storey building jumps out in height which will bring something different to this part than the other buildings surrounding the centre. It will have a stunning view over the park, Table Mountain and the harbor, and improve the feeling of safety in the park and the square trough social surveillance.

The part of the square plated with trees.

The square with both parts of it.

Security and health

Cape Town has a high number of crime, robbery, brakeins, attacks, hijacks etc. One good way to lower the crime rates, beside rising the job opportunities, is by high quality social surveillance. Give people, working or living, in the area a chance to see what's going on.

To keep down the car traffic in the site methods from Sweden and other parts of Europe are used, for example, fewer parking spaces and placed along the streets, more narrow streets, trees, larger space for pedestrians etc. If the streets are livelier the traffic will automatically calm down.

It is suitable to place offices and shops on the bottom floors of a building, while housing will be in the upper floors to. This way one`s home would not get destroyed if flooding occurs. Another alternative is to raise the foundation of the houses to bring the first floor level up a bit. But what gets lost in return is street life and lively facades.

PART 7 - The summary

When we wrote the aim stated at the beginning of this document we had not yet visited the Culemborg goods yard, nor understood the complexity of it. This part discusses to what extent we reached the stated aim. Did we manage to produce a physical plan for the

Culemborg goods yard with a distinct emphasis on sustainability? Did we provide housing for middle to low income groups and how did we do it? How does this plan promote integration of different social, economic and racial groups?

The keywords stated in the aim; ‘sustainability’, ‘low to middle income groups’ and ‘bridge to surroundings’ are used as headlines in this part. We briefly discuss how our different parts support the shared for the whole Culemborg goods yard and reflect over how the plan changed during the process.

The process

The plan grew slowly over a long period. The traffic issues, how to solve the access, the barriers around and within the site were things that affected the plan.

Late in the process we realized that the BRT will pass through our project site. This stunned us and caused a total revision of our pan, or so we thought at first. It was not until after this that we grew bold.

In an environment like this, in a lively city like Cape Town, wild ideas seem to be more accepted in comparison to what we are familiar with in Sweden.

Middle to low income

Even before the first visit to the site, when we first came to Cape Town, we realized that housing for low income group was out of the question. The central situation together with the surrounding barriers and ground conditions etc., make it an expensive area to develop. It is not economically feasible with low income housing here.

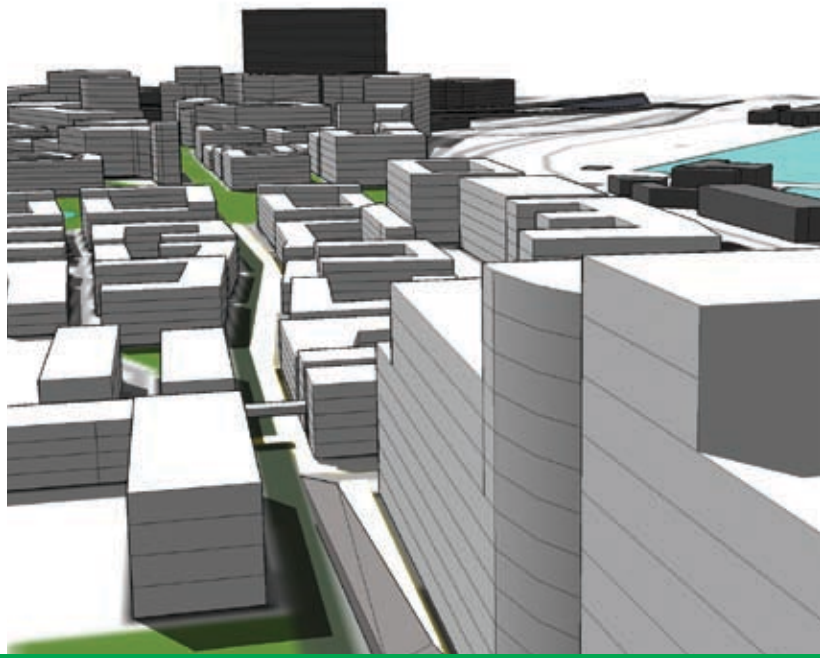
The middle income group is, on the other hand, very suitable. This is the group that wishes to live centrally and can choose public transport over the car.

With these excellent commuting possibilities this can become a very attractive area.

Density

When compared to the blocks presented in the block analysis in PART 3 we think we succeeded in reaching a higher density with smaller scale. The private yards provide semi-private green space for the residents without putting up extra walls.

The streets are narrower, only just so that the necessary traffic can pass, but without excess so that the velocity is held down.

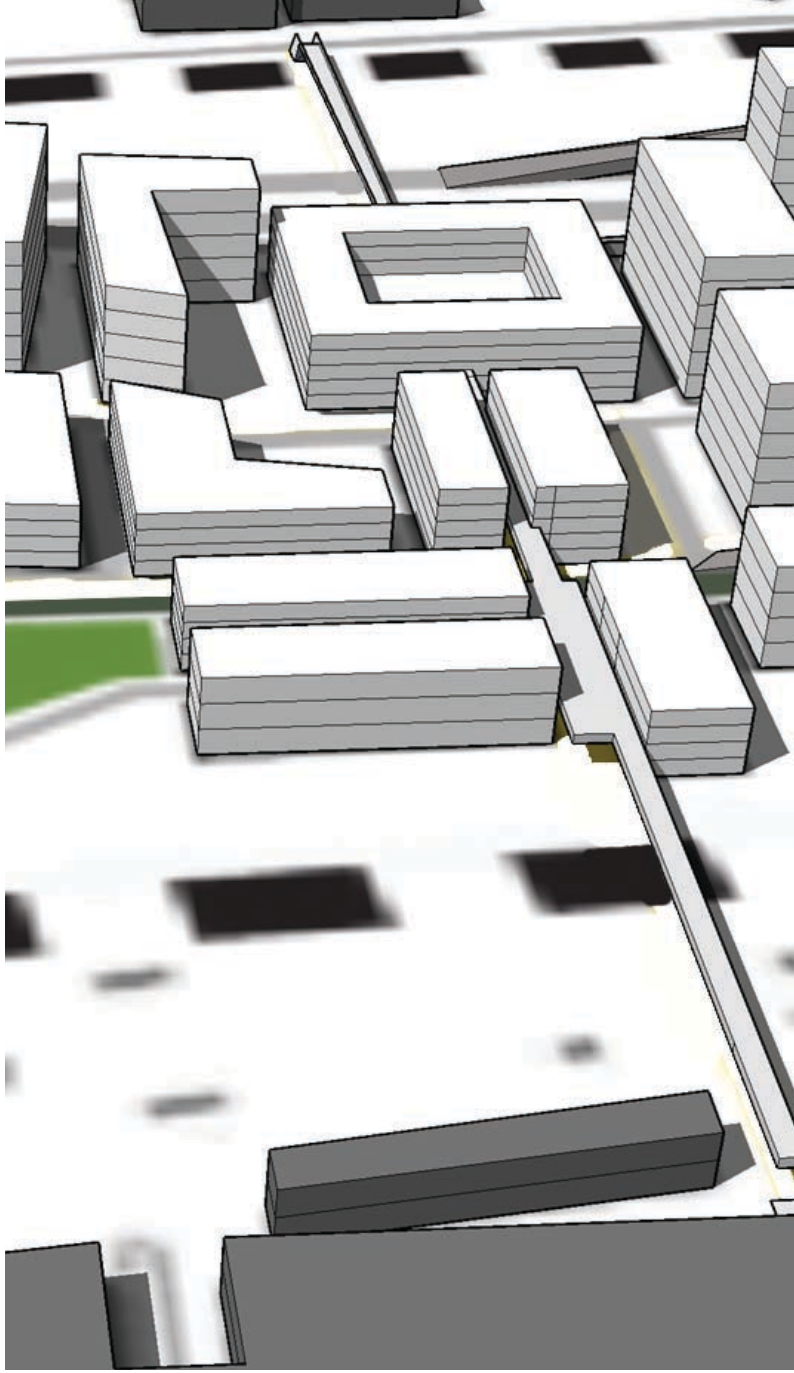


The activity bridge

This situation plan over the activity bridge supports the larger shared plan created for Culemborg, because it enhances an existing important strength.

Part of the idea was to make sure that people who pass there today will still be welcome to pass through when Culemborg is developed.

This area has spaces for many different people. The bridge itself is what connects them; here they will share the space on equal terms. The activities on bridge level will hopefully offer necessities such as the possibility to buy groceries on the way home from work, but also the extras for those who can afford it.

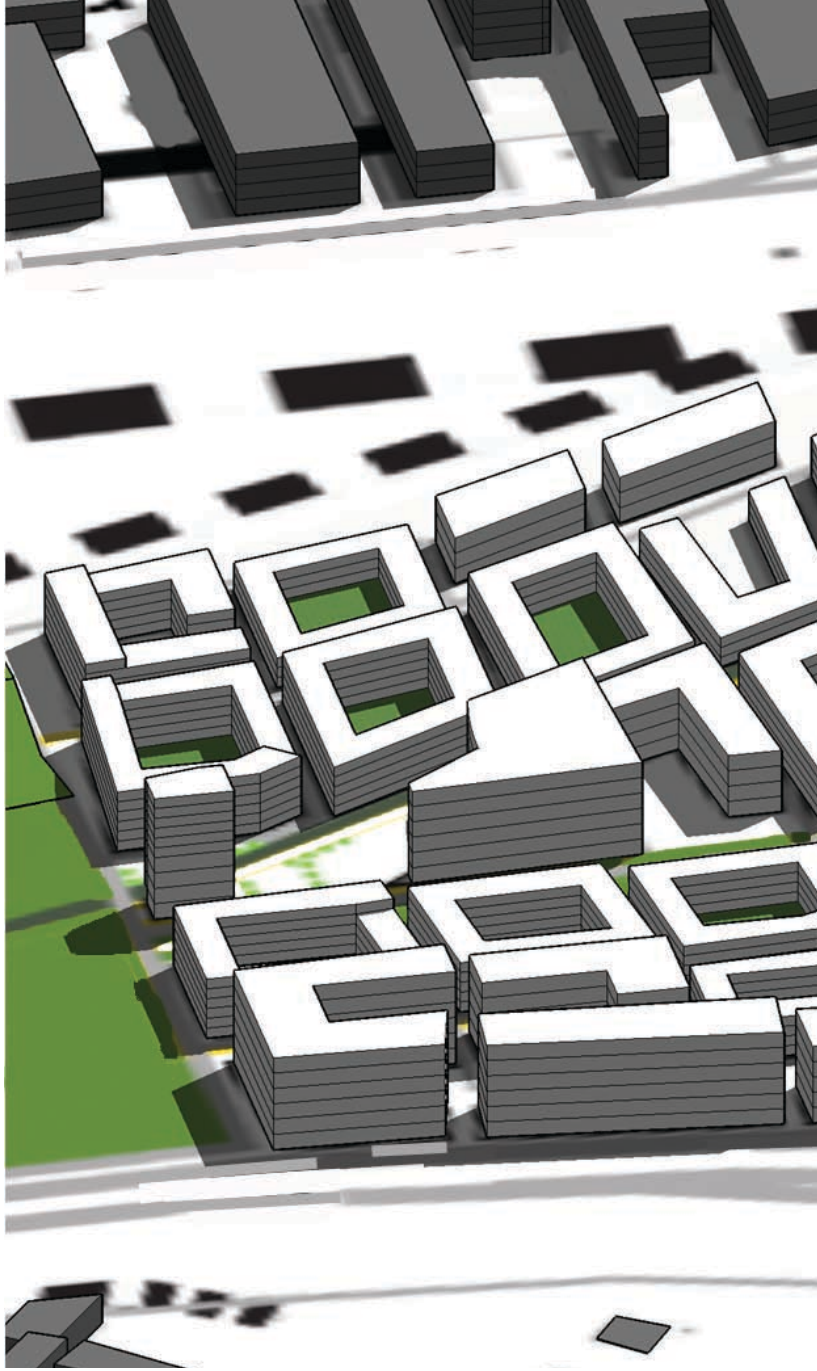


The activity bridge by Tina Wagner.

Bridge to surroundings

We created one new link to Woodstock and enhanced one existing. These are physical bridges that allow people to move freely in and out of Culemborg. The green bridge might be thought of as an expensive solution, but looking at the traffic situation in Cape Town it could unclog the surrounding streets a bit. And it is by all means cheaper than placing the railways underground.

The mix of uses will hopefully attract different groups of people and in this way be a bridge over economical and racial differences. Hopefully the more people interact, the more tolerant they will become of each other's differences. Therefore this is an important bridge in many ways.



The centre of Culemborg by Sandra Boström.

The centre

Integration is so important in South Africa and it can't be forgotten during planning. Small things can make a big difference as long as you are aware of what pre-requisites you can create through town planning. Two of the accesses to and within Culemborg, more or less fixed quite early in the planning process, made it more and more obvious to make a third one cross at the same central point. The centre and the design of the connections will become a question of how successful the area will be as an integrated part of Cape Town.

Still this is a matter of time so it has to be seen from a long term perspective, you may not see changes straight away but perhaps in 10, 15 or 20 years.

Sustainability

The sustainability principles were constantly integrated in the thesis by the knowledge gained through previous studies. We searched for solutions to promote public transport, walking and biking, instead of car use that is so common in South Africa.

By reducing the size and speed of the streets and adding greenery we hope to create safer, more pedestrian friendly streets. The pedestrian was supposed to be the focus, but in a car-dependent city like Cape Town it was hard to plan realistically without dimensioning the roads for a large amount of traffic and with a lot of parking space.

Our hope is that the lively pedestrian friendly streets will also be a good setting for increased social interaction and support social sustainability. With mix use development the possibility to live and work in the same area is en hanced and the use of cars can be eliminated. This also makes people move in the area at all hours, making it safer.

We have dealt with the strong winds to create a comfortablelocal climate, which also limits the cooling of buildings during the winter and thereby the use of energy. It is not within our area to suggest building techniques and materials to lower the energy use. The problem of increased greenhouse effect was hard to deal with, with so many new issues in the, for us, totally new setting. Except the strategies for promoting the use of public transport we reached the conclusion that by adding more greenery at least we can lessen the problem with overheated cities and create green lungs within the city.

PART 8 - Sources

During our studies we have learned very much and very important things. But a lot of the knowledge that this project requierd we got from documents and people with the expertise that we needed to know more about to proceed with our work. This part contains all of the references we have used.

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