

LIVING ON THE LAND

REDESIGNING LAND USE RELATIONSHIPS IN THE PHILIPPI HORTICULTURAL AREA

University of Cape Town

SAUDAH ASMAL

ASMSAU001

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Dissertation presented as part fulfilment of the degree of
Masters of Landscape Architecture

In the School of Architecture, Planning and Geomatics
University of Cape Town, November 2016

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ABSTRACT

Living on the land: Redesigning land use relationships in the Philippi Horticultural Area

Since the mid-1800's the Philippi Horticultural Area (PHA) has been of agricultural significance to Cape Town, producing food for the city. The Area also forms part of the remnant floodplain, and is essential in maintaining the recharge of the Cape Flats Aquifer, an important water source for Cape Town. Conflicting land use agendas are the major threat to resources in the PHA. Besides agriculture, there is an increasing demand on the City of Cape Town to provide housing in close proximity to the city centre. In light of this, re-zoning land in the PHA is being considered. While rezoning will address the demand for housing, it will put even further pressure on the current natural systems and water resources, as well as the historic presence of agriculture in the PHA.

A new approach is required using landscape-based urban design to tackle what would usually be a planning predicament. Densification and development could be viable if they do not impact or encroach on the natural systems and agricultural land in the area, but rather help to sustain them. This requires introducing development typologies that work within the existing landscape and reconfiguring urban form to facilitate positive interfaces with both natural and agricultural systems. This project investigates integrating land use and experimentation with landscape and urban morphology as design tools in reconciling agendas, securing the agricultural and water resources in the PHA.

The structuring land uses utilised are the urban fabric, agricultural land, natural systems and public open space. These are explored through a combination of geo-spatial mapping, collages, and a series of typologies that interrogate land use relationships in the PHA. Experimentation at multiple scales was used, a smaller area being used as a prototype for the larger area. Property lines significantly inform the framework for development, with consolidation and subdivision being the main tools for intervention. The project will re-organise the PHA in a way that enables mutually supportive land-use relationships, to secure the natural resources and function of the PHA while facilitating necessary development.

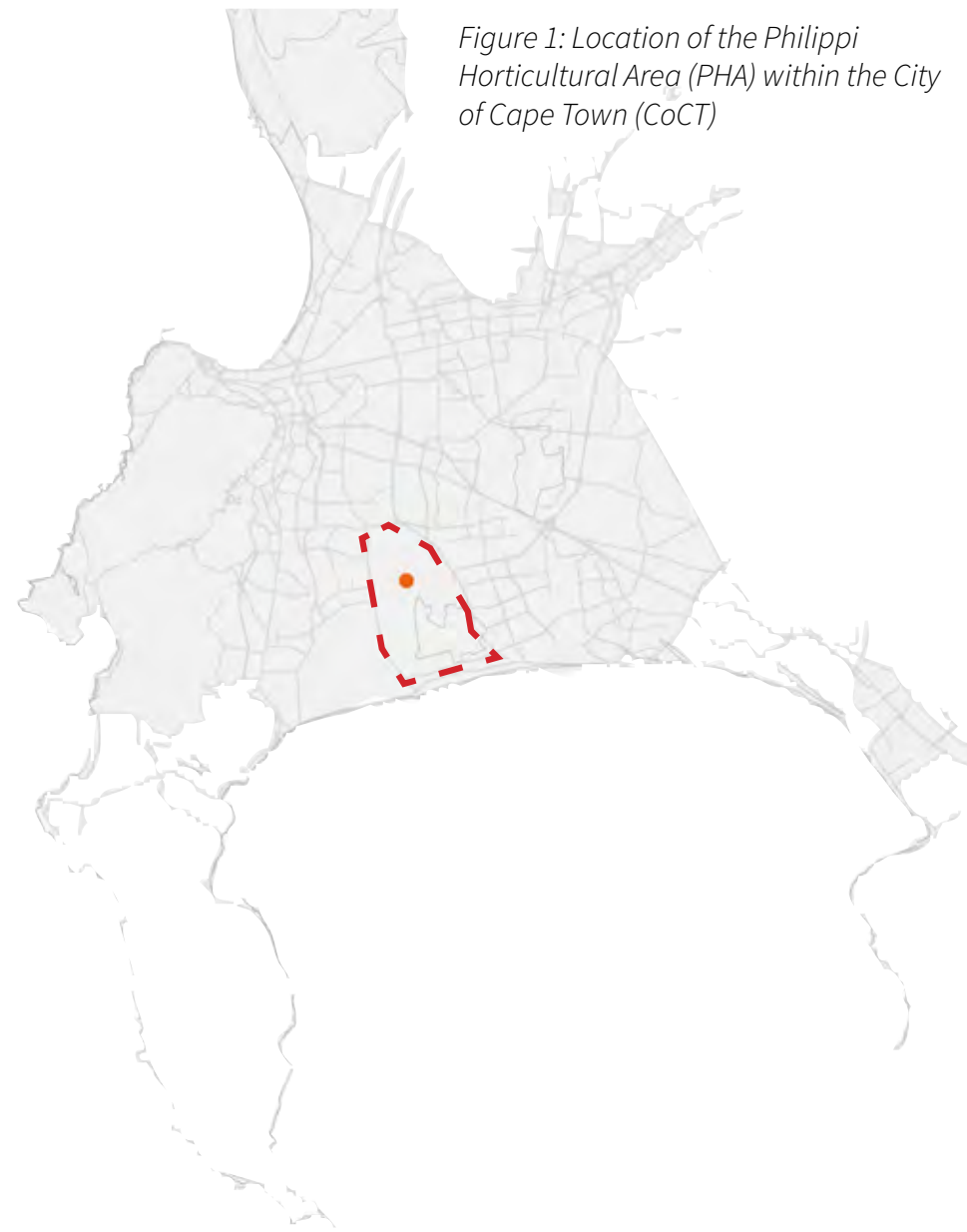


Figure 1: Location of the Philippi Horticultural Area (PHA) within the City of Cape Town (CoCT)

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INTRODUCTION

Since 1830s, the Cape flats/PHA has been used for agriculture, to the extent that it was known as the breadbasket of Cape Town. The area initially became populated by farmers who came as economic refugees from rural Germany (Rabe 2012). They worked and cultivated the land to earn a living through providing fresh produce to the then colony.

Currently, the Philippi Horticultural Area (PHA) is an area of contestation in the city of Cape Town.

The increasing expansion of the Cape Town Metropolitan Area, both formally and informally, has resulted in transformations of land in the PHA as it is eaten into by surrounding land use and a shifting urban edge.

While the area still serves as an important resource in terms of food production and supply to the city, the narrative presented by the City is that the PHA is not intensively farmed and thus can in part be given over to address the need for housing and development. However, the assertion from the farmers in the PHA is that the Area is intensively farmed and that the farming conditions in the PHA provide a unique system for food security for the larger population of the City of Cape Town.

These contrasting narratives require an unbiased analytical tracing to be done of land in the PHA from earliest records until present time. Through this process, it becomes clear which or to what degree these narratives hold true, from which proposals for intervention can then be made.

The PHA is really a series of interacting systems which over time have impacted one another. These engagements must be understood holistically in order to improve on the current situation. Analysis on both a metro and area scale is necessary to understand the role of the PHA in the larger Cape Town network. A landscape-based approach requires working from the ground up, unpacking the natural systems, then the cultural and development layers.

Intervention will also work through this ground-up sequence, being informed by the results of the historical and physical analysis. Due to the rural nature of

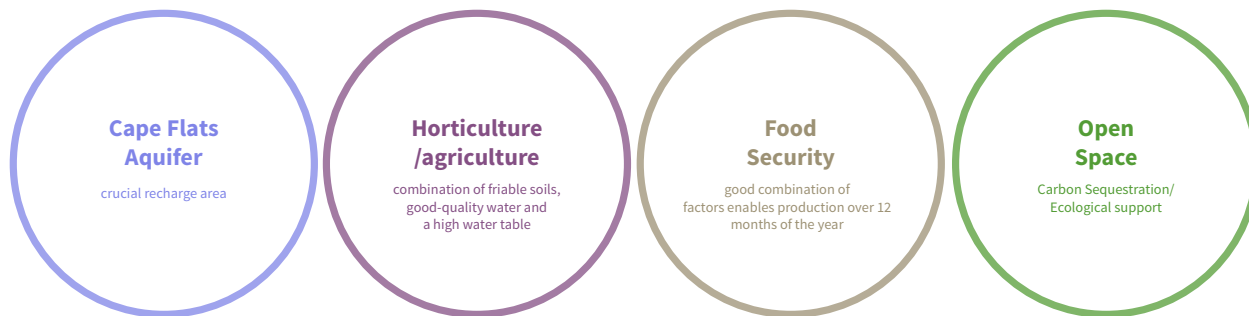
the PHA, new development must emerge out of new urban and agricultural typologies, based on other successful models.

The intention of this design exploration is to test ways of creating land use relationships between the forces of natural systems, agriculture, and urban development which become a means of mutual support rather than competition.

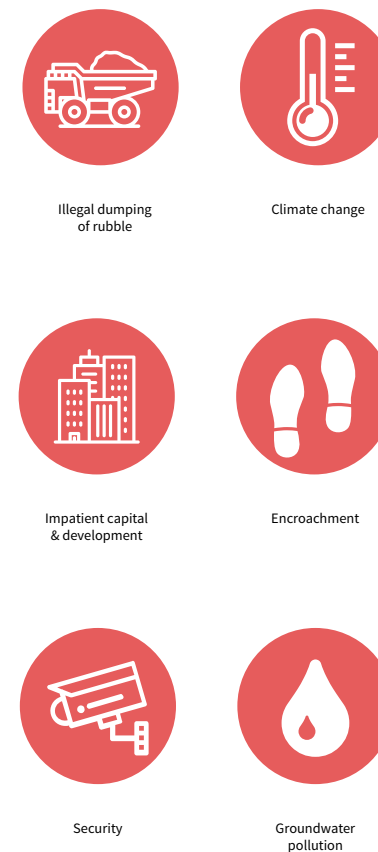
PHILIPPI HORTICULTURAL AREA



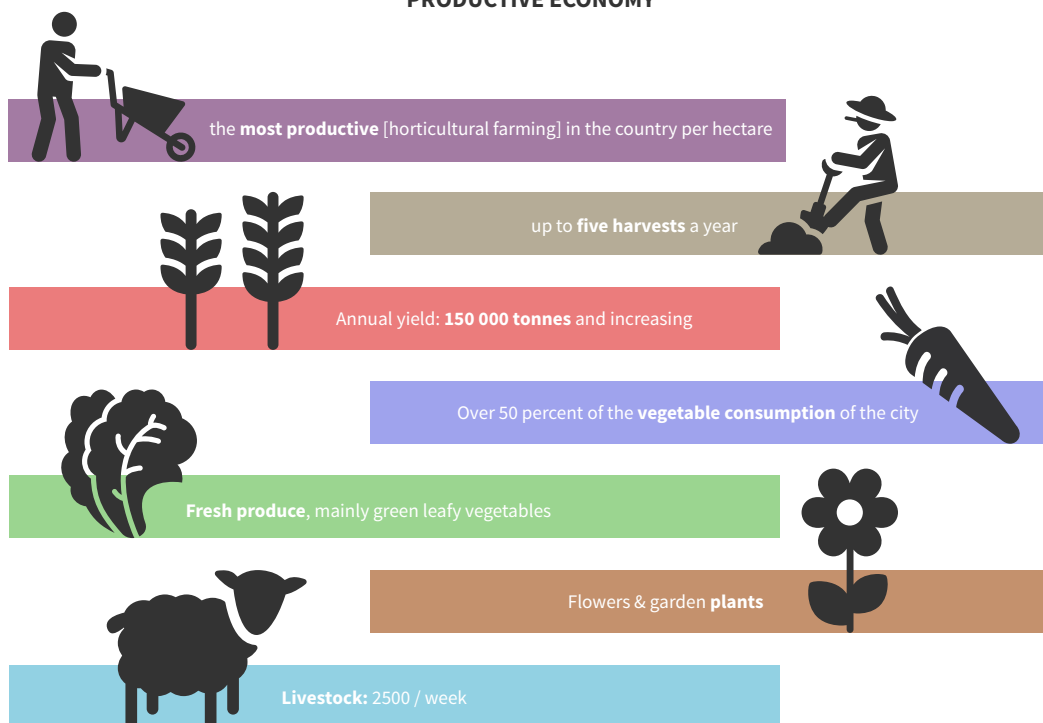
KEY RESOURCES/ROLES



THREATS



PRODUCTIVE ECONOMY

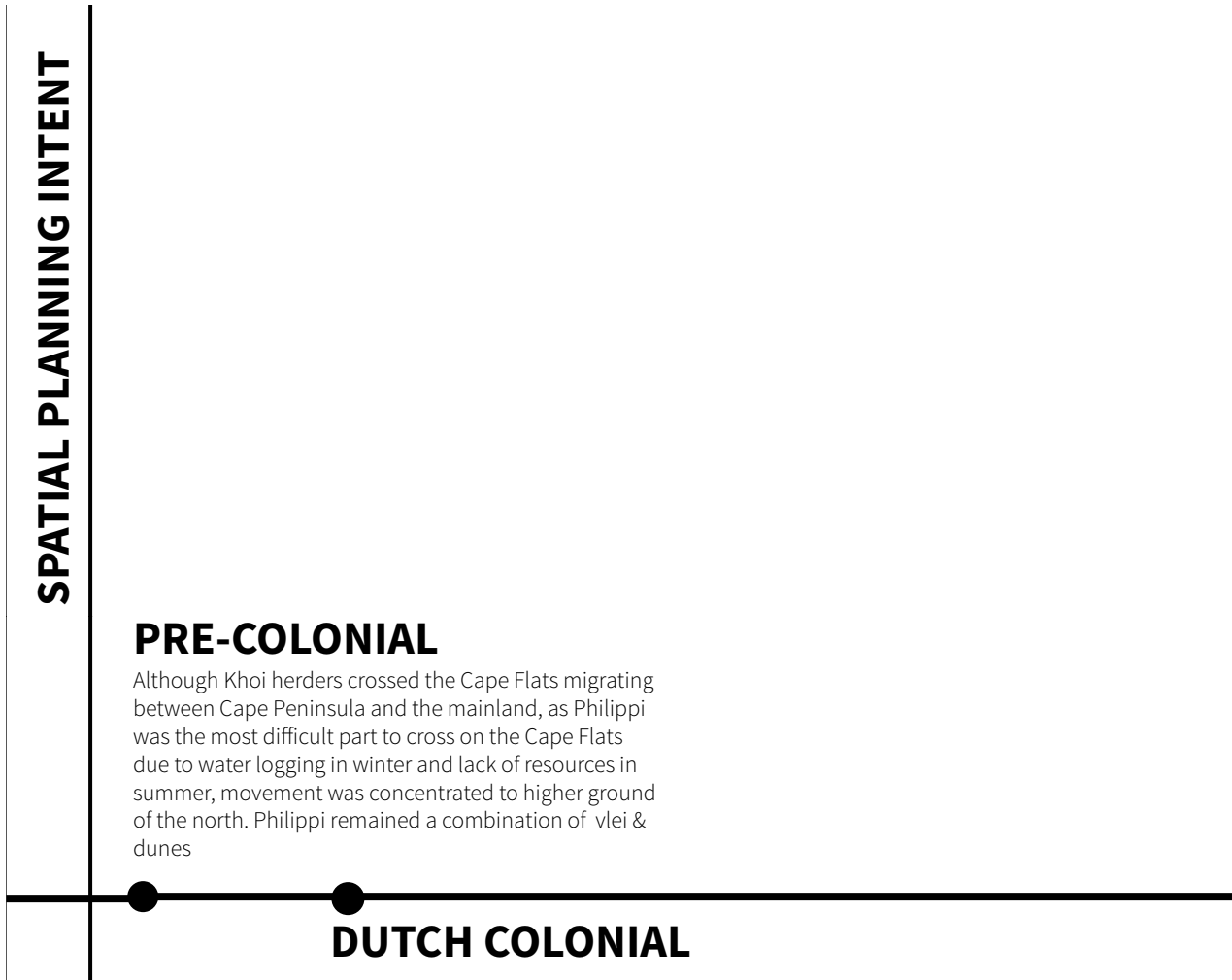


HISTORY

The history of land use change in the PHA must be traced from earliest available records up to present day conditions, with a concurrent comparison to historical spatial planning documents.

The intention is to evaluate whether the spatial planning agenda for the city addresses the land use needs on the ground as identified through the mapping.

Such an evaluation may provide insight and guidance into the increasingly ambiguous territory of how to preserve and maximise the potentially productive land within an urban setting.





First general plan indicating subdivision of farm "Montagu's Gift, the area now known as Schaapkraal

1918

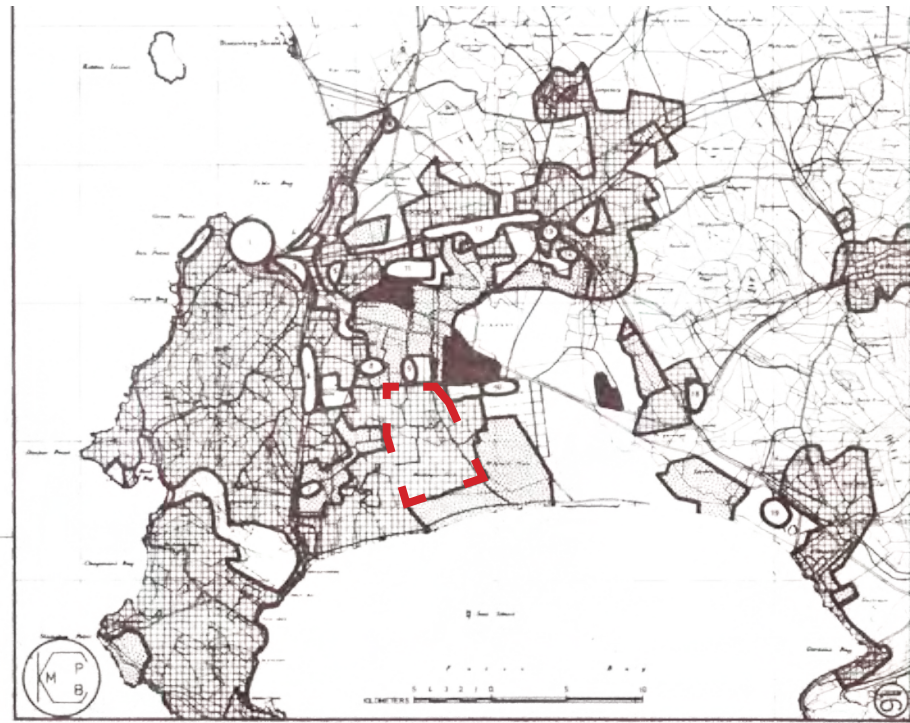
1948
Apartheid begins

1940

positions of the three sister congregations, Wynberg, Philippi and New-Eisleben, and the other Evangelical Lutheran congregations in the Western Cape
Source: Pflanzgarten im Dünemland, 1899



WHITE,	
COLOURED & ASIANS	
BANTU	
VERALGEMEENDE GROEPSGEBIEDE	
BLANKES	
KLEURLINGE EN ASIATE	
BANTOE	



Generalised Group Areas designations (Cape Metropolitan Guide Plan: Illustrations 1975)

1950
Group Areas Act passed
With the Group Areas Act, National Apartheid decision-makers in Pretoria "drew a line" which marked threshold to Hanover Park and Mitchell's Plain. Many of the Germans farming on the Cape Flats were expropriated forced to sell their land and move.

1950



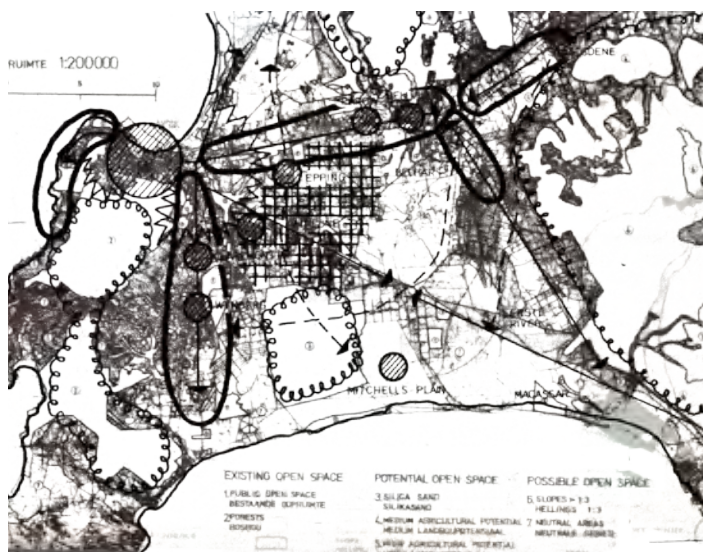
1984 First map to indicate smallholdings (Source: Haysom 2016)



1988 Cape Metropolitan Area Guide Plan



1978 Map of mineral resources within the metropolitan area



Planning documents showing open space in the city overlaid with the spatial development framework (Cape Metropolitan Guide Plan: Illustrations 1975)

1968
PHA identified for silica mining and agriculture in terms of The Physical Planning Act (1967)

Provisions made for industrial activities along northern edge of PHA

Introduction of separate designation for smallholdings

1984
Areas surrounding PHA zoned for urban development

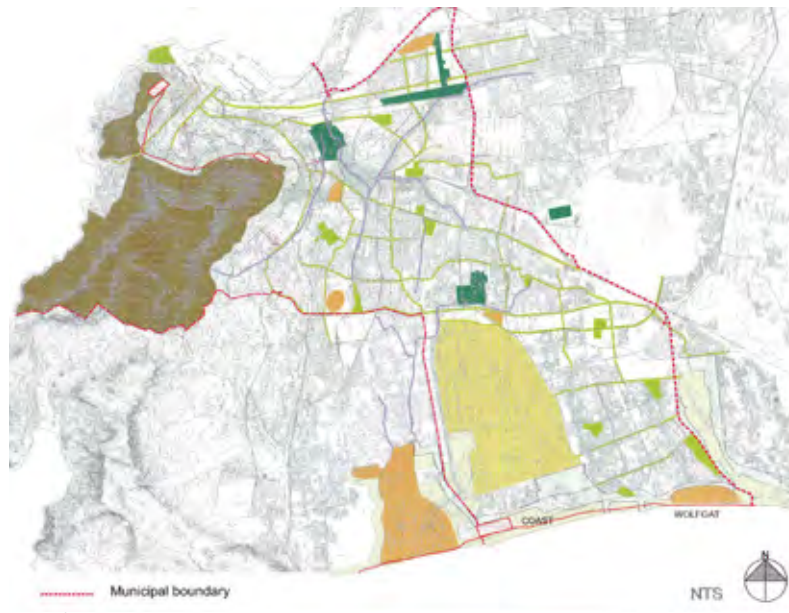
1988
Cape Metropolitan Area Guide Plan
Due to problems arising from 'double reservation' and 'open-endedness' of the term 'agriculture' and the range of activities degrading the productive capacity of the land, the PHA is now reserved for silica mining and horticulture rather than agriculture - a more limited scope of farming activities, with a focus on crops and plant specimen cultivation.

Restriction on conversion of agricultural land to smallholdings because it is unlikely that land will be able to be restored to full agricultural potential

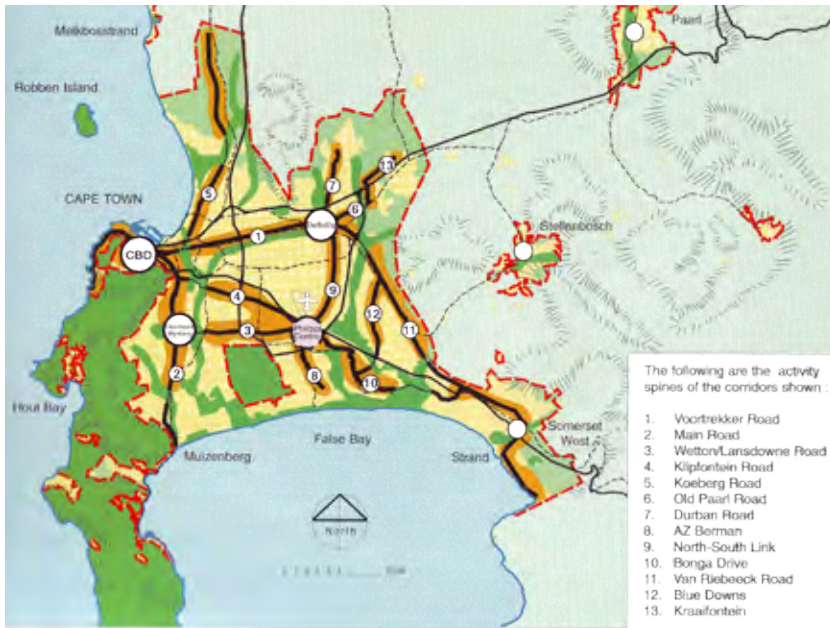
- (1 km Zone approximately 40-100 units per Ha)
- Activity Spine (100m Zone approximately 100 units per Ha)
- Mobility Routes
- Freeways
- Railway Lines
- Metropolitan Open Space
- Maximum extent of the Urban Edge x 20 years
- Urban Edge Study Area
- Mature Metropolitan Nodes
- Proposed Metropolitan Node
- Urban Development

The following are the activity spines of the corridors shown:

1. Voortrekker Road
2. Main Road
3. Wetton/Lansdowne Road
4. Klipfontein Road
5. Koeberg Road
6. Old Paarl Road
7. Durban Road
8. AZ Berman
9. North-South Link
10. Bonga Drive
11. Van Riebeeck Road
12. Blue Downs
13. Kraaifontein



1999 SDF



1996 SDF

1990
87 active farmers in the area

1995

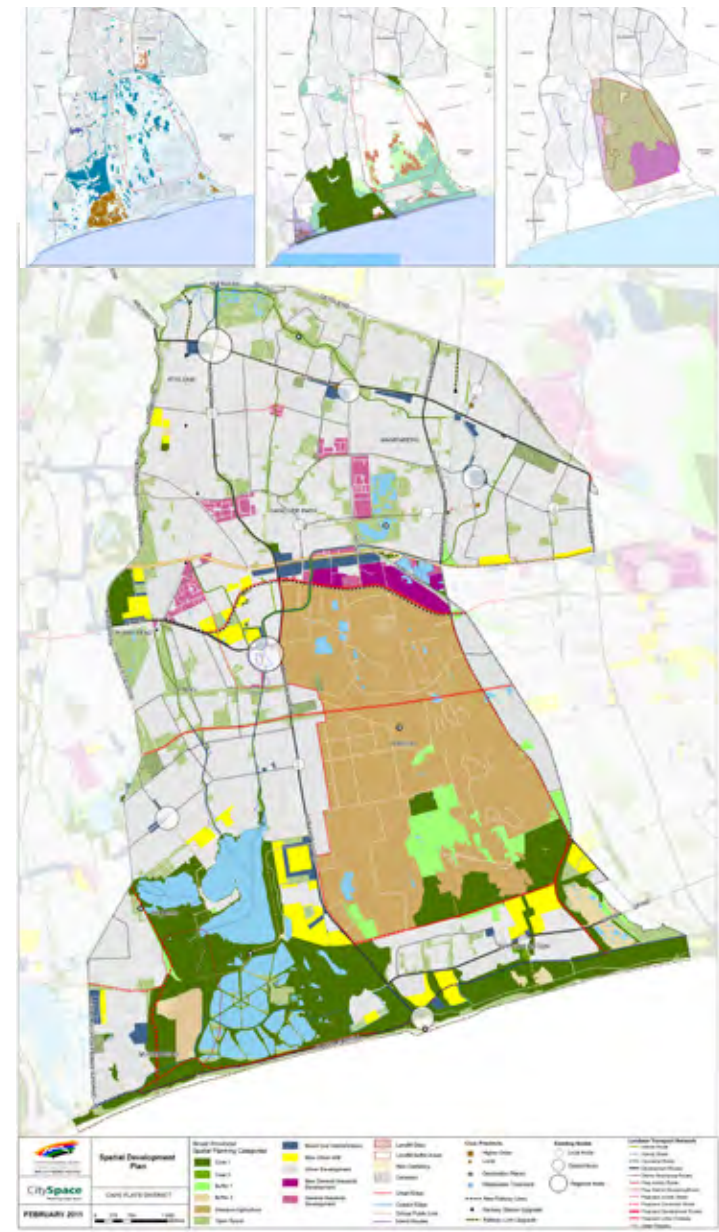
Lansdowne Road Local Structure Plan to see conversion of some agricultural land to industrial. Spatial intent is to create a buffer to horticultural land. At this stage, Schaapkraal is not part of zoned horticultural area and has a separate development policy, this is problematic for enforcement of policy

1990

2000

- Cape Peninsula National Park
- False Bay Coastal Park
- Agriculture
- Ecologically significant remnants
- Rivers and water-courses
- Buffer
- Perennial streams
- Cemeteries
- Multipurpose Urban Parks
- Parks and collective sports fields
- Stormwater, fields, servitudes, etc.
- Intensely planted route
- Public Platforms and Promenades

FIGURE 20B
INTEGRATED SPATIAL
FRAMEWORK: NATURAL
RESOURCE BASE



2011 Cape Flats District Plan

2011

The focus is to (i) Protect PHA as natural asset. (ii) Manage land use and activities, interfaces with the urban. (iii) Conserve CBAs. An Environmental Management framework is drawn up focusing on conservation of existing systems, restoration of damaged systems and sensitive systems which are 'no-go' development options. PHA and Cape Flats are identified for enhancement and restoration.

2010



2012 City of Cape Town SDF Composite Map (Source: SDF 2012)



Figure 4.10 illustrates the urban edge concept. Urban edge management zone introduced into City of Cape Town policy (Source: SDF 2012)



2012

In terms of the SDF, the PHA is zoned rural and sits outside of urban edge
 There is contestation in representation of the urban edge
 Philippi node and Philippi industrial area are identified for intensification of development
 Lansdowne/Wetton corridor is earmarked for increased development
 Food security is mentioned by protecting agricultural areas from urban encroachment and supporting urban agriculture
 There is new policy to protect the city's rural environment through an urban edge management zone.
 The SDF itself is largely development oriented. The area identified for development in the South Eastern portion of the PHA and included within the urban edge corresponds with the biodiversity hot-spot and water resource as identified in systems maps of the SDF, revealing a mixed set of intentions.

DUTCH COLONIAL

1655

VOC Trading Post



The Europeans arrive: Drawing of Table Bay in 1658



Khoi trading sheep for copper with VOC travellers (1627 drawing by Thomas Herbert)

1650s

“Who’s land is this?” hostile encounter between Khoisan and Dutch settlers, those of the Free Burgher Farms. “Hottentots” begin trade embargo against the Dutch who have taken the most fertile grazing pastures and are refusing access to the Khoi for grazing, hunting and foraging. Two skirmishes later, van Riebeeck declares “we have won the land”

1656

Philippi described as a wasteland by Jan van Riebeeck, when the plan to build a canal through the area to connect Table Bay and False Bay was abandoned due to the nature of the terrain and wild life present in the area at the time. Van Riebeeck had sent out an expedition to the Cape Flats for this purpose, who reported hearing large animals such as hippopotami, lions and tigers passing by their tents at night.



A map prepared in 1639 showing the extent of free burgher farms, proposals for the canal joining Table Bay to False Bay and the terrain beyond inhabited by wild beasts - lions, leopards, hippopotami, buck, wildebeest, buffalo

Due to limited access to land, Khoi become unable to sustain their herds. They are left with no option but to sell the cattle to the dutch settlers and to work for them to earn a livelihood.

Cape Flats used for collecting firewood by slaves and as grazing land for the now dutch cattle herds.

A license for grazing was granted by Governor W A van der Stel in 1703, however by 1723 overgrazing by the Dutch herds was already a problem and shifting dunes had become an issue



Johannes Rach's view of Cape Town from the east in 1762, showing the domination of the Castle and the wastelands outside its walls. The land just outside the then extents of Cape Town still exhibited characteristics of a frontier interaction between colonists and indigenous peoples (Atlas van Stolk, Rotterdam)

BRITISH COLONIAL

1795

The Dutch East India Company goes bankrupt and the British take over the Cape. In the face of increasing encounters with the Xhosa who wish to move southwards from the interior, as well as high unemployment “back home”, free passage is offered to those ‘unemployed workmen’ from the Mother Country to emigrate to the Cape, to take advantage of the mildness of the climate and the fertility of the soil. These British settlers have very little knowledge of agriculture and are most times in disputes with indigenous people (“Hottentots”) who have been dispossessed of their land.

1814 - 1870s

The sandy Cape Flats used by the British colonial elite as a hunting ground of wild beasts for sport

1876

As the colony grows, Governor Merriman decides that the flats must become the ‘production source’ for the city. He advocates bringing in German immigrants from the rural parts of Germany to work and improve the land as was successfully done in the Eastern Cape

1876-8

Survey for allotments to German, Swede and Norwegian agricultural immigrants.

The immigrants arrive as economic refugees to a situation much worse than was described to them by the Colony as the sands are poor and climatic conditions are hostile. They dig wells to find water in the hot summer months.

Encouragements to plant port Jackson to stabilize shifting dune sands Merriman asserts that trees and grasses should only be planted as windbreaks and the rest should be agricultural, productive soil

1883

Last set of German immigrants arrive on the flats, many of this group settled in Philippi:

They dig furrows to drain the fields.

The men worked in town by day and on their farms at night, while the women and children worked the farms from the morning

The immigrants built their own shelter. One German could make clay bricks and assisted the rest

They supplement their incomes to make ends meet by:

- harvesting spring flowers for selling
- Collecting scrap metals from dumping sites
- Collection and sales of wild berries in winter

Official opening of Philippi school

1896

The Philippi Agricultural Association is established to represent concerns of people, such as the need for formal roads within shifting sands

1897

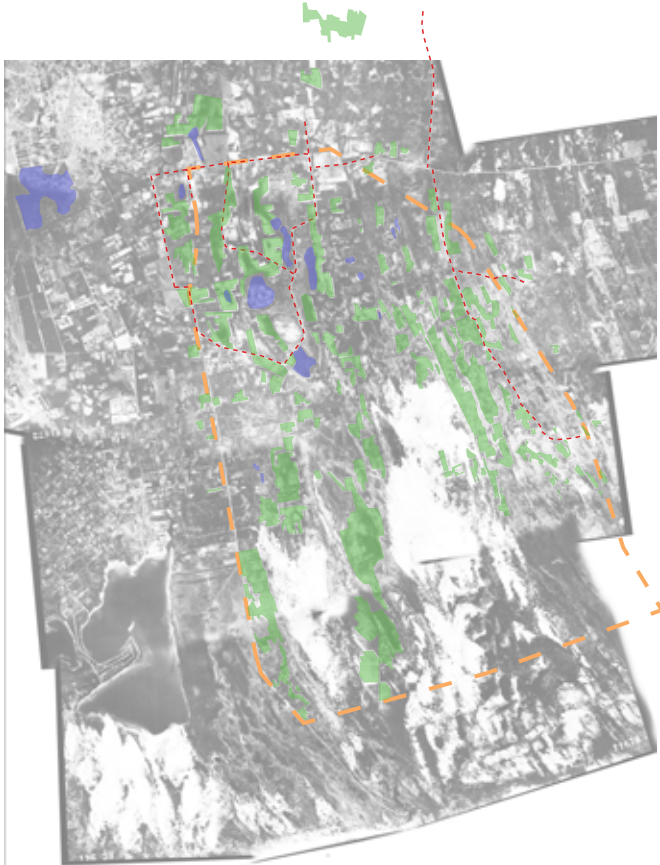
Philippi Church is built and opened on Lansdowne Road

1890s

First roads (dirt tracks) into the area

1938

Earliest aerial imagery of the area. The first few farms have already been established by the 1883 German immigrants. The scale of the initial farmland is small, reflecting the role of the family unit in ownership. The form of agricultural fields is an east-west configuration, responding to the existing dune system. The area is largely inaccessible to the urban population of Cape Town at this stage due to a lack of formal roads in.

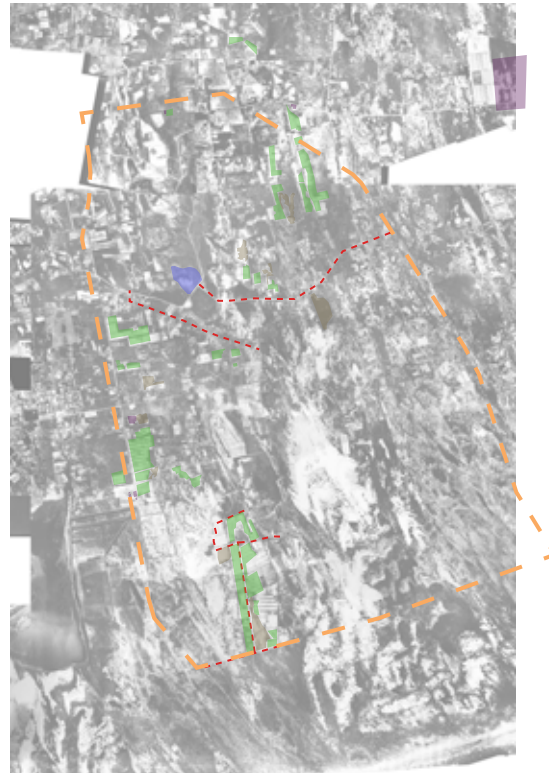


Land use in the PHA in 1938 (author's own, from aerial photography)

1940

1945

Small patches of new land have been cultivated along with the appearance of a few small dirt roads and residential dwellings.

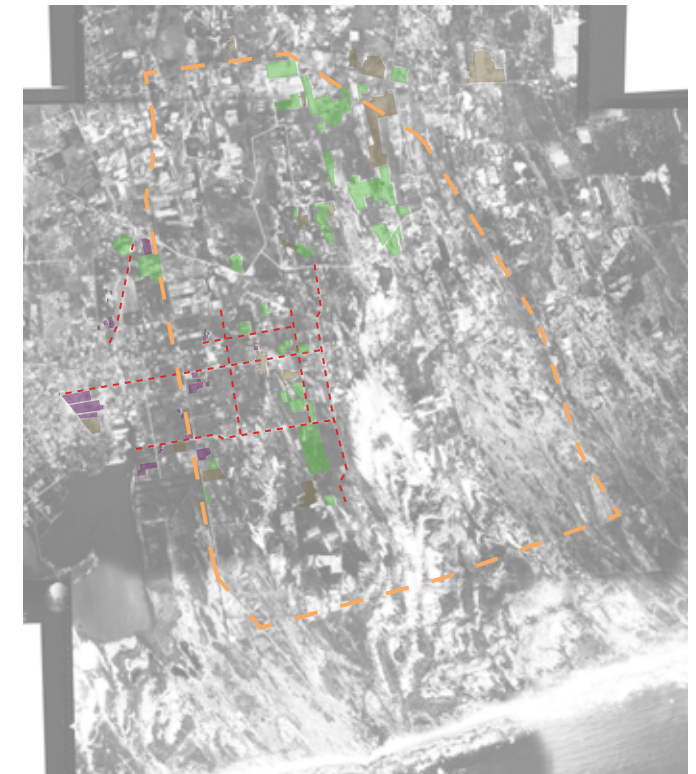


Land use change from 1938 (author's own, from aerial photography)

1950

1953

There is a notable increase of cultivated land in the Northern and Western portions of the area made possible by a series of new roads into the flats. There is some development in Lotus River and Grassy Park which spills over into the PHA, with the introduction of roads linking the farmlands to urban fabric in the west.



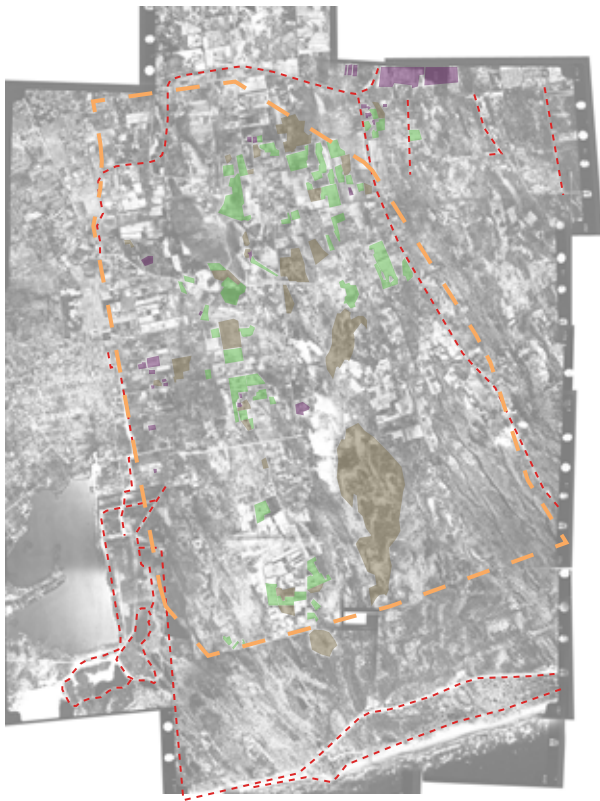
Land use change from 1945 (author's own, from aerial photography)

Agriculture and dirt roads within the area both increase as the immigrants begin to find success in their cultivation of the land and in the sales of their produce to a growing population. With this success and increase in consumption, dune area begins to shrink.

1960

1966

New roads are established as segregational infrastructure providing access for the planned settlement to come, as well as access to opportunistic citizens. Also indicated are the beginnings of large-scale diggings, where silica sand is being mined.

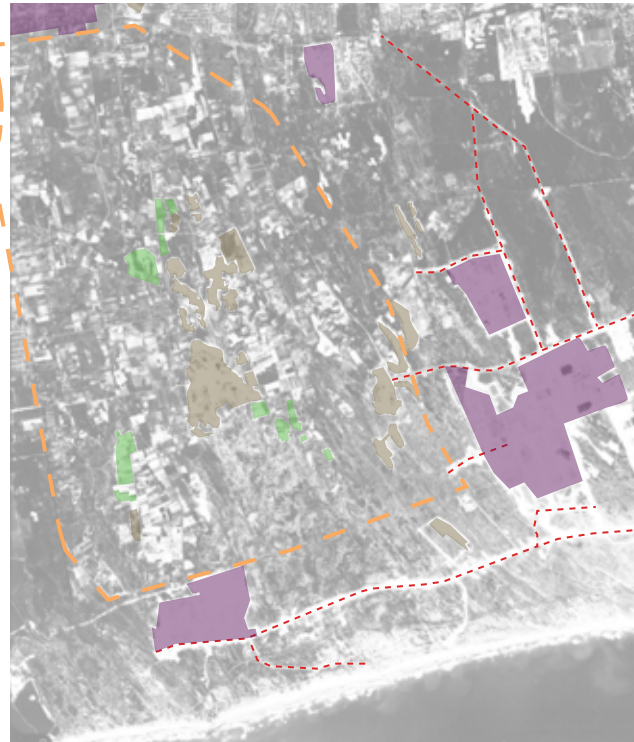


Land use change from 1953 (author's own, from aerial photography)

1970

1977

Mitchell's Plain and Strandfontein suburbs emerge with new associated access roads, as well as the area of Hanover Park. Small portions newly cultivated land become evident. There is a significant increase in land clearing and mining activities.



Land use change from 1966 (author's own, from aerial photography)

1980

1989

Zeekoevlei Wastewater Treatment plant is extended considerably to accommodate a growing urban population on the flats. Strandfontein suburb expands, Mitchell's Plain expands and there is new development of Manenberg, Lenteheur. New roads and railway lines are established. New digging sites appear in the southern portion of the site.



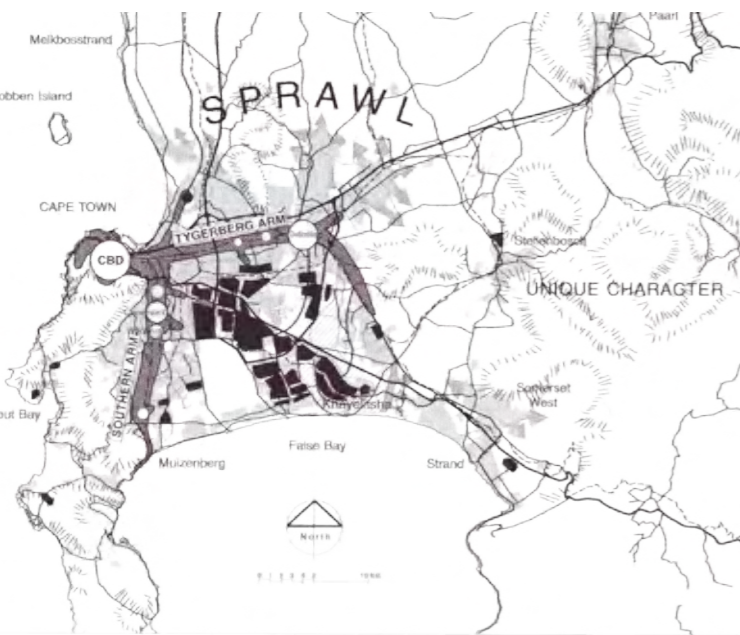
Land use change from 1977 (author's own, from aerial photography)

A lot of development is happening around the area, mostly to the North and the East, taking the form of large-scale infrastructure and new townships/ settlements. The rate of change to agriculture is decreasing. As construction in the city increases and the area becomes more accessible to transport vehicles, silica mining becomes more prevalent in the centre and the east of the PHA. The result of increased mining is a decline in dune area.

1990

No aerial photography was found for the 1990s.

The following land use concerns arise out of a public participation process¹:
There is a need for firm urban/rural boundary
Statutory mechanisms are unable to control development needs in the area
There is a need to integrate mining and farming systems
Investigate the possibility of establishing worker villages in order to provide the necessary thresholds to support the establishment of permanent community facilities, a desperate need of farmworkers



- Disadvantaged Communities (Schematic)
- Threat to Floodplain and Sensitive Environment
- Integrated Development
- Low-density Sub-urban Housing
- Likely Direction of Continued Urban Sprawl if Left Unchecked

Existing settlement patterns (Metropolitan Spatial Development Framework 1996)

2000

2001

The development of surrounding areas increase with Nyanga, Philippi East and Gugulethu. At the same time, more virgin land toward the centre of the area is being cultivated. Diggings continue in the South-East portion of site, within the dunes. The construction of smaller roads allow further penetration into the area



Land use change from 1989 (author's own, from aerial photography)

2010

Significant amount of development in the Schaapkraal smallholdings area, where original farms have been subdivided. The development of Pelican Park begins. Small amounts of new land is cultivated in the centre and north-eastern portions of the area.
Preparation is made for the widening of Strandfontein Road.
There is expansion of existing mining operations.
Additionally, some vlei areas have been infilled.
At this time, active farmers in the area equal 20. The PHA is producing 54% of Cape Town Market's vegetables and 46% of vegetables outside the market.



Land use change from 2001 (author's own, from aerial photography)

2014

New infill development along the Northern border (Lansdowne Road) with the additional expansion of Pelican park. More development occurs on properties in the Schaapkraal smallholdings area. There are patches of new cultivated land, once again both in the centre and around the North Western corner.
A new lane is added to Strandfontein Road, increasing its traffic carrying capacity.



Land use change from 2010 (author's own, from aerial photography)

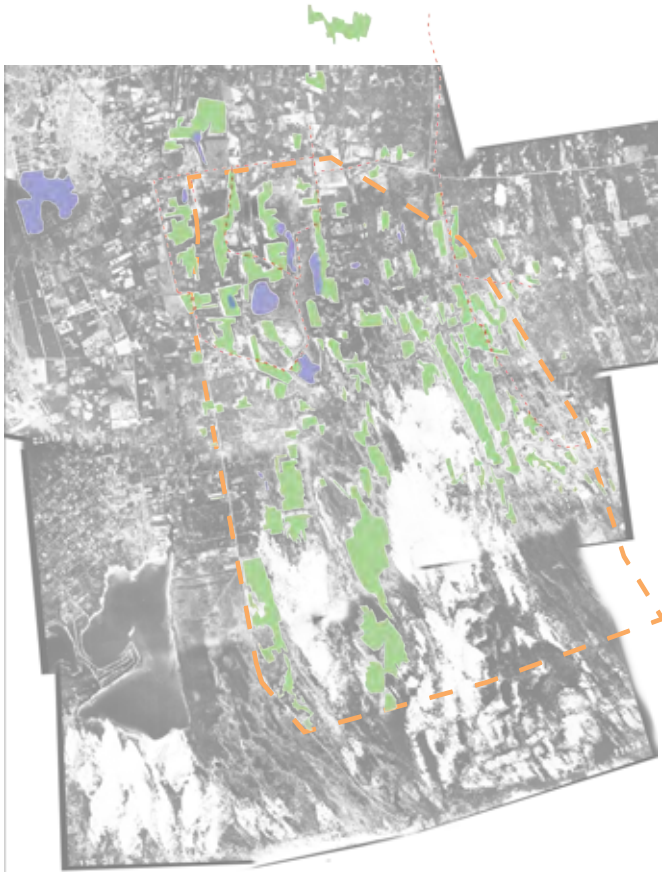
CURRENT

Development along the edges of the PHA in 2001 begin to trickle into the area in subsequent years. In 2010, development, agriculture, mining and roads all seem to slow down, still increasing but by a very small margin as compared to previous years.

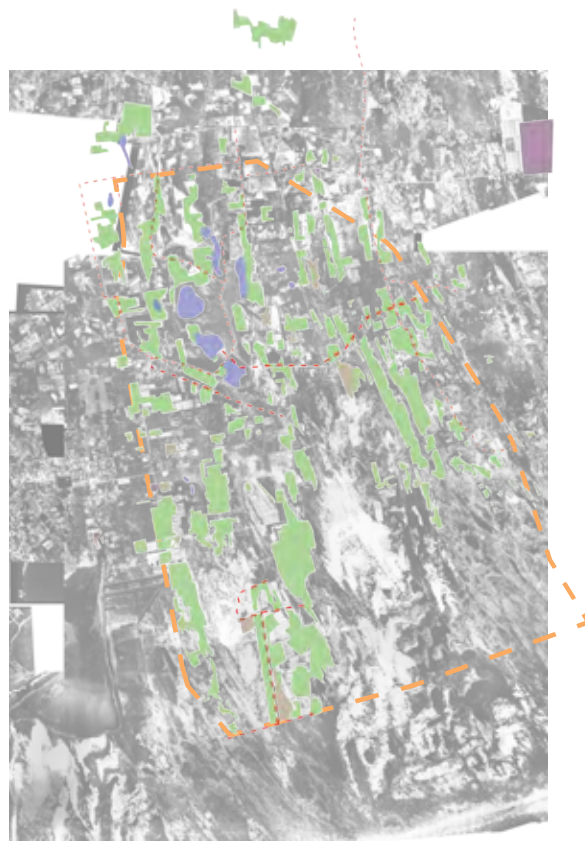
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Land Use Change

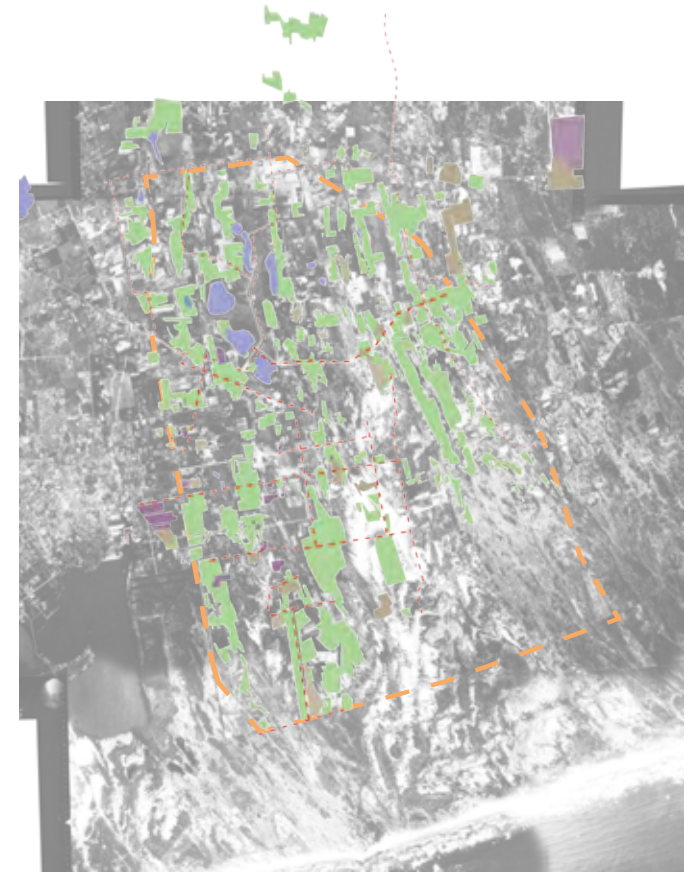
- Roads
- Development
- Cleared land/mining
- Cultivated land
- Water



Land use in the PHA in 1938 (author's own, from aerial photography)

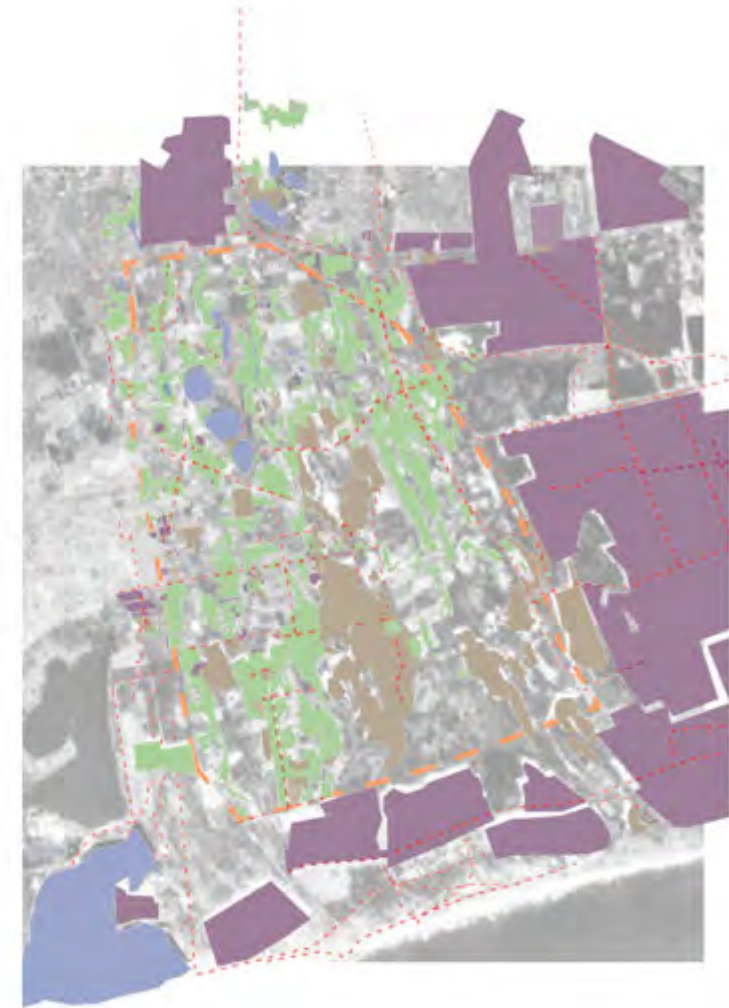
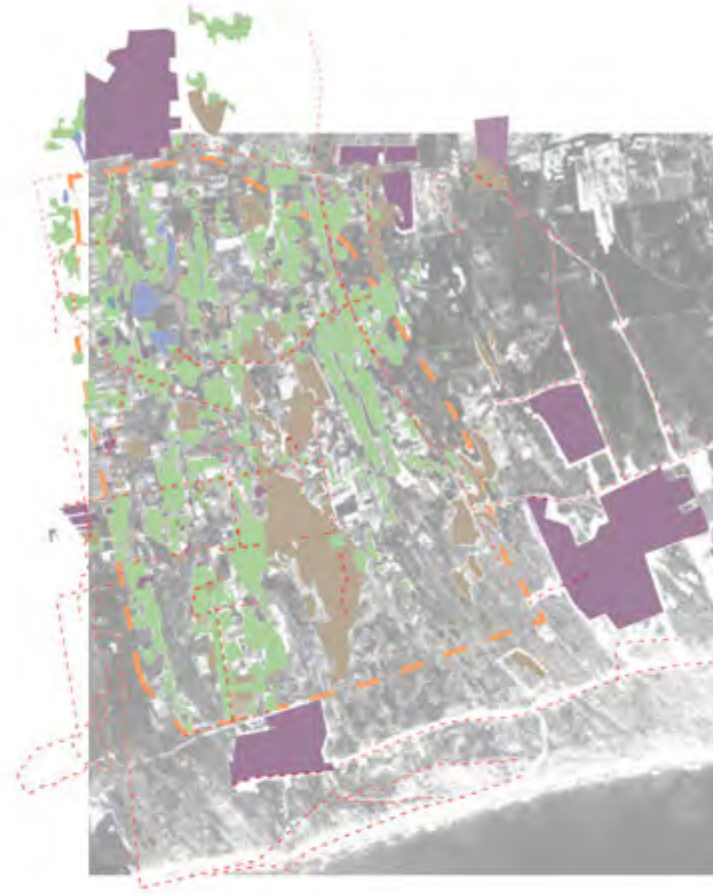
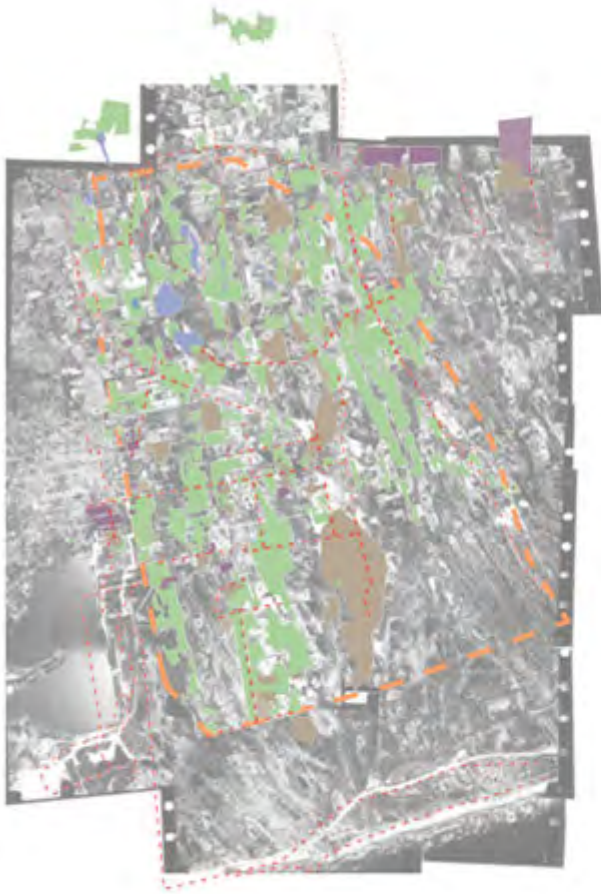


Land use changes in the PHA since 1938 (author's own, from aerial photography)



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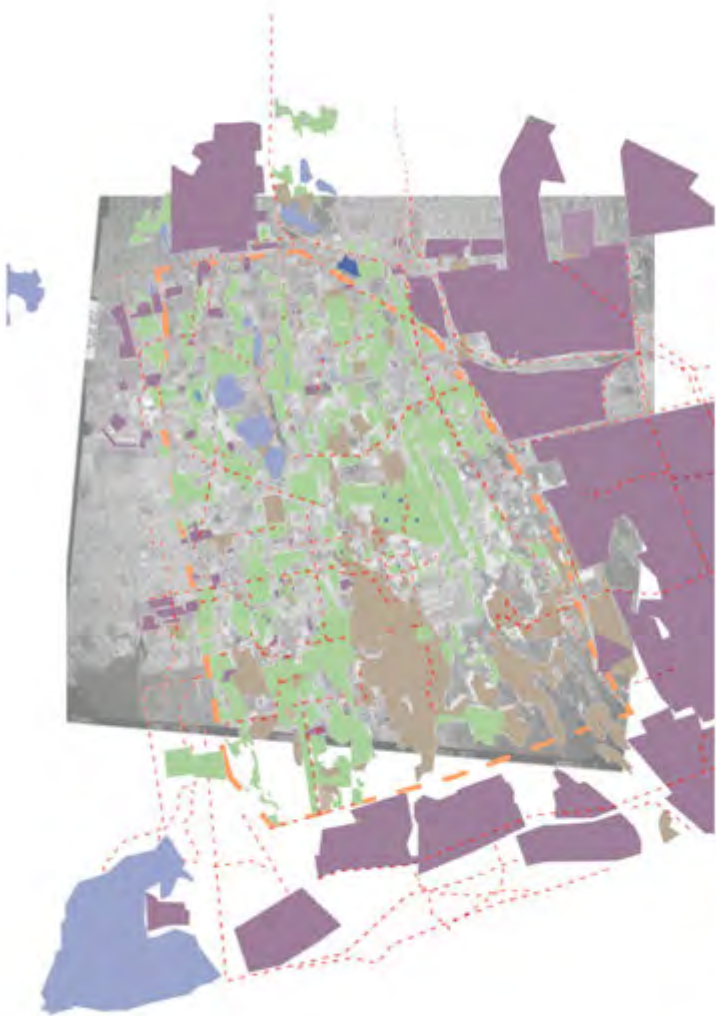


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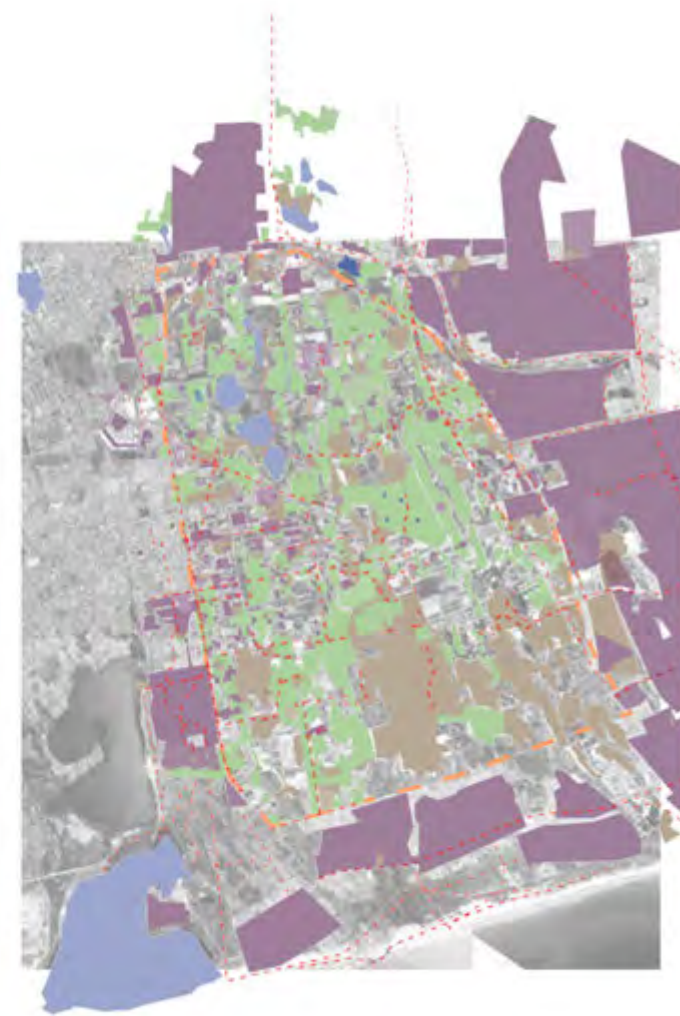
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(author's own, from aerial photography)



Land use changes in the PHA since 1938
(author's own, from aerial photography)

From its origins as vleij, dunes, and the habitats for wild animals, the transformation of land in the PHA began primarily with the hunting of game. Since then, land transformation progressed with the establishment of agriculture to support family livelihoods and ensure food security for a growing colonial settlement. It then developed with 3 dominant land uses: agriculture, sand mining and urban development (mostly residential and industrial).

The analysis of land use changes in the PHA from 1938 onwards by means of aerial mapping has revealed a relatively consistent cultivation of the land for food production that continues today, with farmers trying to extend their fields trying to meet the demand. Mining activities began in the 1960s steadily increasing until the late 2000s, where they reached the same rate as agriculture. Large scale development began in a big way in the 1970s, but since 2010 has slowed to match the growth of the other two land uses, slowly infiltrating into the PHA.

The trends in land use change indicate that there is both need and viability in the PHA for all 3 land uses. However, the plateau that all the land uses are tending toward confirms that the system has little space left for further greenfield transformation. It suggests that the systems are either reaching an equilibrium point, where they will need to be sustained, or reaching their end. Further development or transformation of land in the PHA will serve a great role in determining the eventual outcome, in addition to current land use practices.

Through the study, it is clear that historical political agenda has had a huge impact on the development surrounding the area and its subsequent infringement on the agricultural viability of the land. The initial development provided the impetus for further development in the area, which has put pressure on the land set aside for food production.

The current spatial planning for the PHA is to increase the development allocation, confirmed by the shift in the urban edge. Aside from disregarding the conservation status of the dune system in the South-east, the portion of the area now included in the urban edge is a critical point of recharge of the Cape Flats Aquifer (CFA). To sustainably address the needs of housing and agriculture requires protection of the quality and quantity of water in the Cape Flats Aquifer. The quality is maintained by managing inflows and leaching, and the quantity requires adequate recharge. By including this area in the urban edge, the planned development of the Cape Flats District does little to actively guard the farmland of the PHA.

However, environmental management guidelines stress system rarity and the possibility of alternatives when planning for development. The PHA as productive agricultural land is due to its climate and water resource, a distinguishing factor for its uniqueness. This should take precedence over housing and development needs, as the long term impacts are far greater.

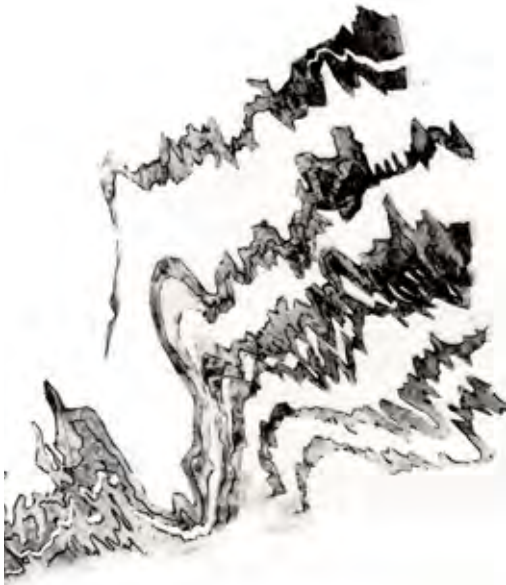
While there is a definite need for housing and development in the city, there are other spaces within the city that can suitably address this need. The same cannot be said for this scale of agriculture.

The quantity of land currently given over to silica mining is also of concern. The timeline of life and rehabilitation of a mine is extensive, and if not properly managed has the potential to seriously and irreparably degrade the land's natural systems.

In terms of preservation, the urban edge management zone mentioned in the SDF could be a step in the right direction to protecting the agricultural land. The system of vleis and mobile dunes is one that is already heavily disturbed, but in this is an opportunity for reconstructive surgery to a system more adaptable and resilient.

The PHA is significant to its immediate surroundings and the greater metropolitan region as an area of food production and care must be taken at a strategic planning level to work with the needs on the ground and well as the long-term impacts of strategic decisions if the public good is to be upheld.

ANALYSIS



1966 dunes - dominant characteristic of the area



2014 agricultural land



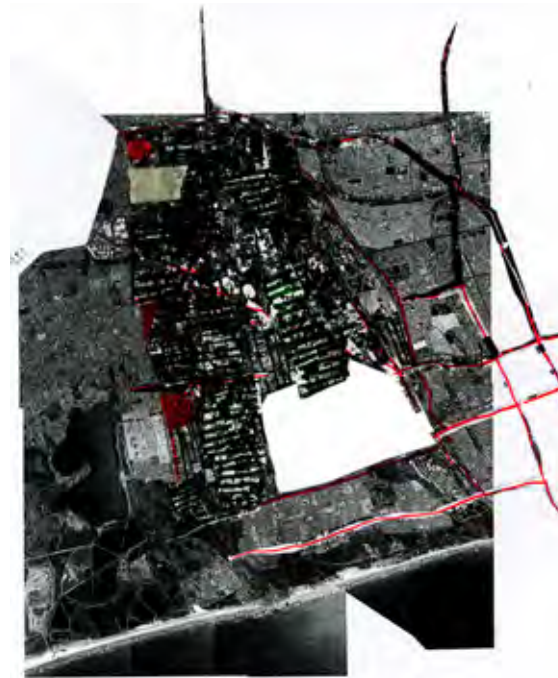
2014 roads



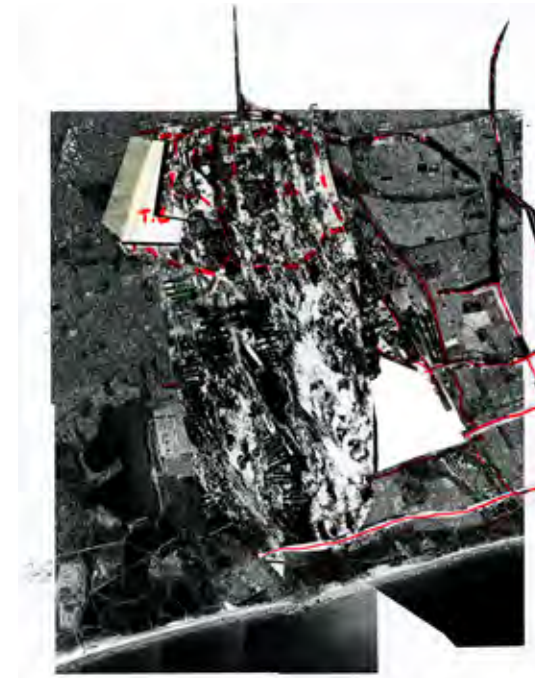
1944 roads and agriculture

Figure 2: Series of collages exploring the dynamics between existing systems in the PHA

Prior to agriculture, the Area was characterised by its mobile dune system and collection of vleis. These set up the structure of all subsequent land transformation in the PHA. The dominant land uses identified in the PHA through historical analysis were these initial dunes and subsequent agricultural land, land clearing/mining, roads and urban fabric. A collage process using historical aerial photographs was the technique to understand the impact of the sequence of these systems on one another. An overlay of the agricultural land with the road system speaks to the fragmentation of the agricultural mass caused by the introduction of formal roads. An analysis of the cultivated agricultural land reflects the original dune system which it came to stabilise. A look at the 2014 overlaid with 1966 shows how little of the original mobile dune system remains.



2014 Urban fabric, roads, and agriculture



2014 Urban fabric, roads and agriculture overlaid with 1966 dune



Figure 3 : Biodiversity within the PHA & connections to the larger city of Cape Town biodiversity network

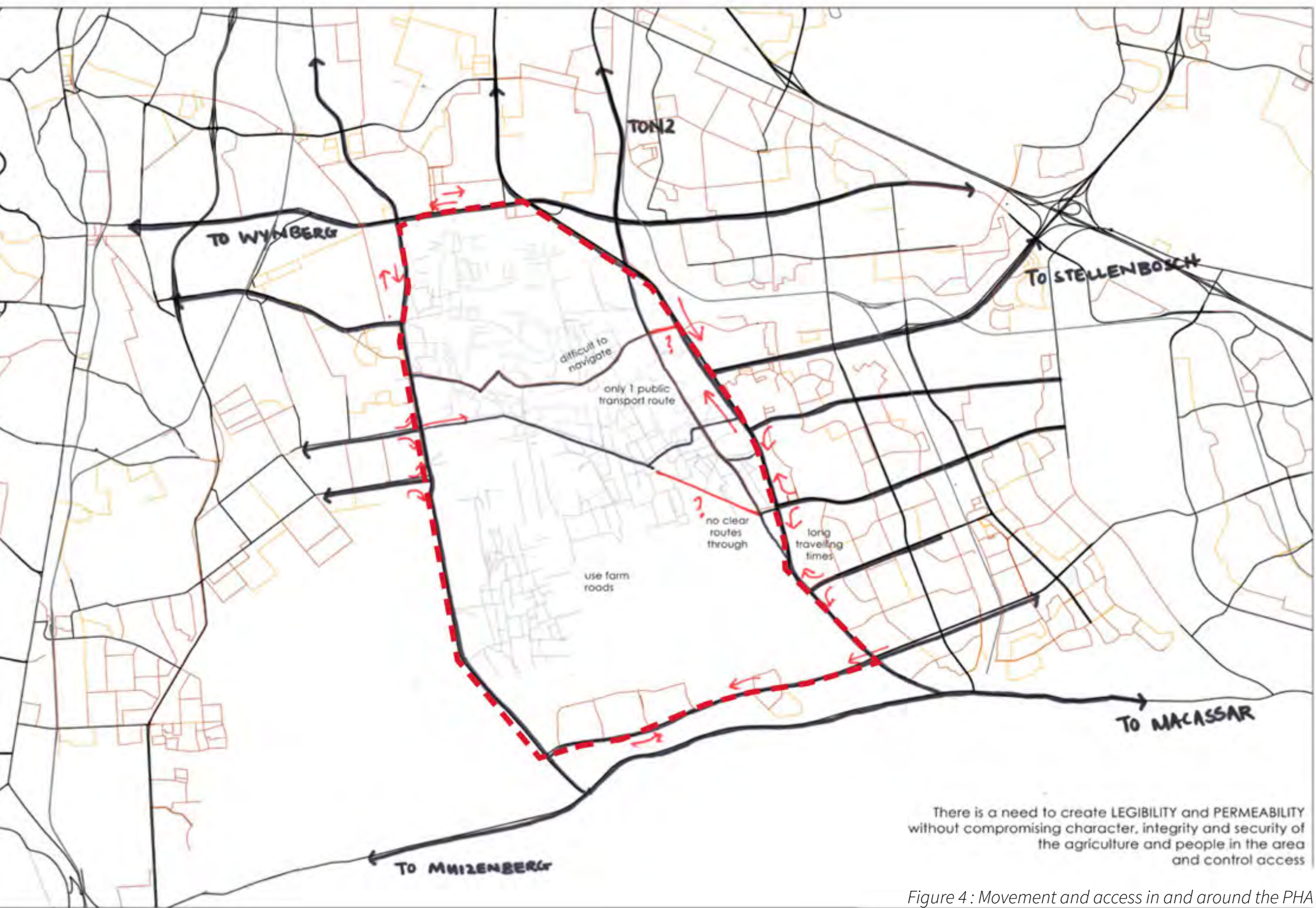


Figure 4: Movement and access in and around the PHA

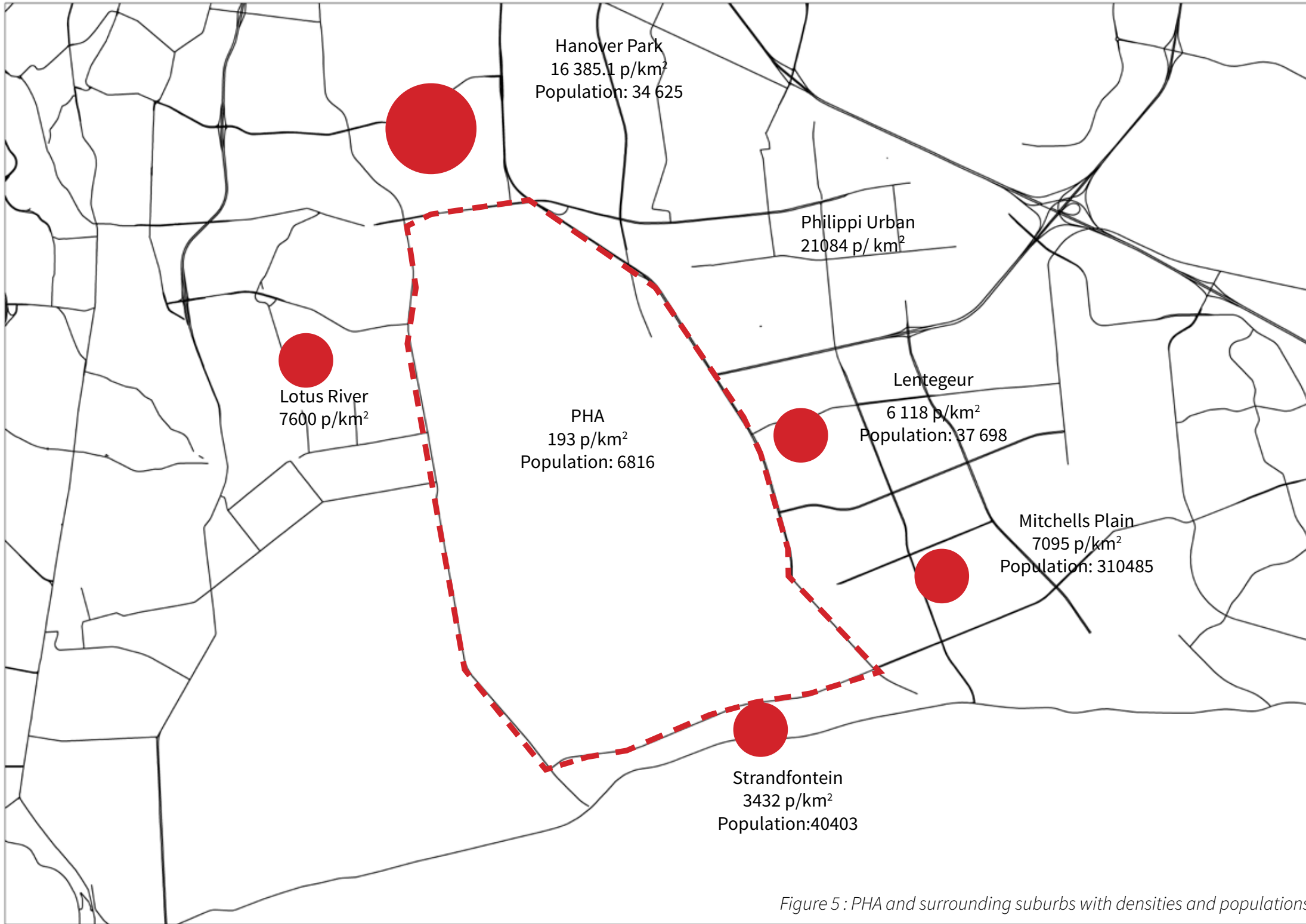


Figure 5: PHA and surrounding suburbs with densities and populations

DESIGNING THROUGH SCENARIOS

Drawing on the theories of a layer cake, the design exploration began with a series of scenarios. The purpose of using scenarios is to establish a hierarchical approach to structure the framework, based on longevity and sustainability of the Area as a system. The sequencing of the scenarios is thus significant in establishing the hierarchy. Each scenario was explored with an objective and a set of principles which allow for application on multiple scales. The scenarios further allow for each approach to be tested to its maximum Utopian end, before consolidating and adjusting to an overall framework. The objective is to arrange the land uses such that they relate to one another in a mutually supportive manner.

As both the agriculture and housing would depend on the water resources in the area, the sequence begins with an ecological approach. In addition to being a crucial recharge point for the Cape Flats Aquifer (CFA), the PHA has the potential to significantly improve connectivity within Cape Town's biodiversity network. It is located such that it can link between Wolfgat Nature Reserve, the False Bay Coast Conservancy and the Macassar Dune Conservation Area in the South and East to Zeekoevlei, Princessvlei, Rondevlei, Kenilworth Racecourse and Table Mountain National Park in the West to Edith Stephens Wetland Park and Cape Town International Airport in the North. In order for this to be achieved, ecological corridors need to be established and protected using the open space currently existing within the PHA. A patch-corridor matrix approach was used to identify potential corridors, using primarily remnant vegetation and dunes, existing wetland areas and maintaining a variety of topography. By the recommendation of a local biodiversity specialist, it was decided that each corridor would be 150m wide with a 25m buffer zone to facilitate movement of indigenous and endangered fauna. Where patches do not exist but connections are required, open agricultural land becomes absorbed into the corridor network, either by expropriation or by ecologically-compliant methods of agriculture such as through pasture mixes, hedges and windbreaks.

The second scenario is that which secures productive land in the PHA as well as providing facilities for the existing farmers and agricultural workers. This social justice approach builds on the needs identified through records and observation of local public participation sessions, as well as reports from specialists and personal observations. Through desktop study and multiple visits to the area, the most productive agricultural land was identified, and mapped out as being vital to preserve. Similarly, agricultural land that could be expropriated for other

purposes was also identified. There a little to no existing social services within the PHA and this places a burden on those within the Area. Those with private vehicles are inconvenienced to drive out for facilities but for those who travel primarily on foot, they have a much more difficult time getting access both physically and financially. It therefore is evident that there is a need for social services within this vacuum, as well as improved accessibility to and through the Area. Lastly, the PHA compared to surrounding areas has a much lower density but also has a number of informal settlements. Many of these began as evicted farmworker families but have since grown and continue expanding slowly and steadily. There is therefore a demand to provide some support and dignity to those squatting communities. Areas for social services and new development were identified through eliminating areas designated to ecology, agriculture and current development, as well as considering strategic location relative to existing and new movement routes.

The third scenario is that of necessary development, which if done correctly can support the agriculture and natural systems of the PHA. There are four new settlements each with a character unique to its location - one being more urban, one an agricultural type of village, one with a focus on ecology and one which is much less dense than the others. The idea of different types of settlements is a type of testing of the development possibilities as well as an acknowledgment of the need for appropriateness. Each new settlement builds on the new social services clusters from the previous scenario. In order to prevent sprawl of the settlements, they are placed in such a way that they are bounded either by agriculture or by existing urban fabric. Aside from social services, the components of the new settlements are housing, mixed use and agriculture. A range of housing and spatial typologies have been designed using these components. They help to test the scenario in all its forms.



Figure 6 : Mapping of Scenario : Ecology

- KEY**
-  Wetland
 -  New connection
 -  Existing
 -  Buffer zone
 -  Erf line



2. (left) Using existing livestock pastures as part of the ecological corridor

3. (below) Stepping stone connections within the PHA where a continuous corridor is not possible; larger patches provide habitats for larger and shyer species, connections o Zeekoevlei nature reserve, wastewater treatment works, and the False Bay Coast Conservancy



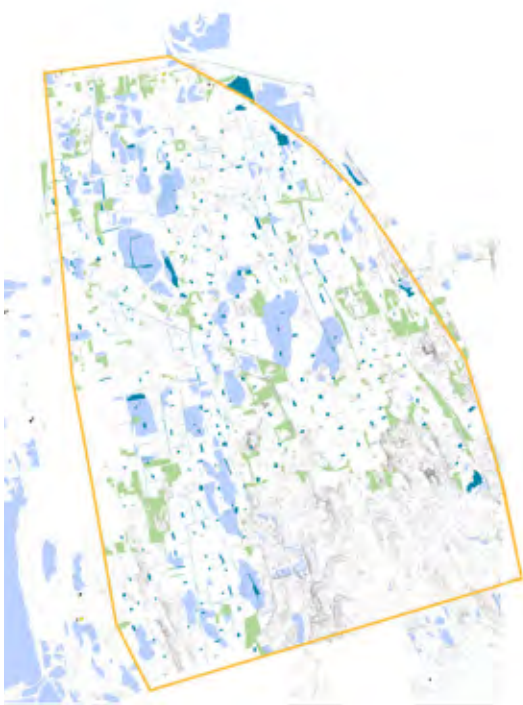
Figure 7 : Illustrative snapshots within Ecology scenario:
1. (below) Connectivity beyond the PHA; contrast between existing remnants, wetlands, and new parts of ecological corridors



SCENARIO: ECOLOGY

Objective: Create a network of green space that preserves the most sensitive and rare habitats and connects to the larger context biodiversity network

- Ecological corridors of 150m width using wetlands/dams, dune & vegetation remnants
- Use agricultural land & elements where necessary to connect
- Incorporate a variety of topography & habitat types
- Incorporate hedges/windbreaks in creating connections
- Maintain a 25m buffer zone on each side of corridor
- Minimise & articulate crossings
- Use wetlands to slow percolation rates and filter pollutants from stormwater and agriculture



Natural Systems



Ecological corridors



Ecology that forms part of corridor

Figure 8: Ecological components



Figure 9 : Mapping of Scenario : Social Justice

KEY

- Agriculture (existing)
- Primary local distributor
- Boundary of e.corridor
- Erf line
- Existing pedestrian movement
- Potential pedestrian movement
- SOCIAL SERVICES**
- School
- Clinic
- Police Station
- Library
- Hall
- Religious centre



Figure 10: Illustrative snapshots within Social Justice scenario:
1. (below) Existing entrances opening up onto new routes to improve accessibility; Existing social services and informal settlements; New cluster of social services
2. (right) New entrances into the area and routes within the area for improved accessibility; Agricultural land preserved and agricultural land expropriated; New cluster of social services

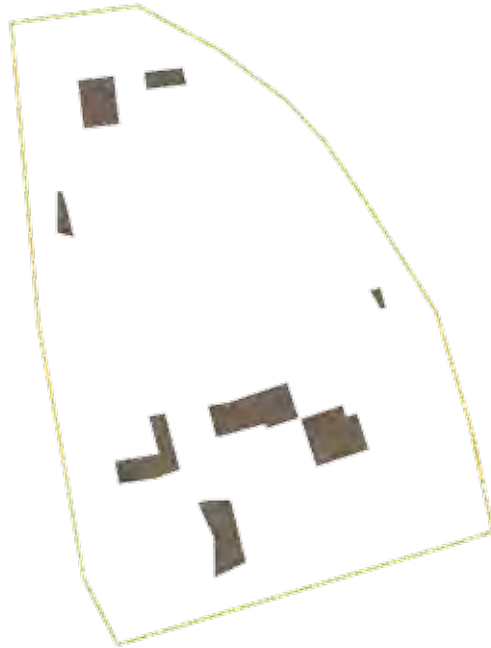
SCENARIO: SOCIAL JUSTICE

Objective = 4 times existing density of 10000

- Absorb density of informal settlements
- Keep existing farms/productive agricultural land
- New to be smallholdings (subdivided larger lots) or commonage (consolidate smaller lots)
- Expropriate rubble yards, unused/degraded lots
- Build on pedestrian movement/desire lines
- New Routes - sensitive vehicular circulation
- Social & community services distributed in settlement clusters within the area
- Focus on provision of agricultural housing



Agricultural land to be preserved
Figure 11 : Social justice components



Agricultural land to be expropriated



Figure 12 : Mapping of Scenario : Development

KEY

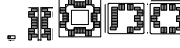



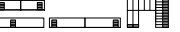



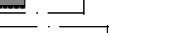
- Existing economic activity
-  BNG housing
-  Suburban home
-  Social housing
-  Urban mixed use
-  Kitchen yards
-  Shared small-holdings
-  1 ha Polyculture plots
-  2 ha Polyculture plots
-  4 ha Polyculture plots



Figure 13: Illustrative snapshots within Development scenario:
 1. (left) New agro-village, settlement bounded by agriculture using primarily smallholding housing typologies; Entrances to settlement shown
 2. (bottom left) New urban settlement bounded by smallholding and large-scale agriculture; Entrances to settlement are indicated; Positive interfaces between agriculture and street, housing and agriculture
 3. (bottom) New settlement with ecological focus; Ecological elements define public open space, serving a functional and aesthetic value rather than being backyarded; entrance to settlement is shown



SCENARIO: DEVELOPMENT

Objective: Create as many economic and housing opportunities as possible within the existing framework

- activity hubs/settlements to have dense urban form bounded by agriculture
- densification around “nodes” (social services) & “corridors” (access routes)
- Infill development into existing fabric
- Introduction of suburban & urban housing & commercial
- Mixed use & mixed income



Existing development



Land left over / available

Figure 14 : Development components

RULES FOR DEVELOPMENT

Densify along the edges of agricultural land as a protective buffer zone. Set up a few clusters of settlement where there is space to provide services within the area.

Along arterial routes:

Commercial, Housing, Smallholdings

Along Primary local distributors:

Social services, Housing, Smallholdings

Along Secondary and tertiary local distributors:

Smallholdings and housing

Along ecological corridors:

Social services or smallholdings

HOUSING AND AGRICULTURAL SPATIAL TYPOLOGIES

While the housing crisis is a reality, it is currently looked at in quite a limited way. A range of typologies were conceptualised to facilitate alternative appropriate agriculture-based development.

There are a few scales and types within the collection of typologies, some more urban and some more agricultural, ranging from small individual plots with houses and 3-storey walk-up sectional-title models of ownership around a shared common space to shared or family smallholdings from half to four hectares. While the ideal situation within an urban environment is high-density low-coverage, the unique character of the PHA requires variety to create contrasting areas of density and open space where the transitional zone is carefully planned to limit the growth of the urban fabric and create a buffer zone for the agriculture.

The range emerged from a mixture of smallholding configurations currently operational in the PHA and BNG social housing models currently being investigated/implemented by the City as well as a combination of the two. Some models draw on guidelines for productive smallholdings.

HOUSING AND AGRICULTURAL SPATIAL TYPOLOGIES

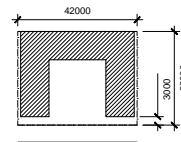
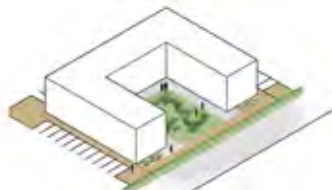


BNG PLOT AND HOUSE

Small Area (90m²)

High Density (4 people, 2-3 storeys)

Low coverage ($24/90 = 0.27$)

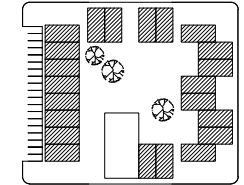


SOCIAL HOUSING / MIXED INCOME

Small Area (1386m²)

High Density (96 people, 3 storey)

High coverage ($800/1386 = 0.58$)

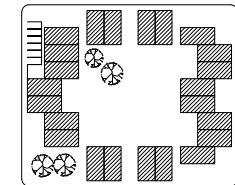


CLUSTER HOUSING - TYPE A

Medium Area (4860)

Medium Density (88 people, 2-3 storey duplex)

Low coverage ($1584/4860 = 0.33$)

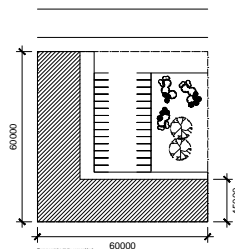
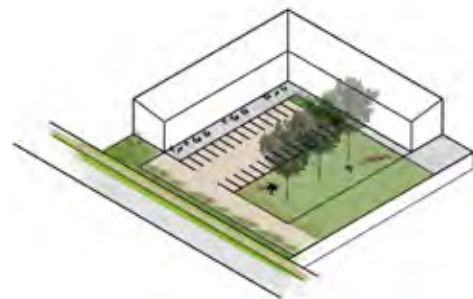


CLUSTER HOUSING - TYPE B

Medium Area (4860)

Medium Density (80 people, 2-3 storey duplex)

Low coverage ($1656/4860 = 0.34$)

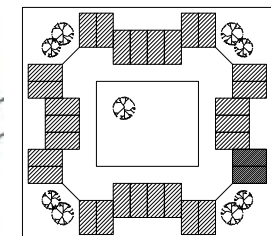


MIXED USE CORNER BLOCK

Small Area (1575m²)

Medium Density (50)

Medium coverage ($1575/3600 = 0.44$)

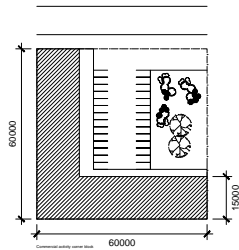
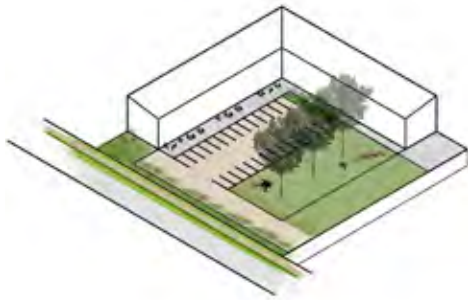


CLUSTER HOUSING - TYPE C

Medium Area (2160)

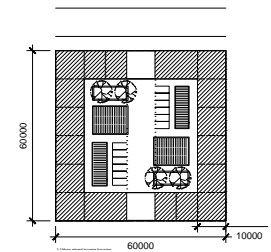
High Density (120 people, 2-3 storey duplex)

Low coverage ($2160/7216 = 0.3$)



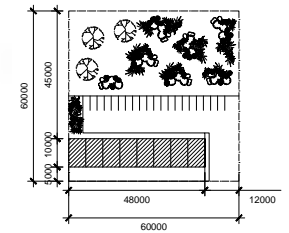
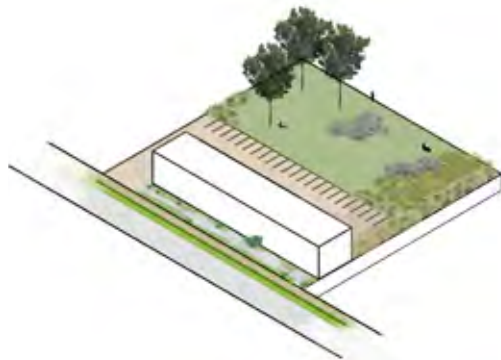
MIXED USE CORNER BLOCK

Small Area (1575m²)
 Medium Density (50)
 Medium coverage (1575/3600 = 0.44)



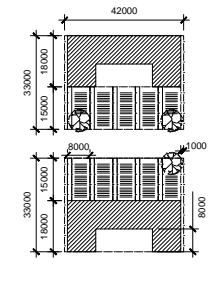
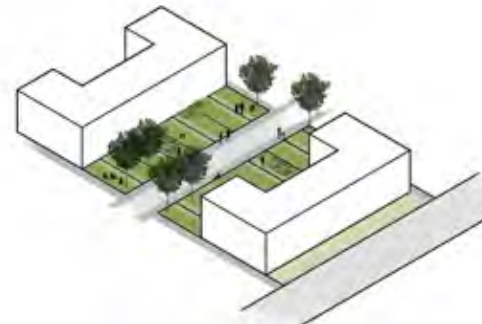
URBAN MIXED INCOME HOUSING

Medium Area (60 x 60 = 3600)
 Medium/High Density (80 people, 3 storeys or higher)
 Medium coverage (1800/3600 = 0.5)



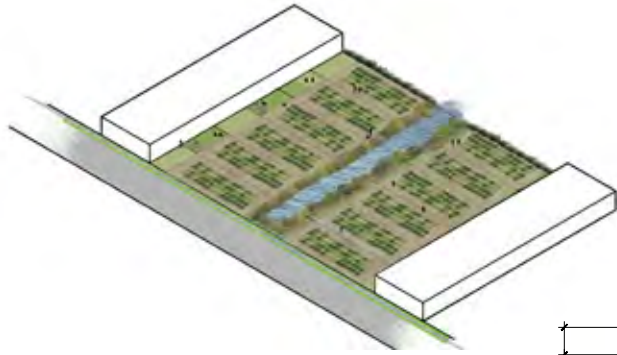
MIXED USE STRIP DEVELOPMENT

Small Area (480m²)
 High Density (30)
 Low coverage (480/3600 = 0.13)



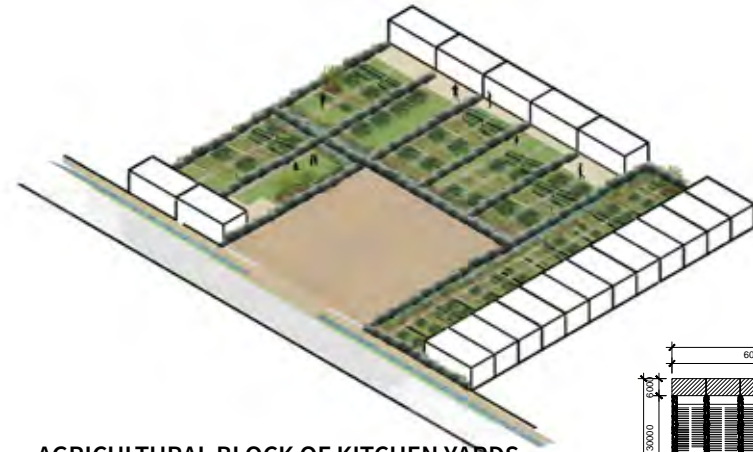
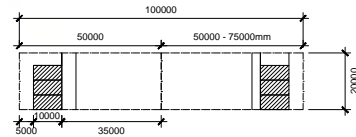
MIXED INCOME HOUSING WITH ALLOTMENT GARDEN

Medium Area (2160)
 Medium/High Density (96 people, 2-3 storey duplex)
 Low coverage (2160/7216 = 0.3)



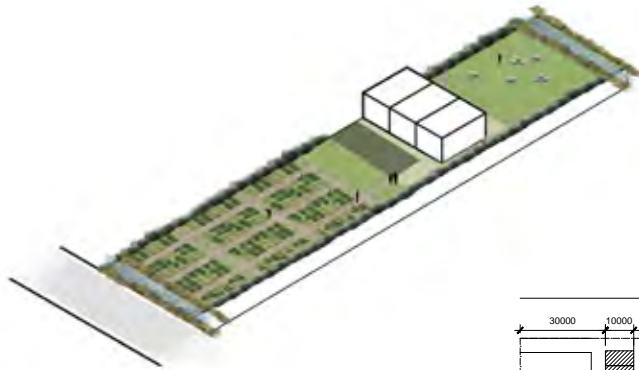
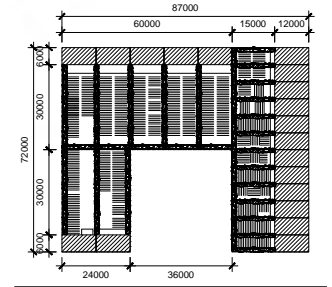
SHORT KITCHEN YARD

Low Area (156m²)
 Medium Density (12 people, 2-3 storey duplex)
 Low coverage (156/1000= 0.16)



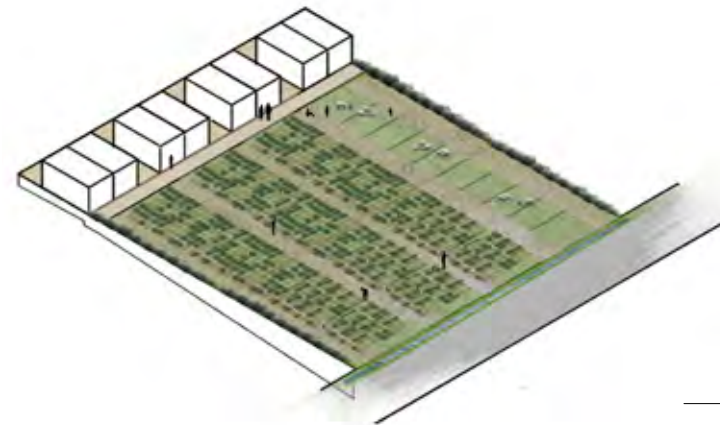
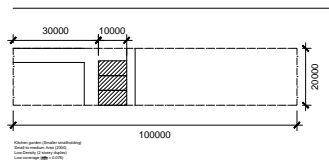
AGRICULTURAL BLOCK OF KITCHEN YARDS

Medium Area (1368m²)
 Medium Density (76 people, 2-3 storey duplex)
 Medium coverage (1368/4968= 0.3)



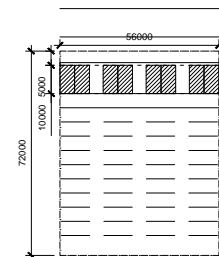
LONG KITCHEN YARD

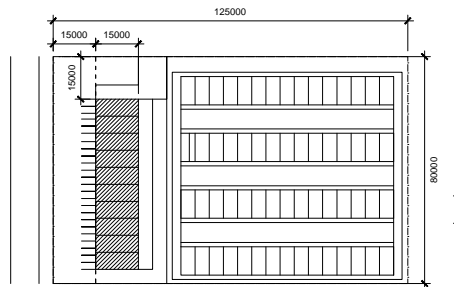
Low Area (156m²)
 Medium Density (12 people, 2-3 storey duplex)
 Low coverage (156/2000= 0.078)



SHARED SMALLHOLDING

Low Area (416m²)
 Medium Density (32 people, 2-3 storey duplex)
 Low coverage (416/4032= 0.1)



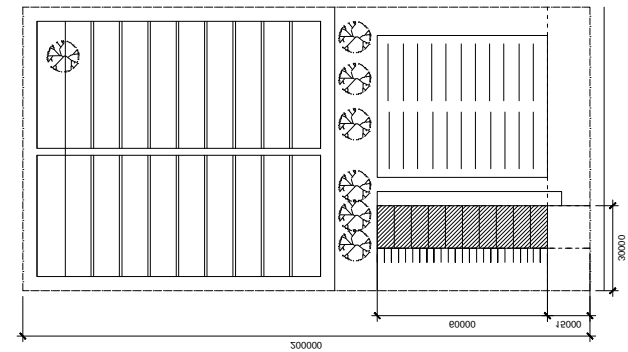
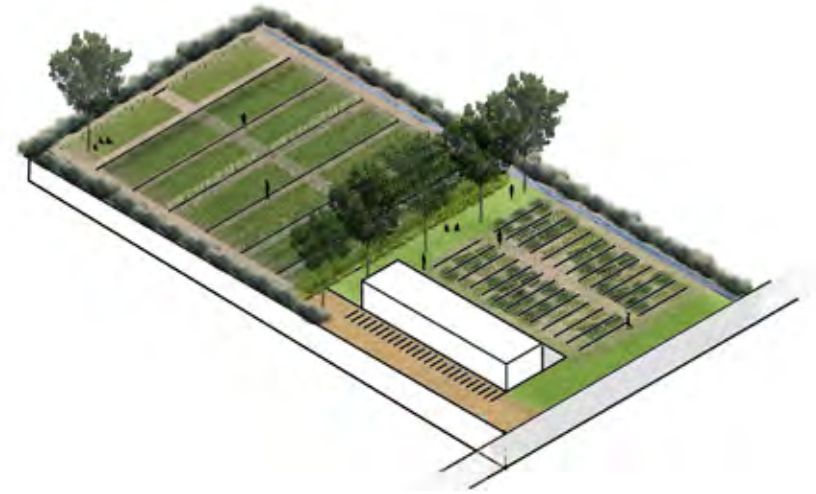


1 HA COMMUNAL SMALLHOLDING

Medium Area (10000)

Medium Density (40 people, 2-3 storeys)

Low coverage ($900/10000 = 0.09$)



2 HA COMMUNAL SMALLHOLDING

High Area (20000)

Medium Density (40 people, 2-3 storeys)

Low coverage ($900/20000 = 0.045$)

APPROACH

RESTORE

a system of natural processes
(Ecological habitats & movement,
flood control, recharge)

PRESERVE

the most productive
agricultural land for current and
emerging farmers

CREATE

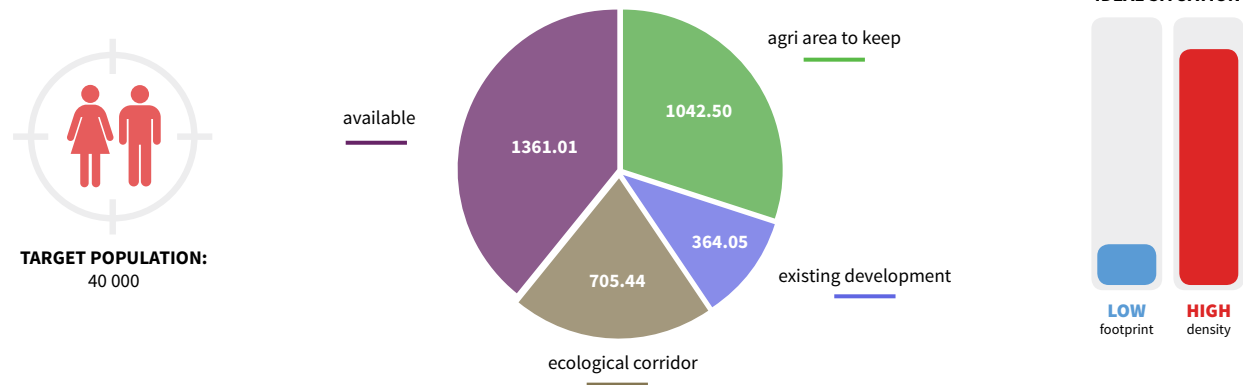
a formalised
public open space system
- a park

PROVIDE

Use development strategically to
buffer and protect the resources as well
as provide social services.

AVAILABILITY AND ZONING OF AVAILABLE LAND

TOTAL AREA OF PHILIPPI (ha)



SOCIAL SERVICES REQUIRED



TYPOLGY AND ALLOCATIONS

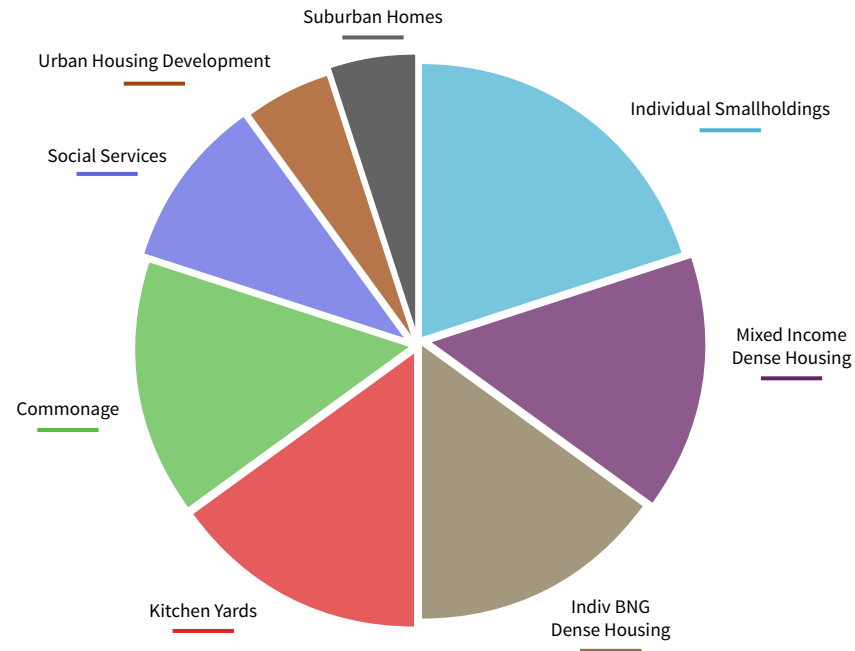




Figure 15 : Landscape and Development Framework for the Philippi Horticultural Area

LANDSCAPE AND DEVELOPMENT FRAMEWORK FOR THE PHILIPPI HORTICULTURAL AREA

Figure: landscape and development framework for the philippi horticultural area

1:8000 @ A0

1. New Settlement. Population: 9552

New settlement transitions to agriculture - provides housing, access to small-scale productive land, and social services. Also an economic hub to serve surrounding farmlands

2. New agricultural settlement. Population: 10 084

New settlement bounded by agriculture - provides economic hub and provides social facilities to serve surrounding farmlands

3. New agricultural Settlement. Population: 6000

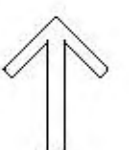
4. New Settlement. Population: 8200

New settlement integrates with ecological elements to densify, serve surrounding farmlands and ensure recharge

5. New social services introduced, building around existing settlement



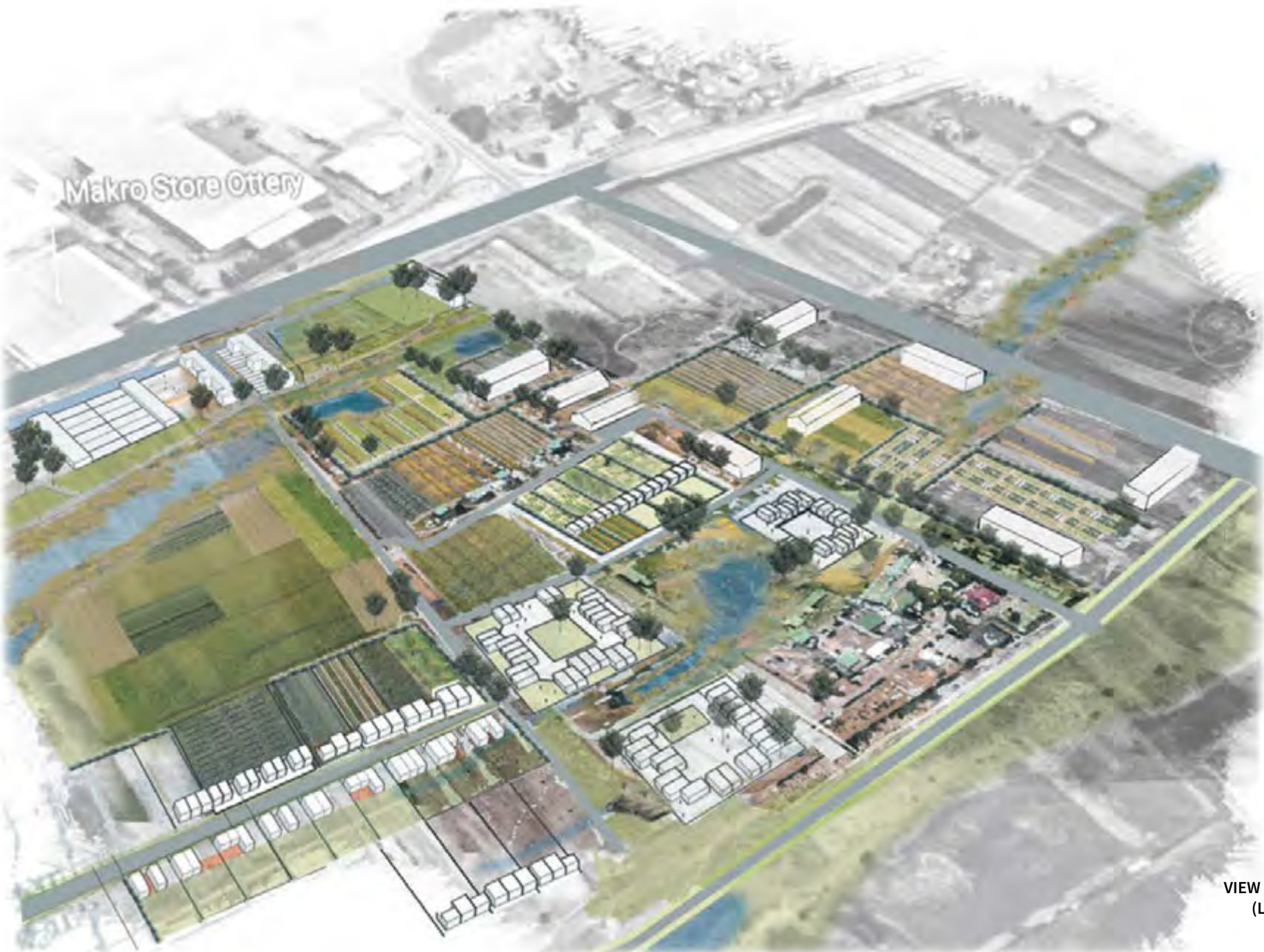
Figure 16 : Strandfontein Road Intervention Site



TYPICAL APPLICATION ON A DETAILED SCALE

Figure: Strandfontein Road Intervention Site
1:2000 @ A0

1. Existing farmhouse buildings
2. Existing seasonal wetland serves also as a feature and recreation area
3. Smallholdings within larger agricultural landscape
4. Market stall
5. Processing and packaging facility
6. Existing labourers homes and kitchen yard gardens
7. 2ha smallholding
8. Commercial development with small footprint allows view into agricultural land
9. Kitchen yard agricultural typologies maintain visual connection to agriculture from road
10. Semi- Public open space facing onto wetland and agricultural land
11. Larger scale agriculture of original erf
12. Mixed Use & mixed income high density units line the street and open out into public open space
13. New dune-like topography allowing for habitat diversity
14. Wetland walkway allows enjoyment of the wetland without disturbing the system
15. Existing wetland extended and deepened to allow more bio-diversity and refuge areas
16. New pre-school off primary local distributor
17. Smallholding opens up onto larger agricultural land too allow labourers to work the field of their landlord employer
18. New dune forming part of ecological connectivity
19. Biofiltration and detention basin



VIEW FROM THE FARMLANDS
(LOOKING NORTH-WEST)

Figure 17: The high-density agricultural landscape



VIEW FROM THE URBAN EDGE
(LOOKING NORTH- EAST)

Figure 18: Ecological corridor and POS system along arterial route

CONCLUSION

The PHA is a unique piece of land in Cape Town, in productivity and aesthetic. It has the potential, not only to provide the people who would otherwise be at risk in a position of being food secure, but also to play a crucial role in connectivity and mobility across the city. However, this potential can only be actualised with sensitive and appropriate long-term planning.

The way the PHA has been treated thus far has been to secure the resources in a linear timeline, which will no doubt have an end point, where development begins to replace what was once productive land. Reversing the developer-mindset, a systems-based approach will provide the necessary paradigm shift to a cyclical and sustainable way of doing things. Through this, the water and agriculture resources in the Area can continue to be used and replenished for generations to come.

This systems-based approach requires prioritising the rehabilitation of the natural systems of the area, which are currently in a state of degradation. An ecological network established from existing opportunities sets up the structure for productive agricultural land to continue to operate, and more to be introduced, but does necessitate a move to more ecological agricultural practices. It is important to address existing needs first, by providing social services and housing for the communities in the PHA at the moment.

Densification and development are viable within this network of natural systems and agricultural land in the area, but in a way that is appropriate to these systems and helps to sustain them. Housing and spatial development typologies with a focus on agriculture and social justice are one way in which this can be achieved. A great deal of care must be paid when dealing with interfaces between these land uses, as positive interfaces will improve security and community in the area, whereas the alternative would be to backyard the productive landscape into further fragmentation. Positive interfacing furthermore allows for the ecological elements to function secondarily as a beautiful and accessible public open space system, allowing movement within and through the area in a way that is activated and safe for those using it.

Through testing on an erf scale, the effects of the typologies on morphology and character of the area can be more clearly imagined, as well as the physical experience of the PHA as a place.

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