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CHAPTER **3**
Context Analysis

CHAPTER 3: Context Analysis

3.1 Introduction

The Analytical Research method will be used for the Contextual analysis to analyse the context of the site, the regional connections to the site (such as connections to local parks, schools, hotels, flats, etc.), public transit and movement to- and around the site.

The method also includes mapping and data gathering to determine the location of existing garden refuse and landfill sites, the origin of waste, existing local parks and sports grounds, population and unemployment rates.

This will result in the identification of potential sites in Pretoria.

3.2 Location

It is important to study the problem within its larger context. This aids in understanding the milieu of the problem and in finding the most suitable site for the design proposal.

Pretoria will be explored as the city context (Refer to Fig. 16). Hereafter, Pretoria south CBD and Sunnyside will be explored as the study area to identify potential sites (Refer to Fig. 31). Once the best possible site has been discovered, it will be focused on in more depth.

3.2.1 City Context

It is necessary to study the city of Pretoria's context with respect to the problem in order to determine the locations of existing landfill sites and the origin of garden refuse—more plainly—the origin and destination of waste in Pretoria.

The study of Pretoria will extend to the outskirts of Akasia, Roodeplaat, Mamelodi, Centurion and Elandsfontein.

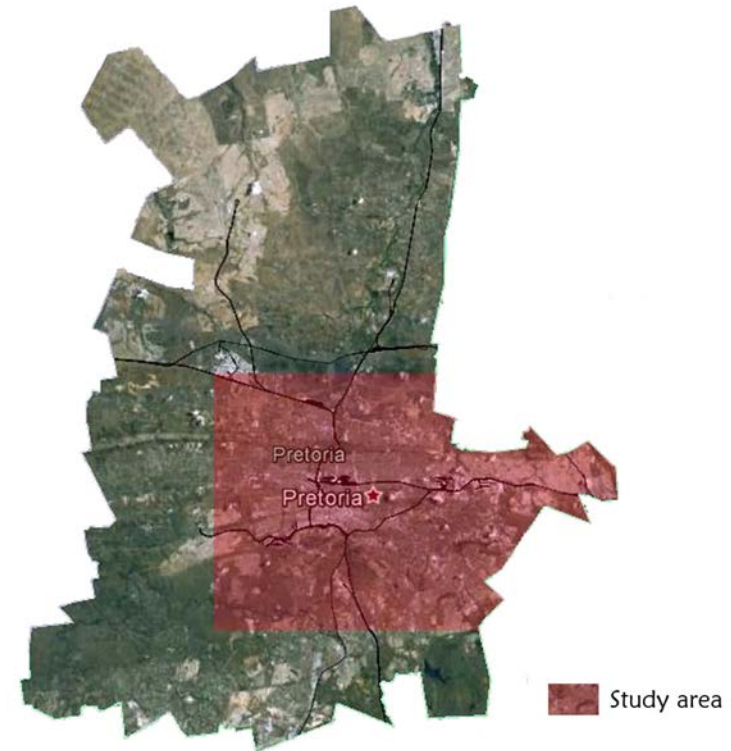


Fig. 16: Map of Pretoria (Map from Google Earth and modified by Author, 2012)

3.2.1.1 Existing Garden Refuse and Landfill sites

Existing garden refuse and landfill sites in Pretoria were mapped, they include: Kwaggasrand Landfill site; Valhalla Landfill site; Garstkloof Landfill site; Derdepoort Landfill site; Onderstepoort Landfill site; Hatherley Landfill site; Philip Nel Park Garden Refuse Site (GRS); Mountain view GRS; Eersterust GRS; Waltloo GRS; Menlo park GRS; Dorandia GRS; Claudius GRS and Magalieskruin GRS.

The map marked with the existing garden refuse and landfill sites clearly indicate that no provision has been made for the organic waste in Sunnyside or Pretoria CBD area (Refer to Fig. 17).

The following sites were visited and analysed in terms of their size, level of activity and origin of the waste:

Kwaggasrand Landfill (Refer to Fig. 18 and 19);
Philip Nel Park Garden refuse site (Refer to Fig. 20 and 21);
Mountain View Garden refuse site (Refer to Fig. 22 and 23);
Eersterust Garden refuse site (Refer to Fig 24 and 25);
Waltloo Garden refuse site (Refer to Fig. 26 and 27); and
Menlo Park Garden refuse site (Refer to Fig. 28 and 29).

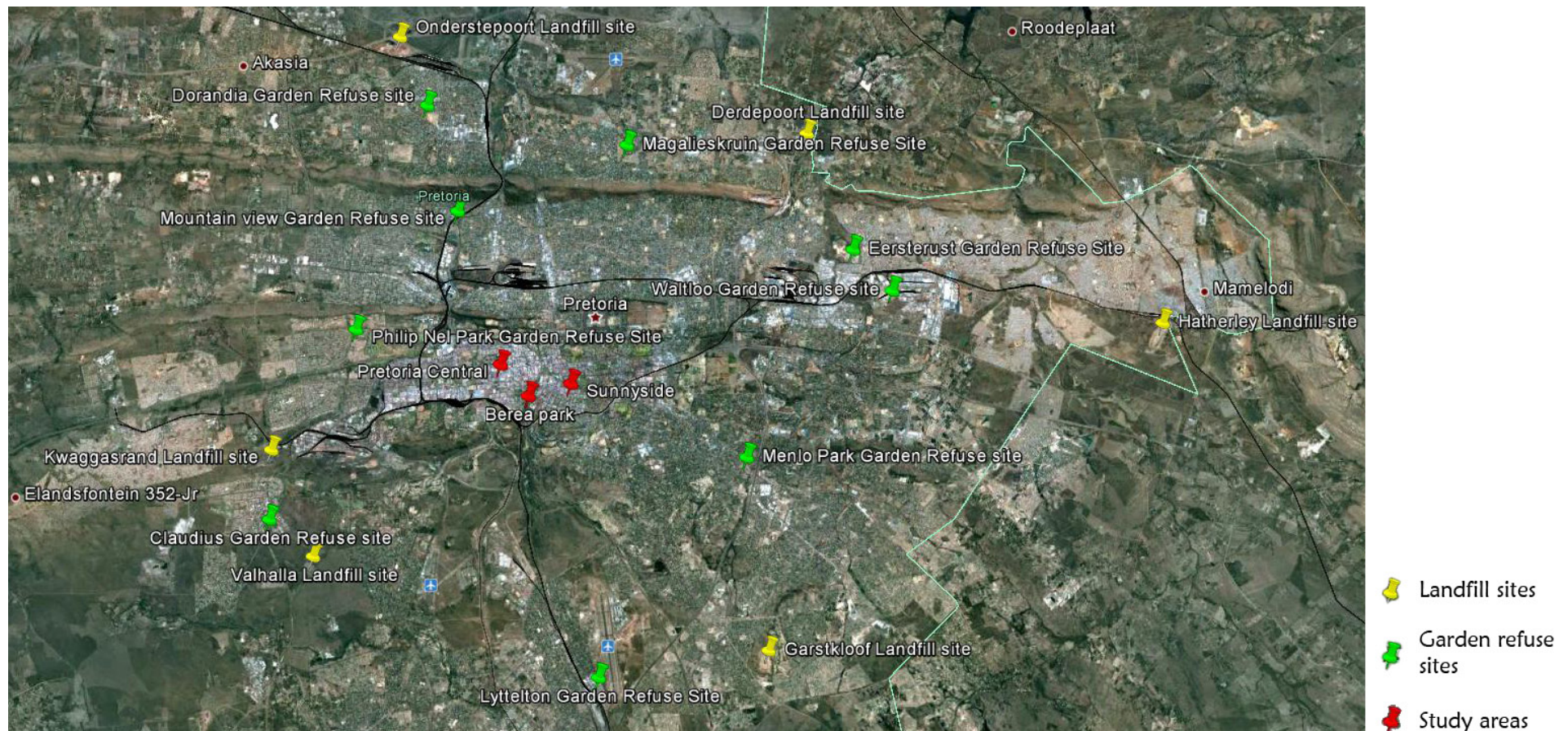


Fig. 17: Existing Garden Refuse and Landfill sites in Pretoria (Map from Google Earth and modifications by Author, 2012)



Fig. 18: Kwaggasrand Landfill Aerial photo (Google Earth, 2012)



Fig. 19: Kwaggasrand Landfill Site (Author, 2012)



Fig. 20: Philip Nel Park Garden Refuse Aerial photo (Google Earth, 2012)



Fig. 21: Philip Nel Park Garden Refuse site (Author, 2012)



Fig. 22: Mountain View Garden Refuse Aerial photo (Google Earth, 2012)



Fig. 23: Mountain View Garden Refuse Site (Author, 2012)



Fig. 24: Eersterust Garden Refuse Aerial photo (Google Earth, 2012)



Fig. 25: Eersterust Garden Refuse Site (Author, 2012)



Fig. 26: Waltloo Garden Refuse Aerial photo (Google Earth, 2012)



Fig. 27: Waltloo Garden Refuse Site (Author, 2012)



Fig. 28: Menlo park Garden Refuse Aerial photo (Google Earth, 2012)



Fig. 29: Menlo park Garden Refuse Site (Author, 2012)

Size and Capacity of Dumping sites

Kwaggasrand landfill site was opened in 1965 and takes in an average of 1 800 tons of waste per day. Kwaggasrand has merely 1 or 2 years left in its operational lifetime, Valhalla Landfill site is already closed, Garstkloof has 3 months left, Derdepoort is also closed, Onderstepoort has 3 to 7 years left and Hatherley Landfill site (opened the most recent, in 1998) has approximately 20 years left.

All garden refuse sites are roughly the same size; it was, however, noted that some sites were more active than others (Refer to Table 1).

3.2.1.2 Origin of Waste

A survey was carried out on the 10th of March 2012 at the identified dumping sites. Dumping site users were asked where they came from (origin of the waste). The need for an additional drop-off site was also assessed.

The results are displayed in Table 2 and indicate that a large area is currently being served by the existing dumping sites. It is also clear that there is no central drop-off point in the Pretoria South CBD and Sunnyside area (Refer to Fig. 30).

	Dumping site	Year open	Size (ha)	Capacity	Activity Level	Life Time	End-destination
1	Kwaggasrand Landfill site	1965	27.2	32 340 000 ton	Busy	1 - 2 years	Rehabilitation
2	Valhalla Landfill site	1964	11.7			Closed	Rehabilitation
3	Garstkloof Landfill site	1980	43.6	11 610 000 ton		3 months	Rehabilitation
4	Derdepoort Landfill site	1995	12.4			Closed	Rehabilitation
5	Onderstepoort Landfill site	1996	51.82	23 460 000 ton		3 - 7 years	Rehabilitation
6	Hatherley Landfill site	1998	96	20 400 000 ton		20 years	Rehabilitation
7	Philp Nel Park Garden Refuse site		1.2	150 m ³ /day	Quite		Kwaggasrand Landfill
8	Mountain View Garden Refuse site		1.4	210 m ³ /day	Very busy		Onderstepoort Landfill
9	Eersterust Garden Refuse site		1.2	150 m ³ /day	Very quite		Derdepoort
10	Waltloo Garden Refuse site		1.2	150 m ³ /day	Busy		Derdepoort
11	Menlo Park Refuse site		2	450 m ³ /day	Very busy		Garstkloof Landfill
12	Dorandia Garden Refuse site			300 m ³ /day			Onderstepoort Landfill
13	Claudius Garden Refuse site			90 m ³ /day			Kwaggasrand Landfill
14	Magalieskruin Garden Refuse site			300 m ³ /day			Derdepoort

Table 1: Size and Capacity of Dumping sites (Dekker & Booysen, modifications by Author, 2012)

3.2.1.3 The destination of waste

Garden Refuse sites: These sites act as garden transfer stations. Once all the bins (30 m³ each) on site have reached their limit, the waste is transferred to landfill sites (Refer to Table 1 for the allocated landfill site for each of the garden refuse sites).

Landfill sites: The waste transported to landfill sites is evaluated at the entrance for approval. Data capturing and payment transactions take place, after which the vehicle is allowed to unload waste onto the operational front.

The waste is processed on the operational front and the recyclable materials are separated from the rest. The remaining waste is compacted into a waste cell and covered with a 150 mm layer of soil.

As stated in section 3.2.1.1 two of the identified landfill sites are already closed and Kwaggasrand is currently running on its reserve. The problem can't be emphasised enough – we are running out landfill space.

	Kwaggasrand Landfill	Philip Nel Park Garden Refuse	Mountain view Garden Refuse	Eersterust Garden Refuse	Waltloo Garden Refuse	Menlo Park Garden Refuse
Arcadia						
Brooklyn						
Capital Park						
Centurion						
Constantia Park						
Daspoort						
East Lynne						
Eersterust						
Groenkloof						
Kilnerpark						
Koedoespoort						
Lynnwood						
Mayville						
Meyerspark						
Montana						
Monument Park						
Môregloed						
Moreleta Park						
Mountain view						
Newlands						
Philip Nel Park						
Pretoria Gardens						
Pretoria North						
Proclamation Hill						
Queenswood						
Rietfontein						
Silver lakes						
Silverton						
Suiderberg						
Val de Grace						
Wapadrand						
Waterkloof						
Waverley						
West Park (Pta West)						
Wonderboom South						

Table 2: Origin of Waste (Author, 2012)

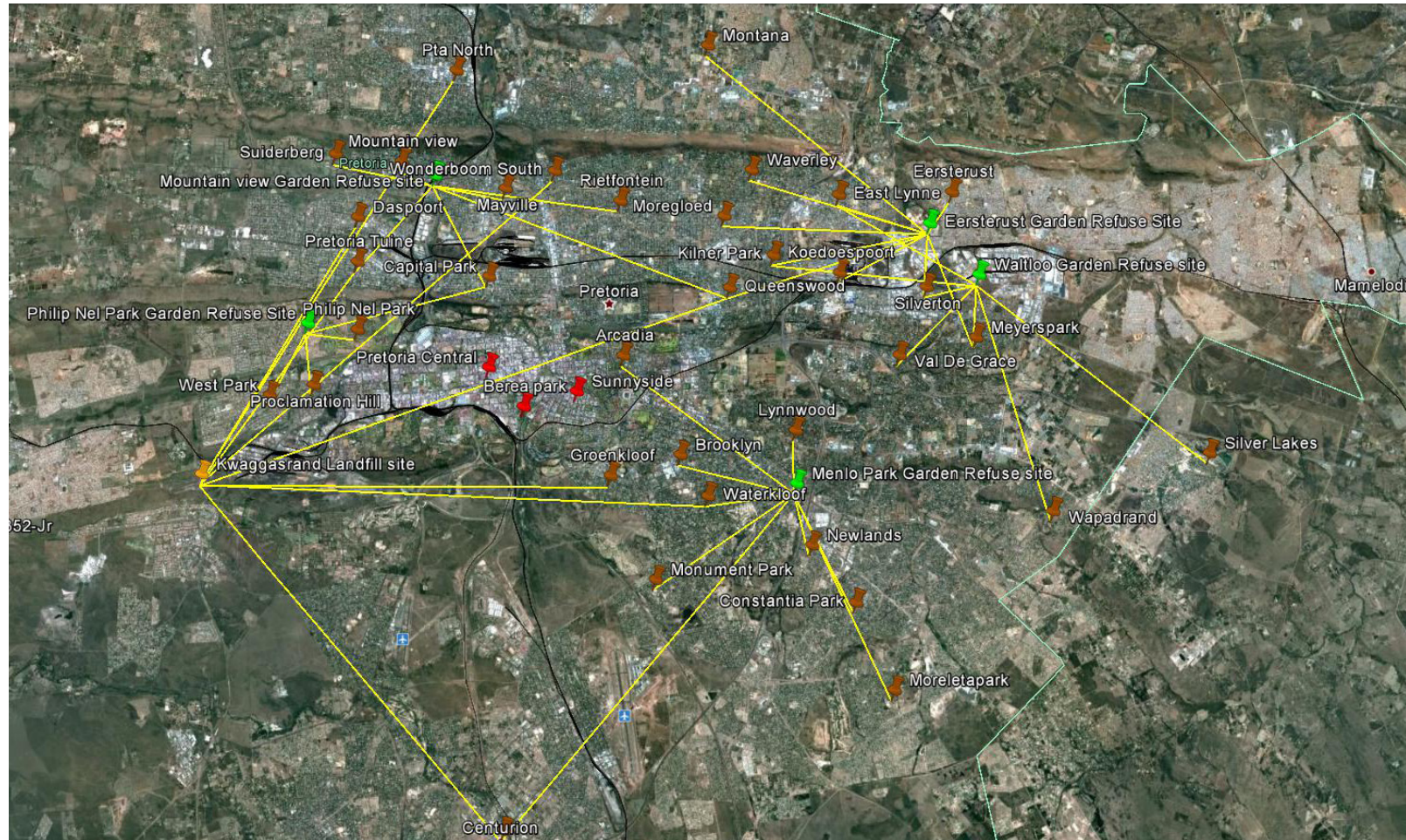


Fig. 30: The Origin of Waste in Pretoria (Map from Google Earth and modifications by Author, 2012)

3.2.1.4 City context conclusion

Pretoria South CBD and Sunnyside have no garden transfer stations or landfill sites in close proximity to which waste can be taken. This exemplifies the need for a centralised waste drop-off point in the Pretoria South CBD and Sunnyside area, therefore these two areas will be investigated as the study area in order to identify potential sites for a waste park (Refer to Fig. 31).

3.2.2 Pretoria South CBD and Sunnyside context

The context of Pretoria South CBD and Sunnyside was analysed due to the need for a centralised waste drop-off point in the area. Even though several residents of Pretoria South CBD and Sunnyside live in apartments and don't have any garden waste, they do produce organic food waste and hard waste which can be recycled.

The aim of analysing different key factors such as the land use and activities, population, employment and transportation of Pretoria South CBD and Sunnyside is to identify potential sites for a waste park.

A group framework for Sunnyside was formulated (Refer to section 3.2.2.5). The framework points out existing open spaces, sports grounds as well as lost spaces (Refer to Fig. 37). This will guide the identification of possible sites.



Fig. 31: Study area in context (Map from ArcGIS and modifications by Author, 2012)

3.2.2.1 Land use and activities

Pretoria South CBD and Sunnyside’s land use is categorised mainly into residential, business, commercial, open space (public and private) and industrial (Refer to Fig. 32).

3.2.2.2 Existing open space, local parks and sports grounds

The map indicates existing open spaces, local parks and sports grounds (Refer to Fig. 33) and the following well-known sites (labelled number 1 – 11 on the map) were identified:

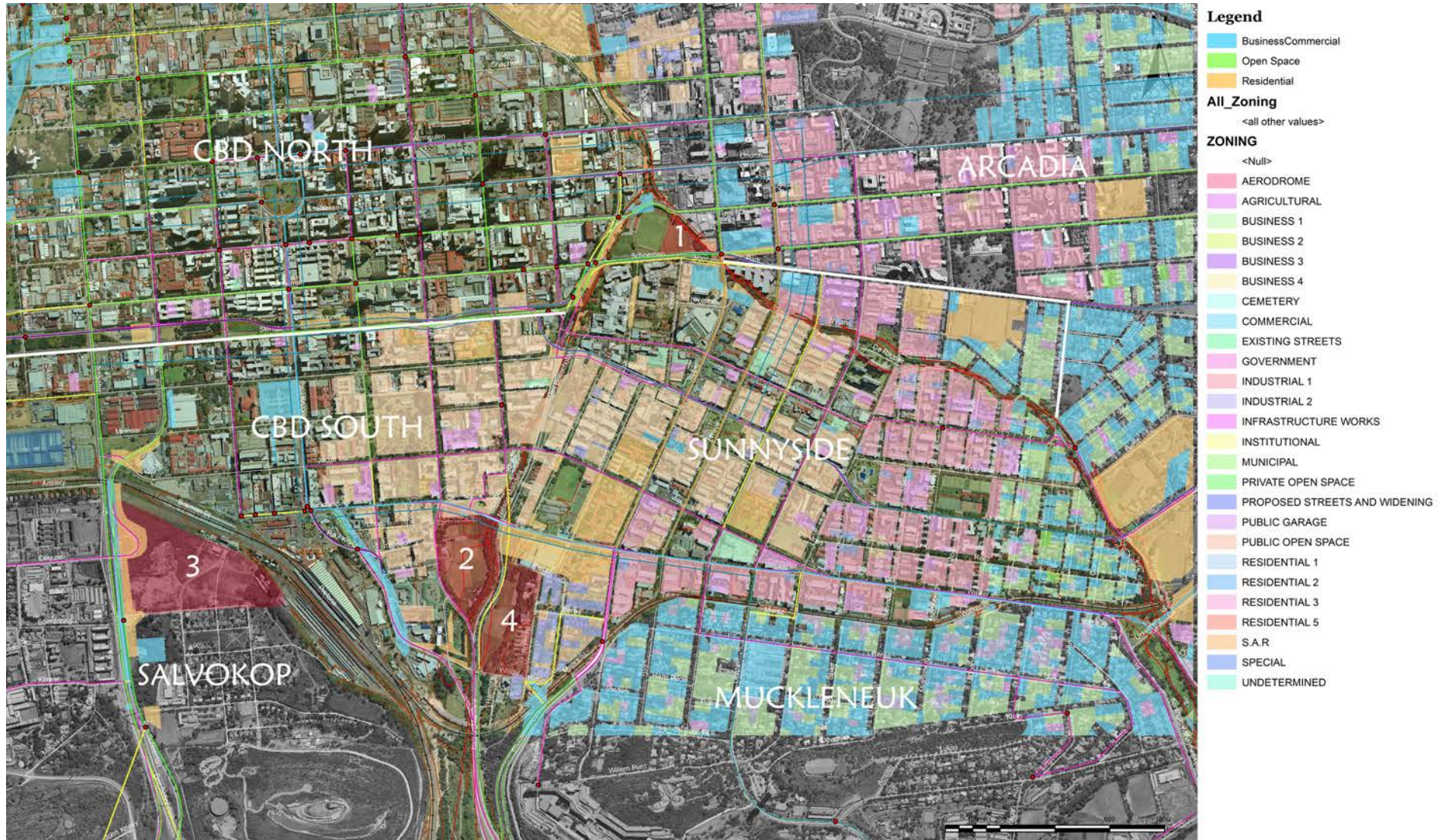


Fig. 32: Zoning of Pretoria CBD and Sunnyside (Map from ArcGIS and modifications by Author, 2012)



Fig. 33: Existing open space and local parks (Capitol Consortium, 1999 modifications by Author, 2012)

3.2.2.3 Employment and population rate

Both Pretoria CBD and Sunnyside are densely populated residential communities. The average household income of Pretoria CBD is high when set against Sunnyside's low average household income. Sunnyside has a higher unemployment rate than Pretoria CBD with relatively young residents in both of these residential communities (Refer to Table 3).

The information implies that there is a need for job creation in these areas to provide young unemployed residents with opportunities to make a living.

3.2.2.4 Transportation

Existing bus stops are illustrated on the transportation map as well as several bus routes, such as the Putco bus route, the Municipality bus route, etc. (Refer to Fig. 34).

As seen on Fig. 34, numerous bus routes exist in and around Pretoria CBD and Sunnyside; making it possible for residents to travel through these areas, however bus stops are limited in some of the areas, making them difficult to reach – not in a “walking distance”.

UNISA Sunnyside Campus		Berea Park		Caledonian Sport Club		Salvokop	
sp_name	Sunnyside	sp_name	Pretoria CBD	sp_name	Trevenna	sp_name	Salvokop
employed	12158	employed	10423	employed	711	employed	5082
unemployed	1781	unemployed	2506	unemployed	153	unemployed	701
avg_hinc	95815	avg_hinc	71517	avg_hinc	86897	avg_hinc	77382
no_income	177	no_income	210	no_income	22	no_income	100
avmincome	8019	avmincome	5326	avmincome	10857	avmincome	8648
male	13019	male	11891	male	789	male	7564
female	13753	female	12860	female	842	female	1735
age_15_19	2585	age_15_19	2757	age_15_19	177	age_15_19	702
age_20_24	7129	age_20_24	6545	age_20_24	488	age_20_24	1601
age_25_29	4742	age_25_29	4865	age_25_29	373	age_25_29	2101
age_30_34	2580	age_30_34	2665	age_30_34	177	age_30_34	1615
age_35_39	1487	age_35_39	1463	age_35_39	69	age_35_39	1073
totpop	26773	totpop	24754	totpop	1631	totpop	9299

Table 3: Income, unemployment and Population rate comparison (Gauteng Census, 2001 and modifications by Author, 2012)



Fig. 34: Transportation (Map from ArcGIS and modifications by Author, 2012)

3.2.2.5 Sunnyside group framework

New frameworks to revitalize the inner city are proposed, but don't succeed in reconnecting Sunnyside to the Pretoria CBD, resulting in Sunnyside to remain separated from the inner city.

The masters class was divided into groups of students working in similar areas and had to propose a framework for that area. Our group worked in Sunnyside.

The group's aim was to create a framework that would reconnect Sunnyside to the inner city by bringing life to it and activating what already exists (Refer to Fig. 35): "revitalize the whole by healing the parts" (Group Framework, 2012). In essence: to activate the "sleeping areas" in the city with our individual interventions (Refer to Fig. 36).

The concluding framework proposal's approach is sensitive and "highly applicable in an era of constrained budgets, limited resources, and urban sprawl" (Group Framework, 2012) (Refer to Fig. 37).

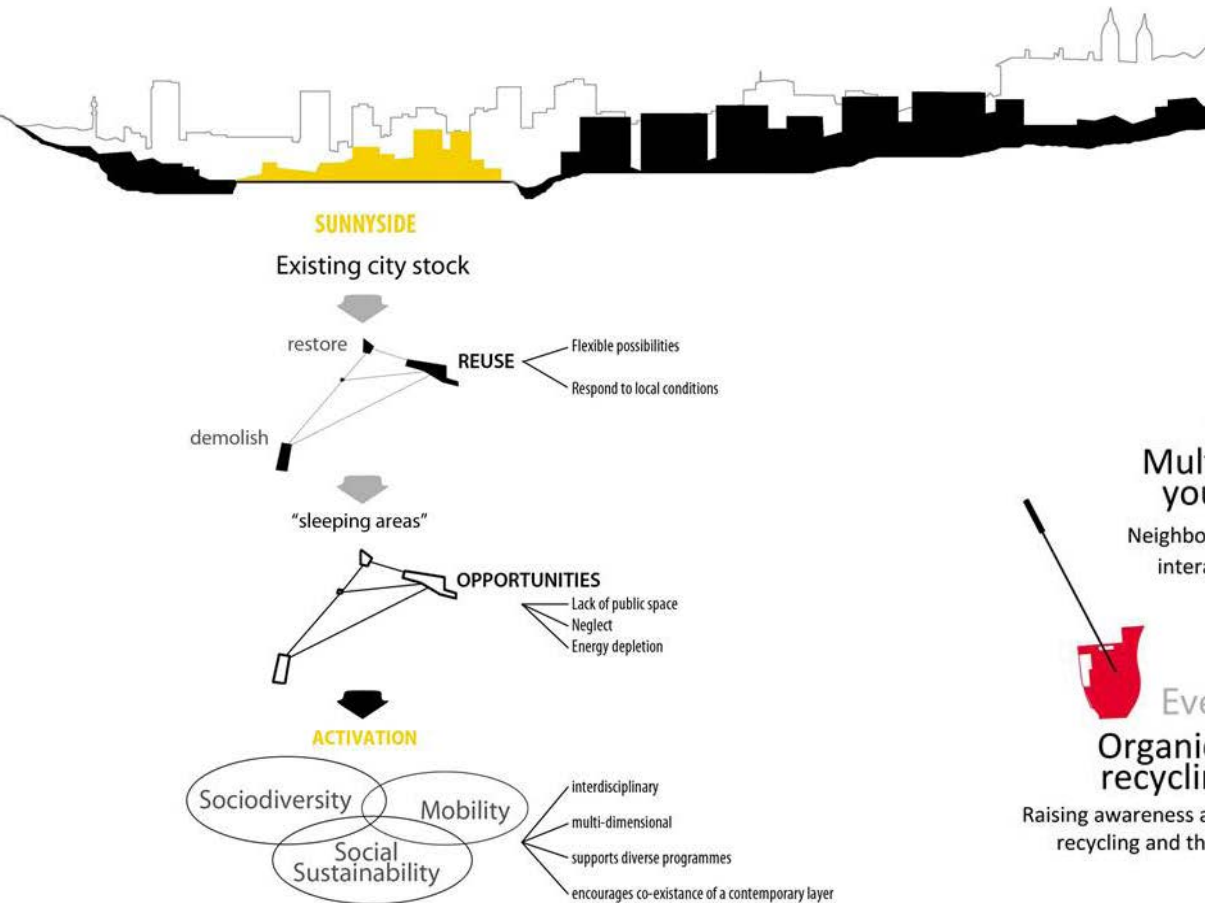


Fig. 35: Aim of the Sunnyside Group Framework (Group Framework, 2012)

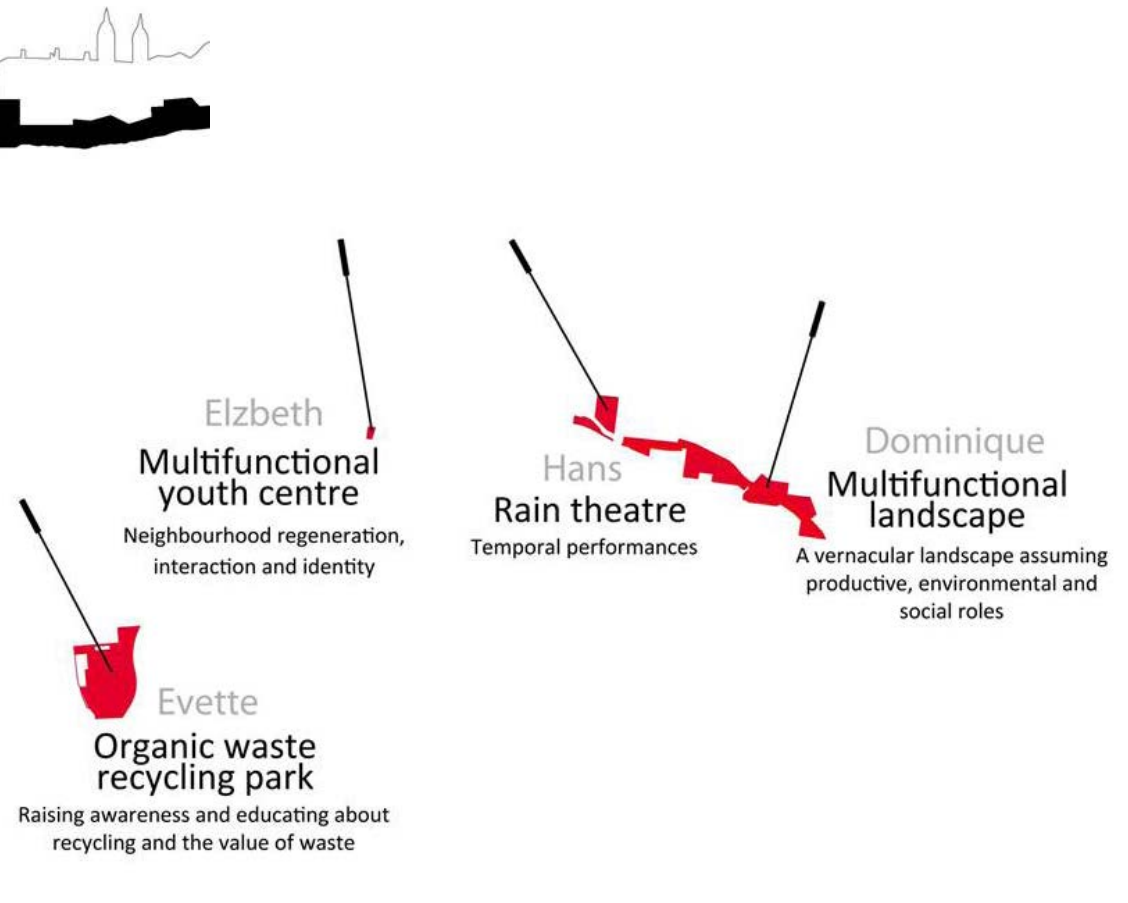


Fig. 36: Individual Interventions (Group Framework, 2012)

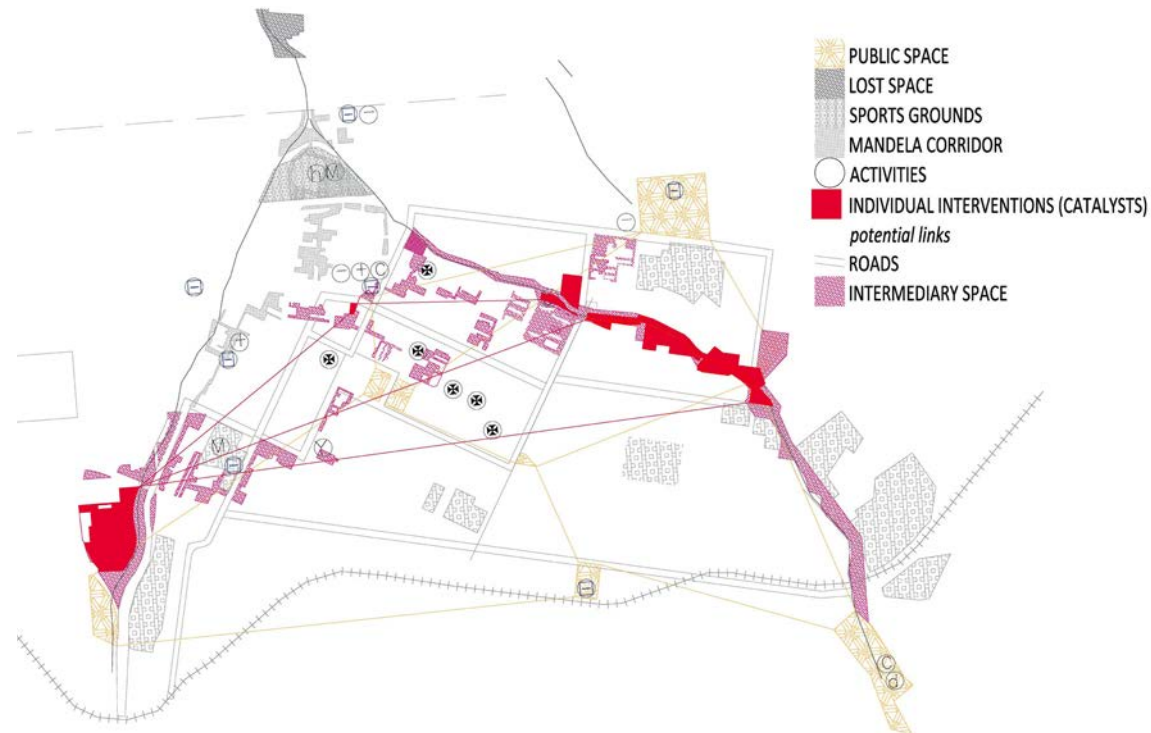


Fig. 37: Concluding Framework Proposal (Group Framework, 2012)

3.3 Site selection criteria for potential sites

The outcome of studying the city's context as well as the Pretoria CBD and Sunnyside context brought forth the possibility to set up criteria, considering the gathered information, to evaluate the potential sites. The criteria explore different factors that measure the suitability of sites for the proposed waste park, namely:

- The site's location – the site:

Should not be in close proximity to existing garden refuse sites – in other words, where there is a need for a garden refuse or waste recycling facility;

Needs to be close to both Pretoria South CBD and Sunnyside to cater for both of these areas;

Must be located in an area with a low average household income, high unemployment rate and relatively young age group – where there is a

need for job creation;

Should be able to relieve pressure from existing (busy) dumping sites;

Has to be easily accessible to the public;

Must be near (within $\pm 250\text{m}$) a densely populated residential area, tertiary education institution, schools (educational purposes), Gautrain stations (transport) and hotels (food waste); and

Should be close to a natural source of water (e.g. river).

- Brownfield site – regeneration;
- Dormant buildings on site – restoration; and
- The size of the site must be sufficient for the proposed program activities.

3.4 Potential sites in Pretoria

Four potential sites (labelled number 1 - 4 on Fig. 38) were identified that complied with the Site selection criteria namely:

1. Caledonian Sport Club (Refer to Fig. 39)
2. Berea Park (Refer to Fig. 40)
3. Salvokop (Refer to Fig. 41)
4. UNISA Sunnyside Campus (Refer to Fig. 42)

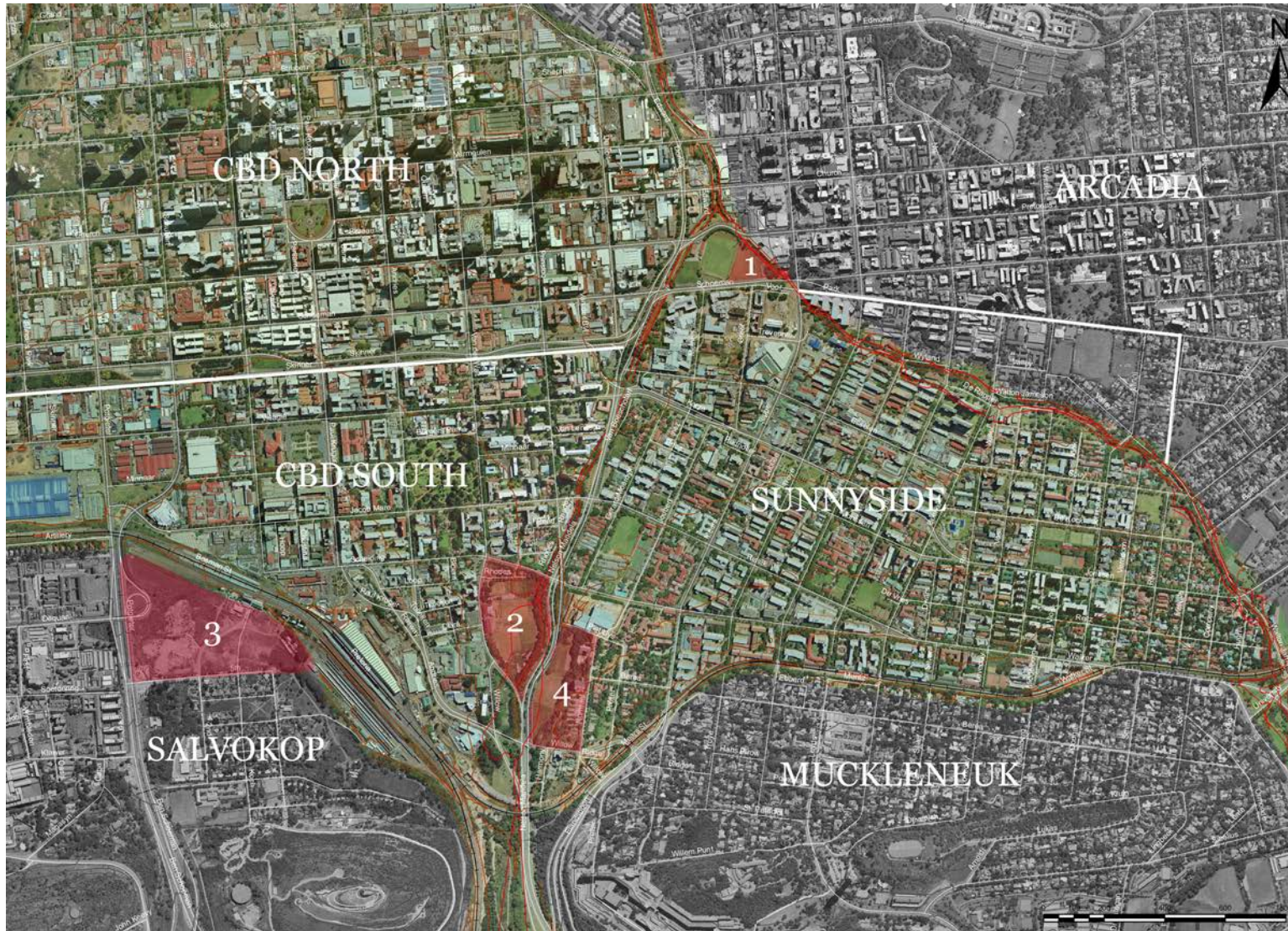


Fig. 38: Potential sites (Map from ArcGIS and modifications by Author, 2012)



Fig. 39: Caledonian Sports Club (Author, 2012)



Fig. 40: Salvokop (Google Maps Streetview, 2012)



Fig. 41: Berea Park (Author, 2012)



Fig. 42: UNISA Sunnyside Campus (Google Maps Streetview, 2012)

3.5 Comparison of potential sites

These four sites were compared to determine the most suitable site for the proposed waste park.

The comparison of the potential sites was done by using a site selection matrix (Refer to Table 4) containing all the factors of the selection criteria. These factors were chosen to measure the potential of the sites, with the problem, current conditions and program in mind, for the proposed waste park.

The average household income, unemployment rate and population density of the potential sites were also compared (Refer to Table 3) to determine where the biggest need for job creation exists.

No.	Site Selection Criteria	Potential sites			
		Sunnyside Campus	Berea Park	Caledonian Sport Club	Salvokop
1	Not in proximity of existing Garden Refuse sites	X	X	X	X
2	Not in proximity of existing Landfill sites	X	X	X	X
3	Close to Sunnyside neighbourhood	X	X	X	X
4	Close to Pretoria South CBD	X	X	X	X
5	Located in area with low average household income		X		X
6	Located in area with high unemployment rate		X		
7	Located in area with relatively young age group	X	X	X	X
8	Relieve pressure from existing dumping sites	X	X	X	X
9	Easily accessible to public		X	X	X
10	Near densely populated residential area (within 250m)		X	X	
11	Close to Tertiary education (within 250m)	X	X		
12	Close to Schools (within 250m)	X	X	X	X
13	Close to a Gautrain Pretoria station (within 500m)	X	X		X
14	Close to Bus stop (within 200m)	X		X	X
15	Close to Hotels (within 500m)	X	X	X	
16	Close to a natural source of water (e.g. river)		X	X	
17	Greyfield site - regeneration	X	X	X	X
18	Dormant buildings on site - restoration		X		
19	Historical value	X	X		
	Total	14	19	13	13

Table 4: Site selection matrix (Author, 2012)

3.6 Conclusion

The site that best complied with the selection criteria was Berea Park (Refer to Table 4) because:

- The site isn't in the proximity of existing garden refuse sites;
- The proposed site is close to both Pretoria South CBD and Sunnyside and will relieve pressure from surrounding garden refuse sites;
- Berea Park's residents have a low average household income, high unemployment rate and are relatively young;
- Berea Park is:
 - Easily accessible to the public;
 - Adjacent to a densely populated residential community, next to (within \pm 250m) UNISA Sunnyside campus, Oost-Eind Primary school (for educational purposes), Pretoria train station, Gautrain Pretoria station, Manhattan Hotel and Holiday Inn; and
 - Next to the Apies river.
- Existing buildings on site – not in use.

The selected site, Berea Park, will be analysed in the next chapter.