04. Movement and infrastructure patterns

- Public and private transport
- Electricity
- Telecommunications
- Water
- Waste
4. Movement and Infrastructure patterns

4.1 Movement

4.1.1 Connectivity with the Region

Good road and rail transport connectivity to main cities/towns exists. By road, Grabouw is located approximately 80km from the Port of Cape Town and approximately 60km from Cape Town International Airport. The N2 national route is the primary east-west road link to the town. There is also a northern road link to Villiersdorp (Figure 4.1). There is an east-west rail link to Elgin and beyond, but there are no stations located on the Grabouw side of the Palmiet River.

4.1.2 Movement within the region

Grabouw is located between Cape Town and Port Elizabeth (Figure 4.2). Farm worker movement is between farms in the Western Cape and seasonal workers come from the Eastern Cape, to work on farms in Grabouw/Elgin.

4.1.3 Public Transport patterns

Public transport is limited to buses and taxis. There are long-distance bus and taxi services to nearby towns, in addition to the local services. The local routes are primarily between the informal and low-cost settlements and the town centre. The majority of long-distance commuters and learners head toward the Helderberg region and the Cape Metropole and make use of taxi and bus services. Minor routes are also serviced, such as the Kleinmond/Hermanus link.

Due to concerns about the safety of the taxis, commuters prefer to use the bus service. Five 65-seater buses leave Grabouw in the morning and travel to the Metropole, whereas 3 minibus taxis make the same trip. About 7 buses depart from Grabouw to Somerset West on weekdays, with an estimated 400 passengers. Bus time-table to Somerset West and Cape Town is provided in Table 4.1.

There is inadequate public transport for farm workers entering Grabouw from the surrounding rural areas.

Informal collection and drop-off activities at the three main entrances to the town on the N2 have given rise to safety concerns for pedestrians.

The multi-purpose public transport facility located on the ‘Plein’ is intended for use by both local and long-distance services. This facility is managed by the Traffic Department and is the only taxi and bus rank in the town. Cross municipal border public transport destinations are Cape Town, Somerset West, Kleimond, Hermanus, Mqanduli.

<table>
<thead>
<tr>
<th>Table 4.1: Bus time-table</th>
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<tbody>
<tr>
<td><strong>Somerset West</strong></td>
</tr>
<tr>
<td><strong>Monday-Friday</strong></td>
</tr>
<tr>
<td><strong>Departure</strong></td>
</tr>
<tr>
<td>5h00</td>
</tr>
<tr>
<td>6h00</td>
</tr>
<tr>
<td><strong>Monday-Friday</strong></td>
</tr>
<tr>
<td>5h00</td>
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<tr>
<td>5h45</td>
</tr>
</tbody>
</table>

Source: Gaffley’s bus service, 2007
4.1.4 Non-motorised transport patterns

The primary mode is walking (Diagram 4.1 and Figure 4.3). There does not appear to be a significant current demand for bicycles. However, this does not mean that increased use of bicycles should not be encouraged, as Grabouw offers excellent opportunities for walking and cycling and creating a more pedestrian friendly town.

4.1.5 Local vehicular movement patterns

Primary road access to Grabouw is gained via three entrance roads that intersect with the N2 National Route, which bypasses the town to the south.

None of the intersections are signalised and traffic safety at the Elgin entrance is of concern.

As a consequence of the N2 bypassing the town, traffic is generally limited to local vehicles and volumes are low. Although there are few formal traffic-calming measures in place, the physical extent and layout of the town results in low vehicle speeds and travelled distances that are relatively short.

The roads are in a reasonable state of repair and they can be maintained at relatively low cost, as a result of the low volumes and speeds.

There are plans in place to make the N2 National Route into a toll road between Somerset West and Bot River. This will significantly alter motorised transport patterns in the vicinity of Grabouw both during and after the construction activities.

4.1.6 Freight

Local industry utilizes road-based freight transport exclusively as a result of convenience and economic factors. The opportunity does exist for a return to rail transport, but this would require a complete refurbishment of Elgin Station as well as a feasibility investigation of the rail linkages to the cold storage facilities at the Port of Cape Town. The Ou Kaapse Weg is presently the one of the routes through the town from the Pineview entrance off the N2 used for freight. There are also entrances via Orchard and Peregrine Farmstalls on the N2 to exit/enter Grabouw.

4.1.7 Rail

The Strand-Bredasdorp line is serviced by diesel-powered locomotives and still utilized for freight, with SA Millsters in Caledon being the largest user. The second largest user used to be the Elgin-Grabouw fruit industry prior to the move to road freight.

Although the line previously provided a combined commuter and freight service, Transnet’s current policy precludes this mix. This policy makes it uneconomical to run a dedicated commuter service, based on the volumes of outbound passenger trips from the town. Furthermore, the travel time is significantly longer than by road.

4.2 Existing infrastructure

The status of the existing infrastructure is summarised below:

4.2.1 Roads

Primary road access to Grabouw is gained via three entrance roads that intersect with the N2 National Route, which bypasses the town to the south. None of the intersections are signalised and owing to the geometry and speeds, traffic safety is an issue, particularly for the safety of pedestrians and conflict with large goods vehicles.

The roads are generally in a reasonable state of repair and most are surfaced. There are unsurfaced roads in the industrial area and the informal settlements. These have a tendency to develop potholes during wet weather.

Most sidewalks are unsurfaced, except in the town center, but the sidewalk along the road from town to the Pineview pump station has been surfaced for the benefit of the pedestrians that use this route.

Traffic volumes are generally low. Although some congestion is experienced on the main road in the town center on Saturday mornings, there are no specific areas that are operating beyond capacity.

The following issues should be highlighted:

- Most of the road cross-sections are standard and adequate to meet the vehicular needs of the town.
- The geometry of the Ou Kaapse Weg lends itself to speed through a fairly densely populated and primarily residential area.

The roads do not have the necessary sidewalks and street lighting to make them pedestrian-friendly.

The South African National Road Agency Ltd (SANRAL) has plans in place to toll the N2 from the R300 to Bot River. Current plans indicate grade-separated intersections at all three entrances to Grabouw, which will effectively sever the town from passing trade.
4.2.2 Energy

Electricity is the mostly used lighting source (Diagram 4.2). In addition, there is a mix of other domestic energy use (paraffin, candles, wood fires and very limited use of gas). Grabouw is supplied directly by the Eskom regional grid and has no alternative electrical power sources at present. Disruptions to the supply have occurred as a result of load shedding.

There is adequate infrastructure to supply the present power needs of the town, but additional powerlines will be required for any future expansion or developments. Eskom have medium-term plans to augment their infrastructure to accommodate additional consumers. These plans will need to be incorporated into the overall planning of new developments.

Diagram 4.2: Sources of lighting

Source: Statistics South Africa, 2001

4.2.3 Information and telecommunications

Information and telecommunications are serviced via the Telkom regional network. Telecommunications are limited to the Telkom fixed-line network and the cellular telephone networks. Access to internet and broad facilities are limited and often inefficient or insufficient to run a business or access market prices/conduct research (interview with local residents).

Diagram 4.3: Main water supply

Source: Statistics South Africa, 2001

4.2.4 Water

Grabouw has the majority of large water users in the TWK Municipality. The majority of households have piped water inside their dwellings (Diagram 4.3). A Water Master Plan was compiled for the Theewaterskloof Municipality by CEs consulting engineers (refer to Figure 4.4 for water use and Figure 4.5 for the existing water flow direction). Owing to the variable topography and elevation differences across the town, the system is operated as five pressure zones, supplied from various reservoirs. Consequently there are zones of low pressure – particularly in the upper reaches.

The existing infrastructure in the old parts of town is aging and failures are giving rise to water losses. The unaccounted for water in Grabouw is 29.8%. Grabouw is an area with “significant supply problems” and “urgent and substantial” upgrades to the bulk supply system are required to ensure a reliable supply to existing consumers.

- There are areas of low residual pressures (i.e. less than 24 m) and high velocities (i.e. greater than 1.5 m/s) during peak-hour conditions.
- The total present storage volume in 6 reservoirs is 8.9 Ml.
- The current reservoir storage capacity is 22 hours, not the required 48 hours.
- The operation of the system is complicated as a result of there being no dedicated rising main from the Water Treatment Works to the Steenbras reservoir.
- The measured average water input to system (in 2004) was 3.2 Ml/d.
- The present theoretical Annual Average Daily Demand (AADD), is 3.4 Ml/d. Including unaccounted-for losses, the AADD increases to 4.5
- The supply pipelines to the treatment works are undersized.
- There is a natural spring in the Rooidakke area. This delivers a flow of up to 8 l/s, but water quality tests have indicated that the water is not of potable standard.
- There is a Water Demand Management Programme in place. Water meters have been installed at all connections, including fire hydrants. Water losses have been reduced to 17% The informal areas don’t have waterborne sewerage at present and a bucket system is in operation.
- The rising main from the Appletiser pump station has deteriorated. The intention is to decommission the Appletiser pump station and divert flow to the nearby Pineview pump station, which is to be upgraded.
- There is ingress of groundwater and stormwater into the sewer system in winter.
- There is no re-use of treated effluent from the WWTW. All treated effluent is discharged into the river.
4.2.5 Sanitation and sewer

The town is served by a formal sewer network, but there are still areas that are inadequately serviced. Owing to topographical constraints in conjunction with the location of the Wastewater Treatment Works (WWTW), the system is heavily reliant on pump stations.

The following issues are relevant:

- The town Wastewater Treatment Works (WWTW) has a design capacity of 3.6 Ml/day and is reported to be treating inflows in excess of the design capacity.
- A minimum of an additional 3500 households will need to be connected to the sewer system to accommodate those presently without water-borne sewerage. This is in addition to any natural growth of the town.
- Geotechnical constraints preclude the use of soakaways as a form of on-site disposal of waste water.
- Sewer pump stations are reported to be inadequate on various levels – i.e. insufficient capacity, inadequate maintenance, power failures.
- There are no contingency plans in place to deal with pump station failures – i.e. no back-up power or overflow ponds.
- The rising mains from the pump stations are reaching the end of their design life and are in need of upgrading.
- The location of the WWTW negates the opportunity to develop land immediately surrounding it.
- There is a shortage of skills for the management, operation and monitoring of the WWTW.

- The quality of the treated effluent entering the Palmiet River does not meet acceptable standards.
- At present, there is no re-use of by-products (e.g. sludge and treated effluent) from the WWTW.
- There are no trade effluent by-laws, consequently effluent standards from industry are not being monitored.
- The maximum measured flow at the treatment works was 2.85 Ml/d in Nov/Dec 2005.
- The present (theoretical) Annual Average Daily Demand (AADD) for the town is 4.48 Ml/d, which exceeds the WWTW design capacity.
- The Grabouw WWTW does not currently have adequate capacity to accommodate flow from future developments.
- The network is served by 4 pump stations.
- Several pipes are running at capacity.
- Numerous system upgrades are required. These are mainly associated with the low-cost housing developments.
- Industrial water users, such as Elgin Fruit Juices and Appletiser treat their own industrial effluent, which is discharged into the river.

Diagram 4.4: Toilet facilities

Source: Statistics South Africa, 2001

Figure 4.4: Water use

Source: Statistics South Africa, 2001
4.2.6 Stormwater

At present, there is no Stormwater Master Plan for Grabouw, although plans are in place to appoint a consultant to draw one up. Grabouw has a relatively wet climate in comparison to most other areas of the Western Cape. It experiences a Mean Annual Precipitation of 1010mm (ARC data) and storms of 43 mm/h intensity have been reported. Stormwater is conveyed and discharged into the river by means of an underground pipe system and overland via the road network and public open spaces.

There is ingress of grey and black water (contaminated by domestic effluent and sewage) into the stormwater channels in the vicinity of the informal settlements (insert 4.1). The contaminated water discharges directly into the river. Two specific areas experience localised flooding during high-intensity storm events.

At present, the system appears to be functional, although there are a few areas where localized flooding occurs during high-intensity storm events. Development of upper slopes will require special attention to limit erosion and flooding downstream. There is a shallow water table owing to the occurrence of rock close to the surface, which impacts on the overall functioning of the system.

In addition, the following issues are notable:

- River systems are not being properly protected. Watercourses are being polluted by poor-quality runoff, particularly in occupied areas where formal infrastructure is lacking.
- No formal management of water quality in terms of the storm water is taking place – e.g. no on-site treatment of runoff by routing it through reed beds.
- The expansion of the occupied areas can result in increased runoff, with associated increase in erosion and flooding potential. Open spaces within communities are neglected. The potential for using the green areas for storm water routing, treatment and infiltration has not been realized.
4.2.7 Solid waste

An Integrated Waste Management Programme has been drawn up for the Theewaterskloof Municipality by Jan Palm consulting engineers. Residents and businesses have “wheelie” bins, which are emptied regularly by collection vehicles and municipal staff (insert 4.2). In the informal settlements, black bags are distributed and the filled bags are collected from a central location. When funds are available, ad-hoc clean-up projects are carried out in the informal settlements. Weekend traders generate a significant amount of litter in the town centre.

There are litter bins located in and around the town centre, but these are sometimes vandalised or removed. The collected refuse is taken to the transfer station at the Wastewater Treatment Works. The refuse collected at the transfer station is trucked to the landfill site at Karwyderskraal. Dried sludge produced by the Wastewater Treatment Works is also removed by truck to the Karwyderskraal landfill site. At present, there is no programme in place for recycling of waste.

- Residents and businesses have “wheelie” bins, which are emptied regularly by collection vehicles and municipal staff.
- In the informal settlements, black bags are distributed and the filled bags are collected from a central location.
- Ad-hoc litter clean-up projects are also carried out in the informal settlements.
- The collected refuse is taken to the transfer station at the Wastewater Treatment Works, following which it is trucked to the regional landfill site at Karwyderskraal – approximately 40km away by road.
- The composition of the domestic waste arriving at the transfer station is mixed wet waste with low content of potentially recyclable material in the form of packaging, plastics, metals and glass. Recovery rate from the waste stream will be low.
- There is no rail link between Grabouw and Karwyderskraal.
- Dried sludge from the Wastewater Treatment Works is also removed by truck to the Karwyderskraal landfill site.
- There is no compaction of waste prior to its removal.
- There is no programme in place for recycling of any waste.