

Annexure 12: Bergrivier Spatial Development Framework

Econometric model

1. Aim

This section of the report aims to substantiate the proposed amendment of the Bergrivier Spatial Development Framework by determining the future demand for housing space in the Bergrivier Municipality.

2. Objectives

Our objectives are to:

- a. Establish the historic demand for housing in Bergrivier.
- b. Make a 5-year forecast of housing demand in the Bergrivier area.
- c. On the premise that the urban edge will be amended, attempt to determine how the future housing demand will potentially be apportioned between the various house-price bands.

3. Methodology

Following is a summary of the methodology used to meet the objectives outlined in §2, written in the same order:

- a. We used historic Stats SA data on the square meterage and number of new housing units completed in Velddrif, Piketberg and Porterville as proxies for new demand in these towns, and analysed it.
- b. Where possible, we used econometric modelling to quantitatively determine the historic association between the square meterage and or units of houses completed and macroeconomic variables, viz., economic growth, interest rates and house prices. The chief shortcomings of the econometric models are:
 - their reliance on historical relationships between the variables and its assumption that these relationships will persist in the future; and
 - the assumption that the macroeconomic forecasts that serve as inputs to the model, will turn out to be correct.

The econometric models formed the foundation of our forecasts.

- c. In the case of a coastal town like Velddrif it can be expected that a large percentage of the total demand for housing would come from outside of the town itself. To get an approximate measure of this external demand we looked at the postal address of the rate payer on the latest valuation roll for Velddrif. We determined how many of the rate payer postal addresses were

outside of Velddrif and how many were in Velddrif. This was then used to calculate an "external demand factor" by dividing the former by the latter.

- d. To determine how the future housing demand will potentially be taken up by households who can afford to buy in the different house-price categories, the following method was adopted:
 - Using 2006 Deeds Office sales transactions data we determined the percentage of the total sales which took place in each of the different house-price categories.
 - Using these percentages, we then apportioned our forecasts for future demand amongst the house-price bands.

4. Findings

CENTRAL PLACES

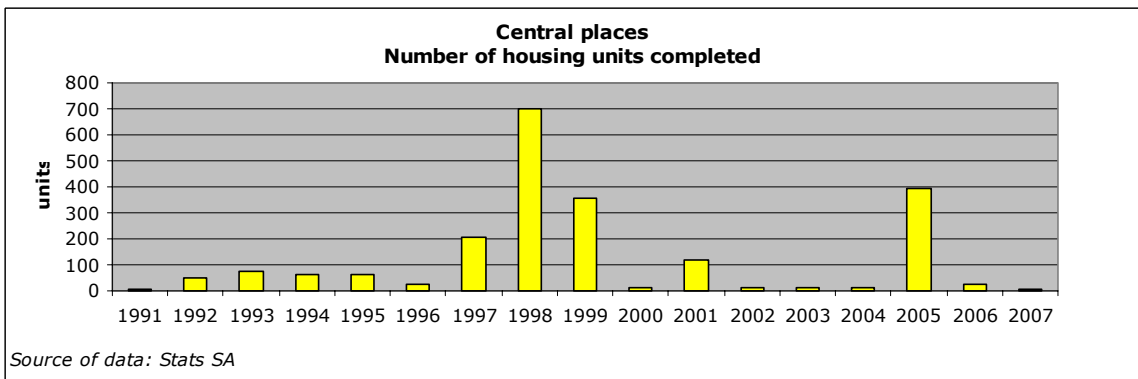
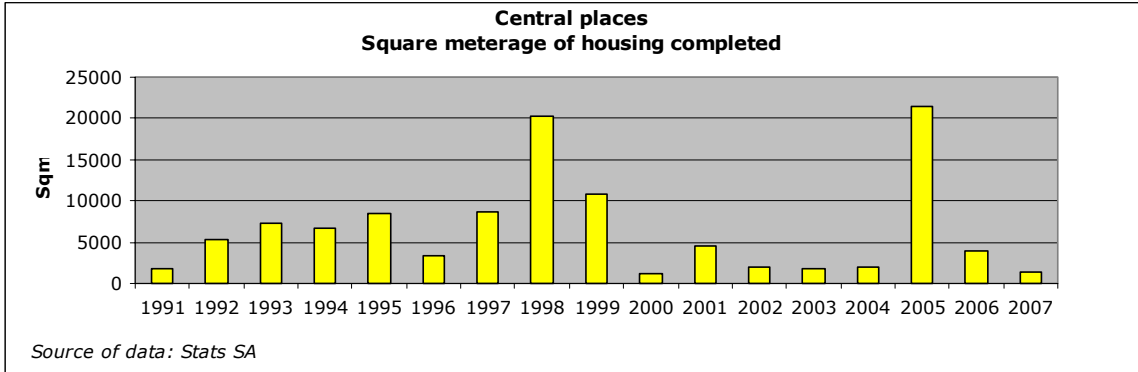
4.1 Piketberg and Porterville

It must be said at the outset that our models to forecast future housing demand in the central places produced less than satisfactory results. In other words, our models could not find statistically robust relationships between housing demand and economic variables such as *real* economic trends, house price trends and interest rates.

Despite the fact that the SA economy has been in an upswing phase since 1999, which concurrently resulted in a booming house market, housing demand in the *central places* remained in the doldrums. The accompanying graphs shows that between 1999 and 2004, when the SA house market went through a strong boom phase, on the back of healthy economic growth and declining interest rates, the "demand" for housing in the *central places* actually trended south. The spikes in the square meterage and units completed in 1998 and 2005 represents surges in low-cost¹ housing completed, hence, these can be seen as outliers². For example, during 2005, 316 low-cost houses were completed. This represented a total construction area of 8.484m² and an average unit size of roughly 27m².

¹ Generally, dwelling-houses with a floor area smaller than, or equal to 30 m².

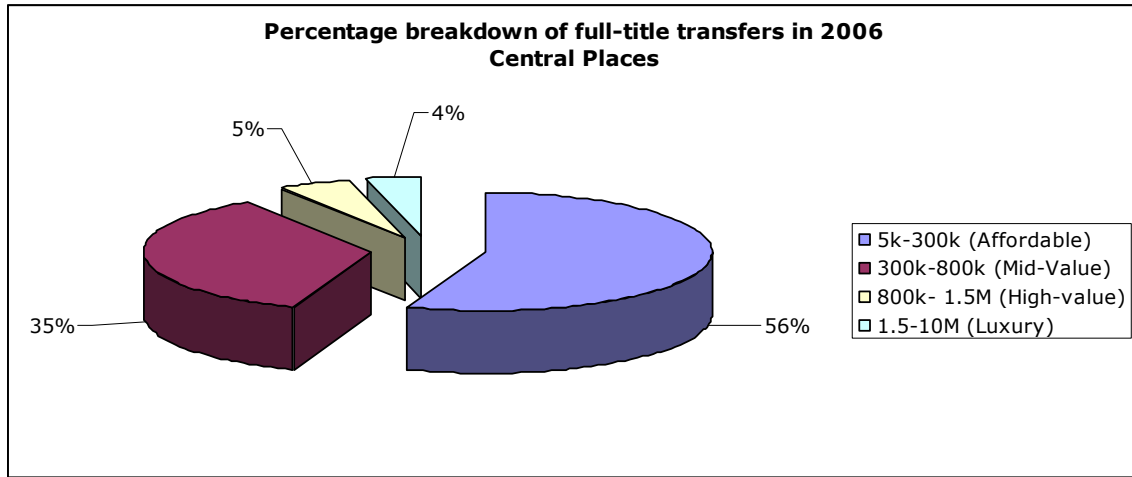
² In statistics an **outlier** is an observation that is numerically distant from the rest of the data.



As a result of the previously mentioned anomaly, the inverse relationship between economic expansion/house price growth and “demand” for housing in the central places, our best estimate of “demand” in the next five years (2008-2012) is based on the experience of the recent past. This is done by simply taking the average of the square meterage or units completed over the last five years as our forecast of new ‘demand’. Furthermore, because 2005 has been identified as an “outlier” year, the 2005 observations for the square meterage and units completed were interpolated and the 5-year averages calculated afterwards. Therefore, as the accompanying table shows, we forecast new ‘demand’ of roughly 2.400m² p.a or 18 units p.a. over the 2008-2012 period.

Table 1: Central places Square meterage and units of housing completed Average (2003-2007)		
	Square meterage	Units
Central places	6.097	90
Central places*	2.365	18
* Excludes the effect of the 2005 outlier year.		
Source of data: Stats SA		

The following pie chart shows the 2006 distribution of full-title transactions in the Central Places across four price classes.



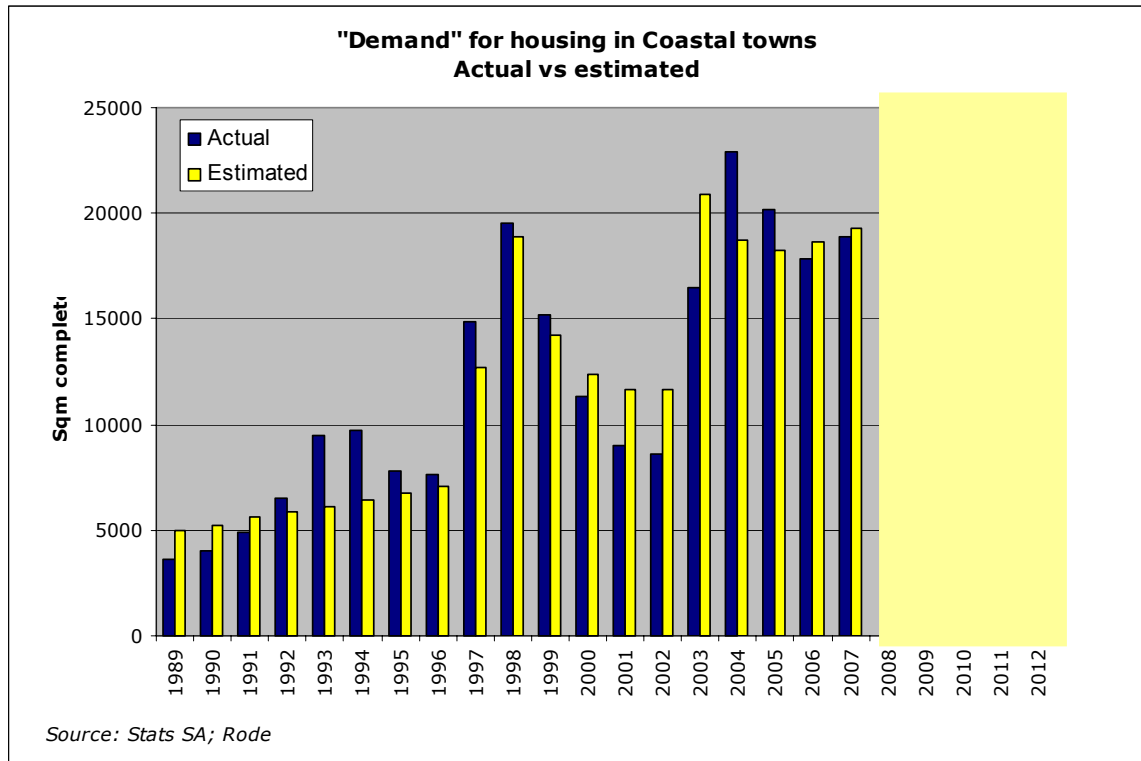
Apportioning the forecasted total demand for housing units in the Central Places reveals that (refer **Table 2**) an average of 6 units per annum, of the total per annum future housing demand, will potentially be taken up by households who would buy in the *Middle-Value* (R300.001 – R800.000) range.

Table 2: Central Places Distribution of demand between price bands						
	Square meterage	Housing units (no.)	56.0% Affordable	35.0% Mid- value	5.0% High- value	4.0% Luxury
2008	2365	18	10	6	1	1
2009	2365	18	10	6	1	1
2010	2365	18	10	6	1	1
2011	2365	18	10	6	1	1
2012	2365	18	10	6	1	1

COASTAL TOWNS

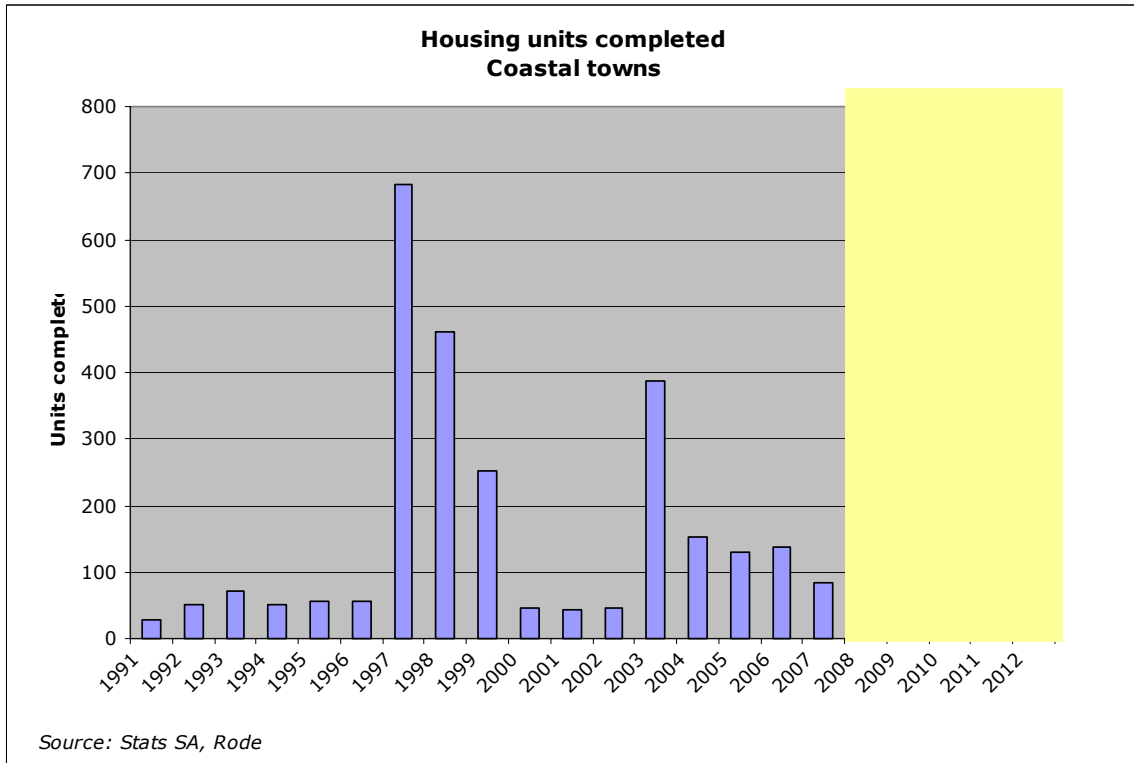
4.2 Veldrif/ Laaiplek/ Dwarskersbos/ Noordhoek

We were able to build an econometric model to explain changes in housing demand in the *coastal* towns. Our model showed that only *house prices* were statistically significant in explaining the trends in the square meterage of housing completed in the Bergrivier coastal areas. Intuitively, this made the most sense, since house prices are, amongst other things, driven by economic growth and interest rates.

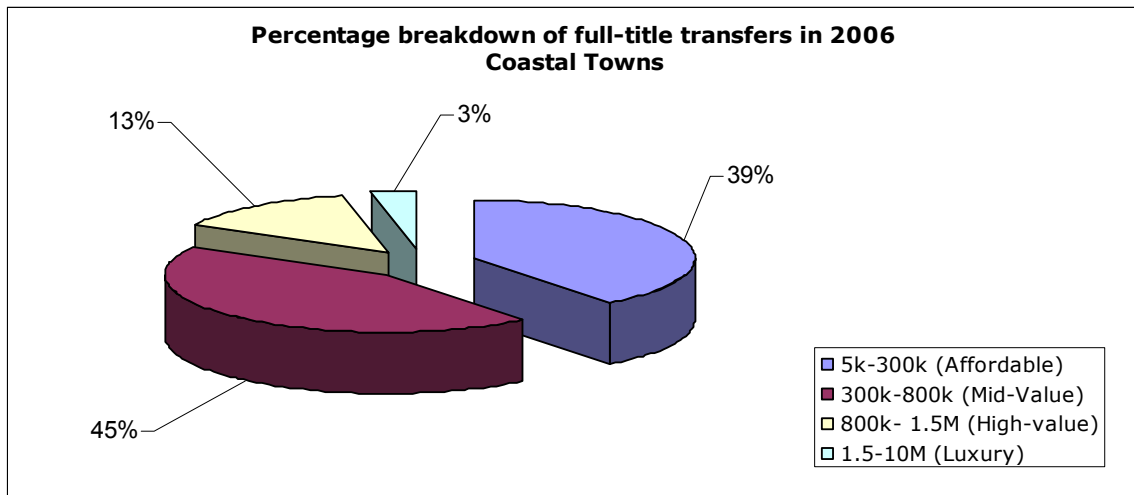


The accompanying graph shows that over the next few years, there would be an average demand for roughly 21.184m² of housing per year. Furthermore, our analysis of the 2007 valuations roll indicated that of the 2.969 houses on the roll only 1.377 of the rate payers' addresses were in the Coastal towns, the rest (1.592) were outside of the Coastal Towns. Therefore, we adjusted our forecast of 21.184m² upwards by an "external demand factor" of 1,16 to 24.279m².

To determine the forecast for the number of housing units, the 24.279m² was divided by the average size of units completed in the coastal towns. Over the period 1989 to 2007, the average size of a housing unit completed in the *coastal towns* was 141m². Therefore, we forecast the demand is approximately 174 housing units per annum over the next few years.



The following pie chart shows the 2006 distribution of full-title transactions in the Coastal Towns across four price classes.



Apportioning the forecasted total demand for housing units in the Coastal Towns reveals that (refer **Table 3**) an average of 77 units per annum, of the total per annum future housing demand, will potentially be taken up by households who would buy in the *Middle-Value* (R300.001 – R800.000) range.

Table 3: Coastal Towns Distribution of demand between price bands							
	Square meterage	m ² increased by external demand factor	Housing units (based on average size of 141 m ²)	39.0% Affordable	44.0% Mid- value	13.0% High- value	3.0% Luxury
2008	20065	23275	165	64	73	21	5
2009	20733	24051	171	67	75	22	5
2010	21266	24669	175	68	77	23	5
2011	21731	25208	179	70	79	23	5
2012	22124	25663	182	71	80	24	5
Average	21184	24573	174	68	77	23	5