Urban LandMark Land Release Assessment Tool: Comparison between the findings of the Western Cape and Gauteng case studies

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Contact Details

PDG

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Introduction

PDG was commissioned to apply the Urban LandMark Land Release Assessment (LRA) tool in two Gauteng case studies, namely Cosmo City and Pennyville in order to a) increase the case study application to generate a database of model inputs and outputs, b) to test the model, and c) to compare the Gauteng experience with that of the Western Cape. This report provides a comparison between the findings of the two Western Cape case studies, Morgan's Village Phase 3 and Blue Berry Hill, and the two Gauteng case studies.

High level comparison

The scale and complexity of the case studies is an important factor in their ability to be modelled accurately. Cosmo City is far larger than the other case studies, comprising approximately 12,000 housing units, and it took 11 years from project start to completion. While Pennyville is of the same scale as Blue Berry Hill, at around 3,000 units, it is important to note that Blue Berry Hill is a planned development and has not yet taken place. Morgan's Village is a small project, at only 682 units, and is the simplest development model, as it only comprises two housing typologies.

Morgan's Village was the only project where land was actually sold to the developer, as two of the projects, Blue Berry Hill and Cosmo City, were undertaken/planned under Land Availability Agreements (LAAs), while Pennyville included a Land Exchange Agreement.

The most distinct difference between the Western Cape and Gauteng case studies concerns the definition and concept of the 'developer'. For the Western Cape case studies the developer was a single entity – the Cape Town Housing Company (CTHC) in Morgan's Village, and an ABSA/Standard Bank consortium in Blue Berry Hill. For the Gauteng case studies, the 'developer' had to incorporate all developers involved through the on-selling of land, or the retention of rental stock. Cosmo City involved multiple developers, while Pennyville included two developers and a social housing institution. This aggregation of entities makes the 'Developer' model inputs more difficult to quantify and the results more difficult to assess.

Differences in model inputs

The model assumptions were kept as constant as possible across the case studies. The financial assumptions were consistent, except for the developer's cost of capital in Morgan's Village, which was set at 3% lower than the others to reflect the availability of concessionary finance rates on that project. The State operating costs for service provision that were used in the Gauteng case studies were significantly different to those used in the Western Cape, and these costs need to be interrogated further. The assumed consumption patterns were similar, but slightly lower in Gauteng. Rates and tariffs were set to reflect the actual charges imposed by the two cities, with an important difference being the lower residential property rates exemption in Cape Town.

The most significant difference in project inputs relates to bulk infrastructure costs, which will vary from project to project. In Gauteng, bulk infrastructure was reported to cost up to ten times more than the bulks required in the Western Cape projects. This may reflect an under-recovery of costs on the Western Cape projects. The unit capital costs of housing construction and the value of the housing subsidies were not significantly different in the two sets of case studies.

Results comparison: State perspective

The State performance for the two sets of case studies is vastly different. In the Western Cape, the model predicts positive returns on investment of 6% on Morgan's Village and

68% on Blue Berry Hill. While the Blue Berry Hill projection is undoubtedly unrealistic, the Morgan's Village figure is possible given adequate cost recovery through services in the long term. The Gauteng case studies, in contrast, show negative returns of -32% and -75% on Cosmo City and Pennyville respectively. This is a result of the large up-front capital outlays from the State on these two projects, with little or no cost recovery in the long term. The total subsidies provided for Pennyville are similar to those provided for Morgan's village, while the subsidies for Cosmo City are 33% higher in real terms, largely due to the high land and bulk infrastructure subsidies.

Results comparison: Developer perspective

Developer performance, as measured by return on investment, is very similar for Morgan's Village and Cosmo City (14% and 13% respectively), but is a modest 8% for Blue Berry Hill. The return on investment for Pennyville is calculated to be 29%, but this is skewed by the assumption that rental stock is retained for 20 years and then sold. The Gauteng figures are also difficult to interpret because of the aggregation of 'developers'. All projects except for Morgan's Village show some level of internal cross-subsidy, with losses on the subsidy units being compensated for by profits on the higher value units.

Results comparison: Household perspective

Owner households are calculated to derive a positive return on investment over 20 years, with the strongest benefit accruing to subsidy beneficiaries in all cases. There is a general trend of declining benefit with increase in property value, driven by lower subsidies and higher operating costs. Social rental units show a net positive return on investment because of the subsidised rent, while market rental units, predictably, reflect a net cost to tenant households.

Conclusions

The State results for the Gauteng case studies indicate that these projects were heavily subsidised through implicit land and bulk infrastructure subsidies. Of concern are the on-going costs to the State over time, which brings into question the financial viability of this development model to the State in the long term.

Land subsidies, in the form of LAAs, and bulk infrastructure subsidies were present in all cases, but higher in the Gauteng case studies, which is indicative of the State's commitment to the success of these projects. While land costs are a fairly small cost of the development, the LAAs help to keep holding costs to a minimum. Bulk infrastructure costs, on the other had are significant, and can 'make or break' these types of projects. The levels and form of subsidisation are therefore important to the developers, and can be costly to the State. It is notable that if land and bulk infrastructure costs are applied universally to integrated developments, then they are regressive in that they favour the higher value properties with larger areas and greater consumption of services.

A key factor of success of integrated developments is getting the housing mix right in order to achieve the State imperative for housing delivery, while maintaining a financially viable product for the developer. The risk of the 'gap' market was highlighted in the Cosmo City study, and was notable in its absence in Pennyville. The Western Cape case study reports also noted the significant financial difficulties in this market. The Gauteng case studies seem to indicate that social rental housing may be a more viable solution to subsidising this market.

Where the Western Cape case studies first highlighted the issues around internal cross-subsidisation in integrated housing projects, the Gauteng case studies confirmed that this form of subsidisation is necessary in order to make these types of developments work.

1 Introduction

In co-operation with the Western Cape Department of Human Settlements and the City of Cape Town, Urban LandMark commissioned 80/20 and PDG to develop an approach to evaluate the cost effectiveness of public land release. A Land release Assessment (LRA) model was developed and used to assess the cost effectiveness of the two case-studies in the Western Cape. The model is an excel-based financial model which undertakes a cost benefit analysis (CBA) from the perspectives of the state, developer and resident households. PDG has been commissioned to apply the LRA model in two Gauteng case studies, namely Cosmo City and Pennyville in order to a) increase the case study application to generate a database of model inputs and outputs, b) to test the model, and c) to compare the Gauteng experience with that of the Western Cape.

This report provides a comparison between the findings of the two Western Cape case studies of Morgan's Village Phase 3 and Blue Berry Hill, and the two Gauteng case studies of Cosmo City and Pennyville. Separate reports cover the application of the model to the Cosmo City and Pennyville case studies, and an assessment of the LRA/CBA model itself.

2 High-level comparison

2.1 Overview of project characteristics

Table 1 provides an overview of the scale and the content of each of the four case studies.

Table 1: Overview of project characteristics

	Western Cape		***Gauteng***	
	Morgan's Village Ph3	**Blue Berry Hill**	**Cosmo City**	**Pennyville**
No. of housing opportunities	682	3406	11785	2751
Total area (ha)	14	75	1105	100
Project period (years)	3	N/A	11	4.5
Housing products				
Subsidy units	341	352	4992	1552
FLISP units		703	669	
Gap units	341	796	2483	
Bonded units		1555	3360	
Social rental units				395
Market rental units			281	804

The first obvious difference between the case studies is the scale of the projects. Cosmo City is vast project, which took place over 11 years, while Morgan's Village is a relative small development of only 682 units constructed over 3 years. Blue Berry Hill and Pennyville are of the same scale, but with the important distinction that Blue Berry

Hill is a proposed future project, which differentiates it from the other three. This makes the results for Blue Berry Hill more speculative.

All four projects include a significant portion of fully-subsidised units, but the housing mix is varied across the case studies. Morgan's Village is the simplest model, with only two distinct housing types, while Cosmo City provides housing opportunities across the whole range of housing typologies[1].

2.2 Land transfer arrangement

The land arrangements for the four case studies are summarised below:

Morgan's Village: The land was purchased from City by the developer. The land for the subsidy units was sold at a discounted rate, while the remainder was sold at market value.

Blue Berry Hill: The Land Availability Agreement between the Province and the developer released the land for development by the developer, with payment of an assessed market value on transfer.

Cosmo City: The Land Availability between the City and the developer released the land for development by the developer, with payment of an agreed fixed value per erf on transfer of subsidised units, and a fixed value plus 50% of profits on bonded and commercial sites.

Pennyville: A Land Exchange Agreement between the City and the developer meant that the land originally owned by the developer was transferred to the city, but with the developer having rights to develop and transfer the property to subsidy beneficiaries. The market rental units were sold to the developer at an assessed market vale.

2.3 Developer

The most distinct difference between the Western Cape and Gauteng case studies concerns the definition and concept of the 'developer'. For Morgan's Village the Cape Town Housing Company (CTHC) was the developer, and was responsible for negotiating the land transfer and managed the project construction (through contracts with contractors). The CTHC remained the owner of the properties during the period of instalment sale for the subsidy units. This simple arrangement meant that modelling was fairly straight forward. For Blue Berry Hill the developer is the ABSA/Standard Bank consortium, which has appointed BKS as project managers. As no development has taken place, it is assumed that the consortium will retain ownership and develop the land as a single entity. Again, this is a very simple situation to model.

For the Gauteng case studies, the 'developer' had to incorporate a number of entities because of sub-division and on-selling of land. At Cosmo City, CODEVCO was the main developer, but sold serviced and un-serviced sites to other developers (who in turn sold serviced sites to 'top structure' developers. For the rental stock at Cosmo City, the site was sold to the Johannesburg Housing Company, who built and now manage the property, and therefore they have to be included in the analysis under the banner of 'developer' in order to capture these costs and benefits. At Pennyville, the situation was simpler, with only three entities grouped together as the 'developer', but this was complicated by the fact that one of these was a State-owned company, the

[1] It is not clear whether the rental units in Cosmo City are classified as Social Rental Housing, but for the purposes of the model they have been classified as market rental units.

Johannesburg Social Housing Company (JOSHCO). The inclusion of JOSHCO as a developer was necessary because they manage the rental stock. However, they did not take transfer of the land because they are owned by the City, and also receive generalised subsidies through their business model, which are not captured in the LRA model.

The difference therefore, between the Western Cape and Gauteng case studies, is that in the Western Cape, the conclusions regarding the costs and benefits to the 'developer' relate to a single entity and can thus be more easily verified and evaluated. In the Gauteng Case studies, the necessary amalgamation of many entities makes the model inputs more difficult to quantify and the results more difficult to assess.

3 Discussion around model inputs

In both sets of case studies, the analysis was undertaken over 20 years, and all units were assumed to be sold after 20 years. The table below provides a comparison of some of the primary financial inputs to the models.

Table 2: Primary financial inputs

	Morgan's Village Ph3	***Blue Berry Hill***	***Cosmo City***	***Pennyville***
State's cost of capital	REPO	REPO	REPO	REPO
Developer's cost of capital	PRIME -3	PRIME	PRIME	PRIME
Household cost of capital	PRIME +1	PRIME +1	PRIME +1	PRIME +1
Property value escalation	10%	10%	10%	10%
Long term CPI	4.5%	4.5%	4.5%	4.5%
Long term electricity inflation	4.5%	4.5%	4.5%	4.5%
Long term prime rate	12%	12%	12%	12%
Long term Repo rate	9%	8%	8%	8%
Collection assumptions	80%-95%[2]	80%-95%	80%[3]	65%-95%[4]
Imputed rent %	7%	7%	6.5%-7.2%	7%-8.7%

The developer's cost of capital was assumed to be Prime in all cases except for Morgan's Village where a rate of Prime -3 was used to match the rate of interest on the project finance provided by the NHFC. Property value escalation was assumed to be 10% per annum in all case studies. The reason for the long term Repo rate being 9% for Morgan's Village, while 8% was used for Blue Berry Hill, is not known. Collection rates vary between 80% and 95%, but in Pennyville the reported collection rate for the social rental housing is much lower. Imputed rent was kept constant in all cases, except for the rental units in Cosmo City and Pennyville where it was specifically calculated for the rental units.

[2] 80% on subsidy housing and 95% on gap housing

[3] Estimate - no data available

[4] 65% reported for JOSHCO units, 95% reported for market rental

Table 3: State operating and capital costs

	Western Cape	*Gauteng*
Operating Cost of Service Provision		
Water Infrastructure Maintenance (R/unit, per month)	-	38.00
Water bulk supply (c/kl)	832.00	354.00
Sanitation Infrastructure Maintenance (R/unit, per month)	-	45.00
Sanitation: Water treatment plant costs (c/kl)	587.00	17.50
Electricity Infrastructure Maintenance (R/unit, per month)	89.00	191.00
Electricity Bulk Supply (c/kWh)	32.40	41.00
Solid waste kerbside collection (per housing unit, per month)	41.00	26.00
Waste Removal: Landfill (R/ton)	69.40	90.00
Waste Removal: Transfer station (R/ton, per day)	27.30	
Waste Removal: Recycling Facility (R/ton, per day)	50.00	
Capital Expenditure		
Waste Removal: Landfill (per housing unit)	100	65
Waste Removal: Transfer station (per housing unit)	1,000	
Waste Removal: Recycling Facility (per housing unit)	2,500	

The State operating costs very considerably between the Western Cape and Gauteng Case studies. They are presented in the table as single costs in the Western Cape and Gauteng respectively, which would be the case if the case study projects were implemented in the same year. The operating costs for the two Western Cape studies should have taken the difference in project start date into account. For the Gauteng case studies, the costs in the table, which are based on actual 2010 costs, were deflated back to nominal costs in the year the project started using the historical CPI values , i.e. 2000 for Cosmo City and 2006 for Pennyville. The Western Cape costs are not referenced, but the water and sanitation costs are definitely too high[5]. The Gauteng costs have been derived from a calibrated Municipal Services Financial Model (MSFM) that was run for the City of Joburg. Transfer stations and recycling facilities were not included in the Gauteng case studies, as it was indicated that all waste from these sites goes directly to landfill.

[5] For example, in an interview with the Senior Manager for water resource at the City of Cape Town in 2010, a cost for bulk water treatment of 278 c/kl was given, and wastewater treatment has been calculated by PDG as approximately 7.06c/kl.

The assumed household unit consumptions for subsidy units are shown in Table 4[6].The Gauteng water consumption and refuse generation rate is slightly lower than those used in the Western Cape in order to correlate with the MSFM figure. The wastewater return flow rate is slightly higher, based on low-income urban residential norms.

Table 4: Household consumption

	Western Cape	*Gauteng*
Electricity (kWh per unit, per month)	250	250
Water (kl per unit, per month)	20	12
Refuse removal and cleansing services (kg per unit, per month)	20	9
Sewage return flow percentage of water used	70%	80%

The relevant rates and tariffs used in the case studies are presented in Table 5. While the tariffs for the two Western Cape studies were entered into the model as the same value, these should have been de-escalated for Morgan's Village to reflect the earlier project start date. The rates are fairly similar and reflect the different pricing strategies of Cape Town and Johannesburg. One important difference, however, is the residential property rates exclusion threshold, which is higher in Cape Town, which means that these households will pay less property rates, and therefore the city will accrue less income.

Table 5: Rates and tariffs

	Western Cape	*Gauteng*
Electricity Rates		
0-50kWh	0	0
50-150kWh	58.11	53.07
150-450kWh	70.47	53.07
450-1500kWh	93.31	83.06
>1500kWh	79.97	86.83
Waste removal		
R0 - R100 000	0	0
R100 001 - R150 000	18.86	60.42
R150 001 - R350 000	37.72	71.55
R350 001 - R400 000	56.58	76.32
>R400 000	75.44	159.00
Residential property rates		
Residential rate	0.00531	0.004928
Residential exemption	200,000	150,000
Water usage (Cumulative)		
0kl - 6kl	0	0
6kl - 10.5kl	3.99	3.62
10.5kl - 20kl	8.51	5.82

[6] Consumption in higher income units was assumed to be higher, but is omitted here for clarity

20kl - 35kl	12.61	10.29
35kl - 50kl	15.58	12.93
Over 50kl	20.55	12.93
Sewage (Cumulative)		
0kl - 4.2kl	-	-
4.2kl - 7.35kl	4.67	2.01
7.35kl - 14kl	9.94	2.39
14kl - 24.5kl	10.87	4.12
24.5kl - 35kl	11.41	5.87
Over 35kl	-	9.70

Table 6 shows the relative expenditure on bulk infrastructure (escalated to 2010 Rands for the Gauteng projects). It is notable that very little bulk infrastructure was assumed necessary for Blue Berry Hill. While both Gauteng case studies required only upgrades of infrastructure, this amount per unit is significantly more than for the Western Cape case studies. Bulk infrastructure is likely to be highly variable between case studies, and the costs are project specific. As a comparison, the default costs and consumptions in the MSFM result in estimates for the marginal cost for bulk infrastructure in South African cities of approximately R32,000 per low-income unit. One may therefore conclude that Cape Town is under-recovering on bulk infrastructure through development charges, as has been suggested in the Western Cape case study report.

Table 6: Bulk infrastructure cost (per subsidy unit)

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Bulk Services upgrade	11,360	2,445	47,236	27,296
Bulk Services in Full	22,720	4,889	-	-

A comparison of the sales prices, subsidy values and rental income (from the developer's perspective) is provided in Table 7. It is encouraging to note that the sales prices are relatively similar across the case studies. The subsidy value paid to the developer is somewhat lower in the Pennyville case study than the others. It is lower than Cosmo City because of the smaller amount of MIG allocated per unit, and it is lower than the Western Cape Case Studies because of a higher top-structure subsidy amount (as a result of escalation of the subsidy over time), and the other subsidies (SCCA, City subvention grant) that were granted in the Western Cape. Although the housing subsidy was also lower in the Cosmo City case study, the MIG subsidy allocation for bulk infrastructure compensates for this and results in a total subsidy equivalent to the Western Cape case studies.

Table 7: Sales prices, Subsidy values and rental received by the developer (per unit)

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Sales price				
FLISP		176,721	185,000	
Gap	368,421	331,450	238,000	
Bonded		452,552	400,000	
Subsidy value				
Subsidy	108,109	101,106	101,232	77,813
FLISP				77,813
Gap				58,455
Bonded				26,476
Rental				
Social Rental (3-bed)				1,500
Market Rental (3-bed)			3,300	2,100

Table 8 provides the unit capital costs for each housing typology. It is important to note that the costs are nominal in the year of construction, and are therefore difficult to compare.

Table 8: Unit capital cost (R/m²)

	Morgan's Village Ph3 (2008)	*Blue Berry Hill (2010)*	*Cosmo City (2005-11)*	*Pennyville (2006-10)*
Subsidy	3,673	3,149	1,927	1,863
FLISP		4,190	2,733	
GAP	5,173	4,497	4,606	
Bonded		5,327	3,243	
Social rental				4,884
Market rental			6,174	4,302

4 Comparison of findings: State perspective

The overall results from the State's perspective for the four case studies are shown in Table 9, below. Both Western Cape case studies show a positive Return on Investment (ROI), with the 68% for Blue Berry Hill being particularly optimistic. The Gauteng case studies show significant losses to the state, with -32% and -75% ROIs respectively. This would be expected in projects that have large up-front capital subsidy outlays, with little or no return from large portions of those projects that are subsidised units (who have subsidised services and rebated property rates). A further cause for the large difference between the Western Cape and Gauteng case studies is the difference in operating costs and tariffs (see Table 3 and Table 5). The net results of the operating cost, tariff and consumption assumptions is that the Western Cape case

studies show municipal cost recovery on services, where the Gauteng case studies show the opposite.

Table 9: State performance

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Total NPV	7,038,344	477,045,588	-784,238,814	-424,187,830
ROI	6%	68%	-32%	-75%

The ROI figures in Table 10 show where the State makes the most loss or profit. The Western Cape case studies show profit on all non-subsidy units, while the Gauteng case studies show losses on all units except for a small positive return on the bonded housing. It is interesting to note that the biggest losses are shown to be made on the social rental housing at Pennyville because of the assumptions made that the City does not fully recover costs through rental or through tariffs. This assumption needs to be tested in practice.

Table 10: Return on Investment from the State's perspective

ROI	*Morgan's Village Ph3*	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Subsidy	-60%	-59%	-88%	-100%
FLISP		7%	-19%	
Gap	108%	95%	2%	
Bonded		99%	26%	
Social rental				-141%
Market rental			-96%	8%

The total explicit and other subsidies provided for the fully subsidised units in each of the four case studies, are presented in Table 11. It is interesting to note that the total subsidy for Cosmo City is slightly higher than that for Pennyville because of the higher bulk infrastructure subsidy and top structure subsidy in Cosmo City out-weighing the higher land subsidy in Pennyville. Note that additional subsidies are present in the Western Cape that were not paid in Gauteng, but the land subsidies and bulk infrastructure subsidies were significantly higher in Gauteng.

Table 11: Total State subsidies for fully-subsidised units (R per unit – 2010 Rands)

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Explicit subsidies				
Institutional subsidy	53,227	55,706	63,258	46,039
Internal services	25,492	25,000	28,285	21,553
City subvention grant	8,600	-		
NHBRC enrolment	1,637	1,298		
SCCCA	10,803	10,602		
Geo-tech variance	8,350	8,500	13,336	8,396
Total explicit subsidies	108,109	101,106	104,879	75,988
Other subsidies				-
Land Subsidy	3,740	-	14,610	20,216
Bulk infrastructure	22,720	3,600	59,639	32,679
Land holding costs		2,815		
Total other subsidies	26,460	6,415	74,249	52,895
Total subsidies	134,569	107,521	179,128	128,883

5 Comparison of findings: Developer perspective

The developer performance, as calculated by the model, is markedly different in the Western Cape and Gauteng case studies, as shown in Table 12. In Morgan's Village and Blue Berry Hill the ROI is 14% and 8% respectively. In the two Gauteng case studies, the ROIs are 13% and 29% respectively. The variation is largely a function of the agglomeration of entities under the banner of 'developer', which means that profits get captured all along the value chain. It is also a function of a lack of information around actual project cost, and where to draw the line on cost (see LRA Tool Assessment Report). It is unlikely that Pennyville will produce such a high return on investment, and the result could be refined with better information.

Table 12: Developer performance

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Total NPV	20,416,921	74,623,042	152,691,007	150,943,303
ROI	14%	8%	13%	29%

Table 13 provides a breakdown of where the greatest returns and losses occur. It is interesting to note that in all case studies apart from Morgan's Village, the negative ROI values reflect losses on the subsidised units, and thus internal cross-subsidisation within the projects. The FLISP units in Blue Berry Hill show a loss, while in Cosmo City they show a small profit. The gap units in the Western Cape show a profit in the Western Cape, but a small loss in Cosmo City. The point to be made here is that in these two sectors, the results are marginal – reflective of the risk that this market represents to the developer. There is also inconsistency around what is termed 'gap' housing. The -5% ROI on the Pennyville social rental units is a result of the JOSHCO

rental subsidy. The profit on the Cosmo City and Pennyville market rental units includes the assumed sale of the units after 20 years.

Table 13: Return on Investment from the developer perspective

ROI	*Morgan's Village Ph3*	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Subsidy	4%	-18%	-11%	-8%
FLISP		-17%	3%	
Gap	19%	15%	-2%	
Bonded		14%	27%	
Social rental				-5%
Market rental			31%	62%

6 Comparison of findings: Household perspective

Households would be expected to derive a positive net benefit of home ownership over the 20 year assessment period, and this is indeed the case in all case studies (Table 14). The negative benefit seen for the market rental units in the Gauteng case studies reflects the fact that imputed rent equals actual rent and thus the on-going service costs result in a negative cash flow.

Table 14: Household NPV

	Morgan's Village Ph3	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Subsidy	166,222	106,330	147,162	200,431
FLISP		72,623	144,938	
Gap	81,131	66,487	187,800	
Bonded		23,606	322,422	
Social rental				61,879
Market rental			-50,502	-101,188

Table 15 presents the total ROI for each unit type. It is clear that the recipients of the subsidy units benefit the most in all cases. The relative difference between subsidy ROIs for the Western Cape and Gauteng case studies relate to the higher consumptions and service costs assumed for the Western Cape case studies. It is suspected that these may be too high in the Western Cape case studies and too low in the Gauteng case studies. Morgan's Village also included instalment sale costs and insurance costs (required as part of the instalment sale), which were not present in the other case studies.

Table 15: Household Return on Investment

ROI	*Morgan's Village Ph3*	*Blue Berry Hill*	*Cosmo City*	*Pennyville*
Subsidy	116%	141%	301%	313%
FLISP		22%	39%	
Gap	13%	11%	52%	
Bonded		3%	46%	
Social rental				39%
Market rental			-6%	-16%

The Gauteng case studies reflect the same general trend of decreasing benefit with increase in property value, which is due to a combination of the initial capital subsidies, and the subsidised services charges and property rates. Social rental produces some net positive benefit to households because of the rental subsidy (imputed rent is greater than actual rent), while market rental produces a net cost in both cases[7].

7 Conclusion

Conclusions relating to the costs and benefits of the three financial actors in the case studies have been drawn in the previous sections of the report. This section deals with more general conclusions that can be drawn through the comparison.

7.1 Longer term financial viability for the State

The overall levels of subsidy in both sets of case studies is roughly equivalent (after correcting for differences in project start date), although in the Gauteng case studies the levels of implicit subsidy through land and bulk infrastructure subsidies was higher. In light of this equivalent level of subsidy, it is interesting to note that model calculates that the Western Cape projects result in a net benefit to the State over 20 years, while the Gauteng cases represent a significant net cost. This would indicate that the State continues to make losses over time in Gauteng, through non-recovery of on-going costs, while in the Western Cape the situation is reversed. It is very important for the City of Johannesburg to look at the on-going costs of low-income housing developments, as these are overlooked due to the political imperative for housing delivery. However, in the Gauteng case studies, the model calculates that this may become a serious issue for the City of Johannesburg in future, with increasing losses being made in these areas. The first issue is the generation of a surplus on services, particularly water and electricity. Electricity recovery is aided through pre-payment meters, but water recovery is an area of concern. The second issue is the recovery of property rates once the property value crosses the exclusion threshold of R150 000. The model shows that for Pennyville, the subsidy units are likely to break this threshold in 2012/13. It is not clear whether the City intends to collect rates from these properties, as it was speculated by a developer that area exclusions are applied to subsidised units. If the subsidy values are used to assess eligibility for property rates, instead of actual market values, then the City will be forgoing a significant amount of revenue – and resulting in a further implicit subsidy to these households.

[7] It is not the intention of this study to argue the merits of ownership of ownership vs. rental. There are many qualitative benefits to rental that are not captured in this analysis.

Unfortunately, the moratorium on subsidised housing sales prevents accurate valuations, but there are other independent means of assessing property value.

7.2 Land subsidies

The Gauteng projects were more heavily subsidised implicitly through land and bulk infrastructure that the Western Cape case studies. The reason for this seems to be the strong impetus from the City of Johannesburg to make a success of the projects. The City does not have control over the value of the housing subsidy, but can make investments in bulk infrastructure and land.

The Gauteng case study findings agree with the findings of the Western Cape case studies found that the land cost is a small percentage of the overall project cost. From the perspective of the developer, the land cost was only 3% and 2% of the total project cost in Cosmo City and Pennyville respectively. The land was heavily subsidised in both cases – more so than the Western Cape case studies. The land availability/exchange agreements also meant that the developers avoided any holding costs on the land, although the previous study also found these cost to be fairly low. The Western Cape case studies showed the land subsidy to be regressive because it favours bigger units over smaller unit. This was also found to be the case in Cosmo City, but not in Pennyville, where no land subsidy was given on the market rental units. However, the subsidy was greater for the free-standing subsidy units than for the walk-up units.

7.3 Bulk infrastructure subsidies

Bulk infrastructure can form a large part of a total project cost. In the case of Cosmo City, bulk infrastructure made up 20% of the total cost, and in Pennyville, 15% of the total cost. The developers were not required to pay these costs, which were funded through MIG grants and other City funding. On the contrary, the developers, who were contracted to construct the bulk infrastructure in both cases, presumably made profits out of these services. The developers noted, however, that these were exceptional circumstances, as current policy is to charge developers development charges (although usually only for the higher income units). They noted that development charges have the potential to "make or break" developments, and are thus crucial to the viability from the developers perspective. The subsidisation of bulk infrastructure may be an important form of subsidy that the State can provide, but is not often reported explicitly as a subsidy. A further problem is that the subsidy is not targeted directly at the poor, as the infrastructure benefits all residents. In fact, it is a regressive subsidy, as high income users place a higher demand on the bulk infrastructure. The Western Cape case study report concluded that access to MIG funding for bulk infrastructure was problematic because of the bureaucratic processes and costs involved in the developer managing the application. In the Gauteng cases the MIG funding was handled by the city and administered as separate contracts to the housing process. It therefore provided no burden to the developer – as has been mentioned previously, the developer benefited through being was contracted to provide these services as well.

7.4 Development finance

The subsidised interest rates on the development finance provided in the Morgan's Village case study were found to increase the viability of the development. Too little information was available in the Gauteng case studies to gauge the cost of capital to

the developer, but the conclusions in this case would be the same: that access to favourable interest rates, particularly on large-scale projects over long time periods, will increase the viability for developers and increase private sector interest in the low-income housing market.

7.5 Timing of funding

The availability of funding from annual housing budgets was noted as a constraint to both Gauteng case studies, but the scale of the project in Cosmo City and the various sources of funding in Pennyville, meant that the developers did not experience cash flow problems and were not delayed by these constraints. A strong message arising out of both case studies was the need for political champions to drive the projects, which was the case in both Gauteng projects.

7.6 Getting the housing mix right

The Western Cape case study report concluded that it may be preferable to stipulate housing product mixes based on price, rather than income level, as this eliminates the risks to the developer in requiring household to access end-user finance at the lower end of the borrowing market. This seems to be the de facto case in Cosmo City where the housing product price of the second phase of 'credit-linked' units was determined based on viability rather than City stipulations. The danger of this is that these units are available to any purchaser, but are still heavily subsidised through implicit subsidies. The latent demand for housing will mean that downward raiding is very likely to occur, forcing the intended beneficiaries of a particular house price bracket out of the development. The conclusion from the Western Cape case study that the lack of information kept by the State puts it in a weak position when negotiating housing product mixes with developers certainly holds true for Gauteng as well. The stipulation of product price, rather than beneficiary income, however, will not help the State solve the issue of the huge housing demand from the gap market, as they have no means of affording even the minimum housing product that is equal to or better than a subsidised unit[8]. This then raises the possibility of focussing on the role of social rental housing to satisfy this market. The experience of Pennyville seems to indicate that social rental housing may be a viable option, as it enables other forms of subsidies (Social Housing Capital Grant, rental subsidies) to benefit these households. The Pennyville model shows that the per unit costs to the State are less for social rental units than for the fully-subsidised BNG units, although the overall return on investment is approximately equal for the social rental family units and the BNG units and far worse for the social rental rooms. It is therefore important that a full assessment of the sustainability of this housing typology is undertaken before it is adopted at scale.

The conclusion from the Gauteng case studies regarding the attractiveness of the gap market for developers is the same as for the Western Cape. The evidence from actual project experience points to the fact that the FLISP subsidy does not work in its current form. Only half of the beneficiaries of the first phase of 'credit-linked' units in Cosmo City accessed the FLISP subsidy. The lack of end-user finance in this market forced the developers to change the housing product to appeal to higher income residents in the R15 000+ income range, who were actually able to access a bond. It is clear that banks are unwilling to lend in the 'FLISP' market, and indications are that the lower threshold for banks' lending appetites is constantly climbing.

[8] The debate around the need to differentiate gap housing from subsidized housing, or the possible need to lower the specifications of subsidy units is discussed in the Western Cape case study report and is not repeated here.

7.7 Internal cross-subsidisation

A strong theme arising out of the Western Cape case studies is the need for cross-subsidisation from the gap and affordable housing to the subsidy units to make the scheme viable for the developer. The report notes that these cross subsidies are problematic for a number of reasons. Internal cross subsidies were apparently required in both Cosmo City and Pennyville from the market-driven and market rental units to the subsidy and credit-driven units. The economy of scale possible in Cosmo City helped, as well as the ability to on-sell the subsidy units to developers who were willing to take smaller margins. A level of cross-subsidy was also present from the commercial and industrial sites, which made the development more viable for CODEVCO, but, as noted in the Western Cape report, these types of cross-subsidy are only possible in the largest integrated developments.

7.8 General comments

The high demand for housing in Cosmo City and for rental units in Pennyville is reflective of a chronic shortage of well-located affordable housing in Johannesburg, and in South African cities more generally. The developers therefore seem to have struck the right balance between providing a cheap enough product to capture the demand in this market, and still achieve sufficient margins – aided greatly by significant State subsidy in these projects. What is important for the State to assess is whether the total amount of subsidy is justifiable for the amount of benefit to the actual target households. Through this model of integrated housing development, the State aims to invest the minimum required to provide the most low-income housing opportunities through private sector turnkey projects. This balance is difficult to achieve without discouraging the private sector. One developer did concur with the finding of the Western Cape case studies, that the ratios need to change to make these developments more attractive to the private sector. He believed that the ratios of subsidised housing to bonded housing should be 40:60.

The application of the LRA model to the Gauteng case studies has been instructive in both the similarities and differences that have emerged in relation to the Western Cape case studies. The Gauteng case studies are more complex projects at a larger scale and have introduced the dynamics of incorporating rental stock into integrated developments. The Gauteng projects were both strongly backed both politically and financially by the City, which has ensured their success. The bureaucratic difficulties that were described in Cape Town did not seem to be a major issue. However, similarities have emerged relating the challenge of incorporating gap and affordable housing into integrated developments, while still providing an incentive for private sector participation. In both sets of case studies it is very informative to explicitly show the costs and benefits of the particular projects to all the parties involved. This allows for an informed analysis of the impact of these projects and the planning of future land release projects.

Comments and Recommendations on the Urban LandMark Land Release Assessment Tool

Final

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pdg Committed to Development

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Contents

1 Introduction

In co-operation with the Western Cape Department of Human Settlements and the City of Cape Town, Urban LandMark commissioned 80/20 and PDG to develop an approach to evaluate the cost effectiveness of public land release. A Land release Assessment (LRA) model was developed and used to assess the cost effectiveness of the case-studies in the Western Cape. The model is an excel-based financial model which undertakes a cost benefit analysis (CBA) from the perspectives of the state, developer and resident households. PDG has been commissioned to apply the LRA model in two Gauteng case studies, namely Cosmo City and Pennyville in order to a) increase the case study application to generate a database of model inputs and outputs, b) to test the model, and c) to compare the Gauteng experience with that of the Western Cape.

This report provides an assessment of the LRA/CBA model itself and provides comments on the user interface and the workings of the model, as well as recommendations for model improvements and future application. Separate reports cover the application of the model to the Cosmo City and Pennyville case studies, and a comparison between the Western Cape and Gauteng case studies.

These model comments are based on the application of the LRA model in the two Gauteng case studies over a period of 3 months. Both case studies tested the model to its extremes – Cosmo City in terms of using all the available typologies and having a project extend over a significant time period, and Pennyville because of the need to review the un-tested rental calculations. As these case studies were fairly complex, the project has necessitated investigations into the model formulae and assumptions. The author is therefore familiar with most, but not all of the model sheets and calculations. It is appreciated that the model has been developed by highly skilled developers with greater Microsoft Excel skills and a better appreciation of and of housing finance than the author. Therefore the critique provided here is aimed at pointing out apparent errors and problems with the model, and improving the model for future use and application by others who should not need to modify the model in any way, and should be able to use the model 'as is'. It is also acknowledged that model was taken to a point and designed to suit the purpose of the initial project application. Some of the situations encountered in the Gauteng case studies were not envisaged in the original model development.

2 User interface and input fields

2.1 General comments

The model has a very good user interface via a simple and clear control panel, which has hyperlinks to all the relevant pages in the model[1]. All pages in the model have links back to the control panel[2], which makes navigation straightforward.

The colour coding of tabs according to financial actor is helpful and makes navigation easy, even if the hyperlinks are not used. The naming convention on the tabs is consistent and easy to understand and sheets not required by the user are hidden.

[1] One error was picked up here, where the "Inputs-Dev Op Costs" hyperlink on the Control Panel goes to the wrong location

[2] The exception is the *Inputs-FLISP* sheet where the hyperlink is missing.

One minor change that can be made is to shift the *Inputs-Dev Capital* sheet to the left so that the sheets are in the same order as presented on Control Panel. Some of the Output sheets are also not in the correct order.

User inputs are colour coded in blue text, and cells that are not to be modified are locked, which guides the user as to where inputs are required and allowed. However, the blue colour only appears once text has been entered, and thus some inputs may be missed. It may be helpful to shade the cells where inputs are required to further guide the user to these inputs.

The model requires a large number of inputs and it is almost certain that the user will not have all the data required. In this case, the model should contain default values which can be used in the absence of data (e.g. State cost of capital or household cost of capital, property value escalation). The source of these default values should be noted in a cell comment in order to inform users of their reliability and validity in their application, and to avoid their indiscriminate use. It is also helpful to shade cells with default values a different colour to normal cell inputs. Default values should always be able to be over-written if better values are available. In this case, the text colour can be changed to illustrate that a default has been overwritten (this is done through conditional formatting in reference to a saved copy of the default values, which are kept on a hidden sheet).

The model sheets that are available to the user are neat and well presented. However, it is good practice to fit the model inputs into a single visible area (i.e. not have to scroll down or across to view input cells). This eliminates the possibility of input cells not being seen. Many of the model sheets do fit into a single visible area, and some may be easily modified to fit into a single screen. It may, however, be necessary to split the *Inputs-Project* sheet into two sheets if this requirement is believed to be important. The hidden sheets could be tidied up somewhat and there are a number of redundant cells and unnecessary calculations that should be deleted.

Worksheet protection has been placed on all cells that do not require user inputs. This is good practice where users may delete or modify formulas unintentionally. However, it also hides cell formulas, which users may want to view in order to understand the format of the input or how it affects the model calculations. There is thus a trade off between maintaining model integrity and transparency of the calculation. The option of distributing the password always exists for users who wish to interrogate the formulas (at their own risk!). However, for developers, it is necessary to get the 'UnlockAll' macro working to avoid having to unlock sheets individually every time the model is opened.

2.2 Specific comments

The following comments refer to specific sheets or cells where clarity is required, or where problems were encountered with inputting data:

Sheet	***Cells***	***Issue***	***Proposed solution***
Inputs-Project	H45:H55	Options in drop down restricted to "walk-up" or "non walk-up". This seems to exclude multi-storey flats.	Change "Non walk-up" to "multi-storey" and adjust dependent cell references
Inputs-State Costs	B22:B23	The word "Drainage" on should, more correctly, be called "Sanitation" or "Sewerage" so as not to confuse it with stormwater drainage.	Change wording

Inputs-Dev Capital	B39	Does 'Landscaping' refer to bulk earthworks? Or is this gardening?	Change wording
Inputs -Project	C29	Only options are upgrade or full bulks required. It may be possible that no bulks are required, so this should be an option.	Include option for no bulk services and amend dependent cell formulae
Inputs -Project	J45:J55	It is not clear that these cells refer to the market value of a completed subsidised unit	Change wording of heading
Inputs-Rates	Column B	The bands for property value, and consumption levels obviously refer to the bands in Cape Town, but these are not consistent across municipalities, so have to be estimated. Perhaps they should be more generic, or better, should be variable as a user input.	Make bands variable default values
Inputs-Rates	Columns D and E	The year of the input is different for different services. For water you have to input the tariff at the year of first occupation, but for electricity it is the tariff at the project start date. For solid waste it is at project start date.	Make inputs consistent – either at occupation, or preferably, at the current date. This would require the current date to be noted on the Inputs-Project sheet and the tariff escalations to be done correctly on the *Inputs-Global Indices* sheet.
Inputs -Project	C5	It is not clear that the 'project period' refers to the total period over which you want to evaluate the project – i.e was set at 20 years for the case studies. If this is incorrect, it creates errors in the model results.	Add clarifying note as cell comment or adjacent to cell

3 Model outputs

Model outputs are well presented in the form of waterfall charts and tables. One possible improvement would be to present the data that informs the waterfall charts (either from the Hide-Waterfall Data sheet or from the tables hidden behind the waterfall charts) into another visible output sheet. A minor comment is that the blank model does not have enough waterfall charts to display the results for more than four units types. These were added for the Gauteng case studies, but have been modified, based on the discussion in Section 5, below.

All Present Values are calculated to the project start date. This is useful for current projects, but for projects started some time ago (such as Cosmo City), evaluation of these costs is difficult. A further complication is that while the State and Developer values are calculated to the project start date, the household benefits are discounted to the first date of occupation. Household benefits are also calculated to the project start date, but these are not the results shown on the *HH-Performance* table and the waterfall charts. If housing types were occupied at different dates, this makes it impossible to compare with each other, or with the State and Developer. It is therefore

suggested that the user be able to enter a common date for comparison (possibly the current date), which the model then uses to present all the data.

4 Model assumptions

This section discusses the apparent assumptions in the model that may need clarification to the user, or may require revision if they are not universally applicable.

4.1 Nominal versus real inputs

There is uncertainty regarding where the model works in nominal values and when it works in real values. My understanding is that all model financial inputs are applied in nominal values in the year in which they are incurred or accrued. The exception to this is the tariff inputs for services, which has been discussed in Section 2.2. The model then calculates future values in nominal terms. These future values are then discounted back to a (real) Net Present Value at the project start date (except for household costs, as discussed above). This approach is uniform and consistent, and is not problematic in itself, but may cause confusion when inputting data. For example, in Cosmo City, the bulk infrastructure was installed over a number of years, but the developers supplied a lump sum figure for the infrastructure costs. It is not clear whether this figure was the sum of all the nominal costs in the years in which they were incurred, or whether it inflated these figures to present day costs. This may not be a significant issue, but it needs to be made clear that all values are entered in nominal terms according to the year in which they are incurred or accrued.

4.2 Rental responsibility

The model assumes that any rental stock is built and managed by the 'Developer' who then receives rental income and/or instalment sale payments. If a state entity (Social Housing Institution, municipality, etc) is the landlord, then it is automatically assumed to be the Developer in the model. This is problematic, as was found in both Gauteng case studies, where state entities ran the rental stock, but private sector developers built and sold the ownership units. There was no option but to lump the state institution with the private developer under the banner of "developer". This simplification distorts the results because these entities have different costs of capital and different financial objectives. State institutions, like JOSHCO, may be subsidised by the City of Johannesburg in a way that affects the viability of the housing project, but is not captured in the model because it affects the institution as a whole. This is a complication that will persist if social rental housing is modelled using the LRA tool. There is also complexity involved in how services are paid for in these public sector rental units. For example, the service charges may be included in the rental fee, but it is not clear then whether the tenants are benefiting for free basic services, whether the housing institution is having to pay the city for these services, or whether the costs are just written off by the City as indigent support.

4.3 FLISP subsidies for gap housing

The model assumes that housing typologies are homogeneous in terms of residents and funding source. This is a necessary simplification, but leads to complications when FLISP subsidies are being used. The model assumes an average income profile in order to calculate the average value of the FLISP subsidies paid to beneficiaries. In practice, income levels and the related FLISP subsidies vary greatly amongst residents of an

area. In the case of Cosmo City, only 50% of the beneficiaries of the first phase of 'credit-linked' housing obtained the subsidy, and in the second phase no subsidies were accessed. This makes it very difficult to determine an 'average' FLISP subsidy. There may also be problems where FLISP subsidies are accessed over different years where the subsidy brackets have changed (although this is a minor complication).

4.4 Development charges

Development Charges / Developer Contributions / Bulk Infrastructure Contribution Levies (BICL) are different names for an amount paid by developers to cover the cost of the bulk infrastructure that is required to serve a development. These charges are applied differently by different municipalities. One method is for the municipalities to make developers to pay for infrastructure that is required specifically for that development (e.g. a bulk sewer, a reservoir, or a water treatment works). A second method is for municipalities to charge a 'marginal cost' based on a formula or on zoning changes. Both methods have been accommodated in the model, and this may lead to confusion by the user.

The first method is accommodated through cells C59:C69 on the *Inputs-Project* sheet, where a percentage is applied to the total bulk infrastructure cost entered in the *Inputs-Bulk Infrastructure* sheet.

The second method is accommodated through Row 52 on the *Inputs-Dev Capital* sheet, where the user can input a fee per unit.

It is correct to accommodate both methods, but some guidance should be given to the user on which method is being employed by the municipality. It is important to note that if the developer is constructing the bulk services, but being paid in full, then the value only gets entered in the *Inputs-Bulk Infrastructure* sheet. The implication of this is that the bulk infrastructure costs accrue to the State, but no profit is recorded for the developer. There should arguably be some profit margin included for the developer in this case. Note that the term 'BICL' is only used in Cape Town and should be changed on the *State-Revenue* sheet, cell B81, to the more universal "Development Charges".

4.5 Imputed rent

Imputed rent is the shelter value to a household of living in a unit, and is approximated by the equivalent market rental value for that property. The model assumes that only owner households realise the benefit of imputed rent, because tenant households pay for this benefit through actual rent. This is true, provided that the rental being charged is market related. If actual rent is below market rent, then the tenant household will accrue imputed rent equal to the difference between the market rental and the actual rental. This was the case with the subsidised social rental units in Pennyville. However, the LRA model has been set up to only consider imputed rent for sale units. The formulas in the *HH-Revenue* sheet, cells G20:AJ30 had to be changed for the Pennyville case study and the waterfall charts also amended to explicitly show the actual rent and imputed rent for all units.

The default value for imputed rent that has been assumed in all case studies is 7%, which is based on the StatsSA calculation of imputed rent in the CPI basket. This calculation changes over time and needs to be re-assessed as new CPI figures are published. However, for the Pennyville case studies, the annual market rentals for the units were calculated to be between 7,2% and 8.5% of property value, which validates the default value of 7%.

4.6 Developer costs of capital

It is not clear to the user that the developer's finance charges are accounted for in the discount rate used (in the *Inputs-Project* sheet cell C36) for discounting capital investment (whether a loan was taken or not, the investment represents an opportunity cost). Finance charges are therefore not reflected anywhere in the model as a cost to the developer. However, in the *Dev-Holding Costs* sheet, a figure can be entered for interest incurred on a loan *prior* to any capital investment in the project being made. More guidance should be provided in this regard.

4.7 Land cost

The model assumes that the land is owned by the State at the project start date. This land is either: donated wholesale by the State, sold at a reduced rate to the developer implying a land subsidy, or sold at market value to the developer. The model is currently not able to handle a situation where the land is not owned by the State, as may well be the case in future housing projects. The price paid for the land is not entered into the model, and therefore all land income is shown as a net benefit. The only costs occur where land has been sold below market value.

4.8 How much does the development "cost"?

From the perspective of the developer, the user enters the cost of construction, and the related revenue from rental, subsidies or sales. But determining the actual 'cost' is not a simple exercise, particularly when multiple developers are involved in the development. How far down the value chain one goes when considering the actual "cost" of building is debateable, because profits are taken the whole way. Is the 'cost' what the main developer pays to the sub-contractor, or top-structure developer?. Or is the 'cost' what all private sector parties involved in the project paid to external parties? Where does one account for the profit made by the primary developer on the sale of a serviced site to a top-structure developer? Different definitions have had to be taken in the two Gauteng case studies: in Pennyville 'cost' was considered to be the cost to main and secondary developers, while in Cosmo City , the costs of primary, secondary and tertiary developers was included. The model is clearly more suited to a project that involves a single developer, with defined costs and revenues.

4.9 Property rates calculation

The model calculates property rates revenue based on the nominal property value multiplied by an inputted c/R value. Allowance has also been made to increase the c/R value over time, with a default value of CPI being given for this escalation. While municipalities do increase the c/R value annually, this is only done because the valuation roll remains static. Once properties are re-valued, the c/R value is adjusted. However, in the model, properties are assumed to escalate in value according to an inputted percentage (10% nominal annual increase has been used in the case studies). It is therefore not necessary to vary the c/R value and the default escalation should be 0. Only if the municipality has an aggressive policy of property rate escalation, should this value be higher than 0.

4.10 Roads, stormwater and street lighting

The model contains line items in the *Inputs-State Costs* sheet for the operating costs of street lighting and municipal roads, but these inputs are not linked to any of the

model calculations, and therefore these costs are excluded from the results. The city will, realistically, incur costs for these two functions, as well as for municipal stormwater maintenance in the project area, and these costs should be accounted for. Estimates of these costs have been made in other financial models (such as the MSFM), and should be included.

5 Errors

5.1 Major functionality problems

In the course of the Gauteng case studies, only two apparent major functional problems were experienced in the model which could not be corrected without modification to the model formulae.

5.1.1 Residual asset value of rental stock

The model calculations from the developer's perspective did not account for the residual value of the housing asset remaining at the end of the model period. It is possible that the assumption was that the asset was written off over the analysis period, but this is unlikely to be the case, given the property value escalation and the relatively long useful lives of buildings. The sheet titled *Dev-Value* appears to have been set up to calculate this residual value, but contained invalid references and was not functioning. It was therefore necessary to add rows to the *Dev-Value* sheet to calculate the asset value over time, based on investment in the asset, and the assumed property value escalation. These calculations still require verification by the model developers.

The asset was then assumed to be sold 20 years after construction, and the value of the asset at the date of sale was then discounted back to the project start date to calculate the NPV of this benefit to the developer. This required modification to the formula on the *Hide-Capital Schedule* sheet, cells B39:B43. If units are rental units, then the new formula adds 20 years onto the period until sale. This ensures that sale revenue is discounted over 20 years. However, these cells also refer to the *Dev-Capex* sheet, which was manually de-linked from this cell to make the model work. This is therefore not fully corrected and will need to be addressed before making this model correction permanent.

This theoretical sale also resulted in a VAT outflow from the developer to the State, also discounted to the project start date. In order to account for the developer cost, sheets *Dev-Revenue* cells F125:AJ135 and *Dev-Capex* cells F83:AJ83 need to be corrected to eliminate the rental restriction. The model does not consider the benefit to the party who purchases the unit after 20 years, and this is probably an unnecessary complication.

The above does not relate to instalment sale arrangements, which were not tested in the Gauteng case studies and are assumed to function correctly.

5.1.2 Imputed rent

The second problem related to the fact that imputed rent could not apply to rental units where rent was subsidised (see Section 4.5, above). It was decided that imputed rent should be calculated for all unit types, and then offset against actual rental paid (which is zero in the case of owned units). The changes that were made to accommodate this revised approach were:

HH-Revenue sheet: The formulas in cells G20:AJ30 were changed to remove the exclusion for rental units.

Hide-Waterfall Data: Include line item for actual rental paid by households

HH-Waterfall sheet: The tables supporting the waterfall charts were amended to add a row for rental expenditure.

In addition, it was noted that rental revenue was included in developer revenue in the results tables, but not displayed on the *Developer-Waterfall* charts. A line item was added to this sheet and the charts modified to display the net benefit correctly.

5.2 Minor errors

The following minor errors were encountered in the model formula, and possible solutions are proposed. Where it is noted that these have been corrected, this refers to the Gauteng case study models and not the blank model version.

Sheet	***Cell***	***Error***	***Proposed solution***
Inputs-State Costs	C59:M59	FLISP calculation to convert income level to subsidy is incorrect – should return zero if value higher than 7000 is entered.	Add cells B40:D40 on *Inputs-FLISP Subsidy* sheet with values 7001,"",0 – corrected
Inputs-Dev Revenue	C11:F16	Formula not copied down for all housing types	Copy formula down – corrected
Inputs-Dev Revenue	C33,49,65	Sum formula not applied to all housing types	Apply sum formula to all housing types – corrected
Inputs-Dev Capital		Model shows #DIV/0! error if any of the capital cost input blocks is left blank	Either provide guidance to warn users that at least one line item in each block must have a cost, or modify dependent formulae to avoid dividing by 0 – not corrected
Inputs-Dev Capital	C14:F16	Cell formulae not copied down from cells above	Copy formulae down - corrected
HH-Costs	G120:AJ129	Incorrect formulas due to relative instead of absolute cell reference	Cell G119 IF(ISNUMBER.. function should refer to 'Inputs-Rates'!E21, not E21, and then copy down and across – corrected
HH-Revenue	G6:AJ16	Incorrect formulae in rows 6 to 16 mean that if sales take place over multiple years, then the formula only returns the units sold in the first year and ignores the other sales. This results in the State, developer and Household revenue being incorrect.	Correct formula to return correct percentages in later years – not corrected
HH-Performance	B19	Should read "Household's nominal rate of return", not "State's nominal rate of return"	Change wording - not corrected
Dev-Op Costs	F33:F104	Formulae reference row 6, when they should reference Rows 7 to 16. This affects how operating costs are transferred to summary.	Change formulae to reference correct row – only partially corrected

6 Recommendations

A number of recommendations have been given in the preceding sections. These recommendations are not repeated here. Instead, this section looks at other

recommendations looking at possible model improvements not covered elsewhere, changes to the model scope, and options for future model application.

6.1 Model improvements

- Possibly add some contact details for the model sponsors/developers if the model is going to be used by others, as well as a disclaimer.
- It would be beneficial to add hyperlinks to the company websites from the logos on control panel
- It would be informative to have a Gantt chart that is generated from the project timetable entered in the *Inputs-Project* sheet. This would enable the user to get a better sense of what happened when, and to check if the dates have been inputted correctly. This would help particularly in larger, more complex projects over long timeframes, such as the case of Cosmo City.
- Guidance notes would assist users in entering the inputs and interpreting the outputs correctly. These could be in the form of cell comments or text boxes alongside the input cells. Lengthy user manuals should be avoided.
- A number of useful summary tables were presented for the Western Cape Case studies that are not part of the blank model. These summary tables, as well as other useful output tables were re-created for the Gauteng case studies. These should be standardised as an additional output sheet in the model.

6.2 Model scope

At present the model covers housing projects that can include up to 11 different housing typologies. The model does not include:

- Benefits to residents, (and potentially the State) of location – specifically reductions in transport costs
- Other benefits to residents such as location in relation to external social facilities like healthcare and education
- Commercial and industrial components of integrated developments
- Internal social and recreational facilities provided as part of the development, either by the State or the developer.
- Differentiation within the grouping of "developer" if more than one developer is involved

Location benefits relate primarily to households, and how much savings can be made on transport costs through living in a particular development. However, a saving is only realised if one relates the transport costs from an area with that of the residents' previous locations, or alternative locations. This may be a valid question when trying to assess the overall benefit of one housing project in relation to another. It is too much detail to assess all travel modes and destinations from the project area, and thus an estimate of the average transport costs from an area is one possible means of including this 'location benefit' aspect. This average transport cost would then appear as an ongoing cost on the *Inputs-Households* sheet. It would thus not represent a benefit, but rather a cost than can be factored into the overall 'bundle' of costs experienced by that household and compared against other locations. There are obvious limitations to this approach, such as the variability of transport mode options and destinations over time, and the difficulty in establishing an 'average' transport cost for an area.

Access to social facilities is a more difficult measure to include in the financial model, and is probably better suited to a qualitative approach, as proposed in the previous LRA project.

The issue of commercial and industrial components of integrated developments arose in the case of Cosmo City, which included a large number of commercial and industrial sites. These sites were an important source of profit which offset the losses made by the City, and increased the viability of the development for the developer. These sites also improve the built environment through access to services and employment. They are thus an important element in the cost or benefit of a particular land use. However, one needs to re-assess the purpose of the model in order to decide whether land uses other than residential should be included. Does the model assess the viability of a certain mix of *housing* products in a given development? Or does it assess the costs and benefits of the chosen *land use* for a given piece of state-owned land? Another issue is that mixed land use will not occur in all cases (as with the Western Cape case studies), which will make comparisons between different case studies difficult.

The inclusion of institutional and recreational facilities within a housing development increases the quality of the living environment and these facilities were present in both Gauteng case studies. While the costs are easily quantifiable, the benefits to the residents are less easy to quantify. However, the developers in one case study noted that there was a very strong correlation between property value and proximity to parks and schools. There is thus an argument for including this expenditure (either on the part of the State or the developer) and measuring the benefit to households and the developer through differential market prices for properties located close to these facilities, or a higher property value escalation figure for all units, if all are equally well located. If this approach is taken, the operating costs of these facilities need to be accounted for. There is some element of qualitative benefit to households that will be missed through this financial approach, but this could also possibly be included in the set of qualitative measures.

Probably the most limiting aspect of the model is the simplistic conception of the 'developer'. It is likely to be more the exception, rather than the norm, that a single developer is involved in future integrated housing developments. For smaller developments this may be the case, but where social rental housing is becoming more popular, there are likely to be both public and private institutions in the developer 'space'. The model can continue to be used for the simple 'single developer' case studies, or for larger projects where multiple developers are grouped together (as in the Gauteng case studies), but thought should be given to making the model more flexible to deal with both public and private sector developers. This would be the first step to differentiating the 'developer'. It may be possible to differentiate further to allow multiple private sector developers, but this may not be necessary given the purpose of the model and the additional complexity required.

It may also be worth differentiating the State – at least into two categories: City and State. The reason for this is that the City is the entity that incurs and accrues on-going costs and benefits of development, and is most impacted by investments with negative returns on investment. It is also useful for National and Provincial government to be able to see what their total cost is in relation to what the City is investing.

6.3 Model application

Financial modellers are continually faced with the dilemma of user-friendliness versus complexity. Does one create a model that is simple to operate and understand by multiple users, or does one add complexity to make the model more accurate and

flexible, but then limit its application by only a few specialists? This is the dilemma faced with the LRA at present. The LRA tool is a highly complex model, but with a relatively user-friendly interface, which means that it has struck a good balance between user-friendliness and complexity. There is room for the model to go both ways, depending on what the intention of the model is, and who is likely to use it.

If the model is intended to be made publicly available for assessment by government officials, housing practitioners and developers, then it is recommended that more guidance be given to users, and that the model be simplified in the number of inputs required. It is also recommended that errors be corrected and some of the assumptions behind the model made clearer. A service provider would be necessary to provide on-going support for user queries, either via an online forum, by email, or over the telephone.

If the model is intended to be a 'cutting-edge' analysis tool for the assessment of any number of varied mixed-use developments, then further development will be required to enable the flexibility that these types of developments require. However, this will mean that the use of the model will be restricted to a few individuals (currently 4), who are familiar with the model formulae.

As the model stands, it would be possible to train more users who would be able to use the model correctly and to interpret the results intelligently, but this would require more guidance to be provided in the model, as well as a hands-on training session (probably 2 days) for all new users.

There is certainly benefit in increasing the number of case studies modelled using the LRA tool in its current form in order to increase build a database of default values and to test the model further, but there are more fundamental decisions that have to be made regarding the intention and future development of the model.

7 Conclusion

The Urban LandMark LRA model is a very useful model for projecting the potential costs and benefits of future projects, based on estimated costs and general development principles. The methodology is sound and the outputs of Net Present Value for each financial actor are easy to understand and the waterfall diagrams are a powerful means of illustrating the hidden and on-going costs that are often ignored in evaluations of housing projects. However, the model is difficult to populate for a real project, due to the complexity of institutional arrangements and funding streams, getting exponentially more difficult as the scale of the project increases. Yet, it is necessary to apply the model to existing housing projects in order to test the model and accumulate a database of default values. Various recommendations have been provided in this report for model improvements, and options have been discussed for future model development and application. In its current form, it is suggested that the model be tested on small housing projects with single developers and then used to project forward with these values.

Urban LandMark Land Release Assessment Tool: Pennyville Case Study Report

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List of abbreviations

al+hdc	Affordable Land and Housing Data Centre
BNG	Breaking New Ground
CBA	Cost Benefit Analysis.
FLISP	Finance-linked Institutional Subsidy Programme
INEP	Integrated National Electrification Programme
IRR	Internal Rate of Return
JOSHCO	Johannesburg Social Housing Company
LRA	Land Release Assessment
MIG	Municipal Infrastructure Grant
NPV	Net Present Value
PPP	Public-Private Partnership
PZR	Pennyville Zamimpilo Relocation (Company)

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1 Introduction

In co-operation with the Western Cape Department of Human Settlements and the City of Cape Town, Urban LandMark commissioned 80/20 and PDG to develop an approach to evaluate the cost effectiveness of public land release. A Land release Assessment (LRA) model was developed and used to assess the cost effectiveness of the case-studies in the Western Cape. The model is an excel-based financial model which undertakes a cost benefit analysis (CBA) from the perspectives of the state, developer and resident households. PDG has been commissioned to apply the LRA model in two Gauteng case studies, namely Cosmo City and Pennyville in order to a) increase the case study application to generate a database of model inputs and outputs, b) to test the model, and c) to compare the Gauteng experience with that of the Western Cape.

This report covers the Pennyville case study and provides background information to the project, as well as the results of the LRA model and an analysis of the results. Separate reports cover the Cosmo City case study, a comparison between the Western Cape and Gauteng case studies and an assessment of the model itself.

2 Project background

The Pennyville housing project arouse out of the need to relocate 1600 families from the Zamimpilo informal settlement in Johannesburg. It was initially intended to be a conventional BNG-type development of 1 800 units. However, the project transformed into an integrated housing development through a joint initiative between the City of Johannesburg's Department of Housing and a private company called the Pennyville Zamimpilo Relocation Pty Ltd (PZR)[1]. The site was developed over 6 years in 4 phases. This project was ground-breaking in many respects, and was the case of the city developing walk-up subsidised units.

In total, 2 751 single-storey, double-storey walk-ups and triple-storey walk-up units were provided, catering for different markets: 1 552 fully-subsidised RDP houses, 207 JOSHCO affordable- rental units, 188 JOSHCO 3-roomed communal units (564 rooms) and 804 middle- and high-income rental units owned by ABSA Commercial Property Finance's property development division, Diluculo Properties.

In addition, the developer donated a crèche, built at a cost of R3,9-million, to the City's Social Services Department. A site has been designated for a school, but has not been developed, and one commercial site was designated for a petrol station, but is unlikely to be developed and may be re-zoned for more residential units. There is also speculation that further phases will be added to Pennyville on adjacent land. Negotiations are underway with Intersite for the land on the other side of New Canada Road for purchase and construction of social amenities.

[1] PZR is now 100% owned by Calgro M3 Holdings

Figure 1: Market rental units at Pennyville, with single-storey and walk-up subsidised units in the background (Source: Calgro M3)

3 Location

The 100 ha Pennyville site is 7km south west of the Johannesburg CBD, on the main BRT route to Soweto. It is also adjacent to the New Canada train station, which makes it a highly accessible location.

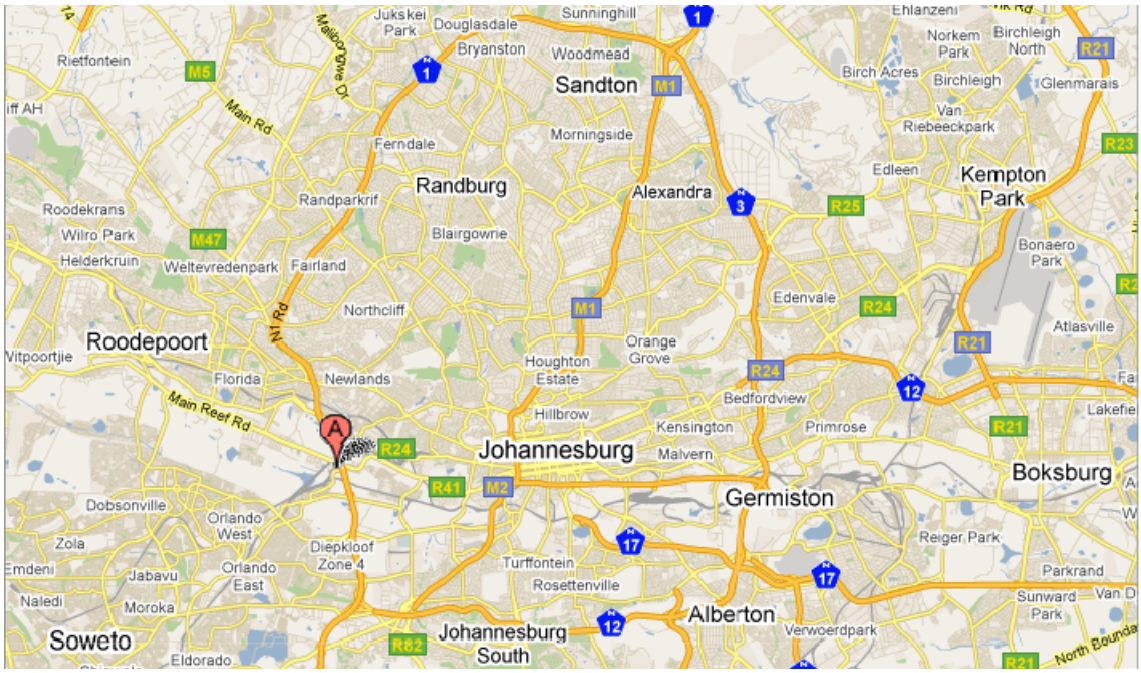


Figure 2: Location of Pennyville in relation to the Johannesburg CBD (Source: Google Maps)

Figure 3: Site plan of Pennyville (Source: Google Maps)

4 Land and services

The site was purchased by the developer in 2006, but could not be used for subsidised housing because the subsidy rules prohibited the use of subsidies on privately-owned land. However, the developer and City signed a land exchange agreement, whereby the Pennyville site was exchanged for a nearby site called Riverlea, which was owned by the City. The Riverlea site was of similar value and more suited to the development of bonded residential units, so was favoured for a private commercial development. Under the land exchange agreement, the City paid the developer the difference in the value of the sites, while the developer paid the City in transfer fees on the bonded housing units developed on the Riverlea sites[2]. However, in the case of the subsidy units the city never took transfer of the land, but transfer happened directly from the developer to the beneficiaries. For the JOSCHO units, as JOSHCO is 100% owed by the City, transfer never took place between the City and JOSHCO. This arrangement short-circuited various administrative issues, and also resulted in zero land holding costs on the part of the developer. The developer therefore did not pay the city for the land, except for the rental units sold to Diluculo, for which the developer paid R9 000 per unit to the City – a total payment of R7.236 million.

Some bulk infrastructure was required to service the site, including a bulk water connection, an outfall sewer, the main bus route through Pennyville, a pedestrian bridge and some preliminary earthworks. These were budgeted for and paid for by the City through their MIG budget. The various separate MIG applications for this work totalled R60 million. The developer was not required to pay any bulk contributions on the project.

[2] As the Riverlea development is not within the scope of this project, we will consider the land to have been donated to the project by the City of Johannesburg, and ignore the details of the land exchange agreement.

Ground was broken on the site in September 2006, with bulk and internal services being constructed concurrently. Top structure construction started in January 2007 and the first units were completed by October of the same year. The first houses were transferred in December 2007, with the final houses of the last phase being handed over in May 2011. The developer sub-contracted the construction of the top structures, but in some cases had to complete the work themselves.

5 Housing mix and target market

The housing mix in Pennyville that was determined by the City of Johannesburg was:

- 1090 fully-subsided free-standing and semi-detached units
- 462 fully-subsidised 2-storey walk-up units
- 207 JOSCHO social rental family units
- 188 JOSHCO 3-room rental units (564 rooms)

In addition, 804 market rental units were constructed on land sold to Diluculo. In total, 3 127 housing opportunities have been provided in Pennyville.

The project was initially conceived to be only free standing, fully subsidised units, but changed to an integrated development firstly because of changes in housing policy and discourse, and a shift towards social rental housing, and secondly to make the project as a whole more viable for the developer. The infrastructure was constructed for the planned 2 800 subsidy units prior to the changes in the development model. It was then agreed that 800 units could be sold to a private company for rental. Therefore, to recoup the 'subsidy' money[3], a portion of the sale price for the rental units went to the City for land and infrastructure. The developer had proposed the units be sold to a partner financial institution, but the City ruled that the sale had to go through correct procurement procedures and the tender process took 10 months to complete. The land was sold to Diluculo for R185 000 (excluding VAT) per unit construction cost (paid to the developer) and R9 000 per unit for the land (paid to the City), with a condition that PZR build the units to pre-determined specifications. The 43m² two-bedroom rental units include kitchens and built-in cupboards. In addition, Diluculo spent approximately R6 000 per unit on landscaping and paving.

The fully-subsidised units have a fairly high specification including tiled rooves, which added approximately R5 000 per unit to the basic cost of the minimum BNG house. This decision was made to increase the attractiveness of the rental units. However, the units are the minimum required size for subsidy units (at the time of the project initiation) of 36m² on fairly small 80m² stands. The free-standing and semi-detached units cost the same amount to construct, but on smaller stands, and thus higher densities, were achievable on the semi-detached units. The eight-year moratorium on the sale of the fully-subsidised means that the actual property value escalation cannot be determined. However, a valuation undertaken by ABSA in 2009 estimated the market value of the units at R120 000. The developer now estimates these units to be worth approximately R200 000.

The walk-up units were more expensive to construct than the single-storey units, but savings were made on the infrastructure required per unit, resulting in a total package

[3] This was not strictly subsidy money yet because of the bridging finance being provided by the City

cost lower than the free-standing units. One complication with the walk-up units was that the Department of Energy did consider these units to qualify for the INEP grant of R3 490, which the City then had to pay.

The single rental rooms were essentially the same unit layout as the 36m² two-bedroom fully-subsidised walk-up units, but with the lounge area converted into a third rental room, with a shared kitchen and bathroom for the three rooms. The three-roomed units were sold to JOSHCO for R80 000 per unit. The single rooms were initially rented out for R250 per month, which included contributions for electricity and water. Over three years this rental has escalated to R284 per month. These units were specifically aimed at serving those renting in the Zamimpilo informal settlement, but who still fulfilled the JOSCHO social housing criteria[4]. A survey found that shacks in Zamimpilo were being rented for R400 per month, and thus the single rental rooms, with full services, offered a better, cheaper alternative.

The 43m² family rental units were built at a cost of R205 000, which included landscaping and security measures. These were initially rented out for R1 500 per month. The result was that they were of a higher specification, but R600 per month cheaper than the market rental units. However, the JOSHCO qualification requirements limited the target market. Even so, the demand for these units was extremely high, and the units were rented out immediately. The collection rate for the JOSHCO units has been reported to be around 65%, which contrasts with the market rental units (see below).

The demand for the 43m^2 market rental units was extremely high. When the first 76 units were advertised, over 500 qualifying applications were received. The qualifying criteria for the rental of R2 100 per month was a monthly income of approximately R8 000 per month. Applications were received from individuals and households earning up to R14 000 per month. The landlord, understandably, accepted the applications from the highest income earners, who represented a much more secure income stream. This resulted in initial collection rates of over 95%, but has led to a greater income disparity between the tenants of the market rental units and the subsidy beneficiaries. The rental of the units has escalated to R2 300 per month over 2 years. The sale agreement to Diluculo specified that 50% of the units could only be sold after 2 years, and the remaining 50% could only be sold after 5 years. The initial two year moratorium on sales is coming to an end, and the units are intended to be sold for R350 000, representing a 50 % increase in value in real terms.

Though the project was initially intended to eradicate the Zamimpilo informal settlement, this was not possible and the informal settlement still remains, although it is now substantially smaller. The first reason for this is the fact that many of the informal settlement residents did not qualify for the housing subsidy. The second reason is that there was significant political competition for the housing opportunities at Pennyville and the City had to make some compromises on the allocations and backyard dwellers from Orlando East, Riverlea and Westbury also had to be accommodated.

It is interesting to note that the project did not include any credit-linked (FLISP) subsidy units for the 'gap' market. The reason for this was a) that the project was initially conceived as a pure BNG fully-subsidised development and only included the social rental component and the market rental units to make the project more viable,

[4] These criteria include qualifying for a state housing subsidy and being first-time housing subsidy recipients.

and b) there was agreement that the banks were not lending to the FLISP target market and these units would be very difficult to sell. The developers argue that in order to create the right balance between rate-paying residents and recipients of free houses and services, integrated developments need to have 60% bonded units and 40% subsidised units. This is an argument that needs to be tested by the model.

However, from the perspectives of the City and the developer, the project ahs been a huge success and they feel that the co-developer model, and the mix of housing provided, has worked well.

6 Project funding

The project was funded primarily from the Provincial housing subsidies, but bridging finance was provided by the City of Joburg and subsidies were paid by the Province to the City on completion of project milestones. The subsidy value changed from R48 344 to R68 334 over the project period. For the purposes of the model, a weighted average subsidy value of R56 381 was used[5], based on the number of fully-subsidised units paid for at the each subsidy level.

In addition to R 60 million of MIG funding, the City provided an undisclosed top-up on the internal infrastructure, which has not been captured in the model. It is difficult to determine the exact investment made by the City because they have not yet fully recouped the subsidy money from the Provincial Department of Local Government and Housing. City Parks and some of the Municipal-Owned Entities (MOEs) provided contributions to the landscaping and public services, but this expenditure was not included in the analysis. The National Department of Energy funded the upgrading of an electrical substation, which was installed by City Power, which has also been excluded due to lack of data.

The National Social Housing Capital Grant was used to put R6 million towards the 400 JOSHCO units. The difference of the cost of the family units was paid for by JOSHCO, at a total cost of approximately R48 million, and the rental rooms were paid for by the City of Johannesburg at a cost of R80 000 per 3-roomed unit. JOSHCO was fully capitalised as a City-owned company by the City of Johannesburg, and obtained an additional loan from DBSA.

Some level of internal cross subsidy was also provided through the sale of the rental units to Diluculo to fund the additional cost of the subsidised top structures, beyond what was covered by the housing subsidy.

The multiple sources of funding (ABSA, MIG, City, JOSHCO) allowed the developer to continue with the development with no bridging finance. As has been mentioned, holding costs were minimised through the transfer of land ownership to the City.

[5] Note that this only refers to the housing subsidy. Other subsidies in the form of MIG and INEP were also applied to the subsidised units, as is discussed later.

7 Results of the financial model

As for the Western Cape case studies, the results of the financial model are discussed from the perspectives of the developer, the State and the beneficiary households. Commentary is also provided on the source and reliability of the model input data. PDG has attempted to use the Urban LandMark Land Release Assessment Tool 'as is', without modifications of the model formulas or questioning the assumptions that are implicit in the model calculations[6]. However, formulas changes have been unavoidable due to the model not treating rental stock adequately. Given that rental stock is a significant portion of the Pennyville project, it was deemed necessary to modify the model. Where the model has been altered, these changes are noted in the report.

Note that all NPV values are calculated in the model to the project start date (2006), but these have been re-escalated to 2011 Rands using standard CPI escalation for ease of analysis.

7.1 The Developer perspective

The Pennyville case study is considerably simpler than the Cosmo City case study in that fewer developers were involved. However, it was still necessary to group a number of entities under the banner of 'developer' for the sake of the model. The 'developer' therefore comprises the main developer, PZR (Calgro M3), their top-structure sub-contractors, Diluculo and JOSHCO. Although JOSCHO is a state-owned entity, it has had to be included here, as it is the entity that manages the social rental units and accrues revenue from these over time; there is no facility in the model to include JOSHCO as the 'State' in this scenario.

The data for the developer was sourced from Calgro M3 and from JOSHCO. All data for the Diluculo units was sourced via Calgro M3. The following points should be noted regarding the data inputs:

- The monthly operating costs for the JOSCHO units were not supplied. However, in their annual review of tariffs, JOSCHO note that the rental does not cover the operating costs and the operating costs have therefore been estimated as 10% higher than the rental (i.e. a 10% rental subsidy).
- The monthly operating costs for the market rental units were not supplied and have been estimated at 40% of rental revenue.
- The developer was assumed to have no holding costs because of the land exchange agreement.
- No construction cost information was supplied for the subsidised units and these have been estimated at R20 000 for internal services and R62 000 for the top structure. This cost of R82 000 per unit is assumed to be all-inclusive of construction overheads and was set in order to reflect a small loss on the subsidy units.
- The capital costs of the social rental and market rental units were set at the prices paid by JOSCHO and Diluculo respectively to Calgro M3. While this represents some degree of profit for the developer, because of the way the

[6] In some instances inputs have had to be modified to suit the context of the specific case study. These are discussed in a separate report dealing with the model itself.

entities have been lumped together in the model this 'internal' profit is not reflected in the model results.

- The model initially ignored the asset value of rental stock remaining at the end of the period of analysis. In order to accommodate this clear benefit to the developer, the model formulas were changed to assume all rental stock to be sold after 20 years. This theoretical sale was used as a proxy for the asset value retained by the developer, should the units still be owned by them. It is acknowledged that the Diluculo units are likely to be sold earlier, in which case less capital benefit is realised sooner, and the asset is transferred to the next owner, who may be a company or a household. However, as the model is not able to cater for this complexity, it is assumed that the units remain rental stock for 20 years.

In total, the Net Present Value (NPV) for the developer is calculated at R203 million (R2011 Rands), representing a 29% return on total costs and an Internal Rate of Return (IRR) of 18%. However, this includes the sale of the rental units after 20 years, with an assumed annual property escalation of 10%. The table below provides a breakdown of the present values by unit type, from the developer's perspective.

Table 1: Developer performance by housing type

NPV			
Mix Type	Per Unit	Total	ROI: PV of Return on Total Cost
Subsidy - single storey	-6,739	-7,345,262	-8.1%
Subsidy - walk-up	-6,739	-3,113,311	-8.1%
Social rental - family	-79,111	-16,376,045	-11.5%
Social rental - rooms	1,226	691,287	1.2%
Market rental	285,545	229,577,850	62.0%
Total NPV		**203,434,519**	**29.0%**

The capital cost of the subsidised units was set to reflect a small loss, given an understanding that there was some degree of cross-subsidisation in the project. Profit is shown for the social rental rooms and a significant profit margin for the market rental units. It is useful to analyse these net costs and benefits in more detail, as is provided in Table 2 (costs escalated to 2011).

Table 2: Inflows and outflows per unit from the developer's perspective

	Subsidy - single per unit	Subsidy - walk-up per unit	Social rental - family per unit	Social rental - rooms per unit	Market rental per unit
Inflows					
VAT inflow	R 2,580	R 2,580	R 6,641	R -	R 8,435
Sales revenue	R -	R -	R 162,491	R 20,634	R 157,289
Subsidy revenue	R 74,170	R 74,170	R 51,069	R 23,131	R 20,416
Rental revenue	R -	R -	R 390,751	R 65,125	R 559,709
Total inflows	R 76,750	R 76,750	R 610,953	R 108,890	R 745,850
Outflows	R -	R -	R -	R -	R -
Land & holding costs	R -0	R -0	R -0	R -0	R -11,404
EIA and rezoning	R -	R -	R -	R -	R -
Prof serv & project admin	R -0	R -0	R -0	R -0	R -0
Infra dev and dev charges	R -25,165	R -25,165	R -25,641	R -8,547	R -25,922
Top structure & NHBRC	R -58,324	R -58,324	R -229,086	R -24,114	R -198,125
Marketing & sales	R -	R -	R -	R -	R -
Operating costs	R -	R -	R -435,337	R -73,846	R -224,854
VAT outflow	R -	R -	R -	R -1,157	R -
Total outflows	R -83,489	R -83,489	R -690,064	R -107,664	R -460,305
Net Position	R -6,739	R -6,739	R -79,111	R 1,226	R 285,545

The subsidy units produce a VAT inflow because of the zero VAT rating on the subsidies paid to the developer. Surprisingly, the market rental units also show a VAT inflow. This is due to the VAT redeemable being calculated in the year of construction (2008), and the VAT payable in the year of sale (2028) – the discount rate therefore generates a net benefit. Subsidy revenue is reflected on all the units because of the infrastructure portion of the housing subsidy that was used for all units before the development model was changed. The land cost of R9 000 per market rental unit is discounted to an NPV of R8 461 in 2006 and then escalated to a cost of R11 404 in 2011. All other costs are reflected as infrastructure or top structure costs as no breakdown of these costs was provided.

Note that the JOSCHO rental subsidy is considered in the model as a subsidy from the developer to the household and not the State to the household.

The assumption regarding the monthly operating costs for the market rental units is a significant variable in the calculation of the rate of return on these units. A sensitivity analysis showed that if the operating costs are set at 60% of rental revenue, the rate of return drops to only 30% for the market rental units and 14% for the developer overall, and these returns drop further to 9% and 3% respectively with operating costs set at 80% of revenue (See Table 3).

Table 3: Sensitivity on market rental operating cost assumption

Assumed operating cost of market rental units as % of revenue	Rate of return on market rental	Overall developer rate of
40%	62%	29%
60%	30%	14%
80%	9%	3%

The interest rate on private sector project financing was assumed to equal the prime interest rate, as no data on borrowing was available. JOSHCO accessed a loan from the DBSA for the purchase of the family units, and the interest rate is likely to be better than this, but this amount only represents approximately 16% of the project cost. The sensitivity analysis given in Table 4 illustrates the impact on the overall return on investment from the developer's perspective if different interest rates are assumed.

Table 4: Sensitivity analysis on developers cost of capital

Assumed Developers nominal cost of capital	Overall developer
PRIME	29%
PRIME - 2	43%
PRIME +2	17%

7.2 The State perspective

The City's cost of administering the project was limited to the supervisory staff because of the turnkey nature of the project and almost all of the project management was undertaken by the developer. However, it is difficult to estimate these costs because of the part-time involvement in the project of individuals from different City departments. It has been assumed that 4 full-time equivalent staff were required to work on the project for the duration of the project, although this is a very rough estimate. The Province's administration costs are minimal as they have no designated staff to the project and the administration was limited to monitoring of subsidy applications and payments. These costs have therefore been ignored in the model.

Note that only Diluculo paid the City for the land. JOSHCO, as a city entity did not specifically pay for the land, and neither did the subsidy beneficiaries. Therefore the full value of the JOSHCO and subsidy unit sites represents a land subsidy from the City.

The NPV of the State's overall position[7] over a 20 year projection is –R424 million (2011 Rands), where total costs amounted to R549 million (2006 Rands - including a land subsidy of R128 million) and total benefits were R234 million. This results in a total return on cost of -75%, with all housing types, except the market rental units, showing a net loss for the State.

[7] Excluding JOSHCO, which is assumed to be a 'developer' for the purposes of the model

Table 5: State performance by housing type

NPV			
Mix Type	Per Unit	Total	ROI: PV of Return on Total Cost
Subsidy - single storey	-218,538	-238,206,322	-102.9%
Subsidy - walk-up	-202,205	-93,418,610	-96.1%
Social rental - family	-164,971	-34,149,079	-92.0%
Social rental - rooms	-125,549	-70,809,669	-189.4%
Market rental	15,418	12,395,849	7.6%
Total NPV		**-424,187,830**	**-74.9%**

State revenue includes a VAT benefit from the theoretical sale of the rental units after 20 years, as discussed previously. The cost and benefit components for each of the unit types are separated into up-front flows versus on-going costs and benefits in Table 6, below:

Table 6: Up-front and on-going costs from the State perspective

Mix Type	Up-front costs and benefits			On-going costs and benefits			Total
	Inflows	Outflows	Net up-front	Inflows	Outflows	Net on-going	
Subsidy - single storey	R 0	R -192,716	R -192,716	R 73,649	R -99,471	R -25,822	R -218,538
Subsidy - walk-up	R 0	R -176,382	R -176,382	R 73,649	R -99,471	R -25,822	R -202,205
Social rental - family	R 55,680	R -170,989	R -115,309	R 47,587	R -97,250	R -49,663	R -164,971
Social rental - rooms	R 7,070	R -104,329	R -97,258	R -	R -28,291	R -28,291	R -125,549
Market rental	R 65,600	R -44,358	R 21,242	R 153,164	R -158,988	R -5,824	R 15,418

The table above shows the significant up-front costs to the State, with smaller costs in the longer term. It is interesting to note that the model shows losses on service provision to all housing types. While this is expected for the subsidised units (receiving free basic water and electricity and rate rebates), it is not expected for the market rental units, where full cost recovery (and even a small profit) would be likely. This anomaly is most likely due to the default operating costs, tariffs and consumptions entered for these residents being incorrect, and adjustments to these figures may be possible to achieve a more realistic scenario. However, it is also possible that the City tariffs are not covering the full costs of service provision.

Table 7 provides an analysis of the explicit an implicit subsidies provided by the State. The internal services subsidy is shown as applying equally to all units because to service the entire site before the development model was changed. Similarly the bulk infrastructure subsidy applies to all units in the development. Land subsidies apply to all units except the market rental units, for which the land was purchased at what is understood to be a market price from the City. The net result is that the subsidy units obtain the highest subsidy (as would be expected), but the market rental units also benefit from State subsidies.

Table 7: State subsidy analysis

	Subsidy - single per unit	Subsidy - walk-up per unit	Social rental - family per unit	Social rental - per unit	Market rental per unit
Explicit subsidies					
Institutional subsidy	R 46,039	R 46,039	R -	R -	R -
Flisp	R -	R -	R -	R -	R -
Internal services	R 21,553	R 21,553	R 21,553	R 7,184	R 21,553
Geo-tech variance	R 8,396	R 8,396	R -	R -	R -
Total explicit subsidies	R 75,988	R 75,988	R 21,553	R 7,184	R 21,553
Other subsidies	R -	R -	R -	R -	R -
Land Subsidy	R 20,216	R 15,555	R 15,555	R 5,185	R -
Bulk infrastructure	R 32,679	R 30,636	R 23,022	R 10,278	R 23,122
Total other subsidies	R 52,895	R 46,191	R 38,577	R 15,463	R 23,122
Total subsidies	R 128,883	R 122,179	R 60,130	R 22,647	R 44,675

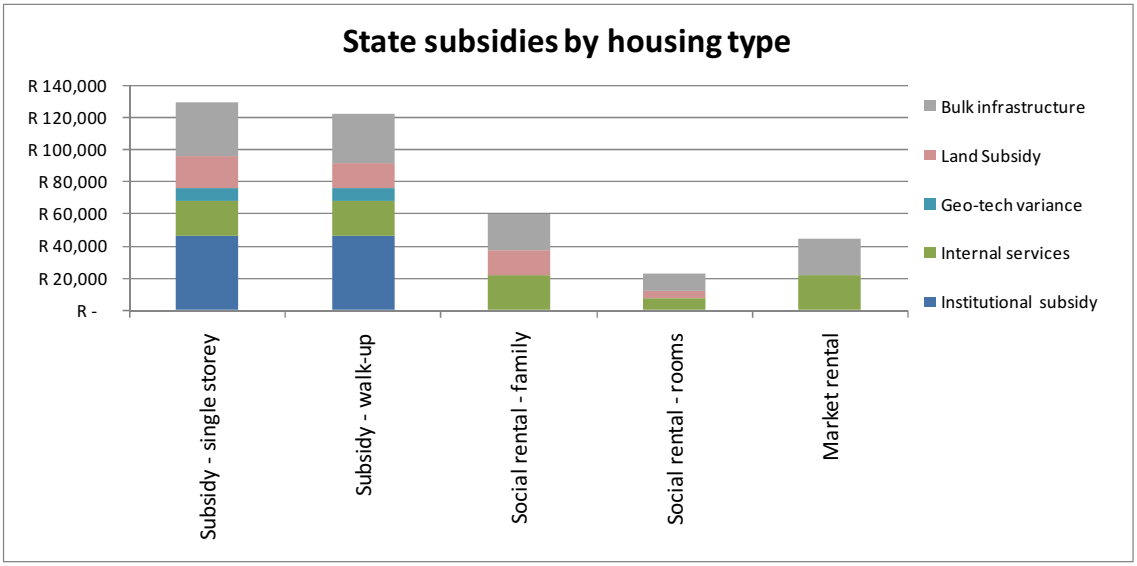


Figure 4: State subsidies by housing type

It is important to note that there are also implicit rental subsidies that apply to the JOSHCO units, as rental is below cost, and also below possible market rentals. This is reflected as a cost to the developer and not State subsidy because JOSCHO picks up this difference, but whether this subsidy is in turn claimed back from Provincial government is not known.

7.3 The Household perspective

Costs and benefits for households are discounted to the first date of occupation in the model. This is problematic when multiple housing types with multiple different dates of occupation. For this reason, the costs and benefits have been de-escalated to 2006 Rand values and then re-escalated to 2011 Rands to be consistent with the other NPVs for the developer and State.

As the project consists of only subsidised and rental units (i.e. no bonded or gap housing), none of households would incur finance charges. The subsidised units generate a positive net purchase of approximately R92 000 due to the assumed sale of the property after 20 years, with a 10% nominal annual property value escalation. The discount rate used for the household NPV calculation is prime+1, as was the case for the Cosmo City and Western Cape case studies. In Table 8, all households are shown to receive the benefit of imputed rent, as explained below.

Table 8: Inflows and outflows from the Households perspective

		Subsidy - single per unit	Subsidy - walk-up per unit	Social rental - per unit	Social rental - per unit	Market rental per unit
Inflows						
	Net Purchase	R 92,366	R 92,366	R -	R -	R -
	Imputed Rent*	R 172,151	R 172,151	R 504,090	R 96,017	R 525,233
	Subsidy	R -	R -	R -	R -	R -
Total inflows		R 264,517	R 264,517	R 504,090	R 96,017	R 525,233
Outflows		R -	R -	R -	R -	R -
	Electricity	R -42,769	R -42,769	R -40,776	R -	R -87,895
	Water	R -3,617	R -3,617	R -3,356	R -	R -9,784
	Property Tax	R -2,537	R -2,537	R -	R -	R -
	Sewage	R -1,426	R -1,426	R -1,323	R -	R -3,509
	Refuse Removal	R -8,195	R -8,195	R -	R -	R -
	Maintenance	R -5,541	R -5,541	R -	R -	R -
	Insurance	R -	R -	R -	R -	R -
	Rent	R -	R -	R -369,338	R -61,556	R -525,233
	Net Purchase	R -	R -	R -	R -	R -
Total outflows		R -64,086	R -64,086	R -414,794	R -61,556	R -626,421
Net Position		R 200,431	R 200,431	R 89,296	R 34,461	R -101,188

The relationship between actual rent and imputed rent was not made explicit in the previous case studies using the LRA tool. Therefore the outputs of the model have been adapted to illustrate this relationship more explicitly. Imputed rent is the benefit that households gain from living in owned accommodation, and is measured by the equivalent rent that would be paid if they were renting the property they lived in. This is estimated by Stats SA as 7% of property value – a figure that has been used in the Western Cape and Cosmo City case studies. However, for households that are renting, imputed rent is equal to the rental that is being paid (provided that it is market-related rental) and thus the net benefit is zero. This has been illustrated by reflecting both the rental and imputed rent for all households, including tenant households. The exception is for social rental, where rentals are below market rental. The net benefit for these households is the imputed rent at (market rental) less the actual rent (at a subsidised level). Fortunately, in the case of Pennyville, the social rental family units are equivalent to the Diluculo market rental units, and thus the actual market rental is known and this difference can be calculated. This calculation is shown in Table 9, and the resulting imputed rent is between 7.6% and 9.3% of property value, which is close to the StatsSA estimate of 7% used as a default value. For the rental rooms, the

equivalent rental in the Zamimpilo informal settlement of R400 was used, as this represents the competition for this rental market. It could be argued that the market rental for these rooms could be higher, but there is no direct comparison by which to establish this. The rental cost and imputed rent benefit can bee seen in the waterfall charts for households in Section 7.4.

Table 9: Calculation of imputed rent for rental units

	Social rental -	Social	Market
Initial property value	R 270,680	R 57,989	R 331,976
Actual rental (per month)	R 1,500	R 250	R 2,100
Market rental (per month)	R 2,100	R 400	R 2,100
Calculated imputed rent	9.3%	8.3%	7.6%

On the cost side, households in the subsidy units are assumed to pay for all services (above the Free Basic Services thresholds), but no insurance has been assumed. For the rental units, the on-going costs that are assumed to be included vary with the unit type. For the social rental rooms, water, electricity, sewage and solid waste are included in the rental, but for the family rooms and market rental units, water and sewage are billed separately and electricity is paid via prepayment meters.

Subsidy households are shown to receive the greatest net benefit (R200 000) over 20 years because of the high imputed rent and the net purchase value of the unit. The benefit for the households in the social rental family units is smaller, but still positive because of the benefit received through the subsidised rental. It is expected that the benefit of the social rental room would be smaller because of the lower value of a single room versus a full 3-bedroom unit. The market rental units show a net cost to the household of R101 000 because the imputed rent benefit and the rental cost net out and only on-going costs remain.

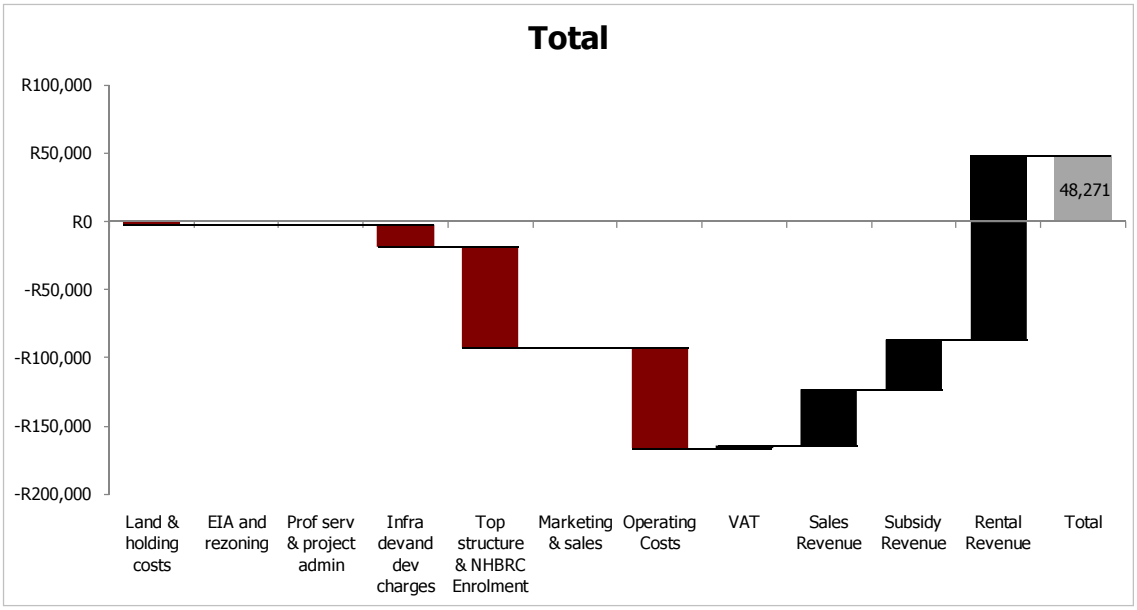
7.4 Summary

The NPV and return on investment for each of the key stakeholders is summarised in the table below:

Table 10: Summary of NPV and ROI for all actors and unit types

NPV and ROI		State	Developer	Household
Total NPV	Subsidy - single storey	R -238,206,322	R -7,345,262	
	Subsidy - walk-up	R -93,418,610	R -3,113,311	
	Social rental - family	R -34,149,079	R -16,376,045	
	Social rental - rooms	R -70,809,669	R 691,287	
	Market rental	R 12,395,849	R 229,577,850	
	Total	R -424,187,830	R 203,434,519	
NPV per Unit	Subsidy - single storey	R -218,538	R -6,739	R 200,431
	Subsidy - walk-up	R -202,205	R -6,739	R 200,431
	Social rental - family	R -164,971	R -79,111	R 89,296
	Social rental - rooms	R -125,549	R 1,226	R 34,461
	Market rental	R 15,418	R 285,545	R -101,188
ROI: PV of Return on Total Cost	Subsidy - single storey	-139%	-11%	422%
	Subsidy - walk-up	-130%	-11%	422%
	Social rental - family	-124%	-15%	29%
	Social rental - rooms	-255%	2%	75%
	Market rental	10%	84%	-22%
	Total	-101%	39%	0%

The total NPVs for the developer and the State are split up into inflows and outflows and displayed graphically in the following 'waterfall' charts. Note that all costs are average costs per unit in the development (3127 units in total) and are given to the project start date for the Developer and State and to the date of occupation for households[8].



[8] This is a limitation of the model and is the reason why the waterfall chart figures will differ from those presented in the tables above.

Figure 5: Developer's overall waterfall chart (per average unit)

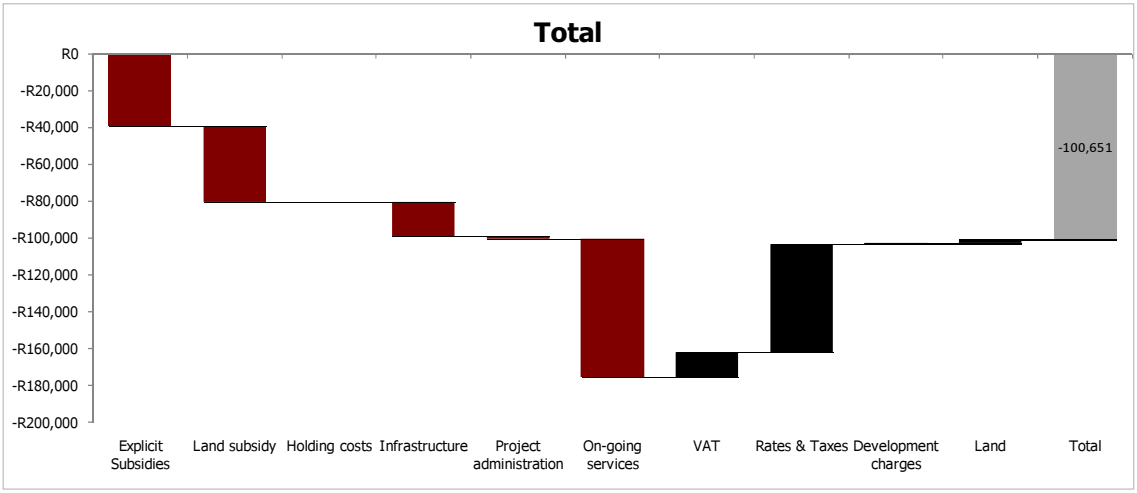


Figure 6: State's overall waterfall chart (per average unit)

The household waterfall charts are given below for each unit type:

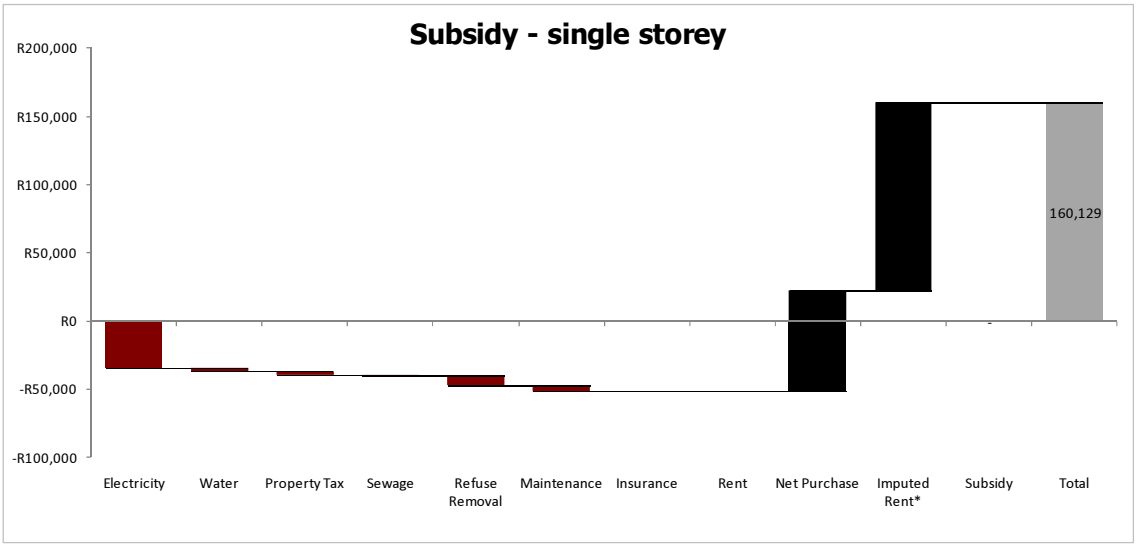


Figure 7: Household waterfall chart – subsidy single storey

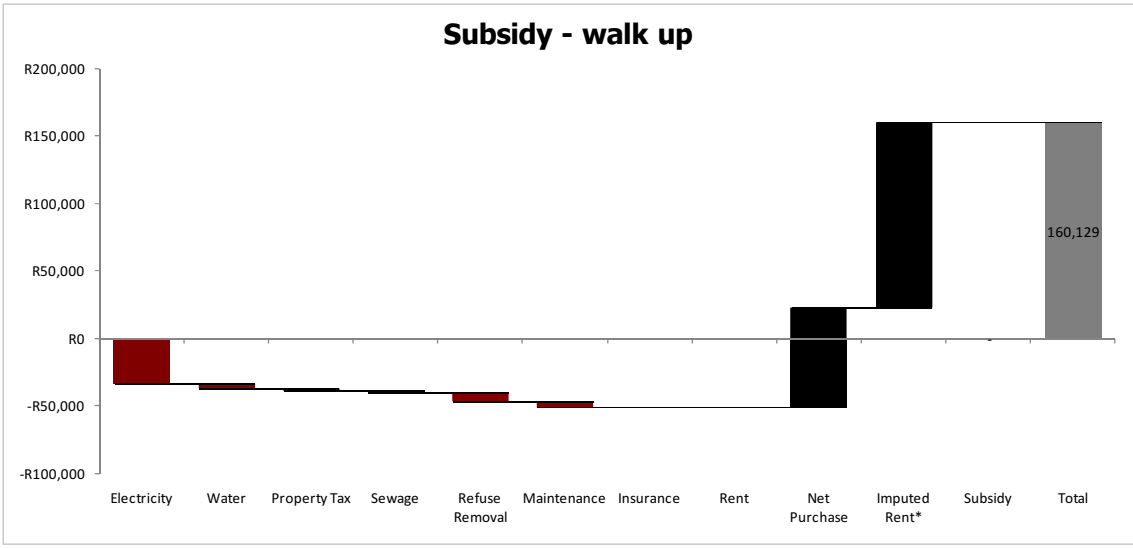


Figure 8: Household waterfall chart – subsidy walk up

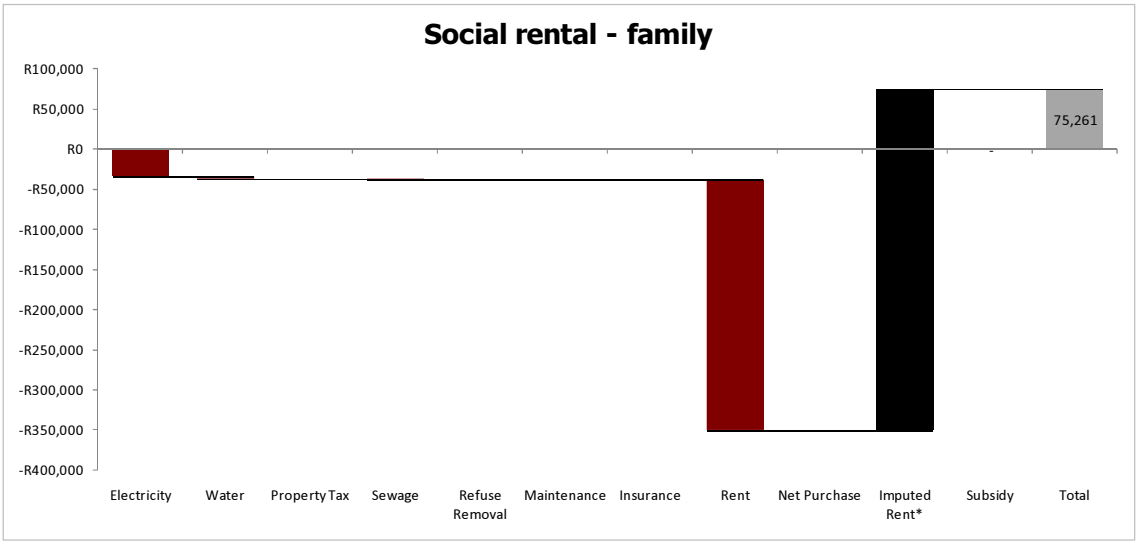


Figure 9: Household waterfall chart – social rental family

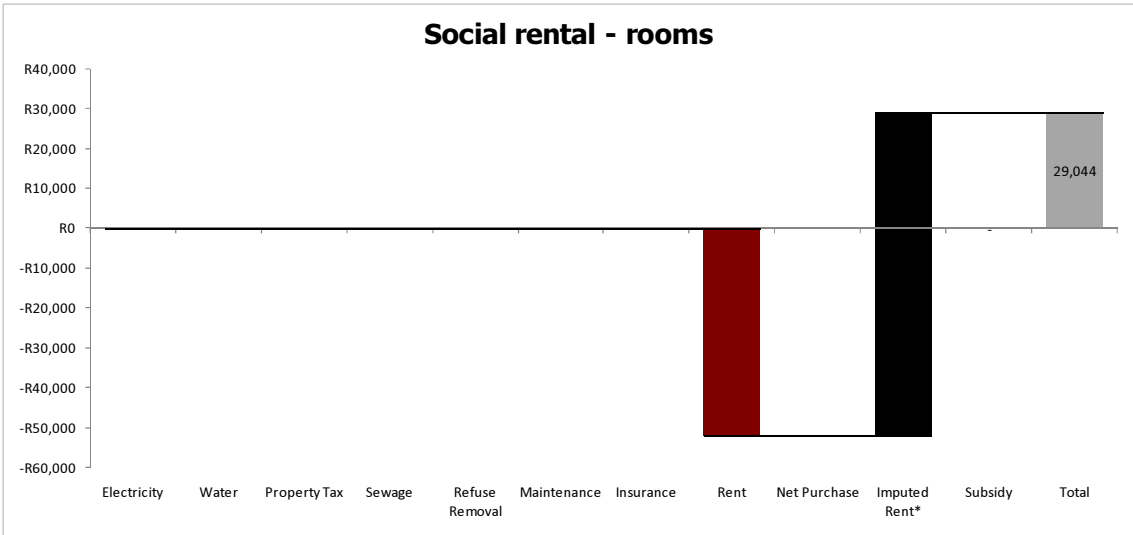


Figure 10: Household waterfall chart – social rental rooms

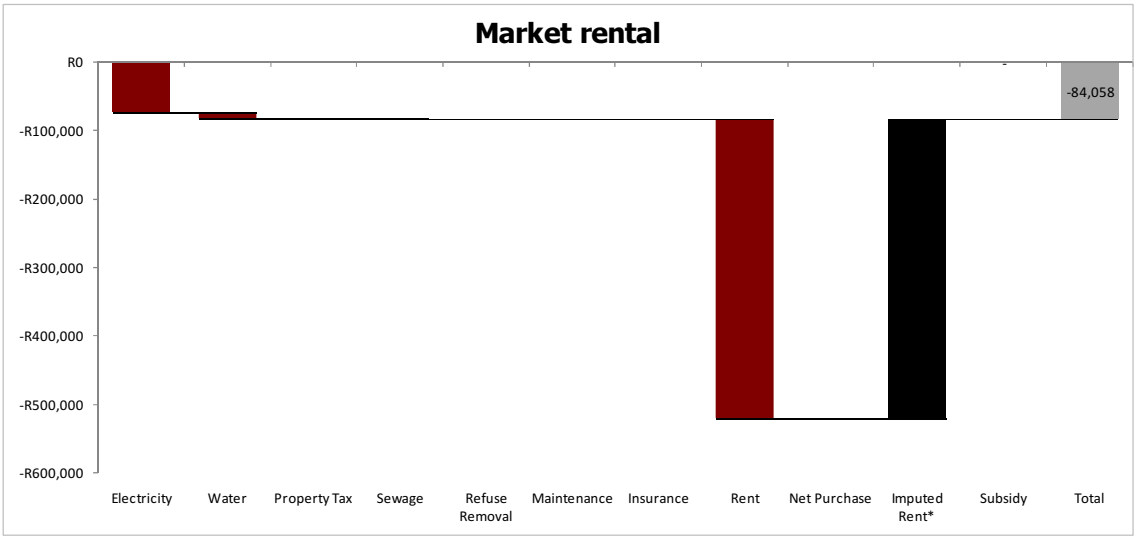


Figure 11: Household waterfall chart – market rental

8 Conclusion

Pennyville is a valuable case study because it represents an integrated housing project built on very well-located land, which managed to be both commercially viable to the developer and affordable to the state. In addition it managed to innovate in terms of the housing typologies produced within the limitations of the housing subsidy, and create a mixture of subsidised, social rental, and market rental units on the same site. It is notable, however, that gap housing was not included in the development due to the perceived difficulty in getting the funding mix right for this market, and the potentially negative effect this would have on the development.

The model results for Pennyville are somewhat theoretical because for the way the developer has had to be treated (combining PZR, JOSHCO and Diluculo) to conform to the model structure. However, some provisional conclusions can be drawn:

Pennyville was conceived as a purely 'BNG' subsidised housing development, but the development model was changed to include social rental and market rental units. As a result, both MIG and the infrastructure portion of the housing subsidy were used for all units. While the subsidisation of these other housing types is not the intention of these subsidies, it is clear that they made the overall development more viable and attractive for the developer.

In addition, the State provided a significant subsidy in making the land available through the land exchange agreement – a pragmatic step that enabled the development to take place.

The high demand for the rental units and the political competition for the subsidy units illustrate that the location and the housing product are highly desirable. The projected escalation of the market rental units is also a positive sign, which results in a significant return on investment for the developer. The subsidy beneficiaries also benefit significantly from the projected property value escalation, as reflected in the positive Net Purchase figures.

The high NPV calculated for the developer represents the benefit to all 'developers' assuming that the rental stock is retained for 20 years. The actual profit to the main developer (Calgro M3) will be less than this, and it almost certain that the rental stock will not be retained by Diluculo for this period. The developer's rate of return is highly sensitive to the cost of capital assumed in the model.

The State makes a loss on all units, with the loss on the subsidy units and the largest negative return on investment on the social rental rooms. The minor loss on the market rental units is surprising, but may be due to errors in the operating costs of servicing these units. It would be expected that the City would at least cover the costs of servicing the units through the tariffs.

Households receiving a subsidy unit achieve the highest net benefit after 20 years, with households in the social rental units also achieving substantial benefits through the subsidised rental of the JOSHCO units. As expected, the market rental units produce a net cost for the tenant households.

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