

# COST BENEFIT ANALYSIS: SOCIAL RENTAL HOUSING

## Think Piece 1: Location & Density



This is one of four Think Pieces prepared by the Social Housing Foundation (SHF) based on the findings of a Cost Benefit Analysis (CBA)<sup>1</sup> of RDP Housing and Social Rental Housing (SRH).

### Key Policy Issues on Location and Density

- The CBA reveals a strong link between good location of housing (defined by proximity to amenities, economic and social opportunities) and benefits to households. Benefits are especially in transport savings, to a lesser extent in reduced crime levels, and marginally in improved education and employment.
- To realise the benefits of good location requires housing to be developed on land that is generally more expensive. Higher densities and multi-dwelling typologies are required to limit per unit development costs.
- While well-located housing benefits from using existing bulk and link infrastructure, although these are usually already included in the land price.
- The CBA shows that the additional benefits to society of centrally-located SRH housing outweigh their additional construction costs, in comparison to cheaper RDP units built on the periphery.
- Where SRH and RDP housing projects are located in the same place (either centrally or on the periphery), the additional benefits to society of SRH do not outweigh their greater costs.
- The CBA indicates that RDP housing projects could be improved by following the lessons of SRH – including increasing density and changing typology – and building on well-located land. However the densification of RDP has fundamental implications for design and management

Each paper highlights a specific theme extracted from the CBA which assessed the economic and social costs and benefits to South African society of SRH compared to RDP housing over a 40-year future timeframe. Applying CBA methodology to housing research is new and the findings have wide ranging consequences for future policy makers across all spheres of government. It is anticipated that the content of these papers will contribute meaningfully to public debate and policy making in relation to housing and urban development in the future.

This Think Piece addresses the issues of housing location and density. These two concerns are inextricably linked and are central to the current debate about the South African urban form and the design of sustainable human settlements. Housing location is essentially a question of the proximity of housing developments to urban / social amenities, educational and employment opportunities and more efficient transportation access. This requires well-located land which is usually more expensive and requires higher density development in order to be financially sustainable and affordable. The CBA set out to understand and test the economic effects of housing typology (e.g. medium-density) as well as location on overall welfare outcomes.

<sup>1</sup> Social Housing Foundation (2009): Cost Benefit Analysis, RDP & SRH

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## Background to this paper

The provision of subsidised housing has been one of the cornerstones of the South African government's broad social welfare programme since 1994. Social Rental Housing (SRH) and Reconstruction and Development Programme (RDP) housing (more recently also known as BNG housing) are two housing types, amongst others, that exist within government's current housing programme.

Social Rental Housing is defined as a form of medium-density rental housing which is typically well located in terms of its access to urban areas. It is usually multiple storey housing due to the fact that it is built on prime land where land prices are high. The intended effect of Social Rental Housing in South Africa is to:

- Contribute to urban restructuring;
- Address structural economic, social and spatial dysfunctionalities; and
- Improve and contribute to the overall functioning of the housing sector.

By contrast, RDP housing is mainly low-density, low-cost housing typically located on the periphery of towns which is owned by the resident. It usually consists of single storey housing constructed on separate plots. While SRH is the main focus of this Think Piece, RDP housing is frequently compared since it has been the dominant form of subsidised housing in South Africa to date.

## Cost Benefit Analysis of Social Rental Housing

Cost Benefit Analysis (CBA) methodology is new in South Africa in the field of housing and offers innovative ways of answering housing policy questions. CBA is a powerful economic decision making tool used to assess whether a (housing) project contributes to an increase in the general welfare of society or not.

It does this by clearly identifying and quantifying in money terms the full range of costs and benefits of a housing project, over the entire life cycle of the project (40 years in the case of a housing project). The costs and benefits included are both direct ones (such as the cost of building the house), and indirect ones (such as the benefit of safer neighbourhoods).

The advantages of the CBA approach need to be balanced against some of its inherent limitations and restrictions. While it adds a valuable economic perspective to decision making, it does not replace the decision making itself, which should still contain other equally critical political and social considerations. Of necessity, a CBA simplifies reality and uses assumptions. While it attempts to include the most critical factors in these assumptions, assumptions are by their nature generalised.

The CBA undertaken used six existing housing projects in South Africa; three from RDP-type housing and three from SRH-type housing. It included the development of a financial and economic model; extensive primary and secondary research collected through a social survey of some 600 households; a review of local and international economic literature in relation to housing and economic effects; and engaged with a dedicated project reference group, comprised of housing and economic specialists.

## Location and Density in the Literature

It is well known that South Africa's sprawling urban landscape was historically separated by race and class, and also by land uses and activities. Access to urban opportunities was unequal and the poor had limited housing choices. These factors were connected (Beall, Crankshaw and Parnell, 2002) and have also continued since apartheid (Zack, 2008).

The location and density of housing is known to be important for making human settlements sustainable. **Location** can reduce urban sprawl, contain energy costs, improve the integration of land uses, and improve access for poor residents to urban opportunities (like employment and services). For the urban poor themselves, the location of their housing may be more important than the quality of the house itself, as location directly impacts on their livelihood. For society, this could also mean more social integration and an opportunity to redistribute wealth (Development Action Group, 2008).

Housing location and **density** are of course closely related. In an efficient land market, land prices are set based on the "highest and best use" of the land. Better located land usually costs more, so more houses need to be built on the land to put it to best use and to keep the houses more affordable. Hence location and density usually go hand in hand.

### Location and density of RDP Housing

The South African government has made enormous achievements in providing shelter and access to basic services for large numbers of poor households. The nation's housing programme has delivered more houses in a shorter period of time than any other country in the world. South Africa has also significantly developed its housing policy, housing finance system, institutional systems and inclusivity (Rust, 2007).

But many post apartheid investments in housing and infrastructure have not corrected spatial and economic inequalities (Khan & Thring, 2003; Charlton and Kihato, 2006). The provision of RDP housing has been a cornerstone of the South African government's poverty alleviation programme. RDP houses have mostly been built on the edges of cities and towns, where land costs are lower. They have typically been sprawling developments of single storey houses on individual plots, with densities far lower than SRH.

### Location and density of Social Rental Housing (SRH)

SRH is intentionally located close to urban areas so as to play a role in urban restructuring. Land located close to urban areas is prime property so land values are higher and demand for the land is also greater. As a consequence of price and maximising on limited space, SRH usually comprises multiple storey buildings which results in a higher density of residents.

## Findings of Financial CBA

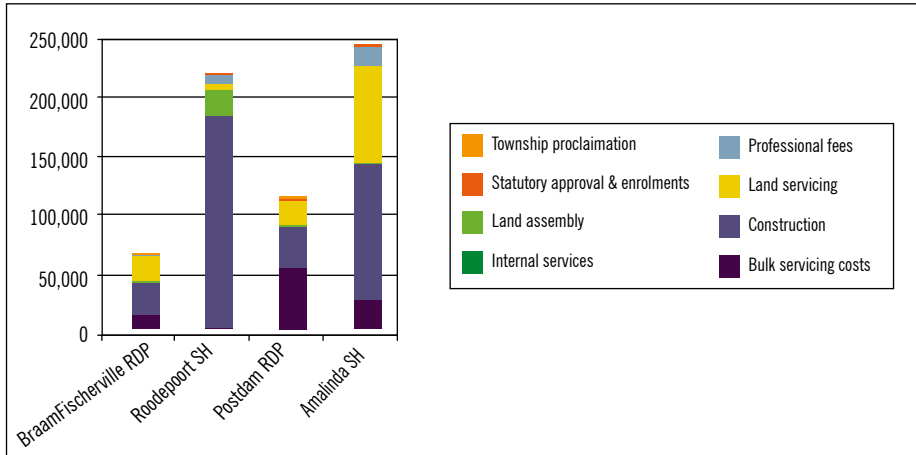
The study examined the once-off building costs related to SRH and RDP housing as well as the life-cycle costs over 40 years. From the view of straight financial costs, SRH is more expensive than RDP housing, both to build initially and to maintain over its full life cycle.

The per unit lifecycle financial costs of SRH is 2 to 2.5 times higher than RDP housing. The higher financial costs of SRH in comparison to RDP housing are caused by their more central location, higher building standards, better ongoing maintenance and servicing.

The CBA findings show that while SRH pays more for land (given its better location), these projects can capitalise on existing bulk infrastructure (although the presence of bulk infrastructure is usually reflected in the land price). In contrast, RDP is often located on cheaper peripheral land. Land is cheaper here, but the

costs of infrastructure and services are high as peripheral land is usually un-serviced (partly why it is cheaper). The figure below shows how location affects bulk servicing costs, which is much higher in the remote Potsdam RDP project than in any of the other settlements studied.

**Figure 1: Once-off costs during initial building of an SRH and RDP house (ZAR)**



## Findings of Economic CBA

This part of the CBA looks at the wider social and economic costs and benefits of housing over 40 years. The economic benefits of SRH compared to RDP are mainly in transport savings, to a lesser extent in lower crime levels, and finally to a small extent in better education and employment. Location and project design of denser settlements seem to make the main difference.

### Transport

As was expected, the study confirmed that residents of well-located SRH units spend on average less time traveling than RDP residents. Travel times to and from schools, public and private health care and other amenities are longer for RDP than for SRH.

The transport costs for RDP and SRH households were measured by both their actual out of pocket costs (taxi and bus fares, petrol for cars, etc.), and by valuing the time spent by households travelling. These costs were corrected for the fact that most SRH residents have higher incomes than RDP residents. This confirmed that it is the location of the house, rather than the income of residents, that causes the difference in travelling time.

It is also interesting that although the Bram Fischerville RDP houses and Roodepoort SRH are the same distance from the Central Business District, the travelling time for RDP was higher. This could be because RDP settlements are much more spread out, with more time needed to walk for example to a taxi rank, or to move through the neighbourhood itself. SRH is more densely built and reduces this 'internal' travel time.

## Education

Well-located housing is expected to make education facilities more accessible to residents, leading to a better education, better jobs and a higher income later in life. Many studies have shown that good quality housing itself tends to improve education levels. From this it is expected that residents of SRH – usually located closer to (good) schools and of better housing quality - are likely to have better education outcomes. This is more so since educational infrastructure lags substantially in RDP settlements.

There were several CBA study findings which supported this:

- SRH residents rated the quality of schools in the area significantly better than those in RDP settlements
- Since moving to RDP housing, children reportedly missed more school days than those in SRH
- The main reason RDP residents said their children missed school more was that the schools were too far away

But these education differences do not seem to have increased actual education dropout rates or similar education indicators one would have expected. The exception is Potsdam, the project which is furthest from the CBD of all the projects studied. At Potsdam, the CBA found an out-of-the-ordinary rate of children either missing school or dropping out completely. While for RDP and SRH projects that are the same distance to CBDs, there was no major difference. These results show that the location of housing seems to have a real impact on education.

## Health

There is consensus that housing in general, irrespective of tenure or type, plays an important role in improved health. The literature suggests that in South Africa, both RDP and SRH perform equally well in improving health outcomes in comparison to informal settlements. But a causal relationship between better housing location and access to improved healthcare was not found in the literature and is unclear and difficult to establish.

General research indicates that health outcomes are the effects of both housing and the residents themselves, and that income differences play a big part in health. This is relevant because of the income differences between typical households in RDP and SRH.

In terms of health and access to healthcare, the CBA found minimal differences in health outcomes between SRH and RDP due to their location or density. The CBA found no evidence that longer travelling times to healthcare facilities led to poorer health levels, and missed work days due to being sick could not be clearly attributed to housing. Since no conclusive effects could be shown to be linked to location, the monetary impacts on health were not included in the CBA. However, health effects on households often take many years or even decades to show clearly and these possible effects should be monitored for future studies.

## Crime

Due to the security measures in SRH and the higher density of housing it was expected that SRH would result in lower crime levels. The CBA results for crime were somewhat mixed, with crime levels appearing to be quite project specific and is in some measure linked to household income. It seems that measures taken in SRH to prevent crime in their buildings are less effective when they are in areas of the city where there is a higher incidence of crime. Location appears to be one of the determining factors in crime levels, but several other factors are also at play. Further research is necessary before any definitive conclusion on crime can be determined.

## Employment

Housing is expected to have a large impact on employment. Housing located close to nodes of economic activity is believed to create job opportunities.

The results from the survey indicate the following:

- More respondents in SRH said they found a job, or found a better job since moving to their current accommodation than respondents in RDP housing.
- Reasons in both housing sectors for finding employment or improving employment are mainly because there are better work opportunities where they live now.
- More adults in social housing said that moving there contributed to them finding employment or improving employment.

In comparing the employment of residents in SRH and RDP, the income and education differences between RDP and SRH households can't be ignored. In general, more residents in SRH have accessed better work since moving into SRH. When correcting for the income effect, however, the CBA shows that the number of residents that have experienced an income increase is almost equal in RDP and SRH. The causal effect of housing on employment is therefore not proven by the CBA.

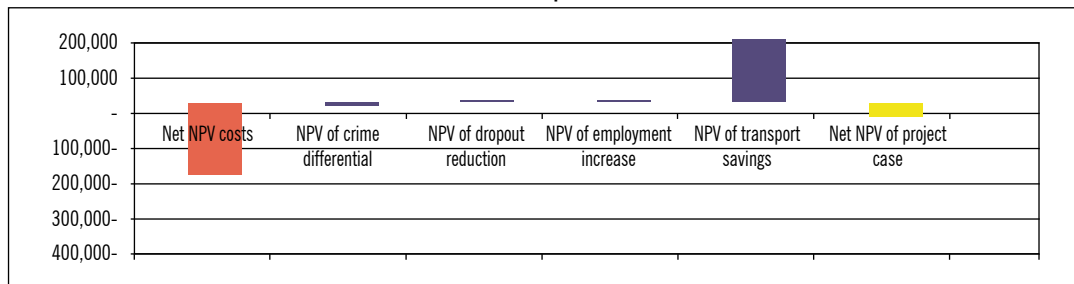
A specific difference between RDP and SRH relates to survivalist business. Lower densities (and relatively big plot sizes) mean that individual households are able to create some kind of income generating activity from their unit (through informal rental or home based enterprises). This, however, should be tempered by the fact that many households in SRH do undertake home-based economic activities and SRH providers are increasingly seeking to accommodate such activities.

## Overall Conclusions of the Economic CBA

In the economic CBA the actual values of the social and economic costs and benefits that are quantifiable over 40 years are calculated. These are then combined with the financial CBA results to give an overall assessment of the Net Present Value (NPV)<sup>2</sup>. Two sets of projects were compared.

Firstly, the Roodepoort SRH project was compared to the Bram Fischerville RDP project. Both projects are about the same distance from the CBD. There were a few differences between the projects in crime, education and employment, however, the SRH project showed significant benefits in transport savings. Combining the financial CBA costs (red bar), with the social and economic costs and benefits (blue bars) showed very little total difference (yellow bar) between the overall costs and benefits of the two projects to society over 40 years. So although the SRH project cost much more to build initially, its overall costs and benefits over 40 years was about the same as RDP.

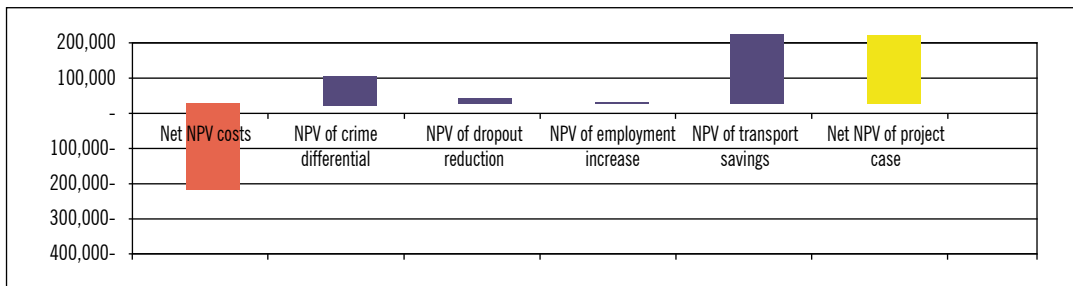
**Figure 2:** Net Present Value (NPV) of Costs and Benefits Comparing Bram Fischerville (RDP) and Roodepoort (SRH)



<sup>2</sup> Net Present Value: The difference of all the costs and benefits of a project over its lifetime, in today's money terms that can be compared. If the NPV of a project is greater than 0 (in other words its benefits add up to more than its costs), then the project is worth investing in.

Secondly, the Amalinda SRH and Potsdam RDP projects were compared. Amalinda is located quite close to the CBD, while Potsdam is much further away. Amalinda had strong net benefits of transport savings, lower crime, and to a lesser extent education and employment benefits. Due to the high cost of crime to society, even small decreases in crime rates have a large monetary impact. Combining all the costs and benefits showed that the well-located SRH project had a very strong overall benefit to society compared to the peripheral RDP project over 40 years. In other words, well located SRH creates far more overall net benefits (and hence lower costs) over time than peripheral RDP projects, even though SRH costs much more to construct initially.

**Figure 3: Net Present Value (NPV) of Costs and Benefits Comparing Potsdam (RDP) and Amalinda (SRH)**



Taken together, the comparison of the two sets of projects shows that location (and hence density) has a big influence on the overall costs and benefits to society over time. When housing is well located, there is little difference between SRH and RDP housing over time, even though SRH costs more to build initially. But when RDP housing is located on the periphery of centres, then even though it costs much less at first, over time it costs South Africa far more than a well-located SRH which brings greater overall societal returns.

- When RDP housing is located on the periphery, SRH is an economically better option over the full lifecycle than RDP housing, with the transport cost savings of SRH representing a substantial benefit for residents, together with reduced crime, better education and employment benefits.
- Where RDP and SRH are located in similar places in the city, they are quite comparable from an economic cost-benefit perspective, however SRH residents still experience transport benefits.

## Policy Implications

The location and density of affordable housing makes a big difference to the overall costs and benefits of housing to South African society over time. The CBA showed that housing that is well-located in urban centres, even though it financially costs much more to build, (due to higher land prices) actually has more benefits for society and costs less over time than does much cheaper housing on the periphery. Cheaper housing on the periphery appears to cost less, but when all costs and benefits over 40 years are counted, it actually costs more to society.

The CBA showed that it was especially location that made the difference. In particular, location benefits came most strongly from money and time savings on transport, and from capitalising on existing infrastructure. The location benefits measured less in crime, education and employment than was expected. Where housing was well located, it made less of a difference whether it was SRH or RDP housing.

The relationship between density and location is well known. Better location in the property market translates into higher land costs. To compensate for such increased land cost, housing typically needs to increase in density if it is to stay affordable for lower-income households. This made it very difficult to separate any effects of density from the effects of location.

For South African housing policy going forward, the CBA suggests strong attention should be paid to location in future affordable housing initiatives. The CBA showed that it is critical to look at full lifecycle costs and benefits when making these locational decisions – it was clearly seen that peripheral RDP housing that seems like a lower cost approach initially, actually cost society much more over time.

The CBA suggests that many of the economic benefits that are being achieved by SRH projects could also be achieved by RDP projects if they are built in better locations and also, therefore, at higher densities with a better spatial layout only possible to a certain extent to RDP. Choosing a favourable location for RDP and investing in security measures could minimise the difference in Net Present Value (NPV) between SRH and RDP, thereby combining a positive outcome for society as a whole by providing housing for the poorest of the poor.

A key strength of SRH seems to be that it has been an effective model for delivering affordable housing in better locations in South Africa's cities and towns. There seems to be little benefit in delivering SRH at more peripheral locations. It is unlikely that such developments would achieve value-for-money, despite cheaper land costs.

Finally, for policy makers it is important to note that the exact balance of costs and benefits can be quite project specific. To make the best assessment of where to build a housing project, and whether to use the SRH or RDP model, the investing authority should set up a project specific CBA, in which at least the aspects of land value, building costs with the chosen density, and transportation costs to residents are looked at. These factors interact closely and a well set up CBA can help to optimise the housing development to achieve the best value for South African society over time.

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