Chapter 4

SUSTAINABLE DEVELOPMENT OF SOUTH AFRICA'S BUILT ENVIRONMENT

4.1 Introduction

A vibrant urban economy is the key to unlocking the full potential of the economy at large.[58] The absence of vibrant urban economies retards development and growth in many sectors, as urban areas provide the necessary impetus and platform for growth. Only when the full potential of such economic hubs are harnessed can economic development and growth be realised. The vibrancy and potential of urban economies in South Africa is threatened by, *inter alia,* inefficient land-use patterns. Land is a critical factor of production that is at the centre of any city's development, and land-use planning influences how land is used and determines how cities grow or develop.

Basically, cities can either develop up or outwards, and each form of development has its own costs and benefits, which are felt differentially by different groups. In South Africa, urban growth form has been influenced by a number of factors, including apartheid spatial regulations which resulted in significant social costs being borne mainly by the poor. While land-use planning influences developmental sustainability, its impact on financial sustainability of cities is seldom analysed. This chapter presents one of the first systematic evaluations of the institutional, financial and fiscal costs of poor land-use management in the South African local government sector. The specific objectives of this chapter are:

- To quantify the financial and fiscal implications of the current urban land-use patterns with respect to the transport, infrastructure, land and housing sectors,
- To examine the current institutional and funding arrangements pertaining to urban public transport and human settlements, and
- To make policy recommendations on the fiscal policy alternatives required to restructure patterns of urban land-use patterns.

This chapter is underpinned by both quantitative and qualitative research. On the quantitative side, the chapter employs a spreadsheet-based city efficiency costing model (CECM), developed specifically to quantify the capital and operating costs of housing, land, transport services and infrastructure for a hypothetical South African city. This hypothetical city has all the key attributes of a South African metropolitan. On the qualitative side, the chapter uses secondary information to evaluate the impact of funding, institutional and legal arrangements on land use in the urban areas.[59] The next section of the chapter provides a summary of the main findings of the study.

58 This is not to discount the importance of the rural economy and rural municipalities.

59 A detailed discussion of the methodological issues is presented in the Financial and Fiscal Commission, Technical Report: Submission for the Division of Revenue 2012/13.

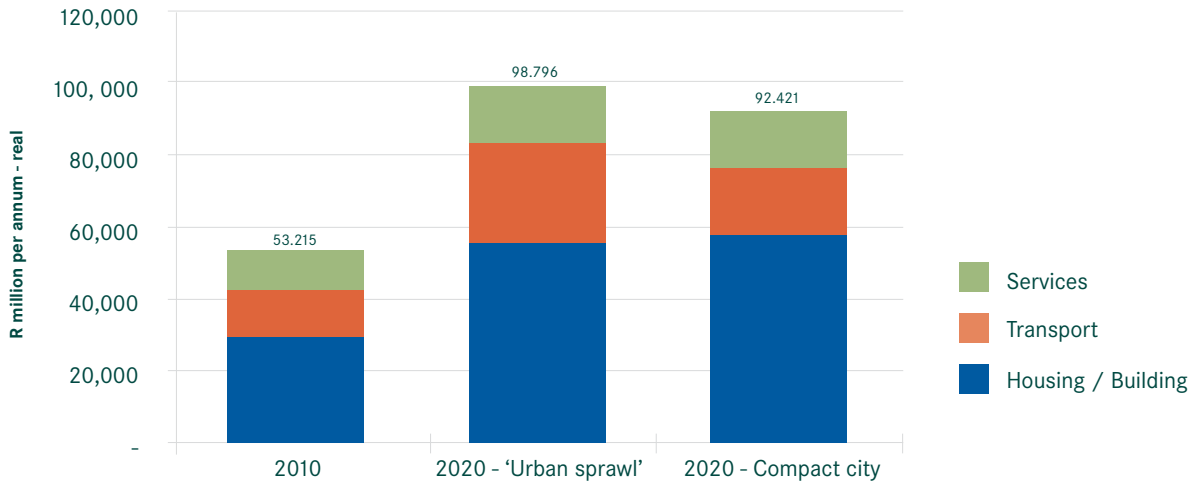
4.2 The Costs of Inappropriate Land-use Patterns in the South African Local Government Sector

This section summarises the main findings on the costs of inappropriate land-use, which are divided into recurrent, capital and environmental.

4.2.1 Recurrent Costs

The findings suggest that the current costs of low-density urban development in South African cities are approximately R6.4 billion more per annum than those of a compact urban form, an operating cost difference of about 7% between the two growth scenarios. If this is extrapolated to only the six metros, the difference between the urban sprawl scenario and the compact city scenario amounts to approximately 1.4% of gross domestic product (GDP) by year ten. The overall results of the CECM indicate that, based on 2010 data, the recurrent costs for the hypothetical city would be R53 billion per annum. By 2020 the recurrent costs (in real 2010 rands) increase to R99 billion and R92 billion for an 'urban sprawl' and 'compact city', respectively. This is illustrated in Figure 26 below.

Figure 26. Recurrent cost by sector (R million per annum real)

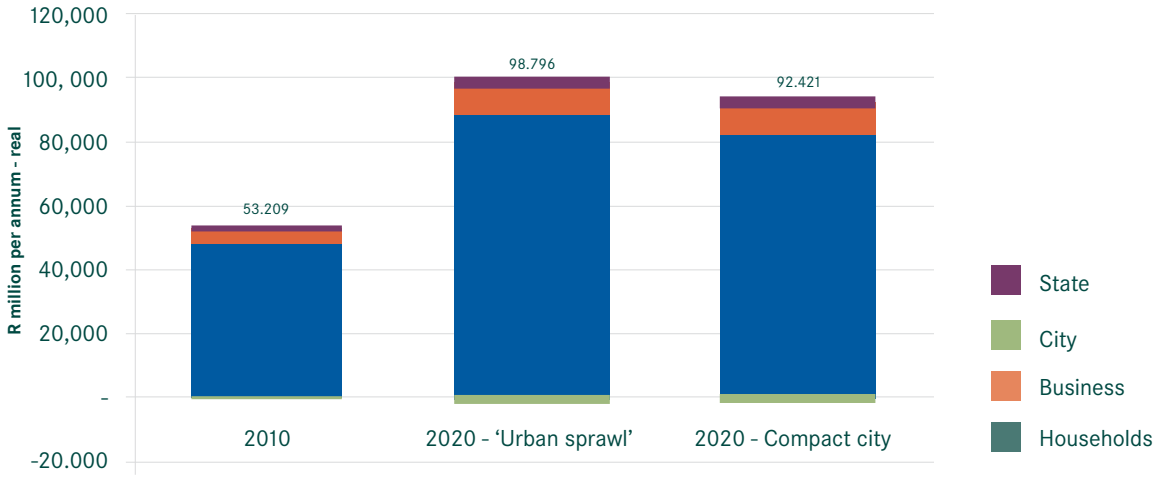


Source: FFC calculations

What is important to note from Figure 26 is that housing is the largest expenditure item across the scenarios, and this trend will continue to 2020. The biggest difference between the two scenarios by 2020 is the transport costs, which is mainly because the model assumes less commuting in the compact city than in an urban sprawl scenario.

The model also shows that households incur the largest financial burden in both scenarios, as illustrated in the Figure 27. However, the burden is larger in the urban sprawl scenario than in a compact city scenario.

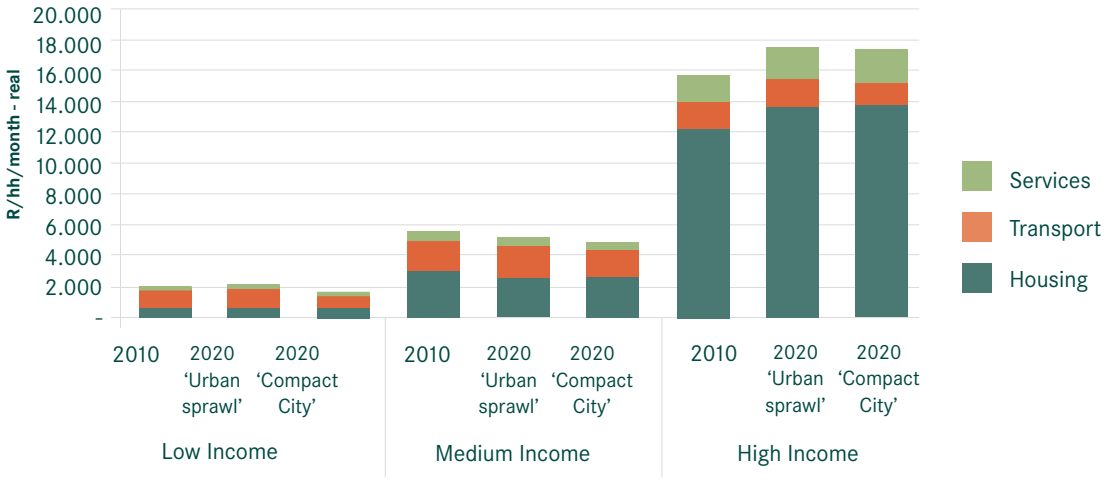
Figure 27. Recurrent cost by financial actor (R million per annum real)



Source: FFC calculations

A further analysis of expenditure on transport, services and housing shows that low-income households spend, per household per month, 14% more in the urban sprawl scenario and 10% *less* in the compact city scenario than in the base year (see Figure 28).

Figure 28. Average recurrent household expenditure (R/hh/month real)



Source: FFC calculations

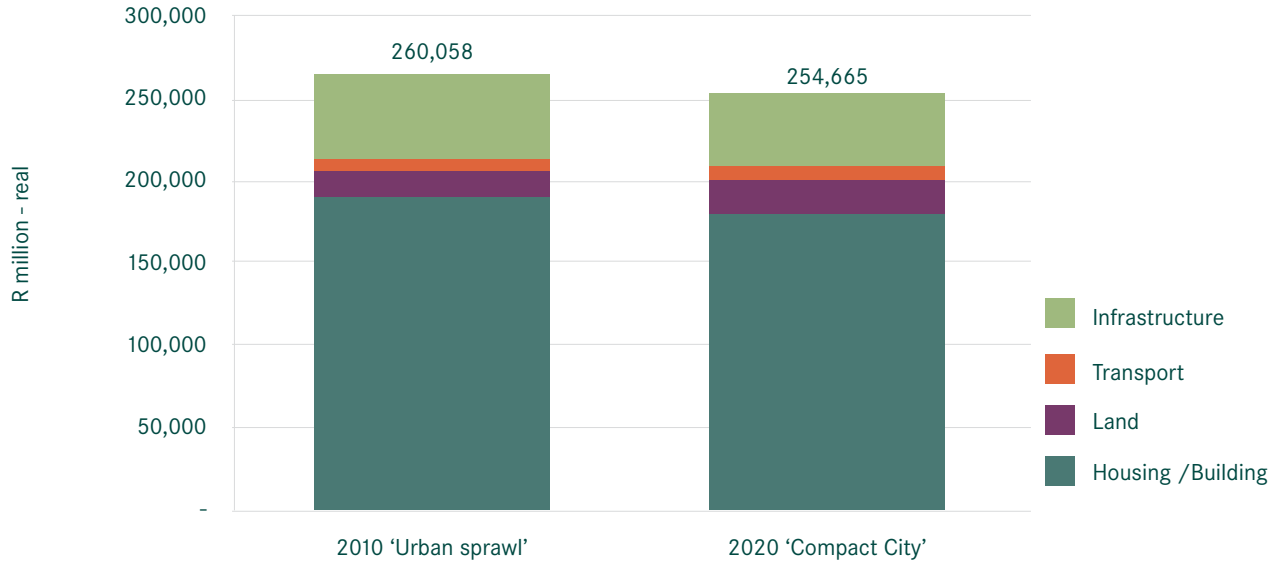
The major difference is in transport costs. Middle-income households spend 8% less in the urban sprawl scenario and 13% less in the compact city scenario on transport. In the urban sprawl scenario, high-income households spend more every month on transport (12% increase) than in the compact city scenario (10% increase). Low-income spending is dominated by transport costs, while high-income spending is dominated by housing expenditure. Thus, all households benefit in the compact city scenario, especially the low- and the middle-income groups, while in the urban sprawl scenario, low-income households are most negatively affected.

4.2.2 Capital Costs and Subsidies

Calculating total capital investment over ten years produces the surprising result that the capital costs are very similar for both scenarios: the urban sprawl scenario is only 2.1% more expensive than the compact city scenario (see Figure 29). Overall infrastructure and transport costs for the two scenarios are almost identical. However, while the same capital is required for transport, public transport usage is lower in the urban sprawl scenario, which mean a higher investment per passenger. The main difference is in land and housing costs. In the urban sprawl scenario, housing/building costs are greater because of the

assumed values of high-income units. For example, the average value of a high-income, single residential property is less that of an average high-income flat. Thus, with increased density, the total capital required is less. Although the relationship is reversed for low-income households, the high-income trend dominates because low-income housing has a much lower value than high-income housing.

Figure 29. Total capital investment over ten years by sector (R million real)



Source: FFC calculations

The study also found that, in the compact city scenario, increased land costs account entirely for the difference in capital costs for businesses. Investment by the city and the state is roughly equal in both scenarios, with government paying more for housing and land, but less for transport and infrastructure.

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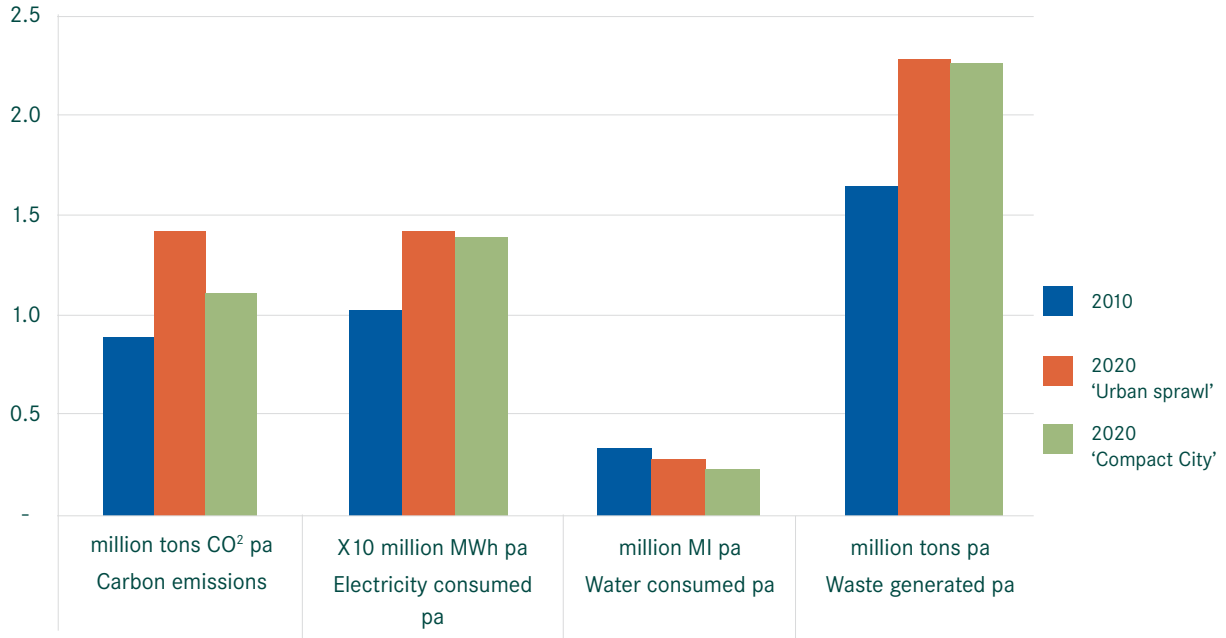
The model reveals that over the next ten years, the urban sprawl scenario will require more housing subsidy (a state housing subsidy of about R5.6 billion topped up with R322 million from the city). The compact city scenario will require a higher state housing subsidy of R6.5 billion, topped up with R1.6 billion from the city over the next ten years. Transport capital subsidies are assumed to cover only rail and BRT systems. In total, for the urban sprawl scenario, the state's contribution will be R6 billion over ten years, versus the city's contribution of R1.7 billion. The compact city scenario will require 4% less subsidy, but for fewer passengers. The total subsidy will amount to R7.7 billion (over ten years), or R897 per passenger per year in the urban sprawl scenario, and R7.4 billion, or R677 per passenger per year in the compact city scenario.

Assuming no change in the subsidy policy, under the compact city scenario public transport operating subsidies will reduce by 33% because of shorter aggregate travel distances on currently subsidised modes: rail and bus. This is a substantial saving and is also indicative of the overall improved efficiency of passenger transport in the compact city.

4.2.3 Environmental Costs

The environmental cost analysis shows that the resource use and waste generation rates are unchanged between the two growth scenarios. As Figure 30 illustrates, the most significant result is a 22% difference in the carbon tons emitted by all transport modes, which implies that compact city models are critical for a sustainable and vibrant city landscapes. In other words, inappropriate land-use patterns in urban spaces are a real threat to the environment.

Figure 30. Environmental impacts of the two growth scenarios



Source: FFC calculations

4.3 Current Challenges in the Built Environment

In this section, the challenges facing the built environment in South Africa are discussed together with the institutional, legal and funding arrangements.

4.3.1 Spatial Form of South African Cities and the Institutional and Legal Arrangements

South African cities are characterised by low-density settlement patterns that were shaped largely by a past system of racial segregation. During the apartheid era, the government introduced pieces of legislation that preserved white supremacy. For example, the 'Group Area Acts' (1950 and 1966) directed population groups into specific urban spaces, separated by buffer zones of open land, with whites allocated to large central areas and blacks displaced to distant urban periphery townships. The apartheid system did not just segregate races, but entrenched inequality, of housing form, geographical location, environmental landscape and distribution of facilities (Spinks, 2001).

In general, South African cities have comparatively low settlement densities [60], when measured by the number of people per hectare. For example, the densest city in South Africa is the City of Johannesburg, which has a population density of 20.9 people per hectare, followed by eThekwini with 15 people per hectare. These levels of density are relatively low when compared to other cities in the developing world, such as Addis Ababa, Bangalore, Ahmedabad and Curitiba that have density levels of 560.8, 134, 207 and 57 people per hectare, respectively.

Low density has, *inter alia*, two disadvantages. The first one relates to the high consumption of land, which increases the per capita cost of land infrastructure and services and, to some extent, limits social interaction. The second disadvantage is that the high demand for movement across the city, and long trips undertaken by people to access important amenities, results in the loss of time and higher spending on public transport, especially for the poor. In South Africa densification has tended to drift towards peripheral areas of the urban core and has taken place without factoring in public transport (Settlement Planning and Dludla Development cc, 2008).

A densification strategy should be aligned with public transport plans. The city of Curitiba, for example, encourages higher densification and mixed-use developments along its famous bus rapid transit (BRT) routes (Magalhâes, 2009). Similarly, the Government of India is making considerable investments in transport infrastructure, under its National

60 Density can be measured in a variety of ways including population density (number of people per hectare), dwelling unit density (number of dwelling units per hectare) and building density (ratio of total floor area of building to the corresponding site) among others.

Urban Transport Policy in 2006 that aims to "ensure safe, affordable, quick, comfortable, reliable and sustainable access" to urban residents to employment and other services.

In South Africa, various pieces of legislation emphasise proper land-use planning and densification, for example: the Development Facilitation Act of 1995 (DFA), the Spatial Planning and Land Use Management Bill of 2011 (SPLUMB), the "Moving South Africa" (MSA) policy document of 1998 and a White Paper on Spatial Planning and Land Use Management (2001). While the DFA attempted to accelerate land development by introducing principles of equity and efficiency in spatial management, a key problem is the spatial planning system, which consists of an overlay of inherited provincial legislation from the 1980s and national legislation governing less formal township establishment from the early 1990s. The problem is further compounded by the fact that some provinces and municipalities did not adopt the mechanisms available under the DFA and continue to develop without an adequate land development framework, which essentially implies that adherence to common national norms and standards is nonexistent. The LUMB (2008) [61] seeks to close this gap, but its enactment has been delayed, which further exacerbates the inappropriate land use. However, the Commission notes and supports a recent development on land-use management with the Department of Rural and Land Reform's publication of a draft Spatial Planning and Land Use Management Bill for comments (in May 2011). This bill is intended to replace all pre-1994 pieces of legislation on land-use management and development, including the DFA.

The coordination between the spheres of government responsible for different modes of public transport is one of the public transport institutional issues that need to be addressed. This has given rise to possibilities of inefficient use of space as well as resources. For example, due to the lack of coordination, some BRT routes (managed by the cities) directly compete with passenger rail routes managed by Passenger Rail Agency of South Africa (PRASA), as these routes are parallel to each other (FFC, 2010). This challenge is associated with uncoordinated investment decisions within the public transport sector and may have negative implications on the long-term sustainability of modes of transport, especially as densities are relatively low to sustain public transport in South African major cities. If not addressed, this low density may be costly and could further lead to underutilisation of services in the bus and rail modes.

According to the Constitution, housing is clearly a concurrent function of the national and provincial governments. The Constitution also provides for the national and provincial governments, through agreements, to assign administration functions to municipalities when:

a. The function would be administered more effectively at the municipality level; and

b. The municipality has the capacity to administer such a function.

In addition, the Housing Act No. 107 of 1997 also makes provision for municipalities with adequate capacity to be accredited[62] with the housing function.

The outcome of all these pieces of legislation is that the housing delivery and development function rests with the higher spheres of government, while the actual delivery of housing and other complementary services such as water and sanitation are municipal responsibilities. Furthermore, municipalities are responsible for the overall Integrated Development Plan (IDP). However, government policy has started to recognise the centrality of municipalities in the provision and management of housing. New developments in this regard include accrediting cities to manage the overall planning and delivery of public human settlements. Such accreditation will result in a more integrated system of housing delivery. On the transport sector, recent developments include devolving public transport function to the cities as provided for by the National Land Transport Act (2009) (NLTA).

Although devolving some functions to the cities is desirable for better coordination and planning, some risks are involved, such as simply transferring existing problems at a sectoral level or within a particular sphere of government to the cities. For example, accrediting cities to undertake the overall human settlements function will not result in much

61 Roles and functions of different spheres of government are covered in the bill. The national is mainly responsible for establishing norms and standards, enforce compliance and capacitate other spheres. Provincial sphere through the provincial land-use tribunals must consider and decide on all applications and appeals lodged and redirected to it in accordance with this bill. Municipalities through municipal land-use committees must consider and decide on all applications lodged or redirected to it in terms of this bill.

62 Accreditation of a municipality, especially level 3, is advantageous as it allows a municipality to administer any national housing programme within its jurisdiction, including receiving, evaluating and approving/disapproving applications for subsidies. Furthermore, a municipality accredited at level 3 would be able to receive its transfer directly from the national government, effectively removing the provincial sphere from the equation. This improves planning as well as implementation and eliminates delays in the disbursement of funding.

improvement if the present funding and capacity challenges within the current framework and land-issue problems are not first resolved. This implies that various issues need to be resolved within the entire and fiscal intergovernmental relations in order to improve the human settlements delivery system.

The challenge of transforming the spatial form of South African cities is greater than institutional coordination failure and legislative gap and is complicated by an urgent need to address housing and other basic services backlogs. A focus on eradicating backlogs has to some extent entrenched the apartheid city form and reflects path dependency, as the government with limited resources could choose either to channel funding to address historical backlogs or to attempt to change the spatial city form.

4.3.2 Funding

Two key challenges are highlighted in this section: the housing subsidy design and the overall funding of the built environment.

(a) The design of housing subsidy

One of the major problems is the current public housing subsidy system, which focuses on direct state provision of housing. In so doing, the system fails to leverage private finance and end-user contributions for housing delivery. The focus on the mass provision of fully-subsidised housing units has also constrained consumers' choice and often leads to sub-optimal output. Furthermore, there has been a lack of focus on key issues such as resolving administrative problems associated with land release and tenure security. In most cases the trade-off has been between the larger stands in distant location, where land is cheaper, and smaller lots, which are normally of poor quality and relatively more expensive, but located closer to economic opportunities.

The location of human settlements and important amenities determines transport costs and expenditure incurred by households. The fact that poor households choose to live in informal settlements, slums and backyard dwellings is an indication that they are prepared to accept poor quality housing closer to economic opportunities. Therefore, if given a choice, they would choose for their houses to be built closer to the jobs.

However, the current system does not allow such choice. The only remedy to the distortion in city shape caused by large subsidised housing programmes is to make subsidies "portable" and to let low income households make their own trade-offs between land-use standards, transport costs and location. An example of a portable subsidy is creating a "housing account" at an existing bank institution, to which qualifying households can also contribute, based on income level. The account would be interest-bearing and tax-free and offer the consumer a choice of when and where to use the subsidy.

The current funding for human settlements has also contributed to the peripheral location of low-cost housing and does not promote densification. The funding grant does not incentivise infill and brownfield developments,[63] but is designed to provide a complete housing product on cheaper peripheral locations. It fails to recognise that the biggest challenge is access to well-located land and providing subsidy amounts sufficient to build settlements with optimum densities that will eventually offset higher land costs. Other cities have achieved higher densification through infill and brownfield developments using incentives/disincentives that the South African system lacks.

(b) Funding for the built environment

A number of sectoral grants within the built environment are currently administered by different spheres of government and departments and are subjected to different conditions and reporting frameworks (see box 4.1).

63 Infill development generally refers to the development that prioritises the development of parcels of vacant, underdeveloped or underutilised sites within an urban area, rather than allowing development of undeveloped land outside the city. Brownfield development refers to development that takes place within an area or on land that was used previously but subsequently become vacant or derelict.

Box 4.1: Conditional Grants in the Built Environment

Integrated housing and human settlements development grant.

Administered by the Department of Human Settlements, its purpose is to provide funding for creating sustainable human settlements, while the urban settlements development grant (USDG) is allocated to metropolitan municipalities to supplement their capital budgets. It is intended to fund the provision of basic municipal services to new housing projects.

Municipal infrastructure grant (MIG cities/urban development grant).

Administered by the Department of Cooperative Governance, its purpose is to provide specific capital finance to address basic municipal infrastructure backlogs for poor households, micro enterprises and social institutions serving poor communities.

Integrated national electrification grant.

Administered by the Department of Energy, it is aimed at the provision of electrification of residential dwellings, the installation of bulk infrastructure, rehabilitation and refurbishment of electricity infrastructure in order to improve the quality of supply.

Regional bulk infrastructure grant.

This grant is for the development of regional bulk infrastructure for water supply under the Department of Water Affairs.

Public transport infrastructure and systems grant.

Administered by the National Department of Transport, it is intended for accelerated planning, construction and improvement of public and non-motorised transport networks.

Neighbourhood development partnership grant.

Administered by the National Treasury, its purpose is to support neighbourhood development projects that provide community infrastructure and create the platform for other public and private partnerships.

The common purpose of these grants is to provide sustainable human settlements with the necessary basic infrastructure. For example, sustainable human settlements should have water and sanitation services, and roads and electricity among other things. The challenge lies not in the funding itself (as shown by the variety of grants) but in the lack of coordination.

Some recent positive developments within the funding framework include the introduction of an urban settlements development grant (USDG) [64], which supplements metropolitan municipalities' capital budgets for the development of sustainable human settlements, and the shifting of the sanitation function to the Department of Human Settlements (DoHS, 2010). These developments are positive for alignment of grants and improved coordination in the delivery of human settlements. However, it is only the beginning of the process, as a number of grants still need to be aligned. Currently, there is a lack of strategic or operational relationship between infrastructure transfers, housing subsidies and other grants/subsidies including the one for public transport investment, which is an issue that the Commission highlighted in 2005 (see Box 4.2).

64 The USDG is the result of merging the MIG cities grant and the internal infrastructure portion of the provincial human settlements development grant.

Box 4.2: Lack of Coordination and Alignment in the Funding for the Built Environment

The lack of coordination is not a new issue, as it was raised by the Commission in 2005. Subsequently a recommendation was made that linking new housing subsidies with MIG (among other things) should be considered. Government accepted the recommendation, but also noted that MIG does not only target new housing. Nevertheless, the Commission remains of the view that this should be done at least for new human settlements developments.

This lack of relationship is reflected in the continued fragmentation of infrastructure-related transfers across different sectors, which leads to delays in infrastructure provision. One practical example of the effect of this lack of coordination is the delay in the provision of human settlements due to unavailability of bulk infrastructure (Sexwale, 2010).

4.4 Recommendations

The current land-use patterns in South African cities result in high economic, fiscal and financial costs. In the current form of city development, households, especially the poor, incur the largest costs, mostly in the form of transport costs. The CECM used in the study to quantify the costs of the current land-use patterns revealed that moving toward a compact city model results in savings within ten years. The main benefit is in the form of reduced spending on transport, as households will be closer to their areas of work and mass public transport (higher density levels are necessary for efficient public transport). Other benefits include reduced fiscal burden on public transport subsidies, as fewer households will be commuting, and lower carbon emissions due to decreased travel distances and use of private cars. Other key challenges within the built environment in South Africa relate to the institutional arrangements, fragmentation in planning, lack of coordination in the funding, lack of incentives to promote densification as well as some legislative shortcomings noted elsewhere in this chapter.

With respect to sustainable development of the built environment, it is recommended that:

- Government actively and specifically pursue the development of a more spatially compact urban form for South African cities, by developing and adopting appropriate policies and financing instruments. Specific fiscal instruments that can support these objectives include wider use of development charges in financing infrastructure associated with the land development process, public transport subsidies that specifically target high density low-income areas, and fiscal incentives for urban land development projects located within the existing urban form.

- Government should conduct a broad-based review of the efficacy of current housing finance arrangements in meeting housing needs within the context of creating sustainable and more compact human settlements. The Commission acknowledges recent developments in the funding framework, including the introduction of the Urban Settlements Development Grant. It believes that this creates an important opportunity for the realignment of other funding instruments in the built environment, particularly the Integrated Housing and Human Settlements Grant. The Commission intends to review the design of the Urban Settlements Development Grant once further details about this programme are made known.

- Government should review analytical work on the fiscal and economic costs of the current urban form of South African cities and guide the Commission as to the further development of these analytical methods.