

The Corridor Densification Option Model as a means for spatial restructuring of South African cities

TJB Van Niekerk



orcid.org 0000-0001-5277-6693

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Supervisor: Mr J Viviers

Co-supervisor: Prof EJ Cilliers

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ABSTRACT

Spatial patterns of South African cities were largely influenced by Apartheid legislation, resulting in fragmented urban forms where spatial patterns were essentially based on racial segregation. Due to parallel dispensation, settlements became segregated, ensuing in a well-established dual city, mono-functional residential precincts associated with physical and land-use barriers. Apart from limited occurrences in metropolitan areas, attempts to address spatial injustices of the Apartheid legacy, gravely failed. Interception of incessant segregated growth, combined with urban sprawl is becoming increasingly evident. Intervention is a prerequisite to duly address the impact of Apartheid and its legacy still prevalent in most urban areas. The National Department of Transport prepared the “Moving South Africa” strategy, during 1998; presenting the Corridor Densification Option Model for the first time. The model was considered to be more appropriate to the existing South African land-use tenure patterns than contemporary planning approaches. The Corridor Densification Option Model and its augmenting attributes are progressively considered by urban planners as an alternative approach to address spatial restructuring of South African cities. In attaining a comprehensible understanding of the Corridor Densification Option Model, its rationale was analysed in greater detail. This research further investigated the model in considering the augmentation of its attributes and to enhance it through recommending contemporary planning approaches. Theoretical sampling was employed, in conducting the literature review and directive review. By further employing the process of open coding, reconstructed data was aggregated in a theoretical matrix, progressed in an assessment matrix and employed in the empirical analysis to assess purposefully selected Municipal Spatial Development Frameworks. It was endeavoured in an attempt to conclude and recommend on the feasibility of the model to attain spatial restructuring. The research revealed that the successful application of the Corridor Densification Option Model will, however, be dependent on the occurrence of specific enhanced attributes thereof in relation to relevant “spatial drivers” (legally required to be adhered to in the preparation of Municipal Spatial Development Frameworks). It does, however, offer a novel approach to spatial restructuring in South African cities in the post-Apartheid epoch.

Keywords: Corridor Densification Option Model, Spatially Segregated Settlements, Integration, Urban Restructuring, Municipal Spatial Development Framework Applicability.

OPSOMMING

Ruimtelike patrone van Suid-Afrikaanse stede was grootliks beïnvloed deur wetgewing van die Apartheidsregering. As gevolg van 'n parallel dispensasie, het nedersettings afsonderlik ontwikkel, wat gelei tot duplisering van sentrale sakegebiede, mono-funksionele residensiële distrikte wat verband hou met fisiese- en grondgebruiksgrense. Afgesien van beperkte gevalle in metropolitaanse gebiede, het inisiatiewe om die ruimtelike ongeregthede, wat steeds voorkom as gevolg van Apartheid, ongelukkig misluk. Voorkeur aan onophoudelike gesegregeerde groei, gekombineer met stedelike verspreiding, word toenemend duidelik. Intervensie is 'n voorvereiste om die impak en nalatenskap van Apartheid, wat tans in meeste stedelike gebiede algemeen voorkom, behoorlike aan te spreek. Die Nasionale Departement van Vervoer het die “Moving South Africa Strategy” in 1998 voorberei wat die “Corridor Densification Option Model” vir die eerste keer voorgestel het. Die model word beskou as meer geskik vir bestaande Suid-Afrikaanse grondgebruik- en eienaarskappatrone as kontemporêre beplanningsbenaderings. Die “Corridor Densification Option Model” en sy addisionele attribute word toenemend oorweeg deur beplanners as 'n alternatiewe benadering om die ruimtelike herstrukturering van Suid-Afrikaanse stede, aan te spreek. Om 'n meer verstaanbare en duidelike begrip van die “Corridor Densification Option Model” daar te stel, is die rasionaal daarvan in meer besonderhede ontleed. Hierdie navorsing het die model verder ondersoek in die uitbreiding van sy bestaande kenmerke en om dit te verbeter deur kontemporêre beplanningsbenaderings aan te beveel. Deur die toepassing van “theoretical sampling” deur middel van “open coding” is data versamel deur 'n literatuuroorsig. Die data was verwerk in die opstel van 'n teoretiese matriks wat verder verwerk was in 'n assesseringsmatriks om die Munisipale Ruimtelike Ontwikkelingsraamwerke te ontleed. Die uitvoerbaarheid van die model word ondersoek op 'n Munisipale Ruimtelike Ontwikkelingsraamwerk aangesien dit as die toepaslike regeringsfeer beskou word om ruimtelike herstrukturering effektief te bereik. Die navorsing het bewys dat die suksesvolle toepassing van die “Corridor Densification Option Model” sal afhanklik wees van die voorkoms van spesifieke kenmerke in verband met relevante ruimtelike bestuurders in ruimtelik gesegregeerde stede in die post-Apartheid epog.

Kern woorde: “Corridor Densification Option Model”, Ruimtelike Gesegregeerde Nedersettings, Integrasie, Stedelike Herstrukturering, Munisipale Ruimtelike Ontwikkelingsraamwerk Toepaslikheid.

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CHAPTER 1 INTRODUCTION AND METHODOLOGY

This chapter captures the background and problem statement of the research (section 1.1), followed by the research aim and objectives (section 1.2). Research questions are also formulated based on the set objectives, to guide the research and the respective chapters thereof. Section 1.3 presents the structure of the research; connecting the research questions and the research methods applied in each chapter. The identified methodology employed in this research is presented in section 1.4, namely the literature and documentation review, case study selection, empirical phase and the supposition of the research. The chapter concludes in section 1.5, identifying the limitations of this research.

1.1 Background and problem statement

Stemming from a historic political change in 1994, substantial efforts were made in South Africa to remedy the inequality and injustice, resulting from a dispensation where spatial patterns were largely based on racial segregation (Christopher, 1986:330-335). Although the extent of legal codification of racial discrimination, were attained by a dominant white minority, South Africa shared a colonial history of European conquest, resulting the lasting physical imprint on cities as “architecture, urban layout and planning reflected European norms, standards and fashion” (Maylam, 1995:22-25; Simon, 1988:191; Simon and Birch, 1992:1029-1045). Pieterse (2002:3) is of opinion that the numerous post-Apartheid legislation and policies intended to intercept the resultant spatially segregated urban forms of Apartheid, are failing and South African cities appear as segregated, fragmented and unequal as previously.

The National Department of Transport prepared the “Moving South Africa” (Moving SA) strategy in 1998, presenting the Corridor Densification Option Model (CDOM) for the first time. It was deemed more fitting to the existing South African urban tenure patterns than the formerly employed planning approaches (Department of Transport, 1998:138). Scholars and urban planners seem to progressively contemplate the CDOM and its attributes as an alternative approach to address spatial imbalances and to attain spatial restructuring of urban settlements. Although the CDOM was, in its original form, proposed as a strategy to readdress public transportation in the post-1994 dispensation, Van Niekerk *et al.* (2017:68), in an emerging analysis, demonstrated that the model may well contribute to spatial restructuring on a Municipal Spatial Development Framework (MSDF) level; especially when considering additional and contemporary planning approaches. The early model, in so far as its rationale, attributes and implantation aims are concerned, however, appears to be ill-defined, thereby limiting its enactment. The aim of this research is to further evaluate the CDOM as it was initially

portrayed in both the Moving SA and the Guidelines for Human Settlement Planning (Guidelines), consider augmentation of its existing attributes and to enhance it through recommending more diverse and contemporary planning approaches. It is endeavoured to reinforce the CDOM as a possible remedy for spatial restructuring of South African cities.

1.2 Research aim, objectives and questions

Referring to the problem statement discussed in section 1.1 the aim of the research is:

To investigate the proposed CDOM, consider its augmentation and enhancing it through more diverse contemporary planning approaches as a possible remedy for spatial restructuring of South African cities.

The research objectives of the study, necessitated in attaining the preceding research aim, are identified below, namely:

1. To provide a historical overview of the events culminating in the spatially distorted urban settlements of South Africa,
2. To examine the rationale, attributes and implementation aims of the existing CDOM as it was initially portrayed in both the Moving SA and the Guidelines,
3. To investigate additional and contemporary planning approaches in reinforcing the CDOM,
4. To determine the CDOM's viability in the attainment of spatial restructuring of South African cities on a Municipal Spatial Development Framework (MSDF) level,
5. To provide recommendations that may well be conducive towards implementing the CDOM on a MSDF level, as a possible means to attain spatial restructuring of South African cities.

In order to achieve the abovementioned research objectives, the following sub-research questions need to be answered:

1. What are the historical events culminating in the spatially distorted urban settlements of South Africa?
2. What is the rationale, attributes and implementation aims of the existing CDOM as it was initially portrayed in both the Moving SA and the Guidelines?
3. What possible, additional and contemporary planning approaches may enhance the CDOM?
4. What is the viability of the CDOM in attaining the spatial restructuring of South African cities on a MSDF level?
5. What recommendations may well be conducive towards implementing the CDOM on a MSDF level, as a possible means to attain spatial restructuring of South African cities?

1.3 Structure of the research

For a transparent interpretation of the research aim and to demonstrate a clear link between the research questions, the methodology employed to address the research questions, the phases of conducting the research and ultimately the chapters relating to each research question (illustrated in Table 1-1) are ensuing deliberated:

Table 1-1: Research Structure

RESEARCH AIM (Refer section 1.2) To investigate the proposed CDOM, consider its augmentation and enhancing it through more diverse contemporary planning approaches as a possible remedy for spatial restructuring of South African cities.				
RESEARCH QUESTIONS (Refer to section 1.2)	METHODS	PHASES	CHAPTERS (Refer to section 1.3)	Phase 1 Introduction and Methodology
1. What are the historical events culminating in the spatially distorted urban settlements of South Africa?	Literature review (Refer to section 1.3.2)	Phase 2 Define and Prepare	Chapter 2 Document Review	
2. What is the rationale, attributes and implementation aims of the existing CDOM as it was initially portrayed in both the Moving SA and the Guidelines?	Literature review (Refer to section 1.3.2)		Chapter 3 Literature Review	
3. What possible, additional and contemporary planning approaches may enhance the CDOM?	Literature review (Refer to section 1.3.2)		Chapter 4 Literature Review	
4. What is the viability of the CDOM in attaining the spatial restructuring of South African cities on a MSDF level?	Assessment (Refer to section 1.3.3)	Phase 3 Collect and Analyse	Chapter 5 Case Study and Analysis	
5. What recommendations may well be conducive towards implementing the CDOM on a MSDF level, as a possible means to attain spatial restructuring of South African cities?	Recommend (Refer to section 1.3.4)	Phase 4 Conclude and Recommend	Chapter 6 Conclusion	
			Chapter 7 Recommendations	

Source: Own construction (2018)

Attaining the main research aim of the study (section 1.2) the research structure is designed to comprise four distinct phases, namely:

1.3.1 Phase 1: Introduction and Methodology

Phase 1 of the research interprets the research and methodological approach in addressing the research questions and includes the following chapter:

- Chapter 1: Introduction and Methodology

This chapter presents the research by defining the background and problem statement of the research, followed by the research aim. Thereafter, research questions are posed in exploring the research aim, ensued by an overview, explaining the structure of the research. This chapter presents a discussion of the research methodology employed in attaining the research aim and the research questions (section 1.2.) and is concluded with a discussion on the limitations of the research.

1.3.2 Phase 2: Define and Prepare

Phase 2 of the research intends to focus on research questions 1, 2 and 3 (section 1.2.), firstly through a document and directive review by considering government policy, repealed and promulgated legislation and supporting guidelines and secondly by exploring literature resources in the form of published books and scientific articles. Phase 2 includes the following chapters:

- Chapter 2: Documentation Review

This chapter considers several literature resources portraying the historical events culminating the detrimental legacy of Apartheid and discriminatory legislation (pre-1994) resulting in spatially segregated South African cities. A similar consideration is given to interim and current policies, legislation and guidelines (following 1994) intending remedial tactics towards prevalent spatial imbalances. The emphasis of this chapter is, however, merely placed on policies and legislation with spatial planning related outcomes. The chapter is concluded with purposefully selected “spatial drivers” derived from the document review.

- Chapter 3: Literature Review

This chapter aims to evaluate the rationale, attributes and implementation aims of the CDOM in its current form. It intends to further explore the CDOM’s urban densification, compact city, corridor development, infill planning, urban regeneration and public transportation planning model components in possibly further augmenting it and in providing a clearer interpretation of the current stance of the CDOM. The chapter is

concluded with purposefully selected attributes derived from the literature review, deemed relevant to the existing CDOM.

- Chapter 4: Literature Review

Chapter 4 considers additional and contemporary planning approaches, in particular transit-orientated development (TOD), smart growth, new urbanism, green urbanism, transit cities and shared mobility (SMS) in contemplating its applicable attributes that may well be merged in and improving the CDOM. The chapter is concluded with the purposefully selected attributes derived from the literature review, deemed incorporable in the CDOM.

In concluding Phase 2 of the research, an emergent theoretical matrix is prepared, combining the purposefully selected “spatial drivers” and the existing, augmented and potential attributes deemed applicable to the CDOM. The theoretical matrix is prepared to be evolved in an assessment matrix necessary to conduct the empirical phase.

1.3.3 Phase 3: Collect and Assess

Phase 3 focuses on research question 4 (section 1.2). During this phase of the research, the theoretical matrix is advanced into an assessment matrix to assess the selected case studies. As this research deals with numerous “how” questions, case studies are deemed the preferred strategy (Yin, 2003:1) to conduct the empirical phase. Phase 3 includes the following chapter:

- Chapter 5: Case Study and Analysis

Selected MSDFs is evaluated in this chapter by making use of the prepared assessment matrix in determining the model’s viability towards the attainment of spatial restructuring on a strategic level.

1.3.4 Phase 4: Conclude and Recommend

In the final phase, a summary of the research results is presented, followed by the overall conclusions in terms of the research results. This phase includes the following chapters:

- Chapter 6: Conclusion

This chapter refers to findings gained through the theoretical and empirical investigations, presenting and discussing the results derived from the empirical phase. Conclusions are drawn from the results by underlining the nominated research questions.

- Chapter 7: Recommendations

In concluding the research, this chapter proposes planning recommendations that may well be conducive towards implementing the CDOM on MSDF level as a potential means for the spatial restructuring of South African cities.

1.4 Research methodology

Considering the aim and research questions identified in section 1.2, a qualitative research method is selected.

1.4.1 Literature and Documentation Review

In attending to the extensive literature and documentation review, theoretical sampling (Cohen *et al.*, 2018:714-717) is employed. The method collects data on a continuing basis, adding sample units to the theory until enough data is gathered to explain a phenomenon (Cohen *et al.*, 2007:492). For the purpose of this research, data is collected through the literature and documentation review that is encompassing and qualitative in nature (Blair, 2015:16-18).

An extensive literature review of historical events culminating in the spatially distorted urban settlements of South Africa including national planning legislation is conducted. It is attempted to identify what the impact of these events and spatial impacting legislation had on urban settlements during the Apartheid epoch, followed with a review of spatial policies, legislation and guidelines, aiming to attain the spatial restructuring of segregated urban forms in the post-Apartheid epoch. A comprehensive investigation is subsequently conducted to attain a clearer understanding of the CDOM's rationale and its theoretical themes of densification, corridor development, infill planning, urban regeneration and public transport planning. In further improving the CDOM; especially from a spatial planning perspective, theory relating to additional and contemporary planning approaches will comprehensively be reviewed. As described in the structure of the research, the review process culminates in:

- Purposefully selected "spatial drivers" derived from the document review,
- Purposefully selected attributes derived from the literature review, deemed relevant to the existing CDOM,
- Purposefully selected attributes derived from the literature review, deemed incorporable in the CDOM.

In concluding the literature and document review, a measure of grounded theory (Cohen *et al.*, 2018:714), namely open coding (Cohen *et al.*, 2018:671) is employed in rendering the above

copious and purposefully selected “spatial drivers” and the existing, augmented and potential attributes deemed applicable to the CDOM, in codes, categories and themes (Cohen *et al.*, 2018:668); all to be combined in a emergent theoretical matrix. The derived theoretical matrix is perceived as being descriptive of spatial restructuring discourse. It is also constructed in order to be progressed in an assessment matrix required to steer the empirical phase.

1.4.2 Empirical Phase

During this empirical phase of the research, the theoretical matrix is progressed in an assessment matrix, by (i) proposing the purposefully selected “spatial drivers” (derived from Chapter 2) as one component of the matrix and by (ii) formulating the purposefully nominated codes, categories and themes reasoned inherent to the CDOM (derived from Chapters 3 and 4), as the opposite component. In the search to find optimum conditions for the attainment of spatial restructuring, this interface offers a valuable instrument to distil information into a comparative framework (Paracchini *et al.*, 2011:79) instead of attempting to concurrently interpret numerous attributes. Assessment is additionally endeavoured by formulating specific questions relating to and informing the purposefully selected themes identified as augmenting and additional to the CDOM. A numerical value is added to the assessment questions, thereby allowing the researcher to purposefully assess the selected case studies. The rationale for preparing an unambiguous assessment matrix is embedded in the fact that:

- The purposefully selected “spatial drivers” (derived from the document review) have at its core, spatial restructuring,
- The purposefully selected “spatial drivers” (being statutory in its departure) are all embedded in the preparation of MSDFs and the MSDFs are therefore perceived as a decisive instrument in, inter alia, the attainment of spatial restructuring,
- The CDOM, from the onset, was proposed as potential model to improve the distorted settlement patterns of a post-Apartheid South Africa and the purposefully selected attributes (derived from the literature review), deemed relevant to the existing CDOM, are therefore also seen as conducive towards spatial restructuring,
- The purposefully selected attributes derived from the literature review, deemed incorporable in the CDOM, correspondingly seeks an improved integrated and compact urban form, signalling spatial restructuring,
- By seeking and nominating the interface between “spatial drivers”, and the augmented and the identified incorporable attributes of the CDOM, the optimum conditions for the attainment of spatial restructuring on MSDF level, may well be identified.

In concluding this section, it is exceedingly significant to outline that this research and its anticipated assessment matrix, are neither prepared nor does it intend to assess MSDFs in determining its compliance in any matter. The development of an assessment matrix is endeavoured in determining whether a MSDF, in view of its strategic and statutory nature, could induce higher levels of spatial restructuring by incorporating purposefully selected enhancing CDOM attributes and purposefully selected “spatial drivers” and its subsequent nominated interfaces. The latter, as it is postulated that numerous nominated interfaces will be beneficial in the attainment of spatial restructuring.

1.4.3 Case Study Selection

As this research deals with numerous “how” questions, case studies are deemed the preferred strategy (Yin, 2003:1) to accomplish the empirical phase. Robson (2002:183) strongly argues that case studies are preferred by researchers for analytic purposes rather than statistical generalisation, while developing theories that may support researchers to comprehend other similar cases, situations or phenomena. For the purpose of this research the multiple case study approach is opted for. The latter is considered a more applicable research approach since theory building conducted from multiple case studies produce more robust and a stronger base for theory building (Eisenhardt and Graebner, 2007:27).

The MSDFs of three type-C settlements in South Africa are identified as the case studies for this research. The Council of Scientific and Industrial Science (CSIR) (2012:11) classified a type-C settlement as a regional service centre or large town with a population between 100 000 and 350 000. The selected MSDFs are assessed by making use of the prepared assessment matrix in determining the model’s viability towards the attainment of the spatial restructuring on a strategic level. Supporting the selection of the three case studies are their similarities in size (not being metropolitan municipalities), urban form, depicting physical segregation and being fragmented settlements. In warranting consistency throughout the research, it is considered ideal to select MSDFs that were prepared, following the commencement of the Spatial Planning and Land Use Management Act (SPLUMA), Act 16 of 2013 during 2015. The following case studies are assessed:

- Metsimaholo Municipality (specifically the urban form of the Sasolburg and Zamdela precincts),
- Stellenbosch Municipality (specifically the urban form of the Stellenbosch, Khayamandi, Idas Valley and Cloetesville precincts), and
- Tlokwe Municipality, recently renamed as the JB Marks Municipality (specifically the urban form of the Potchefstroom, Promosa, Mohadin and Ikageng precincts).

1.5 Limitations of research

Considering the extensive nature of the research topic, limitations are prescribed to constrain the research and to attain the research aim and objectives identified in section 1.3. Firstly, substantial historical and current planning legislation were identified that influenced the racial and physical segregation of South African cities. The intention of the research is not to discuss all the legislation and policies in the pre and post-Apartheid epoch and emphasis is reasonably placed on spatial impacting legislation.

Imitated planning approaches inherent to the existing CDOM, necessitated the consideration of additional and contemporary planning approaches, in particular, TOD, smart growth, new urbanism, green urbanism, transit cities and SMS, depicting similar restructuring attributes than the preceding planning approaches. Even though, numerous planning approaches exist, the aim of the research is to enhance the CDOM, not alter it, substantiating the selecting of the additional approaches to retain the objective of the existing CDOM. The research aims to determine whether the CDOM and its additional and contemporary planning approaches may well attain the spatial restructuring of segregated urban forms. The intension of the research is therefore not the consideration of additional and contemporary transportation related approaches.

In conducting the empirical phase, a specific selection is made relating to the three selected case studies, namely that of type-C settlements. This research is not attempted for the numerous permutations of other Local, District and Metropolitan Governments in South Africa. The research, also only assesses post 2014 MSDFs, thereby not reflecting on earlier prepared MSDFs.

1.6 Acronyms

Table 1-2: Acronyms

TERM	DEFINITION
ANC	African National Congress
BRT	Bus Rapid Transit
CBD	Central Business District
CDOM	Corridor Densification Option Model

CSIR	Council for Scientific and Industrial Research
DFA	Development Facilitation Act
DRDLR	Department of Rural Development and Land Reform
ITP	Integrated Transport Plans
IDP	Integrated Development Planning
IUDF	Integrated Urban Development Framework
LGTA	Local Government Transitional Act
LDO	Land Development Objectives
LRT	Light rail Transpiration
Moving SA	Moving South Africa Strategy
MSA	Municipal Systems Act
MSDF	Municipal Spatial Development Framework
MTSF	Medium Term Strategic Framework
NLTTA	National Land Transport Transition Act
NATMAP	National Department of Transport introduced the National Transport Master Plan
NDP	National Development Plan
TOD	Transit-Oriented Development
RDP	Reconstruction Development Programme
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
SACN	South African Cities Network

SMS	Shared Mobility Systems
UDF	Urban Development Framework

Source: Own construction (2018)

CHAPTER 2 SPATIAL RESTRUCTURING

2.1 Introduction: A spatially segregated South Africa

This chapter aims to address research question 1:

1. What are the historical events culminating in the spatially distorted urban settlements of South Africa?

The Apartheid legislation empowered Local Government to facilitate and regulate the objective of racial segregation and separate development. Goldberg (1993:187-191) is of opinion that the Group Areas Act (1950), supporting the South African Government to enforce segregation, had the most considerable impact in terms of racial segregation, resulting in spatially segregated cities and the rearrangement of urban forms (Higgs, 1971:1). In spatial context, areas were segregated by social amenities and infrastructure, providing separate education, healthcare, social services, local authorities and often separate bulk and infrastructure installations. The implementation of the 1950 Act emanated the continuous and often forceful removal of non-whites in proximity of white settlements to racially separate settlements resulting in a distinct spatially segregated urban form with undeniable dispersed and disconnected precincts. Naude (2001:1-17) deemed the 1950 Act as one of the most infamous centrepieces of Apartheid legislation, ruling residential segregation and enforced confiscation of Africans to 'Own Group Areas'.

Commencement of the "Grand Apartheid" era further strengthened the vision of racial segregation when the National Party formulated a new means for the separate development known as the ethnic city model (Rogerson, 1992:163). Then Prime Minister, Dr. H.F. Verwoerd proposed that the homelands should develop into independent nation-states (Krige and Donaldson, 2000), and several discriminatory acts ensued. Maylam's (1990:57-84) view is therefore comprehended that these discriminatory legislations had at its core the encouragement of a spatially segregated urban form. The majority of the segregated settlements were located within daily commuting distances of former white areas, comprising business and work opportunities, and functioned as demographic growth poles that were mostly linked with one or more commuting corridor (Krige and Donaldson, 2000). As a consequence of Apartheid legislation, the urban form of South African cities is considered inefficient and fragmented, presenting complications for integrated development (Morojele, 2005:1). An unavoidable consequence of the latter is explained by L'Etang (2013:13-19) indicating that this

spatial form was one that racially discriminated against the poor population situated on the urban periphery, resulting in high-transportation cost.

Pieterse (2004:81-104) concludes that the various post-Apartheid legislation and policies expecting to intercept the resultant spatially segregated urban forms of Apartheid, are failing and South African cities remain to appear as segregated, fragmented and unequal. Regardless of the intentions of restructuring the urban landscape by integrating spatially segregated precincts, the urban landscape seems to continuously resemble an essentially segregated spatial form and alternative solutions are increasingly contemplated by scholars to readdress this undesired imbalance. In providing a background of incriminating and remedying legislation, policies and guidelines that significantly contributed to the current stance of urban forms in South Africa, and aiming at relieving the current predicament respectively, an overview will ensuing be provided, considering three chronological distinctive epochs, namely:

- Pre-1990: Apartheid and Urban Segregation
- 1990-1998: Transition Phase and Urban Restructuring
- Post-2000: Urban Restructuring and Integration

This chapter will additionally consider the legislation, policies and guidelines that emanated from the “post-2000: urban restructuring and integration” epoch. It will specifically be assessed in so far as their spatial impact is concerned. This will be attempted by identifying specific “spatial drivers” relating to each, as it will be required in the empirical phase of this research. As it is expected, the identified legislation, policies and guidelines within the selected epoch, adopt a wide spectrum of aspects to guide integrated development; especially succeeding the 1994 elections, that will not necessarily be assessed in the ensuing section. Those aspects dealing with spatial restructuring will rather be concentrated on by ultimately identifying the “spatial drivers” entrenched in the post-Apartheid directives.

2.2 Pre-1990: Apartheid and urban segregation

During the Apartheid era, strong land legislation shaped the development of South African cities for the benefit of the white minority. The following section will assess the fundamental legislation, in particular; the Native Land Act (1913), the Native Urban Act (1923) and the Group Areas Act (1950) that had a significant impact in shaping urban forms and to identify the negative impact legislation had on urban development patterns.

2.2.1 Native Land Act, Act No 27 of 1913

The Native Land Act was the first influential legislation implemented by the Parliament of South Africa in 1913, determining the areas “natives” may possess. It was the first legislation in a series that followed, dealing with spatial segregation and separate development of different racial groups (Krige and Donaldson, 2000). The act consisted of a section, Schedule of Native Areas, identifying existing areas where Africans should be located, constituting merely 8% of South Africa’s surface. Section 2 of the Act, recognised contracts were to be terminated (Letsoalo 1987:41), ensuing in eviction of African tenants from white-owned land. It had devastating socio-economic implications for Africans, since Africans not only lost their only source of income but also their homes, locating them to reserved areas or so-called Home Lands, identified by the Act (Maylam, 1986:143). In addition, this section impeded Africans to enter an arrangement to purchase, hire or any acquisition of land situated outside the identified “native” areas.

The goal of the Act was to prevent Africans from owning or hiring white-owned land that already, at that time, had been exerted by a large number of African farmers. The implications were that the black population of South Africa's rights were restricted, not owning or hiring land, causing significant socio-economic and economic growth consequences. The Act was enforced for nearly forty years that, amongst others, led to the uprising of political parties to overturn the Act.

2.2.2 Native Urban Areas Act, Act No 21 of 1923

The Native Urban Areas Act constituted Local Government to establish settlements for Africans situated on the periphery of urban areas, separating them from white settlements to control the increasing influx and to remove excess Africans within former white areas (Maylam, 1990:66). Consequently, only domestic workers, with the permission of their white employers, were legally able to live in white urban areas (Phuhlisani, 2017:9). The Act is regarded as the cornerstone of segregated urban development in South African, strictly controlling the movement of African males (Glücksman, 2010:11) and limiting Africans to undergo any form of land transition in urban areas (Hamilton, 1987:164). Racial segregation was progressively implemented as specific portions of municipal areas were proclaimed as “whites only”, necessitating all non-exonerated Africans and domestic workers not living at their employers to move to the designated African settlements (townships) and hostels (Davenport, 1969:99). The Act authorised the Government’s first major intervention of African urbanisation, providing a central foundation and framework for residential segregation, fiscal segregation, separate autonomous Local Governments in the same urban area, and influx control. These principles ultimately

established the essential elements of urban segregation and Apartheid, whereupon the ensuing segregation policies and legislation would be built (Maylam, 1990:66).

2.2.3 The Group Areas Act, Act No 41 of 1950

The Group Areas Act was introduced as an instrument by the Parliament of South Africa to divide all racial groups into separate residential and business areas of all settlements (Gopalan, 2014:196). Accordingly, racial segregation operated at three distinct levels, for instance; 'petty Apartheid' (detailed social segregation), 'urban Apartheid' (how urban areas were moulded according to the Group Areas Act) and 'Grand Apartheid' (the creation of 'independent' homelands for each of the African ethnic groups) (Thompson, 2001:192).

This Act had the most substantial impact than any of the previously mentioned legislation in terms of racial segregation, establishing segregated cities, leading to the rearrangement of urban form (Maharaj, 1992:74). Separation of these areas was maintained by implementing an alleged buffer strip to decrease accessibility from other groups. Buffer strips were either man-made, for example; railway lines, roads, industrial areas or physical spaces as rivers or open spaces (Smith, 1992:9). The implementation of the Act cumulated in the continuous and often forceful removal of racial groups, relocating them in separate urban areas. The objective was to assert the central business district in prominent white suburbs, while other racial groups were forced to settle at the periphery, resulting in a spatially segregated urban form with the labour force often settled furthest away from employment opportunities and industrial areas (Salo, 2014:6).

2.3 1990-1998: Transition phase and urban restructuring

During 1990, South Africa experienced a democratic transition to eradicate Apartheid (Inman and Rubinfeld, 2013:1), resulting in the establishment of several policies, legislation and guidelines in an attempt to improve, inter alia, the historically distorted settlement patterns. The following section will assess the initial attempts by the Government to lay an improved foundation for the spatial restructuring of segregated urban forms. The first guiding attempt was the Reconstruction Development Programme (1994) followed by the Development Facilitation Act (1995), the Urban Development Framework (1995) and the Moving SA (1998).

2.3.1 Reconstruction Development Programme of 1994

The Reconstruction Development Programme (RDP) of 1994 was introduced by the ruling political party, the African National Congress (ANC), as an integrated, coherent socio-economic policy framework, accumulating all the people and resources of South Africa in a final process to

eradicate, amongst others, the spatial legacy of Apartheid (DFA, 1995:2-3). The Programme was intended as an essential instrument to redress inherited spatial challenges, namely; insufficient housing, unemployment, insufficient health-care, education and a failing economy (Mafame, 2017:14). It essentially identified two objectives: poverty alleviation and economic reconstruction, affirming that the Government should play a fundamental role to enable integrated growth, economic reconstruction and integrated development. It was seen as a first and decisive integrated programme formulated on ideals of integrated and sustainable development, redressing South Africa's economic inequalities, people-driven processes, establishing a connection between redistribution and growth, development and reconstruction into a unified programme (Parnell *et al.*, 2007:9). The Programme was the first policy that identified the necessity to resolve the legacy of Apartheid through land reform, integrated and compact development and sufficient public transportation, developing industries to utilise local resources and attain local needs (DFA, 1995:83).

The Programme, furthermore, emphasised the importance of sufficient passenger transportation infrastructure provision to integrate different modes of transportation; especially road, rail and air. Public transportation should accordingly be established as a more attractive, accessible and comfortable mode than private cars by imposing stricter parking, access and fuel levies (Mahapa, 2003:8). Transportation infrastructure investment may well be encouraged to directly benefit the expansion of public transportation, prioritising the extension of rail transportation, while bus and taxis services should function as feeders to the rail services or as primary modes if neither service are available. Owing to the fragmented nature of South African cities, rural areas necessitate incessant public transportation and enhanced facilities at more affordable costs (DFA, 1995:38-39). The Programme was a fundamental first step to address the spatial imbalances of Apartheid, creating the foundation for future reconstruction policies, legislation and guidelines.

2.3.2 Development Facilitation Act, Act No 67 of 1995

Development Facilitation Act (DFA), Act No 67 of 1995 was introduced as the first post-1994 legal liability to dispose of Apartheid-related planning legislation; especially its Chapter 1, prompting, amongst other, integration and redevelopment principles to address spatial imbalances (DFA, 1995:2). It comprises several liabilities relating to Local Government planning, land application and land tenure, land development and resolution of conflict (Parnell *et al.*, 2007:11). The Act identified essential land development objectives to achieve higher densities within settlements, while promoting development principles curbing continuous urban sprawl. The integrated development of interconnected compact cities with efficient public transportation was earmarked in ensuring a more environmentally friendly urban pattern

(Fataar, 2015:2). Chapter 1 was, as assumable, compulsory to all levels of Government, allowing the facilitation of reconstruction and development programmes and the successful and rapid implementation thereof.

The Act was a national incentive in assisting Local Governments to expedite the release of land for development, providing a short-term solution for urban and rural restructuring (Parnell *et al.*, 2007:11). According to Naude (2001:1-17), the fundamental contribution of this Act was its obligation to all Local Governments to become 'developmental' Local Governments through compiling Land Development Objectives (LDOs) and Integrated Development Planning (IDP). The Act introduced a set of development principles that facilitated the "restructuring of the spatial environment, aiming to redress the spatially fragmented settlement pattern, general urban building principles, promoting compact development and curbing further urban sprawl, in addition to mixed land-use and integrated development that encored the creation of sustainable cities and a transparent process of public participation (Parnell *et al.*, 2007:11). Chapters 5 and 6 of the Act (relating to land-use management) were declared unconstitutional in 2011, causing the ultimate repeal of the Act. The repeal was preceded by the preparation of several interim bills and the final concluding of the SPLUMA.

2.3.3 Urban Development Framework of 1997

The Urban Development Framework (UDF) 1997, informed by the RDP, aims to encourage an urban development programme that effectively reconstructs urban development and govern future urban development policies of all shareholders in the urban development cadre to achieve a collective vision (UDF, 1997:ii). The Framework was introduced by the National Government with the intention to implement radical programmes and strategies to reconstruct the spatial planning of South African cities, ensuring cities to express a higher degree of urban integration, densification and mixed land-use development (Siyongwana and Chanza, 2015:11). The Framework outlines four critical programmes addressing the legacy of Apartheid within urban areas namely; integrating the city, improving housing and infrastructure, promoting urban economic development and creating institutions for delivery (Du Plessis and Landman, 2002:114). Similarly, to earlier programmes, the Framework addressed the Apartheid legacies of segregation, fragmentation and inequality by mainly focussing on functional integration to facilitate integrated planning, regeneration of former townships and informal settlements, comprising mixed land-use development with sufficient services, urban transportation and infrastructure (Siyongwana and Chanza, 2015:11; UDF, 1997:v).

In addition to its integration emphasis, the Framework intended economic integration by suggesting urban nodes that are spatially integrated, constituting economic growth centres

(connected with high-density activity corridors), while providing citizens within these centres with economic and social opportunities and adequate infrastructure and housing services (Drewes and Van Aswegen, 2012:23). The aforesaid was regarded as an instrument to support future development comprising diverse income groups, races and economic activities. Consequently, improved urban integration may generate an increase in employment opportunities and local purchasing power, preventing capital from escaping local communities. This would ultimately ensure a sustainable urban economy being promoted through integration and sufficient urban transportation (Siyongwana and Chanza, 2015:12).

2.3.4 Moving South Africa of 1998

During 1998, the National Department of Transport launched the Moving SA, presenting the CDOM for the first time. It was deemed more fitting to the existing South African urban tenure patterns than more familiar planning approaches (Department of Transport, 1998:136). The Strategy was introduced by the South African Department of Transport during 1998 as a long-term (2020) transportation strategy in the post-Apartheid regime and the need was pertinently expressed to readdress transportation predicaments of the previous regime (Bickford, 2013:1-13). It set a vision to "provide an effective and sustainable urban transportation system, planned and regulated through the lowest possible level of Government, based on competition and largely private sector operation, which reduces system costs and improves customer service in order to meet customer and national objectives for user cost, travel times, choice, and safety" (Department of Transport, 1998:140).

The Strategy was introduced, in support of Chapter 1 of the DFA principles for land development, to redesign South Africa's spatially segregated settlements (Department of Transport, 1998:138). It identified an essential element of urban planning, focusing investment and resources to high-density corridors and nodes that could ultimately support the required threshold for public transportation ridership (Morojele, 2005:9). The Strategy highlighted distance, density and employment location as significant aspects of land-use that affect the urban layout of South African cities and, subsequently, the economies and service levels of public transportation (Department of Transport, 1998:140).

2.4 Post-2000: urban restructuring and integration

Turok (2001:2349-2377) alarmingly observed that development since 1994, tended to reinforce spatially segregated urban forms by locating economic activity centres further away from low-income areas. The urgency to reconsider effective transformation and restructuring are high on the agenda of the Government that resulted in numerous improved policies, legislation and

guidelines, facilitating urban planners to address the spatial imbalances of the past. The following section will discuss the “new era for urban transformation” of South African cities with the initial implementation of the Municipal Systems Act (2000) followed by the Council for Scientific and Industrial Research’s (CSIR) Guidelines for Human Settlement Planning and Design (2000), the Department of Rural Development and Land Reform’s SDF Guidelines (2014) the National Land Transport Transition Act (2000), the National Transport Master Plan (2011), the National Development Plan (2012), the Medium Term Strategic Framework (2014), the Spatial Planning and Land Use Management (2013) and the most recently implemented Integrated Urban Development Framework (2014).

2.4.1 The Municipal Systems Act, Act No 32 of 2000

Section 152 of the South African Constitution of 1996 identified that the most important aspects of post-Apartheid legislation were to establish decentralised Local Governments; therefore, introducing a shift in the role and authority of the Local Government system (Constitution of South Africa, 1996:76). The Local Government functions as a robust system, ensuring democratic and responsible Government for local communities, guaranteeing the provision of services to communities in a sustainable manner, promoting social and economic development, encouraging a safe and healthy living environment and supporting the involvement of communities and public participation in matters of Local Government (Retief and Cilliers, 2015:563-586). In following the Local Government Transition Act (LGTA) and its Amendment Act, Act 61 of 1995, the Municipal Systems Act (MSA), Act 32 of 2000, had at its core the empowerment of Local Government in order to attain its legal mandate, its constitutional goals, increasing its responsibilities and authority; especially in rural areas. The Act was introduced to complement the Local Government: Municipal Demarcation Act, Act 27 of 1998, by facilitating key municipal organisational, planning participatory and service delivery systems (Pycroft, 2000:143-145; Nyalunga, 2006:15-20).

A key instrument of the Act was the introduction of Integrated Development Plans (IDP), warranting the shift in spatial planning from segregated settlements to establishing communities with inclusive citizens, ensuring pro-poor integrated urban land-use management and streamlining urban land-use, enabling racially integrated communities. The Act compelled each municipality to adopt a single and strategic plan (IDP) for the development of its area of jurisdiction; now demarcated within the context of the Local Government: Municipal Demarcation Act. It replaced the segregated driven planning policies of Apartheid with integrated development and co-ordinates all the municipality’s plans in terms of local economic development that are effectively aligned with the national development priorities and objectives (Simphiwe, 2014:8). The Act promotes the Local Government in the spatial planning process

through implementing MSDFs, comprising a spatial vision, development objectives and sector priorities to aid the process of integrated development. The purpose of the Act is to establish co-ordination between different spheres of Government, each with its own responsibilities while aiming to evidently entail the principles of how integrated development may be attained (Coetzee *et al.*, 2000: 5).

2.4.2 Guidelines for Human Settlement Planning and Design of 2000 and Guidelines for the Preparation of Spatial Development Frameworks of 2014

The Guidelines were prepared to assist professionals in establishing sustainable and vibrant human settlements, but also to restructure spatially segregated urban forms. Schlottfeldt (1995a:2) lamented that urban planners and engineers should be provided with planning guidelines intended to assist the decision-making process, as opposed to general standards that enforce absolute limits. The Guidelines promote the CDOM in attaining spatial restructuring, illustrating that, although certain cities may achieve compaction through increased density, the “corridor city” ought to be the preferred urban pattern in South Africa; especially in ensuring that there is equity when spatial planning is attempted (CSIR, 2000:2-84).

The Guidelines similarly advise the model as the most applicable to urban areas, hampered by the prevailing challenges of a spatially segregated urban form. It endorses the appropriateness of the model in intercepting existing dispersed precincts and low inner-ring densities, the decline in central business district vitality and the decentralisation of continuing satellite development nodes. The CDOM additionally recognises the current vacant areas situated between suburban settlements and townships that should be considered in settlement planning. The Guidelines affirm the existence of corridors in the South African context to a certain extent, nonetheless, emphasise that settlement planning should focus on the densification of existing corridors and the establishment of new corridors for future developments (CSIR, 2000:2-84). Warnich and Verster (2005:343-349) depict that numerous South African policies indeed identify the permutations of a corridor development approach as a solution for existing spatial development challenges. Green *et al.* (2002:7-9), in agreement, suggest that this notion is a feasible concept to effectively restructure spatially segregated urban forms, and by implementing it, addresses urban, social and economic distortions. The question, therefore, remains why, irrespective of all these policies and guidelines, urban settlements continue to reflect a segregated character; an enquiry that prompted this research in inclining towards the CDOM as a means for spatial restructuring.

During 2014, the National Department of Rural Development and Land Reform (DRDLR) introduced the SDF Guidelines in support of the preparation of SDFs in alignment with the

recently adopted SPLUMA. It, in essence, intends to assist government spheres and professionals in compiling SDFs with emphasis on local spatial challenges; especially in so far as MSDF is concerned. The SDF Guidelines are aligned with SPLUMA preconditions and stipulations, requiring all levels of government and para-statal to contribute in the MSDF process with explicit sector plans and spatial proposals. MSDFs must incorporate the founding spatial principles identified by SPLUMA in the preparation process (Laubscher *et al.*, 2016:117). The Guidelines finally aspire to align the formulation of MSDFs with the spatial drivers, outcomes and vision of the National Development Plan, while similarly providing a framework for the evaluation of effective MSDFs as a spatial transformation instrument (DRDLR, 2014:7).

2.4.3 The National Land Transport Transition Act, Act no 22 of 2000

The National Land Transport Transition Act (NLTTA), Act 22 of 2000 was introduced to establish appropriate authorities to effectively govern the future development and restructuring of South Africa's land transportation systems (Van Ryneveld, 2008:30). The Act requires all spheres of Government to be integrated into land-use transportation planning in formulating a series of plans, for instance; national land transport framework, provincial land transport frameworks, rationalization plans, public transport plans and integrated transport plans (ITP) (Van Ryneveld, 2008:32). The function of these land-use transportation plans is to facilitate the integration of land transportation functions with related land-use and economic development functions (Morojele, 2005:90).

More specifically, the Act determines that these transportation plans or frameworks should be developed to "enhance the effective functioning of cities, towns and rural areas through the integrated planning of transportation infrastructure and facilities, transportation operations, bulk services and public transportation services, within the context of IDP's and the land development objectives (LDO's) identified in the DFA (NLTTA, 2000:20). The Act, in alignment with the Moving SA, identifies employment opportunities, housing and services, mixed land-use and high-density future development should be focussed adjacent high-performance public transportation corridors, interconnecting previously segregated settlements (Department of Transport, 2006:4). The Act recognises that high-priority should be administered to infill planning and densification adjacent public transportation corridors, promoting public transportation ridership and reducing the need for long distance travel and travel costs to effectively restructure spatially segregated urban forms of South African cities (Department of Transport, 2006:6).

2.4.4 National Transport Master Plan of 2011

During 2011, the National Department of Transport introduced the National Transport Master Plan (NATMAP) to develop “an integrated, smart and efficient transportation system, supporting a thriving economy that promotes sustainable economic growth, supports a healthier lifestyle, provides safe and accessible mobility options, socially includes all communities and preserves the environment” (Morapedi and Makhari, 2017:779). The essential purpose of the Master Plan is to develop a dynamic, long-term and sustainable multi-modal transportation system framework integrated with land-use development to establish efficient networks, interchanges, infrastructure facilities and terminal facilities that attain service delivery objectives for South Africa (Department of Transport, 2011:8). The fundamental function of the Master Plan, due to the fragmented nature of planning initiatives and development, is to establish a central land transportation plan, integrating different stakeholders and Governmental spheres within the planning process to guide transportation planning, spatial planning, management, and operations to attain land-use and transportation development effectively (Situma, 2007:395).

The Master Plan's integrated spatial vision, accommodated in Chapter 5, declares that transportation and land-use planning contain a strong spatial connection and should not be implemented or provided separately (Department of Transport, 2016:5-2). Accordingly, an integrated system that includes land-use development, economic development and transportation development and provides mobility to citizens and access to employment opportunities should be implemented to achieve the Master Plan's future spatial vision of 2050. The integrated spatial vision identifies four critical areas that should be targeted to ensure effective and efficient integration, namely; focus transportation network development adjacent existing corridors, emerging national corridors, economic nodes and hubs and acknowledge alternative modes of transportation (Department of Transport, 2016:5-3). The Department of Transport (2016:5-3) determined that the central leitmotif of the land transportation system development for 2050 should be focussed to existing transportation corridors to connect nodes and hubs in identified areas consisting of economic opportunities. These nodes and hubs should facilitate high-intensity mixed land-use development that is situated adjacent and or near existing, developing or national corridors (Department of Transport, 2016:5-4).

2.4.5 National Development Plan of 2012 and Medium Term Strategic Framework of 2014

National Development Plan (NDP) was presented during August 2012 by the National Planning Commission to facilitate the eradication of poverty and reducing inequality in South Africa by 2030 (National Planning Commission, 2012:24). The importance of the Plan is to address the

increasing levels of poverty and exclusion of the majority of urban citizens from opportunities and services (Subban and Theron, 2016:44). The Plan emphasised the relevance to enhance the public transportation infrastructure, encouraging social and spatial integration, and improving access to facilities and services (Mafame, 2017:16).

According to Luke and Heyns (2013:3) improving investments to transportation facilities and infrastructure and ensuring a sufficient public transportation system are regarded as fundamental development areas required to achieve the 2030 objectives of the Plan. Chapter 8 of the Plan is exceedingly relevant relating to this research as it earmarks the following spatial drivers:

- transforming human settlements,
- various public transportation policies and planning priorities; especially; private sector investment to public transportation facilities to facilitate the extension of bus services,
- restoring urban commuter trains, and
- connecting high-volume transportation corridors to segregated areas, constituting an integrated and effective urban form (National Planning Commission 2012:283–284).

It further points towards sustainable, integrated urban forms to halt continuous urban sprawl while encouraging high-density development within urban areas, simultaneously supported by efficient public transportation systems (Mafame, 2017:17). Segregated areas, mostly comprising ineffective economic activities and intensity, require sufficient public transportation services on a frequent basis that ensures accessibility and mobility for these citizens. This may be achieved by implementing a sustainable and accessible multi-modal transportation system that is integrated effectively with surrounding land-uses, ensuring optimum urban mobility for all urban citizens it serves (Siyongwana and Chanza, 2014:12).

Given the restricted resource allocation and existing urbanisation patterns, subsidised transportation services are limited to high-density mixed development areas adjacent major transportation corridors, supporting the Moving SA's (Department of Transport, 1998:136-140) proposal to densify transportation corridors. Frequent, affordable and sufficient public transportation should be implemented to ensure the first step to the successful transformation of these segregated forms (National Planning Commission, 2012:188). The Plan strongly focussed on the principle of spatial transformation, encouraging the implementation of a new urban framework namely; Integrated Urban Development Framework (discussed below) that address segregated settlement patterns, underdeveloped economic activity centres in "townships" and effectively integrating urban forms to reduce travel times (Phuhlisani, 2017:15).

Succeeding the ratification of the Plan, the Cabinet introduced the Medium Term Strategic Framework (MTSF) in 2014 as a five-year implementation phase of the NDP, commencing work to align with the programmes of national and provincial departments, local municipalities and public entities with the vision and goals set out in the NDP. The aim of the Strategy is to present a framework, prioritising and arranging development initiatives and Government programmes for the next five years to eventually attain the NDP's goals in 2030 (National Planning Commission, 2014:5). Supporting the spatial goals of the NDP, the Strategy emphasises the spatial challenges in urban and metropolitan areas, still comprising fragmented residential settlements, underdeveloped business centres in townships, high-transportation cost and long commute distances between work and home. The Strategy focusses on integrating fragmented urban settlements and efficiently locating future neighbourhoods, to invest in existing and new public transport networks and support economic development for improved job creation (National Planning Commission, 2014:5).

2.4.6 Spatial Planning and Land Use Management Act, Act no. 16 of 2013

"The previous dispensation in South Africa (pre-1994) had an extraordinarily complex legal framework relating to the different segregated areas" (Christopher, 1994:42). In many ways, legislation was central to Apartheid, embedding segregation through strict requirements concerning property rights and; especially ownership. The challenges resultant from this dispensation ensued in an unprecedented reform of former spatial planning legislation, characterised by a keen emphasis on integrated development. Apartheid legislation was complex and fragmented, comprising a planning system consisting of a limited mechanism for integration. The challenges left by Apartheid legislation resulted in a wide scale legal reform of the existing spatial planning legislation, necessitating the need for integrated development. The SPLUMA principles, norms and standards deemed indispensable for the attainment of integrated development (Joscelyne, 2015:43). Section 3 of the Act provides key objectives for the development of an effective, uniform and comprehensive system, promoting social and economic inclusion (Laubscher *et al.*, 2016:48). This section ensures the effective and efficient use of land to redress previous spatial imbalances resultant from the Apartheid era. Sections 6 and 7 of the SPLUMA offered essential development principles, applying spatial planning, land-use management and land development to all organs of state and other authorities/para-statal, implementing related planning legislation (SPLUMA, 2013:16-18). Furthermore, section 8 of the Act identified principles permitting effect to the development of national norms and standards, implicating planning activity procedures, land use management and land development (SPLUMA, 2013:20).

Section 6 of the Act states the primary approach for integrated spatial development is a tiered system, developing a national plan that effects the development of provincial plans, trickling down to district plans and local development plans (SPLUMA, 2013:16). The tiered system is defined as vertical integration, supporting the revised spatial legislation for frameworks to be constant at different spheres of Government. These frameworks must be strengthened by a set of development principles, norms and standards that supports a consistent approach across all spheres of Government. The Act, consequently, ensures the SDFs consistent coordination and cohesive participation throughout the different spheres of Government (Fuo, 2014:354).

The implementation of the Act significantly altered the scope and scale whereby SDFs are developed and requires national, provincial and local authorities to develop the instrument. The Act provides essential guidance relating to content requirements of SDFs to ensure the development of compliant SDFs; especially section 21, identifying that MSDFs should contain more detail than national, provincial and regional SDFs, for example, to include provisions for population growth and housing demands (Padarath, 2015:36).

The Act, it seems, ought to be conducive for an improved integrated planning system to strengthen the connection between spatial planning, land-use management and land development management that is illustrated by placing all aspects of land-use planning under a standardised system and approach. The process of revoking the overabundance of segregation-based legislation of the previous dispensation and standardising the spatial planning process has hence taken motion as a consequence of the promulgation of the Act (Laubscher *et al.*, 2016:6).

2.4.7 Integrated Urban Development Framework of 2014

During 2014, the Government of South Africa introduced the Integrated Urban Development Framework (IUDF), in addressing diverse urban challenges thereby also responding to Chapter 8 of the NDP to transform human settlements and stimulate economic development at specific opportunity areas (Infrastructure Dialogues, 2014:2). The Framework is by all means, designed as a spatial framework, considering that both urban and rural areas should operate in close affiliation with one another in achieving a sustainable urban environment (De Beer, 2016:37). The Framework was initiated to establish the Government's policy position with the aim of guiding the future development and management of urban areas across South Africa (Venter, 2017:3), while ensuring a framework that provides a practical meaning to the urban vision of the NDP (Department of Cooperative Governance and Traditional Affairs, 2013:9). The Framework is described as the "new deal" for South African cities, in managing the "development of inclusive, resilient and liveable urban settlements that squarely address the unique conditions and

challenges facing South Africa's cities and towns" (Department of Cooperative Governance and Traditional Affairs, 2014:8). The Framework guides future urban growth in a sustainable growth model that is compact, integrated and coordinated (Department of Cooperative Governance and Traditional Affairs, 2016:7).

Achieving the aforementioned, the Framework identified four fundamental goals, in particular; access, growth, governance and spatial transformation, including nine policy levers necessary to attain future integrated urban development (De Beer, 2016:3). The nine integral policy levers required to support the goals are:

- integrated spatial planning,
- integrated transportation and mobility,
- integrated and sustainable human settlements,
- integrated urban infrastructure,
- efficient land governance,
- inclusive economic development,
- empower active communities,
- effective urban governance, and
- sustainable finance (Department of Cooperative Governance and Traditional Affairs, 2014:29-30; Department of Cooperative Governance and Traditional Affairs, 2016:8-10).

The "new deal" for urban forms requires sufficient transportation systems and infrastructure are essential to attain the spatial transformation of previously segregated forms. Supporting the fundamental objective of the CDOM (Department of Transport, 1998:136-140), the Framework identified that future infrastructure and development should be concentrated adjacent high-volume transportation corridors and adjacent emerging economic activity centres (Department of Cooperative Governance and Traditional Affairs, 2016:35).

2.5 Conclusion

Pre-1994 policy, legislation and guidelines were, in essence, founded on racial segregation and control of non-whites migration into urban settlements (Pieterse, 2002:3-37). The reserved white areas were ideally located for development opportunities, with the necessary resources and infrastructure as opposed to the areas reserved for non-whites. Little attention was given to the everyday needs of non-whites (Zegeye and Maxted, 2003:1). This dispensation empowered Local Government to facilitate and regulate the objective of racial segregation and separate development. Naude (2001:1-17) deems the Group Areas Act as one of the most infamous centrepieces of Apartheid legislation. The resultant effect was, inter alia, unequal and distorted

social, spatial and economic urban settlement configurations. Racially and spatially segregated settlements gradually dictated a transition from an “Apartheid Government” to a “Democratic Government”, finally brought about by the countdown to the 1994 democratic elections, and its aftermath. The elected Government embarked on a rigorous endeavour to decimate segregation-based legislation. It was achieved by establishing initial intermediary Local Government that comprised all races of all settlements, employing new principles, philosophies and support systems to successfully transform Local Government. Naude (2001:3) confirms that this process of spatial transformation was supported by a firm legal driving force. Following the interim period and the demarcation of the entire country, sovereign Local Governments were, amongst others, inaugurated further building on the foundations of integrated strategic and settlement planning.

The RDP may be regarded as the most significant implementation in addressing inherited spatial challenges (Parnell *et al.*, 2007:9). The ensuing DFA, and its Chapter 1 principles, fulfilled the intention of changing the development processes and guiding Local Governments in their integrated spatial development role. The DFA’s rationale must be related to the intricacy of the period in which it was established. Its purpose was to cut through a complex montage of timeworn legislation that was frustrating to develop. The DFA’s inclination, from the onset, was to establish newly elected democratic and demarcated municipalities to facilitate equal and integrated spatial development (Naude, 2001:1-17). The UDF, subsequently, engaged in the reconstruction of existing urban development, directing future urban development and strategies to reconstruct spatially segregated urban forms in South African. The Moving SA is perceived as a further and pertinent impetus in redesigning and designing South Africa’s spatially segregated settlements and future settlements by disposing development to intercept sprawl and towards high-density corridors and nodes that may ultimately support the required threshold for public transportation ridership.

In attaining the need for spatial change, reorganised and aligned Local Government structures were deemed key, culminating in the MSA, facilitating municipal organisational changes, integrated and participatory planning and service delivery systems (Pycroft, 2000:114; Nyalunga, 2006:19). In further supporting the sustainable design of urban forms, the NLTTA instituted revised land transportation systems (Van Ryneveld, 2008:30) with emphasis on infill planning and densification adjacent to public transportation corridors. Numerous “reconstructive” legislation and directives, and the repeal of segregation-based legislation followed the post-1994 era, largely directed at unravelling the detrimental Apartheid events. The long-anticipated advent, and in many ways, “the dawn that has come” (Paton, 1988:236) may well be regarded as the eventual promulgation of the SPLUMA during 2013 and its commencement during 2015,

finally repealing remaining discriminatory and dysfunctional National legislation and providing a single and conclusive act to advance spatial planning and land-use management. Finally, the most recently prepared IUDF is a direct response to Chapter 8 of the NDP by guiding the future development and management of urban areas across South Africa (Venter, 2017:3). The IUDF is decisive in progressing the establishment of “inclusive, resilient and liveable urban settlements and equitably undertaking the unique conditions and challenges facing South Africa’s cities and towns”.

This chapter reflects on several and overarching undertakings, attempted by the Government since 1994, to restructure the remnants of the distorted settlements of Apartheid, by implementing policies, legislation and guidelines to eradicate the fragmented nature of South African cities. As introductory outlined, policies, legislation and guidelines were further assessed in identifying and purposefully selecting the specific “spatial drivers” contained therein that ought to be reflected upon in the preparation of MSDFs. In this regard, the MSDF is seen as a significant instrument to attain integrated planning. By employing the identified methodology (Chapter 1), the purposefully selected “spatial drivers”, summarised in Table 2.1 below and emanating from the assessed policies, legislation and guidelines and literature review, will be further progressed into a theoretical matrix. The selected methodology will extensively be discussed in Chapter 5, explaining how the numerous and copious selected spatial drivers, were advanced through a process of open coding (Cohen *et al.*, 2018:671) and categories (Morse, 2008:727) for inclusion in the theoretical matrix.

In commencing with the research, the ensuing Chapters (3 and 4) will, through an extensive literature review, aggregate the existing, augmented and additional attributes deemed applicable to the CDOM, also for inclusion in a theoretical matrix. By identifying the “spatial drivers” in this chapter, the attributes of the CDOM and other planning approaches in the ensuing chapters, a more exhaustive understanding of the contributing elements and forces conducive to the spatial restructuring of South African cities, may well be arrived at. This comprehensive assessment will ultimately be culminated in an expanded assessment matrix to conduct the empirical phase of this research.

Table 2-1: Purposefully Selected Spatial Drivers Derived from The Literature Review

<u>Directives</u>	<u>Reference</u>	<u>Purposefully Selected Spatial Drivers Derived from The Literature Review (emanating from the policies, legislation, guidelines)</u>	<u>Codes (Derived from the Purposefully Selected Spatial Drivers)</u>
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<u>Directives</u>	<u>Reference</u>	<u>Purposefully Selected Spatial Drivers Derived from The Literature Review (emanating from the policies, legislation, guidelines)</u>	<u>Codes (Derived from the Purposefully Selected Spatial Drivers)</u>
National Development Plan of 2012	Mafame, 2017:16-17.	Enhance the public transportation infrastructure, encouraging social and spatial integration, and improving access to facilities and services.	▪ Upgrade informal settlements ▪ Improve balance between location of jobs and people ▪ Mixed Land-Use in relation to Transportation Routes ▪ Better located housing and settlements ▪ Encourage Private Investment ▪ Sufficient Transportation system ▪ Densification in relation to Transportation.
		Establish integrated urban forms to halt continuous urban sprawl, while encouraging high-density development within urban areas that are simultaneously supported by efficient public transportation systems.	
	National Planning Commission 2012:188–284.	Encourage private sector investment to public transportation facilities to facilitate the extension of buss services, restoring urban commuter trains and connecting high-volume transportation corridors to segregated areas, constituting an integrated and effective urban form.	
		Frequent, affordable and sufficient public transportation should be implemented to ensure the first step to successful transformation of these segregated forms.	
Medium Term Strategic Framework of 2014	National Planning Commission, 2014:5.	Integrating fragmented urban settlements and efficiently locating future neighbourhoods, to invest in existing and new public transport networks.	▪ Improve balance between location of jobs and people ▪ Encourage Private Investment ▪ Sufficient Transportation system
Integrated Urban Development Framework of 2014	Department of Cooperative Governance and Traditional Affairs, 2013:9.	Ensuring a framework that provides a more practical guide to the NDP vision.	▪ Guide NDP Vision ▪ Integrated Development ▪ Densification

<u>Directives</u>	<u>Reference</u>	<u>Purposefully Selected Spatial Drivers Derived from The Literature Review (emanating from the policies, legislation, guidelines)</u>	<u>Codes (Derived from the Purposefully Selected Spatial Drivers)</u>
	Department of Cooperative Governance and Traditional Affairs, 2014:8.	Development of inclusive, resilient and liveable urban settlements that squarely address the unique conditions and challenges facing South Africa's cities and towns.	▪ Public Transportation ▪ Sector Priorities ▪ Corridor Densification
	Department of Cooperative Governance and Traditional Affairs, 2016:7-35.	Guide future urban growth in a sustainable growth model that is more compact, integrated and coordinated.	
		Future infrastructure and development should be concentrated adjacent high-volume transportation corridors and adjacent emerging economic activity centres.	
Municipal Systems Act no. 32 of 2000	Simphiwe, 2014:8.	Integrated development and co-ordinated all the municipality's plans in terms of local economic development that is effectively aligned with the national development priorities and objectives.	▪ Policy Alignment ▪ Spatial Vision ▪ Sector Priorities ▪ Spatial Objectives
	Coetzee <i>et al.</i> , 2000:5.	Aimed to promote the Local Governments in the spatial planning process through implementing MSDFs, comprising of a spatial vision, development objectives and sector priorities to aid the process of integrated development.	
Spatial Planning and Land Use Management Act no. 16 of 2013	Joscelyne, 2015:43.	Implemented critical elements for spatial planning that include development principles, norms and standards.	▪ Policy Alignment ▪ Spatial Vision ▪ Explicit Plans ▪ Sector Priorities ▪ Spatial Objectives
	Laubscher <i>et al.</i> , 2016: 48.	SPLUMA provides key objectives for the development of an effective, uniform and comprehensive system that promotes social and economic inclusion.	

<u>Directives</u>	<u>Reference</u>	<u>Purposefully Selected Spatial Drivers Derived from The Literature Review (emanating from the policies, legislation, guidelines)</u>	<u>Codes (Derived from the Purposefully Selected Spatial Drivers)</u>
	SPLUMA, 2013:16-18.	Introduced essential development principles, applying spatial planning, land use management and land development of all organs of state and other authorities that implement related planning legislation.	▪ Precinct Plans ▪ Restructuring Elements
		Integrated spatial development is a tiered system, developing a national plan that effects the development of provincial plans, flowing down to district plans and local development plans.	
	Fuo, 2014:354.	The frameworks are strengthened by a set of development principles, norms and standards that supports a consistent approach across all spheres of Government.	
SDF Guidelines of 2014	Laubscher <i>et al.</i> , 2016: 117.	The SDF Guidelines originated from the SPLUMA preconditions and stipulations, requiring all levels of government to implement an SDF with explicit sector plans and spatial proposals	▪ Vision ▪ Policy Alignment ▪ Spatial Challenges ▪ Sector Plans ▪ Spatial Proposals ▪ Guidelines
		SDFs should aim to incorporate the founding spatial principles identified by SPLUMA into the preparation process.	
	DRDLR, 2014:7.	Assist government spheres on the preparation of SDFs in attaining local spatial challenges.	
		The SDF Guidelines aim to align the formulation of SDFs with spatial outcomes of the NDP while providing a framework for the evaluation of effective SDFs as a spatial transformation instrument.	

Source: Own construction (2018).

CHAPTER 3 UNRAVELLING THE CORRIDOR DENSIFICATION OPTION MODEL

3.1 Introduction

This chapter aims to address sub-research question 2:

2. What is the rationale, attributes and implementation aims of the existing CDOM as it was initially portrayed in both the Moving SA and the Guidelines?

Cities play an essential role in the economic foundation of a country, as cities are areas where the largest portion of the population accumulates in search of improved living standards. Consequently, the urban form of a city is a fundamental element to sustain and improve its function as economic focal point and population centre (Morejele, 2005:1-10). The urban form of cities influences equity, energy efficiency, environmental conservation, promoting more efficient use of infrastructure and ultimately enhances the quality of urban life (Steyn, 2005:1). In this sense, urban form is considered a valuable spatial planning tool. Quite by contrast, a dysfunctional urban form, often resultant from policy and legislation, may have a detrimental effect on the quality of life.

In South Africa, the spatial patterns and resultant urban form of cities were mostly controlled by policy driven planning practices and legislation stemming from the Apartheid regime (Morejele, 2005:1-10). Due to this fundamental parallel dispensation, settlements became segregated, resulting in dual central business districts, mono-functional residential precincts associated with physical and land-use barriers. As a consequence, spatial imbalances evolved where white settlements were located adjacent or near a high-quality central business district (CBD) and or other main economy nodes, while former black settlements were located on the periphery of the city in settlements of a lower developed standard (Pieterse, 2002:3-37). As an outflow of Apartheid legislation, contemporary urban forms of South African cities are considered inefficient and fragmented, presenting severe complications for integrated development (Morejele, 2005:1-10).

Following the eradication of Apartheid in 1994, a demand for alternative planning practises was imminent in promoting spatial integration of all racial groups, rethink urban form and to address the spatial imbalances that resulted from discriminatory legislation. However, urban developments since 1994, tended to locate economic activity centres and mono-functional

neighbourhoods further afar, away from existing activity centres and low-income areas, reinforcing spatially segregated urban forms (Turok, 2001:2349-2377).

In 1998, the Department of Transport reacted to the impacts that physical segregation of cities had on the transportation sector and initiated the Moving SA. The Strategy of the Department of Transport (1998:136-140), for the first time, introduced the CDOM as an approach to remedy spatial injustices (induced by the urban form) through a new integrated transportation plan.

Although the CDOM was introduced as a possible means to address the distorted urban forms of South African cities following the Apartheid era, it appears as if urban planners neither gave it thought nor did it gain momentum as a feasible approach to attain restructured urban forms. Van Niekerk (2016:49-72) confirmed that the CDOM could be implemented as a Model that may well assist both transportation planners and urban planners to attain restructuring in certain South African cities. The structural arch of this chapter, investigates the CDOM and its planning approaches, as initially proposed by the Moving SA and the Guidelines, in an attempt to improve the comprehension of the CDOM as a probable means to address spatial imbalances through the spatial restructuring of spatially segregated urban forms. The ensuing section will elaborate on the initial presentation of the CDOM, as depicted in the Moving SA and the Guidelines, to investigate its initial planning approaches.

3.2 Understanding the corridor densification option model (CDOM)

Interceptions of incessant segregated growth combined with urban sprawl are becoming increasingly evident in the urban context. The South African Cities Network (SACN) (2015:4) proposed intervention as a prerequisite to duly address the impact of colonial planning and its legacy, still prevalent in most urban areas. During 1998, the National Department of Transport prepared the Moving SA; presenting the CDOM as a more fitting response to the existing South African urban form than more familiar planning approaches (Department of Transport, 1998:136-140), instituting urban sprawl and mono-functional residential neighbourhoods.

It was predominately introduced as a long-term (2020) transportation strategy in the post-Apartheid regime strongly readdressing transportation predicaments of the previous dispensation (Bickford, 2013:1-13). Its vision was to “Provide an effective and sustainable urban transportation system, planned and regulated through the lowest possible level of Government, based on competition and largely private sector operation, which reduces system costs and improves customer service in order to meet customer and national objectives for user cost, travel times, choice, and safety” (Department of Transport, 1998:131).

Consequently, the Moving SA was introduced, supported by the compulsory Chapter 2 principles of the DFA (DFA, 1995:8). Although since repealed, these principles were set as an initial attempt in addressing the distorted urban forms of a pre-1994 South Africa. Although three significant strategies were recommended in the Moving SA (Department of Transport, 1998:136-140), this research emphasises one significant principle, namely employment of the CDOM as a means to facilitate spatial restructuring of the urban forms.

The CDOM was deemed more “appropriate to the existing South African land-use patterns”, representative of a spatially segregated urban form (Mabin, 1992:19-21). Most cities in developing countries originated in a “tentacle pattern”, further supporting the applicability of the CDOM to South African cities (Berger *et al.*, 2010:4). Also, the propensity of progressing decentralisation of workplace locations away from the CBD and residential areas are complicating the issue to create more “compact cities” (Gordon and Richardson, 1997:95-96). The latter scholars, it seems, are advocating an alternative approach to address spatially distorted urban forms.

The CDOM additionally, identifies vacant areas occupying the space between most segregated areas, encouraging infill development adjacent major corridors where the development of these vacant areas could ultimately reduce urban sprawl while improving the city’s social and economic amenity (Smith, 2008:1). The Moving SA continues by proposing that distance, density and employment location are all aspects of land-use that affect the urban form of South African cities and their economies and service levels of public transportation (Department of Transport, 1998:136-140). This specific predicament is framed by Donaldson (2001:1-9), arguing that South African cities are amongst the most ineffective in the world, characterised by low-density sprawl, segregation and fragmentation.

Figure 3-1 below illustrates the initial CDOM, presented in the Moving SA (Department of Transport, 1998:136) as an attempt to readdress transportation challenges caused by urban form. Apartheid legislation enforced separate development of different racial groups, stemming the majority of cities to develop in a 'tentacle' pattern where satellite settlements were established outside the urban periphery and connected to the CBD by a high-speed transportation corridor. The main principle of the CDOM is to densify adjacent these high-speed transportation corridors to facilitate improved access to job opportunities, facilities and services for all citizens. The vacant land situated between the satellite settlements and CBD should be identified for infill development since appropriate infrastructure currently exist in these areas, reducing costs of new development and infrastructure provision. Additionally, it is essential that new development in infill areas attain a high-density mixed land-use approach to reduce

continuous low-density urban sprawl and mono-functional development, concurrently creating vibrant and more integrated cities.

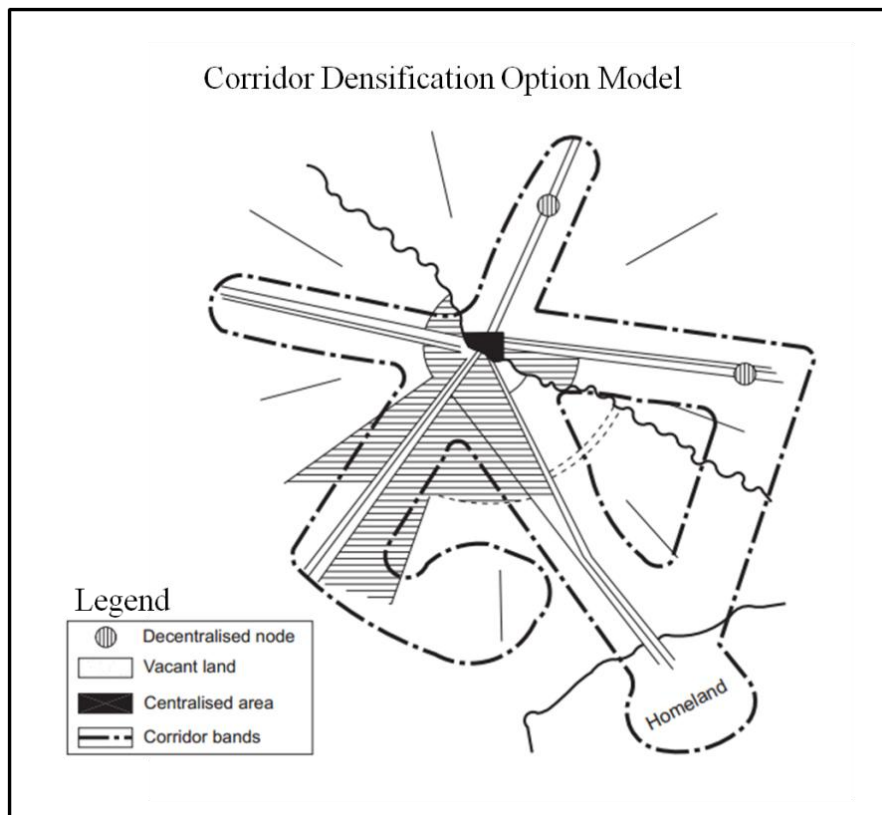


Figure 3-1: Corridor Density Option Model

Source: Department of Transport (1998:137).

Restructuring is, of late, high on the agenda in South Africa, as the recently promulgated SPLUMA (SPLUMA, 2013:14) requires planners to redress the imbalance of the past by identifying “significant structuring and restructuring elements of the spatial form of the municipality, including development corridors, activity spines and economic nodes”. The CDOM, nevertheless, focused much earlier (1998) on the densification of corridors to remedy spatially segregated urban forms through intercepting dispersion. Spatial restructuring of segregated urban forms in South Africa should, therefore, focus on integrating existing transportation systems with efficient activity nodes (Williams, 2000:171-172). Although the CDOM was introduced as a possible means to remedy the Apartheid legacy, it appears to have neither been employed by transportation planners nor urban planners and limited examples, if any, thereof are depicted of urban forms that evolved since 1994. Schensul and Heller (2010:79-81) lamenting, as late as 2010, that social and economic transformation in the post-Apartheid era had made no progress and, at worst, increased inequality and spatial segregation. The researches lamentations are supported in the findings of Schensul and Heller (2010:79-81),

additionally supported by Dewar (1995:407-420), arguing that existing South African cities are characterised by low-density urban sprawl, continual fragmentation and separate development, making them some of the most inefficient in the world. After many efforts of post-Apartheid urban development legislation and policies to address spatial fragmentation, it seems that South African cities appear as segregated, fragmented and unequal as previously (Pieterse, 2004:81-104). It is apparent that developments since 1994, tended to reinforce spatially segregated urban forms by locating economic activity centres further away from low-income areas/townships (Turok, 2001:2349-2377).

Implementation of the CDOM was seemingly met with uncertainty, mostly relating to it not being properly populated with attributes and presenting a more comprehensive explanation of its application and possible requirements to be successfully employed in areas where segregated urban forms, prevailed. Although certainly not deemed the only means for spatial restructuring of segregated urban forms, the resultant effect was the continuance of segregated settlements. It is comprehensible why Strauss (2017:47-51) reported that principal spatial injustice holds profound implications for the planning and development of integrated settlements; especially in medium and small sized settlements, where segregation prevails in stark contrast with the transformative nature of the South African Constitution (Constitution, 1996: 5-11).

Following the repeal of the Moving SA by the Department of Transport during the late nineties, the CDOM appeared to be forgotten and therewith it's potential to serve as a means for restructuring of prevailing segregated urban forms. The CDOM almost immediately resurfaced during 2000 in the Guidelines (CSIR, 2000:2-84); sustaining the strong belief that it could serve a purpose in readdressing spatial imbalances and injustices in a post-Apartheid South Africa. The aim of the Guidelines was, amongst others, to aid professionals in creating vibrant and liveable human settlements and reaffirmed that, although some cities could achieve compaction through increased density, the "corridor city" was captured as the preferred urban settlement pattern (CSIR, 2000:2-84); especially in ensuring that there is equity in the application of spatial development planning. The Guidelines, additionally, presented a more extensive representation of the CDOM, referring concisely to additional planning approaches that could be included for its further enhancement, placing emphasis on urban densification, corridor development, infill planning, urban regeneration and public transportation. Similar to the Moving SA, the Guidelines recommend that the CDOM is most applicable to areas characterised by spatially segregated urban forms. It further endorsed the appropriateness of the CDOM in intercepting existing dispersed precincts and low inner-ring densities, the decline in CBD vitality and the decentralisation of continues satellite development nodes (CSIR, 2000:2-84).

The Guidelines (CSIR, 2000:2-84) further perceived that corridors currently exist to some extent and that settlement planning should focus on the (i) densification of existing corridors and the (ii) establishment of new corridors. Warnich and Verster (2000:343-349) depict that numerous South African policies identify permutations of a corridor development approach as a solution to restructure fragmented urban forms. In agreement, Green *et al.* (2002:7-9) suggest that this notion is a feasible concept that could effectively be employed as a means for spatial restructuring, and by implementing it, also addressing urban, social and economic distortions. Although the Moving SA was repealed, the importance of the CDOM was endorsed shortly afterwards by the CSIR, inserting the original model, as depicted by the Moving SA, in the Guidelines. Owing to the initially vague nature of the original CDOM as depicted in the Moving SA and the Guidelines, the ensuing section will concurrently attempt to identify the initial planning approaches and extensively discuss them.

3.3 Unravelling the initial corridor densification option model

Although the CDOM was, in its original form, proposed as a strategy to readdress transportation in the post-1994 dispensation, Van Niekerk (2016:49-72) provisionally demonstrated that it may well contribute to spatial restructuring considering its applicability from a land-use perspective. It was, however, argued that the contributing factors, resulting in its application failure, may well have been its broad and undefined description, inaccuracy of what it holistically aimed to attain, not being comprehensive in identifying planning approaches supporting its underlying objectives, avoiding to classify specific circumstances required to reinforce its employment and that its origin was mostly from a transportation perspective, not necessarily focusing on additional planning approaches.

A model may be used for more than one function, as supported by Harvey (1969:11), arguing that the same model may be used for many different functions, in this instance, both transportation and land-use constructs are deemed fitting for the CDOM. It must be perceived that, since its initial proposal as a means to address spatially distorted urban forms in the late nineties, numerous spatial restructuring planning approaches since echoed extensively across the different approaches of compact cities, TOD, new urbanism, shared cities, transit cities to smart growth that may well be conducive in enhancing the CDOM from its early origins during the mid-nineties (Tornberg, 2011:3). This multi-applied approach attempts to address urban forms, whereby the reciprocal application of more than one planning approach is contemplated to have pertinent linkages with a multifunction approach. Although valuable to investigate, this research is focussed on the original CDOM and its implications for the spatial restructuring of segregated urban forms. In this regard Gunder and Hiller (2009:195) certain that innovative planning will only come to pass if alternative ways of thinking and doing are engaged with.

The urgency to reconsider the augmentation of the initial CDOM planning approaches is compelled in recent legislation (SPLUMA, 2013:2), advocating planners to redress the imbalances of the past. It was further strengthened through the SDF Guidelines (2014:13) prepared by the Department of Rural development and Land Reform, aiming to redress spatial injustices and the restructuring of socio-economic and environmental considerations in land-use management in order to "balance current development needs with those of the future generations in a transformative manner".

Considering these appeals, and apart from attaining a clearer understanding of the CDOM and its rationale, the research intends to target its further population through identifying contemporary planning approaches in addition to the initial planning approaches of the CDOM. In this respect, Harvey (1969:148) again convincingly argues that a model may have various functions and definitions in order to "perform its function through a multiplicity of media". The latter, and as it was argued by van Niekerk (2016:49-72), is perhaps deemed a potential deficiency of the initially proposed CDOM, being, to some degree, mono-dimensional and vaguely populated, not necessarily employing additional planning approaches. Although the CDOM nominated the specific planning approaches (refer to Figure 3-1), in particular; urban densification, compact city, corridor development, infill planning, urban regeneration and public transportation planning, it will be unravelled in more detail in the ensuing section, by further investigating these approaches.

3.3.1 Urban densification

The Moving SA considered the densification of both existing transportation infrastructure and land-use patterns as the single most important component of the urban strategy to lower overall system costs (Department of Transport, 1998:137). The CDOM connects major activity nodes, creating the purposeful interaction that requires high-density residential (densification) and commercial development focussed adjacent major transportation corridors, an aspect also specifically dealt with in the CDOM (Donaldson, 2006:344-345). Corridors are not merely seen as transportation corridors, but the CDOM portrays its additional function in the spatial restructuring of segregated urban forms. Such is evident in the Densification Policy of Cape Town (2012:2), describing densification, also prescribed in the CDOM's corridor bands, as "the increased use of space, both horizontally and vertically, within existing areas or properties and new development, accompanied by an increased number of units and population threshold", implying that densification may well occur on any developable area within the city. Vacant infill sites (illustrated in the CDOM, see Figure 3-1) within the urban context and 'Greenfield' sites that correspond with the city's policies in terms of future development, are preferred for urban densification (Smith, 2008:1).

In order to attain restored urban forms and intercept further urban sprawl, densification zones may well be identified in lower density development and suburbs. Densification zones ought to be identified in town and city centres, typically as “Brownfield” sites, unutilised institutional lands (Government of Ireland, 1999: 10-12) and “lost urban space” as described by Trancik (1986:3). These strategic areas could be given higher priority for densification policies, considering that current built-up areas in these zones result in greater Government saving for not purchasing expensive land for new development (Nordic Centre for Spatial Development, 2012:1-2).

In considering urban densification, policies may vary in its applicability. The City of Tshwane (2005:15-20) similarly proposes zones adjacent to high-level public transportation routes (typically identified as corridor bands in the CDOM) and transportation nodes; especially in proximity of employment and mixed-use areas that encourage alternative modes of transportation rather than private car usage while reducing the exploitation of outer urban “Greenfields”. The City of New York (2015:1-2) recognises that urban density designs relating to walkability, could provide efficient infrastructure and public open spaces that ensure social integration, economic and creative vibrancy and a healthy living environment.

Ultimately, urban densification is fundamental to the integration of urban mobility systems at two essential levels: walkability of neighbourhoods and urban transportation systems. Aforementioned ensures that daily destinations are accessible for pedestrians generating higher ridership demands that provide dependable, frequent and efficient transportation systems within increased fare box returns and efficient public investment (City of New York, 2015:1-2). Urban densification is, therefore, applied in the CDOM in enhancing its applicability; especially considering its argumentation drives various agendas, although in this instance a “cultural pull” and possible spatial restructuring of segregated urban forms.

3.3.2 Compact city

The Moving SA (Department of Transport, 1998: 136-140) contemplates that the compact city approach is an additional option to increase city densities in a tight radius around the original CBD. Enhancing central city densities may increase public transportation use and sustainable land-uses, however, this approach may fail in numerous cities in South Africa considering the historic land tenure patterns. Due to the fragmented nature of South African urban forms, cities are associated with continuous urban sprawl, resulting in the loss of civic spaces and extended hours of traffic congestion (Belzer *et al.*, 2006:1). Churchman (1999: 389-411) proposed that a compact city, also identified in the CDOM, should aim to intensify central development, combining higher residential and commercial density, mixed land-uses and establishing development restrictions outside an identified area. Restriction of development in certain areas

meant the reserving of high-potential agricultural land situated on the periphery being under the risk of urbanisation,

Burton (2002:226) identified three key aspects of the compact city: high-density, mixed-use and intensity. High-density and mixed land-uses are associated with the urban form of the compact city, while the third aspect relates to the process that should be followed to create a more compact city. The compact city model may be considered as the opposite of urban sprawl, focussing on restrictions to urban growth in specified areas, intensification in certain urban areas and mixed land-use development that emphasis the role of public transportation and effective urban design (Arbury, 2005:15). These aspects are versatile, meaning high-density cities have a high-average population density, high-density built environment, high-density sub-centres, high-density residential areas and density values. Mixed land-use cities have various and diverse supply of facilities and services, constituting both horizontal and vertical mixed-uses. Cities that are intensified have an increase in population, development, the density of sub-centres or nodes and mixed-uses (Burton, 2002:226). SACN (2016:33) confirmed that since 2014, South African cities experienced its highest-level (78%) of urbanisation, supporting the application of the compact city model in the CDOM and its applicability within the South African context.

The compact city model may be implemented as a multi-functional, high-density development that consist of diverse land-uses such as residential, commercial, institutional and corporate, connecting the land-uses with an effective transportation system. The urban form is organised, encouraging walking, cycling and consist of an effective public transportation system that promotes an environment of social interaction (Shrivastava, 2009:7-8). Compact urban development as a component of compact city commonly may also refer to compact development on a neighbourhood or smaller scale than the entire city. Accordingly, this could establish urban compactness within identified neighbourhoods, encouraging high-density development, mixed land-use development, sufficient public transportation systems and environmental conservation (Matsumoto, 2011:17). The unique urban form of contemporary South African cities complicates the implementation of the compact city model, however, the concept of compact urban development may be achievable in certain areas of cities to facilitate spatial restructuring.

3.3.3 Corridor development

Corridor development was considered by the Moving SA as it fits more appropriate in the existing spatial patterns of South Africa as corridors currently exist to some extent in South African cities. Consequently, the Moving SA identified that densification should be focussed

adjacent these corridors and the establishment of new corridors, connecting distant satellite nodes to facilitate spatial restructuring of segregated urban forms (Department of Transport, 1998:136-140). Corridor development and its vast implication are well documented and established in the academic cadre. Its practical implications appear to be successful in several urban environments (City of Hamilton, 2012:2-18; Logan, 2012:22-25; City of Cape Town, 2012:5-10). The inclusion thereof in the CDOM is certainly comprehensible. The corridor development approach could provide an important opportunity to create vibrant pedestrian and transit-orientated areas through investment in infrastructure, residential intensification, infill planning and redevelopment (City of Hamilton, 2012:2-18). A corridor may be considered as a “linear strip of land that connects, major activity nodes, navigating urban or interurban areas that surround a major transportation facility that provides an appropriate level of mobility and accessibility to the surrounding areas that consist of a high-concentration population and mixed land-uses” (Andersen and Burnett, 1998:2). Chittenden *et al.* (1990:5) contributory argued that a corridor is supported by the combination of efficient activity spines that connects multiple activity nodes, while mobility is ensured within the main routes. They additionally identify activity spines as major roads or railway lines that support high-density development and mixed land-use adjacent transportation facilities. By identifying multiple corridor bands, connecting (see Figure 3-1 above) several activity nodes and, more specifically communities, the CDOM supports the approaches resonated by Chittenden and several other scholars (Andersen and Burnett, 1998:2; Logan, 2012:22-25).

Most cities in “developing countries developed in a ‘tentacle pattern’ adjacent major roads leading to the CBD while continuing sprawl as a result of private car ownership” (Berger *et al.*, 2010: 4). In response, the City of Cape Town (2018:2) ensues that the corridor approach challenges urban planners to rethink future development adjacent major public transportation strips. The corridor approach facilitates the transportation of more people than currently possible with private vehicles, although using the same amount of land and limiting the social and environmental impact of urban mobility (Berger *et al.*, 2010:4).

The aim of this approach is seen as an attempt to enhance a more sustainable urbanisation pattern in order for citizens to gain access to services and facilities without having to depend on private car transportation (Berger *et al.*, 2010:4; City of Cape Town, 2018:2). Additionally, corridors could probably be used, in the South African urban context, as a means to attain an integrated urban form that is effectively and efficiently connected, contributing to citywide financial growth and employment opportunities (Green *et al.*, 2002:7-9). The CDOM essentially is a guideline suggested by role playing Government official “to address past spatial and regulatory imbalances” (SPLUMA, 2013:2).

3.3.4 Infill planning

Housing targets forces the Government to locate new neighbourhoods on cheap, available land on the urban periphery that causes continuous urban sprawl. These dispersed neighbourhoods should be provided with transportation systems and other facilities, increasing long-term costs and inefficient development patterns (CSIR, 2000:2-84). Resolving this phenomenon, the Moving SA recognised the vacant areas residing open spaces between most segregated neighbourhoods and urban areas, facilitating the use of these areas for infill development that is situated adjacent existing corridors (Department of Transport, 1998:136-140).

Apartheid legislation resulted in spatially distorted urban forms divided by a variety of “buffers” to ensure a physical and racial separated urban form characterised by urban sprawl (Donaldson, 2001:1-9). Typical “buffer” areas, where they are not physically limiting, may purposefully be considered as suitable for infill planning; especially as their intention was to, by means of interventions, separate communities. Infill development in existing urban areas would halt continuing dispersion and further low-density residential development at the periphery (McConnell and Wiley, 2010:1-14). The CDOM equally suggests the identification of vacant areas (illustrated in Figure 3-1 above) for infill planning purposes. It additionally substantiates that, although selected compaction may be achievable as a means of infill (related to corridor bands); the “corridor city” seems to be the preferable urban form (CSIR, 2000:2-84). As earlier suggested, this reciprocal application of both the corridor city with associated infill planning, is perhaps a more appropriate response than attempting to singularly apply a specific approach. This argument signals the valuable opportunity that may be imbedded in a multifunctional approach in addressing distorted urban forms. The research of Retief *et al.* (2016:56) pertinently suggests that the pursuit of a predictable single future or outcome should be discouraged.

The State of Maryland (2001:4) recognised infill development as “a new development of vacant, abandoned or underutilised land within built-up areas of existing communities, where infrastructure is currently provided”. Infill development may also facilitate the redevelopment of aforementioned areas, portrayed as “Brownfield” regeneration referring to the “remediating and redeveloping of sites that are idle or abandoned after former industrial or commercial use by demolition existing structures and building new structures to change the function and the form of the area” (State of Maryland, 2001:4; Smith, 2008:1; Thornton *et al.*, 2007:116-117).

Successful infill could further attain a mixed-use development dimension provided in the housing, social and commercial needs of fragmented urban forms (Centre for Law, Energy and the Environment, 2014:5-9). The Infill Master Plan of Orange County (2008:4-10) suggests that urban planners should identify the preferred type of infill development required by roughly

establishing the assets and attributes of the surrounding community, for example; determining the economic character of a neighbourhood or community, the character of the local transportation system, location proximity to job opportunities and economic nodes. The aforementioned may assist urban planners to identify the type of infill development that should be pursued (Centre for Law, Energy and the Environment, 2014:5-9; Orange County, 2008:4-10).

Brownfield regeneration is offered in concurrently solving economic, environmental, social and technical problems, by facilitating high-density redevelopment of redundant or contaminated sites (Raco *et al.*, 2008:2669-2670). In doing so, it may well ensure the spatial restructuring of segregated urban forms into tight knit communities and decreases inefficient modes of transportation and service provision (City of Johannesburg SDF, 2010:141-149). It is perceived as an essential planning approach to create a more efficient and spatially integrated urban form. The arguments offered for infill planning seemingly propose an additional planning approach to the CDOM, whereby, amongst others, the “fragmented urban form” (Centre for Law, Energy and the Environment, 2014:5-9) may well be rebalanced and the principle of “spatial justice” be attained (SPLUMA, 2013:18); especially in the South Africa contexts.

3.3.5 Urban regeneration

The Moving SA recognised that the decline of central city vitality and dispersed development nodes continue to challenge the sustainability of urban life (Department of Transport, 1998:136-140). Although not extensively addressed the resultant effect of applying the approach of the CDOM, strongly incline towards, and suggest, some form of urban regeneration. Urban regeneration is seen as a renewal project, promoting the return of citizens and investors to the city, revitalise declining city centres, re-establish economic competition among activity areas and apply initiatives to restore environmental quality within the urban context (The United Nations Environment Program, 2004:7-8). Urban regeneration is an ample integrated vision and action, resulting in the restoration of urban challenges that ensure a long-term enhancement in economic, social, physical and environmental urban conditions (Roberts and Sykes, 2000:17-20).

The Housing Development Agency (2013:10-11) presents urban regeneration as a process that addresses inner city decay to rejuvenate the social, environmental and physical environment within the urban context. The agency confirms that municipal authorities in South Africa fulfil a decisive role as a facilitator creating dedicated structures, tools and strategies. Generally, actions exist at a local level to involve the private and public sector, directed by a coordinated plan, to address urban regeneration.

Additionally, urban regeneration could be construed as an approach that identifies and improves derelict areas, rather than creating new urbanisation (Puppim de Oliveira and Balaban, 2013). This is attained through the regeneration of city centres, previous industrial areas and inner ring suburbs that face continuing decline. Urban regeneration at its most basic, contributes towards the implementation of sustainable development through the 'recycling' of land and buildings, reducing demolition waste and new construction materials, as well as reducing the demand for peripheral urban growth and facilitating intensification and compactness of existing urban forms (European Union, 2015; 7-9). The UN Habitat (2014:2) proposed that good urban planning and design decision making are not enough. Confirming the latter, Whitehead (2003:6) determined that the application of urban regeneration principles should be implemented within strong legislative frameworks, analysis of the local community and its economy, suitable infrastructure and the necessary institutional capacity to enquire urban regeneration projects.

As a consequence of Apartheid legislation, current segregated urban forms are related to underdeveloped, low-income residential neighbourhoods with limited transportation linkages and inadequate economic opportunities (SACN, 2014:4-12). These areas; especially residential precincts located on the urban periphery, are regarded as low-commercial activity areas characterised by low-levels of social amenities, high-unemployment, low-household incomes and poverty. Affirming the aforementioned, the suggested settlement plan advocated by the CDOM, focusses on reigning in the centrifugal tendencies in South African cities to prevent future dispersed extensions. Revitalisation of the derelict CBDs of segregated settlements augments the CDOM and its associated corridors, since it combines nodes and significant activity areas within urban forms that may well, following revitalisation, function as essential locations for residential intensification (City of Hamilton, 2012:2-18).

3.3.6 Public transportation planning

Employment location, density and distance are aspects of land-use affecting the design of South African cities and, in particular, public transportation service levels and urban economics. The Moving SA suggested that the CDOM may enable lower transportation subsidies, increase travel speeds and improve travel frequencies (Department of Transport, 1998:136-140). The CDOM, first suggested in the Moving SA and resurfacing in the Guidelines, inherently comprises a pertinent emphasis of public transportation planning. Public transportation is among the most compelling concerns in the South African transport sector (Walters, 2008:98-99). Justifying the aforesaid, Pillay (2001:1-2) confirms by observing that South African cities mostly comprise segregated settlements, ensuing long travel distances on deprived infrastructure that ultimately affect the level of public transportation ridership. As a

consequence, Government is confronted with mounting public pressure to improve public transportation systems.

This pressure is clearly portrayed in the recently and significant policies of the National Development Plan (2012), its interim Medium Term Strategic Financial Framework (2014) and the National Transportation Master Plan (2011), highlighting in its vision to meet “the needs of freight and passenger customers by 2050, particularly in terms of promoting freight and passenger transportation that is accessible, affordable, safe, of high-quality, reliable”. Public transportation systems not only ensure a variety of modes in the transportation system but aids more people to enter the workforce. Employment opportunities located in proximity to public transportation nodes experience enhanced employee dependability, ensuring citizens to choose a work that is accessible through efficient public transportation (American Public Transportation Association, 2007:4).

In further responding to growing public pressure, the Cabinet of South Africa accepted a Public Transport Strategy during 2007 incorporating a new planning approach to establish a bus rapid transit (BRT) system in major cities. This policy is seen as the first step to improve the high-demand of public transportation and was identified as an essential step to more spatially integrated urban forms (City of Johannesburg, 2013:20). The BRT system, as an appropriate example in the South African context, is essentially a “bus-based mass transit system that delivers fast, comfortable, and cost-effective urban mobility” (American Public Transportation Association, 2007:1). BRT systems were incorporated into South African policies in view of its enormous success (Junge and Groh, 2008:1), integrating the spatially segregated urban form of Curitiba. The core principle of the Curitiba BRT system was based on an integrated land-use and transportation policy adjacent major radial corridors of the city’s linear axes (Pienaar *et al.*, 2005:362-379). BRT systems are perceived as an appropriate solution to provide a high-quality public transportation system that attains the high-transportation demand in South African cities through employing corridors and associated land-use planning as core planning approaches (Venter, 2013:114-116). Additional initiatives could be implemented to further support the BRT system; especially an increase in price taxation upon utilising private cars within cities and, thereby increase the usage of public transportation ridership (Button and Ngoe, 1993:60). Considering the emphasis on public transportation planning in the initial CDOM, BRT systems may well be implemented in South Africa as a suitable solution, providing urban citizens with enhanced access and mobility within urban forms. Research endeavoured by the Bureau of Transport and Communications Economics (City of Canberra, 1997:34) ratified that higher cost for road use could ultimately result in a decline of private car dependency. The Apartheid’s model resulted in deprived citizens being forced further from employment opportunities and

urban amenities. Although private car dependency is exceedingly low in these communities, the public transportation modal split is dominated by 75% ineffective minibus taxis, largely unproductive in transporting a limited number of commuters through several trips with almost no or limited bus services (Brockett, 1996:173-175). The CDOM therefore, endorses a settlement plan that is strongly influenced by its spatial relationship to transportation corridors, modal interchanges and feeder corridors (CSIR, 2000:2-84).

3.4 Conclusion

Wolpe *et al.* (2012:5) argued that a city's spatial form (and structure) are essential for the productivity of urban economies and long-term financial reliability of Local Governments. Additionally, it has a contributing impact on the wellbeing of urban citizens, social interaction patterns, social inclusion and efficient use of resources within a city. The historical development of South African cities during the Apartheid regime was characterised by forced removals based on racial segregation and the development of low-density settlements at peripheral locations. This fragmented urban form was not the only consequence of the Apartheid planning approach, but also modernist planning that focussed on suburban development, separating urban and leisure activities from work, as well as, prioritising technical efficiency over social and environmental imperatives (Biermann and Van Rhyneveld, 2007:2).

During the post 1994 context, a bold vision was introduced to Municipalities in attaining spatial restructuring of segregated urban forms, promoting equal distribution of municipal resources that ensure reliable and efficient service delivery and to create vibrant economic communities. The Government identified that it is essential to address the spatially segregated urban forms resultant from Apartheid. The City of Johannesburg is a leading metropolis with their Policy, introduced in 2010, for the Promotion of Energy Efficiency in Land Use Development. The Policy (City of Johannesburg, 2010:141-149) identified compact city development as an instrument for restructuring. It formed part of the city's IDP and was formally approved as an instrument to facilitate spatial restructuring of segregated urban form. As a result of abovementioned, a number of metro's and cities in South Africa introduced the compact city option as an instrument for spatial restructuring.

Although South Africa made remarkable progress in certain areas, urban forms largely remained segregated, fragmented and unjust. Cities are confronted with rapid urbanisation of the poor for the purpose of seeking employment opportunities. Most of the working class and poor citizens are located on the periphery, distant from the CBD, resulting in long travel distances to employment opportunities and facilities (Salo, 2014:6). The CBD was usually located at the centre of the city, near former white areas, while other racial groups were forced

to settle at the periphery that was connected either with a major transportation route or railway line. These linear elements resulted in the development of a city that, in effect, had a linear urban form (Warnich and Verster, 2005:344).

The preceding planning approaches discussed are the relevant components of the CDOM as portrayed by the Moving SA and the Guidelines. Following a theoretical overview of the initial CDOM approaches, it is derived that there are shortcomings in veneering its appropriate implementation and understanding of the approaches mentioned in the Moving SA and the Guidelines. It is attributed to the mono-functional nature of the specified attributes identified for the CDOM's initial implementation, arguably resulting in the fundamental reason why the CDOM was never given any thought as a possible solution for the spatial restructuring of segregated urban forms. Considerable new and versatile urban planning approaches were since introduced that may likely be incorporated in the CDOM in providing a more appropriate response thereof, in meeting spatial challenges in a post-colonial and reformed South Africa. These new planning approaches will be discussed in the ensuing chapter to identify additional and contemporary planning approaches that could be included and insuring a multi-functional approach in CDOM to facilitate the spatial restructuring of segregated urban forms.

Despite limitations in the CDOM, mostly related to its initial simplified premise, the above literature is exceedingly relevant in highlighting the special circumstances under which the application of the CDOM may well have a positive resultant effect. A summary of these circumstances is provided in the ensuing Table 3-1, and although not exhaustive, it may portray a clearer overview of the CDOM and circumstances prevalent in urban forms, qualifying the employment of the CDOM. Through applying the selected methodology, the above selected theoretical concepts will further be progressed in preparing an assessment matrix. As illustrated above, the selected theory is directly correlated to the existing CDOM planning approaches. Chapter 5 will duly explain, how a process of open coding (Benaquisto, 2008:87) is employed in purposefully selecting the attributes progressing restructuring, emanating from this literature that may well enhance the CDOM as a probable solution to readdress spatial restructuring of segregated urban forms. For this reason, the selected attributes progressing restructuring will be presented in accordance with the initial CDOM planning approaches.

Table 3-1: Purposefully selected attributes derived from the literature review.

<u>CDOM Existing Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
Urban	Donaldson,	Residential and commercial densification could	Densification of urban

<u>CDOM</u> <u>Existing</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
	2006:344-345.	establish nodes that purposefully connected.	form
	City of Cape Town, 2012:2.	Densification adjacent existing transportation corridor bands both horizontally and vertically to increase the population threshold.	Densification adjacent existing transportation corridors
	Smith, 2008:1.	Urban densification is preferred in vacant infill and “Greenfield” site to accommodate future development.	Infill planning
	Government of Ireland, 1999:10-12.	Identify densification zones in suburbs and city centres that are portrayed as “Brownfield” sites to halt future urban sprawl.	“Brownfield” regeneration
	The City of Tshwane, 2005:15-20.	Mixed-use densification adjacent public transportation routes that encourages alternative transportation modes.	Mixed-use development
	City of New York, 2015: 12.	Urban density design promoting walkability may provide social integration, urban vibrancy and a healthy living environment.	Design vibrant cities
		Higher urban densities generate high public transportation ridership, providing dependable, frequent and efficient public transportation.	Alternative transportation modes
Compact City	Churchman, 1999:389-411.	Aim to intensify central city development, encourages higher levels of densification and mixed land-use development.	Urban intensification
			Urban densification
			Mixed-use development
		Establish development restrictions outside the periphery to reserve high potential agricultural land.	Halt urban sprawl
			Environmental conservation
	Arbury,	Identify urban areas for intensification and mixed-use	Intensification

<u>CDOM</u> <u>Existing</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
	2005:15.	development to restrict uncontrolled urban growth.	Mixed-use development
			Halt urban sprawl
	Shrivastava, 2009:7-8.	Compact urban form encourages walking, cycling and sustain an efficient public transportation system.	Alternative transportation modes
Corridor development	City of Hamilton, 2012:2-18.	Corridor development could create vibrant urban forms that encourage walking and cycling.	Design vibrant cities
		Mixed-use high-density development may be located in "Brownfield" areas adjacent corridor bands.	Mixed-use development
			Urban densification
			"Brownfield" regeneration
			Densification adjacent existing transportation corridors
	Andersen and Burnett, 1998:5.	Corridor development could increase the mobility within urban areas, facilitating integration of surrounding areas.	Urban mobility
			Urban integration
	City of Cape Town, 2018:23.	Encourage urban planners to locate future development adjacent major public transportation corridors.	Densification adjacent existing transportation corridors
	Berger <i>et al.</i> , 2010:4.	Corridor development may increase public transportation ridership that simultaneously lessens private vehicles, limiting the environmental impact.	Provide sufficient public transportation
			Environmental conservation
		Establish a more sustainable urban pattern to ensure access to urban services and opportunities.	Accessibility

<u>CDOM Existing Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
Infill Planning	Donaldson, 2001:1-9.	“Buffer” areas that are not physically limiting may be considered for infill planning.	Infill development
	McConnell and Wiley, 2010:1-14.	Infill development could be used as an instrument to halt continual urban sprawl and low-density residential development on the periphery.	Halt urban sprawl
	State of Maryland, 2001:4.	Infill development may facilitate “Brownfield” regeneration to remediate abandoned urban areas.	“Brownfield” regeneration
	Centre for Law, Energy and the Environment, 2014:5-9.	Mixed-use development is encouraged in the housing, social and commercial sector to resolve mono-functional urban forms.	Mixed- use development
	Raco <i>et al.</i> , 2008:2669-2670.	Economic, social and environmental challenges may be overhauled with infill development, locating high-density development in redundant areas.	Urban densification
	City of Johannesburg SDF, 2010:141-149.	Establish tight knit communities; consisting of efficient transportation modes and services that ultimately integrate urban forms.	Provide sufficient public transportation
			Sufficient service provision
			Urban integration
Urban Regeneration	Housing Development Agency, 2013:10-11.	Address inner city decay to rejuvenate the social, environmental and physical urban environment.	Design vibrant cities
			Environmental conservation
	Puppim de Oliveira and Balaban, 2013	Urban regeneration, rather than creating new urbanisation, identifies and improves existing urban sites that already consist of supporting infrastructure.	Urban regeneration
			“Brownfield” regeneration

<u>CDOM</u> <u>Existing</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
Public Transportation Planning	European Union, 2015;7-9.	'Recycle' existing land and buildings to reduce construction cost and development outside the periphery, lessening the demand for resources.	Cost saving
			Halt urban sprawl
			Environmental conservation
	City of Johannesburg, 2013:20.	Implementing BRT systems to improve the high demand of public transportation to ensure access.	Provide sufficient public transportation
			Accessibility
	Institute for Transportation and Development Policy, 2007: 1; Junge and Groh, 2008:1.	BRT systems are buss-based mass transit systems that provide reliable and affordable urban mobility, while integrating distorted urban forms.	Cost saving
			Urban mobility
			Urban integration
	Pienaar <i>et al.</i> , 2005 362-379.	Integrate BRT routes with mixed-use urban development adjacent major radial corridors of the city's linear axes.	Mixed- use development
			Densification adjacent existing transportation corridors.
	American Public Transportation Association, 2007:4.	Public transportation systems not only ensure a variety of modes in the transportation system but aids more people to enter the workforce.	Alternative transportation modes
			Accessibility
		Employment opportunities located in close proximity to public transportation nodes experience enhanced employee dependability.	Integrate land-use and transportation
			Urban mobility
	Button <i>et al.</i> ,	Implement initiatives to reduce private car use and	High-level public

<u>CDOM</u> <u>Existing</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
	1993:60.	encourage public transportation ridership.	transportation ridership

Source: Own construction (2018).

CHAPTER 4 ADDITIONAL AND CONTEMPORARY PLANNING APPROACHES ENHANCING THE CDOM

4.1 Introduction

This chapter aims to address research question 3:

3. What possible, additional and contemporary planning approaches and its attributes may enhance the CDOM?

South African cities are regarded as amongst the most ineffective and unequal in the world, characterised by vast numbers of low-density sprawl and fragmentation, where development is located in discrete pockets or cells, separating land-uses, civil services, economic opportunities, race and income groups (Dewar, 1992:245-246). Since the eradication of Apartheid, the black population were empowered to move without constraints, resulting in the rapid growth of metropolitan areas; especially in former black townships informal settlements (SACN, 2016:29). It is evident that South African cities face pressing challenges, resulting from dysfunctional planning systems implemented by Apartheid legislation, for instance, continuous urban sprawl, significant housing backlog, prevalent segregation, inequality, poverty, continuous spread of informal settlements within cities and on the urban edge and inefficient provision of infrastructure and services (UN-HABITAT, 2014:13).

The South African Government introduced foreign urban development models to address these spatial challenges; nevertheless, these imported models are currently failing as a result of their single dimensional nature (UN-HABITAT, 2014:7). Berrisford (1998:213-230) is in agreement, stating that South African cities developed differently than cities in Europe and America, through the substantial impact of Apartheid, bestowing a unique spatial urban form, requiring a particular urban development model that is designed for the South African context. Generally, South African cities, similar to major cities around the world, are considered as complex systems, comprising several components and challenges, inter alia, transportation networks, physical and spatial planning, urban design, the natural environment and social behaviour that are required to function in a collective unit (Boydell, 2007:4-7).

The South African Government is currently pressured to introduce new initiatives to restructure the failing South African urban form. As a consequence of urban sprawl, unstable economic growth in settlements and poor accessibility, the National and Local Government should implement improved programmes to attain urban densification; especially involving corridors

and the spatial restructuring segregated settlements. The continual deterioration of distant human settlements and public transportation infrastructure to metros introduce unique circumstances and present ideal possibilities to establish strategies for South African cities to support restructuring and coherent spatial development (SACN, 2016:47).

As a result of pressing urban challenges and failing urban development models, an alternative model should likely be investigated. The CDOM's initially vague description in the Moving SA and later in the Guidelines arguably resulted in its failure as a possible solution to progressing urban challenges. The ensuing chapter aims to identify additional and contemporary planning approaches and its relevant attributes that might be introduced to further enhance the CDOM. The identified additional and contemporary planning approaches will be studied in determining their correlation to the CDOM and whether their attributes could function as conducive attributes to enhance the existing attributes of the CDOM (refer to Chapter 3). The initial CDOM, it seems, was mono-dimensional in its description and implementation, requiring the consideration of additional and contemporary planning approaches that may enhance the CDOM's applicability. These approaches and relevant attributes thereto will be discussed to establish the significance thereof in possibly being incorporated in the CDOM. This offers a broader strategy to integrate various additional and contemporary planning approaches in strengthening the CDOM and its potential employment as a model to attain spatial restructuring.

4.2 Strengthening the corridor densification option model with additional and contemporary planning approaches

Richards (2004:1-3) affirms that models may facilitate as a means to investigate several different scientific functions. He emphasises that models may be applied in scientific research as a constructional instrument to extent existing theory when it is limited. A model may be considered as a formalised expression of certain scientific theory, while the formalised expression may be created in consideration of other theory (Brodbeck, 1959:379). Harvey (1969:149) importantly conveyed that in the deficiency of general theory, a model could be used as a temporary instrument to illustrate what research think the structure of the theory should or could be. Considering the seeming failure of the CDOM as a spatial restructuring model for South African cities, general theory regarding the CDOM is extremely scarce; the latter impelled this research in extending this theory. This method is identified as a construction of a priori model that enables the researcher to suggest or extend theory, allowing conclusions and manipulations to be formulated of a certain event even in absence of current theory (Harvey, 1969:153).

In the ensuing section, the CDOM will be investigated in terms of a priori model, since the initial description of the CDOM was limited, perhaps resulting in its failure as a possible approach to spatially restructure segregated urban forms prevailing in South African cities. It will further briefly discuss TOD, smart growth, new urbanism, green urbanism, SMS, and transit cities as additional and contemporary planning approaches to the current attributes of the CDOM, emphasising the attributes within these approaches that may well act as additional attributes to underline the CDOM.

4.2.1 Transit-orientated development

Calthorpe (1993:56) defined TOD as “a mixed-use community within an average 2,000-foot (or 10-minute) walking distance of a transportation stop and a core commercial area. TOD’s mix residential, retail, office, open space and public uses in a walkable environment, creating a convenient environment for residents and employees to travel by transportation, bicycle, foot, or car”. Olaru *et al.* (2011:220) similarly noted that TOD is an existing neighbourhood or new development located within an 800m walk of a major public transportation station, comprising moderate to high-density mixed land-uses. The land-use pattern is a combination of residential, commercial and business opportunities intended for pedestrians and cyclists without excluding automobiles.

Consensually, Holmes and Hemert (2008:4) construed that the mixed-use neighbourhoods within a TOD are aimed at maximising access to public transportation. Also, Curtis *et al.* (2009:25) are of opinion that the distribution of mixed land-use development adjacent corridors creates a two-way travel flow that spread travel demand equally throughout the day. TOD’s may be applied as a high-density development centre in close proximity to a public transportation station with continuously lower density development spreading outward, connected with a sufficient street network to effectively integrate commercial and business activities with active transportation (Holmes and Hemert 2008:4; Kamruzzaman *et al.*, 2014:55).

Successful TOD present unique benefits to the individual, local and regional levels owing to the fragmented and unequal nature of most South African cities (Holmes and Hemert 2008:6). Through applying extensive planning, TOD may encourage local business and retail opportunities and, increased land value, stemming from public investment in new transportation infrastructure, substituting expensive surface parking and other private car infrastructure with land-uses profitable for Local governments and business. It may well result in communities that are more desirable to live and work in, providing citizens with diverse commercial and housing choices (Belzer *et al.*, 2006:20).

Admitting the preceding benefits are significant, the most compelling benefit occur at regional level by creating a more sustainable travel behaviour and development pattern while generating cost effective usage of public transportation. TODs offer a wave of other benefits, including reduced transportation costs for individuals and families, expanded mobility choices and increased transportation ridership that in turn increases revenue for the city (Joshi *et al.*, 2017:5). Bertolini (1999:207-208) in this regard, explains that the private car travel needs for citizens living within a TOD reduces due to the proximity and connected arrangement of land-uses. When citizens need to travel greater distances to access services or commodities in other areas of the city, they could choose fast, frequent and well-connected public transportation services that are available at the transportation nodes within the TOD. It is therefore an area of human interaction and an urban development process characterised by centralised decentralisation (Bertolini, 1999:207-208). Carlton (2009:15), supportively notes that TOD could ultimately provide citizens with appropriate and efficient located homes, convenience of walking and public transportation, mixed-use services and efficient affordable access to the city, while ensuring the spatial restructuring of segregated urban forms.

The urban form of South African cities is inefficient and fragmented, locating the majority segregated settlements on the urban periphery within daily commuting distances of former white areas that are connected with one or more commuting corridors, resulting in high-transportation cost (Morojele, 2005:1-10; L'Etang, 2013:13-19). Considering the unique urban form of South African cities, TOD may be introduced as an additional and contemporary planning approach within the CDOM to address segregation and inequality since it comprises various similar attributes. TOD aims at building more compact, high-density development patterns, comprising mixed land-use development surrounding a central public transportation node. It is further deemed a valuable additional planning approach to the CDOM, considering similar comparable attributes than compact city (refer to section 3.3.2.) and public transport planning (refer to section 3.3.6.), requiring cities to pursue a more mixed land-use approach, constituting alternative transportation modes while enhancing the accessibility of urban citizens and intensifying urban areas to restrict uncontrolled urban sprawl.

4.2.2 Smart growth

Incessant segregated growth combined with continuing urban sprawl, characterised by scattered development that increase commuting distances, depletes local resources and consumes open space, becoming a major challenge for South African cities, as previously discussed in section 3.3. Handy (2005:146) is of opinion that smart growth is one of the paramount planning instruments to combat urban sprawl. Mohammed *et al.* (2016:4) supportively concurred that smart growth is a planning approach aimed at building urban,

suburban and rural neighbourhoods with efficient housing and public transportation choices, located in proximity to work, recreational and commercial activities.

Smart growth policies are dedicated to restricting further urban sprawl through implementing neighbourhood restoration programmes, urban revitalisation, identifying future growth and higher density development areas within cities (Lewis and Knaap, 2012:49). Alexander and Tomalty (2002:398) argued that by achieving higher densities smart growth could necessitate a range of environmental, social and economic benefits. These include:

- Efficient use of existing urban areas and conservation of critical farmland.
- Decline in private car usage and commuting distances.
- Creating a larger employee base for surrounding businesses that result in mixed land-uses.
- Decreasing urban consumption of energy and water.
- More efficient infrastructure provision and maintenance, reducing municipal expenditure.
- Improving quality of life by locating services and amenities in close proximity to residences.
- Produces diverse and affordable housing typologies for a wide range of citizens.

Future development should be focussed on existing urban areas and not inclined to undeveloped areas, saving expenditure on infrastructure development and providing alternative modes of transportation for e.g. walking, cycling and transportation (Handy, 2005:146). Smart growth neighbourhoods should focus on compact development, accessible transportation, walkability and mixed land-use development patterns that strengthen the notion to re-use existing urban areas. Ultimately, smart growth development patterns may create high-density mixed land-use and pedestrian friendly development that encourage resourceful land-uses and increase transportation ridership (State of Maryland, 1997:31).

Danielsen *et al.* (1999:516) essentially recognised that apart from previous attempts of smart growth policies were to curb urban sprawl; its objective is not to limit or stem future growth. Its aim is not only to enhance the urban economy, but to serve the environment and local community. Successfully implementing smart growth through public and private subsidies establish and encourage development to focus a portion of regional growth into inner city suburbs and city centres. It may be attained through the regeneration of existing dilapidated city centres and the re-use inner city suburbs, facilitating the urban region's future growth. Consequently, the overall urban economy is strengthened, the liveability within the city is improved and the farmlands and natural resources on the outer fringes are protected and

restored (Burchell *et al.* 2000:823). Pieterse (2004:82-83) alarmingly noted that the spatial imbalances in South African cities are typically former white settlements located adjacent high-quality CBD's and other main activity nodes, while former black settlements were located on the urban fringes, resulting in greater commuting distances and lower standard development; indeed "dumb growth" as depicted by Gunder and Hiller (2009:195)

Scott (2007:20), in supporting the CDOM, argued that future development may be focussed within city centres situated near new and existing transportation services, resulting in mixed land-uses and higher housing densities. Light rail transportation, as an additional attribute to smart growth, encourages a deviation from automobile use to rail transportation (Handy, 2005: 158), reflecting similar attributes as urban regeneration (section 3.3.5) and infill planning (section 3.3.4). This includes the development of vibrant neighbourhoods located adjacent to transportation corridors, ensuring sustainable urban patterns that increase access to services and opportunities. Consequently, smart growth as an additional planning approach to the CDOM, may increase urban mobility, facilitating the integration of surrounding urban areas that ultimately enhance access, reduce travel time and cost, curb urban sprawl and ensure a higher quality of life.

4.2.3 New urbanism

Knaap and Talen (2005:109) construed new urbanism as an organised development within cities that develop compact precincts and neighbourhoods, walkable mixed land-use development, focussing on transportation friendly systems and consist of diverse housing topologies, aspects also addressed within the CDOM. New urbanism encourages broader sidewalks, grid network layout, integration of different housing topologies, retail and businesses that are located within close walking and cycling distances to citizens. However, neighbourhoods that are isolated or comprise a "branch street system" do not support new urbanism (Alias *et al.*, 2010:4). New urbanism advocates the conservation of regional open spaces, while integrating adjacent neighbourhoods with existing developments and towns. It constitutes a mixed-use development approach, creating neighbourhoods that are within close walking or commuting distances from commercial areas and provides open spaces for public use (Hickichi, 2003:10).

The new urbanism approach not only functions on a specific scale but include: the whole city region, neighbourhood, district and the corridor and ultimately the built environment, property and blocks (Knaap and Talen, 2005:109). At the regional level, new development in proximity to the urban edge should be integrated with the existing neighbourhoods. Development that is not located adjacent to the urban edge should be arranged as villages or towns, supporting the

urban housing and retail balance. Bohl (2000:762) argued that new urbanism encourages design-based strategies of conventional urban forms, curbing further urban sprawl and restore central city vitality. Also, towns and villages should comprise a variety of public and private land-uses to support the regional economy and prevent the concentration of poverty in a single area.

The neighbourhood, the district and the corridor are considered as the fundamental elements to develop and redevelop a metropolis. The Congress for New Urbanism (2000:10) identified that these areas should be compact, containing mixed land-uses and are pedestrian friendly. Andres and Plater-Zyberk (1994:12) added that the built environment could be managed, solving various challenges confronting existing governments, for instance; congestion, social isolation, pollution and economic decline. It is suggested that neighbourhoods should be designed with a variety of housing topologies and price levels to attract citizens of different ages, races and income to enhance social interaction, strengthening personal bonds that are necessary for a healthy community. A similar notion is highlighted in the recently promulgated SPLUMA, requiring MSDFs to designate specific areas for inclusionary housing (SPLUMA, 2013:33). In this instance inclusionary housing is perceived as a mixed housing development, comprising different affordable housing typologies with diverse densities that may be rental units or privately owned, accessible to public transportation and related social amenities. At the street and building scale, the Congress for New Urbanism (2000:10) proposes the design of neighbourhoods to augment the unique identity of every area, accepting a consistent and original architectural style that encourages local history, culture, geography and climate. Principally, new urbanism is not an effort to duplicate old neighbourhoods, but to establish new neighbourhoods that focus on traditional design principles, while providing modern amenities that are demanded by consumers (Alias *et al.*, 2010:3).

The responsibility of urban architecture and landscape design are to identify streets and public spaces as areas for social interaction in the neighbourhoods. Although many efforts were implemented to attain the spatial integration of South African cities, Turok (2001:2349-2377) noted that urban development since 1994 continuous to encourage spatially segregated development by establishing economic activity centres remote from low-income neighbourhoods, resulting in higher commuting costs and distances, low-service levels and inadequate housing and job opportunities. It appears that the duly implementation of the neighbourhood design principles of new urbanism in these areas, mostly being mono-functional “sleep towns”, at least, see the establishment of more diverse urban amenities where residents have to travel to these amenities elsewhere, will be intercepted gradually.

It may be argued that new urbanism is an essential urban planning approach to attain spatial restructuring and ought to be employed in the South African context, signalling equal

opportunities and infrastructure, with socio-economic and environmental benefits for urban citizens. New urbanism may be applied in the CDOM, as it comprises closely related attributes than urban regeneration (section 3.3.5). It addresses inner city decay by re-using abandoned or decaying urban sites to improve existing urban areas currently comprising supporting infrastructure. New urbanism emphasises the “recycling” of land, reducing building cost and limiting development outside the urban periphery to lessen the demand on agricultural resources. The neighbourhood, district and corridor are considered as essential elements to develop and redevelop major cities, recognising a mixed land-use and pedestrian friendly development patterns. This notion is supported by Day (2003:84), emphasising that new urbanism promotes the end of segregation between rich and poor by establishing diverse and liveable neighbourhoods, conforming a wide-range of housing, land-use and densities that are effectively integrated with effective corridors to provide efficient access and alternative modes of transportation; especially walking and cycling.

4.2.4 Green urbanism

South African cities facilitated a resource-intensive growth path that resulted in unequal and inefficient growth in different sectors; especially energy, water, waste, food and transportation. Cities use unsustainable energy, resulting in rapid growing waste sites, an increase in soil pollution and declining freshwater resources. The rapid increase in CO₂ emissions in South African cities resulted from unsustainable transportation modes as taxi's and private cars (South African Cities Network, 2016:10) is a continually growing concern. Figure 4-1 below illustrates the concern by portraying dramatic contribution to emissions by different sectors in the South African environment; especially CO₂ emissions generated by transportation. Campbell (1996:297) advocates that urban planners already have experience in being confronted with disputes over economic growth versus equity and economic growth over environmental protection, in that “conflict in development is where the real action for urban planners will be: seeking to resolve both environmental and economic equity issues at once.”

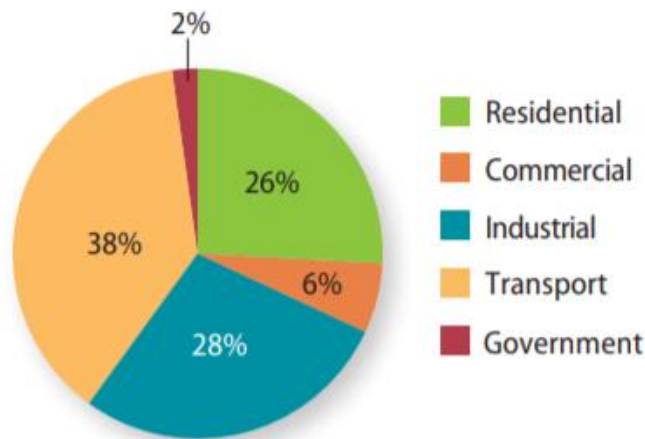


Figure 4-1: Emissions per Sector

Source: Sustainable Energy South Africa (2015:22).

Nassar (2013:339) reflected that green urbanism may be employed, as an urban model, to achieve zero-emission and zero-waste within cities that encourages compact energy-efficient urban development patterns, pursuing urban transformation and urban regeneration of existing CBD's and urban forms, while promoting development of socially and environmentally sustainable urban forms. Green urbanism attains walkability within mixed-use development and transit-orientated neighbourhoods, aiming to curb urban sprawl and promote a sense of community (Lobejko *et al.*, 2015:23). It identifies the value of ecosystems and urban greening, resulting in the protection of critical urban environments to reduce pollution, constrain extreme urban climates and provide an urban drainage system that is cost-effective. In doing so, it develops an urban economy that is more attractive with improved health benefits, while conserving and improving the ecological diversity of the urban environment (Jabareen, 2006:43).

Green urbanism principles, identified by Lehman (2010:1-10), are proposed to integrate various approaches to reduce water, energy and material usage, while considering the location of cities and local climate that is used to enhance natural resources. Green infrastructure and green planning within cities may minimise energy expenditure, food scarcity and exhaustion of materials at each level of the city life-cycle. Green urbanism comprises the three essential aspects of; energy and materials, ecosystem services (water and biodiversity), urban and transportation planning (Zareba, 2016:2). Cities should, therefore, minimise their energy and material consumption by following a more compact development and densification on existing renewable resources as "Brownfield" sites and underutilised buildings and structures (Lehmann, 2008:418).

Urban planning identifies the techniques and designs used to attain green urbanism that directly reduces the ecological footprint of cities. Tang (2010:179) indicates that the urban form is an essential approach to conserve energy and materials of contemporary cities. The orientation and layout of the city recognises the location of the city and the surrounding climate, guiding urban planners to implement the optimal urban design and architectural techniques to conserve energy, for example: direction of the urban grain and narrow streets maximises street shading and natural cooling and solar shading in courtyards reduce energy loads and supply renewable energy. In evaluating the success of Curitiba's BRT, Lindau (2010:17-27) is of opinion that an efficient integrated public transportation system connected with effective bicycle and pedestrian networks could ultimately reduce the energy consumption and environmental impact of automobiles.

Rapid population growth, settlement expansion, straining natural resources and open spaces, water and food scarcity and a coal dominated energy sector challenge the quality of life for the major portion of South African citizens (SACN, 2016:21). Green urbanism similarly to infill planning (refer to section 3.3.4), densification (refer to section 3.3.1) and public transportation planning (refer to section 3.3.6) aims to attain a mixed land-use approach, developing transit-orientated neighbourhoods and enhancing walkability to intercept continuous urban sprawl. This approach stresses the importance that cities should minimise their energy and material consumption by densifying existing "Brownfield" sites and underutilised buildings. Green urbanism further provides sufficient public transportation, integrating transportation services with surrounding land-uses that increase public transportation ridership to protect critical agricultural resources and reduce urban pollution. Consequently, green urbanism, as an additional approach to the CDOM, may address spatial injustices (unacceptable living quality and infrastructure) and attain integration of socio-economic and environmental considerations in land-use management in order to "balance existing development for future generations in a transformative manner" (Department of Rural Development and Land Reform, 2015:13).

4.2.5 Shared mobility as a component of shared cities

After 24 years of democracy, South African cities are characterised as highly fragmented where duplication is more evident than sharing facilities (Pieters, 2004:81-104). Sharing is generally referred to as a "socio-economic ecosystem, facilitating the share of human and physical resources that includes shared production, creation, trade, distribution and the consumption of services and goods by different people and organisations (Botsman, 2013)". Using goods and services instead of owning them are the core principle of sharing, offering an instrument to urban mobility challenges in cities (Mourey and Köhler, 2017:3). Shaheen *et al.* (2016:3) states "...the use of a motor vehicle, bicycle, or other low-speed mode enables users to obtain short-

term access to transportation as required, rather than requiring ownership". SMS may be implemented in the urban transportation system for more reliable, efficient, accessible, convenient, predictable and consistent alternative modes of transportation that present more effective payment options (Spulber *et al.*, 2016:2). SMS promotes the increase in average occupancies per vehicle that indirectly lessen the carbon footprint of cities, improving the capacity and the energy efficiency of current transportation systems (Kortum, 2016:1). SMS is highlighted in this chapter as it considers the provision of alternative transportation modes, improving the urban mobility and accessibility of citizens living in segregated settlements.

The enhancement of SMS ensues the decrease in private car usage and encourages the use of public transportation, since it is a more affordable and attractive mode of transportation that enhance the mobility options for urban citizens with limited financial resources (Spulber *et al.*, 2016:2; Franckx, 2016:11). The development of SMS to low-income communities is an essential step to increase the usability of the entire system as a complementary mode of the existing transportation system (Mourey and Köhler, 2017:3). Literature proposes that SMS and existing public transportation systems should complement one another by identifying different mode objectives and destinations for every modal service. The Shared-Use Mobility Centre (2016:11) illustrated that existing public transportation systems with a separated ridership catchment were responsive to the new possibilities of accumulative mobility options and services that SMS provide (Shared-Use Mobility Centre, 2016:11). Additionally, it could be implemented to resolve first/last mile challenges within low-income and disadvantaged communities, establishing accessible, convenient and cost-effective mobility options at strategic locations adjacent public transportation hubs, for example; bike sharing (Sand *et al.*, 2016:1). First/last mile solutions provided by SMS options could improve accessibility and quality of life for low-income communities that are typically dependant on traditional public transportation. Kodransky and Lewenstein (2014:24) identified that SMS broaden the customer's public transportation use when the origin and destination of the trip is not supported by existing public transportation.

One of the fundamental challenges for SMS is the utilisation thereof in low-income communities, considering this it is generally supported by private transportation companies, generating lump sum membership fees, application fees and overuse fines (Shaheen *et al.*, 2016:68; Kodransky and Lewenstein, 2014:15). Government should play an essential role to overcome this challenge by regulating, subsidising and providing incentives for SMS for , in particular; excluding membership fees and reducing usage fees for citizens located in low-income communities (Sand *et al.*, 2016:2; Kodransky and Lewenstein, 2014:16).

Continuous urban sprawl, inefficient access to public transportation and shortage of alternative transportation modes are complicating the provision of viable public transportation systems in

South African cities (Van Ryneveld, 2008:63). SMS, as an additional attribute to the CDOM, could assist government agencies to provide affordable and quality alternative modes of transportation. Similarly, to public transportation planning (refer to section 3.3.6), SMS implements initiatives to reduce private car usage and encourages public transportation ridership, lessening the carbon footprint of cities, improving the capacity and energy efficiency of current transportation systems. SMS is a significant initiative to address the first/last mile challenges facing many South Africans that live in segregated settlements by effectively integrating these services with the existing urban transportation system. Consequently, SMS comparable urban densification (refer to section 3.3.1) and public transportation planning (refer to section 3.3.6) benefit particularly from high-density mixed land-use development located proximity to high-level transportation corridors, supporting the initial attributes of the CDOM that encourage corridor densification to restructure spatially segregated urban forms (CIVITAS, 2016:13).

4.2.6 Transit cities

Donaldson (2006:344) is of opinion that Apartheid planning resulted in inefficient cities that are unequally developed characterised by low-density urban sprawl, fragmentation and separation, facilitating long-distance commutes between neighbourhoods and employment opportunities. The Department of Transport (2003:31) identified the average travel time to work, using all available transportation modes is 43 minutes per commute. If only public transportation is calculated, the average travel time increases to 59 minutes per commute, exceeding the one-hour average travel time per day suggested by Marchetti (1994:75). The South African average travel time of two hours per day could result in behaviour changes of individuals and society that could have a negative impact, for instance; lost productivity, “unhappy” citizens, high-transportation cost and high-levels air pollution (PWC, 2017:2).

Transit cities are explained as a series of local satellite nodes situated around a major CBD that are connected to surrounding satellite nodes with fast rail services. These surrounding satellite nodes are 20 to 30 kilometres in diameter, comprising high-density mixed land-uses and an integrated, multi-modal transportation system, focussing on light rail transportation (LRT), busses (BRT), cycling and walking (Toronto Transit Commission, 2009:10; Newman and Kenworthy, 2006:48; Newman *et al.* 2016:434). Contrary to the development patterns of corridors (refer to section 4.2.2.), city centres and satellite nodes consist of high-density mixed land-uses that is closely integrated around the transportation systems (Newman and Kenworthy, 1996:13), attracting investment for new business and housing opportunities, indirectly supporting the public transportation ridership within these areas (Newman, 2004:28). Development in city centres and satellite nodes should focus on rehabilitation of streets for

improved walking and cycling and enhanced public transportation (BRT/LRT) to ensure frequent and efficient access to all urban regions (Newman, 2004:28). The aim of transit cities is therefore to restore the connection between transportation and land-use development. Aschauer (1991:1) affirms the latter; arguing that public transportation investment could generate double the economic advantages to a city than investment in more highways.

Transit cities (see ensuing Figure 4-2) are commonly 20 to 30 kilometres in diameter comprising their own individual town centre or CBD. Ideally a series is developed that connects them to the town centre with a light rail and/or bus service. Various local centres are located adjacent the corridors feeding in to the town centre. The entire urban form would ultimately comprise a selection of transit cities linked together and connected with a fast rail service. Consequently, most of the citizens will live within walking or cycling distances to local services in the local centre. Main services, amenities and work are still located in the town centre, while other higher level services remain in other town centres; especially the original CBD that is accessible by rail. However, it is essential for these local centres and town centres to be independently sustainable in each of the transit city sections of the city region (Newman and Kenworthy, 2006:48).

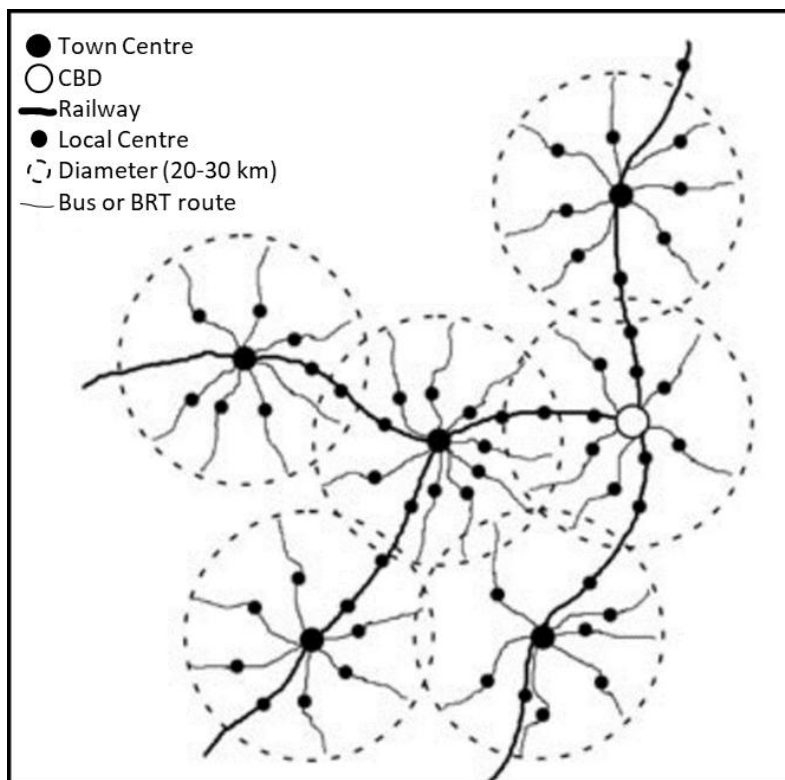


Figure 4-2: Transit City Model

Source: Newman and Kenworthy (2006:48).

Transit cities (see Figure 4-2 above) are commonly 20 to 30 kilometres in diameter comprising their own individual town centre or CBD. Ideally a series is developed that connects them to the town centre with a light rail and/or bus service. Various local centres are located adjacent the corridors feeding in to the town centre. The entire urban form would ultimately comprise a selection of transit cities linked together and connected with a fast rail service. Consequently, most of the citizens will live within walking or cycling distances to local services in the local centre. Main services, amenities and work are still located in the town centre, while other higher level services remain in other town centres; especially the original CBD that is accessible by rail. However, it is essential for these local centres and town centres to be independently sustainable in each of the transit city sections of the city region (Newman and Kenworthy, 2006:48).

In reflecting on the South African context and the relevance of transit cities to the CDOM, it is strongly supported by the Moving SA (Department of Transport, 1998:136-140), also suggesting that transportation corridors, consisting of concentrations of high-density mixed land-uses adjacent to the corridor, could be used to restructure the spatially segregated settlements (townships) and efficiently connect the low-density inner ring suburbs with the CBD. Transit cities, as confirmed by Newman *et al.* (2016:434), may well be implemented within the CDOM as most third world countries (South Africa) already comprise cities with high-density urban forms and linear development, enabling them to implement efficient transportation systems. It is important to note that proximity is an essential element to transit cities, ensuring future urban development is anchored to corridors and decentralised satellite nodes, meaning new development will only ensue at locations where modal interchanges are reached within a five to ten-minute walk (Newman *et al.*, 2016:434). The mere application of the CDOM in addressing spatially segregated urban forms, as will be duly contemplated in the empirical phase of this research, seems to be effective in medium and large towns (CSIR, 2012:11) where growth is less rampant but continuous urban sprawl still prevail (Harrison and Todes, 2014:15). In these settlements, the establishment of a transit city urban form may not be feasible as a single strong city centre exist and application of the CDOM, as portrayed in the Moving SA and the Guidelines, seems the desired approach. However, in large urban and metropolitan areas, where strong satellite nodes have indeed become a familiar phenomenon, its application as a single solution appears limited. In these instances, transit cities are valued as a collective strategy, to spatially restructure segregated urban forms.

4.3 Collective impact approach as a positive response to the CDOM

The “Collective Impact Approach” is defined as an “assumption of beliefs that not one single policy, government department, organisation or program may undertake or resolve the

increasingly complex social problems society currently encounters. The approach proposes that multiple organisations and entities from different sectors abandon their own agenda in favour of a common agenda, shared measurement and alignment of effort” (Collaboration of Impact, 2014). It is in strong relation to the work of Retief *et al.* (2016:56), advising that seeking after a single ideal solution should be navigated from. In accord with both these arguments, Paracchini *et al.* (2011:79) not to abridge the challenges of a multifaceted world and that compiling a framework of multiple indicators, in seeking solutions, is instead advised.

Cities in African nations are currently confronted with major urban development challenges in their attempts to implement sustainable and socially viable communities. After the eradication of Apartheid in 1994, South African cities introduced a variety of external urban development models. It is currently detectable that these urban development models have not been as conducive to the spatial restructuring of segregated urban forms as initially anticipated (UN-Habitat, 2014:7). It could be ascribed to the fact that the majority of urban development models originated in America in the 20th century and attempted to reflect the reality of its cities in other cities across the world (González and Medina, 2004:74).

Park (1915:578), as early as 1915, claimed that cities are the most exceptional and complex human designs ever created, while facilitating the habitat of civil human beings. Contemporary cities, when designed, are demanding that their complex nature and diverse planning aspects should be taken into consideration to address urban challenges (Gallegos, 2017:162). Recognition of the aforementioned suggests that not one single urban development model should be implemented in a city to achieve future development objectives, but it should be broadened to integrate multiple approaches as a collective approach (Spiekermann and Wegener, 2018:68). Augmenting and proposing additional and contemporary planning approaches to strengthen the CDOM in its employment as a collective approach, is acceptable. This is supported by Haughton (1997:194) emphasising that each attribute has considerable merits in their own right. Accordingly, the CDOM is a unique South African urban model that attempts to integrate the enhanced nature of the augmenting attributes into a single model to facilitate the spatial restructuring of South African cities.

4.4 Conclusion

The notion for a clear, positive and common vision identified in the UDF for the future development of South African cities has not yet been achieved. Most cities continue to present insufficient spatial characteristic, while enforcing spatial segregation, socio-economic exclusion and inequality (Schensul and Heller, 2010:79-81). Regardless of several attempts by the Government to restructure South African urban forms, current urban development reinforces

separation, continual urban sprawl and unjust development on the periphery with inefficient infrastructure and access to opportunities. Even though numerous lives have since been changed; especially with the provision of over three million housing opportunities and infrastructure development, the influence of private sector development and uncoordinated public sector investments have not established more equitable, inclusive and integrated cities (SACN, 2016:49-50). Supporting this notion, Dewar (1992:255) argued the National Government currently has no cohesive idea of the optimal urban form that South African cities should attain.

The CDOM, as a transportation model was implemented to readdress the transportation challenges of Apartheid as it was considered more appropriate to the existing urban land-use tenure patterns than more familiar planning approaches. However, the CDOM was neither given pertinent thought nor specific attention from professionals, owing to the restricted representation and absence of its necessary attributes. The latter promoted this research and, in particular this chapter, in considering additional and contemporary planning approaches, portraying comparable attributes as the CDOM are deemed incorporable thereto. This was done to identify specific attributes (refer to Table 4-1 below) within the literature describing the considered planning approaches to ascertain whether its attributes may be accepted into the CDOM as conducive attributes in further enhancing its implementation.

As a result of the complex nature of cities in South African comprising unique spatial forms, pressing urban challenges and failure of foreign planning models sanctioned as ideal instruments to rectify the Apartheid planning legacy, an alternative restructuring and domestic planning model will be required to spatially restructure segregated urban forms (UN-Habitat, 2014:7). The presence of these diverse planning obstacles may encourage the South African Government to facilitate the collective impact approach, in terms of the CDOM, as a new urban planning model to possibly be employed in the spatial restructuring of segregated urban forms. Spiekermann and Wegener (2018:68) recognised that no single planning approach or model is sufficient to address diverse urban challenges, thereby emphasising the necessity for the expansion of the CDOM to potentially embrace the TOD, smart growth, new urbanism, green urbanism, SMS, and transit cities in a collective manner. These additional and contemporary planning approaches were purposefully selected as they entail similar spatial objectives than the initial points of departure of the CDOM. In concluding the literature review, the above-mentioned additional attributes of the considered planning approaches, in conjunction with the augmented approaches of the initial CDOM discussed in Chapter 3, will be progressed into a theoretical and ultimately an assessment matrix to endeavour the empirical phase. Consideration of the additional and contemporary planning approaches was attempted to

explore the attributes thereof, summarised below, that will possibly be conducive to the CDOM and the employment thereof as a means to attain spatial restructuring. The empirical phase commences in the ensuing chapter where a methodology of open coding (Cohen *et al.*, 2018:671) is applied to further progress the copious attributes derived from the literature review, into the said theoretical and assessment matrix. Table 4-1 below illustrates the purposefully selected attributes derived from the literature.

Table 4-1: Purposefully selected attributes derived from the literature review.

<u>CDOM</u> <u>Supporting</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
Transit-Orientated Development	Calthrope, 1993:56.	Establishes a mixed-use community that encourages alternative modes of transportation for e.g. public transportation, bicycle and walking.	Mixed-use development
			Alternative transportation modes
	Olaru <i>et al.</i> , 2011:220.	Neighbourhoods that consist of moderate to high-density mixed land-use, while supporting alternative modes of transportation without excluding automobiles.	Urban densification
			Mixed-use development
			Alternative transportation modes
	Holmes and Hemert, 2008:4.	Mixed-use neighbourhoods within a TOD are aimed to maximise access to public transportation.	Accessibility
	Curtis <i>et al.</i> , 2009:25.	Distribute mixed land-use development adjacent to corridors creates two-way travel flow that spread travel demand equally throughout the day.	Densification adjacent existing transportation corridors
	Kamruzzaman <i>et al.</i> , 2014:55.	Facilitate as a high-density development centre in nearby a public transportation station that connects a street network to integrate transportation with surrounding land-uses.	Urban densification
			Integrate land-use and transportation
	Center for Transit-Oriented Development, 2006:20.	May create communities that are more desirable to live and work in, providing citizens with diverse commercial and housing choices.	Design vibrant cities
			Mixed-use development
	Joshi <i>et al.</i> , 2017:5.	Encourage higher level public transportation ridership, resulting in fewer private cars on the road,	High-level public transportation ridership

<u>CDOM</u> <u>Supporting</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
		reduced pollution and reduced transportation costs.	Environmental conservation
			Cost savings
	Bertolini, 1999:207-208.	Create neighbourhoods that are liveable, social and commercial that consist of a transit station node to attract public transportation.	Design vibrant cities
			Provide sufficient public transportation
Smart Growth	Handy, 2005:146.	Smart growth is an essential planning instrument to combat urban sprawl.	Halt urban sprawl
		Future development should be focussed into existing urban areas, saving cost on infrastructure development and providing transportation modes.	"Brownfield" regeneration
			Cost savings
			Alternative transportation modes
	Mohammed <i>et al.</i> , 2016:4.	Create neighbourhoods with efficient public transportation choices in proximity to work, recreational and commercial activities.	Provide sufficient public transportation
			Mixed-use development
	Lewis and Knaap, 2012:49.	Implement neighbourhood restoration programmes that identify urban revitalisation, future growth areas and higher density development within cities.	Urban regeneration
			Urban densification
	State of Maryland, 1997:31.	Neighbourhoods should focus on compact development, accessible transportation, walkability and mixed land-use development.	Compact development
			Accessibility
			Mixed-use development
		Smart growth could create high-density mixed land-use and pedestrian friendly development that increase transportation ridership.	Urban densification
			Pedestrian friendly development
			High-level public transportation ridership

CDOM Supporting Attribute	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
	Burchell <i>et al.</i> 2000:823.	Regeneration of existing dilapidated city centres and inner-city suburbs to facilitate the urban region's future growth.	Urban regeneration
New Urbanism	Knaap and Talen, 2005:109.	Organised development within cities that develop compact mixed land-use neighbourhoods focused on pedestrian friendly transportation systems.	Compact development
			Mixed-use development
			Pedestrian friendly development
	Hickichi, 2003:10.	Conservation of regional open spaces, while integrating adjacent neighbourhoods. Constitute a mixed-use development approach, creating walkable neighbourhoods.	Environmental conservation
			Mixed-use development
			Pedestrian friendly development
	Bohl, 2000:762.	Encourage design-based strategies of conventional urban forms to curb further urban sprawl and restore central city vitality.	Halt urban sprawl
			Urban regeneration
	The Congress for New Urbanism, 2000:10.	Neighbourhood, the district and the corridor are considered as the fundamental elements to develop and redevelop a metropolis, recognising a compact, mixed-use and pedestrian friendly development.	Compact development
			Mixed-use development
			Pedestrian friendly development
Green Urbanism	Nassar, 2013:339.	Green urbanism could be used to achieve zero-emission and zero-waste within cities that encourages compact urban development patterns, while regenerating existing CBD's.	Reduce urban pollution
			Compact development
			Urban regeneration
	Lobejko <i>et al.</i> , 2015:23.	Attains walkability within mixed use development and transit-orientated neighbourhoods that aims to curb urban sprawl.	Pedestrian friendly development
			Mixed-use development

CDOM Supporting Attribute	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
			Halt urban sprawl
	Jabareen, 2006:43.	Identifies the value of ecosystems and urban greening, resulting in the protection of critical urban environments and reducing urban pollution.	Environmental conservation
			Reduce urban pollution
	Zareba, 2016:2.	Green infrastructure and – planning within cities could minimise energy expenditure, food scarcity and exhaustion of materials at each level of the city life-cycle.	Ecosystem services
	Lehmann, 2008:418.	Cities should minimise energy and material consumption by following a more compact development and densification on existing renewable resources as “Brownfield” sites and underutilised buildings and structures.	Compact development
			Urban densification
			“Brownfield” regeneration
	Lindau, 2010:17-27.	Efficient integrated public transportation system connected with effective bicycle and pedestrian networks could ultimately reduce the energy consumption and environmental impact of automobiles.	Provide sufficient public transportation
			Pedestrian friendly development
			Reduce urban pollution
Shared Mobility Systems	Mourey and Köhler, 2017:3.	Using goods and services instead of owning them are the core principle of sharing, establishing an instrument that could address urban mobility challenges in cities.	Urban mobility
	Shaheen <i>et al.</i> , 2016:3.	Use of a motor vehicle, bicycle, or other low-speed mode that enables users to obtain short-term access to transportation as needed, rather than requiring ownership.	Accessibility
			Alternative transportation modes
	Spulber <i>et al.</i> , 2016:2.	Could be implemented in the urban transportation system for more reliable, efficient, accessible, convenient, predictable and consistent alternative	Provide sufficient public transportation
			Accessibility

<u>CDOM</u> <u>Supporting</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
		modes.	Alternative transportation modes
	Kortum, 2016:1.	Augment the average occupancies per vehicle that indirectly lessen the carbon footprint of cities, improving the capacity and the energy efficiency of current transportation systems.	Reduce urban pollution
	Sand <i>et al.</i> , 2016:1.	Could resolve first/last mile challenges within low-income communities, establishing accessible, convenient and cost-effective mobility options.	Provide sufficient public transportation
			Accessibility
			Cost savings
Transit Cities	Newman and Kenworthy, 2006:48.	Transit cities consist of high-density mixed land-uses and an integrated, multi-model transportation system.	Provide sufficient public transportation
			Urban densification
			Alternative transportation modes
	Newman <i>et al.</i> 2016:434.	Development patterns of corridors establish linear development of medium density mixed land-uses adjacent the corridor, integrating the adjacent urban areas to improve access.	Densification adjacent existing transportation corridors
			Mixed-use development
			Urban integration
	Newman and Kenworthy, 1996:13.	City centres and satellite nodes consist of high-density mixed land-uses that is closely integrated around the transportation systems.	Urban densification
			Mixed-use development
	Newman, 2004:28.	Development in city centres and satellite nodes should focus on rehabilitation of streets for improved walking and cycling and enhanced public transportation.	Urban regeneration
			Pedestrian friendly development
			Provide sufficient public transportation

<u>CDOM</u> <u>Supporting</u> <u>Attribute</u>	<u>Reference</u>	<u>Theory</u>	<u>Attributes</u>
	Aschauer, 1991:1.	Efficient transportation could facilitate cities to optimise market forces that increase urban densities near transit stations, creating more efficient satellite nodes and increase urban sprawl.	Urban densification
			Halt urban sprawl

Source: Own construction (2018).

CHAPTER 5 CASE STUDY ANALYSIS

5.1 Introduction

This chapter aims to address research question 4:

4. What is the viability of the CDOM in attaining the spatial restructuring of South African cities on a MSDF level?

The methodology outlined in Chapter 1 of the research will be employed in the empirical phase and comprises the distinct milestones of reviewing documents and literature, aiming in ultimately preparing a detailed assessment matrix to eventually assess the selected case studies. The documents and literature review revealed the purposefully selected (i) “spatial drivers” and (ii) attributes derived from the literature review, deemed relevant to the existing CDOM and (iii) attributes derived from the literature review, deemed incorporable in the CDOM. As the documents and literature review are concluded in the preceding chapters, the ensuing sections will explain, in more, detail how the final assessment matrix is arrived at and compiled, explain its assessment questions and the numerical values related thereto, describing the selected case studies and explaining the assessment of the case studies.

The assessment, in general, is conducted by nominating specific interfaces in the assessment matrix and a discussion of the most pertinent interfaces will ensue each case study assessment. As outlined in Chapter 1, by seeking and nominating the interface between (i) “spatial drivers” and the (ii) augmented and the identified incorporable attributes of the CDOM, the optimum conditions for the attainment of spatial restructuring on MSDF level, may well be identified. The section concludes by summarising all the case study assessments in a single aggregated assessment in obtaining a broader view of the optimum conditions required and identified for the attainment of spatial restructuring on MSDF level, for typical type-C municipalities.

5.2 Preparing the assessment matrix

5.2.1 The process of coding

Open coding, as suggested by Cohen et al. (2018:671) is performed in ultimately aggregating the codes in a theoretical matrix. Coding is considered as the dismantling and reconstructing of data identified in the theoretical phase of the research (Cohen et al., 2007:494). Coding, as applied in this qualitative research, generally implies a word or phrase and assigning them with codes, representing certain theory identified in the literature (Lincoln and Guba, 1985:347).

These codes are then applied to further differentiate the data, enabling the researcher to reorganise it into smaller categories, sub-groups and possibly themes in assisting with drawing conclusion from the data (Benaquisto, 2008:88).

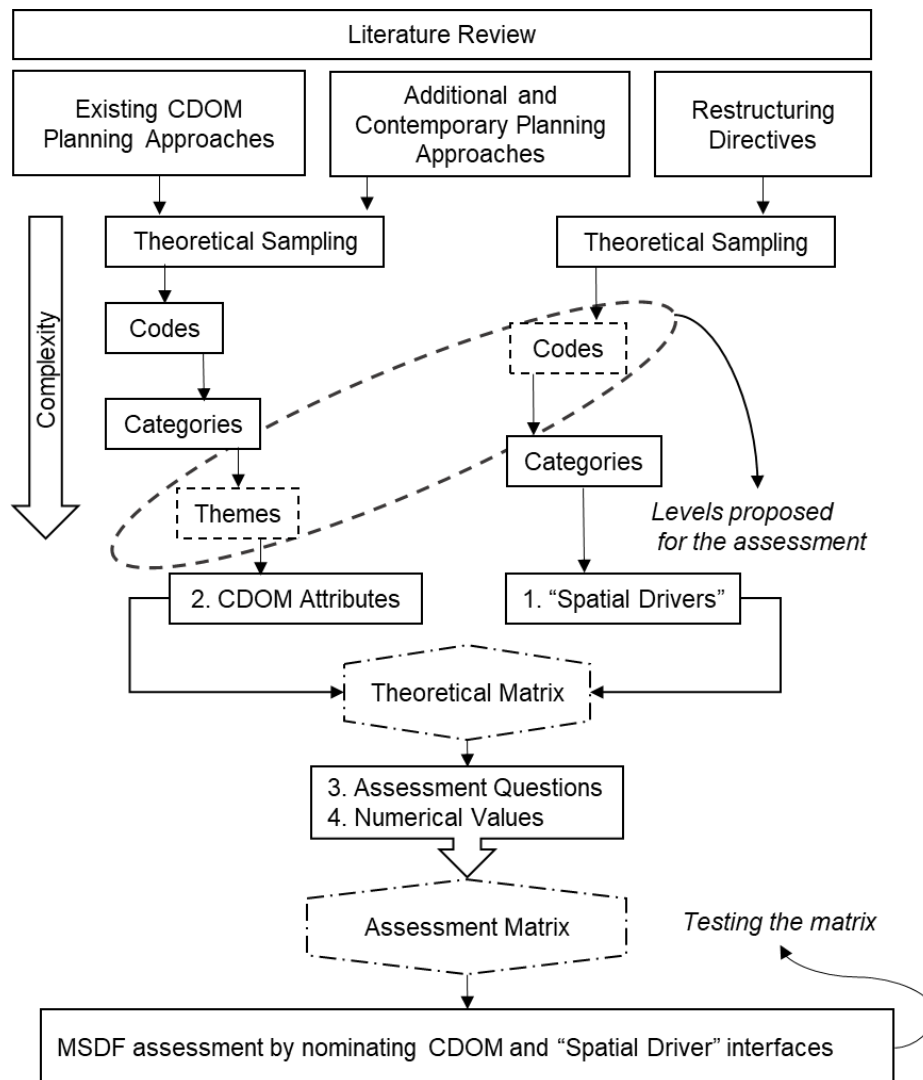


Figure 5-1: Methodology process

Source: Own Construction (2018).

In “reconstructing the data” derived from the literature and directive review close line-by-line reading (Benaquisto, 2008:87) is applied. The purpose of this approach is to identify and derive as many sentences or phrases as possible comprising spatial restructuring codes. The codes are subsequently organised and progressed in categories (Cohen *et al.*, 2007:478), and, where complexity of the data suggests progression in themes (see Figure 5-1 above). This method facilitates the grouping or organising of specific codes, as they comprise similar attributes that are closely related to each other (Lincoln and Guba, 1985:347). Categories represent the fundamental features or topic of the identified text of phrases, illustrating connections between different assessment units (Cohen *et al.*, 2007:478). Morse (2008:727) proposes that by

progressing categories into themes, it may aid the researcher in the analytic process of the research. In this instance, and in view of the complexity of the literature review, copious data, relating to the existing CDOM and additional and contemporary planning approaches, proposed for incorporating in the CDOM, inclined the researcher to finally organise categories in themes, duly portrayed in preceding Figure 5-1. In this research, all the identified categories and themes (where applicable) are combined in a theoretical matrix, further to which it is progressed in an assessment matrix, as an assessment matrix (or cross-tabulation) (Cohen *et al.*, 2007:482) was deemed the most appropriate instrument to select interfaces. It is considered as multiple cases require a more intensive assessment method in producing a multi-dimensional summary of the data (Miles and Huberman, 1994:93–95). Although the rationale for preparing an unambiguous assessment matrix is duly explained in Chapter 1 (section 1.4.2), it is reaffirmed that it further permits the researcher in nominating the interface between “spatial drivers”, and the augmented and the identified incorporable attributes of the CDOM, in an endeavour to identify the optimum conditions for the attainment of spatial integration on MSDF level.

The theoretical matrix is, as explained above, progressed in an assessment matrix, by (i) further advancing the selected codes derived (refer to Tables 2-1, 3-1 and 4-1) in categories (for the selected “spatial drivers”) and in categories and themes (for the CDOM attributes), then (ii) proposing the categories of the purposefully selected “spatial drivers” as one component (axis) of the matrix and the (iii) categories and themes inherent to the CDOM, as the opposite component (axis) referred to as attributes. The labels, “spatial drivers” and CDOM attributes, are merely assigned in assisting readers of this research, as it is deemed more familiar terminology, instead of continuously referring to categories and themes (see Figure 5-1 above).

5.2.2 The process of preparing assessment questions

In the progress of the theoretical matrix to the assessment matrix, two significant steps are required; namely the setting of assessment questions and the coupling of numerical values thereto (see Figure 5-1 above). The identified assessment questions are founded on the explored literature review and are prepared for each selected theme (relating to the CDOM attributes). It implies that assessment questions are set for each attribute of the CDOM. Because “spatial drivers” are only formulated to code level, and are considered sufficient and explanatory, assessment questions are not set here.

It has already outlined that the literature review was cumbersome and complete resulting in multiple codes being extracted from it. It would not have been feasible to do the assessment of case studies with all the codes. Therefore, further categories and themes are determined in the respect. It is important to confirm that codes are not considered on a higher or lower than

themes and are dealt with on the exact same assessment level (see Figure 5-1 above). Questions are only formulated for the CDOM attributes by reading, and re-reading through the explored theory, and then incorporated in the assessment matrix (see Table 5-1 below). Each question is thus formulated to determine the application of each attribute. Numeric values are assigned to each question and values of 0-3 are used as follows:

- **0:** Where MSDF does neither refer to attributes nor “spatial drivers” and no indication thereof is depicted in the MSDF,
- **1:** Where the attributes or “spatial drivers” in the MSDF are merely described or simply listed,
- **2:** Where the attributes or “spatial drivers” are referred to, described and visually presented (where applicable), but are not strategically progressed, merely a discussion/ explanation thereof, and
- **3:** Where the attributes or “spatial drivers” are referred to, described and visually presented (where applicable) indicated strategically progressed with a set of outcomes and/ or projects.

A numerical value from 0 to 3 (four possibilities) is correlated with the assessment questions, thereby allowing the researcher to constructively assess the selected case studies. For the research to present insightful assessments from the case study analysis, the assessment matrix requires the percentage of the nominated interfaces between the CDOM attributes and “spatial drivers”. This value is attained by dividing the nominated interfaces value of the MSDF by the maximum obtainable nominated interface value of 882. This number is attained by multiplying the 21 CDOM attributes with the 14 spatial drivers and subsequently multiplying it with the maximum numerical value of 3. The ensuing Table 5-1 presents an abstract, as an illustration, of the prepared assessment questions. For the comprehensive table, containing all the identified questions, refer to Annexure 1.

Table 5-1: Assessment Questions

<u>Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring</u>	<u>Assessment Questions to Complete the MSDF Analysis</u>	<u>Analysis Value</u>
Land-Use nodes	No reference	0
	Reference to future/ existing nodes	1
	Identification of existing nodes	2
	Future nodes identified	3
Mixed-Use	No reference	0
	Reference to mixed-use development	1
	Identification of existing zones	2

<u>Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring</u>	<u>Assessment Questions to Complete the MSDF Analysis</u>	<u>Analysis Value</u>
	Identification of mixed-use strategies	3
Infill (Optimal Location)	No reference	0
	Reference to infill	1
	Infill areas identified	2
	Infill progressing integration	3
Activity Streets (corridor feeders)	No reference	0
	Reference to activity streets	1
	Activity streets identified	2
	Activity streets identified connected to corridors	3
Transportation Related Land-Use	No reference	0
	Reference land-uses supporting transportation	1
	Identification of land-uses supporting transportation	2
	Spatial representation of high-density mixed-use areas located in proximity to public transportation	3
Existing Corridors	No reference	0
	Reference existing corridors	1
	Identification of existing corridors	2
	Existing corridors progressing integration	3
Defined Urban Edge	No reference	0
	Reference Urban Edge	1
	Identification of Urban Edge	2
	Development contained within urban edge/development related to the urban edge	3
Brownfield Regeneration	No reference	0
	Reference Brownfield regeneration	1
	Identification of sites for Brownfield regeneration	2
	Specify optimal land-uses in Brownfield regeneration	3
Non-Peripheral Neighbourhoods	No reference	0
	Reference non-peripheral neighbourhoods	1
	Neighbourhoods not reflecting peripheral expansion (employing centripetal forces)	2
	Non-peripheral expansion and including measures to intercept sprawl	3
Residential vs. Employment	No reference	0
	Employment vs. residential awareness	1
	Strategies reducing residential and work location/nodes in proximity of neighbourhoods	2
	Providing for residential land-uses in proximity with economic/ nodes in proximity to segregated settlements	3
Future Corridor Identification	No reference	0
	Reference future corridors	1
	Identification of future corridors	2
	Identification of future corridors progressing integration	3
CBD Regeneration	No reference	0
	Reference CBD regeneration	1
	Identification of CBD regeneration zones	2
	CBD regeneration strategies	3
Neighbourhood Regeneration	No reference	0
	Reference neighbourhood regeneration	1
	Identification of neighbourhood regeneration zones	2
	Neighbourhood regeneration strategies	3
Informal Settlements Regeneration	No reference	0
	Reference informal settlements regeneration	1
	Identification of informal settlements regeneration zones	2
	Informal settlement regeneration strategies	3
Corridors Densification	No reference	0
	Reference Corridor Densification	1
	Identification of existing corridors for densification	2

<u>Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring</u>	<u>Assessment Questions to Complete the MSDF Analysis</u>	<u>Analysis Value</u>
	Identification of future corridors for densification	3
Densification Nodes	No reference	0
	Reference densification nodes	1
	Identification of densification nodes	2
	Nodal densification strategies	3
Densification: Land-Use Zones	No reference	0
	Reference to land-use densification zones	1
	Identification of densification zones in proximity to public transportation	2
	Land-use densification strategies	3
Transportation Modes	No reference	0
	Reference transportation modes	1
	Identification of existing transportation modes	2
	Strategies progressing alternative transportation modes	3
Transportation Nodes	No reference	0
	Reference Transportation nodes	1
	Identification of existing transportation nodes	2
	Future transportation nodes in proximity to neighbourhoods/informal settlements	3
Public Transportation	No reference	0
	Reference public transportation	1
	Public transportation strategies	2
	Identification of public transportation network(s)	3
Transportation Green (Walkability and Connectivity)	No reference	0
	Reference walkability and connectivity	1
	Strategies to enhance walkability and connectivity	2
	Spatial specific proposals	3

Source: Own Construction (2018).

Ensuing Table 5-2 merely illustrates, as an example, the final assessment matrix that will be employed in the assessment of the case studies. The values in the assessment matrix are purely illustrative.

Table 5-2: Assessment Matrix

<u>Coding</u>		<u>Categories</u>													
		<u>Policy</u> <u>NDP, MTSF & IUDE</u>							<u>MSA, SPLUMA, SDF 2014</u> <u>Guidelines</u>						
<u>Purposefully Selected Spatial Drivers</u>		Policy Alignment	Sector Priorities	Integrated Development	Optimal Located Development	Informal Settlement Regeneration	Public Transportation	Connectivity	Corridor Densification	Spatial Challenges/ Analysis	Spatial Vision	Spatial Objectives	Explicit Plans	Restructuring Elements	Spatial Proposals
<u>Purposefully Selected</u> <u>Augmenting and Additional</u> <u>CDOM Attributes Progressing Restructuring</u>															
<u>Categories:</u>	<u>Themes:</u>														
Land-Use	Nodes														
	Mixed-Use														
	Infill (Optimal Location)														
	Activity Streets														
	Transport Related Land-Use														
Sprawl Measures	Defined Urban Edge														
	Brownfield Regeneration														
	Non-Peripheral Neighbourhoods														
Restructuring	Existing Corridors														
	Residential vs. Employment														
	Future Corridor Identification														
Regeneration	CBD Regeneration														
	Neighbourhood Regeneration														
	Informal Settlements Regeneration														
Optimisation	Corridors Densification														
	Densification Nodes														
	Densification: Land-Use Zones														
Transportation	Public Transportation														
	Transportation Nodes														
	Transportation Modes														
	Transportation Green (Walkability and Connectivity)														

Source: Own Construction (2018).

5.3 Multiple case study assessment

5.3.1 Introduction

Cohen *et al.* (2007:253) suggest that case studies comprise several hallmarks, supporting the selection of the particular case studies in this research, for instance; it is concerned with a detailed and meaningful description of events relevant to the case; it blends description with analysis of events; and it highlights specific events that are relevant to the case. The ensuing criteria were considered in selecting the case studies:

- Considering the aim of this research, it is deemed appropriate to select MSDFs as case studies; especially of urban settlements that are currently spatially segregated, comprising fragmented urban settlements and experiencing incessant urban sprawl,

- It is further reasoned preferable to select cases characterised as type-C settlements, since the majority of major cities and metropolitan areas in South Africa, comprise programmes and frameworks intending to facilitate restructuring (Harrison and Todes, 2014:15).

Three selected MSDFs of three type-C settlements located in the Free State Province, Western Cape Province and North-West Province are identified as case studies for this research namely the MSDFs of the:

- Metsimaholo Municipality (specifically the urban form of the Sasolburg and Zamdela precincts),
- Stellenbosch Municipality (specifically the urban form of the Stellenbosch, Khayamandi, Idas Valley and Cloeteville precincts) and,
- Tlokwe Municipality, recently renamed as the JB Marks Municipality (specifically the urban form of the Potchefstroom, Promosa, Mohadin and Ikageng precincts).

Figure 5-1 below illustrates the locality of the selected case studies in their demarcated Provinces within South Africa. The purposefully selected “spatial drivers” (being statutory in its departure) are all embedded in or should be embedded in the preparation of MSDFs. The recently promulgated SPLUMA additionally directs that MSDFs must consider recently implemented policies (Laubscher *et al.*, 2016:51). A MSDF is therefore perceived as a decisive planning instrument in, inter alia, the attainment of spatial restructuring. Consequently, recent MSDFs (prepared since 2014) are identified as appropriate case studies. Each case study represents an entire study, demonstrating the spatial form of the assessed settlement and the level of attainment of restructuring the municipality.

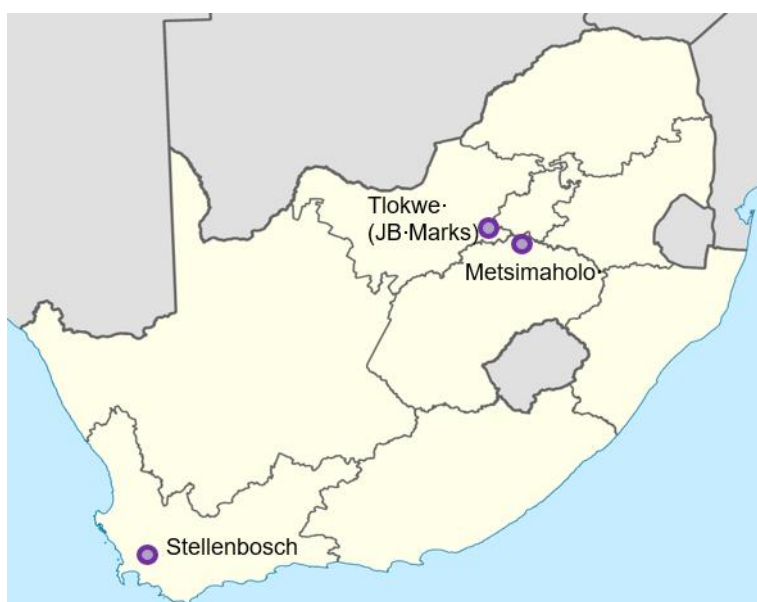


Figure 5-2: The locality of the purposefully selected case studies

Source: Own construction (2018).

As previously discussed (section 1.4.3), it is important to outline that this research and the prepared assessment matrix, are neither endeavoured, nor does it anticipate to assess MSDFs in determining its compliance in any matter. The preparation of the assessment matrix is undertaken in determining whether a MSDF, in view of its strategic and statutory nature, could induce higher levels of spatial restructuring by the incorporation of purposefully selected and enhancing CDOM attributes and purposefully selected “spatial drivers” and its ensuing nominated interfaces. The latter, as it is postulated that numerous nominated interfaces will be beneficial in the attainment of spatial restructuring, as it will be explored in the following case study assessment.

5.3.2 Metsimaholo MSDF

5.3.2.1 Introduction

The Metsimaholo MSDF (2016:72) affirms the location of Sasolburg and Zamdela in the Free State province within the heart of worldly renowned coalfields, known as the Vaal Triangle, also including Vanderbijlpark and Vereeniging. The urban settlement is generally referred to as the “industrial hub” of South Africa, amongst others, housing the internationally celebrated “oil from coal” refineries. The Greater Sasolburg was proclaimed on 8 September 1954 and it developed progressively to the fourth largest town in the Free State. Sasolburg, developed in the early twentieth century, may serve as an example of a modern ‘Garden City’ model. The objective of this model was to ensure an ideal living environment for all urban citizens, while facilitating physical and mental well-being (Metsimaholo MSDF, 2016:72). The Zamdela residential neighbourhood, located southeast of Sasolburg, may also be perceived as a contemporary town with a variety of single residential units and hostels, relevant to the industrial character of the larger urban area. The Metsimaholo MSDF (2016:72) laments, that although Sasolburg was planned as a traditional ‘Garden City’, its development was influenced by Apartheid planning as Sasolburg and Zamdela were typically racially and also physically segregated by the vast SASOL “oil from coal” refinery and its ash dumps between the two residential areas, thereby imposing a physical barrier and, inevitably, segregation.

5.3.2.2 Assessment

Table 5-3: Assessment Matrix of Metsimaholo MSDF

<u>Coding</u>		<u>Categories</u>													
		<u>Policy NDP, MTSF & IUDE</u>							<u>MSA, SPLUMA, SDF 2014 Guidelines</u>						
<u>Purposefully Selected Spatial Drivers</u>		Policy Alignment	Sector Priorities	Integrated Development	Optimal Located Development	Informal Settlement Regeneration	Public Transportation	Connectivity	Corridor Densification	Spatial Challenges/ Analysis	Spatial Vision	Spatial Objectives	Explicit Plans	Restructuring Elements	Spatial Proposals
<u>Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring</u>															
<u>Categories:</u>	<u>Themes:</u>														
Land-Use	Nodes	1	1	1	1	0	0	1	1	1	0	0	3	2	1
	Mixed-Use	1	1	1	1	0	0	1	1	1	0	1	2	2	1
	Infill (Optimal Location)	1	1	0	1	1	0	0	0	1	0	3	3	2	1
	Activity Streets	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Transport Related Land-Use	1	1	1	1	0	0	1	1	1	0	0	2	1	1
Sprawl Measures	Defined Urban Edge	0	1	0	1	1	0	0	0	0	0	1	3	1	1
	Brownfield Regeneration	1	1	1	1	1	0	0	0	0	0	2	3	2	1
	Non-Peripheral Neighbourhoods	1	1	0	1	0	0	1	0	1	0	2	2	1	1
Restructuring	Existing Corridors	0	1	1	1	0	0	1	1	1	0	1	3	2	1
	Residential vs. Employment	1	1	2	1	2	0	0	0	0	0	1	2	1	1
	Future Corridor Identification	0	0	1	1	0	0	1	1	1	0	1	3	0	1
Regeneration	CBD Regeneration	0	1	0	1	0	0	0	0	1	0	0	2	2	1
	Neighbourhood Regeneration	0	0	0	1	2	0	0	0	1	0	0	0	0	1
	Informal Settlements Regeneration	1	1	0	1	1	0	0	0	1	0	2	2	2	1
Optimisation	Corridors Densification	0	1	1	1	2	0	1	2	1	0	1	2	1	1
	Densification Nodes	1	1	1	1	2	0	0	1	1	0	1	2	1	1
	Densification: Land-Use Zones	1	1	1	1	0	0	1	1	1	0	1	2	1	1
Transportation	Public Transportation	1	1	1	1	0	1	1	1	1	0	0	2	2	1
	Transportation Nodes	0	1	1	1	0	0	1	1	1	0	1	2	2	1
	Transportation Modes	1	0	1	1	0	0	0	0	0	0	1	0	1	1
	Transportation Green (Walkability and Connectivity)	1	1	1	1	0	1	0	0	1	0	0	0	0	1
Total		13	17	15	20	12	2	10	11	16	0	19	40	26	20
%		21%	27%	24%	32%	19%	3%	16%	17%	25%	0%	30%	63%	41%	32%
<u>Points obtained</u>		221													
Percentage of nominated interfaces		25%													

Source: Own construction (2018).

Considering policy alignment, the Metsimaholo MSDF aligns not only with the “spatial drivers” associated with relevant policy, legislation and guidelines, but identifies relevant priorities in the municipality that should be addressed accordingly. However, the “spatial vision” neglects to address any relevant restructuring attributes. The strategic phase of the MSDF identifies the need to integrate previously segregated settlements with Sasolburg in order to enhance the urban form and offering opportunities for all citizens; nevertheless, the “spatial vision” falls short in doing similar, resulting in a 0% value being assigned.

In consideration of “integrated development” and “restructuring elements”, the MSDF identifies numerous strategic areas within Sasolburg and Zamdela for infill planning and Brownfield regeneration; especially adjacent existing corridors to intercept continuous urban sprawl. The aforementioned areas are also considered to comprise high-density mixed land-use zones, resulting in a more compact urban form where residents live closer to facilities, opportunities and amenities. In terms of informal settlements, regeneration zones are identified in Zamdela to improve the quality and vitality within these areas. The MSDF recognises areas requiring regeneration and specifying the required services that should be implemented. Nonetheless, it provides no strategies to effectively ensure “informal settlement regeneration”, resulting in a value of 16% being assigned.

The existing connectivity within the municipality is seen as inadequate as the main public transportation mode in Metsimaholo MSDF is mini-bus taxis with no access to rail transportation. The MSDF attempts to improve “connectivity” by identifying future transportation nodes within the existing transportation network and it recommends the improvement of existing mini-bus taxi stops. The MSDF do not succeed in providing detail plans on the implementation of high-level transportation nodes with sufficient transportation related land-uses, supporting public transportation. Pedestrian infrastructure is enhanced by implementing CBD regeneration, recommending that the existing street reserves should be broadened and separated from automobile transportation. However, strategies are not provided to improve the modal split in enhancing access to facilities and services for urban and rural citizens. The MSDF recommends the “metro” rail transportation system as an alternative public transportation mode for Transnet’s consideration to be enhanced; especially as a substantial number of residents commute daily from Zamdela to Vanderbijlpark, Vereeniging and the metropolitan areas of the Gauteng province, further afar, resulting in a value of 3% being assigned.

Relating to the “spatial objectives”, to which a value of 30% is assigned, the MSDF addresses the “spatial restructuring elements” of the municipality for the next five years. It addresses the majority of the fundamental restructuring attributes identified in the literature review of the research, i.e., infill planning, Brownfield regeneration, mixed-use development, non-peripheral neighbourhoods, corridor densification and informal settlement regeneration. “Explicit plans” are offered (assigned value of 63%) whereby the future development within the municipality should adhere to in the ensuing five years. The plans are apparent without misinterpretation, providing sufficient guidance for future development. Owing to the Sasol “oil from coal” refinery located between Sasolburg and Zamdela, the urban area unavoidably adopted a linear pattern rendering infill planning nearly obsolete. Most vacant sites are identified as infill areas, recommending mixed-use high-density development. Due to the limited infill areas remaining,

the MSDF identifies specific areas adjacent the corridor connecting Sasolburg and Zamdela for vertical densification, limiting the potential for future sprawl. Most vacant sites are specified for infill purposes, recommending up-zoning in the form of mixed-use high-density development, assigning the attempts at “integrated development” with a value of 24%. Due to limited infill areas the MSDF identifies specific areas adjacent the corridor connecting Sasolburg and Zamdela for vertical densification and to intercept incessant sprawl.

Most neighbourhoods; especially in the informal settlements, are reminiscent of typical mono-functional residential precincts, lacking mixed-use and higher-density developments. Although small clusters/nodes of business areas are provided for in the neighbourhoods and informal settlements, the concentration of mixed-uses remain in the Sasolburg and Zamdela. CBDs that are mostly surrounded by mono-functional residential development. The Sasolburg CBD and the northern extension of Sasolburg comprise the most nodes with limited nodes identified in Zamdela. The MSDF neglects to effectively provide future and additional nodes, thereby not meeting the needs of the majority of citizens, having to commute from Zamdela to Sasolburg. Reflecting on densification, the MSDF earmarks nodes in Sasolburg and Zamdela within proximity of the identified corridor. Said corridor, connecting Sasolburg and Zamdela, is identified for densification, although in specific areas densification will be challenging as a consequence of the SASOL “oil from coal” refinery. Although the corridor is pertinently earmarked, long-term restructuring strategies demonstrating “optimal land-use” and densities adjacent the corridor, or the identifying of additional corridors, are not proposed, resulting in a value of 17% being assigned.

The overall assessment of the Metsimaholo MSDF, in so far as the nomination of interfaces between CDOM attributes and “spatial drivers” is concerned, attained a value of 26%, reasoned to be low. In particular instances the MSDF considers effective CDOM attributes; especially corridor development surrounded with high-density development on optimal located infill areas. Even though the attributes are addressed, the MSDF falls short in presenting effective strategies to facilitate its successful implementation. This may well be argued as the reason for the lack of spatial restructuring in the Sasolburg/Zamdela urban area. If more interfaces could be identified, it might imply a higher value and spatial restructuring probably would have been well on course. The analysis concludes with the assumption that the minimum interfaces are nominated as the MSDF is not succeeding in addressing the necessary CDOM attributes and not reflecting on the essential “spatial drivers”.

5.3.3 Stellenbosch MSDF

5.3.3.1 Introduction

Stellenbosch, known as the second oldest town in South Africa, is located in the Western Cape Province in the heart of the South African wine lands, approximately 55km to the east of Cape Town with the “Eerste” River flowing through the town (Musakwa, 2013:70; Arendse, 2014:31; Stellenbosch MSDF, 2017:4). Mafame (2017:80) determines that prior to the Apartheid era, Stellenbosch was organised in a spatially segregated manner with most of the white population settling near the CBD and the non-white population settling on a worker’s settlement area towards the northwest of Stellenbosch. This area, in essence, offers to support the labour force for the surrounding farms, including Stellenbosch. Stellenbosch remains reminiscent of a racially segregated urban settlement where most of the white population reside in the CBD and the southern suburbs of Brandwacht and Die Boord, while the majority of the African and coloured citizens reside Khayamandi, Idas Valley and Cloetesville north of the CBD (Mafame, 2017:84).

5.3.3.2 Assessment

Table 5-4: Assessment Matrix of Stellenbosch MSDF

<u>Coding</u>		<u>Categories</u>													
		<u>Policy NDP, MTSF & IUDF</u>							<u>MSA, SPLUMA, SDF 2014 Guidelines</u>						
<u>Purposefully Selected Spatial Drivers</u>		Policy Alignment	Sector Priorities	Integrated Development	Optimal Located Development	Informal Settlement Regeneration	Public Transportation	Connectivity	Corridor Densification	Spatial Challenges/ Analysis	Spatial Vision	Spatial Objectives	Explicit Plans	Restructuring Elements	Spatial Proposals
<u>Purposefully Selected</u>	<u>Augmenting and Additional</u>														
<u>CDOM Attributes Progressing Restructuring</u>															
<u>Categories:</u>	<u>Themes:</u>														
Land-Use	Nodes	0	1	1	1	1	1	1	1	1	1	2	3	1	1
	Mixed-Use	0	1	1	1	1	1	1	0	1	0	1	3	3	3
	Infill (Optimal Location)	0	1	1	3	0	0	0	0	3	1	1	3	3	3
	Activity Streets	0	1	1	1	0	3	3	0	1	0	3	3	3	3
	Transport Related Land-Use	0	1	1	1	1	1	1	0	1	0	1	2	2	2
Sprawl Measures	Defined Urban Edge	0	1	1	1	1	1	0	0	1	0	1	3	3	1
	Brownfield Regeneration	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	Non-Peripheral Neighbourhoods	0	1	1	1	1	1	1	0	1	0	1	3	1	2
Restructuring	Existing Corridors	0	1	1	1	1	1	1	0	1	0	1	2	2	1
	Residential vs. Employment	0	2	2	3	1	3	2	0	3	1	1	2	1	2
	Future Corridor	0	1	1	1	0	1	1	0	1	0	1	1	1	1
Regeneration	CBD Regeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Neighbourhood Regeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Informal Settlements Regeneration	1	1	1	1	1	1	1	0	1	1	1	1	1	1
Optimisation	Corridors Densification	0	1	1	0	0	1	0	1	1	0	0	1	1	1
	Densification Nodes	0	1	1	2	1	2	2	0	1	0	1	2	2	1
	Densification: Land-Use Zones	0	1	1	1	1	1	1	0	1	0	1	2	1	1
Transportation	Public Transportation	0	1	1	1	0	2	2	0	1	0	1	1	1	1
	Transportation Nodes	0	1	1	1	1	1	1	0	1	0	1	1	1	1
	Transportation Modes	0	1	1	1	0	1	1	0	1	0	1	1	1	1
	Transportation Green (Walkability and Connectivity)	1	1	1	1	0	1	1	0	1	0	2	3	2	3
Total		2	20	19	22	11	23	20	2	22	4	21	38	30	29
%		3%	32%	30%	35%	17%	37%	32%	3%	35%	6%	33%	60%	48%	46%
Points obtained		263													
Percentage of nominated interfaces		30%													

Source: Own construction (2018).

Reflecting on “policy alignment” (for which a value of 3% is assigned), the Stellenbosch MSDF does not align with any relevant policy, legislation and guidelines identified in the literature review. It is accredited to the fact that MSDF constitutes a sector plan of the Municipal IDP that comprehensively presents “policy alignment”. In this instance, the MSDF perceives it unnecessary to represent “policy alignment”. This notion is, however, in stark contrast with the dictations of Laubscher *et al.*, (2016:51) finding that the SPLUMA additionally directs municipalities to consider recently implemented policies when preparing a MSDF. Although the

Stellenbosch MSDF is deficient in addressing this specific “spatial driver”, the majority of the CDOM attributes identified in the literature review are implemented.

Considering the CDOM attributes, Brownfield regeneration, is the only attributes the MSDF fails to address, mostly as the municipality comprises limited vacant areas. Nonetheless, the MSDF identifies several zones for urban regeneration through infrastructure upgrading (especially in informal settlements) and increased densities to intercept incessant urban sprawl. The Stellenbosch MSDF emphasises the delineation of the urban edge for each neighbourhood with the intention to densify development and in further intercepting sprawl. “Explicit plans”, (assigned a value of 60%) are presented, affirming the importance to concentrate future development and conserving valuable agricultural land. The MSDF focusses on the existing built-up areas and proposes strategies to increase densities, comprising mixed-use development in proximity to high-level public transportation corridors. It ensures that every neighbourhood within the municipality is reviewed in determining the most “optimal location” (assigned interface value of 35%) for specific land-uses that may establish a sustainable urban form.

Reflecting on “informal settlements regeneration”, the continuous urban sprawl of informal settlements and low-density neighbourhoods distantly located from Stellenbosch are identified. The MSDF finds Khayamandi, Idas Valley and Cloeteville as delivery areas for diverse housing topologies, incremental upgrading of the informal settlements and the implementation of effectively located transportation nodes. Apart from the MSDF identifying these settlements for regeneration, it does not furnish strategies to guide the process and secure outcomes, resulting in a value of 17% being assigned. The MSDF addresses “public transportation” by suggesting regeneration projects across the municipality in reducing the private car dependency and enhance the modal split. It is attempted by identifying existing and future nodes within the transportation network to implement TODs. The MSDF recommends that these TODs should be strategically located transportation nodes, comprising high-density mixed land-use development that increase the connectivity and accessibility within the municipal area. Emphasis is also placed on existing and future pedestrian infrastructure and facilities to reduce private car dependency. This emphasise advances connectivity and accessibility within the municipality.

Although the MSDF dwindles in identifying “corridor densification”, it identifies existing and future corridors to connect the aforementioned TODs, suggesting that future development should be focussed adjacent these corridors as a measure to, not only intercept continuous urban sprawl, but to restructure the urban form. The “spatial vision” (assigned value of 6%), does neither capture nor suggests CDOM attributes, only referring to nodes, infill planning, residential vs. employment and informal settlements. Although the MSDF provides the most

specific “spatial vision” of the three case studies it does not underscore the legal requirements of restructuring in the strategic planning process of the Stellenbosch MSDF.

The MSDF presents “explicit plans”; rather than presenting a general plan of the entire municipal area, detailed spatial plans are introduced for the various precincts. Detailed precincts plans are compiled earmarking the in-depth development per area for the ensuing 5 years. The precincts are planned with their individual urban edges, endorsing the importance of strategies to intercept urban sprawl and encourage spatial restructuring. Mixed-use development and densification are addressed in correlation with the previously mentioned TODs. The aforementioned, introduced an “integrated development strategy” within the MSDF (assigned value of 30%), emphasising it as specific focusses of the MSDF and laments high-density mixed-use development in all precincts.

In concluding, an overall assessment of the nominated interfaces between the CDOM attributes and the “spatial drivers”, the Stellenbosch MSDF attains a value of 30%. Although, the Stellenbosch MSDF identifies the majority of the CDOM attributes in relation to the “spatial drivers”, the nominated interface value remains low, since the MSDF simply identifies CDOM attributes, while failing to introduce strategies and outcomes to effectively steer spatial restructuring. This may well be argued as a reason for non-compliant restructuring in the assessed municipality. The overall assessment value might have been higher had the Stellenbosch MSDF assigned specific strategies and outcomes to the initially identified CDOM attributes. The analysis concludes by disputing that spatial restructuring is not merely achievable, at least not by only describing it in planning guidelines and statutory documents, i.e., the MSDF. By pertinently addressing spatial drivers and CDOM attributes on a strategic and detailed planning level, a higher interface value could have been attained.

5.3.4 Tlokwe (JB Marks) MSDF

5.3.4.1 Introduction

Potchefstroom is generally accepted as the oldest town in Northwest, founded in 1838 by Andries Hendrik Potgieter. The town is located on the “Mooi Rivier” riparian approximately 40km northeast of Klerksdorp with 140 000 citizens and the home of the Potchefstroom campus of the Northwest University (Gouws, 2016; Tlokwe MSDF, 2014:13). Since the establishment of Potchefstroom, the town was reserved for white citizens while other races lived in a separate area known as the ‘native location’. During 1959 its residents were relocated to a newly established precinct, known as Ikageng, towards the west of the town (Jansen van Rensburg, 1995:598). Potchefstroom functions as the primary node within the municipality while Ikageng,

Promosa and Mohadin function as secondary nodes, also being peripheral precincts. The main economic sectors of the municipality are higher education, followed by governmental facilities, social facilities, finance and business services. The current urban spatial form is indicative of a spatially segregated urban form with the white population largely residing in Potchefstroom and the remaining racial groups, mostly in Ikageng, Promosa and Mohadin (Tlokwe [JB Marks] MSDF, 2014:26).

5.3.4.2 Assessment

Table 5-5: Assessment Matrix of Tlokwe (JB Marks) MSDF

<u>Coding</u>		<u>Categories</u>													
		<u>Policy NDP, MTSF & IUDE</u>								<u>MSA, SPLUMA, SDF 2014 Guidelines</u>					
<u>Purposefully Selected Spatial Drivers</u>		Policy Alignment	Sector Priorities	Integrated Development	Optimal Located Development	Informal Settlement Regeneration	Public Transportation	Connectivity	Corridor Densification	Spatial Challenges/ Analysis	Spatial Vision	Spatial Objectives	Explicit Plans	Restructuring Elements	Spatial Proposals
<u>Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring</u>															
<u>Categories:</u>	<u>Themes:</u>														
Land-Use	Nodes	1	1	3	3	0	0	3	0	1	1	0	3	1	1
	Mixed-Use	0	1	1	1	0	0	1	0	1	0	0	2	1	1
	Infill (Optimal Location)	0	1	1	1	0	0	0	0	1	1	0	2	1	1
	Activity Streets	1	1	0	1	0	1	1	0	1	0	0	3	1	1
	Transport Related Land-Use	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Sprawl Measures	Defined Urban Edge	0	1	1	1	0	0	1	0	1	0	1	3	1	1
	Brownfield Regeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Non-Peripheral Neighbourhoods	0	0	0	1	0	0	0	0	0	0	0	1	1	0
Restructuring	Existing Corridors	1	1	2	1	0	1	1	0	1	0	1	2	1	1
	Residential vs. Employment	0	1	1	1	0	0	1	0	0	1	0	2	1	0
	Future Corridor Identification	0	1	1	1	0	1	1	0	1	0	0	2	1	1
Regeneration	CBD Regeneration	0	0	0	0	0	0	1	0	1	0	1	0	1	1
	Neighbourhood Regeneration	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Informal Settlements Regeneration	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Optimisation	Corridors Densification	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	Densification Nodes	0	0	0	0	0	1	1	0	1	0	0	1	1	1
	Densification: Land-Use Zones	1	1	1	1	0	1	1	0	1	0	1	1	1	1
Transportation	Public Transportation	0	0	0	0	0	1	1	0	1	0	0	1	2	1
	Transportation Nodes	0	0	0	0	0	1	1	0	1	0	0	0	1	0
	Transportation Modes	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Transportation Green (Walkability and Connectivity)	1	1	1	1	0	1	1	0	1	0	1	1	1	1
Total		7	10	13	13	0	8	16	0	13	4	5	24	16	13
%		11%	16%	21%	21%	0%	13%	25%	0%	21%	6%	8%	38%	25%	21%
<u>Points obtained</u>		142													
<u>Percentage of nominated interfaces</u>		16%													

Source: Own construction (2018).

The Tlokwe (JB Marks) MSDF misconstrues “policy alignment” as it aimlessly copies the sections concerning spatial restructuring from the policy, legislation and guidelines without

connecting it with the spatial challenges and objectives of the municipality. Informal settlements present a significant urban challenge within the MSDF and are addressed in “policy alignment” and the “spatial vision”. Nonetheless, the necessity for restructuring is merely referenced; neither presenting specific plans nor offering measures to attain the incremental upgrading of these area.

The “spatial vision” presents broad terms for the future development within the MSDF, failing to emphasise the immediate spatial challenges required to be addressed to direct development for the ensuing five years. The MSDF attempts to restructure the segregated urban form by identifying existing and future nodes in proximity to neighbourhoods but falls short in identifying future nodes, thereby progressing restructuring. The existing and future nodes within Potchefstroom are connected with existing and future corridors, however, these corridors are not recommended for high-density development, including mixed-uses adjacent thereto. Despite limiting continuous urban sprawl of the informal settlements to the west of Potchefstroom, by delineating the urban edge, the MSDF proposes future township establishments to the north, east and northwest near the urban edge, distant from business opportunities and other amenities, resulting in an assigned value of a value of 21%.

Infill planning is limited in the MSDF as a consequence of vast dolomite deposits between Potchefstroom and Ikageng. There are, however, several vacant sites located beyond the dolomite deposits, suitable for infill planning that ought to intercept incessant urban sprawl. Attention is, however, not devoted to Brownfield regeneration. Potchefstroom comprises several vacant areas and neglected parks that may offer opportunities for Brownfield regeneration. Apart from the neighbourhoods surrounding the North West University (NWU) and the Potchefstroom CBD, density within the MSDF urban edge is relatively low. The existing densification and related challenges are referenced in the MSDF with no identification of densification zones, nodes or corridors and no recommended strategies.

A significant encounter of the Tlokwe (JB Marks) Municipality is the physical separation of Potchefstroom and Ikageng, Promosa and Mohadin with most citizens residing in segregated areas distant from Potchefstroom. This results in extended commuting distances, with mini-bus taxis and cycling as the main transportation modes available to these citizens. No reference is provided in the MSDF to increase the modal split or to establish transportation nodes in Ikageng, Promosa and Mohadin to enhance the public transportation system. Although the corridor connecting Potchefstroom and the other segregated settlements are identified, transportation nodes are not identified in proximity to the neighbourhoods adjacent this corridor or any of the other identified corridors. “Public transportation” are evidently not considered when compiling the MSDF resulting in an assigned value of 13%. While the majority of citizens rely on

walking and cycling to access facilities and services in Potchefstroom, no reference to enhance pedestrian-friendly transportation is made.

As a consequence of the increasing student attendance at the NWU, limited on-campus residential facilities and the development of student housing surrounding the campus, certain businesses relocated to the “Bult” area (a business node immediately adjacent to the NWU campus), resulting in partial CBD declination in Potchefstroom. The existing commercial land-use patterns are dispersed, extending from the original CBD towards the “Bult” area, mostly in ribbon like patterns, following main arterials. Although the MSDF proposes CBD regeneration, it does not provide distinct strategies/ a precinct plan to attain regeneration. Other regeneration zones are also not identified, neither in the peripheral neighbourhoods nor in the informal settlements. Considering “corridor densification”, the MSDF wanes (a value of 0% assigned) by not contributing to this “spatial driver”, irrespective of the fact that a transportation corridor connects the segregated settlements of Potchefstroom.

The overall MSDF assessment presents a low-nominated interface value of 16%, signalling that CDOM attributes in relation to the relevant “spatial drivers” are not well attained. The latter is reasoned as a significant failure in addressing spatial reconstruction within the municipality. The analysis concludes that limited interfaces are nominated as the MSDF is not succeeding in addressing essential CDOM attributes and not reflecting on the important “spatial drivers”, therefore it is deemed as an unrealistic response towards spatial restructuring.

5.3.5 Overall Assessment of the Case Studies

The accumulative assessment is necessary in view of the research aim, attempting to determine whether the CDOM may well be conducive to attain spatial restructuring of South African cities. Since the MSDF is perceived as an instrument to attain restructuring, the conduciveness of the CDOM to this instrument is supplementary assessed. The latter; especially in view of Section 21 of the SPLUMA, determining that the MSDF must “identify current and future significant structuring and restructuring elements of the spatial form of the municipality, including development corridors, activity spines and economic nodes” (SPLUMA, 2013:33). The legal compliance of MSDFs not achieving this, is reasoned questionable. The aggregated assessment is attempted in evaluating the average interface values of the CDOM attributes and “spatial drives” generated from the assessment matrixes of the MSDF case study assessment and are illustrated in Table 5-6 below.

Table 5-6: Assessment Matrix of the Purposefully Selected Case Studies

Purposefully Selected Spatial Drivers Purposefully Selected Augmenting and Additional CDOM Attributes Progressing Restructuring Per Case Study	Policy Alignment	Sector Priorities	Integrated Development	Optimal Located Development	Informal Settlement Regeneration	Public Transportation	Connectivity	Corridor Densification	Spatial Challenges/ Analysis	Spatial Vision	Spatial Objectives	Explicit Plans	Restructuring Elements	Spatial Proposals
Tlokwe (JB Marks) Municipality	11%	16%	21%	21%	0%	13%	25%	0%	21%	6%	8%	38%	25%	21%
Stellenbosch Municipality	3%	32%	30%	35%	17%	37%	32%	3%	35%	6%	33%	60%	48%	46%
Metsimaholo Municipality	21%	27%	24%	32%	19%	3%	16%	17%	25%	0%	30%	63%	41%	32%
Combined %	12%	25%	25%	29%	12%	17%	24%	7%	27%	4%	24%	54%	38%	33%

Source: Own construction (2018).

The assessment portrays that “policy alignment” is a pertinent concern in the preparation of MSDFs (a valued of 12% assigned). The latter, notwithstanding the explicit directive of the SPLUMA section 8, affirming that norms and standards for land-use management and land development must reflect “the national policy, national policy priorities and programmes relating to land-use management and land development” (SPLUMA, 2013:2) and that MSDFs must assist in (section 12) “integrating, coordinating, aligning and expressing development policies and plans,” emanating from the various spheres of government (SPLUMA, 2013:27). The assessment additionally portrays that the Metsimaholo MSDF, to a certain extent, reflects on “policy alignment” and that the Tlokwe (JB Marks) MSDF did not analyse the municipal area in aligning the MSDF with the relevant “spatial drivers”.

Continuous urban sprawl remains a significant concern in the assessed MSDFs, signalling settlement’s fragmented urban forms and increased automobile dependability. Of the three case studies, Metsimaholo MSDF singularly attempts to address informal settlements. It recommends “corridor densification” by identifying a corridor connecting Sasolburg and Zamdela and implementing CDOM attributes to effectively integrate the two settlements and intercept the continuous urban sprawl of Zamdela. The case studies, in general, attempt the implementation of CDOM attributes but fail in presenting strategies and outcomes (projects) to guide the implementation thereof, resulting in an assigned value of 25%.

“Public transportation” (an assigned value of 17%) is a significant concern in all three case studies as alternative transportation modes are limited in municipalities. However, considering the “integrated development”, the Stellenbosch MSDF portrays the majority of the CDOM attributes (an assigned value of 30%), owing to the introduced TODs in the various precincts and precinct plans.

An exceedingly low-value is assigned (7%) relating to the “corridor densification”. The Stellenbosch and Tlokwe (JB Marks) MSDFs do not pertinently address this driver. Quite by contrast, the Metsimaholo MSDF reflects on “corridor densification”, identifying a corridor situated between Sasolburg and Zamdela that should be developed with high-density mixed land-uses in an attempt to integrate the two settlements. Although the Tlokwe (JB Marks) MSDF refers to existing and future corridors, it neglects in identifying specific corridors progressing integration between the main city and the segregated settlements. The “spatial driver” is not addressed in the Stellenbosch MSDF, although corridors connecting the segregated settlements are identified. The CDOM attribute being the most continually addressed by all three case studies, is the provision of “explicit plans”, illustrating the preferred development and target areas for the next five years (assigned value of 54%). In most instances the MSDFs referred to or identified the CDOM attributes, although wanting in proposing effective strategies and outcomes to guide future development.

The SPLUMA is specific in directing that Municipalities must prepare MSDFs that are informed by a long-term “spatial development vision statement and plan” that is guided by relevant sector policies and plans; “across all sectors of government” (SLUMA, 2013:25). Mere “spatial visions” lacking in spatial content, and not targeting governmental policy, legislation and guidelines, will negate MSDFs with a spatial restructuring emphasis. The “spatial visions” (assigned value of 4%), of all three case studies do not succeed in addressing CDOM attributes and “spatial drives”. Spatial challenges highlighting urban restructuring are narrowly contemplated. This is an apparent shortfall as the “spatial vision” is the commencing element to steer the preparation of a compliant MSDF that may serve as a strategic planning instrument to confront spatial restructuring in each municipality.

5.4 Conclusion

Since 1994, the South African Government continuously attempted the spatial challenges resultant from the Apartheid dispensation by implementing various policies, legislation and guidelines (refer to Chapter 2). The significance of the SPLUMA (2013:24), partially illustrated above, is embedded in the preparation of, amongst others, MSDFs as employable strategic planning instruments to facilitate spatial restructuring of segregated urban forms

Assessment of selected MSDFs as case studies, in seeking the interface and correlation between identified CDOM attributes and “spatial drivers”, illustrates that minimum requirements should be met if spatial restructuring is to be attained and, a deficiency herein, may well render the MSDF preparation process to a strategy lacking “significant structuring and restructuring elements” (SPLUMA, 2013:33). The assessment recognises that the MSDFs mention a number

of CDOM attributes and adhere to certain “spatial drives”, and in a lesser extent addresses the specific implementation thereof and not assigning specific strategies and outcomes thereto. This notion is confirmed by the recently introduced SDF Guidelines (Department of Rural Development and Land Reform, 2014:19), suggesting that MSDFs in South Africa are generally compiled considering inconsistent development principles, lacking transparent spatial attention and comprising exhaustive pages containing non-directional assessment.

In concurrence with the view of the Department of Rural Development and Land Reform, assessed MSDFs illustrated certain shortfalls, that may well be advanced with a more detailed and appropriate interfaced approach through the employment (or at least adherence to) of “spatial drivers” and by seeking to address a variety of the existing and incorporable attributes of the CDOM. The aforementioned signifies that preparation of a MSDF should continuously be informed by these attributes and drivers to ensure legal compliance by (i) reflecting on national policy, national policy priorities and programmes relating to land-use management and land development, (ii) by integrating, coordinating, aligning and expressing development policies and plans emanating from the various spheres of government and (iii) by reflecting significant structuring and restructuring elements (SPLUMA, 2013:21). In this respect, the CDOM possibly will contribute to the MSDF preparation process by presenting a number of approaches in the form of attributes that may further augment spatial restructuring. The ensuing chapter aims to conclude the research, discussing each research question in context with the research completed in the preceding chapters.

CHAPTER 6 CONCLUSIONS

6.1 Introduction

This chapter presents the key findings that originated from the literature review and the case study assessment necessary to attain the research aim identified in Chapter 1, namely:

To investigate the proposed CDOM, consider its augmentation and enhancing it through more diverse contemporary planning approaches as a possible remedy for spatial restructuring of South African cities.

The aim of this chapter is to concisely present the findings of the preceding chapters required to attain the research aim. Section 6.2 will present an extensive discussion of the research results, correlating to the research questions (section 1.2) to illustrate a specific connection to the aim of the research. Section 6.3 will, subsequently, present the conclusion of the research, considering the research method, literature review and the results of the case study assessment required to determine whether the CDOM may be implemented as a possible remedy to spatially restructure segregated urban forms.

6.2 Conclusion of research results

The following section discusses the research questions, identified in section 1.2, and how they are addressed in order to attain the research aim. A synopsis of the research questions, reflecting with their corresponding conclusions are illustrated in the ensuing Table 6-1.

Table 6-1: Summary of the research questions compared with the main research aim.

Conclusions relating to research question 1: What are the historical events culminating in the spatially distorted urban settlements of South Africa?

Chapter 2 investigated relevant historical events resulting in the spatially distorted settlement patterns of South African cities, inter alia, including legal directives that presented this disruptive impetus. In further investigating the phenomenon of spatially distorted settlement patterns, recent events and restructuring policies, legislation and guidelines were ensuing contemplated. All in determining the directives to readdress the segregated development, ascending immediately prior to and following the 1994

democratic elections.

Section 2.2 recognised that Apartheid legislation shaped the segregated urban form currently persisting in South African cities. This is supported by Maylam (1990:66), sustaining that the intention of this legislation was to impose racial and physical separated development, resulting in forced removals of non-white citizens to areas located on the periphery of settlements. The development pattern of this urban form was characterised by segregated settlements, comprising dual cities that developed parallel to each other with dual CBDs, neighbourhoods and amenities. The areas were physically separated, usually with a buffer, limiting the access of non-white citizens to the city.

The investigation of section 2.3, established that the newly elected National Government fervently attempted to readdress the fragmented urban nature of the settlements by implementing directives in the form of the RDP, DFA (since repealed), UDF and the Moving SA. Aforementioned directives intended the facilitation of an integrated and compact development approach to adequately provide equal services, infrastructure and opportunities. Despite the fact that these directives sought to address the fragmented nature of urban forms, it was concluded that its achievements remained questionable. The SACN (2011:47) in supporting the latter, postulates that the directives failed, owing to their pressured implementation and unrealistic development goals.

Resultant from the debatable attempts to attain spatial integration during the 1994 to 2000, post-Apartheid epoch, the National Government introduced further forward-thinking directives, in the form of the MSA (succeeding the LGTA), the CSIR's Guidelines for Human Settlement Design, NLTA, NATMAP, NDP, SPLUMA, MTSF, SDF Guidelines and IUDF, attempting to rectify the spatial challenges still affecting South African urban forms. Directives, of late, engaged numerous restructuring attributes to address the spatially segregated urban forms of South African cities (refer to section 2.4). it, however, appears that recent directives, in some instances, succumbed to similar impediments than their forerunners. SACN (2011:50), ascribed to the latter by lamenting that prospective integrated planning lacked sufficient alignment by Local Government, often being in conflict with the spatial vision and objectives of higher National and Provincial Government.

Notwithstanding, the efforts of Government, it was concluded that initial historical events and restructuring directives that followed, did to entirely prosper as numerous large, medium and small towns in the South Africa dejectedly remained as segregated urban forms, necessitating an alternative measure to purposefully grapple spatial restructuring. It was in conclusion concurred with Hall and Porterfield (2001: xxii) "that we must be proactive in effecting change", rather than being despondent in the midst of an incessant and highly segregated landscape. The research, resulting from the diaspora of post-1994 directives (section 2.5), purposefully selected "spatial drivers" deemed inherent to the

restructuring discourse and concluded that it ought to be reflected upon in the preparation of MSDFs.

Conclusions relating to research question 2: What is the rationale, attributes and implementation aims of the existing CDOM as it was initially portrayed in both the Moving SA and the Guidelines?

Chapter 3 determined and elaborated on the initial supporting attributes of the CDOM, proposed in the Moving SA and the CSIR's Guidelines for Human Settlement Design in grasping of the initial rational of the model. Reflecting on, the Department of Transport initially introduced the CDOM as a transportation strategy to integrate previously segregated urban settlements (section 3.2). This was prepared by identifying high-level transportation corridor bands connecting these settlements with the CBD and implementing infill planning, densification and mixed-use development adjacent these corridors. The Department of Transport presented the CDOM as the most suitable option, since South African cities originated in a "tentacle" pattern owing to Apartheid legislation.

The research (section 3.2) derived that the objectives of the initial CDOM were to identify existing transportation corridors connecting dispersed settlements, while developing the vacant areas surrounding these corridors with high-density mixed-use neighbourhoods in support of a public transportation system. Even though the CDOM appears to be the most suitable approach for South African cities, the research concluded that the model never gained the required attention from planning professionals and engineering specialist, largely attributed to its vague and mono-functional nature.

The latter prompted the research in further concluding that the initially applied CDOM ought to be augmented by identifying and extensively researching its planning approaches. In attaining the latter, section 3.3 augments the initial attributes in more detail, in particular, urban densification, compact city, corridor development, infill planning, urban regeneration and public transportation planning. In supporting the Moving SA premise of densification as the foremost component of the CDOM, the research similarly concluded that densification zones (section 3.3.1), the compact city (section 3.3.2), mixed-use neighbourhoods adjacent high-level transportation corridors (section 3.3.3 and 3.3.4) and CBD regeneration (section 3.3.5) have a duty to serve as augmented components, inherent to the CDOM narrative.

In conclusion of Chapter 3, ensuing the extensive investigation of the CDOM's rationale, attributes and implementation aims, the research lamented that the initial planning approaches related to the CDOM, were ineffectually presented. The latter, seeing that the Department of Transportation presented the model as a "transportation strategy, hence concluding that the augmentation of the CDOM by means of land-use and spatial planning attributes are exceedingly preferable. The research, resulting from the

review of the CDOM's rationale, attributes and implementation aims (section 3.4), purposefully selected augmenting attributes deemed intrinsic thereto and concluded that it should serve as augmenting attributes to the CDOM, in progressing restructuring.

Conclusions relating to research question 3: What possible, additional and contemporary planning approaches may enhance the CDOM?

As the research concluded the necessity of augmenting the CDOM (Chapter 3), Chapter 4 ensuing endeavoured an assessment of additional and contemporary planning approaches that will likely be beneficial in the enhancement of the CDOM. The assessment suggested, in maintaining the innovative spatial objective of the preliminary CDOM, to expand the model with additional and contemporary planning approaches that entailed equivalent attributes as the planning approaches identified in Chapter 3. The aim of the research was not to alter the original CDOM, rather to contemplate its enhancement through additional and contemporary planning approaches, in particular; TOD, smart growth, new urbanism, green urbanism, SMS and transit cities as an effective alternative to address the persisting fragmented environment.

In supporting the foregoing, the research was impelled to extensively explore these planning approaches in determining their applicability as potential enhancing attributes to the CDOM. The research concluded in that the additional and contemporary planning approaches will arguably serve purpose in progressing the model as it underlined resembling attributes of the CDOM by giving emphasis to high-density development in proximity to high-level transportation corridors (section 4.2.1), identifying existing urban areas already comprising infrastructure for redevelopment (section 4.2.2 and 4.2.3) and improving accessibility and mobility by locating public transportation opportunities in proximity to neighbourhoods that encourage walking and cycling (section 4.2.5). The research thereby concluded that the selected planning approaches, by the nature of their propensities to grapple with the centrifugal forces synonymous with urban sprawl, will prospectively enable urban restructuring through the application of an enhanced CDOM.

However, in response to the initial CDOM's mono-dimensional nature and breakdown in impacting on distorted settlement patterns, the research additionally concluded that the employment of the CDOM, as a collective and aggregated impact approach (section 4.3.), have a potential role to play in cultivating urban regeneration. This signified the likelihood of the existing CDOM and its additional and contemporary planning approaches to be collectively compiled in a single model, implementing all attributes in a multifunctional manner in evolving urban restructuring. The research, resulting from the assessment of additional and contemporary planning approaches (section 4.4), purposefully selected

additional attributes and concluded that it ought to be incorporable in the CDOM, thereby progressing its restructuring emphasis.

Chapter 4 saw the completion of the literature and documentation review phases of the research, in twofold by respectively (i) exploring the CDOM's initial, additional and contemporary planning approaches, concluding that, derived at restructuring attributes, may well enhance the CDOM and (ii) by concluding that specific "spatial drivers" ought to be reflected upon in the preparation of MSDFs. These conclusions were firstly compiled in a theoretical matrix and secondly set forth as point of departure for the compilation of an assessment matrix to conduct the empirical phase, explained in the ensuing section.

Conclusions relating to research question 4: What is the viability of the CDOM in attaining the spatial restructuring of South African cities on a MSDF level?

As was concluded in Chapter 4, Chapter 5 had at its core a collectively and aggregating approach and concluded that the prepared theoretical matrix could arguably be progressed in an unambiguous assessment matrix to conduct the empirical phase. Section 5.2 clarified the research method (theory-based sampling by means of open coding) employed in deriving at the above attributes and "spatial drivers" constructed in the assessment matrix. The concluding progressed assessment matrix (section 5.2) was finally entrenched:

- (i) in the purposefully selected "spatial drivers" having from its inception, spatial restructuring, being embedded in the preparation of MSDFs, seen as a deceive instrument in, inter alia, the attainment of spatial restructuring,
- (ii) in the existing CDOM, from the onset offered as a probable model to improve the distorted settlement patterns of a post-Apartheid South Africa through its the purposefully selected attributes,
- (iii) in the purposefully selected attributes derived from the literature review, deemed incorporable in the CDOM, correspondingly seeking an improved integrated and compact urban form, similarly signalling spatial restructuring, and
- (iv) in seeking and nominating the interface between "spatial drivers", and the augmented and the identified incorporable attributes of the CDOM, thereby seeking optimum and conducive conditions for the attainment of spatial restructuring on MSDF level.

The concluded assessment matrix was ultimately employed in numerically analysing the MSDFs of three type-C settlements (section 5.3) that were identified as case studies, mostly as consequence of the segregated spatial forms of its precincts, by seeking the interfaces outlined above. The research

therefore concluded that type-C settlements ought to be assessed in view of the fact that the mainstream of major cities and metropolitan areas in South Africa, since embraced strategies intending spatial restructuring. The analysis illustrated the highest interfaced value attained by the Stellenbosch MSDF, an assigned value of 30% (refer to 5.3.3) followed by the Metsimaholo MSDF that attained an interface value of 26% (section 5.3.2), and the Tlokwe (JB Marks) MSDF Municipality, that attained an interface value of 16% (section 5.3.4). Flowing this analysis, the research concluded that while most Municipalities implemented certain of the CDOM attributes and adhered to certain “spatial drivers”, they merely identified deficits relating to the spatially distorted forms of their respective precincts, not succeeding in providing effective strategies, outcomes and detailed plans in attaining spatial restructuring (refer to section 5.3.5). It was concluded as reason for the lack in spatial restructuring in the selected urban settlements. The analysis concluded that the minimum interfaces were nominated, as the MSDFs are not succeeding in addressing the necessary CDOM attributes and not reflecting on essential “spatial drivers” (section 5.3.5).

The analysis perceived the above attained values as low, and concluded that the likelihood of the prepared MSDFs, succeeding in spatial restructuring, is debatable. The analysis (section 5.4) accordingly argues that a MSDF, adhering to purposefully selected CDOM attributes, interfaced with purposefully selected “spatial drivers”, all having spatial restructuring as reference, have a likely role to play in the spatial restructuring advent. In this respect, the research concluded the analysis, signalling that MSDFs may well serve as strategic planning instruments to expedite spatial restructuring in type-C settlements in South Africa.

Source: Own Construction (2018).

6.3 Compendium of the research

The commencing phase of the research presented the scope of the research, identifying the process and methods in accomplishing the research aim. The employment of a qualitative research method, in this instance, theoretical sampling (Cohen *et al.*, 2018:714-717) (section 5.2); was opted for as the methodology for exploring the research aim. This phase presented the research aim as the investigation of the existing CDOM, by considering its augmentation and enhancement through additional and contemporary planning approaches as a possible remedy for the spatial restructuring of South African cities. Phase 2 of the research were twofold, by firstly (i) reviewing literature and directive sources, illustrating the negative impact Apartheid legislation had on spatial development in South African cities. Post-1994 directives were ensuing assessed in identifying the spatial restructuring attempts of the post-Apartheid Government in the form of “spatial drivers” compulsory for a compliant MSDF. This phase of

the research, secondly, conducted (ii) a review of literature sources in identifying the initial, additional and contemporary planning approaches deemed incorporable in the CDOM.

Phase 3 presented a description of the research methodology in preparing for the empirical phase and ultimately exploring the research aim outlined in phase 1. Purposefully selected existing, additional and contemporary attributes of the CDOM (refer to Table 3-1 and 4-1) and purposefully selected “spatial drivers” derived from restructuring directives, obtained through employing the processes theoretical sampling (Suri, 2011:7) and open coding (Cohen et al., 2018:670), were compiled in a theoretical matrix. These processes culminated in the generation of themes and categories and proposed as CDOM (see Figure 5-1) attributes and “spatial drivers”, for incorporation in the theoretical matrix. This process was significant in advancing the theoretical matrix in an assessment matrix for the ultimate assessment of the case studies. Three MSDFs were selected as case studies, prepared from 2014 (in reflecting the most recent SDF Guidelines prepared by the DRDLR) onwards and being reminiscent of spatially segregated urban forms. It was endeavoured in determining the relevance of MSDFs as strategic planning instruments to facilitate spatial restructuring on a municipal level. The assessment of the case studies concluded that, albeit, not being effective in presenting explicit plans, strategies and outcomes, partial attempts were depicted, reflecting on the identified CDOM attributes and “spatial drivers”, and in so doing, restricted improvement of spatial restructuring. MSDFs, as was concluded, will serve a purpose as strategic planning instruments in attaining spatial restructuring, subject to an escalation in nominated interfaces between the identified CDOM attributes and “spatial drivers”.

The preceding chapters illustrated the extensive spectrum of the research process in attaining the research aim. Phase 4 concluded the research findings, now serving as reference for the ensuing recommendations. The final phase presented the conclusions of the research questions in correlation with its specific chapter and it will subsequently be ensued by recommendations that may well be conducive towards the implementation of the CDOM as an appropriate means to attain spatial restructuring.

CHAPTER 7 RECOMMENDATIONS

7.1 Introduction

The aim of this chapter is to propose planning recommendations in attaining the final research question identified in Chapter 1, namely:

5. What recommendations may well be conducive towards implementing the CDOM on a MSDF level, as a possible means to attain spatial restructuring of South African cities?

The research considers the CDOM as a possible approach to attain spatial restructuring in South African cities by investigating the (i) historical events culminating in the spatially distorted urban settlements (ii) the existing model's initial rationale, attributes and implementation aims (iii) the possible, additional and contemporary planning approaches that may enhance it (iv) and the viability of the CDOM in attaining the spatial restructuring of South African cities on a MSDF level (see Figure 5-1). Contemplating the conclusions (section 6.2) presented in Chapter 6, it is readily assumed that the research objectives (section 1.2) were attained. It was undeniably concluded that Apartheid legislation significantly influenced spatial patterns in South Africa and consequentially the prevailing urban forms (research objective 1). This undesirable spatial legacy inevitably necessitated alternative tactics to attain spatial restructuring. The CDOM, as it was proposed by the Moving SA and Guidelines (research objective 2), were investigated in determining its probability to play a significant role in attaining spatial restructuring as it is continually being promoted in reformation directives. The CDOM was enhanced by identifying additional and contemporary planning approaches (research objective 3) deemed incorporable in the model. In seeking and nominating the interface between "spatial drivers", and the augmented and the identified incorporable attributes of the CDOM, optimum and conducive conditions for the attainment of spatial restructuring on MSDF level were determined, and it was concluded that MSDFs may well serve as strategic planning instruments to expedite spatial restructuring in type-C settlements in South Africa (research objective 4).

This chapter (section 7.2) offers recommendations to improve the conduciveness of the CDOM in attaining spatial restructuring on a strategic, and evidently a compulsory level; in this instance through the preparation of MSDFs. Recommendations are also provided in potentially directing further research, seeing that this research merely focussed on the enhancement of the model through planning approaches and emphasis was not placed on particular transportation planning augmentations. The ensuing section presents the offered recommendations.

7.2 Recommendations

The ensuing recommendations are provided to promote spatial restructuring on a strategic level through MSDFs by suggesting the incorporation of “spatial drivers” and CDOM attributes in the preparation of these documents. The case study analysis argued that, failing in following this approach, or at least endeavouring it, may culminate in disappointing urban restructuring results; the latter in stark contradiction to recent directives outlining the obligation of Local Governments.

Although the CDOM was in existence through the Moving SA and the Guidelines, its vague and mono-functional presentation as a transportation strategy did not draw valid attention from Local Governments and their service provides in the preparation of MSDFs. The existing CDOM is therefore perceived as an emerging model, immediately following a new dispersion, perhaps not well formulated, well attributed and multifunctional in its approach, prompting this research enhancing its attributes and evolving its applicability on a strategic level.

(i) Existing CDOM not recommended for implementation:

Although the CDOM was in existence through the Moving SA and the Guidelines, during 1998 and 2000 respectively, its vague and mono-functional presentation as a transportation strategy did not draw valid attention from Local Governments and their services were not provided in the preparation of MSDFs (section 3.2 refers). The existing CDOM is, therefore, simply recommended as an emerging model, immediately following a new dispersion, perhaps not well formulated, well attributed and mono-functional in its approach. It is recommended not to employ the model in its emergent stance, but preferably considering employment of its improved state (section 4.2 refers) as proposed in this research; especially should the spatial restructuring of segregated settlements be pertinent in a specific Local Government.

(ii) CDOM to adopt a multifunctional dimension:

In the acquisition of its initial rationale, that of spatial restructuring (section 3.2 refers), it will likely be obligatory for the CDOM to adopt a multifunctional dimension (section 4.3 refers) to address the prevailing spatially distorted settlements of South African; a notion strongly supported by Retief *et al.* (2016: 56) (section 3.3.4 refers) arguing that megatrends underscore the need for moving away from seeking a predictable single future or outcome. The current monofunctional appearance of the CDOM is reasoned obsolete.

(ii) Incorporable attributes to progress the CDOM:

It is recommended that a multifunctional approach will arguably be attained by (i) initially “unravelling” the original CDOM’s planning approaches, through urban densification, compact city, corridor development, infill planning, urban regeneration and public transportation planning (Chapter 3, section 3.3 refers) and secondly by incorporating the additional and contemporary planning approaches of TOD, smart growth, new urbanism, green urbanism, SMS and transit cities (Chapter 4, section 4.2 refers). By exploring literature in supporting the said approaches, specific attributes are selected (section 5.2 refers) and recommended as incorporable to the CDOM. Its practical application is embedded in a developed assessment matrix (section 5.2 refers), duly explained in ensuing recommendation section x.

(iii) CDOM to be collectively employed:

Chapter 3 identified that the existing CDOM is not deemed a feasible means for spatial restructuring, largely resultant from the mono-functional nature thereof. In view of Berrisford’s (1998:213-230) argument (section 4.1 refers), the research acknowledges that each municipality comprise unique spatial challenges. The research recommends the employment of the enhanced CDOM as a collective approach (section 4.3 refers); especially since the various and diverse attributes have different merits for its employment in addressing spatial restructuring (sections 6.2 refers). Although it is accepted that all the attributes of the CDOM will not concurrently be applied, it is recommended that municipalities identify and implement the most suitable restructuring attributes addressing the specific challenges resulting from its unique fragmented urban form, in engaging the CDOM.

(iv) Compliant MSDFs to be prepared:

The compulsory nature of restructuring directives necessitates the interpretation and the reflection thereof in Local Government policies, inter alia, emphasised by the SPLUMA (section 2.4.6 refers) and, in this manner, also directing the preparation of MSDFs. MSDFs are consequently perceived as statutory instruments to guide spatial planning endeavoured by Local Governments (section 5.3.1 refers). Specific restructuring directives, therefore, place the preparation of MSDFs under obligation to grapple a spatial restructuring advent. It is recommended that these directives should play a role in the preparation of a MSDF, in warranting alignment with national directives. It is further

recommended that these compulsory alignments could be achieved by subjecting the preparation of MSDFs to selected “spatial drivers”, thereby rendering compliant MSDFs.

(v) CDOM to be incorporated in MSDFS:

The MSDF is the only statutory instrument to target spatial planning and implementation of national policies (section 5.3.1 refers) on Local Government level. Should the CDOM stand alone, simply as a model, its implementation value is questionable. It was lamented in the research, argued as a probable explanation for its ineffectiveness to renovate spatial restructuring (section 5.3.2, 5.3.3 and 5.3.4 refers). It is, therefore, recommended that the enhanced CDOM should be elevated to a strategic as well as a statutory level, to be justly directional to spatial restructuring. The MSDF is recommended in this respect as the most appropriate instrument in incorporating the CDOM.

(vi) Revision of the Guidelines for human settlement planning and design:

It is recommended that the existing Guidelines (section 3.2 refers), implication of the DRDLR, should be reviewed or the amendment thereof should be considered. The recommended revision does not propose to simply incorporate transportation planning in the MSDF preparation process, rather a specific review by including the improved attributes of the CDOM; especially as the SPLUMA (2018:32) underscores the necessity in identifying “significant structuring and restructuring elements of the spatial form of the municipality, including development corridors, activity spines and economic nodes” (section 3.2 refers). This recombination is further evident as spatial restructuring is a supposed priority by Local Governments (section 5.3.1 refers). Said revision may, therefore, keenly promote the elevation of the CDOM to a statutory and strategic planning level in the MSDF (recommendation [v] above refers).

(vii) MSDFS to seek increased interfaces between CDOM attributes and “spatial drivers”:

MSDFS being reminiscent of spatially segregated urban forms were assessed in the empirical phase of the research (section 5.3.1 refers). As outlined, the research did not aspire in determining the compliancy of MSDFS (refer to section 1.4.2), rather to determine whether MSDFS, through employment of the CDOM attributes, will expedite spatial restructuring on a municipal level. It is recommended that MSDFS should steer from merely referring to the significance of spatial restructuring in general (section 5.3.5 refers) and should, inter alia, present restructuring instilled spatial visions, strategies and outcomes and explicit plans, thereby, improving its success in attaining spatial

restructuring (section 6.2 refers). It is also recommended that MSDFs may well serve as planning instruments in attaining spatial restructuring, subject to the escalation of the nominated interfaces between the identified CDOM attributes and “spatial drivers” (section 6.2 refers).

(viii) Expansion of the CDOM attributes through transportation planning attributes:

Assessed MSDFs attained an interface value of 17% relating to “public transportation” (section 5.3.5 refers). Walters (2014:5) ascribe this to insufficient capacity to implement policy and the lack of expertise in local municipalities (section 6.2 refers). It must be comprehended that the Moving SA primarily introduced the CDOM as a transportation strategy to address the urban challenges, and this research emphasised only on the potential development of its planning attributes (section 1.1 and 1.5 refer). Considering the limitations of the CDOM, in terms of a transportation planning perspective, the research recommends forthcoming research to (i) also improve the CDOM's transportation planning attributes and (ii) similarly, its incorporation in strategic planning documents, in this instance the MSDF. It is recommended that the employment capabilities of the CDOM will be strengthened by its presentation as an integrated model, reflecting both augmented transportation and spatial planning attributes (section 2.3.2 refers).

(ix) Transit cities as the CDOM's progressive model:

The application of the assessment matrix was focussed on type-C settlements in view of its incessant and reminiscence to spatially segregated urban forms (section 1.4.3 refers). the research recommended that the CDOM ought to be incorporated in strategic spatial planning documents (the MSDF) (section 6.2 refers); especially should a spatial restructuring advent be anticipated. However, in the event of recurrent urbanisation, in the form of inevitable sprawl and independent multi-activity nodes surrounding a CBD, predominant in larger type municipalities, feasible employment of the CDOM remains uninformed (section 1.5 and 5.3.1 refers). The research recommends the transit city model as a predictable solution, since it is an accustomed phenomenon to interconnect strong satellite nodes with the CBD by means of effective rail or bus routes (section 4.2.6 refers). This recommendation sees activity nodes in the transit city to be assessed as “individual” CDOMs, intercepting continuous sprawl of each individual settlement, while encouraging a more structured and compact urban form. The recommendation, however, accepts the overarching and mutual interconnection (section 4.2.6 refers) of independent multi-activity nodes, as predicted in the transit city model, thereby not defying the objectives of urban restructuring in large rapidly expanding municipalities.

(x) Functionality of the assessment matrix in assessing MSDFs:

It is recognised that the prepared assessment matrix is by no means deemed a final or complete assessment tool. The employment of a different methodology and the further improvement of the CDOM may well see a further augmented assessment matrix. It is, however, accepted that spatial restructuring is, and will always be, inherent to spatial development discourse in South Africa (section 2.1 refers). It is, therefore, recommended that the prepared assessment matrix may already serve as a promising assessment tool in deciding whether spatial restructuring is attainable through prepared MSDFs, in particular; to determine which attributes should be present or which attributes should be provided as catalyst to spatial restructuring.

7.3 Conclusion

The cautions of Musisi (2018) is still resonating through the UN's 9th World Urban Forum, held in Kuala Lumpur, Malaysia, earlier this year, alarming that "Africa must get it right on urbanisation". The South African Government, still grappling with the Apartheid legacy and its remnants of spatially segregated and distorted settlements, are effortlessly attempting in "getting it right on urbanisation". The past settlement patterns, coupled with a dramatic surge in urbanisation, in which South Africa now seems to be taking the undesirable lead of 3,5 % per annum (Adesina, 2016:5), incessantly contest government to seek new and innovative solutions in meeting its directives and confront spatial restructuring. In concluding this research, it is recommended that "getting it right" may well be entrenched in the augmented CDOM as a possible remedy for spatial restructuring of South African cities.

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