SPATIAL PLANNING, TRANSPORTATION PLANNING AND ENVIRONMENTAL MANAGEMENT POLICY INFORMING STRATEGIC PLANNING IN SUPPORT OF MODELLING AS INTEGRATIVE INSTRUMENT IN DEVELOPING COUNTRIES

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ABSTRACT

The debate for the need to align spatial planning, transportation planning and environmental management strategically, functionally and operationally in support of modelling is ongoing internationally since the early 2000s. This incorporates the articulation of the planning instruments used by professionals within these functional fields and the way in which it is coordinated and aligned.

With the approval of the Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013) and the SPLUMA Regulations (23 March 2015) in South Africa, the statutory planning legislation framework applicable during the previous political dispensation was reformed and democratized.

In this article the alignment between policy and legislative frameworks, guidelines and processes to support planning and development in spatial systems will be discussed. The approach presented in this article will serve as a guide in planning within developing countries.

Keywords: environmental management, integrated planning, spatial planning, transportation planning, transformation processes.

1 INTRODUCTION AND BACKGROUND

Spatial planning and its interface with transportation planning and environmental management form the focal point in attaining and promoting sustainable planning and development [1]. This challenge in South Africa is addressed in the policy and legislative framework and more specifically in the publication of the Spatial Planning and Land Use Management Act (SPLUMA) [2] and its Regulations [3]. Several policy documents such as the National Transport Master Plan (NATMAP) [4], National Development Plan (NDP) [5], Draft Integrated Urban Development Framework (DIUDF) [6] and the Draft National Land Transport Strategic Framework (NLTSF) [7] recognize the need for strategic and functional integration.

The principle of sustainable development and the need for improved integration is not a new debate. The UN Habitat [8] in its Global Report on Human Settlements (Planning and Design for Sustainable Urban Mobility) identified the urban mobility challenge and more specifically the sustainability challenge to pivot on the integration of land use and transportation planning; social dimensions and reality; environmental dimensions; economic dimensions and institutional and governmental roles and responsibilities. These principles are directly and indirectly applied in various sources of the UN Habitat 2: International Guidelines on Urban and Territorial Planning [9].

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The State of the African Cities (UN Habitat) [10] identifies forces such as population, urbanization, urban development, urban planning and resource management, urban culture and green urban development as the main agents for change and development. It is also closely aligned to the focus for UN Habitat 3 that will deal with '*The Future we Want: The City we Need*' that is to be held in 2016.

2 POLICY AND LEGISLATIVE FRAMEWORK GUIDING THE ALIGNMENT

The supporting policy and legal framework underpinning the frameworks are included in Scheepers [11] and Van Wyk [12]. To understand this relationship the planning and development before and since democratization in 1994 should be noted.

2.1 Spatial planning transformation in a developing country

The democratic government in 1994 inherited a segregated and fragmented spatial system guided by an evenly ineffective policy and legislative framework. The transformation of this framework commenced with the Draft Green Paper on Development and Planning [13]. The development within the South African national spatial system originated with the arrival of migrants from various parts of the world spatial system. This led to the development of the first spatial region in South Africa that met the theoretical requirements as developed by Friedmann [14]. The spatial systems of South Africa can be classified as consisting of multinational spatial systems inclusive of various African countries [15]. The South African spatial system consists of the National Spatial System subdivided into nine Provincial Spatial Systems (PSS). Each of the PSS consists of wall-to-wall municipalities inclusive of Metropolitan, District and Local Municipalities. These spatial systems consist of regions, core areas, rural orientated areas and various corridors and networks linking the core areas and hinterland of the spatial systems.

The National Planning Commission (NPC) since its inception in 2010 contributed to documenting the effects of the spatial legacy by the formulation of a Diagnostic Overview [16] and strategic (intervention) proposals in the NDP [5].

Of significance in the transformation process is the promulgation of the first new set of democratic laws that served as a pivotal point to restructure the characteristics of spatial planning through the Development Facilitation Act [17] and the principles as included in the Constitution of the Republic of South Africa [18].

The spatial planning scene changed with the adoption of the Constitution [18], Municipal Structures Act [19] and the Municipal Systems Act [20]. This resulted in the formulation of Integrated Development Plans (IDPs) within the municipal sphere of government. This transition and transformation process culminated in the approval of SPLUMA [2] and SPULMA Regulations [3].

The Department of Rural Development and Land Reform (RDLR) is in the process of reviewing the Guidelines for the preparation of Spatial Development Frameworks (SDFs) [21] to align the formulation of spatial plans in terms of the provisions, development principles and norms. This includes the enhancement of alignment between spatial planning, transport and environmental management. It is IDP orientated and based on international theory and best practice. Emphasis is placed on strategic approaches rather than to be prescriptive. It requires cross-sectional alignment and integration. Principles of spatial justice, sustainability, efficiency, resilience, management and administrative approaches are fundamental to SPLUMA.

2.2 Transportation planning transformation

Transport planning in South Africa became a statutory planning activity with the enactment of the Urban Transportation Act [22]. The National Land Transport Transition Act (NLTTA) [23] was used until 2009 when the National Land Transport Act [24, 25] was promulgated.

In this context various policy documents underpin the transformation process: White Paper on National Transport Policy [26]; Moving South Africa (Vision 2020) [27]; Rural Transport Strategy for South Africa [28]; NATMAP 2050 [29] and Draft National Land Transport Framework [30]. The National Department of Transport (NDoT) in 2014/15 commenced with the revision and adaptation of NATMAP 2050 by the formulation of a Synopsis Report [31] to address components related to alignment, integration and transportation.

2.3 Environmental management

Environmental management started with the enactment of the Environment Conservation Act [32]. The publication of the document entitled 'Integrated Environmental Management (IEM) in South Africa' (Council for the Environment) [33] in 1989 marked the introduction of the concept of environmental management. The term IEM was chosen to indicate a general approach to integrate environmental considerations across all stages of the planning and development cycles.

The publication of the National Environmental Management Act (NEMA) [34] introduced new approach to and role of environmental considerations in development. It provides the framework for cooperative environmental governance and promotes the application of environmental assessment and management tools in the management of activities. The intention of NEMA was formalized through publication of the EIA Regulations [35]. In 2010 revised NEMA EIA Regulations [36] were promulgated inclusive of changes to the listing of activities.

From an assessment of the content of the policy and legislative framework the conclusion can be drawn that restricted provision for the integration of the interface between the professions and fields of focus exists. This conclusion should be read with the objectives as identified in the National Framework for Sustainable Development in South Africa (NFSD) [37]. It makes provision for enhancing systems for integrated planning and implementation; sustaining ecosystems and using natural resources efficiently; economic development via investing in sustainable infrastructure; creating sustainable human settlements and responding appropriately to emerging human development, economic and environmental challenges. SPLUMA [2, 3] provides for provision of specific development principles and norms; intergovernmental support; SDFs; land use management and land development management. The alignment within the policy and legislative frameworks is strategic in nature and does not address functional and operational issues. It is reflected in different application processes resulting in duplication and conflicting approval procedures.

3 THE ALIGNMENT BETWEEN SPATIAL PLANNING, TRANSPORTATION PLANNING AND ENVIRONMENTAL MANAGEMENT

SPLUMA (2013) [3, 4] contains the following objectives: provision for a uniform, effective and comprehensive system of spatial planning and land use management; ensuring that the system of spatial planning and land use management promotes the social and economic inclusion; provision of development principles, norms and standards; sustainable and efficient use

of land; cooperative government and intergovernmental relations within all spheres of government and redress of imbalances of the past and to ensure equity in spatial development planning and land use management systems. Table 1 shows the interface between focuses and instruments as provided for in spatial planning, transportation planning and environmental management policies and legislation.

Figure 1 shows the graphical alignment between strategic planning and operational levels of instruments (Table 1). From this the complexities and need for alignment and integration

Table 1: Interface in focus and instruments as provided for in spatial planning, transportation planning and environmental management.

SPLUMA (2013)	NLTTA (2000)/NTA (2009)	NEMA (1998)
Development principles and norms and standards	General principles for transportation planning	General objectives
Intergovernmental support	Types of transportation plans	Environmental Implementation Plans (EIPs)
Spatial Development Frameworks (SDFs)	Provisions on transportation planning	Environmental Management Plans (EMPs)
National Spatial Development Framework (NSDF)	National Land Transport Strategic Framework (NLTSF)	Integrated Environmental Management (IEM)
Provincial Spatial Development Framework (PSDF)	Provincial Land Transport Frameworks (PLTF)	Environmental Impact Assessments (EIAs)
Regional Development Framework (RSDF)	Integrated Transport Plans (ITPs)	Environmental Authorizations (EAs)
Municipal Development Framework (MSDF)	Freight Transport Plans (FTP)	Strategic Environmental Assessments (SEAs)
Land Use Management (LUM)	Transportation plans and changes in land use and public transport infrastructure and services	Environmental Management Programme (EMPs)
Land Development Management (LDM)	Rationalization of public transport services (RATPLANS)	Monitoring and Performance Assessment (M&PAs)
Municipal Land Use Plans (MLUP)	Public Transport Plans (PTPs)	Mine Closure Plans (MCPs)
Statutory Planning (SP)	Commuter rail plans (CRP)	
	Transport Impact Studies (TISs)	
	Traffic Impact Assessments (TIAs)	

Source: Own construction from SPLUMA [2, 3], NLTTA [23], NLTA [24, 25] and NEMA [34, 36]

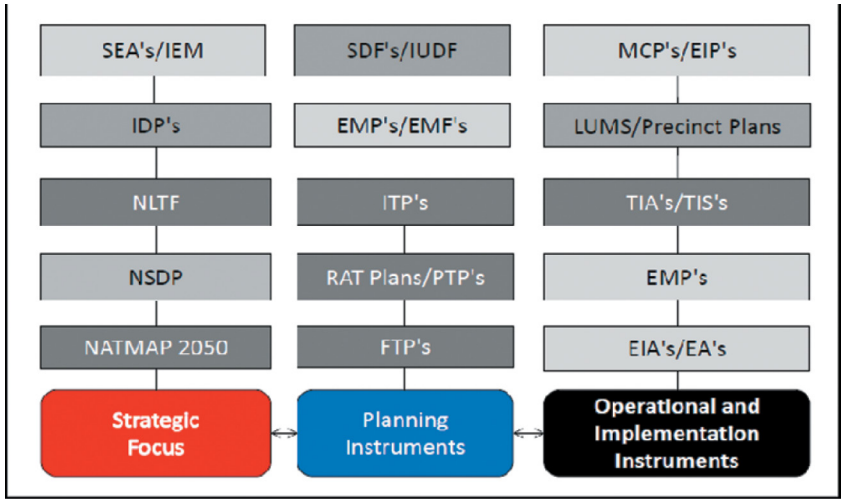

Figure 1: Alignment between planning instruments*

Source: Own Construction, 2016. *Refer to Table 1 for the abbreviations.

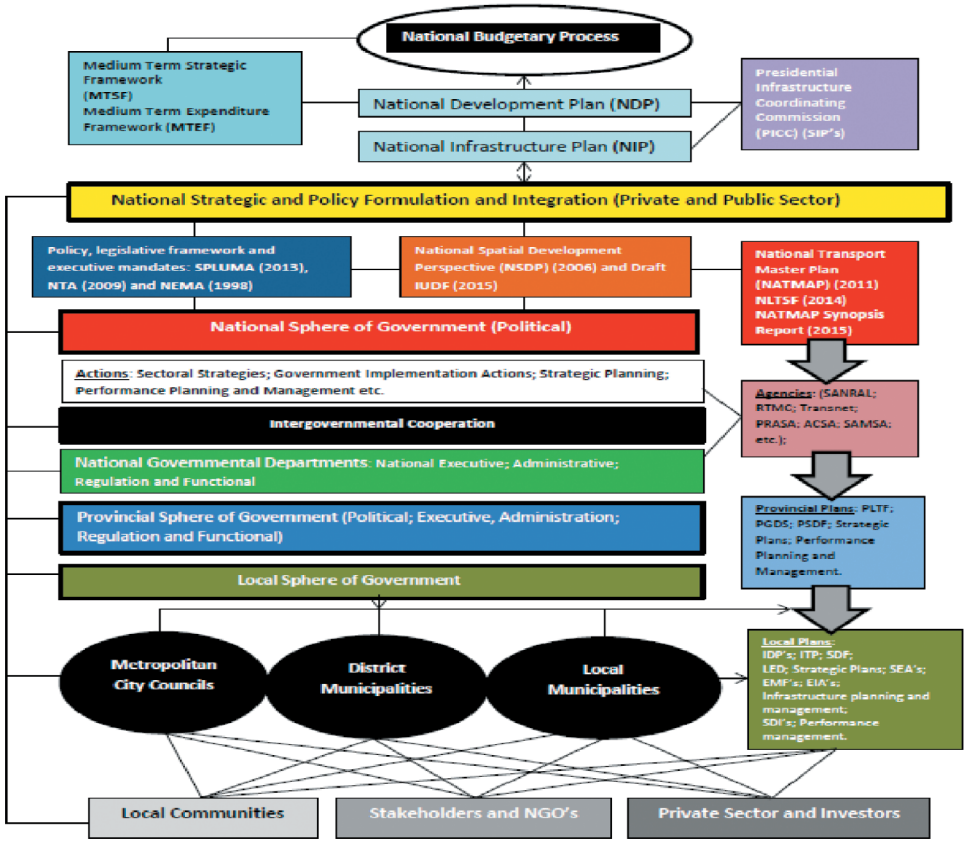

Figure 2: Complexities of integration between spatial planning, transportation planning and environmental management between spheres of government.

Source: Own construction, 2016.

can be deduced. The fact that instruments are formulated based on competencies allocated to different spheres of government necessitates intergovernmental cooperation as provided for in the legislative frameworks (Fig. 2).

The existing complexities are illustrated in Fig. 2 as far as the roles and functions of the different spheres of government are concerned. It demonstrates the basic need to promote cooperative governance. Various professions as well as the integration of planning instruments (plans) fulfil a vital role. In terms of the Constitution [17] government is constituted as national, provincial and local spheres of government which are distinctive, interdependent and interrelated. Provision is thus made for intergovernmental structures such as the Intergovernmental Forum (IGF), President's Coordinating Council (PCC), Intergovernmental Relations Committees of Ministers and Provincial Councils (MINMEC), Organized Local Government (SALGA) and Forum for South African Directors-Generals (FOSAD) [38].

4 THE DOMAIN DIRECTING ALIGNMENT AND INTEGRATION

Generally planning (inclusive of spatial planning, transportation planning and environmental management) entails the consideration of what can and should happen where in spatial systems. Litman [39] points out that 'Planning refers to the process of deciding what to do and how to do it. Planning occurs at many levels, from day-to-day decisions made by individuals and families, to complex decisions made by businesses and governments.'

5 POLICY AND LEGISLATIVE FRAMEWORK AND THE DIVISION OF FUNCTIONS

An assessment of the content of the policy and legislative framework indicates that restricted provision for the integration of the interface between different professions and spheres of government exists. It is due to the underlying complexities and restrictions in place guiding the division of powers and functions. This division of functions fulfils an important role in alignment and integration. Several publications contribute to insight into this complex situation (Refer to National Treasury [40], University of the Western Cape [41], COGTA [42] and Van Wyk [43]. It includes an ongoing debate regarding the content of the legislative and executive functional areas relating to 'planning' that are enjoyed by each sphere of government. Table 2 contains a summary of core functions and activities.

Table 2: Planning instruments formulated and managed by spheres of government in South Africa*.

Description/type	National	Provincial	Municipal
Transportation planning			
NATMAP 2050	x		
NATMAP 2050 Synopsis Report (2015)	x		
NLTF (2015) (Draft)	x		
Public Transport Plans (PTPs)		x	x
Commuter Rail Plans (CRPs)	x	x	
Rationalization of Public Transportation Services (RAT Plans)		x	x

Freight Transport Plans (FTPs)		x	x
Transportation Sector Plans (TSPs)		x	x
Transportation Infrastructure Plans (TIPs)	x	x	x
Traffic Impact Assessments (TIAs)			x
Transportation Impact Studies (TIS)		x	x
Provincial Land Transport Frameworks (PLTFs)	x	x	
National Land Transport Strategic Framework (NLSTF) (2014)	x	x	
Integrated Transport Plans (ITPs)		x	x
Spatial planning			
National Development Plan (NDP)	x		
National Spatial Development Framework (NSDF)	x		
Provincial Spatial Development Perspective (PSDP)	x	x	
Regional Spatial Development Framework (RSDF)		x	x
Municipal Spatial Development Frameworks (MSDFs)			x
Land Use Management Systems (LUMS)			x
Land Development Management Plans (LDMPs)			x
Rural Development Plans (Strategies) (RDPs)		x	x
Municipal Regeneration Plans (Urban Renewal etc.) (MRPs)			x
Precinct Plans (PPs)			x
Site Development Plans (S.Dev.Ps)			x
Integrated Development Plans (IDPs)		x	x
Integrated Urban Development Framework (IUDF)		x	x
Statutory Planning Processes (SPPs)			x
Spatial Development Plans (SDPs)		x	x
Environmental management			
Strategic Environmental Assessments (SEAs)		x	x
Integrated Environmental Management Plan (IEMPs)		x	

(Continued)

Table 2: (Continued).

Description/type	National	Provincial	Municipal
Environmental Management Plans (EMPs)		x	x
Environmental Impact Assessments (EIAs)		x	x
Environmental Authorizations (EAs)		x	
Mine Closure Plans (MCPs)	x	x	
Environmental Implementation Plans (EIPs)		x	x
Environmental Management Programme (EMProg.)		x	
Monitoring and Performance Assessment Plans (MPAPs)		x	x

*Types of plans are generic only. Terminology and content are determined by policies, guidelines and standards.

6 ALIGNMENT AND INTEGRATION FROM A SUSTAINABILITY PERSPECTIVE

As far as alignment and integration from a sustainability perspective is concerned, cognizance should be taken of the following institutional requirements as contained in the Constitution [17]: fostering friendly relations; assisting and supporting one another; informing one another of, and consulting one another on, matters of common interest; coordinating actions and legislation with one another; adhering to agreed procedures and avoiding legal procedures against one another. Alignment and integration thus set the scene for sustainability from a planning perspective. In the case of sustainability as objective, there is a focus difference between the concepts of alignment and integration. Alignment refers to articulation of the scope and content of policy and legislative framework on a strategic level. Integration refers to actions and processes involved on an operational level (Fig. 1). Sustainability thus implies resilience and is integrated.

7 STRATEGIC MANAGEMENT, MANAGEMENT AND MODELLING TO ENHANCE ALIGNMENT AND INTEGRATION IN SPATIAL SYSTEMS

Alignment and integration between the functional fields of spatial planning, transportation planning and environmental management are core in enhancing sustainability and resilience within spatial systems. The approaches as formulated by Geerlings and Stead [44], Stead et al. [45] and Stead and Meijers [46] focus on this relationship. Modelling as a mechanism refers to the endeavour to promote the interface through strategic management processes and functional planning instruments (modelling) with a view to articulate and predict impacts and long-term implications. It should, however, be noted that modelling *per se* serves only as a '*tool*' or '*instrument*' in order to support decision making for complex problems based on integrated scenario (strategic) planning.

Several authors have reported on integrating urban planning and environment in a spatial context. A valuable contribution is the report published by the United Nations Environmental Programme (UNEP) containing key principles and approaches for cities in the 21st

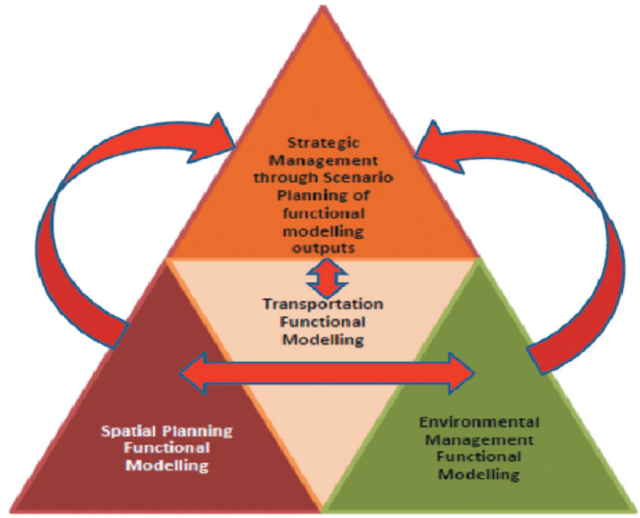

Figure 3: Simplistic functional modelling concept for spatial systems.
Source: Own construction, 2016.

century [47]. Related research focuses on the development of a framework to assist the integration of environmental, social and economic issues in spatial planning [48]. It includes the question of spatial planning and environmental assessment [49]. The work by McKenna Davis [50] contains an in-depth case analysis related to green infrastructure. The application of mapping for planning from a sustainability perspective followed by McKenna adds value to the arguments contained above. A further example of modelling alignment and integration impacts is contained in the research by Waddell [51] on land use and transportation planning and modelling and the challenges in research and practice. However, alignment and integration consist of much more than to predict outcomes, but include the task to optimize space and places in terms of planning, development, decision making and delivery. It includes factors of spatial balance, potential realization, impact, continuity, sustainability and resilience as core considerations. Figure 3 shows a simplistic concept to align and integrate strategic management to outputs of functional modelling.

Modelling is often being viewed as '*number crunching*' and sometimes adjudicated as mathematical input that needs to be assessed in context to more rational and simplistic methodologies. Figure 3 aligns strategic management to the outcomes of functional modelling.

8 CONCLUSIONS

- Spatial planning, transportation planning and environmental management alignment and integration are dependent on the policy and legal framework and its supporting tools applied in spatial systems.
- Developing democracies include diverse policy and legal frameworks that can be classified as being unnecessarily complex and complicated.
- In theory, provision is made for alignment and integration between all spheres of government through application of specific planning tools to promote sustainability and resilience. In practice, this goal and objective is seldom achieved due to segregation forces supporting political systems instead of serving its communities in an integrated and holistic fashion.

- Restructuring of policy, legislation and planning tools and instruments within all spatial systems is a pre-condition if the need for alignment and integration promoting development is to serve democracy effectively and efficiently.
- Planning too often is driven by '*planning to plan*' focuses instead of developing more simplistic modelling tools inclusive of functional modelling informing strategic planning and management systems and *vice versa*. Rethinking spatial planning to enhance sustainability and resilience represents a priority challenge in all developing countries.

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