ALIGNMENT OF SPATIAL, TRANSPORTATION AND ENVIRONMENTAL PLANNING: PRACTICES UNDERPINNING STRATEGIC APPROACHES IN DEVELOPING COUNTRIES

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ABSTRACT

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

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 last bastion of ‘Apartheid’ planning legislation from the previous political dispensation was reformed. Although this process is still legislatively being finalized at provincial and municipal levels of government through adapting new transformation structures, guidelines, policies and regulations, the opportunity exists to assess the impacts of alignment to improve strategic planning, modelling, coordination and decision making.

In this chapter the alignment between the policy and legislative frameworks, guidelines, processes and the need for integration will be discussed. The approach presented in this paper will especially guide planning within developing countries based on the learning experiences from spatial systems in developed countries.

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

1 INTRODUCTION TO ALIGNMENT AND INTEGRATION

Internationally, spatial planning and its alignment and interface with transportation planning and environmental management form the focal point in attaining and promoting sustainable planning, development and delivery. The issue of misalignment between various levels of government in developing countries and more specifically South Africa dates back to 1910 during the formation of the Union of South Africa from its colonial inheritance. However, since democratization in 1994 and the promulgation of the Constitution of South Africa (Act 108 of 1996) [1], resulting in the establishment of three distinct spheres of government, the lack of alignment and integration became more prevalent.

In order to understand the context of this chapter, one should consider what is implied by the concept of ‘*alignment*’? From a governmental and planning perspective, ‘*alignment*’ includes the articulation and optimization of processes contained in goals and objectives (inclusive of communication, involvement, engagement, support and capacity-building activities) to ensure efficient and effective outcomes through optimal application of planning instruments in plan formulation and decision making, as provided for in different policies and legislation across all levels of government.

‘*Integration*’ thus refers to processes and methodological approaches and procedures followed in planning processes through application of specific instruments and/or planning tools. *Alignment* and *integration* are often used inter-changeably. Modelling to be effective

should thus be applied to alternative focuses such as spatial planning, transportation planning and environmental management.

The dilemma of alignment and integration, or the lack thereof, was also experienced internationally in planning processes in developed countries. The best example from international practice relates to the approach to assess integration in Europe of policy and research. Geerlings and Stead [2] state that ‘policy’ integration should include the following dynamic focuses:

- Vertical integration between different levels of government.
- Horizontal integration between sectors or professions in one organization.
- Inter-territorial integration between neighbouring authorities or authorities with a shared interest in infrastructure or resources.
- Intra-sectoral integration between different sections or professions.

Stead et al. [3] identify the following hierarchical foci in dealing with an approach towards integration: co-operation at the lowest level consisting of dialogue and information; co-ordination, coherence and consistency with emphasis on transparency; integration and joined-up policy approaches inclusive of dialogue and avoiding of conflicts. These are supported by inter-organizational coordination; inter-organizational collaboration; intergovernmental management and network management.

Essentially, many of these concepts are present in strategic planning instruments in South Africa such as the Integrated Development Plan (IDP) and environmental management processes such as Strategic Environmental Assessment (SEA) and Environmental Management Frameworks (EMFs) and related practices and planning processes. The realization of optimal alignment and integration approaches between strategic and planning instruments (in developing as well as developed countries) represents a main challenge. May et al. [4] also addressed the issues of integration of policy instruments as a challenge within urban transport policy.

In South Africa, the White Paper on Spatial Planning and Land Use Management [5] states that land-use and development decisions must promote a harmonious relationship between the built and the natural environment while ensuring that land development is sustainable over a longer term. Claasens [6] was one of the first planners to confront the interface between spatial planning, development planning and conservation in promoting sustainable development. Sowman and Brown [7] developed a framework to assist integration between the IDP process and environmental management in order to promote sustainability. Berrisford and Kihato [8] concluded that defining the relationship between planning and the environmental laws is a question that is persistently dogged by planning and environmental practitioners in South Africa. This view is derived from research by Sowman [9] and Todes [10] for a spatial system being classified in a developing country.

Todes et al. [11] address the relationship between planning and environmental management in South Africa based on a case study for the provincial spatial system of KwaZulu-Natal. From the outcome, specific research elements inclusive of purpose, method and evidence base are identified to demonstrate the relationship between planning and environmental management across spheres of government, tools applied and types of plans. Of importance to this chapter is the conclusion that the relationships between planning and environmental management in South Africa are complex and also the result of formal systems in planning and environment inclusive of elements such as agency, power practice and discourse. This describes the dynamics within developing countries and/or spatial systems accurately.

Todes et al. [11] isolate the following core components in assessing integration:

- The purposes of planning.
- Tools and mechanisms applied.
- Distribution of responsibilities.
- Resources and capacity.
- Networks, capacity and discourse.

In this regard, the work by Schoeman [12] on the interface between urban and regional planning, environmental management and transportation planning should also be noted. The deduction by Todes et al. [11] is based on the work developed by Vigar et al. [13]. Todes et al. [11] conclude, in general, that there is a need for greater integration between planning and environmental management in context with the assessment components identified earlier. It is concluded that integration is more than a technical process. At the same time, the legal system, forms of planning and environmental management and practical considerations are all fulfilling an important role in promoting inclusivity in integration. This may be attained through merging of functions; incorporation of foci, institutional integration, and coordination of vertical and horizontal linkages.

Retief and Rossouw [14] also address the theme of alignment and integration from a strategic perspective and conclude that the development of urban environmental policy is directly linked to the IDP process. According to them, the focus is to integrate sustainability into the IDP process and there is a clear convergence between legal and policy requirements for planning and environmental management present. Du Plessis [15] argues that, despite the recognition of the need for greater alignment of sustainability criteria at all levels of integrated spatial planning, some challenges and shortcomings still remain. This includes the lack of integration of sustainability principles inclusive of the application and/or use of environmental information in IDP and related processes.

With the exception of Geerlings and Stead [2], Stead et al. [3] and May et al. [4], the shortcoming in the abovementioned publications relates to the fact that it only focus on integration between spatial planning and the environment. Waddell [16] broadened the approach towards urban development for land use, transportation and environmental planning. The other authors as discussed, based their focuses on strategic spatial planning based on development instruments (IDP process) [17] and environmental management as included in Retief and Rossouw [14] and Du Plessis [15]. In order for *alignment* and *integration* to be inclusive, one should also address the inclusion of transport planning in the process of alignment and integration.

This challenge can in part be addressed by assessing the existing policy and legislative framework and, more specifically, the opportunities created by the Spatial Planning and Land Use Management Act (SPLUMA) [18] and the SPLUMA Regulations [19]. Several policy documents such as the National Transport Master Plan (NATMAP) [20]; the National Development Plan (NDP) [21]; the Draft Integrated Urban Development Framework (DIUDF) [22], and the Draft National Land Transport Strategic Framework (NLTSF) [23] recognize the need for alignment and strategic integration between focuses as dealt with in this chapter.

The principle of sustainable development and the need for improved integration is not a new debate. In its Global Report on Human Settlements (Planning and Design for Sustainable Urban Mobility) [24], the UN Habitat 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, as well as institutional and governmental roles and responsibilities. These

principles are directly and indirectly applied in various sources of UN Habitat 2: International Guidelines on Urban and Territorial Planning [25].

From the Africa perspective consisting of developing countries, the State of the African Cities (UN Habitat, 2014) [26] in its '*Re-imagining sustainable urban transitions*' identified integration of factors 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. This implies the involvement of various stakeholders, professions and spheres of government to manage and guide the alignment and integration theme dealt with in this chapter. It is also closely aligned with the focus for UN Habitat 3 [27] on '*The future we want: The city we need*' to be held in 2016.

Many role players within the planning domain have realised that there is a delicate balance between environmental, human, economic, institutional, spatial planning and transportation planning to deliver on sustainable development and to promote alignment and integration. This balance is, however, being impacted upon in a negative sense, due to the fact that this relationship is not addressed and reflected on in the application of planning instruments, tools and implementation by all spheres of government and professions involved. Todes et al. [11] and Berrisford and Kihato [8] provide the reasons for this misalignment. It results in impacts such as ecological degradation, widening of development inequality, segregation and compartmentalization of planning, and non-delivery. It also leads to spatial inefficiency and conflicts in planning and development priorities as being experienced in South Africa.

2 POLICY AND LEGISLATIVE FRAMEWORK GUIDING ALIGNMENT AND INTEGRATION

Tables 1 and 2 give an overview of the policy and legislative framework guiding alignment and integration in terms of policy and legislative framework as applicable to South Africa. The supporting legal principles underpinning the frameworks are included in Scheepers [28] and Van Wyk [29]. The Berrisford and Kihato's [8] paper is clear on the state of considerable flux that exists in the policy and legislative provisions since democratization in 1994. Transformation from the apartheid system to the democratic system represented many challenges to accommodate change in an orderly and legal fashion.

The complexities in alignment between spheres of government, professions and stakeholders can be deduced from an analysis of the existing policy and legislative framework. This diversity and complexities promote and enhance misalignment, lack of integration, subjective application of planning principles and planning tools, and non-delivery in terms of roles and functions. In order to understand this, the transformation of spatial planning, transportation planning and environmental management within spatial systems should be noted.

2.1 Influence of spatial planning transformation

With democratisation in South Africa in 1994, the democratic government inherited a segregated and fragmented spatial system guided by an evenly ineffective policy and legislative framework. The transformation of this framework (notwithstanding several authors referring to the spatial fragmentation consequences of its application by previous political dispensations) commenced with the Draft Green Paper on Development and Planning prepared by the National Development and Planning Commission in 1999 [29]. This was followed by the White Paper on Planning and Land Use Management (RSA, 2001) [5].

In context to the guiding principles for alignment and integration included in these documents, it was preceded by the Development Facilitation Act, Act 67 of 1995 [30], as a vehicle to accommodate spatial change and transformation within all spatial systems. Todes et al. [11] conclude that planning in the post-apartheid period focused on facilitation, with an emphasis on reconstruction and development. Planning instruments such as the IDP process (strategic planning) and the introduction of Spatial Development Frameworks (SDFs) as well as other sectoral plans were introduced.

These processes, although it was a step forward, did not resolve the need to transform the legislative reality guiding spatial planning and development in terms of the new democratic needs and expectations. It created new strategic processes with a general requirement for alignment and integration. More emphasis on the need for alignment and integration, is provided for by SPLUMA [18] and its regulations [19].

Researchers such as Dewar et al. [31], Tomlinson [32], Swilling [33], Mabin and Smit [34], PlanAct [35], Tilman and Wall [36] and Harrison et al. [37] have documented the spatial implications of the historical spatial planning and development practices in South Africa.

Since its inception in 2010, the National Planning Commission (NPC) contributed to documenting the effects of the spatial legacy by the formulation of the Diagnostic Overview [38] and strategic (intervention) proposals as contained in the National Development Plan (NDP) [21]. Oranje and Merrifield [39] reported extensively on national spatial development planning in South Africa (1930–2010), while Drewes and Van Aswegen [40] published an overview of the historic process of national planning in South Africa from a temporal perspective. Lessons learnt from these will assist in applying SPLUMA (2013) through promotion of alignment and integration in context to the theme of this chapter.

Spatial development in South Africa can be subdivided into four distinct spatial development phases:

- Phase 1: Urban and rural formation phase (1652 to 1948).
- Phase 2: Urban and rural separation (fragmentation) phase (1948 to 1994).
- Phase 3: Urban re-integration phase and rural development (post-1994 to 2010).
- Phase 4: Spatial system development, reconstruction, integration and consolidation phase (post-2010 to the present).

Of significance in the transformation process related to spatial planning and development was the promulgation of the first new set of democratic laws that serve as a pivotal point to restructure the characteristics of spatial planning in South Africa and the need for alignment and integration. The spatial planning scene changed significantly with the promulgation of the Constitution [1], Municipal Structures Act [41] and the Municipal Systems Act [42]. This resulted in the formulation of Integrated Development Plans (IDPs) (previously Land Development Objectives (LDOs)) for all institutional entities within the municipal spheres of government. The transition and transformation process culminated in the establishment of the National Planning Commission (NPC) in 2011, the National Development Plan (NDP) in 2012 [21], and eventually the approval of SPLUMA (2013) [18] and SPULMA Regulations (2015) [19].

2.2 Transportation planning transformation to enhance alignment and integration

Transportation planning in South Africa became a statutory planning activity with the enactment of the Urban Transportation Act 78 of 1977 [43]. Transportation planning, development and management are guided by the core policies and legislative framework. The

National Land Transport Transition Act (NLTTA) [44] was used until 2009 when the National Land Transport Act [45] and its Regulations [46], [47] were promulgated.

In this context, various policy documents guide the transport planning, transformation and regulating processes: White Paper on National Transport Policy [48]; Moving South Africa (Vision 2020) [49]; Rural Transport Strategy for South Africa [50]; the National Transport Master Plan 2050 (NATMAP 2050) [20], [49] and the Draft National Land Transport Framework (2014) [23]. In 2014/2015, the National Department of Transport (NDoT) commenced with the revision and adaption of NATMAP 2050 by the formulation of a Synopsis Report [51] to address specific components related to alignment, integration and transportation-related system and network issues and components. It includes addressing the interface between the NDP (2012) [21], SPLUMA [18] and NATMAP 2050 [23], [51] and related areas of concern.

2.3 Environmental management in enhancing alignment and integration

South Africa was slow to develop and institute formal procedures for environmental assessment. It was only with the enactment of the Environment Conservation Act [52] that provision was made to formulate environmental policy to guide decision-making and to prepare environmental impact reports as pointed out by Sowman et al. [53]. The publication of the document entitled *Integrated Environmental Management (IEM) in South Africa* (Council for the Environment, 1989) marked the introduction of the concept of environmental management in South Africa. The term IEM was chosen to indicate a general approach that integrates environmental considerations across all stages of the planning and development cycle and would be applicable to policies, programs, plans and projects [54].

The publication of the National Environmental Management Act (NEMA) [55] introduced a new approach to, and role of environmental considerations in development. NEMA provides the framework for co-operative environmental governance in South Africa and promotes the application of environmental assessment and management tools to ensure integrated environmental management of activities. The intention of NEMA was formalized with the publication of the EIA Regulations (2006). On 3 August 2010, the revised NEMA EIA Regulations [56] were promulgated and includes changes to the listing of activities that impact on the use of land as provided for in SPLUMA [18].

2.4 Need for improved alignment and integration

In assessing the role of alignment and integration within the context of this chapter, Tables 1 and 2 were compiled. The tables summarise core policies and legislative framework as to assess alignment and integration between spatial planning, transportation planning, and environmental management. Most of the policy and legislative framework provides for the promotion of the principles underlying alignment and integration of functions and processes between all spheres of government although in practice planning, implementation and operative processes are being dealt with in isolation. The lack of delivery within all spatial systems is indicative of failing alignment and integration processes notwithstanding a diverse and detailed policy and legislative framework.

The promulgation of SPLUMA (2013) [18], necessitates that the causes and effects of historic weak alignment on implementation and delivery be assessed. No formal surveys will be carried out, as this chapter focuses on assisting and informing basic knowledge on improving alignment, integration, strategic planning and the application of modelling techniques for improved decision making and delivery.

Table 1: Core policies guiding the interface between spatial planning, transportation planning, and environmental management. (Source: author's own compilation, 2015.)

Spatial planning	Transportation planning	Environmental management
Reconstruction and Development Plan (1994)	White Paper on National Transport Policy (1996)	Global Biodiversity Strategy: Guidelines for action to save, study and use earth's biotic wealth sustainably and equitably (published by the WRI, IUCN and UNEP in 1992)
Growth, Economic and Redistribution Strategy (1996)	Moving South Africa (1996)	Balancing the Scales: Guidelines for increasing Biodiversity's Chances through Bioregional Management (published by the World Resources Institute in 1996).
White Paper on South African Land Policy (1997)	Rural Transport Strategy for South Africa (2003)	Minimum requirements for the Classification, Handling and Disposal of Hazardous Waste (Second Edition) (1998) (DWAF)
Urban Development Framework (1997)	Draft minimum requirements for the preparation of integrated transport plans (ITP) (2007)	Integrated Environmental Management Guidelines Series (1992)
Rural Development Framework (1997)	NDOT: Public Transport Strategy (2007)	DEAT: An Environmental Policy for South Africa (Green Paper) (1996)
White Paper on Water and Sanitation (1997)	NDOT: Public Transport Action Plan (2007–2010)	White Paper on Integrated Pollution and Waste Management for South Africa (2000)
White Paper on Local Government (1998)	National Land Transport Strategic Framework (2006–2011) (2002) (Draft)	Strategic Environmental Assessment in South Africa (2000)
Green Paper on Development and Planning (1999)	NDOT: Road Infrastructure Strategic Framework for South Africa (2006)	DEAT (2002) <i>Screening, Information Series 1</i> , Department of Environmental Affairs and Tourism (DEAT), Pretoria.
National Integrated Rural Development Strategy (2000)	NDOT: Rural Transport Strategy for South Africa (2007)	DEAT (2002) <i>Scoping, Integrated Environmental Management, Information Series 2</i> , Department of Environmental Affairs and Tourism (DEAT), Pretoria.
King Report II on Corporate Governance for South Africa (2002)	NDOT: Implementation Strategy to Guide the Provision of Accessible Transport in South Africa (2009)	
White Paper on Spatial Planning and Land Use Management (2001)	NDOT: Final Draft National Scholar Transport Policy (2009)	
National Spatial Development Perspective (2003)	NDOT: Transport Action Plan (2010)	
Mining Charter (2003)	NDOT: National Transport Master Plan 2050 (NATMAP) (2010)	
Construction Charter (2005)		
ASGISA (2006)		
National Spatial Development Perspective (2006)		

Table 1: Continued.

Spatial planning	Transportation planning	Environmental management
<p>Housing Atlas (2006)</p> <p>Sustainable Human Settlement Planning: Resource Book (2008) (NDoH)</p> <p>Area-based Planning. Department of Rural Development and Land Reform (2008/2009)</p> <p>NPC: A Guide to the National Planning Framework (2009)</p> <p>NPC: Green Paper. National Strategic Planning (2009)</p> <p>Comprehensive Rural Development Programme. Department of Rural Development and Land Reform (2009)</p> <p>National Planning Commission Diagnostic Overview (2011)*</p> <p>National Developed Urban Development Framework (2015)</p>	<p>NDOT: Road Freight Strategy for South Africa (2011)</p> <p>NDOT: Non-Motorized Transport (NMT) Policy (2012)</p> <p>NDOT: Department of Transport Strategic Plan (2012-2014)</p> <p>TRANSNET: Long-Term Planning Framework (2012)</p> <p>PRASA: PRASA National Strategic Plan (2012)</p> <p>NDOT: Draft National Land Transport Strategic Framework (NLSF) (2014)</p> <p>NDOT: NATMAP Synopsis Report (Draft) 2015*</p>	<p>DEAT (2002) <i>Specialist Studies, Information Series 4</i>, Department of Environmental Affairs and Tourism (DEAT), Pretoria.</p> <p>DEAT (2002) <i>Impact Significance</i>, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism (DEAT), Pretoria.</p> <p>DEAT (2004) <i>Overview of Integrated Environmental Management</i>, Integrated Environmental Management, Information Series 0, Department of Environmental Affairs and Tourism (DEAT), Pretoria.</p> <p>DEAT (2004) <i>Criteria for determining Alternatives in EIA</i>, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs and Tourism (DEAT), Pretoria.</p> <p>DEAT (2004) <i>Environmental Impact Reporting</i>, Integrated Environmental Management, Information Series 15, Department of Environmental Affairs and Tourism (DEAT), Pretoria.</p> <p>Strengthening Sustainability in the Integrated Development Planning Process (2001)</p> <p>State of the Environment Reporting: Draft Guidelines for Local Municipalities (2005)</p> <p>DEAT Information Series (2004-2009)</p> <p>National Framework for Sustainable Development (2008)</p>

*Cross-cutting policies.

Table 2: Core legislative framework guiding interface. ** (Source: author's own compilation, 2015.)

Spatial planning	Transportation planning	Environmental management
National Building Regulations and Building Standards Act 103 of 1977 Town Planning and Township Ordinance, Ordinance 15 of 1986 Land Use Ordinance (Cape of Good Hope), Ordinance 15 of 1985 Removal of Restrictions Act 84 of 1967 The Less Formal Township Establishment Act 113 of 1991 The Physical Planning Act 88 of 1967 (Sections 6, 8 and 11) Development Facilitation Act 67 of 1995 (DFA) Constitution of the Republic of South Africa 108 of 1996 Bill of Human Rights 1996 Physical Planning Act 88 of 1967 Municipal Structures Act 117 of 1998 Restitution of Land Rights Act 22 of 1993 Interim Protection of Informal Rights Act 76 of 1995 Prevention of Illegal Eviction from Unlawful Occupation of Land Act 19 of 1998 Reconstruction and Development Programme Act 79 of 1998 Municipal Systems Act 32 of 2000 Development Facilitation Act 67 of 1995 (DFA) Physical Planning Act 125 of 1991 Less Formal Township Establishment Act 113 of 1991 (LEFTFA) Subdivision of Agricultural Land Act 70 of 1970 (SALA) Removal of Restrictions Act 84 of 1967 Community Land Reform Act 28 of 1996 (CLARA) Housing Act 107 of 1997 National Land Use Management Bill (Draft 2008) Local Government: Municipal Integrated Development Planning Regulations, 2001. Spatial Planning and Land Use Management Act (SPLUMA) 16 of 2013* R. 239 SPLUMA Regulations (23 March 2015)*	Advertising on Roads and Ribbon Development Act 21 of 1940 Fencing Act 31 of 1963 National Land Transport Transition Act 22 of 2000* Urban Transport Act 78 of 1977 National Transport Interim Arrangements Act 45 of 1998 Transport Appeal Tribunal Act 39 of 1998 Cross Border Road Transport Act 4 of 1998 Road Traffic Act 29 of 1989 National Road Traffic Act 93 of 1996 The South African National Roads Agency Limited and National Roads Act 7 of 1998 National Land Transport Act 5 of 2009 and Regulations (R.1208, 2009) R. 877 National Land Transport Act 5 of 2009: National Land Transport Regulations on Contracting for Public Transport Services	Health Act 63 of 1977 Water Act 54 of 1956 National Water Act 36 of 1991 Water Services Act 108 of 1997 National Environmental Management Act 107 of 1998 (NEMA) National Environmental Management: Air Quality Act 39 of 2004 National Environmental Management: Waste Act 59 of 2009 National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) National Environmental Management: Protected Areas Act 57 of 2003 (NEMPAA) National Heritage Resources Act 25 of 1999 (NHRA) Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) World Heritage Convention Act 49 of 1999 Biodiversity Act 10 of 2004 R.543: National Environmental Management Act 107 of 1998): Environmental Impact Assessment Regulations, 2010 (33306) R.544: Listing Notice 1: List of activities and competent authorities identified in terms of sections 24(2) and 24D (33306) R.545: Listing Notice 2: List of activities and competent authorities identified in terms of sections 24(2) and 24D (33306) R.546: Listing Notice 3: List of activities and competent authorities identified in terms of sections 24(2) and 24D (33306) R.547: Environmental Management Framework Regulations, 2010

*Cross-cutting legislation.

**Various by-laws exist within municipalities.

The transformation reality, as summarized above, is indicative of the complexities and challenges in the alignment and integration of the policy and legislative frameworks. This is a well-known area of debate among professionals. Practitioners in these disciplines within the public and private sectors have interpreted the interface for professional and practical reasons differently and alternatively. The evolution over the past decade of policy and legislative frameworks did not necessarily promote a common understanding of the interface between processes.

From an assessment of the content of the policy and legislative framework (Tables 1 and 2), it can be concluded that there is restricted provision for the formal alignment and integration of the interface between spatial planning, transportation planning, and environmental management. References to this are very general and sometimes of a purely philosophical nature. This statement should be interpreted with the objectives, as identified in the National Framework for Sustainable Development in South Africa (NFSD) (2008) [57] that 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.

The provisions contained in SPLUMA [18] and the SPLUMA Regulations [19] provide, *inter alia*, for the application of specific development principles and norms (Chapter 2); intergovernmental support (Chapter 3); spatial development frameworks (Chapter 4); land-use management (Chapter 5), and land-development management (Chapter 6). These provisions should be interpreted from the alignment and integration debate, as reported on in this chapter. The lessons learned indicate a lack of alignment and integration in terms of the processes that underpin the current policies and legislative framework. Thus far, SPLUMA [18] seems to be a step ahead in the alignment of spatial planning, land use management, and land development.

However, the existing policy and legislative framework (preceding SPLUMA) is classified as complicated, confusing and incomplete. The lack of a comprehensive and overarching guideline document and processes to promote and integrate planning and development as fields of specialization by various foci can clearly be inferred. Much of the alignment within the policy and legislative frameworks is strategic in nature and does not address functional and operational perspectives.

3 A FRAMEWORK TO MEASURE ALIGNMENT AND INTEGRATION

SPLUMA [18] provides for the following objectives that are fundamental to enhance alignment and integration:

- To provide for a uniform, effective and comprehensive system of spatial planning and land-use management.
- To ensure that the system of spatial planning and land-use management promotes the social and economic inclusion.
- To provide development principles, norms and standards.
- To provide for sustainable and efficient use of land.
- To provide for co-operative government and intergovernmental relations within all spheres of government.
- To redress imbalances of the past and to ensure equity in spatial development planning and land-use management systems [18].

Against this background, Table 3 shows the interface between foci and instruments as provided for in spatial planning, transportation planning, and environmental management policies and legislation (Tables 1 and 2).

In assessing the content of Tables 1, 2 and 3, the complexities and need for alignment and integration in planning within all spatial systems are evident. For the purposes of this chapter, it is not only focuses, processes and strategic approaches that need to be aligned and integrated. The effect of such planning and development within the spatial system needs to be assessed as well. Modelling is the appropriate way as to deal with the effect of planning and development in an accountable fashion.

Attaining this goal depends on the sphere of government responsible for the compilation, approval, implementation and monitoring and may include a national department, a provincial department, or a local government. It may also be a concurrent responsibility between different spheres of government. As will be deduced later in this chapter, the availability of data to undertake modelling to quantify and qualify spatial planning proposals and implementations seems to be problematic in developing countries.

4 IMPACT OF THE DIVISION OF FUNCTIONS, ROLES AND COOPERATION BETWEEN SPHERES OF GOVERNMENT

The role of government in South Africa is based on functions and obligations allocated to the different spheres in terms of the legislative framework (Table 2), intergovernmental cooperation arrangements and Constitutional Court rulings [58]. From an assessment of the

Table 3: Interface in focus and instruments as provided for in core spatial planning, transportation planning, and environmental management legislation. (*Source: author's own compilation from SPLUMA [18], NLTTA [46], NLTA [47] and NEMA [55].*)

SPLUMA (2013)	NLTTA (2000)/NTA (2009)	NEMA (1998)
<ul style="list-style-type: none"> • Development principles, norms and standards • Intergovernmental support • Spatial Development Frameworks (SDFs) • National Spatial Development Framework (NSDF) • Provincial Spatial Development Framework (PSDF) • Regional Spatial Development Framework (RSDF) • Municipal Spatial Development Framework (MSDF) • Land-Use Management (LUM) • Land-Development Management (LDM) • Municipal Land-Use Plans (MLUP) • Statutory Planning (SP) 	<ul style="list-style-type: none"> • General principles for transportation planning • Types of transportation plans • Provisions on transportation planning • National Land Transport Strategic Framework (NLTSF) • Provincial Land Transport Frameworks (PLTF) • Integrated Transport Plans (ITPs) • Freight Transport Plans (FTP) • Transportation plans and changes in land use and public transport infrastructure and services • Rationalization of public transport services (RATPLANS) • Public Transport Plans (PTPs) • Commuter rail plans (CRPs) • Transport Impact Studies (TISs) • Traffic Impact Assessments (TIAs) 	<ul style="list-style-type: none"> • General objectives • Environmental Implementation Plans (EIPs) • Environmental Management Plans (EMPs) • Integrated Environmental Management (IEM) • Environmental Impact Assessments (EIAs) • Environmental Authorizations (EAs) • Strategic Environmental Assessments (SEAs) • Environmental Management Programmes (EMPs) • Monitoring and Performance Assessments (M&PAs) • Mine Closure Plans (MCPs)

policy and legislation framework, it can be concluded that there are general provisions for the alignment and integration within government and its functions. Provisions for this are contained in the Constitution (1996, Chapter 3, Section 41: 40–41) [1]. The complexities and restrictions in place guiding the division of functions between spheres of government are evident. To understand the division of functions, the obligations to, and roles of co-operative governance should be considered. Cooperative government and intergovernmental relations provide for the following arrangement in terms of alignment and integration:

- To provide and enhance effective, transparent, accountable and coherent government within the national spatial system as a whole.
- To respect and recognize the constitutional status, institutions, powers and functions in all spheres of government.
- To exercise powers and functions conferred on it in terms of the Constitution.
- To exercise the powers and its functions in a manner that does not encroach on the geographical, functional or institutional integrity of any government in another sphere.
- To co-operate with each other in mutual trust and good faith (Constitution, 1996, Chapter 3, Section 41) [1].

The division of functions fulfils an important role as far as alignment and integration are concerned. The role of any sphere of government in terms of functions and the level of responsibility may be classified as strategic, functional, or operational, or any combination thereof.

Several authors contributed further insight into this complex arrangement: National Treasury, *Trends in Intergovernmental Finances: 2000/01–2006/07* [59]; Steytler and Fessha, *Defining Provincial and Local Government Powers and Functions* [60]; *The Management of Concurrency* (2005); COGTA, *Division of Functions* (2002) [61] and Van Wyk, *Planning in all its (Dis)Guises: Spheres of Government, Functional Areas and Authority* [62].

The University of the Western Cape (Community Law Centre) [60] provided a valuable contribution in determining the appropriate functions and powers within local government. Van Wyk [62] concludes that it is an ongoing debate regarding the content of the legislative and executive functional areas relating to ‘planning’ that are enjoyed by each sphere of government. For alignment and integration to be promoted, the mechanism of cooperative governance must be applied and practiced among all spheres of government. Berrisford and Kihato [8] states specifically that there is a need to create effective intergovernmental communication.

In an effort to simplify the understanding of the complexity of the division of functions, Table 4 was compiled, indicating the core functions and activities allocated to the national, provincial and municipal spheres of government. Table 4 is based on the provisions of the Constitution [1] and the Municipal Structures Act to illustrate the competencies, roles and functions between spheres of government as it was originally intended by the legislator.

Van Wyk [29] points out that Chapter 3 of the Constitution should constantly remind every organ of state, inclusive of every functionary in every sphere of government, of the importance of co-operation, because the principles of co-operation reinforce the values underlying open, transparent and responsible government. Van Wyk further concludes that, in light of the varied functional areas such as agriculture, environment, housing and transport that play a role in planning, the challenge remains to ensure that principles of co-operative government feature significantly at all times. Co-operation remains a constitutional obligation.

Table 4: Core functions and activities allocated to national, provincial and municipal spheres of government related to spatial planning, transportation planning, and environmental management.*

Powers, functions and/or activities			
Schedule 4: Functional areas of concurrent national and provincial legislative competence (Part A)			
Function/activity	National	Provincial	Local
Airports other than international and national airports	x	x	
Environment	x	x	
Nature conservation	x	x	
Pollution control	x	x	
Provincial public enterprises	x	x	
Public transport	x	x	
Public works	x	x	
Regional planning and development	x	x	
Road traffic regulation	x	x	
Urban and rural development	x	x	
Vehicle licensing	x	x	
Schedule 4: Functional areas of concurrent national and provincial legislative competence (Part B)			
Air pollution		x	x
Municipal airports		x	x
Municipal planning			x
Municipal public transport		x	x
Municipal public works		x	x
Pontoons, ferries, jetties, piers and harbours		x	x
Schedule 5: Functional areas of exclusive provincial legislative competence (Part A)			
Provincial planning		x	
Provincial roads and traffic		x	
Schedule 5: Functional areas of exclusive provincial legislative competence (Part B)			
Fences and fencing		x	x
Municipal roads			x
Noise pollution		x	
Street trading			x
Street lighting			x
Traffic and parking			x

*1. Functions and activities should be interpreted in terms of concurrent responsibilities, as contained in the applicable legislative framework; 2. Concept of distinctive, interdependent and interrelated across some functions and activities listed in the Constitution (1996) applies; 3. The rulings of the Constitutional Court as far as powers and functions are concerned, should be consulted; 4. Functions may cut across spheres of government.

Berrisford and Kihato [8] state that there is uncertainty as to the roles of the three spheres of government. The negative effects resulted from the DFA (1995) and the White Paper on Spatial Planning and Land-Use Management (RSA, 2001) [5] that are now being addressed through SPULMA (2013). It, thus addresses the incomplete work of local government reform in South Africa.

Table 5 shows examples of plans formulated by the different spheres of government in terms of powers, functions, duties and activities dealt with earlier and in terms of the focus of this chapter.

Table 5: Planning instruments formulated and managed by different spheres of government.*

Description/type	National**	Provincial	Local***
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 (FTP)		x	x
Transportation Sector Plans (TSP)		x	x
Transportation Infrastructure Plans (TIP)	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 Spatial 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 Plans (IEMPs)		x	
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.

**May include agencies' concurrent functions with provinces.

***Municipalities are the only sphere of government constitutionally to make and adopt detailed by-laws on land-use management and its other function, as included in the Constitution (1996) and the Municipal Structures Act (1998).

One can infer the need for alignment and integration from Tables 4 and 5. The context should, however, be interpreted in line with Figs 1 and 2. The system complexities, dynamics and need for integration to optimise development within spatial systems are evident.

Fig. 1 illustrates the vertical and horizontal alignment and integration among the three spheres of government. It shows the organization of the different spheres of government, integration and formulation of planning instruments, structures, institutions and agencies involved. It depicts the basic need to promote cooperative governance through both process and management practices within all spheres of government. Various professions as well as the integration of planning instruments (plans) fulfil a vital role in this instance.

Figure 1: Complexities of alignment and integration between different spheres of government, agencies, co-operation structures and planning instruments. (Source: author's own compilation, 2015.)

*Implies vertical and horizontal alignment within a municipality as well as with adjacent municipalities. Alignment and integration as provided for in SPLUMA (2013).

Figure 2: Interfaces between IDP, IEM and ITP within municipalities.* (Source: author's own compilation, 2015.)

Malan [63] states that the system of intergovernmental relations and co-operative government in South Africa is rapidly evolving. This is due to the statutory commitment of the various spheres of government to the implementation of the principles of co-operative and intergovernmental relations (refer to Figs 1 and 2).

In terms of section 41: 40–41 of the Constitution (1996) [1] (refer to Fig. 1), government is constituted as national, provincial and local spheres of government: distinctive, interdependent and interrelated. Provision is made for intergovernmental structures such as the Intergovernmental Forum (IGF), the President's Coordinating Council (PCC) and Intergovernmental Relations Committees of Ministers and Provincial Councils (MINMEC); Organized Local Government (SALGA) and Forum for South African Directors-General (FOSAD) (COGTA, 2002) to promote alignment and integration between all spheres of government.

5 THE DOMAIN OF SPATIAL PLANNING FROM AN ALIGNMENT AND INTEGRATION PERSPECTIVE: ROLE AND IMPACT OF VARIOUS DISCIPLINES
Generally, planning (including urban and regional planning, transportation planning, and environmental management) entails the consideration of what can and should happen where, in the spatial systems. It includes the foci and interaction of different policies and practices

(tools and instruments) across regional space, and sets the role of spaces, places and interaction between professions in a wider context. It goes well beyond ‘traditional planning’ (inclusive of authorizations) and includes strategic, functional, operational planning and monitoring of all planning and activities. The alignment and integration is related to vertical, horizontal, concentric and three dimensional implications of spatial, transport and environmental on each other. This provides for an ongoing assessment of trans-disciplinary impacts and intervention as to promote sustainable planning and development.

5.1 Role of education and training in professions and capacity

Fig. 3 shows the interfaces between fields of education and training for professions involved in the theme of this chapter. The core relationships between subject themes and disciplines are depicted in terms of their orientation from an urban and regional planning perspective.

The relationship between education, training and professional development is fundamental for the way in which alignment and integration is being dealt with in practice and in the workplace. In terms of SPLUMA (2013), planning includes various disciplines, as illustrated in Fig. 3. In some instances, it may imply duplication within certain spheres of government that requires centralization. Co-operation between planning-related and other disciplines is thus a focal consideration in promoting alignment and integration. Todes et al. [11] state that the need for integration may be addressed through:

- Centralizing disciplines such as planning and environmental management.
- Mainstreaming certain concerns and concepts.
- Institutional integration.
- Coordination through improved vertical and horizontal linkages.

Figure 3: Interfaces in education and training of professions. (Source: Schoeman, 2010 [12].)

Table 6 shows a classification of the core foci for planning activities based on international and national norms and principles based on the focuses as dealt with in this chapter. The foci are grouped as follows: spatial planning; urban planning; policy and strategy formulation;

Table 6: Core planning foci based on international and national norms and principles.
(Source: author's own compilation, 2015.)

Core professional planning focus	Domain as interpreted internationally and nationally
Spatial planning	Planning systems; practices in regional space; role of places; strategic frameworks; forward planning; scale of regional planning; development in physical environment; spatial plan formulation; impact of migration; regional spatial planning needs; regional corridor and nodal development.
Urban planning	Role of places; anticipating development; scale of urban planning; surface and beneath surface development; urban development; urban regeneration and development; urban design; site planning; urban spatial planning needs; neighbourhood development; urban corridor and activity node development; urban renewal.
Policy and strategy formulation	Interaction of policies; policy interventions; multi-perspective approaches; disaster preparedness plans; input in drafting of policy and legislation.
Land-use management	Land-use planning; land-use management and control; regulating development; control of land use; management of change in land use; legal issues related to land use and building codes; legal issues related to environmental regulations.
Built environment	Style of buildings; design of public spaces; conservation of historic buildings; development of public spaces and places; location, design and layout of buildings.
Land availability	Land reservation; identification of land for development.
Transportation planning	Innovative forms of transport; accessibility between places of residence, work and amenities; traffic congestion management; air pollution management; transport and land-use models; transportation frameworks.
Environmental management	Relationship between built and environment; negative impacts on natural environment; natural impacts on communities; protection of natural environments; standard of environmental quality; environmental sustainability; landscape development; legal issues related to environmental management.
Socio-economic and spatial development	Social and economic status quo and forecasting; community regeneration; regional and economic development; rural enterprise; sectoral policies; planning research; technical analysis; smart growth strategies; economic development plans; development of resources; socio-economic profiles.
Facilitation and communication	Compromise formulation; lead public consultation processes; education, training and capacity-building; identification of community needs; community goals and vision compilation; development consultation; public address, meeting and facilitation.
Human settlement development	Housing development; housing strategies.
Rural development	Community development; area-based planning.
Feasibility studies	Appreciation of spatial complexities; deeper underlying causes; integrated analysis.
Implementation	Infrastructure needs; infrastructure programming; general management; needs prioritization; implementation and enforcement strategies; determination of infrastructure and amenities capacity.
Project management	Management of programs for planning and implementation; quality management.
Infrastructure planning	Supporting the planning and development of engineering infrastructure based on sustainable planning policies, practices and needs.
Management and analysis support systems	GIS applications and techniques; modelling; systems analysis.

land-use management; involvement in the built environment; land availability; transportation planning; environmental management; impact assessments; authorizations; socio-economic and spatial development; facilitation and communication; human settlement development; rural development; feasibility studies; implementation; project management, as well as management and analysis based on the application of decision support systems.

The problematic nature of alignment and integration between specific disciplines originates in the education and training of professionals functioning in these domains. The curricula within these programs do not allow for an understanding of the realities being shared among professions. This creates a professional backlog between professions to reason and debate across professional boundaries from an alignment and integration background. This complicates co-operation, plan formulation, implementation and monitoring.

This implies the need for the revision of the competencies and standards applied in curricula for education and training of professions functioning in such disciplines. This is not only a challenge for higher education institutions, but also implies the role and responsibilities of Professional Councils governing such disciplines. The three foci dealt with in this chapter are being controlled by the following professional councils: South African Council for Planners (SACPLAN) (Planning Professions Act 36 of 2002; Engineering Council of South Africa (ECSA) (Engineering Professions Act 46 of 2000), and the South African Council for Natural Scientific Professions (SACNASP) (Natural Scientific Professions Act 27 of 2003). Todes et al. [11] conclude that “the language used in each profession is not necessarily readily understood by the other”. This also applies to the theme of this section.

Capacity within disciplines is also a problem for the majority of professions in South Africa. Disciplines not only consist of professionals, but are also supported by an array of supporting staff with other related and sometimes different qualifications that need to be trained, capacitated and applied in disciplines such as spatial planning, transportation planning, and environmental management. Enhancing alignment and integration thus depends on the dynamic reality inclusive of internalities and externalities being influenced by various professions. To this reality the impact of political will and preferences (notwithstanding the policy and legislative frameworks) complicates the attainment of alignment and integration.

The combination or integration of functions or disciplines alone will not resolve such challenges. The solution lies somewhere between a combination of training and education, extension of competencies and standards for professional registration and provision of adequate capacity in terms of specialization and supporting staff. These resources should be applied in the context of the functions, roles and obligation for government to co-operate, as discussed earlier. Capacity building for politicians within all spheres of government on the need for alignment and integration based on empowerment on the principles guiding the related professions based on the policy and legislative framework need be implemented to ensure alignment and integration as discussed in this chapter.

6 SPLUMA (2013) AS AN INSTRUMENT TO PROMOTE ALIGNMENT AND INTEGRATION

The context of addressing the challenge of alignment and integration by SPLUMA [18] is illustrated in Fig. 4, showing the reality to meet the overarching goals and objectives from a sustainability perspective set out in the objectives contained in Chapter 1 of SPLUMA and, specifically, the development principles and norms and standards (Chapter 2).

Table 7 shows the outcome of an alignment and integration analysis based on the provisions of SPLUMA (2013).

Figure 4: Enhancement of sustainability through alignment and integration by SPLUMA (2013). (Source: author's own compilation, 2015.)

The South African Cities Network [64] summarized SPLUMA as a tool for spatial transformation in a very effective and focused manner by explaining the background, and spatial transformation and by identifying potential spatial transformation levers.

Berrisford and De Visser [65] state that SPLUMA is classified as framework legislation rather than as comprehensive revision of the status quo for land-use management. Berrisford and De Visser (2015) further point out that SPLUMA returns to the planning in the pre-1990s thinking, inclusive of the philosophy '*planning everything*'. It relies heavily on SDFs in all spheres of government. It also includes '*wall to wall*' land-use management schemes. It is pointed out that the negative effects resulting from the contents of the DFA (1995) [30], White Paper on Spatial Planning and Land-Use Management [5] and Draft Land Use Management Bill [66] are now being addressed through SPLUMA (2013) and its Regulations (2015). It thus addresses the incomplete work of local government planning reform (Berrisford and Kihato [8]).

SPLUMA (2013) recognizes provincial competencies for law-making (Schedule 1 of the Constitution) and specifies the roles (inclusive of intergovernmental support) of national, provincial and municipalities (Chapters 2 to 4). Chapters 5 and 6 deal with land-use management and land-development provisions and arrangements. Section 8 (Norms and Standards) may be determined by the National Minister to allow for consistency across the country. This will promote alignment and integration.

SPLUMA (2013) further operates parallel to other laws. It repeals existing national laws (see Table 7). SPLUMA adds to what the Municipal Systems Act (2000) provides for in terms of the IDPs and SDFs, and it should be noted that SPLUMA does not contradict the MSA (2000) or any other act.

Table 7: Assessment of roles, alignment, integration and involvement of spheres of government in the implementation of SPLUMA (2013).
(Source: *author's own compilation, 2015.*)

Alignment components, functions and obligations	Sphere of government				
	National	Provincial	Metros	DMs	LMs
Chapter 1: Introductory provisions					
<ul style="list-style-type: none"> • Application of the Act • Objectives of the Act • Spatial planning system • Categories of spatial planning 	Align Align Align Align	Coordinate Integrate Implement Coordinate/ Formulate	Integrate Implement Implement Formulate	Integrate Integrate Implement Coordinate/ Formulate	Integrate Integrate Implement Formulate
Chapter 2: Development principles and norms and standards					
<ul style="list-style-type: none"> • Application of development principles • Development principles • Norms and standards 	Monitor Enacted Enacted	Integrate Integrate/Apply Integrate	Implement Apply Apply	Implement Apply Apply	Implement Apply Apply
Chapter 3: Intergovernmental support					
<ul style="list-style-type: none"> • National support and monitoring • Provincial support and monitoring • Municipal differentiation 	Apply Engage Apply	Coordinate Implement Engage	Align Align Align	Align Engage Apply	Implement Engage Apply
Chapter 4: Spatial development frameworks					
<ul style="list-style-type: none"> • Preparation of spatial development frameworks • Preparation and content of national spatial development frameworks • Preparation and content of provincial spatial development framework • Preparation and content of regional spatial development framework • Preparation and content of municipal spatial development framework • Status of spatial development frameworks 	Enacted Apply Coordinate Enacted Enacted Enacted	Apply Engage Implement Coordinate Coordinate Monitor	Apply Engage Input Implement Implement Enforce	Apply Engage Input Implement Implement Enforce	Apply Engage Input Input Implement Enforce

Table 7: Continued.

Alignment components, functions and obligations	Sphere of government				
	National	Provincial	Metros	DMs	LMs
Chapter 5: Land-use management					
• Role of executive authority	Enacted	Coordinate	Implement	Implement	Implement
• Land-use scheme	Enacted	Coordinate	Implement	Implement	Implement
• Purpose and content of land-use scheme	Enacted	Enforce	Implement	Implement	Implement
• Legal effect of land-use scheme	Enacted	Coordinate	Enforce	Enforce	Enforce
• Review and monitoring of land-use scheme	Enacted	Coordinate	Enforce	Enforce	Enforce
• Amendment and monitoring of land-use scheme and rezoning	Enacted	Coordinate	Management	Management	Management
• Consultation with other land development authorities	Enacted	Coordinate	Engage	Engage	Engage
• Alignment of authorizations	Enacted	Coordinate	Engage	Engage	Engage
• Record of amendments to land-use scheme	Enacted	Coordinate	Engage	Engage	Engage
• Enforcement of land-use scheme	Enacted	Monitor	Compile	Compile	Compile
•	Enacted	Coordinate	Apply	Engage	Apply
Chapter 6: Land-development management					
• Municipal land-use planning	Enacted	Coordinate	Implement	Implement	Implement
• Municipal cooperation	Enacted	Coordinate	Engage	Engage	Engage
• Establishment of Municipal Planning Tribunals	Enacted	Monitor	Implement	Implement	Implement
• Processes of Municipal Planning Tribunal	Enacted	Coordinate	Implement	Implement	Implement
• Related land-development matters	Enacted	Monitor	Engage	Engage	Engage
Chapter 7: General provisions					
• Commencement of registration of ownership	Enacted	Coordinate	Implement	Implement	Implement
• Regulations	Enacted	Formulate	Apply	Apply	Apply
• Exemptions	Enacted	Coordinate	Determine	Determine	Determine
• Delegation	Enacted	Coordinate	Apply	Apply	Apply
• Non-impediment of function	Enacted	Coordinate	Monitor	Monitor	Monitor
• Offences and penalties	Enacted	Coordinate	Apply	Apply	Apply
• Repeal of laws	Enacted	Coordinate	Apply	Apply	Apply
• Transitional provisions	Enacted	Coordinate	Implement	Implement	Implement
• Short title and commencement	Enacted	Implement	Apply	Apply	Apply

Table 7: Continued.

Alignment components, functions and obligations	Sphere of government				LMs
	National	Provincial	Metros	DMs	
Schedule 1: Matters to be addressed in Provincial Legislation					
<ul style="list-style-type: none">Provincial legislation regulation land development, land-use management, township establishment, spatial planning, subdivision of land, consolidation of land removal of restrictions and related matters	Enacted	Implement	Apply	Apply	Apply
Schedule 2: Schedules land-use purposes					
<ul style="list-style-type: none">List of land-use purposesDefinitions	Enacted Enacted	Implement Apply	Implement Apply	Implement Apply	Implement Apply
Schedule 3: Appeal of laws					
<ul style="list-style-type: none">Removal of Restrictions Act (1967)Physical Planning Act (1967)Less Formal Township Establishment Act (1991)Physical Planning Act (1991)Development Facilitation Act (1995)	Enacted Enacted Enacted Enacted Enacted	Coordinate Coordinate Coordinate Coordinate Coordinate	Transition Transition Transition Transition Transition	Transition Transition Transition Transition Transition	Transition Transition Transition Transition Transition

7 PERSPECTIVES ON STRATEGIC PLANNING AND MODELLING AS MECHANISMS TO GUIDE ALIGNMENT AND INTEGRATION

The line of argument for improved alignment and integration between spatial planning, transportation planning and environmental management within spatial systems (in both developing and developed countries) is based on the need for a new approach and/or mechanism to promote such goals and objectives. The approaches as formulated by Geerlings and Stead [2], Stead et al. [3] and Stead and Meijers [67] focused on policy development that is applicable to the theme being dealt with in this chapter. However, the complexities in terms of policies directing the focuses in South Africa is much more diverse and complicated (see Table 1 and Table 2) and the line of argument developed in this chapter are based on these complexities.

Strategic planning through integrated development planning applied to South Africa in [17] (an example for other developing countries) provides an applicable framework to deal with such complexities in terms of policies and spatial planning responsibilities such as alignment and integration. Table 8 provides an overview of the content included in the integrated development plan for South Africa to promote alignment and integration [68]. From the assessment of the abovementioned content the absence of sector plans such as an Environmental Management Framework (EMF), Integrated Environmental Management (IEM) and Strategic Environmental Management Assessment (SEA) is evident. This table should also be related to the contents as included in Figs 1 and 2.

Alignment and integration in this context within all other spheres of government is evident and needs to be implemented and coordinated amongst all spheres of government (within the context of planning, identification of needs, prioritization, implementation and operationalization).

This interpretation also needs to be assessed against the following approaches supporting strategic planning as a mechanism to promote alignment and integration:

Albrecht et al. [69] and Albrecht [70] state that in the 1990s the strategic approach to the organization of space at different levels of scale became more prevalent (note: the IDP process in the RSA as discussed above was formalized since 2002). He concludes that 'The 'alternative' strategic planning presented in this paper is conceived as a democratic, open, selective, and dynamic process. It produces a vision to frame problems, challenges, and short-term actions within a revised democratic tradition'. Albrecht further points out that the strategic process is underlain by the following factors:

- It involves content and process.
- Statics and dynamics.
- Constraints and aspirations.
- The cognitive and the collective, the planned and the learned.
- The socioeconomic and the political.
- The public and the private.
- The vision and the action.
- The local and the global.
- Legitimacy and a revised democratic tradition.
- Values and facts.
- Selectivity and integration ability.
- Equality and power.
- Long term and short term.

Table 8: Summary of the Integrated Development Plan (IDP) Process implemented in South Africa to address the complexities in the spatial systems from a strategic planning perspective. (Source: adapted from DPLG, 2008 [66].)

PACKAGING OF THE IDP: IDP COMPONENTS "A plan for all Government"	
A	<p>Executive Summary: A concise overview of the municipality, its current situation, key challenges and opportunities, as well as the priority strategies of the municipality to improve its situation over the five-year term of the IDP, indicating the most critical targets to be achieved. This summary should answer the following questions:</p> <ol style="list-style-type: none"> 1. Description of the institution 2. Challenges and issues to be addressed 3. What opportunities exist 4. An approach for improvement and integration 5. Next five (5) years planning focus 6. Measurement of progress (application of balanced score cards (BSC) and goal achievement matrixes (GAM)) 7. IDP development
B	<p>Situational Analysis: A detailed (deep rigorous) status quo analysis of the municipal area, with Inputs from the Community, Community Organizations, Business, Non-State Actors, Sector Departments, SOE's – State Owned Enterprises, and Spatial Analysis. SWOT analysis critical environmental scan. The use of latest acceptable information and data should inform the analysis. This section to be concluded by Identification of Priority Issues in relation to: <i>Demographic, Economic, Infrastructure, and Environmental issues. This section also to reflect which entity is responsible for what service in terms of powers and functions.</i></p>
C	<p>Development Strategies: Long Term Growth and Development Goals (Vision, Mission, Strategic Objectives and Strategies structured into 5 plus Key Performs Areas (KPA's) of the Five Year Local Government Strategic Agenda. (Suggested to be forecasted at 10–15 Years and structured into the 5 KPAs of the Five Year Local Government Strategic Agenda) The Additional Area would be Spatial Analysis.</p>
D	<p>High Level Spatial Development Framework (SDF): Overview of Spatial Development Framework (Text and few Maps)</p>
F	<p>Implementation Plan: 5-3 Year Five Year, Three Year Implementation Plan with Committed Human and Financial Resources. Developed to Project level. (To be Updated annually)</p>
G	<p>Annual Operational Plan – Business Plan One Year Detailed Operational Plan that speaks to SDF. The SBDIP and Annual Plan should become one plan in the applicable Financial Year. (Reviewed Annually)</p>
H	<p>Financial Strategy (Financial Plan) Multi-Year Budget with a three-year commitment and a strategy for municipal revenue generation, outside grants (funds), over a medium to long term. The Annual Budget should be confirmed and adopted with the IDP. (Reviewed annually)</p>

Table 8: Continued.

PACKAGING OF THE IDP IDP COMPONENTS “A plan for all Government”					
I	Organisational Performance Management System: Key Performance Indicators for each objective and Annual Performance Report of previous year. <i>(Reviewed Annually)</i>				
	ANNEXURES: This section to be prefaced by an outline on the status of all applicable Sector Plans. This can be done in a single table.				
J	Sector Plan Focus	Applicable to Sphere of Government			
		Metropolitan Councils	District Municipalities	Local Municipalities	
J.1	Detailed Spatial Dev. Framework,	Yes	Yes	Yes/No	
J.2	Detailed Disaster Management Plan	Yes	Yes	Yes/No	
J.1	Land Use Management Framework	Yes	Yes	No	
J.2	Land Use Management System	Yes	No	Yes	
J.3	Coastal Zone Management Plan	Yes	Yes	Yes/No	
J.4	Waste Management Plan	Yes	Yes	Yes	
J.5	A. Water Service Development Plan (all WSAs); B. Water Resources Plan; C. Forestry Plan	Yes	Yes	Yes/No	
J.6	Integrated Transport Plan	Yes	Yes (Bulk)	Yes	
J.7	Housing Plan	Yes	No/yes	Yes	
J.8	Energy Master Plan (Electricity Master Plan)	Yes	Yes (Bulk)	Yes	
J.9	Local Economic Development Plan	Yes	Yes	Yes/no	
J.10	Infrastructure Investment Plan Extended Public Work Program (EPWP) Compliant. The Infrastructure Plan is derived from the Long-Term Growth and Development Strategy, and is primarily based on the rigorous spatial analysis. It would therefore be contextualized with the District's Spatial Development Framework, and the Land Use Management System of the Local Municipality. A considered and well-designed Infrastructure Plan will ensure the delivery of services and development of the local economy.	Yes	Yes	Yes	
J.11	Area Based Plans (Land Reform)	Yes	Yes	No	
J.12	Anti-Corruption Strategy	Yes	Yes	Yes	
J.13	What is needed from Sectors This must take the simple form of a table. It needs to list the sector department and what is needed from that department in terms of assistance, support, information, etc.	Yes	Yes	Yes	

Olesen [71] has taken the debate further to the neo-liberalisation of strategic spatial planning. She states that neo-liberalisation of strategic planning has manifested as a result of governance reforms aiming to reduce or abolish spatial planning at national and regional scales. This is in stark contrast to the need for strategic planning as to integrate transportation and spatial planning as to optimize and enhance alignment and integration to promote delivery and sustainability (Fig. 4). This action is also in contradiction to the application of planning instruments as being dealt with in this chapter.

Modelling as mechanism to enhance alignment and integration refers to the endeavour to enhance the interface through representing the reality of spatial planning, transportation planning and environmental management in an abstract way by relating the focuses of the planning instruments (plans) to each other with the view to predict impacts and long term predictions.

Several authors have reported on integrating the environment in urban planning and environment. The most valuable contribution to this chapter relates to the report published by the United Nations Environmental Programme (UNEP) in 2013 containing key principles and approaches for cities in the twenty-first century [72].

Other publications and approaches more specifically deal with the effects of urban form and/or land use on transportation planning and *vice versa* [73]–[75]. Related research themes focused on the development of a framework to assist the integration of environmental, social and economic issues in spatial planning [76]. Research related to the question of spatial planning and environmental assessment [77] supports the theme as discussed in this chapter. However, limited specific research thus far focused on the alignment and interface as discussed in context to the line of argument above.

In support of the theme of this chapter, McKenna Davis (Editor) in 2010 [78] published an in-depth case analysis related to green infrastructure. Of significance to the theme of this chapter is the application of mapping for planning from a sustainability perspective.

The best example of modelling complexities in alignment and integration between spatial, transportation and environmental planning and management in support of the abovementioned principles are contained in the work by Waddell in 2011 [79]. He illustrates fundamentally how land use and transportation planning modelling and its challenges in research and practice be approached. He points out that academic research in integrated land use planning and transport is on the rise. This statement by implication links closely to the need for the integration in context to the focus of this chapter. However, alignment and integration consists of much more than to predict outcomes but to optimize space and places in terms of planning, development and delivery. In this the factors of spatial balance, potential realization, continuity and sustainability are the main considerations.

Modelling is basic to strategic planning and decision making and present practices need to be re-engineered as to support the domains of alignment and integration. This will require that the outcome and implications for all disciplines, plans and development focuses be modelled in terms of alternative scenarios and that the related impacts are appropriately quantified and qualified.

Furthermore, to enhance alignment and integration, fundamental changes in management and planning approaches and practices (inclusive of addressing the issue of contradictions, non-alignment of planning processes and duplication in procedures) need to be identified in system wide contexts with the common objective to promote sustainability on trans-disciplinary levels.

Waddell [79] identifies the following challenges for integrated modelling:

- Transparency.
- Behavioural validity.

- Empirical validity.
- Ease of use or simplicity.
- Computational performance.
- Flexibility.
- Data availability and quality.
- Role of uncertainty.

In his article [16], Waddell applies UrbanSim in modelling urban development for land use, transportation and environmental planning. This is possible in developed countries where the addressing of the abovementioned challenges could be met. In developing countries, only some of the attributes used in UrbanSim restricts successful application to assess alignment and integration within the spatial systems. In Chapter 2 the authors show how to overcome these restrictions in a developing country.

This implies the development of a more simplified macro modelling approach to address the challenge of alignment and integration. The methodologies as discussed above need to be applied in an integrated fashion to address the dynamics such as interest of different sphere of government, institutions, stakeholders, values, policies, legislation, guidelines and planning within all spatial systems in an integrated approach.

In developing such a modelling approach the spatial effects of spatial planning, transport planning and environmental management (plans) will have to be applied, quantified and qualified based on a model that are able to optimize spatial alignment, integration and impacts in support of sustainability (Fig. 4).

8 PERSPECTIVES FROM LESSONS LEARNED

This chapter discussed the building blocks and therefore the need for improved alignment and integration between spatial, transportation and environmental planning and management and the development processes underpinning each discipline, the policy and legal framework guiding it, the division of powers, the functions, duties and obligations, and the opportunities created by the transformation of the existing policy and legal framework provided for with the promulgation of SPLUMA (2013). This perspective and challenge exist in all developed as well as developing countries in the need to be transparent, avoid duplication and accountable in support of strategic planning and management processes.

Perhaps the greatest area of concern is the processes and conditions related to obtaining land-use rights, development planning considerations, project approval in terms of transportation plans inclusive of traffic impact studies and environmental authorizations. All of these processes impact on optimization of spatial planning based on different strategic planning instruments and synchronizing land use activities.

The complexity of current legislative processes and procedures (as applicable to most developing countries), notwithstanding process transformation provided for by SPLUMA (2013) in the case of South Africa, may cause continued uncertainty among spheres of government and professionals in terms of planning, implementation and project monitoring.

Issues such as how to align, engage, integrate, coordinate, support and implement the formulation of spatial development frameworks, land-use management and development planning processes need to be addressed through formal capacity-building and intensive formal training among all stakeholders and all spheres of government. The implementation of transformation instruments such as SPLUMA (2013) will, however, add to the administrative and professional demand within already under capacitated municipalities. The same applies to other spheres of government within all spatial systems where development challenges need to be addressed effectively and efficiently. To this reality

political intervention by government in some developing countries may complicate the challenge even further.

The previous spatial and land-use management dispensation in South Africa culminated in the fragmentation of land-use decision-making and requirements, due to the national policy and legislative framework that does not appropriately address the division of functions and powers. Accountability and support in sustainability were thus not reflected and articulated in land-use decisions and environmental authorisations (Kidd, 2008: 85–102). SPLUMA (2013) provides a framework to address the issues of accountability and sustainability. Attention should also be paid to transform all core legislation through amendments in order to promote alignment and integration and not to rely on the provisions guiding co-operative government and intergovernmental relations, as provided for in the Constitution (Act 108 of 1996) only. This challenge also relates to position in other related developing countries and in some cases even to some developed countries.

The promulgation of SPLUMA (2013) and its Regulations (2015) in South Africa directs municipal planning by formalising the role of SDFs within all spheres of government and provides for a new system of land-use management and land development within municipalities. It thus applies to all spheres of government and emphasises the role of municipalities as being the most important sphere of government, as it is closest to the people and communities in terms of delivery. An important focus is the promotion of sustainability in terms of spatial planning, land-use management and land development through alignment and integration.

SPLUMA (2013) thus serves as the interface in promoting alignment and integration within the existing policy and legislative framework guiding planning and development. At this stage, many practitioners view the NDP (2012) as being an *ideology* that needs the support of instruments such as SDFs within all spheres of government in order to determine what is to happen, where and when. SPLUMA (2013) may assist in this, as it serves as important vehicle for alignment, integration and cooperative governance as a prerequisite for a successful democracy.

Contesting spatial planning, land-use and development-planning issues through the Constitutional Court and/or any Court of Law will result in failure and continuation of the past misalignment, lack of integration, and absence of coordination, resulting in continuing spatial planning inefficiency and non-delivery. This specifically applies to the position in most developing countries.

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