Transportation planning within the Gauteng Province of South Africa: an overview of instruments on strategic planning between 1970 and 2014

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Abstract

Since 1994 with democratization the national and its underpinning provincial spatial systems in South Africa were subjected to intensive transformation processes and impacts resulting from a changing policy, legislative and planning instrument frameworks. These influences and impacts resulted in important planning and development consequences for strategic transportation, spatial planning and development within all spheres of government.

The South African National Spatial System (NSS) consists of nine (9) Provincial Spatial Systems (PSS). These PSS anchor and optimize transportation and spatial planning and development. Due to historic and locational factors, the study area (Gauteng PSS) fulfils a primary role in the growth and development of the national economy (NSS) and its development.

The paper is an endeavour to assess the evolution of provincial planning instruments qualitatively to support sustainable development and to link need and potential in terms of national and provincial plans and to reconcile the transformation process in local context.

Keywords: strategic planning, national planning, provincial planning, local planning, sustainability, land use and transportation integration, spatial planning.

1 Introduction

Land use and transportation integration forms the backbone of an efficient urban settlement and development pattern. It promotes the cost-effective operation of

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the province's transportation system and has the potential to direct urban development as such development tends to concentrate close to major transportation routes. Land use and transportation integration ensures an improved relationship between areas of residence and areas of employment, which can lead to shorter commuter distances and a better two-way use of transport infrastructure.

The abovementioned implies that the role of planning instruments guiding strategic planning within all spatial systems fulfils an important role in effective spatial and transportation management. Fundamentally this statement is the anchoring phrase of planning in all spatial systems as implied within the National Spatial Development Perspective (NSDP) [1]; National Development Plan [2] NATMAP [3]; South African National Infrastructure Plan [4]; Framework for Strategic Plans and Annual Performance Plans [5]; Gauteng Integrated Transport Master Plan (Plan 25 Years) [6] and the State of South Africa's Economic Infrastructure [7]. The foundation of these documents and its related strategic planning instruments were founded in the Post 1994 era after democratization. The real significant policy and legislative changes however only took effect after 2000.

2 Purpose of the paper

The purpose of this paper is to assess the evolution of strategic transportation planning as it has unfolded before and since 2000 within Gauteng Province and to relate it to the strategies as formulated in the public domain inclusive of the National Development Plan [2]; GITMP [6], in terms of NATMAP 2050 [3] and other related planning instruments. The paper thus focuses on the goals and objectives contained in national and provincial planning documents in terms of 'what' should happen as to ensure sustained macro-economic growth versus the micro-economic reality of 'when' and 'where' it is to be developed.

3 Spatial planning systems and strategic planning

Regional planning theory underpins development within all spatial systems inclusive of regions, metropolitan and urban areas. A summary of the most significant regional development theory was published inter alia by Dawkins [8] and Nijkamp and Abreu [9]; Szajnowska-Wysocka [10] and Capello [11]. One of the most comprehensive works on regional planning was published by Friedmann [12]. He points out that most of the theories as included in the before mentioned literature overviews, do not explains the systematic interrelations between development and space and then developed a theory on the development process in its spatial dimension. Knowledge of these regional planning theories are fundamental in understanding the dynamics of spatial planning systems and its relationship to transportation and its supporting systems and components.

Various authors have attempted to document the historical development of the South African spatial system. These included Houghton [13]; Davies [14] and Browett and Fair [15]. In an assessment of the applicable spatial planning

theories and its influence on underpinning the development of spatial systems, Schoeman [16] identifies the stadiums through which the South African National Spatial system has evolved inclusive of a pre-industrial phase (1652 to 1870), Transition Stage (1871 to 1910) and Industrial Stage (1911 to the present). A similar classification of provincial and local spatial systems are much more complicated than the stadiums model. Such classifications includes factors impacting of a functional classification of urban development within spatial systems, the application of the regional and urban development theories and socio-economic data and information.

The South African spatial system consists of the National Spatial System subdivided into 9 Provincial Spatial Systems (PSS). Each of the PSS's consists of wall to wall municipalities inclusive of Metropolitan, District and Local Municipalities [17]. Figure 1 shows the geographical extend of spatial systems as it exists in South Africa based on its level of socio-economic development profiles and classification in terms of gross domestic product.

This division of the spatial systems was derived at through a scientific demarcation process and considerations by the Demarcation Board in 1998. The basis of demarcation is to arrive at an ideal structure of local government that are spatially integrated, institutionally sound, functional viable and developmental in orientation [17]. If the data and information and demarcation process followed is assessed, it is clear that this is more of an administrative process as the content of regional planning theory, spatial system realities and potential is not addressed in an inclusive fashion.

Figure 1: Provincial Spatial Systems within South Africa. (*Source: http://www.nationsonline.org/oneworld/map/za_provinces_map2.htm*)

Albrecht *et al*. [18] and Albrecht [19] point out that in the 1990s a strategic approach to the organization of space at different levels of scale became more prevalent. 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 pointed 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 integrativity.
- Equality and power.
- Long term and short term.

Olesen [20] has taken the debate further to the neoliberalisation of strategic spatial planning. She states that neoliberalisation 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 service and infrastructure development and delivery. This action is also in contradiction to the application of planning instruments as being dealt with in this paper.

4 Development of spatial and strategic transportation planning instruments within the Gauteng Provincial Spatial System in the period 1970 to 2000

The evolution of strategic transportation planning instruments within the study area during the period 1970 to 2000 consisted of two distinctive periods namely: the Apartheid Era (from 1948 to 1994) followed by Transformation Era (after democratization) until 2000. During this period strategic planning was still driven by the contents of the then existing policy and legislative frameworks (an inheritance of the preceding dispensation). I guided transportation planning and development well into the Democratized Post 2000 Era. As indicated above, there is an identifiable hierarchy of spatial systems within space that can be classified in a specific stage of development based on amongst others factors such as population concentration and distribution; level of economic activity (Gross Domestic Product) (GDP) and employment opportunities; Human Development Index (HDI), access to social amenities, locational realities such as

geographical areas of residential and work places resulting from and driving the need for movement of people, goods and services. These impacting factors clearly culminates in distinctive spatial systems in terms of development status and characteristics and its need for transportation planning and development.

For the purposes of this paper, the historical spatial change within the Gauteng City-Region was adequately documented by Mubiwa and Annegarn in 2013 [21]. Of significance is the classification of spatial growth within the study area in the following distinctive phases:

- 1890s: Mining and urban growth in the then Southern Transvaal.
- 1900s–1930: Colonial spatial planning and initial northward expansion.
- 1930–1950s: Post-war industrialisation and post-colonial spatial planning.
- 1960s–1990s: Apartheid spatial planning and decline in gold mining.
- 1991–2009: Detailed land use change in the Gauteng-City Region.

From a study of the interface between transportation and land use during each of the phases of spatial growth and change, it is evident that each development phase requires more intensive planning and upgrading of transportation infrastructure as a direct result of the demand transferred from the changing nature and spatial dynamics within such system.

The formal transportation planning within the Gauteng Provincial Spatial System commenced in 1970 with the development of a strategic road network for the Pretoria-Witwatersrand-Vereeniging (PWV) area [22]. The focus of the strategic planning was to facilitate decisions for statutory land use applications; guide future land use planning and development; identify strategic road network reserves and to develop a 1975 base strategic road network to support future development scenarios (1985, 2000, 2015 and 2025 strategic road networks). This strategic transportation model was based on the USA Federal Highway Transportation Model [23].

The road network planning for the PWV was continually updated with statistical, land use and transportation data and information as to cater for trends in urbanization and other spatial development influences and realities [24]. Transportation and socio-economic models feeding into strategic transportation planning was published in 1990 [25]. In 1991 a Draft PWV Public Transport Study was published inclusive of a strategic analysis of the status of transportation within the study area [26].

The transportation and spatial development challenges experienced in the 1990s resulted in a Workshop in 1992 on urban transportation policy and the priority of urban transport within the Provincial Spatial System. Strategic thinking then started to focus on the establishment of metropolitan transport areas as to deal with the challenges and dynamics through effective institutional structures.

The abovementioned strategic transportation instruments entered a new stage in the period 1992–1994 with the Vectura PWV Public Transportation Study inclusive of an environmental perspective [27]; cost of public transport [28]; traffic safety, information systems and security [29]; transportation subsidisation [30]; institutional structures [31]; policy and spatial development in support of

public transportation [32] and a rationale for public transport in the PWV Area [33].

The abovementioned strategic transportation planning approach served as the foundation of the democratisation challenges as experienced within the National Spatial System leading up to the promulgation of the first Constitution in 1996 [34]. Most of the transportation and spatial planning and development challenges at the time focused on integration and accessibility within the urban and rural environments of all spatial systems in terms in inter- and intra-movement of people, goods and services. In 1997 the First Interim Provincial Transport Framework for the study area after democratization was published [35].

During the period 1994 to 1996 the Transvaal Provincial Administration Roads Department was transformed into the Gautrans Department of Roads and Public Works in line with the process of democratisation with the focus to serve as a strategic and operational unit for the Gauteng Provincial Spatial System. This step resulted in the formation of the Gauteng Transport Co-ordination Committee (TCC) in 1997. The TTC serves as an important forum as to enhance strategic and operationalization of policies aligned to transportation management, planning and development inclusive of economic, spatial, land use, environmental and implementation matters [36].

The professional planning focuses within strategic and operational planning (internationally and nationally) needs also to be taken note of. These professional focuses guides the assessment of the standing and status of strategic transportation planning instruments within the study area. Table 1 shows an overview of the focuses within the professional disciplines involved in the development of transportation planning instruments and strategic planning frameworks.

In the interpretation and assessment of the evolutionary patterns of transportation planning instruments and processes as documented above the following phases, focuses and outcomes can be deduced (Table 2).

5 Development of spatial and strategic transportation planning instruments within the Gauteng Provincial Spatial System in the period 2000 to 2014

The period 2000 to 2014 in the evolution of planning instruments and strategy formulation within the study area was strongly influenced by the changing policy and legislative framework that was brought about by the Constitution (1996) [37] and new democratic approaches in transportation planning instrument development and strategy formulation. The Constitution allocates and assign transportation functions to the various Provinces. For the purposes of this paper the NSDP [1]; NDP [2]; NATMAP [3]; South African Infrastructure Plan [4]; National Land Transport Act (2009) [37] and Gauteng Integrated Transport Master Plan (GITMP) (Plan 25 Years) [6] and the Gauteng Integrated Transport Master Plan (Plan 5 Years) [38] represents the core legislative and policies driving transportation planning instruments and strategy formulation and implementation in the period 2000 to 2014.

Table 1: Core professional planning focuses based on classification of the norms for the domain internationally and nationally.

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; neighborhood 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 programmes for planning and implementation; quality management
Management and analysis support systems	GIS applications and techniques; modeling; systems analysis;

Source: own construction.

Table 2: Classification of phases, focus and outcomes in the development of planning instruments, evolution in strategic planning thinking and outcomes.

Phase classification	Focus and process	Outcome and guidance
Chaotic planning Phase (1880-1969)	• Ad hoc interventions • Isolated planning and development	• Crisis planning and management plans. • Focuses on links rather that system development
Initiation of sensitivity for formal planning approaches Phase (1970-1989)	• Land use and development impacts • Strategic road network planning • Future development scenario's • Land use and transportation integration	• Integrated approach and framework • Broad guidelines • Limited statutory enforcement and power • Based on alignment, cooperation and consensus between stakeholders • Formal statistical data and information analysis
Maturity planning Phase (1990-1994)	• Urban transport policy and priority • Strategic thinking and analysis • Consolidation of existing knowledge • Emphasis on modeling	• Formation of effective institutional structures • Democratization influences • Formal integration • Review of existing plans • Inter-disciplinary approaches
Transformation of planning instruments and strategic Planning Phase (Post 1995 to 1999)	• System integration • Focus on accessibility • Mobility • Urban form	• Planning and development integration • Improved coordination • Framework formulation • Development of strategic approaches
Consolidation and Integration Phase (Post 2000)	• Integration of spatial and transportation planning and development	• Improved planning instrument alignment and integration strategies. • Improved system wide effectiveness and efficiency

Source: own construction, 2015.

These core instruments are supported by various guiding national legislation and policies that culminated in the Gauteng Transport Infrastructure Act (Act 8 of 2001) [39]; Gauteng Transport Framework Revision Act (Act 8 of 2002) [40]; Gautrain Management Agency Act (Act 5 of 2007) [41] and the Revision of the NLTSF (2006) [42] which is in the process of being reviewed by the National Department of Transport. In this regard the Gauteng Land Transport Framework (2009 to 2014) [38] represents an important transition phase and directive in the development and application of transportation planning instruments and strategies in the period 2000 to 2014.

The publication of 'a discussion document on the long-term development plan for the Gauteng City-Region' in 2012 [43] however preceded the publication of the GITMP (5 and 25 Years) that is indicative of the alignment and integration

of spatial and transportation planning instruments and its culmination in strategies guiding development within the Gauteng Provincial Spatial System.

The Gauteng City-Region Observatory in 2013 enhanced the application of planning instruments and strategy formulation to a higher level with the publication of Modelling urban spatial change: a review of international and South African modelling initiatives (2013) inclusive of an approach to interpret and model the intricate dynamics within the metropolitan urban environment [44]. The Mobility in the Gauteng City-Region Report (2014) [45] introduced the notion of 'A new *golden era*' for transportation planning within the study area.

6 Conclusions related to the development of spatial and strategic transportation planning instruments within the study area and lessons learnt

From the abovementioned the following conclusions can be drawn for spatial systems which evolve from a colonial background to a democratisation:

- Spatial systems are not static and evolves through distinctive phases of transportation and spatial development.
- The role and status of transportation planning instruments and strategic planning frameworks, depends on the 'footprint' inherited from Colonialism and activities related to the exploration of mineral resources such as diamonds, gold, iron ore, coal, platinum etc. that is not distributed evenly within spatial systems.
- The process and evolution and transformation of transportation planning instruments within the study area can be summarized as shown in Figure 2.

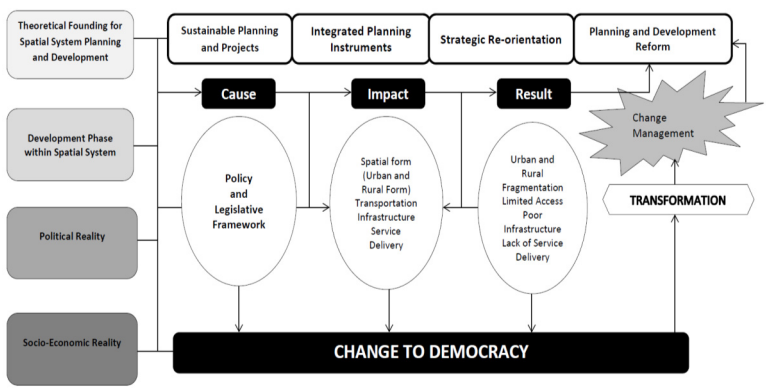

Figure 2: Process and evolution that influence transportation planning and development in the study area. (*Source: own construction, 2015.*)

- Democratization forms the corner stone of integrated sustainable transportation planning. It was illustrated that in the stage that preceded democracy the focus of transportation documents was technical in nature with limited stakeholder and community participation. It is followed by strategic thinking and trans-disciplinary analysis and plan formulation.
- Transportation planning and development within the Gauteng Province has now developed to an integrated sustainable planning and implementation stage. This will now enhance the delivery of sustainable projects and improved accountability and monitoring of transportation projects and its impacts to constructively serve society.
- This overview and assessment provides valuable insights and lessons for non-democratized societies and spatial systems migrating to full democratisation status both politically, socio-economic, spatial and in transportation planning and development.

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