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Sustainable infrastructure planning: a comparative perspective for integrated local road infrastructure planning in the United Kingdom and the Netherlands

Abraham Marshall Nunbogu *

Department of Planning and Management, University for Development Studies, Wa, Ghana

Abstract

Policy debates around the world calls for cross-sectoral policy integration within policy documents. In land use planning, there is a general acceptance that integrating actions across transportation and environmental sectors is key for sustainable development. In this regard, there is a gradual transformation in transportation policies and the design of transport infrastructure. This paper therefore, explores the nature of integrated transport planning in the United Kingdom (UK) and the Netherlands. Content analysis of the two cases through literature review shows existing differences and similarities. Whereasthe Dutch case of road infrastructure integration is rooted in their spatial planning system, the British type of integration occurs in a process of negotiation between local districts and developers and in the form of planning obligation. Also, issues of comparative planning cultures influence the extent of integration in the two countries. The output of the comparison provides lessons for integrated road infrastructure planning for developing countries, especially Ghana.Policy implications are discussed.

Keywords: Sustainability; Transportation; Integration; Infrastructure and Planning

* Corresponding author. *E-mail address:* anunbogu@gmail.com

1. Introduction

Since the 1970s there has been growing interests in developing sustainable approaches and frameworks for the design, implementation, monitoring and evaluation of road infrastructure (Wheeler and Beatley, 2004; Alpkokin, 2012) This push for sustainable road infrastructure frameworks is propelled by concerns about the need to connect socio-economic and environmental issues in spatial and transport policy development (Heeres et al., 2012). This implies spatial planning has to strive for a good balance between socio-cultural, economic and ecological concerns but should not compromise the quality of life of individuals and society's wellbeing, hence, the need for a multi-scalar approach towards policy design and implementation.

Till date, remarkable developmental reports, policy documents by European Union, African Union, Organisation for Economic Co-operation and Development and academic papers have continued to deliberate on policy strategies for sustainable transport planning (see Marshall and Banister, 2007; Heeres, et al., 2012).

Though these policy debates seek to integrate sustainable issues in spatial planning, there is no prime policies that guarantees socio-economic and environmental sustainability and of public acceptability (Alpkokin, 2012). In this regard, planners including spatial planners are encouraged to manage spatial development whilst minimizing the negative impacts on the environment. In this policy context, one-way academia can support the policy discourse and to provide concrete empirical knowledge is through analyzing varied spatial frameworks and approaches with unique geo-physical features. Hence, this paper seeks to establish a comparative perspective for integrated road infrastructure planning in the Netherlands and the United Kingdom.

Though the Dutch and British road infrastructure planning issues have been widely studied, many of these research works viewed them individually with little comparative input for policy transplantation. Therefore, this paper seeks to compare and contrast how road infrastructure planning integrate other land uses such housing, business, water, nature and recreation, with reference to their historic and/ or institutional arrangement and spatial planning cultures. This would provide convenient lessons for development planners and practitioners most especially to those in third world countries such as Ghana. Thus, the study posits the following research questions;

1) How are local transport plans in the case countries integrated with other land uses?
2) What lessons can be learnt and serve as basis for policy transfer?

This paper is largely descriptive. Review of scientific literature identified issues of road infrastructure integration in the case countries. This fixes the pieces of information about integrated road infrastructure planning to identify lessons for consideration in Ghana. The findings from literature constituted the framework for the discussion of the Ghanaian share of integration. The study also collected data from the department of Urban roads to fill data gaps. With this, the next section discusses the basis for integrated road infrastructure planning and why the Dutch and British cases are ideal for comparison.

2. Basis for transport infrastructure Integration

Several dynamic and multi-scalar factors in the fields of economic, socio-cultural, politics and finance have impacted on contemporary planning approaches on road infrastructure development (Heeres, et al, 2012). The increased global debates on sustainable development since the 1970s triggered by the Club of Rome (1972) has progressively influenced governments policy makers and other development practitioners to 'think environmentally' and strive to 'act sustainably' in their quest of creating healthy societies. Also, following the neo-liberal, and participatory governance logic, government is progressively involving market and other development-related stakeholders in policy formulation so as to encourage efficient role casting and to ensure optimum policy out-comes (Heeres et al., 2012). This cross-scale and multi-level governance implies spatial development policies have to integrate issues and address concerns emerging from the varied sectors of the economy. Moreover, the influence of European Union and other international and domestic regulations on environment needs a more integrative approach to incorporate environmental issues in planning. Finally, the issue of scarcity of space, coupled with population growth and urban sprawl demands innovative approach to effectively combine spatial activities to ensure uniformed spatial development and to prevent conflicting land uses and interests amongst stakeholders.

Since spatial planning is not an isolated system but a product of 'cultural forces' (De Vries and Van den Broeck, 1997; Booth, 2005)the above identified factors and other forces of globalization might have had an influence on the policy system, including the spatial planning system of the Dutch and British. For instance, in terms of public investment in road infrastructure, the British approach is the 'Planning Gain system' where private market parties such as real estate developers are required to match real estate developments with the development of other infrastructure, whilst the Dutch uses the 'comparable cost recovery system' as stipulated in their Land Development Act (Janssen-Jansen and Woltjer, 2010). Besides, there is a great freedom of operation at the local level (through negotiations) in UK and the comparable obligatory instructions by the land use plans (no negotiations) in the Dutch case.

Also, the British planning system is grounded by its main aim of controlling spatial development and for the public interest unlike, the Dutch system, which seeks to protect private interests. In the UK planning system, the national government supervisors and regulates planning policies and issues development guidancefor local authorities on various policy areas. "There are no national or regional spatial plans like in the Dutch system" (Janssen-Jansen and Woltjer, 2010; pp. 912).

Another key feature of the UK planning system is discretion (Janssen-Jansen and Woltjer, 2010). Local authorities or districts have the option to consider certain 'case-specific' issues and make decision on the acceptability of certain projects. However, the Dutch has a bureaucratic and more legalistic tradition, which highlights the significance of protection and uniform approach of selecting projects based on their advantages (Woltjer, 2014). Inferring from the above, it is clear that each of the case country has a unique spatial planning cultures. This therefore provides a good base to conduct a comparative study to ascertain how each integrates other land uses into road infrastructure planning.

3. Analysis of the Dutch case of road infrastructure integration

This section gives a brief overview of early development in Dutch road infrastructure planning. It continues with a description of how road infrastructure is integrated with other land uses in the Dutch spatial planning.

3.1. Summary of early development

Since the 1960s onwards, the Dutch government has made massive investment to develop road infrastructure under the polder model. Spatial planning was therefore established in broad land use plans (Alpkokin, 2012; Heeres et al., 2010). Although they were policy gaps in implementation, there was a level of policy integration in which the Housing Ministry, Spatial Planning and Environment has had a higher priority (Alpkokin, 2012). Though this approach was much more top-down, it brought vast development and propelled the growth of the national road network by 1207km between 1960 and 1975 (Heeres, et al., 2012).In the Dutch road transport planning sector, an internal integration of mobility policy was initiated in the 1970s which triggered a change in policy from 'demand-following policy to demand guiding policy'. This policy sought to improve the harmonization between transport networks. A classic attempt to achieve this is the 'institution of the location–specific accessibility profiles' – ABC policies (Heeres et al., 2012, pp 151)

Internal integration was also demonstrated with the institution of the Long-range Infrastructure and Transport programme – MIT. This programme aimed to integrate traffic and transport policy so as to enhance accessibility (Alpkokin, 2011). Also, since the 1990s, policies on infrastructure have been formulated with the active participation of regional and local institutions. This ensures consistency in the road, rail and waterways and creates sustained frameworks for integration (RWS, 2004). The current National Spatial Strategy dubbed "Creating space for Development" unites four ministries to establish an integrated approach to road infrastructure development and the other four main policy areas such firm location; network of cities; residential location; and compact city. The plans have also created room for the integration of land use functions hence highlighting the importance of integrating road infrastructure with other land uses.

Having reviewed how past and present policies aim to ensure integration in land use planning with specific emphasis on road infrastructure planning. The next section highlights how integration is done externally (cross-sectoral integration) within the transport-planning sector. This will be done using the model of Struiksma and Tillema (2009), which conceptualized three types of integration within road infrastructure planning.Heeres et al., (2012) further conceptualized this and described the Dutch road infrastructure planning to have moved form a "line-oriented approach to an area-oriented approach" of road infrastructure planning.

3.2. Integration at the local level

Inferring from the model of Struiksma and Tillema (2009), the Dutch road infrastructure planning has moved from 'routing' to landscaping and finally to total design where full integration is realized. Under the routing policy, the structure plan recognizes the importance for specific planning instruments for road infrastructure

at one hand whilst given attention to relationship between transport infrastructure and other policy sectors from the beginning of planning process. Despite the routing, roads cut through certain protected areas. In the quest to protect the environment from the negative impacts of road infrastructure, policy makers adopted landscaping and mitigation measures. In rural areas, these measure aimed to protect landscape and ecology whilst in the urban centres the measures targeted the nuisance caused by the use of roads including the social and physical barrier functions (Struiksma and Tillema, 2009).

Currently, a more effective approach is the development-oriented planning system, which seeks to develop and redevelop settlements by means of 'total design'. The Ministry of Housing, Spatial Planning and the Environment highlights the significance of ''integrative activities'' and ''cooperative processes of complementary actors'' who plays significant roles in spatial development. The main motive for this is to integrate infrastructure with the socio-physical landscape of society (RVW, 1998; Heeres et al., 2012). Total design approaches are motivated by urbanism dynamics with architectural and aesthetic values. A Dutch example of road infrastructure integration is the Sijtwende-project and the A2 motorway Maastricht-project. The A2 motorway Maastricht-project involves the integration of land tunnel, real estate development and the improvements in the public open space. This helped in the reduction of challenges associated with road infrastructure planning and at the same time enhanced liveability.

4. Integrated road infrastructure planning in the United Kingdom

The UK also has its tale of integrated road infrastructure planning especially with a lack of geographical focus in spatial plans, and policy integration (Janssen-Jansen and Woltjer, 2010). This section will first give a summary of early developments on road infrastructure planning and continue with a description of how road infrastructure is integrated with other land uses.

4.1. Summary of early development

The 'predict and provide' approach dominated the British transport planning in the post-war era. In the 1970 onwards, the economic competitiveness prevailed in the British policy debates. Transport manifested itself in the metaphor of road for prosperity (see Owens, 1995). In the 1980s, the idea of individuality and personal freedom was translated into the road transport planning to justify road constructions to relieve congestions and enable free flowing network (Vigar, 2001). During this period, the neo-liberal ideology of the Conservative government gained the dominance of market over state provision and influenced the privatisation and deregulation of road transport. The road transport sector was therefore integrated with market needs but not with the other spatial land uses.

In the 1990s, a new line of reasoning emerged in the design of policy guidance, which legitimizes the usage of land use planning as a tool for general transport and environmental policies (Owens, 1995). The main motive was to integrate land use and transport policy together in a manner that ensures ease mobility whilst minimizing the need to travel. Then, from the year 2000, public agencies begin to recognize the

interrelationships between land use, economy, environment, and social functions such as health and education. This was visible in the 10-year Transport plan (see DETR, 2000; DfT, 2004a and 2004b). However, the poor integration across departments of central government, particularly between transport and the other sectors such as health, education and environment was an impediment to achieving this (Hull, 2005).

4.2. Integration at the local Level

The basis of the British road planning system is revealed by its main system of regulating development and land use for the interest of the public, unlike the Dutch system which is geared towards the protection of private interest (Janssen-Jansen and Woltjer, 2010).With the British planning system and road infrastructure planning in particular, the central government provides planning guidelines. Though there are national transport strategies, there are no spatial plans, which comprises the local and regional road infrastructure plans like the Dutch case (see Janssen-Jansen and Woltjer, 2010). This therefore affects cross-sectoral integration road infrastructure planning. The integration of road transport is therefore dependent on voluntary partnership between elected local government, and other public and private agencies (DETR, 2000, p. 5) This is different from the Dutch system where the integration is stipulated by the National, Regional and Local spatial plans which provide a comprehensive land use view for the Netherlands.

At the lower level, local authorities are responsible for the preparation of local development frameworks integrating issues such as road (under the local transport plan), housing, and recreation and the general spatial planning (Hull, 2005; Janssen-Jansen and Woltjer, 2010). At this level some sort of integrated road infrastructure planning occurs. For instance there is a negotiation process before a permit can be release for the development of land. Therefore, local government is able add to planning permits conditions they think are good provided they relate to the project for which the planning permit is needed. The district can transfer the internal road task to a housing developer since the houses to be constructed would generate traffic. The possibility to attach planning conditions to land use permits makes this approach distinctive to the Dutch approach of integration. However, there might be an overlapping in terms of land use integration since the whole process is flexible. The negotiation power of the land developer would therefore determine the kind of auxiliary services to be provided in addition. This can therefore be related to the area-oriented approach of the Dutch road infrastructure planning though there are some differences.

Similarly, another instance during which integration of road infrastructure planning occurs at the local level is through the planning obligations (this could be in kind such as development of access roads or financial obligations). “Planning obligation is possibility that a developer takes on certain commitments” (Janssen-Jansen and Woltjer, 2010 pp. 913). For example, the developer could add certain services such as access roads, car park or providing a mix of housing type to the development proposal that would make it attractive to the local district. This approach to integration saves local districts money that would have been used for preparing land or providing roads.

A classic example of integration in the UK is demonstrated in the Queen Elizabeth II Barracks in Fleet, Hamsphire (even though it was a stalemate). Though the developer was to construct 1100 houses, including, a school, shops, a community centre, a church, a day care facility, green area for sports and nature, he was

obligated to local road infrastructure, sidewalks, bicycle lanes, facilities for a group of bats. Another example of planning obligation is the Milton Keynes urban area development tariff system which is an amount of money per dwelling, or per hectare of employment land, that is payable by the developers of land in the Urban Development Area (UDA).

However, the UK approach to integrated road infrastructure planning is mostly "outside in", where the integration emanates from the area towards the road infrastructure, whilst the Dutch approach combines both "outside in" and "inside out" (integration from element of infrastructure to the area) approaches (Arts, 2007; in Heeres et al., 2012).

5. Discussions and conclusion

According to De Jong (1999), institutional transplantation, in which elements from the planning system of a country are transferred to another is often difficult because of the different planning cultures and or institutional arrangements from which these planning systems arise. Despite, countries could learn lessons from other planning systems that they can use for the betterment of their spatial planning. This section highlights a comparative thought of integrated road infrastructure planning in both countries. This will be done by providing answers to the questions raised in the introduction. It continues with a discussion for lessons drawn from both countries for consideration in Ghana.

5.1. Integration between spatial planning and road Infrastructure

The integration of road infrastructure planning and other spatial planning sectors is the main practice among the Dutch. The Dutch road planning strategy brings together with other land-uses and transport investments. This is made possible because of the Dutch spatial planning system and subsequent sectoral collaboration and coordination ranging from the local to the national level. Transport planning is not seen as single issue but an integrated activity that should be done with relevant stakeholders and sectors. One main advantage of this approach is that it promotes institutional collaboration and Public-Private-Partnership at the implementation stage of the spatial plans.

Similarly, in the UK, guidance documents specify that transport plans should conform and complement other local development plans (Headicar, 2009). However, unlike the Dutch system that is set by the national spatial plan, each Local district has the discretion to prepare its transport plan in accordance with the guidelines provided by the central government.

5.2. Integration with other land uses

The Dutch approach to integration considers roads as part of a wider transportation system. This includes other modes of transportation and involves different stakeholders within the transportation sector. Design solutions are used to integrate the road with its surroundings and improve its spatial quality. This minimizes

the negative impacts of road infrastructure and embeds it into the socio-physical and environmental landscape of society (Shannon and Smets, 2010). It can therefore be described as a 'catch all concept' or 'an area-oriented/context-sensitive approach' (Heeres et al., 2012) base on spatial quality that seeks to foster utilization of the sustainability concept by integrating socio-cultural, economic and environmental aspects of development with spatial planning.

Unlike the Dutch case of integration which has evolved through various stages (routing, landscaping and mitigation, and total design) and rooted in their spatial planning system, the British type of integration occurs in a process of negotiation between local districts and developers and in the form of planning obligation. This therefore makes integrated road infrastructure planning flexible and a non-binding system unlike the Dutch approach that emanates from the spatial plans and emphasizes the legal security of spatial plans and road transport plans in particular.

However, similarities can also be found. Both planning practices portray features of integrated road infrastructure planning and an increasing spectrum of collaboration between public and private market parties. In both countries, there are efforts to ensure transport network coherence with other land uses.

5.3. Integration in Ghana and lessons

The basis of the Ghanaian planning system is influenced by its regional economic planning approach. The central government plays a vital role in planning and managing development activities across the country, and in undertaking public sector investments. Unlike the Dutch planning system, it seeks to control development and land use for public interest. There are national instructions or policy guidelines binding the planning activities of regional and local planning authorities. The planning system establishes a direct connection between national development strategies and the spatial realization of these strategies through a chain of conformity of plans. At the local level, local planning authorities – Metropolitan, Municipal and District Assemblies – control development, as they have the authority to plan, implement and regulate development. Each local authority prepares a Spatial Development Framework (SDF), which must be in conformity with the higher level of plan.

The SDF provides the development framework for the development of these areas and guidelines for the development of the structure and local plans. Local plans include details land use plans and may be used for redevelopment schemes, commercial and recreational development. A Local Plan is prepared every time a development requires an access road or has its own internal road network (TCPD, 2011). Integration is supposed to occur at this stage of planning. However, The country's spatial planning practice based on a concept of land use segregation; adopts mono-functional land uses, discrete zoning, regulation and consensus — a relic of colonial spatial planning (Baffour et al., 2014) contributing to urban sprawl. The goal of spatial dichotomy of housing and road infrastructure creates an overlap between road infrastructure development and the development of the other land uses.

The Medium Term Development Plans are also not integrated with land use plans prepared by the Town and Country Planning Departments (TCPD) of respective district assemblies (NDPC, 2013). These situations further compel spatial planners to view road infrastructure design and development as short-term and

modally based. Therefore, what lessons may Ghana draw from this comparative study? As shown in the discussion above, project negotiation is a genuine planning task performed by local authorities in UK. The UK approach can offer District planning authorities the prospect to enhance their relationship with private developers towards road infrastructure construction. Project negotiations would offer the possibility to make road transport plans flexible.

Another lesson for Ghanaian spatial and road infrastructure planning is planning obligation. This makes it possible for desirable developments which might not formally conform with existing development plans. Planning obligations can advance the financial fortunes of MMDAs, and they can create an opportunity for the redistribution of profits from profitable land uses to non-profitable ones. Obligations in the form of taxes or cash can be used to fund some of the development projects of the districts (Janssen-Jansen and Woltjer, 2010). This would therefore ensure a perfect integration between road infrastructure and other land uses.

On the other hand, the Dutch integrated planning approach can also offer useful lessons for road infrastructure planning in Ghana. The total design or area-oriented approach of road infrastructure planning enhances the legal security and predictability of what road transport plans have to offer the citizens. This also promotes stakeholder collaboration and cross-sectoral linkages between organization and agencies involved in spatial planning.

Inferring from the above analysis, it is observed that each country has its own planning culture. For instance, the Dutch emphasis of spatial quality could be attributed to its compact city concept and the polder model adopted in spatial planning systems. In the case of the UK, it could be seen that the neoliberal forces played an important role in its road transport planning system. The main aim was to regulate development and land-use for the interest of the public which is not different from the Ghanaian case.

Also, it came to bear that, international drivers in planning practices such as climate change and sustainable development played an important role in the internal planning cultures of these countries. This therefore confirms Booth's (Booth, 2005) assertion that planning is not an isolated phenomena but a product of cultural forces. This raises several mind-boggling thoughts as to how spatial planning in Ghana withstands these international forces since there are several local specific issues to consider. Thus, the government with its planning institutions, departments and agencies has to adjust and reposition their focus so as to blend their social and moral responsibilities with business models as discussed in the British case. This should be done within the framework of sustainable development in order to achieve a blended value of economy, environment and society.

Therefore, Spatial Planners in Ghana, especially officials of the Town and Country Planning Departments, Urban roads and department of highways, local folks and entrepreneurs have to collaborate and find a synergy between road infrastructure plans, its content and the spatial qualities of each settlement. They have to understand and appreciate the interdependency between environment, society and road infrastructure. And focus on the non-linear patterns and processes that emerge, harnessing the positive effects while minimising the negative impacts.

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