Model of Integrated Transport and Land Use Policy Objectives - Comparison of Hannover and Bristol Regions' Policies

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***Abstract*—**This paper is an attempt to identify relationships between transport and land use policy objectives. A model of such interrelationships has been developed in order to provide a theoretical framework for integration of transport and land use policies. That model constitutes a system of integrated transport and land use policy objectives, which jointly aim at attainment of *sustainable accessibility*. The model has been used as a framework to compare two case study policies – transport and land use policies valid in Hannover (Germany) and Bristol (United Kingdom) regions. Within each case the degree of internal integration of the policies analysed has been assessed.

***Keywords*—**Transport planning, land use planning, policy integration, accessibility.

I. Introduction

TRANSPORT and land use are closely interconected. Transport is one of the spatial activities and transport infrastructure is an element of spatial structure. Therefore the transportation system is a part of spatial organization. This fact implies a strict link between the general spatial planning and the sectoral transport planning. This relation implies also a connection between transport and land use planning which is an element of spatial planning too. These domains are separate but interrelated. A consequence of this interrelation is a need to coordinate or even integrate transport and land use policies. Integration of sectoral policies, which represents a step beyond coordination, aims to develop a joint, holistic policy[1]. The need to integrate transport and land use policies is widely recognised throughout Europe[2, 3].

II. Aims and Method of Research

The aims of the presented research are:

- → creation of a theoretical model of transport and land use policy objectives integration,
- → assessment of the degree of integration of two case study policies - transport and land use policies in the regions of Hannover (Germany) and Bristol (UK), applying the model as a definition of integration.

The above aims broadly define construction of this paper and research methodology.

III. The Primary Goals of Transport Policy

In order to identify the overall goal of transport policy a relation between mobility and accessibility should be established. Mobility which is the immediate aim of the transport system, serves to achieve accessibility that constitutes the prime aim of travel. In this context mobility and transport should not be regarded as goals in themselves, but rather as measures to achieve accessibility. Therefore it can be assumed that the primary goal of transport policy is accessibility[4]. The next step in reasoning is an attempt to define a relationship between accessibility and other spatial planning objectives that takes into account different socio-economic goals. This article does not aim to analize this issue in depth, therefore this relationship is defined in a generic way.

According to the paradigm of sustainable development no social activity should undermine another. Therefore an objective of one sectoral policy should be to minimise conflict with other sectoral objectives. These objectives ought to conform with each other as much as possible, taking into account mutual impacts and interrelations. In the case of accessibility it is necessary to consider all impacts in its implementation – economic, social and environmental ones, which can be regarded as costs that should be minimised. In conclusion an overall goal of *sustainable accessibility* is proposed for transport policy, which is commensurate with sustainable development objectives.

sustainable accessibility = good and low cost accessibility

Restated the aims of transport policy are to provide optimal accessibility and low cost transportation. How can these aims be achieved?

In order to answer this question let us reflect upon the term *accessibility*. It describes the ease of reaching a destination – in terms of the time needed to reach it. It is characterised by two features – a spatial aspect of distance and a comunication aspect of transport mode. These two aspects indicate two possible ways of improving accessibility – a spatial and a transportational one – that reaffirms the close link between land use and transport policy in terms of accessibility.

Improved accessibility can be achieved in two ways:

1. reducing the distance traveled, by reallocating the destinations in space, so that they are closer to each other and better linked together,

2. improving the transport system so that the journey is quicker[5].

In order to lower the transport costs, as a condition of making accessibility more sustainable, the same measures can be taken:

1. reducing unnecessary journeys to reduce the amount of travel and shorten distances travelled,
2. improving the transport system to make travelling cheaper.

In conclusion, sustainable accessibility can be achieved by the proper allocation of land uses and transport system improvements. It is obvious that the best results can be achieved by combining these two measures in order to reach a synergic effect that maximises the benefits. Such synergy can be reached by integration of land use and transport policies.

IV. Integration of Transport and Land Use Policies

Achievement of a functional cohesion of land use and transport structures implies a basic link between transport and land use policies. It is a task of holistic spatial planning to coordinate the creation of this linkage to ensure that the transport system is embeded in the spatial structure in the most effective way. Hence the most evident link between land use and transport planning is the allocation of transport infrastructure in relation to land uses.

Other possibilities of acting in this field remain solely in the separate domains of land use and transport planning policies, but it has to be emphasised, that their obcectives should be mutualy coherent and coordinated. Moreover they should take into account the fact that they jointly serve a common goal which is sustainable accessibility. Let us try to define land use and transport policy objectives that aim both at improvement of land use allocations and transport system enhancement so that they serve to increase accessibility and lower its costs.

Accordingly sustainable development from the point of view of transport accessibility should be characterised by proximity of land uses. This requires an appropriate concentration of development and an adequate mix of uses, which together assures a proper allocation of land uses that minimises the need to travel between them. The key land use policy objectives from the point of view of accessibility are therefore land use concentration and mix of uses. These types of spatial structures are described in the German planning literature as *economical* in both transport *(verkehrssparsam)* and land use *(flaechensparsam)* terms[6]. Nevertheless the above aims are not absolute and sole objectives, and so the pursuit of sustainable accessibility must not cause a decrease in quality of life. Therefore there is a need to responsibly manage the concentration and mixing of uses so that any external costs that might reduce the quality of life, are not increased. The key policy objectives of urban environment improvement are then focussed on increasing densities, and concentration of development, without a decline in the quality of life. Such an approach is embedded in an idea of the *compact city*[7] which claims that advantages of a more compact city form comply with environmental protection and social objectives thereby contributing the achievment of sustainable development[8]. These advantages are mostly related to the *reduction of transport* which is the prime factor in the decline in the quality of urban environments[9]. This identifies another connection between transport and land use policy that substantiates the need for integration[10].

Now let us move to the domain of transport planning and the objective of improving the transport system. There are two possible solutions in this field: extension of transport system or improving its efficiency. The extension of transport system without its simultanous rationalization does not satisfy the precondition of sustainability as it contradicts the objective of transport cost reduction. The continuation of the prevailing transportation policies, typically based on the development of inefficient and unsustainable transport modes, because it implies huge external costs of transport[11] imposed on society, is economically non-rational and environmentally controversial. This approach therefore does not comply with sustainable development objectives. The above is primarily focussed on the expansion of individual car transport, which is uneconomical from the point of view of the whole society as it has the greatest external costs in comparison to other transport modes[12]. The extension of transport system can be justified only if it leads to a real enhancement of the system and not just to a temporary increase of network capacity, as is the case with road network extension. Therefore the main emphasis in the aim for transport system improvement should be given to its *rationalization*, that leads to both an increase of efficiency as well as a reduction of costs. Efficiency improvements to the transportation system requires a rationalization of modal distribution, so that the overall cost of its functioning is as small as possible. This requires consideration of all costs of transport, which poses challenges given the fact that at present most costs are external, and so “hidden” and difficult to unequivocally estimate[13].

Efficient modal distribution requires maximisation of *non conflicting and cost effective* transport modes. Such economical transport modes are commonly described as *environmentally friendly* or *sustainable.* Walking, cycling and rail can fulfil the above requirements. The walking and cycling transport are characterised by lowest costs (cheap infrastructure, low degree of conflict) whereas rail transport is the most effective with relatively low conflicts. The specification of economical transport modes can be broadened to include public transport in general as a more sustainable alternative to individual road transport.

The most uneconomical and the most widespread means of transport is road transport. Its expansion is driven by neglecting in the cost benefit analysis its negative externalities: costs of road infrastructure, cost of sealed land, pollution of the environment, road accidents and traffic organization, all of which result in its uneffectiveness and high degree of conflict. Transport planning that takes into account the above relations should aim at to maximise *modal shift*[14] towards the more economical means of transport. In order to achieve this aim sustainable transport modes should be enouraged while reducing road traffic[15]. Evidence shows that ensuring the possibility of using efficient public transport network is not sufficient incentive to abandon car use[16]. Therefore it seems to be necessary to introduce both a restrictive road traffic policy and other measures to encourage changes in transport preference. Among these other measures adequate land use planning is of a paramount importance.

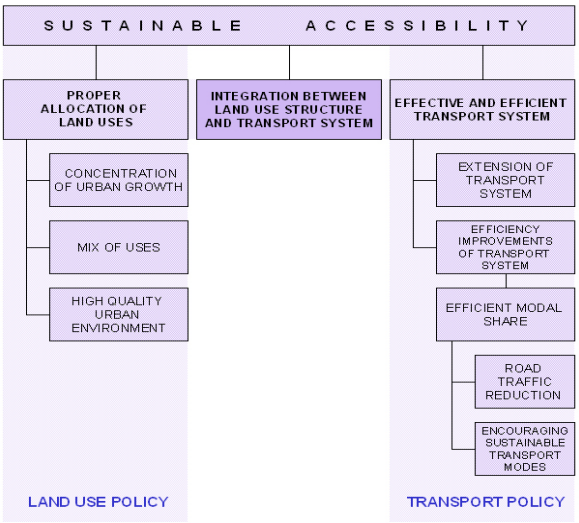

Fig. 1 Model of integrated transport and land use policy objectives

Based on the above reasoning a *model of integrated transport and land use policy objectives* has been created, which are targeted at the attainment of sustainable accessibility. The model integrates the operational aims of land use and transport policies, and is embedded in a holistic system of spatial policy objectives which takes into account all pursuits and aspects of spatial development (Fig. 1).

V. Case studies – Integration of Hannover and Bristol Regions' Transport and Land Use Policies

To what extent does the above model of integrated transport and land use policy compare with existing policies in Germany and the United Kingdom? In order to address this issue, case studies of transport and land use policies in the regions of Hannover (Lower Saxony) and Bristol (South-West England) have been developed for analysis and comparison. Policy objectives from the key statutory documents setting out the transport and land use policies at all levels of planning administration for both regions have been analised. For the purposes of this research the following documents are assumed to be of key relevance:

- national level: *Raumordnungsgesetz*[17], Planning Policy Statement 1: Delivering Sustainable Development[18] and Planning Policy Guidance 13: Transport[19];
- regional level: *Landes Raumordnungsprogramm Niedersachsen*[20] and Regional Policy Guidance for South West[21];
- subregional level: *Regionales Raumordnungsprogramm Hannover*[22], subregional statements of RPG SW, and Bath and North East Somerset, Bristol, North Somerset, South Gloucestershire Joint Replacement Structure Plan[23].

A. Sustainable Accessibility

'Ensuring good accessibility of all parts of the country' is one of the main objectives of German spatial policy[24]. English policy aims at ensuring and improving accesibility[25] of services and employment[26]. Policies in both case studies describe the need to take into account the economic, environmental and social impacts of transport development. The German case strives to 'detach the economic and transport growth'[27], to 'minimise the level of harmful emissions produced by transport'[28] and to 'take into account transport needs and the security of various social groups'[29]. The English case aims to reduce the impact of transport on the environment'[30] 'reduce isolation for people without the use of a car'[31] and 'achieve the environmental, social and economic benefits that arise from efficient and responsible use of infrastructure'[32] Social and health related costs are considered in policy statement such as 'to reduce community severance and the threat of traffic'[33]. There is a clear connection of the policy to sustainable development objectives.

B. Integration between Land Use Structure and Transport System

Policies in both case study regions emphasise the issue of land use and transport planning integration, as well as the integration of the spatial structure and the transport system. The integration of transport and land use planning is one of the policy objectives in both cases[34]. The German policy advocates 'an integration of political, transport, regional and town planning measures'[35], and the English policy supports 'an effective management of urban growth'[36] in order to harness the full potential of public transport. In England it is required that the regional Transport Strategy supports the spatial strategy of RPG[37] and that 'strategies in the Development Plan and the local transport plan are complementary'[38].

In Germany the aim of policy integration is clearly expressed as a 'unity of land use and transport' *(Einheit von Siedlung und Verkehr)*[39] and is one of the key spatial planning objectives. To achieve it a 'support of the planned spatial and settlement structure, based on the central places system, by an adequate development of regional transport networks'[40] is proposed. In England the policy requires that developments support transport networks[41].

In both policies there are many statements which directly bind urban growth with transport networks, to ensure the accessibility of development. In Germany the main emphasis is on 'ensuring that as many areas as possible are served by rail transport'[42] to be achieved via 'land use concentration in the catchment areas of regional rail networks'[43]. In Hannover region a planning tool of 'development priority areas' *(Vorranggebiete fuer Siedlungsentwicklung)*[44], designated primarily at areas served by railways[45], has been introduced. These requirements are firmly embedded in a spatial development concept of 'Central Places System' *(Zentrale-Orte-System* [46] which aims, *inter alia*, at ensuring an efficient and economical transport service[47].

In England land use and transport network integration is supported by a 'sequential approach by sites designation' that gives preference to central places and those well served by public transport[48] as well as 'major strategic sites' where preference is given to 'previously developed sites within existing urban areas, well located to public transport'[49]. The same principles are followed on the subregional level by a 'locational strategy'[50] which is promoted by the Bristol region's Structure Plan.

In the English case study there are a number of statements that demonstrate the general assumption of the integration of land use and transport structures including 'reduce the walking distance between land uses, and to public transport'[51] and 'ensure that interchange points are well related to travel generating uses'[52]. Policy also promotes concentrating development in existing centres, next to public transport interchanges[53]. Furthermore, there are many detailed directives in PPG13 and RPG that encourage new development to be integrated with public transport networks[54] and 'well served by sustainable modes of transport'[55], especially in the case of travel intensive uses[56].

LAND USE POLICY

C. Proper Allocation of Land Uses

There is a precise statement in the German policy about the relationship between the proper allocation of land use and the reduction of unnecessary travel: 'urban growth *(Siedlungsentwicklung)* should be managed by the allocation and mixing of different land uses so that it contributes to current traffic reduction and the avoidance of its additional growth'[57] . It is one of the principles of German spatial planning embeded in a binding way in the main planning act (ROG). Similarly, the English system aims in PPS1 to 'encourage patterns of development which reduce the need to travel by private car'[58].

Furthermore, in the German case, in several places the aim is advocated to secure urban growth with also a 'reduction of traffic' *(Verkehrsvermeidung)*[59] (avoidance of unnecessary travels and reduction of distances travelled[60]). Similar statements exist in the English policy – eg. 'prevent development trends undermining traffic reduction objectives'[61]. The most prevalent term used is *reducing the need to travel*. This objective appears many times in the planning documents[62], and indicates a major emphasis in English planning on the integration of transport and land use policy objectives.

D. Concentration of Urban Growth

Both policy case studies recommend concentration of urban growth and development. German planning mentions 'spatial concentration of urban growth' *(Siedlungstaetigkeit)*[63], as one of the key planning principles binding for the whole system. It recommends the focussing of urban growth in Central Places[64], while reducing urban growth in the more peripheral areas[65].

The English counterpart of the German Central Places System (ZOS) are the Primary Urban Areas (PUAs). English planning promotes 'concentrated growth at the PUAs and other designated centres of growth'[66], which together with 'market towns'[67] form a similar construct as the German ZOS. It is also recommended to 'concentrate new housing in existing cities'[68] whereas urban growth outside cities is to be minimised, 'resisting dispersal pressures'[69] that increase transport demand.

Policies for the concentration of growth support increased development densities in cities, especially in order to increase the number of developments served by public transport. In the German case 'denser development and housing located in the catchment areas of regional railway networks' is advocated[70] whereas the English case promotes 'intensive development on the most accessible sites'[71] and 'high density, mixed use development in and around town centres'[72]. The vital issue of 'ensuring a critical mass of residents to support services such as new or enhanced public transport provision'[73] is also identified. The English pursuit to increase the density of development is consistent and well embeded in the whole planning policy[74].

E. Mix of Uses

In both cases policies express a need to deliver a mix of land uses to reduce travel demand[75]. The linkage between housing and employment in order to reduce the need for every day commuting[76] is stressed. Statements about the need to ensure a land use structure that enables people to 'meet their every day needs locally' *(wohnortnahe Befriedigung)*[77] clearly indicate a purpose to coordinate the land use objective of mixed use with transport policy. The English additionally raise an issue of *self-containment*[78] - ensuring the maximum provision of uses locally. This is firmly connected with a policy of promoting vitality and viability of existing centres (UK)[79] *Funktionsfähigkeit* of Central Places (D)[80].

F. High Quality Urban Environment

Similar statements which express a necessity to improve attractivness and the quality of urban environment while increasing population densities occur in both cases[81]. Provision of a high quality urban environment in priority growth areas (ZOS, PUAs, town and local centres) is strongly emphasised[82]. The English planning case promotes *urban renaissance*[83], which is a comprehensive approach towards the policy of increasing the quality of life in cities as a sustainable alternative to urban sprawl.

TRANSPORT POLICY

G. Efficient and Effective Transport System

In both cases policies aim at the creation of an effective and economically efficient transport system: D – 'both environmentally friendly *(umweltfreundlich)* and economicaly efficient transport development *(Verkehrsentwicklung)*'[84] UK – 'sustainable transport patterns'[85] as well as 'ensuring a modern, efficient and integrated transport system that meets all travel needs'[86].

H. Transport System Extension

In both cases policies prefer extension of sustainable transport networks. The German case advocates 'an extension of the railway network as a basis of a national transport system'[87]. It gives a generic priority to railways extensions[88] while the road network is assessed as sufficent and its further extension is not recommended. The English policy encourages railway investments too (light rapid[89], rail freight terminals[90]), however its statements are not as categoric as in the case of German policy. Both systems limit road network development to cases where it could contribute to public transport improvements[91]. The Bristol case also requires a set of other environmental and sustainability conditions to be fulfilled, however these requirements are limited to non-trunk roads[92].

Both policies aim at achieving direct, convenient, attractive, and safe pedestrian and cycle networks[93], however the German one is further-reaching in this field mentioning continouity which is a key feature of cycle network as well as development of cycle lanes next to all types of roads[94] and all areas of the country[95]. Both cases promote development of 'park and ride' facilities[96], though in the German case study a development of 'park and bike' system is also proposed[97]. Policies in both case study regions promote the extension of public transport networks[98], whereas in the Hannover region an emphasis is put on rail transport[99], in Bristol developing bus networks is the main focus[100].

I. Efficiency Improvements

None of the policies clearly supports the increase of efficiency of the transport system as a sustainable way of improving it. However maximum modal shift towards sustainable transport modes is proposed.

J. Efficient Modal Share

The issue of efficient modal share is of a major importance in German transport policy, which demands a 'task-critical *(aufgabengerecht)* and environmentally friendly *(umweltschonend)* modal share between different transport networks'[101] and operators[102]. In order to achieve this 'integration of transport networks' *(Verknüpfung aller Verkehrssysteme)*[103], particularly sustainable ones[104] and the creation of organizations responsible for integrating different transport networks at the regional level *(Verkehrsverbunde)*[105] is encouraged.

The English planning does not explicitly support the efficient modal share of different transport means. However it identifies a 'sustainable transport hierarchy'[106], which promotes sustainable transport modes, and is *de facto* an attempt to rationalize the modal share. There is an aim also to achieve a 'more sustainable pattern of the distribution of movement of goods'[107] and 'maximise the potential usage of public transport'[108]. Integrating transport links'[109] is also identified in the pursuit of a fully integrated transport network[110], but there is no requirement for the creation of *Verkehrsverbunde*.

In order to achieve an efficient modal share both case studies policies propose a 'modal shift' *(Verkehrsverlagerung)* towards 'more sustainable transport systems' *(umweltverträglichere Verkehrsträger)*[111]. There is a focus on a shift from road to rail[112] in both cases, but in Germany there is a generic priority of rail transport in relation to road transport[113]. Along with rail water[114] and 'regional public transport' *(öffentlicher Personennahverkehr)*[115] is also promoted. A reduction of road transport and the encouragement of ecological transport modes is forseen as a means of increasing the share of sustainable transport modes.

K. Road Traffic Reduction

The objectives of general traffic reduction *(Verkehrsvermeindung)* and clear preference of sustainable transport modes do not result in an explicit statement about an aim of road traffic reduction in the German policy. The 'removal of roads in dense urban areas'[116] and 'excluding of individual car transport from recreation areas'[117] are means to reduce road traffic in the Hannover region. The Bristol policy aims to reduce traffic and congestion[118], by means of 'discouraging car use'[119]. It states a number of parking and road management[120] measures targeted at road traffic reduction. The introduction of 'road user charging policies'[121] and reduced parking requirements[122] to limit parking possibilities is recommended . 'Lower speed limits', and other 'measures to slow traffic' are also postulated in areas of high pedestrian concentration[123].

L. Promoting Sustainable Transport Modes

Promoting sustainable transport modes is a key policy element of both cases. The German case commends 'encouraging the most economical *(wirtschaftlichste)*, environmentally friendly *(umweltschonendste)* and energy efficient *(energiesparendste)* transport modes'[124]. An important postulate of the English policy in this field is 'encouraging more sustainable travel choices'[125], particularly walking, cycling and public transport[126], which are given priority on urban roads[127]. English policy 'promotes walking as a primary mode of travel'[128], 'giving priority to people over ease of traffic movement'[129]. Cycling is also promoted[130] along with improvments to pedestrian and cycle networks[131]. Both cases indicate a need to improve the attractiveness and efficiency of public transport[132], to be achieved by giving priority to public transportation in relation to the individual transport[133], in the case of the UK - 'promoting bus priority measures'[134], whereas the German case advocates 'avoiding a competetive road traffic paralell to public transport lines'[135].

V. Conclusion

A quantitative comparison of the analysed policy systems is very difficult because of different approaches to the specification of the planning documents. The German planning system is based on development plans, unlike the English system, in which the most important planning policy on the national level cosists of guidance, just recently being reformed towards more enforcable policy statements. This can be a reason why the Enlish policy documents tend to be more discursive which sometimes results in the unnecessary repetition of statements. They are, however, on the whole more detailed in comparison to their German counterparts. The German plan-led spatial policy system is charactrised by brevity and precision of statements, which focus on spatial activities within the remit of the planning administration. Separation of motivation and justification from legally binding policies by placing them in distinct parts of the documents makes them easy to analize. Nevertheless difficulties caused by above differences do not affect the result of policy content analysis.

The proposed model of transport and land use policies integration is viewed as a system of spatial policy objectives that aim for the attainment of sustainable accessibility. All of the assumptions included in the model are taken into account in the spatial policies of both case study regions, however some of them are not expressed directly or different terms are used to describe them.

In both case studies there are statements about responsible ways of ensuring good accessibility, but in none of them is the term *sustainable accessibility* used. Both policies aim at the integration of land use structures with transport systems, the proper allocation of land uses and the mix of uses. Settlement concentration objectives exist in both case studies although the German approach is more holistic due to the inclusion of the Central Places Concept in the entire planning system[136]. Both systems identify a need to secure a high quality of urban environment based on increased population densities. However, there are a greater variety of statements promoting urban renaissance and city centre development in the English policy. The creation of an efficient transport system is an objective of both case studies. In Germany comprehensive links are made between economic and environmental goals, by emphasising the issue of cost effectiveness. None of the policies address directly the rationalization of the transport system as a sustainable way of improving it. In relation to the issue of the extension of transport networks both policies emphasise the extension of sustainable transport modes infrastructure, but there is a greater emphasis in Germany on the development of railways, continous cycle networks and integrated regional public transport networks. Both policies generally discourage further road network extension and aim at the integration of all transport networks. In both cases a rationalization of modal share is promoted by recommending a shift towards more sustainable transport modes. The English policy has a more innovative set of road and parking management measures in order to reduce road traffic. Both case studies are compliant on the issue of promoting sustainable transport modes.

In both cases policies can be viewed as integrating transport and land use planning. However, a critical analiysis of transport and land use policies is recommended in order to improve their degree of systematisation and thereby to increase the cohesion of holistic spatial planning systems.

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[57] ROG 2.2

[58] PPS1, 13(ii)

[59] LROP A 3.6 01; RROP D 2.5 02, D 3.6.0 01, D 3.6.0 02

[60] LROP A 3.6 01, C 2.5 01, C 3.6.0 01; RROP D 3.6.0 02

[61] SP P.2f, P.47, P.54

[62] RPG 1.31, VIS 1, SS 2, 3.13, 3.68, 4.9, SS 5, 4.15, EC 6, 5.25, 8.21, 8.4,

8.5, TRAN 1, TRAN 3, TRAN 4, TRAN 7; PPG 13, 3, 4, 72; PPS1, 27(vii); SP OBJ.E, P.1.7, P.38, P.59
[63] ROG 2.2
[64] ROG 2.2; LROP A1, A3.6, B1 04, B4 02, C1.1 02, C1.5 01, C1.5 03; RROP D 1.1 02, D1.5 02, D1.6.1 01, D1.6.2 02
[65] LROP A2.2, B5 04; RROP D 1.5 02, D1.5 05, D1.6.3
[66] RPG VIS 1, 3.8, SS 2, 3.13, 4.9, 8.4
[67] RPG SS 19, 8.21
[68] PPG 13, 6.3, 13; RPG SS 19
[69] PPG 13, 71; RPG SS 19
[70] RROP D 1.5 02
[71] PPG 13, 21
[72] PPG 13, 76.3; RPG SS 5
[73] RPG 3.8
[74] PPS1, 27(viii); Planning Policy Statement 3 (PPS3): Housing, 2006, 45; RPG, HO 6, 3.8, SS 8; SP P.1.1, P.35, P.38, P.59
[75] D- ROG 2.2; LROP C1.5 01, RROP D1.5 03; UK - PPG 13, 21, 30 ,30.3; RPG 3.8, 4.14, 4.15, EN 4; PPS1, 27(ii), 27(viii), 36; SP P.1.1, P.2c, P.38
[76] D- ROG 2.2; LROP C1.5 01; UK - PPG 13, 30.1, 43; SP P.33, P.2c
[77] D - RROP D 3.1 09, D 3.6.0 02; UK - RPG 4.15
[78] RPG 3.13, 7.3
[79] RPG EC 6; PPG 13, 35, 51.4, 59; SP P.2a, P.38, P.44; PPS1, 27(vi)
[80] RROP D1.6.1 04
[81] D- LROP B4 01; UK - PPG 13, 66; RPG EN 4, EC 6; PPS1, 20,17,18; SP P.1.1
[82] D - LROP C 3.8 03; UK - RPG 3.8; SP P.38
[83] RPG 3.18, 3.7, 3.8; EN 4, 7.3; SP P.3
[84] RROP D 3.6.0 01
[85] RPG EN 4
[86] RPG 8.5
[87] LROP A 3.6
[88] LROP C 3.6.3 02
[89] RPG TRAN 3; SP P.49
[90] RPG TRAN 6
[91] D - RROP D 3.6.3 01; UK - SP P.58
[92] SP P.58
[93] D - LROP A 3.6, C 3.6.6; RROP D 3.6.6 01, D 3.6.6 02, D 3.8 05; UK - RPG TRAN 10; SP P.51, P.59
[94] LROP C 3.6.6; RROP D 3.6.6
[95] LROP A 3.6
[96] D - LROP C 3.6.1; RROP D 3.6.1 07; UK - RPG TRAN 10; SP P.50, P.49
[97] LROP C 3.6.1; RROP D 3.6.1 07, D 3.6.6 04
[98] LROP A 3.6; RROP D 2.4 02, D 3.6.1 04; UK - RPG, TRAN 10; SP P.2b
[99] RROP D 3.6.1 08
[100] RPG TRAN 10; SP P.48
[101] RROP D 3.6.0 01, D 3.6.0 03
[102] RROP D 3.6.0 05
[103] LROP A 3.6 02, C 3.6.1, C 3.6.0 02, C 3.6.5, 01; RROP D 3.6.0 01, D 3.6.0 03, D 3.6.1 01, D 3.6.1 09
[104] LROP C 3.6.6; RROP D 3.6.6 02
[105] LROP C 3.6.1; RROP D 3.6.1
[106] RPG TRAN 10
[107] RPG TRAN 3, TRAN 6, TRAN 7
[108] PPG 13, 20.2, 72
[109] RPG 3.74, SS 8, SS 19
[110] SP P.49, P.50
[111] D - RROP D 3.6.0 01, D 3.6.0 03; UK - RPG TRAN 5, TRAN 10; SP P.60, P.49, P.61, P.62
[112] D - LROP C 3.6.2 01; RROP D 3.6.2 01; UK - RPG TRAN 4
[113] LROP A 3.6 02
[114] D - ROG 2.2 12; LROP A 3.6 02, C 3.6.2 04; RROP D 3.6.0 04; UK - SP P.1.7
[115] D - LROP C 2.5 01, RROP D 2.5 02; UK - RPG, TRAN 10; SP P.48
[116] LROP C 3.6.3 04
[117] LROP C 3.8 02
[118] RPG TRAN 2; SP P.50, P.62, OBJ.E
[119] RPG TRAN 5; SP P.50, P.54, P.55, P.59
[120] RPG TRAN 3, TRAN 5, TRAN 6; PPG 13, 6.7, 67; SP P.38, P.47, P.48, P.50, P.51, P.54, P.55, P.62
[121] RPG TRAN 3, TRAN 5; PPG 13, 6.7
[122] RPG 2.7; PPG 13, 49, 52, 53; SP P.54, P.59; RPG 8.17
[123] SP P.55
[124] RROP D 3.6.0 02, D 3.6.0 03
[125] PPG 13, 3, 4, 6.7, 48, 49, 52, 59; RPG TRAN 3, 1.31, 8.3, 8.5, 8.17, TRAN7; SP P.1.7, P.54, P.55
[126] RPG TRAN 3, 1.31, 4.8, 4.15, TRAN 10; PPG 13, 42, SP OBJ.E
[127] RPG TRAN 5; PPG 13, 6.8, 65, 67; SP P.48
[128] PPG 13, 30; SP P.51
[129] PPG 13, 6.8
[130] PPG 13, 49
[131] SP P.1.7, P.50
[132] D - ROG 2.2; UK - RPG TRAN 10; PPG 13, 72; SP P.1.7, P.34, P.47, P.48, P.61, P.62
[133] D - LROP A 3.6 02, C 3.6.1; RROP D 2.4 02, D 3.6.1 01, D 3.6.1 04; UK - PPG 13, 67; RPG TRAN 10
[134] RPG TRAN 10; SP P.48, P.50
[135] LROP C 3.6.1; RROP D 3.6.3 02
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