Capacity of the Trunk Road Network to Accommodate Planned Growth

Summary of Analysis

July 2012

Introduction

1.1 The purpose of this note is to present the findings of Transport Scotland's overview of the extent to which the trunk road network can support the delivery of development plan allocations, particularly for housing. The analysis provides a snapshot of the relationship between planned development and the capacity of the trunk road network.

1.2 This generally comprises a high level review of the potential impacts of development proposals, specifically during the period up to 2017, on the current capacity of the trunk road network and how this varies across the country.

Background

1.3 Scottish Planning Policy clearly sets Scottish Ministers position that a development should mitigate its impact where it would have a detrimental effect on existing levels of service. This means where the design capacity of the infrastructure is exceeded by a proposed development, mitigation measures should be put in place, where practicable, at the cost of the development.

1.4 Where road safety permits, Transport Scotland applies a degree of flexibility to conditional planning application approvals. Applying this pragmatic and proportionate approach towards its development planning and management responsibilities balances the potential effects of development on the trunk road network and the requirement to mitigate these, against the objective of supporting sustainable economic growth.

1.5 In continuing with this proactive and pragmatic approach, this report provides an overview of where anticipated areas of significant constraint will be evident on the trunk road network as a result of the demands from development.

Analysis

1.6 The analysis undertaken to inform this report comprises a review of all available development data detailed within adopted and emerging development plans throughout the country and provides an estimate of the likely effects of the demand from additional development proposals on the trunk road network.

1.7 The intended outcome is to identify locations where the effect of the additional demand from proposed development allocations will be such that the operation of the trunk road network will be significantly constrained when considering the impact on capacity and/or safety.

1.8 For the purposes of this overview, "significantly constrained" is defined at a "strategic" level and is intended to indicate locations on the trunk road network where current operational conditions are such that any additional demand from development proposals at that location will result in either: severe congestion to the extent that standstill conditions are likely to

prevail during peak periods; or the safe operation of the trunk road will be compromised. In these circumstances Transport Scotland could not support such proposals until such time that significant infrastructure interventions are in place.

1.9 It should be noted that, whether or not significant constraints are identified on the trunk road network, development proposals will require to comply with the statutory development management process to gain planning consent. These proposals will, therefore, be required to provide safe and efficient access to the development and determine its specific effects, if any, on the trunk road network.

1.10 While this report focuses on the period up to 2017 the information indicated provides an overview of planned development up to 2035. In this context, the report also provides some narrative on the potential impacts of development post 2016.

Key Findings

1.11 Table 1.1 indicates that the total housing allowances within the current Structure Plans and Strategic Development Plans in Scotland, supplemented where appropriate by Local Development Plan information, is over 128,000 in the period up to 2017 and 417,000 up to 2035.

Table 1.1 Housing Allowances by Development Plan Area

Development Plan housing allowance	Short term 2012 - 2016	Medium term 2017 - 2025	Long term 2026 - 2035
Aberdeen City & Shire	18425	21450	26112
Angus	1650	2640	2310
Argyll & Bute	2068	2122	
Ayrshire	11688	8656	
Dumfries & Galloway	2431	3403	
Dundee	3050	4880	4270
Edinburgh & Lothians	27009	49942	55557
Falkirk	3908	5470	
Fife	3833	7133	2240
Glasgow and Clyde	33545	43727	
Inverness (Highland)	10160	13299	7757
Moray	1904		
Perth and Kinross	4550	7280	6370
Scottish Borders	1739	3083	2435
Stirling & Clackmannanshire	2279	4500	4330
Total	**128239**	**177585**	**111381**

Note – a list of reference documents is provided at Annex A.

1.12 A review of the scale and location of proposed allocations against the prevailing trunk road operational conditions was undertaken. This concluded that in nine of the fifteen Development Plan areas indicated in Table 1.1 no areas of "significant constraint", as defined in paragraph 1.8, are anticipated on the trunk road network.

1.13 Table 1.2 details each development plan area and the percentage of allocations which are not affected by "significant trunk road network constraints" and, therefore, can be accommodated.

1.14 In addition to the information on proposed allocations, Table 1.2 also provides, for reference purposes the annual average build rates, as per Table 1.1, and the estimated annual build rate required to deliver the proposed 2012 – 2016 allocations.

1.15 While "significant constraints" are anticipated at specific locations within six of the development plan areas detailed within Table 1.2, it is estimated that the majority of the proposed housing allocations within these areas are not affected by the identified constraints. Two of the six areas (Dundee and Perth & Kinross) while not significantly constrained across their areas, they are subject to particular localised areas of significant constraint, see main text for more information.

1.16 The proposed allocations where no "significant constraints" are anticipated and, having been identified within the relevant development plan, could be delivered through the development management process as detailed in paragraph 1.9.

Table 1.2 Percentage of Housing Allocations up to 2017 not affected by significant trunk road network constraints

Development Plan housing allowance	Short term 2012 – 2016	Pro Rata Annual Rate 2012-2016	Accommodated Allocation (%) 2012 – 2016	Pro Rata Annual Accommodated Allocation 2012-2016	Average annual build rate 2006 – 2010
Aberdeen City & Shire	18425	3685	10519 (57%)	2104	2012
Angus	1650	330	100%	-	421
Argyll & Bute	2068	414	100%	-	296
Ayrshire	11688	2338	6846 (59%)	1370	1490
Dumfries & Galloway	2431	486	100%	-	528
Dundee	3050	610	2855 (94%)	571	582
Edinburgh & Lothians	27009	5400	14812 (55%)	2962	3221
Falkirk	3908	782	100%	-	559
Fife	3833	767	100%	-	1311
Glasgow and Clyde	33545	6709	100%	-	6823
Inverness (Highland)	10160	2032	6670 (66%)	1334	1559 (all of Highland)
Moray	1904	380	100%	-	449
Perth and Kinross	4550	910	4086 (90%)	817	714
Scottish Borders	1739	348	100%	-	591
Stirling and Clackmannanshire	2279	456	100%	-	553
Total	**128239**		**99145 (77%)**		

1.17 Tables 1.1 and 1.2 indicate that 77% (99,145) of the 128,239 housing units allocated up to 2017 are located in areas where it is considered that the trunk road network is not significantly constrained. As such, these could be delivered without the need for significant infrastructure investment.

1.18 The anticipated effects of the remaining 23% (or 29,094 units) are such that the trunk road network at these locations will experience “significant constraint”. These allocations cannot be accommodated without the implementation of significant infrastructure mitigation.

1.19 The remainder of this report details the methodology and outcomes of the overview of the proposed housing allocations detailed within adopted or emerging development plans.

2. Methodology

2.1 This report seeks to provide a national overview of the relationship between, and impact of, planned development and the capacity of the trunk road network.

Data Sources

Development Plan Data

2.2 The overview is based upon available land use allocations detailed in approved and emerging structure, strategic and local development plans to date (February 2012). The focus of this report is the land use allocation information on housing, particularly in the period up to 2017.

2.3 To ensure that all relevant supporting evidence is considered to best inform this overview, development management issues, i.e. live planning applications and Transport Scotland’s responses to these, with regard to accommodating and supporting delivery of development have also been considered.

2.4 The definition of the period over which the report focuses has been guided by the initial phasing timescales identified within the adopted and emerging plans, and provides Transport Scotland with an overview of how it can best support delivery of development plan aspirations in the short term.

Transport Appraisal Information

2.5 In addition to the development planning data, the overview has also been informed, where appropriate, by more detailed transport appraisal and studies as follows:

- Strategic Transport Projects Review (STPR) (December 2008);
- Perth and Kinross - Perth Traffic and Transport Issues STAG report (May 2009);
- Aberdeen City and Shire - Detailed modelling and A90 Corridor Comparative Study (2011);
- Fife – various appraisal and modelling studies (2011);
- Highland – A96 Corridor Development Framework and modelling exercise (2007 to date);
- Dundee and Angus – West Dundee Study (2005 and 2012);
- Ayrshire – South Ayrshire Corridor Study (November 2008);
- West Edinburgh Transport Appraisal; and
- SESplan appraisal and modelling (2008)

- Transport Scotland's SESplan Proposed Strategic Development Plan, Cumulative Transport Appraisal, Technical Note (Dec 2011).

Detail of Methodology

Assessment of Development Allocations

2.6 To allow consideration of the effects of the development plan aspirations over the plan period the allocations have been initially phased into short (up to 2017), medium (2017 to 2025) and long (2026 to 2035) term.

2.7 The degree of detail on housing allocations generally provides the scale of allowances within the plans, and within defined timescales i.e. number of units allocated over short, medium and longer term. In many cases, however, the phasing of delivery is not readily available. In these instances the phased delivery of allocations has been detailed on a pro-rata basis over the short, medium and long term. It should also be noted that while the long term phase extends to 2035, not all development plans provide details on allocations to that year.

Capacity of the Trunk Road Network to Accommodate Demand from Development

2.8 An overview of the prevailing and potential future trunk road conditions in each of the development plan areas has been undertaken. This has been based upon Transport Scotland's knowledge of the operational conditions of its network, and further informed by, the various studies, appraisals and modelling exercises that have been undertaken and detailed in paragraph 2.5.

2.9 The overview has considered existing network conditions, particularly in terms of the level of peak hour congestion, particular sensitivities on safety, and the possible effects that the additional demand from proposed future allocations may have on the safe and efficient operation of that network, focussing on the period up to 2017.

2.10 The report identifies, for each of the development plan areas considered, the potential sections of the network that are likely to be "significantly constrained", as defined in paragraph 1.8, either in the context of severe congestion resulting in standstill conditions, or safety being compromised as a result of the increased demand from development plan allocations. In these circumstances it is likely that Transport Scotland would not be able to support planning applications without significant infrastructure investment prior to the development's impact on the network being realised.

2.11 For the purposes of this overview, significantly constrained in a safety sensitive context means instances where additional demand, as a consequence of development, is likely to result in unacceptable safety issues such as queuing on slip roads at grade separated junctions extending onto the mainline carriageway or increased demand on turning manoeuvres particularly right turn manoeuvres, at at-grade junctions.

2.12 The areas of potential safety sensitivity have been identified through issues relating directly to increased demand from development capacity as a consequence of significant allocations within the plans. Where these additional pressures are being brought to bear on the trunk road network, a further check on the potential for safety sensitivity was undertaken through interrogation of the information obtained from Transport Scotland Strategic Road Safety's Moving Cursor Programme. The Moving Cursor Programme is a software tool for screening accident records on the entire trunk road network in order to identify accident clusters. It utilises information from the STATS19 accident database maintained by the police.

2.13 Accident data was reviewed over a period of three calendar years, from 2008 to 2010, at each of the identified locations where it was considered that the interaction of housing allocations and trunk road network operating conditions may conflict in a safety context.

3. Regional Analysis

3.1 An initial overview of the proposed housing allocations up to 2017, indicated in Table 3.1, was undertaken to assess the potential effects on the trunk network, particularly at areas of existing constraint.

Table 3.1 Housing Allowances by Development Plan Area

Development Plan housing allowance	Short term 2012 - 2016	Medium term 2017 - 2025	Long term 2026 - 2035
Aberdeen City & Shire	18425	21450	26112
Angus	1650	2640	2310
Argyll & Bute	2068	2122	
Ayrshire	11688	8656	
Dundee	3050	4880	4270
Dumfries & Galloway	2431	3403	
Edinburgh & Lothians	27009	49942	55557
Falkirk	3908	5470	
Fife	3833	7133	2240
Glasgow and Clyde	33545	43727	
Inverness (Highland)	10160	13299	7757
Moray	1904		
Perth and Kinross	4550	7280	6370
Scottish Borders	1739	3083	2435
Stirling and Clackmannanshire	2279	4500	4330
Total	**128239**	**177585**	**111381**

Note: Not all Development Plans provide details of allocations over the chosen phasing periods

3.2 As a consequence the following areas were not considered to fall into a category where the trunk road network would become “significantly constrained” and were therefore, not subject to further review:

- Angus;
- Argyll and Bute;
- Dumfries and Galloway;
- Falkirk;

- Fife;
- Glasgow and Clyde;
- Moray;
- Scottish Borders; and
- Stirling and Clackmannanshire.

3.3 Having sifted the above development plans from the overview, a further review of the following areas was undertaken.

- Aberdeen City and Shire;
- Ayrshire;
- Dundee;
- Edinburgh and the Lothians;
- Inverness (Highland); and
- Perth and Kinross.

3.4 This further review identified, at a strategic level, where the potential development pressures from proposed housing allocations are located i.e. areas of "significant constraint" on the trunk road network, and estimated the likely number of housing units where delivery would require the provision of significant infrastructure.

3.5 Where the information is readily available the total number of housing allocations includes both proposed allocations, considered to be new allocations, and effective supply, which are already allocated within adopted plans.

3.6 The estimation of the numbers of housing units that may affect the trunk road was informed by examining the location of development, establishing a trunk road area of influence associated with these allocations and then estimating the proportion of the allocations which it was considered would impact upon that part of the trunk road network.

3.7 The following provides an analysis of each of the plan areas identified as having allocations where the trunk road network will be "significantly constrained" due to the additional demand from proposed housing allocations up to 2017.

3.8 In determining the scale of housing allocations affected, and indicated in the following diagrams, where specific time periods did not correspond with the period up to 2017 the housing number data, where available, on allocations and effective supply have been derived on a pro rata basis. A view has also been undertaken with regard to the likely percentage of the total allocations that will result in significant constraints on the trunk road network.

Aberdeen City and Shire

Context and Background

3.9 The Aberdeen City and Shire SDP Main Issues Report identifies the aspiration for approximately 18425 housing units up to 2017.

3.10 The recently adopted Aberdeenshire Local Development Plan and Aberdeen City Local Development Plan provide further details on the scale, location and phasing of housing allocations.

Capacity of the Transport Network to Accommodate Growth

3.11 Many of the current issues of congestion within Aberdeen City will be dealt with through the provision of the Aberdeen Western Peripheral Route (AWPR). The AWPR will provide economic, safety and environmental improvements by acting as a bypass for strategic traffic that does not need to access the city centre, a local distributor by providing access to key areas in the conurbation, and a better link to existing and proposed Park-&-Ride facilities. It is, therefore, critical to the performance of the transport network in the area and to the ability of the trunk road network to accommodate the planned levels of development.

3.12 The A96 in the proximity of Inverurie currently experiences significant peak hour delays, particularly at Port Elphinstone, Thainstone and Blackhall roundabouts. The current high levels of demand mean that there is little or no capacity on the existing network to accommodate further demand from the proposed housing allocations.

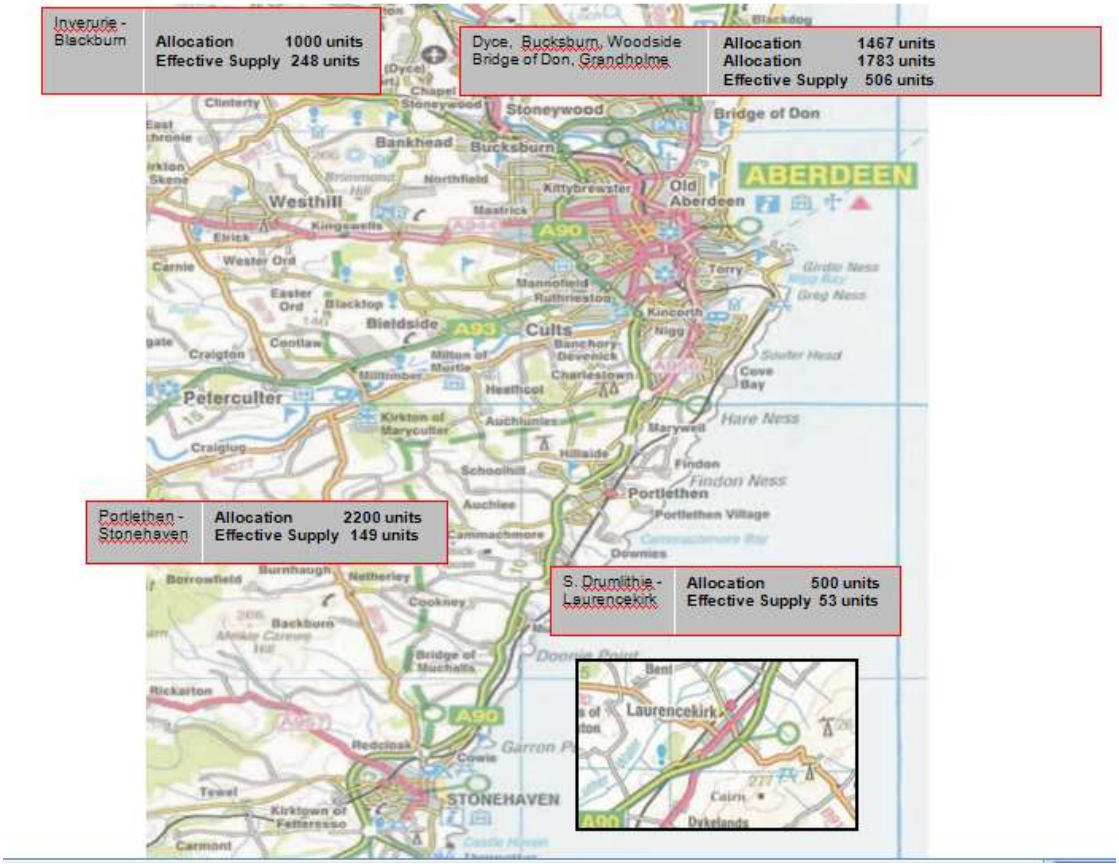
3.13 While the main concerns relating to the “significant constraints” within the Aberdeen City and Shire area relate to capacity, there are also significant safety concerns relating to the at grade junctions on the A90 at Laurencekirk, and a number of minor at grade junctions on the A90 between Stonehaven and Charleston (A90(T)/A956) junction. Any increase in demand due to development will increase the turning manoeuvres at these junctions, particularly right turn movements.

3.14 Figure 3.1 indicates the anticipated areas of the trunk road network that will experience “significant constraint” on its operational characteristics up to 2017.

Figure 3.1 Areas of Significant Constraint on Trunk Road Network

3.15 When considering the areas of "significant constraint" on the network and location of allocations within the Aberdeen City and Shire development plan area, it is estimated that of the 18,425 allocated to 2017, in the order of 10519 units (57%) can be accommodated. The additional demand from the remaining 7906 units located as detailed in Figure 3.2 is likely to result in significant capacity and, in some instances, safety constraints on the trunk road network.

Figure 3.2 Housing Allocations Affected by Significant Network Constraints Up to 2017



3.16 As noted above, the AWPR is critical to the performance of the trunk road network within Aberdeen City and Shire. It is a committed scheme and, subject to the resolution of the legal challenges, will be delivered. On this basis, Transport Scotland has endeavoured to take a proactive role in discharging its development planning and management responsibilities.

3.17 As a consequence, Transport Scotland and the local planning authority have taken a pragmatic approach to development management when considering the potential impact of development on the trunk road network. This has generally comprised supporting development proposals by seeking, where practicable, site specific mitigation or financial contributions, but also accepting a degree of detriment to the trunk road over a period until such time that the AWPR is in place.

3.18 While this approach will result in a continued deterioration of operating conditions on the trunk road network (but without compromising road safety) it generally enables development to proceed. Therefore, in the context of this report, while stating that the trunk road network is "significantly constrained" in this area, these constraints are not currently compromising development proposals.

3.19 Given the degree of constraint currently experienced on the A90 and A96, it is still, however, considered appropriate to highlight these issues in this report.

3.20 There is little influence of the AWPR on allocations within Inverurie and as such the "significant constraints" at this location may compromise delivery of the proposed housing allocations.

3.21 The pragmatic approach detailed, however, cannot be applied where the safe operation of the network is likely to be compromised. This circumstance affects proposed allocations in the proximity of the A90 at Laurencekirk and Elsick. Demand from development will result in significant increases in turning movements, particularly right turn manoeuvres at existing at-grade junctions on the A90. These issues will require to be resolved prior to development proceeding.

Ayrshire

Context and Background

3.22 The structure plan, The Joint Ayrshire Structure Plan, is now considerably out of date and not an appropriate indication of current development plan aspirations. The information on housing allocations within Ayrshire has been drawn from the emerging North Ayrshire Proposed Plan, the adopted East Ayrshire Local Plan and South Ayrshire Main Issues Report. When considering each of these Plans they identify an aspiration for a total of 11,688 housing units, up to 2017.

Capacity of the Transport Network to Accommodate Growth

3.23 Work undertaken by South Ayrshire Council, Transport Scotland and developers has shown that the A77 corridor around Ayr will come under significant pressure as a result of future development. With at-grade junctions and much of the route of single carriageway standard, there is little prospect of being able to deliver a significant proportion of the future housing demand without incurring major network performance issues.

3.24 In addition to the significant capacity constraints at the above locations on the A77, there are two further areas of "significant constraint" in relation to safety concerns at Bellfield grade separated interchange and at Symington/Bogend Toll at grade junctions. The safety concerns relate to the potential effect of increased demand from proposed development resulting in: with regard to the former, queuing on the southbound off slip extending on to the mainline of the A77; and, with the latter, increased turning manoeuvres, particularly right turning at both at grade junctions.

3.25 Given that no specific allocations are proposed that will immediately affect the Symington/Bogend Toll at grade junctions and the current commitment of Scottish Government to upgrade to grade separation at this location, it is still considered worthwhile highlighting this issue for the purposes of this report.

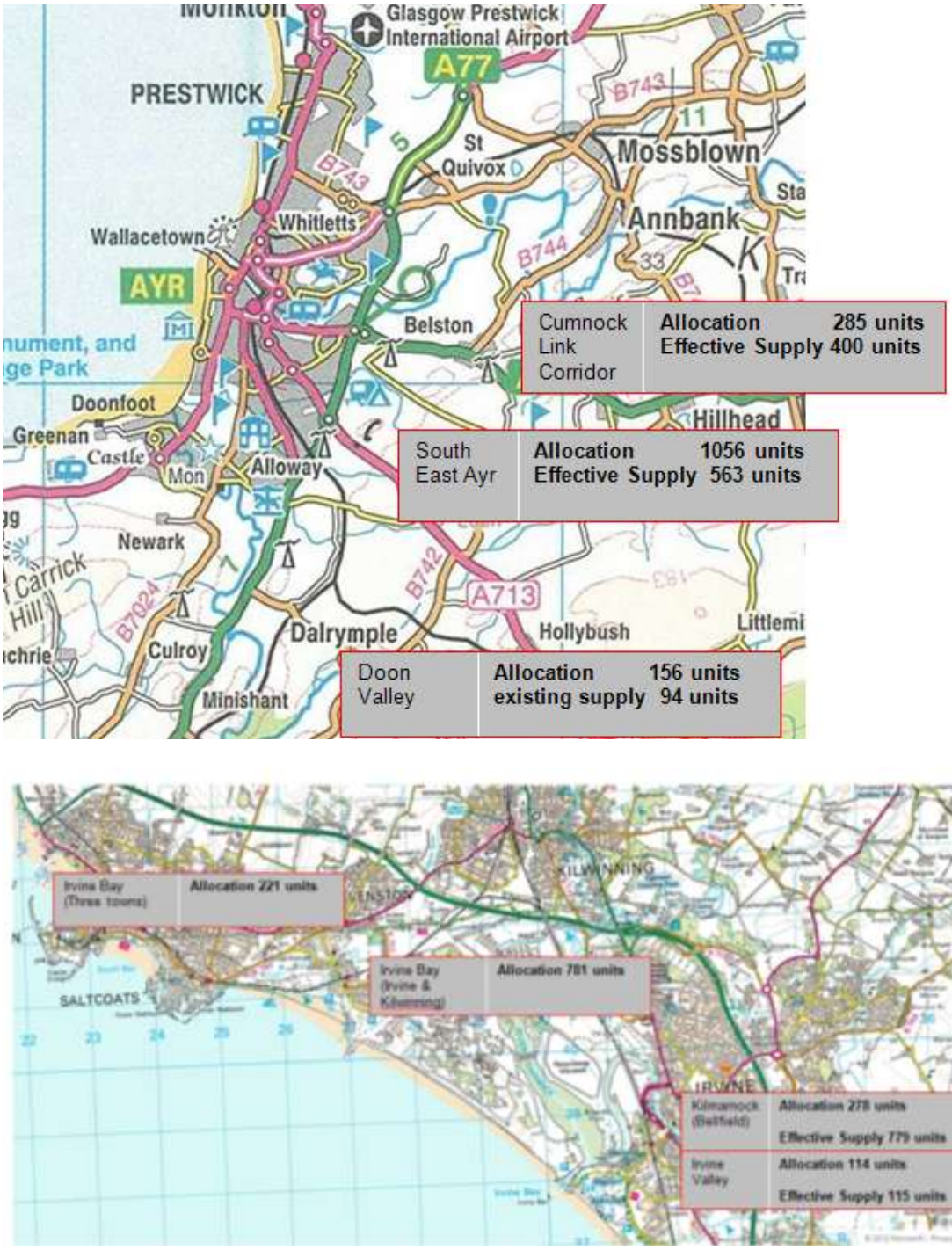
3.26 In addition to the "significant constraints" on the A77, there is a potential further "significant constraint" on the A78, Pennyburn roundabout. North Ayrshire Council is currently undertaking modelling to determine the effect of proposed development at this location. This will clarify the extent to which the trunk road network is "constrained". For the purposes of this report Pennyburn roundabout has been assumed as a "significant constraint".

3.27 Figure 3.3 indicates the anticipated areas of the trunk road network that will experience "significant constraint" on its operational characteristics up to 2017.

Figure 3.3 Areas of Significant Constraint on Trunk Road Network

3.28 When considering the areas of "significant constraint" on the network and location of allocations, it is estimated that 6846 units (59%) of the 11,688 housing units allocated in the combined Ayrshire LDPs can be accommodated up to 2017. The delivery of the remaining 4842 units, as indicated in Figure 3.4, will be compromised by the significant network constraints identified in Figure 3.3.

Figure 3.4 Housing Allocations up to 2017 Affected by Significant Network Constraints



Dundee

Context and Background

3.29 The proposed TAYplan Strategic Development Plan identifies the aspiration for approximately 3050 housing units up to 2017 within the Dundee area. The Main Issues Report (MIR) of the emerging Dundee Local Development Plan provides some further detail on the scale and location of these allocations.

Capacity of the Transport Network to Accommodate Growth

3.30 A key component of the road network within the Dundee area is the A90, which is at or approaching capacity on the western approach to Dundee. This part of the network is particularly constrained during the peak period at the A90 Landmark/Swallow and A90 Myrekirk roundabouts. Further development in the proximity of this part of the trunk road network will further exacerbate these conditions and it is unlikely that this could be accommodated given the significant impact on congestion and delays.

3.31 Figure 3.5 indicates the anticipated areas of the trunk road network that will experience significant constraint on its operational characteristics up to 2017.

Figure 3.5 Areas of Significant Constraint on Trunk Road Network

3.32 When considering the areas of "significant constraint" on the network and the location of allocations, it is estimated that 2855 units (94%) of the 3050 units allocated within the Dundee area can be accommodated up to 2017. The delivery of the remaining 195 units, as indicated in Figure 3.6, will be compromised by the "significant capacity constraints" at the locations identified in Figure 3.5.

Figure 3.6 Housing Allocations up to 2017 Affected by Significant Network Constraints

3.33 A scheme of mitigation to address the significant constraints at Landmark/Swallow roundabout was previously identified through the development planning and management process at that time.

3.34 Dundee City Council is currently undertaking further modelling to determine the potential effects of the development plan at this location and it is likely that an amended scheme of mitigation will be identified.

3.35 It should be noted that while it is estimated that there is potential for “significant constraint”, the vast majority of the housing allocations within Dundee City area are not constrained and as such there is no impediment to development.

Edinburgh and the Lothians

Context and Background

3.36 The emerging Proposed SESplan Strategic Development Plan identifies the aspiration for approximately 27,000 housing units up to 2017,

Capacity of the Transport Network to Accommodate Growth

3.37 There is insufficient capacity within the existing trunk road network to readily accommodate the proposed development allocations.

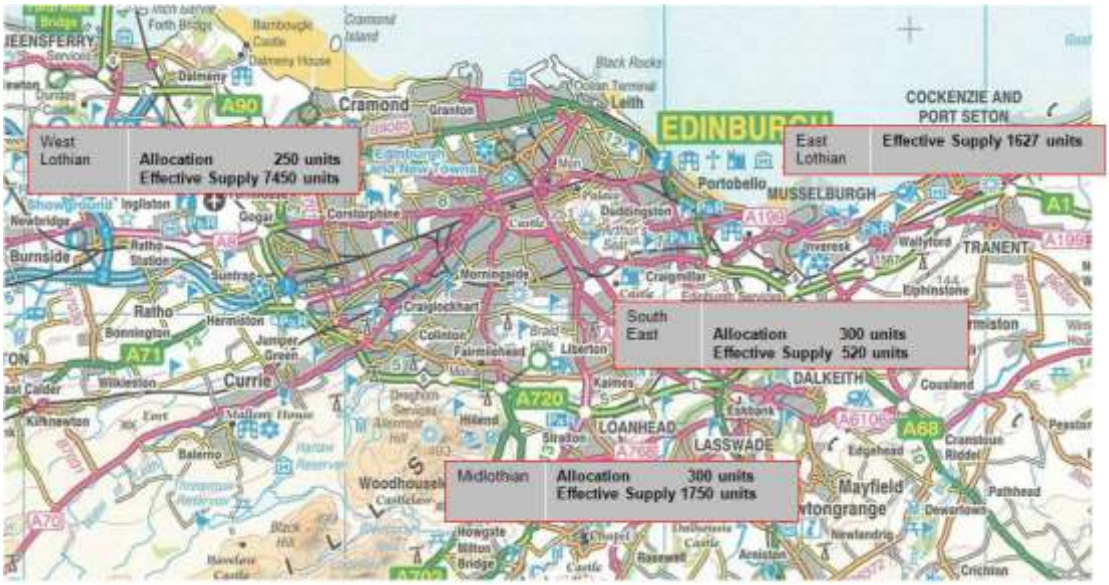
3.38 The significantly constrained sections of the trunk road network in the SESplan area include the M8, M9, A720, and A1 with many parts of the road network already experiencing significant congestion. The impact of the proposed allocations and the associated additional demand would be to take parts of the trunk road network significantly over capacity. This would create stand-still conditions during peak times, with peak time congestion occurring for longer periods.

3.39 The significant constraint within this area is generally with regard to the lack of capacity on the trunk road network, however, there is also a safety concern at the A720/A1, Old Craighall grade separated junction. This relates specifically to the increase in demand from development allocations resulting in queuing on the westbound off slip extending onto the A1 main carriageway.

Figure 3.7 Areas of Significant Constraint on Trunk Road Network

3.40 When considering the areas of "significant constraint" on the network and location of allocations, it is estimated that 14,812 units (55%) of the 27,009 housing units allocated in the emerging SESplan SDP can be accommodated up to 2017. The delivery of the remaining 12,197 units, located as indicated in Figure 3.8, will be compromised by the "significant network constraints" identified in Figure 3.7.

Figure 3.8 Housing Allocations up to 2017 Affected by Significant Network Constraints



Inverness (Highland)

Context and Background

3.41 The Proposed Highland Wide LDP identifies the aspiration for approximately 10,160 housing units up to 2017. The emerging Inner Moray Firth Local Development Plan, to be published in Spring 2012, provides further details on the scale, location and phasing of housing allocations in that area.

Capacity of the Transport Network to Accommodate Growth

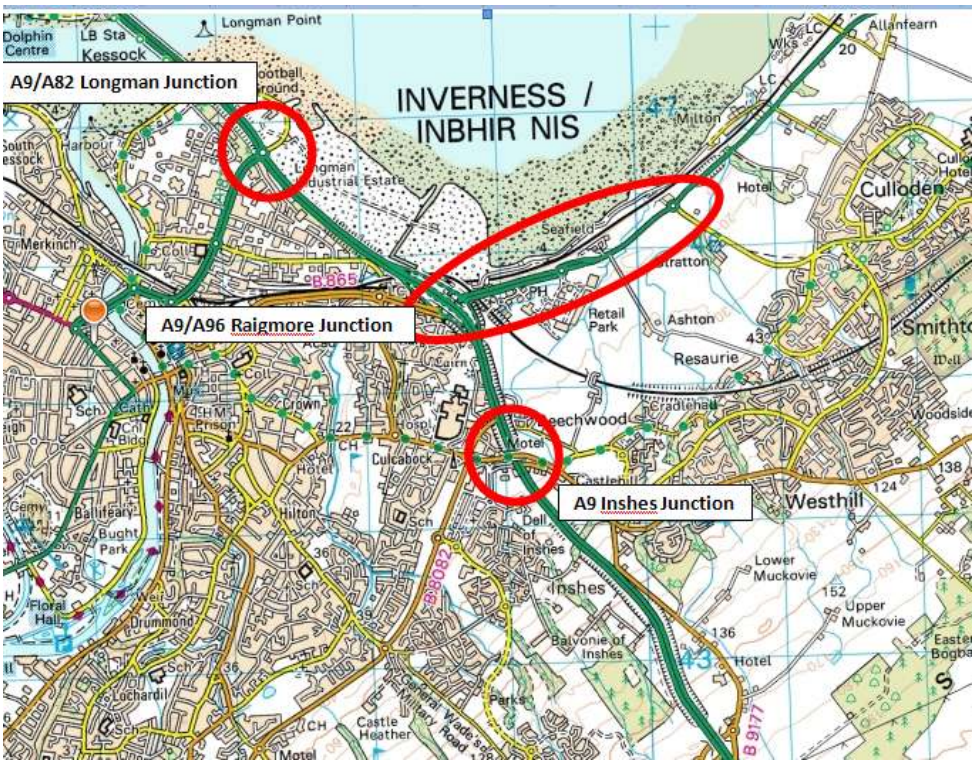
3.42 The A96 corridor to the east of Inverness is currently of single carriageway standard. The current high levels of demand mean that there is little or no capacity to accommodate further demand from the proposed housing allocations. The A96 corridor immediately to the east of Inverness experiences considerable congestion to beyond the Inverness Business and Retail Park as does the A96/A9 Raigmore and A9/A82 Longman Road junctions which operate significantly over-capacity during peak periods with resultant congestion and delays.

3.43 There is also a trunk road safety concern at the A9 Inshes junction where standing queues extend onto the main carriageway of the A9.

3.44 The effects of further development in these areas will increase peak period congestion with the likely impact of standstill conditions and peak spreading.

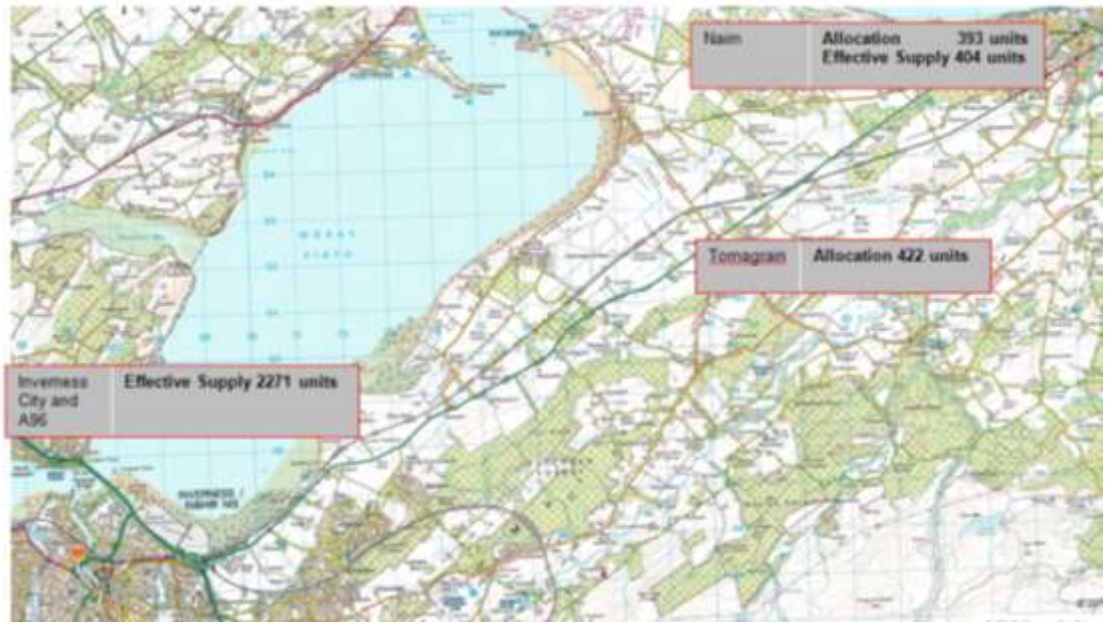
3.45 Figure 3.9 indicates the anticipated areas of the trunk road network that will experience "significant constraint" on its operational characteristics up to 2017.

Figure 3.9 Areas of Significant Constraint on Trunk Road Network



3.46 When considering the areas of "significant constraint" on the network and location of allocations, it is estimated that 6670 units (66%) of the 10,160 housing units allocated in the Highland Wide LDP can be accommodated up to 2017. The delivery of the remaining 3490 units, as indicated in Figure 3.10, will be compromised by the "significant network constraints" identified.

Figure 3.10 Housing Allocations up to 2017 affected by Significant Network Constraints



3.47 The A96 to the east of Inverness is currently a significant constraint to delivery of housing allocations. When considering development proposals up to 2017, however, given Scottish Government's commitment to the dualling of the A96 by 2030, Transport Scotland and the local planning authority have employed a pragmatic approach to support and encourage development through the development management process.

3.48 This has comprised a phased approach whereby the first phases of development have been defined and assessed, and measures determined to mitigate the anticipated effects on the trunk road network. The effects and mechanisms for delivery of subsequent phases will be determined in conjunction with future delivery of infrastructure on this corridor.

3.49 With regard to the safety concerns at Inshes junction, this is currently being addressed through the development management process.

3.50 The approach taken is similar to that within Aberdeen City and Shire in that it enables phased development to proceed to a degree. In this case the approach is such that the delivery of agreed mitigation measures is incumbent upon individual developers. As such, with regard to the trunk road network, there is potentially a risk management issue, since should any identified measures not be delivered by a specific developer it may compromise development within the corridor. The consequences of the failure to deliver mitigation would be that the A96 corridor would remain significantly constrained with the associated issues of inability to accommodate proposed allocations.

Perth and Kinross

Context and Background

3.51 The emerging Tayplan, Strategic Development Plan identifies the aspiration for approximately 4550 housing units within the Perth and Kinross area up to 2017. The emerging Proposed Perth and Kinross Local Development Plan provides further detail on scale and location of allocations.

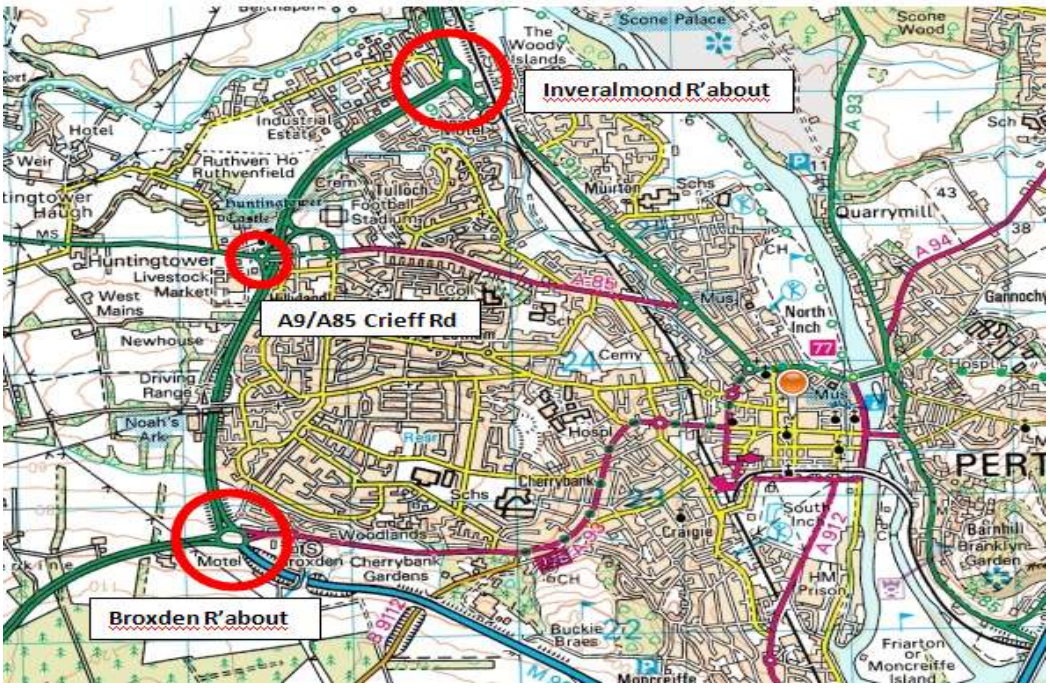
Capacity of the Transport Network to Accommodate Growth

3.52 Perth is centrally located offering access to the Central Belt via the M90 and A9, to the north via the A9 and to Dundee and the east via the A90.

3.53 To the west of Perth, conflict between local and strategic traffic occurs at the major A9/A912 Inveralmond and A9/M90/A93 Broxden, which are major at-grade junctions, and also at the A9/A85 grade separated junction. Further development to the west of Perth will place additional stress on these junctions particularly in the short term at the A9/A85 interchange. The A85, single carriageway standard road with numerous junctions is not able to readily accept additional demand from further development traffic which is likely to lead to significant congestion and delay resulting in standstill conditions during peak periods.

3.54 Figure 3.11 indicates the anticipated areas of the trunk road network that will experience significant constraint on its operational characteristics up to 2017.

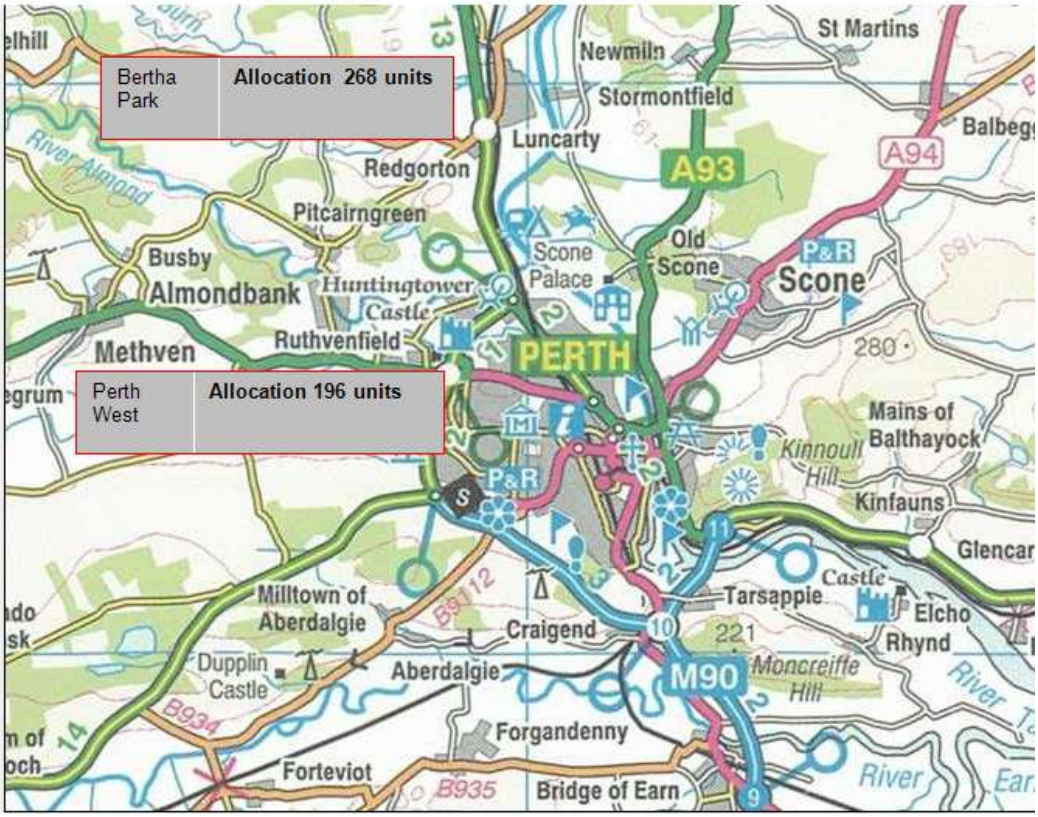
Figure 3.11 Areas of Significant Constraint on Trunk Road Network



3.55 Table 3.12 indicates 4550 housing units allocated in the period up to 2017. Of these, the allocations at Bertha Park and Perth West will impact upon the constrained part of the network. While the Plan only provides details of the entire period to 2024, the number of allocations located at Bertha Park and Perth West, up to 2017, as indicated in Figure 3.12, is defined on the basis of a 5 year pro rata of the total allocations up to 2024.

3.56 Considering the area of constraint on the trunk road network to the west of Perth and the location of allocations, it is estimated that in the order of 4086 units (90%) of the development plan allocations can be accommodated. The additional demand from the 464 units at Bertha Park and Perth West allocations is likely to result in "significant capacity constraints" on the trunk road network. The delivery of the allocations at these locations is therefore likely to be compromised until significant infrastructure is provided.

Figure 3.12 Housing Allocations up to 2017 Affected by Significant Network Constraints



SUMMARY

3.57 Transport Scotland has taken an overview of the extent to which the trunk road network can support the delivery of development plan allocations, particularly for housing. The analysis provides a snapshot of the relationship between planned development and the capacity of the trunk road network.

3.58 Table 3.2 summarises the total housing allocations, comprising effective supply where available and proposed new, within the fifteen development plan areas reviewed up to 2017. It indicates that 77% of these allocations will not be affected by "significant constraints" on the trunk road network and can be delivered through the development management process.

3.59 In only six out of the fifteen areas is the trunk road network "significantly constrained" to the extent that it would not be able to support delivery of allocations in the absence of significant mitigation.

3.60 While these "significant constraints" are anticipated at specific locations, the majority of the proposed housing allocations within these six development plan areas will still, however, be able to be delivered with only access and/or local mitigation provision.

Table 3.2 Allocations up to 2017

Development Plan housing allowance	Short term 2012 - 2016	allocation (%) not constrained 2012 - 2016
Aberdeen City & Shire	18425	10519 (57%)
Angus	1650	100%
Argyll & Bute	2068	100%
Ayrshire	11688	6846 (59%)
Dumfries & Galloway	2431	100%
Dundee	3050	2855 (94%)
Edinburgh & Lothians	27009	14812 (55%)
Falkirk	3908	100%
Fife	3833	100%
Glasgow and Clyde	33545	100%
Inverness (Highland)	10160	6670 (66%)
Moray	1904	100%
Perth and Kinross	4550	4086 (90%)
Scottish Borders	1739	100%
Stirling and Clackmannanshire	2279	100%
Total	**128239**	**99145 (77%)**

4. Post 2016

3.61 This overview focuses on the short term up to 2017. The potential implications beyond 2016 will, however, require to be considered in the context of scale and location of allocations, effect on the trunk road network and delivery of committed infrastructure.

3.62 Table 3.1 – Housing Allowances by Development Plan Area indicates that in the period 2017 to 2025, approximately a further 177,500 housing units are allocated within the fifteen development plan areas.

3.63 The approach taken by Transport Scotland in areas such as Aberdeen City and Shire and Inverness is predicated on accepting, in the short term, detriment to the trunk road network for a period until such time that identified infrastructure will be in place. The delivery of these interventions will be the responsibility of either Scottish Government, local authorities, developers or a combination of these. A number of local authorities are examining or in some instances promoting the potential of protocols to support delivery of required infrastructure.

3.64 In areas such as Perth and Kinross, the phasing of delivery of housing allocations is limited in the short term, up to 2017. The consequence of this is that the delivery of a relatively low number of housing units is compromised due to the identified significant constraints. The majority of the allocations affecting the constrained locations of the trunk road network is proposed for post 2016. From this overview these post 2016 allocations will require significant infrastructure to be provided prior to delivery.

3.65 In the circumstances indicated above, these significant infrastructure provision issues need to be addressed to enable delivery of sustainable economic growth. Should appropriate infrastructure not be delivered in the period post 2016, the trunk road network will experience significant increases in congestion during peak periods resulting in standstill conditions, increased journey times and significant peak spreading. The consequence of these trunk road operational issues is likely to significantly compromise delivery of future housing allocations.

REFERENCES:

Planning Authorities	References/ Plan
All Councils	**Strategic Transport Projects Review (STPR)** **Report 1 (May 2008), Report 2 (May 2008), Report 3 (October 2008) and Final Report (October 2009)** **Housing Statistics for Scotland (March, 2012)**
Highland Council	**The Highland Wide proposed LDP (Sept, 2010)**
Moray Council	**Moray Structure Plan -** **Approved by Scottish Ministers April 2007**
Aberdeen City and Aberdeenshire Councils	**Aberdeen City and Shire SDP MIR (Oct, 2011)**
	Aberdeenshire Proposed LDP (June 2010) and Aberdeen City Proposed LDP (Sept, 2010)
Angus and Dundee City Council	**TAYplan Proposed SDP (June, 2011)**

	Dundee City MIR LDP (Oct, 2011)
Perthshire and Kinross Council	**Perth & Kinross Proposed LDP (Feb, 2012)**
	TAYplan Proposed SDP Perth Traffic and Transport Issues STAG (May 2009)
Clackmannanshire and Stirling Councils	**Clackmannanshire Local Plan 1st Alteration (June, 2009)**
Falkirk Council	**Falkirk LDP MIR (Nov, 2011)**
Fife Council	**SESplan Proposed SDP (Nov, 2011)**
	TAYplan Proposed SDP (June, 2011)
City of Edinburgh, East Lothian, Midlothian and West Lothian Councils	**SESplan Proposed SDP (Nov, 2011)**
	SESplan appraisal and modelling (2005 to 2009) **West Edinburgh Transport Appraisal – STAG (2010)** **Transport Scotland's SESplan Proposed Strategic Development Plan, Cumulative Transport Appraisal, Technical Note (Dec 2011)**
Scottish Borders	**SESplan Proposed SDP (Nov, 2011)**
Dumfries and Galloway Council	**Dumfries and Galloway LDP MIR (March, 2011)**
East Ayrshire, North Ayrshire and South Ayrshire Councils	**East Ayrshire Local Plan Adopted 2010**
	South Ayrshire LDP MIR (May, 2010) **North Ayrshire Proposed LDP (April,**

	2011)
Dumbarton and Clydebank, East Dunbartonshire, City of Glasgow, Inverclyde, North Lanarkshire, East Renfrewshire and Renfrewshire Councils	**Glasgow and the Clyde Valley Proposed SDP (June, 2011)**
Argyll and Bute Council	**Argyll and Bute LDP MIR (May, 2011)**