

**West Northamptonshire Development
Corporation**

DAVENTRY HOUSING APPEALS

**Proof of Evidence of
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on Transport Issues**

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1 INTRODUCTION

- 1.1 This proof of evidence has been prepared by David Bird representing West Northamptonshire Development Corporation (WNDC). The details of my qualifications and experience are included in my first proof of evidence to this inquiry [ref: WNDC/4].
- 1.2 The proof covers two issues. First, the need for and potential provision of the Flore, Weedon and Upper Heyford (FWUH) bypass. In particular I address the question of what development can reasonably take place before provision of a bypass.
- 1.3 Secondly the public transport provision proposed for each of the appeal sites and how this affects the overall accessibility of the sites. My first proof dealt with accessibility issues; however full details of public transport provision were not available at that time and so my consideration of public transport was deferred until information became available. Most of the required information has now been made available although there are still some outstanding queries that I have raised with the appellants.
- 1.4 I include a Glossary of Terms at **Appendix A**.

2 HIGHWAYS MODELLING AND THE FWUH BYPASS

- 2.1 In this section I examine the issues related to the traffic modelling that has taken place before and during this inquiry. This work broadly splits into two. First, assessment of the roads local to Daventry that has been commissioned by Northamptonshire County Council (NCC). I have no particular comment to make on this work and WNDP are content to let NCC lead on this matter and negotiate appropriate mitigation measures. However, as planning authority, WNDP reserve the right to make further comment on the final mitigation packages that emerge from the current negotiations.
- 2.2 The second area of assessment is of the wider Strategic Road Network (SRN), comprising the M1 motorway, M45 motorway, the A5 Trunk Road and the A45. This work has focussed on capacity issues in Flore and Weedon and at M1 Junction 16. WNDP have particular concerns on this issue as the results of preliminary work undertaken suggested that it may not be possible to allow any development on the appeal sites prior to completion of the FWUH bypass. Therefore WNDP have commissioned me to examine the issue in more detail and suggest a strategy for allowing housing development to proceed whilst protecting the interests of the Highways Agency (HA), NCC and residents in Flore, Weedon and Upper Heyford.
- 2.3 In order to do this I have examined the modelling work that has been undertaken to date and also carried out some new analysis in order to establish certain thresholds and parameters.
- 2.4 The work is summarised in the following paragraphs of this proof as follows:
- I have summarised the modelling work that has been undertaken by NCC and the HA, particularly on the SRN. This demonstrates the need for the FWUH bypass to be provided if the full RSS housing allocation for Daventry is to be delivered.
 - This being the case I have then investigated the likely timescales for delivery of the bypass.

- Whilst the traffic analysis has shown that there is some link capacity on the A45 such that some development could proceed before the FWUH bypass is delivered, the critical constraint is the A45/A5 crossroads (Weedon Crossroads) which is currently operating at or close to capacity during the morning peak period. I have therefore examined if it would be feasible to permit some development prior to provision of the FWUH bypass notwithstanding this constraint.
- Finally I summarise WNDC's position on development thresholds and the FWUH bypass.

Current Position on Modelling

- 2.5 The impacts of the three appeal sites have been modelled using the Daventry Transport Study Multi Modal Model (DTSMMM), which was built by Arup (on behalf of Northamptonshire County Council) to assess proposed growth in the town and associated transport strategies. The DTSMMM model examines the performance of the network during a weekday AM peak hour as experience in the area is that this is the busiest hour during the typical weekday.
- 2.6 The DTSMMM model contained a 2004 base year and 2021 future year assessment, however for the purposes of assessing the appeal sites was updated to a future year of 2026.
- 2.7 The updated model was utilised by NCC to examine the impact on the local road network, within Daventry and main corridors to/from Daventry.
- 2.8 The model was then audited by Faber Maunsell (on behalf of the HA) to examine the impact of the appeal sites on the SRN.
- 2.9 The modelling undertaken by both Arup and Faber Maunsell examined the background highway network operation in 2026, known as the '2026 Reference Case', and seven key development scenarios, as follows:
- Scenario 1 - 2026 AM development at Monksmoor Farm + Church Fields+ Danetree;

- Scenario 2 - 2026 AM development at Monksmoor Farm + Danetree;
- Scenario 3 – 2026 AM development at Monksmoor Farm + Church Fields;
- Scenario 4 - 2026 AM development at Church Fields + Danetree;
- Scenario 5 - 2026 AM development at Monksmoor Farm only;
- Scenario 6 - 2026 AM development at Church Fields only;
- Scenario 7 - 2026 AM development at Danetree only.

2.10 The extension of the model to include elements of the strategic road network allows for the potential provision of the Flore-Weedon-Upper Heyford (FWUH) bypass with the aim of understanding the level of development that would trigger the requirement for a single carriageway bypass, and also the further dualling of the bypass.

NCC Modelling (Arup)

2.11 The Arup modelling concluded that junction improvements were required to a number of junctions within Daventry, with the scenarios including multiple appeal sites having a greater impact than those of the singular developments, i.e. Scenarios 1-4 had the greatest impact on the local road network (Arup report, para 7.2.1).

2.12 A link capacity assessment was undertaken for the A45 corridor to examine the level of development that would trigger the need for the FWUH bypass. The Arup report concluded that the trigger points for this were different depending on the Scenario examined, however for Scenario 1, a single carriageway bypass would be required when a total of 2,250 dwellings are delivered, and a dual carriageway would be required when a total of 6,150 dwellings are delivered. Both assume an equal split of dwellings across the three appeal sites (Arup report, Appendix H).

2.13 The Arup report also concludes that if both the Monksmoor and Church Fields sites were to be permitted, a single carriageway bypass would be required after the delivery of 1,970 dwellings (in 2017), however a dual carriageway bypass would not be required when both schemes are fully built-out (circa 5,000 dwellings).

HA Modelling (Faber Maunsell)

- 2.14 The HA report outlined the impact of the seven development scenarios on the key SRN junctions, and identified the need for mitigation.
- 2.15 The HA has raised concerns over the validation of the model in the A5 corridor, stating that the flows produced by the model do not accurately represent those on the ground. However, I understand the HA's position is that, whilst there are concerns over validation, the model can be used to provide a useful assessment to the inquiry of the effects of the various development scenarios.
- 2.16 One junction of particular concern is at the A5-A45 (Weedon Crossroads), which is currently operating at or close to capacity during the AM peak period. Furthermore, there is a constraint on the link capacity of the A45. The HA report concluded that should the junction capacity issue be resolved, the level of development provided would need to be limited to that which does not trigger the link capacity issue prior to provision of the FWUH bypass. This is considered to be circa 3,500 dwellings for Scenario 1 (HA report, para 13.2).
- 2.17 The HA have stated that, whilst it is acknowledged that the junction is operating at or near capacity and this situation is likely to worsen due to traffic growth even if no development took place on the appeal sites, they have no plans to improve the junction. Inherent in this stance is an acceptance by the HA that conditions in Weedon are likely to worsen assuming traffic does continue to grow.

Potential mitigation measures

- 2.18 A range of potential mitigation measures have been examined at the Weedon Crossroads junction, including minor alterations to the existing junction layout, alterations to the signal timings, and provision of a new junction..
- 2.19 According to the HA modelling report, a number of options for small scale improvement were examined but it was concluded that these would not provide sufficient capacity to cope with demand in 2026. Options tested included improvements to the signal timings at the junction and provision of additional lanes on the A5 North and A45 East arms of the junction.

- 2.20 Notwithstanding the capacity issues at the Weedon Crossroads, it was acknowledged at the Preliminary Highways Round Table Session that a small amount of additional traffic induced by development may be acceptable to the HA on an interim basis subject to there being a firm commitment to delivering a long-term solution, such as the FWUH bypass (Exploratory Transport Round Table Session Note, Ref ID4, para 8).
- 2.21 A recent junction mitigation scheme proposing a new junction layout, referred to as the 'roundabout in the field' (RITF) scheme was designed by Stuart Michael Associates, the transport consultants acting on the Church Fields site.
- 2.22 The RITF scheme was assessed by the HA and considered to provide potential relief to the junction capacity issue. The scheme did not, however, remove the link capacity issue on the junction approaches, therefore it was only seen as being capable of allowing the delivery of up to 3,500 dwellings (as discussed earlier in this section).
- 2.23 The estimated costs for construction of the RITF scheme and concerns over the deliverability, including environmental impact, land ownership, etc. have meant that the highway authorities do not consider that this is a viable scheme in lieu of a wider mitigation strategy such as the bypass. In terms of the delivery of the RITF scheme, on behalf of WNDC, I support the stance taken by the highway authorities in regard to this potential mitigation measure.

Flore, Weedon, Upper-Heyford Bypass

- 2.24 The East Midlands Regional Plan (RSS8 – 2009) sets out a housing provision figure of 10,800 dwellings for Daventry District in the period 2001 to 2021, thereafter for the period 2021 to 2026 the provision is set out for the total West Northamptonshire HMA of 2,645 units.
- 2.25 The NCC modelling report suggests that from a link capacity perspective, a single carriageway could be required as early as 2015 depending on the level of residential development permitted.

- 2.26 It is currently planned that the bypass will be provided as a single-carriageway initially, with the land available for dualling as and when required. According to NCC the build programme for the bypass would be circa 24 months with a further 12 months required for dualling works. The bypass would be built out in two stages, such that the dualling is provided when it is needed.
- 2.27 NCC has submitted an 'Expression of Interest' to the Department for Transport (DfT) for funding to allow the delivery of the bypass. NCC have stated in Technical Group meetings that their expectation is that the cost of providing the single carriageway bypass will be funded by the residential and employment development sites across Daventry, with contributions to be made on a 'per-development unit' basis. This will be supplemented by public sector funding as it becomes available.
- 2.28 Given the importance of provision of the bypass I have outlined below the main tasks that would be required along with potential timescales for delivery of a bypass.
- 2.29 I judge the development of the FWUH bypass to be effectively at Programme Entry Stage. To progress with the scheme it will need to be assessed using the DfT WebTAG methodology. I have provided at **Table 2.1** an outline assessment of the work required to submit a planning application for the bypass. This is only an outline and is likely to vary when the specifics of the scheme are known.

Table 2.1 – FWUH Bypass Key Delivery Stages and Timescales

Key Task/Stage		Duration
Updating of traffic data and modelling to produce validated model agreed by NCC and HAA. Use of model to undertake testing of proposed bypass and do minimum solutions.		9 months
Scheme development and Assessment to prepare options (including non highway solutions) for Public Consultation process. This includes gathering of environmental and other constraint information including land ownership. Stakeholder consultation. This item can take place concurrently with the traffic assessment.		(9 months)
Public Consultation process (including feedback and reconsideration of alternatives)		6 months
Preparation of full scheme to support detailed planning application (detailed design, WebTAG, Environmental statement etc)		12 months
Consideration of Application to grant of consent		9 months
Referral to GOEM (if the bypass is not included in the Joint Core Strategy as a departure from the local plan)		1 month
Challenge Period (judicial review)		(3 months)
Compulsory purchase order preparation and publication (including referencing exercise, preparation of Statement of Reasons, Statement of Case, Committee report)		6 months
Compulsory Purchase Order Inquiry and Determination Period (from making of Order, period for negotiating objections, Inquiry and decision period)		18 months
Compulsory purchase order challenge period		(6 weeks)
Finalise detailed design and issue to tender		12 months
Tender return		3 months
Build	Single Carriageway bypass	24 months
	Additional dualling of bypass	12 months
Totals (Single Carriageway)	Excluding Inquiries	82 months
	Including Inquiries	100 months
Totals (Dual Carriageway)	Excluding Inquiries	94 months
	Including Inquiries	112 months

2.30 I have based the above timescales on experience of similar road-building schemes elsewhere, such as the widening of the A453 in Nottingham. In general the activities have been assumed to be sequential except for the first two items that are assumed to run concurrently along with the challenge periods when

preparation work is assumed to continue. These concurrent items are shown in parentheses in the table. The construction period will depend very much on the final scheme adopted. Furthermore, construction timescales can be accelerated but at a cost.

- 2.31 Timescales have not been added for financing and it is assumed that finance will be gained from the private and/or public sector in parallel with the above activities and would not lead to any delay.
- 2.32 It may be possible to reduce the timescale if, for example, certain activities are undertaken before certain decisions are known. For example, one could undertake the detailed design before the results of the CPO are known.
- 2.33 On the other hand there are risks to the above suggested timescales. In particular, there is a possibility that the planning application may be called in or recovered by the Secretary of State for determination. This would have an impact on the timescales although the planning and CPO inquiries are likely to be conjoined.
- 2.34 In summary my reasonable “mid” estimate is that preparation will take some 58 months or 5 years and construction a further 2 years, or 3 years if a dual carriageway is required. This would therefore deliver a single carriageway bypass in 7 years, i.e. in about 2016 if preparation work starts straight away. If a CPO public inquiry is required then the total timescale for delivery of the single carriageway bypass extends to 100 months or about 8 years, i.e. in about 2017. For a dual carriageway the total timescales are 8 years i.e. 2017 without an inquiry and about 9 years i.e. 2018 with an inquiry.

A5-A45 Weedon Crossroads Assessment

- 2.35 The analysis of the Weedon Crossroads presented by the HA has been undertaken in a conventional way and demonstrates that the existing junction is currently operating at or close to capacity and that addition of both “background” traffic growth and generated traffic from the appeal sites leads to a further worsening of the position.

- 2.36 Taken at face value this would potentially lead to no development that put any traffic through the crossroads being permitted before the FWUH bypass was open to traffic, possibly in around 2016.
- 2.37 This is a far from desirable situation given the desire of government to bring forward housing urgently and having regard to WNDG's own corporate objectives which include the delivery of development and infrastructure that enables regeneration and growth. Therefore, the HA and others involved in the transport issues at this inquiry, including my own company, have been exploring the extent of development that could take place before completion of the bypass. Two questions are relevant. First, whether there is an improvement that could be carried out at the junction to give some improvements in capacity. Secondly, what level of increased congestion and delay might be acceptable at the Weedon crossroads prior to completion of the bypass. In other words how many residential units can be occupied on the appeal sites before the bypass is completed without creating unacceptable levels of congestion.
- 2.38 Faber Maunsell on behalf of the HA issued a draft note on this topic dated 7 April 2009. The note examined the existing junction layout only (i.e. no improvements) and the addition of both background traffic growth and traffic from the 7 development scenarios. The rates of build for each scenario were based on the housing trajectories put forward to the inquiry.
- 2.39 In very broad terms the analysis concludes that circa 1,500 units could be developed before congestion reached the levels caused by just background traffic growth in 2020.
- 2.40 The analysis undertaken by Faber Maunsell includes for "background" traffic growth based on adjusted NRTF central growth rates. Traffic generated by the development scenarios is then added on top. The projected background growth from 2007 to 2020 is 22.1%. Whilst this is a conventional approach I consider this is likely to give an over-estimate of future congestion. This is because background traffic growth is primarily as a result of population growth and therefore there is likely to be some double counting. In other words the background growth will be due, in part, to developments such as those proposed on the appeal sites.

2.41 Furthermore, the very fact that the Weedon Crossroads junction is operating at or above capacity will act as a disincentive to people making trips in the peak hour and will therefore tend to reduce growth. In fact a series of traffic surveys undertaken at the junction in the peak hour show that there has been no increase in traffic flows in recent years but rather a reduction. The relevant table is included below:

Table 2.2 – Comparison of Collected Survey Data

Link/ Movement	2007 Count	2008 Count	2009 Count
A5 North	425	389	412
A45 East	824	756	786
A5 South	738	588	617
A45 West	752	809	867
Junction Total	2739	2542	2682

Note – all traffic flows are presented in Passenger Car Units (PCU)

2.42 The dates and sources of the above traffic surveys were as follow:

- Tuesday 4th December 2007, commissioned by the HA.
- Unknown date in June 2008, commissioned by Integrated Transport Planning (ITP).
- Tuesday 12th February 2009, commissioned by SBA.

2.43 In the light of the above, I have undertaken some further analysis of the junction using measured 2009 flows and without adding background traffic growth. The key advantage of this is that it isolates the effects of the various appeal proposals rather than the matter being complicated by background growth. In essence the analysis shows the direct effects of various development scenarios on the performance of the junction. I put this analysis forward as an additional piece of work which complements rather than replaces Faber Maunsell's analysis.

2.44 I have also explored a minor junction improvement that could be achieved within the highway boundary. The results of this work are summarised in the following paragraphs.

- 2.45 The A5-A45 junction has been modelled using LINSIG for Windows, which assesses the theoretical capacity of standalone junctions. LINSIG models traffic flows in Passenger Car Units (PCU); PCU are derived using a set of conversion factors that take account of the relative size of different types of vehicle, for example a car would have a PCU value of 1.0, whereas a bus would have a larger PCU value of 2.0 to reflect its greater size. The 2009 surveyed flows were modelled to ascertain the existing operation of the junction. The junction is operated by Microprocessor Optimised Vehicle Actuation (MOVA), which is an adaptive traffic control capable of maximising capacity at a junction by providing green-time to the most congested arms by detecting traffic flows using sensor loops in the ground. Signal timing datasets have been obtained from Faber Maunsell to update the junction model.
- 2.46 Junction performance is measured in Degree of Saturation (DoS), with a DoS of 90% being the design capacity. Junctions can continue to operate satisfactorily at greater than 90% but queues and delays start to build. LINSIG provides an overall measure of congestion at the junction, called the Practical Reserve Capacity (PRC), which is a measure of how much additional traffic could pass through the junction while maintaining a maximum DoS of 90% on all links. The results of the analysis of the existing junction with the measured traffic flows are shown in **Table 2.3** below, whilst the existing junction layout is shown in **Appendix B**.

Table 2.3 – A5-A45 Junction 2009 AM Peak Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead, Right	96.2	12.2
	Left	19.1	1.9
A45 East	Right	24.7	1.3
	Left, Ahead	99.1	27.3
A5 South	Right	36.8	3.2
	Ahead, Left	85.0	11.3
A45 West	Right	100.2	12.7
	Left, Ahead	93.3	18.6

Note: Cycle Time 77 seconds, PRC -11.3%

2.47 The results show that the Weedon Crossroads junction currently operates at capacity, with three arms of the junction showing a DoS value of greater than 90%. The A45 West arm is forecast to be the most heavily congested with a DoS of 100.2%.

Deliverable Short Term Mitigation

2.48 I have examined the existing junction layout to see if additional capacity could be achieved through amendments to the layout, lane allocation and signal timings. A potential improvement scheme was identified and this is shown at **Appendix C**. The scheme comprises the following changes to the junction:

- A5 North arm approach is widened to allow provision of three lanes at the stop line, two of which are provided for ahead movements and one for left turn movements. In addition there is a short flare for right turners.
- A45 East will be widened to allow the provision of a longer left turn flare. The give-way slip lane will also be moved approximately 2-3 metres to the southeast;
- A5 South lane markings will be altered to allow a full left turn lane and one ahead lane with a second ahead lane flare. The position of the left turn give-way slip lane will be slightly amended and the lane converted to signal control;

- No alterations are proposed on the A45 West arm of the junction.
- Junction timings have been 'optimised by delay' to find most efficient cycle time.

2.49 The proposed junction layout was tested for the 2009 measured traffic flows; the results are shown in **Table 2.4** below.

Table 2.4– A5-A45 Junction 2009 AM Peak Amended Junction Layout Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead	75.8	7.0
	Left	20.8	2.0
A45 East	Right	24.7	1.3
	Ahead	82.0	14.4
	Left	11.7	0.1
A5 South	Ahead, Right	67.5	7.9
	Left	30.9	3.7
A45 West	Right	82.0	6.9
	Left, Ahead	84.0	14.7

Note: Cycle Time 77 seconds, PRC 7.1%

2.50 The results in Table 2.4 forecast that the operation of the junction would be significantly improved as a result of the amendments outlined above. The DoS experienced on all arms of the junction reduced below 90%, and queue levels reduced accordingly.

2.51 I have considered a number of development scenarios that could proceed in the short term shown below. Scenarios C and D have been derived as an iterative process, ie what quantum of development would lead to conditions no worse than existing.

- A. Full development of just Monkmoor
- B. Full development of just Church Fields
- C. Full development of Monkmoor (1,000 units)+ 35% of Church Fields (1,400 units)
- D. Even distribution of development on all 3 sites (955 units per site)

2.52 The development flows have been provided from Arup from the DTSM model. I have examined these flows and consider them reasonable. The model does show some variation in the assignment of the flows depending on the site e.g. a greater proportion of Monksmoor and Church Fields traffic is assigned to the A5 than for Danetree. Whilst it may be reasonable for the model to show this, in reality traffic will assign to the route that is most convenient and quickest at the time of travel.

2.53 A summary of the results of the analysis are included at **Appendix D** and summarised below.

2.54 The results of the Scenario A - 2009 Base + Monksmoor modelling are included in **Table 2.5** below.

Table 2.5 – A5-A45 Junction Scenario A Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead	75.8	7.0
	Left	40.0	4.2
	Right	17.1	0.4
A45 East	Right	25.2	1.3
	Ahead	85.1	15.5
	Left	11.7	0.1
A5 South	Ahead, Right	67.5	7.9
	Left	39.1	4.9
A45 West	Right	82.7	7.0
	Left, Ahead	85.5	15.3

Note: Cycle Time 77 seconds, PRC 5.3%

2.55 The results in Table 2.5 above show that the junction would operate within capacity with a PRC of 5.3%.

2.56 The results of the Scenario B - 2009 Base + Church Fields modelling are included in **Table 2.6** below.

Table 2.6 – A5-A45 Junction Scenario B Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead	134.3	97.8
	Left	36.3	6.3
	Right	35.4	1.2
A45 East	Right	38.9	3.8
	Ahead	144.1	254.8
	Left	23.5	0.2
A5 South	Ahead, Right	143.3	149.4
	Left	61.8	13.8
A45 West	Right	140.2	88.4
	Left, Ahead	147.4	261.7

Note: Cycle Time 120 seconds, PRC -63.8%

2.57 The results shown in Table 2.6 above show that the junction would operate at well over capacity with severe queuing.

2.58 The results of the Scenario C - 2009 Base + Monksmoor + 35% of Church Fields are included in **Table 2.7** below.

Table 2.7 – A5-A45 Junction Scenario C Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead	94.8	17.9
	Left	42.2	7.4
	Right	25.1	0.8
A45 East	Right	26.6	2.5
	Ahead	98.1	40.6
	Left	15.8	0.1
A5 South	Ahead, Right	100.0	27.5
	Left	50.9	10.4
A45 West	Right	95.4	16.2
	Left, Ahead	98.9	41.0

Note: Cycle Time 120 seconds, PRC -11.2%

2.59 The results show that this level of development would cause the junction to operate at a similar PRC as the existing situation. However the cycle time of the signals has been increased to 120s which leads to some increases in queuing.

2.60 The results for Scenario D – an even distribution of development across all 3 sites is shown in **Table 2.8** below:

Table 2.8 – A5-A45 Junction Scenario D Capacity Assessment

Arm	Link	DoS (%)	Queue Length (PCU)
A5 North	Ahead	98.0	19.1
	Left	46.0	8.0
	Right	24.9	0.8
A45 East	Right	31.3	3.0
	Ahead	89.1	29.0
	Left	13.7	0.1
A5 South	Ahead, Right	100.1	24.2
	Left	62.0	11.6
A45 West	Right	98.1	18.3
	Left, Ahead	98.5	41.2

Note: Cycle Time 120 seconds, PRC -11.2%

2.61 The results in Table 2.8 show that this level of development would cause the junction to operate at a similar PRC as the existing situation. As with Scenario C the cycle time of the signals has been increased to 120s which leads to some increases in queuing.

2.62 In summary the above analysis demonstrates that:

- The improved junction would operate within capacity if just Monksmoor was fully developed.
- The junction would operate no worse than in the current situation with: 2,400 units on Monksmoor/Church Fields or 2,865 units spread across all 3 sites.

2.63 The analysis I have summarised above is not directly comparable with that within the Faber Maunsell note of 7 April. This is because the FM analysis includes for background growth and is based on different scenarios. However both sets of

analysis seek to explore the level of development that could be permitted prior to completion of the FWUH bypass.

- 2.64 What my analysis demonstrates is that circa 2400 units could be developed at Monksmoor and Church Fields without a significant detrimental impact on the Weedon Crossroads. Based on the trajectories before the inquiry, under Scenario 3 (Monksmoor and Church Fields proceed) some 1,575 units will be constructed before 2016 which is the year in which it is feasible for the bypass to be open. Therefore there is a good deal of leeway between the likely number of units that would be constructed and the number I consider could be permitted prior to the bypass completion. A further factor of safety is that my analysis demonstrates no detriment compared with the existing performance of the existing junction whereas in reality some degradation of the junction's performance is likely to be acceptable.
- 2.65 Further important considerations in determining the appropriate way forward are: the standard of bypass to be constructed and how it will be funded. As I noted earlier, Faber Maunsell have identified that all of Monksmoor and Church Fields can be built out without the need for dualling of the bypass. However, according to their work, if Danetree was permitted as a result of this inquiry then it would potentially be committing the authorities to provision of a dual carriageway. However it is WNDC's case that planning permission should not be granted for Danetree now and provision of housing over and above that provided by Monksmoor and Danetree should be considered through the Core Strategy.
- 2.66 The results of the Core Strategy will determine the appropriate location for further housing and the required infrastructure to support it. This may or may not lead to the need for dualling of the bypass. The scheme that emerges from the Core strategy can still make an appropriate and timely contribution to the single carriageway FWUH bypass.
- 2.67 It is also the case that the dualling of the bypass would need to be funded. This will limit the contribution that Danetree can make to a single carriageway bypass.

Further Considerations

2.68 In examining the consequences of congestion experienced at constrained junctions or networks there are a number of further considerations that need to be taken into account :

- i) Period of Congestion – At the Weedon Crossroads congestion generally only takes place during the morning peak period. The traffic surveys I commissioned during February 2009 show the following profile:

Table 2.9 – Summary of A5-A45 Junction Traffic Flows across Morning Peak Period

Time Period	Total Junction Flows
07:00 – 07:15	337
07:15 – 07:30	448
07:30 – 07:45	509
07:45 – 08:00	658
08:00 – 08:15	614
08:15 – 08:30	650
08:30 – 08:45	581
08:45 – 09:00	568
09:00 – 09:15	557
09:15 – 09:30	457
09:30 – 09:45	457
09:45 – 10:00	377

As can be seen, flows peak between approximately 07:45 and 09:15 and fall away significantly after that. The peak therefore lasts for around one and a half hours. Therefore, the primary effects of increased traffic flows will only be increased congestion for a short period of the day.

- ii) Peak spreading – motorists will change their departure time to allow them to undertake their journey in a shorter timescale, i.e. motorists will leave earlier or later for work if it means avoiding congestion at the A5-A45 junction. This will result in trips being spread across a longer period than the traditional 08:00 – 09:00 peak hour, and with greater numbers of employers allowing

flexible working hours is a material consideration in this instance. Local employers, such as Barclaycard, NCC, and Oliver Adams bakery in Northampton are known to offer flexible working hours to staff.

This is a concept accepted by The Highways Agency. For example at M20 Junction 4 the concept of peak spreading due to congestion was accepted by Parsons Brinckerhoff on behalf of the Highways Agency (see **Appendix E**).

- iii) Modal shift – the potential for motorists to change mode of travel from the private car to other modes such as walk, cycle or public transport is dependent on several factors, including: inconvenience experienced as a motorist, distance travelled, availability of public transport, relative journey time, parking availability/cost, etc. If levels of congestion along the A45 increase then there will be a greater incentive to switch mode for journeys to Northampton, particularly to rail. This will be aided by the service improvements on the route from Long Buckby to Northampton.

Following service upgrades by rail operator London Midland in December 2008 there is now an improved range of destinations and frequency of services available at Long Buckby rail station. **Table 2.10** below summarises the direct rail services available from Long Buckby rail station during the morning and off-peak periods, along with journey times to a range of destinations.

Table 2.10 - Summary of Direct Rail Services from Long Buckby Station

Destination	AM Peak Period service departures (7-9am)	Off Peak service departures (per hour)	Average Journey Time (mins)
Birmingham New Street	4	2	49
Rugby	4	2	10
Coventry	4	2	22
Northampton	5	2	13
Milton Keynes	3	1	38
London Euston	3	1	90

As can be seen there are a total of 5 direct services to Northampton during the morning peak period, with a journey time of just 13 minutes. When combined with a 21 minute bus journey to Long Buckby rail station from Daventry town centre (as per existing service D6) and some waiting time, this equates to a circa 40 minute journey. This is comparable with the circa 35 to 40 minute car journey time. However, if congestion and therefore journey time on the A45 increase then rail will become increasingly attractive thus leading to a reduction of traffic at the Weedon Crossroads junction.

- iv) Limitations of junction modelling software – it is widely acknowledged that the signals modelling software package LINSIG is not capable of reproducing the exact results for a junction that operates on MOVA (as is the case at Weedon Crossroads). This is due to LINSIG modelling the junction with a set of standard signal timings which are averaged across the modelled hour. In contrast, MOVA operates by varying the green time for each arm of the junction depending on the level of traffic waiting on it, this meaning that a typical or average set of timings cannot be deduced. As a result of this, the junction is expected to operate better in reality than the predictions of the LINSIG modelling. The improvement achieved as a result of introducing MOVA to a junction that operates by standard Vehicle Actuation is thought to be in the region of 13% in terms of delay, and circa 2-3% in capacity terms. This is acknowledged within the Transport Research Laboratory report MOVA Traffic Control Manual (3 May 2006, Issue B), which states at paragraph 2.1.3 that:

*“Gauging how effective MOVA is likely to be at any one junction is difficult. During the 20-site trial carried out in the late 1980s (Peirce and Webb, 1990), it was found that, **on average** MOVA gave a reduction in delay of 13% (which generally equates to about 2-3% improvement in capacity). However, the benefits over D-system VA varied depending on the exact nature of the site. Sites with large numbers of lanes and heavy traffic benefited the most with ‘smaller’ less congested sites gaining less (though still very worthwhile generally). There were exceptions and it is difficult to generalise on the reasons for the small benefits where they occurred.”*

Summary and Conclusions on Highway Issues

- 2.69 I give in the paragraphs below a summary of WNDC's position and the conclusions I would invite the Inspector and Secretary of State to draw on the highway and traffic issues.
- 2.70 It is acknowledged that to allow full development of the housing allocated to Daventry in the RSS, the FWUH bypass will be required and is desirable to relieve those communities of through traffic. Such a bypass could be delivered by 2016.
- 2.71 Peak hour congestion is a fact of life in many parts of the UK. A key feature of the congestion at the Weedon Crossroads is that it generally only occurs in the morning peak period. For the remainder of the day conditions are reasonable.
- 2.72 Government policy is against "predict and provide" particularly in the peak periods. The emphasis is much more on reducing the volume of traffic generated by developments by use of travel planning, alternative modes etc. and getting new development in the right place. Some congestion during the peak commuter periods is acceptable.
- 2.73 The Highways Agency have accepted the fact of congestion in Weedon for many years and have not considered it a priority to solve the problem.
- 2.74 A useful test for the purposes of this inquiry is to consider how the Weedon Crossroads junction performs with the addition of generated traffic from the appeal proposals without adding "background" growth. This identifies the specific effects of the traffic from the appeal proposals and supplements the analysis undertaken by Arup on behalf of NCC and Faber Maunsell on behalf of the HA.
- 2.75 I consider that a small scale improvement can be introduced that will provide some increase in capacity at Weedon Crossroads in the short term.
- 2.76 The results of my preliminary analysis suggest that if up to 2,400 units were developed on the Monksmoor and Church Fields sites prior to delivery of the bypass the Weedon Crossroads junction, with minor improvements, would

operate no worse than in the existing situation.. The agreed trajectories suggest that only 1,575 units would be built on these two sites by 2016 when it is feasible that the single carriageway bypass could be completed. Therefore the timescale for provision of the bypass would not lead to delay in the delivery of housing on these two sites. In reality development could proceed at a quicker rate than anticipated especially if some degradation in the performance of the junction was accepted.

- 2.77 Work undertaken by Faber Maunsell concludes that without any junction improvement, if 1,575 units were constructed at Monksmoor and Church Fields then conditions at the Weedon Crossroads would be no worse than they would be in 2020 due to natural traffic growth.
- 2.78 The anticipated increases in congestion that modelling suggests will happen with no improvement to the Weedon Crossroads junction are unlikely to happen in reality. This is due to the way people will adjust their journeys to avoid delay. This might be through a change in travel time or switching mode.
- 2.79 According to Arup's A45 Corridor Analysis Trigger Points table within Appendix H of the Daventry Public Inquiry Modelling Technical Note (February 2009) provision of development on the Danetree site will trigger the need for dualling of the bypass. Therefore, a grant of planning permission for Danetree would trigger the need for the additional funding of the dualling which would limit the contribution that Danetree can make to the single carriageway bypass.
- 2.80 Furthermore, grant of planning permission now for Danetree would potentially commit the authorities to provision of a dual carriageway bypass. However it is WNDC's case that housing provision beyond Monksmoor and Church Fields should properly be considered through the Core Strategy which will determine the appropriate location for further residential development and the appropriate infrastructure provision.
- 2.81 WNDC will continue to work with other stakeholders and in particular the HA and NCC to deliver the FWUH bypass as soon as possible..

2.82 In conclusion, the analysis set out above demonstrates that planning permission could be granted for Monksmoor which would not need to be conditioned on provision of the bypass. However, a Grampian style condition would need to be applied to Church Fields limiting the provision to circa 1,400 units before the bypass is completed.

3 PUBLIC TRANSPORT PROPOSALS

- 3.1 In my original proof of evidence on accessibility issues, I dealt with issues of proximity, connectivity and accessibility by walking and cycling for the three appeal sites. However, at the time insufficient information on public transport was available to draw meaningful conclusions. Most of the required information is now available and therefore in this section I summarise my analysis of the public transport provision for each site and what this means for the overall accessibility and connectivity analysis.
- 3.2 In this section I will outline the public transport proposals of the three appeal sites, and examine the viability of the services proposed, and the likely modal shift that will be produced.
- 3.3 At the initial Highways Round Table Session (RTS), the appellants were requested to provide details demonstrating the viability of the bus services being proposed for each site. This information has been received from each appellant, albeit in varying forms, and I comment on this analysis as appropriate.
- 3.4 Discussions have taken place between the developers transport consultants and NCC regarding the required level of public transport provision. The requirements for new development within Northamptonshire should accord with the standards set out within the Transport Strategy for Growth (TSfG) – Public Transport Guidelines for New Development, December 2006.
- 3.5 Section 4 of the TSfG sets out a matrix of standards for bus service frequencies to new sites dependant on settlement type and size. The matrix is included at **Appendix F**. The appeal sites are classed as ‘Settlement Type A’, with the following requirements for each appeal site as shown in **Table 3.1**.

Table 3.1 – Transport Strategy for Growth – Required Bus Service Frequencies

Settlement Size	Appeal Site	Bus Frequency Required
751 – 1,000 dwellings	Monksmoor	20 min daytime service, and hourly evening and Sunday bus service to town centre
3,001 – 4,500 dwellings, and 4,501+ dwellings	Church Fields Danetree	10 min daytime service, and half-hourly evening and Sunday bus service to town centre

Danetree

Public Transport Proposals

3.6 The public transport provision associated with the Danetree appeal site comprises the provision of two bus services, as follows:

- Service 1 – new bi-directional ‘figure of eight’ service will be provided connecting the site with Daventry town centre and wider destinations within Daventry. Service to be provided 16 hours per day Monday to Saturday and 10 hours per day Sunday.
- Service 2 – diversion of existing service D2 between Daventry and Northampton. Service D2 to be provided 16 hours per day Monday to Saturday and 12 hours per day Sunday. The loss of two services per hour on Admirals Way will be mitigated by increasing frequency of existing service D1 from half-hourly to every 20 minutes. Service D1 to be provided 12 hours per day Monday to Saturday and 12 hours per day Sunday.
- Resultant headway through site upon completion is 6 services per hour to Daventry town centre (4 northbound and 2 southbound) and 2 services per hour to Northampton.

The phasing and frequency of the public transport improvements proposed is summarised in **Table 3.2** below. As can be seen the service frequency complies with the NCC Transport Strategy for Growth requirements.

Table 3.2 – Danetree Appeal Site – Proposed Public Transport Frequency

Bus Frequency	Phase 1 2011/12	Phase 2 2012/13 – 2013/14	Phase 3 2014/15 – 2015/16	Phase 4 2016/17 onwards
Dwellings Delivered*	0-125	126 – 675	676 – 1,425	1,426 – 5,150
New Daventry Service				
Mon – Sat daytime	60 mins	30 mins	20 mins	15 mins
Mon – Sat evening	60 mins	60 mins	60 mins	30 mins
Sunday	60 mins	60 mins	60 mins	30 mins
Diverted D2 Service				
Mon – Sat daytime	30 mins	30 mins	30 mins	30 mins
Mon – Sat evening	60 mins	60 mins	60 mins	60 mins
Sunday	120 mins	120 mins	120 mins	120 mins
Total Mon - Sat daytime Town Centre Frequency	3	4	5	6
Journey Time to Town Centre	11-13 mins	11-13 Mins	11-13 mins	11-13 mins

* Approximate Total Dwellings estimated from Housing Trajectory provided in ITP Technical Note 14: Danetree Public Transport Demands

- 3.7 Bus priority measures are proposed at the northern and southern vehicular accesses. At the southern access this takes the form of bus lanes on the eastbound and southbound arms of the junction, whilst at the northern access bus lane is proposed on the northbound entry arm of the roundabout junction.
- 3.8 The bus priority measure at the northern access junction provides little benefit to buses travelling to Daventry. The junction comprises a section of flared bus lane on the northbound approach, continuing in the form of a dedicated lane through to Norton Road west. This is provided with the aim of facilitating bus left turn movements. However, it only provides buses with the ability to bypass the traffic leaving the site on the north bound approach, possibly up to 3-4 queuing vehicles, prior to buses having to give way to traffic leaving the roundabout on to the Norton Road west arm of the junction. Thus the buses will still be delayed leaving the site.

- 3.9 The internal roads within the site have been designed to prioritise bus movement, by diverting cars away from bus routes, and forcing them to give way to buses where the two modes meet.

Viability Assessment

- 3.10 A report setting out the background calculations used to assess viability of the proposed bus services was provided by ITP (Technical Note 14 – Danetree Public Transport Demands). The report sets out the proposed public transport measures, the derivation of modal share and patronage, revenue forecasts and operating cost estimates.
- 3.11 The public transport modal split for the site has been calculated by ITP using regression analysis. The modal split is arrived at by deriving a mathematical formula based on a set of trip pairs of journeys made across the county of Northamptonshire from the 2001 Census. The trip ends were examined for variables such as public transport provision, car ownership, journey time, and transport interchange. The trip pairs comprise details of the origin, destination, and modal split of a journey made, along with the number of times it has been undertaken.
- 3.12 The 2001 Census contained a total of approximately 10,000 results. These results were then narrowed to a total of 63 trip pairs which were deemed to be similar in nature to the likely trips made from the site, i.e. contain a bus service, links to the town centre, etc.
- 3.13 The ITP technical note states that their methodology predicts that 11.7% of all trips made by residents and 12.2% of all trips made by employees on the site would be made by bus. Of trips from the site to the town centre, 20% are anticipated to be by bus whereas from the site to Northampton the prediction is for a 12% bus mode share.
- 3.14 The methodology adopted by ITP is not a standard methodology for assessing modal split. I consider the best way of testing its validity is to see whether the results are reasonable and what one would expect.

3.15 In order to benchmark what I believe the potential modal split of the site is I have investigated other locations with similar characteristics to the Danetree site. From my search I was not able to find directly comparable locations within Daventry.

3.16 The example I have used for this purpose is the village of Hillmorton, located approximately 3.5km to the east of Rugby. Stagecoach operates bus service 3/3A through Hillmorton to Rugby at a 15-20 minute frequency with a journey time to Rugby town centre of circa 16-18 minutes.

3.17 Travel to work data for journeys to Rugby from the ward of Hillmorton was obtained from the 2001 Census, the modal split results are shown in **Table 3.3** below.

Table 3.3 – 2001 Census Travel to Work Modal Split for Journeys to Rugby from the Ward of Hillmorton

Travel Mode	Modal Split
Car Driver	63.6%
Car Passenger	10.8%
Bus	7.3%
Walking	8.1%
Cycle	6.1%
Motorcycle	2.0%
Taxi	1.8%
Rail	0.4%
Total	100.0%

3.18 The results shown in Table 3.3 above demonstrate that for the ward of Hillmorton, the bus modal share was 7.3%. This should be compared with the prediction of a 20% bus modal share from Danetree to the town centre.

3.19 It should be noted that the comparison between Hillmorton and Danetree is not an exact one, with a marginally greater journey time to Rugby town centre, and the bus service operating a little less frequently. However the fact that the existing modal share is approximately one third of that predicted at Danetree suggests that the ITP prediction is an over estimate.

- 3.20 I also have significant concerns over the predicted bus modal split for those working on the site. The ITP prediction is 20% for those living within Daventry and working on the site yet the existing modal split for those working within Daventry is only 2.8%.
- 3.21 The cost of the total public transport provision is estimated to be £1.20m.
- 3.22 My conclusion from the above is that the ITP analysis is likely to significantly over-estimate the bus modal share for trips to and from the Danetree site. Given the difficulties of accessing the town centre by walking or cycling identified in my first proof this means that people who do not use the bus will either drive in to Daventry or chose to undertake their business in other towns.
- 3.23 I would also note that there will be no direct bus link from the Danetree site to Long Buckby station and this will act as a significant disincentive for residents and employees to use rail to access locations such as Northampton, Coventry, Rugby and Birmingham. As I have set out in Section 2 of this proof services from Long Buckby have recently been upgraded.

Monksmoor

Public Transport Proposals

- 3.24 The public transport provision associated with the Monksmoor appeal site comprises the use, and potential diversion, of existing service D2, and provision of a new service providing links to both Long Buckby rail station and the employment areas within Daventry during peak periods.
- 3.25 The developer envisages that the existing service D2 could be diverted into the site, however cannot guarantee this due to the way the bus operating contracts are let. Contracts are administered by NCC and charged back to the developer on a monthly basis.
- 3.26 The D2 service currently runs on a 30 minute frequency, and this would be upgraded to a 20 minute frequency when the development reaches a total of 751 dwellings. This is in accordance with the service level agreement requirements

contained within the Northamptonshire Transport Strategy for Growth (as included in **Appendix F**). The existing D2 service will serve the site until such time as it is more than 400m from any dwelling, at which time the service could be diverted into the site to maintain this distance.

3.27 The new service will provide a link to Long Buckby during the morning and evening commuter peak periods, providing two services to/from Long Buckby during each period to coincide with the main commuter trains. The service will then provide two trips to serve the western employment areas within Daventry, thus serving the local employment peak hour. The service would not run through the day but would recommence in the evening peak visiting the western employment areas first (two trips) and the rail station after that in the late peak (two trips). This would operate Monday to Friday from occupation of the 51st dwelling and would also call at Lang Farm to increase the potential viability.

3.28 The phasing and frequency of the public transport improvements proposed is summarised in **Table 3.4** below.

Table 3.4 – Monksmoor Appeal Site – Proposed Public Transport Frequency

Bus Frequency	Phase 1	Phase 2	Phase 3
Dwellings Delivered	0-50	51-750	751 +
Enhanced D2 Service			
Mon – Sat daytime	30 mins	30 mins	20 mins
Mon – Sat evenings	-	60 mins	60 mins
Sundays	-	60 mins	60 mins
MM1A Long Buckby Commuter Service*			
Mon – Fri Peak Periods	-	30 mins (2 services)	30 mins (2 services)
MM1B Daventry Western Employment Service*			
Mon – Fri Peak Periods	-	30 mins (2 services)	30 mins (2 services)
Total Mon - Sat daytime Town Centre Frequency	2	2	3
Journey Time to Town Centre	15 mins	15 mins	15 mins

Note: The bus service numbers MM1A and MM1B were not provided by the appellant, I have added these service numbers for ease of commentary in the remainder of this section.

- 3.29 The provision of a bus-only link to the neighbouring Church Fields site has been discussed and agreed in principle between the developers of the two sites. This link would allow services currently operating along Welton Lane to Eastern Way to serve both sites, which could serve to reduce journey times for proposed bus services to Long Buckby rail station.

Viability Assessment

- 3.30 Details of the proposed services, along with likely costs and estimated levels of patronage required were provided by the Denis Wilson Partnership (DWP) following their discussions with NCC's Public Transport Officer.
- 3.31 The Framework Travel Plan for the Monksmoor site has not yet been fully agreed, with some matters currently awaiting agreement with NCC. The Travel Plan will set out the existing and target modal splits. I have therefore reviewed the information available and provide my considerations below.
- 3.32 The existing D2 service currently operates commercially, and does not therefore require subsidy from NCC. The cost of one further bus per hour to the service will therefore need to be made viable by patronage from the Monksmoor site. Given that the site will ultimately provide 1000 units it is likely, from my experience elsewhere, that one additional bus will be viable. However no evidence to confirm this has been provided by Monksmoor.
- 3.33 Furthermore, no evidence has yet been provided to demonstrate the viability of the new MM1A and MM1B services. However provision of this service should be seen as a positive intervention and provides an important link to Long Buckby station.

Church Fields

Public Transport Proposals

- 3.34 The public transport provision associated with the Church Fields appeal site is proposed in four phases as follows:

- Phase 1 (up to 500 dwellings) - no public transport provision is proposed as the first 500 dwellings provided located within 400 metres walking distance of the existing bus services operating on Eastern Way (services D1,D2,D3,D6,D7).
- Phase 2 (500 to 750 dwellings) – existing services D1 and D2 to be extended into the site providing a combined half-hourly service to Daventry town centre and Northampton. A new service D6A will provide an hourly service connecting the site with Daventry town centre and Long Buckby village and rail station during commuter peak periods (07:00 – 10:00 and 16:00 – 19:00).
- Phase 3 (750 to 1,500 dwellings) - new bespoke service CF1 introduced connecting the site with Daventry town centre and other destinations in Daventry. Provides a 20 minute frequency to the town centre when combined with services D1 and D2. Service D6A to be enhanced to half-hourly frequency. Potential to link service D6A with Monksmoor development if realised.
- Phase 4 (1,500 dwellings) – additional bespoke service CF2 connecting site with town centre and other destinations within Daventry; service will provide minimum frequency of 15 minutes when combined with other town centre services.

The phasing and frequency of the public transport improvements proposed is summarised in **Table 3.5** below.

Table 3.5 – Church Fields Appeal Site – Proposed Public Transport Frequency

Bus Frequency	Phase 1	Phase 2	Phase 3	Phase 4
Dwellings Delivered	0 - 500	500 - 750	750 - 1,500	1,500 +
D1 & D2 Service				
Mon – Sat daytime	30 mins	30 mins	30 mins	30 mins
Mon – Sat evenings	-	60 mins	60 mins	30 mins
Sundays	60 mins	60 mins	60 mins	60 mins
D6A Service				
Mon – Sat daytime	120 mins	60 mins	30 mins	30 mins
CF1 Service				
Mon – Sat daytime	-	-	60 mins	60 mins
CF2 Service				
Mon – Sat daytime	-	-	-	60 mins
Total Mon - Sat daytime Town Centre Frequency	2.5	3	5	6
Journey Time to Town Centre	7 mins	7 mins	7 mins	7 mins

- 3.35 The junction between the existing alignment of the B4036 and Norton Road will form a bus-only access junction. The B4036 will be realigned to the south of the Church Fields site, with the existing B4036 alignment being retained as a movement and access corridor within the development.
- 3.36 The public transport provision through the site will utilise this corridor, rejoining the new alignment of the B4036 at the eastern periphery of the site. A further bus-only link to the adjacent Monksmoor site has also been discussed and agreed in principle, such that public transport services to Long Buckby, for example, can take a more direct route whilst serving both sites.
- 3.37 Given the site's proximity to Long Buckby station and the improvement in rail services I would hope that the frequency of bus service to the station can be enhanced from that proposed. The likelihood of this occurring will be enhanced if both Monksmoor and Church Fields proceed.

Viability Assessment

- 3.38 A review of the background calculations used to assess viability of the proposed bus services was provided by i-Transport (*Viability of Public Transport Services*, February 2009). The document sets out the proposed public transport measures, estimated costs of bus services, estimated patronage and revenues, and viability of the proposed bus services. I have reviewed the assumptions and calculations contained within this report and summarise my findings below.
- 3.39 The public transport patronage has been taken from the DTSMmm modelling work undertaken by Arup (on behalf of NCC) which for Scenario 6 predicts that a total of 607 daily trips would be made from the site by public transport. These trips are then split into journey purpose, factored up to annual trip levels and the potential revenue generated by allocating typical fares to the trip levels.
- 3.40 No modal split data is given in the Arup report and therefore it is difficult to benchmark the bus use figures. However, I consider the factoring of the trips from hourly to daily and from daily to annual to be reasonable.
- 3.41 The costs associated with the above service level provision are set out within the viability report, as discussed with both Stagecoach and NCC's Public Transport Officer. The report also provides a further assessment of the anticipated revenue from trips that are not associated with the site, i.e. use of the services provided within the wider Daventry area.
- 3.42 The cost associated with providing the full scope of public transport services is circa £575,000 per annum. The report concludes that the revenue that would be generated by the site would total approximately £1.33 million per year, whilst potential revenue from other trips within Daventry could account for a total revenue of £226,000 per annum.
- 3.43 The revenue calculations for residential-based trips contained within the report made the assumption that this would be generated across 52 weeks of the year, thus making no allowance for changes in patronage due to bank holidays. I have clarified this with the appellant who supplied revised calculations demonstrating

that the associated 2% reduction in residential trip revenue would not have any viability implications.

- 3.44 The report concludes that using revenue forecasts for site-based trips only, the proposed bus services will become financially viable after 9 years of operation. The assessment including revenue from wider non-site based trips predicts that Monday to Saturday daytime services will be viable from commencement, however with additional evening and Sunday services it will become viable after 4 years.

Summary and Conclusions

- 3.45 From the above analysis I would draw the following conclusions.
- 3.46 All three sites have sought to provide a level of bus service that reflects the requirements set out in NCC's Transport Strategy for Growth. For Monksmoor and Church Fields this is building on existing services that currently pass the sites whereas for Danetree the services are new. As an overview this will tend to lead to higher costs for provision at Danetree than the other two sites and this is borne out by the evidence.
- 3.47 The consequence of this is that the viability of the Danetree services is likely to be more marginal than the other sites. This therefore makes the provision at Danetree more vulnerable to a reduction in modal share, reduced build out rates or indeed the full development not being completed. I have raised questions over the validity of the Danetree modal share estimates.
- 3.48 Both Church Fields and Monksmoor provide 6 services per hour i.e. one every 10 minutes to the town centre once the schemes are fully developed out. Monksmoor with its smaller number of units provides 3 services per hour during the final phase of development.
- 3.49 Therefore I consider the bus provision at Church Fields and Danetree to be broadly similar and to give no particular advantage to one site over the other in terms of accessibility to the town centre.

- 3.50 Monksmoor has a lower level of service to the town centre but this is as expected given the smaller number of units. However provision complies with the requirements of NCC's Transport Strategy for Growth.
- 3.51 On rail use, both Church Fields and Monksmoor make provision for bus services to Long Buckby station whilst Danetree makes no such provision. I consider the improvement in rail services from Long Buckby to be a very positive thing and provide real opportunities to access locations such as Rugby, Northampton, Coventry and Birmingham within a reasonable journey time and frequency. The bus provision from Monksmoor and Church Fields create the opportunities for people to take advantage of these services without driving to the station.

4 SUMMARY AND CONCLUSIONS

- 4.1 In this evidence I have considered two of the key issues related to provision of development at the three appeal sites, namely the effect on traffic capacity on the A45 and A5 and the public transport provision at the sites. I summarise my evidence in the paragraphs below.
- 4.2 The starting point for WNDC is that they wish to see and encourage residential development that fulfils the RSS requirements. However, this development has to be located in the right location and in a timely manner.
- 4.3 It is acknowledged that to allow for the full development envisaged at Daventry the FWUH bypass is required. Evidence submitted to the inquiry by Arup on behalf of NCC shows that this would need to be a single carriageway under a number of the development scenarios. However, any scenarios involving development at Danetree would require dualling of the bypass.
- 4.4 WNDC are keen to work with NCC to secure provision of the FWUH bypass in an expedient manner. I consider it feasible that the bypass could be delivered by 2016.
- 4.5 Prior to provision of the bypass there are two constraints on the A45 which limit the volume of housing development that can proceed namely the link capacity of the A45 and the capacity of the A45/A5 junction (Weedon Crossroads).
- 4.6 Analysis by Arup and Faber Maunsell varies and gives the link capacity as restricting development to between 2250 and 3500 units before the bypass is provided (under Development Scenario 1).
- 4.7 Faber Maunsell's analysis of Weedon Crossroads demonstrates the increase in congestion and delay that would occur as a result of various scenarios of development but draws no firm conclusions. However, it does show that if up to 1575 units were developed at Monksmoor and Church Fields by 2016, conditions would be no worse than in a no-development scenario in 2020.

- 4.8 My own analysis has considered some minor junction improvements that could be implemented within the highway boundary. With these improvements in place development of up to 2400 units at Monksmoor and Church Fields would produce traffic conditions no worse than existing.
- 4.9 The housing trajectories put forward to the inquiry show that Monksmoor and Church Fields proceeding together would produce 1575 units by 2016.
- 4.10 I therefore conclude that full development at Monksmoor and a proportion of development at Church Fields can be permitted to proceed prior to completion of the FWUH bypass. Furthermore, if the bypass is completed by 2016 or thereabouts this should not delay the provision of housing on those 2 sites.
- 4.11 Granting of consent for Danetree at this stage would potentially commit the authorities to provision of a dual carriageway bypass. However it is WNDC's case that housing provision beyond Monksmoor and Church Fields should properly be considered through the Core Strategy which will determine the appropriate location for further residential development and the appropriate infrastructure provision.
- 4.12 My analysis of the proposed public transport provision at the 3 sites shows that they all put forward levels of bus service that comply with NCC's requirements under their Transport Strategy for Growth.
- 4.13 I consider the provision at Church Fields and Monksmoor to be broadly similar and to give no particular advantage to one site over the other.
- 4.14 The Monksmoor provision to the town centre is less frequent than Church Fields and Danetree but this is as to be expected given the significantly smaller number of units to be provided.
- 4.15 The costs associated with bus provision at Danetree are higher than at the other sites which makes provision more vulnerable to changes in modal split, phasing etc.

- 4.16 On rail use, both Church Fields and Monksmoor make provision for bus services to Long Buckby station whilst Danetree makes no such provision. I consider the improvement in rail services from Long Buckby to be a very positive thing and provides real opportunities to access locations such as Rugby, Northampton, Coventry and Birmingham within a reasonable journey time and frequency. The bus provision from Monksmoor and Church Fields create the opportunities for people to take advantage of these services without driving to the station.
- 4.17 In my first proof of evidence on Accessibility Issues (WNDC/4) I concluded that Church Fields was the most accessible of the 3 sites before this inquiry with Monksmoor being the second best. I also concluded that in comparison Danetree was divorced from the existing urban area and provided poor quality linkages to the town centre.
- 4.18 My analysis within this proof of evidence does not change those conclusions. The bus services provided at Danetree do not “make good” the inherent deficiencies of the site when compared with Church Fields and Monksmoor. For a site to be well related and integrated with the town centre it needs to have good quality, contiguous pedestrian and cycle routes that link to the urban fabric. Bus services whilst fulfilling a function can never replace the function of those links.

