Derby HMA Aligned Core Strategies

Preferred Growth Strategy Consultation October 2012

Derby Housing Market Area Potential Core Strategy Sites Non-Technical Summary & Position Statement

1. Introduction

1.1 The Derby Housing Market Area (HMA) local authorities have commissioned transport modelling work to test the transport impacts of potential strategic development sites, taking account of potential mitigation interventions. The modelling will form part of the evidence base that will inform the Local Plans of the three HMA local authorities. It is being undertaken in consultation with all relevant stakeholders, including the Highways Agency, developers, promoters and other transport infrastructure and service providers. The mutual influence on transport of the HMA local authorities and other local authorities bordering the HMA area has been taken fully into account.

1.2 This paper describes the initial stage of the modelling process, which exclusively addresses the Derby Urban Area (DUA). The methodology involves the modelling of traffic volumes on the transport network at 2026, then adds trips generated by a range of potential new strategic development sites to gauge the impact on the performance of the transport infrastructure. Various permutations of mitigation interventions are then tested, including measures to encourage modal shift towards public transport, cycling and walking, and infrastructure improvements to enhance the capacity of the transport network. These are described in Table 1.

1.3 Following the consideration of responses to the Preferred Growth Strategy (PGS) consultation, being undertaken during autumn, 2012, amendments may be made to the Strategy as appropriate. This potentially amended version will form the basis of an HMA-wide transport modelling exercise using an expanded version of the DUA model.

1.4 As with the DUA, the HMA modelling will test the impact of potential mitigation interventions, comprising both measures to encourage modal shift and infrastructure enhancements. In addition to those schemes considered as part of the DUA test, these will include the proposed Woodville Regeneration Route, a new access to the Nestle manufacturing plant at Hatton, an A610 new link road between Ripley and Langley Mill, including a bypass for Codnor, and local highway infrastructure improvements to support proposed development at land north of Denby.

1.5 The conclusions drawn from this exercise, together with all other relevant evidence, will inform the local authorities in preparing the “Publication Draft” versions of their respective Local Plans. These will be made available for consultation in 2013 as the next step in moving toward final adoption.

2. Derby Urban Area Potential Core Strategy Sites – Traffic Impact Assessment Report

2.1 This document should be read alongside the technical **Derby Urban Area Potential Core Strategy Sites, October 2012** report, compiled by MVA for the Derby Housing Market Area Transportation Group. It provides a non-technical summary of the main findings of the tests to investigate the transport impact of a number of *potential* housing sites in the Derby Urban Area, the effects of possible mitigation measures and the functioning of the transport network in and around Derby.

2.2 Data provided by the modelling is indicative only and should also not be quoted as absolute figures, which can be misleading. It can, however, be used to infer patterns of travel behaviour and broad levels of response in terms of the potential mitigation measures. More detailed analysis is ongoing to investigate issues identified in the transport modelling and provide better information for schemes where the potential for good levels of improvement has been indicated.

Modelling Methodology

2.3 The potential housing sites included in the transport modelling exercise are shown in Figure 1. The modelling exercise was carried out to assist in the selection of a PGS for the Derby Urban Area and includes a range of sites put forward to the HMA Councils for their consideration. Not all sites considered for inclusion in the PGS were included in the testing, however. This may have been because some sites had already been considered unsuitable for other planning reasons and there was no requirement to consider their specific traffic impacts. Some smaller sites that have been included in the final Derby PGS were also not included in the modelling exercise because the modelling methodology used is more appropriate for larger sites.

2.4 Finally, some sites included in the PGS were already considered 'committed' in terms of preparing a 'reference case' (see below).

2.5 Additionally, the assessment included sites that were ultimately not included in the PGS documents (for various reasons including, in some cases, those related to transport). As such, the transport mitigation testing includes more potential sites than the PGS documents. This has enabled comparison of the relative transport merits of a greater number of alternative sites to support the creation of a robust evidence base.

2.6 It also means that the housing numbers and resultant impact on the transport network reflected in the test could be considered to represent a 'worst case scenario' or a buffer, within which the transport implications of the potential development can be broadly understood.

2.7 The **reference case** for these tests includes existing and committed residential development and infrastructure schemes up to 2026. The 2026 end date reflects the existing Derby Area Transport Model (DATM) and represents a realistic proxy for the 2028 Core Strategy end date without requiring costly and time consuming updates to the model. The reference case is used to help us to

understand how the transport network would function by 2026 without the potential housing development, and provide a meaningful comparison for scenarios with the potential development in place.

2.8 A **'No Mitigation'** scenario was then modelled, which added in the potential development to help us to understand the effects on the network without any intervention. This provides a baseline for this report and presents a 'worst case' scenario, without any mitigation measures. The results of each mitigation test have been compared to this scenario in order to be able to assess the different levels of mitigation that might be achieved.

2.9 Table 1 shows the 5 mitigation packages that were tested. In the absence of the resources required to test all of the possible combinations of mitigation measures, the tests were designed to build on each other.

Table 1 - The Mitigation Tests

Test	Includes:
Test 1 – Public Transport and Smarter Choices	• Public Transport Improvements (including new services and service improvements) • Osmaston Rd corridor improvements • London Rd corridor improvements • Boulton Moor Park and Ride and corridor improvements • Newhouse Farm Park and Ride • Derby City Hospital Park and Ride extension • Associated realistic level of smarter choices, including the provision of facilities for and promotion of cycling, walking and public transport
Test 2 Local Measures and test 1	• Completion of South Derby Link Road, A38 to A514 (see Figure 2 • Rail Station at Sinfin/Stenson Fields (see Figure 2) • Widening of/new Stenson Road Bridge • Mickleover / Mackworth Express Busway
Test 3 A50 + test 1	• New access to the A50 (see Figure 2) • Measures from test 1, no measures from Test 2
Test 4 – A50 + tests 1 and 2	• New access to the A50 (see Figure 2) • Measures from tests 1 and 2
Additional Test 5 A38	• A38 Grade Separation • Measures from all previous tests

2.10 Test 1 reflects the fundamental first step of supporting and enhancing sustainable transport options before considering other interventions and this is included in all the tests. This test allows us to understand what can be

achieved with measures to enhance, support and promote public transport, walking and cycling.

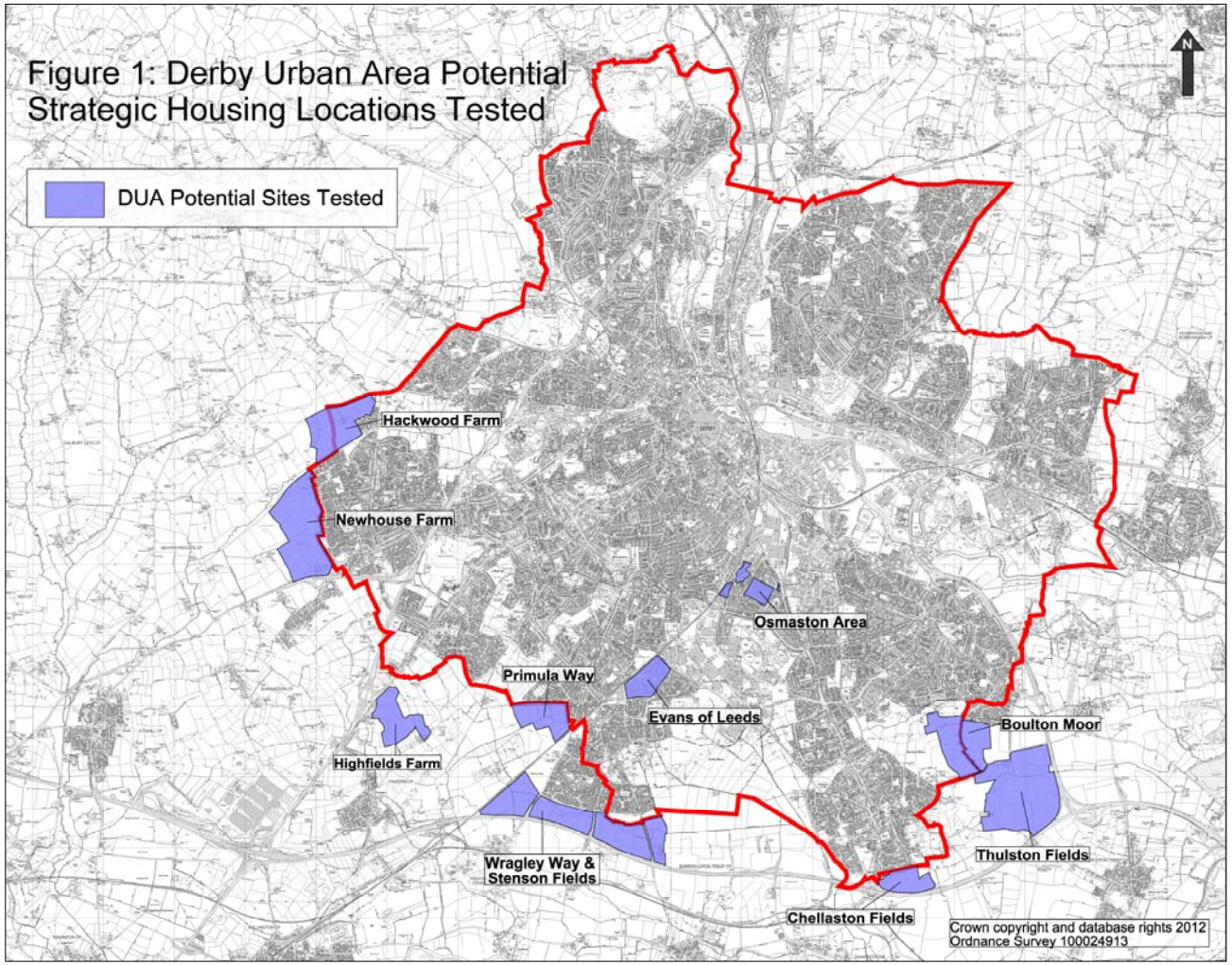
2.11 Test 2 included a range of mitigation measures on the local network, including the potential for a new link road, possible new rail station and the widening of Stenson Road Bridge. This test also included the Mickleover / Mackworth Express Busway, which is included in the City of Derby Local Plan Review (CDLPR) but has not been implemented. This would help determine whether the Core Strategy should continue to identify this scheme.

2.12 Test 3 tested a potential new junction on the A50 trunk road along with the measures in Test 1. It was important to test this without the local measures from Test 2 to enable us to understand the contribution of the different elements and how the junction performed in isolation.

2.13 Test 4 included everything from Tests 1 to 3 to investigate how the potential mitigation measures may work in combination.

2.14 Test 5 added the A38 Derby Junctions Grade Separation to the package, allowing us to see the influence of improvements to the Trunk Road Network. Although the tested A38 Derby Junctions Grade Separation is a Highways Agency led scheme with no date for implementation, this allowed us to investigate the extent to which the potential development could be mitigated if all identified options for improvement to Derby's transport network were implemented.

Figure 1 – Derby Urban Area potential strategic housing locations



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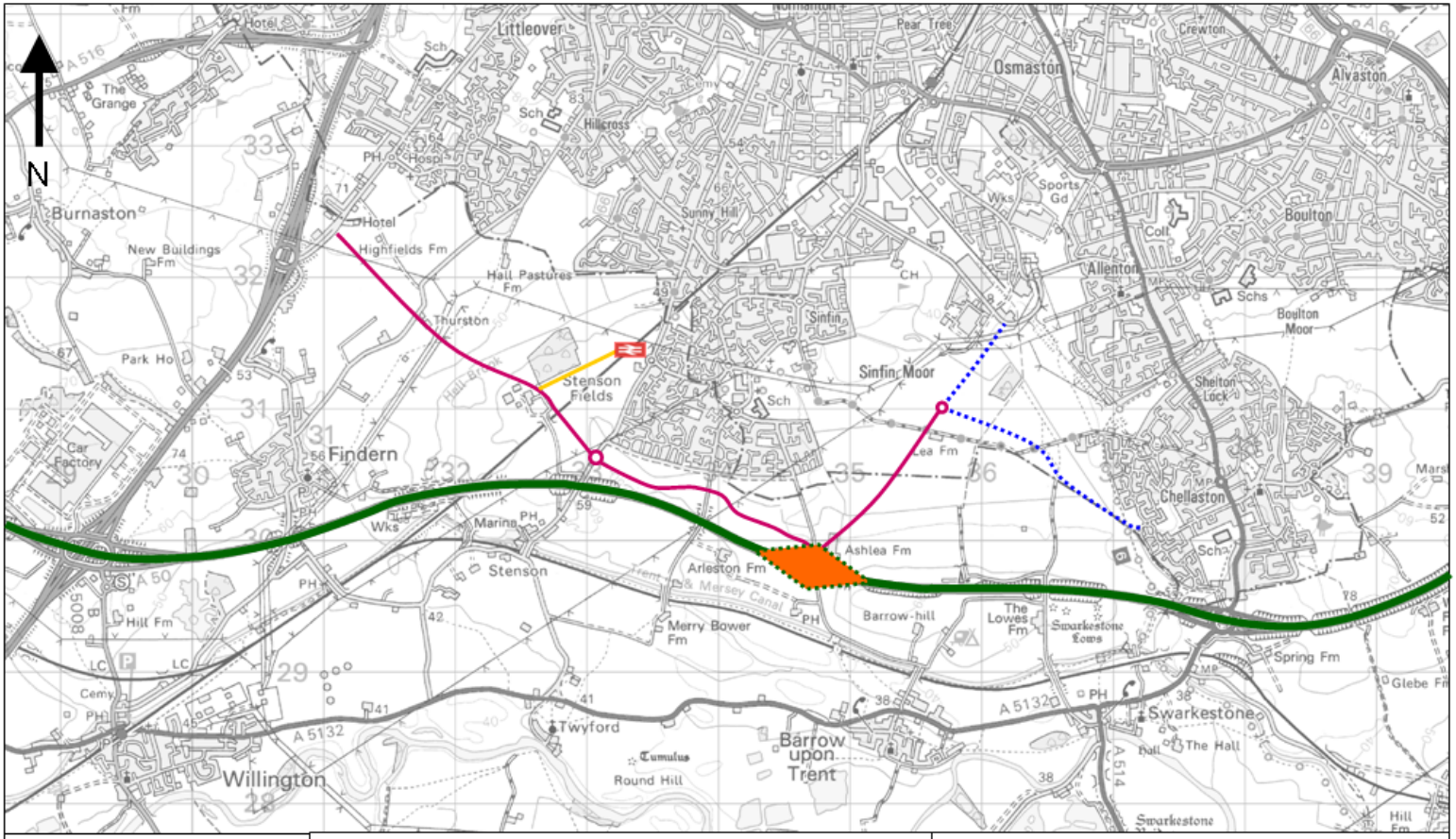

Key:

- = South Derby Link Road
- = City of Derby Local Plan T12 new road
- = A50
- = Potential New Rail Station
- = Potential Rail Station Access
- = Potential A50 junction

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Figure 2: Potential mitigation schemes

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3. Results

3.1 Tables 2, 3 and 4 below provide a summary of the changes throughout the whole of the network in each mitigation scenario tested. These figures are most useful for comparison purposes, and assess the overall impact of the mitigation measures on the wider road network. Briefly they include:

- **Average Speed –** expressed as kilometres per hour for all traffic within the model simulation area. Lower average speeds will reflect that increased traffic levels lead to further delays.
- **Over capacity queues (pcu-hrs)–** this reflects time spent queuing at junctions that are over capacity. This is likely to increase with growing levels of traffic as more junctions reach capacity.
- **Severity index** - this provides an indication of the level of mitigation achieved by the identified strategy on the busiest roads. It takes account of the length of roads affected by congestion, the number of vehicles affected and the level of congestion. This index is an indicator without a unit and only takes into account roads which are at or approaching capacity.
- **Total Travel time (pcu-hrs)-** this represents the total time on the network during week day commuter peak hours, with any increase suggesting trips are taking longer.
- **Total Travel distance (pcu-kms)-** this shows the total distance travelled on the network, with increases suggesting that trips are being reassigned and people are having to travel further to avoid congestion.
- **Carbon emissions indicator –** expressed as annual CO_2 tonnes. This provides an indication of the main carbon dioxide equivalent emission impacts on a network wide basis.

3.2 It should be noted that figures have been rounded to the nearest whole number in Tables 2, 3 and 4. This means that, where the change in value is quite small, the percentage mitigation can appear different between tests, while the actual value appears to be the same. This is the case for Average Speed, for example, where the AM peak value is 37km/h for Tests 1 to 4, but the percentage mitigation varies by 18%.

3.3 The effect of the changes to the network in terms of increases and decreases in traffic flows and junctions that are considered to be over capacity are mapped for each mitigation scenario in the full **Derby Urban Area Potential Core Strategy Sites report, October 2012** compiled by MVA**.**

Table 2 - Performance Indicators for each testing scenario in the AM weekday peak (08:00 – 09:00)

	Performance Indicator		Reference Case	No Mitigation	Mitigation Test 1	Mitigation Test 2	Mitigation Test 3	Mitigation Test 4	Mitigation Test 5
AM Peak	**Over Capacity Queues (pcu-hrs)**	Value	772	1,290	1,120	1,063	1,137	1,071	628
		Percent Mitigated	-	-	*33%*	*44%*	*29%*	*42%*	*128%*
	Average Speed (km/h)	Value	38	36	37	37	37	37	39
		Percent Mitigated	-	-	*30%*	*39%*	*35%*	*48%*	*152%*
	Total Travel Time (PCU-hrs)	Value	14,849	16,544	16,035	15,905	15,847	15,720	15,379
		Percent Mitigated	-	-	*30%*	*38%*	*41%*	*49%*	*69%*
	Total Travel Distance (pcu-kms)	Value	566,599	594,231	586,847	585,881	580,800	581,210	605,562
		Percent Mitigated	-	-	*27%*	*30%*	*49%*	*47%*	*-41%*
	Severity Index	Value	322	352	345	267	311	310	322
		Percent Mitigated	-	-	*25%*	*281%*	*135%*	*137%*	*100%*

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Table 3 - Performance Indicators for each testing scenario in the PM weekday peak (17:00 – 18:00)

	Performance Indicator		Reference Case	No Mitigation	Mitigation Test 1	Mitigation Test 2	Mitigation Test 3	Mitigation Test 4	Mitigation Test 5
PM Peak	**Over Capacity Queues (pcu-hrs)**	Value	837	1,448	1,323	1,193	1,299	1,218	910
		Percent Mitigated	-	-	*21%*	*42%*	*24%*	*38%*	*88%*
	Average Speed (km/h)	Value	38	35	36	36	36	36	38
		Percent Mitigated	-	-	*17%*	*30%*	*35%*	*48%*	*104%*
	Total Travel Time (PCU-hrs)	Value	15,566	17,524	17,171	16,969	16,978	16,786	16,702
		Percent Mitigated	-	-	*18%*	*28%*	*28%*	*38%*	*42%*
	Total Travel Distance (pcu-kms)	Value	583,652	617,280	611,102	609,666	610,437	608,845	627,918
		Percent Mitigated	-	-	*18%*	*23%*	*20%*	*25%*	*-32%*
	Severity Index	Value	211	258	252	180	317	243	251
		Percent Mitigated	-	-	*33%*	*168%*	*-127%*	*32%*	*14%*

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Table 4 - Carbon emissions for each testing scenario

Carbon Emissions	Value	427,504	437,582	431,197	430,910	430,774	430,525	430,034
Annual CO_2 (tonnes)	Percent Mitigated	-	-	*63%*	*66%*	*68%*	*70%*	*75%*

4. Analysis

4.1 The analysis of the initial modelling outputs provided in this update should be considered as indicative only and subject to modification as further data and analysis becomes available from the ongoing investigation. For this reason the emerging patterns are described in broad terms.

4.2 Data describing the AM peak often differs from the PM peak because of differing circumstances on the network at these times. For example, the PM peak travel tends to be spread over a longer period and affects more roads and junctions because of the variety of journey purposes and destinations. However, in the AM peak, in which commuting is the primary reason for travel, fewer junctions are affected but the effects are more acute as demand is focussed around key areas of the network and travel occurs within a more constrained time period. This is reflected in higher levels of severity index in the AM peak, which considers the most congested areas of the network. In the PM peak values are higher for the network wide statistics, such as over capacity queues, reflecting the greater frequency of localised congestion.

The Reference Case

4.3 The modelling of the Reference Case indicates that, by 2026, there will already be a large number of junctions throughout the network that are at or above capacity in peak hours, even without the additional traffic generated by the potential housing development. Main areas of the network predicted to have severe congestion by 2026 include:

- Sections of the inner and outer ring road
- Western routes into the city centre from the A38
- The A608 to the north of the city
- The A52 to the east
- The A514 to the south
- The A38 non-grade separated junctions
- The A50 Trunk Road junctions with the A6 and A514

4.4 Existing congestion has an effect on the behaviour of additional traffic in the No Mitigation Scenario, as only limited increases can be accommodated on routes that are already congested. Additional pressure on congested routes generally results in the redistribution of traffic to alternative routes, extending the proportion of the network that can be considered to be congested.

The 'No Mitigation' Scenario

4.5 The majority of traffic flow increases identified in the No Mitigation Scenario are on routes to the south of the city, reflecting the location of a significant proportion of the potential development. This is described in more detail in the full **Derby Urban Area Potential Core Strategy Sites report, October 2012**.

4.6 Tables 2 to 4 show that in comparison with the reference case, the 'no mitigation' scenario shows some clear changes to the performance indicators. In particular, the data shows that in both AM and PM peak, the time spent queuing at 'over capacity' junctions increases significantly, leading to a fall in average speeds as congestion and queues increase. This will result in increased journey times, varying in severity across the network. For example, a journey between Mickleover and Pride Park might be up to two minutes longer in the AM peak and up to three minutes longer on the return journey in the PM peak. Similarly, a journey from Allestree to Victory Road in Sinfin might increase by approximately one and a half minutes in the AM peak and the return journey in the PM peak might be up to two minutes longer. As a proportion of overall journey time these can be considered quite small increases. However, where congestion causes significant rerouting and increased travel distances, the increase in travel time is likely to be greater. These potential rerouting choices are the subject of ongoing analysis.

4.7 The data also suggests that, without mitigation, annual CO_2 emissions would increase by 2.4% or 10,078 tonnes per year over and above the 'reference case' position.

4.8 The results of Tests 1 to 5 indicate the extent to which the effects of the potential developments can be mitigated.

Test 1: **Public Transport and Smarter Choices**

4.9 Sustainable growth being key to the planning process, it was important to start with sustainable transport options and see how much could be achieved with these alone. Initial modelling outputs indicate that public transport improvements and smarter choices have the potential to mitigate a moderate proportion of the proposed development impact, mitigating up to a third of the impact of the potential development on the local road network in the AM peak and up to a fifth of the impact in the PM peak, Tables 2 and 3. These effects can be seen to a lesser or greater extent depending on the specific circumstances of the site, including proximity to proposed public transport corridor improvements.

4.10 A significant proportion of the benefits of Test 1 come from the opportunities provided by walking and cycling, especially where potential developments can link into an established sustainable transport network and existing facilities are accessible.

4.11 Public Transport also contributes to the potential mitigation package but has limitations because of the nature of the sites. Table 5 shows patronage figures for potential bus and Park and Ride services. Predicted overall patronage on the bus services is provided to aid the understanding of commercial viability of the service as a whole. Patronage generated by the potential developments is also provided separately to allow the contribution of the developments to be identified.

4.12 Low patronage figures on some services are a reflection of the peripheral position of the sites and the level of anticipated connectivity to the existing transport network. The model takes account of the relative attractiveness of travel options including the influence of service frequency and journey times.

Table 5 – Indicative Mode Share and patronage figures

Bus Services

	Overall patronage		Development Patronage	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Boulton Moor and Thulston Fields	142	69	38	34
Hackwood Farm	55	78	16	16
Newhouse Farm	6	4	1	1
Highfields Farm	81	35	11	5
Chellaston Fields	198	134	10	8
Sinfin Lane	303	166	78	62
Wragley Way	181	136	5	4

Park and Ride Services

	AM Peak Hour	24 Hour
BM PnR	57	312
Newhouse Farm PnR	3	14
City Hospital PnR	234	787

4.13 In transport terms, New House Farm and Hackwood Farm sites can be considered the least sustainable. The other sites either have successful bus services nearby that could be extended or in population terms are closer to the critical mass required to support a commercially viable new service, such as at Boulton Moor and Thulston Fields.

4.14 Looking at indicative patronage figures for existing services overall they seem to be closer to the level required to support some level of enhanced services into the sites. For example, at Wragley Way, although the additional patronage that the model predicted would come from the new development is minimal, the overall patronage on the route is relatively good. This means that, with appropriate investment into bus services and infrastructure, and potentially in combination with network improvements from other mitigation measures, there may be a way to extend the existing service into the site to serve the new development. However, it will be intrinsically difficult to achieve high frequency bus services to some of the potential developments due to the peripheral nature of the majority of the sites. It will also be important to ensure that existing services are not adversely affected by adjustments for the new developments.

4.15 The Hackwood and Newhouse Farm tested services are, by necessity, new and where they do pick up passengers along the route they compete with and potentially undermine existing successful services. The modelling indicates that a commercially viable bus service for these sites is unlikely to be achieved in the formats tested.

4.16 Similarly, the results indicate very low peak hour patronage figures for the potential Park and Ride service for Newhouse Farm, which means it would not become a commercially viable prospect. However, results for Boulton Moor Park and Ride and the City Hospital Park and Ride show levels of patronage that indicate that the initiatives could be successful. Additional analysis has indicated that the City Hospital Site does not directly mitigate the potential development sites in the test but may have other benefits. Further investigation is ongoing into the role of Park and Ride within the evolving mitigation package.

4.17 Within Test 1 it should be noted that the corridor improvements make valuable contributions to the success of the public transport services and mode share.

4.18 In terms of carbon emissions, the measures in Test 1 make by far the greatest contribution to mitigating the impact of the potential development, achieving 63% mitigation (see Table 4). This is a reflection of the type of mitigation measures included in this test and the environmental benefits of public transport walking and cycling in comparison to single occupancy car travel.

Test 2 – Local measures plus Public Transport and Smarter Choices

4.19 In addition to public transport and smarter choices, the local measures included in Test 2 are:

- A South Derby Link Road joining Rykneld Road with the T12 Link Road (see Figure 2)
- Widening or replacement of Stenson Road Bridge to enable two way working
- A new rail station near Stenson Road (see Figure 2)
- Mickleover / Mackworth (Mick/Mack) Express Busway

4.20 The results of Test 2 indicate that in terms of the most congested routes reflected in the severity index, this is the best performing mitigation package. The severity index data shows that the measures mitigate the development impact by more than 100% in both the AM and PM peaks. This means that some routes would function better than before the development. In terms of the network as a whole, the mitigation package reduces traffic flows through local residential areas and eases pressure on the local highway network. There are particular benefits in terms of reduced vehicle flows for the A50, Osmaston Road, London Road, sections of the A5111 and the T12 link road. Improvements to the network are greater than Test 1 alone.

4.21 Much of the improvement is attributable to the attractiveness of the South Derby Link Road, which provides alternative route choices and valuable linkages to major employment sites to the south of the city. Possible dis-benefits associated with the South Derby Link Road would include a moderate increase in traffic along routes that feed into the new road. Most new road schemes also result in a level of induced traffic because the attractiveness of the new link results in traffic rerouting to fill extra capacity provided. The South Derby Link Road is the subject of further investigation, considering design requirements, affordability and deliverability. It may be possible to plan the delivery of the road as a phased approach, providing some stretches earlier than others.

4.22 A potential new Rail Station, which was tested with 30 minute rail services in both directions throughout the day, received a reasonable level of patronage in the test. The result suggests that the rail station is worth further consideration and could be an important future element of a sustainable transport network. This is also the subject of further investigation to consider deliverability issues

4.23 Changing Stenson Road Bridge to two way working alleviates the queuing at the bridge but traffic still encounters congestion further along the route towards the city centre. Traffic flow actually increases on Stenson Road as a result of the measures in Test 2. This is likely to result from the combination of the bridge widening and connection to the South Derby Link Road making the route more attractive. Traffic flow is, however, reduced through the nearby residential area, through which traffic previously rerouted to avoid the queues. This requires additional analysis to understand the relative sensitivities within the area.

4.24 The patronage on the 'Mick/Mack' Express Busway was insignificant. It did not contribute measurably to the mitigation package and would not be a viable prospect for these purposes.

4.25 In terms of climate change, these measures would provide only a very marginal benefit over and above Test 1; reducing carbon emissions by just 287 tonnes per annum.

4.26 The outcome of further investigation into the well performing measures contained within Test 2 will help to inform the final mitigation package.

Test 3 – The new A50 junction plus Public Transport and Smarter Choices

4.27 Data from Test 3 indicates that in both peaks the new A50 junction causes re-routing of existing traffic, as traffic is attracted from the T12 link in the east, Stenson Road in the west, and the A5132 in the South. The effects of this are that the congestion is largely displaced from those roads into Sinfin.

4.28 The modelling also demonstrates significant differences between traffic flows in the AM and PM peaks. The effectiveness of the junction as a mitigation measure varies considerably, therefore, due to these differences. In the AM peak Test 3 mitigation measures cause a greater reduction in the impact of the potential development sites when compared to the PM peak. This is because the existing constraints on the network mean that more traffic re routes via the new A50 junction in the AM peak. Although this increases flows significantly on the trunk road, overall there is a mitigating effect across the network as a whole.

4.29 In the AM peak the total travel time and distance across the network also decreases with the mitigation measures as traffic has the ability to select quicker/ more direct routes as the road improvements free up capacity.

4.30 In the PM peak the network congestion is less acute but spread out over a wider area, meaning the new junction should be comparatively less attractive as an alternative route than in the AM peak. However, the principle effect of the new junction is to induce traffic into the area, filling capacity, increasing flows and adding to congestion in the vicinity, bringing it closer to levels in the morning peak and therefore creating a negative impact.

4.31 In the PM peak the total travel time and distance across the network decreases minimally but congested route kilometres actually increase to levels above those demonstrated with no mitigation.

4.32 When considered as a whole there are measurable improvements from the new A50 junction in some areas at certain times. However, elsewhere and at different times of the day significant negative effects mean that the overall positive impact of the A50 junction appears limited.

4.33 Again, the impact on reducing carbon emissions over and above that achieved in Test 1 was minimal.

4.34 Additional investigation into the overall benefits and deliverability of a new A50 junction is ongoing.

Test 4 – The A50 Junction, Local Measures, Public Transport and Smarter Choices

4.35 Test 4, which includes the new A50 junction as well as local measures, public transport and smarter choices performs similarly in some respects to Test 2. The combination of measures significantly increases the highway capacity to the south of the city and provides some additional improvements to the functioning of the local network in terms of travel time.

4.36 However, potential capacity benefits are undermined, in the PM peak in particular, by increased traffic flows resulting from the attractiveness of the route options made possible by the A50 junction. This reduces the severity index benefits realised by the measures in Test 2 alone and reflects the pattern created by the new A50 Junction in Test 3.

4.37 The results of Test 4 indicate that delivering the A50 junction alongside the South Derby Link Road would be unlikely to provide significantly greater overall benefits than delivering the link road without the A50 junction. More detailed analysis is ongoing to aid understanding of the relationship between the schemes and their relative merits.

Test 5 – A38 Derby Junctions Grade Separation, the A50 Junction, Local Measures, Public Transport and Smarter Choices

4.38 Test 5, which includes the measures from the previous tests and the A38 Derby Junctions Grade Separation, provides the greatest network wide benefits of all the mitigation packages in terms of complete mitigation of the impact of the potential development on over capacity queues and average speed. However, travel distance is increased as people reroute to use the longer but potentially faster alternative. In addition, although the severity index shows 100% mitigation in the AM peak, the PM peak value is only 14% as a result of induced traffic.

4.39 The modelling indicates that the Grade Separation would provide additional network benefits. However, as a Highways Agency led scheme with wider influences, a more detailed study would be required to understand the network interactions fully. For the purposes of this study, this test has provided information about the interaction of the A38 scheme with other potential mitigation measures and confirmed the importance of well functioning A38 junctions to Derby.

5. Conclusions

How do the different sites and areas compare?

5.1 All of the potential sites tested would benefit from mitigation measures such as traffic management improvements and the promotion of smarter choices to improve the provision and accessibility of pedestrian and cycling facilities. These can be tailored to each site as appropriate.

5.2 As discussed in Section 4 the peripheral nature of many of the sites can make them difficult to serve with high frequency public transport services as journey times and distances are considerable. Where existing services can be extended this provides greater possibilities for serving the new developments.

5.3 Where a new development will require a completely new bus service it will need to achieve higher levels of development patronage to become commercially viable. The transport modelling has predicted this will be difficult to achieve, making it especially difficult to provide public transport services for Hackwood Farm and New House Farm potential development sites. This means that the potential sites towards the south of the City are more sustainable, with greater opportunities for bus services and better access to existing amenities.

5.4 Conversely, the impact of growth on the transport network from sites towards the south of the City is likely to be higher than more northerly options because the network in this vicinity is already more constrained. It may, however, be possible to overcome this issue because there are also more opportunities for targeted transport mitigation schemes in this area.

5.5 For example, investigation to date on the South Derby Link Road has shown that this could be particularly beneficial to the potential sites around the south of the City. An equivalent scheme has not been identified for the more northerly site options. The A38 junctions grade separation may directly benefit potential development to the west of the A38 but this is a Highways Agency led scheme which is unlikely to be deliverable within the plan period. This site based information is increasing through ongoing investigation.

6. Summary of the likely transport mitigation package for the Preferred Growth Strategy

6.1 The likely mitigation package is made up of elements that were tested and found to successfully contribute to a mitigation package for the potential strategic housing developments. It also includes elements that could not be tested in the model but are known to be of value or have been tested outside this exercise. Taking into account all relevant planned work and the potential to focus existing measures at key areas of growth, the potential transport mitigation package for the Preferred Growth Strategy is likely to include:

- integration of land use and provision of local facilities. For example, education and retail facilities to reduce the need to travel
- a high level of Smarter Choices support for public transport, walking and cycling, with associated enhancement of the pedestrian and cycle network and transport interchange improvements
- completion of the ‘T12’ Link Road

- dynamic strategic traffic management potentially linking with the Highway Agency network, for example linked, networked gantry signs for congestion management
- traffic management to help the network to function effectively including signal control systems
- Derby Rail Station Master Plan, Castleward Boulevard and public realm improvements
- London Road rail bridge improvements to prevent eventual closure
- junction and road improvements, to address capacity and safety, for improved functioning of the network and immediate accommodation of demand
- public transport improvements including new services/service enhancements and infrastructure to improve bus priority and reliability
- Boulton Moor Park and Ride and corridor improvements
- Osmaston Road corridor and London Road improvements

6.2 In addition, key potential elements of the mitigation package undergoing further investigation are:

- New Rail Station in the Sinfin/Stenson Fields area, including potential Park and Ride rail service, bus interchange, substantial cycle parking and good pedestrian links
- Completion of a South Derby Link Road from the A38 via Rykneld Road to the A514 via the T12 link, Figure 2
- Widening or replacement of Stenson Road Bridge
- New junction providing access to the A50, Figure 2
- The potential role of Park and Ride
- A38 Derby junctions grade separation - a Highways Agency led scheme

6.3 It is unlikely that it will be possible, practicable or desirable to bring forward all of the elements under investigation into the final mitigation package for delivery prior to 2028. Further analysis and feedback from consultation will allow us to identify the most appropriate, prioritised delivery schedule to complement the final preferred growth strategy.

7. Next steps

7.1 Between now and the submission of the Derby HMA Core Strategies in 2013, a significant amount of work will be completed to ensure that the HMA has the best possible transport mitigation package to support the planned housing growth. Briefly, this will include:

- Continuing analysis of transport mitigation options
- Refinement of the preferred growth strategy and mitigation requirements following public consultation
- Modelling of the final preferred growth strategy and corresponding mitigation package