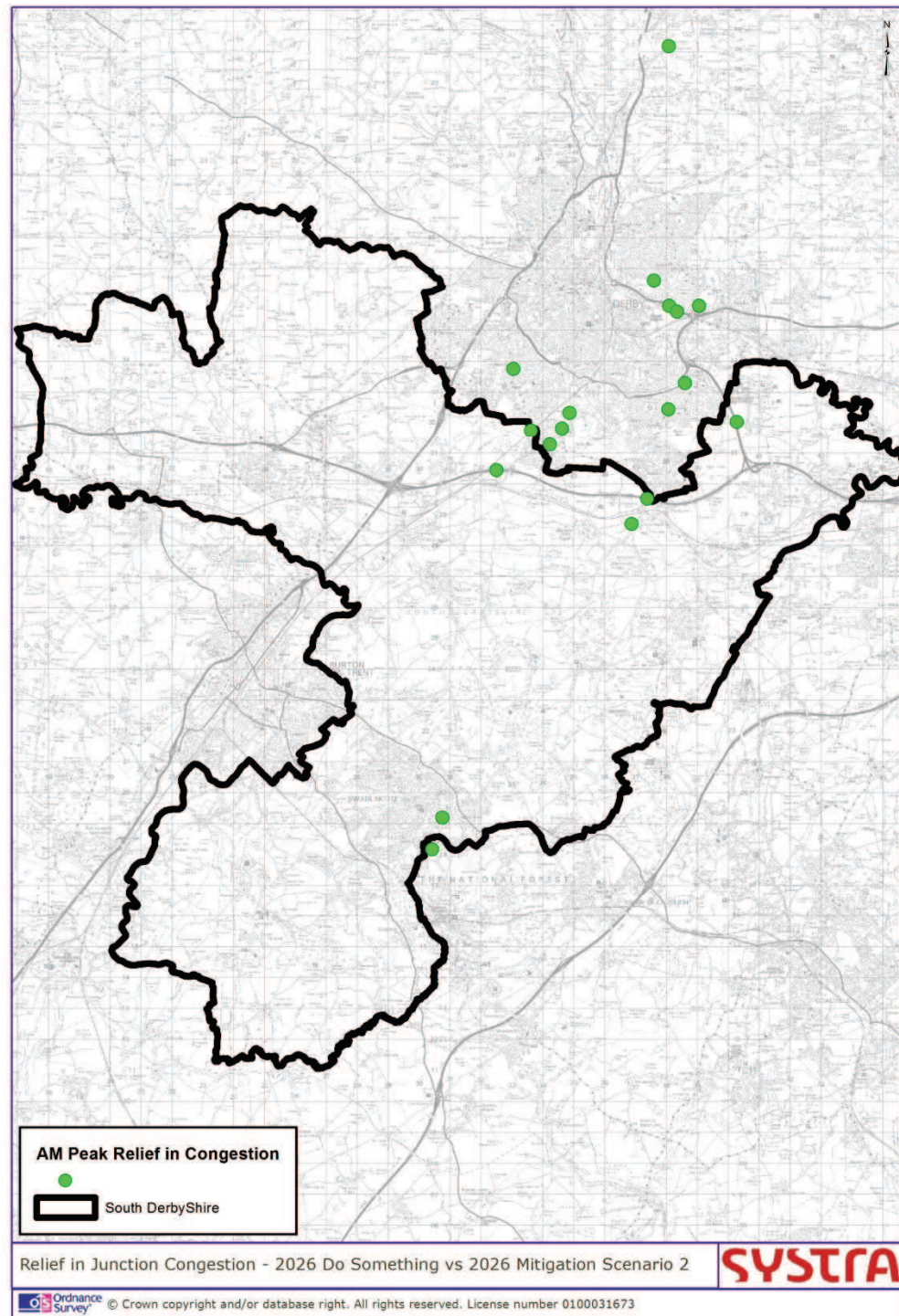




SYSTRA

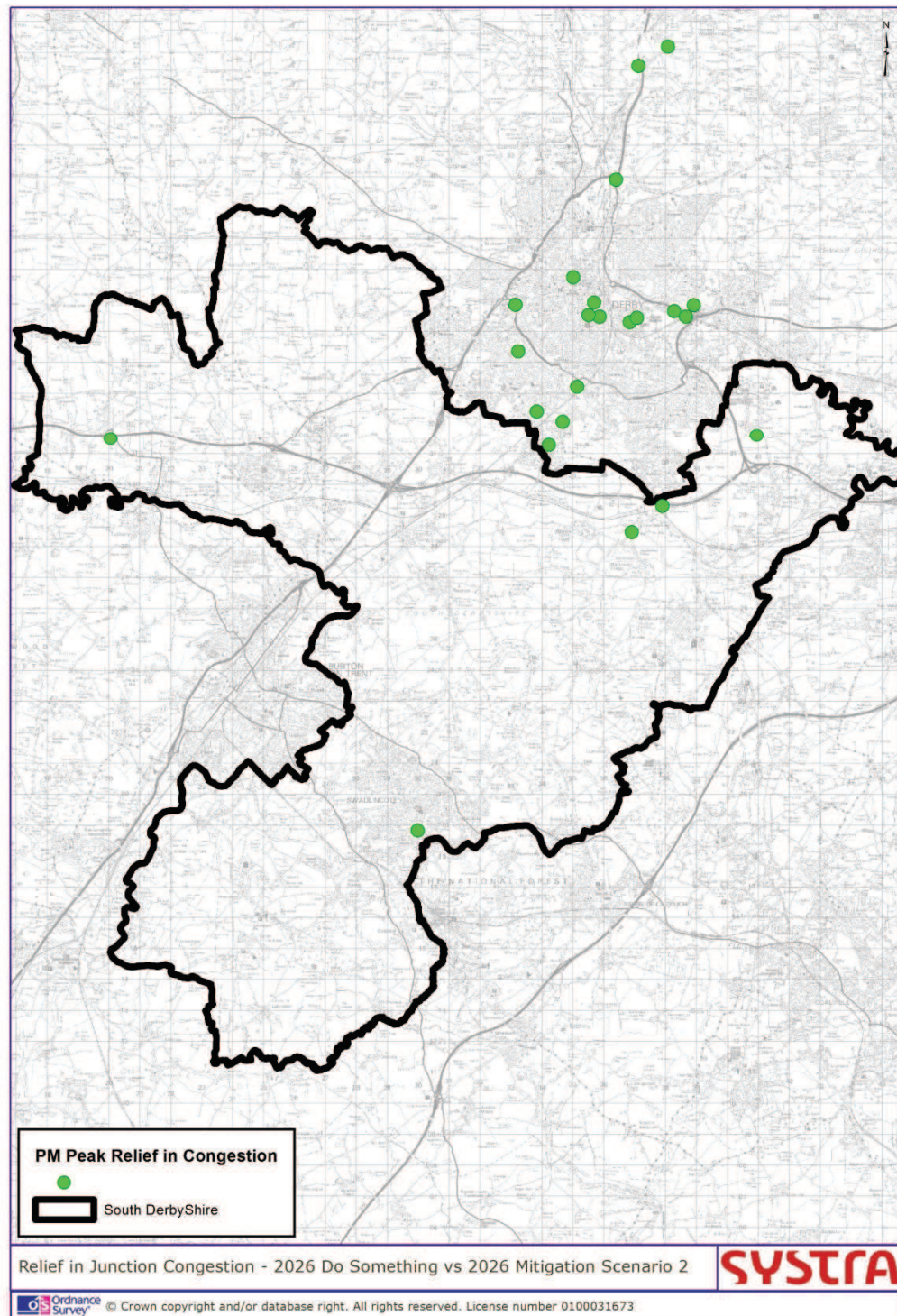
Figure 47. Relief of Junction Congestion – With Development Scenario vs Highway Mitigation Scenario – South Derbyshire - Morning Peak





SYSTRA

Figure 48. Relief of Junction Congestion – With Development Scenario vs Highway Mitigation Scenario – South Derbyshire - Evening Peak





Network Indicators

- 7.6.8 The Network Indicators for the Highway Mitigation and With Development Scenarios are provided in Tables 26 and 27. This indicates that congestion in South Derbyshire, as indicated by the over-capacity queues indicator, reduces as a result of the Highway Mitigation proposals (2% in the AM peak and 3% in the PM peak). This reduction in over capacity queues can be translated into a mitigation of 28% in the morning peak and 11% in the evening peak.
- 7.6.9 This results in an increase of average speed of around 1% in the morning peak and evening peaks as a result of the Highway Mitigation proposals. This is a mitigation of 41% in the morning peak and 33% in the evening peak.

Table 26. Network Indicators (morning peak) – South Derbyshire

INDICATOR	MORNING PEAK			
	REF CASE	WITH DEV.	FULL MITIGATION SCENARIO	PERCENTAGE MITIGATION
Over Capacity Queues (PCU Hrs)	486	838	738	28%
Total Travel Time (PCU Hrs)	7,631	8,903	7,429	116%
Total Travel Distance (PCU kms)	419,974	461,374	481,545	-49%
Average Speed (km/hr)	55	51.8	53.1	41%

Table 27. Network Indicators (evening peak) – South Derbyshire

INDICATOR	EVENING PEAK			
	REF CASE	WITH DEV.	FULL MITIGATION SCENARIO	PERCENTAGE MITIGATION
Over Capacity Queues (PCU Hrs)	500	815	780	11%
Total Travel Time (PCU Hrs)	7,593	8,918	9,127	-16%
Total Travel Distance (PCU kms)	418,818	460,159	482,018	-53%
Average Speed (km/hr)	55.2	51.6	52.8	33%



8. A38 GRADE SEPARATION SENSITIVITY TEST

8.1 Overview

- 8.1.1 All the previous Core Strategy tests and modelling results assume the A38 Grade separation schemes as being promoted by Highways England have been implemented. These scheme significantly reduce the level of congestion along the A38 to the west of Derby City Centre resulting in a high level of vehicle transfer to this route which in turn relieves other routes on the local highway network. These schemes also result in a significant redistribution of local traffic within Derby City.
- 8.1.2 The A38 grade separation schemes are now committed schemes being progressed by Highways England and are due for completion by the end of the decade.
- 8.1.3 In order to identify the potential impacts of the Core Strategy should this committed scheme not be implemented before the completion of the Core strategy developments, a sensitivity test has been undertaken without the A38 scheme in place. Detailed model outputs from this sensitivity test are detailed in Appendix C with the main conclusions gained from these outputs summarised below.

8.2 Summary of A38 Sensitivity Test Outputs

- 8.2.1 In the absence of grade separation, the Core Strategy results in more traffic increase along the M1 and A50. This is due to a reduction in capacity at the A38 junctions which can only accommodate the development traffic by diverting the existing A38 traffic onto other roads (primarily the M1). These impacts are more significant in the PM peak. There will be similar more localised rerouting for traffic accessing the city centre but these are less obvious due to the scale of the changes and also the complexity due to knock on effects throughout the network.
- 8.2.2 Without grade separation, the Core Strategy induced congestion is more significant along:
- the A38 corridor within Amber Valley; and
 - northern parts of Derby.
- 8.2.3 This is due to the limited routes that the additional traffic has to access Derby from the North due to the congestion on the A38, additional options present themselves once the grade separation is in place which allow a greater spread of this traffic and also the use of more suitable routes.
- 8.2.4 Removal of grade separation results in significant increase in Derby bound traffic utilising the minor radials (Stenson Road, Deep Dale Lane and Arleston Lane) in the vicinity of the Core Strategy sites to the south of the City. This makes it harder to mitigate the impacts of the Core Strategy within Central and southern parts of Derby as the mitigation is delivering traffic onto more congested routes. Hence the lower level of mitigation in Derby City. This is particularly the case in the AM peak because the major share of AM peak traffic is commuting (which is generally Derby bound) whereas the PM traffic has roughly similar shares of commuting and other traffic which has a more spread destination profile.



9. CONCLUSIONS

9.1 Overview

9.1.1 This report summarises the modelling results for the Derby HMA Core Strategy. Four 2026 scenarios were modelled for this study:

- Reference Case;
- With-Development Scenario;
- Non-Highway Mitigation Scenario; and
- Full Mitigation Scenario.

9.1.2 Only AM and PM peaks have been modelled.

9.2 Reference Case

9.2.1 The 2026 Reference Case included all committed and completed developments and infrastructure schemes. Key highway schemes included in the Reference Case were:

- Connecting Derby (already implemented);
- A38 grade separation;
- Raynesway grade separation (already implemented);
- London Road Bridge open to all traffic and Litchurch Lane closed;
- Junction improvements at A5111/A514 Mitre Island;
- New layouts for A5111 junctions with Stenson Road and Sinfin Lane;
- M1 widening between junctions 25 and 28 (already implemented);
- T12 Link Road and associated schemes; and,
- A38/A50 Toyota junction revised layout.

9.2.2 The Reference Case results predicted an overall increase in traffic and congestion.

9.3 With-Development Scenario

9.3.1 The With-Development Scenario was built on the Reference Case and included all of the Core Strategy sites.

9.3.2 The highway trip rates for the Core Strategy sites were derived from TRICS database. These trip rates were agreed by Derby HMA group and the Highways Agency prior to undertaking the modelling work.

9.3.3 The proposed Core Strategy is forecast to generate a total of 13,277 vehicle trips in the AM peak and a total of 13,893 vehicle trips in the PM peak.

9.3.4 In the absence of any mitigation package, the Core Strategy is forecast to increase the levels of congestion across the HMA. The increase is 90% in the AM peak and 76% in the PM peak. The district level impact is given below:

- In Amber Valley, the congestion is forecast to increase by 134% in the AM peak and 113% in the PM peak.
- In Derby City, the congestion is predicted to increase by 88% in the AM peak and 78% in the PM peak.



- Within South Derbyshire, the congestion is likely to increase by 72% in the AM peak and 63% in the PM peak.

9.4 Non-Highway Mitigation Results

- 9.4.1 The non-highway mitigation package included public transport measures and smarter choices for travel. The smarter choices were modelled by reducing the highway demand for Core Strategy development sites for short-distance journeys. For journeys less than 2km long, the highway demand for the Core Strategy sites was reduced by 20%. For journeys longer than 2kms but shorter than 5kms, a 10% reduction was implemented. No reduction in highway trips was made for journeys longer than 5km.
- 9.4.2 The non-highway mitigation package resulted in reduction of short-distance highway trips for Core Strategy sites and also a shift from highway to public transport. This resulted in an overall reduction in highway traffic compared with the With-Development Scenario.
- 9.4.3 The non-highway mitigation results in reduction in traffic along:
- the A6;
 - the A38;
 - the A52;
 - the A50; and
 - the A5132
- 9.4.4 The network statistics show modest levels of mitigation achieved through the non-highway mitigation package. These have been summarised below:
- For full HMA area, 13% mitigation was achieved in both the peak hours.
 - For Amber Valley, the levels of mitigation achieved were 27% across both peaks.
 - For Derby City, 9% mitigation was achieved across both peak hours; and
 - Within South Derbyshire, the levels of mitigation achieved were 4% in the AM peak and 9% in the PM peak.

9.5 Full Mitigation Modelling Results

- 9.5.1 Full highway mitigation package includes non-highway as well as highway mitigation measures. The highway mitigation measures tested as part of this study include:
- Provision of a roundabout junction at the Kilburn Toll Bar and improvements to Coxbench junction in association with development on the Land North of Denby;
 - Woodville Regeneration Route;
 - Broomy Farm Link Road;
 - Phase 1 of the South Derby Integrated Transport Link from Stenson Road to link with the T12 Link Road at Infinity Park;
 - Improvements to the A50/A514 junction. This included signalisation of the A50 eastbound off-slip accompanied by widening and signalisation of the A514 north; and
 - A52 improvements at the Wyvern.



- 9.5.2 The new road infrastructure provided significant rerouting options particularly near southern areas of Derby, Swadlincote and along the B6179 in Amber Valley. All this resulted in a change in traffic profile.
- 9.5.3 The new road infrastructure provides relief to the local areas, however, on the wider network their impact is limited as these measures are primarily aimed at mitigating the local impacts of the core strategy schemes.
- 9.5.4 The percentage mitigation achieved by the Full Mitigation Package is summarised below:
- Across the Fully Modelled Area, 22% mitigation was achieved in the AM peak and 23% mitigation achieved in the PM peak;
 - Within Amber Valley, the levels of mitigation achieved was 44% in the AM peak and 38% in the PM peak;
 - For Derby City, 23% mitigation was achieved in the AM peak. This percentage was 26% in the PM peak;
 - Within South Derbyshire, the mitigation achieved was 28% in the AM peak and 11% in the PM peak.;

9.6 A38 Grade Separation Sensitivity Test

- 9.6.1 In the absence of grade separation, the Core Strategy results in more traffic increase along the M1 and A50. This is due to a reduction in capacity at the A38 junctions which can only accommodate the development traffic by diverting the existing A38 traffic onto other roads (primarily the M1).
- 9.6.2 Removal of grade separation results in significant increase in Derby bound traffic utilising the minor radials (Stenson Road, Deep Dale Lane and Arleston Lane) in the vicinity of the Core Strategy sites to the south of the City. This makes it harder to mitigate the impacts of the Core Strategy within Central and southern parts of Derby as the mitigation is delivering traffic onto more congested routes.

9.7 Conclusion

- 9.7.1 The full mitigation package is forecast to provide significant relief to a number of areas within HMA, however, it does not fully mitigate the impacts of the Core Strategy.
- 9.7.2 This means there is a need to explore further mitigation options by individual developers at their respective planning application stages.

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