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FORECASTING REPORT



SYSTRA

DERBY - NOTTINGHAM TRANSFORMING CITIES

FORECASTING REPORT

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1. INTRODUCTION

1.1.1 SYSTRA has been commissioned by Nottingham City Council to utilise the East Midlands Gateway Model (EMGM) to appraise the proposed schemes for the Derby- Nottingham Transforming Cities submission.

1.1.2 EMGM is a multimodal transport model built following the guidance in WebTAG Unit M2. EMGM has all the expected demand responses (time of day, main mode, destination, route/submode) arranged in the standard hierarchy order. The strength of its responses match the expected strengths in the WebTAG realism tests. Its component highway and public transport models have been shown to validate acceptably against observed data.

1.1.3 This report details the approach and model outputs relating to the development of the Forecast Reference Case models. It outlines the key modelling assumptions, infrastructure schemes and land use assumptions to forecast the 2016 base model to the following future year Reference Cases:

- 2023 – Year of Opening of the Transforming Cities Schemes.
- 2043 – 20 year Forecast Horizon.

1.1.4 For the purposes of this study both Reference Cases assume that the HS2 station at Toton and associated local infrastructure is not constructed as this is not as yet a committed scheme.

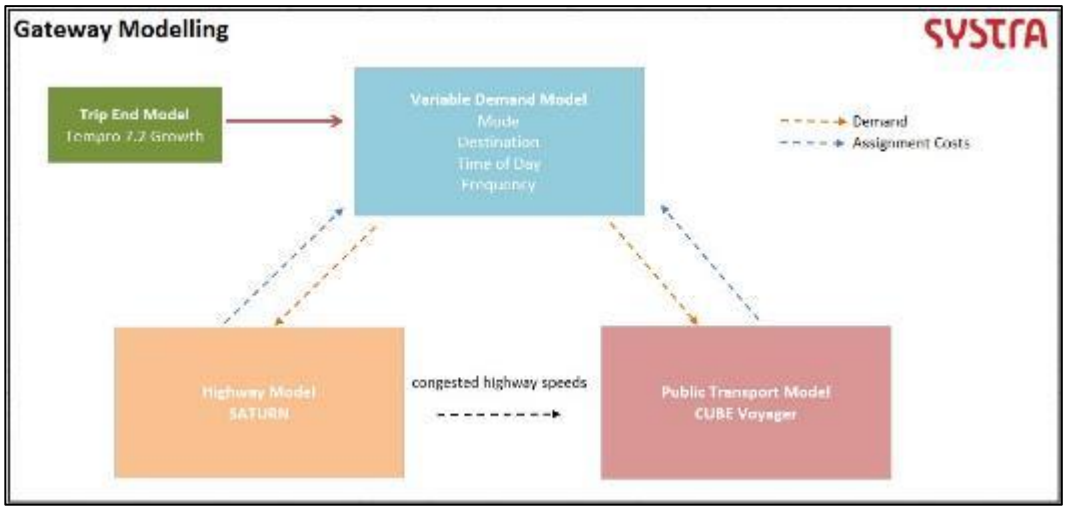
2. FORECASTING METHODOLOGY

2.1 Structure of the Gateway Model

2.1.1 An overview of the structure of the East Midlands Gateway model is shown in Figure 1. The Gateway modelling suite is comprised of the following elements:

- SATURN Highway Model;
- CUBE Voyager Public Transport Model;
- Cube Variable Demand Model including destination, mode choice, trip frequency and time of day responses; and,
- TRICs based Trip End Model.

Figure 1. EMGM Overview

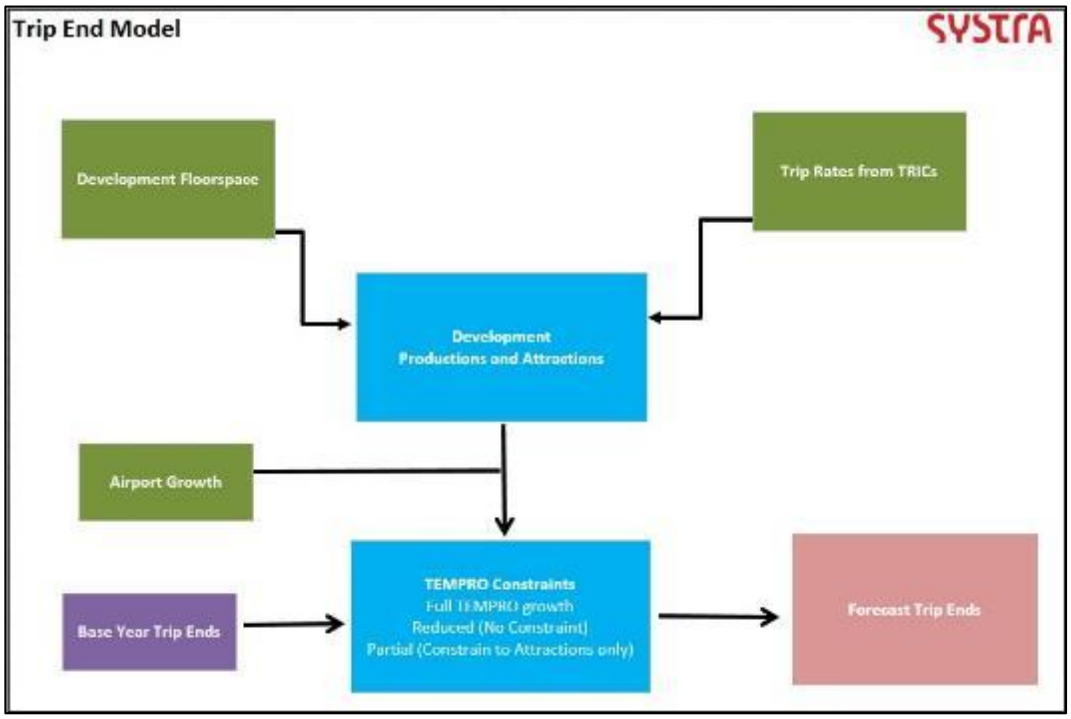


2.2 Forecast Demand and the Trip End Model

2.2.1 Forecast demand is calculated in the Trip End Model, the structure of which is shown in Figure 2. The number of development trips is calculated from TRICs trip rates applied to floorspace or the number of dwellings. The development trips are added to the base matrices then the background growth applied to the matrix in a way that ensures that the outturn growth matches the TEMPRO 7.2 growth forecasts.

2.2.2 Outturn generations for developments which have been entered specifically will closely align the expected level of generations. Residual TEMPRO growth is applied uniformly to surrounding wards within each MSOA and constrained at a district level.

Figure 2. Trip End Model



2.2.3 East Midlands Airport growth provided by the airport is applied as a development zone to ensure that the growth in passengers and freight predicted by the airport is achieved within the model.

2.2.4 Trip rates have been extracted from TRICS 7.5.1 for different types of land-use and segmented by mode and time period. The final trip rates applied in the trip end model are shown in Table 1.

Table 1. Trip Rates

	AM PEAK (8:00 - 9:00)			INTER-PEAK (12:00 - 13:00)			PM PEAK (17:00 - 18:00)		
	Arrival	Departure	Total	Arrival	Departure	Total	Arrival	Departure	Total
Residential 250> (per dwelling)	0.183	0.729	0.912	0.212	0.21	0.422	0.57	0.257	0.827
B1 Employment (per 100sqm)	1.631	0.115	1.746	0.312	0.343	0.655	0.102	1.479	1.581
B2 Employment (per 100sqm)	0.388	0.145	0.533	0.23	0.242	0.472	0.081	0.375	0.456
B8 Employment (per 100sqm)	0.087	0.023	0.11	0.04	0.028	0.068	0.011	0.042	0.09
Primary Education (per 100sqm)	7.193	1.613	8.806	0.318	0.319	0.637	0.311	0.658	0.969
Secondary Education (per 100sqm)	2.341	0.256	2.597	0.109	0.128	0.237	0.066	0.634	0.7
Food Retail (per 100sqm)	3.518	2.624	6.142	6.736	6.64	13.376	6.558	6.887	13.445
Non-Food Retail (per 100sqm)	0.287	0.069	0.356	0.506	0.472	0.978	0.253	0.206	0.459
Café/Restaurant/Bar (per 100sqm)	0	0	0	7.581	2.609	10.19	6.256	2.874	9.13
Health Centre(Clinic) (per 100sqm)	1.952	0.355	2.307	1.479	1.42	2.899	0.124	0.805	0.929

2.3 Changes to Costs

Values of Time in the Public Transport Model

2.3.1 The value of time in the public transport model has been calculated from the WebTAG data book, issued May 2018. The values used in the model are set out in Table 2.

Table 2. Value of time in the public transport model (£ per hour, 2010 prices)

YEAR	VALUE OF TIME		
	WORK	COMMUTE	OTHER
2016	20.04	10.69	4.88
2023	21.34	11.38	5.20
2043	30.64	16.34	7.46

Values of Time and Vehicle Operating Costs Highway Model)

2.3.2 Values of time and vehicle operating costs have been calculated from the information in the WebTAG data book, issued May 2018. They are expressed in values of pence per minute (PPM) and pence per kilometre (PPK) for a passenger car unit (pcu).

Table 3. Value of time (pence per minute) and vehicle operating cost (pence per kilometre)

PURPOSE	2016		2023		2043	
	PPM	PPK	PPM	PPK	PPM	PPK
Commute	20.26	12.34	21.60	9.99	31.01	9.97
Business	30.21	14.86	32.21	13.70	46.25	13.68
Other	13.98	12.34	14.90	9.99	21.40	9.97
LGV	21.71	14.80	23.15	15.11	33.24	15.53
HGV	18.40	39.64	19.62	55.26	28.16	62.38
Taxi	20.26	12.34	21.60	9.99	31.01	9.97

Public Transport Fares

2.3.3 Bus and tram fares have been assumed to increase at 1% above inflation for all years between 2016 and 2043 in line with central government policy. Rail fares have been assumed to grow 1% above inflation each year between 2018 and 2043.

3. 2023 REFERENCE CASE

3.1 Overview

3.1.1 This chapter summarises transport infrastructure schemes and developments which have been included within the 2023 Reference Case.

3.1.2 The Reference Case has been based on the predicted levels of development assumed to be occupied by 2023 and includes key transport infrastructure changes.

3.2 Committed Infrastructure Schemes

3.2.1 A wide variety of infrastructure projects are scheduled to be completed between the 2016 base year and the 2023 Reference Case. The following transport schemes have been represented in the 2023 networks:

- Nottingham City and Nottinghamshire
  - A52 Improvements between A6005 (QMC) and A46(T) Bingham;
  - Turning Point South;
  - Gedling Access Road;
  - New Skills Hub NET station; and,
  - Boots link road.
- Derby and Derbyshire
  - New signal controlled access onto Osmaston Road and improvements to Mitre Island associated with the Tesco's Allenton development;
  - New layout of the Stenson Road/A5111 junction associated with the Stenson Fields development;
  - Radbourne Lane Development Mitigation;
  - Schemes associated with the South Derbyshire Core Strategy (south of the A50);
  - Highway Proposals associated with the East Midlands Gateway development adjacent to M1 J24;
  - Signalisation of the A38/A50 junction;
  - Signalisation of the A514/A50 junction;
  - A52 Wyvern Improvements;
  - Rolls Royce Victory Road Realignment; and
  - Southern Derby Integrated Transport Link (Infinity Park Way to Stenson Road).
- Leicestershire
  - Bardon vehicular link and improvements to A42 junction 13 (associated with the Bardon Grange development);
  - Link Road between A512 and A6 north and improvements to M1 J23 (associated with the Garendon development);
  - Castle Donnington Western Relief Road linking Back Lane with Hill Top (associated with the Castle Donnington development);

- Signalisation of the A50/A46 roundabout (associated with the Ashton Green and Glenfield Park developments);
- Signalisation of the A46/Ansty Lane roundabout (associated with the Ashton Green development); and,
- Kegworth Bypass.

- Highways England

  - EM SRFI Mitigation at M1 J24/24a;
  - Improvements to M1 J22 (associated with the Bardon Grange development);
  - Grade Separation of A38 junctions with A61, A52 and A5111;
  - A453 Mill Hill roundabout and Crusader roundabout improvement schemes as conditioned to the consented Clifton South SUE development (planning reference 14/01417/OUT);
  - Smart Motorways schemes implemented along the M1 between J23a and J25;
  - A52 improvements between the QMC junction and the A46 to include:
    - dualling of the A52 between the Wheatcroft and Gamston junctions
    - the site accesses facilitating the Gamston development;
  - M1 J20 signalisation to support the Lutterworth East development; and
  - A46/A6 junction improvements to support North Birstall development.

3.3 Committed Developments

3.3.1 A number of proposed developments are expected to be completed or under development between 2016 and 2023. Tables 4 to 6 contain a summary of the developments that are over 250 dwellings (or equivalent generations for non-residential developments) that have been specifically modelled in the 2023 Reference Case.

3.3.2 If part of the development has been built before 2017 the generations will be included within the 2016 Base Year.

3.3.3 Where sites have not been defined as having a specific employment type the reference case has assumed the breakdown assumptions applied in previous core strategy testing which are as follows:

- Derby City and Derbyshire – 20% B1, 40% B2, 40% B8
- Leicestershire – 20% B1, 40% B2, 40% B8
- Nottingham City and Nottinghamshire – 40% B1, 30% B2, 30% B8

3.3.4 In instances where the local plans have detailed land use in hectares we have assumed that gross floor area is 50% of the overall development site.

Table 4. Site Specific Developments 2023 (Nottingham City and Nottinghamshire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Rolls Royce	Ashfield	Mixed	450		23,500	17,625	17,625
South of Broomhill Farm	Ashfield	Residential	240				
North of Kingsmill Hospital	Ashfield	Residential	125				
Butlers Hill	Ashfield	Employment			2,975	2,975	
Blenhelm Lane	Ashfield	Employment			6,400	4,800	4,800
West of Fulwood	Ashfield	Employment				6,000	6,000
Summit Park	Ashfield	Employment			19,480	14,610	14,610
Welshcroft Close	Ashfield	Employment				4,250	4,250
Oddicroft Lane	Ashfield	Employment					13,425
Castlewood Business Park	Ashfield	Employment			16,670	12,503	12,503
Pinxton Lane	Ashfield	Employment			6,300	4,725	4,725
Mowlands	Ashfield	Mixed	450		11,250		
Newark Road	Ashfield	Residential	133				
Beck Lane	Ashfield	Residential	200				
Alfreton Road	Ashfield	Residential	202				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
East of Sutton Parkway	Ashfield	Residential	248				
Boots Site	Broxtowe	Mixed	275		50,000		
Field Farm	Broxtowe	Residential	450				
Awsworth	Broxtowe	Residential	175				
Eastwood	Broxtowe	Residential	625				
Kimberley	Broxtowe	Residential	300				
Chetwynd Barracks	Broxtowe	Residential	400				
Innovation Campus	Broxtowe	Residential	750				
Bramcote, E of Coventry Lane	Broxtowe	Residential	150				
Stapleford, W of Coventry Lane	Broxtowe	Residential	120				
Stockings Farm	Gedling	Residential	170				
Teal Close	Gedling	Mixed	415		2,250	6,750	
Top Wighay Farm	Gedling	Mixed	750		12,750		8,500
North of Papplewick Lane	Gedling	Residential	300				
Westhouse Farm	Gedling	Residential	210				
H16 Park Road, Calverton	Gedling	Residential	390				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Howbeck Road	Gedling	Residential	205				
Gedling Colliery	Gedling	Mixed	525		6,000	4,500	4,500
Bestwood Village	Gedling	Residential	123				
Ravenshead	Gedling	Residential	330				
Radmanthwaite Road	Mansfield	Residential	188				
Ratcher Hill Quarry	Mansfield	Employment			2,100	1,575	1,575
Sherwood Oaks	Mansfield	Employment			2,700	2,025	2,025
Portland Gateway	Mansfield	Employment			39,738	32,513	
Riverside	Mansfield	Employment			5,363	4,388	
Chalfont Drive	Nottingham City	Residential	238				
Former Padstow School Site Gainsford Crescent	Nottingham City	Residential	136				
Eastside Extended Island Site	Nottingham City	Residential	875				
Hicking Pentecost South Site Queens Road	Nottingham City	Residential	175				
Sovereign House Sheriffs Way	Nottingham City	Residential	127				
Stanton Tip	Nottingham City	Mixed	250		4,000	3,000	3,000
Clifton West	Nottingham City	Residential	143				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Waterside	Nottingham City	Mixed	1,500		30,000	22,500	22,500
Boots Site	Nottingham City	Mixed	300		50,000		
Thomas Foreman Site	Nottingham City	Residential	162				
Forest Mills	Nottingham City	Residential	150				
Medipark	Nottingham City	Mixed			19,877		
Nottingham Skills Hub	Nottingham City	Education		1,426 pupils			
Edwalton	Rushcliffe	Mixed	750		4,500		
Edwalton	Rushcliffe	Mixed	750				
Cotgrave	Rushcliffe	Mixed	470		9,000	6,750	6,750
North of Bingham	Rushcliffe	Mixed	500		15,500	11,625	11,625
RAF Newton	Rushcliffe	Mixed	275		6,500	4,875	4,875
Clifton South	Rushcliffe	Mixed	990		13,200	9,900	9,900
Gamston	Rushcliffe	Mixed	1,000		10,000	7,500	7,500
East Leake	Rushcliffe	Residential	1,060				
Keyworth	Rushcliffe	Residential	450				
Radcliffe on Trent	Rushcliffe	Residential	900				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Ruddington	Rushcliffe	Residential	250				

Table 5. Site Specific Developments 2023 (Derby City and Derbyshire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Rykneld Road (Heatherton Extn)	Derby City	Residential	900		7,000		
Chaddesden Sidings (South)	Derby City	Employment			39,016	9,290	18,580
Derby Royal Infirmary	Derby City	Residential	400				
Chaddesden Sidings (West)	Derby City	Employment				13,000	13,000
Raynesway/Derby Commercial Park	Derby City	Employment				59,000	59,000
Manor/Kingsway Hospitals	Derby City	Mixed	400		20,000		
Innovation Centre	Derby City	Employment			2,500		
Chellaston Business Park/Infinity Park	Derby City	Employment			2,500	42,013	92,160
Brook Farm Chaddesden (Derby City)	Derby City	Residential	275				
Hackwood Farm (Derby City)	Derby City	Residential	410				
Nightingale Works	Derby City	Residential	400				
Infinity Park Extension	Derby City	Employment			5,000	30,000	

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Various City Centre	Derby City	Residential	750				
Castleward	Derby City	Residential	800				
Friar Gate Goods Yard	Derby City	Retail	200				
Tesco Allenton	Derby City	Retail		17,902 SQM			
Wragley Way (Derby City)	Derby City	Residential	180				
Boulton Moor/Snelsmoor Grange	Derby City	Residential	800				
Wragley Way (SDDC)	South Derbyshire	Residential	644				
Boulton Moor Phase 1	South Derbyshire	Residential	489				
Boulton Moor Phase 2	South Derbyshire	Residential	315				
Boulton Moor Phase 3	South Derbyshire	Residential	95				
Land at Hackwood Farm (SDDC)	South Derbyshire	Residential	145				
Land South of Sinfin Moor/Infinity Park	South Derbyshire	Employment			1,500	1,500	12,000
Primula Way	South Derbyshire	Residential	183				
Chellaston Fields	South Derbyshire	Residential	250				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land West of Mickleover Phase 1 (Newhouse Farm)	South Derbyshire	Residential	150				
Land West of Mickleover Phase 2	South Derbyshire	Residential	126				
Land West of Mickleover Phase 3	South Derbyshire	Residential	550				
Broomy Farm	South Derbyshire	Residential	200				
Land NE of Hatton	South Derbyshire	Residential	200				
North of William Nadin Way	South Derbyshire	Residential	285				
Church Street, Church Gresley	South Derbyshire	Residential	200				
Land off The Mease, Hilton	South Derbyshire	Mixed	243		3,500	7,000	7,000
Woodville Regeneration Area	South Derbyshire	Mixed	75				
Land North of Dove Valley Business Park	South Derbyshire	Employment			14,150	28,300	28,300
Land South of Cadley Hill	South Derbyshire	Employment			2,500	5,000	5,000
Highfield Farm	South Derbyshire	Residential	491				
Drakelow Power Station	South Derbyshire	Mixed	1,100		6,000	12,000	12,000
Swarkestone Road	South Derbyshire	Residential	250				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land at Swadlincote Lane, Church Gresley	South Derbyshire	Employment			1,500	3,000	3,000
Phase 1 Radbourne Lane	Amber Valley	Residential	265				
Phase 2 Radbourne Lane	Amber Valley	Residential	300				
Land south of Mansfield Rd / North of A38	Amber Valley	Residential	220				
Coppice Farm	Amber Valley	Residential	180				
Lily Street Farm, Derby Road, Swanwick	Amber Valley	Mixed	300		7,210	14,420	14,420
Kedleston Road, Quarndon	Amber Valley	Residential	200				
Cinderhill	Amber Valley	Residential	750				
Ripley	Amber Valley	Residential	500				
Stanton Regeneration Site	Amber Valley	Mixed	500		16,125	10,000	21,000
West of Quarry Hill Road	Amber Valley	Residential	175				

Table 6. Site Specific Developments 2023 (Leicestershire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Bardon Grange, Coalville	North West Leicestershire	Residential	208				
East Midlands Distribution Centre	North West Leicestershire	Employment					50,493
South East Coalville	North West Leicestershire	Residential	702				
Standard Hill Coalville	North West Leicestershire	Residential	280				
Money Hill (Phase 1) Ashby	North West Leicestershire	Residential	284				
Money Hill (Phase 2) Ashby	North West Leicestershire	Residential	588				
Land at Money Hill Ashby	North West Leicestershire	Employment			8,000	16,000	16,000
Holywell Spring Farm Ashby	North West Leicestershire	Residential	400				
Burton Road/Moira Road Ashby	North West Leicestershire	Residential	275				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Castle Donington	North West Leicestershire	Residential	501				
Bosworth Road, Measham	North West Leicestershire	Residential	180				
East Midlands Gateway	North West Leicestershire	Employment			557,500 (6m square feet)		
Loughborough, Science Park	Charnwood	Employment			125,000		
Garendon Park, Loughborough	Charnwood	Mixed	1,600		7,500	15,000	15,000
North East of Leicester	Charnwood	Mixed	2,250		6,500	13,000	13,000
North of Birstall (Broadnook)	Charnwood	Mixed	825		15,000	30,000	30,000
Watermead	Charnwood	Employment			6,250	11,875	11,875
West Shepshed	Charnwood	Residential	446				
Pegasus Business Park Extension	North West Leicestershire	Employment			54,400		36,000

3.4 2023 East Midlands Airport Growth

3.4.1 SYSTRA has undertaken a meeting with East Midlands Airport to obtain information on passenger, employee and freight growth through the airport as well as any proposals for the expansion of ancillary development in and around the site.

3.4.2 Table 7 provides detailed growth predictions for trips associated with the airport zones for the 2023 Reference Case based on information provided by the airport. These have been agreed with the airport. These zones have been amended outside of any TEMPRO constraint as growth in airport trips is not fully represented in the TEMPRO growth assumptions.

Table 7. East Midlands Airport 2023 (Total Person Trips)

TIME PERIOD	AIRPORT SITE	2023 GENERATIONS	
		IN	OUT
AM Peak (0800-0900)	Main Airport (central)	1,429	588
	DHL Freight (Western)	685	141
	Pegasus	656	147
Interpeak (av 1100-1400)	Main Airport (central)	1,045	679
	DHL Freight (Western)	285	188
	Pegasus	148	183
PM Peak (1700-1800)	Main Airport (central)	908	966
	DHL Freight (Western)	300	539
	Pegasus	167	526

4. 2043 REFERENCE CASE

4.1 Overview

4.1.1 There is limited information relating to infrastructure proposal and land use changes after the implementation of the current Core Strategies which should be completed by 2033.

4.1.2 The known sites up to this 2033 Core Strategy year are shown in Table 8 to 10. In addition the 2043 Reference Case has applied the following assumptions:

- Application of the generic TEMPRO 7.2 growth assumptions between 2033 and 2043 at a ward/district level within the simulated modelled area and at a regional level outside this area.
- Identical infrastructure schemes as those detailed in the 2023 Reference Case.
- East Midlands Airport growth to 2043.

Table 8. Site Specific Developments 2043 (Nottingham City and Nottinghamshire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Rolls Royce	Ashfield	Mixed	900		47,000	35,250	35,250
South of Broomhill Farm	Ashfield	Residential	480				
North of Kingsmill Hospital	Ashfield	Residential	250				
Butlers Hill	Ashfield	Employment			5,950	5,950	
Blenhelm Lane	Ashfield	Employment			12,800	9,600	9,600
West of Fulwood	Ashfield	Employment				12,000	12,000
Summit Park	Ashfield	Employment			38,960	29,220	29,220
Welshcroft Close	Ashfield	Employment				8,500	8,500
Oddicroft Lane	Ashfield	Employment					26,850
Castlewood Business Park	Ashfield	Employment			33,340	25,005	25,005
Pinxton Lane	Ashfield	Employment			12,600	9,450	9,450
Mowlands	Ashfield	Mixed	900		22,500		
Newark Road	Ashfield	Residential	266				
Beck Lane	Ashfield	Residential	400				
Alfreton Road	Ashfield	Residential	403				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
East of Sutton Parkway	Ashfield	Residential	495				
Boots Site	Broxtowe	Mixed	550		100,000		
Field Farm	Broxtowe	Residential	450				
Awsworth	Broxtowe	Residential	350				
Eastwood	Broxtowe	Residential	1,250				
Kimberley	Broxtowe	Residential	600				
Chetwynd Barracks	Broxtowe	Residential	1,000				
Innovation Campus	Broxtowe	Residential	750				
Bramcote, E of Coventry Lane	Broxtowe	Residential	300				
Stapleford, W of Coventry Lane	Broxtowe	Residential	240				
Stockings Farm	Gedling	Residential	339				
Teal Close	Gedling	Mixed	830		4,500	13,500	
Top Wighay Farm	Gedling	Mixed	1,500		25,500		17,000
North of Papplewick Lane	Gedling	Residential	300				
Westhouse Farm	Gedling	Residential	210				
H16 Park Road, Calverton	Gedling	Residential	390				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Howbeck Road	Gedling	Residential	205				
Gedling Colliery	Gedling	Mixed	1,050		12,000	9,000	9,000
Bestwood Village	Gedling	Residential	245				
Ravenshead	Gedling	Residential	330				
Radmanthwaite Road	Mansfield	Residential	375				
Ratcher Hill Quarry	Mansfield	Employment			4,200	3,150	3,150
Sherwood Oaks	Mansfield	Employment			5,400	4,050	4,050
Portland Gateway	Mansfield	Employment			79,475	65,025	
Riverside	Mansfield	Employment			10,725	8,775	
Chalfont Drive	Nottingham City	Residential	475				
Former Padstow School Site Gainsford Crescent	Nottingham City	Residential	272				
Eastside Extended Island Site	Nottingham City	Residential	1,750				
Hicking Pentecost South Site Queens Road	Nottingham City	Residential	350				
Sovereign House Sheriffs Way	Nottingham City	Residential	253				
Stanton Tip	Nottingham City	Mixed	500		8,000	6,000	6,000
Clifton West	Nottingham City	Residential	285				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Waterside	Nottingham City	Mixed	3,000		60,000	45,000	45,000
Boots Site	Nottingham City	Mixed	600		100,000		
Thomas Foreman Site	Nottingham City	Residential	323				
Forest Mills	Nottingham City	Residential	300				
Medipark	Nottingham City	Mixed			39,753		
Nottingham Skills Hub	Nottingham City	Education		1,426 pupils			
Edwalton	Rushcliffe	Mixed	750		4,500		
Edwalton	Rushcliffe	Mixed	750				
Cotgrave	Rushcliffe	Mixed	470		18,000	13,500	13,500
North of Bingham	Rushcliffe	Mixed	1,000		31,000	23,250	23,250
RAF Newton	Rushcliffe	Mixed	550		13,000	9,750	9,750
Clifton South	Rushcliffe	Mixed	3,000		40,000	30,000	30,000
Gamston	Rushcliffe	Mixed	4,000		40,000	30,000	30,000
East Leake	Rushcliffe	Residential	1,200				
Keyworth	Rushcliffe	Residential	450				
Radcliffe on Trent	Rushcliffe	Residential	900				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Ruddington	Rushcliffe	Residential	250				

Table 9. Site Specific Developments 2043 (Derby City and Derbyshire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Rykneld Road (Heatherton Extn)	Derby City	Residential	600		7,000		
Chaddesden Sidings (South)	Derby City	Employment			39,016	9,290	18,580
Derby Royal Infirmary	Derby City	Residential	400				
Chaddesden Sidings (West)	Derby City	Employment				13,000	13,000
Raynesway/Derby Commercial Park	Derby City	Employment				163,000	163,000
Manor/Kingsway Hospitals	Derby City	Mixed	700		20,000		
Innovation Centre	Derby City	Employment			2,500		
Chellaston Business Park/Infinity Park	Derby City	Employment			2,500	42,013	92,160
Brook Farm Chaddesden (Derby City)	Derby City	Residential	275				
Hackwood Farm (Derby City)	Derby City	Residential	410				
Nightingale Works	Derby City	Residential	400				
Infinity Park Extension	Derby City	Employment			5,000	45,000	

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Various City Centre	Derby City	Residential	750				
Castleward	Derby City	Residential	800				
Friar Gate Goods Yard	Derby City	Residential	500				
Tesco Allenton	Derby City	Retail		17,902 SQM			
Wragley Way (Derby City)	Derby City	Residential	180				
Boulton Moor/Snelsmoor Grange	Derby City	Residential	800				
Wragley Way (SDDC)	South Derbyshire	Residential	1,950				
Boulton Moor Phase 1	South Derbyshire	Residential	978				
Boulton Moor Phase 2	South Derbyshire	Residential	630				
Boulton Moor Phase 3	South Derbyshire	Residential	190				
Land at Hackwood Farm (SDDC)	South Derbyshire	Residential	290				
Land South of Sinfin Moor/Infinity Park	South Derbyshire	Employment			3,000	3,000	24,000
Primula Way	South Derbyshire	Residential	366				
Chellaston Fields	South Derbyshire	Residential	500				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land West of Mickleover Phase 1 (Newhouse Farm)	South Derbyshire	Residential	300				
Land West of Mickleover Phase 2	South Derbyshire	Residential	252				
Land West of Mickleover Phase 3	South Derbyshire	Residential	1,100				
Broomy Farm	South Derbyshire	Residential	400				
Land NE of Hatton	South Derbyshire	Residential	370				
North of William Nadin Way	South Derbyshire	Residential	570				
Church Street, Church Gresley	South Derbyshire	Residential	400				
Land off The Mease, Hilton	South Derbyshire	Mixed	485		7,000	14,000	14,000
Woodville Regeneration Area	South Derbyshire	Mixed	150		12,000	24,000	24,000
Land North of Dove Valley Business Park	South Derbyshire	Employment			28,300	56,600	56,600
Land South of Cadley Hill	South Derbyshire	Employment			5,000	10,000	10,000
Highfield Farm	South Derbyshire	Residential	800				
Drakelow Power Station	South Derbyshire	Mixed	2,200		12,000	24,000	24,000
Swarkestone Road	South Derbyshire	Residential	450				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land at Swadlincote Lane, Church Gresley	South Derbyshire	Employment			3,000	6,000	6,000
Phase 1 Radbourne Lane	Amber Valley	Residential	530				
Phase 2 Radbourne Lane	Amber Valley	Residential	600				
Land south of Mansfield Rd / North of A38	Amber Valley	Residential	440				
Coppice Farm	Amber Valley	Residential	340				
Lily Street Farm, Derby Road, Swanwick	Amber Valley	Mixed	600		14,420	28,840	28,840
Kedleston Road, Quarndon	Amber Valley	Residential	400				
Cinderhill	Amber Valley	Residential	3,000				
Ripley	Amber Valley	Residential	1,000				
Stanton Regeneration Site	Amber Valley	Mixed	2,000		64,500	40,000	84,000
West of Quarry Hill Road	Amber Valley	Residential	350				

Table 10. Site Specific Developments 2043 (Leicestershire)

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Bardon Grange, Coalville	North West Leicestershire	Residential	800				
East Midlands Distribution Centre	North West Leicestershire	Employment					100,986
South East Coalville	North West Leicestershire	Residential	1,565				
Standard Hill Coalville	North West Leicestershire	Residential	400				
Money Hill (Phase 1) Ashby	North West Leicestershire	Residential	605				
Money Hill (Phase 2) Ashby	North West Leicestershire	Residential	1,022				
Land at Money Hill Ashby	North West Leicestershire	Employment			16,000	32,000	32,000
Holywell Spring Farm Ashby	North West Leicestershire	Residential	400				
Burton Road/Moira Road Ashby	North West Leicestershire	Residential	275				
Castle Donington	North West Leicestershire	Residential	895				

DEVELOPMENT	DISTRICT	DEVELOPMENT TYPE	HOUSING	RETAIL/EDUCATION	B1 (SQM)	B2 (SQM)	B8 (SQM)
Bosworth Road, Measham	North West Leicestershire	Residential	300				
East Midlands Gateway	North West Leicestershire	Employment			557,500 (6m square feet)		
Loughborough, Science Park	Charnwood	Employment			175,000		
Garendon Park, Loughborough	Charnwood	Mixed	2,048		9,600	19,200	19,200
North East of Leicester	Charnwood	Mixed	3,375		9,750	19,500	19,500
North of Birstall (Broadnook)	Charnwood	Mixed	1,634		29,700	59,400	59,400
Watermead	Charnwood	Employment			12,500	23,750	23,750
West Shepshed	Charnwood	Residential	892				
Pegasus Business Park Extension	North West Leicestershire	Employment			54,400		36,000

4.2 2043 East Midlands Airport Growth

4.2.1 Table 11 provides details growth predictions for trips associated with the airport zones for the 2043 Reference Case. These zones have been amended outside of any TEMPRO constraint as growth in airport trips is not fully represented in the TEMPRO growth assumptions.

Table 11. East Midlands Airport 2043 (Total Person Trips)

TIME PERIOD	AIRPORT SITE	2043 GENERATIONS	
		IN	OUT
AM Peak (0800-0900)	Main Airport (central)	2,920	1,059
	DHL Freight (Western)	1,182	298
	Pegasus	656	147
Interpeak (avg. 1100-1400)	Main Airport (central)	2,536	1,150
	DHL Freight (Western)	782	345
	Pegasus	148	183
PM Peak (1700-1800)	Main Airport (central)	2,399	1,437
	DHL Freight (Western)	796	696
	Pegasus	167	526

5. CORE SCENARIOS

5.1 Introduction

5.1.1 This section describes the results of the forecasting for the 2023 and 2043 Reference Cases.

5.2 Key Highway Impacts

Actual Flow

5.2.1 Figures 3 to 6 show actual flow in 2023 and 2043 for the AM and PM peak hours.

5.2.2 While flows are higher in 2043 than in 2023, the distribution of flows does not alter significantly between the two years. The greatest actual flows are found on the following key routes through the region:

- M1
- A42
- A52
- A38
- A50
- A453 between M1 and Nottingham
- Raynesway
- Clifton Boulevard

Figure 3. Actual Flows 2023 Morning Peak - Study Area

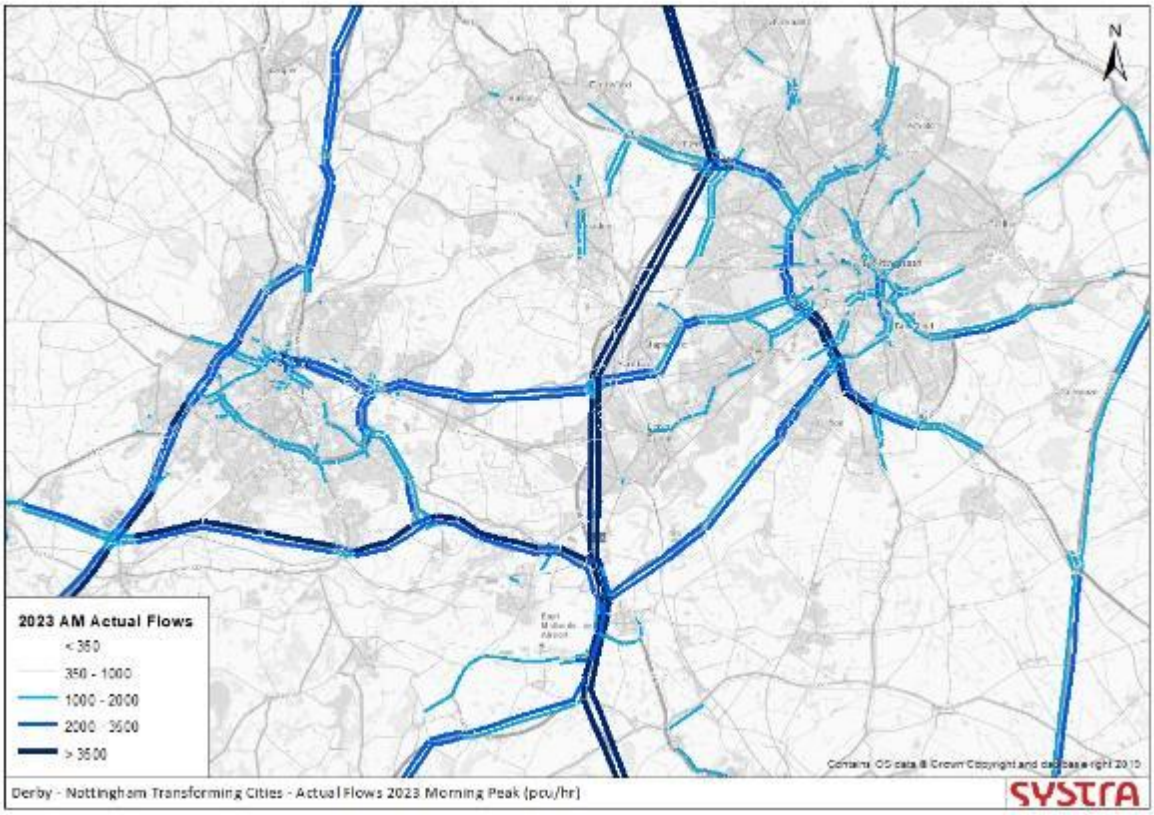


Figure 4. Actual Flows 2023 Evening Peak – Study Area

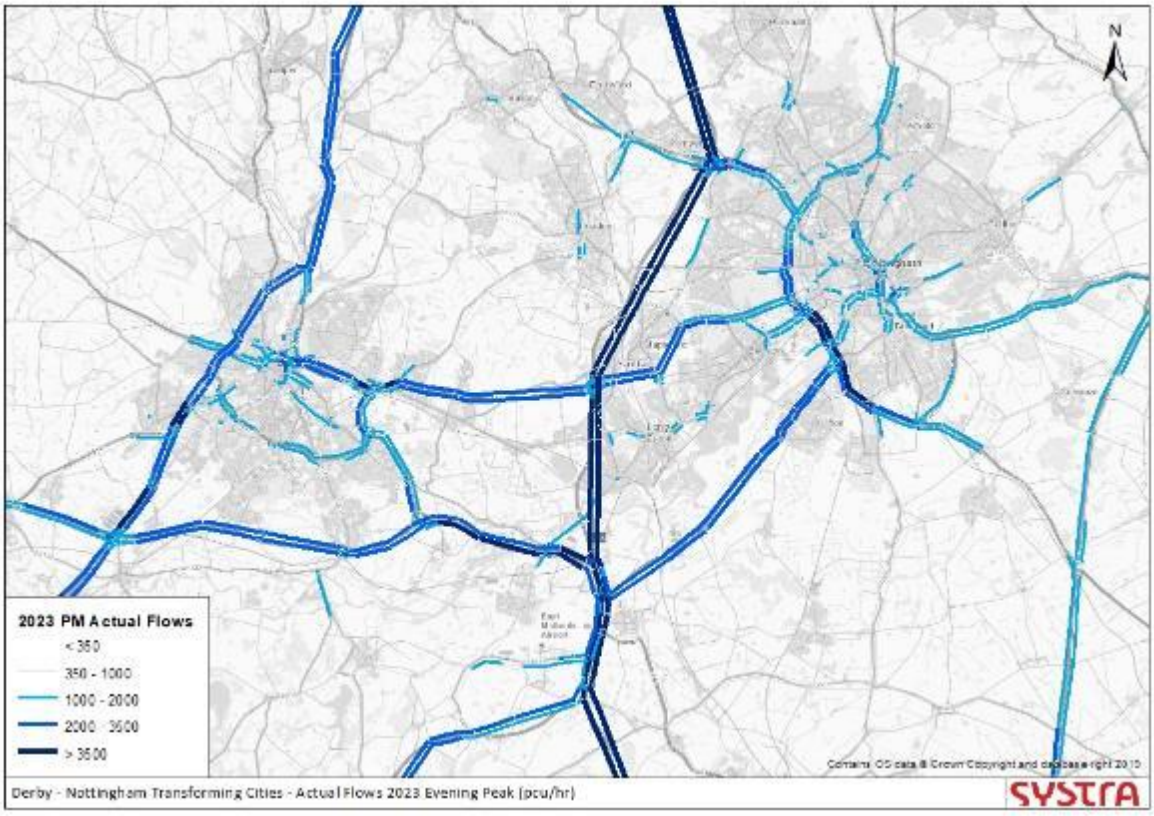


Figure 5. Actual Flows 2043 Morning Peak – Study Area

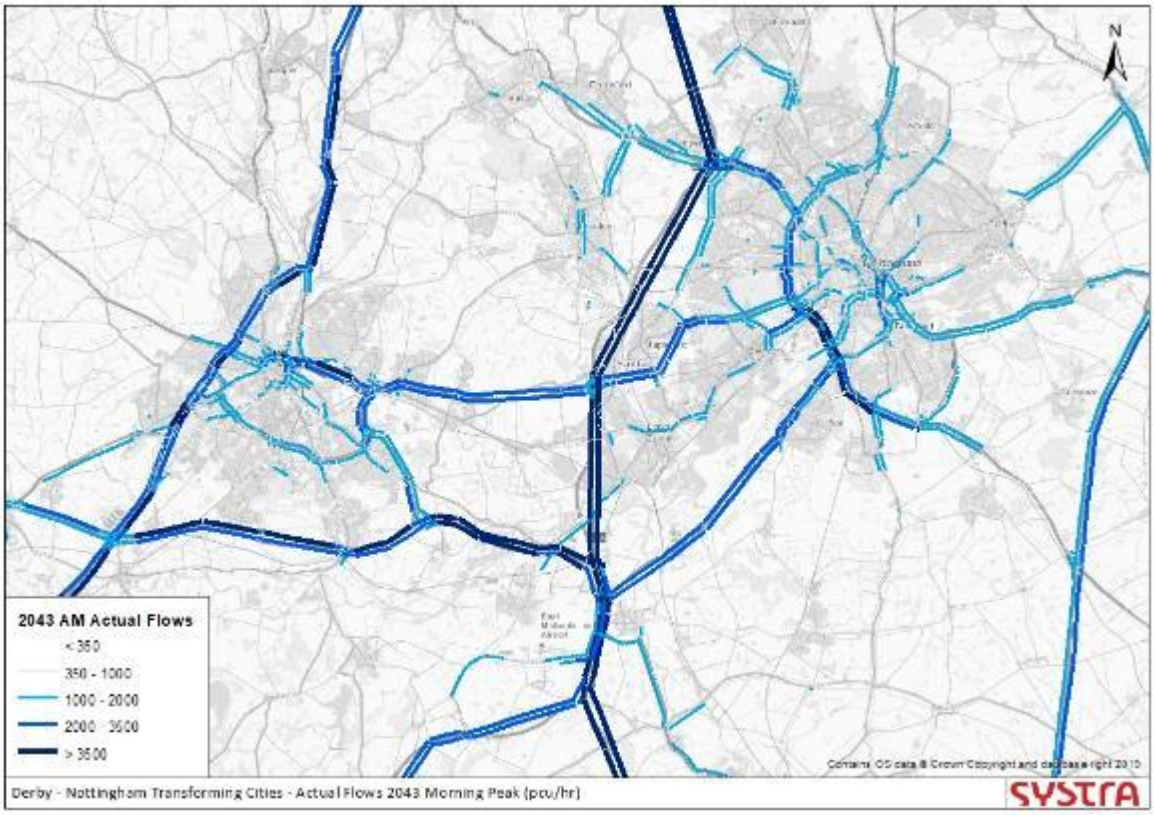
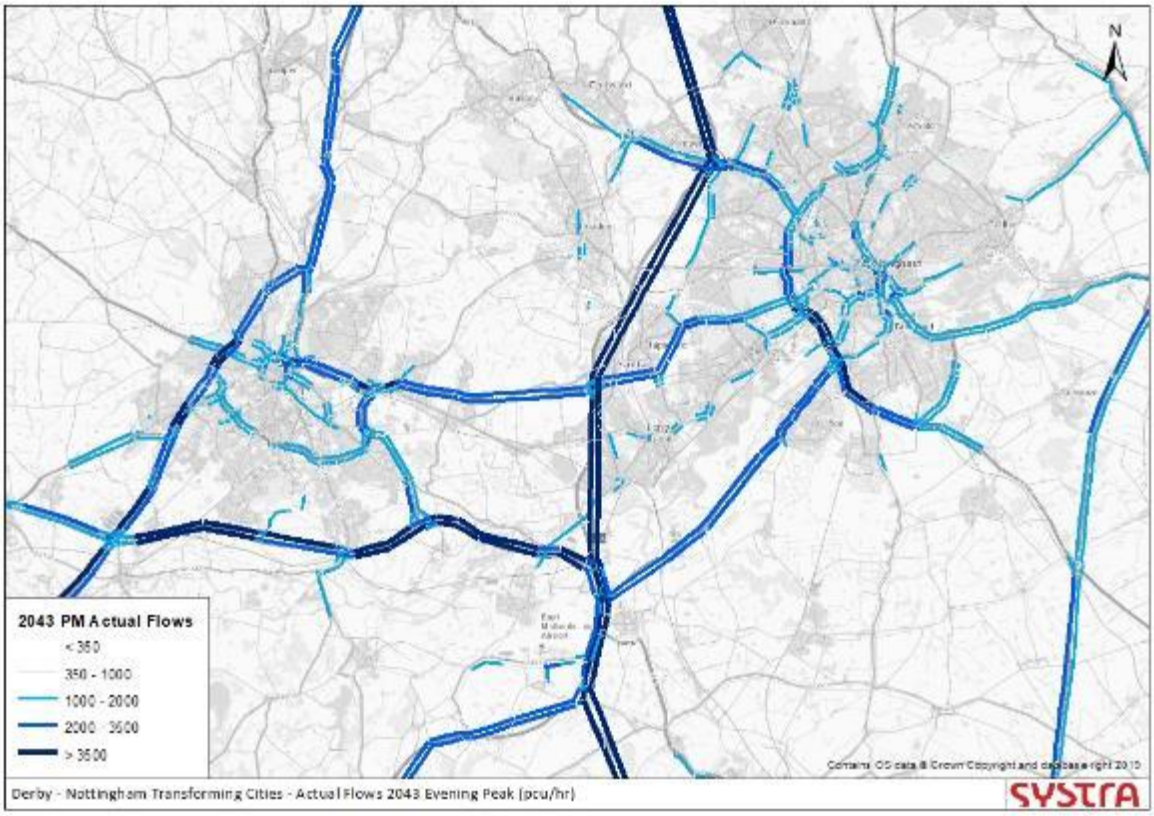


Figure 6. Actual Flows 2043 Evening Peak – Study Area



Junction Congestion

5.2.3 Figure 7 to Figure 10 show junction congestion in 2023 and 2043. Junction congestion is measured using a ratio of volume to capacity, expressed as a percentage. A V/C ratio of 85% is considered to be the operational capacity of a junction, as delays and queues are likely to be observed when this threshold is crossed. Therefore, a junction can be thought to be approaching capacity at 75% V/C, and at 100% or greater a junction is operating beyond its capacity.

5.2.4 Junction congestion is directly affected by the growth in demand. There are many more junctions over 75% capacity in 2043 than in 2023. The large number of junctions which are approaching capacity or over capacity in 2023 and 2043 illustrates the results of considerable growth from the current day already congested networks in the area.

5.2.5 While there is widespread congestion throughout the area, there are no particular areas that have substantially more congestion or less than any other area.

Figure 7. Junction Congestion 2023 Morning Peak – Study Area

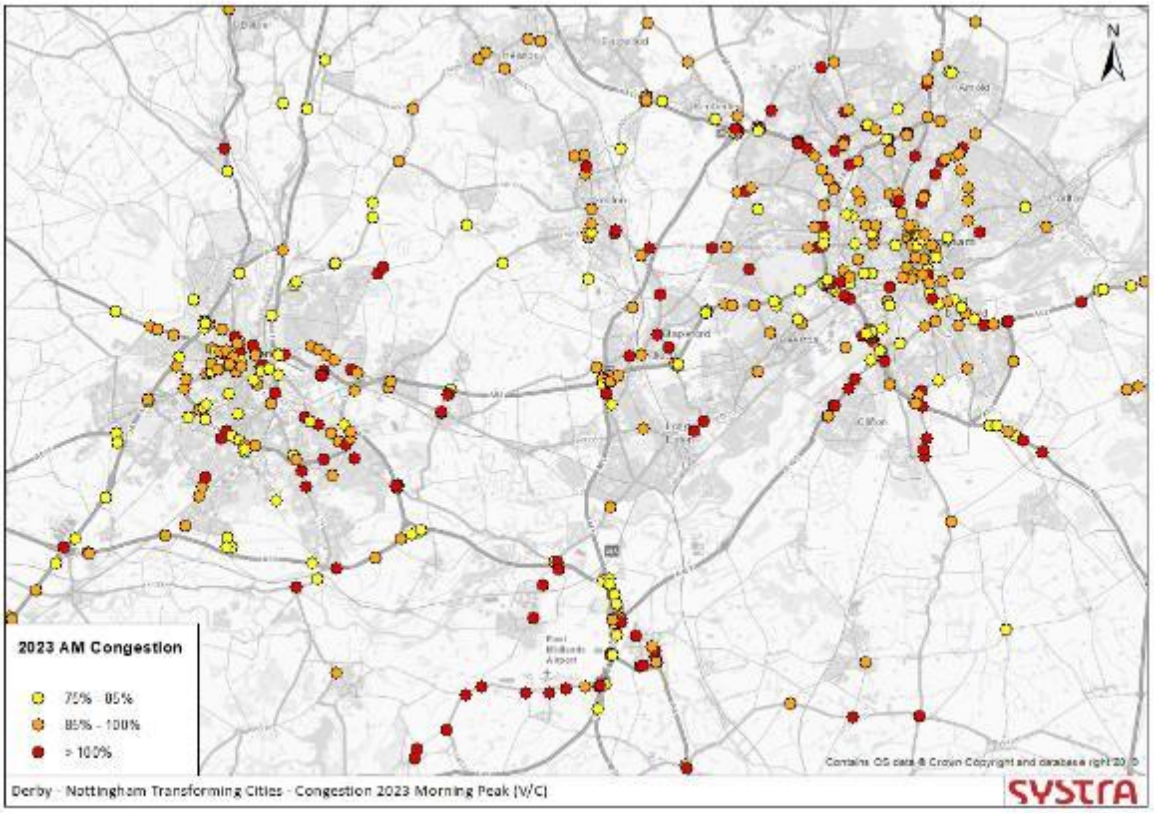


Figure 8. Junction Congestion 2023 Evening Peak – Study Area

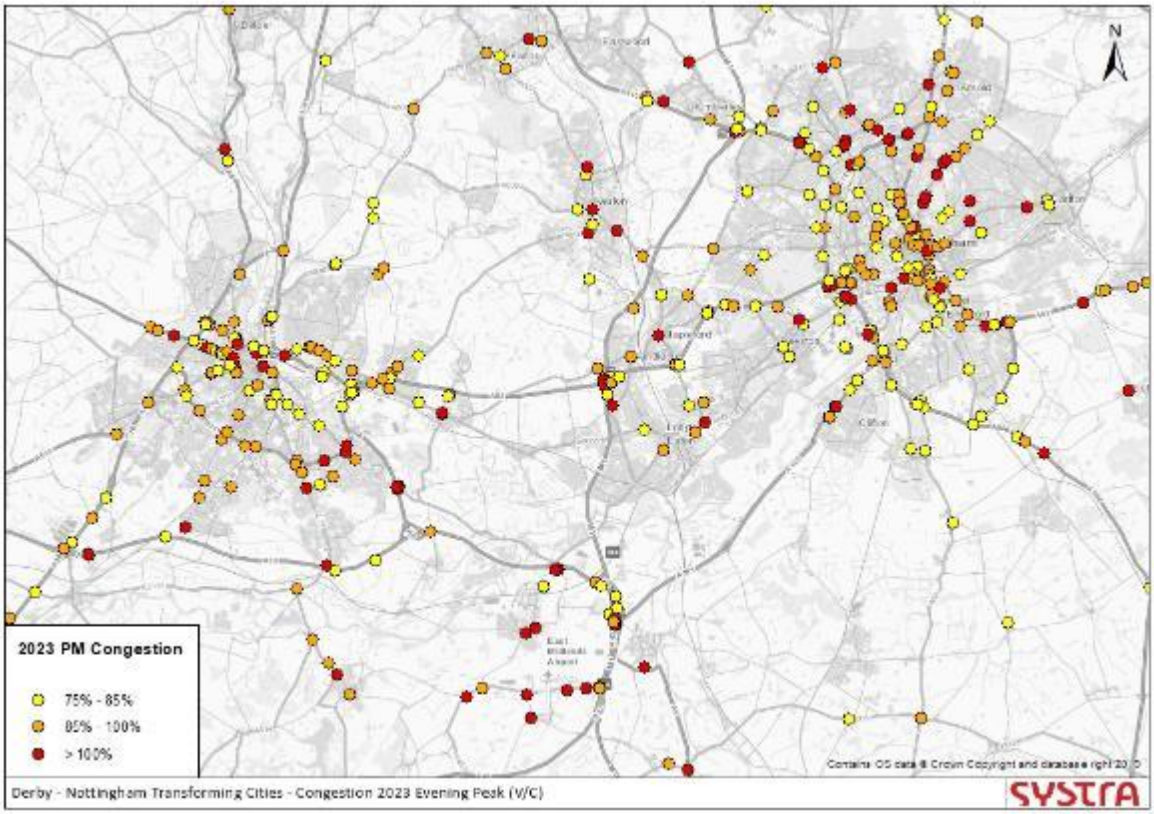


Figure 9. Junction Congestion 2043 Morning Peak – Study Area

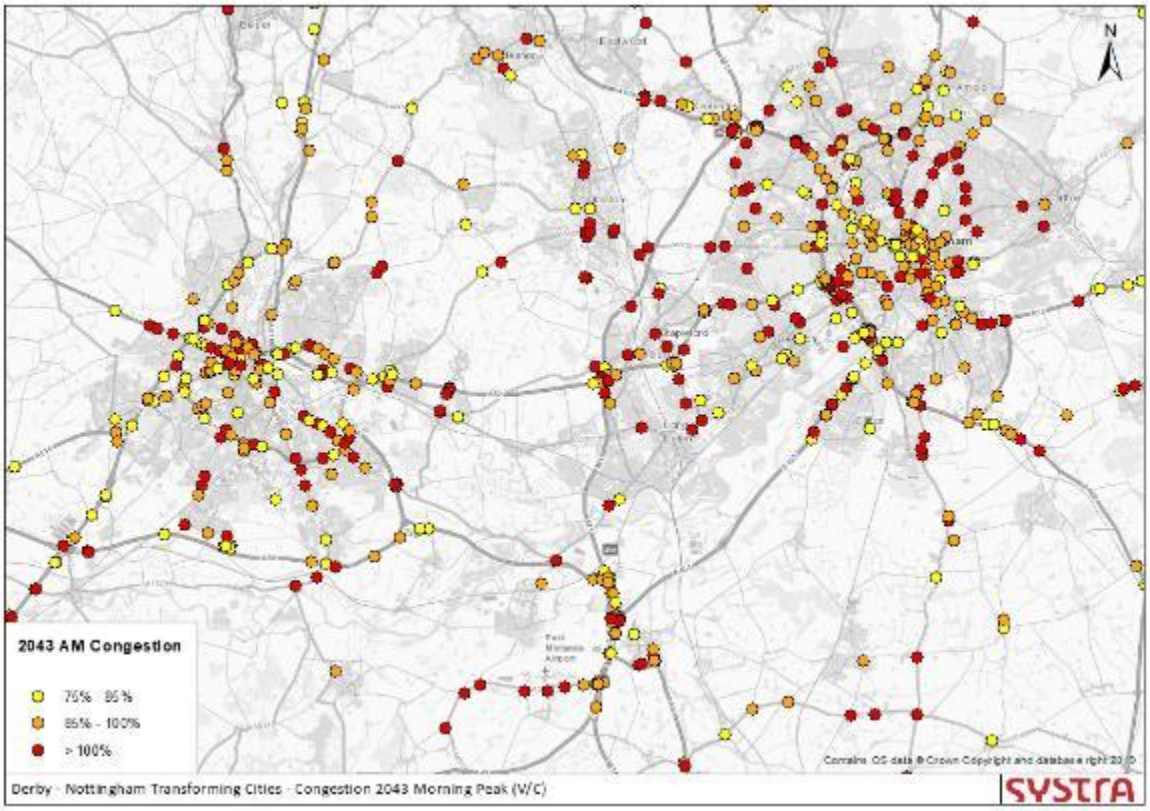
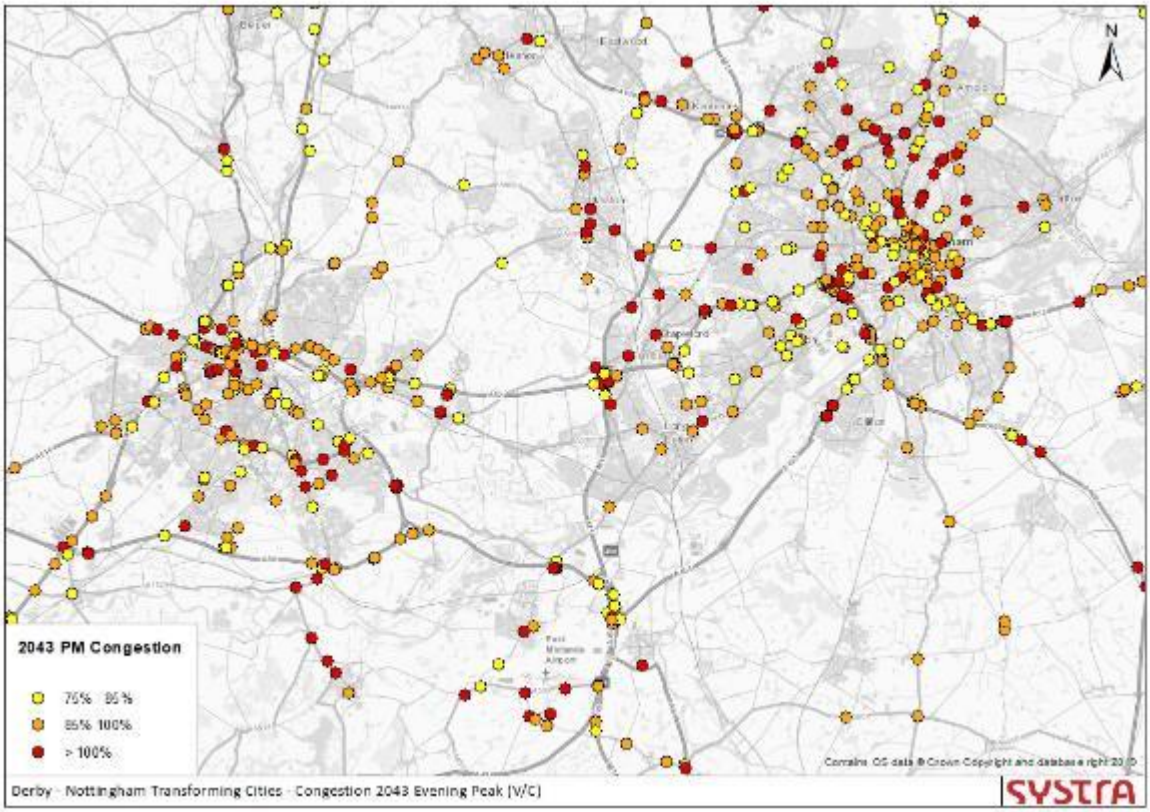


Figure 10. Junction Congestion 2043 Evening Peak – Study Area



6. CONCLUSION

6.1.1 This report describes the methodology used to develop the East Midlands Gateway Reference Case models and the results of the forecasting. It contains the key modelling assumptions, infrastructure schemes and land use assumptions used to forecast the 2016 base model to the following future year Reference Cases:

- 2023 – Year of Opening of the Transforming Cities Schemes.
- 2043 – 20 year Forecast Horizon.

6.1.2 Committed developments expected to be completed or under construction in 2023 and 2043 have been included in the Reference Cases. Residential developments over 250 dwellings (or equivalent generations for non-residential developments) have been specifically modelled and other developments are accounted for through the application of TEMPRO growth assumptions. Growth associated with East Midlands airport is not constrained to TEMPRO and has been derived following a meeting with East Midlands.

6.1.3 Congestion at junctions is predicted to be widespread, as many junctions throughout the modelled area approaching or exceeding capacity by 2023, and this is worsened by increased growth in 2043.

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