TECHNICAL NOTE

2023 & 2043 REFERENCE CASE ANALYSIS

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1. INTRODUCTION

1.1.1 SYSTRA has been commissioned by ITP to create two new future year models within the East Midlands Gateway Model to assist with the Transforming Cities bid on behalf of Nottingham and Derby City Councils. This note details the transport network and land use assumptions made to create the 2023 and 2043 Reference Cases developed for use within the Transforming Cities project.

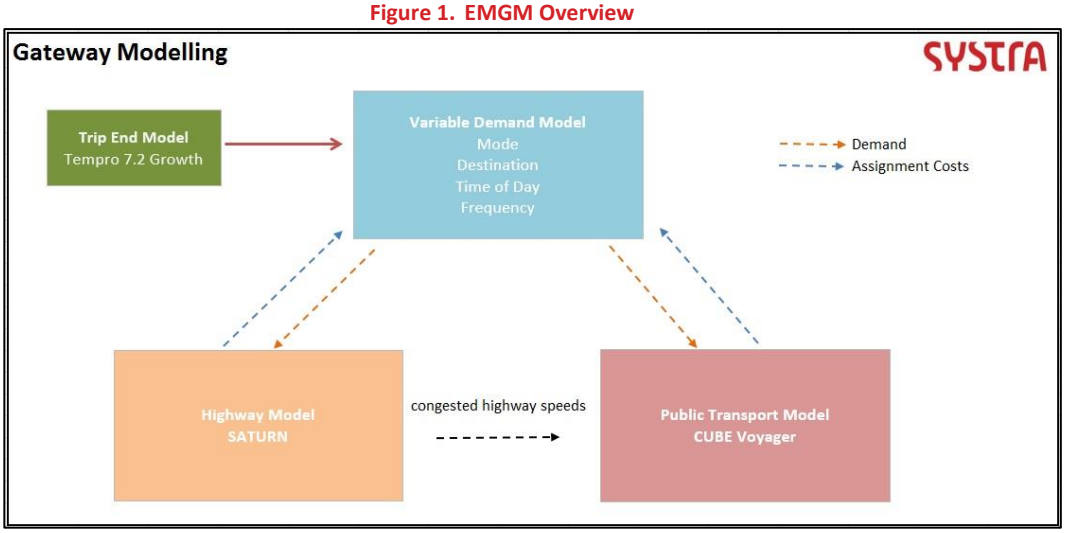
2. FORECASTING METHODOLOGY

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

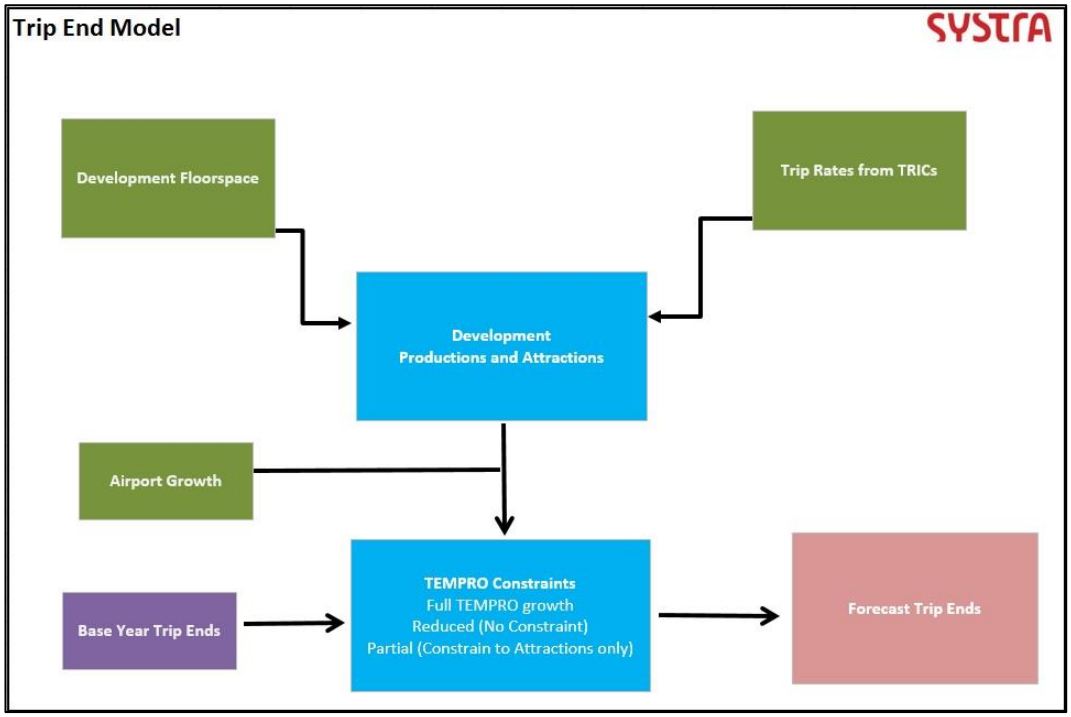


2.2 Forecast Demand and the Trip End Model

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 Mode



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 Values of Time – 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

2.4 Values of Time and Vehicle Operating Costs – Highway Model

2.4.1 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

2.5 Public Transport Fares

2.5.1 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 those transport infrastructure schemes and developments which are included within the 2023 reference case.

3.2 Committed Infrastructure

3.2.1 For the 2023 reference case it was assumed that the infrastructure agreed with the relevant local councils for the 2033 forecast year would be appropriate.

3.2.2 Any infrastructure associated with the implementation of HS2 at the proposed East Midlands Toton station was removed.

3.2.3 A wide variety of infrastructure projects are scheduled to be completed between the EMGM 2016 base year and the 2033 forecast year. The following transport schemes have been represented in the 2023 network:

- 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:

    - duelling 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 Committed Development for the 2023 reference case are derived from the 2026 forecast year previously created in EMGM, they are listed in Table 4.

Table 4. 2026/2023 Site Specific Developments

Development	District	Development type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Cinderhill	Amber Valley	Residential	750				
Coppice Farm	Amber Valley	Residential	180				
Kedleston Road, Quarndon	Amber Valley	Residential	200				
Land south of Mansfield Rd / North of A38	Amber Valley	Residential	220				
Lily Street Farm, Derby Road, Swanwick	Amber Valley	Mixed	300		72	144	144
Phase 1 Radbourne Lane	Amber Valley	Residential	265				
Phase 2 Radbourne Lane	Amber Valley	Residential	300				
Ripley	Amber Valley	Residential	500				
Stanton Regeneration Site	Amber Valley	Mixed	500		161	100	210
West of Quarry Hill Road	Amber Valley	Residential	175				
Alfreton Road	Ashfield	Residential	202				
Beck Lane	Ashfield	Residential	200				
Blenhelm Lane	Ashfield	Mixed			64	48	48
Butlers Hill	Ashfield	Mixed			30	30	
Castlewood Business Park	Ashfield	Mixed			167	125	125
East of Sutton Parkway	Ashfield	Residential	248				
Mowlands	Ashfield	Residential	450				
Mowlands	Ashfield	Residential			113		
Newark Road	Ashfield	Residential	133				
North of Kingsmill Hospital	Ashfield	Residential	125				
Oddicroft Lane	Ashfield	Employment					134
Pinxton Lane	Ashfield	Mixed			63	47	47
Rolls Royce	Ashfield	Mixed	450		235	176	176
South of Broomhill Farm	Ashfield	Residential	240				
Summit Park	Ashfield	Mixed			195	146	146
Welshcroft Close	Ashfield	Employment				43	43
West of Fulwood	Ashfield	Employment				60	60
Awsworth	Broxtowe	Residential	175				
Boots Site	Broxtowe	Mixed	275		500		
Bramcote, E of Coventry Lane	Broxtowe	Residential	150				

Development	District	Development type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Chetwynd Barracks	Broxtowe	Residential	400				
Eastwood	Broxtowe	Residential	625				
Field Farm	Broxtowe	Residential	450				
Kimberley	Broxtowe	Residential	300				
Stapleford, W of Coventry Lane	Broxtowe	Residential	120				
Garendon Park, Loughborough	Charnwood	Mixed	1600		75	150	150
Loughborough, Science Park	Charnwood	Residential			1250		
North East of Leicester	Charnwood	Mixed	2250		65	130	130
North of Birstall (Broadnook)	Charnwood	Mixed	825		150	300	300
Watermead	Charnwood	Mixed			63	119	119
Boulton Moor/Snelsmoor Grange	Derby City	Residential	800				
Brook Farm Chaddesden (Derby City)	Derby City	Residential	275				
Castleward	Derby City	Residential	800				
Chaddesden Sidings (South)	Derby City	Mixed			390	93	186
Chaddesden Sidings (West)	Derby City	Employment				130	130
Chellaston Business Park/Infinity Park	Derby City	Mixed			25	420	922
Derby Royal Infirmary	Derby City	Residential	400				
Friar Gate Goods Yard	Derby City	Residential		250			
Hackwood Farm (Derby City)	Derby City	Residential	410				
Infinity Park Extension	Derby City	Mixed			50	300	
Innovation Centre	Derby City	Residential			25		
Manor/Kingsway Hospitals	Derby City	Residential	700		200		
Nightingale Works	Derby City	Residential	400				
Raynesway/Derby Commercial Park	Derby City	Employment				1630	1630
Rykneld Road (Heatherton Extn)	Derby City	Residential	900				
Rykneld Road (Heatherton Extn)	Derby City	Residential			70		
Tesco Allenton	Derby City	Residential		179			
Various City Centre	Derby City	Residential	750				
Bestwood Village	Gedling	Residential	123				
Gedling Colliery	Gedling	Mixed	525		60	45	45
H16 Park Road, Calverton	Gedling	Residential	390				

Development	District	Development type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Howbeck Road	Gedling	Residential	205				
North of Papplewick Lane	Gedling	Residential	300				
Ravenshead	Gedling	Residential	330				
Stockings Farm	Gedling	Residential	170				
Teal Close	Gedling	Mixed	415		23	68	
Top Wighay Farm	Gedling	Mixed	750		128		85
Westhouse Farm	Gedling	Residential	210				
Portland Gateway	Mansfield	Mixed			397	325	
Radmanthwaite Road	Mansfield	Residential	188				
Ratcher Hill Quarry	Mansfield	Mixed			21	16	16
Riverside	Mansfield	Mixed			54	44	
Sherwood Oaks	Mansfield	Mixed			27	20	20
Bardon Grange, Coalville	North West Leicestershire	Residential	208				
Bosworth Road, Measham	North West Leicestershire	Residential	180				
Burton Road/Moira Road Ashby	North West Leicestershire	Residential	275				
Castle Donington	North West Leicestershire	Residential	501				
East Midlands Distribution Centre	North West Leicestershire	Employment					505
Holywell Spring Farm Ashby	North West Leicestershire	Residential	400				
Land at Money Hill Ashby	North West Leicestershire	Mixed			80	160	160
Money Hill (Phase 1) Ashby	North West Leicestershire	Residential	284				
Money Hill (Phase 2) Ashby	North West Leicestershire	Residential	588				
Pegasus Extension	North West Leicestershire	Mixed			544		360
South East Coalville	North West Leicestershire	Residential	702				
Standard Hill Coalville	North West Leicestershire	Residential	280				
Boots Site	Nottingham City	Residential	275		500		
Chalfont Drive	Nottingham City	Residential	238				
Clifton West	Nottingham City	Residential	143				
Eastside Extended Island Site	Nottingham City	Residential	875				
Forest Mills	Nottingham City	Residential	150				
Former Padstow School Site Gainsford Crescent	Nottingham City	Residential	136				
Hicking Pentecost South Site Queens Road	Nottingham City	Residential	175				
Medipark	Nottingham City	Residential			199		

Development	District	Development type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Sovereign House Sheriffs Way	Nottingham City	Residential	127				
Stanton Tip	Nottingham City	Mixed	250		40	30	30
Thomas Foreman Site	Nottingham City	Residential	162				
Waterside	Nottingham City	Mixed	1500		300	225	225
Clifton South	Rushcliffe	Mixed	990		132	99	99
Cotgrave	Rushcliffe	Mixed	470		90	68	68
East Leake	Rushcliffe	Residential	1060				
Edwalton	Rushcliffe	Residential	750				
Edwalton	Rushcliffe	Residential	750		45		
Gamston	Rushcliffe	Mixed	1000		100	75	75
Keyworth	Rushcliffe	Residential	450				
North of Bingham	Rushcliffe	Mixed	500		155	116	116
Radcliffe on Trent	Rushcliffe	Residential	900				
RAF Newton	Rushcliffe	Mixed	275		65	49	49
Ruddington	Rushcliffe	Residential	250				
Boulton Moor Phase 1	South Derbyshire	Residential	1058				
Boulton Moor Phase 2	South Derbyshire	Residential	700				
Boulton Moor Phase 3	South Derbyshire	Residential	190				
Broomy Farm	South Derbyshire	Residential	200				
Chellaston Fields	South Derbyshire	Residential	250				
Church Street, Church Gresley	South Derbyshire	Residential	200				
Drakelow Power Station	South Derbyshire	Mixed	1100		60	120	120
Highfield Farm	South Derbyshire	Residential	491				
Land at Hackwood Farm (South Derbyshire)	South Derbyshire	Residential	145				
Land at Swadlincote Lane, Church Gresley	South Derbyshire	Mixed			15	30	30
Land NE of Hatton	South Derbyshire	Residential	200				
Land North of Dove Valley Business Park	South Derbyshire	Mixed			142	283	283
Land off The Mease, Hilton	South Derbyshire	Mixed	243		35	70	70
Land South of Cadley Hill	South Derbyshire	Mixed			25	50	50
Land South of Sinfin Moor/Infinity Park	South Derbyshire	Mixed			15	15	120
Land West of Mickleover Phase 1 (Newhouse Farm)	South Derbyshire	Residential	150				

Development	District	Development type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Land West of Mickleover Phase 2	South Derbyshire	Residential	126				
Land West of Mickleover Phase 3	South Derbyshire	Residential	550				
North of William Nadin Way	South Derbyshire	Residential	285				
Primula Way	South Derbyshire	Residential	183				
Swarkestone Road	South Derbyshire	Residential	250				
Woodville Regeneration Area	South Derbyshire	Mixed	75		60	120	120
Wragley Way (South Derbyshire)	South Derbyshire	Residential	644				

3.4 2023 East Midlands Airport Growth

3.4.1 SYSTRA has previously undertaken meetings 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. Such data has been provided for the 2026, 2033 and 2048 forecast periods.

3.4.2 The 2023 Reference case utilises 2026 growth predictions for trips associated with East Midlands airport. Table 5 provides detailed growth predictions for trips associated with the airport zones for 2026. 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 5. East Midlands Airport (Total Person Trips)

TIME PERIOD	AIRPORT SITE	2048 GENERATIONS	
		In	Out
AM Peak (0800-0900)	Main Airport (central)	2013	636
	DHL Freight (Western)	671	212
	Pegasus	656	147
Interpeak (av 1100-1400)	Main Airport (central)	1223	743
	DHL Freight (Western)	408	248
	Pegasus	148	183
PM Peak (1700-1800)	Main Airport (central)	1160	1342
	DHL Freight (Western)	387	447
	Pegasus	167	526

4. 2043 REFERENCE CASE

4.1 Overview

4.1.1 This chapter summarises those transport infrastructure schemes and developments which are included within the 2043 reference case.

4.2 Committed Infrastructure

4.2.1 Committed infrastructure within the 2043 forecast year remains unaltered from the 2023 reference case.

4.3 Committed Developments

4.3.1 Committed Developments for the 2043 model are based on those expected to be present by 2048, details can be found in Table 6.

Table 6. 2048/2043 Site Specific Developments

Development	District	Development Type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
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		14420	28840	28840
Kedleston Road, Quarndon	Amber Valley	Residential	400				
Cinderhill	Amber Valley	Residential	3000				
Ripley	Amber Valley	Residential	1000				
Stanton Regeneration Site	Amber Valley	Mixed	2000		64500	40000	84000
West of Quarry Hill Road	Amber Valley	Residential	350				
Rolls Royce	Ashfield	Mixed	900		47000	35250	35250
South of Broomhill Farm	Ashfield	Residential	480				
North of Kingsmill Hospital	Ashfield	Residential	250				
Butlers Hill	Ashfield	Employment			5950	5950	
Blenhelm Lane	Ashfield	Employment			12800	9600	9600
West of Fulwood	Ashfield	Employment				12000	12000
Summit Park	Ashfield	Employment			38960	29220	29220
Welshcroft Close	Ashfield	Employment				8500	8500
Oddicroft Lane	Ashfield	Employment					26850
Castlewood Business Park	Ashfield	Employment			33340	25005	25005
Pinxton Lane	Ashfield	Employment			12600	9450	9450
Mowlands	Ashfield	Mixed	900		22500		
Newark Road	Ashfield	Residential	266				
Beck Lane	Ashfield	Residential	400				
Alfreton Road	Ashfield	Residential	403				
East of Sutton Parkway	Ashfield	Residential	495				
Boots Site	Broxtowe	Mixed	550		100000		
Field Farm	Broxtowe	Residential	450				
Awsworth	Broxtowe	Residential	350				

Development	District	Development Type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Eastwood	Broxtowe	Residential	1250				
Kimberley	Broxtowe	Residential	600				
Chetwynd Barracks	Broxtowe	Residential	1000				
Bramcote, E of Coventry Lane	Broxtowe	Residential	300				
Stapleford, W of Coventry Lane	Broxtowe	Residential	240				
Innovation Campus	Broxtowe	Residential	950				
Loughborough, Science Park	Charnwood	Employment			175000		
Garendon Park, Loughborough	Charnwood	Mixed	2048		9600	19200	19200
North East of Leicester	Charnwood	Mixed	3375		9750	19500	19500
North of Birstall (Broadnook)	Charnwood	Mixed	1634		29700	59400	59400
Watermead	Charnwood	Employment			12500	23750	23750
West Shepshed	Charnwood	Residential	892				
Rykneld Road (Heatherton Extn)	Derby City	Mixed	600		7000		
Chaddesden Sidings (South)	Derby City	Employment			39016	9290	18580
Derby Royal Infirmary	Derby City	Residential	400				
Chaddesden Sidings (West)	Derby City	Employment				13000	13000
Raynesway/Derby Commercial Park	Derby City	Employment				59000	59000
Manor/Kingsway Hospitals	Derby City	Mixed	400		20000		
Innovation Centre	Derby City	Employment			2500		
Chellaston Business Park/Infinity Park	Derby City	Employment			2500	42013	92160
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			5000	45000	
Various City Centre	Derby City	Residential	750				
Castleward	Derby City	Residential	800				
Friar Gate Goods Yard	Derby City	Residential	500				
Tesco Allenton	Derby City	Employment		17902			
Wragley Way (Derby City)	Derby City	Residential	180				
Boulton Moor/Snelsmoor Grange	Derby City	Residential	800				
Stockings Farm	Gedling	Residential	339				

Development	District	Development Type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Teal Close	Gedling	Mixed	830		4500	13500	
Top Wighay Farm	Gedling	Mixed	1500		25500		17000
North of Papplewick Lane	Gedling	Residential	300				
Westhouse Farm	Gedling	Residential	210				
H16 Park Road, Calverton	Gedling	Residential	390				
Howbeck Road	Gedling	Residential	205				
Gedling Colliery	Gedling	Mixed	1050		12000	9000	9000
Bestwood Village	Gedling	Residential	245				
RAmber Valleyenshead	Gedling	Residential	330				
Radmanthwaite Road	Mansfield	Residential	375				
Ratcher Hill Quarry	Mansfield	Employment			4200	3150	3150
Sherwood Oaks	Mansfield	Employment			5400	4050	4050
Portland Gateway	Mansfield	Employment			79475	65025	
Riverside	Mansfield	Employment			10725	8775	
Bardon Grange, Coalville	North West Leicestershire	Residential	800				
East Midlands Distribution Centre	North West Leicestershire	Employment					100986
South East Coalville	North West Leicestershire	Residential	1565				
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	1022				
Land at Money Hill Ashby	North West Leicestershire	Employment			16000	32000	32000
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				
Bosworth Road, Measham	North West Leicestershire	Residential	300				
EMG SRFI	North West Leicestershire	Employment					
East Midlands Airport (Main)	North West Leicestershire	Employment					
East Midlands Airport (DHL)	North West Leicestershire	Employment					
Pegasus Extension	North West Leicestershire	Employment			54400		36000
East Midlands Airport (Pegasus)	North West Leicestershire	Employment					

Development	District	Development Type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Chalfont Drive	Nottingham City	Residential	475				
Former Padstow School Site Gainsford Crescent	Nottingham City	Residential	272				
Eastside Extended Island Site	Nottingham City	Residential	1750				
Hicking Pentecost South Site Queens Road	Nottingham City	Residential	350				
Sovereign House Sheriffs Way	Nottingham City	Residential	253				
Stanton Tip	Nottingham City	Mixed	500		8000	6000	6000
Clifton West	Nottingham City	Residential	285				
Waterside	Nottingham City	Mixed	3000		60000	45000	45000
Boots Site	Nottingham City	Mixed	600		100000		
Thomas Foreman Site	Nottingham City	Residential	323				
Forest Mills	Nottingham City	Residential	300				
Medipark	Nottingham City	Employment			39753		
Nottingham Skills Hub	Nottingham City	Employment					
Edwalton	Rushcliffe	Mixed	750		4500		
Edwalton	Rushcliffe	Residential	750				
CotgrAmber Valleye	Rushcliffe	Mixed	470		18000	13500	13500
North of Bingham	Rushcliffe	Mixed	1000		31000	23250	23250
RAF Newton	Rushcliffe	Mixed	550		13000	9750	9750
Clifton South	Rushcliffe	Mixed	370		20000	15000	15000
Gamston	Rushcliffe	Mixed	4000		40000	30000	30000
East Leake	Rushcliffe	Residential	1200				
Keyworth	Rushcliffe	Residential	450				
Radcliffe on Trent	Rushcliffe	Residential	400				
Ruddington	Rushcliffe	Residential	250				
Wragley Way (South Derbyshire)	South Derbyshire	Residential	1950				
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 (South Derbyshire)	South Derbyshire	Residential	290				
Land South of Sinfin Moor/Infinity Park	South Derbyshire	Employment			3000	3000	24000
Primula Way	South Derbyshire	Residential	366				

Development	District	Development Type	Residential	Food Retail	B1 (sqm)	B2 (sqm)	B8 (sqm)
Chellaston Fields	South Derbyshire	Residential	500				
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	1100				
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		7000	14000	14000
Woodville Regeneration Area	South Derbyshire	Mixed	150		12000	24000	24000
Land North of Dove Valley Business Park	South Derbyshire	Employment			28300	56600	56600
Land South of Cadley Hill	South Derbyshire	Employment			5000	10000	10000
Highfield Farm	South Derbyshire	Residential	800				
Drakelow Power Station	South Derbyshire	Mixed	2200		12000	24000	24000
Swarkestone Road	South Derbyshire	Residential	450				
Land at Swadlincote Lane, Church Gresley	South Derbyshire	Employment			3000	6000	6000

4.4 2043 East Midlands Airport Growth

4.4.1 The 2043 Reference case utilises 2048 growth predictions for trips associated with East Midlands airport. Table 7 provides detailed growth predictions for trips associated with the airport zones for 2048. 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 (Total Person Trips)

TIME PERIOD	AIRPORT SITE	2048 GENERATIONS	
		In	Out
AM Peak (0800-0900)	Main Airport (central)	3,292	1,176
	DHL Freight (Western)	1,306	337
	Pegasus	656	147
Interpeak (av 1100-1400)	Main Airport (central)	1,423	1,469
	DHL Freight (Western)	411	451
	Pegasus	148	183
PM Peak (1700-1800)	Main Airport (central)	1,167	2,884
	DHL Freight (Western)	386	1,178
	Pegasus	167	526

5. DATA OUTPUTS

5.1 Flow Data

5.1.1 Flow data for both highway and PT are presented in Shapefiles located in Appendix 1. The shapefiles contain data as listed in Tables 8-10.

Table 8. Data Specification

DATA	UNIT
A Node	
B Node	
Distance	Kilometres
Link Type	See Table 9
Passenger Flows	People
Walk Flow	People
Actual Flow UC 1-7	PCU's - See Table 10 for user class definition.
Bus fixed highway flows	PCU's
Total Actual Flow	PCU's

Table 9. Link Type Definition

LINK TYPE	DEFINITION
0	Walk Only Links
1	Highway Links
2	SRN Links
101	Rail Links

LINK TYPE	DEFINITION
102	NET links
103	Walk Only Links
111	Rail access/egress
112	NET access/egress
121	Special zone to rail connectors

Table 10. User Class Classification

USER CLASS	TYPE
UC1	Car Commute (Without Workplace Parking Levy)
UC2	Car Commute (With Workplace Parking Levy)
UC3	Car Employers Business
UC4	Car Other
UC5	LGV
UC6	HGV
UC7	Taxi

5.2 Congestion

5.2.1 Volume over Capacity percentage plots for the AM, IP and PM periods are displayed in Figures 3 through 5 for 2023 and Figures 6 to 8 for 2043. Shapefiles are located in Appendix 2.

Figure 3. 2023 AM Volume over Capacity Plots

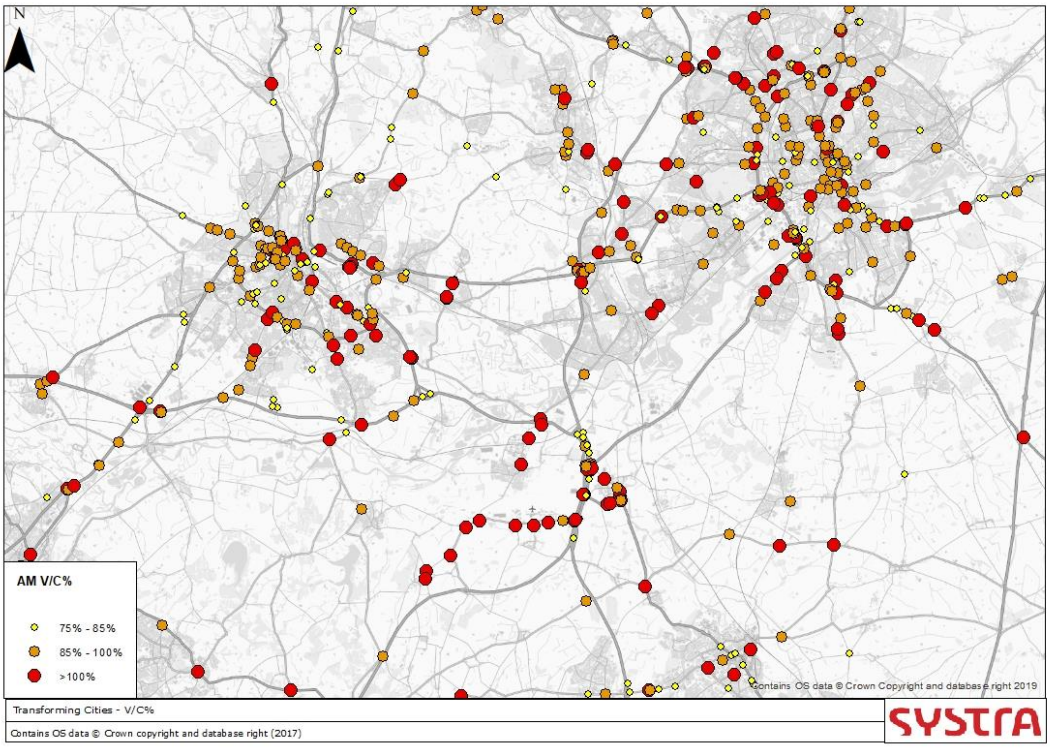


Figure 4. 2023 IP Volume over Capacity Plots

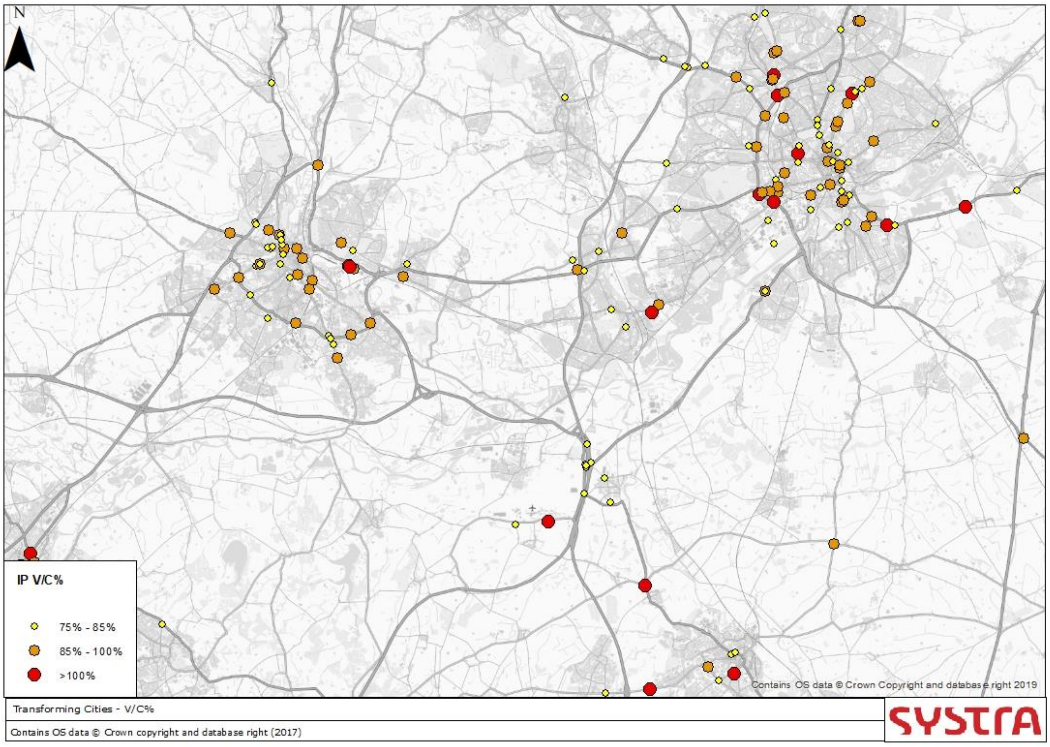


Figure 5. 2023 PM Volume over Capacity Plots

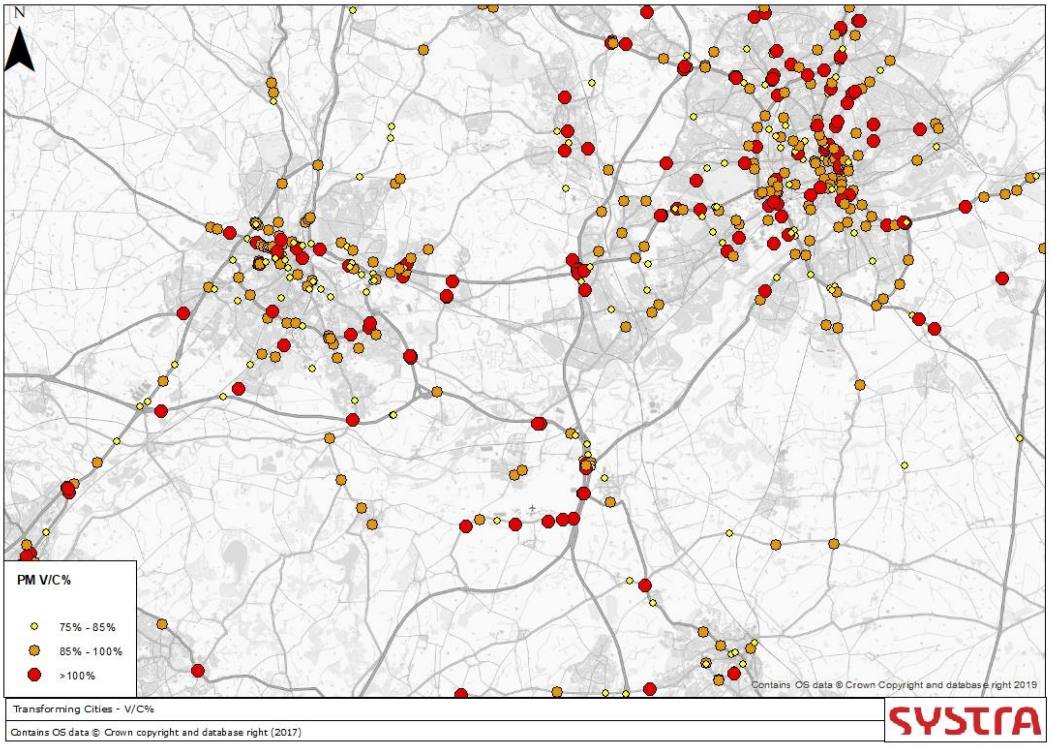


Figure 6. 2043 AM Volume over Capacity Plots

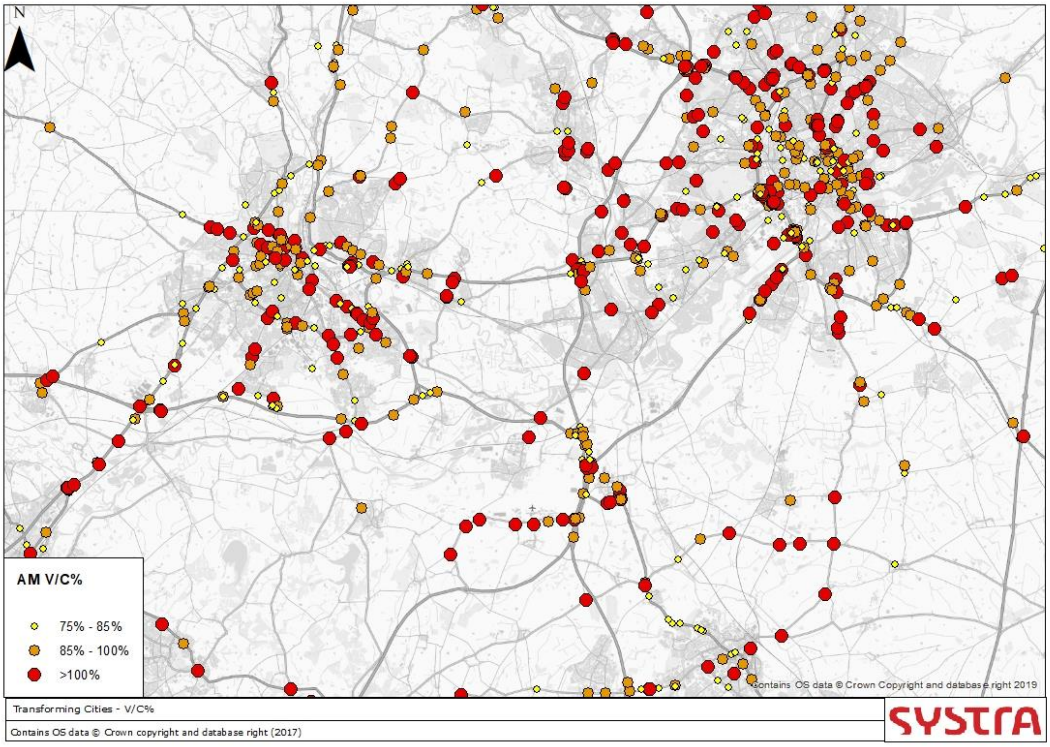


Figure 7. 2043 IP Volume over Capacity Plots

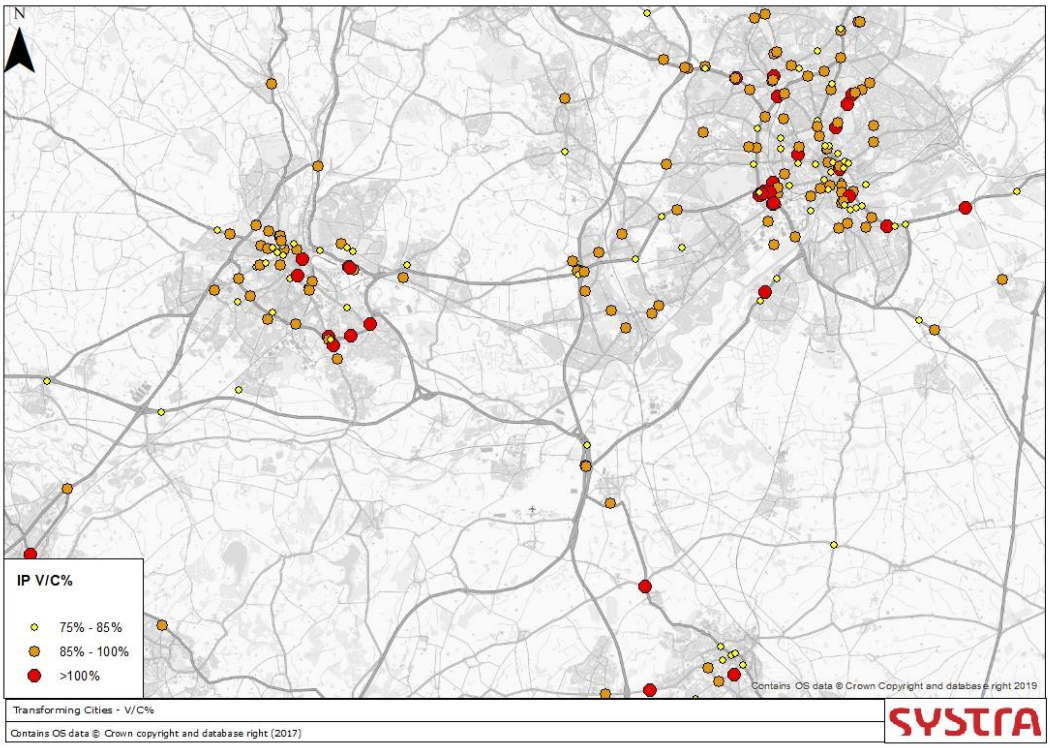
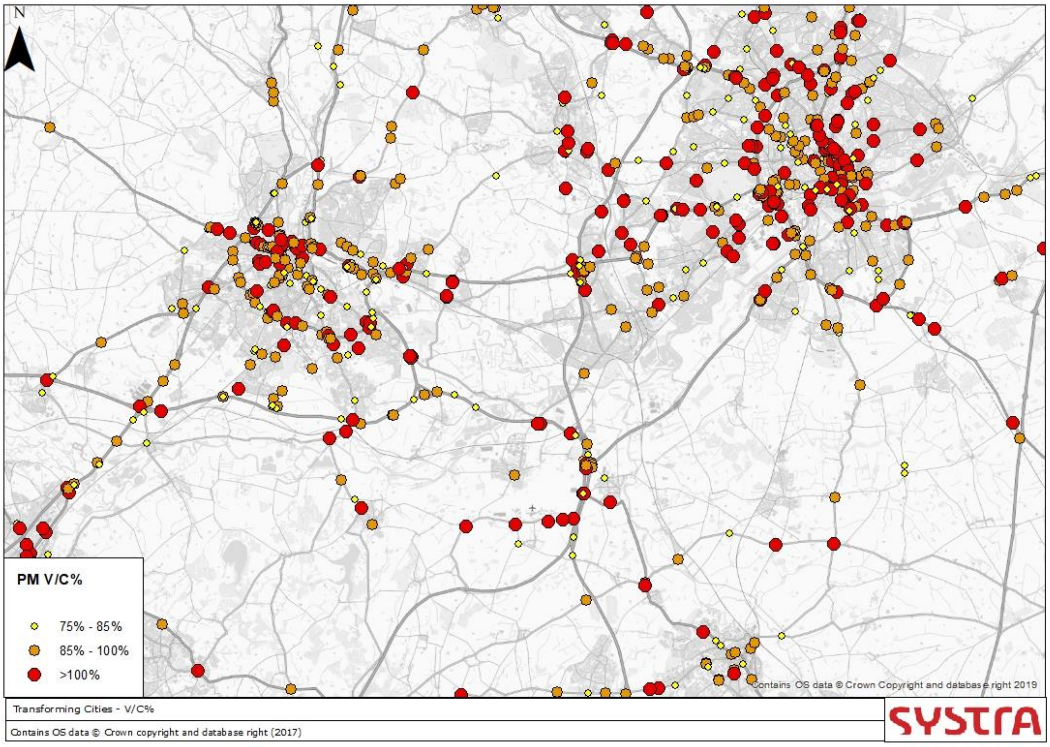


Figure 8. 2043 PM Volume over Capacity Plots



5.3 OD Matrices

Origin/Destination matrices for both the 2023 and 2043 Reference Cases are located in Appendix 3 .

5.4 Park And Ride Usage

5.4.1 Park and ride arrivals for the 2023 AM and IP periods are depicted in Tables 11 & 12. It is assumed that all users depart in the PM period.

Table 11. 2023 AM P&R Usage

SITE NUMBER	SITE NAME	ZONE NUMBER	ARRIVALS						
			PT Urban	PT External	PT Total	HY Urban	HY External	HY Total	PnR Total
1	Phoenix	191	39	32	71	154	137	290	362
2	The Forest	197	55	8	62	460	58	518	580
3	Queens Drive	189	13	45	58	87	89	176	233
4	Racecourse	200	11	32	43	140	93	233	275
5	Hucknall	436	23	27	50	33	143	176	226
6	Moor Bridge	201	25	18	42	56	86	141	184
7	Wilkinson St	192	4	0	4	47	2	50	54
8	Clifton	404	5	76	81	23	191	214	295
9	Beeston	338	35	23	58	141	126	267	325
10	Meteor	691	1	5	6	46	43	90	96
11	Pride Park	687	8	9	17	114	26	140	157
12	EAST MIDLANDS PARKWAY	1223	1	13	14	0	8	9	23

Table 12. 2023 IP P&R Usage

SITE NUMBER	SITE NAME	ZONE NO	ARRIVALS						
			PT Urban	PT External	PT Total	HY Urban	HY External	HY Total	PnR Total
1	Phoenix	191	7	11	19	14	24	38	56
2	The Forest	197	9	3	12	55	18	73	85
3	Queens Drive	189	2	18	20	16	20	36	56
4	Racecourse	200	2	7	9	18	27	44	53
5	Hucknall	436	3	8	11	6	38	45	56
6	Moor Bridge	201	2	5	7	7	25	32	39
7	Wilkinson St	192	1	0	1	4	0	5	5
8	Clifton	404	1	31	32	3	50	54	86
9	Beeston	338	15	13	28	17	47	64	91
10	Meteor	691	1	1	2	3	17	21	22
11	Pride Park	687	4	4	8	13	4	17	25
12	EAST MIDLANDS PARKWAY	1223	1	5	6	0	3	3	8

5.4.2 Park and ride arrivals for the AM and IP periods are depicted in Tables 13 & 14. It is assumed that all trips depart in the PM period.

Table 13. 2043 AM P&R Usage

SITE NUMBER	SITE NAME	ZONE NO	ARRIVALS						
			PT Urban	PT External	PT Total	HY Urban	HY External	HY Total	PnR Total
1	Phoenix	191	42	32	74	188	153	341	415
2	The Forest	197	53	6	60	486	55	541	600
3	Queens Drive	189	12	39	51	86	85	171	222
4	Racecourse	200	12	26	38	179	84	263	301
5	Hucknall	436	23	30	53	37	170	207	260
6	Moor Bridge	201	25	18	43	64	91	155	198
7	Wilkinson St	192	4	1	5	54	5	59	64
8	Clifton	404	5	87	92	25	303	329	421
9	Beeston	338	36	29	65	171	184	354	419
10	Meteor	691	1	5	6	46	46	92	98
11	Pride Park	687	5	8	13	110	26	135	148
12	EAST MIDLANDS PARKWAY	1223	2	15	16	1	14	15	31

Table 14. 2043 IP P&R Usage

SITE NUMBER	SITE NAME	ZONE NO	ARRIVALS						
			PT Urban	PT External	PT Total	HY Urban	HY External	HY Total	PnR Total
1	Phoenix	191	8	12	20	16	27	43	63
2	The Forest	197	10	4	13	60	20	81	94
3	Queens Drive	189	2	18	20	17	19	36	56
4	Racecourse	200	3	7	10	21	28	49	59
5	Hucknall	436	3	10	13	7	44	51	65
6	Moor Bridge	201	2	5	7	7	25	33	40
7	Wilkinson St	192	1	0	1	5	1	5	6
8	Clifton	404	1	36	37	4	67	70	108
9	Beeston	338	15	17	32	21	60	81	113
10	Meteor	691	1	1	2	4	18	22	23
11	Pride Park	687	4	4	8	14	5	18	26
12	EAST MIDLANDS PARKWAY	1223	1	4	5	0	2	2	7

APPROVAL					
Version	**Name**		**Position**	**Date**	**Modifications**
1	Author	Benjamin Lander	Consultant	27/09/2019	
	Approved by	Helen O'Mara	Associate	27/09/2019	
2	Author			DD/MM/YY	
	Checked by			DD/MM/YY	
	Approved by			DD/MM/YY	