

Appendix A Modelling assumptions

A.1 Reference Case growth

- A.1.1 It should be noted that the updated CBLTM Base Year is representative of June 2016.
- A.1.2 CBC have therefore provided housing growth assumptions between 2016/17 and 2034/35. These assumptions were derived from the following documents:
- Uncertainty Log – November 2017¹⁸:
 - The information provided in this document was used to identify the allocated dwelling growth between 2017/18 (Q3 & Q4) and 2024/2025 (for Forecast Year 2025) or 2034/35 (for Forecast Year 2035)
 - Only the ‘Complete’, ‘Site complete’, ‘Deliverable’ and ‘Developable’ sites were included. ‘Deliverable’ and ‘Developable’ sites are respectively associated with ‘Near Certain’ and ‘More than Likely’ likelihoods;
 - The ‘Uncertain’ sites at time of model development (i.e. 50 dwellings in HT034, 9 dwellings in HT105 and 81 dwellings in HT158) were excluded from the process;
 - Uncertainty Log – January 2017¹⁹: the information provided in this document was used to identify the dwellings effectively built in 2016/17 and 2017/18 (Q1 & Q2), by comparison to the information provided by the November 2017 Uncertainty Log;
 - Unallocated growth (i.e. small sites and windfall allowance) was identified in both versions of the Uncertainty Log:
 - 2016/17 and 2017/18 assumptions were derived from the January 2017 Uncertainty Log, while the 2018/19 to 2025/26 assumptions were derived from the November 2017 Uncertainty Log; and
 - In each year (or half-year), unallocated growth was applied the same geographic distribution as the respective allocated growth.
- A.1.3 CBC have also provided employment (i.e. job) growth assumptions between 2014 and 2035:
- Uncertainty Log – January 2017:
 - The information provided in this document was used to identify the allocated employment growth for 2014-21, 2014-26 and 2014-31;
 - At these sites, it was assumed that no employment growth happened between 2014 and 2016, and that no growth would happen between 2031 and 2035;
 - Linear growth was assumed between 2021 and 2031 in order to estimate the employment growth by 2025;
 - Unallocated non-B jobs were also identified:
 - 13,227 jobs between 2016-35 for a total job growth of 23,900 jobs²⁰ between 2016-35;
 - Linear growth was assumed between 2016 and 2035 in order to estimate the employment growth by 2025; and
 - In each period (i.e. 2016-25 and 2025-35), unallocated employment growth was applied the same geographic distribution as the respective housing growth.

¹⁸ Email from CBC, 13-Nov-17

¹⁹ Email from CBC, 02-Mar-17

²⁰ Email from CBC, 23-Feb-17

A.1.4 LBC²¹ have provided their Local Plan housing and employment growth assumptions between 2016 and 2031:

- For housing growth, only the 'Committed' and 'Local Plan' sites were included;
- For employment growth, linear growth was assumed between the expected start and finish years provided, in order to estimate employment growth by 2025; and
- TEMPro (NTEM v7.2) was used to estimate 2031-35 housing and employment growth factors, which were then applied to the identified 2016-31 housing and employment growth (with the exception of growth allocated to CBLTM development zones).

A.1.5 **App. Table 1** summarises the resulting committed housing and employment growth assumptions by authority (CBC / LBC) and Forecast Year (2025 / 2035). It should be noted that some of the growth has been allocated to specific CBLTM development zones (see §A.3 for further explanation).

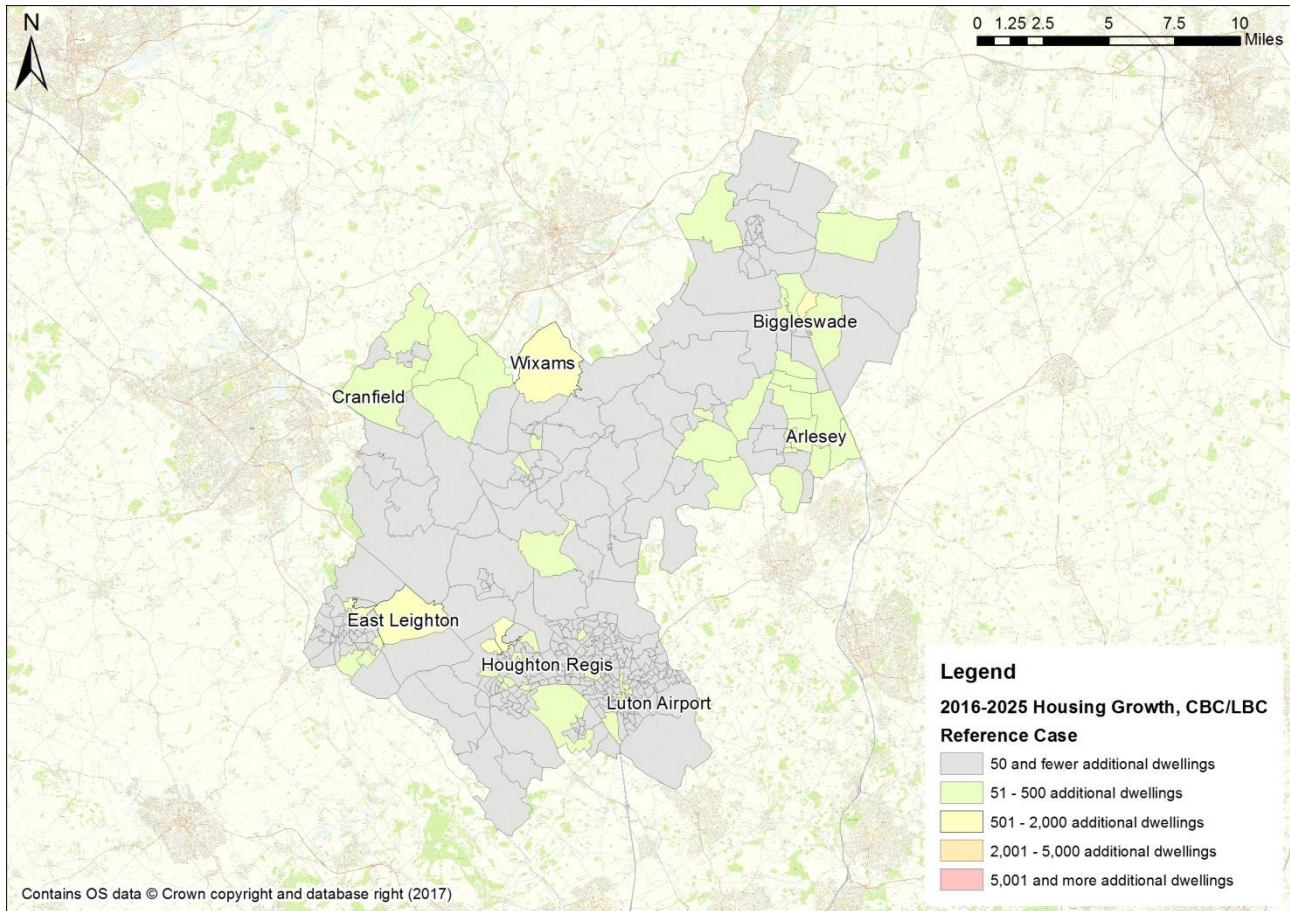
App. Table 1: Reference Case growth assumptions within CBC and LBC

Source	Data Type	Location	CBLTM dev. zone	2016-25 growth	2016-35 growth
Luton Borough (Local Plan growth)	Dwellings	Kimpton Road / Napier Park	Yes	0	600
		Other sites	No	1,333	4,564
		Sub-total		1,333	5,164
	Jobs	Kimpton Road / Napier Park	Yes	1,624	3,016
		Butterfield Green	Yes	2,161	4,013
		Century Park	Yes	1,181	2,599
		Other sites	No	7,144	9,590
		Sub-total		12,110	19,218
	Dwellings	Wixams Southern Extension	Yes	1,581	3,586
		East Leighton Buzzard	Yes	1,066	1,612
		Houghton Regis North site 1	Yes	673	2,674
		Houghton Regis North site 2	Yes	1,187	2,098
		Other sites	No	10,516	11,856
		Sub-total		15,023	21,826
	Jobs	Wixams Southern Extension	Yes	324	500
		East Leighton Buzzard	Yes	1,440	2,400
		Houghton Regis North site 1	Yes	2,161	2,961
		Houghton Regis North site 2	Yes	550	550
		Other sites	No	9,779	17,489
		Sub-total		14,254	23,900

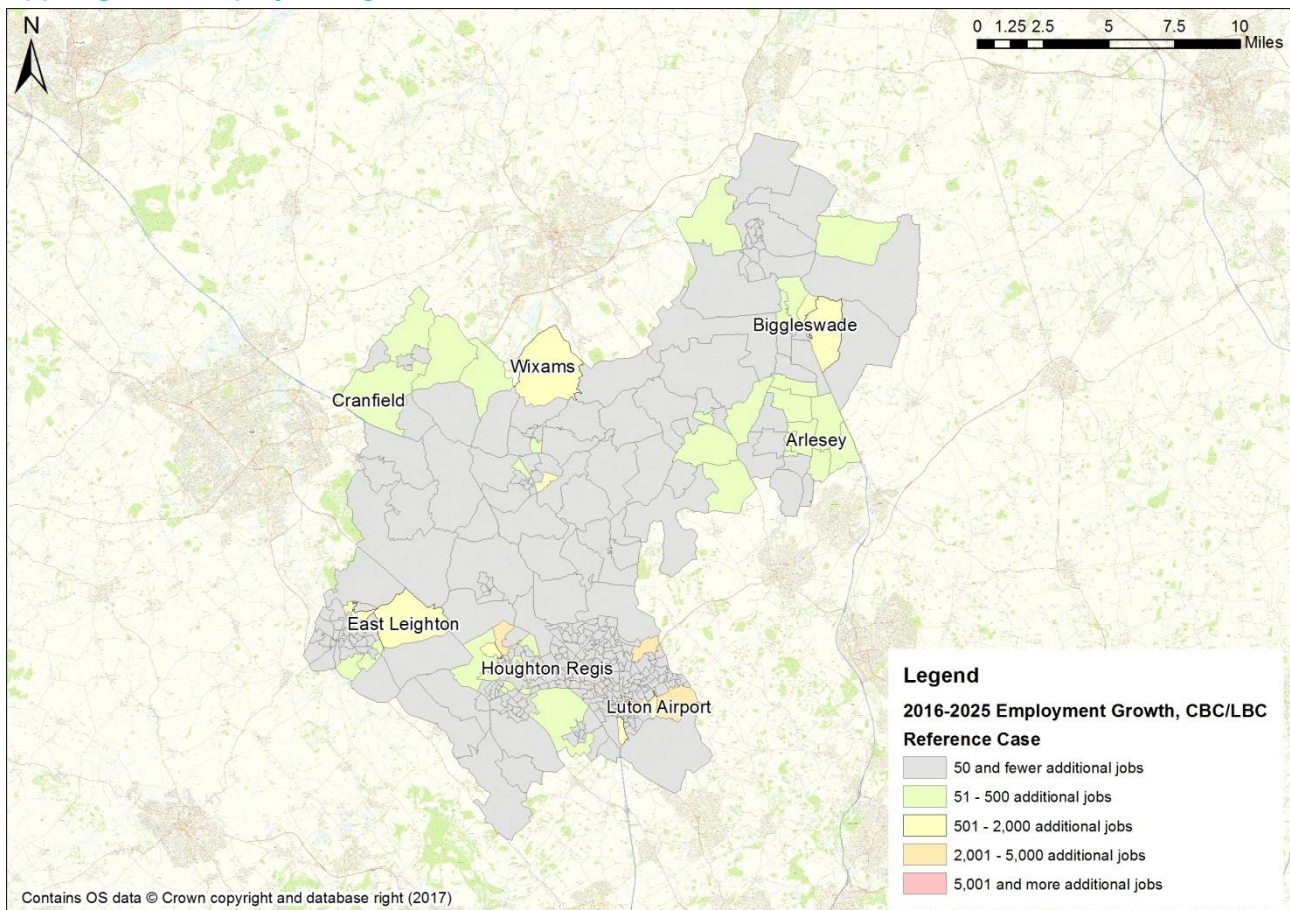
A.1.6 **App. Figure 1 – App. Figure 4** present the resulting cumulative housing and employment growth assumptions in Central Bedfordshire and Luton for the Reference Case model scenario, for Forecast Years 2025 and 2035.

²¹ Emails from LBC (08-Oct-15 and 21-Jan-16)

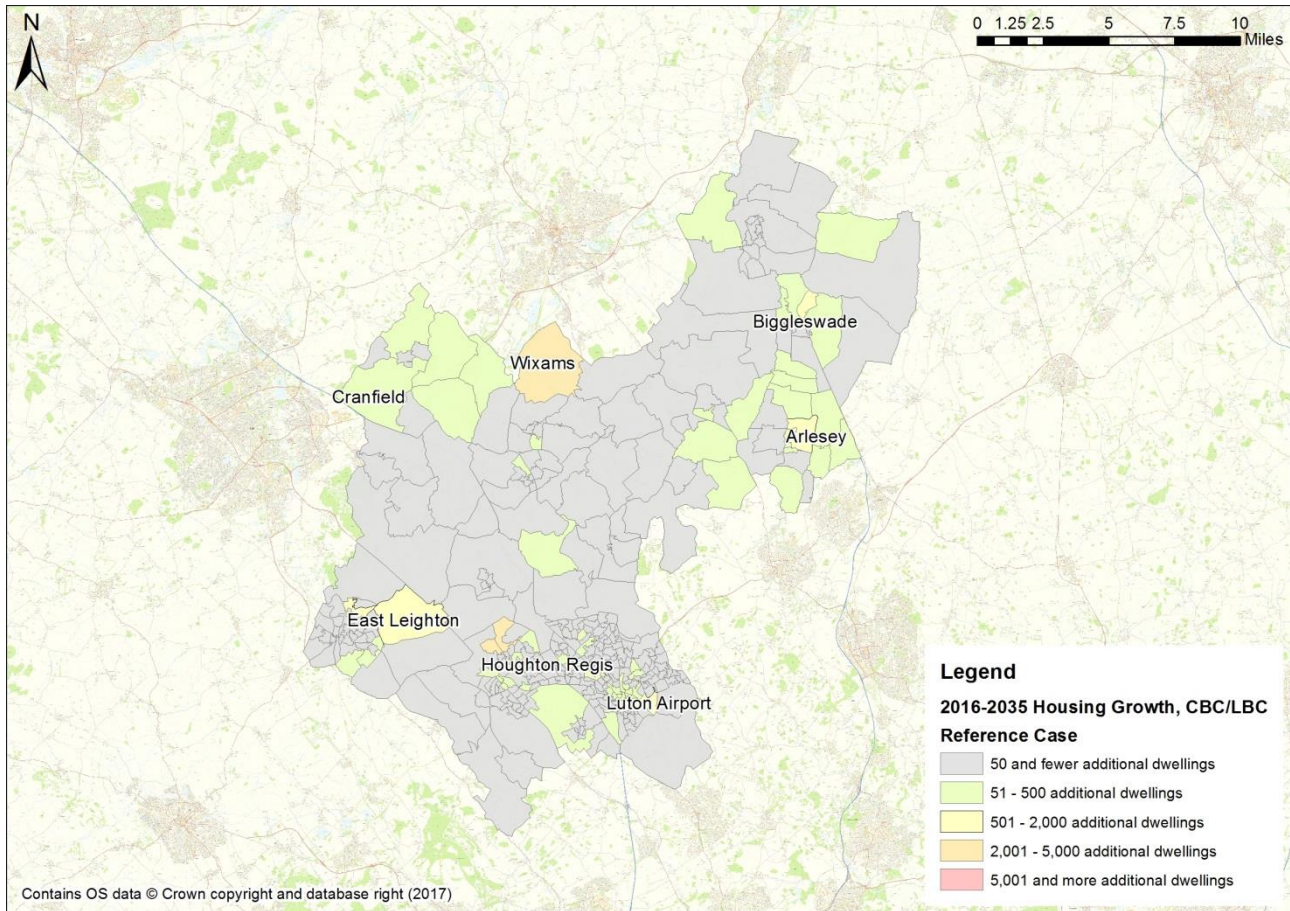
App. Figure 1: Housing growth in Central Bedfordshire and Luton, Reference Case, 2025



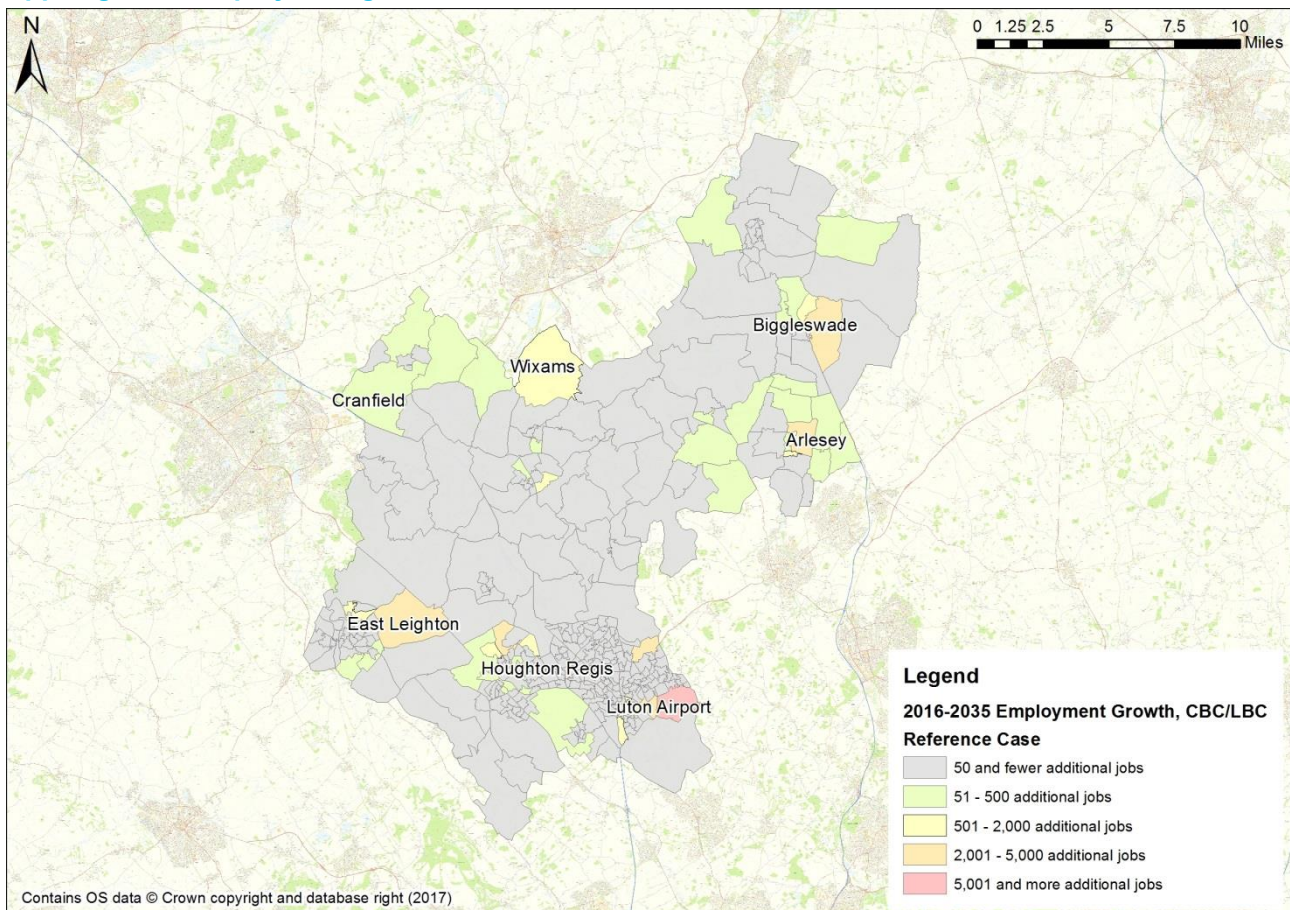
App. Figure 2: Employment growth in Central Bedfordshire and Luton, Reference Case, 2025



App. Figure 3: Housing growth in Central Bedfordshire and Luton, Reference Case, 2035



App. Figure 4: Employment growth in Central Bedfordshire and Luton, Reference Case, 2035



A.2 Local Plan growth

- A.2.1 It should be noted that the Local Plan growth assumptions below are to be considered in addition to the committed growth defined for the Reference Case scenarios.
- A.2.2 CBC have provided the following housing assumptions for the Local Plan period of 2015-35:
- Local Plan growth assumptions²²:
 - The information provided was used to identify the Local Plan's allocated strategic housing growth between 2016/17 and 2024/2025 (for Forecast Year 2025) or 2034/35 (for Forecast Year 2035);
 - By definition, growth allocated outside the Local Plan period (i.e. 2035-36 onwards) was excluded from the evidence base for the Regulation 19 submission;
 - Unallocated growth (including windfall) was also identified and included;
 - Local Plan growth allocation:
 - Four strategic sites were identified by CBC²³; and
 - 176 potential small and medium sites had passed CBC's "initial stage 1 appraisal and [were] going through further appraisal to generate the final locations"²⁴ at time of model development.
- A.2.3 It is acknowledged that the list of small and medium sites was not finalised at time of model development. It was therefore assumed that each small or medium site identified would contribute to the Local Plan growth proportionally to its overall capacity. There is a risk that some growth may be allocated in CBLTM to sites which will eventually be discarded or that growth be minimised at other small or medium sites.
- A.2.4 However, it should be noted that:
- The difference between the total capacity identified (10,553 dwellings) and the Local Plan requirements (9,950 dwellings including windfall) is small (603 dwellings or 5.7% of total capacity); and
 - At site level, any difference between the assumed growth in CBLTM and the final housing allocation will be limited, as 85% of the identified small and medium sites have a total capacity of less than 100 dwellings.
- A.2.5 At a strategic level, it is not expected that any discrepancy between the modelling assumptions and the final allocations proposed as part of CBC Local Plan should have a significant impact on the transport evidence base submitted.

²² v4 November 2017.xlsx (email from CBC, 21-Nov-17)

²³ CBC Strategic Sites.shp (email from CBC, 16-Nov-17)

²⁴ DRAFT sites and capacities -small to medium.xlsx (email from CBC, 16-Nov-17)

A.2.6 In addition, CBC have confirmed that all employment growth would be equally allocated between four employment sites²⁵. These jobs are expected by 2025, with the exception of RAF Henlow, which should deliver 30%²⁶ of its jobs between 2025 and 2035.

A.2.7 **App. Table 2** summarises the resulting Local Plan dwelling and employment growth assumptions in Central Bedfordshire by Forecast Year (2025 / 2035). It should be noted that some of the growth has been allocated to specific CBLTM development zones (see §A.3 for further explanation).

App. Table 2: CBC Local Plan growth assumptions (in addition to the Reference Case growth)

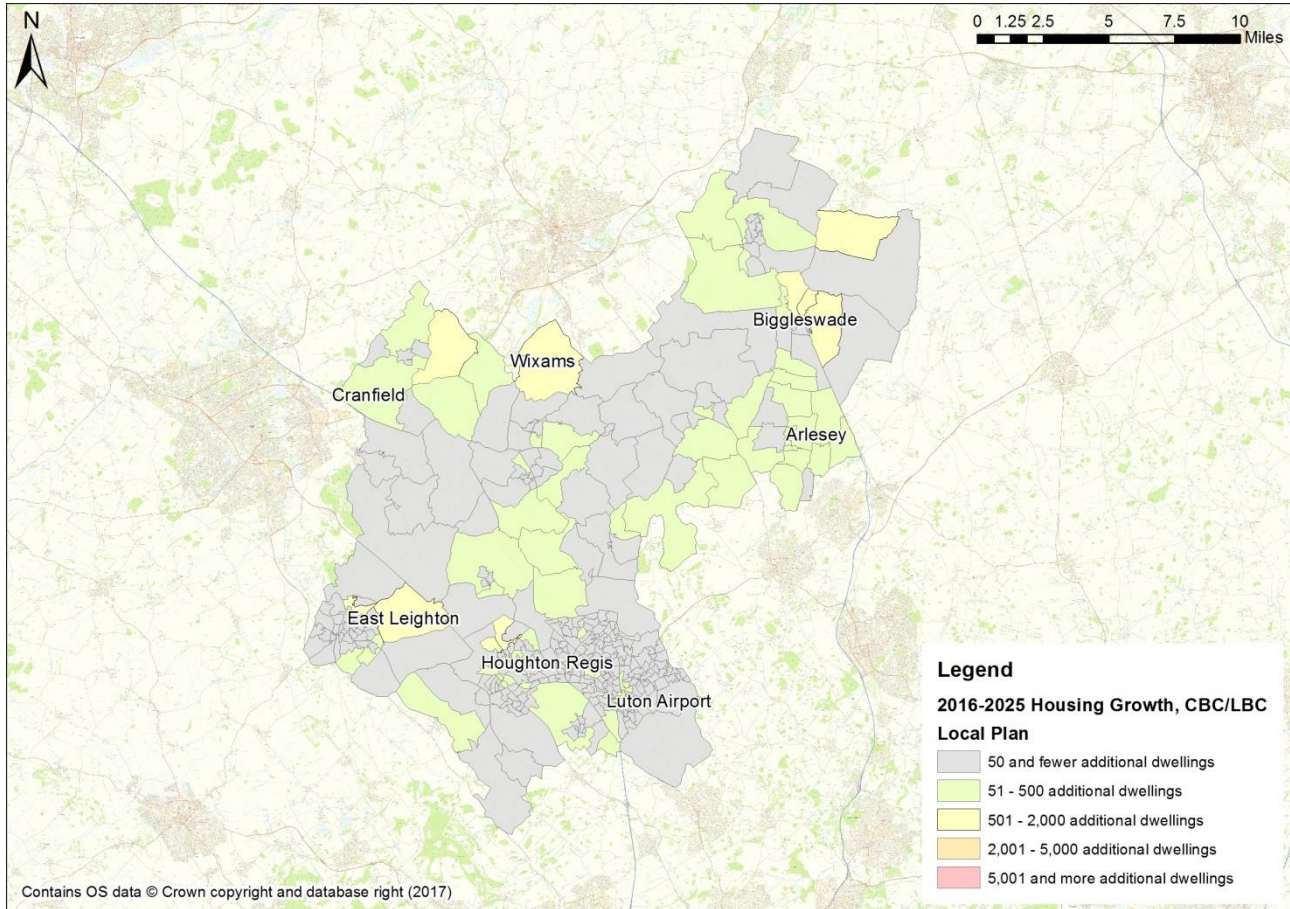
Data Type	Location	CBLTM dev. zone	2016-25 growth	2016-35 growth
Dwellings	North of Luton	Yes	300	3,100
	Marston Vale Growth	No	900	3,700
	East of Arlesey	No	150	1,150
	East of Biggleswade	No	200	1,500
	Other sites	No	3,100	9,950
	Sub-total		4,650	19,400
Jobs	Sundon Rail Freight Interchange	Yes	2,000	2,000
	Marston Gate	Yes	2,000	2,000
	RAF Henlow	Yes	1,400	2,000
	Holme Green Farm (Biggleswade)	Yes	2,000	2,000
	Sub-total		7,400	8,000

A.2.8 **App. Figure 5 – App. Figure 8** present the resulting cumulative housing and employment growth assumptions in Central Bedfordshire and Luton for the Local Plan model scenario, for Forecast Years 2025 and 2035.

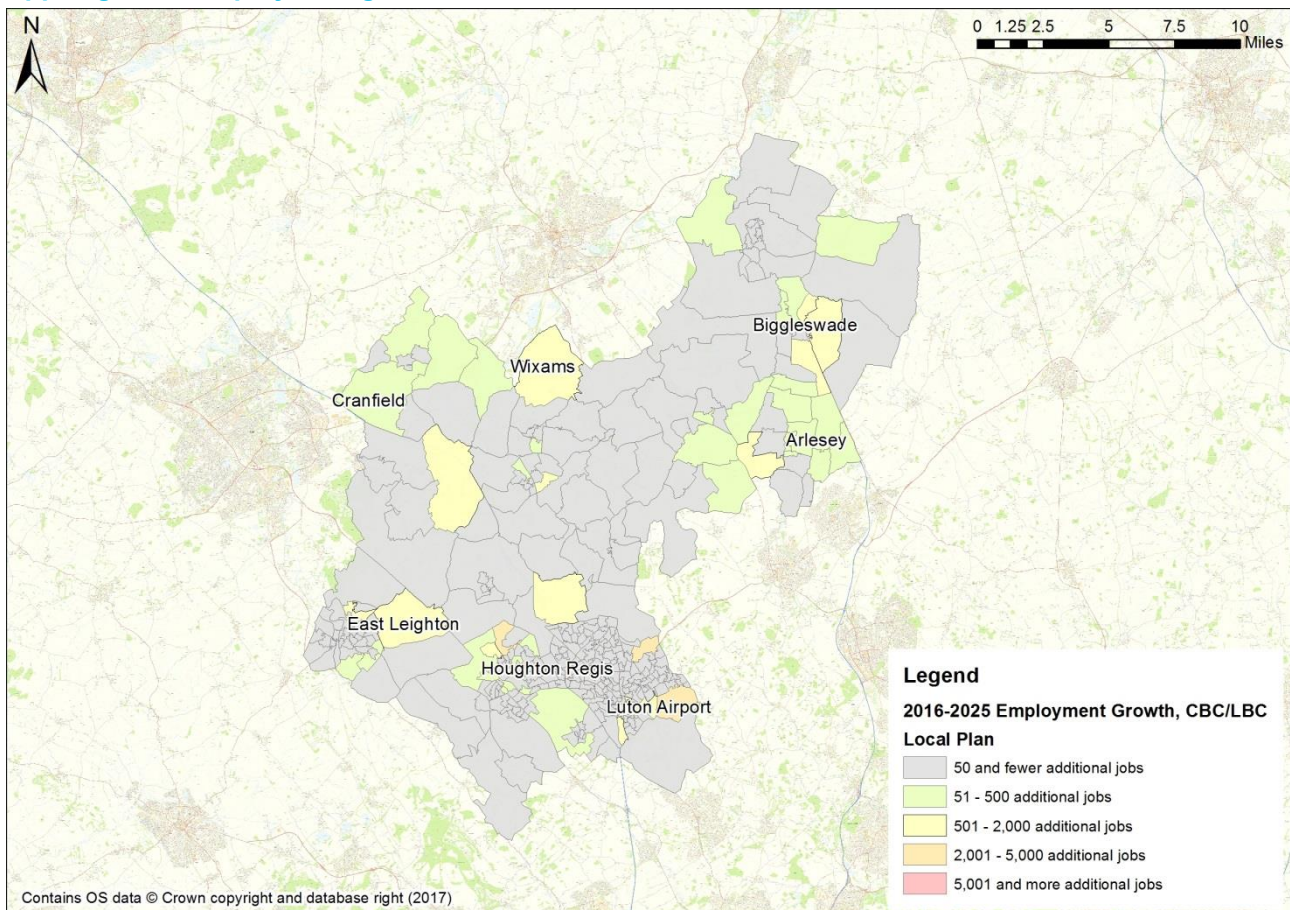
²⁵ Emails from CBC, 27-Nov-17

²⁶ Emails from CBC, 23-Nov-17

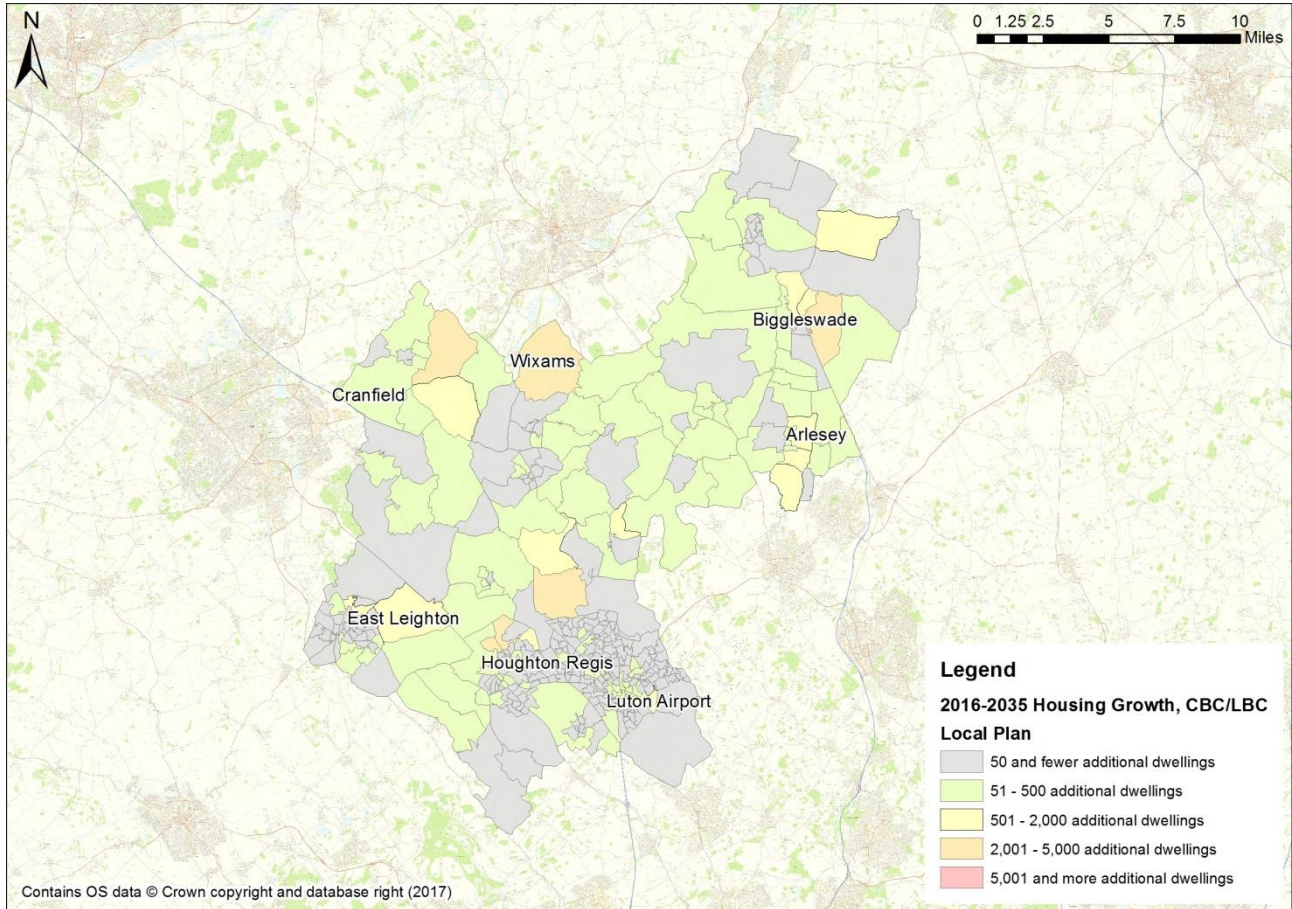
App. Figure 5: Housing growth in Central Bedfordshire and Luton, Local Plan, 2025



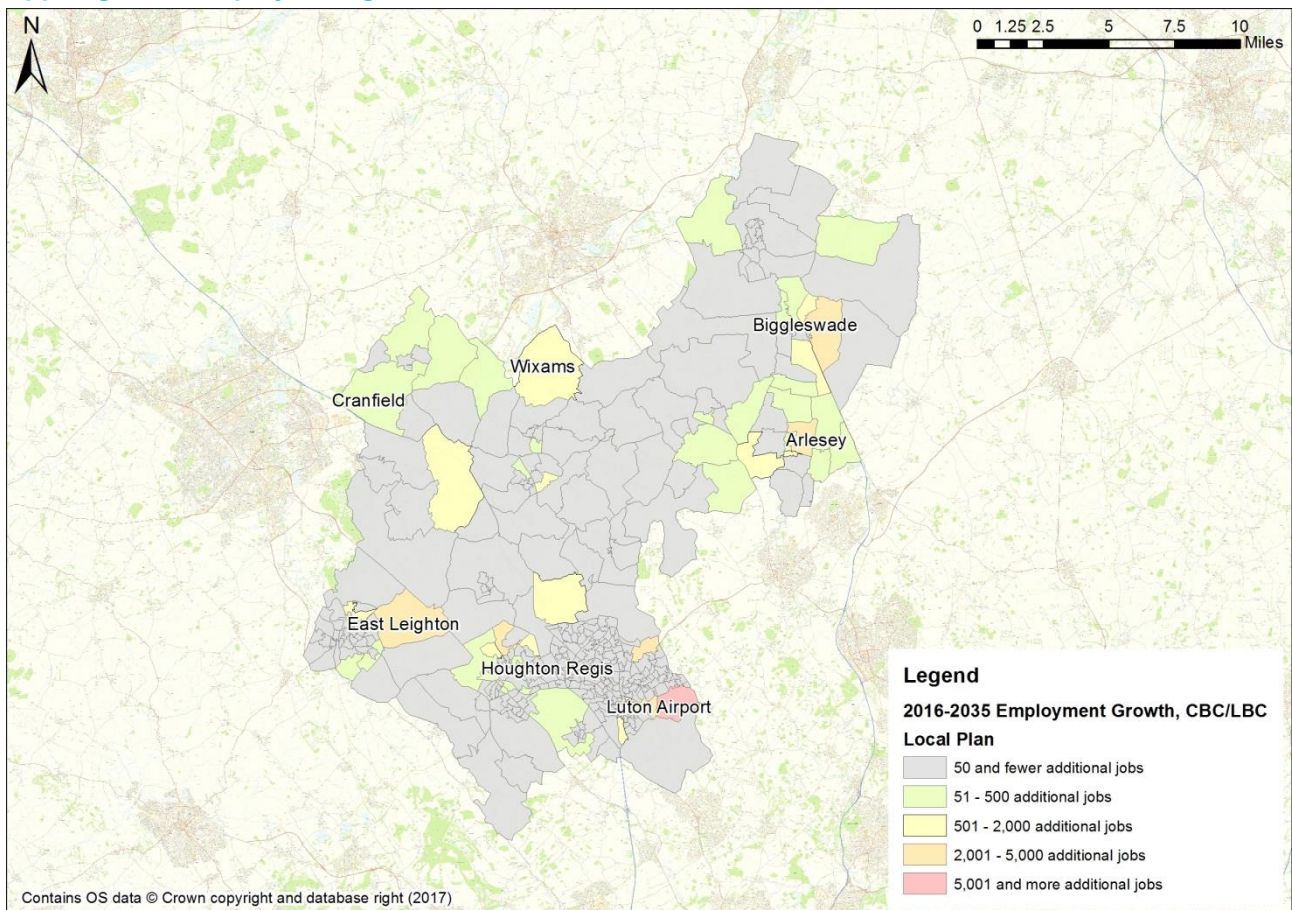
App. Figure 6: Employment growth in Central Bedfordshire and Luton, Local Plan, 2025



App. Figure 7: Housing growth in Central Bedfordshire and Luton, Local Plan, 2035



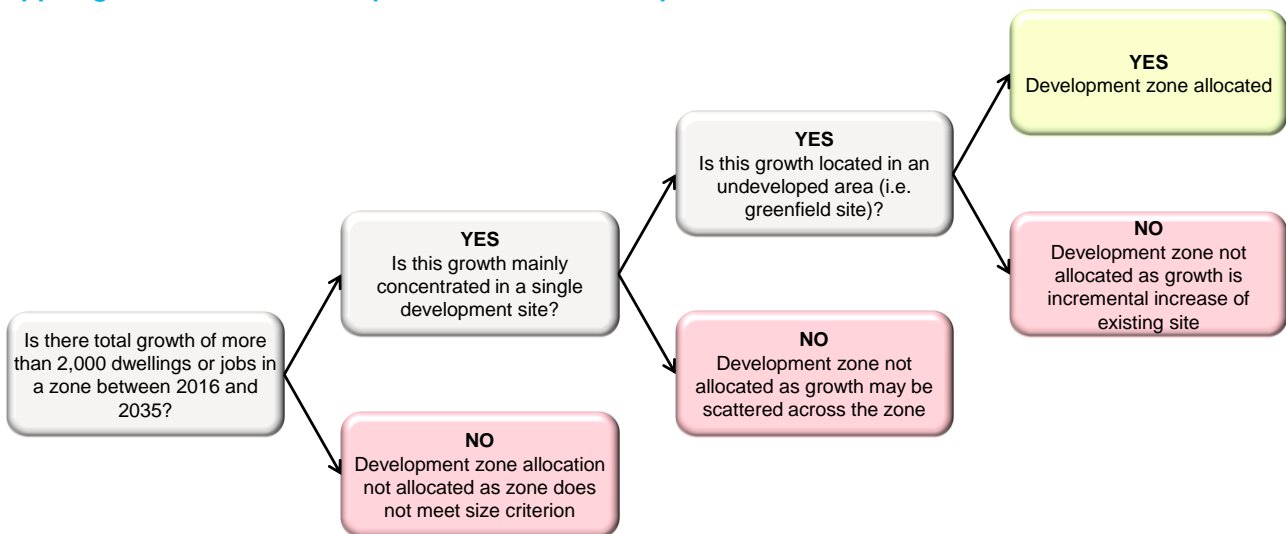
App. Figure 8: Employment growth in Central Bedfordshire and Luton, Local Plan, 2035



A.3 CBLTM development zone allocation

- A.3.1 As discussed in the CBLTM Forecasting Report²⁷, there are a number of locations in Central Bedfordshire and Luton where significant levels of growth (in terms of housing and/or employment) are anticipated to come forward in previously undeveloped areas. The trip patterns of these developments are likely to be materially different to those currently observed at these locations (based on the existing land use), and as such require special consideration in terms of forecast demand estimation and access point(s) onto the network.
- A.3.2 This issue is addressed by introducing in the CBLTM “development zones”, for which there is no existing travel demand pattern. A selection process has been developed to decide whether a development site should be allocated to a new development zone, as shown in **App. Figure 9**.

App. Figure 9: CBLTM development zone allocation process



²⁷ CBLTM_TN04_Forecasting_Note_v3.1, issued 12-Sep-17

Appendix B Link stress and Junction delays (extended)

B.1.1 **App. Figure 10 – App. Figure 21** present the link stress and junction delays:

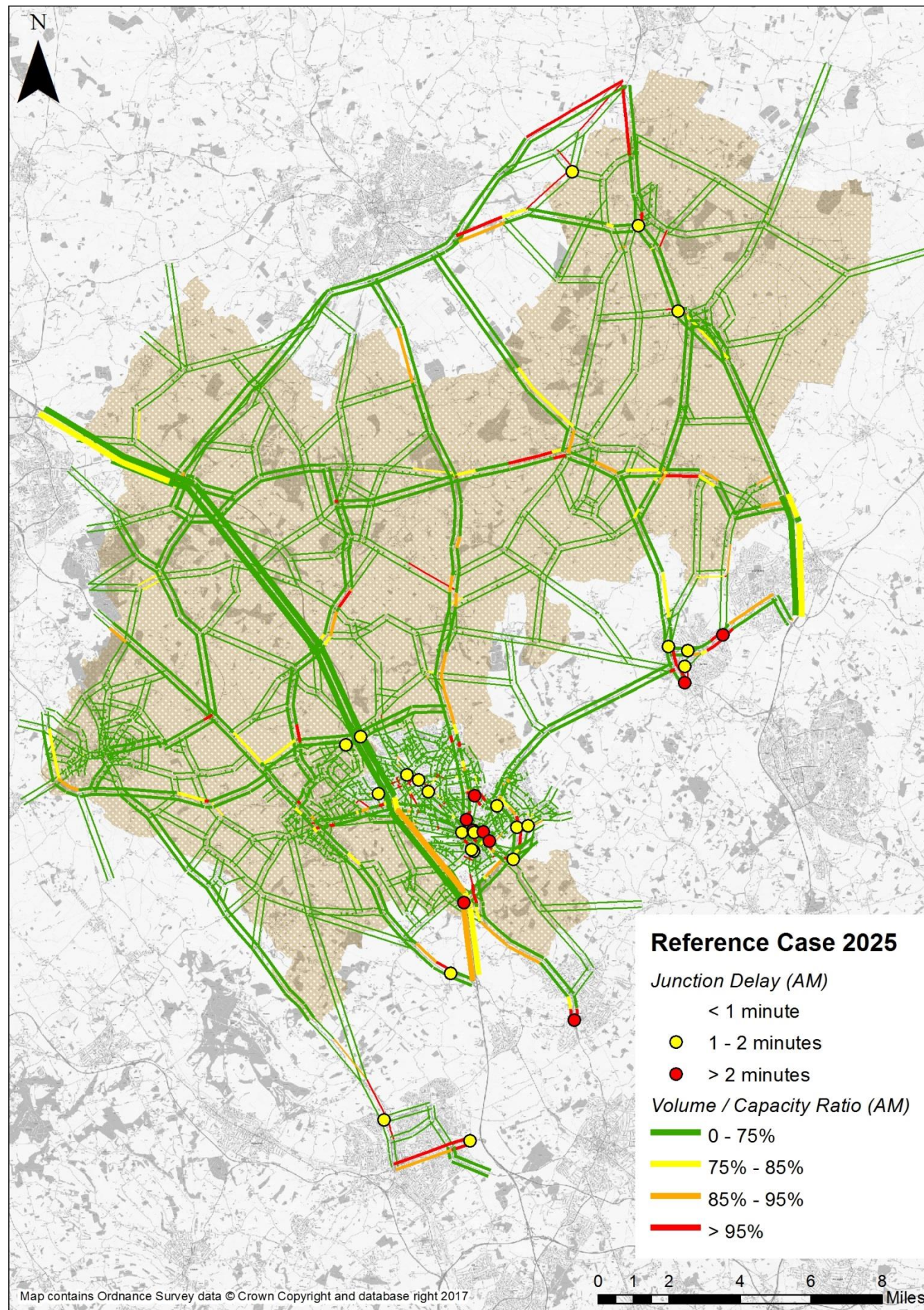
- For each CBLTM scenario: Reference Case, Local Plan – strategic sites and Local Plan – strategic sites*;
- By Forecast Year: 2025 and 2035; and
- By time period: morning (AM) and evening (PM) peak.

B.1.2 This detailed set of results includes:

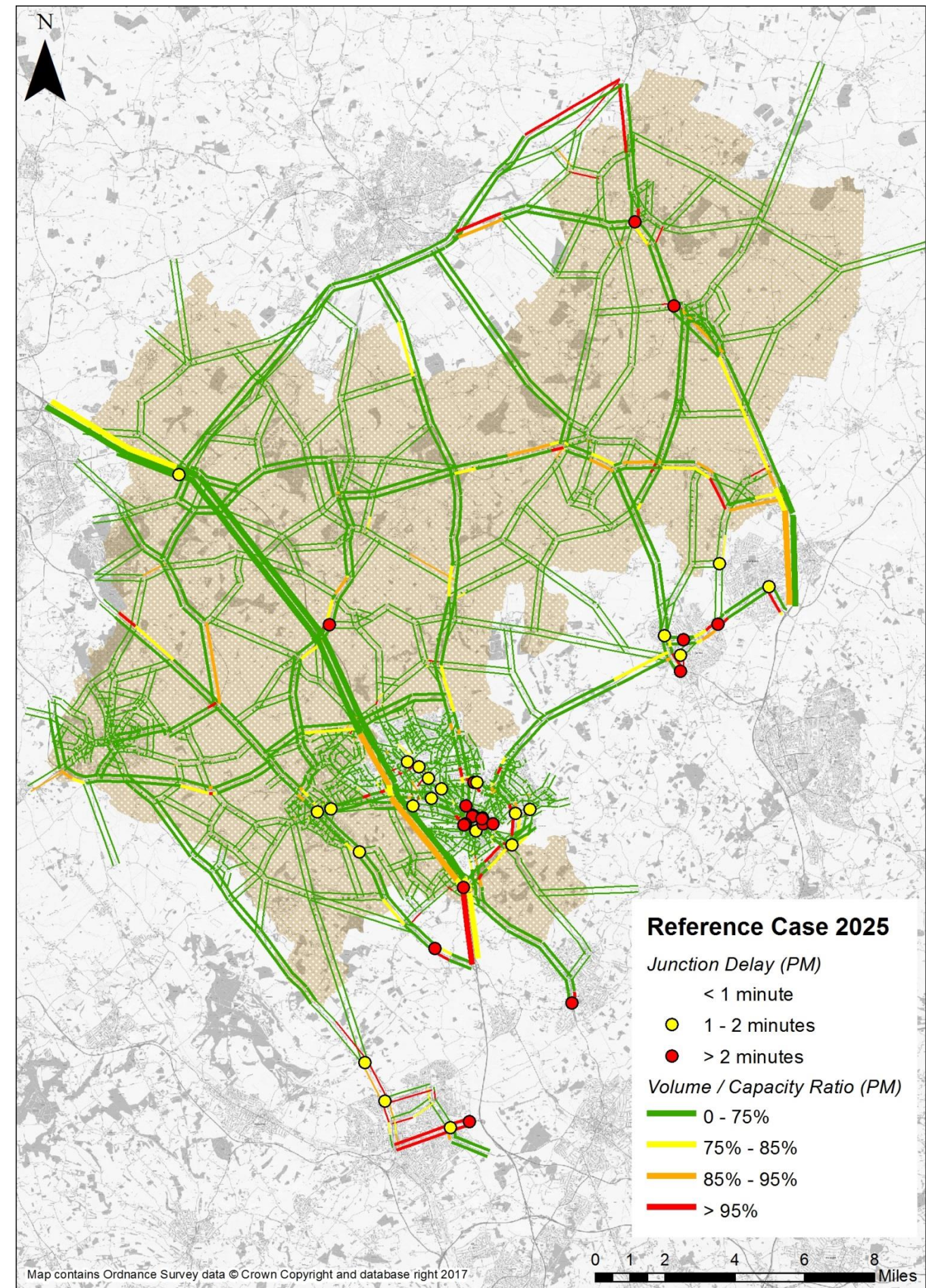
- All roads within Central Bedfordshire (as coded in CBLTM);
- All roads within Luton Borough (as coded in CBLTM);
- In Buckinghamshire: the B440 and all routes east of the B440;
- In Bedford Borough: the A421 and the roads south of the A421; and
- In Hertfordshire: Letchworth Garden City, Hitchin, the A505 and all routes north of the A505, Harpenden, the A5183 to M1 Junction 9 and Hemel Hempstead.

B.1.3 **It should be noted that the CBLTM has been developed and validated for the purpose of representing Central Bedfordshire and Luton. Any result outside Central Bedfordshire is presented for indicative purposes only.**

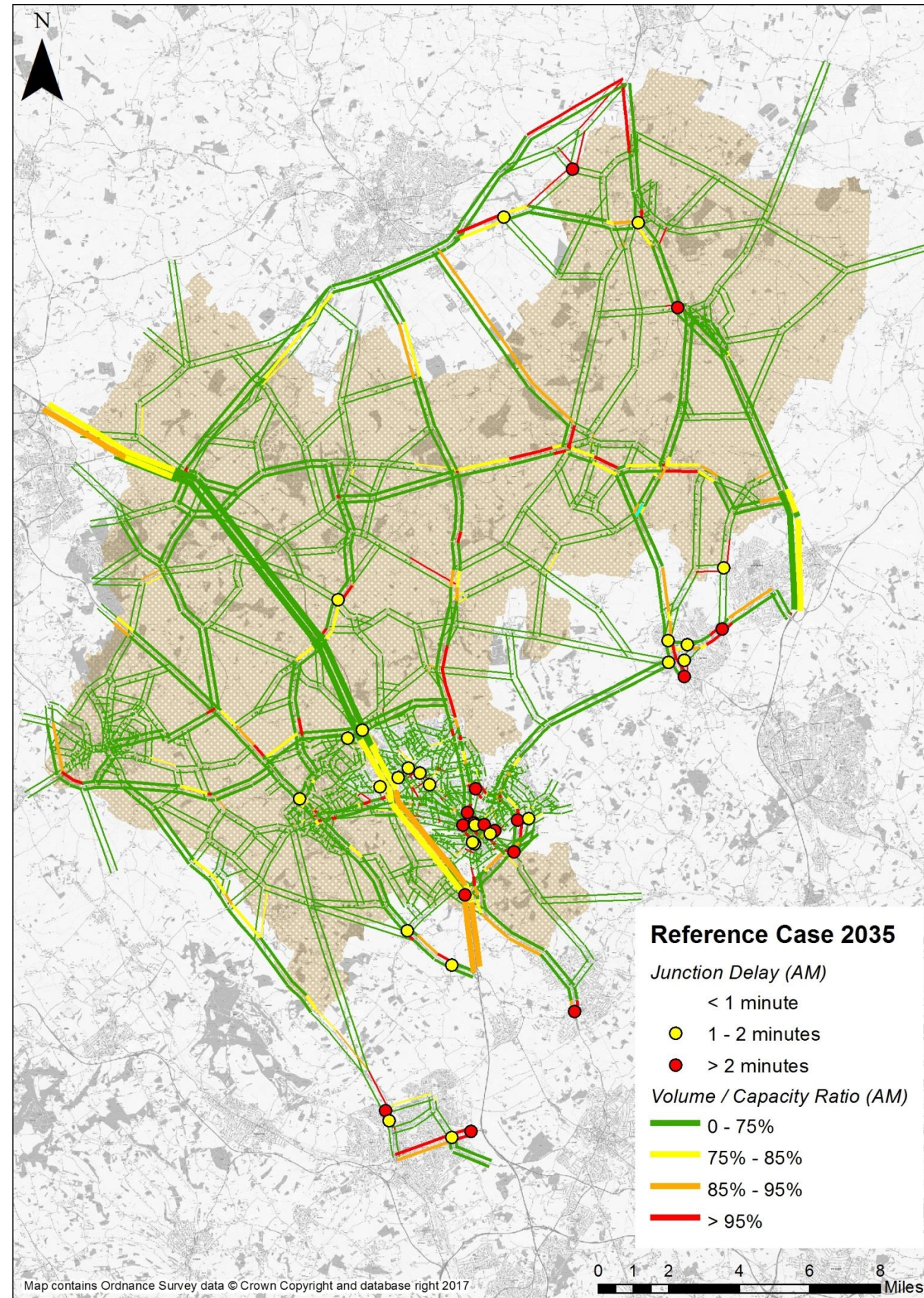
App. Figure 10: Link stress and Junction delays, 2025 Reference Case, AM



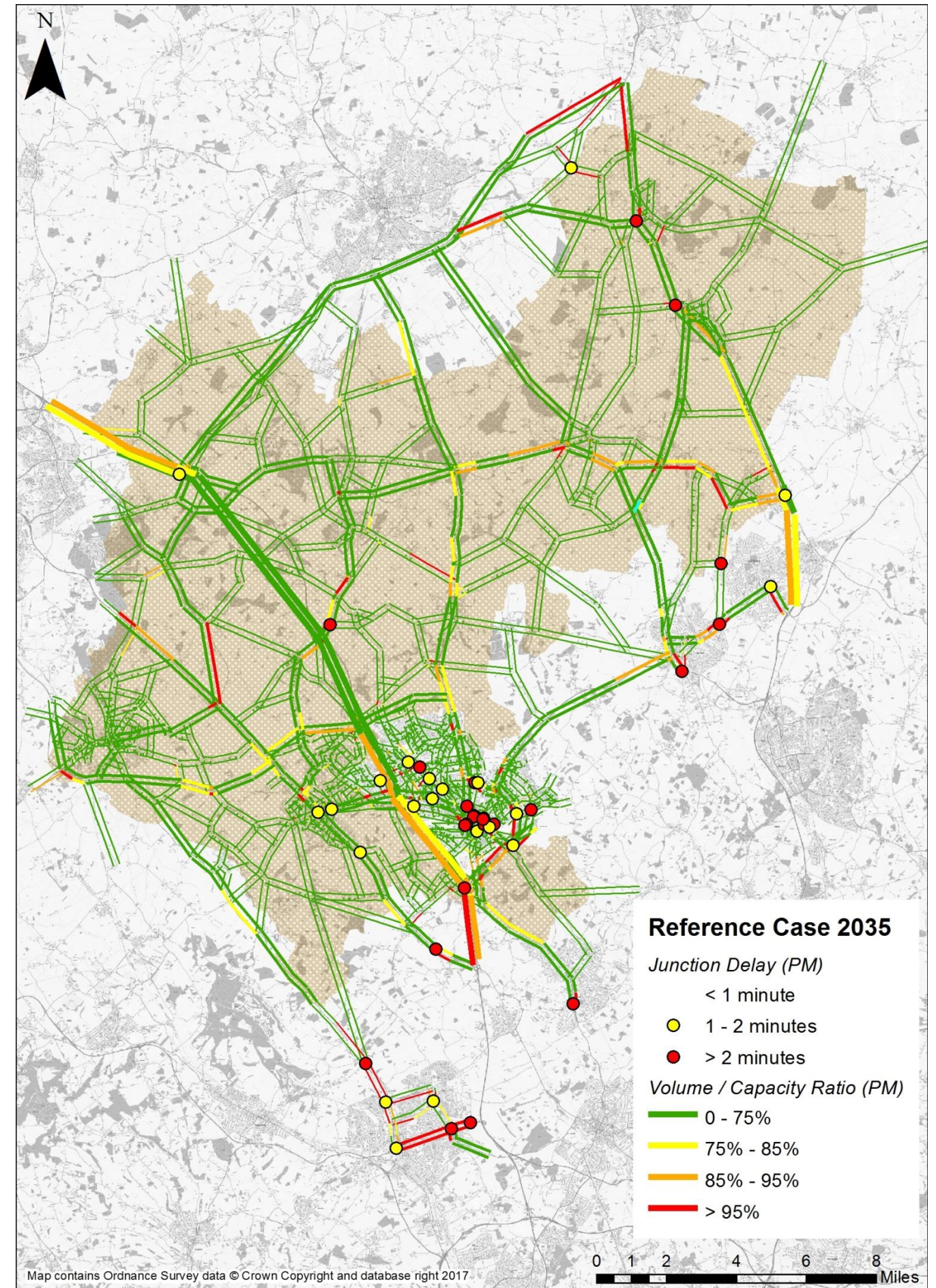
App. Figure 11: Link stress and Junction delays, 2025 Reference Case, PM



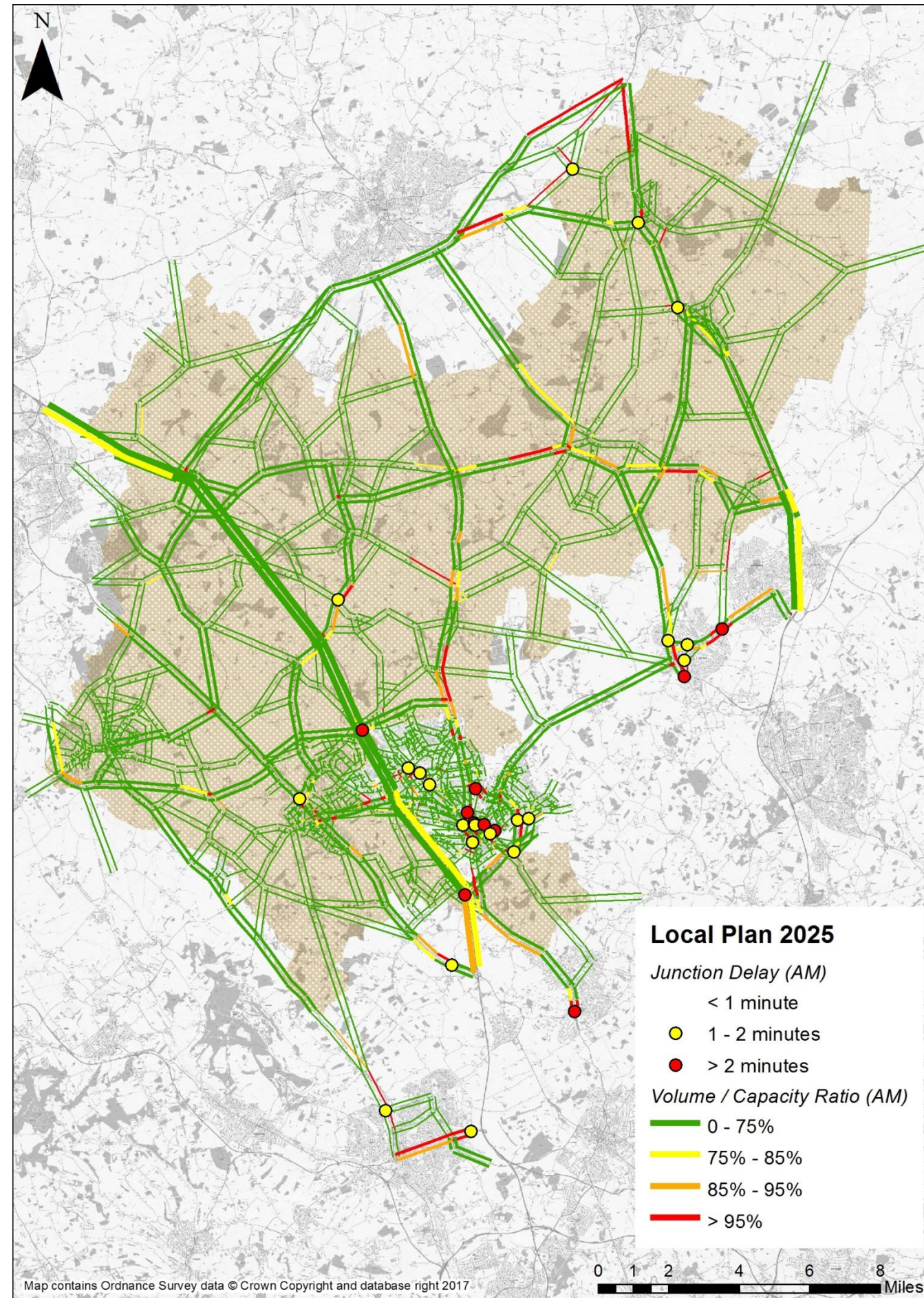
App. Figure 12: Link stress and Junction delays, 2035 Reference Case, AM



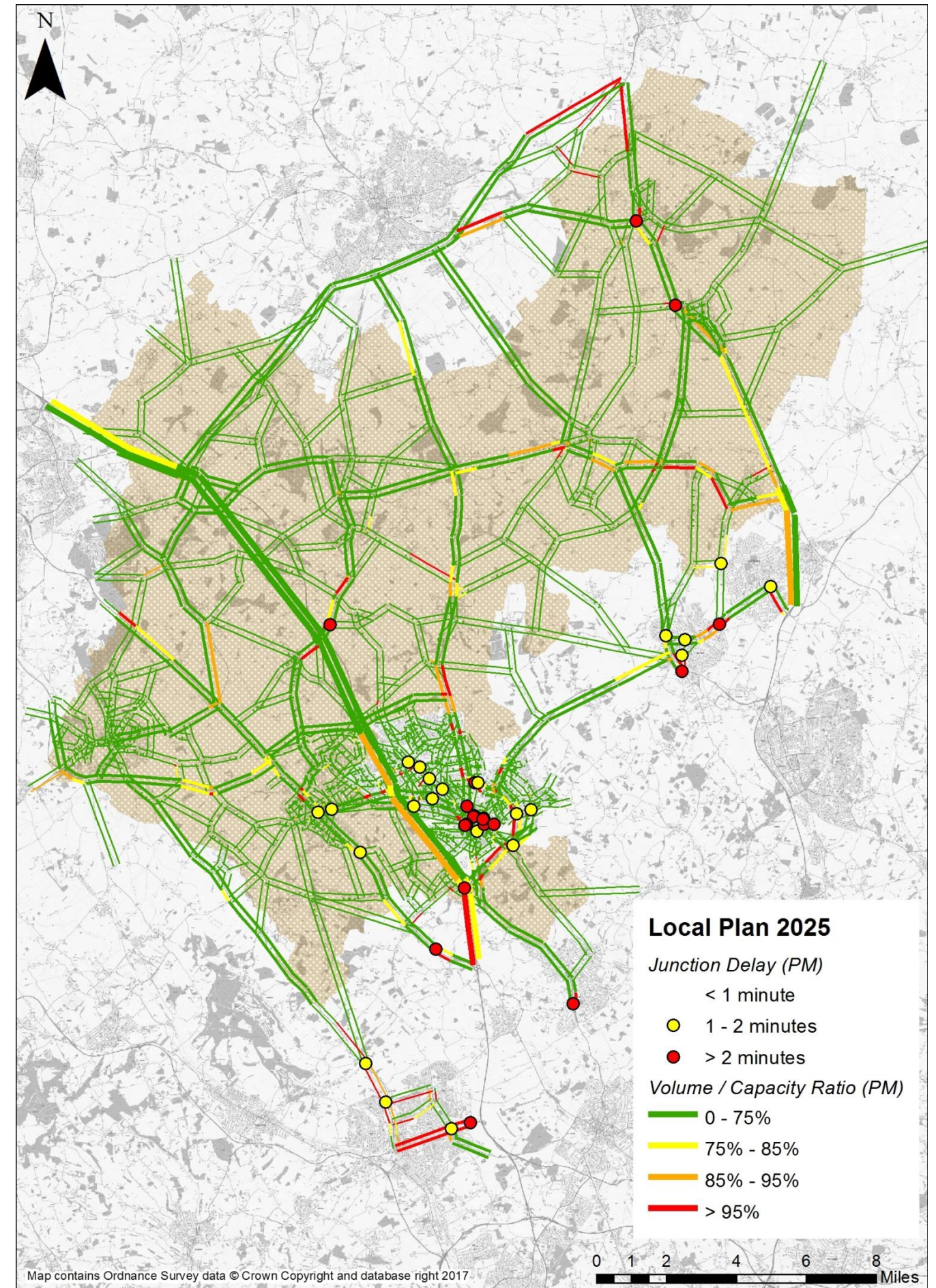
App. Figure 13: Link stress and Junction delays, 2035 Reference Case, PM



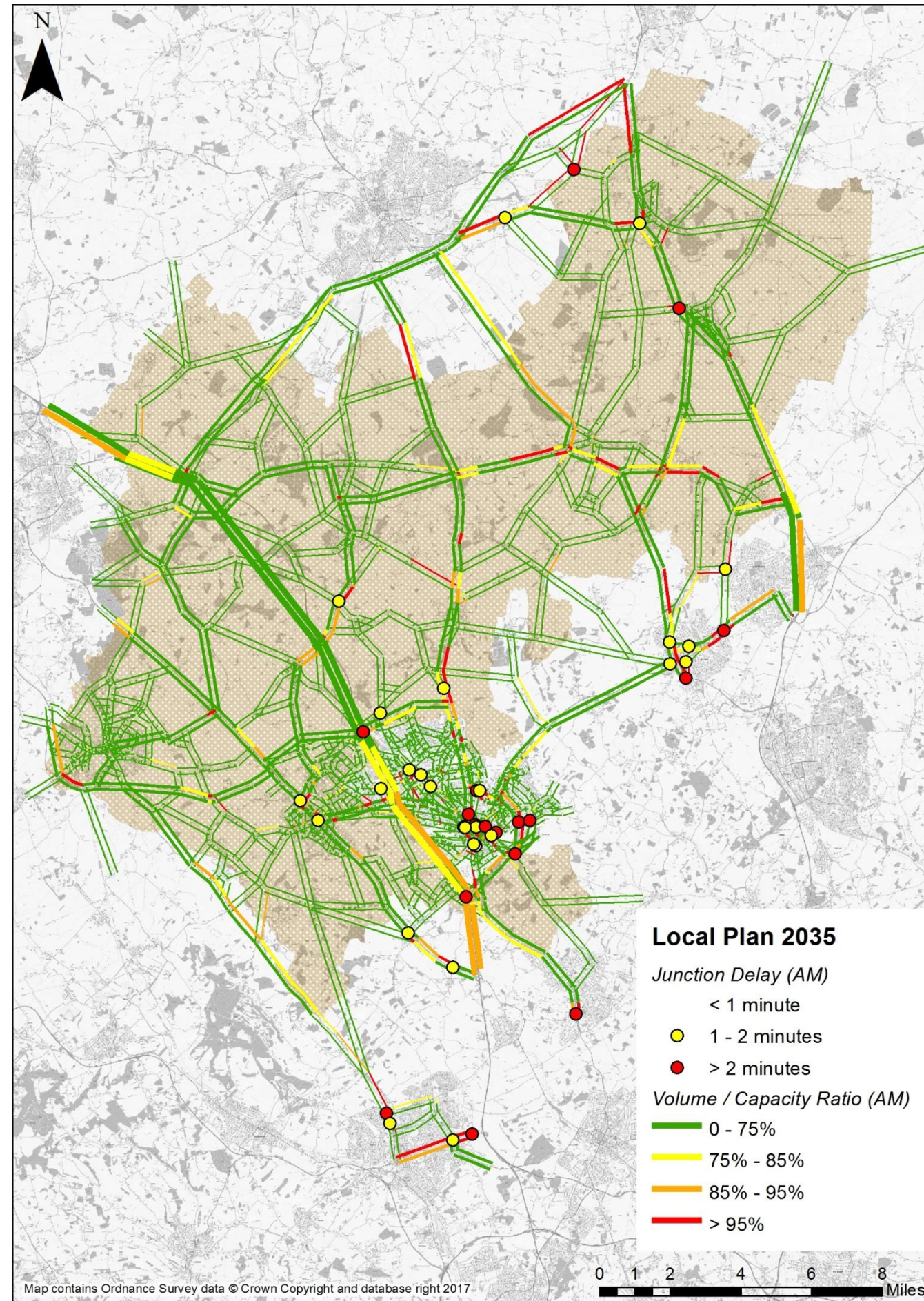
App. Figure 14: Link stress and Junction delays, 2025 Local Plan, AM



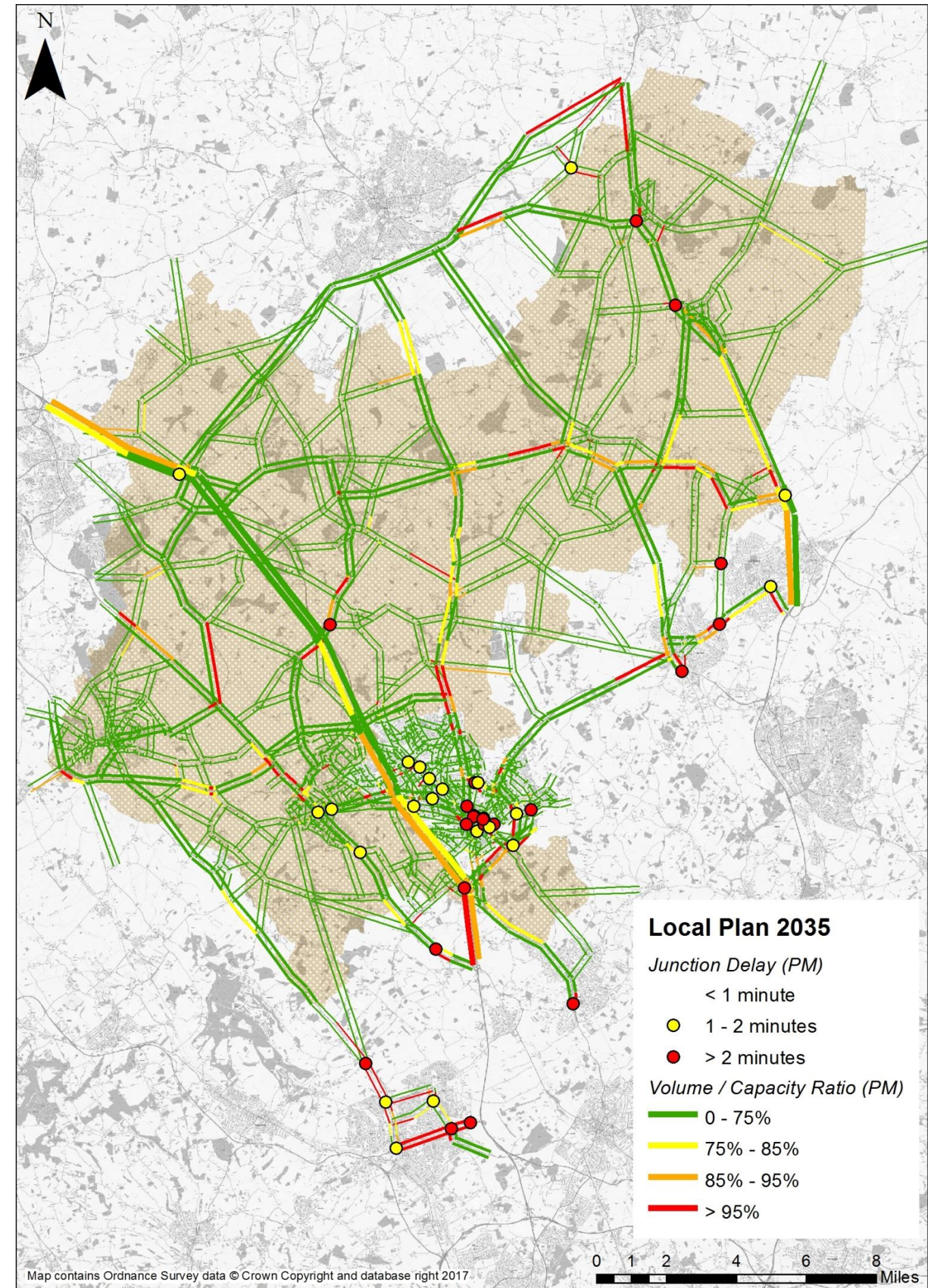
App. Figure 15: Link stress and Junction delays, 2025 Local Plan, PM



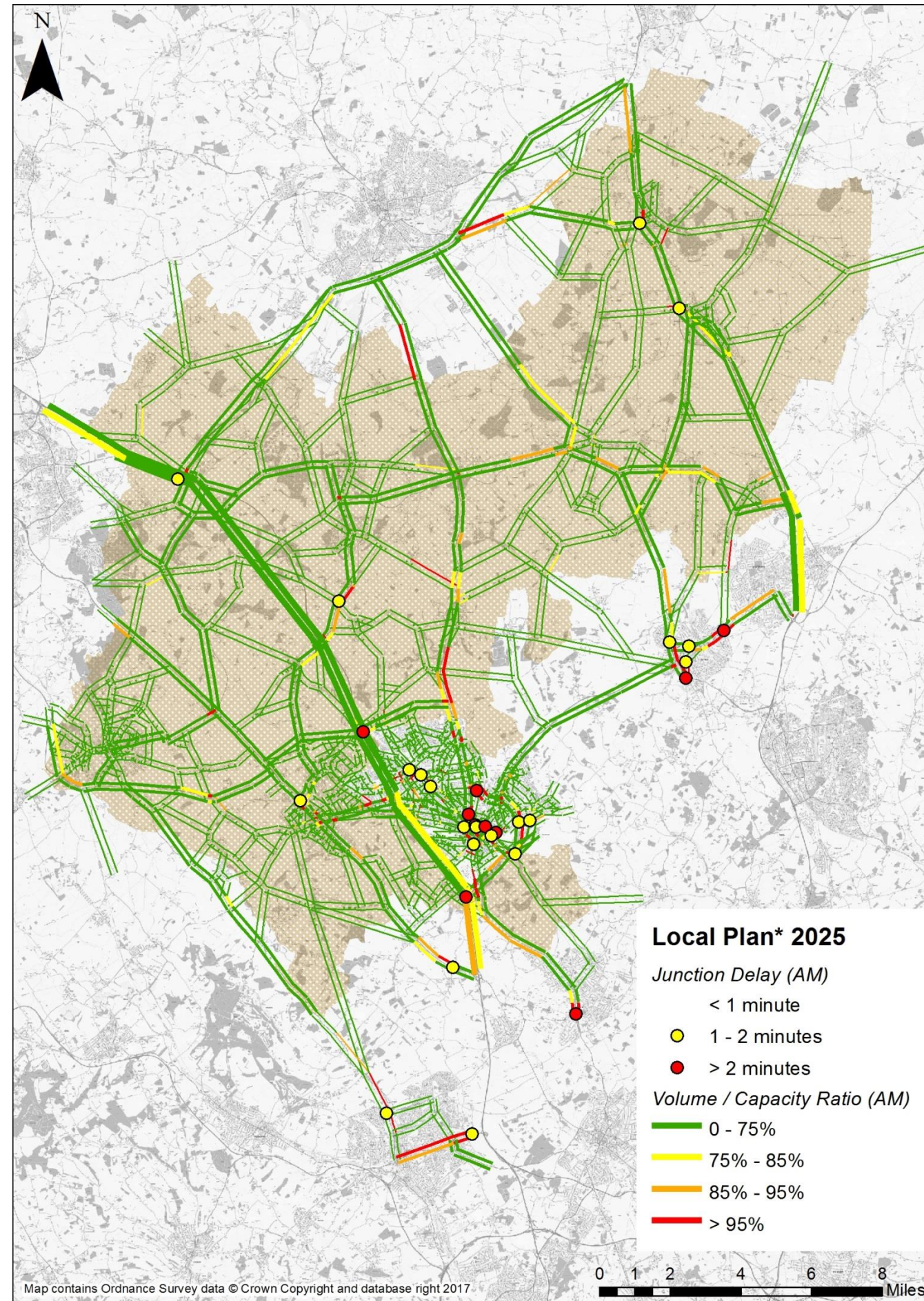
App. Figure 16: Link stress and Junction delays, 2035 Local Plan, AM



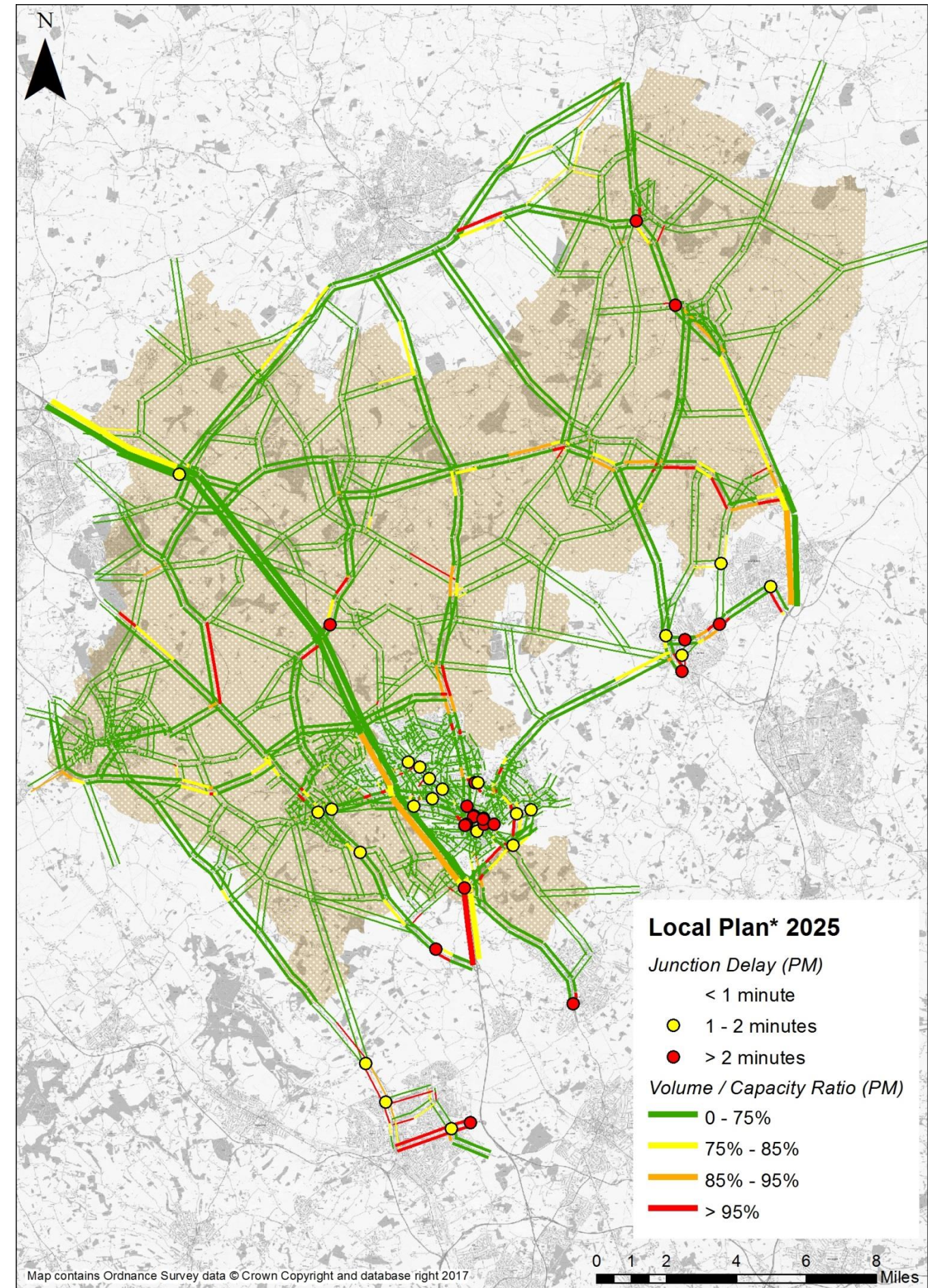
App. Figure 17: Link stress and Junction delays, 2035 Local Plan, PM



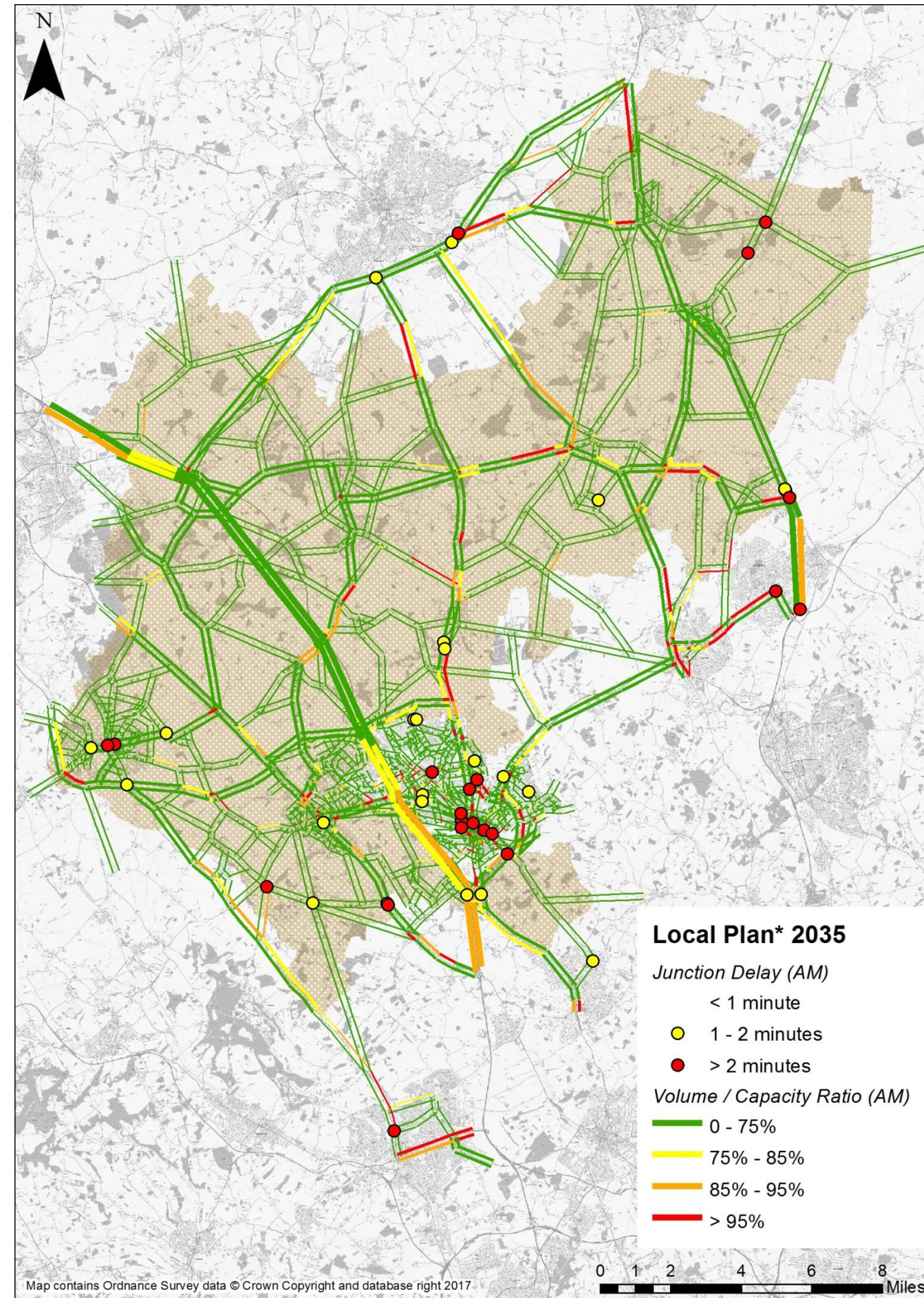
App. Figure 18: Link stress and Junction delays, 2025 Local Plan*, AM



App. Figure 19: Link stress and Junction delays, 2025 Local Plan*, PM



App. Figure 20: Link stress and Junction delays, 2035 Local Plan*, AM



App. Figure 21: Link stress and Junction delays, 2035 Local Plan*, PM

