

Planning and Transportation

LUTON LOCAL PLAN (2011-31)

TRA 001 – Facilitating Growth, Transport Background Paper

April 2016

Planning and Transportation

Department of Environment and Regeneration



EXPLANATORY NOTE ON TRANSPORT MODELLING UNDERTAKEN FOR LUTON LOCAL PLAN

Background

This note summarises the technical work that has been undertaken on transport modelling and related issues during the various stages of preparing the Luton Local Plan (2011-2031).

For the avoidance of doubt, the results of these tests should only be used in assessing the high level strategic transport impacts of the development proposals in the emerging Luton Local Plan. The two main stages of the process of preparing the Luton Local Plan when modelling work was undertaken were during the preparation of:

- the consultation draft of the Local Plan (in 2013/14), and
- the pre-submission version of the Local Plan (between October 2015 and April 2016).

In each of these assessments, the transport impacts of three planning scenarios in the Luton Local Plan have been undertaken in both the morning and evening peak periods, namely a baseline of developments expected to be completed by 2016 (scenario A), together with developments within Luton (Scenario B) and additional developments on the periphery of Luton under the “Duty to Co-operate” (DtC, Scenario C) expected to be completed by 2016 and 2031. However it should be noted that, given the similar amount of development in some scenarios, in some cases these scenarios have been combined.

The modelling work takes account of highway improvements that are necessary to support the development, in particular, of strategic allocation sites identified in the Luton Local Plan. In addition, technical work was undertaken in 2014-15 to identify those junctions or roads that could get close to or go over-capacity by 2031 as a result of the planned development, and to propose measures that could mitigate those impacts. In this context, the modelling work undertaken for the consultation draft of the Luton Local Plan only took account of the changes in the number and distribution of new homes and jobs, whereas the modelling for the Pre-submission Luton Local Plan also took account of the planned increase in the number of passengers to London Luton Airport.

Consultation draft of the Luton Local Plan¹

The baseline (2016) network changes took account of the completion of the Busway, Luton town centre transport scheme and the M1 Junction 10a improvements. By 2031, and in particular in Scenario C where additional development takes place to the north of the conurbation and east of Luton, additional highway infrastructure includes the A5-M1 Link (including the new M1 Junction 11a) and Woodside Link, together with northern and eastern bypasses of Luton.

Scenario A 2016

Due to the limited differences between the two planning data sets, differences between the assignment results are negligible in 2016 between Scenario A and Scenario B/C. In this Scenario, the main areas of peak period congestion were on parts of the main routes into

Luton on the New Bedford Road, Hatters Way, Dunstable Road, Leagrave Road and the A505 in the vicinity of the airport.

Scenario B versus Scenario A in 2031

The main changes in traffic flow impacts between these two planning scenarios are on the A505 Vauxhall Way and Airport Way in the vicinity of the strategic employment or mixed use sites (Luton Airport, Century Park, Butterfield Green and Napier Park) identified in the Luton Local Plan. There is limited highway impact in the west and north of Luton (the main exception to the latter being in the Barton Road/New Bedford Road corridor), as the bulk of planned development is to north, east and south of the town.

Scenario C versus Scenario A in 2031

The additional impacts of the “DtC” Scenario indicate the following additional differences to the above:

- an overall increase in trips in Central Bedfordshire, around Leighton Buzzard, Houghton Regis, North Luton and East Luton.
- the combined impact of the northern bypass and developments to the north of Luton mean that east-west routes show a drop in trips as an alternative route is available, while north-south routes show an increase in trips as there is more demand.

Junction mitigation assessment

This work was undertaken in two phases. The first phase², carried out between January and June 2014, examined all of the junctions, 27 in total, that the aforementioned modelling work had identified as going close to or over capacity. The main reason for limiting this assessment to junctions is because, in an expansive built up area, the capacity on the approaches to the junctions tends to be the key limiting factor. This phase of the work categorised the junctions into four categories; those currently being improved (Package 1), those where network constraints meant there are limited opportunities for further improvement (Package 2), and other junctions (Packages 3 and 4).

The second phase of this study³, undertaken between January and June 2015 examined those junctions in more detail where there was scope for further improvements. Indicative engineering designs were developed including, in a couple of cases, a limited number of options, and the design parameters were re-input to the transport model in order to test whether these proposed design changes resulted in improved operation of those junctions.

For the avoidance of doubt, this is just a high level operational assessment and, as more detailed design of individual junctions is progressed, a more detailed operational assessment based on current and future traffic conditions will be undertaken.

Pre-submission draft of the Luton Local Plan⁴

The baseline (2016) network changes took account of the completion of the Busway, Luton town centre transport scheme and the M1 Junction 10a improvements. The modelling for

the Pre-submission Plan also included an intermediate year, 2021, which in Scenarios B and C took account of some strategic development and related infrastructure north of the conurbation. By 2031, and in particular in Scenario C where additional development takes place to the north of the conurbation and east of Luton, additional highway infrastructure includes the A5-M1 Link (including the new M1 Junction 11a) and Woodside Link, together with northern and eastern bypasses of Luton.

This modelling work also considered two alternatives. The first of these, in the 2016 Baseline, excluded the A5-M1 Link and the Woodside Link as these are still under construction and aren't expected to be complete until early 2017. The second, in 2031, includes a reduced scale of development east of Luton. In addition, the modelling for the Pre-submission Plan also reviews the performance of the junction mitigation measures outlined above.

The Tables and Plans appended to this report summarise the vehicle kilometres and vehicle hours (the latter is an indication of congestion) for the various Scenarios described above.

Scenario A 2016

In Scenario A, the main areas of peak period congestion were on parts of the main routes into Luton on the New Bedford Road, Hatters Way, Dunstable Road, Leagrave Road and the A505 in the vicinity of the airport. In comparing Scenario A with the alternative, the main conclusion to draw is that the addition of the A5-M1 Link and Woodside Link results in a significant reduction in vehicle kilometres and vehicle hours in Luton. In particular this is because this road infrastructure, combined with the new M1 Junction 11a, provides an improved route in particular from the residential areas of Lewsey and Sundon Park to the strategic highway network.

Scenario B versus Scenario A in 2031

The main changes in traffic flow impacts between these two planning scenarios are on the A505 Vauxhall Way and Airport Way in the vicinity of the strategic allocation employment or mixed use sites (Luton Airport, Century Park, Butterfield Green and Napier Park). There is limited highway impact in the west and north of Luton (the main exception to the latter being in the Barton Road/New Bedford Road corridor), as the bulk of planned development is to north, east and south of the town.

Scenario C versus Scenario A in 2031

The additional impacts of the "DtC" scenario indicate the following additional differences to the above:

- an overall increase in trips in Central Bedfordshire, around Leighton Buzzard, Houghton Regis, North Luton and East Luton.
- the combined impact of the northern bypass and developments to the north of Luton mean that east-west routes show a drop in trips as an alternative route is available, while north-south routes show an increase in trips as there is more demand

In comparing Scenario C with the alternative, the reduction in the scale of development east of Luton results in a marginal reduction in traffic and congestion on the east side of Luton.

References

1. Luton Local Plan: Initial transport evidence base (SATURN Model) - November 2013 (TRA 006)
2. Luton Local Plan junction assessment - technical note - July 2014 - AECOM Luton (TRA 008)
3. Luton development plan - Junction mitigation assessment - June 2015 - AECOM (TRA 009)
4. Luton Local Plan - 2015 Pre Submission Transport Evidence - April 2016 - AECOM (TRA 001A)

Network Statistics

Luton, Dunstable, East of Luton and
Houghton Regis

Network Statistics; Luton

AM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) (AM)	192,621	188,663	215,319	223,345	235,539	253,453	251,313	251,088
Road Distance (km) (AM)	344	343	351	368	351	366	366	362
Free Flow Vehicle Time (veh-hours) (AM)	3,686	3,660	4,093	4,168	4,471	4,797	4,742	4,747
Assigned Vehicle Time (veh-hours) (AM)	4,727	4,731	5,470	5,546	6,416	6,872	6,732	6,792
Vehicle Delay Time (veh-hours) (AM)	1,041	1,071	1,377	1,378	1,945	2,076	1,990	2,044
Vehicle Queued End of Hour (PCUs) (AM)	760	855	1,033	1,062	1,605	1,789	1,583	1,659
Speed (kph) (AM)	41	40	39	40	37	37	37	37

PM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) (PM)	205,977	202,332	227,679	236,881	247,753	265,619	263,422	263,308
Road Distance (km) (PM)	344	343	351	368	351	366	366	362
Free Flow Vehicle Time (veh-hours) (PM)	3,795	3,773	4,208	4,311	4,602	4,913	4,865	4,864
Assigned Vehicle Time (veh-hours) (PM)	4,946	4,965	5,662	5,796	6,530	7,034	6,869	6,920
Vehicle Delay Time (veh-hours) (PM)	1,151	1,192	1,454	1,486	1,928	2,121	2,003	2,056
Vehicle Queued End of Hour (PCUs) (PM)	790	877	1,015	1,023	1,376	1,535	1,425	1,496
Speed (kph) (PM)	42	41	40	41	38	38	38	38

Network Statistics; Dunstable

AM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) AM	19,726	22,031	20,971	21,080	22,615	22,567	22,611	22,660
Road Distance (km) AM	62	62	62	62	62	62	62	62
Free Flow Vehicle Time (veh-hours) AM	537	592	570	572	615	612	613	614
Assigned Vehicle Time (veh-hours) AM	676	826	740	739	848	841	844	845
Vehicle Delay Time (veh-hours) AM	139	235	170	168	234	229	231	231
Vehicle Queued End of Hour (PCUs) AM	130	227	161	160	223	220	222	223
Speed (kph) AM	29	27	28	29	27	27	27	27

PM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) PM	18,788	20,972	20,095	20,070	22,381	22,298	22,300	22,282
Road Distance (km) PM	62	62	62	62	62	62	62	62
Free Flow Vehicle Time (veh-hours) PM	509	556	544	542	605	601	601	601
Assigned Vehicle Time (veh-hours) PM	623	715	675	673	774	769	770	769
Vehicle Delay Time (veh-hours) PM	115	158	132	131	169	168	169	169
Vehicle Queued End of Hour (PCUs) PM	101	147	118	119	159	159	160	160
Speed (kph) PM	30	29	30	30	29	29	29	29

Network Statistics; East of Luton

AM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) AM	8,787	8,844	9,759	9,613	10,857	14,196	11,845	14,215
Road Distance (km) AM	31	31	31	31	31	43	43	43
Free Flow Vehicle Time (veh-hours) AM	115	115	129	127	145	230	185	230
Assigned Vehicle Time (veh-hours) AM	123	123	140	139	161	282	216	280
Vehicle Delay Time (veh-hours) AM	8	8	11	11	16	53	30	51
Vehicle Queued End of Hour (PCUs) AM	0	0	0	0	0	26	11	24
Speed (kph) AM	72	72	70	69	67	50	55	51

PM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) PM	8,057	8,114	9,888	9,723	10,940	14,975	12,794	14,982
Road Distance (km) PM	31	31	31	31	31	43	43	43
Free Flow Vehicle Time (veh-hours) PM	106	107	131	129	146	244	202	244
Assigned Vehicle Time (veh-hours) PM	112	113	144	141	164	308	232	309
Vehicle Delay Time (veh-hours) PM	6	6	13	12	17	64	30	65
Vehicle Queued End of Hour (PCUs) PM	0	0	0	0	0	38	9	39
Speed (kph) PM	72	72	69	69	67	49	55	48

Network Statistics; Houghton Regis

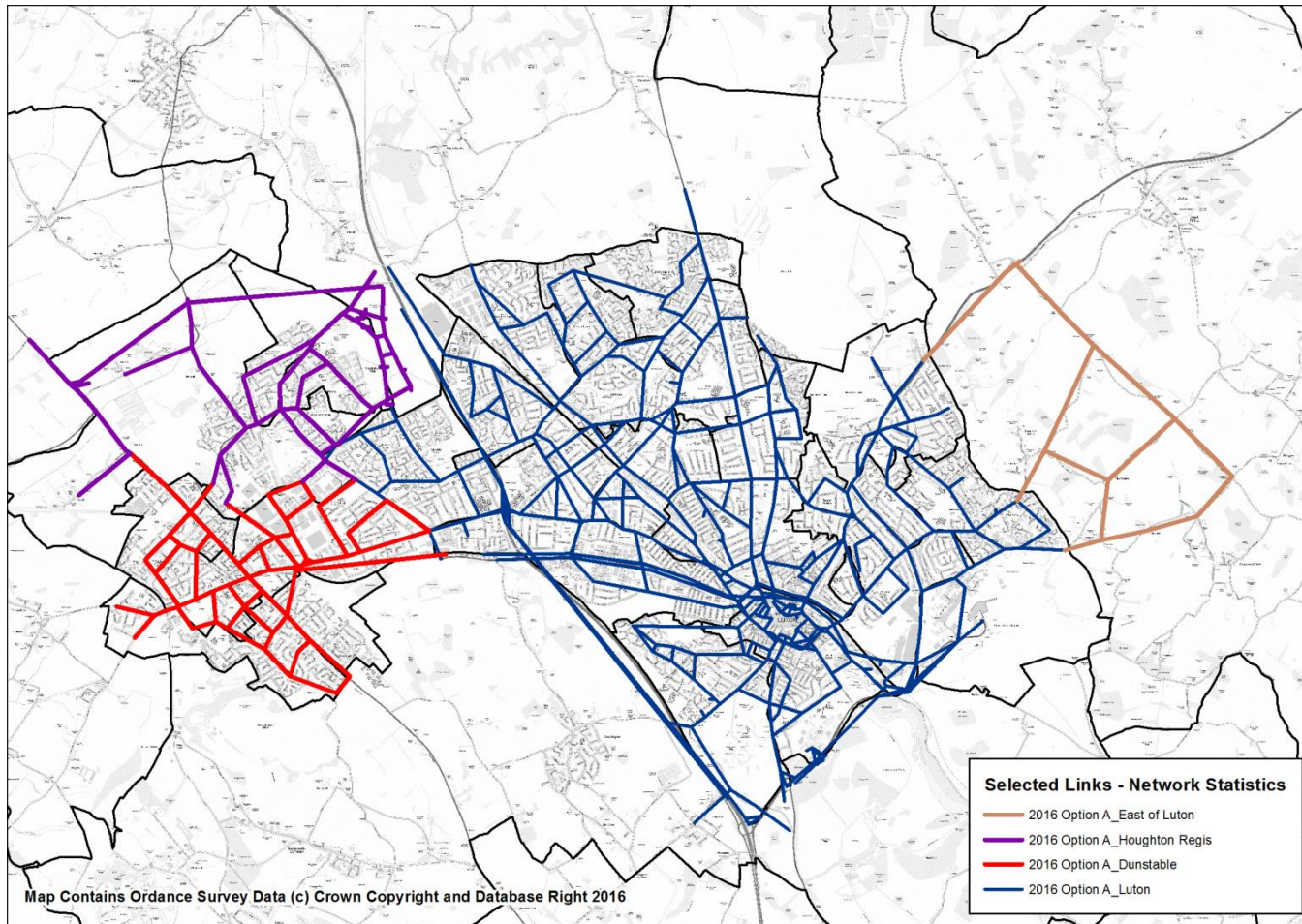
AM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) AM	31,641	17,098	38,192	38,176	45,200	46,329	46,347	46,281
Road Distance (km) AM	59	35	70	70	70	70	70	70
Free Flow Vehicle Time (veh-hours) AM	494	407	616	612	766	767	768	766
Assigned Vehicle Time (veh-hours) AM	599	545	750	743	989	986	987	982
Vehicle Delay Time (veh-hours) AM	104	138	134	131	224	219	219	216
Vehicle Queued End of Hour (PCUs) AM	26	91	28	27	90	93	93	91
Speed (kph) AM	53	31	51	51	46	47	47	47

PM Peak	2016 Option A	2016 Option A (Alternative)	2021 Option B	2021 Option C	2031 Option B	2031 Option C	2031 Option C (Alternative)	2031 Option C With Junction Mitigation
Vehicle Distance (veh-km) PM	32,537	17,944	37,374	37,882	45,094	46,672	46,815	46,711
Road Distance (km) PM	59	35	70	70	70	70	70	70
Free Flow Vehicle Time (veh-hours) PM	477	412	568	565	724	733	734	734
Assigned Vehicle Time (veh-hours) PM	569	500	684	681	934	921	924	922
Vehicle Delay Time (veh-hours) PM	93	88	116	117	210	188	190	189
Vehicle Queued End of Hour (PCUs) PM	10	23	14	16	73	55	56	55
Speed (kph) PM	57	36	55	56	48	51	51	51

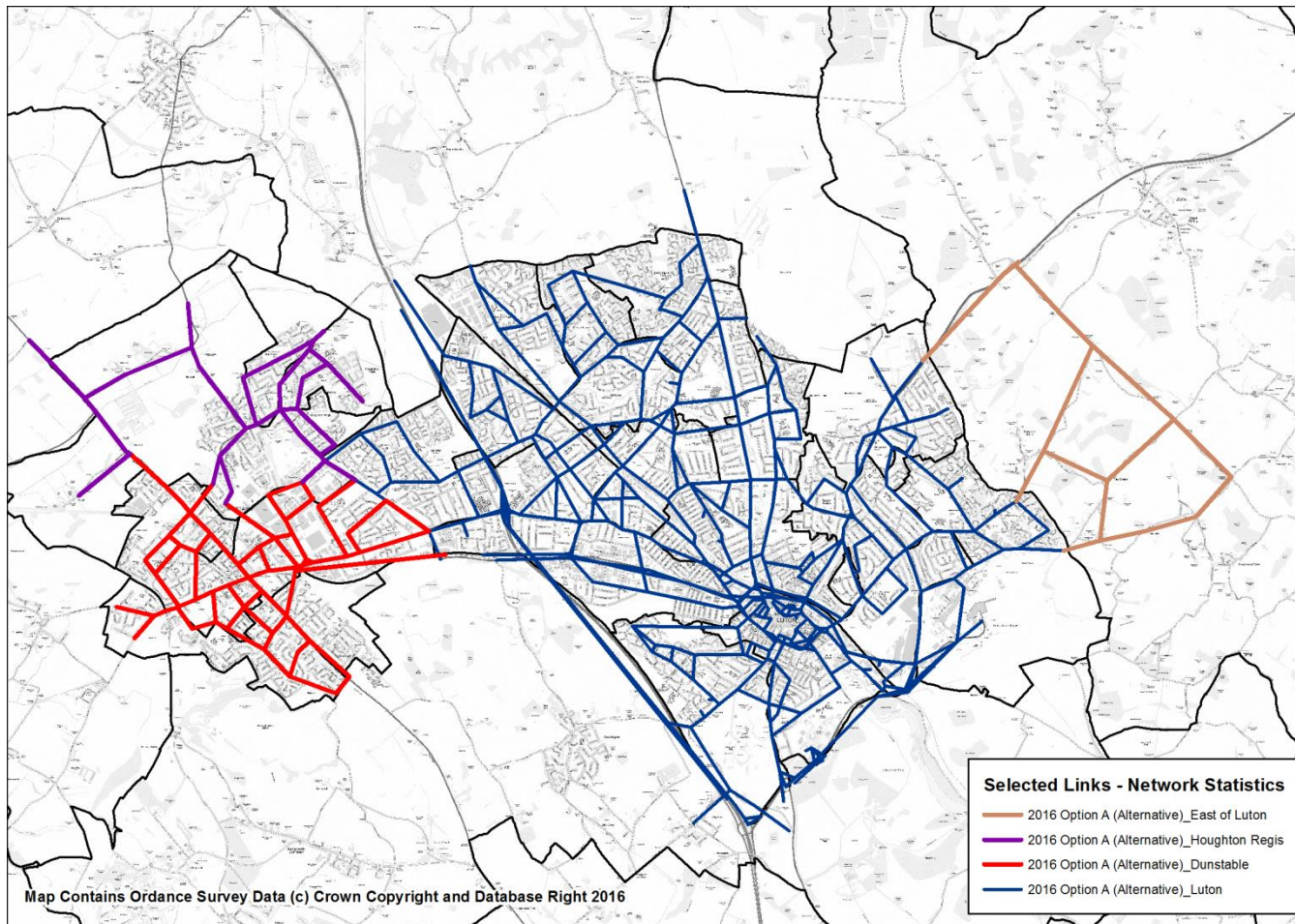
Maps

Network links used to obtain network statistics for Dunstable, East of Luton and Houghton Regis

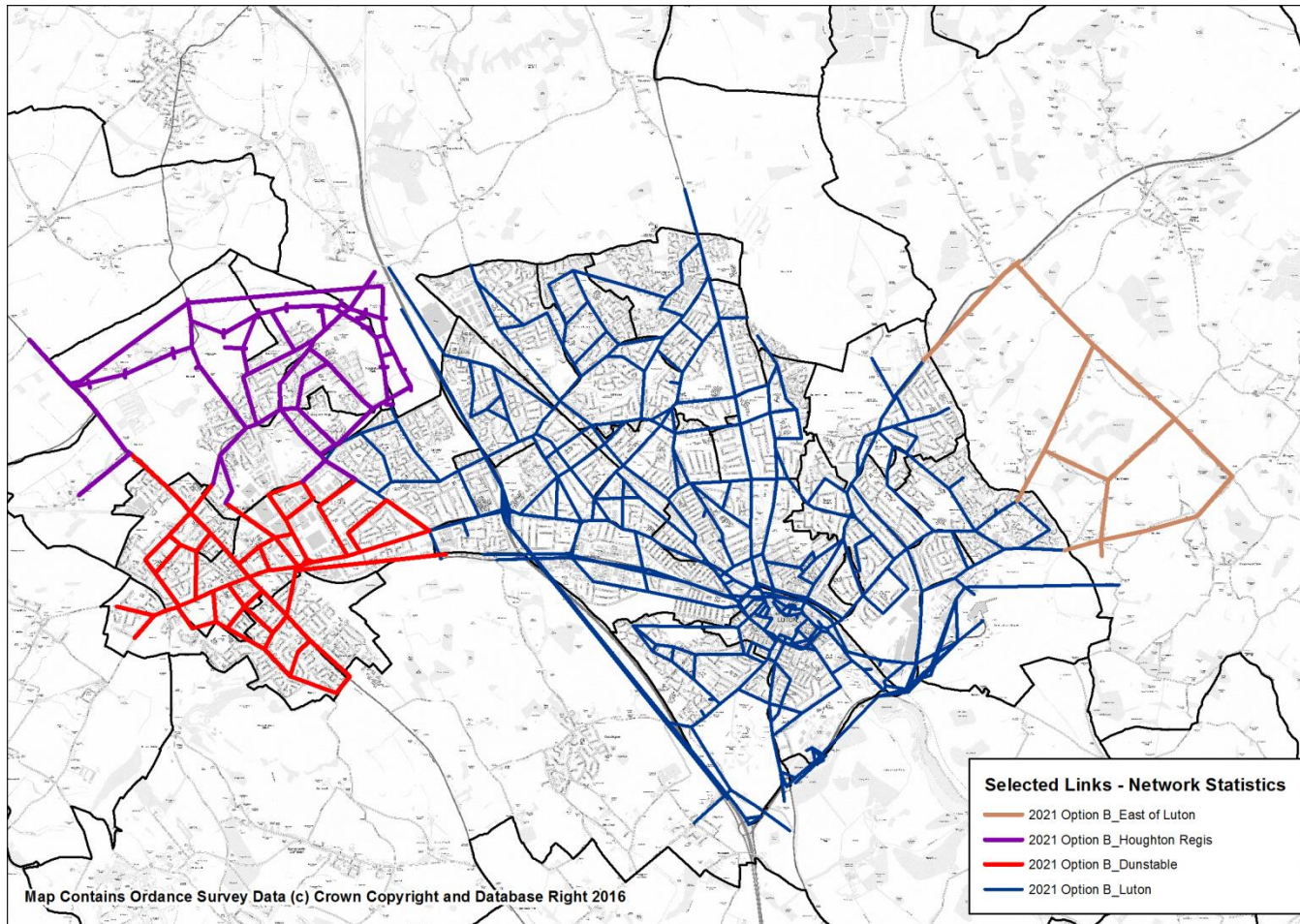
2016 Option A



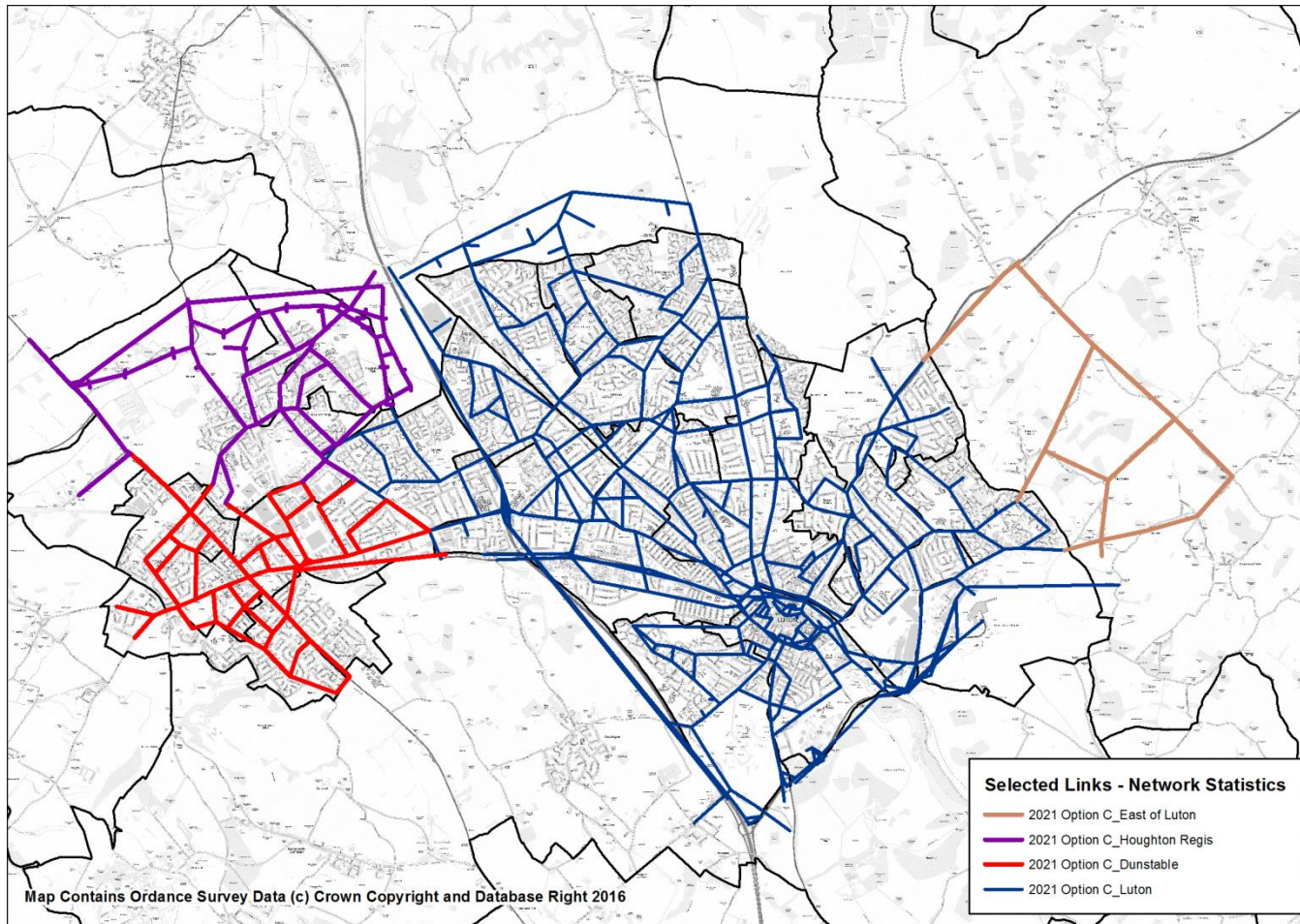
2016 Option A (Alternative)



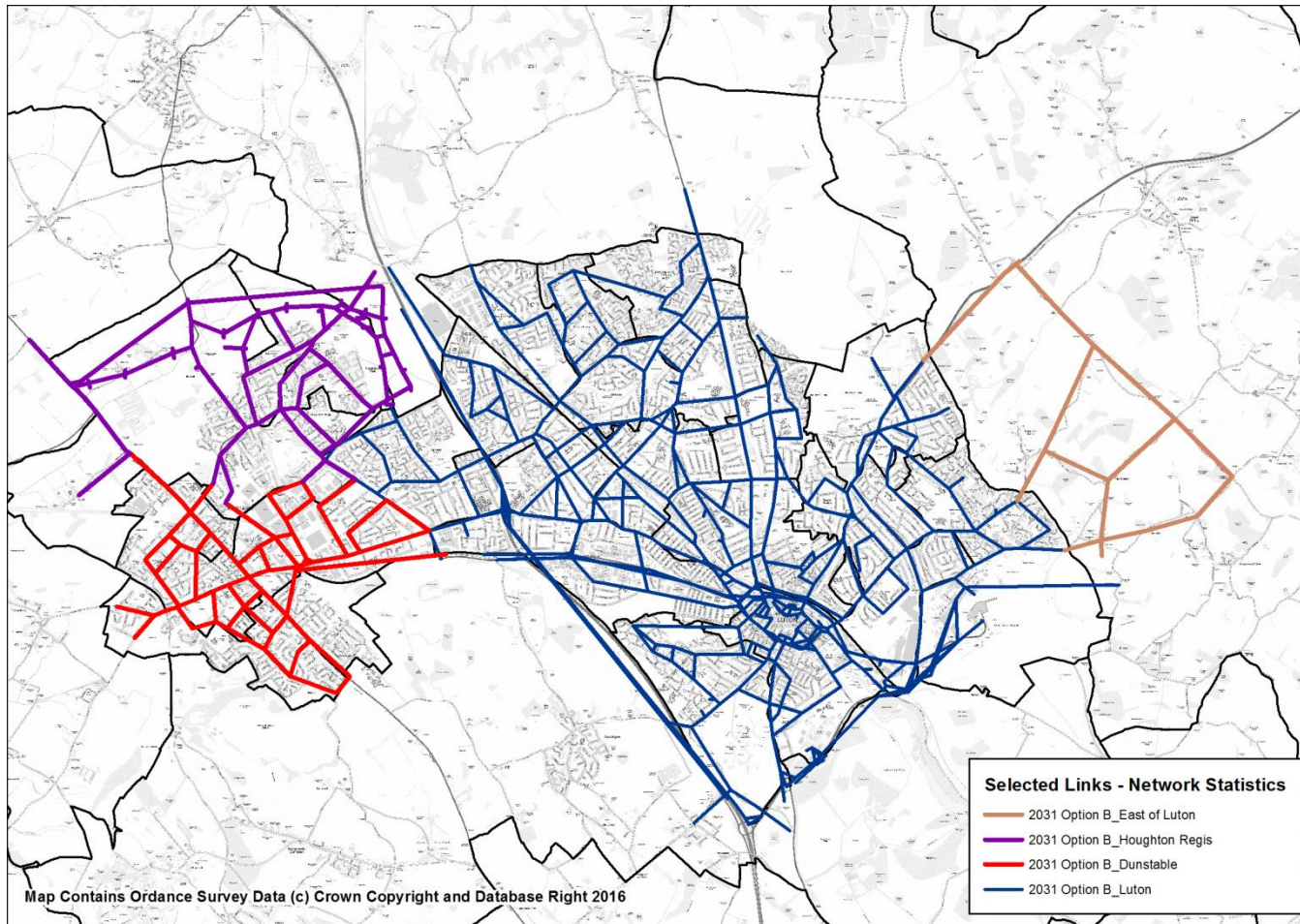
2021 Option B



2021 Option C



2031 Option B



2031 Option C, Option C (Alternative) and Option C With Mitigations

