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1 Introduction

This technical note has been prepared as an addendum to previous highway testing of the Basildon Borough Council (BBC) Publication Local Plan (also referred to as the 'Final Growth Scenario'), which will provide the planning framework for future growth and development within the Basildon Borough area up to and beyond 2034.

This addendum considers minor subsequent potential changes proposed to the Publication Local Plan, following a Council meeting held on Thursday 07th June 2018, and provides a high level assessment of the highway impacts expected from the following potential modifications:

- South West Billericay - a reduction of 300 residential units within the Billericay area, located adjacent to the proposed western relief road;
- Noak Bridge - a reduction of 300 residential units within the Basildon area, located north of the A127/A176 Noak Bridge Interchange North (Junction Ba1); and
- East Basildon Urban Extension - relocation of development proposals and revisions to the transport network and access routes within the Bowers Gifford & North Benfleet (BG&NB) Neighbourhood Area, located to the east of Basildon, as detailed within the proposed Draft Masterplan.

2 Scheme Assessments

2.1 South West Billericay

This high level assessment considers the impact of removing 300 residential units within the Billericay area, previously proposed and tested within the Final Growth Scenario. The reduction is proposed on sites in close proximity to the proposed Western Link Road (WLR) and a high level overview of the change in likely traffic impact is discussed below.

The development sites situated along the route of the proposed WLR were classified as predominately ‘suburban area’ locations. The total trips (arrivals and departures) were calculated for this development type for 300 residential units using the previous trip rates used for the Final Growth Scenario. This identified the following trip reductions across the Billericay area, as shown in **Table 2-1** below.

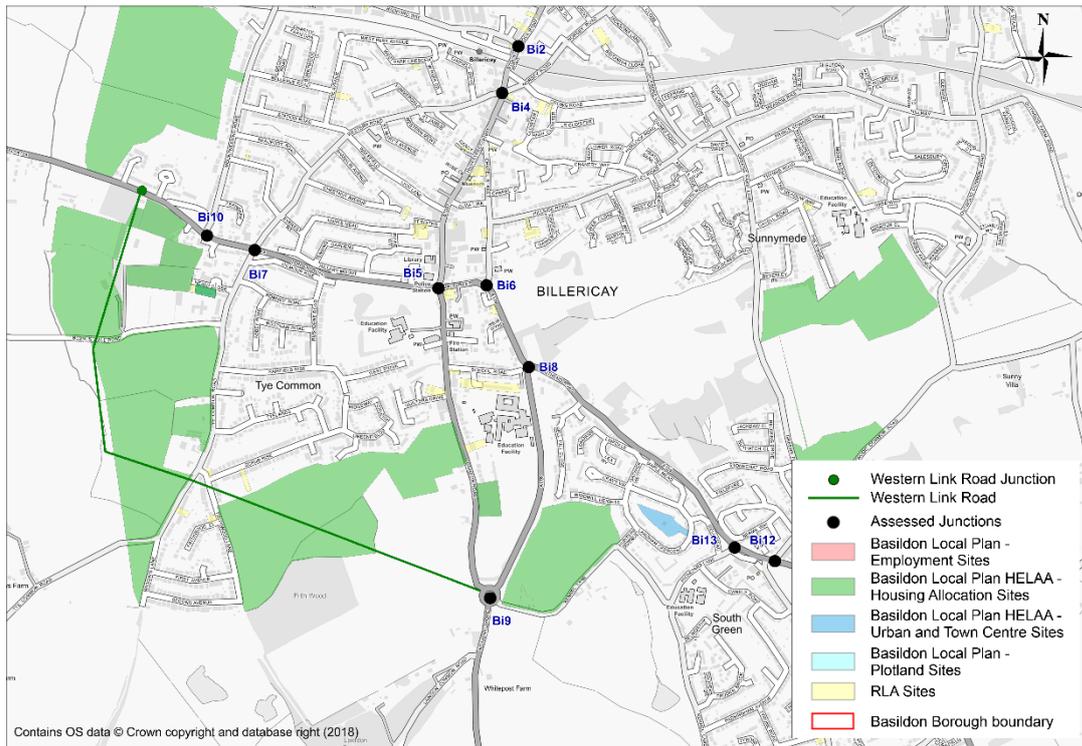
Table 2-1 South West Billericay - Trip Generation

Trip Generation	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip rate (suburban area)	0.099	0.287	0.386	0.276	0.138	0.414
Total trips (300 units)	30	86	116	83	41	124

These results show a total reduction across the Billericay area of 116 trips in the AM peak (30 arrivals and 86 departures) and 124 trips in the PM peak (83 arrivals and 41 departures).

The map provided in **Figure 2-1** shows the development sites and junctions located within close proximity of the proposed western relief road, considered most likely to be affected from the reduction in residential units and therefore vehicle trips, as detailed in **Table 2-1** above.

Figure 2-1 South West Billericay - Site Location



Although this reduction in trips will generate a lower impact in the Billericay area, alleviating the level of traffic congestion forecasted for the local road network, it is considered the introduction of the proposed WLR is still required to mitigate the overall impact of the Final Growth Scenario in Billericay.

As shown in **Table 2-2** below, in comparison to the total trips previously proposed and tested within the Final Growth Scenario, the calculations demonstrate the reduction of 300 residential units (although positive in terms of local congestion concerns) will only have a minor impact on overall anticipated traffic growth (less than 10% reduction for each peak period), and therefore the justification remains for the proposed WLR.

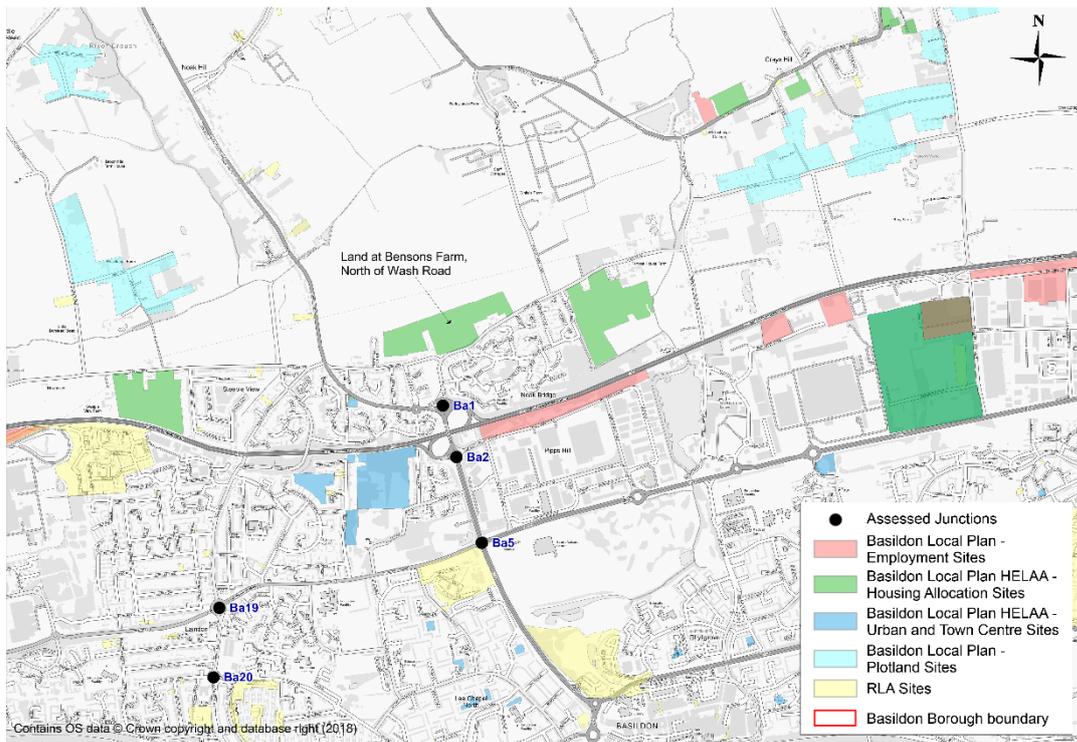
Table 2-2 South West Billericay - Trip Reduction

Trip Generation	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Total trips (Billericay)	327	871	1198	838	463	1300
Total trips (300 units)	30	86	116	83	41	124
Reduction (%)	9.1	9.9	9.5	9.9	9.0	9.4

2.2 Noak Bridge

A high level assessment has been undertaken to consider the reduction of 300 residential units at the 'Land at Bensons Farm, North of Wash Road' development site, located to the north of Junction Ba1 (as shown in **Figure 2-2** below), and the impact this has on the future operation of the junction, within the AM and PM peak periods.

Figure 2-2 Noak Bridge Assessment - Site Location



The total trips (arrivals and departures) were calculated for the development site (classified as an edge of town location) using the previous trip rates used for the Final Growth Scenario. These trips were subsequently reduced by 10% on the basis that approximately 90% of all trips would be distributed through Junction Ba1 and the remainder to other local routes. This identified the following trip reductions for Junction Ba1, as shown in **Table 2-3**.

Table 2-3 Noak Bridge Assessment - Trip Generation

Trip Generation	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip rate (edge of town)	0.134	0.334	0.468	0.330	0.158	0.488
Total trips (300 units)	40	100	140	99	47	146
90% of total trips (300 units)	36	90	126	89	43	132

These results show a total reduction for Junction Ba1 of 126 trips in the AM peak (36 arrivals and 90 departures) and 132 trips in the PM peak (89 arrivals and 43 departures).

These trip reductions were applied to the total Publication Local Plan development trip matrix for Junction Ba1 for both the ‘Final Growth Scenario’ and ‘Final Growth Scenario Plus Mitigation’ (with full traffic reassignment). The trip reductions were applied proportionally for all turning movements at the junction, and equated to the following total development reductions from the initial development flow matrices, as shown in **Table 2-4** below.

Table 2-4 Noak Bridge Assessment - Trip Reduction

Scenario	AM Total	PM Total
Final Growth Scenario	22.3%	22.3%
Final Growth Scenario Plus Mitigation	15.7%	17.1%

These results show the calculated development trips from the 300 residential units equate to a total reduction of approximately 22% of all development flows from the ‘Final Growth Scenario’ and approximately 16% for the ‘Final Growth Scenario Plus Mitigation’ for both the AM and PM peak periods.

A comparison of the total flows at the Junction Ba1 for each scenario is shown in **Table 2-5** below.

Table 2-5 Noak Bridge Assessment – Flow Comparison

Scenario	AM Total	PM Total
Base Scenario	3801	4010
Background Growth Scenario	4133	4346
Final Growth Scenario	4700	5186
Final Growth Scenario (reduced development trips)	4574	5055
Final Growth Scenario Plus Mitigation	4711	4743
Final Growth Scenario Plus Mitigation (reduced development trips)	4584	4611

These results show the growth scenarios with reduced development trips have a lower total flow than their initial comparable scenarios (with the full development trips included), yet, they remain significantly higher than the flows modelled within the base and background scenarios.

Junction modelling was undertaken to test the revised ‘Final Growth Scenario’ and ‘Final Growth Scenario Plus Mitigation’ with reduced development trips, as a standard roundabout for the existing layout and as a signalised roundabout (with an increased circulatory carriageway and widened entries) as the proposed mitigation option.

The results are expressed as the maximum Ratio of Flow to Capacity (RFC)/Degree of Saturation (DoS) value recorded on the worst junction arm in the AM and PM peak periods. A junction is considered to operate within desirable capacity with a value of 0.85 or lower, within theoretical capacity with a value between 0.85 and 1.00, exceeding theoretical capacity with a value between 1.00 and 1.15, and significantly exceeding capacity with a value greater than 1.15.

The following colour bands have been applied to highlight the RFC/DoS values for ease of reference:

- **Green** < 0.85: Junction within desirable capacity;
- **Yellow** 0.85 – 1: Junction within theoretical capacity;
- **Amber** 1 – 1.15: Junction exceeding capacity (potential to mitigate with sustainable transport measures); and
- **Red** >1.15: Junction significantly exceeding capacity, (potential to mitigate with junction design or significant flow reduction).

The junction modelling results are shown in **Table 2-6** below.

Table 2-6 Noak Bridge Assessment – Junction Modelling Results

Scenario	AM Total	PM Total
Base Scenario	0.80	1.06
Background Growth Scenario	0.95	1.17
Final Growth Scenario	1.31	1.38
Final Growth Scenario (reduced development trips)	1.22	1.35
Final Growth Scenario Plus Mitigation	1.06	1.24
Final Growth Scenario Plus Mitigation (reduced development trips)	1.04	1.22

The junction modelling results show the junction with reduced development trips continues to operate at a similar level to their initial comparable scenarios (with the full development trips included), with the decrease in development trips resulting in a minimal impact on the junction performance, albeit a minor overall improvement.

Nonetheless, the junction continues to exceed capacity for the Final Growth Scenario, both with and without mitigation.

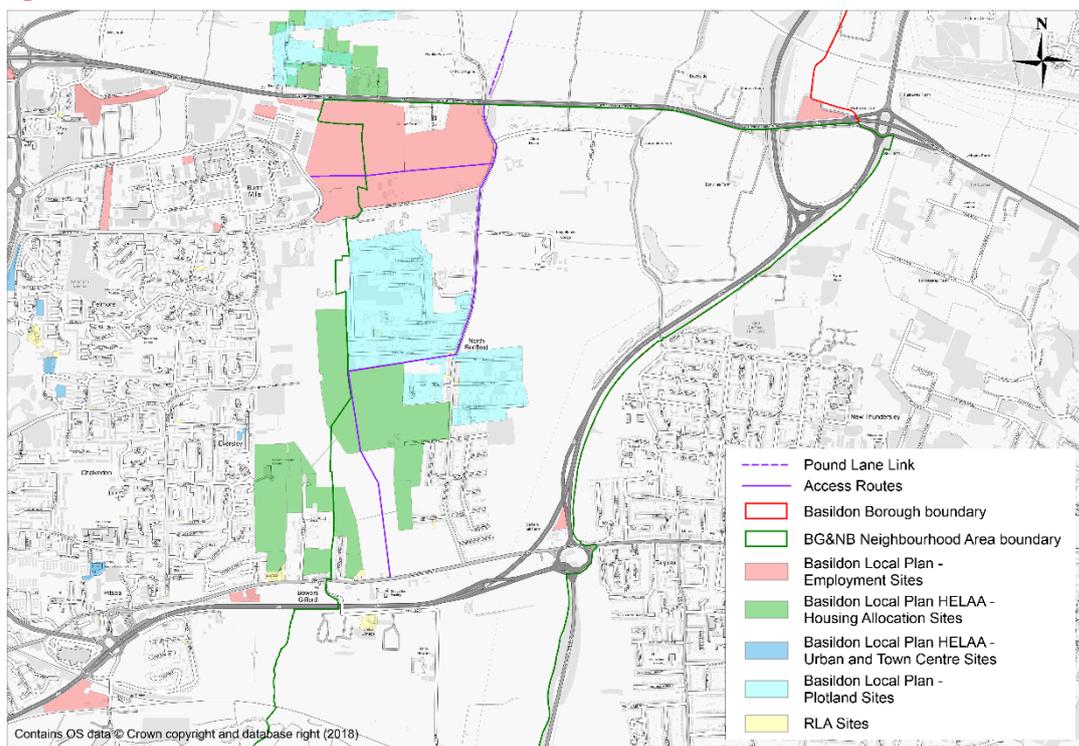
Although minor improvements are shown between the initial and reduced development flow scenarios, the junction continues to operate within the same 'colour bands', and therefore presents justification to proceed with the mitigation option proposed at Junction Ba1.

2.3 East Basildon Urban Extension

A high level assessment has been undertaken to consider the impacts of the relocation of development proposals, alongside revisions to the transport network and access routes, within the East Basildon Urban Extension area. This development area is located within the Bowers Gifford & North Benfleet (BG&NB) Neighbourhood Area boundary, located to the east of Basildon, and considers two alternative development and transport options within their proposed Draft Masterplan, in comparison to what has been previously proposed and tested within the Final Growth Scenario.

The development allocations and transport network previously proposed and tested within the Final Growth Scenario is shown in **Figure 2-3** below.

Figure 2-3 East Basildon Urban Extension – Final Growth Scenario



This proposes employment sites to the north, residential sites to the south (RLA and HELAA) and the build out of plotland sites in the centre of the East Basildon Urban Extension area. Surrounding transport links proposed include the new Pound Lane link, (A127 Junction and Tresco Way / Cranfield Park Road Link), the new link road parallel to Burnt Mills Road, alongside additional access routes southbound towards London Road and the Green link to the central area from east Pitsea.

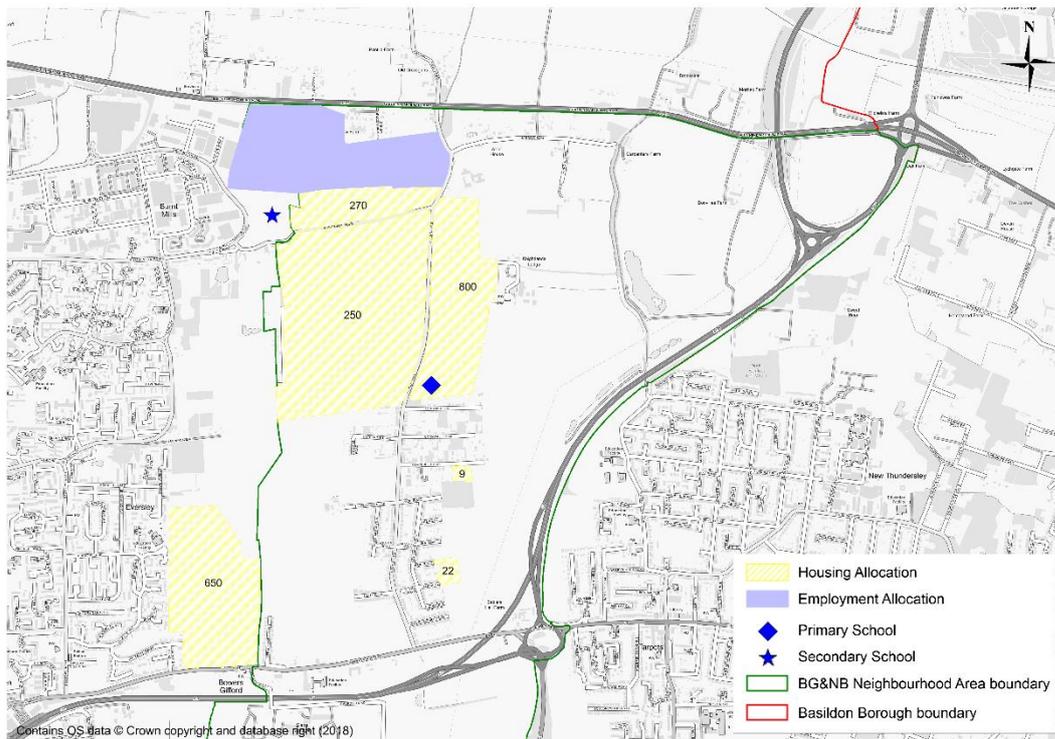
Overall, a total of 2,000 houses are to be delivered to the east of Basildon, with 1,350 houses located within the Neighbourhood Area boundary (and therefore provided as part of the BG&NB Neighbourhood Plan). In addition, the employment site is a strategic allocation required through the Local Plan, and will be provided regardless of the contents of the BG&NB Neighbourhood Plan.

The two alternative potential development options (Option 1 and Option 2) proposed in the Draft Masterplan for the BG&NB Neighbourhood Plan are detailed below as follows:

Option 1 (as shown below in **Figure 2-4**):

- 650 to the east of Pitsea;
- 250 in the North Benfleet plotland area;
- 800 to the east of Pound Lane in North Benfleet (with provision of a Primary School to the southern edge and local centre);
- 9 to the southern edge of the North Benfleet plotland area to the north east of Bowers Gifford;
- 22 to the east of Bowers Gifford; and
- 270 at Bradfields Farm, south of the employment allocation, (with provision of a Secondary School).

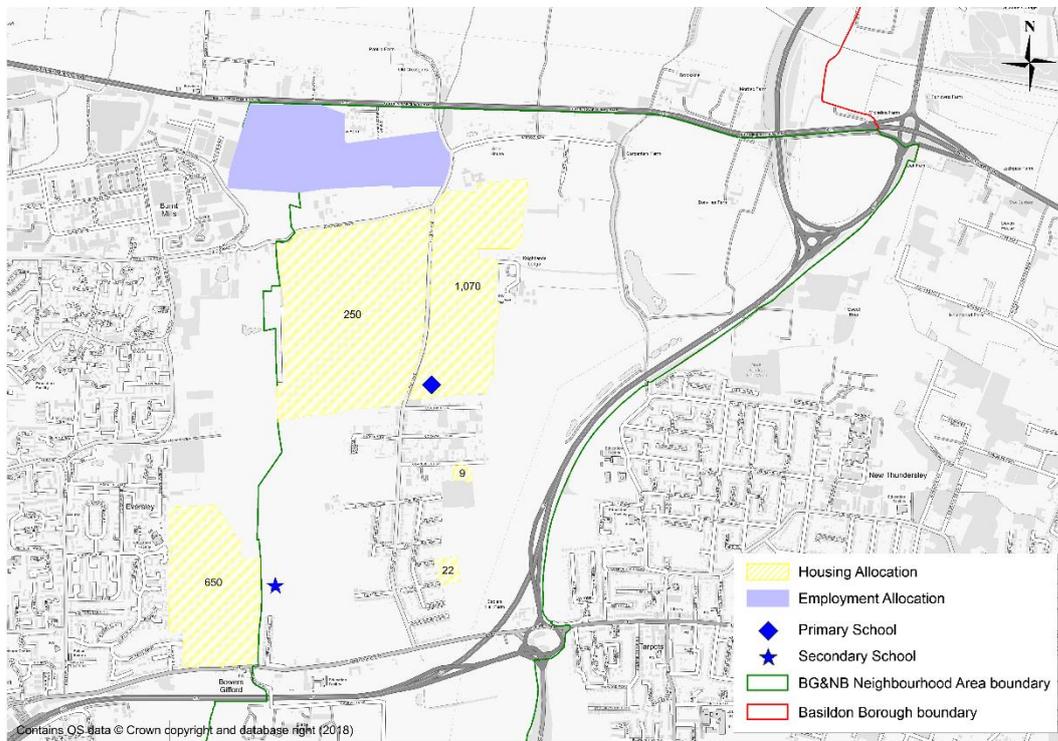
Figure 2-4 BG&NB Neighbourhood Plan - Housing Option 1



Option 2 (as shown below in **Figure 2-5**):

- 650 to the east of Pitsea (with provision of a Secondary School adjacent to the housing development);
- 250 in the North Benfleet plotland area;
- 1,070 to the east of Pound Lane in North Benfleet, 800 adjacent to the plotland area (with provision of a Primary School on the southern edge), and a further 270 compared to option 1 to the east of the proposed employment allocation;
- 9 to the southern edge of the North Benfleet plotland area to the north east of Bowers Gifford; and
- 22 to the east of Bowers Gifford.

Figure 2-5 BG&NB Neighbourhood Plan - Housing Option 2



The two alternative potential development options (Option 1 and Option 2) propose a broadly similar spatial arrangement to that previously proposed and tested within the Final Growth Scenario, proposing only minor adjustments to the allocation of units at each of the site locations. These alterations are therefore expected to have a minimal impact on the wider road network (and subsequently the outcome of the modelling results), given the likeness in terms of the origin and destination of trips to be produced by the proposed developments.

The two alternative potential transport options (Option A and Option B) proposed in the Draft Masterplan for the BG&NB Neighbourhood Plan are detailed below as follows:

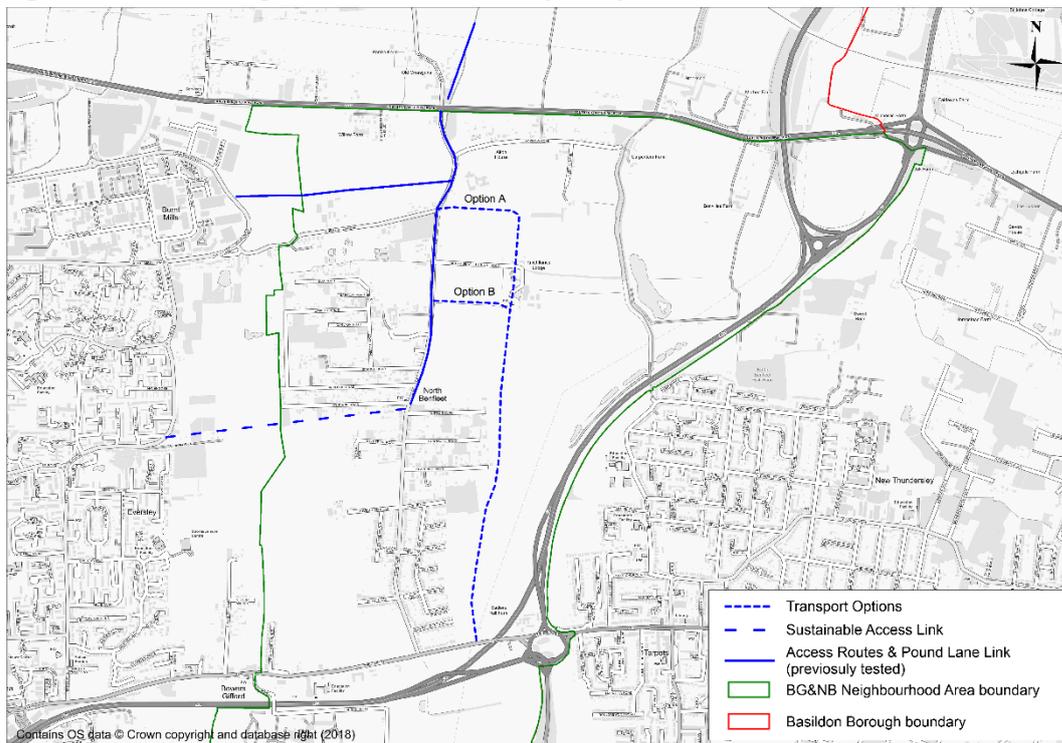
Option A (as shown below in **Figure 2-6**):

- The new Pound Lane link and the new link road parallel to Burnt Mills Road (leading to the business corridor) as previously tested;
- Bus Link from Tyefields to Pound Lane for buses, cyclists and pedestrians only (the Green link); and
- New Link road from Burnt Mills Road to London Road located to the eastern edge of the new development proposed in North Benfleet and to the east of Bowers Gifford.

Option B (as shown below in **Figure 2-6**):

- The new Pound Lane link and the new link road parallel to Burnt Mills Road (leading to the business corridor) as previously tested;
- Bus link from Tyefields to Pound Lane for buses, cyclists and pedestrians only (the Green link); and
- New Link Road from Pound Lane to London Road which connects via a route to the eastern edge of the development in North Benfleet and to the east of Bowers Gifford, with a new access approximately half way between Burnt Mills Road to the north and Clarence Road to the south.

Figure 2-6 BG&NB Neighbourhood Plan - Transport Options



The two alternative potential transport options (Option A and Option B) propose an extended link from Pound Lane, past the Neighbourhood Area boundary to connect to Tyefields, as a sustainable access link for buses, cyclists and pedestrians only. In addition, two alternative link road routes are proposed from Pound Lane to London

Road, aligned to the eastern edge of the Bowers Gifford settlement (extending from Burnt Mills Road for Option A and further south - approximately half way between Burnt Mills Road and Clarence Road - for Option B) in comparison to the initial route previously proposed and tested within the Final Growth Scenario, aligned to the western edge of the Bowers Gifford Settlement.

This illustrates that the alternative potential transport options propose a broadly similar spatial arrangement to that previously proposed and tested within the Final Growth Scenario, with only minor adjustments proposed, via an extension to the link from Pound Lane, and alternative routes for the link to London Road. These alterations are therefore expected to have a minimal impact on the wider road network (and subsequently the outcome of the modelling results), given the likeness in terms of the location of the access road routes to be provided for the proposed development.

In summary, the comparative housing allocations, road network layout and links to the wider network have not materially changed to that previously proposed and tested in the Final Growth Scenario. The development revisions (proposed in Option 1 and Option 2) and alternative transport options (proposed in Option A and Option B) are therefore considered to have a minimal change in impact on the local junctions and highway network. Given the negligible impact of the revisions proposed in all options, additional transport modelling work is not considered necessary at this stage.

Nevertheless, it should be noted that there may be the need for detailed design and feasibility to be carried out at a later date to ensure that any alternative access would be achievable as part of the Final Masterplan. This is with particular reference to the proposed connection at London Road for both the alternative link road routes, aligned to the eastern edge of the Bowers Gifford settlement. Given its proposed proximity to the Sadlers Farm junction, it is considered feasibility work may be required to consider and mitigate any potential problems that may occur, and to demonstrate that the implementation and future operation of this junction is feasible.

This is expected to be addressed through any Transport Assessment supporting any sites, as they come forward, to establish the specific impacts and to ensure that they are appropriately mitigated. Individual developers will therefore be expected to address specific design considerations and promote adequate mitigation.

3 Conclusion

This technical note provides a high level assessment of the highway impacts anticipated from three separate minor potential changes proposed to the Publication Local Plan (following a Council meeting held on Thursday 07th June 2018). Comparison has been made to the inputs and measures previously proposed and tested within the Final Growth Scenario.

Technical assessments were carried out, providing justification to retain the two proposed highway schemes; the WLR in Billericay and Noak Bridge junction improvements in Basildon. Assessment results demonstrated the need to implement these schemes to provide sufficient mitigation measures on the local road network under both the 'initial' and the 'reduced' Final Growth Scenarios. It is concluded that even with the development changes in place, although providing a positive change with regards to traffic demand, the reductions in vehicle trips are not expected to generate a significant enough impact to justify the removal of these mitigation schemes.

A qualitative review was undertaken with regards to the changes proposed to the development relocation and transport network and access routes within the East Basildon Urban Extension area. This review illustrated that the proposed changes are not expected to result in a change to the distribution and volume of traffic, with comparable housing locations and total unit numbers across the development sites (proposing minor reallocations across the sites), as well as comparable access routes (proposing minor realignments for two of the link roads). Therefore, it is anticipated these changes will provide comparable results to the arrangements previously proposed and tested within the Final Growth Scenario.

The potential changes in the East Basildon Urban Extension area, proposed within the Draft Masterplan will be provided as part of the BG&NB Neighbourhood Plan, and therefore no additional feasibility work will be required for the purposes of the Council's Local Plan. However, as the proposals for the Neighbourhood Plan progress it is likely that further feasibility work will need to be carried out at a later date, providing further detailed analysis (potentially through the Transport Assessment work required) to ensure there is robust evidence to support the Neighbourhood Plan at examination.