
MID SUSSEX DISTRICT COUNCIL DRAFT SITE ALLOCATIONS DPD PUBLIC CONSULTATION

HIGHWAYS AND TRANSPORT TECHNICAL NOTE 02

IN RESPECT OF LAND NORTH OF THE A2300, GODDARDS GREEN, BURGESS HILL, WEST SUSSEX

16TH JANUARY 2020

1.0 Executive Summary

- 1.1 Project Newton is the proposed Science and Technology Park (S&TP) to the north of the A2300, identified by MSDC as the preferred location, which benefits from a deliverable vehicular access via an existing junction, and from the existing roads already extending north-south through the site.
- 1.2 The Project Newton team commissioned SYSTRA to undertake an additional round of modelling using MSDC's Mid Sussex Transport Study (MSTS) model, to compare the Project Newton S&TP site and the south S&TP site on a like-for-like basis.
- 1.3 The detailed comparison of the performance metrics clearly demonstrates that the Project Newton S&TP site north of the A2300 has notably less traffic impact than the south S&TP site, which demonstrably supports the MSDC decision to allocate the Project Newton site for the S&TP within the emerging DPD.
- 1.4 The proposed Project Newton A2300 'hamburger' roundabout, which has been the subject of pre-application discussions with West Sussex County Council Highways, has been tested using the AM and PM peak hour traffic flows extracted from the MSTS model. In doing so, the proposed junction is shown to operate within capacity in MSDC's envisaged 2031 traffic scenario, without demand management mitigation.
- 1.5 It is shown that the A2300 / Cuckfield Road roundabout will be significantly over capacity in the scenario with the S&TP south site. There is limited scope within the available highway land to increase the junction's capacity; the deliverability of further improvements exists only with the Project Newton (north) S&TP site.
- 1.6 The S&TP south site access comprises a new, additional junction on the A2300. In a scenario with the S&TP south site, the flow of traffic on the A2300 will be disrupted by both the new junction and the significant delays at the Cuckfield Road roundabout.
- 1.7 In order to provide evidence for Project Newton's anticipated scale of travel mode shift away from the motorcar, Connect Consultants has referred to local Census data and has considered potential bus service improvements which could be delivered via the emerging Project Newton Sustainable Access Strategy and the Burgess Hill Public Transport Strategy. This also has regard to the Northern Arc Sustainable Transport Strategy.
- 1.8 A 10% mode shift is wholly realistic in view of the potential bus service improvements, the emerging Project Newton Sustainable Access Strategy, the proximity of Project Newton to the future Northern Arc residential areas, Bolney Grange Business Park, and The Hub employment site, and the synergies between the respective public/sustainable transport strategies.

- 1.9 This document summarises our findings of the additional traffic modelling and further justifies the LPA identification of the Project Newton site north of the A2300 as the preferred site for the S&TP in the emerging Site Allocation DPD by MSDC.

2.0 Introduction

- 2.1 Connect Consultants Limited is a firm of transport planning and highway design consultants that have been instructed by Glenbeigh Developments Ltd and Wortleford Trading Company Ltd in relation to the promotion of their land to the north of the A2300 at Goddards Green, West Sussex, for a future Science & Technology Park, known as Project Newton.
- 2.2 This is in the context of the Mid Sussex District Council Draft Site Allocations DPD (Regulation 18) Public Consultation, in which Mid Sussex District Council (MSDC) has identified the Project Newton site, on the north of the A2300, as the preferred location for a Science & Technology Park (S&TP).
- 2.3 A Technical Note (TN), dated 14th November 2019 by Connect Consultants, was submitted in response to the highways and transport evidence base published by MSDC alongside the Draft DPD, which refers to strategic traffic modelling undertaken on behalf of MSDC by SYSTRA.
- 2.4 Additional strategic traffic modelling has subsequently been completed by SYSTRA on behalf of Project Newton, to further inform the Regulation 18 consultation representation.
- 2.5 This TN sets out the details and outputs of the additional modelling, which further supports the allocation of Project Newton as the preferred S&TP location.
- 2.6 This TN also considers the proposed Project Newton vehicular access strategy, which is shown to be preferable to that of the S&TP south site, in the context of the future traffic scenario as envisaged by MSDC.
- 2.7 Finally, this TN considers the potential travel-mode shift that could be realised through the emerging Project Newton Sustainable Access Strategy.
- 2.8 This should be read in conjunction with the 14th November 2019 TN.

3.0 Mid Sussex Transport Study

- 3.1 To support the Site Allocations DPD, Mid Sussex District Council commissioned SYSTRA to run a strategic highway model to inform and update the Mid Sussex Transport Study (MSTS).

Selection of S&TP North Site compared to South Site

- 3.2 Scenarios 2 and 3 of the MSTS were used for the comparative assessment of the northern and southern sites for the S&TP allocation, whereby the Project Newton site to the north of the A2300 is included in Scenario 2, and the site to the south of the A2300 is included in Scenario 3.

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- 3.3 The MSTs focussed on Scenario 2c, which includes the upgrading of the A2300/Cuckfield Road roundabout to a 'hamburger' roundabout, which is one of the three proposed vehicular access options suggested in pre-application discussions between the Project Newton team and WSCC.
- 3.4 The scale and mix of uses of the S&TP differs between Scenario 2c and Scenario 3; the south site was assessed with c.35-40% less traffic than the north site.
- 3.5 Despite the significant difference in scale, the two site options were compared in terms of 'traffic impact', which in this instance is defined by the number of junctions at which the modelling predicts a 'severe' or 'significant' impact.
- 3.6 A 'severe' impact is defined in the MSDC methodology as a junction with any approach arm experiencing either of the following:
- a junction with an increase in ratio of flow to capacity (RFC) of 10% or more to an RFC of 95% or more in any period in any Scenario; or
 - an increase in average delay of one minute or more to an average delay of two minutes or more in any period in any Scenario.
- 3.7 A 'significant' impact is defined by the MSDC methodology as a junction with any approach arm experiencing the following:
- a junction with an increase in ratio of flow to capacity (RFC) of 5% or more to an RFC of 85% or more in any period in any Scenario.
- 3.8 Despite the Project Newton site being assessed at a significantly larger scale with significantly more traffic than the south site, the MSTs Scenarios 2c and 3 show that the Project Newton (north) site (Scenario 2c) will have less traffic impact than the south site.
- 3.9 The overarching conclusion is that while Scenario 2c results in 9 'significant' impacts compared to 7 in Scenario 3, Scenario 2c has only 11 'severe' impacts compared 12 'severe' impacts in Scenario 3. This distinction contributed to the selection of the northern site as the preferred site.
- 3.10 As the north and south site options were not assessed on a like-for-like basis, the Project Newton team commissioned SYSTRA to undertake an additional round of strategic traffic modelling to include a more realistic like-for-like assessment, in which the two potential locations of the S&TP are compared using the same scale and mix of uses in both locations; the only difference being the sites' access arrangements and the associated difference in traffic distribution.
- 3.11 The additional modelling is set out in the next section.

4.0 Additional Strategic Traffic Modelling.

- 4.1 The Project Newton team commissioned SYSTRA to undertake an additional round of modelling using MSDC's Mid Sussex Transport Study model, to compare the two S&TP site options on a like-for-like basis.

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- 4.2 The modelling tested two new scenarios, 8 and 8b, which both include the same set of future developments across the district, as per MSDC's most up-to-date assumptions, both including a S&TP comprising 2,500 jobs.
- 4.3 The only difference between the two is that Scenario 8 has the S&TP on the Project Newton site north of the A2300 accessed via the proposed hamburger roundabout, while Scenario 8b has the S&TP on the south site accessed via a new three-arm standard roundabout on the A2300, located approximately half way between Pookbourne Lane and Bishopstone Lane.

Detailed Comparison of the S&TP North and South Sites – Methodology

- 4.4 The methodology used by MSDC for the high-level comparison of the traffic impacts of various future development scenarios is, by necessity, a relatively crude method with only three categories; 'OK', 'significant' and 'severe'.
- 4.5 Scenario 8 shows the Project Newton site to have eight severe and nine significant impacts, while Scenario 8b shows the south site to have nine severe and nine significant impacts.
- 4.6 This is shown in the table provided in Appendix 1, "*Mid Sussex Transport Study: Scenario 8 results Summary*".
- 4.7 Due to the high level, strategic nature of the comparison methodology, there is no immediate visibility of how 'significant' or how 'severe' each site option's impacts are.
- 4.8 While the MSDC methodology is appropriate for comparing district-wide variations in strategic development options, it does not provide enough detail for the purposes of comparing two identical developments which are geographically very close.
- 4.9 In order to comprehensively compare the traffic impacts of the two S&TP site options, Connect Consultants has undertaken a more detailed analysis of the key junction performance metrics which comprise the outputs of the strategic modelling.
- 4.10 The MSTs results are reported in terms of four metrics which are used as indicators of the traffic impact on each approach arm to each junction:
- Demand (number of vehicles)
 - RFC (ratio of traffic flow to capacity, in percentage terms)
 - Delay (seconds)
 - Average Queues (in PCUs, passenger car units, a proxy for vehicles)
- 4.11 The table "*Mid Sussex Transport Study: Junction approach arm statistics for identified locations*", provided in Appendix 2, shows these four metrics for each approach arm to each of the key junctions within the traffic model.
- 4.12 It shows the four metrics in four modelled scenarios; the 2017 baseline, the 2031 Reference Case (without the S&TP), 2031 Scenario 8 (Project Newton S&TP scenario) and 2031 Scenario 8b (the S&TP south site scenario).
- 4.13 Colour-coding within the table identifies 'significant' and 'severe' impacts, as defined by the MSDC methodology.

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- 4.14 Using the detailed statistics from the table "*Mid Sussex Transport Study: Junction approach arm statistics for identified locations*" (in Appendix 2), Connect Consultants has compiled a table which quantifies (rather than categorises) the scale of impact at each junction, and from which a more comprehensive comparison has been made between the two S&TP site options.
- 4.15 This table, provided at Appendix 3, includes the 22 junctions which are shown to have either 'significant' or 'severe' impacts in either or both the AM and PM peaks in either Scenario 8 (with the Project Newton S&TP site) or Scenario 8b (with the south S&TP site).
- 4.16 In this table, each of the four metrics are amalgamated to produce a 'whole junction' total for each metric for each of the 22 junctions; the number of vehicles (demand) on each approach arm are summed to produce each junction's total demand; the average RFC for each junction is calculated as the mean of the RFC on each approach arm; the delay on each arm is summed to produce each junction's total delay; and the average queue length on each approach arm is summed to produce the total average queue for each junction.
- 4.17 In this way, the impact at each junction is quantified rather than being allocated to a broad classification.
- 4.18 For all four metrics, a lower value equates to a better junction performance.

Detailed Comparison of the S&TP North and South Sites – Results

- 4.19 The detailed comparison table described above is provided in Appendix 3, from which there are two outputs.
- 4.20 One is a points-based comparison between Scenario 8 and Scenario 8b in terms of the count of 'better performances' across the four metrics. In instances where the two scenarios have equal values for the same metric, no count is applied as their performance is equal.
- 4.21 The Project Newton site (Scenario 8) scores 65 'better' performances against the south site (Scenario 8b), while the south site scores only 46 'better' performances against the Project Newton site.
- 4.22 The second output is the sum of the delay at all of the junctions, on the basis that delay is the most readily recognised indicator of performance out of the four metrics. The lowest resultant value represents the best overall performance across all of the 22 junctions as it equates to less overall delay.
- 4.23 The Project Newton site totals 6,167 seconds of delay, approximately 27% less (better) than the south site's total of 8,466 seconds of delay.
- 4.24 It is worth noting that Scenario 8 includes the proposed upgrade of the A2300/Cuckfield Road roundabout to a 'hamburger' roundabout junction, which forms part of the Project Newton access strategy. The 'hamburger' link provides a through-route for non-S&TP traffic travelling east/west on the A2300; a benefit which is not included in Scenario 8b.

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- 4.25 While it can be argued that the 'hamburger' junction forms part of the Project Newton access and is therefore a valid component of Scenario 8, the site comparison calculations have also been undertaken excluding the junction of the A2300 / Cuckfield Road.
 - 4.26 If the A2300/Cuckfield Road junction is excluded from the calculation, the Project Newton site scores 59 'better' performances against the south site, while the south site scores 44 'better' performances against the Project Newton site, and the Project Newton site totals 5,891 seconds of delay, approximately 15% less (better) than the south site's total of 6,897 seconds.
 - 4.27 This detailed comparison of the performance metrics clearly demonstrates that the Project Newton S&TP site has notably less traffic impact than the south S&TP site, which demonstrably supports the MSDC decision to allocate the Project Newton site for the S&TP within the emerging DPD.

5.0 Junction Capacity Analysis

- 5.1 The strategic traffic modelling of Scenario 8 includes a 'hamburger' roundabout at the junction of the A2300 and Cuckfield Road, as proposed as part of the Project Newton access strategy.
- 5.2 The outputs shown in the table in Appendix 2 show that without any physical mitigation or demand-management measures the junction will operate within capacity in the Scenario 8 AM peak hour, however it shows that the Cuckfield Road (S) and A2300 (W) approaches are slightly over capacity in the PM peak hour.
- 5.3 The strategic nature of the MSTs modelling is such that it is not an appropriate tool for the detailed assessment of junction operation and capacity.
- 5.4 As such, in order to provide confidence that the proposed 'hamburger' roundabout will be able to accommodate the future traffic scenario envisaged by MSDC, Connect Consultants has tested the proposed junction using industry-standard LinSig3 software.
- 5.5 LinSig3 is a specialist computer software for modelling and assessing the operation of signal-controlled junctions and networks of junctions. It takes into account the geometric parameters of the junction layout, traffic flows and speeds, and the detailed signal timings.
- 5.6 A LinSig model of the initial design of the 'hamburger' roundabout has been built and tested using the AM and PM peak hour traffic flows extracted from the MSTs Scenario 8. In doing so, the proposed junction is assessed against the 2031 traffic scenario as envisaged by MSDC, without any physical mitigation or demand-management measures.
- 5.7 The detailed modelling results demonstrate that the proposed junction will accommodate the future, unmitigated traffic levels within the junction's capacity.
- 5.8 Further design work and detailed traffic modelling, including demand management measures, will be undertaken as the Project Newton development proposal progresses, via continued liaison with WSCC Highways and Highways England.

- 5.9 It is worth noting that in Scenario 8b (S&TP south site) the layout and design of the A2300 / Cuckfield Road roundabout is as per WSCC's planned A2300 Improvement Scheme. The MSTs modelling outputs (in Appendix 2) show that in Scenario 8b the A2300 / Cuckfield Road roundabout will be significantly over capacity in both the AM and PM peak hours.
- 5.10 Beyond the A2300 Improvement Scheme, there is very limited scope within the available highway land to increase the junction's capacity to accommodate the S&TP (south site) traffic.
- 5.11 The land surrounding the A2300 / Cuckfield Road junction is owned by the Project Newton team, and therefore the deliverability of further improvements exists only with the Project Newton (north) S&TP site.
- 5.12 In addition to this, the south S&TP site access comprises a new, additional junction on the A2300, located between the A2300 / Cuckfield Road roundabout and the A2300 / Pookbourne Lane junction. As such, in a scenario with the south S&TP site, the flow of traffic on the A2300 will be disrupted by both the new junction and the significant delays at the Cuckfield Road roundabout.

6.0 Potential Travel Mode Shift

- 6.1 A key element of the Project Newton S&TP is that it will incorporate a comprehensive sustainable access strategy which will ensure that sustainable travel is at the centre of the development's ethos. The emerging Project Newton Sustainable Access Strategy will be developed with regard to the Burgess Hill Public Transport Strategy (BHPTS) (2016), and also the Public Transport Strategy of the adjacent Northern Arc strategic development site.
- 6.2 The BHPTS has a range of objectives to increase the use of public transport in and around Burgess Hill, with a focus on new developments in the area. Its aim is to *"provide a vision for how Burgess Hill can be best served by public transport and how the proposed developments across the town can contribute towards sustainable transportation"*.
- 6.3 The BHPTS seeks to, *"knit together a more integrated public transport network as multiple development sites (new and existing) and destinations are connected together"*, as well as, *"by introducing travel and parking demand management measures to complement and enhance an integrated public transport network"*.
- 6.4 The BHPTS recommends that, *"New developments should be required to consider and support public transport solutions which not only considers mitigation of impacts for their individual sites but rather to provide comprehensive solutions that considers impacts on the entire network in tandem with other potential new or existing developments."*
- 6.5 A number of key public transport routes are identified in the BHPTS, which anticipate the delivery of the S&TP by connecting the S&TP site with the Northern Arc and other parts of Burgess Hill, including the town centre and rail station.
- 6.6 In the MSTs and the Regulation 18 evidence base, sustainable travel forms the basis of the future traffic mitigation envisaged by MSDC.

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- 6.7 A package of sustainable travel measures is assumed to reduce car trips to/from the S&TP site by 3%, via three measures identified as:
- Improved PT interchange Burgess Hill
 - Bus Shelters within development with RTI (Real Time Information)
 - Bus Services to Burgess Hill and station
- 6.8 As set out in the Connect Consultants 14th November 2019 TN, the emerging Project Newton Sustainable Access Strategy is far broader and more comprehensive than the three measures assumed in the modelling, and is likely to achieve a significantly greater mode shift towards sustainable travel than the 3% assumed in the SYSTRA modelling. It is envisaged at mode-shift of at least 10% will be realised.
- 6.9 In order to provide evidence for the anticipated scale of travel mode shift, Connect Consultants has referred to Census data to understand more about the likely travel patterns that will be associated with Project Newton, and subsequently to identify the potential for travel mode shift. This is outlined in the following section.

Likely Home Locations of Future Workforce

- 6.10 A broad indication of the likely home locations of the future S&TP workforce can be gained by referring to Burgess Hill's Victoria Business Park; a large employment zone located at the southwestern side of Burgess Hill, which can be used as an analogue site to the Project Newton site.
- 6.11 While the types of employment use will differ between Victoria Business Park and the Project Newton S&TP, Census data for the Victoria Business Park area provides a useful geographical indication of the future Project Newton journey origins, irrespective of whether the mix and scale of uses within Project Newton change as the development plans progress.
- 6.12 Census 2011 dataset *WF01BEW - Location of usual residence and place of work* provides information about the origins and destinations of commuting journeys. For the purposes of this analysis, the workplace destination is taken to be an amalgamation of the three Census Output Areas which cover the Victoria Business Park employment zone (Mid Sussex 012D, Mid Sussex 014F, and Mid Sussex 015D).
- 6.13 The Census dataset has been analysed to identify the home locations, in the form of Census Output Areas, of all people who work within this amalgamated Victoria Business Park 'destination zone'.
- 6.14 The most common home locations of people working at Victoria Business Park are shown in Table 1, by absolute number and percentage of the total number working within the destination zone.
- 6.15 As would be expected, there are distinct clusters of home locations in the surrounding towns, notably; 28% from Burgess Hill, 13% from Brighton and Hove, 7% from Haywards Heath, 5% from Lewes, 5% from Horsham, and 4% from Crawley.

- 6.16 The proportions of Victoria Business Park employees living in these key geographical areas can be used to indicate the potential geographical spread of the future Project Newton site workforce. This can then be quantified by applying these proportions (percentages) to the number of AM and PM peak vehicle trips associated with the S&TP as assumed in the MSTs. This is shown in Table 2.
- 6.17 Table 2 shows that potentially 488 vehicles will travel from Burgess Hill in the AM peak, 223 from Brighton and Hove, and 72 from Crawley.

Table 1 – Origins of population working within Burgess Hill’s southwest employment zone

Origin / home location	Number of people	Percentage of total population employed within the destination zone
Burgess Hill	1519	28%
Brighton and Hove	695	13%
Elsewhere in Mid Sussex	465	9%
Haywards Heath	398	7%
Lewes	292	5%
Horsham	276	5%
Crawley	225	4%
Wealden	188	4%
Worthing	171	3%
Adur	170	3%
Arun	71	1%
Eastbourne	52	1%
Reigate and Banstead	51	1%

Table 2 – Potential origins of future workforce at Project Newton

Workforce Origins		Peak Hour Vehicle Trips	
Percentage of total workforce		AM: 1720	PM: 1528
Burgess Hill	28%	488	434
Brighton and Hove	13%	223	198
Elsewhere in Mid Sussex	9%	149	133
Haywards Heath	7%	128	114
Lewes	5%	94	83
Horsham	5%	89	79
Crawley	4%	72	64
Wealden	4%	60	54
Worthing	3%	55	49
Adur	3%	55	49
Arun	1%	23	20
Eastbourne	1%	17	15
Reigate and Banstead	1%	16	15

Public Transport Improvements

- 6.18 Connect Consultants is engaged in ongoing discussions with Metrobus, one of the local bus operators, to explore opportunities to expand on the BHPTS and to provide an exemplar 'superhub' immediately adjacent to the Project Newton site's junction with the A2300, which would include bus facilities along with flexible working space, a café/restaurant, cycle shop/repair facility, taxi pickup/drop off point etc.
- 6.19 The Project Newton site also has the benefit of being adjacent to the Northern Arc strategic development site. The 'superhub' would be close enough to the Northern Arc development for there to be a synergy between the public transport strategies for the two developments, thereby satisfying one of the key objectives of the BHPTS.
- 6.20 As part of the emerging Project Newton Sustainable Access Strategy, and in accordance with the BHPTS, there is the potential to improve and enhance the existing bus services in the vicinity of the site, as well as the opportunity to introduce new bus services.
- 6.21 Some potential service improvements that could be delivered via the Project Newton S&TP are set out below.

Service 273 Crawley – Brighton (Metrobus)

- 6.22 There are currently two buses in each of the AM and PM peak periods. This could be improved to provide an hourly service, with a minor diversion off the A2300 to the Project Newton 'superhub'.
- 6.23 If it is assumed that there is capacity for 30 S&TP passengers on each of the existing two peak-hour buses, plus capacity for 60 passengers on an additional service in each peak, there is potentially the ability to accommodate 120 S&TP passengers from Crawley and 120 from Brighton in each peak.

Service 100 Burgess Hill – Horsham (Compass Travel)

- 6.24 There are currently three buses from Burgess Hill in the AM peak and three buses to Burgess Hill in the PM peak, passing the Project Newton site. This could be improved to provide 4 buses in each peak.
- 6.25 If it is assumed that there is capacity for 30 S&TP passengers on each of the existing three peak-hour buses, plus capacity for 60 passengers on an additional service in each peak, there is potentially the ability to accommodate 150 S&TP passengers from/to Burgess Hill in each peak.

Service 35A/C Burgess Hill circular (Compass Travel)

- 6.26 This is currently an hourly service in each direction (clockwise and anticlockwise). The routes could potentially be extended to serve the Project Newton 'superhub', thereby connecting the site with Burgess Hill and the train station, and potentially the Northern Arc development.
- 6.27 If it is assumed that there is capacity for 30 S&TP passengers on each directional service, there is potentially the ability to accommodate 60 S&TP passengers from/to Burgess Hill in each peak.

Potential new Fastway service: Gatwick, Crawley, Burgess Hill and Brighton (Metrobus)

- 6.28 A new Fastway service could potentially provide four 60-seater buses per hour during the peak periods, equating to 240 S&TP passengers in each peak hour.
- 6.29 This could accommodate 240 S&TP passengers from/to Gatwick and Crawley in each peak, and 240 from/to Brighton and/or Burgess Hill.

Potential Travel Mode Shift to Bus

- 6.30 The combined potential capacity associated with the improvements listed above represents a total of 930 bus passengers in each peak hour, which equates to approximately 50%-60% of the total S&TP vehicle trips in the peak hours. This is summarised in Table 3.

Table 3 – Potential Travel Mode Shift to Bus

Workforce Origins	Peak Hour Vehicle Trips		Potential Bus Capacity	
	AM	PM	AM	PM
Burgess Hill	488	434	330	330
Brighton and Hove	223	198	240	240
Crawley	72	64	360	360
Total S&TP trips	1720	1528	930	930

- 6.31 It is acknowledged that the 'potential bus capacity' figures shown above represent a pool of passengers which could be served by the public transport improvements, and are subject to ongoing dialogue and support from the bus operators. Nonetheless, the scale of the potential pool demonstrates that it is entirely feasible that a travel mode shift of 10% can be achieved.

Potential Travel Mode Shift to Other Sustainable Modes

- 6.32 In addition to the significant potential mode-shift to bus travel, the emerging Project Newton Sustainable Access Strategy provides many opportunities for the future workforce to travel by non-car modes. These are set out in the 14th November 2019 TN (by Connect Consultants), and are repeated below for ease of reference.
- 6.33 The western parts of the adjacent Northern Arc development site, in particular its residential area, are within walking distance of the Project Newton site, and the Project Newton masterplan includes numerous links and connections, which means that a significant area of residential land, as well as bus stops within the Northern Arc development, will be within walking distance.
- 6.34 There are also links to the adjoining Bolney Grange Business Park, providing additional non-car permeability with the surrounding land uses, helping to reduce the overall number of vehicle trips.
- 6.35 As part of the A2300 Corridor Improvement Scheme, a footway / cycleway will be provided along the route's northern side between the A2300 / A23 interchange and Burgess Hill. The route passes the Project Newton site's southern boundary, thereby providing the site with a good quality, attractive, local and longer-distance pedestrian/cycle route.
- 6.36 The Project Newton site is located within walking distance of the nearby Hub employment development and its associated sustainable transport links, including a pedestrian and cycle route to Burgess Hill via Gatehouse Lane, and the provision of a signal-controlled pedestrian and cycle crossing over Jane Murray Way in Burgess Hill, where it intersects with Gate House Lane.
- 6.37 The Project Newton access strategy incorporates pedestrian and cycle crossings over Cuckfield Road and the A2300, thereby providing a safe and attractive connection between the Project Newton site and the existing residential areas of Burgess Hill via a low-trafficked route.
- 6.38 Furthermore, the residential parcels of the Northern Arc development lie on the northern side of the A2300; meaning that future Northern Arc residents will be able to walk to the Project Newton site without the need to cross the A2300.
- 6.39 There is a significant local population located within cycling distance of the site including most of Burgess Hill, Hurstpierpoint, Sayers Common, Ansty, and Goddards Green. The entire Northern Arc site is also within cycling distance, and its residential areas are on the same side of the A2300 as the Project Newton site, meaning that future Northern Arc residents will be able to cycle to the Project Newton site without the need to cross the A2300.
- 6.40 The Project Newton masterplan includes five EcoCycle stores with accommodation for more than 1000 cycles, along with a cycle shop and cycle repair facility.

- 6.41 In this way, the emerging Project Newton Sustainable Access Strategy will provide additional benefits to the wider population which would achieve a wider-reaching regional mode-shift than just the S&TP users.
- 6.42 As such, on the basis of the emerging Project Newton Sustainable Access Strategy, and the sustainable ethos throughout the Project Newton masterplan, there is good evidence to indicate that a 10% mode shift away from the motorcar will be achieved.

7.0 Conclusions

- 7.1 The Project Newton team commissioned SYSTRA to undertake an additional round of modelling using MSDC's Mid Sussex Transport Study model, to compare the Project Newton S&TP site and the south S&TP site on a like-for-like basis.
- 7.2 The modelling tested two new scenarios which both include the same set of future developments across the district, as per MSDC's most up-to-date assumptions, both including a S&TP comprising 2,500 jobs.
- 7.3 In order to comprehensively compare the traffic impacts of the two S&TP site options, Connect Consultants has undertaken a more detailed analysis and comparison of the four key junction performance metrics which comprise the outputs of the strategic modelling.
- 7.4 A points-based comparison is made between Scenario 8 (with the Project Newton site) and Scenario 8b (with the S&TP site site) in terms of the count of 'better performances' across the four metrics.
- 7.5 The Project Newton site (Scenario 8) scores 65 'better' performances against the south site (Scenario 8b), while the south site scores only 46 'better' performances against the Project Newton site.
- 7.6 Secondly, the sum of the delay at all of the junctions is calculated, on the basis that delay is the most readily recognised indicator of performance.
- 7.7 The Project Newton site totals 6,167 seconds of delay, approximately 27% less (better) than the south site's total of 8,466 seconds of delay.
- 7.8 Even if the A2300/Cuckfield Road junction is excluded from the calculation, the Project Newton site scores 59 'better' performances against the south site, while the south site scores 44 'better' performances against the Project Newton site, and the Project Newton site totals 5,891 seconds of delay, approximately 15% less (better) than the south site's total of 6,897 seconds.
- 7.9 This detailed comparison of the performance metrics clearly demonstrates that the Project Newton S&TP site has notably less traffic impact than the south S&TP site, which demonstrably supports the MSDC decision to allocate the Project Newton site for the S&TP within the emerging DPD.
- 7.10 A LinSig model of the initial design of the 'hamburger' roundabout has been built and tested using the AM and PM peak hour traffic flows extracted from the MSTs Scenario 8. In doing so, the proposed junction is assessed against the 2031 traffic scenario (without mitigation) as envisaged by MSDC.
- 7.11 The detailed modelling results demonstrate that the proposed junction will accommodate the future traffic levels within the junction's capacity.

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- 7.12 It is shown that the A2300 / Cuckfield Road roundabout will be significantly over capacity in the scenario with the S&TP south site. There is limited scope within the available highway land to increase the junction's capacity; the deliverability of further improvements exists only with the Project Newton (north) S&TP site.
- 7.13 The S&TP south site access comprises a new, additional junction on the A2300. In a scenario with the S&TP south site, the flow of traffic on the A2300 will be disrupted by both the new junction and the significant delays at the Cuckfield Road roundabout.
- 7.14 The assumption made by MSDC and SYSTRA in the DPD evidence base is that a specific package of sustainable travel measures will reduce car trips to/from the S&TP site by 3%. That 3% is assumed to be achieved via the following three measures:
- Improved PT interchange Burgess Hill
 - Bus Shelters within development with RTI (Real Time Information)
 - Bus Services to Burgess Hill and station
- 7.15 Project Newton considers that a travel mode shift of 10% is realistically achievable. In order to provide further evidence for the anticipated scale of travel mode shift away from the motorcar, Connect Consultants has referred to Census data and potential bus service improvements which could be delivered via the emerging Project Newton Sustainable Access Strategy and the Burgess Hill Public Transport Strategy to identify the potential for travel mode shift.
- 7.16 At this early stage the potential travel mode shift figures are subject to ongoing dialogue and support from the bus operators, nonetheless, the combined capacity associated with potential bus service improvements represents a total of 930 bus passengers in each peak hour, which equates to approximately 50%-60% of the total S&TP vehicle trips in the peak hours.
- 7.17 While this represents a pool of passengers which could be served by the public transport improvements, the scale of the potential pool demonstrates that it is entirely feasible that a travel mode shift of 10% can be achieved
- 7.18 As MSDC believes that 3% can be achieved by the three measures listed above, an additional 7% mode shift is wholly realistic in view of the potential bus service improvements, the extensive emerging Project Newton Sustainable Access Strategy, the proximity of Project Newton to the Northern Arc and Bolney Grange Business Park, and the associated synergies between the respective public transport strategies.
- 7.19 It is therefore entirely feasible that a 10% mode shift away from the motorcar will be achieved.

**APPENDIX 1 – MID SUSSEX TRANSPORT STUDY: SCENARIO 8
RESULTS SUMMARY**

**APPENDIX 2 – MID SUSSEX TRANSPORT STUDY: JUNCTION
APPROACH ARM STATISTICS FOR IDENTIFIED LOCATIONS**

Mid Sussex Transport Study: Junction approach arm statistics for identified locations			2017											2031 Reference Case											2031 Scenario 8											2031 Scenario 8b										
New ID	Area	Junction	Approach Arm	Junction Type	MSTS Stage 3	2017					2031 Reference Case					2031 Scenario 8					2031 Scenario 8b																									
						AM Dem (Veh)	AM RFC (%)	AM Delay (s)	AM Avg Q (pcu)	PM Dem (Veh)	PM RFC (%)	PM Delay (s)	PM Avg Q (pcu)	AM Dem (Veh)	AM RFC (%)	AM Delay (s)	AM Avg Q (pcu)	PM Dem (Veh)	PM RFC (%)	PM Delay (s)	PM Avg Q (pcu)	AM Dem (Veh)	AM RFC (%)	AM Delay (s)	AM Avg Q (pcu)	PM Dem (Veh)	PM RFC (%)	PM Delay (s)	PM Avg Q (pcu)																	
NORTH																																														
N1	Copthorne	A264 / A2220 Copthorne	Brookhill Road (N)	Roundabout		344	36	15	0	525	44	14	0	421	41	14	0	856	73	16	1	425	41	14	0	849	75	16	1	425	41	14	0	851	76	17	1									
N1		A264 (E)	2031 Scheme	AM Del.		781	61	13	0	1138	85	14	1	574	43	12	0	1105	87	16	2	655	49	12	0	1102	86	15	1	639	48	12	0	1105	86	15	1									
N1		Copthorne Hotel Access	capacity increase			43	1	10	0	60	1	10	0	62	1	10	0	69	1	10	0	62	1	10	0	69	1	10	0	62	1	10	0	69	1	10	0									
N1		A2220 (S)				872	65	12	0	508	39	12	0	1129	75	12	0	1141	77	12	1	1383	68	13	1	1383	68	13	1	1383	68	13	1	1383	68	13	1									
N1		A264 Copthorne Way (W)		PM Del.		1376	97	18	3	1173	75	10	0	1408	109	19	70	1230	79	11	1	1393	109	19	70	1262	83	11	1	1406	109	18	67	1276	85	12	1									
N2	Copthorne	A264 / B2028 Copthorne	B2028 Turners Hill Road (N)	Roundabout	AM Del.	171	25	5	0	447	64	7	0	255	13	3	0	715	35	4	0	277	14	4	0	736	36	4	0	274	14	4	0	736	36	4	0									
N2		A264 Snow Hill (E)	2031 Scheme			504	58	4	0	467	77	12	1	251	12	3	0	395	20	4	0	285	13	3	0	384	20	4	0	296	14	3	0	389	20	4	0									
N2		B2028 Turners Hill Road (S)	capacity increase			384	51	5	0	369	58	7	0	617	29	3	0	345	17	4	0	649	30	3	0	363	18	4	0	636	30	3	0	363	18	4	0									
N2		A264 Copthorne Common Road (W)				917	102	64	15	845	87	4	0	965	46	4	0	1149	54	3	0	968	46	4	0	1282	60	3	0	955	45	4	0	1333	63	3	0									
N4	Copthorne	B2028 / B2037 Copthorne	B2028 West Park Road (N)	Roundabout	AM Del.	249	23	3	0	374	39	4	0	375	34	3	0	456	52	5	0	385	35	3	0	444	52	5	0	416	37	3	0	443	52	5	0									
N4		B2037 Snow Hill (E)	In Surrey			449	43	4	0	101	11	4	0	494	49	4	0	95	13	5	0	494	49	5	0	73	10	5	0	488	49	5	0	72	10	5	0									
N4		B2028 West Park Road (S)				515	56	5	0	237	21	3	0	770	89	12	2	332	29	3	0	753	86	11	1	334	28	3	0	760	89	12	2	339	29	3	0									
N4		B2037 Effingham Road (W)				176	19	4	0	655	61	4	0	245	25	4	0	913	81	5	0	258	26	4	0	949	84	5	0	960	84	5	0	946	84	5	0									
N6	East Grinstead	A22 / Imberhorne Lane	A22 (W)	Signalised T-junction		723	46	9	1	856	58	11	2	719	45	8	1	933	62	11	2	736	47	5	1	974	64	11	2	736	47	5	1	966	63	11	2									
N6		A22 (E)	near 770 Imberhorne Lane			714	80	27	3	792	75	20	3	716	100	81	4	840	86	26	3	669	101	75	8	833	83	24	3	668	101	64	6	836	84	25	3									
N6		Imberhorne Lane (S)				366	48	18	1	183	32	19	1	369	49	18	1	326	55	24	2	457	65	20	2	359	61	25	2	455	64	20	2	358	60	25	2									
N7	Crawley Down	B2028 Turners Hill Road / Wallage Lane	B2028 Turners Hill Road (N)	Priority Junction	B2114	318	16	1	0	561	29	1	0	345	17	1	0	996	49	2	0	381	19	1	0	1121	55	2	0	373	19	1	0	1168	57	2	0									
N7		B2028 Turners Hill Road (S)	near 852 Old Vicarage Field			268	13	1	0	195	10	1	0	493	23	1	0	224	11	1	0	521	24	1	0	247	12	1	0	249	23	1	0	249	23	1	0									
N7		Wallage Lane				352	57	24	0	178	32	12	0	544	100	73	5	387	88	43	2	533	100	79	6	387	98	74	5	599	100	74	5	375	99	78	5									
N8	Turners Hill	B2110 / B2028 Turners Hill	B2028 North Street (N) (priority)	Crossroads		556	32	2	0	704	37	2	0	873	48	2	0	1348	68	3	0	902	50	2	0	1472	73	4	0	900	50	2	0	1509	75	4	0									
N8		B2110 East Street (E)	near 852 Old Vicarage Field	AM Del.		387	92	29	3	687	101	76	8	420	115	32	33	312	107	195	16	426	116	35	4	426	118	38	4	426	118	38	4	426	118	38	4									
N8		B2028 Selsfield Road (S) (priority)	also Ref 116, 492, 553			803	41	2	0	1063	36	2	0	765	38	2	0	765	38	2	0	1074	50	2	0	805	40	2	0	1104	51	2	0	797	39	2	0									
N8		B2110 Paddockhurst Road (W)				563	108	186	27	535	107	171	23	492	110	233	29	453	108	203	23	488	112	274	34	427	109	232	25	488	110	241	30	424	109	237	25									
N9	Felbridge	A264 / A22 Felbridge	A264 Copthorne Road (W)	Roundabout		676	61	15	2	609	65	21	3	578	105	194	17	585	102	131	8	605	107	227	23	595	103	145	11	603	107	218	22	597	103	250	11									
N9		A22 Eastbourne Road (N)				384	68	28	2	504	65	20	2	492	56	13	1	599	64	14	2	496	56	13	1	632	67	14	2	496	56	13	1	622	66	14	2									
N9		A22 London Road (S)				1326	73	70	14	1112	68	47	4	1376	108	241	60	1267	100	100	11	1414	108	241	60	1278	101	113	15	1409	108	241	60	1281	101	117	17									
N10	West Hoathly	Selsfield Road / Vowels Lane	Selsfield Road (N)	Roundabout		597	30	1	0	801	39	2	0	650	32	1	0	1074	52	2	0	653	31	1	0	1101	53	2	0	654	32	1	0	1109	53	2	0									
N10		Vowels Lane (E)				183	37	7	0	177	40	9	0	308	54	6	0	286	80	23	2	341	61	7	0	302	83	24	2	327	59	7	0	303	84	26	2									
N10		Selsfield Road (S)				664	36	2	0	593	34	2	0	779	43	2	0	692	46	3	0	705	47	3	0	705	47	3	0	705	47	3	0	705	47	3	0									
CENTRAL																																														
C1	Handcross	B2114 Junction, Handcross	B2110 High Street (N) (priority)	Priority Junction	B2114	558	35	3	0	761	44	3	0	714	45	3	0	889	51	3	0	735	46	3	0	867	50	3	0	752	46	3	0	838	48	3	0									
C1		B2114 (S) (priority)				332	17	1	0	130	7	1	0	398	20	1	0	139	7	1	0	394	20	1	0	395	20	1	0	395	20	1	0	395	20	1	0									
C1		B2110 (W)				453	63	4	0	320	45	4	0	603	83	5	0	486	67	4	0	625	87	5	0	495	69	4	0	610	84	5	0	518	71	4	0									
C2	Lower Beeding	B2110 / B2115 Leechpond Hill	B2110 (E)	Priority Junction	AM Del.	491	32	3	0	530	29	2	0	569	35	3	0	718	40	2	0	582	36	3	0	722	40	2	0	515	32	3	0	699	39	2	0									
C2		B2110 Leechpond Hill (S)	In Horsham			253	13	1	0	162	8	1	0	186	9	1	0	251	12	1	0	181	9	1	0	258	13	1	0	184	9	1	0	262	13	1	0									
C2		B2115 (W)				269	39	4	0	270	38	4	0	516	72	4	0	337	49	4	0	530	74	4	0	544	76	5	0	544	76	5	0	544	76	5	0									
C3	Slough Green	B2115 Junction, Slough Green	B2114 Cuckfield Road (N) (priority)	T-junction		153	8	1	0	71	4	1	0	95	5	1	0	80	4	1	0	94	5	1	0	78	4	1	0	94	5	1	0	74	4	1	0									
C3		B2114 (E) (priority)		AM RFC		639	30	1	0	477	24	1	0	788	34	1	0	569	27	1	0	787	34	1	0	609	29	1	0	609	29	1	0	609	29	1	0									
C3		B2115 Slough Green Lane (W)				388	58	4	0	492	67	4	0	582	83	6	0	620	84	5	0	568	81	5	0	611	83	5	0	589	83	5	0	693	94	7	1									
C4	Haywards Heath	Borde Hill Lane / Cophold Lane	Borde Hill Lane (N)																																											

APPENDIX 3 – DETAILED COMPARISON OF THE S&TP NORTH AND SOUTH SITES

Junctions at which there are 'significant' and 'severe' impacts in either Scenario 8 (Project Newton site) or Scenario 8b (S&TP south site)				
Junction ID	Area	Name	Scenario 8 Impact NORTH	Scenario 8b Impact SOUTH
N7	Crawley Down	B2028 Turners Hill Road / Wallage Lane	Significant	Severe
C3	Slough Green	B2115 Junction, Slough Green	OK	Significant
C5	Haywards Heath	B2114/B2036 Whitemans Green	Significant	Significant
C6	Haywards Heath	B2036/Ardingly Rd, Whitemans Green	Significant	Severe
C7	Haywards Heath	A272/B2036	Severe	Severe
C10	Bolney	A23/A272 Bolney Road	Significant	Significant
C12	Haywards Heath	A273/Isaacs Lane/Traustein Way	Significant	Significant
S1	Burgess Hill	A23/A2300 southbound on-slip	Severe	Severe
S2	Burgess Hill	A23/A2300 eastern roundabout	Severe	Severe
S3	Burgess Hill	A2300/Cuckfield Road	OK	Severe
S4	Burgess Hill	Cuckfield Road / The Hub	OK	Significant
S5	Burgess Hill	A2300 / Northern Arc Spine Road	Severe	OK
S6	Burgess Hill	Junction Road/B2113, Burgess Hill	Severe	Severe
S7	Hurstpierpoint	B2117/B2116 Hurstpierpoint	Significant	Severe
S8	Hassocks	A273/B2116 Hassocks (Stonepound)	Severe	Severe
S9	Pyecombe	A23/A281 eastbound on-slip	Severe	OK
S19	Hassocks	B2112 / Lodge Lane	OK	Significant
S22	Burgess Hill	Valebridge Rd / Junction Rd / Leylands Rd	Severe	OK
S23	Burgess Hill	A273 / B2036 / Marchants Way	Significant	Significant
S24	Burgess Hill	A273 / Sussex Way	Significant	OK
S25	Burgess Hill	West Street / Fairfield Road	Significant	Significant
S26	Burgess Hill	A273 / York Road	OK	Significant

Severe	8	9
Significant	9	9

Peak Hour	Total of Junction Demand (Veh)		Average of RFC (%)		Total of Delay (s)		Total of Average Q		Total 'better' performances	
	North Site	South Site	North Site	South Site	North Site	South Site	North Site	South Site	North Site	South Site
PM	1755	1792	55	56	77	81	5	5	3	
PM	1293	1370	39	42	7	9	0	1	4	
PM	1775	1826	71	73	14	16	0	1	4	
PM	2252	2202	75	71	165	201	37	48	2	2
AM	2437	2469	104	103	285	259	62	55	1	3
PM	2401	2440	104	103	314	364	66	77	3	1
PM	2478	2402	76	70	19	17	2	2		3
PM	2887	2863	67	66	104	98	25	22		4
PM	4217	4255	104	105	218	269	27	28	4	
AM	4178	3550	96	70	179	25	61	5		4
AM	6146	4544	50	111	30	959	4	302	3	1
PM	5270	4730	76	89	246	610	39	216	3	1
PM	1927	1954	56	94	226	1236	63	227	4	
AM	5416	4163	84	62	37	20	8	3		4
PM	4731	4874	68	64	99	25	45	4	1	3
AM	1485	1495	79	79	793	813	58	61	3	
PM	1199	1203	56	56	671	665	51	49	1	2
AM	1257	1793	37	57	16	24	0	1	4	
PM	1688	1963	53	59	123	144	24	27	4	
AM	1927	1849	104	106	869	996	77	88	3	1
PM	2038	2070	103	93	725	652	62	60	1	3
PM	4298	4345	102	102	377	365	12	10	1	2
AM	1245	1336	40	44	13	16	1	2	4	
PM	1950	1964	72	71	370	354	62	58	1	3
AM	2102	2218	63	68	35	47	4	8	4	
PM	2160	2285	67	69	27	29	3	3	3	
PM	2505	2481	74	69	16	13	1	0		4
AM	1252	1142	36	33	15	15	1	1		2
PM	930	899	27	24	10	9	0	0		3
AM	1916	2122	78	90	87	135	20	31	4	

Total delay	6167	8466
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Total 'better' performances	65	46
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Excluding S3 A2300/Cuckfield	5891	6897	59	44
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