Stafford Borough Local Plan 2020 - 2040: Preferred Options Responses

Agents, Developers and Landowners - Part 8

Consultation Period: 24 October - 12 December 2022

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Stafford BOROUGH COUNCIL

Reference ID Code	Name / Organisation	Parts	Page Number
123	Stoford Properties Ltd, Redhill Farm	A - P	1

From: Jo Russell [redacted]
Sent: 12 December 2022 11:53
To: Strategic Planning Consultations
Subject: Preferred Options - Land at Redhill Farm, Stafford - Stoford-Cantrill - Email 1
Attachments: Response Form - Redhill Farm - Stoford - Cantrill.docx; Reps - residential 221208 final draft.docx; App 2 Housing Land Supply.pdf; App 1 - Site boundary edged red.pdf

Good morning

Please find attached representations prepared Stoford Properties Ltd. The representations are made with regards of land at Redhill Farm, east of A34, Stafford.

This email is one of 8 emails.

The representations comprise

1. Completed response form (this email)
2. Representations prepared by Stoford (this email)
3. Appendices (this and 7 following emails)

Jo Russell MRTPI | Planning Director

[redacted]

STOFORD

[redacted]

Contact Details

Full name (required): Jo Russell

Email (required): [redacted]

Tick the box that is relevant to you (required):

- ☐ Statutory Bodies and Stakeholders
- ✓ Agents and Developers
- ☐ Residents and General Public
- ☐ Prefer not to say

Organisation or Company Name (if applicable): Stoford Properties Ltd

Tick the box that is relevant to you:
(*This is a non-mandatory question but helps us understand the demographic of our respondents.)*

[redacted]

Do you want to be added to our Local Plan consultation database to be notified about future local plan updates?

[redacted]

Contents

The Local Plan Preferred Options includes the topics listed below.

Each topic has a series of standard questions in order for you to provide a response. You do not have to respond to each of the topics or answer all of the questions. The page numbers below relate to the page the topic starts in this consultation form.

All of the local plan documents and the Local Plan 2020-2040: Preferred Options document are available here: https://www.staffordbc.gov.uk/local-plan

Vision and Objectives

Q1. There are eight objectives for the local plan to achieve the vision of:

"A prosperous and attractive borough with strong communities."

Of the following objectives which 3 are the most important to you?

Please make your choice from the list of objectives below. (Maximum of 3 to be selected)

Local Plan Preferred Options document reference: Page 12

- ☐ Contribute to Stafford Borough being net zero carbon by ensuring that development mitigates and adapts to climate change and is future proof.
- ☐ To develop a high value, high skill, innovative and sustainable economy.
- ☐ To strengthen our town centres through a quality environment and flexible mix of uses.
- ☐ To deliver sustainable economic and housing growth to provide income and jobs.
- ☐ To deliver infrastructure led growth supported by accessible services and facilities.
- ☐ To provide an attractive place to live and work and support strong communities that promote health and wellbeing.
- ☐ To increase and enhance green and blue infrastructure in the borough and to enable greater access to it while improving the natural environment and biodiversity.
- ☐ To secure high-quality design.

Development Strategy and Climate Change Response

Q2. The development strategy and climate change response chapter includes the policies below.

Do you agree with each of the policies in this chapter?

Select Yes or No for each of the policies and then use the box below each policy to add additional comments.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 19 to 40

Policy 1. Development strategy (which includes the total number of houses and amount of employment land to be allocated and the Stafford and Stone settlement strategies)

No

Policy 1 Comments:

Please see attached representations to Policy 1, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford

Policy 2. Settlement Hierarchy (Tier 1: Stafford, Tier 2: Stone, Tier 3: Meecebrook, Tier 4: Larger settlements, Tier 5: Smaller settlements)

No

Policy 2 Comments:

Please see attached representations to Policy 1, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford

Policy 3. Development in the open countryside - general principles

Yes / No

Policy 3 Comments:

Policy 4. Climate change development requirements

Yes / No

Policy 4 Comments:

Policy 5. Green Belt

Yes / No

Policy 5 Comments

Policy 6. Neighbourhood plans

Yes / No

Policy 6 Comments:

Meecebrook Garden Community

Q3. The local plan proposes a new garden community called Meecebrook close to Cold Meece and Yarnfield. This new community is proposed to deliver housing, employment allocations, community facilities, including new schools, sport provision and health care facilities, retail and transport provision, which includes a new railway station on the West Coast Main Line, and high quality transport routes.

Do you agree with the proposed new garden community?

No

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 41 to 45

Comments:

Please see attached representations to Policy 7 and 8 , prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford

Site Allocation Policies

Q4. The Stafford Borough Local Plan 2020 - 2040 proposes allocations for both housing and employment to meet the established identified need.

The site allocation policies chapter includes the policies below for housing and employment allocations.

Do you agree with the proposed allocations?

Select Yes or No for each of the following policies and then use the box below each policy to add additional comments.

Explain your reasoning and add any evidence to justify your response. Please provide details of alternative locations for housing and employment growth if you consider this is appropriate.

Ensure any comments relate to the policy comment box you are completing.

If you do want to submit a new site for consideration through the local plan process, we are still accepting sites through the Call for Site process, details are available here: https://www.staffordbc.gov.uk/call-sites-including-brownfield-land-consultation

Local Plan Preferred Options document reference: Pages 47 to 56 and appendix 2.

Policy 9. North of Stafford

No

Policy 9 Comments:

Please see attached representations to Policy 9, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford. We do not object to the principle of the allocation. We have concerns regarding the assumed rate of housing delivery.

Policy 10. West of Stafford

No

Policy 10 Comments:

Please see attached representations to Policy 10, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford. We do not object to the principle of the allocation. We have concerns regarding the assumed rate of housing delivery.

Policy 11. Stafford Station Gateway

No

Policy 11 Comments:

Please see attached representations to Policy 11, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford. We do not object to the principle of the allocation. We have concerns regarding the assumed rate of housing delivery.

Policy 12. Other housing and employment land allocations.
(*In your response, please specify which particular site you are referring to, if relevant*.)

No

Policy 12 Comments:

Please see attached representations to Policy 12, prepared by Stoford Properties Ltd in respect of land at Redhill Farm, Stafford. We do not object to the principle of the allocations. We have concerns regarding the assumed rates of housing delivery. We also object to the omission of Redhill Farm, from the list of allocated sites.

Q5. The Stafford Borough Local Plan 2020 - 2040 proposes to allocate land for Local Green Space and Countryside Enhancement Areas throughout the borough.

The policies which relate to these proposals are listed below.

Do you agree with the proposed allocations?

Select yes or no for each of the policies and then use the box below each policy to add additional comments.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 56 to 59 and appendix 2.

Policy 13. Local Green Space
(In your response, please specify which particular site you are referring to, if relevant)

Yes / No

Policy 13 Comments:

Policy 14. Penk and Sow Countryside Enhancement Area (Stafford Town)

Yes / No

Policy 14 Comments:

Policy 15. Stone Countryside Enhancement Area

Yes / No

Policy 15 Comments:

Economy Policies

The Economy Policies chapter contains policies that seek to protect employment land and support economic growth within the Borough.

Q6. The local plan seeks to protect previously allocated and designated industrial land and support home working and small-scale employment uses.

The relevant policies are: 16, 17 and 18.

Do you agree with these policies?

Select Yes or No and then use the box to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: pages 61 to 65

Comments:

Q7. The Stafford Borough Plan proposes policies around the town centres uses, agriculture and forestry development, tourism development and canals.

The relevant policies are: 19, 20, 21 and 22.

Do you agree with these policies?

Yes / No

Select Yes or No and then use the box below to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: pages 65 to 71

Comments:

Housing Policies

The Housing Policies chapter contains policies that seek to provide for identified need across the borough and support houseowners.

Q8. The local plan proposed a policy (Policy 23) on affordable housing.

Do you agree with this policy?

Yes / No

Select yes or no and then use the box below to add additional comments.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: pages 74 to 76

Comments:

Q9. The local plan proposes a policy (Policy 30) to help meet identified local need for pitches for Gypsies and Travellers. There are 2 new proposed sites; one near Hopton and the other near Weston.

Do you agree with this policy?

Yes / No

Select yes or no and then use the box below to add additional comments. In your response, please specify which particular site you are referring to, if relevant.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: pages 84 to 86

Comments:

Q10. The local plan proposes policies around homes for life, rural exception sites, new rural dwellings, replacement dwellings, extension of dwellings, residential subdivision and conversion, housing mix and density, residential amenity and extension to the curtilage of a dwelling.

The relevant policies are: 24, 26, 27, 28, 29, 21, 31, 32 and 33.

Do you agree with these policies?

Yes / No

Select yes or no and then use the box below to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: pages 73 to 89

Comments:

Design and Infrastructure Policies

Q11. The design and infrastructure chapter contains policies on urban design general principles, architectural and landscape design, infrastructure to support new development, electronic communications, protecting community facilities and renewable and low carbon energy.

The relevant policies are: 34, 25, 36, 37, 38, 39 and 40.

Do you agree with these policies?

Yes / No

Select yes or no and then use the box below to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 91 to 99.

Comments:

Environment Policies

Q12. The environment policies chapter contains policies on the historic environment, flood risk, sustainable drainage, landscapes, Cannock Chase Area of Outstanding Natural Beauty (AONB), Green and blue infrastructure network, biodiversity, Special Areas of Conservation (SAC), Trees, Pollution and Air Quality.

The relevant policies are: 31, 42, 43, 44, 45, 46, 47, 48, 49, 50 and 51.

Do you agree with these policies?

Yes / No

Select yes or no and then use the box below to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 101 to 119.

Comments:

Connections

Q13. The connections policies chapter contains policies on transport and parking standards.

The relevant policies are: 52 and 53

Do you agree with these policies?

Yes / No

Select yes or no and then use the box below to add additional comments. If referring to a specific policy, please include the policy number.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Local Plan Preferred Options document reference: Pages 121 to 124.

Comments:

Evidence Base

To support the Local Plan 2020-2040 an evidence base has been produced.

The evidence base is available to view on our website here:
www.staffordbc.gov.uk/new-lp-2020-2040-evidence-base

Q14. Have we considered all relevant studies and reports as part of our local plan?

Yes / No

Select yes or no and then use the box below to add additional comments.

Explain your reasoning and add any evidence to justify your response.

Ensure any comments relate to the policy comment box you are completing.

Comments:

Q15. Do you think there is any further evidence required?

Yes / No

Select yes or no and then use the box below to add additional comments.

If you think additional evidence is needed, please state what you think should be added and explain your reasoning.

Ensure any comments relate to the policy comment box you are completing.

Comments:

General Comments

If you have any further comments to make on the Local Plan Preferred Options document and evidence base, please use the box below.

If you need further space to add comments, please add pages to the end of the consultation form and reference which question you are answering.

Thank you for taking the time to complete this consultation form.

Completed forms can be submitted by email to:
strategicplanningconsultations@staffordbc.gov.uk

Or returned via post to: Strategic Planning and Placemaking, Stafford Borough Council, Civic Centre, Riverside, Stafford, ST16 3AQ

The consultation closes at 12 noon on Monday 12 December 2022, comments received after this date may not be considered.

STOFORD

Land at Redhill Farm, East of the A34, Stafford

1. Stoford have an agreement with the Cantrill family who are the sole owners of land to the east of the A34, north of Stafford. The land is edged red on the attached plan (**Appendix 1**) and their land ownership extends to the west of the A34 too, where land is identified within the emerging Local Plan as being protected for employment uses (separate representations are made in support of this).

2. These representations object to the Preferred Options Local Plan that fails to allocate the Cantrill land for residential development.

3. The following policies are addressed within these representations
    - **Policy 1 Development Strategy**
    - **Policy 2 Settlement Hierarchy**
    - **Policy 7 Meecebrook Site Allocation and Policy 8 Masterplanning and Design at Meecebrook**
    - **Policy 9 North of Stafford**
    - **Policy 10 West of Stafford**
    - **Policy 11 Station Gateway Stafford**
    - **Policy 12, Policy 1, Table 1 and The Omission of Land at Redhill Farm as a housing allocation**

Policy 1 Development Strategy

1. We object to this policy which fails to identify land at Redhill Farm for residential development and include it within Table 1 as a source of housing supply. We also object to the assumed rates of delivery that stem from the allocations listed within Table 1. We also question whether the housing requirement is adequate, given previous levels of housing completions.

2. Policy 1 outlines that 10,700 new homes will be provided for over the 2020-2040 period, equating to an annual average of 535 homes. We accept that this figure is above the minimum annual requirement that is specified as 391 dwellings per annum (as at June 2022, and referenced within para 1.7[1] of the *Housing and Employment Number Topic Paper*.

3. However, given housing delivery has been (on average) 609 dwellings per annum for the last eleven years[2] (para 1.1), we do not consider that the Local Plan has gone far enough in terms of addressing the housing needs that the past 11 years of delivery have demonstrated is evident within Stafford. We do accept that 535 homes per annum as detailed within Policy 1 is above the current Plan requirement of 500 homes, however it is still far short of delivery rates to date.

4. The level of vacant homes within Stafford is above the national average, at 2.7% in 2018[3] and the Council's evidence base suggests that this could be a significant problem. However, we note that the Council is proactively addressing this issue with the appointment of an Empty Homes Officer [4] who between 2016 and 2021 oversaw the reduction in empty homes by 19%. Vacant Homes should not be used as a reason to justify why the annual requirement is set at 535 (para 3.13 *Housing and Employment Number Topic Paper*) alongside levels of affordability and house prices. We are conscious that the Bank of England has raised interest rates consecutively this year from a starting position of 0.25% to a current 3% as of 17 November 2022. We therefore question the assumption that the Council's evidence base makes with regards to levels of affordability in Stafford.

5. Policy 1 advises that the housing requirement will be delivered by
   i. The completion of north Stafford and west Stafford Strategic Development Locations
   ii. Completion of existing commitments as detailed within Appendix 6 of the Plan
   iii. The development of a new Garden Community at Meecebrook
   iv. Station Gateway
   v. Other housing allocations detailed under policy 12
   vi. Windfall sites, that accords with the policies of the Plan
   vii. Housing within rural areas, that accords with the policies of the Plan

6. Paragraph 1.3 of the emerging Plan also refers to the Borough agreeing to meet some of the unmet housing needs from other authorities within the region. A contribution of 2,000 homes is allowed for. The delivery of these homes is to be via the Meecebrook Garden Community (para 1.4). Given that the Council's housing trajectory does not forecast the delivery of homes

[1] *Housing and Employment Number Topic Paper*.
[2] *Housing and Employment Number Topic Paper*
[3] http://resi-analysts.com/wpcontent/uploads/LGA/Reports/Stafford.pdf para 3.13
[4] https://www.expressandstar.com/news/local-hubs/staffordshire/stafford/2022/03/09/hundreds-of-empty-homes-brought-back-into-use/

until 2030 at Meecebrook, it will be 2037 before the 2,000 homes intended to meet needs from outside of the Borough are satisfied (assuming 7 years of delivery at 300 dwellings per annum – see Local Plan Housing Trajectory). We do not consider this to be an effective means of addressing unmet housing need, to delay the delivery in this way. Furthermore, we comment on our concerns regarding the deliverability of Meecebrook and the assumed rates of delivery in our objections to Policy 7 and 8, and evidenced our supporting work prepared by Claremont Planning (**Appendix 2**). Our view is that if unmet needs are to be met within the Plan, these should be delivered across a range of sites, earlier within the Plan Period so as to meet needs across a broader spectrum and with less risk being placed on one source of supply.

7. Our accompanying report prepared by Claremont Planning (**Appendix 2**) provides a critique of the sites listed in Policy 1 from a supply perspective, and how these may perform. The conclusions that Claremont reach on our behalf are that housing delivery begins to fall short of the Council's trajectory by 2025/26, and becomes increasingly pronounced in the early 2030's - when Meecebrook is due to deliver – but in reality will not.

8. Policy 1 (Para 1.10) states that the spatial strategy for the delivery of development reflects the settlement hierarchy in Policy 2, with the largest allocations being made to Stafford, then Stone. Stoford agree that this approach is the most sustainable and enables new allocations to be focussed on the urban areas where access to services and facilities is more readily available.

9. We therefore object to the Preferred Options Local Plan that fails to allocate the Cantrill land for residential development, as edged in red (**Appendix 1**) given that it is located at Stafford – a tier one settlement. An allocation here could secure some 600 dwellings, a local centre, and a primary school. As demonstrated within our accompanying Vision Document (**Appendix 3**), this site presents an opportunity for a new neighbourhood that extends the current allocation at North of Stafford, ties into the infrastructure that Stoford have delivered via the Pets at Home development, and is a site that is suitable, available and achievable. This is consistent with what para 1.10-1.11 of the Local Plan describes. Further comments are also made later in our representations, focussing on why Redhill Farm should be allocated.

10. Furthermore, the Councill's evidence base acknowledges the relationship between a settlement (and growth allocated to it) and the proximity to recognised industrial estates. The Settlement Assessment and Profiles (2022) document states

    'The relationship that the settlement has with a Recognised Industrial Estates (RIE) is also important, as it reduces the need to travel and provides an opportunity to work closer to home. Within rural areas the RIE's are important for sustainable rural communities, and whilst there is no certainty that these local employment opportunities are taken up by local residents, it is nevertheless important that these opportunities exist and are in relatively close proximity.'

11. Land at Redhill Farm is opposite the recently completed Pets at Home development (with some 700 jobs available), the established Redhill Industrial Estate, and the proposed 31.15ha draft employment land allocation west of Pets at Home – which is also being promoted by Stoford.

Policy 2 Settlement Hierarchy

1. Stoford have mixed views on Policy 2 – supporting the Settlement Strategy for Stafford, whilst objecting to the inclusion of Meecebrook as a Tier 3 settlement. We explore these points below.

2. Stoford object to the proposed Settlement Hierarchy for the inclusion of Meecebrook Garden Community as a Tier 3 settlement. Given that the proposed development is yet to be commenced, and indeed (according to the Local Plan) will not commence delivery of new homes until halfway through the plan period - 2030/31 (the prospects of this we comment on in other representations), this appears to position Meecebrook Garden Community above other more sustainable, established settlements, simply because of the proposed scale of the allocation. Given para 2.2 of the Draft Plan advises

   'the settlement hierarchy is informed by the Settlement Assessment and Profiles (2022) which analysed the site and level of facilities of the Borough's settlement',

3. then our objection must be correct – because Meecebrook Garden Community currently has no services and facilities to be assessed that could warrant its position as a Tier 3 settlement. Paragraph 6.9 of the Settlement Assessment and Profiles (2022) confirms that

   'It has been noted that the current availability to the services and facilities that have been used in the production of this settlement hierarchy can and are likely to change over time, so this hierarchy will be reviewed when required in the future'. **[our underlining]**

4. **The Local Plan advises (para 2.2 above) that the hierarchy is informed by the *Settlement Assessment and Profiles (2022)* however Meecebrook is not assessed within that document at all.** There are only four references to Meecebrook, none relate to an assessment. Para 3.4 of the Settlement Assessment and Profiles (2022) supports our view on this, stating

   'The first three tiers of the settlement hierarchy were straightforward to establish with these being: Tier 1: Stafford, Tier 2: Stone and Tier 3: Meecebrook Garden Community (which is proposed in the Preferred Options).'

Strategy for Stafford

5. Stoford do support the Stafford Settlement Strategy outlined page 27 of the Local Plan. The strategy of focussing on Stafford is supported albeit we question the delivery rates associated with the strategic locations listed here, given progress to date (evidenced in **Appendix 2**) and the reliance of the housing strategy for the Plan being placed on such a small number of sites.

Policy 7 Meecebrook Site Allocation and Policy 8 Masterplanning and Design at Meecebrook

1. Stoford object to the allocation at Policy 7, principally on the basis of deliverability and the rates of housebuilding that the housing trajectory within the Plan (Preferred Options Appendix 6) supports.

Background

2. On 21 May 2022, the then Housing Minister announced the Garden Town and Villages programme;

   https://www.gov.uk/government/news/garden-communities-set-to-flourish-across-england

   Meecebrook was awarded £330,000, taking the total Government funding to nearly £1.5m

   https://www.staffordshire.gov.uk/Newsroom/Articles/2022/05-May/New-train-station-for-proposed-Garden-Community-in-Staffordshire-gets-Government-boost.aspx

3. The proposal was for a Garden Village of 10,000 homes, albeit now the allocation of 3,000 homes by 2040, and a further 3,000 beyond the Plan period (not allocated in this Plan) is somewhat short of that. We are not aware whether the Garden Village funding of nearly £1.5m remains at this level or will be proportionately decreased. This could affect what could be delivered as part of the proposals and how sustainable it may be as a settlement.

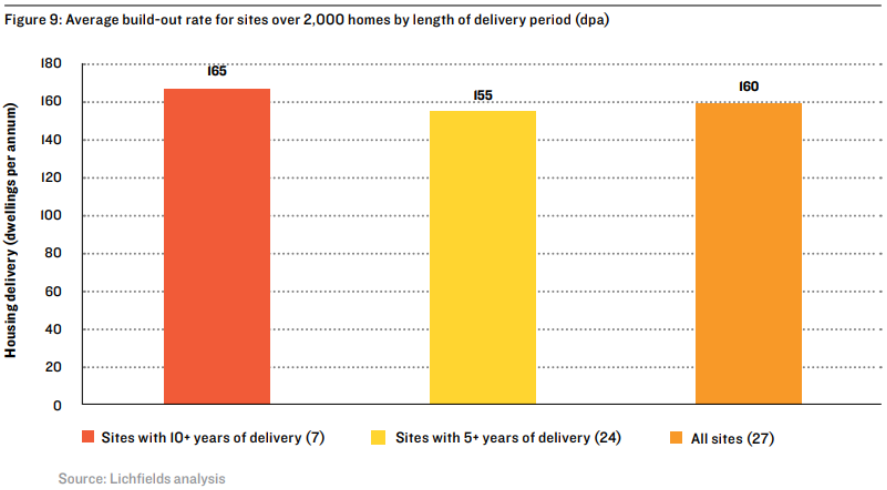
Delivery Rates

4. Our evidence (**Appendix 2)** concludes that Meecebrook will not deliver 300 homes per annum every year from 2030/31, and as a result the Plan will fall short. Policy 1 highlights that the housing provision should be for 10,700 homes (535 per annum) and that the supply comprising completions, commitment and new allocation) exceeds this, at 12,580 homes (a surplus of 1,380). If Meecebrook were to deliver from 2030/31 (which we question as a start date, later in this representation) at a rate of 160 dwellings per annum (which we also discuss in the following paragraphs), the shortfall of 1,400 (i.e. 3,000 minus 1,600 completions, = 1,400 shortfall) then there would be no surplus in supply and no flexibility in the Plan. it would also require Meecebrook to deliver 1,600 homes, and all other commitments totalling 5,925 dwellings, and other allocations (listed in Policy 1) to all come forwards too.

5. The Council has presented no evidence to support the housing trajectory that assumes 300 dwellings per annum will be delivered from 2030/31 to 2040 at Meecebrook. By contrast we would highlight the report prepared by Lichfield[5] that advises that the average delivery rate for sites over 2,000 homes, like Meecebrook, was just 160 dwellings per annum (see extract below/overleaf). The median figure was 137 dwellings per annum. Lichfield assessed 180 sites in their report, 'Start to Finish 2', of which 97 sites were for 500+ homes and we consider this sample to be representative in the absence of any alternative evidence by the Council.

[5] Lichfield, Dec 2019 'How does your garden grow?' Page 13

[6]This is based on the completions of seven examples, Chapelford Urban Village, Broadlands, Kings Hill, Oakley Vale, Cambourne, The Hamptons and Wixhams



Source: Lichfield, Dec 2019 'How does your garden grow?'

Lead in times

6. The Local Plan does allow for some lead in time for delivery to commence at Meecebrook, however Stoford do not consider this to be sufficient and in our view, delivery will not commence until 2035/36. When this does commence, the rate of delivery will also be fewer than 300, as evidenced in our **Appendix 2.**

7. Lichfield's, in their report referenced above – 'Start to Finish 2', suggest that the majority of Garden Community sites which have no permissions yet will take 7-8 years (depending on their size) to commence delivering. However, delivery time was an average of 8.4 years (Figure 4 of the Lichfield Report) from the validation of the first planning application to the completion of the first dwelling. In order to achieve the delivery rate presented in the Council's Local Plan trajectory – a valid panning application would need to be with the Council now. This is simply not the case.

8. There are a number of hurdles to first cross, before a planning application is prepared and submitted – even if the application were to twin track the Local Plan or possibly run ahead of it – neither of these options appears to be one that the Council is suggesting and so we presume that the planning application will follow the adoption of the Local Plan (as the Local Plan also advises).

9. The following timeline is therefore in our view, more realistic:

Local Plan Adoption	October 2024
Landowner Collaboration Agreement required	No details available to confirm that this process has commenced
Framework Masterplan SPD (see policy 7 criterion L and N)	October 2025
Detailed Neighbourhood Masterplan and Design Code (see Policy 8 criterion B)	October 2026
Preparation of an outline planning application	March 2027 - submission

(assume preparation commences during the Masterplan/Design Code stages – hence shorter period allowed for)	
Confirmation that funding and delivery of railway station, secondary and primary schools, electricity, gas, water, on site renewable energy, strategic highways is identified	Ongoing process - assume agreed by 2029
Approval of outline planning application (nb: ad hoc or piecemeal development is not supported - Policy 7, criterion N)	March 2029
Reserved Matters Submissions and Approval	March 2031
Discharge planning conditions	End of 2031
Commence development - enabling works, infrastructure to support first phase of development	Commence 2032 – roads, levels, drainage, etc
First dwelling completion	2034-35 monitoring year

10. Therefore, if the housing trajectory were to be amended to be reflective of the Lichfield evidence and the above table outlining a more realistic timeline, the Garden Village would not see development commencing until late 22034/2035. This would most likely relate to one reserved matters application/one housebuilder outlet with other outlets commencing in the following years subject to approval. Therefore, assuming circa **40 homes are completed in 2034-35**;

- 2035-36 = 80 homes
- 2036-37 = 160 homes
- 2037-38 = 160 homes
- 2038-39 = 160 homes
- 2039-40 = 160 homes

Total homes completed at Meecebrook by 2040 = 760 homes. This would represent a shortfall of 2,240 homes.

11. We highlight above that the Plan allows for a surplus in supply of 1,380 homes, however that is assuming Meecebrook delivers at a rate of 300 homes per annum from 2030. Therefore, not only is the surplus suggested by the Plan eroded away as a result of a more realistic rate of delivery at Meecebrook (i.e. 160dpa opposed to 300 dpa) but the lead in times when factored in, mean that the start onsite is much later than the Council's assumed 2030-31 monitoring year.

Infrastructure led

12. We acknowledge that Garden Communities have a role to play in delivering new homes. However, it is widely accepted that these are significant developments that often require infrastructure to be delivered up front in order to make them sustainable.

13. Para 105 of the NPPF 2022 states:

'Significant development should be focused on locations which are or <u>can be made</u> sustainable, through limiting the need to travel and offering a genuine choice of transport modes'. (our emphasis)

14. The emphasis here is on 'can be made sustainable', because **without the delivery of employment, schools, retail, community facilities railway station, strategic highways infrastructure upgrades, cycle and pedestrian linkages, the development will not be sustainable.** Presently, the allocation comprises a combination of 35 landowners (**Appendix 6**) with no formal collaboration agreement between the parties, no equalisation, no agreed phasing and therefore no certainty. Certainty of availability is necessary to underpin a Local Plan allocation, and particularly one that rests 24% of the housing supply on its shoulders.

15. Of further concern is the evidence within the Council's Local Plan and CIL Viability Assessment. The following extracts are most relevant and confirm a lack of evidence in terms of viability and availability.

7.5 The limiting factor to determine viability at Meecebrook is the S106/infrastructure cost at £XXXXX per dwelling. This may become more of a limiting factor if further work shows that the cost is higher than our assumption.

7.6 Secondly, the willingness of all landowners to release their land for development is not certain. Whilst landowners have been identified and are continuing to work with SBC, further engagement is needed to solidify the proposed red line boundary of the site. There still remains an imminent requirement to open dialogue with these landowners to discuss viability and expectations. Further information is required to add more detail to the emerging and evolving viability status of this site, which in turn enables the viability of the site to be modelled more accurately. This helps inform discussions with landowners, specifically in regards to expectations of potential land receipts.

16. Stoford asked the Council's policy team for further details during the consultation period regarding the above and the omission of appendices 7 and 8 from that report too, that would support the financial position behind Meecebrook. We were advised[6] that the information published was correct and no further details have been offered by way of a response.

17. We consider that additional work is necessary to underpin the feasibility of the Garden Community proposal and that is not justified or effective for the Local Plan to place such reliance on a proposals that is still in such infancy. As such we believe that the delivery of the Meecebrook proposals will not commence in 2030/31 as per the Council's housing trajectory and additional allocations need to be made (we therefore offer the land east of the A34, Stafford), to ensure that delivery of the Plan is not hindered.

Comprehensive Development

18. The Policy is correctly framed in terms of requiring a comprehensive development, because in our view this is essential to ensure that Meecebrook is a sustainable Garden Community. Policy 7 and M and N are helpful, requiring that infrastructure is delivered at appropriate

[6] Email correspondence between Stoford and Stafford Borough Council, 7 November 2022

stages, rates and scale to support the development, and confirming that piecemeal and ad hoc development of Meecebrook is not supported. In order to achieve this, it will be necessary to formalise the landowner agreement, agree a masterplan, phasing, and ensure that infrastructure, services and facilities, including the funding required to support them, are delivered hand in hand with phases of residential development. Without this, new homes will be isolated, be car dependent and residents have no choice other than to drive outside of Meecebrook for basic day to day needs, jobs and schools. This is not the concept of a Garden Community. However we question the potential to deliver this infrastructure in a timely fashion and certainly by the 2030 date that is suggested for completing the first 300 homes. At the very least, schools will not be available on site within this first year of development – leaving children to communicate outside of Facebook for schooling and unlikely to then change schools mid way through their education once on site schools become available.

Meecebrook Railway Station

19. Stoford and other land promoters/housebuilders have jointly commissioned research (**Appendix 4**) to comment on the deliverability of the railway station proposals that form an integral part of Meecebrook.

20. So integral is the railway station, that criterion L of the policy refers to the development only being able to commence once a route to funding and delivery in line with the phasing set out in the SPD has been identified for the railway station.

21. Delivering a railway station is costly, time consuming and without certainty. However based on criterion L (Policy 7) the delivery of 3,000 homes at Meecebrook is dependent on this.

22. The Council's evidence base contains no details regarding any engagement with Network Rail, or confirmation of their acceptability of the proposals for a new railway station on the West Coast Main Line, which will have knock on implications for journeys connecting the south and north of the country.

23. There are no clear routes to funding, phasing or timing for the new station, and this has significant implications for the delivery of new homes given the requirements of criterion L and M within Policy 7.

24. Page 21 of **Appendix 4** sets out how the approach to evidencing the proposed new railway station at Meecebrook, aligns to the Network Rail guidance for new stations. The conclusions are of significant concern. Section 5.1.1 of that report highlight the key concerns relating to the difficulties of introducing a new station onto the West Coast Main Line; the absence of any Network Rail Strategy to include Meecebrook; the absence of critical mass for demand and the lack of funding for such projects I the current climate. Fundamentally, Appendix 1 of the report replicates a Freedom of Information Request with responses from Network Rail which include:

There are currently no Network Rail proposals for a station at Meecebrook and our planners have advised that they have not been consulted with directly by Stafford Borough Council or Staffordshire County Council on this subject.

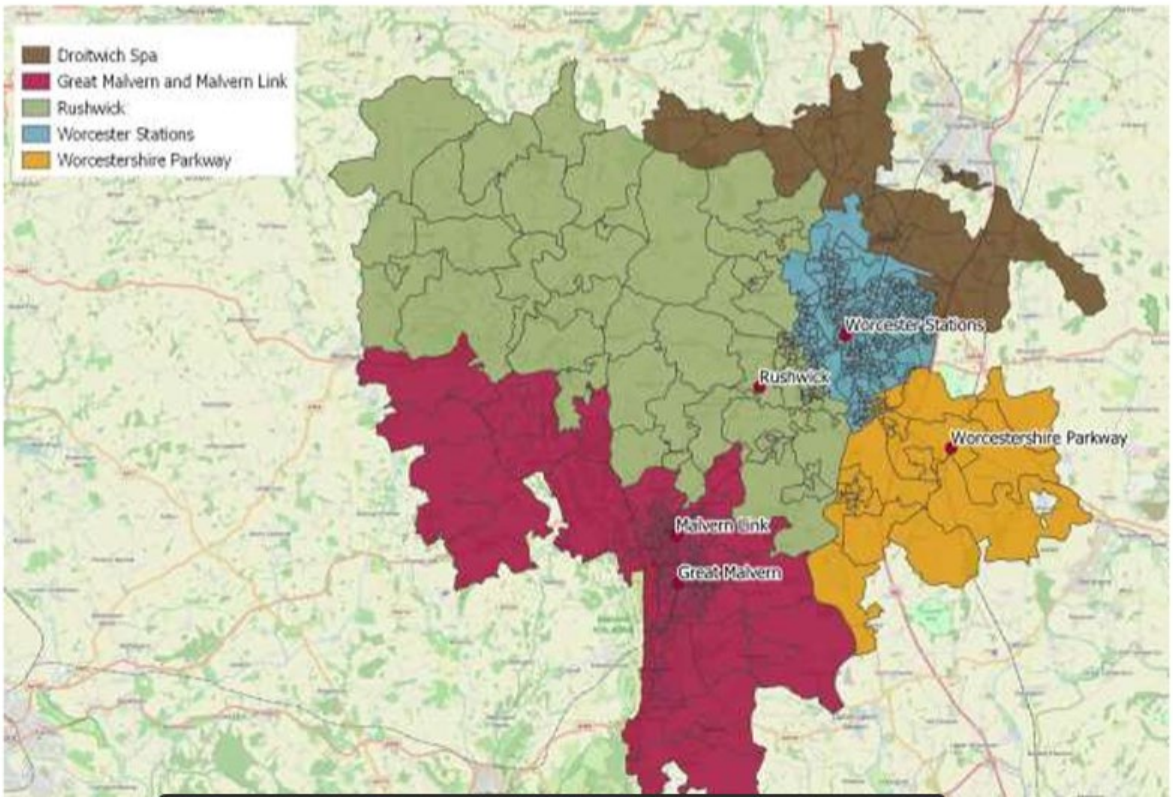
This casts doubt in our view on the deliverability of the railway station in the short to medium term and certainly the ability for new homes to be delivered sustainably at Meecebrook in the absence of such facilities.

25. It is also helpful to consider how other LPAs have sought to deliver railways stations as part of new development. Bedford Local Plan is ahead of Stafford, having undertaken consultation on a Submission version of their Plan and they are looking to submit it in January 2023 and adopt by the end of next year. Their Plan also includes a new settlement proposal at Little Barford notably of 4,000 homes and this includes a railway station on the east Coast Mainline. Their housing trajectory[7] includes for the supply of homes at Little Barford in year of one of its delivery – being just 100 homes, rising to 200 in the following years, before rising again. The Plan is yet to be submitted and examined but is a helpful comparison.

https://edrms.bedford.gov.uk/OpenDocument.aspx?id=n5ZbUWFzNN8hMg%2bGpp4nvw%3d%3d&name=Stepped%20trajectory%20paper.pdf

Within South Worcestershire, the Regulation 19 Plan includes proposals for a new rail halt at Rushwick. This is an existing settlement and a location where a further 1,000 new homes are planned. In addition, the business case for that rail halt includes an analysis of meeting passenger demand for neighbouring areas and the analysis confirms a strong rural catchment as shown in the extract below taken from the SWDP evidence base.

7 https://edrms.bedford.gov.uk/OpenDocument.aspx?id=n5ZbUWFzNN8hMg%2bGpp4nvw%3d%3d&name=Stepped%20trajectory%20paper.pdf



Source: Figure 28, Rushwick Station Strategic Outline Business Case, 2021

Meecebrook services and facilities

26. Meecebrook is proposed to be a new community, where new homes will be dependent on the delivery of local schools, service, shops, and other community facilities in order to create a sustainable neighbourhood. These services and facilities are not in place and will need to be developed alongside the new homes, bringing into question how these become viable in the early stage of the development when footfall is low. For example, a local shop will need customers arising from more than circa 300 homes in the first few years of the development in order to be viable, and operators such as Spar, Nisa, One Stop. The Meon Vale development on the edge of Stratford, Warwickshire for example, secured the development of 500 new homes, and 300 units of holiday accommodation and facilities including a local shop – however in order for that development to be sustainable, planning conditions required the early delivery of facilities secluding the shop and this required a developer (St Modwen) with significant experience in this field, in order to deliver this scale of development in the early years. A further key difference in that example was that St Modwen was the single landowner on the site. There are no assurances here that such an approach will be taken to secure the delivery of the services and facilities needed and no principal developer with experience of doing this scale of development on board, leading the process.

Meecebrook Employment Land

27. The northernmost part of the allocation is 7miles south of j15 of the M6, via the A519. This is a single carriageway, with the route passing through the villages of Cotes Heath and Beech. Travelling south to the M6 would cause vehicles to take the A519 through Eccleshall and onwards to junction 14. The routes will not be attractive to occupiers within the B2/B8 sector,

in addition to the distance from the motorway, absence of any existing businesses and the overall strength of location is considered to be weak.

28. The masterplan suggests that the 15ha of employment land will be located as an expansion to existing industrial areas. A further 15ha is proposed for beyond the Plan period. This would be broadly similar in size to the 31.15ha allocated as a draft at Stafford North – a site that Stoford also have an agreement on with the landowner and sperate representations have been made.

29. Within those representations we note that the 31.15ha is simply insufficient to meet the requirements of occupied with whom we are having detailed conversations and looking to locate/expand here. Our representations detail that once the gross/net site size is calculated, the available site area will only support up to three new units with footprints that match current market demands. Given that Meecebrook is allocating 15ha within this Plan period, the reality is that only two or possibly three small/medium units (based on sizes currently being sought by local occupiers) could be accommodated at Meecebrook. This further brings into question the likelihood of the Meecebrook employment allocation being delivered. Enticing an occupier to a location with no critical infrastructure in place and limited supply chains/existing industrial estates, and labour supply to connect to, gives rise to doubts about the prospects for delivering 15ha of employment land at Meecebrook.

30. By contrast, Stoford are supporting the 31.15ha expansion of Stafford North, whereby existing businesses at the adjacent Redhill Industrial estate are already in situ and a strong labour force is available by way of existing and proposed residential developments. Stoford have two occupiers already interesting in taking almost the entirety of the draft allocation there. This demonstrates the importance of location, that Meecebrook simply cannot offer.

31. Secondly, Stoford are proposing the delivery of 18ha of employment land (with the potential for expansion) on land south of Stone, immediately adjacent to the existing Stone Business Park and with the ability to connect directly to the A34. That land is also within one single ownership, and as our separate representations outline, is suitable available and achievable. This land has not been included within the Plan as an employment allocation - however our separate representations make a case that it should be, ahead of/ as an alternative to Meecebrook.

Policy 9 North of Stafford

1. North of Stafford Strategic Development Location is an allocation from the former Local Plan, that has benefited from a number of planning permissions to date, that will eventually deliver in excess of 3,000 homes.

2. Stoford do not object in principle to this allocation, and we are supportive of the location as a sustainable for residential development. The Stafford North Masterplan document, approved by the Council (prepared by Pegasus in 2016) is a comprehensive document that has guided the planning applications since then.

3. We have presented the key planning history at North of Stafford below:

	Reference/ Application Number	**Description of Development**	**Date Application Received**	**Date Application validated**	**Date Decision Made**	**Applicant Name**
1	13/18533/REM - 257 dwellings	13/18533/REM | Submission of Reserved Matters (layout, scale, appearance and landscaping) for the construction of 257 dwellings served via two access points from Beaconside (approved under planning permission 10/13362/OUT), landscaping, car parking, earthworks to facilitate storm water drainage and all other ancillary and enabling works (Phase 1) | Land At Beaconside Stafford Staffordshire	8th April 2013	20th May 2013	1st August 2013	Taylor Wimpey North Midlands
2	14/20781/REM - 152 dwellings	14/20781/REM | Reserved matters application (appearance, landscaping, layout and scale) for 152 dwellings pursuant to planning permission 10/13362/OUT | Land To North Of Beaconside And East Of A34 Stone Road Beaconside Stafford Staffordshire	15th July 2014	15th July 2014	24th September 2014	Taylor Wimpey North Midlands
4	*10/13362/OUT - 409 dwellings: 152 dwellings (Reserved Matters 14/200781/REM) and 257 dwellings (Reserved Matters 18533/REM)*	***Outline permission for the above Reserved Matters:*** *10/13362/OUT | Residential development - 409 dwellings (outline)*	*12th April 2010*	*12th April 2010*	*31st August 2012*	*Akzo Nobel UK Ltd*
3	20/32039/REM to outline permission 16/24595/OUT- 700 dwellings	20/32039/REM | Reserved matters application for 700 dwellings to outline permission 16/24595/OUT seeking approval of layout, scale, appearance and landscaping, and including internal access roads, footpaths, drainage, associated parking provision, open space and infrastructure. | Land North Of Marston Grange Marston Stafford Staffordshire	3rd May 2020	24th March 2020	3rd February 2021	Barratt West Midlands & Bovis Homes (Mercia Region)
	16/24595/OUT- 700 dwellings	***Outline permission for the above Reserved Matters:*** *16/24595/OUT- Outline planning application for residential development of*	*27th July 2016*	*17th Nov 2016*	*10th October 2018*	*Akzo Nobel UK Ltd*

		up to 700 dwellings (Use Class C3), 1 No. (up to 60 bed) elderly living facility (Use Class C2), a one form entry primary school (Use Class D1) and a local centre to provide up to 2500 sqm GIA of open use (Use Classes A1 and/or A2 and/or A3 and/or A5 and/or D1) development together with supporting infrastructure including: green infrastructure, highways and associated works. All matters are reserved other than the principal points of access.				
5	16/25450/OUT - 2,000 dwellings	16/25450/OUT | Outline planning application for mixed-use development, comprising of the demolition of existing buildings and structures, the erection of up to 2,000 dwellings (Use Class C3), 2 no. Local Centres to provide up to 4,500 sqm of GIA (Use Class A1- up to 1,100 sqm, Use Classes A2/A3/A5 - up to 2,800 sqm and Use Class A4- up to 600 sqm), 1 no. Health Centre (Use Class D1- up to 600 sqm), 1 no. (up to 60 bed) elderly Living Facility (Use Class C2), a two form entry Primary School (Use Class D1), a five form entry Secondary School (Use Class D1), together with supporting infrastructure including: green infrastructure, highways and associated works. All matters are reserved with the exception of principal means of access on to existing highway | Land North Of Beaconside Stafford	19th December 2016	20th December 2016	30th May 2022	Maximus Strategic Stafford LLP
6	18/28182/REM and 16/25260/OUT - 100 dwellings	18/28182/REM | Reserved matters for 100 dwellings with details of appearance, landscaping, layout and scale pursuant to outline application 16/25260/OUT | Land North Of Marstongate Farm Marston Lane Marston Stafford Staffordshire	8th March 2018	14th March 2018	12th June 2018	Miller Homes Limited
	16/25260/OUT - 100 dwellings	***Outline planning permission for above reserved matters*** *Outline planning application for residential development with associated works and the demolition of existing building and structures . All matters are reserved other than means of access to the site.*	16 Nov 2016	25th Nov 2016	22nd Jan 2018	Richborough Estates

4. The above table was sourced from planning application data held on the Stafford Borough Council website, during November 2022. It shows the key dates in securing planning permission for the sites that comprise 'North of Stafford.'. From 2022/23 onwards until the end of 2040, the Housing Trajectory within the Plan suggests that 2,700 homes will be delivered. Based on the fact that 2,000 dwellings are permitted in outline (ref. 16/25450/OUT) and a further 700 have reserved matters approval (20/32039/REM), we have presumed that these two permissions will be responsible for delivering the 2,700 dwellings that make up this part of the housing trajectory figure for North of Stafford. The 1,120 completed homes within

years 2020/21 and 2021/22 are most likely to be from the residual permissions listed in the above table (i.e., sites 1,2,6).

5. With regards to delivery beyond 2022, our contact with the Bovis sales office during this period of consultation confirmed that only 10 homes had been completed, albeit no contact was possible with Barratt West Midlands (who control the remainder of the 700 unit scheme (20/323039/REM). Whether it is reasonable for a further 73 homes to be completed before the 31 March 2023 (as per the 22/23 monitoring year within the Housing Trajectory) is a matter for further consideration and based on build rates within this part of the site to date, it is questionable.

6. The 2000 dwellings (16/25450/OUT) is yet to progress to reserved matters stage. An application for some of the infrastructure has been made in the form of reserved matters, however not for the homes themselves. Based on the above timelines, it is reasonable to assume some delivery in 2025/26, which is when the first of the 2,000 homes occurs in the trajectory. However, the delivery of over 200 homes per annum from Stafford North at that time (and beyond for the next few years) is unrealistic and has not been evidenced on any existing site within Stafford to date.

7. It is our view that Stafford North's housing delivery rates should be reduced to represent 2,700 dwellings over the period 2021-2040, as supported by our report at **Appendix 2**

Policy 10 West of Stafford

1. Policy 10 refers to the delivery of 1729 dwellings of the course of the Plan period, and the housing trajectory confirms that these will be delivered between 2022/23 and 2031/32.

2. The site is an allocation carried over from the 2014 Local Plan. 1500 homes were approved under 17/27731/FUL, which forms a major proportion of the Berryfield site. 1,058 of these dwellings await reserved matters approval. The housing trajectory suggests that these will commence delivery in 2024/25. Given reserved matters is yet to be approved for these homes, there is a question regarding the reliability that 150 dwellings can arise **every year** from this phase of the development rising to 250 dwellings per annum. This rate of completions has not been seen to date on other sites in Stafford.

3. In addition, 352 homes within the allocation remain without planning permission. With the rates of delivery being proposed on other phases of the same site i.e. 150 dwellings per annum from one housebuilder (Taylor Wimpey), there is some scepticism regarding the potential for market saturation within this site and the extent to which further housebuilders could be attracted here given the anticipated rate of growth being assumed from Taylor Wimpey. It is also notable that the Stafford Station Gateway site is proposed to deliver 900 dwellings over broadly the same period.

4. Our report at **Appendix 2** recommends a reduced rate of delivery from 250 dwellings per annum, which extends the period for this site to be completed to 2034.

Policy 11 Station Gateway Stafford

The Plan allocates 900 homes to the Station Gateway site.

We note that this is a brownfield site and in principle, the site is supported, and forms part of a wider masterplan. St Modwen Homes are already land owners for part of the site and it is sensible to assume that delivery will continue. That said, the commencement date of 2028/29 appears optimistic for what is a complex brownfield site, and therefore our report at Appendix 2 suggests a later date of 2030/31 for the first completions on site.

Policy 12, Policy 1, Table 1– The Omission of Land at Redhill Farm as a housing allocation

1. Stoford object to the omission of Land north of Redhill Farm **(Appendix 1)** being allocated for residential development, and consider that it should be listed as one of the allocations at policy 1, 12 and referred to within Table 1 (Page 22) of the Plan. The site could deliver some 600 homes.

2. The site was considered by the Council within
- The Strategic Housing and Employment Land Availability Assessment 2022) - SHELAA **(Appendix 7)**
- The Site Assessment Profiles 2022 (**Appendix 8**)

and within the Site Selection Topic Paper (2022), the four stage process towards the Site Selection is outlined.

3. Land north of Redhill Farm was rejected at Stage 4, page 43 of the Site Assessment Profiles confirms. Within these representations we address the reasons listed for rejection, and in addition, provide further evidence in respect of the Site Assessment undertaken by the Council and listed on page 43 of the Site Assessment Profiles.

4. At Stage 1 and 2 of the assessment process, the site was established as being **available, suitable, and achievable,** and therefore it was concluded that it was potentially developable**. (Appendix 7)**

Available

5. To recap, the site is within single land ownership of Mr and Mrs Cantrill, with whom Stoford have an agreement to promote the land and secure a planning permission for development. It is available, and with initial survey work having been undertaken a planning application can be prepared in 2023 for submission within the same year. If positively determined, the site could commence development in 2024 and the first home completed in 2025. The SHELAA confirms that the site is available. Mention is made of infrastructure to the site needing to be confirmed. As a direct result of delivering the Pets at Home scheme on the opposite side of the A34, Stoford have knowledge of the location of services and utilities that are available, and through the delivery of the new roundabout access on the A34, the site can be accessed. The roundabout has been designed and built to a size that can accommodate the residential development being promoted here, and the land being promoted by Stoford to the northwest of Pets at Home, for employment use.

Suitable

6. The site is suitable for residential development, being adjacent to the settlement boundary of Stafford and the Strategic Development Location of North Stafford where over 3000 homes are being delivered, including some being allocated within this Local Plan. The site is located on a bus route, with a new extended cycleway and footpath extension also providing opportunities for non-motorised modes of travel towards Stafford. Local employment opportunities are available within walking distance, west and south of the site at Redhill Industrial Estate and north Stafford Business Park. Additional services and facilities are being delivered at Beaconside, south of the site, however within our proposals we include land for a 2 form entry primary school, a local centre, open space and a network of footpaths and cycleways, creating a new yet connected neighbourhood to Stafford.

7. The SHELAA refers to the Historic Environment Records being a possible constraint to the site's suitability. BSA Heritage have considered the site and its development potential. An advice note is included at **Appendix 9.**

8. The closest designated heritage asset to the site is a Grade II listed milestone on the west side of the dualled Stone Road several hundred metres to the south west. This small 19th century feature has a limited setting which enhances its significance and would not be affected by change within the site. All other designated heritage assets lie at such a distance that they would not be harmed through change to their setting given distance and context.

9. Although not designated, Redhill Farm farmhouse within the site is of local heritage interest. The proposals for the site require the loss of Redhill Farm farmhouse and structures to the north to facilitate safe access. This loss would rate as minor adverse and would need to be weighed against the scheme benefits, as set out for non-designated heritage assets. Historic building recording could be completed ahead of demolition. Overall, the results of the heritage advice do not lead to a conclusion that the site is unsuitable for development.

Achievable

10. The site is achievable for residential development and this is also confirmed within the SHELAA 2022. In determining achievability, this is essentially a judgment about the economic viability of the land. Stoford are an experienced developer – predominantly in the commercial field, however more recently in our joint venture partnership to deliver a mixed-use regeneration scheme in the centre of Digbeth, Birmingham. In addition, the proposals for Redhill Farm have been developed in conjunction with advice from JLL, and their residential agency team. The value of the proposals has been modelled with their expertise and this has confirmed that a scheme of circa 600 homes, 2ha of land for a two-form entry primary school, local centre and approiate financial contributions via section 106 towards education, public transport, and further matters to be considered, is viable. Stoford benefit from in house planning and land advice, where team members have worked in a consultancy until recently for national housebuilders and also for land promoter Gladman.

11. Within the Site Assessment Profiles 2022, the land at Redhill Farm was considered but rejected at Stage 4, following the consideration of evidence, para 2.1 advises.

12. We examine the assessment in the following table, using the same assessment criteria as the Council's Site Assessment Profile.

Topic Area	Evaluation
Education	The Council's Assessment advises that the primary schools at Stafford North are unlikely to be able to accommodate the number of pupils that would arise from the development of Redhill Farm. In addition, the Assessment advises that the expansion of those school is unlikely. Stoford have commissioned independent leading advice from EFM (**Appendix 10**). EFM work nationally with LPAs and the private sector and advise on education provision. The EFM Report concludes that capacity across Stafford for primary school places is effectively spoken for, without the development of North Stafford – some 3,300 homes. Whilst Stafford North SDL does include provision for a one form entry and a two-form entry primary school, neither are yet built. No detailed planning permission for either school is place, and it is not clear if the funding or land for either school has been transferred. Table 12 concludes that by 2028, there will be a requirement for 3 forms of entry within primary school provision – thus both primary schools that form part of the North Stafford SDL will need to be open by then. By 2030, there will need to be a further form of entry available and given the Council's evidence advise that

	expansion of these two schools is not likely – this means that the North Stafford SDL has a shortfall in primary school provision. Stoford proposal for Redhill Farm includes land for a two-form entry primary school that will satisfy the needs arising from the development of circa 600 homes at Redhill Farm and could provide the solution for the currently unmet education needs that will arise by 2030 at North Stafford. Land at Redhill Farm is the logical solution to this very critical problem that Stafford Borough will face in the next few years. Having a short-term solution, in a deliverable site such as Redhill Farm, is something that the Council can use to address this problem whilst also infilling a gap within the housing trajectory that we have highlighted earlier in these representations and within the appended housing land supply report (Appendix 2). We note that a five-form entry secondary school is proposed as part of the adjacent North Stafford SDL scheme. The Redhill Farm proposals include land for a two-form entry primary school, with financial contributions being payable through the S106 process to the LEA in respect of securing school place provision. The details of this can be discussed with the LEA as part of the evolution of the Local Plan.
Transport	The Council's Site Assessment Profile confirms that two points of access are required for the site. The illustrative masterplan demonstrates that this is achievable. The Site Assessment Profile states that highways impact would need to be assessed on the A34 corridor and related roundabouts and the link road to the M6. The highways advice provided by BWB to support our promotion of Redhill Farm (Appendix 11) confirms that 1. The new roundabout on the A34 built to serve Phase 2 and Redhill Roundabout would continue to operate within capacity. 2. The allocations are not expected to have a severe impact at the A34/William Bagnall Drive crossroads junction although some form of mitigation is expected to be needed, such as increasing flare lengths and kerb realignment. 3. Whilst the impact on M6J14 will need to be assessed further within any future Transport Assessment produced in consultation with National Highways, it is concluded that the impact would be minor, and any mitigation (if required) is likely to be modest. 4. The allocations are expected to require mitigation at the Aston Roundabout and Stafford Roundabout in Stone. However, the latter is likely to require a more comprehensive solution if capacity issues are to also be resolved.
Ecology	The Site Assessment Profile 2022 advises that the land at Redhill Farm has high overall ecological sensitivity and is within a Great Crested Newt Impact Zone. Ecology Solutions have prepared Appendix 12, and this confirms that that the habitats on site are, in the main, of relatively low ecological value with the hedgerows likely to be of greatest interest. While it is expected that a large proportion of existing habitats would be lost from the Site's development, any

	future scheme has the capacity to ensure that a net gain in biodiversity is achieved as part of an ecological led landscape strategy. While further survey work is required to determine the usage of the Site by notable and protected species, the presence of these species, if found, would not represent an overriding ecological constraint on the development of the Site. The Site has the capacity to provide any necessary mitigation to ensure its lawful development and would be designed to retain and enhance opportunities for wildlife. With this in mind, the potential presence of ecological receptors in and around the proposed Site should not represent any objection to its allocation within the new Local Plan. With regards to the Great Crested Newt Impact Zone, Appendix 12 advises that whilst previous survey work has indicated an absence of Great Crested Newts within at least three of the four on-site ponds, there remains the possibility that this species has dispersed into the Site since previous survey work was undertaken. A known population of Great Crested Newts is present to the west within the new Pets at Home development and, while the A34 represents a significant dispersal barrier, there is a hydrological link that could allow dispersal to occur. There may also be presence within the pond located in the east of the Site that was not subject to previous survey work. With this said, the presence of Great Crested Newts does not present an overriding ecological constraint, with a number of options available to lawfully facilitate the development of the Site. Owing to the Site being located within a red risk impact zone it is likely that some mitigation would be required during the clearance of suitable terrestrial and aquatic habitats for Great Crested Newts, however, this would be substantially less than what is required via the traditional Natural England European Protected Species (EPS) licensing route. Regardless of the mitigation strategy to be applied, any future development has scope to retain and enhance opportunities for Great Crested Newts, alongside other notable and protected species.
Landscape	The Site Assessment Profile considers that the land at Redhill Farm have medium landscape sensitivity. Our Landscape Statement (Appendix 13) agrees that the landscape has moderate sensitivity however it also concludes that the site has a high capacity for development. Our illustrative masterplan takes account of the recommendation within Appendix 13, and these have influenced the potential layout development, retention of key features and integration of green infrastructure.
Heritage	The Site Assessment Profile advises that land at Redhill Farm has low direct impacts and low setting impacts. Overall, the Profile considers that there is no substantial harm. BSA Heritage Consultancy (Appendix 9) confirms that the site has no historic landscape value, is of low archaeological potential, and the farmhouse and buildings are only of local heritage interest. Development of the site is not precluded.
Water and Electricity	The Site Assessment Profile advises that there is medium potential impact on sewerage infrastructure and low potential impact on surface water sewerage infrastructure. Stoford's development of the Pets at Home site included water infrastructure and other services provision within the site. Our working knowledge

	of local utilities availability will be furthered with additional survey work as we continue to promote this site for development. There are no known concerns. There are no electricity issues for this site.

13. Two reasons are provided within the Site Assessment Profiles document for rejecting the site. These relate to education capacity constraints that the council considers are unlikely to be resolved, and ecology concerns that would need to be suitably mitigated for.

14. Our accompanying evidence at **Appendices 10 and 12** address these points specifically. Appendix 10 confirms how the education capacity constraints can be addressed and how this provides wider benefits for North Stafford. **Appendix 12** confirms that the site has the capacity to provide any necessary mitigation to ensure its lawful development and would be designed to retain and enhance opportunities for wildlife.

Our Vision for Land at Redhill Farm

15. We have prepared a Vision Document (**Appendix 3**) that accompanies these representations, and this sets out our Vision for Land at Redhill Farm:

16. To create an attractive, vibrant, and sustainable neighbourhood that connects seamlessly to the urban area of Stafford town, offering a mix of new homes, community facilities and land for a primary school to address the need for housing and school places, and meet the diverse needs of Stafford.

17. We set out the opportunity for

    - Delivering circa 600 new homes across a range of dwelling sizes and tenures to cater for different household sizes.
    - A mix of house types including homes for retirement living
    - Community facilities including a local centre with convenience retail, nursery and 2ha of land for a primary school
    - Sustainable walking and cycling routes
    - Three public parks totally 4.47ha, two of which include a range of children's play equipment
    - Substantial green infrastructure, sustainable drainage and ecological enhancement

18. We propose that new homes could be delivered on site in 2025 and the development be completed by 2034 – which infills the time delays that arise from the delivery of other allocations within the Local Plan that we identify in our representations and **Appendix 2** (Housing Supply Report, by Claremont Planning)

Conclusion

19. The above representations set out our justification and evidence for why the land at Redhill Farm should be allocated. Such an allocation would provide the Local Plan with a sustainable option to bolster the housing trajectory, ensure new homes continue to be delivered at Stafford – in accordance with the spatial strategy, and within a site where access infrastructure is readily available.

Appendices

Appendix 1 Site boundary edged red

Appendix 2 Claremont Planning Housing Land Supply Report

Appendix 3 Vision Document

Appendix 4 Review of new passenger station proposals

Appendix 5 Email correspondence between Stoford and Stafford Borough Council, 7 November 2022

Appendix 6 Plan of landownership at Meecebrook (landowners' details available for parcels no. 1-17)

Appendix 7 SHELAA 2022 Extract

Appendix 8 The Site Assessment Profiles 2022

Appendix 9 Heritage Advice Note

Appendix 10 Education Report in Support of the Promotion of land at Redhill Farm, Stafford

Appendix 11 BWB Highways Advice

Appendix 12 Ecological Statement

Appendix 13 Landscape Statement

Appendix 14 Sustainability Statement

Reference ID Code: 123; Stoford Properties Ltd, Redhill Farm - Part D

STAFFORD, STONE ROAD, RESIDENTIAL

SITE PLAN

Rev	Date	By	Description
-			

Key:

Red Line Boundary - 29.29Ha

SGP
Architects + Masterplanners

Waterfront House,
[redacted]

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REVIEW OF HOUSING LAND SUPPLY & TRAJECTORY

EMERGING STAFFORD BOROUGH LOCAL PLAN

ON BEHALF OF STOFORD PROPERTIES LTD

December 2022

Our Ref: CLR276

Claremont Planning Consultancy Ltd

[redacted]

QUALITY MANAGEMENT

Prepared and Authorised by:	**Amelia Cary / Eleanor Lovett**
Date:	**December 2022**
Project Number/Doc Reference:	**CLR276 / Housing Supply Review**

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APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 Claremont Planning Consultancy has been instructed by Stoford Properties, to undertake a review of the housing land supply and trajectory outlined in the emerging Stafford Borough Local Plan. The report is intended to accompany representations to the Stafford Local Plan Preferred Options consultation.

1.1.2 The Preferred Options draft of the emerging Stafford Borough Local Plan represents the second formal stage of consultation undertaken as part of the preparation of the Plan. The Preferred Options provides a full draft of the emerging Plan, confirming details including the level of housing and employment required across the plan period, as well as how these will be distributed across the Borough, and specifically identifying the preferred site allocations that will be relied upon to meet these emerging requirements. Additionally, the Council has identified the anticipated trajectory for delivery of those sites.

1.1.3 In order to assess whether the approach proposed is robust and justified, and in accordance with the plan-making requirements set out in the National Planning Policy Framework, Claremont Planning has undertaken a detailed review of both the housing requirement and supply. In respect of the housing requirement, this has included consideration of whether the Council's decision to adopt a housing requirement of 535 homes per annum is appropriate. Following this, a detailed assessment of the Council's proposed approach to meeting this housing requirement will be outlined, including the sites that the Council is reliant upon, as well as the assumptions made regarding the trajectory. Claremont will use this assessment to critique the Council's housing supply and trajectory, and provide an alternative view.

1.1.4 This report is intended to demonstrate that whilst the Council's approach may be considered to be justified, it is important that as the Plan progresses towards examination, the Council should ensure that the approach is sound and robust. Furthermore, the Council should recognise the risks of progressing a Plan that does not fulfil the national policy requirements or provide a robust basis for maintaining appropriate levels of housing delivery in the future.

1.2 Structure of this Report

1.2.1 Firstly, the report will consider Stafford Borough Council's record on housing delivery. This will include consideration of the total completions achieved annually, against the relevant target. Consideration is given to the record of affordable housing delivery across the Borough and how this compares to the Council's target. The delivery of major allocated sites in the adopted Plan will be considered, including how many units had consent by 2020/21, and how this compares to the expectations of the adopted Local Plan's housing trajectory. Brief consideration is also given to the record of housing completions in the previous year presented in the Council's Housing Land Monitor.

1.2.2 Secondly this report will consider the Council's proposed housing requirement and whether this is reasonable and robust.

1.2.3 It will then consider in detail assumptions regarding lead in times and build out rates, which the Council have used to calculate the housing trajectory. This will consider the Council's evidence and how this has been used to influence the assumptions behind delivery of each site.

Additionally, it will consider the assumptions that the Council has applied to windfall sites and C2 developments.

1.2.4 The report then goes on to consider the large site allocations in turn, considering the background and context of each site, and whether the assumptions made in the emerging Plan are reasonable having regard to the conclusions reached in regard to lead in times and build out rates. In respect of each site, we consider what contribution is reasonable to expect each site to make in the emerging Plan.

1.2.5 The report will then go on to consider the implications for these factors on the housing trajectory. This will consider each source that will contribute to the emerging Plan's housing supply, and identify the Council's assumptions, our assumptions and the difference between these.

1.2.6 Finally, the report will consider the contribution towards the housing supply shortfall that can be made through the allocation of an additional site, Land at Redhill Stafford, which is promoted by Stoford Properties through this Plan.

2 PREVIOUS HOUSING SUPPLY & DELIVERY

2.1 Introduction

2.1.1 In order to effectively assess the housing land supply and trajectory outlined in the emerging Stafford Borough Local Plan, it is first required to examine the previous housing land supply and delivery of the Plan for Stafford Borough (Part 1), adopted in 2014. Based on an objectively assessed need, the Plan for Stafford Borough (Part 1) set out a requirement for 500 dwellings per annum, to be delivered over the Plan period. To accurately inform the assessment of the housing requirement and delivery assumptions for the emerging Local Plan, this section will review the existing record of housing delivery for Stafford Borough to ascertain the scale, location and completion rates of previous housing allocations and windfall sites.

2.2 Record of Housing Delivery

2.2.1 The Plan for Stafford Borough (Part 1) identified an objectively assessed need to deliver 500 dwellings per annum, totalling 10,000 dwellings for the Plan period (2011-2031). The table below sets out the total completions for the period 2011/2012-2021/2022, indicating over-delivery of housing compared to the Plan target of 5,500 dwellings.

Year	Completions	Target	Shortfall
2011/12	425	500	75
2012/13	306	500	194
2013/14	411	500	89
2014/15	428	500	72
2015/16	688	500	-188
2016/17	1010	500	-510
2017/18	863	500	-363
2018/19	699	500	-199
2019/20	752	500	-252
2020/21	614	500	-114
2021/22	506	500	-6
Total	**6,702**	**5,000**	**-1,702**
Average for the period 2011-2022	609		

Source: Number of dwellings completed during the Plan period from the Stafford Borough Land for New Homes Housing Monitor report (2022)

2.2.2 As identified in the above table, since the start of the Plan period there has been overprovision against the Plan target of 1,702 dwellings, with over-delivery particularly evident in the last 7 years. It is noted that during 2011-2014, the Council did not include C2 residential accommodation as counting towards the 5 year land supply, however during this period, 69 C2 residential dwellings were completed. For the monitoring years since 2014/2015 C2 and C3 completions have been recorded within the 5 year land supply. When this overprovision is assessed against the rate required for the whole Plan period, there is a remaining balance for 3,298 completions before the end of the Plan period, as highlighted in the table below.

Plan Period	Completion Rate
Annual Target (2011-2031)	500

Annual Completion Average (2011-2022)	609
Cumulative Completions (2011-2022)	6,709
Remaining Balance (2022-2031)	3,298

Source: Completion rates table from the Stafford Borough Land for New Homes Housing Monitor report (2022)

2.2.3 The Policy Framework for Stafford Borough states that new residential development should predominantly be delivered in Stafford, Stone and 11 Key Service Villages (KSVs) across the borough. For housing growth, the Plan envisages that 70% of new dwellings will be delivered in Stafford, 10% in Stone, 12% in the Key Service Villages and 8% across the rest of the Borough. Since the start of the Plan period in 2011 to 2021, 54% of housing completions have been delivered in Stafford, 14% in Stone, 20% in the Key Service Village, and 12% in rural areas. There has therefore been an under-delivery in Stafford and an over-delivery in Stone, the Key Service Villages, and other rural areas. However, when both housing completions and commitments are considered together, the percentages generally accord with the Plan's target. This demonstrates that generally permissions have been granted in accordance with the distribution strategy set out in the Plan, although delivery has not been as fully consistent with this. The table below sets out the housing targets and delivery across the settlement hierarchy.

Table 2.1 Housing Targets and Completions across the Settlement Hierarchy

Location	Policy Target (%)	Completions 2011-2021 (%)	Completions and Commitments (%)
Stafford	70	54	72
Stone	10	14	9
Key Service Villages	12	20	11
Rural Areas	8	12	8

Source: Settlement hierarchy housing targets and delivery table from Stafford Borough Authority Monitoring Report (2021)

2.2.4 During the period 2011-2021, 7000 new dwellings have been allocated for delivery at Stafford town, in line with policy targets. Since 2011, 3,333 dwellings have been completed, and there are a further 5,407 dwellings either under construction, with planning permission or allocated within the Local Plan. Similarly, 1000 new dwellings have been allocated for delivery in Stone since 2011. 864 dwellings have been built, and a further 294 dwellings benefit from planning permission.

2.2.5 A focus of the existing Plan for Stafford Borough is for sustainable development and the utilisation of brownfield land. During the monitoring year 2020/21, 43% of housing completions were on brownfield land, which represents a 13% increase compared to the previous monitoring year. However, it should be noted that this figure is significantly lower than at the start of the Plan period. For example, during the monitoring year 2012/13, 80% of housing completions took place on brownfield land. This occurred as a result of greenfield sites coming forward through the adopted Plan for Stafford Borough's development strategy.

2.2.6 Generally, affordable housing delivery has increased over the Plan period to date, however since the start of the Plan period the average remains under-target. In total, 196 units of affordable housing were delivered in the monitoring year 2020/21, which represents a slight increase from the figure of 189 units in the monitoring year 2019/20. However, these figures both fall below the

target rate of 210 units per year, with the average delivery of affordable housing per year since the start of the Plan period sitting at 167 units. Table 2.2 provides an overview of affordable housing delivery across the Plan period.

Table 2.2 Affordable Housing Delivery

Monitoring Year	Number of affordable housing units delivered
2011/12	83
2012/13	48
2013/14	91
2014/15	199
2015/16	159
2016/17	343
2017/18	219
2018/19	147
2019/20	189
2020/21	196

Source: Affordable housing delivery table from Stafford Borough Authority Monitoring Report (2021)

2.3 Previous Local Plan Allocations

2.3.1 In order to provide a full review of the previous housing land supply and delivery, a brief assessment of the progress of allocations, or Strategic Development Locations (SDLs), from the existing Plan for Stafford Borough (2011-2031) has been undertaken.

	North of Stafford	West of Stafford	East of Stafford	Stone
Allocation Total	3,100	2,200	653	500
Planning Permission (as of 2020/21)	2,798	1,475	623	479
Completions (by 2020/21)	477	373	623	264
Housing Trajectory expectations (by 2020/21)	635	951	653	240
Number of Affordable (by 2020/21)	10	98	192	83

Source: Previous Local Plan allocations data sourced from Stafford Borough Authority Monitoring Report (2021)

2.3.2 From this assessment, it can be demonstrated that both the North of Stafford and West of Stafford strategic site allocations have not met the expectations set out within the housing trajectory. The completion rate for the North of Stafford Strategic Site falls below the housing trajectory by 188 dwellings, and the completion rate for the West of Stafford Strategic Site is significantly below the housing trajectory by 578 dwellings. Whilst these completion rates fall significantly behind the timescales for 2020/21, this does not represent the full housing trajectory for the Plan period. As such, there is potential for these strategic site allocations to be delivered in line with the housing trajectory targets for completion, however there is a likelihood for delays.

2.3.3 Delivery of the East of Stafford strategic site allocation falls slightly behind the housing trajectory, which had envisaged completion by the monitoring year 2018/19. The completions by the end of the monitoring year 2020/21 are largely in line with the trajectory, although have fallen slightly behind by 30 dwellings. Whilst behind timescales, it is envisaged that this site will be completed in the forthcoming years.

2.3.4 At the end of the 2020/21 monitoring year, a total of 264 dwellings have been completed at the Stone strategic site allocation. The rate of completion at Stone exceeds the target set out in the Plan for Stafford Borough housing trajectory of by 24 completed dwellings by 2020/21 and as a result, completions on this strategic site are slightly ahead of schedule.

2.4 Completions for the 2021/22 Monitoring Year

2.4.1 In order to undertake a thorough review of the emerging Plan Housing Trajectory and Supply, the most recent Housing Monitor Land for New Homes report from Stafford Borough Council has also been considered. This report identifies current completion rates and delivery of new dwellings by site type, location and origin across the Borough.

2.4.2 During the monitoring year 2021/22, 98% of residential completions have been in the urban areas of Stafford, Stone and the Key Service Villages, with 65% occurring in Stafford town and 26% in Stone. This indicates a shift away from the settlement hierarchy targets set out in the adopted Plan for Stafford Borough, with completions in Stone 16% higher than the 10% target for the Plan period, and completions for Stafford 5% below target. Additionally, this demonstrates a decrease in rural completions to just 2% of the total completions, which is considerably below the 8% expectation identified in adopted policy.

2.4.3 With regards to the origin of completion, it is important to distinguish the percentage of completions occurring on either unallocated (Windfall) sites or allocated sites (Strategic Development Locations). In the monitoring year 2021/22, unallocated (Windfall) sites accounted for 44% of total completions. Due to allocated sites, which are the Strategic Development Locations (SDLs) now having planning permission and delivering housing completions, there is an increasing trend towards a greater percentage of completions on allocated sites. As such, 56% of completions have been delivered on allocated sites.

2.4.4 Given that the adopted Plan for Stafford Borough places emphasis on the need for sustainable development and the effective use of brownfield land, a review of the completions by site type for the monitoring year 2021/22 has been undertaken. 27% of development is recorded as having taken place on Previously Developed Land (PDL), whereas 73% of development has occurred on Greenfield land in the past year. This demonstrates a significant decrease in development on brownfield land since the start of the Plan period.

2.4.5 Further, the Housing Land Monitor there are 5,626 outstanding net commitments for the Borough as at 31 March 2022, of which 76% originate from allocated sites.

3 HOUSING REQUIREMENT

3.1 Determining an Appropriate Housing Requirement

3.1.1 The National Planning Policy Framework, at Paragraph 35, identifies the tests of soundness for plan-making, establishing that Plans are 'sound' if they are:

- Positively prepared;
- Justified;
- Effective; and
- Consistent with national policy.

3.1.2 In respect of the housing requirement, the first test requires that Plans should, 'as a minimum' seek to meet the area's objectively assessed needs, and be informed by agreements with other authorities so that unmet needs from neighbouring areas are accommodated where practical to do so and consistent with achieving sustainable development. It is therefore important that as the Council progresses the preparation of the emerging Local Plan, it is based upon a sound and robust housing requirement. This should take into consideration both the objectively assessed need of the Borough itself, but also factors such as unmet needs from other authorities

3.1.3 The starting point in calculating the housing requirement, should be the Government's standard methodology. However, the Government has confirmed that the figure derived from this is intended to be a minimum figure, and a starting point, rather than a mandatory target (MHCLG Technical Consultation on Updates to National Planning Policy and Guidance, 2018). The 2020 Housing and Economic Development Needs Assessment considers whether there is justification for uplifting the standard method housing figure, based on a number of factors. This includes factors such as demographic needs, economic growth, unmet housing needs, and affordable housing requirements.

3.1.4 The EHDNA identified the need to consider the extent to which the standard method housing requirement is consistent with the economic success of Stafford and the wider area. It provides that this would support proposals for a higher housing requirement figure in the emerging Local Plan to ensure that the Borough can accommodate a sufficient, economically active, workforce to meet needs arising from projected economic growth; particularly when taking into consideration the planned strategic economic growth as part of the Garden Community and Station Gateway proposals. The NPPF at Paragraph 81 requires that policies should '*seek to address potential barriers to investment, such as inadequate infrastructure, services or housing, or a poor environment*', confirming the link between economic growth and housing needs. Given the economic aspirations of the emerging Plan to create a 'prosperous borough' with three of the emerging Plan objectives referencing economic growth and jobs, this illustrates the importance of economic-led growth.

3.1.5 With regards to unmet housing needs from neighbouring authorities, the emerging Plan and accompanying evidence base does not provide much information as to how the Council is intending to address this. The Housing and Employment Land Requirement topic paper, within Section 1, appears to discount the need to pursue higher growth scenarios as there is no coordinated approach with neighbouring housing market areas. Therefore, this would require

significant increases in net migration from neighbouring HMAs, which would be inconsistent and potentially incompatible with assumptions underlying strategies for housing and growth in those neighbouring housing market areas. Whilst this may be the case, it is widely accepted that in the case of Birmingham and the Black Country authorities, there is a significant shortfall in housing land when compared to the full housing requirements going forward. A request for Stafford to accommodate 1,500-2,000 dwellings to contribute to unmet needs from the Black Country is noted, and has been taken into consideration in setting the emerging Plan housing requirement, however there is no reference to the Birmingham unmet need that has recently been formally published, or consideration of the implications of the withdrawal of the Black Country Plan. The EHDNA confirms that whilst the Borough can be considered to represent a standalone housing market area and travel to work area, there is some overlap in TTWA with Wolverhampton. As such, there may be some specific requirement to address this relationship within the emerging Plan, particularly when recognising the high level of housing need arising in Wolverhampton and the urban uplift applied to the authority as part of the standard method. As the emerging Plan progresses to the next stage, it is therefore considered essential that Stafford Borough Council engages with other authorities, including the Birmingham and Black Country Councils, to ensure that any requirement for unmet needs arising from these authority areas is factored into the strategy for Stafford Borough.

3.1.6 The EHDNA identifies an affordable housing need of between 252 and 389 dwellings per annum, which represents a substantial figure. Whilst the housing requirement topic paper identifies a number of factors that mean that these figures may be over-estimating the level of need, the Council should recognise the importance of boosting affordable housing delivery through the emerging Plan. The EHDNA identifies that affordability ratios in the Borough have worsened in recent years, with lower quartile affordability ratios worse than median ratios, indicating that those on lower incomes may struggle to afford even lower priced properties. In respect of previous delivery of affordable housing, despite some years where delivery has been strong and over the target, generally it has been less than the target with on average 167 affordable dwellings delivered each year since 2011/12 as evidenced in the 2021 Authority Monitoring Report. Whilst it is recognised that meeting the affordable housing need in full is unlikely to be feasible, taking into consideration previous under-delivery of affordable housing and the scale of affordable housing needs identified in the latest evidence, uplifting the housing requirement to increase affordable housing delivery would appear to be justified.

3.2 The emerging Plan Housing Requirement

3.2.1 The Council has determined that it is appropriate to apply an uplift to the standard method figure of 408 dwellings per annum, with the Plan based on a housing requirement of 535 dpa. This has been chosen as it enables the delivery of the Borough's own housing needs of 435 dpa (8,700 during the period 2020-2040) as well as the contribution towards unmet needs from the region of 2,000 dwellings. It is considered that whilst this approach could be supported, there is potentially a need for the emerging Plan to be promoting higher levels of growth that would need to be supported by further increases to the housing requirement. This relates specifically to the need to support the aspirations for economic growth; the potential to accommodate unmet housing needs from the wider Birmingham and Black Country Housing Market Area; as well as the Borough's own needs in respect of affordable housing. It is considered that the housing requirement as currently proposed is not sufficient to address these matters, and as the Plan progresses to the next stage the Council should give further consideration to what would be an

appropriate housing requirement. It is important that this decision is supported by further evidence of discussions with neighbouring authorities, and ensuring that the approach to housing through the Plan will support the approach to economic growth and jobs that is being advanced. This is critical in order to ensure that the Plan can be capable of being found sound through the examination process and meets the requirements of the Duty to Co-Operate.

3.2.2 It should also be recognised that the housing need figure generated by the standard method will change over time, as the inputs are variable. The Council should recognise this, and ensure that as the Plan progresses the standard method calculation is checked and any adjustments required to the housing requirement are made as necessary. Once the Plan has been submitted for examination, the PPG confirms that the Council can rely on the figure at that stage for 2 years, which should be sufficient for the duration of the examination. However, Local Plan examinations can become protracted where there is a need to provide further evidence or where there is a requirement for multiple rounds of hearings, for example. The housing requirement should therefore continue to be monitored during the examination process, in recognition of the potential need to modify the housing requirement to ensure that the Plan is proposing sufficient housing to meet the Borough (and neighbouring authorities) needs for the entirety of the plan period.

4 HOUSING DELIVERY ASSUMPTIONS

4.1 Introduction

4.1.1 The emerging Plan housing trajectory is reliant on assumptions relating to housing delivery, including estimations for lead in times and build out rates. Whilst an initial review indicates that the Council has adopted an evidence-based approach, a detailed review has been undertaken to consider whether the assumptions are realistic taking into consideration past performance and other available evidence.

4.1.2 This section of the report accordingly provides a detailed assessment of the Council's assumptions for housing delivery across the emerging Local Plan, through a review of evidence provided by the Council, and other evidence. This information is presented in the Lead in Times and Build Out Rates Assumptions topic paper, which has been published alongside the Preferred Options draft of the Plan, and details the evidence the Council has had regard to when making its assumptions on these matters. This assessment will accordingly focus primarily on lead in times and build out rates, as well as briefly give regard to delivery of windfall sites and care accommodation. As such, it will consider whether the assumptions made by the Council are justified, or whether this assessment has highlighted evidence that the housing delivery assumptions should be altered.

4.1.3 A key factor to be considered as part of this are the timescales for the adoption of the emerging Local Plan. The Council has provided a timetable in the introductory section of the Preferred Options draft, which considers each stage of the process. This was also presented in the previous draft of the Plan. When comparing the timescales presented at each stage, it is apparent that the Council's expectations have not been met so far, and therefore some caution should be given when considering the timescales going forward.

Stage	March 2020 Issues & Options	October 2022 Preferred Options
Commencement	July 2017	July 2017
Scoping the Issues	July 2018	July 2018
Issues & Options	March 2020	March 2020
Preferred Options	January 2021	October 2022
Publication	June 2021	July 2023
Submission	December 2021	November 2023
Examination	March 2022	February 2024
Adoption	October 2022	October 2024

Source: Local Plan timescales from Stafford Borough March 2020 Issues & Options Report and October 2022 Preferred Options draft

4.1.4 It is apparent when comparing the two timetables that timescales have slipped since the publication of the Issues & Options draft in 2020. This is not unexpected, particularly in light of wider events during 2020 and 2021, however it demonstrates that timescales are liable to change. Furthermore, the Council has not included much contingency time within the timetable, and it is considered particularly optimistic to expect that a Plan can be submitted for examination and adopted within one calendar year. The Planning Inspectorate guidance indicates that on average examinations take *'around a year, to a year and a half'*. It is therefore suggested that in the interests of robustness, the Council should not expect that the Plan is adopted until the spring/summer of 2025 (i.e., during the monitoring year 2025/26). Even this may be an optimistic view, should the consultation on the publication version be delayed, or should there be delays associated with requirements to produce additional evidence or justification once the Plan has been submitted.

4.2 Lead-in Times

4.2.1 To establish the lead-in time assumptions for Stafford Borough, historic monitoring data of housing completions between the period 1 April 2011 to 31 March 2022 published by the Council has been reviewed and analysed, as presented in the recently published Lead In Times Topic Paper. The lead-in time assumptions of Lichfields' Start to Finish report (2020) have also been considered as these offer a 'sense check' when establishing the assumptions for Stafford Borough.

Stafford Borough's Historic Lead-in Times

4.2.2 The historic lead-in times for Stafford Borough were presented in the Topic Paper. These have been calculated by working out the difference in terms of years from the date the application was validated, to when the site was recorded as having commenced the development. This data is presented in the table below.

Table 4.1 Stafford Borough Historic Lead in Times

Site size (dwellings)	Number of sites	Mean lead-in times (years)	Median lead-in times (years)	Min value (years)	Max value (years)
5 to 9	48	2.1	1.5	0.2	8.4
10 to 49	60	2.2	1.3	0.1	11.7
50 to 99	13	3	2.1	0.5	9
100 to 499	15	3.7	3.6	1.2	8

Source: The mean, median, minimum and maximum lead-in times for each site size group based on the historic completions data. Table 2 of the Stafford Borough Lead in and Built Rate Assumptions Topic Paper (2022)

4.2.3 The table shows that the sites which have 5 to 9 dwellings, and 10 to 49 dwellings have a similar mean lead-in time between 2.1 and 2.2 years, which indicates that applications for smaller sites are generally validated faster than larger sites. As expected, the lead-in time increases as the site size increases. This is likely as a result of some of the larger sites having an outline application submitted first. It can also be seen that the mean and median values recorded do not vary significantly, which suggests the data has a fairly even spread, although there is a substantial

difference between the minimum and maximum values recorded in respect of all sizes of developments.

Lichfields' Start to Finish Report (2020)

4.2.4 Within the industry data report provided by Lichfields, a range of sizes of sites were assessed to determine the average lead-in times for differing scales of development. A summary of this data is outlined in Table 4.2 below.

Table 4.2 Lichfields' Start to Finish Average Lead In Rates

Site size (dwellings)	Average timeframe from validation to completion of first dwelling (years)
50 to 99	3.3
100 to 499	4.0
500 to 999	5.0
1,000 to 1,499	6.9
1,500 to 1,999	7.0
2,000+	8.4

Source: Lichfields' Average Lead in rates. Data from Lichfields Start to Finish Report (February 2020)

4.2.5 Lichfields' Start to Finish report found that the lead in time was on average 3.3 years for sites of between 50 and 99 dwellings, and 4.0 years for sites consisting of 100 to 499 dwellings. This is comparable to the lead-in times from Stafford Borough's historic completions data for applications with a lead-in time of 3.7 years for sites of 50 to 99 dwellings, and 4.1 years for sites of 100 to 499 dwellings.

Stafford Borough's Lead-in Times Assumptions

4.2.6 Using Stafford Borough's historic lead-in times data and industry data from the Lichfields' Start to Finish Report (2020), Stafford Borough's lead-in times assumptions were calculated, based on the time from the application validation date to the start date of the development. The proposed lead-in time assumptions for Stafford Borough are outlined in Table 4.3 below.

Table 4.3 Stafford Borough Lead in Times Assumptions

Site size (dwellings)	Application type	Lead-in time (years)
5 to 9	No outline application	1
5 to 9	With outline application	2
10 to 49	No outline application	1
10 to 49	With outline application	2
50 to 99	No outline application	1
50 to 99	With outline application	2.5
100 to 499	No outline application	2
100 to 499	With outline application	4
500+	With outline application	4.5

Source: Stafford Borough's proposed lead in time assumptions. Table 7 of the Stafford Borough Lead in and Built Rate Assumptions Topic Paper (2022)

4.2.7 It is necessary to consider how the proposed lead-in time assumptions for Stafford Borough compare to the actual recorded historic completions and industry data provided in the Lichfields' Start to Finish report (2020). This will enable an assessment of whether the lead-in time assumptions are sound and justified, or whether they can be deemed fundamentally unrealistic and require adjustment.

4.2.8 It should be noted that Stafford Borough's definition of lead-in times differs from the defined lead-in time in the Lichfields' Start to Finish report (2020), which defines the lead-in time as the time taken from the application validation date to when the first dwelling is completed on site. This difference results from a lack of available data for completion dates for dwellings within Stafford Borough, and as such the start date has been used instead of the first completion date.

4.2.9 Stafford Borough's calculation from the date of validation of the application to the start date of the development can be critiqued, as it fails to consider the period of time from the allocation of the site or adoption of the plan to submitting a valid application. For larger site allocations, such as Strategic Development Locations, this could be an elongated process and subject to delays. The Council has also failed to include the time taken from starting on site to the first completion, which may represent a short period of time for small developments where completions can be realised quickly, however may be a significant period on larger sites where infrastructure delivery is required first. On this basis, it can be considered failing to acknowledge this time period in the calculations of lead-in times may indicate the housing delivery assumptions to be too optimistic, in that they fail to account for potential delays to implementation or prolonged periods between site allocation and validation of an application.

4.2.10 When the actual recorded historic lead-in times for Stafford Borough are compared to the proposed lead-in time assumptions, there is little difference, particularly for sites which have 5 to 9 dwellings and 10 to 49 dwellings. For larger sites, there is a slight discrepancy between historic mean lead-in times and proposed lead-in assumptions. For example, this is evident on sites with between 50 and 99 dwellings, where the historic mean lead-in time of 3 years is higher than the proposed lead-in time assumption of 2.5 years for sites with an outline application, and 1 year for sites without. This demonstrates that the Council may have been optimistic in their assumptions for lead-in times compared to historic records.

4.2.11 The Lichfields' report found that for larger sites of 500+ dwellings, it takes on average between 5 to 8.4 years from the validation of an outline application to the delivery of the first dwelling on site. This figure differs from the proposed lead-in time assumptions made by Stafford Borough, which anticipate that all sites with 500+ dwellings would have a lead-in time of 4.5 years. Either a separate category should be identified for sites over 1,000 dwellings, to reflect the c.7-8 years lead in time anticipated for such sites, or the Council should increase the lead in time applied to such sites to at least 6-7 years.

4.2.12 As such, it can be argued that the lead-in time assumptions made by Stafford Borough are more optimistic than the historic lead-in times and the averages set out in the Lichfields' Start to Finish Report. Our conclusions on lead in times have been presented in Table 4.4 below, which also provides a comparison between the Council's assumptions, and the data presented in Lichfields' report.

Table 4.4 Proposed Lead-in Times for Stafford Borough

Site size (dwellings)	Stafford historic Lead in Times (years)	Stafford Borough's Lead in Times assumptions (years)	Lichfields' Average Lead in Times (years)	Claremont's proposed Lead in Times (years)
5 to 9	2.1	2	-	2
10 to 49	2.2	2	-	2
50 to 99	3	2.5	3.3	3
100 to 499	3.7	4	4.0	4
500 to 999	-	4.5	5.0	5
1,000 to 1,499	-	4.5	6.9	6.9
1,500 to 1,999	-	4.5	7.0	7
2,000+	-	4.5	8.4	8.4

Source: Claremont Planning (2022)

4.2.13 Claremont have proposed these lead-in times to reflect both industry data and historic data for Stafford Borough. A lead-in time of 2 years has been proposed for both dwelling sizes between 5 to 9 dwellings and 10 to 49 dwellings, as this accurately reflects the historic lead-in times for the Borough, and is not considered optimistic. For sites sized between 50 and 99 dwellings, a lead in time of 3 years is proposed. Whilst this is greater than the assumptions proposed by Stafford Borough, this lead-in time has been achieved historically, and therefore is realistically achievable in the emerging housing trajectory. For sites sized between 100 to 499 dwellings, a 4 year lead in time is proposed, to align with industry data. As there is no available historic data for sites greater than 500 dwellings, Claremont's lead in assumptions reflect the industry data provided within the Lichfields' report.

4.2.14 It should be recognised that these figures are averages, and the actual lead in times achieved on sites will vary. Factors that will affect this will include whether the site is located adjacent to existing development or remote from settlements, whether the site is greenfield or brownfield, or the type of infrastructure required to be delivered on site prior to the start of residential build out. It will also depend on whether outline or full planning applications are pursued, and at what stage housebuilders get involved in respect of the planning process to avoid the need for applications to vary consents. There will also be cases where sites are proposed adjacent to existing development, where infrastructure such as roads or utilities has already been implemented previously with the capacity to deliver the further development, without requiring further upgrades. This clearly demonstrates that whilst these average figures can be applied for the purposes of calculating the housing trajectory and supply, it may be that shorter or longer lead in times are achieved and this will have implications for the housing trajectory for the emerging Plan.

4.3 Build Out Rates

4.3.1 As with the lead-in time assumptions, it is necessary to consider how the proposed build out rate assumptions for Stafford Borough presented in the topic paper, compare to the actual recorded historic completions and industry data provided in the Lichfields' Start to Finish report (2020). This will enable an assessment of whether the build out rare assumptions are sound and justified, or whether they can be considered too optimistic and require adjustment.

Stafford Borough's Historic Build Out Rates

4.3.2 The table below sets out the historic build out rates for each site size group across Stafford Borough, rounded to the nearest whole number. These rates have been calculated by establishing the build rate per site, which is the number of units delivered divided by the number of years taken for the site to built out. This provides the dwellings per annum (dpa) figure.

Table 4.4 Historic Build Out Rates in Stafford Borough

Site size (dwellings)	Number of sites	Mean build rate (dpa)	Median build rate (dpa)	Min value (dpa)	Max value (dpa)
5 to 9	48	5	4	1	15
10 to 49	60	13	12	2	48
50 to 99	13	27	28	15	37
100 to 499	15	38	36	17	86

Source: The mean, median, minimum and maximum build rate for each site size group based on the historic completions data. Table 8 of the Stafford Borough Lead in and Built Rate Assumptions Topic Paper (2022)

4.3.3 As expected, the historic build out rates increase as the site size increases, but it should also be noted that the minimum value and maximum value between each group overlap. This suggests a degree of variation in terms of how quickly the sites are built out and it cannot be taken as a guarantee that because a site is smaller the build rate will be lower than a larger site. Similarly, it is worth noting that some of the smaller sites are likely to have included conversions or change of uses from barns to houses or offices to apartments for example. It is reasonable to anticipate that office conversions will take less time overall to build out per unit when compared to developing a greenfield site that will require infrastructure such as roads and water connections that will increase the build out time and the ability to complete as many units in each year. As a result, this is likely to have affected the mean and median build rates.

4.3.4 Additionally, the site allocations for Stafford Borough, particularly the Stafford SDLs, have been slow in coming forward and delivery challenges have negatively affected progression when compared to the adopted Plan's housing trajectory. Delivery and completions of these sites are expected to improve in the coming years, and as such higher build rates are projected to be delivered in the future. No current applications for large sites with 500+ dwellings have been completed, so this site size has not been included within the historic build out rate data presented by the Council.

Lichfields' Start to Finish Report (2020)

4.3.5 The Start to Finish report, prepared by Lichfields, sets out the mean and median annual delivery (dwellings per annum) across different size groups to provide the average rate at which new homes are build on site. This industry data is outlined in the table below.

Table 4.5 Lichfields' Start to Finish Average Build Out Rates

Site size (dwellings)	Mean annual delivery (dwellings per annum)	Median housing delivery (dwellings per annum)
50 to 99	22	27
100 to 499	55	54
500 to 999	68	73

1,000 to 1,499	107	88
1,500 to 1,999	120	104
2000+	160	137

Source: Lichfields' Average Build Out rates. Data from Lichfields Start to Finish Report (February 2020)

4.3.6 The report demonstrates that larger sites can deliver on average more dwellings per year than smaller sites. Further, larger sites which are build out over a period of 5 years or more are likely to coincide with a period of economic slowdown, which is likely to affect the average build out rate, as this is more likely to fluctuate from year to year. Importantly, the report demonstrates that even on the largest sites, where 2,000 dwellings or more are proposed, the average build out rate was 160dpa, illustrating an extended build out period can typically be expected for these substantial sites.

Stafford Borough's proposed build out rate assumptions

4.3.7 The build out rate assumptions proposed by Stafford Borough are based on the calculated mean and median values from the historic completions data, neighbouring authority assumptions and industry examples from the Lichfields' Start to Finish report (2020), for each of the dwelling size groups. The proposed build out rate assumptions for Stafford Borough are also presented in the Topic Paper, and are reproduced in the table below.

Table 4.6 Stafford Proposed Build Out Rates

Site size (dwellings)	Annual build rate (dwellings per annum)
5 to 9	5
10 to 49	20
50 to 99	30
100 to 499	50
500 to 999	70
1,000 to 1,499	110
1,500 to 1,999	120
2000+	160

Source: Stafford Borough's proposed build rate assumptions. Table 12 of the Stafford Borough Lead in and Built Rate Assumptions Topic Paper (2022)

4.3.8 Within the Lichfields' Report, a mean build rate (dpa) of 22 was recorded for sites with a size of 50 to 99 dwellings, which is comparable although lower than Stafford Borough's historic calculated build rate of 27, and somewhat comparable to yet lower than Stafford Borough's proposed build rate assumption of 30. Additionally, Stafford Borough's proposed build rate assumption for 100 to 499 dwelling sites is 50 (not including the in-progress SDL applications), compared to 55 in the Lichfields' report, which can be deemed a minimal difference. Any differences could have occurred as a result of differences in the time period used for calculating the build rate. As such, the proposed build out rate assumptions for Stafford Borough appear consistent with the industry data set out in the Lichfields' Start to Finish report, and it can be considered that these assumptions are justified.

4.3.9 When the historic build out rates for Stafford Borough are compared to the proposed build out rate assumptions, there is considerable accuracy for sites with 5 to 9 dwellings, as the proposed build out rate of 5 dwellings per annum matches the historic mean build rate. As the size of the site increases, the proposed build out rate grows less comparable to historic build out rate records. This is likely due to the smaller number of completed sites of larger sizes, meaning there is less data to base the historic calculations on. However, the proposed build out rates for larger sites appears to be optimistic, particularly for sites with 100 to 499 dwellings where there is a dpa difference of more than 30% between the historic build out rates and proposed assumptions.

4.3.10 As previously highlighted, the Council's topic paper confirms that there is no historic record for sites which are larger than 500 dwellings, due to no site of this size having yet been completed. As such, the proposed build out rate assumption of 70 dwellings per annum for sites larger than 500 dwellings may be too optimistic, on the basis that no sites of this size have been completed since the start of the Plan period in 2011 so there is no record demonstrating that this level of delivery is achievable. Furthermore, the maximum delivery achieved on sites up to 499 dwellings has been 86 dwellings per annum, and so achieving an average rate of 70 dpa consistently on all sites over 500 dwellings is considered optimistic with no evidence that this could be sustained. This equally applies to sites over 1,000 dwellings, whereby the Council's proposed build out rates reflect the evidence presented in the Lichfields' report, but has not been backed up by evidence from the Borough itself.

4.3.11 As such, it can be argued that the build out assumptions made by Stafford Borough are more optimistic than the historic build out rate and the averages set out in the Lichfields' Start to Finish Report. However, there is not sufficient data available for the Borough to identify what build out rates are likely to be achieved by the emerging Plan, and in respect of smaller sites, the Council has demonstrated near to these rates historically and therefore it is reasonable to assume that such rates can be achieved. We have therefore applied the Council's proposed Build Out Rates for the purposes of this assessment. Prior to progressing the Plan and submitting it for examination, the Council should seek further evidence to justify the assumptions made and therefore support the housing trajectory. Our conclusions on build out rates have been presented in Table 4.7 below, which also provides a comparison between the Council's assumptions, and the data presented in Lichfields' report. It should however be recognised that these are average build out rates, and higher or lower rates may be achieved in reality. This will vary depending on how many housebuilder outlets are on site at any time, whether phases can be delivered simultaneously or are required to be built out consecutively due to infrastructure implementation requirements for example.

Table 4.7 Comparison and Proposed Build out Rates for Stafford Borough

Site size (dwellings)	Stafford's historic Build Out Rates (dwellings per annum)	Stafford Borough's Build Out Rate assumptions (dwellings per annum)	Lichfields' Average Build Out Rate (dwellings per annum)	Claremont's proposed Build Out Rate assumptions (dwellings per annum)
5 to 9	5	5	-	5
10 to 49	13	20	-	20
50 to 99	27	30	22	30
100 to 499	38	50	55	50
500 to 999	-	70	68	70
1,000 to 1,499	-	110	107	110
1,500 to 1,999	-	120	120	120
2,000+	-	160	160	160

Source: Claremont Planning (2022)

4.4 Windfalls

4.4.1 The projected housing trajectory for the emerging Local Plan predicts windfall sites to contribute 50 dwellings per annum from 2025/26, year 6 of the Plan period. The Lead-in and Build Rate Assumptions Paper states that this rate of 50 windfall dwellings per annum has been calculated in accordance with historic data, but there is no reference to the historic windfall records in the 5 Year Housing Land Supply Statement or Authority Monitoring Report 2020/21. The Land for New Homes document does identify that for the monitoring year 2021/22, 44% of completions were on windfall or unallocated sites, but it is not clear what proportion of these can actually be classified as windfalls, or whether some of these dwellings were completed on sites that had been identified through the plan process, but not chosen to be allocated. Paragraph 71 of the NPPF states that: "*Where an allowance is to be made for windfall sites as part of anticipated supply, there should be compelling evidence that they will provide a reliable source of supply. Any allowance should be realistic having regard to the strategic housing land availability assessment, historic windfall delivery rates and expected future trends."* As such, it is considered necessary to review the Council's housing trajectory for windfall sites, to assess whether the prediction to contribute 50 dwellings per annum is justifiable or realistic.

4.4.2 The timescales for adoption of the emerging Local Plan have already been delayed compared to the Council's expectations set out in the Issues & Options draft, and as such our assumption is that the new Local Plan will not be adopted until spring/summer 2025 at the earliest. On the basis that the Local Plan is formally adopted in 2025, the trajectory as currently proposed identifies that there would be an immediate reliance on windfall sites. However, Paragraph 68 of the NPPF states that policies should identify a supply of specific, deliverable sites for years one to five of the plan period; and specific, developable sites or broad locations for growth for years 6-10 and 11-15 of the plan. By virtue of this, it is arguable that windfalls should not be relied on for the first five years following adoption of the plan, as the housing requirement should be met during these years through identified specific deliverable sites. As such, the windfall allowance should only be included for the subsequent later years of the housing trajectory for the Plan, commencing at least five years after the adoption of the plan.

4.4.3 The Planning Advice Service Good Plan Making Guide establishes that: *"Windfall sites' are sites that have not been identified in the plan preparation process and hence unexpectedly become available. They are unforeseen and unplanned-for sites, so a site identified in a SHLAA cannot be a 'windfall site' even if it has not been chosen as one of the allocated sites."* This further reiterates that windfall sites should not be included within the first five years of the housing trajectory for the Plan period. It is unlikely that sites will come forward at the start of the Plan period that were not assessed through the plan making process, and as such there should not be a reliance on windfall sites within these first five years, where the focus should be on delivering allocated sites.

4.4.4 The delivery of any windfall sites with the first five years following adoption of the Plan should be considered to be a bonus and would assist with the need to boost housing supply and ensure that a sufficient amount and variety of land can come forward as needed, as set out in Paragraph 60 of the NPPF. However, Paragraph 15 of the NPPF requires for Council's planning systems to be genuinely plan-led. It can be argued that reliance on speculative sites to come forward as windfalls in the early stages of the Local Plan does not constitute a plan-led system, and the level of windfalls currently proposed to be included in the trajectory cannot be considered to be justified and should be reconsidered. It is therefore suggested that the contribution from windfalls in the trajectory should be reduced to 500 dwellings, deducting 250 dwellings from the housing supply.

4.5 Care Accommodation

4.5.1 The Council's 5 Year Land Supply Statement 2021 states that:

> *"The Council considers it prudent to differentiate between the different types of accommodation classed as C2. Where all the facilities for each unit (dwelling) are behind a separate door, these units will be counted in full towards the supply. However, where a development is a "bedroomed" development, such as a care home, the number of bedrooms provided cannot simply be used as a proxy for the number of dwellings that will be released to the market, thus contributing to a net increase in supply. In accordance with the PPG (paragraph 43) the Council has applied a ratio of 1.8 adults per household to each C2 bedroomed establishment, meaning that for each 1.8 bedrooms in a care home 1 dwelling is released into the market."*

4.5.2 The Council's consideration of care accommodation is limited to bedroomed care homes, and as such fails to accommodate other specialist care accommodation such as sheltered housing. In the example of all forms of specialist and age restricted housing, it may not necessarily be the case that a dwelling is freed up once a person moves into sheltered housing, particularly if prior to this they had been living with family or a partner that does not require specialist accommodation. As such, the delivery of sheltered housing and other specialist care accommodation will not always release dwellings into the market, and therefore the ratio of 1.8 adults per household to each C2 accommodation should be extended to incorporate the full scope of specialist care accommodation.

4.5.3 This should be recognised in the housing trajectory, particularly given the proposed requirement for the larger allocations to deliver specialist housing for older people on site. This will have implications for the number of housing units contributing to the trajectory from each site, where specialist dwellings should not be considered to represent a full dwelling each in the calculations.

5 SITE SPECIFIC REVIEW

5.1 Introduction

5.1.1 In order to assess whether the emerging Local Plan makes appropriate provision for housing this section of the report will consider in detail a number of the proposed allocations. This will focus upon the large allocations identified in Table 1 of the emerging Local Plan: Land North of Stafford; Land West of Stafford; Meecebrook Garden Community; and Stafford Station Gateway. Additionally, some of the larger allocations included under Policy 12 of the emerging Plan will be considered.

5.1.2 In respect of each proposed allocation, this section of the report will consider the background and context of each site; the assumptions made in the emerging Plan; whether these are reasonable having regard to the conclusions reached in the previous chapter on lead in times and build out rates; and finally reaching a view on the contribution that each site should be expected to make in the emerging Plan.

5.2 Land North of Stafford

5.2.1 This allocation was allocated in adopted Local Plan under Policy Stafford 2 – North of Stafford. The policy envisaged that approximately 3,100 homes, alongside at least 36ha of employment land will be delivered by 2031. The trajectory established that first completions were anticipated on the site by 2015/16 (30 dwellings), with the completion rate increasing to 220 dpa by 2020/21, a rate which was anticipated to be delivered consistently until 2029/30. The full trajectory for this site, as presented in Appendix F of the adopted Local Plan is reproduced in Table 5.1 below.

Table 5.1 – North of Stafford SDL adopted Local Plan Trajectory

2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
				30	40	65	120	160	220	220	220	220	220	220	220	220	220	220	105

Source: North of Stafford SDL housing trajectory in adopted Plan for Stafford Borough (2014)

5.2.2 The Plan for Stafford Borough was adopted in 2014, meaning that the first completions on the site were expected within the first two years following adoption. The completion rates forecast for this site would have been established on the basis of evidence presented at the Local Plan examination, which confirms the deliverability of the site.

5.2.3 The Council's Housing Land Supply Statement 2021 provides a detailed trajectory of actual completions on this site across the Plan period. This confirms that the first completions on the North of Stafford SDL were achieved in 2014/15, delivering 44 dwellings for that monitoring year. It is necessary to compare the actual completions against the above Local Plan trajectory, which is presented in Table 5.2 below.

Table 5.2 North of Stafford Comparison between Local Plan Trajectory and Actual Completions from HLS Statement

Source: Claremont Planning (2022)

Monitoring Year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
LP					30	40	65	120	160	220
Cumulative LP					30	70	135	255	415	635
HLS				44	56	72	43	54	130	78
Cumulative HLS				44	100	172	215	269	399	477
Difference between LP & HLS				+44	+70	+102	+80	+14	-16	-158
Monitoring Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
LP	220	220	220	220	220	220	220	220	220	105
Cumulative LP	855	1075	1295	1515	1735	1955	2175	2395	2615	2720
HLS	-	-	-	-	-	-	-	-	-	
Difference between LP & HLS	-	-	-	-	-	-	-	-	-	-

5.2.4 The above table demonstrates that actual completions on the North of Stafford site have not reflected the expectations set out in the adopted Local Plan. The first completions on site were delivered in advance of the timescales set out in the housing trajectory, and within one monitoring year following the adoption of the Plan, which meant that delivery was initially above the target level. However, the completion rate fell significantly below the forecast in the monitoring year 2017/18, and no completion rates in subsequent years have met the trajectory targets, or been maintained at consistent levels. However, 477 dwellings have already been completed on this allocated site up to and including the monitoring year 2020/21, representing an average delivery of 68 dwellings per annum since 2014/15. This confirms that the site is deliverable, and will continue to deliver dwellings in the emerging Local Plan's Housing Land Supply.

5.2.5 Considering that delivery of the North of Stafford strategic site allocation will continue into the emerging Local Plan's Housing Land Supply, a review of the emerging Local Plan expectations for North of Stafford has been undertaken. Policy 9 sets out the expectations for the North of Stafford site allocation, confirming the expectation to deliver the remaining allocation of 2,700 new homes through a mix of housing types, tenures, sizes and styles, with a proportion of affordable

housing in line with Policy 23. Additionally, Policy 9 confirms the expectation that the allocation will deliver provision to meet the needs of an ageing population through extra care and specialist housing provision. The emerging Plan housing trajectory is provided in Appendix 6, which is reproduced in Table 5.3 below.

Table 5.3 – Emerging Local Plan Housing Trajectory for North of Stafford

2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
	83	95	159	219	219	219	211	155	120	155	155	155	155	120	120	120	120	120

Source: North of Stafford SDL housing trajectory in emerging Plan for Stafford Borough Preferred Options report (2022)

5.2.6 This trajectory demonstrates a continued high expectation with regards to on site delivery, expecting similar levels compared to the adopted Local Plan, where delivery rates were expected to peak at 220 dwellings per annum. Whilst a slight reduction is demonstrated in this trajectory, it still expects a peak of 219 dwellings per annum between 2025/26 and 2027/28, with more variation in other years than previously suggested. Considering that the completion rate has not exceeded 130 dwellings per annum since the adoption of the Plan for Stafford Borough, this emerging Local Plan Housing Trajectory does not appear to be supported by evidence.

5.2.7 From the available evidence in the Housing Land Supply Statement and housing monitor documents, the following can be deduced:

- Land North of Beaconside (13/18533/REM) – Reserved matters permission granted for 257 dwellings completed in 2019/20 according to housing monitor.
- Land North of Beaconside (14/20781/REM) – Reserved matters permission granted for 152 dwellings completed in 2021/22 according to housing monitor.
- Land North of Beaconside (14/21007/FUL) – Full planning permission granted for 66 dwellings completed in 2021/22 according to housing monitor.
- Land North of Beaconside (20/32039/REM) – Reserved matters permission granted for 700 dwellings. First completions anticipated to be 83 dwellings in 2022/2023, with an anticipation for completions to increase to 99 dwellings per annum between 2024/24 and 2027/28. The site is expected to be completed by 2029/30.
- Land North of Beaconside (18/28182/REM and 16/24595/OUT) – Reserved matters permission granted for 100 dwellings completed in 2021/22 according to housing monitor.
- Land North of Beaconside (16/25450/OUT) – Outline Planning permission granted for 2,000 dwellings. First completions expected for 60 dwellings in 2024/25. There is an expectation for 120 dwellings to be delivered by annum between 2025/26 and 2023/31. These delivery rates could be achieved in the forthcoming years should detailed consent be secured, but there remains uncertainty regarding the total number of dwellings on this allocation until detailed consent is granted.

5.2.8 Available evidence confirms that, as of November 2022, 3,275 dwellings have been consented on this allocation, which represents the whole total of the allocation. However, detailed consent has only been granted for 1,275 dwellings, which represents a proportion of less than half of the total. There are 2,000 units still without detailed planning permission, which will likely delay the delivery of remaining phases of this allocation.

5.2.9 In any event, it is considered that the build out rates that the Council has applied to this allocation in the emerging Plan are not realistic and do not reflect what is likely to be achievable. Claremont Planning has had regard to the considerations set out in Section 4 of this report when assessing this, as well as the actual delivery rates achieved on this site historically. Given that the site has not met the expected completion rates set out in the Housing Trajectory for the adopted Plan for Stafford, it is unlikely that the completion rates set out in the emerging Local Plan will be met without any delays. If the Council consider that it is likely that higher delivery rates can be achieved on this site, it is considered that this should be justified through provision of evidence demonstrating this.

5.2.10 Given that 477 dwellings have already been completed at this allocation up to and including the monitoring 2020/21, there are 2,798 dwellings remaining to be delivered. Assuming that 160 dwellings can be delivered at most each year in line with our conclusions on build out rates outlined in Table 4.7, this would require delivery to continue at this higher level, consistently for longer than the Council's emerging trajectory envisages. It is considered reasonable to expect that the whole allocation can be delivered in the emerging Plan period, although the contribution that the site will make in the early years following the adoption of the Plan is likely to be reduced, with greater numbers delivered in years 11-15 and 15-20 of the plan period. Should delivery not be sustained at 160 dwellings per year consistently, it is likely that the delivery of this allocation may extend beyond the emerging plan period.

Table 5.4 – Proposed Local Plan Housing Trajectory for North of Stafford

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
Emerging LP		83	95	159	219	219	219	211	155	120	155	155	155	155	120	120	120	120	120
Claremont		83	95	159	160	160	160	160	160	160	160	160	160	160	160	160	160	160	123
Difference		-	-	-	-59	-59	-59	-51	5	40	5	5	5	5	40	40	40	40	40

Source: Claremont Planning (2022)

5.3 Land West of Stafford

5.3.1 This allocation was similarly allocated in the adopted Local Plan, under Policy 3 – West of Stafford. The policy anticipated that approximately 2,200 new homes will be delivered by 2031. The trajectory established that first completions were anticipated on the site by 2014/15 (65 dwellings), with completions increasing to 150 dpa by 2017/18, a rate which was anticipated to be achieved consistently until 2027/28. The full trajectory for this site, as presented in Appendix F of the adopted Local Plan is reproduced in Table 5.5 below.

Table 5.5 – West of Stafford SDL adopted Local Plan Trajectory

2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
			65	141	145	150	150	150	150	150	150	150	150	150	150	150	125	75	

Source: West of Stafford SDL housing trajectory in adopted Plan for Stafford Borough (2014)

5.3.2 The Local Plan was adopted in 2014, and it is therefore apparent that completions on the site were expected within the first year following adoption. It is assumed that this would have been based on evidence presented to the Local Plan examination, confirming the deliverability of the site and justifying the completion rates forecast within the trajectory.

5.3.3 The Council's Housing Land Supply Statement provides a detailed trajectory of actual completions on this site. This confirms that the first completions on the West of Stafford SDL were not achieved until 2016/17, and at that point, only one phase was delivering, with completions at only 17 in that first year.

Table 5.6 West of Stafford Comparison between Local Plan Trajectory and Actual Completions from HLS Statement

Monitoring Year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
LP				65	141	145	150	150	150	150
Cumulative LP				65	206	351	501	651	801	951
HLS						17	109	96	78	73
Cumulative HLS						17	126	222	300	373
Difference between LP & HLS				-65	-206	-334	-375	-429	-501	-578
Monitoring Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
LP	150	150	150	150	150	150	150	125	75	

HLS	-	-	-	-	-	-	-	-	-	
Cumulative LP	1101	1251	1401	1551	1701	1851	2001	2126	2201	
Difference between LP & HLS										

Source: Claremont Planning (2022)

5.3.4 The table above demonstrates that actual completions on the West of Stafford site have not reflected the expectations set out in the adopted Local Plan. Whilst the first completions were still delivered within a relatively short period following the adoption of the Plan (within 2 monitoring years) it is apparent that this was at a much lower level than forecast, and completions in subsequent years have not reached the levels anticipated, or been maintained at consistent levels. However, 373 dwellings have already been completed on this allocated site up to and including in 2020/21, confirming that the site is deliverable and will play a part in the emerging Local Plan's Housing Land Supply.

5.3.5 With this in mind, a review of the emerging Local Plan expectations for West of Stafford has been undertaken. West Of Stafford is identified in Policy 10, confirming the expectation of the delivery of the remaining allocation of 1,729 homes to provide a mix of housing types, tenures, sizes and styles, as well as a proportion of affordable housing in accordance with Policy 23. Additionally, Policy 10 confirms the expectation that the allocation will deliver provision to meet the needs of an ageing population through extra care and specialist housing provision. The emerging Plan housing trajectory is provided in Appendix 6, which is reproduced in Table 5.7 below.

Table 5.7 – Emerging Local Plan Housing Trajectory for West of Stafford

2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
	162	118	150	150	250	250	250	202	150	47								

Source: West of Stafford SDL housing trajectory in emerging Plan for Stafford Borough Preferred Options report (2022)

5.3.6 This demonstrates an increased expectation with regards to on site delivery, as in the adopted Local Plan, delivery rates were expected to peak at 150 dwellings per annum, however this has increased to 250 dwellings per annum in the emerging Local Plan. This represents a significant increase, and does not appear to be supported by available evidence. The Council's Land for New Homes housing monitor document suggests that 250 dwellings per year could be achieved, should delivery rates on the Land at Burleyfields parcel (17/27731/FUL) reach 150 dwellings per year, and be complemented by 100 dwellings year on the remaining allocation. Whilst this relates to 352 dwellings, and detailed consent and delivery could be achieved within three years, this is not supported by a current application and therefore the delivery of these units lacks certainty within the timescales identified.

5.3.7 From the available evidence in the Housing Land Supply Statement and housing monitor documents, the following can be deduced:

- Former Castleworks – 18/29160/FUL – full permission for 80 dwellings consented and implemented – site is under construction. Current application to vary consent relating to apartments (22/36326/FUL) pending consideration however anticipated that this site will be delivered in full.

- Former Castleworks – 19/30343/FUL – separate full permission for 24 affordable dwellings completed in 2020/21 according to housing monitor.

- Land South Of Doxey Road (14/20425/FUL / 16/24740/FUL) – approval for 170 dwellings granted in 2015, with four additional plots consented through 16/24740/FUL), 174 dwellings completed in 2019/20 according to housing monitor.

- Former Rugby Practice Pitches (17/26061/FUL) – 70 dwellings approved in 2018 and completed in 2019/20 according to the housing monitor.

- Land At Burleyfields (17/27731/FUL) – hybrid consent with full permission for 442 dwellings and outline for remaining 1058 dwellings approved in May 2019. Subsequent Reserved Matters approvals for 102 dwellings (21/35225/REM) and 122 dwellings (21/35230/REM) and further Reserved Matters application for 222 dwellings pending (22/36542/REM). First completions were delivered in 2020/21 according to the housing monitor, which anticipates that completions will increase to 150 dwellings by 2025/26. Considered that the delivery rates could be achieved in forthcoming years should the current Reserved Matters approval be secured and that phase implemented within 2 years, as otherwise the phases with detailed consent will be completed with no other parcels ready to be implemented. There are still a further 612 dwellings in this parcel where detailed consent has yet to be sought, and there should be some uncertainty regarding the total number of dwellings on this allocation until detailed consent is granted for the remainder.

5.3.8 Available evidence confirms that as of November 2022, 1,848 dwellings have been consented on this allocation, which represents a significant proportion of the total. However, detailed consent has only been granted for 1,014 dwellings, whilst Reserved Matters approval is pending for a further 222 units. There are 964 units still without detailed planning permission, which may delay the delivery of remaining phases of this allocation.

5.3.9 In any event, it is considered that the build out rates that the Council has applied to this allocation in the emerging Plan are not realistic, failing to reflect previous delivery and do not reflect what is likely to be achievable. Claremont Planning has had regard to the considerations set out in Section 4 of this report when assessing this, as well as the actual delivery rates achieved on this site historically. Given that 373 dwellings have already been completed at this allocation, there are 1,827 dwellings remaining to be delivered. Assuming that approximately 160 dwellings can be delivered at most each year, this would extend the build out period when compared to the expected trajectory presented in the Plan. Whilst the site is likely to still be delivered in full during the plan period, it is likely to extend beyond the Council's expected completion date of 2031/32 to 2033/34.

Table 5.8 – Proposed Local Plan Housing Trajectory for West of Stafford

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
Emerging LP		162	118	150	150	250	250	250	202	150	47								
Claremont		162	118	150	150	160	160	160	160	160	160	160	29						
Difference		0	0	0	0	-90	-90	-90	-42	10	113	160	29						

Source: Claremont Planning (2022)

5.4 Meecebrook Garden Community

5.4.1 Meecebrook Garden Community is proposed to be allocated through Policy 7 and 8 in the emerging Plan, to deliver 3,000 dwellings and 15ha of employment land by 2040, as part of a larger planned new community. The site accordingly represents 24% of the total housing supply for the emerging Plan, as set out in Policy 1 – Development Strategy.

5.4.2 The emerging Plan identifies that it is intended that Meecebrook will be where the Council delivers unmet needs from neighbouring authorities, and if it is demonstrated that Meecebrook will not be able to deliver 3,000 dwellings, then the quantum of unmet needs accommodate in the emerging Plan will need to be reviewed. This approach suggests that the Plan's ability to accommodate unmet needs is reliant on this site alone, despite the requirements of national policy and the Duty to Co-operate. It is not considered appropriate to conclude that the Borough will not be able to accommodate as much, if any, unmet needs should the capacity of this site be reduced.

5.4.3 The proposed allocation of a large Garden Community at Meecebrook has been in consideration for some time, as the Council secured Government funding in 2019 to support the development of evidence base documents and preparation of a Vision for the new settlement. Further Government funding was secured in 2022, the majority of which was earmarked to look at rail infrastructure and connectivity, which is evidenced in supporting documentation that has been published alongside the Preferred Options draft of the Plan.

5.4.4 It does however appear from the available evidence that at the moment the Council is promoting the site without an agreed land promoter, developer, housebuilder or landowner collaboration agreement. It is important that the Council demonstrates that it will be possible to realise the visions for this site, and that it will be deliverable.

5.4.5 The current proposed trajectory for Meecebrook is not considered to be justified, as well as the proportion of the overall housing supply that the Council anticipate will be delivered on this site during the emerging plan period. It is a concern that over-reliance on this site could result in a Plan that is not deliverable and unable to meet the housing needs as a whole. The Council expect

that delivery on the site will commence by 2031/32, and will achieve 300 dwellings per year consistently until the end of the plan period in 2040. This would cumulatively deliver 3,000 dwellings, or 24% of the overall housing supply identified in the Plan.

5.4.6 It is unclear what the Council have based this trajectory on, as the evidence base on build out rates has concluded that on average, even by the Council's estimation, is likely to be in the region of 70 dwellings per annum. The Lichfields' Start to Finish report identifies that higher build out rates in the region of 160 dwellings per annum can be evidenced from reviewing delivery on large sites previously. However, this would not justify a proposed build out rate of 300 dwellings per annum on any single year, and particularly not to be consistently achieved for ten years. At most, it is considered that the Council should be expecting the site to deliver 160 dwellings per annum. It should be recognised that this is unlikely to be delivered in the first years of completions on the site, and there should be a consideration for Claremont's proposed lead-in time assumption of 8.4 years for sites of 2000+ dwellings as identified through Table 4.4. As such, on the basis that the Local Plan will not be adopted before 2025 as identified in Paragraph 4.1.4, it is proposed that first completions at Meecebrook should not be expected until the monitoring year 2034/35. The first years will likely achieve lower completions than this average rate, before achieving a maximum delivery of 160 dwellings per annum from 2036/37. This would achieve 760 completions by the end of the Plan period, demonstrating a shortfall of 2,240 dwellings compared to the housing trajectory proposed in the emerging Local Plan.

Table 5.9 – Proposed Local Plan Housing Trajectory for Meecebrook Garden Community

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
Emerging LP										300	300	300	300	300	300	300	300	300	300
Claremont														40	80	160	160	160	160
Difference										-300	-300	-300	-300	-260	-220	-140	-140	-140	-140

Source: Claremont Planning (2022)

5.5 Stafford Station Gateway

5.5.1 Stafford Station Gateway is a new allocation in the emerging Local Plan, and comprises a mixed-use development of partly brownfield land, located in central Stafford. A review of the emerging Local Plan expectations for Stafford Station Gateway has been undertaken. Policy 11 sets out the Council's expectations for the Stafford Station Gateway site, confirming it is expected to deliver approximately 900 new homes, depending on the mix of apartments and houses, together

with new office space and other workspaces. In addition, it is anticipated that the development will include a hotel and multi-storey car park. Additionally, the development must deliver a set of key requirements, including new and improve bicycle and pedestrian routes, food and beverage and retail uses not exceeding 1400 sqm floorspace, and contributions towards school expansion. The emerging Plan housing trajectory is provided in Appendix 6, which is reproduced in Table 5.10 below.

Table 5.10 – Emerging Local Plan Housing Trajectory for Stafford Station Gateway

2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
							70	70	70	70	70	70	70	70	70	70	100	100

Source: Stafford Station Gateway housing trajectory in emerging Plan for Stafford Borough Preferred Options report (2022)

5.5.2 This trajectory demonstrates a continued expectation for on-site delivery from 2028/29 to the end of the Plan period. 70 dwellings per annum are expected to be delivered on site each year from 2028/29 to 2037/38, subsequently rising to an expectation for 100 dwellings per annum for the monitoring years 2038/2039 to 2039/40. Whilst these expected delivery rates are considerably lower than the larger strategic site allocations, the proposed trajectory is still considered to be optimistic. The build out rate assumptions for Stafford Council state that 70 dwellings per annum could be completed on sites with between 500 and 999 dwellings. Similarly, the Lichfields' Start to Finish report stated that the mean build out rates for residential developments of between 500 and 999 dwellings is 68 dwellings per annum. Stafford Station Gateway falls within this size bracket, so the expectation to deliver 100 dwellings per annum in the final two years of the emerging Local Plan is beyond the Council's own build-out rate assumptions and industry data, and as such is not supported by evidence and should be considered unrealistic, and in our proposed trajectory the build out rate has been maintained at 70 dpa.

5.5.3 The Council has identified that completions on this site are anticipated during 2028/29, which is not considered to be realistic when taking into consideration available evidence. The Council's own evidence suggests that it anticipates sites of 500-999 dwellings to have a lead-in time of approximately 4.5 years, whereas the Lichfield's Start to Finish report suggests that in reality, on average sites of this size take approximately 5.0 years. There is no evidence to suggest that preparatory work on this site will commence prior to the adoption of the Plan and confirmed allocation of this site, and so these timescales should be applied from 2025/26 onwards, when it is reasonable to anticipate that the Local Plan will be adopted.

5.5.4 Furthermore, when delivery on site commences, it usually begins at a lower build out rate and increase in subsequent years. This reflects the requirements to implement infrastructure and groundworks prior to building out the first dwellings, which can delay and reduce the opportunity to realise as much development in the first year or two of the development. This is reflected in the actual build out rates that have been achieved historically on allocated sites, for example in the North and West of Stafford SDLs, where delivery initially was at a lower rate than was subsequently achieved. As such, a reduced build out rate of 35 dwellings per annum has been applied to the first year of completions in our proposed trajectory.

5.5.5 Given the above evidence, it is considered that the build out rates that the Council has applied to this allocation in the emerging Plan are not realistic and do not reflect what is likely to be achievable. Claremont Planning has had regard to the considerations set out in Section 4 of this report when assessing this, as well as comparisons with the actual completion rates delivered historically on other strategic site allocations. Given that the historic evidence and industry data does not align with the expected completion rates for Stafford Station Gateway set out in the emerging Local Plan, it is unlikely they will be achieved. Assuming that 70 dwellings can be delivered each year on average, this would extend the build out period when compared to the expected trajectory presented in the Plan, and will extend beyond the emerging Local Plan period. It may be that higher completions are achieved in some years, particularly taking into consideration that much of this development is envisaged to comprise flatted developments, where completions are typically expected to happen in clusters as whole blocks are completed at once. However, these years will usually be preceded and followed by years where fewer or zero completions are realised, resulting in the average figures identified.

5.5.6 Table 5.11 is presented below and sets out a revised housing delivery trajectory for Stafford Station Gateway, based on a detailed review. It is estimated that 665 dwellings could be delivered by the end of the Plan period, which would be 235 dwellings lower than the Council's expected completions by the end of the housing trajectory and reduce the contribution that this site would be expected to make to the emerging Plan's housing supply.

Table 5.11 – Proposed Local Plan Housing Trajectory for Stafford Station Gateway

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
Emerging LP								70	70	70	70	70	70	70	70	70	70	100	100
Claremont										35	70	70	70	70	70	70	70	70	70
Difference								-70	-70	-35	-	-	-	-	-	-	-	-30	-30

Source: Claremont Planning (2022)

5.6 Land at Ashflats (STAFMB03)

5.6.1 The Land at Ashflats site has been allocated for residential development within the emerging Local Plan. The emerging Local Plan through Policy 12 identifies that the site is expected to deliver 268 new dwellings over the emerging Plan period. In order to assess whether the site is deliverable, it is important to review the planning history and any constraints associated with the site. This will establish whether the site can yield the number of dwellings set out in the emerging Local Plan housing trajectory.

5.6.2 A review of Stafford Borough Council's online planning register has highlighted a number of relevant previous planning applications, which were advanced by Seddon Homes:

- **13/19524/OUT –** Outline application for 320 dwellings (all matters reserved except access) was refused in 2014. The sole reason for refusal was on the basis that the proposed development was on greenfield land outside the residential development boundary of Stafford and given there was a sufficient supply of housing at that point in time was contrary to the development plan. The Council considered that the proposal was therefore premature and could prejudice development that it hoped would come forward in Strategic Development Locations, as identified in the soon to be adopted new Plan for Stafford Borough.

- **APP/Y3425/A/14/2217578 -** An appeal was lodged and subsequently dismissed in December 2014. In dismissing the appeal, the Inspector concluded that as the proposal involved, what at that time the Inspector deemed unnecessary development of greenfield land, the proposed development would conflict with and harmfully undermine the intentions of the development plan. Furthermore, as the Council could at that time demonstrate a five year supply of deliverable housing sites paragraph 49 of the National Planning Policy Framework was not engaged. It was on this basis only that the appeal was dismissed.

- **15/21838/OUT –** An outline application to demolish Lawford House for residential development was submitted on 20 February 2015. The Council considered that there has been no significant change in the development plan since the previous applications were submitted, and as such declined to determine the application.

5.6.3 It should be noted that, despite previous refusals and dismissals, there has been no evidence presented to demonstrate that the site could not accommodate 320 dwellings. Whilst a range of objections had been raised by third parties regarding previous planning applications, the Council Officer's Report and the Planning Statement of Common Ground indicated that "there are no 'technical' objections from relevant consultees. Stafford Borough Council and the Planning Inspector both subsequently determined that the site was suitable for housing and was satisfied that all technical matters could be addressed. However, at the time of determination, the Borough could demonstrate a sufficient supply of delivering housing at other, more favourable sites, and so planning permission was not granted and the appeal subsequently dismissed as the site was outside the settlement boundary and development at this location would conflict with the development plan.

5.6.4 Stafford Borough Council's SHELAA (2022) indicates that the site has multiple owners and is constrained by a Tree Preservation Order, Public Rights of Way, Historic Environment Record, a location within Flood Zone 2 and 3, and the presence of mineral deposits. However, these are not considered to represents constraints that would preclude development on the site, providing these matters are appropriately addressed through scheme design and the planning process.

5.6.5 Although the site was refused permission previously and not allocated in the development plan due to other more favourable sites including non-greenfield sites at that time, it can be considered that this site has potential to come forward and be delivered during the emerging Plan period. However, the emerging Local Plan allocates this site for 268 dwellings, which is a reduction on previous proposals by Seddon Homes' for 320 dwellings. This reduction may present financial

viability issues for the housebuilder, which could present delays in the delivery of this site. Alternatively, delivery on the site may exceed the proposed allocation, thereby increasing the contribution this site may make to the housing supply. It is noted that there is currently no valid or approved application for this site, and there are a number of constraints, which again may present delays to delivery. However, it is considered reasonable to expect that the site will be delivered during the emerging Plan period and therefore is retained within the supply for the trajectory in our assumptions.

5.7 Land at Marlborough Road (STO07)

5.7.1 The Land at Marlborough Road has been allocated for residential development within the emerging Local Plan. A review of the emerging Local Plan expectations for Land at Marlborough Road has been undertaken, and Policy 12 sets out an expectation to deliver 101 new dwellings over the emerging Plan period.

5.7.2 In order to assess whether the site is deliverable, it is important to review the planning history and any constraints associated with the site. This will establish whether the site can yield the number of dwellings set out in the emerging Local Plan housing trajectory. The site is currently under dual ownership, in use as agricultural farmland, and has a Tree Preservation Order on site.

5.7.3 The site was promoted for new housing in 2013-2015, by David Wilson Homes, who sought the delivery of residential development at this site. A review of Stafford Borough Council's online planning register has highlighted a number of relevant previous planning applications:

- **13/19605/FUL –** Full application for residential development of 114 dwellings, including the creation of a new access onto Spode Road, creation of open space, associated landscaping and associated infrastructure. The application was refused on 24 March 2014. The sole reason for refusal related to the amount of additional traffic generated by the proposed development, together with the constrained ability to disperse additional vehicles in the surrounding residential area, which would result in unacceptable levels of noise and disturbance that would have a significantly harmful effect on the living conditions of neighbouring residents.

- **APP/Y3425/A/14/2220297** – An appeal was lodged following the above refusal. This appeal was dismissed and the Planning Inspector concluded that the proposal would be harmful to the living conditions of neighbouring residents with particular regard to noise and disturbance. The proposal would therefore conflict with spatial principle 7 (I) of 'The Plan for Stafford Borough' (June 2014), and a core planning principles of the Framework which states that planning should always seek to secure a good standard of amenity for all existing occupants of buildings (paragraph 17). The appeal decision was subsequently challenged in the High Court, where the Judge found in favour of the appellants and quashed the decisions, referring the appeal back to the Planning Inspectorate for re-determination, where the appeal was subsequently dismissed.

- **15/21873/FUL -** Full application for residential development comprising 114 dwellings including the creation of a new access onto Marlborough Road, creation of open space, associated landscaping and associated infrastructure. The revised proposals advanced through this application were found to have appropriately dealt with residential amenity through revisions to design and highway access, overcoming the previous issues raised

in this regard. Despite this, the application was refused on 19 May 2015, as it would lead to a disproportionate amount of development taking place at a lower level of the settlement hierarchy. This would undermine the development strategy set out in Spatial Principle 4 of the Plan for Stafford Borough, which is not in accordance with the genuinely plan-led approach advocated in paragraph 17 of the NPPF. The proposed development was on a greenfield site, and was not deemed necessary as the Council can demonstrate a 5 year supply of housing land without this site.

- **APP/Y3425/W/15/3136258 -** An appeal was submitted and subsequently withdrawn.

5.7.4 As highlighted in the planning history for this site, two major applications have been submitted and refused on the site, which would constitute a disproportionate amount of development taking place at a lower level of the sustainable settlement hierarchy, and where issues relating to amenity and traffic were also raised. It was considered through these applications and appeals that the proposed development would not be in accordance with local or national planning policies, and as such was not deemed acceptable, suitable or deliverable.

5.7.5 Although this site has been allocated in the emerging Local Plan, the site has not been granted outline planning permission. Allocation of this site will need to demonstrate that it is an appropriate location for development, and that the development could appropriately address previous concerns regarding amenity and traffic. Furthermore, the Council will need to demonstrate that Stone, as a less sustainable settlement where large scale growth has previously been delivered, is an appropriate location for the allocation of further growth. It may be concluded that it would be more appropriate to allocate the site for a reduced number of dwellings, reducing the contribution that this site could make to the housing supply for the emerging Plan.

5.8 Land East of Oakleigh Court (STO13)

5.8.1 The Land East of Oakleigh Court has been allocated for residential development within the emerging Local Plan. A review of the emerging Local Plan expectations for Land East of Oakleigh Court has been undertaken, and Policy 12 sets out an expectation to deliver 131 new dwellings over the emerging Plan period. The site is currently being promoted for new housing developed by the Strategic Land Group, who are seeking the delivery of circa 125 new dwellings of a range of types and tenures, with an extensive network of public open space and a new convenience retail store at this site.

5.8.2 In order to assess whether the site is deliverable, it is important to review the planning history and any constraints associated with the site. This will establish whether the site can yield the number of dwellings set out in the emerging Local Plan housing trajectory. The site has no known legal or ownership issues, but has constraints related to Tree Preservation Orders, Public Rights of Way, landfill and Flood Zone 3.

5.8.3 There is no available planning history for the site, meaning that no planning applications have been submitted on this site. As such, we are unable to assess whether the site is deliverable based on previous application determinations. Considering the physical site constraints, it can be interpreted that delivery of 131 new dwellings at this site may be subject to challenges regarding TPOs, flooding and PROWs.

5.9 Land at Uttoxter Road (STO16)

5.9.1 The Land at Uttoxeter Road has been proposed to be allocated for residential development within the emerging Local Plan. A review of the emerging Local Plan expectations for Land at Uttoxeter Road has been undertaken, and Policy 12 sets out an expectation to deliver 97 new dwellings over the emerging Plan period.

5.9.2 The site has no known legal or ownership issues, and is relatively unconstrained, although is within a landfill buffer. In order to assess whether the site is deliverable, it is important to review the planning history and any constraints associated with the site. This will establish whether the site can yield the number of dwellings set out in the emerging Local Plan housing trajectory.

5.9.3 A review of Stafford Borough Council's online planning register has highlighted a number of relevant previous planning applications, which were advanced by Richborough Estates Partnership LLP:

- **14/21316/OUT -** Outline application with all matters reserved (with the exception of the main vehicular access) for development of site for residential uses (Use Class C3 - maximum 90 dwellings) with associated infrastructure and landscaping validated on 19 November 2014, and was subsequently refused on 1 October 2015.

- **16/24533/OUT -** Outline application with all matters reserved (with the exception of the main vehicular access) for development of site for residential uses of up to 85 dwellings (Use Class C3) with associated infrastructure and landscaping validated on 4 August 2016, and was subsequently refused on 17 May 2017. The main reason for refusal was the location of the proposed development on a greenfield site in the open countryside adjacent to Stone and outside of the settlement boundary as set out in Part 2 of The Plan for Stafford Borough. The Council can demonstrate a 5 year supply of housing, including a 20% buffer. The proposal would therefore contribute towards a disproportionate amount of development taking place at a lower level of the sustainable settlement hierarchy. This would conflict with and undermine the development plan.

5.9.4 As highlighted in the planning history for this site, two major applications have been submitted and refused on the site, on the basis that it would constitute a disproportionate amount of development taking place at a lower level of the sustainable settlement hierarchy, and on a greenfield site. It was considered through these applications that the proposed development would not be in accordance with local or national planning policies, and as such was not deemed acceptable, suitable or deliverable. In order for this site to be considered acceptable and deliverable, it must be included within the settlement boundary of Stone and allocated for development through the emerging Plan. However, there are no technical reasons apparent as to why development on this site is not achievable within the emerging Plan period subject to concluding the site is an appropriate location for growth through the Plan preparation process.

5.10 Land East of Stafford Road (GNO04 (west))

5.10.1 The Land East of Stafford Road has been proposed to be allocated for residential development within the emerging Local Plan. A review of the emerging Local Plan expectations for Land East of Stafford Road has been undertaken, and Policy 12 sets out an expectation to deliver 100 new dwellings over the emerging Plan period.

5.10.2 In order to assess whether the site is deliverable, the planning history has been reviewed and any constraints associated with the site considered in order to establish whether the site can yield the number of dwellings set out in the emerging Local Plan housing trajectory. The site has no known legal or ownership issues, but the site is not available within the next five years. It is considered that the necessary infrastructure for this site is not available within the locality, and alternative measures must be sought. The site is divided by the settlement boundary for the recognised Local Plan settlement of Gnosall, and thus falls both within and adjacent to a sustainable settlement. The following constraints exist: Public Right of Way, Historic Environment Record, and Tree Preservation Orders which abut the site on its north western boundary.

5.10.3 A review of Stafford Borough Council's online planning register has highlighted one relevant previous planning application, which was advanced by First City Ltd:

- **13/19587/OUT -** Erection of up to 150 dwellings, provision of open space and access works (all matters reserved except access to Stafford Road), validation on 20 December 2013 and refused on 5 March 2014. The main reasons for refusal relate to the location of the proposal on a greenfield site outside the Residential Development Boundary of Gnosall in The Plan for Stafford Borough. As such, the proposal is contrary to local planning policies and is inappropriate, due to the scale of the proposal in relation to the existing village. Additionally, the proposal would necessitate the loss of good quality agricultural land and would constitute a significant intrusion into open countryside detracting from the intrinsic character and appearance of the surrounding rural area.

- **APP/Y3425/A/14/2223556** – An appeal was submitted following the above refusal, but was withdrawn on 10 March 2015.

5.10.4 As highlighted in the planning history for this site, one major application has been submitted and refused on the site, on the basis that it would constitute a disproportionate amount of development taking place at a lower level of the sustainable settlement hierarchy, and would necessitate the loss of good quality agricultural land. It was considered through these applications that the proposed development would not be in accordance with local or national planning policies, would constitute a significant intrusion into open countryside, and as such was not deemed acceptable, suitable or deliverable. In order for this site to be considered acceptable and deliverable, it must be included within the settlement boundary of Gnosall. It is considered that there are no technical reasons apparent as to why development on this site is not achievable within the emerging Plan period subject to concluding the site is an appropriate location for growth through the Plan preparation process.

5.11 Land to rear of Woodseaves School (HIG13)

5.11.1 The Land to the rear of Woodseaves School has been proposed to be allocated for residential development within the emerging Local Plan. Policy 12 in the emerging Local Plan sets out an expectation to deliver 88 new dwellings over the emerging Plan period.

5.11.2 It is not known if the necessary infrastructure is considered to be available within the locality. Additionally, the ownership status of the site is not known, and the timescale for delivery is also not known.

5.11.3 There is no available planning history for the site, establishing that no planning applications have been submitted on this site. As such, we are unable to assess whether the site is deliverable as

no consideration of constraints has been undertaken through the planning application process. However it does not appear from available evidence that there are any physical site constraints, and therefore it is anticipated that delivery of 88 new dwellings could be achievable. However, Stafford Borough's SHELAA 2022 highlights that the availability of the site is not known, and it is located adjacent to but not within a recognised Local Plan settlement. As such, the Council must demonstrate through the examination that this site is an appropriate and sustainable location for development and that there is the necessary infrastructure to support development.

5.12 Summary of Policy 12 Sites

5.12.1 Our analysis has identified that there may be difficulties in delivering the proposed dwellings at some of the larger sites identified, based on our assessment of physical site constraints and planning histories. On several of these sites, previous applications for planning permission have been refused, although principally these refusals related to the location being beyond the settlement boundary and development would conflict with the development plan. The emerging Plan will therefore need to demonstrate that such sites represent the most appropriate and sustainable sites as part of the site selection process in order to justify their allocation. However, the proposed housing trajectory set out in the emerging Local Plan does not provide individual delivery trajectories for the Policy 12 sites, and as such we have been unable to assess whether the Council's expectations are reasonable and justifiable. Whilst the Council may not meet the exact targets identified in the trajectory for the delivery of 885 dwellings on Policy 12 sites by 2033/34, it can be considered reasonable to expect this housing delivery to be completed by the end of the Plan period.

6 HOUSING TRAJECTORY

6.1 Review of the Council's Assumptions & Implications for Housing Supply

6.1.1 As set out, this report has undertaken a review of the Council's assumptions which underpin the housing trajectory, considering the previous record of housing delivery, as well as other available industry evidence. This has demonstrated that in most cases, the proposed site allocations will be anticipated to deliver in full, during the plan period, even if first completions occur later in the plan period, and build out rates are lower than the Council anticipated.

6.1.2 However, in the case of Meecebrook and Stafford Station Gateway, these sites represent new proposed site allocations, where it is considered that the Council's assumptions are optimistic, and these sites will not deliver the level of completions anticipated. In both cases, it is considered that first completions will not be achieved on site as early as the trajectory anticipated, and build out rates will not be as high as the trajectory suggests. As such, the contribution that these sites are likely to make to the emerging Plan's housing trajectory will be less than suggested in the Preferred Options draft of the Plan.

6.1.3 Additionally, we have identified concerns in respect of the Council's approach to windfall developments. It is not considered robust to rely on delivery from windfall sites in the years immediately following the adoption of the Plan, and so these have been removed from the trajectory until the latter years of the plan period, removing 250 dwellings from the potential supply.

6.1.4 Our review is presented in the housing trajectory provided at Appendix 1, which is based on the trajectory provided in Appendix 6, considering the Council's position, our assumptions, and the difference between these. This proposes the reduction to the Council's housing supply of 2,725 dwellings. This would mean that the Council is still able to meet the standard methodology housing requirement, however, it would not provide sufficient buffer or allow the emerging Plan to contribute towards unmet housing needs from neighbouring authorities. It is considered that in order to do this, the Council must recognise that additional sites are required to be allocated through the emerging Plan, to enable the Council to meet the proposed housing requirement in full and ensure that the Plan is capable of being found sound.

6.2 Land at Redhill, Stafford

6.2.1 Stoford Properties is promoting land at Redhill, Stafford, as an omission site through this Local Plan consultation. The site has been considered by the Council, within the SHELAA 2022. The SHELAA confirms that the site is available, suitable and achievable. However, given the issues identified in respect of the Council's approach to housing supply and the trajectory, it is considered that this site should be additionally positively considered and allocated as the Plan progresses.

6.2.2 The site is expected to deliver circa 600 dwellings, and it is anticipated that development could commence within a short period, subject to securing the allocation of the site through the next draft of the Plan and planning permission once the Plan has progressed and is close to, or has been, adopted.

6.2.3 It is anticipated that delivery of residential development on Land at Redhill could commence within a reduced time period when compared to the average lead in time for sites in Stafford, because the access infrastructure serving the site is being delivered as part of other development proposals expected to be completed in 2023. This will enable the site to be accessed at an earlier stage than would typically be expected for a greenfield proposal. Subject to securing a draft allocation, an early planning application would be made on the site and the first completions could be achieved on site in 2025/26.

6.2.4 Once delivery on site has commenced, Stoford anticipates that completions will be realised at 40 dwellings in the first year of completions, increasing to 70 dwellings per annum on average, in line with our expectations for sites over 500 dwellings as set out in Chapter 4 of this report. This is on the basis that there will be two developer outlets on site, delivering different phases of development simultaneously, ensuring that such a build out rate can be maintained consistently.

6.2.5 By additionally including Land at Redhill in the housing trajectory as identified in Appendix 1, this would help to reduce the shortfall identified in the housing trajectory. It would particularly help to meet the shortfall identified in the years immediately following adoption of the Plan, where the Council is currently proposing to rely on windfall completions to assist in maintaining housing supply. It will also help to meet the shortfall anticipated where contributions from larger allocations have been reduced, including at Meecebrook and the Stafford Station Gateway sites, where it has been demonstrated that it is not considered likely that the first completions will be achieved until later in the plan period, and where evidence suggests that the build out rates will likely be lower than the Council currently anticipates.

Table 6.1 – Proposed Local Plan Housing Trajectory for Land at Redhill Stafford

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40
Emerging LP					0	0	0	0	0	0	0	0	0						
Claremont					40	70	70	70	70	70	70	70	70						
Difference					+ 40	+ 70	+ 70	+ 70	+ 70	+ 70	+ 70	+ 70	+ 70						

Source: Claremont Planning (2022)

7 SUMMARY & CONCLUSIONS

7.1.1 This report has been prepared on behalf of Stoford Properties, to provide a review of the housing land supply and trajectory outlined in the emerging Stafford Borough Local Plan. The report is intended to accompany representations to the Stafford Local Plan Preferred Options consultation.

7.1.2 The review of the Council's housing delivery record demonstrated that the authority has performed strongly in recent years. The record of delivery on allocated sites has however been mixed, with sites such as Stone and East of Stafford delivering almost in line with the adopted Plan's trajectory, whilst other allocations at North and West of Stafford have not performed as strongly so far. The evidence base confirms that the proportion of completions on brownfield sites has reduced over time, and the level of outstanding net commitments across the Borough.

7.1.3 The emerging Plan housing requirement has been considered. The Council has recognised the need to increase the housing requirement above the minimum number calculated through the Government's standard methodology, ensuring that the emerging Plan can contribute towards meeting unmet needs from neighbouring Housing Market Areas. However, it should be recognised that the current approach will only deliver a small amount of housing to meet substantial unmet needs arising particularly from Birmingham and the Black Country, and the level of this need may need to be reconsidered as the Plan progresses and more discussions between the Council and its neighbouring authorities take place to ensure that the Plan will meet the Duty to Cooperate. The Council should also recognise that there may be a need to reconsider the housing requirement as the standard methodology calculation should be revisited annually, as data inputs into this calculation will fluctuate over time.

7.1.4 Our analysis has identified that in respect of lead in times, the Council has applied optimistic assumptions that do not necessarily reflect historical records either in Stafford or elsewhere as evidenced through industry data compiled by Lichfields. With regards to build out rates, it is considered that the Council is similarly been optimistic, however on smaller sites these reflect what has been achieved already in the Borough, and on larger sites reflect industry averages. It should be recognized that where the Council intend to rely on these through the examination, these should be appropriately justified. The approach to windfalls is not considered to be justified, in particular the Council's proposal to rely on windfalls contributing towards housing delivery immediately following the adoption of the Plan, in order to maintain a housing supply.

7.1.5 In respect of specific sites, a review of background and context of each site has been undertaken, as well as the assumptions made and whether these are reasonable. In respect of each site, it has been assessed as to whether the Council's expectations are reasonable, or whether these should be adjusted in order to establish a more robust and defensible trajectory. A brief summary of our conclusions on each site is as follows:

- **North of Stafford** – this is a site allocated in the adopted Plan where delivery of some phases has commenced. Delivery commenced on the site earlier than was predicted in the trajectory, although build out rates were not as high as expected. The anticipated future delivery rates should accordingly be adjusted in order to be more realistic, although the site is expected to be delivered within the emerging Plan period providing delivery of 160 dpa can be achieved and sustained.

- **West of Stafford** - also allocated in the adopted Plan, where delivery has commenced. Delivery did not commence until later into the plan period than anticipated, and has been significantly lower than the trajectory anticipated. However, it is expected that delivery on this site will continue and could achieve 160 dpa. If such levels of delivery can be sustained, the remainder can be delivered during the emerging plan period although the contribution that the site will make during the earlier years of the plan will be reduced.

- **Meecebrook** – a new Garden Community proposed to be allocated in the emerging Plan. The proposals have been supported by Government funding and are supported by emerging evidence indicating the allocation will be deliverable. However if the Council is to rely on this allocation to deliver 24% of emerging housing supply, the selection of this site must be appropriately justified. The lead in time applied to this site is optimistic and does not reflect evidence. Delivery rates proposed on the site are not realistic or evidence based and should be reduced to 160 dpa in accordance with evidence.

- **Stafford Station Gateway** – a new mixed-use allocation in the emerging Local Plan. The Council's expectations in respect of both lead in times and build out rates are not considered to be realistic or achievable and have been modified in our assessment. This results in extending the build out period for this site beyond the end of the proposed plan period, and reducing the contribution to be made by this site to the emerging housing supply by 165 dwellings.

7.1.6 Additionally, we have reviewed some of the larger sites proposed in Policy 12. Our analysis has identified that there may be difficulties in delivering the proposed dwellings at most of these sites, based on an assessment of physical site constraints and planning histories. The emerging Plan will need to demonstrate that such sites represent the most appropriate and sustainable sites as part of the site selection process in order to justify their allocation. Furthermore, it is unclear whether the trajectories assumed are reasonable, as site specific information has not been detailed at this stage. Whilst the Council may not meet the exact targets identified in the overall housing trajectory for the delivery of 885 dwellings on Policy 12 sites by 2033/34, it can be considered reasonable to expect this housing delivery to be completed by the end of the Plan period.

7.1.7 The report has finally considered the housing trajectory, assessing the Council's assumptions versus our expectations, and the difference between these. This demonstrated that there is a gap in the emerging housing supply of 2,725 dwellings, which would mean that based on the current strategy, the Council would not be able to fully address the emerging housing requirement. As such, it is considered that the Council needs to consider the allocation of additional sites through the emerging Plan in order to ensure that the Plan accords with the tests of soundness.

7.1.8 It is proposed that land at Redhill, Stafford, which is promoted by Stoford Properties to the Council through representations to this current consultation, represents a suitable site which could assist in meeting the shortfall identified. The site would deliver circa 600 dwellings, in a sustainable location to the north of the town, and allocation of this site would assist in ensuring that the emerging Local Plan is appropriately considering all alternative sites and will meet the housing needs identified for the Borough through the emerging Plan period.

APPENDIX 1 – HOUSING TRAJECTORY

		2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40		Total
Past Completions		**614**	**506**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**1120**
	Emerging LP	**0**	**0**	**83**	**95**	**159**	**219**	**219**	**219**	**211**	**155**	**120**	**155**	**155**	**155**	**155**	**120**	**120**	**120**	**120**	**120**		**2700**
	Claremont	0	0	83	95	159	160	160	160	160	160	160	160	160	160	160	160	160	160	160	123		2700
Stafford North SDL	Difference	0	0	0	0	0	-59	-59	-59	-51	5	40	5	5	5	5	40	40	40	40	3		0
	Emerging LP	**0**	**0**	**162**	**118**	**150**	**150**	**250**	**250**	**250**	**202**	**150**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**1729**
	Claremont	0	0	162	118	150	150	160	160	160	160	160	160	160	29	0	0	0	0	0	0		1729
Stafford West SDL	Difference	0	0	0	0	0	0	-90	-90	-90	-42	10	113	160	29	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**55**	**55**	**36**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**146**
	Claremont	0	0	55	55	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		146
Stone SDL	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**171**	**171**	**171**	**170**	**170**	**110**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**1063**
	Claremont	0	0	171	171	171	170	170	110	100	0	0	0	0	0	0	0	0	0	0	0		1063
Large Permissions	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**64**	**64**	**64**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**192**
	Claremont	0	0	64	64	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		192
Small Permissions	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**12**	**12**	**12**	**12**	**12**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**94**
	Claremont	0	0	12	12	12	12	12	34	0	0	0	0	0	0	0	0	0	0	0	0		94
C2	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**0**	**0**	**0**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**		**750**
	Claremont	0	0	0	0	0	0	0	0	0	0	50	50	50	50	50	50	50	50	50	50		500
Small site windfall	Difference	0	0	0	0	0	-50	-50	-50	-50	-50	0	0	0	0	0	0	0	0	0	0		-250
	Emerging LP	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**	**300**		**3000**
	Claremont	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	80	160	160	160		760
Meecebrook	Difference	0	0	0	0	0	0	0	0	0	0	-300	-300	-300	-300	-260	-220	-140	-140	-140	-140		-2240
	Emerging LP	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**100**	**100**		**900**
Stafford Station	Claremont	0	0	0	0	0	0	0	0	0	0	35	70	70	70	70	70	70	70	70	70		665
Gateway	Difference	0	0	0	0	0	0	0	0	-70	-70	-35	0	0	0	0	0	0	0	-30	-30		-235
	Emerging LP	**0**	**0**	**0**	**0**	**0**	**86**	**5**	**58**	**210**	**211**	**88**	**104**	**105**	**18**	**0**	**0**	**0**	**0**	**0**	**0**		**885**
Other site	Claremont	0	0	0	0	0	86	5	58	210	211	88	104	105	18	0	0	0	0	0	0		885
allocations (P12)	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Emerging LP	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**
Land at Redhill Farm	Claremont	0	0	0	0	0	40	70	70	70	70	70	70	70	70	0	0	0	0	0	0		600
Stafford	Difference	0	0	0	0	0	40	70	70	70	70	70	70	70	70	0	0	0	0	0	0		600
	Emerging LP	614	506	547	515	592	687	706	721	891	688	778	726	680	593	575	540	540	540	570	570		12579
	Claremont	614	506	547	515	592	618	577	592	700	601	563	614	615	397	320	360	440	440	440	403		10454
Total	Difference	0	0	0	0	0	-69	-129	-129	-191	-87	-215	-112	-65	-196	-255	-180	-100	-100	-130	-167		-2125

STOFORD

Land at Redhill Farm, East of A34, Stafford

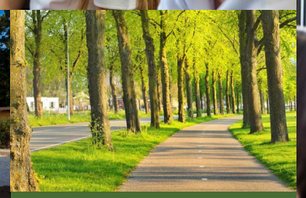
Creating a vibrant and sustainable neighbourhood











1

WHY REDHILL FARM?

Site Plan

LAND AT REDHILL FARM

Creating a vibrant & sustainable neighbourhood

December 2022

Infrastructure-led residential development of around 600 new homes in Stafford, outside of the Green Belt

A deliverable proposal that could be a viable alternative to the proposed allocations, particularly those of a strategic scale where infrastructure will be required.

Free of any restrictive designations and extensive opportunities for new landscape and green infrastructure.

New access roundabout under construction and to be completed Summer 2023.

Located on a frequent bus route.

Logical extension to Beaconside (North Stafford Development Location) that supports the Local Plan settlement hierarchy.

Supporting facilities to create a vibrant and sustainable community including land for a new primary school, a neighbourhood centre and an abundance of green infrastructure.

Recently upgraded footpath / cycleway between the site and Stafford town, encouraging active travel to Stafford Town to stimulate local economic growth.

Stoford has a proven track record of delivery across Stafford Borough, including Pets at Home in Stafford, Jaguar Land Rover in Stone and Staffordshire County Council offices in the heart of Stafford.

Significant contribution towards the housing requirement for Stafford with a site that can deliver quickly within 10 years.

Direct access to job opportunities at Stafford North Business Park.

2

EXECUTIVE SUMMARY

THE VISION

To **create** an **attractive**, **vibrant**, and **sustainable neighbourhood** that **connects seamlessly** to the urban area of **Stafford town,** offering a mix of **new homes, community facilities** and land for a **primary school** to address the need for housing and school places, and **meet** the **diverse needs** of **Stafford**.

Illustrative Masterplan

KEY DEVELOPMENT ATTRIBUTES

MARKETING NEED

A 29 hectare infrastructure-led neighbourhood at Redhill Farm, providing around 600 new market and affordable homes across a range of housing types and sizes, including retirement living and serviced plots for self or custom builders, as appropriate.

Providing 2 hectares of land for a new primary school alongside financial contributions to meet the shortfall of available school places in Stafford.

GREEN INFRASTRUCTURE

Creating over 9 hectares of open space and opportunities for biodiversity net gain.

AVAILABLE NOW

The site is available now, and the landowner is working collaboratively with us.

EARLY DELIVERY

Stoford are a trusted development partner and are committed to the early delivery at Redhill Farm. The site access infrastructure will be completed by Summer 2023, tying into the new roundabout delivered via the Pets at Home development.

CONNECTIVITY

Land at Redhill Farm on the edge of the principal town of Stafford benefits from the largest range of services and facilities including a railway station. New bus stops are consented just 40m south of the main access, facilitating access to Stafford Town centre and the local railway station. A new 3.5 metres wide shared footway/cycleway is being delivered along the eastern side of the A34 from the site access roundabout south towards the William Bagnall Drive signal controlled junction. The internal estate road has been designed to continue the A34 footpath/cycleway through the development, accommodate buses and ensure that all residents are within 400 metres of a bus stop.

ACCESSIBLE

The new roundabout will be completed in Summer 2023. Stoford have delivered this as part of the Pets at Home development. There is an upgraded footpath and cycleway along the A34 connecting to Stafford.

The proximity of the site to Redhill Industrial Estate, Pets at Home and the draft employment allocation west of this, provides opportunities to work closer to home.

A direct walking route from the A34 to the school is proposed to encourage sustainable travel for pupils and their families who are not located on the neighbourhood.

A secondary left in/left out access is proposed alongside the roundabout to serve the site.

COMMUNITY FACILITIES

We propose a local centre and land for a primary school which are essential to developing a successful and sustainable community.

The site will provide an abundance of open space with two parks compromising a Local Equipment Area for Play (LEAP) and a Neighbourhood Equipped Area for Play providing play opportunities for older and younger children.

UNCONSTRAINED

The site is free of any restrictive ecological, environmental or heritage designations.

3

THE SITE

Aerial's of the Site

The Vision document is prepared by Stoford to support our proposals for a sustainable, cohesive neighbourhood at Redhill Farm, Stafford in response to the Council's Local Plan: Preferred Options.

Land at Redhill Farm, east of the A34 in Stafford ('the Site') provides an exceptional opportunity of 29 hectares to create a successful and sustainable neighbourhood that extends the 'North of Stafford Strategic Development Location' and ties into the infrastructure that Stoford have delivered to date. The site is encased by development to the east, south and west making it an entirely logical site to develop adjacent to the Borough's most sustainable settlement.

Green infrastructure is plentiful at the site, accounting for over 9 ha, thereby providing an attractive landscape for development, creating open space opportunities, and supporting a biodiversity net gain.

The site has excellent transport links with direct access onto the A34 via the newly constructed roundabout, delivered by Stoford as part of the Pets at Home development, west of the A34. The site is within 3miles (15 minutes cycle) of Stafford railway station on the West Coast Mainline, both of which provide important linkages with the West Midlands and north Staffordshire conurbations. The upgraded 3m wide footpath / cycleway along the eastern side of the A34, currently under construction promotes a sustainable travel option from the site to the roundabout with the A513 Beaconside.

Public transport along the A34 is frequent and readily available to serve the site with bus stops close to the entrance of the site on the A34 with the potential to divert these into the site if required.

Our approach to this site is underpinned by a commitment to design and place, connectivity and sustainability. In section 6 we demonstrate how our proposals for Land at Redhill are suitable, deliverable and do not adversely impact on Stafford's natural or built environment.

Excellent Transport Links

29 hectares for sustainable neighbourhood space

9 hectares for Green Infrastructure

4

STOFORD

An Introduction

WHO WE ARE

Stoford are one of the UK's leading property developers and a trusted developer for local authorities seeking high quality, sustainable developments.

Stoford have a close working relationship with Stafford Borough Council in respect of delivering major development. We are nearing completion of the BREEAM Excellent, 670,000 sqft Pets at Home distribution centre on the Stafford North Business Park, which will deliver around 700 new jobs, and recently delivered a 21 hectare vehicle storage depot for Jaguar Land Rover at Stone Business Park. In 2011 we also delivered BREEAM Excellent offices in the heart of Stafford for Staffordshire Council.

Last month, Stoford submitted a planning application to deliver an 84,000 square feet purpose-built broadcast centre for the BBC at the historic Typhoo Building in Digbeth, which will be one of Birmingham's first net zero carbon buildings in construction. The building is also on target to achieve a BREEAM rating of 'outstanding' and an energy performance certificate (EPC) of 'A', and is the first of two applications – the latter will be submitted in early 2023 and comprise mixed use residential and office led development, including up to 600 residential units.

We have a breadth of experience in delivering a range of projects including apartments at Manor House Drive in Coventry and Bournbrook Court in Birmingham, a hotel and drive-thru restaurants at Castlegate Business Park in Dudley, and a co-operative convenience food store (14,000sqft) alongside residential units at All Saints Square in Birmingham. Most recently, in October 2022 we delivered a 76,000 square foot ambulance service hub in Oldbury for the West Midlands Ambulance Service..

pets at home

Stafford North Business Park
Stafford
670,348 sq ft

Stoford have their own in-house planning team comprising Jo Russell and Stacey Green who have 35 years combined experience in the public and private sectors, with a specific focus on strategic residential and commercial schemes. They both have a range of experience in the promotion of land through the Development Plan process including Examinations and securing planning permissions for strategic, residential projects. Land Director Andy Hartwright worked for Gladman for almost 20 years.

We would welcome the opportunity to continue to work with Stafford Borough Council, alongside key stakeholders and local communities to deliver a high quality, vibrant and well-connected neighbourhood at Redhill Farm.

BBC Headquarters Typhoo Wharf
Dlgbeth, Birmingham
84,000 sq ft

Garden Court
Birmingham
29 Units

Bournbrook Court
Birmingham
35 Apartments

Manor House Drive
Coventry
120 Apartments

Jo Russell
Planning Director

STOFORD

Stacey Green
Planning Manager

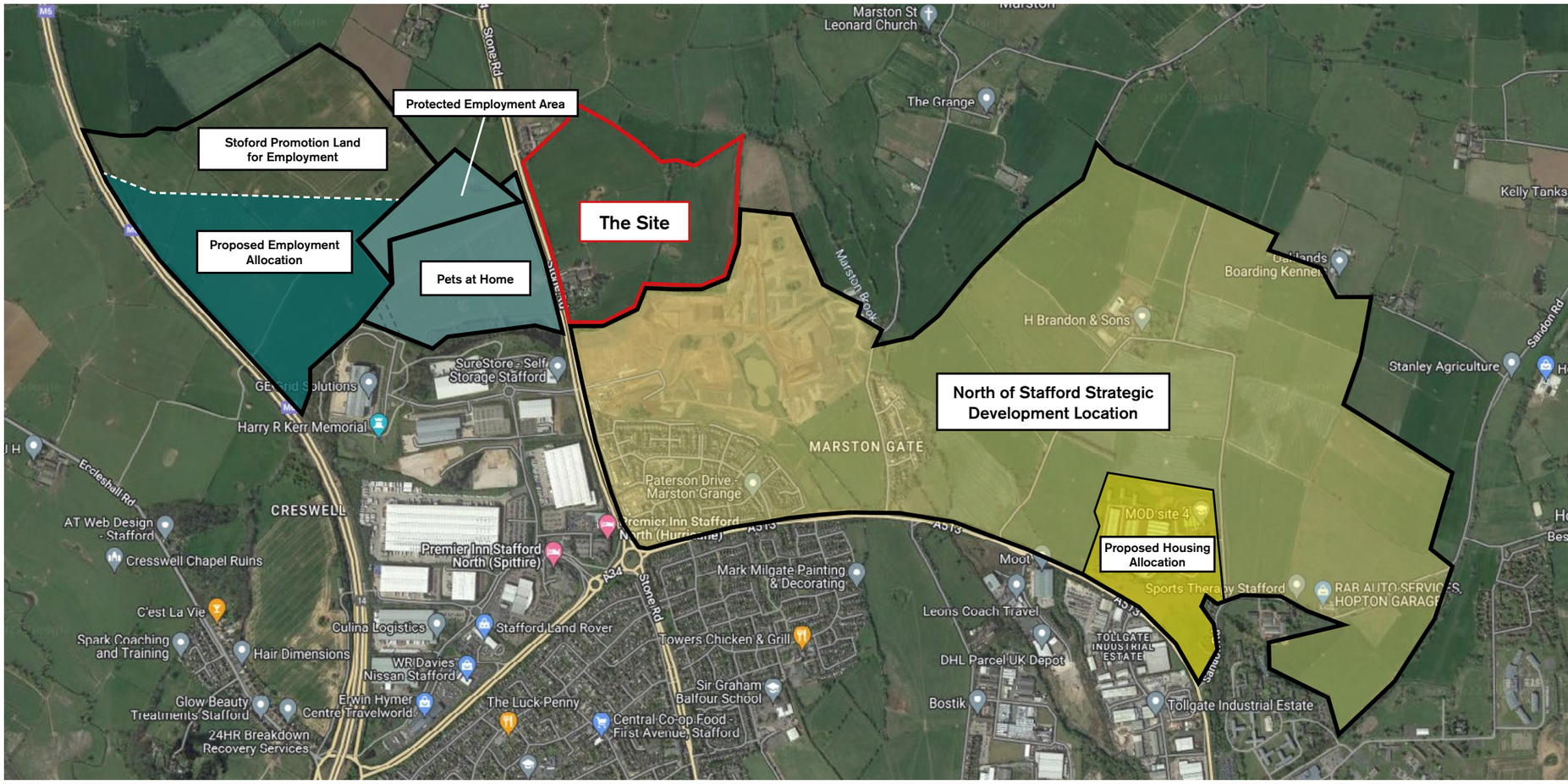
STOFORD

Tony Nash
Development Director

STOFORD

5

LOCAL PLAN & CONTEXT FOR HOUSING GROWTH



Spatial Portrait of North Stafford

Local Plan & Context for Housing Growth

ALLOCATION OF LAND AT REDHILL FARM FOR RESIDENTIAL DEVELOPMENT IS NECESSARY TO STRENGTHEN THE BOROUGH'S HOUSING SUPPLY

We are broadly supportive of the housing requirement set out in Policy 1 of the Preferred Options Local Plan, which outlines that 10,700 new homes will be provided between 2020-2040, equating to an annual average of 535 homes. However, given housing delivery has been on average 609 dwellings per annum for the last eleven years (para 1.1), we do not consider that the Local Plan has gone far enough in terms of addressing the housing needs that the past 11 years of delivery have demonstrated is evident within Stafford.

We consider there is scope to increase the housing requirement and for our site at Redhill Farm to satisfy this need. Our site can also provide an earlier and more effective means of addressing unmet housing need from outside of the Borough.

The settlement strategy of focussing the majority of growth on Stafford is supported albeit we are sceptical about the delivery rates associated with the strategic locations (North Stafford, West Stafford and the new Garden Community at Meecbrook) given progress to date and the reliance of the housing strategy for the Plan being placed on such a small number of sites.

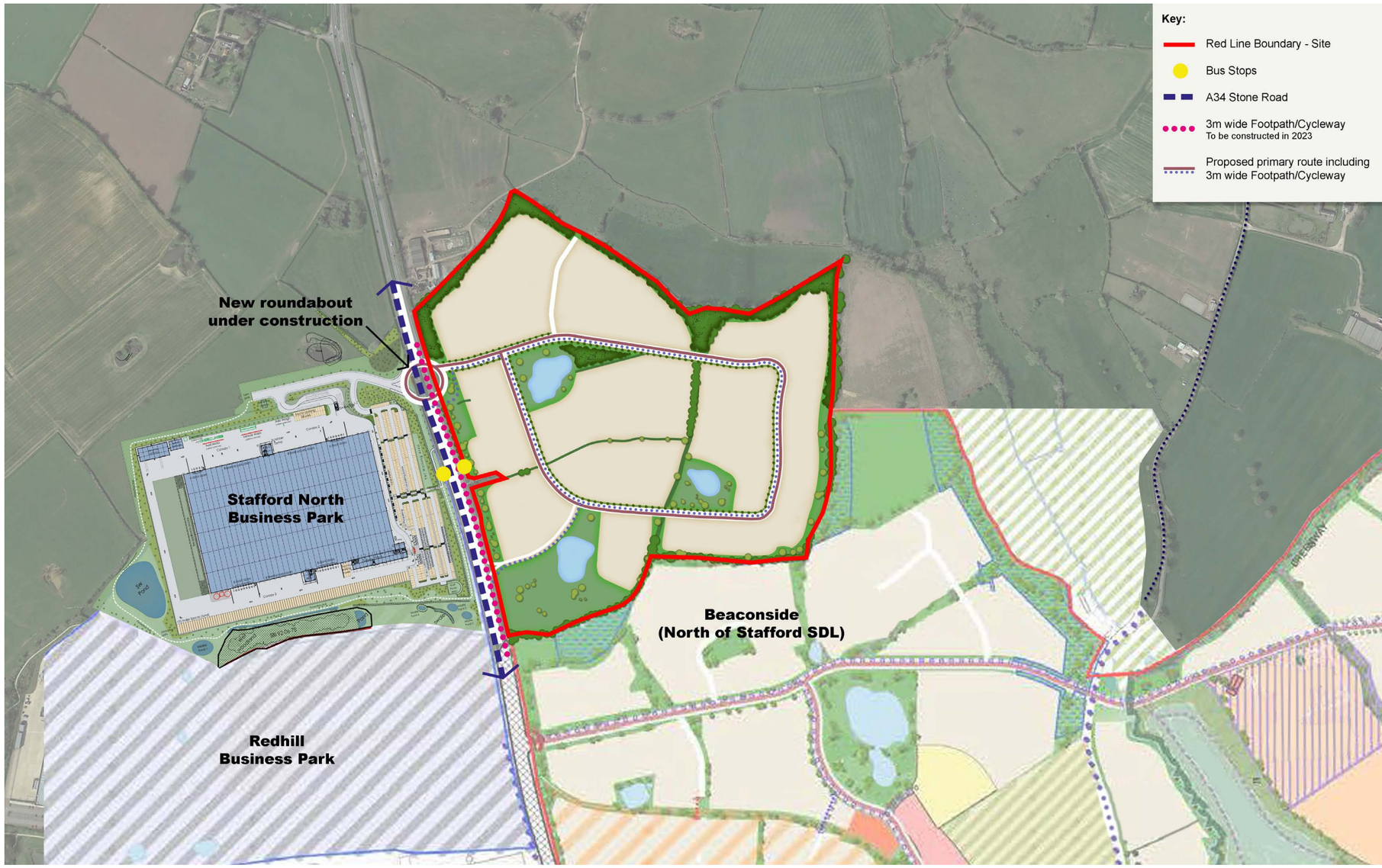
The evidence contained within our accompanying representations conclude that the proposed Meecebrook Garden Village will not deliver 300 homes per annum every year from 2030/31, and as a result the Plan will fall short. Therefore, whilst the Plan appears to allow for a surplus in supply of 1,380 homes this is eroded away as a result of a more realistic rate of delivery at Meecebook (i.e. 160dpa opposed to 300 dpa). The lead-in times suggested by the Council for delivery to commence at Meecebrook are also considered to be insufficient,. In our view, delivery will not commence until 2035/36.

The allocation of our site is necessary to bring forward development in the earlier years of the plan period and plug the gap in housing delivery that an adjusted trajectory of the larger allocations would create. Given that our site is in single ownership and infrastructure ready we can realistically start on site within 3 years and complete the development by 2033/34. A housing trajectory for the site is included at section 10.

Importantly, our site provides land for a primary school, which alongside financial contributions, will provide necessary school places to address a local shortfall. This matter is discussed in detail in the Education Report accompanying our representations.

6

SURROUNDINGS



Context Plan

LAND AT REDHILL FARM

Creating a vibrant & sustainable neighbourhood

December 2022

Land at Redhill Farm is strategically located between the North of Stafford Strategic Development Location and Stafford North Business Park. The residential development of Marston Gate, Beaconside (forming part of North of Stafford Strategic Development Location) is immediately south of the site and currently being constructed.

The proximity of the business park and Stafford town, alongside the proposed A34 pedestrian crossing and the new footpath / cycleway along the A34 reduces the need to travel by car and provides an opportunity to work close to home. The site is within easy reach of the town's services, facilities and transport links, and a further local centre and primary school will be on-site providing the ultimate convenience.

Stafford Railway Station is located within 3 miles, and can be accessed via a footpath cycleway or bus. The route is largely flat. The site offers direct access on to the A34, which benefits from a frequent bus service (no. 101) between Hanley and Stafford railway station. The service is half hourly during peak hours. Two new bus stops are proposed just 40m south of the access roundabout on the A34 and the internal estate road has been designed to accommodate buses and ensure that all residents are within 400 metres of a bus stop. Junction 14 of the M6 motorway is only 1 mile from the site.

LAND USE

The site is in agricultural use, Grade 3 and compromises five medium sized grass fields. There is a farmhouse and related agricultural buildings on the western side of the site, which would be demolished as part of the development.

The land use plan shows how our site would nestle

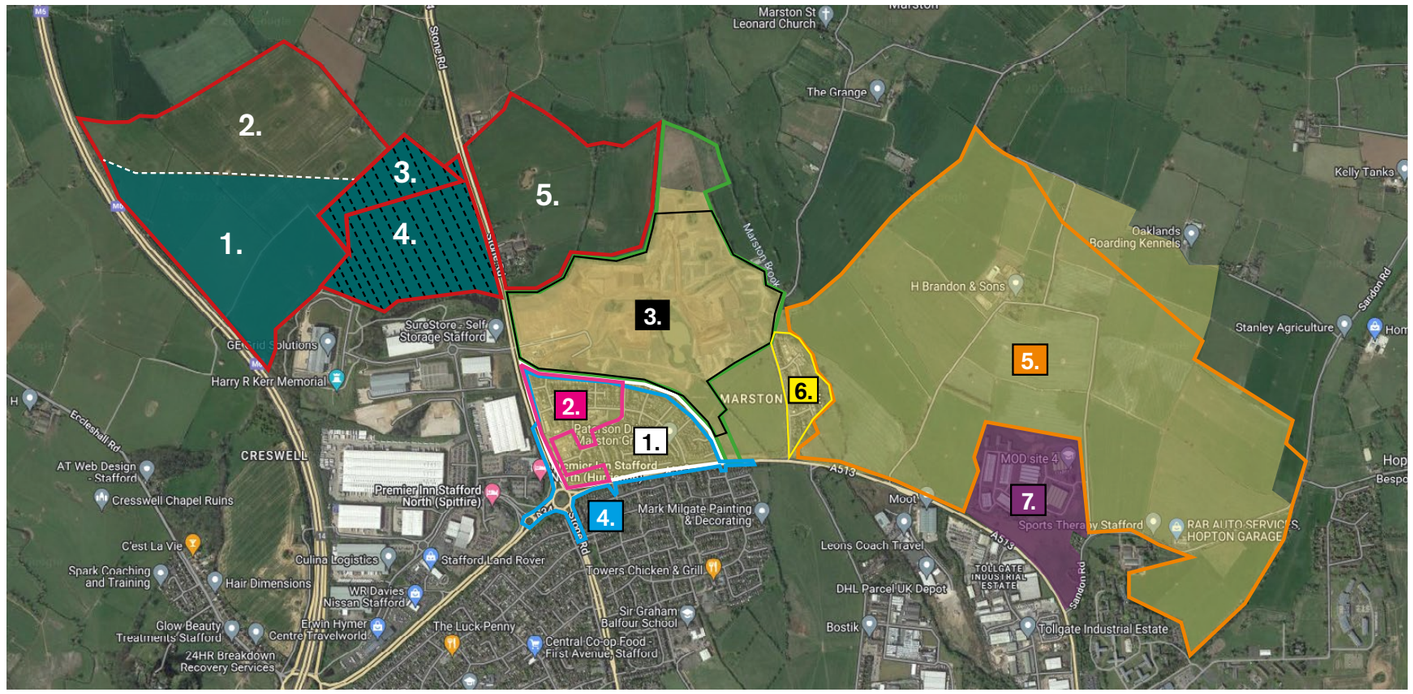
Land edged Red, White Numbering

1.	Draft employment allocation - Land to the North of Redhill (31.15ha) (Stoford/Landowner Agreement)
2.	Stoford promotion land for employment
3.	Protected Employment Area
4.	Pets at Home / Employment Land Commitment
5.	Stoford promotion land for residential development

Strategic Allocation (Adopted)

1.	13/18533/REM - 257 dwellings
2.	14/20781/REM - 152 dwellings
3.	20/32039/REM to outline permission 16/24595/OUT- 700 dwellings
4.	10/13362/OUT - 409 dwellings: 152 dwellings (Reserved Matters 14/200781/REM) and 257 dwellings (Reserved Matters 18533/REM)
5.	16/25450/OUT - 2,000 dwellings
6.	18/28182/REM and 16/24595/OUT - 100 dwellings
7.	Proposed Housing Allocation - 396 dwellings
	North of Stafford Strategic Development Location
	No application

Land Use Plan



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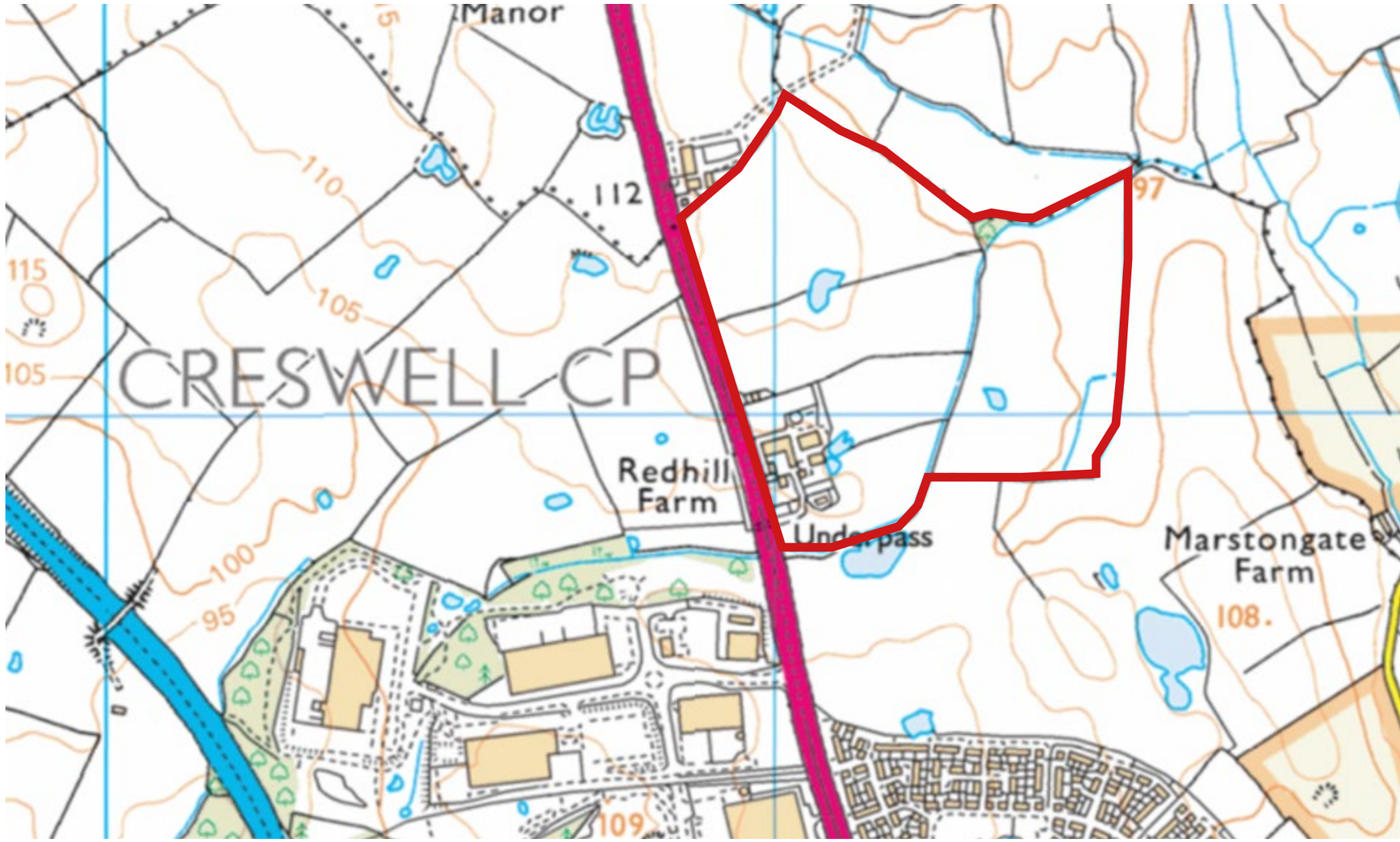
SITE SUITABILITY



Contours Plan

TOPOGRAPHY

The site is largely flat at 105 AOD with a slight rise towards the far northwest corner to 110 AOD. The AOD of the site is comparable with its immediate surroundings including the adjoining North of Stafford Strategic Development Location.

LANDSCAPE SENSITIVITY & CHARACTER

The site is not covered by any statutory environmental designations that might preclude development. It is not within a 'Special Landscape Area, a 'Strategic Gap' or 'Green Belt'.

A Landscape Statement has been prepared which is appended to our Local Plan representations.

In terms of landscape character the report notes that the site is heavily influenced by the residential development to the south, the A34 and Pets at Home building. The Stafford Borough Council Landscape Sensitivity Study (p35) states:

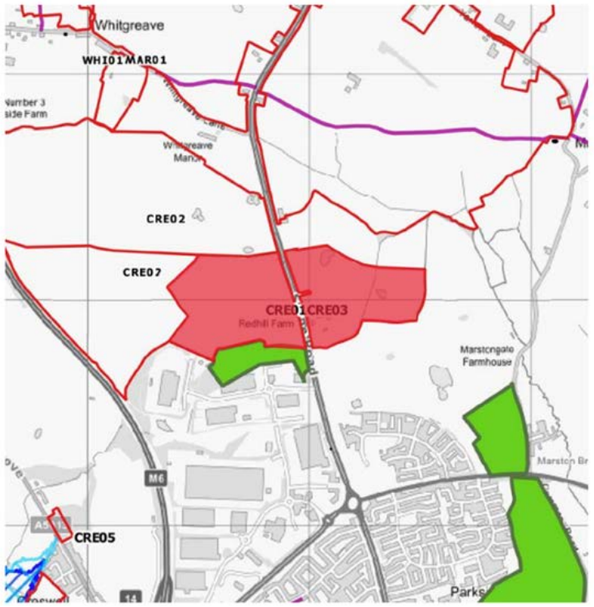
'Site CRE01/03 is considered the least sensitive site within the Strategic Development Site boundary owing in part to its relationship with the existing settlement edge'.

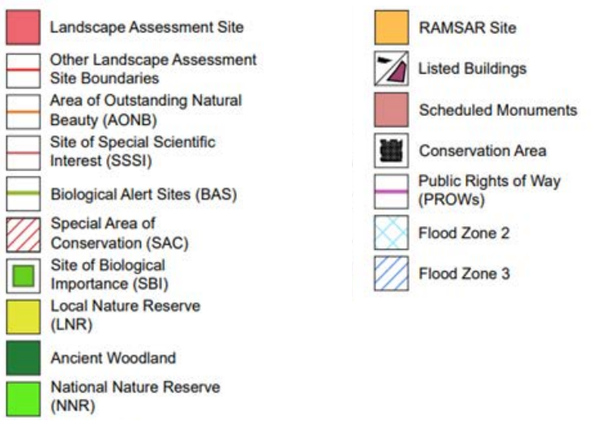
We conclude that the site has moderate landscape sensitivity and low to moderate visual sensitivity owning to the existing neighbouring development forementioned.

Importantly, in terms of landscape capacity, it is considered that the site has high capacity for residential development. It is recommended that the development include significant perimeter planting to the west and north alongside careful siting to minimise impact on existing vegetation and pond features.

The masterplan at section 9, includes extensive buffer zones to the northern and eastern boundaries of the site in order to respond to the more sensitive mid distance residential receptors.

The site has also been carefully designed around the existing vegetation to minimise any loss and all ponds are being retained.





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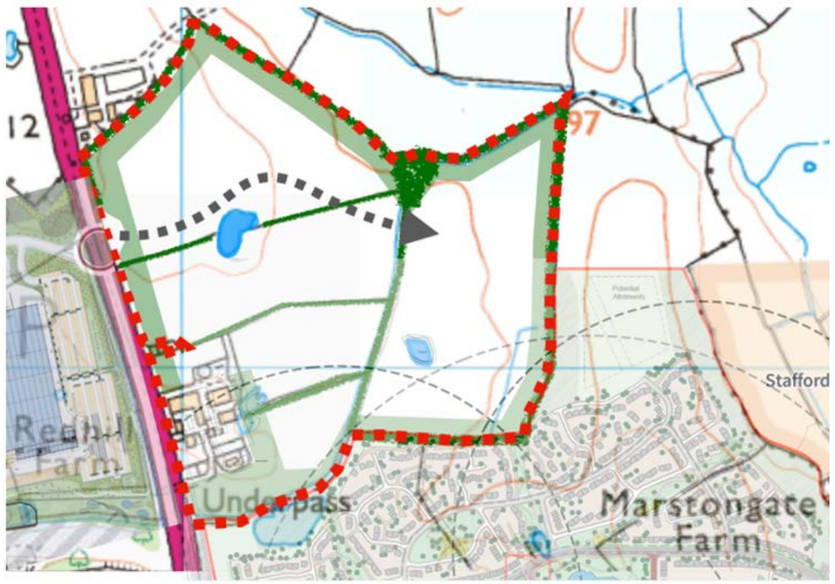
View from within the site looking due south



Landscape framework diagram. Source: Potterton Landscape Statement, November 2022.

TREES

There are some hedgerow trees but no freestanding trees within the site. A small triangular shaped copse is located midway along the northern boundary of the site which adjoins a hawthorn hedge with intermittent trees that runs southwards. The eastern boundary abuts Marston Brook which has typical riparian vegetation in the form of willow and alder along its banks.

There is limited vegetation along the A34 frontage owing to the new A34 roundabout currently under construction.

The proposal ensures that the copse and field hedgerows are retained, maintaining the main field structure with minimal removal to accommodate the internal estate road, footpath and cycleway. Any loss of vegetation would be considered as minimal, and would be substantially mitigated through an extensive scheme of on-site planting and habitat management / offsetting.

BIODIVERSITY

In the Council's 'Site Assessment Profiles (Preferred Options Stage)', the site is considered to have high overall ecological sensitivity given its location within the red risk impact zone for Great Crested Newts; and in the Council's SHELAA 2022, a Site of Biological Importance (SBI), located 30m southwest of the site on the opposite side of the A34 is referred to as being a potential constraint to development.

Ecology Solutions have assessed the suitability of the site for development and provide their advice in an Ecology Statement which is appended to our Local Plan representations. Importantly, the Ecology Statement confirms that the ecological receptors in and around the site do not represent an overriding ecological constraint to the development of the site.

There are no statutory sites in or immediately adjacent to the Site. The closest designated statutory site is Doxey and Tillington Marshes Site of Special Scientific Interest (SSSI) which is located 1.7km to the southwest. Given the intervening distances between the site and SSSI it is unlikely that the site's development would have an adverse impact on the SSSI.

In respect of the SBI on the opposite side of the A34, no direct impacts are considered likely, however the site would appear to be hydrologically linked to the SBI, therefore appropriate safeguards would need to be undertaken during the construction phase, with particular focus on pollution prevention measures, to ensure no adverse impacts occur to this SBI. Stoford have recently delivered the Pets at Home development located immediately next to the SBI. This has been delivered in a sensitive manner which safeguards the SBI and the same precautions would be taken to protect this asset during development of this site, as required.

As referred to above, the Site is located within the red risk impact zone for Great Crested Newts, meaning there is a high likelihood that this species is present within the Site or in adjacent land. In 2020 survey work on the site's ponds was undertaken for the adjacent Pets at Home development. The result of the population class surveys carried out on the three ponds did not record presence of Great Crested Newts. However, we are aware that there remains the possibility that Great Crested Newts may have dispersed into the site since previous survey work was undertaken. We will undertake further survey work to determine the presence, or otherwise of this species in future ecology work.

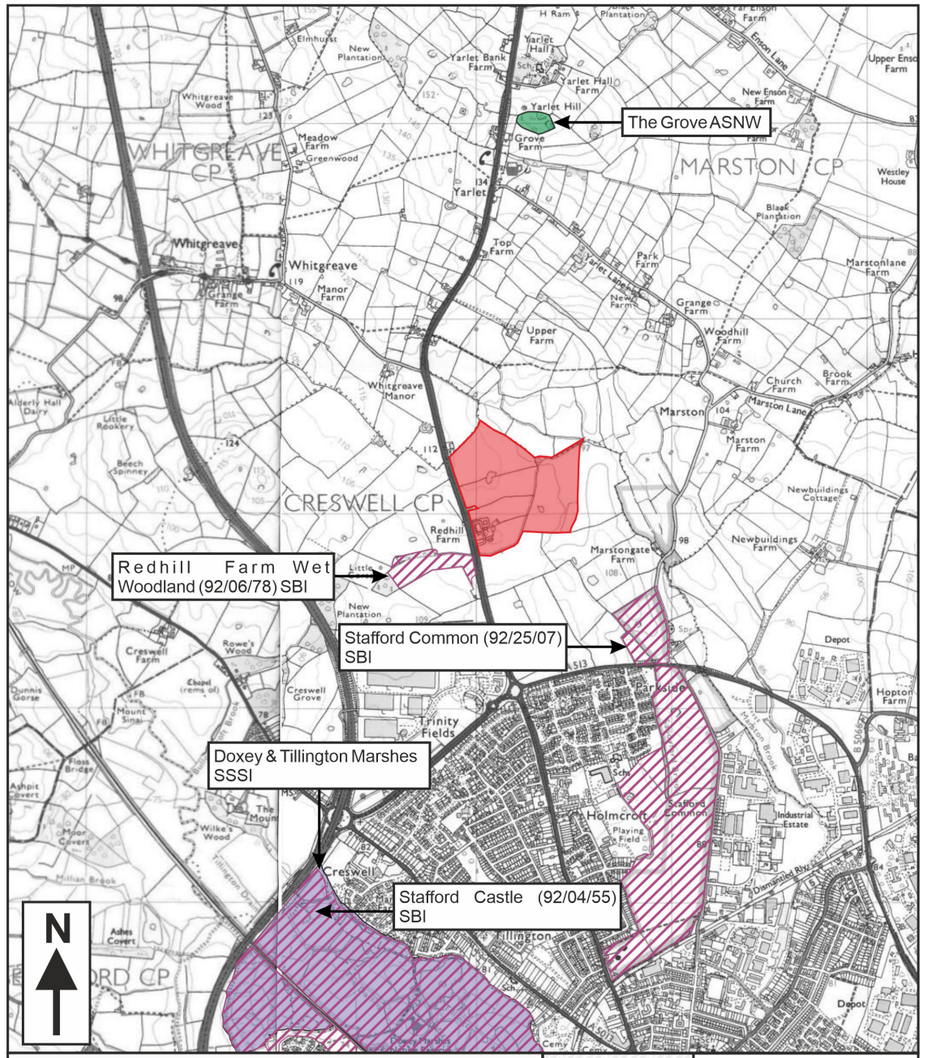
With this said, we importantly note that the presence of Great Crested Newts does not present an overriding ecological constraint, with a number of options available to lawfully facilitate the development of the Site. We are fully committed to the most appropriate mitigation strategy for Great Crested Newts, as may be required.

Our proposals incorporate the existing ponds into its design, allowing for opportunities to be retained, whilst also offering enhancements to these waterbodies to promote usage by Great Crested Newts. Green corridors and hedgerows have been largely retained, bolstered by new landscape planting to maintain dispersal opportunities across the developed site and allow dispersal off-site to any existing populations.

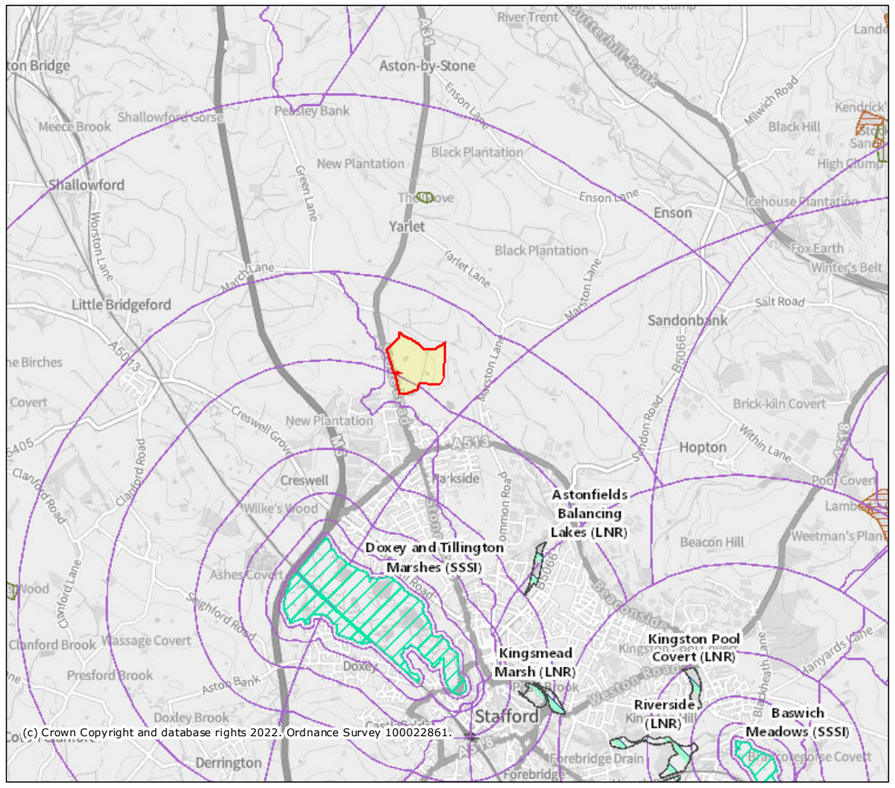
With regards to habitats, the majority of these are likely to be of low ecological value given the intensification of agricultural practices that have been applied to these in the past. The habitats of greater interest are likely to be the hedgerows, albeit for the opportunities they provide wildlife rather than any intrinsic value. As set out at section 9, our proposals have been designed to retain and enhance opportunities for wildlife.

The site is likely to offer some suitability for badgers and bats and limited suitability for reptiles. We will undertake further survey work to determine the use of the site by notable and protected species, but note that the presence of these species, if found, would not represent an overriding ecological constraint on the development of the site. Thus, the site is entirely suitable for residential development and not ecologically constrained.

A full range of ecological surveys will inform our emerging development proposals for the site.



Plan ECO1 - Site Location and Ecological Designations



Appendix 2 from Ecology Statement

TRANSPORT & MOVEMENT

Our highway consultant, BWB have assessed the likelihood of achieving access to the site from the A34 and reviewed the sustainable travel opportunities available. The potential highway impacts of our proposal on the surrounding network, alongside the proposed and consented employment and housing sites in Stafford have also been tested. Full details are provided in BWB's Highway Advice accompanying our representations.

Stoford are delivering a new 3 arm roundabout on the A34 to serve the Pets at Home development, which will be complete in summer 2023. It is proposed that our proposals at Redhill Farm would be primarily accessed via this roundabout. A secondary left in/left out access can also be delivered in addition to serve the site. Hence, suitable vehicular access is achievable.

Stafford North Business Park (Pets at Home) and the Marston Grange developments are delivering several local infrastructure improvements to provide walking, cycling and public transport connections to the associated sites. These improvements make the site entirely suitable for development and will connect future residents to the wider areas of Stafford. The proposed improvements, listed here, are indicatively show on the sustainable travel infrastructure plan.

- A new signal-controlled Toucan crossing on the A34 immediately south of the roundabout (to accommodate both pedestrians and cyclists).
- A 3.5 metres wide shared footway/cycleway along the eastern side of the A34 from the new roundabout south towards the William Bagnall Drive signalcontrolled junction. The footway/cycleway will then extend through the new Marston Grange residential development and connect with the A513 Beaconside.
- A 2 metres wide footway along the western side of the A34 from the new roundabout south towards the William Bagnall Drive junction.
- Signal-controlled crossings on three of the arms at the A34/William Bagnall Drive junction (A34S, residential access and Redhill Business Park access arms).
- Two new bus stops on the A34 approximately 40 metres south of the new roundabout featuring a layby to ensure that traffic is not obstructed by waiting buses.

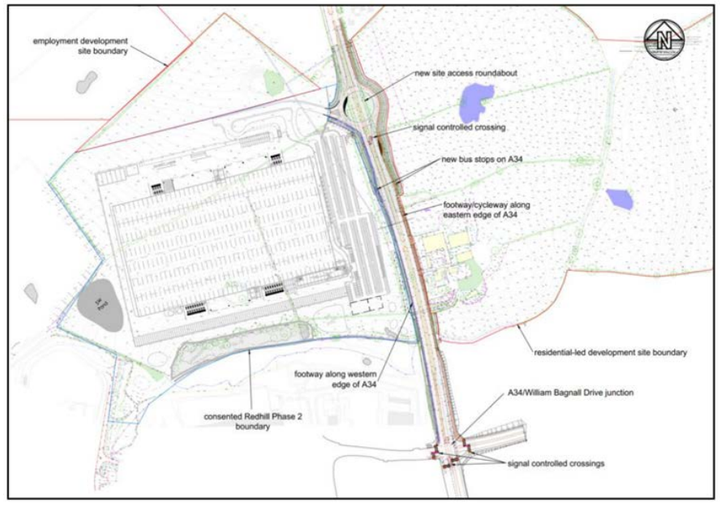
The new bus stops will be served by Route Number 101, which currently travels along the A34 twice per hour in either direction. Route Number 101 provides a connection to Stafford Town Centre (including the railway station), Newcastle-under-Lyme and Hanley (Stoke-on-Trent).

The internal estate road of our development has been designed to accommodate buses and ensure that all residents will be within 400 metres of a bus stop.

To further encourage sustainable travel, the following infrastructure is proposed as part of our proposals:

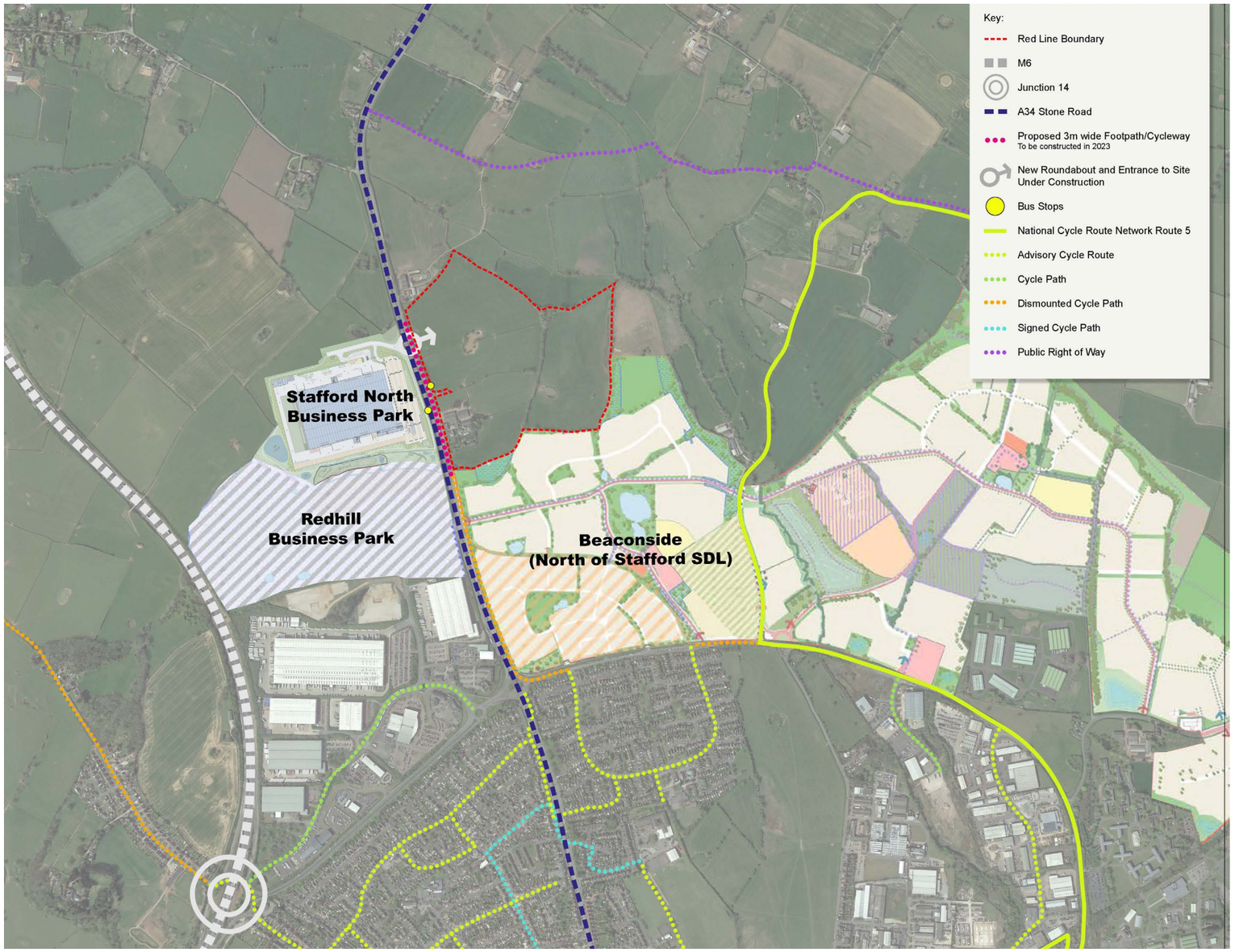
- A new footway/cycleway network within the proposed residential allocation extending from a new connection to the A34 at the southwest corner of the site to the A34 roundabout via an internal spine road.
- Suitable crossing facilities within the site to connect people to the building entrances.

These improvements, alongside those which are consented will encourage active travel and reduce car use.



Consented Sustainable Travel Infrastructure Plan

Movement Plan



HIGHWAY CAPACITY

The junctions along the A34 corridor have been tested for capacity with this proposed residential development, alongside Stoford's proposed employment development west of the A34 in place at a future year of 2040. The results of this work demonstrate that there should be no significant impacts on the existing operation of the highway network that should preclude the site from being allocated in the Local Plan.

In respect of highway capacity, BWB have also considered the effects of the proposed employment site south of Stone Business Park on the A34. It was found that there would be a minimal increase in traffic which would have little effect on the effectiveness of the A34.

Overall, it is concluded that the site is sustainable and the proposed development, alongside other consented and proposed developments in Stafford would not result in any significant highway impacts that could not be mitigated.

HERITAGE

Our Heritage Advisor has assessed the site's historic environment and considered the potential effects of our proposal on this.

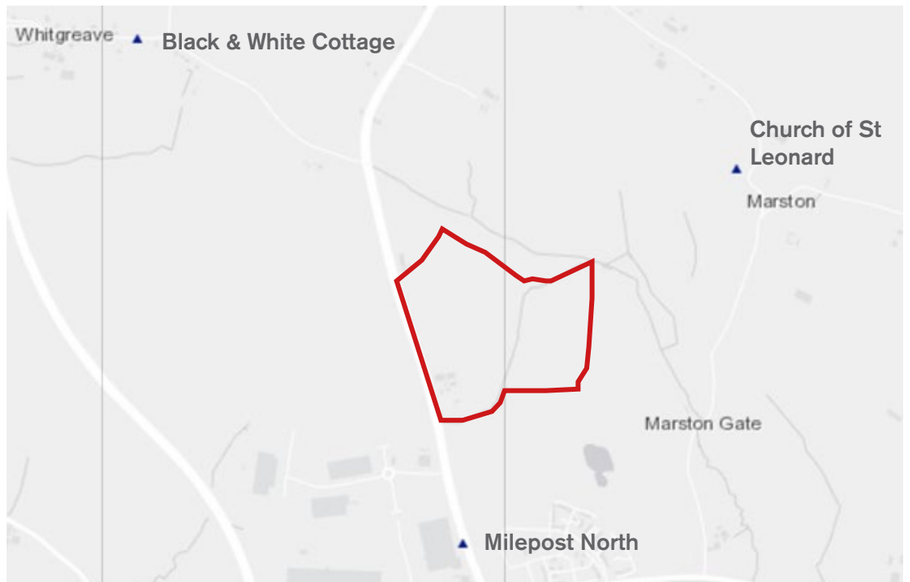
The closest designated heritage asset to the site is a Grade II listed milestone on the west side of the dualled Stone Road several hundred metres to the south west. This small 19th century feature has a limited setting which enhances its significance and would not be affected by change within the site. All other designated heritage assets lie at such a distance that they would not be harmed through change to their setting given distance and context.

Although not designated, Redhill Farm farmhouse within the site is of local heritage interest. This brick building is externally largely unaltered and is likely to be early 19th century in origin. Two ranges of associated ancillary brick buildings lie to the north. However, the buildings' original context has changed considerably through the dualling of the adjacent Stone Road and replacement of some farm structures in the 20th century. The proposed loss of the farmhouse and structures to the north would rate as minor adverse and would need to be weighed against the scheme benefits, as set out for non-designated heritage assets. Historic building recording could be completed ahead of demolition.

The historic landscape of the site is of no special interest and has been compromised by residential development to the south and modern farm buildings at Redhill Farm within and the dualled Stone Road and commercial development beyond the site to the west. As set out in Section 9, the surviving hedgerows are being retained as far as is practical which is beneficial and accords with current policy.

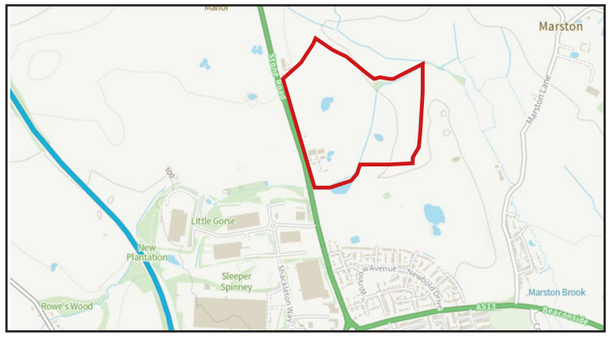
There is no indication of early activity within the site or the wider study area surrounding it. Low potential is indicated by the negative results of fieldwork completed ahead of development in recent decades, with the Pets at Home site to the west subject to geophysical survey and a watching brief, but with nothing of note revealed. In addition, no significant features were identified during investigation of the extensive residential development area south of the site. Thus, the site is considered to have low archaeological potential and there is no indication that the site could not be developed.

Magic Map Plan of Listed Buildings



FLOOD RISK

The Environment Agency Flood Map confirms that the site is located in Flood Zone 1, meaning that the site has the lowest probability of flooding with less than 1 in 1,000 annual probability of river or sea flooding. This is more important than ever since the Borough Council has declared a climate emergency.



Environment Agency Flood Map

The Government's surface water drainage map indicates that the vast majority of the site is at very low risk of surface water flooding and the eastern boundary is at low risk of surface water flooding.

There are 3 existing drainage ponds on the site which will be retained and fully integrated into our proposals. A detailed Flood Risk Assessment and Drainage Strategy would accompany any planning application for the Site and mitigate for any surface water risk and reduce the impact of climate change.

Gov. UK Surface Water Flood Mapping

AIR QUALITY

The proposals will include measures to reduce the reliance on fossil fuel-driven motor vehicles, and through a travel plan, will encourage the use of public transport, cycling and walking. On-plot Electric Vehicle charging points will encourage people to switch to electric vehicles. Our proposals also include extensive green infrastructure provision totalling 9.39ha.

GAS PIPELINE

There is a high-pressure gas pipeline located over 120m north of the site which runs east to west. The inner and middle zones of the site marginally clip the northern edges of the site which do not include residential development. Residential development is proposed in the northern parts of the site that fall within the outer zone, which the HSE's (Health and Safety Executive) planning land use methodology advises to be appropriate. The more sensitive uses comprising the school, nursery, retirement living , local centre and outdoor space have been proposed beyond the outer zone. We will engage with the HSE as our proposals for the site are progressed, however we do not consider the suitability of the site for development is affected by presence of the pipeline, which is outside of the site.

SUSTAINABILITY

Stoford has a proactive approach to sustainability and the creation of sustainable development that maximises the economic, social and environmental benefits of development.

We are committed to using all resources efficiently, as part of the construction and operation of each home on our site in order to achieve net zero carbon operational energy.

Our proposals will incorporate water efficient features and equipment to ensure that each home achieves a maximum water usage of 110 litres per person per day, follows the principles of the energy hierarchy, and maximises opportunities for sustainable design features where feasible (such as rainwater harvesting and greywater recycling, green roofs, and maximising the use of recycled materials).

We are proud that our employment developments are now starting to achieve net zero carbon in operation. At Ellesmere Port, our development for Vauxhall, currently under construction, will achieve this, as will our development at Redditch Gateway.

The Sustainability Statement accompanying our representations to the Local Plan provides more details on how our proposed development can mitigate adverse impacts and target opportunities relating to the environment, economy and society so that an intrinsically sustainable development is delivered.

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OPPORTUNITIES & CONSTRAINTS

Opportunities & Constraints Plan

The site has no environmental constraints and a range of opportunities as evidenced here:

Around 600 new homes, supporting facilities and infrastructure

Direct vehicular access from the new roundabout on A34

Recently upgraded footpath / cyclepath on A34 between the site and Stafford town which we can utilise.

Improved pedestrian accessibility across the A34 to job opportunities at the adjacent business park.

Existing bus services along A34 and potential to divert these through site.

Retention and enhancement of the existing drainage ponds.

Retention of existing hedgerows and trees, and supplemental planting / green infrastructure

Sustainable Urban Drainage and enhancements to biodiversity

Incorporation of children's play equipment

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THE MASTERPLAN

Illustrative Masterplan

ACHIEVING THE VISION - ATTRACTIVE, VIBRANT & SUSTAINABLE

The masterplan for the site has been developed through a comprehensive analysis of its opportunities and constraints to present a scheme that is not only attractive, vibrant and sustainable. The site is suitable, achievable and deliverable.

The main field structure is retained across the site and much of the internal vegetation. With the exception of key access points, all boundary vegetation has been retained and that in the northern and eastern boundaries has been substantially reinforced / enhanced to minimise any impact on the wider landscape.

The school is centrally located within the site providing easy access for all families across the development. It is located on the main spine road with a dedicated footpath / cycleway along its entirety. A footpath has also been included through the southern public park opposite the school to the A34 to provide direct access for families that do not reside on the development.

A public park has been strategically placed next to the school with Local Equipment Area for Play (LEAP) for younger children while the southernmost park provides a Neighbourhood Equipped Area for Play providing play opportunities for older and younger children.

The local centre and retirement living units have been located alongside one another at the entrance of the site to facilitate easy access for older persons to the on-site convenience facilities. This location also provides a more convenient opportunity for older persons to access bus services on the A34.

The local centre can also benefit local employees from the adjacent business park who have the option to walk or cycle to these across the proposed pedestrian crossing.

Overall, the masterplan is robust and deliverable, with movement, landscape, ecology, heritage and archaeology all technically tested and fully supported.

In summary the following features are provided:

Around 600 new homes across a range of dwelling sizes and tenures to cater for different household sizes. This range will also allow for variety within the proposed street-scape

The development achieves an average net density of approximately 37.5 dwellings per hectare (dph) based on an assumed net development area. This allows for variation in density across the development including a higher density at the centre of the site, fronting the main internal estate road and lower densities towards the rural edge. Overall, the density results in the efficient use of the site whilst at the same time being appropriate to the local area, thereby helping to assimilate the development into the surrounding areas.

A mix of house types including homes for retirement living.

Community facilities including a local centre with convenience retail, nursery and 2ha of land for a primary school

Sustainable walking and cycling routes throughout the development

Three public parks totalling 4.47ha, two of which include a range of children's play equipment

Substantial green infrastructure, sustainable drainage and ecological enhancement

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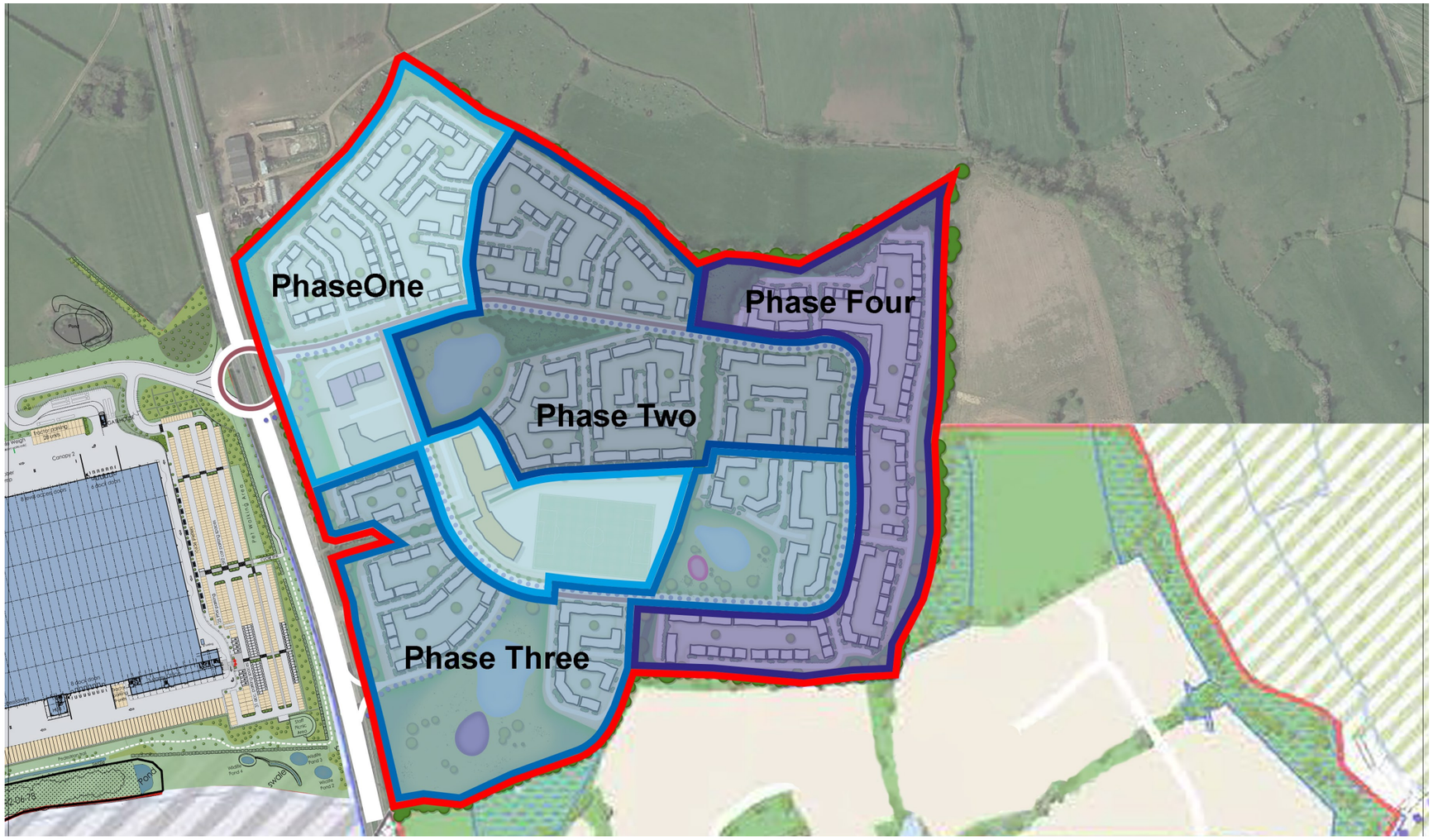
PHASING PLAN

Given that the site is infrastructure ready we are confident that the site can deliver early in the Plan Period and be complete within 10 years of a consent



Phasing Plan

SITE TRAJECTORY

With a planning consent approved in 2023/24 we propose that the site could deliver 40 homes in its first year (2025/26) and start delivering 70 homes per year, from two outlets, from 2026/27. The development would be complete by 2034.

2023 / 2024	2024 / 2025	2025 / 2026	2026 / 2027	2027 / 2028	2028 / 2029	2029 / 2030	2030 / 2031	2031 / 2032	2032 / 2033	2033 / 2034
Planning consent	Discharge conditions / enabling works	40	70	70	70	70	70	70	70	70
Totals			110	180	250	320	390	460	530	600

11

SUMMARY

Land at Redhill Farm provides a compelling opportunity for a sustainable addition to the local community.

Provides a logical extension to Beaconside (North of Stafford Strategic Development Location)

Promotes and extends the range and quality of local facilities for Stafford, including convenience retail and a primary school

Is located within walking distance of job opportunities.

Is accessible by bus and cycle to the town centre and railway station

Creates a significant amount of new public open space, play opportunities, and biodiversity enhancements, positively contributing to the health and well-being of existing and new residents..

[redacted]

[redacted]

[redacted]

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Meecebrook

Review of new passenger station proposals

5th December 2022

intermodality
transport strategy & delivery

Document history

Date	Version	Issued to	Status	Quantity	Format	Approved
01/12/2022	1	Client	Draft	1	PDF	NTG
02/12/2022	2	Client	Draft	1	PDF	NTG
05/12/2022	3	Client	FINAL	1	PDF	NTG

This document contains the expression of the professional opinion of Intermodal Solutions Limited (Intermodality) as to the matters set out herein, using its professional judgment and reasonable care. It is to be read in the context of the Agreement between Intermodality and Richborough Estates Ltd (the "Client"), and the methodology, procedures and techniques used, Intermodality's assumptions, and the circumstances and constraints under which its mandate was performed. This document is written solely for the purpose stated in the Agreement and for the sole and exclusive benefit of the Client, whose remedies are limited to those set out in the Agreement. This document is meant to be read as a whole and sections or parts thereof should thus not be read or relied upon out of context.

Intermodality has, in preparing any cost estimates, followed methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgement and reasonable care, and is thus of the opinion that there is a probability that actual costs will fall within the specified error margin. However, no warranty should be implied as to the accuracy of estimates. Unless expressly stated otherwise, assumptions, data and information supplied by, or gathered from other sources (including the Client, other consultants, testing laboratories and equipment suppliers etc.) upon which Intermodality's opinion as set out herein is based has not been verified by Intermodality; Intermodality therefore makes no representation as to its accuracy and disclaims all liability with respect thereto.

Intermodality disclaims any liability to the Client and to third parties in respect of the publication, reference, quoting, or distribution of this report or any of its contents to and reliance thereon by any third party.

Contents

1 Introduction

1.1 Scope of this report

1.1.1 Stafford Borough Council (SBC) is promoting a new Garden Community settlement at Meecebrook. SBC describe the site as lying approximately 6km west of the market town of Stone, in Staffordshire and near to the villages of Eccleshall, Swynnerton and Yarnfield. The M6 motorway runs east of the site, along with the HS2 line. The West Coast Main Line and Stafford to Manchester Railway Line, via Stoke-on-Trent, form part of the extensive railway network surrounding the site, with the closest station located in Stone.[1] The new Garden Community would include around 6,000 homes, employment space and community facilities. This will also include infrastructure needed to support the homes like GP and health provision, sustainable travel, and a new West Coast mainline railway station. Meecebrook Garden Community will be considered as part of the Council's Local Plan 2020-2040 process, with 3,000 new homes and necessary infrastructure to be delivered by 2040, and a further 3,000 new homes beyond 2040.[2]

1.1.2 Intermodality has been commissioned by a consortium of developers and land promoters, comprising Richborough Estates Ltd, Bloor Homes Ltd, Bellway Homes Ltd and Stoford Developments Ltd, to review the Council's proposals for the new station on the West Coast Main Line (WCML).

[1] Meecebrook Garden Community Leaflet, page 2
[2] https://www.staffordbc.gov.uk/meecebrook-new-garden-settlement

2 Development of new station proposals

2.1 Network Rail guidance

2.1.1 Network Rail (NR) is the licenced, regulated manager of the national rail network. Any new station proposal on the national rail network will require engagement with, and approval of, Network Rail. Network Rail's licence obligations require it to be confident that when schemes are completed, they can be operated and maintained safely, reliably, efficiently and cost effectively.[3]

2.1.2 In its guide to investment in new stations, Network Rail states (our highlighting):

> The Investment in Stations Guidance is for use by any organisation which is interested in investing in station facilities. Such promoters would typically include **local authorities**, private developers, regional bodies and community rail partnerships. The guidance aims to ensure that such investment returns the maximum benefit to the investor and to passengers and other station users.
>
> New Stations: A Guide for Promoters was originally published by the Strategic Rail Authority (SRA) in 2004. Following significant changes in the structure of the rail industry and the winding up of the SRA, Network Rail published a revised document Investment in Stations: A guide for promoters and developers in 2008. An update was published in 2011 to accompany the Network RUS: Stations published in the same year. This 2017 version retains the core guidance offered in the 2011 edition. Updates have been made to structure and content based on feedback from stakeholders:
>
> - The document has been updated to take account of changes to legislation, policy and standards;
> - **Greater emphasis is placed on the requirement that schemes be value for money, fit with industry plans, have an affordable whole life cost, and minimise disruption to the operational railway**;
> - The document has been restructured to guide promoters clearly through key considerations for the initial development of a scheme.
>
> The key considerations discussed are as follows:
>
> - An option selection process should be carried out in order to establish that the option selected is the most effective means of achieving the promoter's objectives;
> - **Engagement with both the local train operating company (TOC) or companies, the Station Facility Owner (SFO) and Network Rail is vital as they can advise the promoter as to the potential operational and financial viability of a proposal for station investment at an early stage;**
> - **Enhancement of existing station facilities should generally be the first option considered for station investment as it is likely to minimise disruption and adverse operational impacts on the railway**. Consideration should be given to relocating an existing station or the opening of a new station where enhancement does not meet the scheme's objectives or there are additional benefits associated with these options. **However, station relocation or the addition of a new station to the network is likely to cause disruption and will only be possible where operational constraints allow**;

[3] Investment in Stations, A guide for promoters and developers, Network Rail June 2017, page 17

- The timescale for construction of a new station is generally, on average, two years from start to finish. Significant time before this is required to develop and approve a proposal;
- Any proposed investment needs to demonstrate a positive impact for passengers and the existing railway network. For example, a new station needs to serve a new market and provide links to origins and destinations which would be desirable to potential passengers **without substantial disadvantages such as longer journey times for existing passengers**. This positive impact should be demonstrated in a WebTag compliant business case;
- Investment proposals must consider government objectives for the relevant route and the Long Term Planning Process (LTPP) which is the rail industry's plan to 2043. **Proposals which have impacts conflicting with industry strategy are unlikely to secure industry support**;
- Proposed investment should consider other recent and planned investments in stations and the rail network. A programme of planned investment may provide a good or even a one-off opportunity for coordinated third party investment in station facilities. Conversely, the relocation of a station which has recently seen substantial investment or **the opening of a new station on a section of line that has had journey time improvements is unlikely to offer benefit to the railway**;
- When station investment is partially or wholly funded by the Department for Transport (DfT) or Transport Scotland (TS) from a ring fenced fund, or is under a commercial framework to administer DfT or TS funding, the investment should be targeted to meet the conditions of that funding. These may include revenue return to the DfT or TS, generation of new revenue streams, passenger satisfaction improvement measurement through passenger survey Key Performance Indicators (KPIs) or other specific objectives.[4]

2.1.3 Network Rail then summarises the process for preparing a proposal for a new station:

In order to show how the above objectives will be achieved by investing in a station the proposal will need to:

- Identify the nature of the local transport challenges being faced;
- Determine the different transport options that could be adopted;
- Understand the existing and future market for rail travel;
- Demonstrate why a rail based enhancement is most appropriate as part of a package of enhancements or on its own;
- Evaluate which of the potential options for rail investment is appropriate; consideration should be given to rolling stock and timetabling solutions which for some objectives may offer better value for money than investment in a station;
- Consider the impact of the proposed option on the operation of the railway;
- Consider how the proposed option fits with industry strategy and objectives.[5]

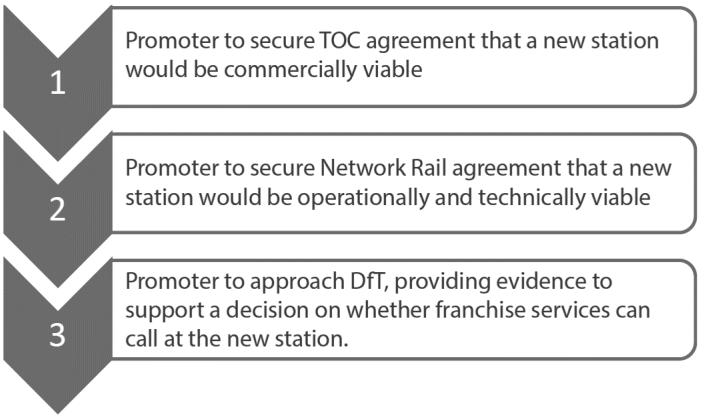
2.1.4 Throughout the document, Network Rail stresses the importance of early engagement with the rail industry on proposals for new stations, stating:

[4] Pages 3-4
[5] Page 5

A Train Operating Company (TOC) must support the provision of services to the new station and early engagement with TOCs is essential to any proposal.[6]

Without a positive business case a scheme will not be taken forward for consideration by railway industry stakeholders. The railway industry encourages promoters to have early discussions with the contacts identified in chapter 8 to establish the likely viability of proposals and for guidance in preparing a business case. It is vital that rail industry bodies are consulted as early as possible in the development of a proposal for investment in a station. Network Rail and the relevant TOC(s) will be able to gauge the potential viability of a scheme from the outset. They can also provide specific local advice and guidance on operational considerations which must be taken into account in order to develop a successful proposal, and information on any enhancements or changes to service patterns already planned at the station. The diagram below sets out the early steps promoters should take in developing a proposal for a new station.[7]

Figure 1 Early steps for promoters of new stations (source Network Rail)



Operational and performance issues need to be considered at the inception stage of the project and early engagement with Network Rail and TOCs is recommended to establish scheme feasibility. It is important that a proposal for a new station is developed with cognisance of the current and planned service pattern on the route and of existing infrastructure constraints. Engagement with Network Rail is advisable in these cases as they may be able to provide an early view of forthcoming Route Study recommendations.

Having established whether there is a fit with the industry planning framework, a promoter will also need to form an early view as to the appropriate service pattern at the new station. This would include the practicality of stopping all or just some of the existing services at the new station, or of introducing new services to serve the facility. The views of the relevant franchising authority should be sought.[8]

[6] Page 6
[7] Page 7
[8] Page 13

Early engagement with the rail industry is indispensable to ensure that proposals for station enhancements or new stations can be developed successfully. Network Rail's route-based Strategic Planning teams act as the first point of contact for promoters. Where Network Rail is involved in the proposed enhancement, Network Rail's Strategic Planning teams will work with developers and local authorities on the scheme throughout the feasibility processes and planning stages.[9]

As the day to day operators of stations, TOCs have invaluable knowledge about the needs of their customers and the issues that need to be addressed. They are a key party to any changes that are proposed and should be involved in any proposal from an early stage.[10]

Early dialogue with industry parties is essential as they can assist promoters in working through these requirements and in some cases take the lead to ensure that certain requirements are met.[11]

2.1.5 In addition to Network Rail, the Department for Transport (DfT) will in turn expect to receive an initial Strategic Outline Business Case (SOBC) for the new station, as with other station projects being developed or promoted in recent years (see Table below). This also highlights the range of lead times involved in delivering new stations:

Table 1 Examples of recent station SOBC

Site	First proposed	SOBC	BCR	Opening date
Old Oak (London)[12]	2010	2017	3.5	2030
Magor and Undy (South Wales)[13]	2013	2018	1.7	None at present
Worcestershire Parkway[14]	2006	2014	3.3 – 3.6	2020
Cambridge South[15]	2017	2021	1.9	2025
Darlaston and Willenhall stations (West Midlands)[16]	2017	2021	4.7 – 6.5	2023

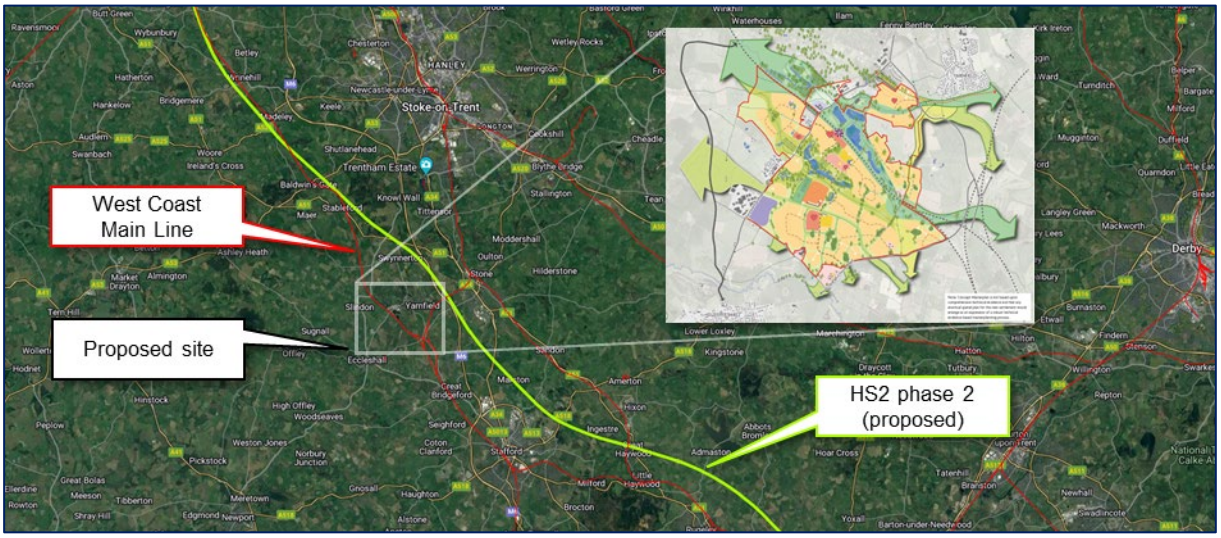
[9] Page 17
[10] Page 20
[11] Page 21
https://www.whatdotheyknow.com/request/599394/response/1427134/attach/3/FINAL%20Old%20Oak%20Overground%20Stations%20Consolidated%20SOBC%202017%20Full%20Document.pdf?cookie_passthrough=1
[13] http://magorstation.co.uk/wp-content/uploads/2020/06/Magor-and-Undy-Station-SOBC-revB.pdf
[14] http://e-planning.worcestershire.gov.uk/swift/apas/run/WCHDISPLAYMEDIA.showImage?theSeqNo=15526&theApnkey=848&theModule=1
[15] https://sacuksprodnrdigital0001.blob.core.windows.net/twao-cambridge-south-infrastructure-enhancements/Cambridge%20South%20station%20OBC/Cambridge%20South%20Outline%20Business%20Case.pdf
[16] https://governance.wmca.org.uk/documents/s5126/Report.pdf

3 The proposed site

3.1 Location

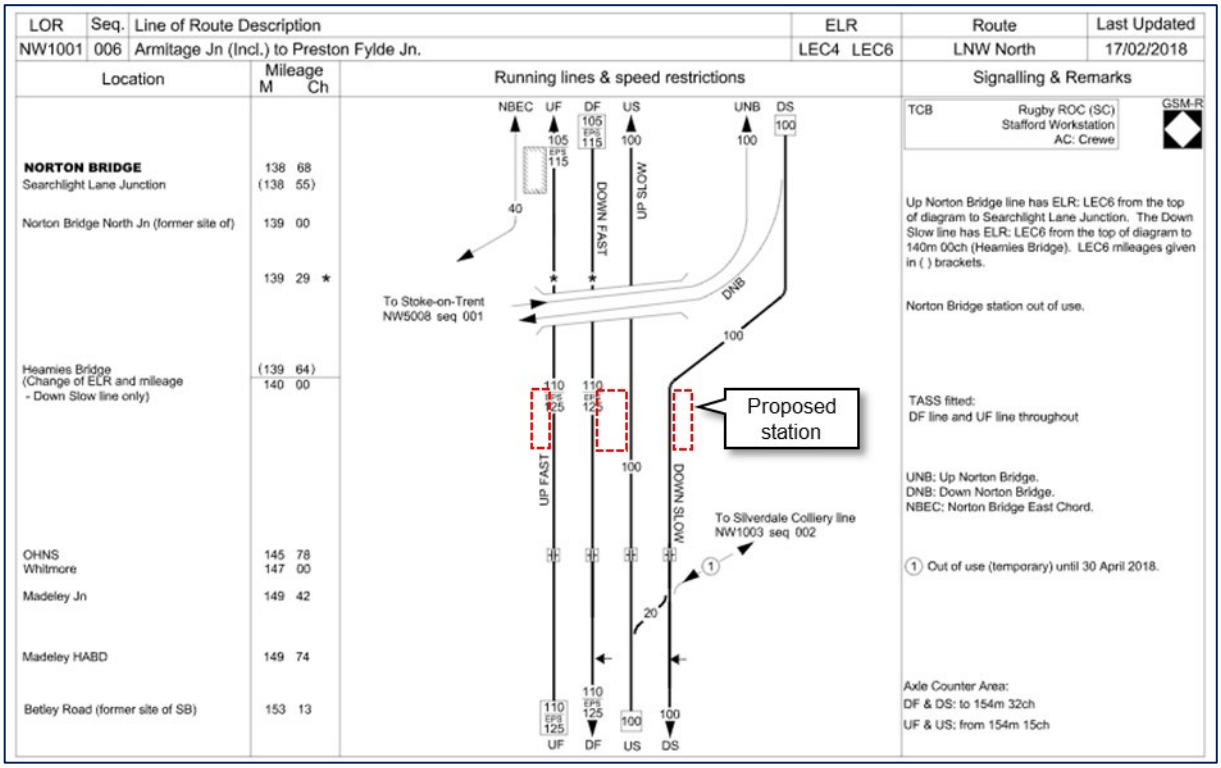
3.1.1 The location of the site relative to the West Coast Main Line (WCML) is shown in the Figure below:

Figure 2 Location plan



3.1.2 The site is located immediately to the north of Norton Bridge Junction, a major grade-separated intersection of the WCML between the routes to Crewe, Stafford and Stoke-on-Trent respectively:

Figure 3 Site location (source Network Rail Sectional Appendix, north to bottom of picture)



3.1.3 The proposed location is a four-track main line, with trains passing the site at speeds of up to 100-125mph. It is also worth noting that the track layout has two running lines for "fast" services at 110-125mph linespeed on the eastern side of the formation (left on the above Figure) and two running lines for "slow" services on the western side of the formation (right on the above Figure). The feasibility studies undertaken for SBC (see next section) assume that new platforms would be needed to enable trains to call at the station on the fast lines when the slow lines are closed for engineering and vice versa. This would require major works to (and disruption of) the entire WCML, to separate the fast and slow lines to allow the insertion of a new island platform and outer platforms, as indicated in the Figure above.

3.2 West Coast Main Line current traffic levels

3.2.1 The WCML falls within Network Rail's North West & Central (NW&C) route, described as follows:

> NW&C is the 'Backbone of Britain' – the economic spine linking our main cities. We connect workers with jobs, people with loved ones and goods to market.
>
> Our infrastructure runs from London Euston and Marylebone in the south through the Chiltern and West Midlands regions, the North West of England and Cumbria before joining with Scotland at Gretna. We are home to the West Coast Main Line, the busiest mixed-use railway in Europe, serving London, Birmingham, Manchester, Liverpool, Edinburgh and Glasgow.
>
> In the five years to 2024, passenger demand is set to grow by 12% and freight by 18%. Major railway upgrade schemes to cater for this growth include HS2, East West Rail, Midlands Rail Hub and the Great North Rail Project.
>
> - 246.5 million annual rail passenger journeys;
>
> - 1.3 million passengers travel through this region each weekday;
>
> - 6,724 passenger and freight services per day;
>
> - 700,000 tonnes of freight is moved each week.[17]

3.2.2 With regard to the section of the WCML south of Crewe, Network Rail further notes:

> The West Coast South route stretches from the south of Crewe to London Euston. It carries millions of passengers and up to 10% of freight traffic a year.
>
> It's also the busiest mixed-use railway in Europe, forming Anglo-Scottish journeys between London, Glasgow and Edinburgh via the West Midlands and North West, as well as providing commuter links direct to the capital through Hertfordshire, Northamptonshire and Buckinghamshire.
>
> This piece of track is the main route for electrified freight trains which helps to remove lorries from the roads and will contribute to the UK's ambition to reach net zero carbon emissions by 2050.[18]

[17] https://www.networkrail.co.uk/running-the-railway/our-regions/north-west-and-central/
[18] https://www.networkrail.co.uk/running-the-railway/our-routes/west-coast-mainline-south/

3.2.3 The latest (December 2022) working timetable (WTT) shows over 500 trains passing the site every 24 hours, split almost 50:50 between passenger and freight, with a train passing the site of the new residential community every 3 minutes throughout the day and night, including 2,400 tonne aggregate trains, 775m long intermodal trains and 125mph high-speed passenger trains.[19] This level of intensity and variety of rail traffic creates major challenges for developing any new station on this section of the WCML, not least the knock-on effects to existing passenger and freight services of introducing an additional station stop within the timetable.

3.2.4 Even with the proposed construction of phase 2 of HS2 (see below), the WCML is already expected to see additional growth in traffic for passenger and freight, the latter boosted by new developments such as the West Midlands Interchange project under construction to the south of Meecebrook, at Four Ashes in Staffordshire, which will have capacity to generate up to 10 new freight trains per day onto the WCML.[20]

3.3 West Coast Main Line journey time improvements

3.3.1 The WCML has been the subject of a series of major route upgrades to improve capacity and capability over the last 20 years. The first phase of the upgrade, south of Manchester, opened in 2004 delivering journey time improvements of 1 hour 21 minutes for London to Birmingham and 2 hours 6 minutes for London to Manchester. A second phase, introducing 125 mph running along most of the line, opened in December 2005, bringing the fastest journey between London and Glasgow from 5 hours 10 minutes to 4 hours 25 mins. Substantial further works were undertaken, including quadrupling of the track in the Trent Valley, upgrading the slow lines, remodelling track and signalling through Nuneaton, Stafford, Rugby, Milton Keynes and Coventry stations, which was completed in late 2008. A £250 million project to grade-separate the tracks at Norton Bridge, which allowed for increased service frequency as well as improved line-speeds, was completed in 2016.

3.3.2 We are not aware of the Meecebrook station proposals ever being considered within any of these route upgrades, Network Rail noting in its new station guidance (see previous section) that "the opening of a new station on a section of line that has had journey time improvements is unlikely to offer benefit to the railway."

3.4 West Coast Main Line route strategy

3.4.1 Network Rail's specification of, and plans for, the WCML are set out in its 2021 Route Specification document.[21] Network Rail makes no reference to proposals for a new station at Meecebrook.

3.5 HS2

3.5.1 Phase 2a would extend the new high speed railway line north west to the proposed Crewe Hub station from the northern extremity of Phase 1 (London to West Midlands) north of Lichfield. Phase 2a was approved by the House of Commons in July 2019, and received Royal Assent on 11 February 2021. Construction of phase 2a will be in parallel with Phase 1, HS2 suggesting that services will begin operating between London, Birmingham and Crewe between 2029 and 2033.[22]

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[19] Source Network Rail (realtimetrains.co.uk website)
[20] https://news.railbusinessdaily.com/west-midlands-interchange-is-set-to-boost-local-jobs-and-the-economy/
[21] Delivering a better railway for a better Britain Route Specifications 2021 North West and Central (NW&C) region, Network Rail
[22] https://www.hs2.org.uk/the-route/west-midlands-to-crewe/

4 Meecebrook station feasibility studies

4.1 Reports produced to date

4.1.1 Reports produced to date include:

- Meecebrook Garden Community Transport Strategy, July 2020 (Atkins);
- Pre-Feasibility Report V0.1, March 2022 (SLC Rail);
- Feasibility Report v1.0, July 2022, updating work in the March 2022 report (SLC Rail).

4.2 July 2020 Atkins report

4.2.1 Notably, the Atkins report assumed a much higher level of development (around 10,000 homes[23]) than currently proposed.

4.2.2 The main findings of the 2020 report related to the station included:

- Overall, it was found that the additional trips on the external highway network as a result of trips from Meecebrook Garden Community would still have a major impact even with the new railway station, and therefore potential mitigation solutions would need to be considered, including
  - Highway mitigation measures along existing corridors or junctions to improve the existing highway capacity;
  - An additional motorway junction to provide additional access to the SRN; or
  - The promotion of alternative sustainable modes of transport to reduce car dependency;[24]
- It is understood that Staffordshire County Council (SCC) are engaging with Network Rail regarding the potential to deliver a new railway station on the West Coast Mainline;[25]
- Stafford Borough has good rail connectivity and is served by the West Coast Main Line with existing railway stations located at Stone, Stafford and Stoke-on-Trent. It is important to note that the proposed alignment of HS2 runs to the north of the site. It is proposed that Stoke will become an 'integrated high-speed station' where passengers can travel on classic-compatible HS2 trains and access the high-speed network to the South.[26]

[23] Page 4 section 1.1
[24] Page 7, 24
[25] Page 8
[26] Page 8

4.3 July 2022 SLC report

Demand modelling

4.3.1 SLC draws on an appended analysis by SYSTRA to conclude that once Meecebrook is fully built there is a prospect of station revenue generating a medium level of value for money (BCR 1.5). To set this in context, the Department for Transport's "WebTAG" categorisation of projects defines "medium" value for money as a BCR of between 1.5 and 2.0, so the case for the new station would be at the lower end of this range.

4.3.2 It is also important to note here the assumption in the demand forecasting that the new station would be open by 2026 (an optimistic assumption, given the time stations can take to plan, secure approval / funding and construct, see Table 1), but to achieve a viable position the entire 6,000 homes would need to have been delivered.

4.3.3 This is an important point to note, as SBC suggest an initial phase of 3,000 new homes and necessary infrastructure to be delivered by 2040, and a further 3,000 new homes beyond 2040, the implication being (assuming the Council's lead-in times and delivery rates of 300 dwellings per annum) that 6,000 homes could take until beyond 2050 to deliver. In the interim, SYSTRA has previously noted, in a separate analysis of another proposed settlement and station in Bedfordshire on behalf of the local planning authority, that:

> The development, in isolation of any other new settlement development options, will allocate 4,500 dwellings, **below the 5,000 dwellings considered the indicative benchmark for considering the construction of a new railway station**.[27]

4.3.4 It is also worth noting that SYSTRA forecast that a new station would abstract customers from existing stations of 4,423 per annum in 2026 (assumed first year of opening, 4 years before the delivery of any houses on site) to 9,936 in 2040 (end of Local Plan Period).[28] SYSTRA further note in this regard:

> The number of passengers lost from existing services [14,000 in 2026 to 31,000 in 2040] is fairly significant compared to station trip generation in 2026. However, by 2040, after full development build out this is far less significant.[29]

4.3.5 This level of abstraction from existing stations and services (which would be assumed to increase further beyond 2040) would be one of the key considerations by TOCs, Network Rail and DfT in determining the acceptability of the new station proposals. In the short term, the implication is that the new station, in a remote location devoid of any development, would then abstract passengers from existing stations, diverting highway trips into the local area.

4.3.6 SYSTRA conclude the analysis that:

> Our analysis has shown that that station is predicted to generate medium value for money. However, this is entirely dependent on the delivery of development surrounding the station.[30]

4.3.7 SYSTRA then reiterate later in the document that:

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[27] Sharnbrook Railway Station Initial Transport Feasibility, SYSTRA for Bedford Council
[28] Page 13 of SYSTRA report
[29] Page 14 of SYSTRA report
[30] Page 9 of SYSTRA report

> Delivering a station at Meecebrook is predicted to deliver Medium value for money. However, this is heavily dependent on the delivery of the adjacent Garden Village development.[31]

Train Service Planning

4.3.8 SLC conclude that there is a reasonable prospect of achieving a train frequency of two trains per hour at the station, albeit noting that HS2 introduces a level of complexity in developing a future train plan specification.

4.3.9 These conclusions draw on supporting appended work by Rail Aspects, which sets out the context in terms of current traffic levels and utilisation of the WCML, stating:

> The Stafford-Crewe section of the WCML is intensively utilised, although the segregation of Fast Lines and Slow Lines combined with the recent grade-separation of the junction at Norton Bridge provide some flexibility with the principal constraints being either side of Crewe, where the four-track alignment narrows to a three-or two-track alignment.
>
> South of Stafford, the Trent Valley is a 2-track railway between Milford Jn. and Colwich Jn., then reverts to 4-track except for a short distance south of Nuneaton.
>
> The route between Stafford and Wolverhampton is, by the current standards of the railway network, relatively lightly utilised with only six trains passing in each direction in most hours. Further to the south, this route becomes increasingly congested through Wolverhampton and at Birmingham New Street and the service is sufficiently intensive throughout the day that it is very difficult to find flexibility in train paths.
>
> Onwards towards Liverpool, the route is fairly congested with a mixture of high-speed, regional and local services, although with some flexibility around individual train paths.
>
> In summary, retiming of services to accommodate a station call at Meecebrook would probably need to take place away from Birmingham New Street and the WCML South, and also minimise any impact on high-profile, high-speed services on the WCML.[32]

4.3.10 An important point to note from the Rail Aspect report is the need for new platforms serving both the fast and slow lines on the WCML, the report stating:

> Provision of station calls at Meecebrook is highly likely to require provision of a 4-platform station, i.e. platforms on the Fast Lines and on the Slow Lines. Although it would probably be possible to arrange for the majority of weekday stopping services to be timetabled on the Slow Lines, this would not be possible on Sundays owing to engineering access restrictions. It is also considered likely that services planned via the Slow Lines will be regularly run via the Fast Lines during periods of disrupted running, as a service recovery measure.[33]

4.3.11 The Rail Aspect report notes potential issues with the signalling and operation of services through any new station:

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[31] Page 19 of SYSTRA report

[32] Page 6 of Rail Aspect Report
[33] Page 2 of Rail Aspect Report

> Local signalling is designed for high speed non-stop services, with block lengths of 1100m to 1400m (Figure 2) and the planning headway in the immediate vicinity is 3 minutes between following train services (up to a maximum of 13 trains per hour on the Fast Lines).
>
> Consequently, it should be assumed that the current signalling would not be ideally suited to stopping of services within the signal blocks.
>
> However, given the relatively anticipated level of service, together with the flexibility offered by the 4-track configuration, any alterations to existing signalling are considered likely to be necessary only if it is required to run consecutive stopping services at close headways or if the location of existing signals conflicts with other engineering considerations such as the location of station platforms.

4.3.12 In terms the performance impact on other services, the Rail Aspect report states (our highlighting):

> Introduction of the station calls within the existing service would likely have some performance implications, particularly in the form of risk of knock-on delays to other train services, **as the route is congested, especially towards Liverpool, and towards Wolverhampton and Birmingham**. These risks have not been quantified but are considered unlikely to be severe enough to prevent further development of the scheme at this stage.[34]
>
> It is inevitable, when inserting additional station calls in existing services, that some level of performance risk is incurred. It is noted that the WMT London Northwestern service groups have recently performed below Operator target performance levels, and any proposals to modify the service are likely to have some degree of sensitivity around potential performance impacts.
>
> In this case, the specific risks would be increases in "1st Order" reactionary delays along the Stafford-Crewe corridor and potentially on towards Rugby, Birmingham and Crewe, i.e. faster trains being delayed by the stopping services. "2nd Order" reactionary delays, i.e. outbound services delayed by late arrival of the inbound service might also be a risk, in particular at Liverpool (see Section 8.3) and Birmingham New Street where some splitting and joining of services takes place.
>
> Avanti West Coast have stated an objective of running a second hourly Euston-Liverpool path. Details of this service are not yet available; there is some risk that this would further complicate adjustments to the timetable.
>
> Aside from performance risks, there may be complexities in the detail of retiming of services either locally (for example, diverting from the Fast to the Slow line) or more widely (for example, rigid timetable structures in the Liverpool area) that are not apparent from this initial overview. [35]

4.3.13 The situation post-HS2 is also referenced by Rail Aspect, which notes (our highlighting):

> Once Phase 2a is open between Birmingham and Crewe, high speed services are expected to operate from London Euston via HS2 and Crewe Hub, to Glasgow, Edinburgh, Manchester, Liverpool and North Wales using classic-compatible high speed rolling stock.

[34] Page 2 of Rail Aspect Report
[35] Pages 11 and 12 of Rail Aspect Report

In theory, this will remove most long-distance high-speed traffic from the WCML south of Crewe; **however, it appears likely that at least some paths will be retained to maintain connectivity with intermediate stations** such as Milton Keynes, Rugby, Coventry, Wolverhampton, the Trent Valley stations and Stafford. As end-to-end journey times will become less sensitive, it is also possible that these paths will be regularised, e.g. adding additional calls at Milton Keynes or Stafford, for example.

This would offer improved journey times from these locations whilst also reducing constraints on capacity on the Stafford-Crewe section, either by reducing the number of required paths or by increasing the flexibility of remaining paths (possibly also opening up the potential to introduce calls at Meecebrook in residual train services).

However, constraints on other routes (Crewe to/from Liverpool in particular, and between Wolverhampton and Birmingham to some extent) would probably remain in place post-HS2.

4.3.14 In terms of industry engagement, Rail Aspect confirm that no industry engagement was undertaken at the time of writing, noting that Train Operating Companies (TOCs), Freight Operating Companies (FOCs) and Network Rail will need to be engaged at the earliest opportunity.[36]

4.3.15 Rail Aspect concludes that:

Based on the analysis that has been conducted, and assuming a timetable baseline equivalent to the December 2019 (pre-COVID) service specification, station calls at Meecebrook could be accommodated in at least one of the two existing twice-hourly West Midlands Trains services between Liverpool Lime Street and Birmingham New Street/London Euston, by means of timing adjustments to these services and without undue consequences.

Insertion of calls in other passing services (predominantly Avanti West Coast high speed services) is likely to prove more problematic and has not been investigated in depth at this stage.[37]

4.4 Station location, value-for-money and Strategic Case

4.4.1 SLC conclude in the Executive Summary that:

- A potentially viable location has been identified;
- A good prospect of obtaining an acceptable BCR;
- A proposed methodology to make the strategic case is defined, although the summary table indicates that work on the strategic case was yet to be completed.

4.4.2 SLC appear to have undertaken a considerable amount of work, covering technical disciplines and topics typically associated with, involving or led by Network Rail, but without any evidence of Network Rail (or wider industry) involvement in developing, reviewing or validating this work.

4.4.3 Of the options considered, SLC indicate the North Option to be preferable, within the context of the main risk and cost drivers identified as follows:

[36] Page 12 of Rail Aspect Report
[37] Page 1 of Rail Aspect Report

> The main risk and cost drivers for this option are associated with the signalling modifications required to accommodate the station, as the existing signals are too far away (and obstructed by structures) to be visible from the platform ends. Early engagement with Network Rail's Signalling Project Engineer (PE) and Route Asset Manager (RAM) is therefore critical to the success of this option.
>
> In addition, the Network Rail RRAP [Road-Rail maintenance vehicle Access Point] will need to be relocated to accommodate the new platform, however as the existing RRAP and access route is located fully within the boundaries of the current development masterplan, it is assumed that this relocation will be feasible and some change to the RRAP will be required as part of the development masterplan, regardless of the station project going ahead.[38]

4.4.4 In terms of costs, SLC suggest the base cost for the North Option to be £34.1m, plus risk allowance of 60%, totalling £54.6m, SLC noting these exclude the significant recent increase in construction costs.[39] This differs from the assumption used in the SYSTRA report of £39.99m plus Optimism Bias, market price conversion and inflation totalling £102.6m, almost twice that assumed by SLC.[40]

4.4.5 The reports do not explain how the difference between station / farebox income and the significant upfront investment costs, or annual operating costs (£200,000 excluding Optimism Bias of up to 41%[41]) would be covered in the period between 2026 and the mid-2050s when the development achieves the critical mass needed to deliver a viable business case.

4.5 Rail industry engagement

4.5.1 As with the Network Rail guidance set out in Section 2 earlier, the SLC report makes repeated references for the need to engage with the wider rail industry, but there is no evidence that the local authorities have engaged with Network Rail, TOCs, FOCs, the Rail Delivery Group, the Rail Freight Group, or the Department for Transport.

4.5.2 This lack of engagement is highlighted by a recent (October 2022) Freedom of Information request made to Network Rail asking for confirmation of whether a new station had been agreed with SBC and what stage the proposals had reached.[42] Network Rail responded (see Appendix) stating that (our highlighting):

> 1) Please confirm if a new West Coast Mainline station has been agreed.
>
> **We have not made any agreements relating to a new station at Meecebrook. As mentioned above, our planners are carrying out work to assess the long-term impact of some new station proposals on the West Coast South route, but this work is not looking at developing the case for, or the deliverability of, a new station at Meecebrook in the short-to-medium term.**
>
> 2) If it has not been agreed, what stage are proposals at?
>
> **There are currently no Network Rail proposals for a station at Meecebrook and our planners have advised that they have not been consulted with directly by Stafford Borough Council or Staffordshire County Council on this subject.**

[38] Page 31 of the Feasibility Report
[39] Page 18 of Feasibility report
[40] Page 16 of SYSTRA report
[41] Page 17 of SYSTRA report
[42] https://www.whatdotheyknow.com/request/meecebrook_claims_regarding_new

3) What would be the approximate total cost of a new station?

We are unable to advise on this point, as Network Rail has not assessed this.

4) Who would pay for this?

Again, we are unable to advise as we do not have any specific proposals for Meecebrook.

5) Does a new development on greenfield (instead of brownfield) fit with the Network Rail environmental strategy?

As we have not been involved in any proposals, this is not something Network Rail has looked at.

5 Conclusions

5.1 The case for a new station at Meecebrook

5.1.1 The pre-feasibility and feasibility studies, and our assessment of the technical work, highlight several key issues and areas of risk in developing a brand new, multi-platform station on the WCML, including:

- The intensity of current rail services on the WCML, the 'Backbone of Britain', the busiest mixed-use railway in Europe with a nationally-significant role for moving passengers and freight;
- A series of major upgrades to the WCML have been undertaken in recent years to improve capability and reduce journey times, including a major grade-separated junction at Norton Bridge, but without any provision being made in the previous or current strategy for any new station at Meecebrook;
- Engineering access on the WCML, which shuts either the fast or slow lines passing the site, would necessitate a 4-platform station to be constructed for network operational reasons, but which would not otherwise be justified commercially, adding substantially to the complexity, cost and risk of delivering the station, relative to the size of the adjacent development which would need to fund and sustain it;
- Current signalling not being suitable in capacity or location to accommodate a new station, and as such adding to the complexity, cost and risk of delivering the project, in terms of new and altered signalling;
- A new station would abstract demand and revenue from existing stations;
- The need for the entire development to be completed (which might not occur for another 30 years) in order to generate sufficient critical mass of demand, with no indication in the reports on how / who would cover the financial losses in the intervening period;
- The ability to fund and deliver rail enhancements in the current climate, SLC noting recently that:

> Covid-19 and its multiple impacts on ways and places of work, demand for rail travel, government funding of railway services and future enhancements, and some resultant semi-permanent service reductions, including a number affecting Worcestershire.
>
> The collapse of rail passenger demand during the COVID lockdown from March 23rd 2020 not only required substantial funding support from government for the maintenance of services but challenged industry thinking and evidencing of future network development given its impact upon ways of working, locations of work, commuting and leisure travel, and hence of the nature of train services and connectivity that may be required in a post-COVID future.[43]

- The conclusion from Atkins that, even if the station were to be delivered, the development would still generate considerable levels of highway trips, requiring further mitigation measures;[44]
- The conclusion of SLC that the station business case would achieve a BCR of 1.5, at the low end of the range for "medium" value for money.

[43] Worcestershire Draft Rail Investment Strategy 2 2022 to 2050, SLC Rail for Worcestershire County Council, July 2022, pages 3 and 9
[44] Atkins report page 7, 24

5.1.2 Even setting aside these challenges, the fundamental concern with the conception of the proposals for a new station at Meecebrook is the apparent complete lack of early (or any) engagement with the rail industry, especially with Network Rail as the licenced, regulated manager of the national rail network. Network Rail's licence obligations require it to be confident that when schemes are completed, they can be operated and maintained safely, reliably, efficiently and cost effectively. Network Rail's guidance clearly and repeatedly states the need for, and benefits of, early engagement with industry, including TOCs, FOCs, DfT and other industry stakeholders

5.1.3 The WCML is one of the busiest routes in Britain, therefore demonstrating a compelling business case, in operational or commercial terms, will be particularly challenging. The post-COVID environment, with the substantial structural reductions in travel, farebox income and investment, means the value-for-money threshold for new stations across the network will now be set even higher, as promoters chase reduced public funding.

5.1.4 This creates a major concern with the viability of the proposed new station, given that the level of development needed to achieve (at best) a medium level of value-for-money would not be in place before the mid-2050's at the earliest, but with a scheme that assumes a station would be fully operational (with all investment and operating costs then covered) within the next 4 years. It is a major concern that the work to date does not explain how the significant upfront investment costs (£54-103m, which as SLC note does not factor in the significant recent increases in construction costs) or operating costs (£200,000 per annum excluding Optimism Bias of up to 41%) would be covered in the period between 2026 and the mid-2050s.

5.1.5 Having progressed early-stage multi-disciplinary feasibility work in the post-COVID rail sector, for a multi-platform station serving and affecting all four fast and slow lines of the 100-125mph WCML, with associated performance and capacity risks to over 500 existing passenger and freight services per day, without any early-stage engagement with Network Rail or wider industry stakeholders, clearly conflicts with the industry guidance (and the conclusions of the reports commissioned by SBC to date). The suggested merits and deliverability of the proposed new station therefore carry little or no weight in the absence of a review and validation by Network Rail and the wider rail industry stakeholders.

5.1.6 Based on our experience with the planning and implementation of major rail-related developments, we would have expected to see evidence of the station proposals being worked up to at least Engineering Stage 2 of Network Rail's governance for assessing new projects (Project Acceleration in a Controlled Environment or PACE), backed by a Basic Services Agreement (BSA) between SBC and Network Rail, within which a multi-disciplinary feasibility study would be undertaken jointly by the parties, with Network Rail providing a Commercial Scheme Sponsor to manage the process.

5.1.7 A critical initial component in this work would be a capability study, to determine to the satisfaction of Network Rail (and/or the TOCs/FOCs) the ability to path existing passenger services through any new station without importing unacceptable performance risk, as determined by Network Rail through its quality assurance process.

5.1.8 In the absence of such engagement, with reference to Network Rail's published guidance for new stations, the following limited conclusions can be drawn:

Table 2 Alignment of Meecebrook station proposals against NR guidance

Guidance	Current status
Greater emphasis is placed on the requirement that schemes be value for money, fit with industry plans, have an affordable whole life cost, and minimise disruption to the operational railway	A good prospect of obtaining an acceptable BCR provided entire development is built Construction and operation would bring disruption to all four WCML running lines
Option selection process to be undertaken	Limited assessment without industry engagement
Engagement with both the local train operating company (TOC) or companies, the Station Facility Owner (SFO) and Network Rail is vital as they can advise the promoter as to the potential operational and financial viability of a proposal for station investment at an early stage;	None to date as confirmed in writing by Network Rail
Enhancement of existing station facilities should generally be the first option considered for station investment as it is likely to minimise disruption and adverse operational impacts on the railway.	Not considered
Consideration should be given to relocating an existing station or the opening of a new station where enhancement does not meet the scheme's objectives or there are additional benefits associated with these options. However, station relocation or the addition of a new station to the network is likely to cause disruption and will only be possible where operational constraints allow	Relocation not considered Proposed addition of a new station Construction and operation would bring disruption to all four WCML running lines
The timescale for construction of a new station is generally, on average, two years from start to finish. Significant time before this is required to develop and approve a proposal	Reports produced in 2022 assume opening in 2026
Any proposed investment needs to demonstrate a positive impact for passengers and the existing railway network. For example, a new station needs to serve a new market and provide links to origins and destinations which would be desirable to potential passengers without substantial disadvantages such as longer journey times for existing passengers. This positive impact should be demonstrated in a WebTag compliant business case;	Limited assessment without industry engagement
Investment proposals must consider government objectives for the relevant route and the Long Term Planning Process (LTPP) which is the rail industry's plan to 2043. Proposals which have impacts conflicting with industry strategy are unlikely to secure industry support	Not referenced in Network Rail's Route Specification No evidence provided on LTPP alignment or other industry strategies
Proposed investment should consider other recent and planned investments in stations and the rail network. A programme of planned investment may provide a good or even a one-off opportunity for coordinated third party investment in station facilities. Conversely, the relocation of a station which has recently seen substantial investment or the opening of a new station on a section of line that has had journey time improvements is unlikely to offer benefit to the railway;	No evidence provided of wider synergies beyond HS2 The new station would be on a section of the WCML which has had substantial journey time improvements in recent years, but without any cognisance or provision for a new station
When station investment is partially or wholly funded by DfT from a ring fenced fund, or is under a commercial framework to administer DfT funding, the investment should be targeted to meet the conditions of that funding. These may include revenue return to the DfT, generation of new revenue streams, passenger satisfaction improvement measurement	Limited assessment without industry engagement

Guidance	Current status
through passenger survey Key Performance Indicators (KPIs) or other specific objectives	
Identify the nature of the local transport challenges being faced	Limited assessment without industry engagement
Identify the nature of the local transport challenges being faced	Limited assessment without industry engagement
Determine the different transport options that could be adopted	Limited assessment without industry engagement
Determine the different transport options that could be adopted	Limited assessment without industry engagement
Understand the existing and future market for rail travel	Limited assessment without industry engagement
Demonstrate why a rail based enhancement is most appropriate as part of a package of enhancements or on its own	Limited assessment without industry engagement
Demonstrate why a rail based enhancement is most appropriate as part of a package of enhancements or on its own	Limited assessment without industry engagement
Evaluate which of the potential options for rail investment is appropriate; consideration should be given to rolling stock and timetabling solutions which for some objectives may offer better value for money than investment in a station	Limited assessment without industry engagement
Consider the impact of the proposed option on the operation of the railway	Limited assessment without industry engagement
Consider how the proposed option fits with industry strategy and objectives.	No assessment
A Train Operating Company (TOC) must support the provision of services to the new station and early engagement with TOCs is essential to any proposal.	No engagement
Without a positive business case a scheme will not be taken forward for consideration by railway industry stakeholders. The railway industry encourages promoters to have early discussions to establish the likely viability of proposals and for guidance in preparing a business case. It is vital that rail industry bodies are consulted as early as possible in the development of a proposal for investment in a station. Network Rail and the relevant TOC(s) will be able to gauge the potential viability of a scheme from the outset. They can also provide specific local advice and guidance on operational considerations which must be taken into account in order to develop a successful proposal, and information on any enhancements or changes to service patterns already planned at the station.	No engagement
Operational and performance issues need to be considered at the inception stage of the project and early engagement with Network Rail and TOCs is recommended to establish scheme feasibility. It is important that a proposal for a new station is developed with cognisance of the current and planned service pattern on the route and of existing infrastructure constraints. Engagement with Network Rail is advisable in these cases as they may be able to provide an early view of forthcoming Route Study recommendations	Limited assessment without industry engagement
Having established whether there is a fit with the industry planning framework, a promoter will also need to form an early view as to the appropriate service pattern at the new	Limited assessment without industry engagement

Guidance	Current status
station. This would include the practicality of stopping all or just some of the existing services at the new station, or of introducing new services to serve the facility. The views of the relevant franchising authority should be sought	
Early engagement with the rail industry is indispensable to ensure that proposals for station enhancements or new stations can be developed successfully. Network Rail's route-based Strategic Planning teams act as the first point of contact for promoters. Where Network Rail is involved in the proposed enhancement, Network Rail's Strategic Planning teams will work with developers and local authorities on the scheme throughout the feasibility processes and planning stages.	None
As the day to day operators of stations, TOCs have invaluable knowledge about the needs of their customers and the issues that need to be addressed. They are a key party to any changes that are proposed and should be involved in any proposal from an early stage.	Limited assessment without industry engagement
Early dialogue with industry parties is essential as they can assist promoters in working through these requirements and in some cases take the lead to ensure that certain requirements are met.	None

5.1.9 As recommended by the Council's own advisers, the merits, deliverability and acceptability of the proposed new station can therefore only be confirmed with proper input from Network Rail, at least up to Engineering Stage 2 of the company's PACE corporate governance for assessing new stations, as well as input from other key stakeholders, including but not limited to:

- Passenger Train Operating Companies (TOCs), not least West Midlands Trains (London Northwestern Railway subsidiary), Avanti West Coast, CrossCountry, Caledonian Sleeper, Locomotive Services, West Coast Railways, Rail Operations Group and SLC Rail Operations;
- Rail Freight Operating Companies (FOCs), namely Colas Rail, DB Cargo, DC Rail, DRS, Freightliner, GB Railfreight and Varamis Rail;
- Rail Delivery Group and the Rail Freight Group;
- Department for Transport;
- Office of Rail & Road.

Appendix

Appendix A **Freedom of Information response from Network Rail**

Source: https://www.whatdotheyknow.com/request/meecebrook_claims_regarding_new

[redacted]

By email: request-906118-c2ae0023@whatdotheyknow.com

[redacted]

31 October 2022

Dear [redacted]

Information request
Reference number: FOI2022/01225

Thank you for your email of 9 October 2022, in which you requested the following information:

> *Stafford Borough Council is claiming that a new railway station will be built at a proposed garden village called Meecebrook on the West Coast Mainline.*
>
> *The proposals are significantly scaled back now and exclude the MOD brownfield site that was originally part of the proposals in 2020.*
>
> *1) Please confirm if a new West Coast Mainline station has been agreed.*
>
> *2) If it has not been agreed, what stage are proposals at?*
>
> *3) What would be the approximate total cost of a new station?*
>
> *4) Who would pay for this?*
>
> *5) Does a new development on greenfield (instead of brownfield) fit with the Network Rail environmental strategy?*

I have processed your request under the terms of the Environmental Information Regulations 2004 (EIR).[1]

[1] The EIR, like the Freedom of Information Act 2000 (FOIA), allows people to access information held by public authorities like Network Rail. When people ask for environmental information, we need to consider the request under the EIR rather than the FOIA. In this case, I am of the view that information relating to major infrastructure proposals meets the definition of environmental information at regulation 2(1)(c) of the EIR because it is information about a measure that impacts the environment.

[redacted]

I have consulted colleagues in our Strategic Planning and Sponsorship teams for the West Coast. They have advised me that they do not hold any recorded information that meets your request. This is because Network Rail is currently assessing the potential impact on the network of some new station proposals, but has not carried out any specific assessments of a proposal for Meecebrook.

Please see below for some advice to help address each of your questions:

1) Please confirm if a new West Coast Mainline station has been agreed.

We have not made any agreements relating to a new station at Meecebrook. As mentioned above, our planners are carrying out work to assess the long-term impact of some new station proposals on the West Coast South route, but this work is not looking at developing the case for, or the deliverability of, a new station at Meecebrook in the short-to-medium term.

2) **If it has not been agreed, what stage are proposals at?**

There are currently no Network Rail proposals for a station at Meecebrook and our planners have advised that they have not been consulted with directly by Stafford Borough Council or Staffordshire County Council on this subject.

3) What would be the approximate total cost of a new station?

We are unable to advise on this point, as Network Rail has not assessed this.

4) Who would pay for this?

Again, we are unable to advise as we do not have any specific proposals for Meecebrook.

5) Does a new development on greenfield (instead of brownfield) fit with the Network Rail environmental strategy?

As we have not been involved in any proposals, this is not something Network Rail has looked at.

You may wish to find out more from Staffordshire County Council about their proposals – contact details are available at: Contact - Staffordshire County Council

If you have any enquiries about this response, please contact me in the first instance at [redacted]Details of your appeal rights are below.

[redacted]

Please remember to quote the reference number at the top of this letter in all future communications.

Yours sincerely

Angharad Morgan
Information Rights Specialist

Appeal rights

If you are unhappy with the way your request has been handled and wish to make a complaint or request a review of our decision, please write to the Compliance and Appeals team at Network Rail, [redacted]N, or by email at [redacted] Your request must be submitted within 40 working days of receipt of this letter.

If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner (ICO) can be contacted at [redacted] or you can contact the ICO through the 'Make a Complaint' section of their website on this link: https://ico.org.uk/make-a-complaint/

The relevant section to select will be "Official or Public Information".

Intermodality

[redacted]

From: [redacted]
To: [redacted]
Cc: [redacted] Strategic Planning Consultations
Subject: RE: Local Plan and CIL Viability Assessment - question
Date: 07 November 2022 09:02:55
Attachments: image002.png
image003.png
image004.png
image006.png
image662195.png

Thanks [redacted]

The information presented in the report is correct and what can currently be shared at this stage.

Kind regards

[redacted]

Stafford BOROUGH COUNCIL

[redacted] Strategic Planning & Placemaking Manager
Stafford Borough Council | Civic Centre | Riverside | Stafford | ST16 3AQ
[redacted] | www.staffordbc.gov.uk

From: [redacted]
Sent: 07 November 2022 08:27
To: [redacted]
Cc: [redacted] Strategic Planning Consultations <Strategicplanningconsultations@staffordbc.gov.uk>
Subject: Re: Local Plan and CIL Viability Assessment - question

Dear [redacted]

Thank you for your email.
My email to you/your team wasn't a response to the consultation, more so it was asking a question because para 7.5 seems to be missing a figure (where xxxx is inserted) and the two appendices I refer to are also missing ? Please can you advise in those points ?
Thanks

Jo Russell MRTPI | Planning Director

[redacted]

STOFORD

[redacted]

From: [redacted]
Sent: Monday, November 7, 2022 8:22 AM
To: [redacted]
Cc: [redacted] Strategic Planning Consultations <Strategicplanningconsultations@staffordbc.gov.uk>
Subject: RE: Local Plan and CIL Viability Assessment - question

Hello [redacted]

Thank you for your message, which will be included as a response to the current consultation on the Local Plan 2020-2040.

Kind regards

[redacted]

[redacted] Strategic Planning & Placemaking Manager
Stafford Borough Council | Civic Centre | Riverside | Stafford | ST16 3AQ
[redacted]

From: [redacted]
Sent: 04 November 2022 21:42
To: [redacted]
Cc: [redacted]
Subject: Local Plan and CIL Viability Assessment - question

Hi [redacted]

I have been reading the Local Plan and CIL Viability Assessment and I hoped you might be able to confirm what the figure should be please in the para that reads

7.5 The limiting factor to determine viability at Meecebrook is the S106/infrastructure cost at £XXXXX per dwelling. This may become more of a limiting factor if further work shows that the cost is higher than our assumption.

Also, Appendix 7 and 8 are empty. I note that they say 'redacted' , however is that redacted in terms of them being completely removed, or should they be included but with elements redacted?

Thank you

[redacted]

STOFORD

[redacted]

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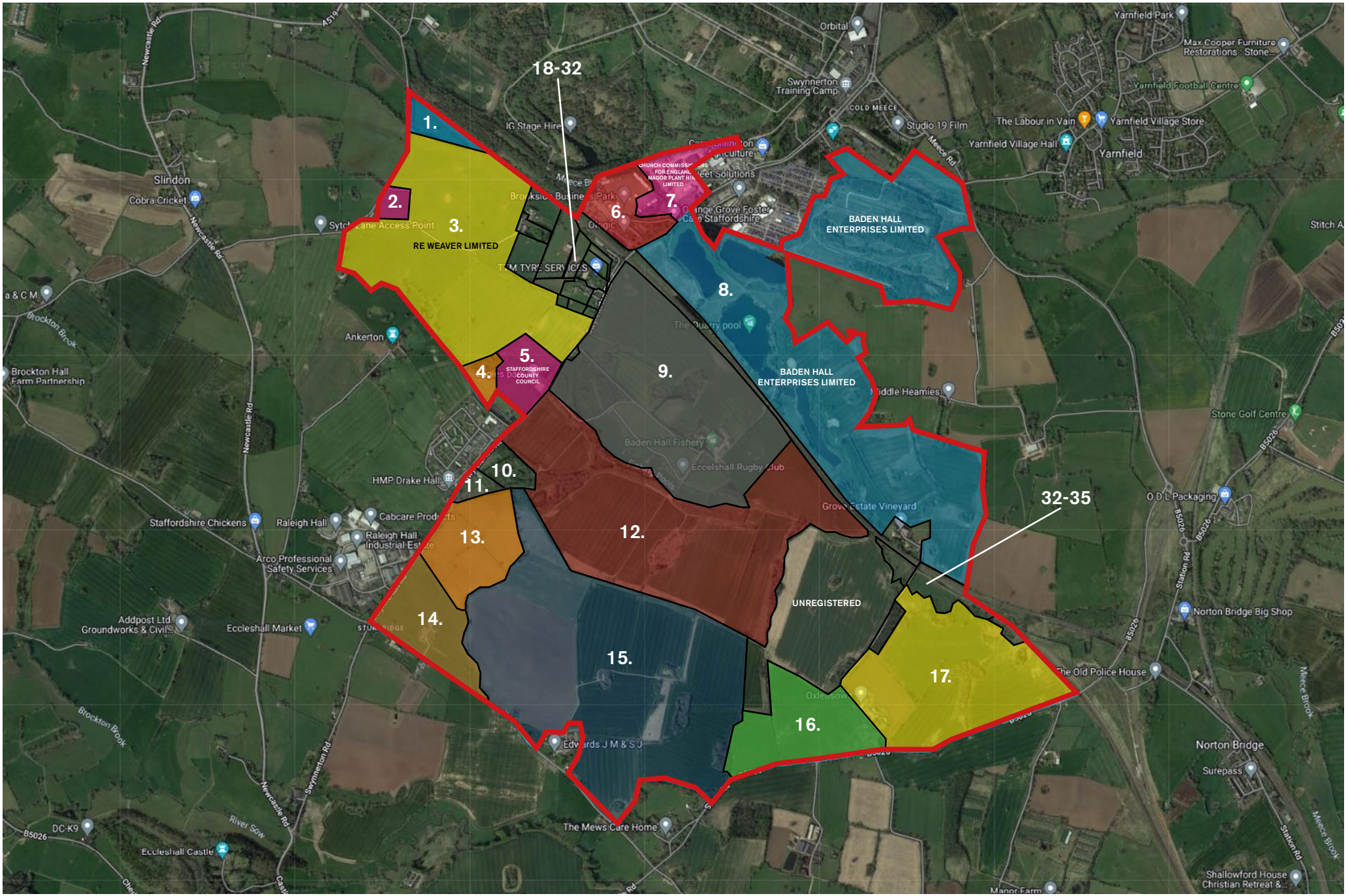
18-32
1.
2.
3.
RE WEAVER LIMITED
4.
5.
STAFFORDSHIRE COUNTY COUNCIL
6.
7.
8.
BADEN HALL ENTERPRISES LIMITED
9.
BADEN HALL ENTERPRISES LIMITED
10.
11.
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17.
UNREGISTERED
32-35
Orbital
Swynnerton Training Camp
IG Stage Hire
Studio 19 Film
The Labour in Vain
Yarnfield Village Store
Yarnfield Village Hall
Yarnfield
Yarnfield Park
Max Cooper Furniture Restorations - Stone...
Yarnfield Football Centre
COLD MEECE
Meece Rd
Slindon
Cobra Cricket
Newcastle Rd
Ankerton
Brockton Brook
Brockton Hall Farm Partnership
Baden Hall Fishery
Eccleshall Rugby Club
HMP Drake Hall
Staffordshire Chickens
Raleigh Hall
Raleigh Hall Industrial Estate
Arco Professional Safety Services
Addpost Ltd Groundworks & Civil...
Eccleshall Market
Edwards J M & S J
The Mews Care Home
DC K9
Eccleshall Castle
River Sow
Swynnerton Rd
Stone Golf Centre
O D L Packaging
Norton Bridge Big Shop
The Old Police House
Norton Bridge
Surepass
Shallowford House Christian Retreat &...
Meece Brook
Station Rd
B5026

Plot Number	Owner (if available on Land Insight)	Address (on Land Insight)	Title Number
1		Land At Mill Meece, Stafford	SF277755
2		Eastfields Bungalow, Sytch Lane, Staffordshire, Stafford, ST21 6LX	SF599994
3	RE WEAVER LIMITED	Land At Slindon, Eccleshall ST21 6LX Land At Ankerton, Slindon, Eccleshall ST21 6LZ Land On The West Side Of Swynnerton Road, Eccleshall, Stafford ST21 6LG	SF358099, SF350853, SF629521
4		Land On The Northwest Side Of Swynnerton Road, Stafford	SF480884
5	STAFFORDSHIRE COUNTY COUNCIL	Land On The North Side Of Swynnerton Road, Badenhall, Eccleshall, Staffs ST21 6LG	SF450621
6		Suite 9, Brookside Business Park, Cold Meece Road, Staffordshire Stone, ST15 0RZ	SF349336
7	CHURCH COMMISSIONERS FOR ENGLAND MAGNOR PLANT HIRE LIMITED	Land At Cold Meece, Stone ST15 0QL ST15 0QN, ST15 0QW, ST15 0SP, ST15 0UD, ST15 0YA	SF579156 SF466977
8	CHURCH COMMISSIONERS FOR ENGLAND BADEN HALL ENTERPRISES LIMITED	Land At Cold Meece, Stone ST15 0QL, ST15 0QN, ST15 0QW ST15 0SP, ST15 0UD, ST15 0YA Land Lying To The East Of Swynnerton Road, Eccleshall ST15 0QN, ST15 0RZ Land At Lower Heamies Farm, Chebsey ST21 6JU	SF579156 SF404905 SF410592 SF505785
9		Badenhall, Swynnerton Road, Staffordshire, Stafford, ST21 6LG	SF273724
10		Land At Drake Hall, Eccleshall	SF305169
11		Land At Sturbridge, Eccleshall, Stafford	SF397430
12		Land Lying On The East Side Of Swynnerton Road, Eccleshall	SF273721
13		Land Lying To The North East Of Sturbridge Old Farm Sturbridge, Eccleshall, Stafford	SF572437
14		Sturbridge Old Farm, Hilcote Lane, Staffordshire, Stafford, ST21 6LE	SF590990
15		Hilcote House Farm Cottage, Hilcote Lane, Staffordshire, Stafford, ST21 6JX	SF412611
16		Land On The West Side Of, Oxleasows Farm, Chebsey, Stafford ST21 6JU	SF608611
17		Oxleasows, Lower Heamies Lane, Staffordshire, Stafford, ST21 6NX	SF631007

Plot Number	Owner (if available on Land Insight)	Address (on Land Insight)	Title Number
18			
19			
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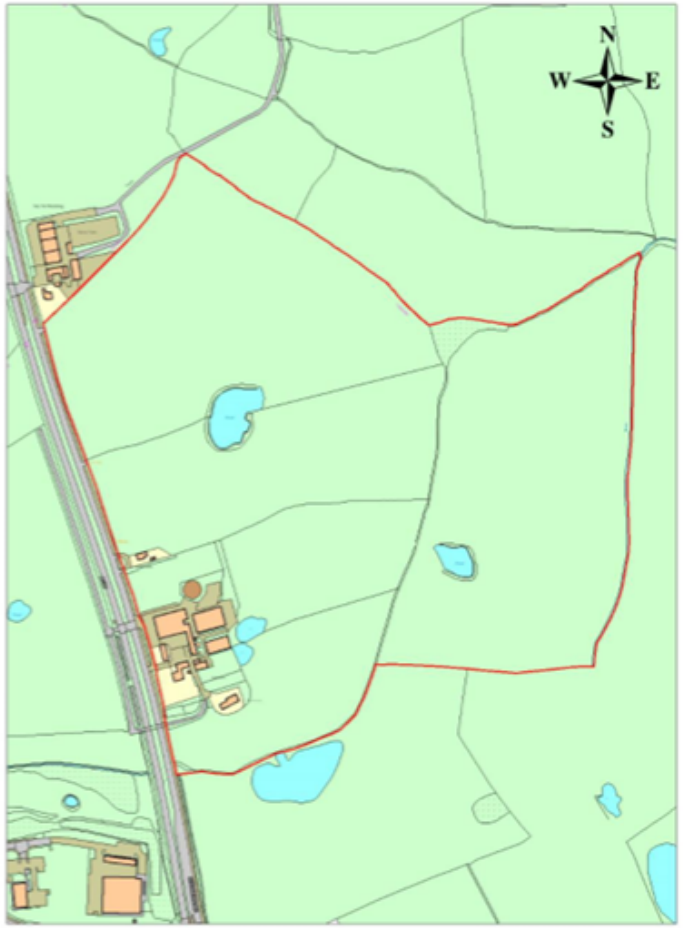
Extract from SHELAA 2022

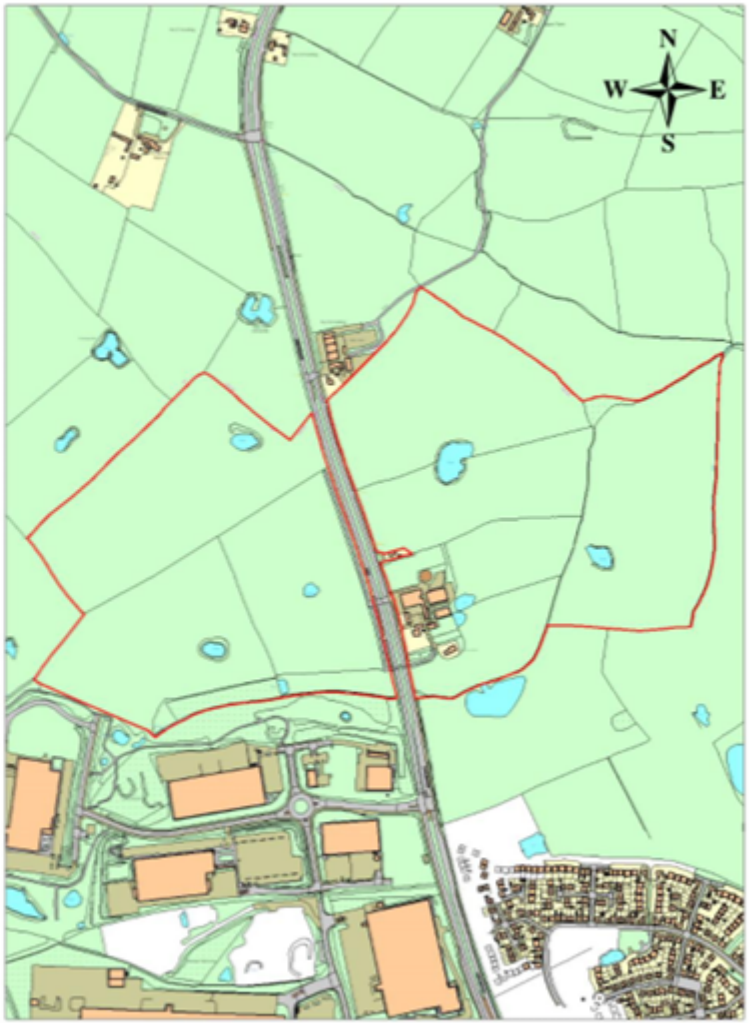
Stafford Borough Council SHELAA 2022

CRE03	Site Name: Redhill Farm, Stone Road, Stafford, ST18 9SA		
Ward	Seighford and Church Eaton	**Parish**	Creswell
Size	29.4 hectares	**Potential Yield**	617
Greenfield or Brownfield	Greenfield		
Current Use	Agricultural purposes.		
Deliverability Summary			
Available	The site will become available in the next 5-10 years		
Availability Assessment	The necessary infrastructure is considered to be available within the locality, but the provision of infrastructure to the site will need to be confirmed with the relevant utility companies. The site has been submitted by a third party, whom has no legal connection to the site whatsoever and the site will become available in the next 5-10 years.		
Suitable	The site is adjacent to a currently recognised Local Plan settlement.		
Suitability Assessment	The site is situated adjacent to the currently recognised Local Plan settlement of Stafford. The following constraints exist: Historic Environment Record.		
Achievable	The site is achievable.		
Achievability Assessment	The site is classified as CIL typology STA1, which is considered financially viable.		
Status	The site is potentially developable based on the compliance with Policy C5 of the Local Plan and Paragraph 72 of the NPPF.		



Stafford Borough Council SHELAA 2022

CRE01	**Site Name:** Land allocation to the north of Redhill, ST18 9SA		
Ward	Seighford and Church Eaton	**Parish**	Creswell
Size	53.5 hectares	**Potential Yield**	1,124
Greenfield or Brownfield	Greenfield		
Current Use	Divided between being used for agricultural purposes and being allocated for employment in the Local Plan.		
Deliverability Summary			
Available	The site won't be available for 10-15 years.		
Availability Assessment	Some of the necessary infrastructure is considered to be available within the locality, but the provision of infrastructure to the site will need to be confirmed with the relevant utility companies. There are no known legal or ownership issues, and the site will become available in 10-15 years.		
Suitable	The site is divided by the settlement boundary for the recognised Local Plan settlement of Stafford.		
Suitability Assessment	The site is divided by the settlement boundary for the recognised Local Plan settlement of Stafford, and thus falls both within and adjacent to a sustainable settlement. The following constraints exist: Historic Environment Record, Site of Biological Importance.		
Achievable	The site is achievable.		
Achievability Assessment	The site is classified as CIL typology STA1, which is considered financially viable.		
Status	The area of the site not allocated for employment in the Local Plan could be developable based on the compliance with Policy C5 of the Local Plan and Paragraph 72 of the NPPF.		



Extract from Site Assessment Profiles 2022

SHELAA ID Code: CRE01 and CRE03

Site Name: Redhill Farm

Adjoining / nearby settlement: Stafford

Ward: Seighford and Church Eaton

Parish: Creswell

Greenfield or Brownfield: Mixed

Potential Yield (dwellings): 372

Site Size (hectares): 17.67

Site Selection Assessment

Topic Area	Evaluation
Education	**Primary School:** Stafford North Primary Schools. Development unlikely to be able to be accommodated within existing capacity, school expansion is unlikely. **Secondary School:** Sir Graham Balfour High School. Development cannot be accommodated within existing capacity; school cannot be expanded.
Transport	Two access points required. Impact would need to be assessed on A34 corridor and related roundabouts, also impact on link road to M6 Jn14. **Accessibility Score:** 4/6
Ecology	**High** overall ecological sensitivity. **Red** Great Crested Newt risk impact zone.
Landscape	**Medium** overall landscape sensitivity.
Heritage	**Low** direct impacts, **Low** setting impacts. **No substantial harm.**
Water	**Medium** potential impact on sewerage infrastructure. **Low** potential impact on surface water sewerage infrastructure.
Electricity	No issues for this site.

Outcome of Assessment: Rejected Site

Reasoning: Education capacity constraints are unlikely to be able to be resolved. Additionally, ecology concerns would need to be suitably mitigated for.


Stafford
CRE01 and CRE03
Date: September 2022
Scale: 1:5,000
Legend
Site Boundary
Settlement Boundary
High Pressure Pipeline Buffer
SBI
Tree Preservation Order
Tree Preservation Order

BSA HERITAGE Archaeology & Historic Environment Consultancy

[redacted]

S. Green

[redacted]

By email only

7th December 2022

Dear [redacted]

BSA2011 Land East of Stone Road, Stafford – Appraisal of Heritage and Archaeology Implications

I write further to your recent request for an appraisal of the archaeological and heritage interest of your site east of Stone Road, Stafford which you are promoting for residential and related development. Archaeological and heritage assessment has previously been completed for the site by BSA Heritage Limited, alongside their full assessment and investigation of the adjacent 'Pets at Home' development area.

Background research has included fresh consultation with the Staffordshire Historic Environment Record (HER) and past consultation with the Staffordshire Record Office and William Salt Library in Stafford. These and online sources informed a site walkover in 2020. Research and the site survey indicate low archaeological potential and no conflict with designated heritage assets.

The closest designated heritage asset to the site is a Grade II listed milestone on the west side of the dualled Stone Road several hundred metres to the south west. This small 19th century feature has a limited setting which enhances its significance and would not be affected by change within the site. All other designated heritage assets lie at such a distance that they would not be harmed through change to their setting given distance and context.

Although not designated, Redhill Farm farmhouse within the site is of local heritage interest. This brick building is externally largely unaltered and is likely to be early 19th century in origin. Two ranges of associated ancillary brick buildings lie to the north. However, the buildings' original context has changed considerably through the dualling of the adjacent Stone Road and replacement of some farm structures in the 20th century.

It is understood that proposals for the site require the loss of Redhill Farm farmhouse and structures to the north to facilitate safe access. This loss would rate as minor adverse and would need to be weighed against the scheme benefits, as set out for non-designated heritage assets. Historic building recording could be completed ahead of demolition.

The historic landscape of the site is of no special interest and has been compromised by residential development to the south and modern farm buildings at Redhill Farm within and the dualled Stone Road and commercial development beyond the site to the west. Retention of surviving hedgerows as far as is practical would accord with current policy.

[redacted]

[redacted]

By email only

There is no indication of early activity within the site or a wider study area surrounding it. HER records confirm vestiges of medieval ridge and furrow may survive, but also that the area was agricultural in that period, forming the fields of more distant settlements. Other records reflect the area's post-medieval agricultural use, including field boundaries, the sites of isolated farm buildings and marl pits. These latter, where earth was extracted to enrich surrounding fields, often survive, but are of negligible heritage interest, as are vestiges of other medieval or later agricultural remains.

Low archaeological potential is also indicated by the negative results of fieldwork completed ahead of development in recent decades, with the Pets at Home site to the west subject to geophysical survey and a watching brief, but with nothing of note revealed. No significant features were identified during investigation of the extensive residential development area south of the site either.

Future development would be supported by an assessment report and subsequent fieldwork, but there is no indication that the site could not be developed in accordance with policy and guidance

I trust this appraisal is useful, but please let me know if you have any queries or require further information.

Yours sincerely

Ben Stephenson
Director

[redacted]

Education Report in Support of the Promotion of Land at Redhill Farm Stafford For Stoford Properties Ltd

Stephen Clyne

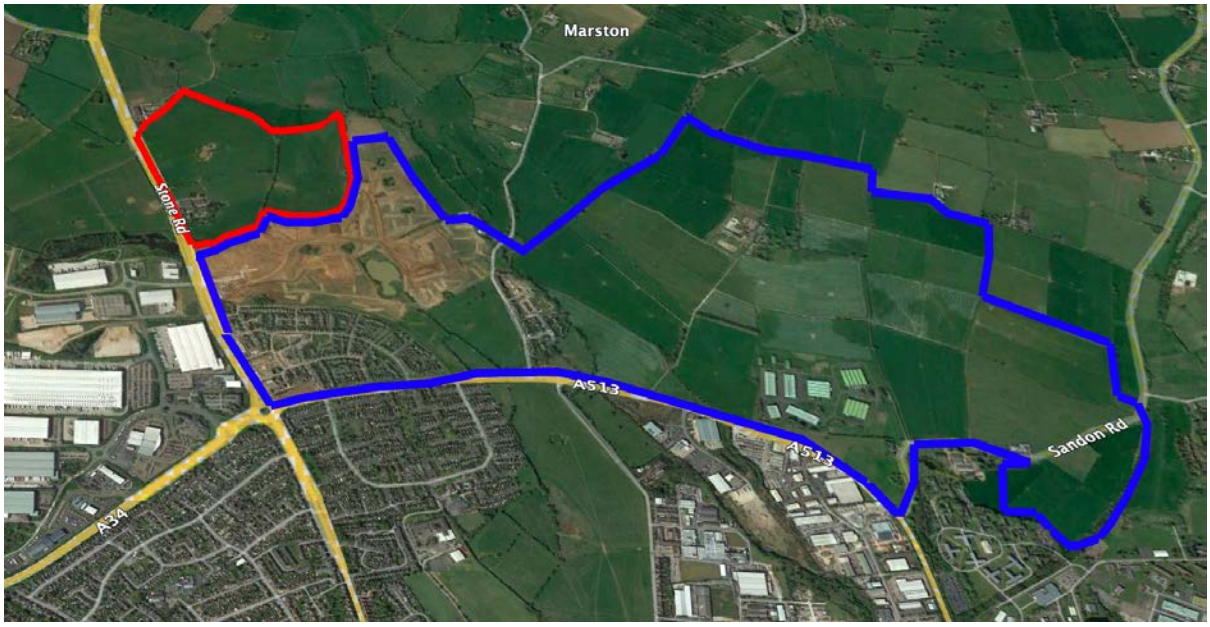
LCP DipSMS Cert Ed MAE

Ver. 2.0

4th December 2022

Introduction

The land being promoted (outlined in Red Map 1), and the subject of this report, is located immediately to the northwest corner of the North of Stafford SDL (outlined in Blue Map 1) and east of the A34 Stone Road.



Map 1 © Google Earth

The North of Stafford SDL is planned for 3,275 new homes with the southwest corner constructed in the period from 2014. By June 2021 this amounts to some 618 new homes.

SCC position

Staffordshire County Council (SCC) is the Education and Children's Services Authority for the area. SCC has published a document headed Stafford Borough Council Local Plan - Potential Sites Consultation – February 2022. The document "gives an overview of the impact of residential development on a school place planning area basis to enable SBC to consider in conjunction with comments from other stakeholders to take an overall view on settlements/sites for the preferred options".

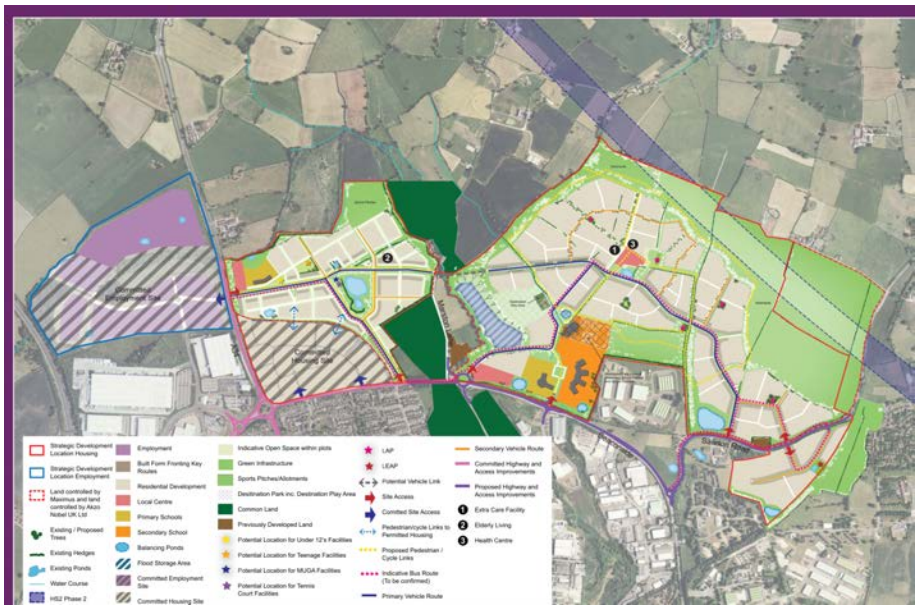
It continues, “Generally, 1,000 new homes equates to 1FE of additional provision required which is 210 primary school places……..”.

The County Planning Obligation Policy document:
https://www.staffordshire.gov.uk/Education/Schoolsandcolleges/PlanningSchoolPlaces/Information-for-developers/Planning-policy.aspx
sets out the presumed child yield by District. For Stafford at 0.3 per dwelling per year of age confirms the figure in the Site Consultation document.

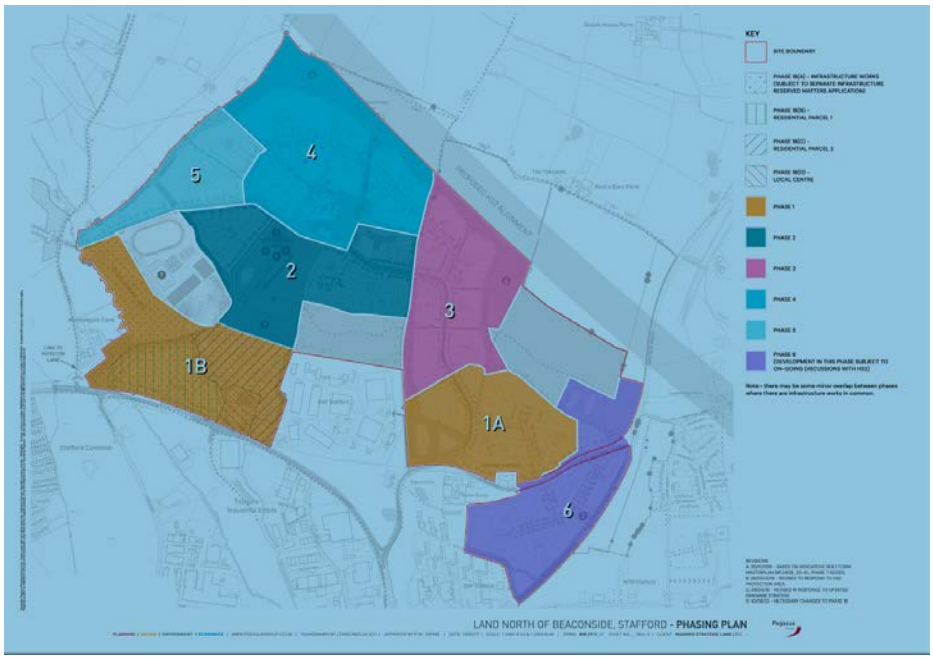
PPR per dwelling per year groups

Area	Tier	PPR per dwelling per year group - Primary/First	PPR per dwelling per year group - Middle	PPR per dwelling per year group - Secondary/High	PPR per dwelling per year group - Sixth form
Cannock Chase – Cannock Town	2T	0.045	n/a	0.03	0.03
Cannock Chase – Other areas	2T	0.03	n/a	0.03	0.03
East Staffordshire - Burton	2T	0.03	n/a	0.03	0.03
East Staffordshire - Uttoxeter	3T	0.045	0.03	0.03	0.03
Lichfield – Burntwood	2T	0.03	n/a	0.03	0.03
Lichfield	2T	0.045	n/a	0.045	0.03
Newcastle	2T	0.03	n/a	0.03	0.03
South Staffordshire	3T	0.03	0.03	0.03	0.03
Staffordshire Moorlands	3T/2T	0.03	0.03	0.03	0.03
Stafford and Stone	3T/2T	0.03	0.03	0.03	0.03
Tamworth	2T	0.045	n/a	0.03	0.03

Thus, it is logical for the North of Stafford SDL at 3,000 homes to plan for 3fe of primary school provision – a 1fe school to the west and a 2fe primary school at the centre.



Map 2 SDL Overall Masterplan



Map 3 SDL Masterplan (Area Still to be Developed)

Department for Education advice to Education Authorities (Securing Developer Contributions for Education November 2019) says (paragraph 8), “Pupil yield factors should be based on up-to-date evidence from recent local housing developments, so you can forecast the education needs for each phase and type of education provision arising from new development”.

A prime example relevant to the SDL lies within the SDL between Stone Road and the A513 where new housing has been being delivered since mid/late 2014

SDL Phase 1

By June 2022 Royal Mail Postal Address File (PAF) reported that 618 homes had been delivered and all within a single Census Output Area E00151547.

Map 4 Phase 1 SDL at 23rd April 2021 © Google Earth

Census Output Area E00151547

Derived from postal addresses, the Census Output Area can be described geographically as Map 5.

Map 5 Census Output Area E00151547 (may be larger but no additional dwellings) © Google Earth

Prior to 2014, the Census Output Area had 148 residential addresses.

Address	Postcode	Postcode Start Date	Homes
Cresswell Drive	ST18 9QP	198001	
Stone Road	ST18 9SE	198001	
The Mount	ST18 9QT	198001	
Wilkes Road	ST18 9QR	198001	
Hurricane Close	ST16 1GZ	200210	148
Mustang Drive	ST16 1GW	200305	
Spitfire Close	ST16 1GX	200501	
Shackleton Way	ST16 1GY	200610	

Table 1 Dwellings in the Output Area Prior to SDL Commencement

Postcodes dated 198001 represent existing dwellings at the commencement of the national postcode system.

In the period to mid-2020, 554 dwellings were delivered.

Address	Postcode	Postcode Start Date	Homes
Newbold Drive	ST16 1WA	201407	
Quincy Way	ST16 1WD	201408	
Valley Drive	ST16 1NZ	201410	
Randolph Close	ST16 1WE	201411	
Jefferson Walk	ST16 1WF	201510	
Paterson Drive	ST16 1WH	201610	
Deere Furrow	ST16 1WN	201701	
Dunbar Close	ST16 1WN	201708	
Burbank Burrow	ST16 1WJ	201807	
Andrus Way	ST16 1WP	201901	
Marston Lane	ST18 9TS	201902	
Winnow Ave	ST16 1GE	201902	
Pasture Lane	ST16 1GJ	201906	
Buttercup Croft	ST18 9TQ	201907	
Yarrow Grove	ST16 1GL	201911	
Till View	ST16 1GG	202001	
Acre Mews	ST16 1GF	202005	554
Middlesham Ave	ST16 1GS	202005	

Table 2 Dwellings Delivered in the First Six Years of he SDL

In the year to May 2021 a further 44 dwellings at Harrow Place within the Phase 1 SDL area and 22 at Clover Way Marston (located between the 2 major SDL parcels) have been identified by Royal Mail in the PAF but these are discounted from this briefing note as the Office for National Statistics (ONS) have not published more recent population by year of age data at this level.

The Office for National Statistics published relevant insights into the impact of the 554 dwellings delivered in the Output Area.

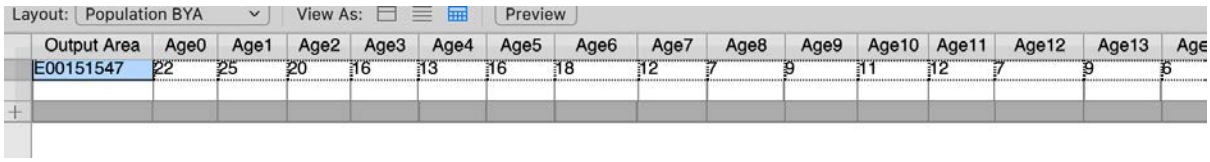
Firstly, Live Births by Sex and Output Area, England and Wales, births that occurred between 1st July 2001 and 30th June 2020 (Table 3). Second, Population by Year of Age Mid-2020 and third, the equivalent for March 2011 (Census).

OA	Sex	7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
E00151547	M	4	1	1	0	1	1	3	2	3	6	7	11	16
	F	2	1	1	2	0	1	0	2	4	3	7	16	18
	Both	6	2	2	2	1	2	3	4	7	9	14	27	34

Table 3 Births Time Series Extract

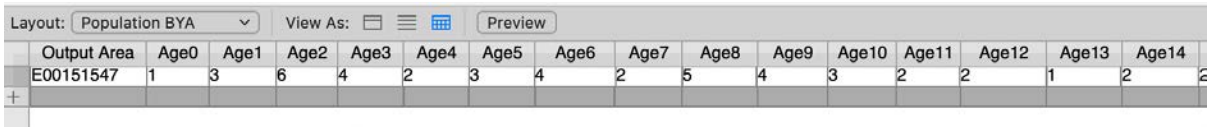
Table 3 is a time series that shows that births in the area (157 established homes) yielded 1 or 2 births a year in the years leading up to the start of development. From the outset of

development, the number of births started to rise, reaching 34 in the 12 months from 1st July 2019. It indicates approximately 30 births from the new 554 dwellings. This corresponds to 5.4 births per 100 homes. If representative of child numbers in the years following, it equates to a primary school equivalent of 38 primary pupils per 100 homes.



Output Area	Age0	Age1	Age2	Age3	Age4	Age5	Age6	Age7	Age8	Age9	Age10	Age11	Age12	Age13	Age
E00151547	22	25	20	16	13	16	18	12	7	9	11	12	7	9	6

Table 4 Population by Year of Age mid-2020



Output Area	Age0	Age1	Age2	Age3	Age4	Age5	Age6	Age7	Age8	Age9	Age10	Age11	Age12	Age13	Age14
E00151547	1	3	6	4	2	3	4	2	5	4	3	2	2	1	2

Table 5 Population by Year of Age Census 2011

Table 4 is the mid-year estimate by year of age for mid-2020 and Table 5 the equivalent for Census Year 2011. Again, the difference following the commencement of development within the SDL is clear and unambiguous.

This suggests that at mid-2020 the primary school age cohort living on the first phase of the SDL is:

Recep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
11	13	14	10	2	5	8	64

Table 6 Predicted Primary School Age Children Resident on the SDL mid-2020

A Freedom of Information request has been submitted to the County Council (01.12.2022) as to the number of children enrolled at local primary schools with SDL home postcodes.

By implication and rolling pre-school numbers forward, the current numbers are likely to be:

Recep	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
14	14	11	14	10	2	5	70

Table 7 Predicted Primary School Age Children Resident on the SDL mid-2022

The difference between the forecast child yield set out by the County Council and the evidence on the ground at the SDL is not surprising to EFM. It's research elsewhere in England identifies high child yields from edge of settlement developments where the new housing is extremely popular for young families.

The phenomena of high child yields from new settlements are not new and has been recorded for over 100 years.

Shortfall

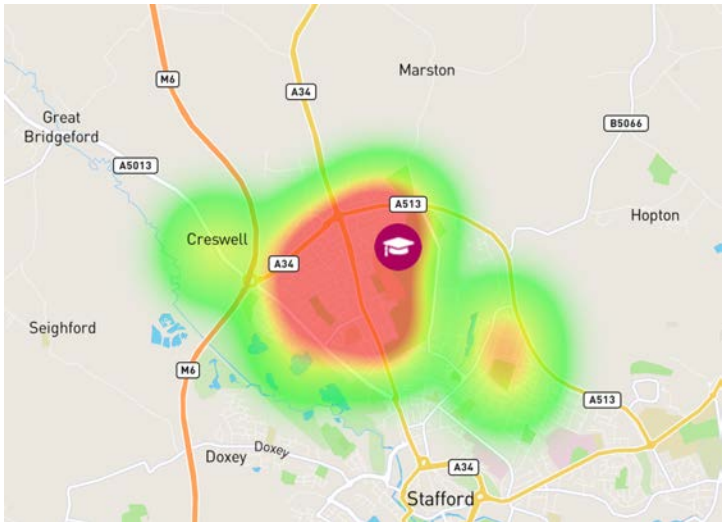
Based on the evidence to date, the shortfall in provision for the SDL, where 3fe of provision (1 x 2fe plus 1 x 1fe) is identified on the Masterplan for 3,000 homes, is significant. It looks like a peak of 38 primary pupils per 100 homes and a longer-term average probably around 20% less as the child yield from new dwellings falls over time as they mature and reflect the profile of the longer term existing stock housing.

This suggests that 5fe of primary school provision is more appropriate.

Existing School Infrastructure

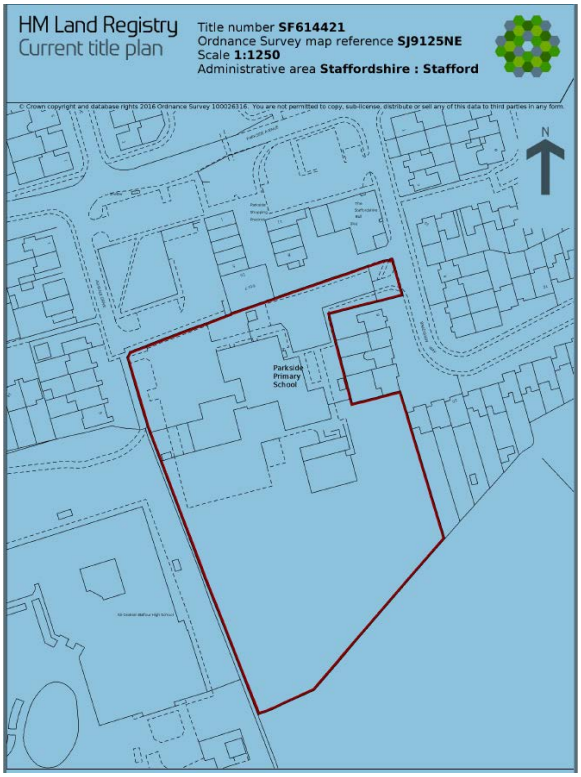
Map 6 The Primary Schools within 1.75miles (as the Crow Flies) Which May be Within a 2 Mile Walking Distance © Google Maps

Map 6 identifies the location of 4 primary schools within a theoretical 2 mile walking distance of part of the SDL and two beyond that criterion. (A 2 mile safe walking distance is set in the Education Act 1996 as the distance beyond which the nearest available school requires the education authority to provide or fund transport to school). The heat map for Parkside Primary School indicates that the existing SDL pupils are primarily enrolling at the School with the red area crossing the A334/A513 into the SDL.



Map 6 Parkside Primary School Enrolment Heat Map © School Guide

Parkside Primary School is a 315 place (1.5fe) school with, at January 2022, 322 pupils. It is on a site of approximately 1.23ha.



Map 7 Parkside Primary School Site Plan

The Department for Education (DFE) publishes non-statutory area guidelines for mainstream schools in Building Bulletin 103 (June 2014). Annex B: Site Areas identifies that the minimum site area for a school of 315 pupils is 1.25ha (124,895m2). The School is at its maximum size for its site area. It is also full

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NoR	PAN
46	46	46	46	45	47	45	322	45

Table 8 Parkside Primary School Roll (January 2022)

Parkside Primary School is grouped with five others with their locations identified on Map 6 (above).

Estab	school_name	school_postcode
2400	Tillington Manor Primary School	ST16 1PW
2006	Veritas Primary Academy	ST18 0FL
2014	John Wheeldon Primary Academy	ST16 3LX
3469	St Patrick's Catholic Primary School	ST16 3BT
3147	St John's CofE Primary Academy	ST16 3RZ
2401	Parkside Primary School	ST16 1TH

Forecasts are not published on a school-by-school basis though SCC will have that information.

Collectively, the schools have 2,222 places and are anticipated to have 2,218 pupils in 2025/26. They currently (January 2022) have 2,042 pupils (92% occupancy).

At the reception stage there are 315 places and for September 322 applications. It is probable that some of the pressure for places will be coming from within Stafford as the forecast requirement for September 2023 will be 353 applications.

Capacity across Stafford is effectively spoken for, without the SDL.

Trajectory

The Stafford Borough Local Plan 2020-2040 indicates graphically the North SDL on a year-by-year basis (Table 9).

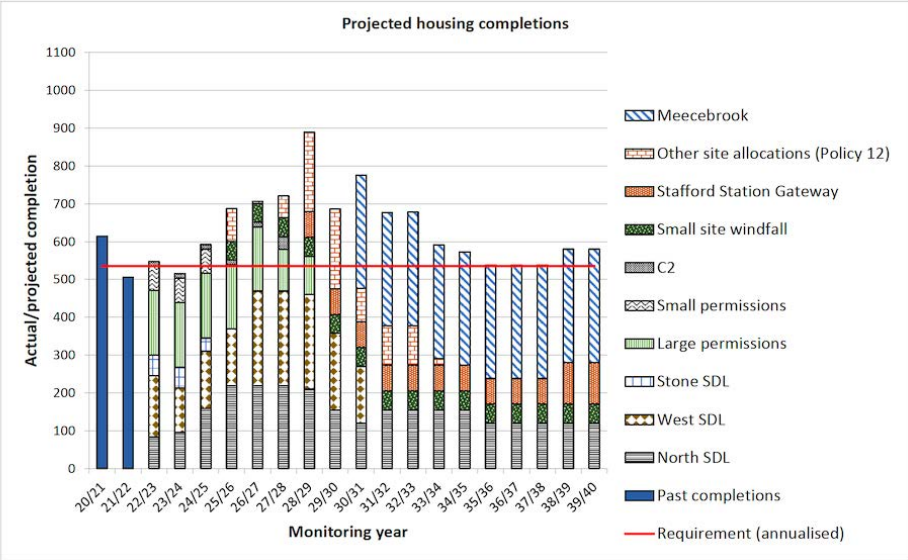


Table 9 SBC Projected Housing Delivery

Including SDL Phase One, derived from Royal Mail data, gives a year-by-year housing trajectory. For illustrative purposes, this note assumes that 10% of dwellings will be non-child or reduced child households (one bed, over 50s, flats/apartments, and vacant properties).

2. Timescale for development a	*Staffod SDL*	First completions assumed to be Apr	2013	insert year

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Assumed completions over the year to July	25	63	65	65	100	100	100	100	90	100	160	210	210	210
net of 1 beds over the year to July	23	57	59	59	90	90	90	90	81	90	144	189	189	189
Assumed completions by July, total	23	79	138	196	286	376	466	556	637	727	871	1060	1249	1438

2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	
200	160	127	160	160	160	160	110	110	110	110	110				Total Dwellings 3275
180	144	114	144	144	144	144	99	99	99	99	99	0	0	0	
1618	1762	1877	2021	2165	2309	2453	2552	2651	2750	2849	2948	2948	2948	2948	

Table 10 Housing Completions July each year

For modelling purposes, the key child number figure is the number of 4 year olds as they are the oldest year group not already on roll at a primary school.

The default position for new state funded schools is that they are academies, which are independent schools receiving their operating funding from the Department for Education. The permission for an Academy to open resides with the Regional Commissioner on behalf of the Secretary of State. The normal trigger is 24/25 4-year olds with some certainty that similar/greater numbers will follow in each of the following years.

Table 11 (below) sets out the predicted numbers arising from the wider SDL based on the indicated dwelling delivery.

3. Number of Children by age, at July each year

	Age of Children											
Year	0	1	2	3	4	5	6	7	8	9	10	Primary
2014	1	1	1	1	1	1	1	1	1	1	1	0.0
2015	4	4	4	4	4	4	4	4	4	4	4	0.1
2016	7	7	7	7	7	7	7	7	7	7	7	0.2
2017	10	10	10	11	11	11	11	11	11	11	11	0.4
2018	14	15	15	15	15	15	15	15	15	15	15	0.5
2019	19	19	20	20	20	20	20	20	20	20	20	0.7
2020	23	24	24	24	25	25	25	25	25	25	25	0.8
2021	23	23	24	24	24	25	25	25	25	25	25	0.8
2022	25	23	23	24	24	24	25	25	25	25	25	0.8
2023	27	25	23	23	24	24	24	25	25	25	25	0.8
2024	34	32	30	28	28	28	29	29	30	30	30	0.9
2025	41	38	36	34	33	32	33	33	34	34	34	1.1
2026	48	46	43	41	39	37	37	38	38	39	39	1.3
2027	58	56	53	51	49	47	45	45	45	46	46	1.6
2028	68	69	66	64	61	59	57	55	55	56	56	2.0
2029	77	78	79	76	74	71	69	67	66	65	66	2.5
2030	86	87	88	89	87	84	82	80	78	76	76	2.9
2031	98	96	97	98	99	96	94	91	89	87	86	3.3
2032	107	106	104	105	106	106	104	101	99	97	95	3.5
2033	116	113	112	110	111	112	113	110	108	105	103	3.7
2034	127	123	121	119	118	119	120	120	118	115	113	3.9
2035	141	135	131	129	127	125	126	127	128	126	123	4.2
2036	154	148	143	139	137	135	133	134	135	136	134	4.6
2037	167	162	156	151	147	144	143	141	142	143	144	4.9
2038	177	172	167	161	156	152	150	148	146	147	148	5.2
2039	187	183	178	172	167	161	157	155	153	152	153	5.6
2040	196	192	188	183	178	172	167	163	160	159	157	5.9
2041	205	201	198	193	188	183	178	172	168	166	164	6.3
2042	215	210	206	203	199	194	188	183	177	173	171	6.6

Table 11 Pre and Primary School Age Numbers Based on the Child Yield from Phase 1

The right-hand column of Table 11 is the form of entry, based on the 4 year olds in each year through to 2042.

Year	No 4 yr olds	Form of Entry
2023	24	1
2025	33	2
2028	61	3
2030	87	4
2034	118	5
2037	147	6

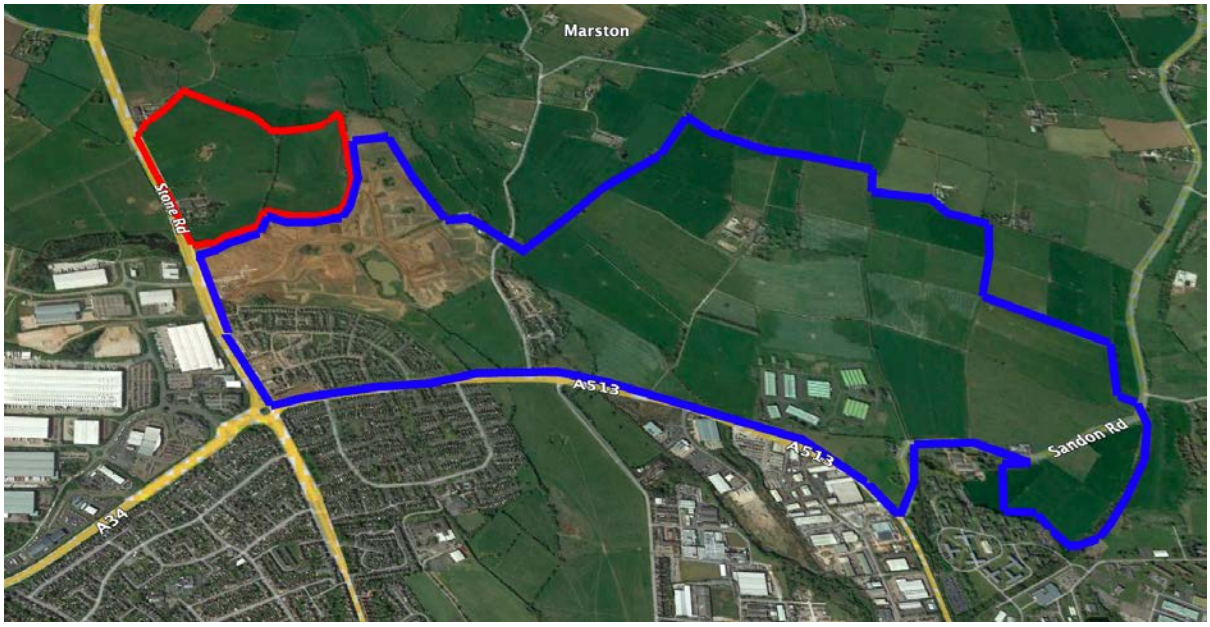
Table 12 Indicated Triggers

Subject to no further significant expansion of the SDL beyond the 3,275 dwellings by 2039, numbers will begin to fall.

Whilst the trajectory indicates a peak of 6.6 forms of entry, it is likely that 20%-25% will be a mixture of short-term need delivered through temporary arrangements (bulge classes) short life accommodation and parental choice of school including faith schools and the independent sector.

Solution

Land at Redhill Farm is available, is adjacent to the SDL and is being promoted with a 2fe primary school. This would provide a safety net of sufficient additional primary school capacity to meet any contingency.



Map 5 The SDL (edged blue) and Redhill Farm (edged red)

STAFFORD, STONE ROAD, RESIDENTIAL

STRATEGIC MASTERPLAN

Rev	Date	By	Description
-			

Key:

- Red Line Boundary
- Residential
- Local Centre & Apartments
- Retirement Living
- Primary School including sports provision
- Proposed Loop Road inc. 3m wide Footpath/Cycleway
- Boulevard Trees set in Grass Verge
- 3m Wide Footpath/Cycleway To be Constructed in 2023
- Existing Mature Hedgerow
- Existing Trees
- Proposed Trees
- Ponds
- LEAP
- NEAP
- Proposed Woodland Habitat

Pedestrian Crossing

Left In Left Out Secondary Access

SGP
Architects + Masterplanners
[redacted]
www.stephengeorge.co.uk

SGP File Ref:	20-113 K001	**Drawing No:**	201130-SGP-ZZ-ST-DR-A-001001
Project No:	20-113	**Rev:**	F
Drawn By:	CA	**Scale:**	NTS @A3
Date:	29/04/22		

APPENDIX 2: North of Stafford Planning History

	Reference/ Application Number	Description of Development	Date Application Received	Date Application validated	Date Decision Made	Applicant Name
1	13/18533/REM - 257 dwellings	13/18533/REM | Submission of Reserved Matters (layout, scale, appearance and landscaping) for the construction of 257 dwellings served via two access points from Beaconside (approved under planning permission 10/13362/OUT), landscaping, car parking, earthworks to facilitate storm water drainage and all other ancillary and enabling works (Phase 1) | Land At Beaconside Stafford Staffordshire	8th April 2013	20th May 2013	1st August 2013	Taylor Wimpey North Midlands
2	14/20781/REM - 152 dwellings	14/20781/REM | Reserved matters application (appearance, landscaping, layout and scale) for 152 dwellings pursuant to planning permission 10/13362/OUT | Land To North Of Beaconside And East Of A34 Stone Road Beaconside Stafford Staffordshire	15th July 2014	15th July 2014	24th September 2014	Taylor Wimpey North Midlands
3	*10/13362/OUT - 409 dwellings: 152 dwellings (Reserved Matters 14/200781/REM) and 257 dwellings (Reserved Matters 18533/REM)*	***Outline permission for the above Reserved Matters:*** *10/13362/OUT | Residential development - 409 dwellings (outline)*	*12th April 2010*	*12th April 2010*	*31st August 2012*	*Akzo Nobel UK Ltd*
4	20/32039/REM to outline permission 16/24595/OUT- 700 dwellings	20/32039/REM | Reserved matters application for 700 dwellings to outline permission 16/24595/OUT seeking approval of layout, scale, appearance and landscaping, and including internal access roads, footpaths, drainage, associated parking provision, open space and infrastructure. | Land North Of Marston Grange Marston Stafford Staffordshire	3rd May 2020	24th March 2020	3rd February 2021	Barratt West Midlands & Bovis Homes (Mercia Region)

5	*16/24595/OUT- 700 dwellings*	***Outline permission for the above Reserved Matters:*** *16/24595/OUT-* Outline planning application for residential development of up to 700 dwellings (Use Class C3), 1 No. (up to 60 bed) elderly living facility (Use Class C2), a one form entry primary school (Use Class D1) and a local centre to provide up to 2500 sqm GIA of open use (Use Classes A1 and/or A2 and/or A3 and/or A5 and/or D1) development together with supporting infrastructure including: green infrastructure, highways and associated works. All matters are reserved other than the principal points of access.	*27th July 2016*	*17th Nov 2016*	*10th October 2018*	*Akzo Nobel UK Ltd*
6	16/25450/OUT - 2,000 dwellings	16/25450/OUT | Outline planning application for mixed-use development, comprising of the demolition of existing buildings and structures, the erection of up to 2,000 dwellings (Use Class C3), 2 no. Local Centres to provide up to 4,500 sqm of GIA (Use Class A1- up to 1,100 sqm, Use Classes A2/A3/A5 - up to 2,800 sqm and Use Class A4- up to 600 sqm), 1 no. Health Centre (Use Class D1- up to 600 sqm), 1 no. (up to 60 bed) elderly Living Facility (Use Class C2), a two form entry Primary School (Use Class D1), a five form entry Secondary School (Use Class D1), together with supporting infrastructure including: green Infrastructure, highways and associated works. All matters are reserved with the exception of principal means of access on to existing highway | Land North Of Beaconside Stafford	19th December 2016	20th December 2016	30th May 2022	Maximus Strategic Stafford LLP
7	18/28182/REM and 16/25260/OUT - 100 dwellings	18/28182/REM | Reserved matters for 100 dwellings with details of appearance, landscaping, layout and scale pursuant to outline application 16/25260/OUT | Land North Of Marstongate Farm Marston Lane Marston Stafford Staffordshire	8th March 2018	14th March 2018	12th June 2018	Miller Homes Limited
8	16/25260/OUT - 100 dwellings	***Outline planning permission for above reserved matters*** *Outline planning application for residential development with associated works and the demolition of existing building and structures . All matters are reserved other than means of access to the site.*	16 Nov 2016	25th Nov 2016	22nd Jan 2018	Richborough Estates

APPENDIX 3 Sustainable Travel Infrastructure Improvements

Propsoed 4TH Arm

Roundabout currently under construction

0 10 20 Meters

Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

Rev	Date	Details of issue / revision	Drw	Rev
P1	20.05.22	Preliminary Issue	DH	AP

Issues & Revisions

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Client

STOFORD

Project Title

LAND EAST OF THE A34 STONE ROAD, STAFFORD

Drawing Title

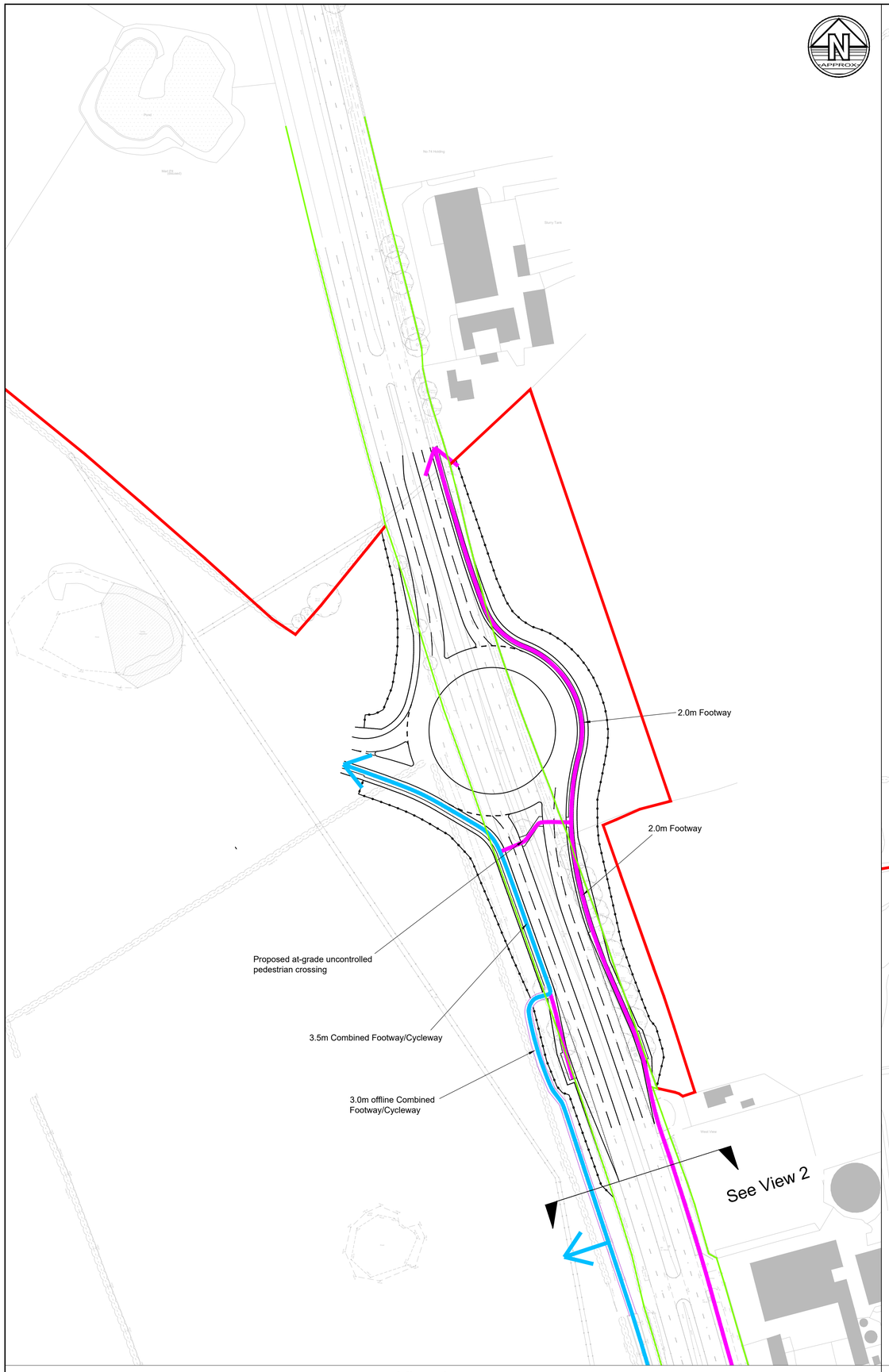
4TH ARM GENERAL ARRANGEMENT

Drawn:	D. Hodgson		Reviewed:	A.Passmore	
BWB Ref:	BMT 2473	Date:	20.05.22	Scale@A1:	1:500

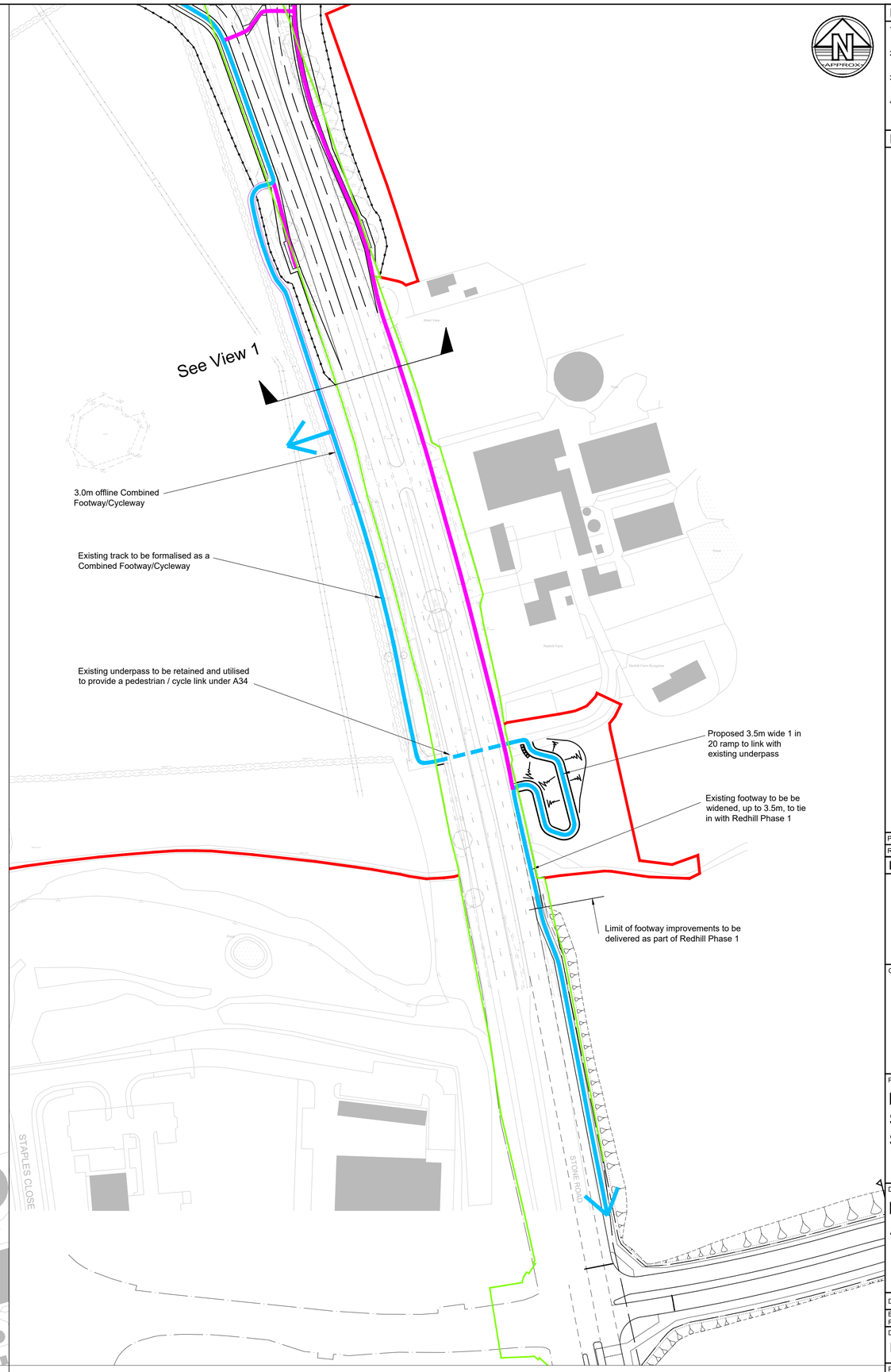
Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
RP2-BWB-GEN-4TH-SK-C-1000	S1	P1



View 1



View 2

Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- Site Boundary
- Highway Boundary
- Combined Pedestrian / Cyclist Route
- Pedestrian Route

Rev	Date	Details of issue / revision	Drw	Rev
P1	15.09.20	Preliminary Issue	JF	DH

Issues & Revisions

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[redacted]

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Client

STOFORD

Project Title

LAND WEST OF THE A34 STONE ROAD, STAFFORD

Drawing Title

PROPOSED PEDESTRIAN AND CYCLE ROUTES

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APPENDIX 4: Modelling Technical Note

Project Name	**North Stafford Proposed Employment and Residential Local Plan Allocations – Modelling Work**		
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1. INTRODUCTION

1.1 This Technical Note includes full details of the modelling work undertaken within a separate Transport Note prepared to support employment and residential allocations to the north of Stafford through the Stafford Borough Council (SBC) Local Plan process (report ref: **RP3-BWB-GEN-XX-RP-TR-0002_HN**). This Technical Note sets out the following details:

1. Trip rates and traffic generation.
2. Traffic distribution.
3. Background traffic growth.
4. Modelling results.
5. Summary.

1.2 This Technical Note should be read in conjunction with the accompanying Transport Note.

2. HIGHWAY IMPACT

2.1 The 2020 Transport Assessment (supporting Phase 2) included results of junction capacity assessments undertaken to test the impact of the associated development traffic. Traffic flows were obtained from the Stafford SATURN model at a future year of 2033 and included all local committed development and infrastructure planned to be delivered during that time. This included traffic from the 'Land North of Marston Grange' development and associated link road being delivered between the A34 and the A513.

2.2 The SBC Local Plan period extends to 2040 and therefore growth factors have been obtained from the TEMPro database to scale the 2033 flows to 2040. TEMPro filtering removed planning data assumptions across Stafford during this period as the planning data used in the 2033 SATURN flows are higher than predicted and also because the employment and residential allocations in Stafford would make up the remaining shortfall in housing and jobs (thereby preventing double counting). **Appendix A** includes the TEMPro outputs, which calculated the following growth factors:

- 2033 – 2040 (AM) = 1.013
- 2033 – 2040 (PM) = 1.010

2.3 Using the above information, the following traffic flow scenarios have been calculated:

- **Diagram STA1** = 2033 SATURN Flows.
- **Diagram STA2** = 2040 Base Flows
- **Diagram STA3** = 2040 Base + Pets at Home

2.4 Whilst the 2040 traffic flows should be acceptable for the purposes of this Technical Note, any future Transport Assessment would obtain new traffic flows from up to date survey information and the latest version of the Stafford SATURN model. However, they are considered robust for the reasons set out in the Transport Note.

Development Traffic Generation, Distribution and Assessment Scenarios

2.5 Employment and residential trip rates from the Stafford SATURN model have been used to calculate the potential peak hour traffic generation that could be generated by the allocations. The Stafford SATURN model does not provide trip rates for the primary school and therefore these have been obtained from TRICS by filtering the database to generate surveys from sites with similar characteristics. The TRICS data for the primary school is included at **Appendix B**. **Table 1** shows the trip rates for each of the land uses included in the allocations.

Table 1: Trip Rates

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
B8 Employment Trip Rates (per 100sqm GFA)						
Lights	0.098	0.025	0.123	0.030	0.089	0.199
HGVs	0.028	0.025	0.053	0.021	0.022	0.043
Total Veh.	0.126	0.050	0.176	0.051	0.111	0.162
B2 Employment Trip Rates (per 100sqm GFA)						
Lights	0.340	0.120	0.460	0.050	0.270	0.320
HGVs	0.030	0.020	0.050	0.000	0.000	0.000
Total Veh.	0.370	0.140	0.510	0.050	0.270	0.320
Residential Trip Rates (per dwelling)						
Lights	0.120	0.350	0.470	0.320	0.140	0.460
HGVs	0.000	0.000	0.000	0.000	0.000	0.000
Total Veh.	0.120	0.350	0.470	0.320	0.140	0.460
Primary School Trip Rates (per pupil)						
Lights	0.324	0.266	0.590	0.018	0.034	0.052
HGVs	0.000	0.000	0.000	0.000	0.000	0.000
Total Veh.	0.324	0.266	0.590	0.018	0.034	0.052

2.6 Using the above trip rates and the quantum of development being considered within the Stafford allocations, **Table 2** calculates the peak hour traffic generation for development Option 1, whilst **Table 3** calculates the peak hour traffic generation for development Option 2. It is expected that the number of primary school children arising from the allocation would account for 40% of places at the school and hence the trip generation has been reduced accordingly to account for the smaller number of external trips.

Table 2: Traffic Generation for Development Option 1

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
12,500sqm Employment Development Traffic Generation						
Lights	12	3	15	4	11	15
HGVs	4	3	7	3	3	6
Total Veh.	16	6	22	6	14	20
PCU	20	9	29	9	17	26
1 million sqft (93,000sqm) Employment Development						
Lights	91	23	114	28	83	111
HGVs	26	23	49	20	20	40
Total Veh.	117	47	164	47	103	151
PCU	143	70	213	67	123	190
650 Residential Dwellings						
Lights	78	228	306	208	91	299
HGVs	0	0	0	0	0	0
Total Veh.	78	228	306	208	91	299
PCU	78	228	306	208	91	299
476 Place Primary School*						
Lights	92	76	169	5	10	15
HGVs	0	0	0	0	0	0
Total Veh.	92	76	169	5	10	15
PCU	92	76	169	5	10	15
Total Traffic Generation						
Lights	273	330	604	245	195	440
HGVs	30	26	56	23	23	46
Total Veh.	303	357	661	266	218	485
PCU	333	383	717	289	241	530

*The traffic generation has been reduced by 40% to reflect the number of school places taken up by the residential allocation.

Table 3: Traffic Generation for Development Option 2

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
12,500sqm Employment Development Traffic Generation						
Lights	12	3	15	4	11	15
HGVs	4	3	7	3	3	6
Total Veh.	16	6	22	6	14	20
PCU	20	9	29	9	17	26
1.7 million sqft (160,000sqm) Employment Development						
Lights	157	40	197	48	142	190
HGVs	45	40	85	34	35	69
Total Veh.	202	80	282	82	178	259
PCU	247	120	367	116	213	328
650 Residential Dwellings						
Lights	78	228	306	208	91	299
HGVs	0	0	0	0	0	0
Total Veh.	78	228	306	208	91	299
PCU	78	228	306	208	91	299
476 Place Primary School*						
Lights	92	76	169	5	10	15
HGVs	0	0	0	0	0	0
Total Veh.	92	76	169	5	10	15
PCU	92	76	169	5	10	15
Total Traffic Generation						
Lights	339	347	687	265	254	519
HGVs	49	43	92	37	38	75
Total Veh.	388	390	779	301	293	593
PCU	437	433	871	338	331	667

*The traffic generation has been reduced by 40% to reflect the number of school places taken up by the residential allocation.

2.7 The details in **Tables 2** and **3** show that development Option 1 is expected to generate up to 661 peak hour movements (and 717 pcus), whilst development Option 2 could generate up to 779 peak hour movements (and 871 pcus). Whilst the above figures provide an indication of the likely traffic volumes, the figures are likely to be worst-case as they do not account for any internalisation of trips between the residential and employment uses and assume only 40% of school places would be taken up from within the residential allocation. They also do not account for an expected higher number of active travel trips given the future infrastructure improvements detailed in **Section 3** of the Transport Note. However, the final trip generation calculations will be detailed within the supporting Transport Assessment and provide evidence to justify any reductions to account for internalisation etc.

2.8 Since the work in this Technical Note was originally undertaken, further development of the proposals has demonstrated that Development Option 2 would most likely comprise 135,000sqft (12,500sqm) of B2/B8 use and 1.4 million sqft of B2/B8 use, with an approximate 15% B2/85% B8 split. In addition, it is likely that the land to the east of the A34 would be suitable for circa 600 dwellings rather than 650 dwellings. Therefore, the agreed trip rates in **Table 1** have been used to calculate the peak hour traffic generation for this alternative and more likely development quantum to compare against the figures in **Table 3**. The traffic generation is shown in **Table 4**.

Table 4: Traffic Generation for Alternative Development

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
12,500sqm B2/B8 Employment Development Traffic Generation						
Lights	17	5	22	4	15	19
HGVs	4	3	7	2	2	5
Total Veh.	20	8	28	6	17	23
PCU	24	11	35	8	19	27
1.4 million sqft (130,000sqm) B2/B8 Employment Development						
Lights	174	51	226	43	151	193
HGVs	37	32	69	23	24	48
Total Veh.	211	82	293	66	176	241
PCU	248	114	362	89	200	289
600 Residential Dwellings						
Lights	72	210	282	192	84	276
HGVs	0	0	0	0	0	0
Total Veh.	72	210	282	192	84	276
PCU	72	210	282	192	84	276
476 Place Primary School*						
Lights	92	76	169	5	10	15
HGVs	0	0	0	0	0	0
Total Veh.	92	76	169	5	10	15
PCU	92	76	169	5	10	15
Total Traffic Generation						
Lights	355	342	699	244	260	503
HGVs	41	35	76	25	26	53
Total Veh.	395	376	772	269	287	555
PCU	436	411	848	295	313	608

*The traffic generation has been reduced by 40% to reflect the number of school places taken up by the residential allocation.

2.9 The calculations show that the alternative, more likely development option is expected to generate 848 two-way pcus in the morning peak hour and 608 two-way pcus in the evening peak hour. This is marginally less than shown in **Table 3** for Development Option 2 and hence the following assessment constitutes robust assessment for the proposals.

2.10 The agreed distribution pattern used to assign traffic from Phase 2 to the surrounding highway network has also been retained to assign the above traffic generation. As with Phase 2, separate distribution patterns were used for light and heavy vehicles and are shown in **Diagram STA4** (light vehicles) and **Diagram STA5** (HGVs).

2.11 Using these distribution patterns, **Diagrams STA6** and **STA7** show the traffic assignment for light vehicles and HGVs respectively for development Option 1, whilst **Diagrams STA8** and **STA9** show the traffic assignment for light vehicles and HGVs for development Option 2.

2.12 In light of the above, the following traffic flow scenarios have been calculated to understand the end of Local Plan traffic flows.

- **Diagram STA10** = 2040 + Pets at Home + Development Option 1
- **Diagram STA11** = 2040 + Pets at Home + Development Option 2

Junction Modelling

2.13 The following section tests the capacity of the three off-site junctions on the A34 with the employment and residential allocations in place. It also considers the percentage change in traffic flows along each arm of M6J14. The purpose is to demonstrate whether the allocations could cause any significant capacity problems on the surrounding network, if mitigation is likely to be needed and whether this is likely to be deliverable.

Junction 1: Site Access Roundabout

2.14 The potential 4-arm roundabout on the A34 has been tested for capacity. The 3-arm ARCADY model presented in the 2020 Transport Assessment for Phase 2 has been retained, with a fourth arm being added to the east. Geometric information for the fourth arm has been taken from General Arrangement drawing included in the Transport Note and mirrors the geometry of the arm serving Phase 2 to the west. The modelling assumes that 100% of traffic from the allocations would enter and depart via this junction, which is worst-case noting that the residential allocation to the east would be served by two points of access. **Appendix C** includes the full ARCADY output data, whilst **Table 5** summarises the results.

Table 5: Site Access Roundabout ARCADY Summary Results

	Morning Peak Hour			Evening Peak Hour		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
2040 + Pets at Home + Development Option 1						
Access (E)	0.9	9.99	0.48	0.2	5.10	0.14
A34 (S)	6.3	11.80	0.86	6.6	12.01	0.86
Access(W)	0.3	7.37	0.17	0.6	7.92	0.32
A34 (N)	6.5	11.58	0.86	3.4	6.97	0.76
2040 + Pets at Home + Development Option 2						
Access (E)	1.0	11.03	0.51	0.2	5.45	0.14
A34 (S)	9.3	16.88	0.90	7.8	14.04	0.88
Access(W)	0.4	7.98	0.23	1.0	9.65	0.45
A34 (N)	7.7	13.54	0.88	3.8	7.80	0.78

2.15 The results show that the site access roundabout would operate within capacity. There would be no significant delays or queueing along any of the four arms during either peak hour period. Hence, from a capacity perspective, the new roundabout is considered suitable in serving development on both sides of the A34.

Junction 2: Left in, Left out Site Access

2.16 The priority-controlled left in/left out junction on the A34 shown at **Drawing Number RP3-BWB-ZZ-XX-DR-TR-0001 Revision P1** has been tested for capacity. The modelling assumes that 100% of traffic arriving to the residential allocation from the north on the A34 and all traffic departing to the south on the A34 would use this junction, which presents a highly

robust assessment given that this is a secondary access. **Appendix D** includes the full PICADY output data, whilst **Table 6** summarises the results.

Table 6: Left in, Left out Access PICADY Summary Results

	Morning Peak Hour			Evening Peak Hour		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
2040 + Pets at Home + Development Option 1						
Stream B-AC (site access)	0.3	4.65	0.26	0.1	3.59	0.08
Stream C-AB (A34S)	0.0	0.00	0.00	0.0	0.00	0.00
2040 + Pets at Home + Development Option 2						
Stream B-AC (site access)	0.3	4.71	0.26	0.1	3.65	0.08
Stream C-AB (A34S)	0.0	0.00	0.00	0.0	0.00	0.00

2.17 The results show that the priority-controlled left in/left out junction would operate within capacity. Therefore, from a capacity perspective there would be no reason to propose a signal-controlled layout although this would also be an option that could be considered as part of any future Transport Assessment.

Junction 3: A34/William Bagnall Drive Signal-Controlled Junction

2.18 The LinSig model for the A34/William Bagnall Drive signal-controlled crossroads junction has been retained from the 2020 Transport Assessment supporting Phase 2 to test the impact of the allocations. The modelling assumes that traffic from the allocations heading towards the A513 Stafford bypass would route through the Marston Grange development. **Appendix E** includes the LinSig output data, whilst **Table 7** summarises the results.

Table 7: A34/William Bagnall Drive Junction LinSig Summary Results

	Morning Peak Hour		Evening Peak Hour	
	MMQ (pcu)	DoS (%)	MMQ (pcu)	DoS (%)
2040 Base Year				
A34 (N)	23.4	82.9	19.3	78.3
Betony Villas	14.5	82.2	10.7	78.2
A34 (S)	21.3	73.5	16.2	65.4
Redhill Access	3.3	58.9	10.7	78.8
PRC	8.6%		14.2%	
2040 + Pets at Home				
A34 (N)	24.7	84.9	21.2	82.0
Betony Villas	14.8	83.7	10.9	80.0
A34 (S)	23.4	77.7	19.3	72.9
Redhill Access	3.3	58.9	10.9	80.8
PRC	6.0%		9.8%	
2040 + Pets at Home + Development Option 1				
A34 (N)	38.2	97.2	24.9	89.2
Betony Villas	22.3	96.2	13.7	89.2
A34 (S)	26.9	85.4	23.2	80.4
Redhill Access	3.3	58.9	12.0	87.1
PRC	-8.0%		0.9%	
2040 + Pets at Home + Development Option 2				
A34 (N)	43.0	98.9	26.3	91.1
Betony Villas	25.7	98.1	14.0	89.8
A34 (S)	29.4	88.3	23.8	81.3
Redhill Access	3.3	58.9	12.6	89.5
PRC	-9.9%		-1.2%	

2.19 The results show that the junction is expected to operate within theoretical capacity where each arm would have a Degree of Saturation of less than 100%, however given the results show negative Practical Reserve Capacity it is likely that queueing and delays may start to occur, particularly along the A34(N) and Betony Villas (Marston Grange) arms.

2.20 Any future Transport Assessment would therefore consider a scheme of mitigation to address any significant impacts triggered by the allocations. As a starting point, mitigation would consider sustainable travel improvements to reduce the number of vehicle trips altogether. In terms of physical improvements, at this early stage, mitigation could include extending the length of the left turn flare on the A34(N) and amending the lane configuration to allow for ahead and left turning movements in the southbound

direction. This would require carriageway widening to the south of the junction and possibly minor kerb realignment on Betony Villas, although this should be achievable within available land. Hence, whilst further assessment is required, it is likely that the A34/William Bagnall signal-controlled junction would be capable of accommodating traffic from the employment and residential allocations.

Junction 4: A34/A513 Signal Controlled Roundabout

2.21 The LinSig model for the A34/A513 signal-controlled roundabout has been retained from the Stafford North Business Park Transport Assessment to test the impact of the allocations. **Appendix F** includes the LinSig output data, whilst **Table 8** summarises the results.

Table 8: A34/A513 Junction LinSig Summary Results

	Morning Peak Hour		Evening Peak Hour	
	MMQ (pcu)	DoS (%)	MMQ (pcu)	DoS (%)
2040 Base				
A34 (N)	9.4	71.7	9.9	73.2
A513	8.4	75.9	7.7	71.4
A34 (S)	6.4	68.9	6.4	70.8
A34-M6 Link	5.4	65.9	6.1	71.9
PRC	16.2%		22.9%	
2040 + Pets at Home				
A34 (N)	10.8	77.7	9.1	68.7
A513	8.6	77.1	7.6	74.1
A34 (S)	7.0	75.3	6.8	74.4
A34-M6 Link	4.9	62.5	6.0	70.8
PRC	15.8%		20.9%	
2040 + Pets at Home + Development Option 1				
A34 (N)	14.6	85.4	12.4	80.9
A513	10.2	84.8	6.5	66.1
A34 (S)	9.2	85.8	7.9	80.4
A34-M6 Link	10.1	85.2	8.7	79.5
PRC	4.9%		11.2%	
2040 + Pets at Home + Development Option 2				
A34 (N)	12.5	87.4	12.3	80.3
A513	11.2	87.9	8.2	77.0
A34 (S)	9.7	87.8	7.4	77.0
A34-M6 Link	9.8	83.1	9.2	80.9
PRC	2.4%		11.3%	

2.22 The results show that the A34/A513 signal-controlled roundabout is predicted to operate within capacity when accommodating traffic from the employment and residential allocations at a 2040 future year. Hence, the approved signal-controlled junction arrangement should be suitable in accommodating future traffic flows without any further improvements being needed.

Junction 5: M6 Junction 14

2.23 To understand the impacts of the employment and residential allocations at M6J14, **Table 9** compares the traffic flows on each arm against the 2040 Base + Pets at Home scenario.

Table 9: A34/William Bagnall Drive Junction LinSig Summary Results

	2040 Base Year + Pets at Home	2040 Base Year + Pets at Home + Development Option 1	Increase (no./%)	2040 Base Year + Pets at Home + Development Option 2	Increase (no./%)
Arm 1: A34					
Morning Peak Hour	1347	1545	15%	1572	17%
Evening Peak Hour	1430	1512	6%	1542	8%
Arm 2: A5013 (east)					
Morning Peak Hour	757	757	0%	757	0%
Evening Peak Hour	829	829	0%	829	0%
Arm 3: M6 northbound off-slip					
Morning Peak Hour	1161	1232	6%	1255	8%
Evening Peak Hour	1277	1355	6%	1368	7%
Arm 4: A5013 (west)					
Morning Peak Hour	1037	1043	1%	1045	1%
Evening Peak Hour	974	980	1%	981	1%
Arm 5: M6 southbound off-slip					
Morning Peak Hour	620	665	7%	679	16%
Evening Peak Hour	455	517	14%	527	9%

2.24 The results show that the allocations could increase traffic flows by up to 17% on the A34. Whilst National Highways would be consulted on any future planning application, it is considered that the impacts are likely to be modest, although if required, mitigation could be achieved by delivering minor kerb-realignment and/or alterations to the signals. Hence, it is considered that the development options being considered would not have a significant impact at M6J14.

3. ASSESSMENT OF JUNCTIONS IN STONE

Introduction

3.1 The proposed employment and residential allocations at Stafford are expected to generate 160 movements (or 179 pcus) in the morning peak hour and 134 movements (or 151 pcus) two-way to the north along the A34 towards Stone. This additional traffic therefore has the potential to cause impacts at the Aston Roundabout and Stafford Roundabout.

3.2 To provide an understanding of the potential traffic implications at these junctions, historic traffic flow data has been obtained from a Transport Assessment Addendum supporting a residential development at Udall Grange located on Eccleshall Road in Stone (**13/19002/OUT**). The planning application received permission for 500 dwellings in February 2015 and is now largely built out and occupied. The Transport Assessment Addendum contains turning count information from 2012 at the two roundabouts, which has been extracted and shown on **Diagram STO1**. Relevant extracts from the 2012 Transport Assessment Addendum are included at **Appendix G.**

3.3 The 2012 traffic flows have been scaled up to 2040 by obtaining growth factors from the TEMPro database. To start with, growth factors have been obtained to scale the 2012 flows to 2033, which includes all planning data assumptions during this time such as the Stafford North Business Park development and is in keeping with the assessment undertaken for the junctions in Stafford. Separate growth factors have then been obtained to scale the 2033 flows to 2040 but with all planning data assumptions removed across Stafford, as it is considered that this would be covered by the allocations in both Stafford and Stone, that will be manually added onto the background flows to avoid double counting. **Appendix A** includes the TEMPro outputs, which calculate the following growth factors:

- 2012 – 2033 (AM) = 1.243
- 2012 – 2033 (PM) = 1.245
- 2033 – 2040 (AM) = 1.044
- 2033 – 2040 (PM) = 1.042

3.4 Using the above information, the following traffic flow scenarios have been calculated.

- **Diagram STO1** = 2012 Observed Flows
- **Diagram STO2** = 2033 Base Flows
- **Diagram STO3** = 2040 Future Flows
- **Diagram STO4 =** 2040 Future Flows with Development Option 1
- **Diagram STO5 =** 2040 Future Flows with Development Option 2

3.5 The 2040 two-way traffic flows entering/departing Stafford at the new roundabout (**Diagram STA2**) have been compared against the 2040 two-way traffic flows entering/departing Stone (**Diagram STO3**) to check whether the numbers are consistent between the two data sets. The data shows that the 2040 traffic flows derived using the 2012 survey data from the Udall Grange Transport Assessment are approximately 13%

lower than the 2040 traffic flows derived using the Stafford SATURN model. This could be because of additional traffic joining the A34 towards Stafford from local villages or simply because traffic flows reduced from 2007 to 2012 when the two surveys were undertaken. Whilst this is currently unknown, this difference has been considered in the following assessments of the Aston Roundabout and Stafford Roundabout.

Assessment of Aston Roundabout

3.6 The Aston Roundabout was modelled as part of the Transport Assessment Addendum supporting the Udall Grange development. The assessment considered a future year of 2027 inclusive of local committed developments and the associated 500 dwellings. The results showed that the junction was expected to exceed capacity and therefore mitigation was proposed. Those improvements have since been delivered and are what are shown on the ground today. The modelling results under the improved layout within the Transport Assessment Addendum (now existing) are summarised in **Table 10**.

Table 10: Aston Roundabout Modelling Results (2027 Future Year)

Approach	2017 with 185 units				2027 with 500 units			
	AM Peak		PM Peak		AM Peak		PM Peak	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A34 Stafford Road north	0.777	3	0.517	1	0.855	6	0.566	1
A51	0.737	3	0.292	0	0.883	6	0.343	1
A34 Stafford Road south	0.473	1	0.602	2	0.514	1	0.638	2
Brooms Road	0.118	0	0.654	2	0.129	0	0.760	3

3.7 The results show the junction is forecast to operate within capacity at the 2027 future year, inclusive of general background growth and the Udall Grange development. However, the existing junction is unlikely to operate within capacity in 2040 when accounting for the additional 13 years of traffic growth.

3.8 To understand the potential impacts of the Stafford allocations, **Table 11** shows the percentage increase in traffic along each arm compared to the 2040 background flows.

Table 11: Percentage Change in Traffic Flows at Aston Roundabout

	2040 Future Year	2040 Future Year + Development + Stafford Development Option 1	Increase (no./%)	2040 Future Year + Development + Stafford Development Option 2	Increase (no./%)
Arm 1: A34(N)					
Morning Peak Hour	2392	2456	2.7%	2473	3.4%
Evening Peak Hour	1474	1531	3.8%	1538	4.3%
Arm 2: A51					
Morning Peak Hour	1073	1073	0%	1073	0%
Evening Peak Hour	602	602	0%	602	0%
Arm 3: A34(S)					
Morning Peak Hour	1142	1213	6.2%	1221	6.9%
Evening Peak Hour	1684	1737	3.1%	1754	4.2%
Arm 4: Brooms Road					
Morning Peak Hour	224	224	0%	224	0%
Evening Peak Hour	686	686	0%	686	0%

3.9 The results show that the Stafford allocations could trigger a 4.3% increase in traffic on the A34(N) and a 6.9% increase in traffic on the A34(S). Given that the junction is likely to be already over capacity in 2040, it is likely that this will require mitigation.

3.10 HS2 are delivering an improvement scheme at Aston Roundabout as part of the strategy for mitigating the impacts of construction traffic associated with the railway works. Indicative proposals have been found on HS2 drawing CT-05-220-R2 included at **Appendix H**, which show how a segregated left turn lane would be provided for movements from the A51 to the A34 southbound. By 2040, construction of HS2 will have been completed and the improvement scheme will result in an overall benefit to the operation of the junction.

3.11 Whilst modelling results for the improved junction layout are unavailable, the HS2 improvements may not be sufficient for the junction to operate satisfactorily with the allocations in place. Nevertheless, there are opportunities available to provide mitigation through minor widening of the approach arms and this will be considered as part of any future Transport Assessment.

Assessment of Stafford Roundabout

3.12 The Stafford Roundabout was also modelled as part of the Transport Assessment Addendum supporting the Udall Grange development at a future year of 2027. The results showed that the junction would exceed capacity and hence mitigation was proposed. Those improvements have since been delivered and are what are shown on the ground today. The modelling results under the improved layout within the Transport Assessment (now existing) are summarised in **Table 12**.

Table 12: Stafford Roundabout Modelling Results (2027 Future Year)

Approach	2017 with 185 units				2027 with 500 units			
	AM Peak		PM Peak		AM Peak		PM Peak	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A34 The Fillybrooks north	0.941	12	0.781	2	1.086	81	0.878	6
Stafford Road	0.741	3	0.578	1	0.867	6	0.578	1
A34 The Fillybrooks south	0.529	1	0.858	3	0.567	1	0.858	6
Eccleshall Road	0.554	1	0.655	1	0.709	2	0.655	2

3.13 The results show that all arms of the junction are expected to operate within capacity with the exception of the A34(N) arm during the morning peak hour. This situation is expected to worsen with an additional 13 years of traffic growth from 2027 to 2040.

3.14 To understand the impacts of the Stafford allocations, **Table 13** shows the percentage increase in traffic along each arm compared to the 2040 background flows.

Table 13: Percentage Change in Traffic Flows at Stafford Roundabout

	2040 Future Year	2040 Future Year + Development + Stafford Development Option 1	Increase (no./%)	2040 Future Year + Development + Stafford Development Option 2	Increase (no./%)
Arm 1: A34(N)					
Morning Peak Hour	1527	1588	4.0%	1605	5.1%
Evening Peak Hour	1273	1327	4.2%	1334	4.8%
Arm 2: Stafford Road					
Morning Peak Hour	1104	1107	<1%	1108	<1%
Evening Peak Hour	921	924	<1%	924	<1%
Arm 3: A34(S)					
Morning Peak Hour	1532	1603	4.6%	1611	5.2%
Evening Peak Hour	2279	2332	2.3%	2349	3.1%
Arm 4: Eccleshall Road					
Morning Peak Hour	963	963	0%	963	0%
Evening Peak Hour	704	704	0%	704	0%

3.15 The results show that Stafford allocations could have a 5.1% increase in traffic on the A34(N) arm and a 5.2% increase in traffic on the A34(S) arm which is likely to require mitigation. The environment around the junction is largely built up on all sides and therefore any mitigation could involve delivering a scheme of signalisation at the roundabout to provide better control for movements and prioritise arms that are expected to reach capacity, such as the A34(N). This would have wider benefits in terms of allowing signal-controlled pedestrian crossings to be implemented at the junction, which would provide safer conditions for vulnerable road users and possibly encourage

more local residents to travel by sustainable modes and reduce overall traffic movements.

3.16 In summary, it is considered that the additional traffic generated by the Stafford allocations is likely to require modest mitigation at the Aston Roundabout and Stafford Roundabout in Stone. However, the latter is likely to involve a more comprehensive solution if existing capacity issues are to also be resolved.

4. SUMMARY

4.1 This Technical Note has been prepared to set out full details of the modelling work undertaken to support sites located to the north of Stafford through the SBC Local Plan process.

4.2 The main conclusions of the Technical Note are as follows:

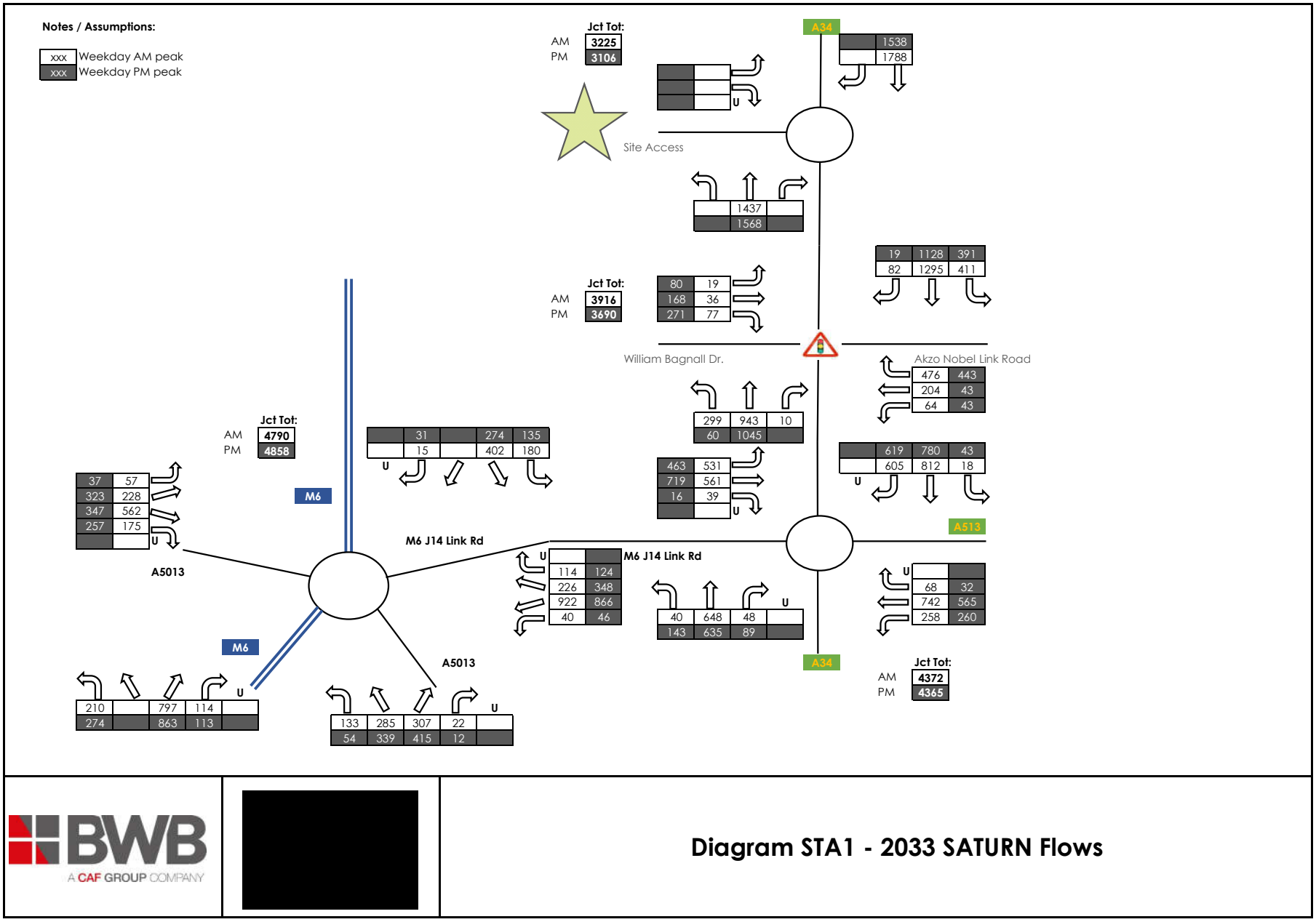
1. The new roundabout on the A34 built to serve Phase 2 and Redhill Roundabout would continue to operate within capacity.

2. The allocations are not expected to have a severe impact at the A34/William Bagnall Drive crossroads junction although some form of mitigation is expected to be needed, such as increasing flare lengths and kerb realignment.

3. Whilst the impact on M6J14 will need to be assessed further within any future Transport Assessment produced in consultation with National Highways, it is concluded that the impact would be minor and any mitigation (if required) is likely to be modest.

4. The allocations are expected to require mitigation at the Aston Roundabout and Stafford Roundabout in Stone. However, the latter is likely to require a more comprehensive solution if capacity issues are to also be resolved.

TRAFFIC FLOW DIAGRAMS



BWB
A CAF GROUP COMPANY

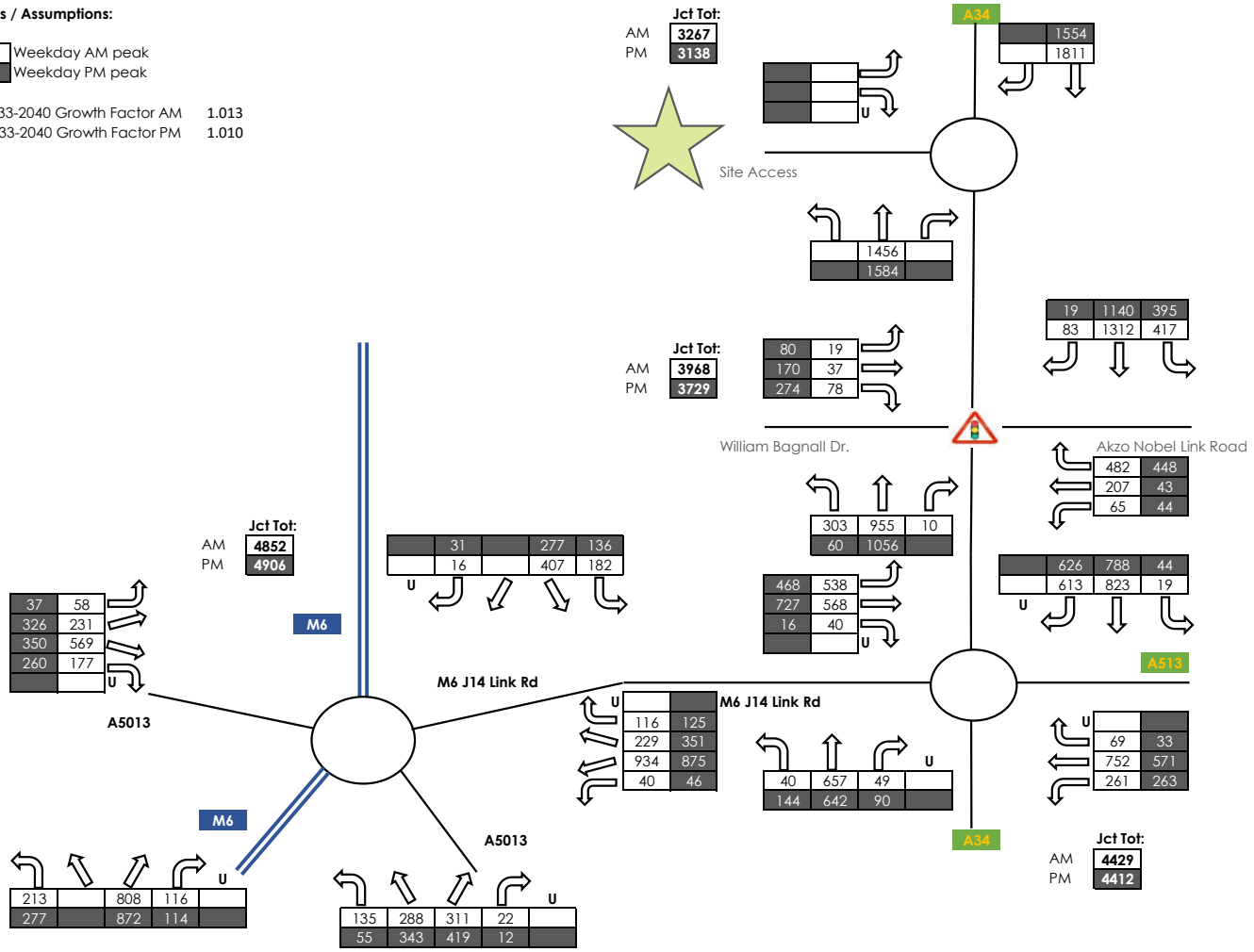
[redacted]

Diagram STA1 - 2033 SATURN Flows

Notes / Assumptions:

xxx	Weekday AM peak
xxx	Weekday PM peak

2033-2040 Growth Factor AM 1.013
2033-2040 Growth Factor PM 1.010



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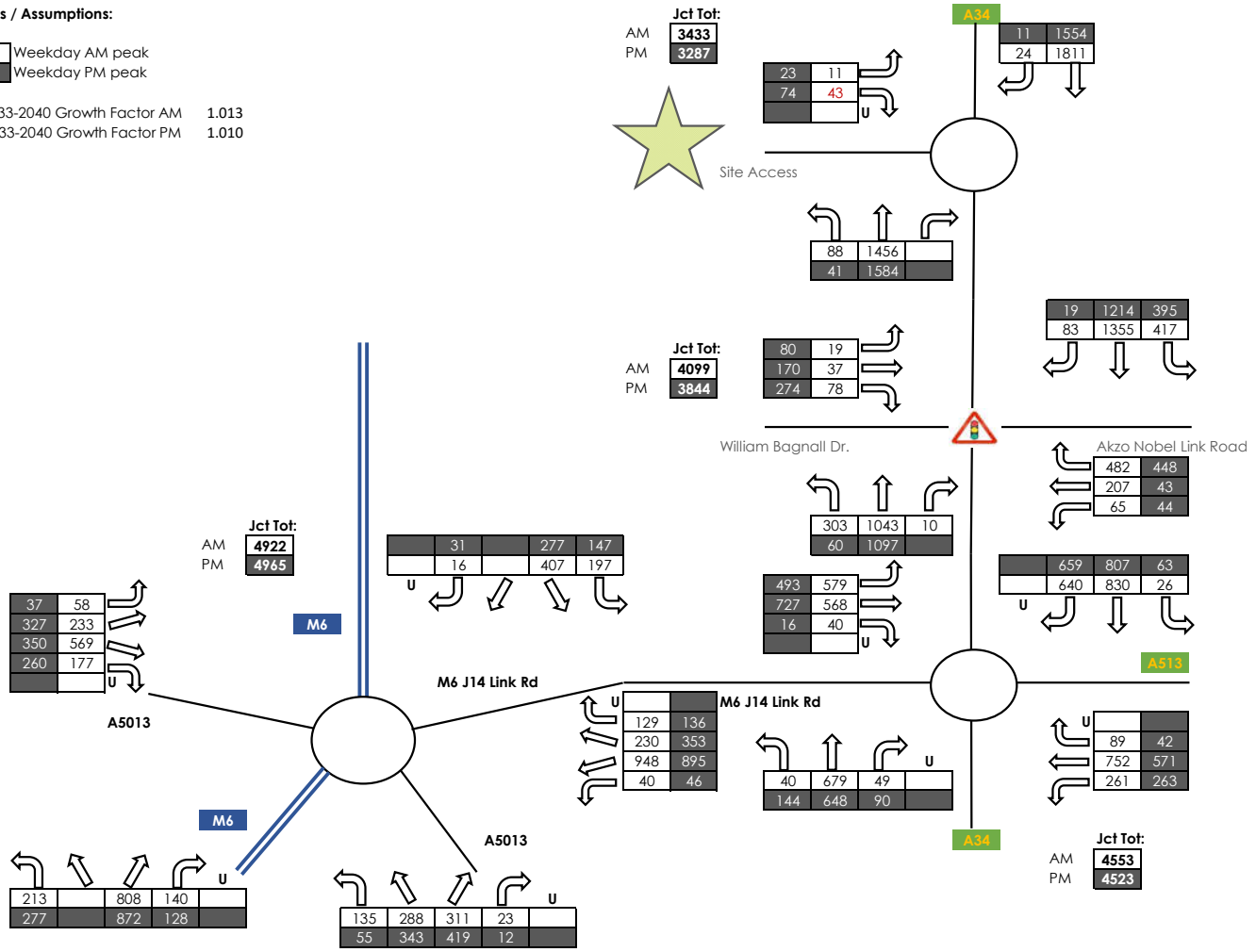
[redacted]

Diagram STA2 - 2040 Base Flows

Notes / Assumptions:

xxx	Weekday AM peak
xxx	Weekday PM peak

2033-2040 Growth Factor AM 1.013
2033-2040 Growth Factor PM 1.010



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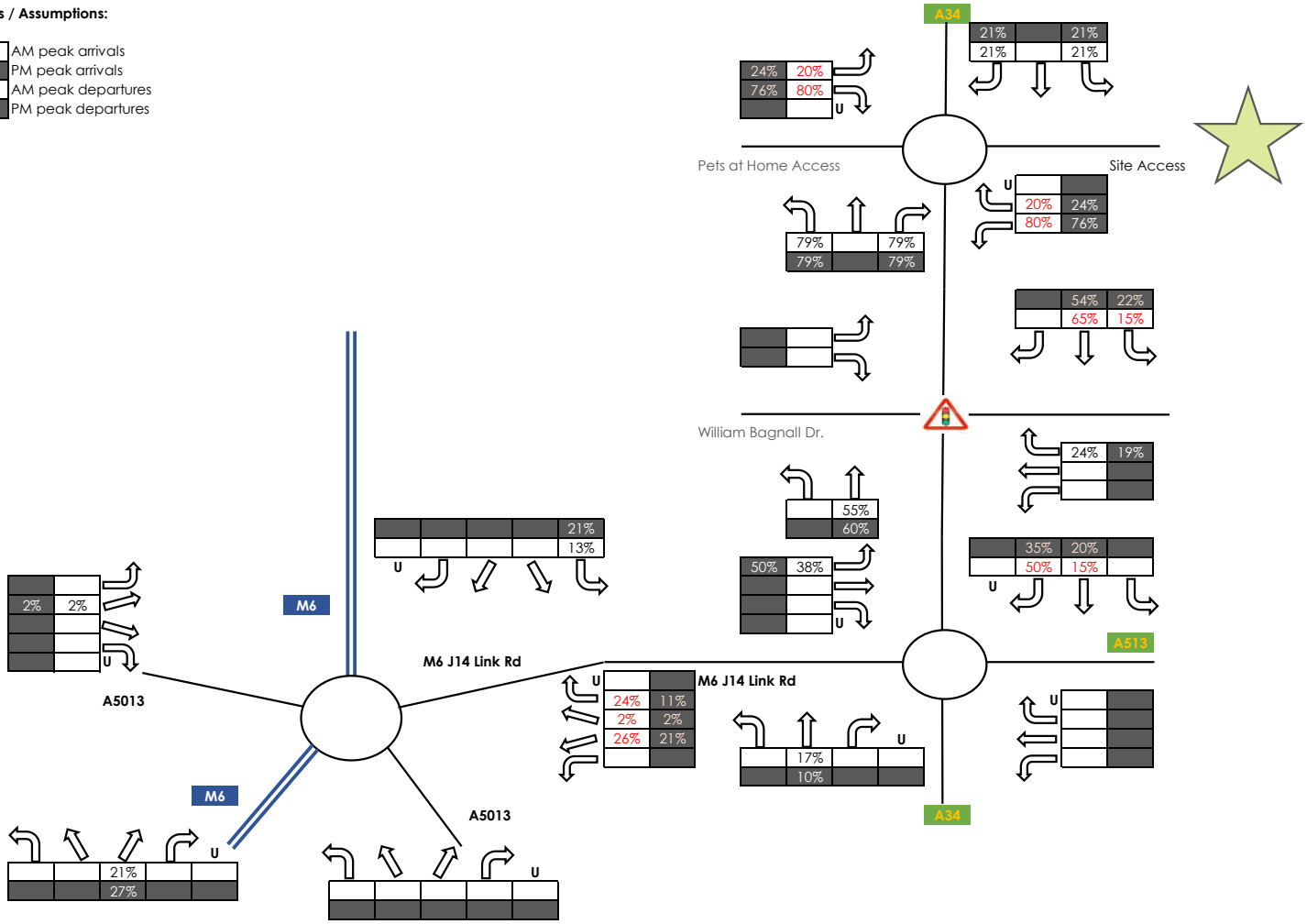
[redacted]

Diagram STA3 - 2040 Base Flows + Pets at Home

Notes / Assumptions:

xx%	AM peak arrivals
xx%	PM peak arrivals
xx%	AM peak departures
xx%	PM peak departures



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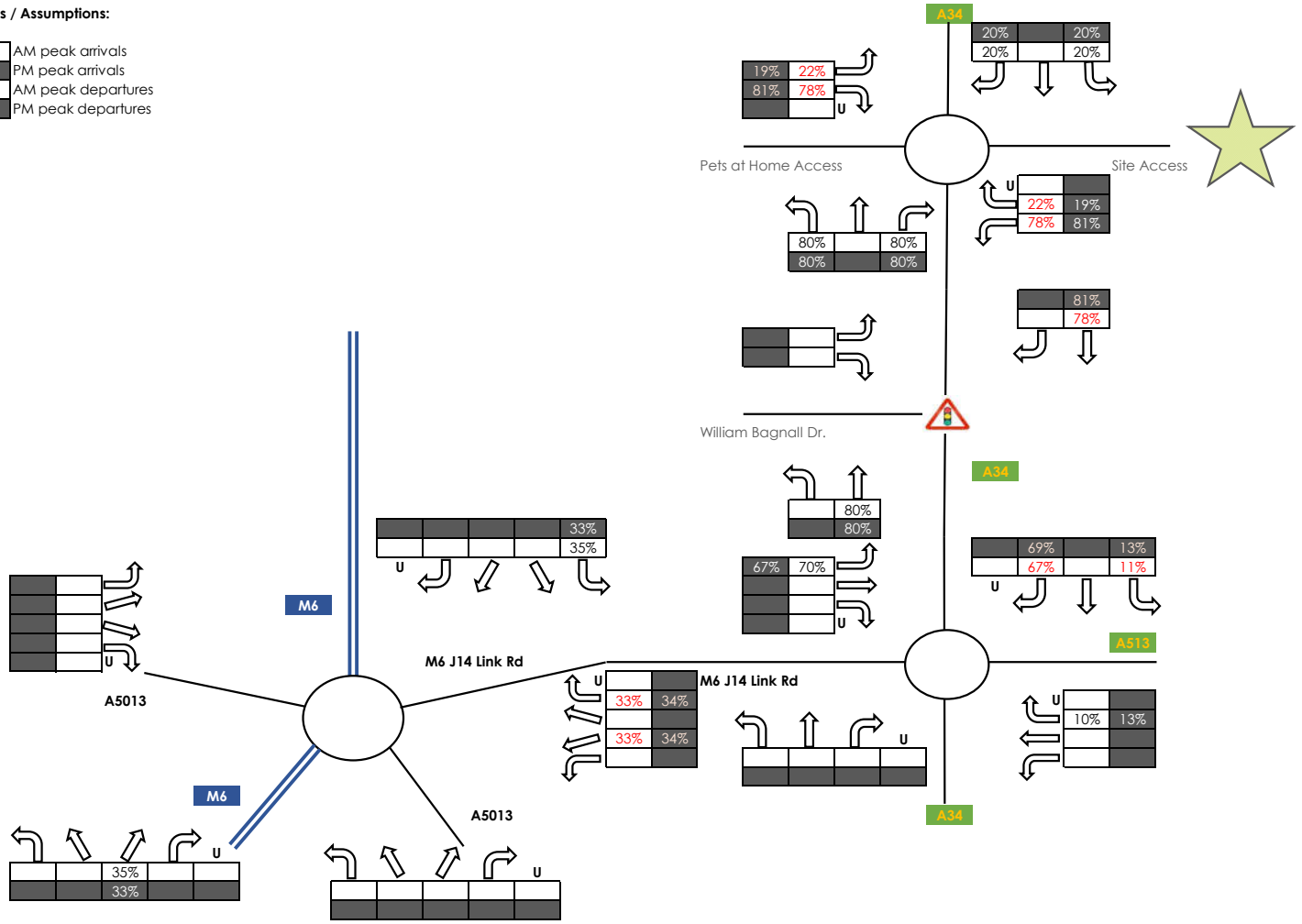
[redacted]

Diagram STA4 - Light Vehicle Distribution

Notes / Assumptions:

xx%	AM peak arrivals
xx%	PM peak arrivals
xx%	AM peak departures
xx%	PM peak departures



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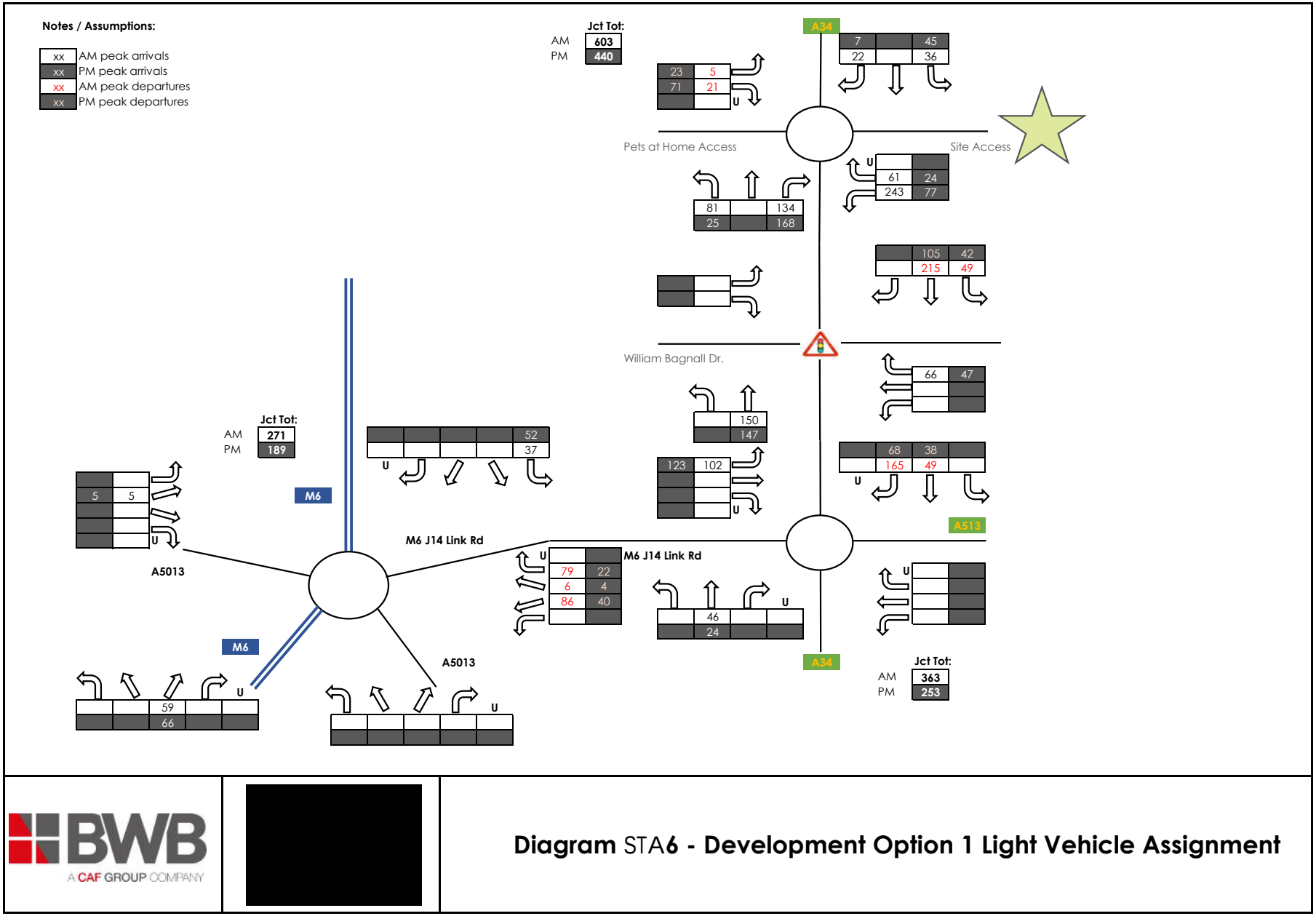
[redacted]

Diagram STA5 - HGV Distribution



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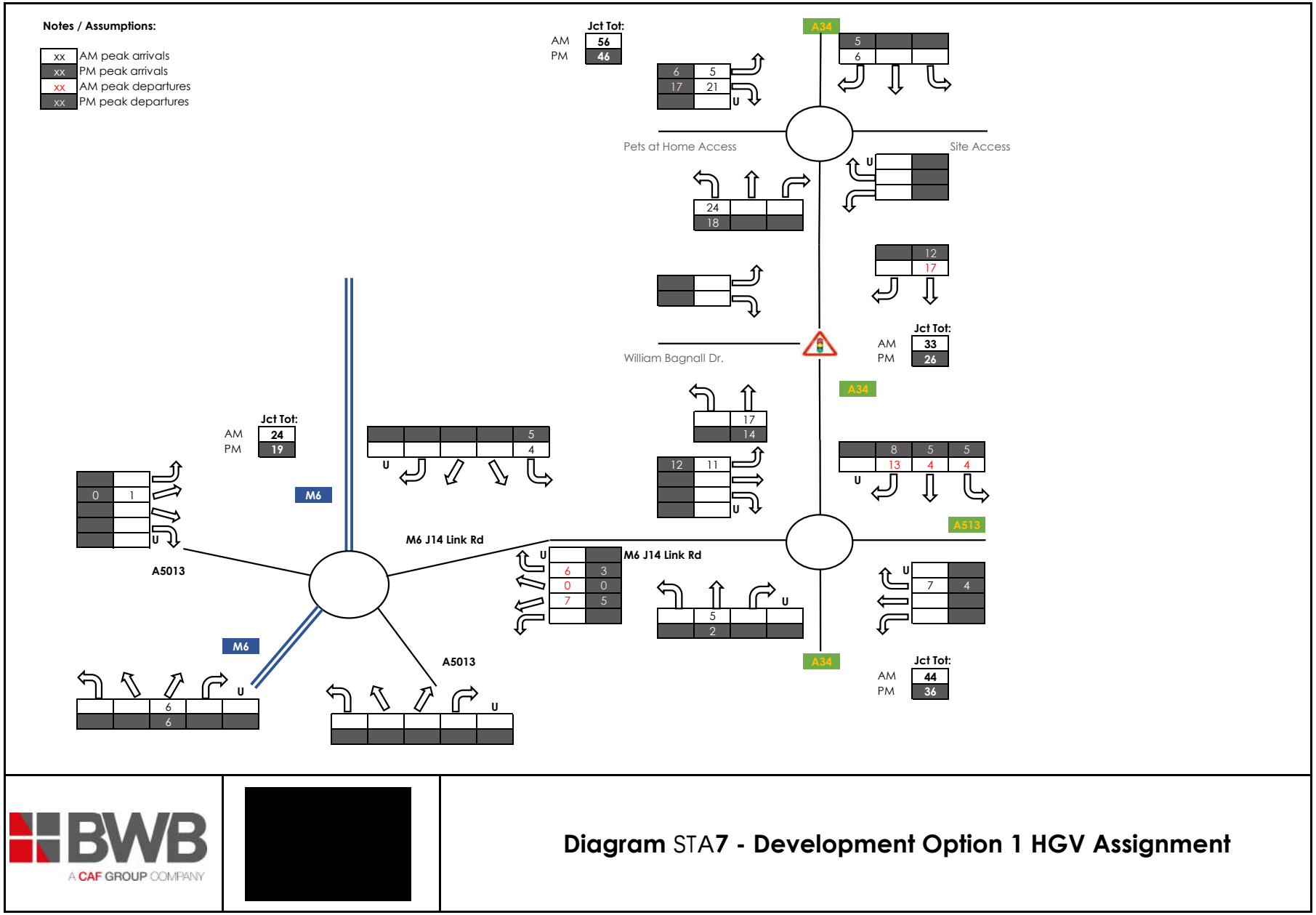
[redacted]

Diagram STA6 - Development Option 1 Light Vehicle Assignment



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[redacted]

Diagram STA7 - Development Option 1 HGV Assignment

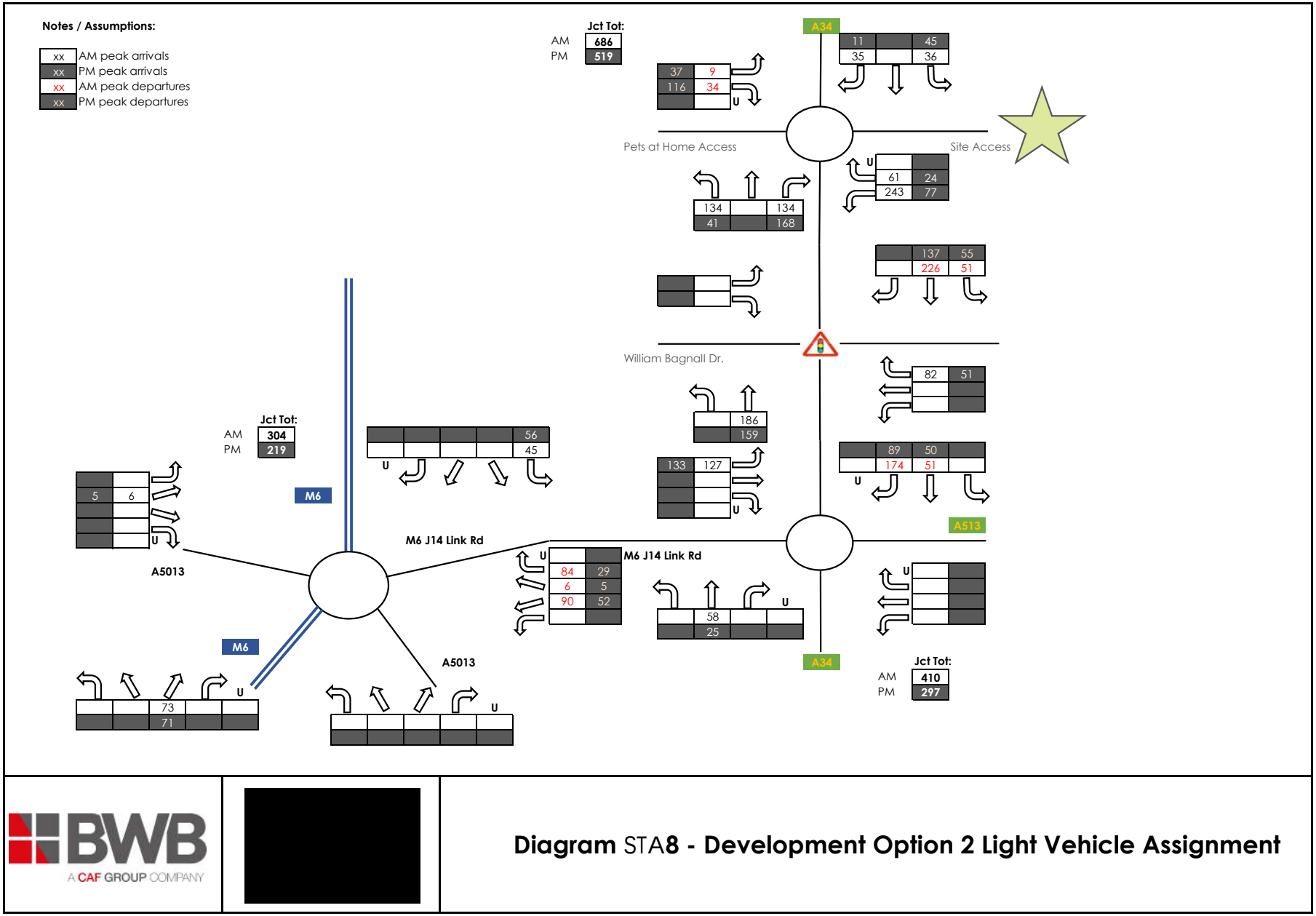
Notes / Assumptions:
xx AM peak arrivals
xx PM peak arrivals
xx AM peak departures
xx PM peak departures
Jct Tot:
AM 686
PM 519
A34
Pets at Home Access
Site Access
William Bagnall Dr.
A513
M6 J14 Link Rd
M6 J14 Link Rd
A5013
A5013
M6
M6
Jct Tot:
AM 304
PM 219
Jct Tot:
AM 410
PM 297
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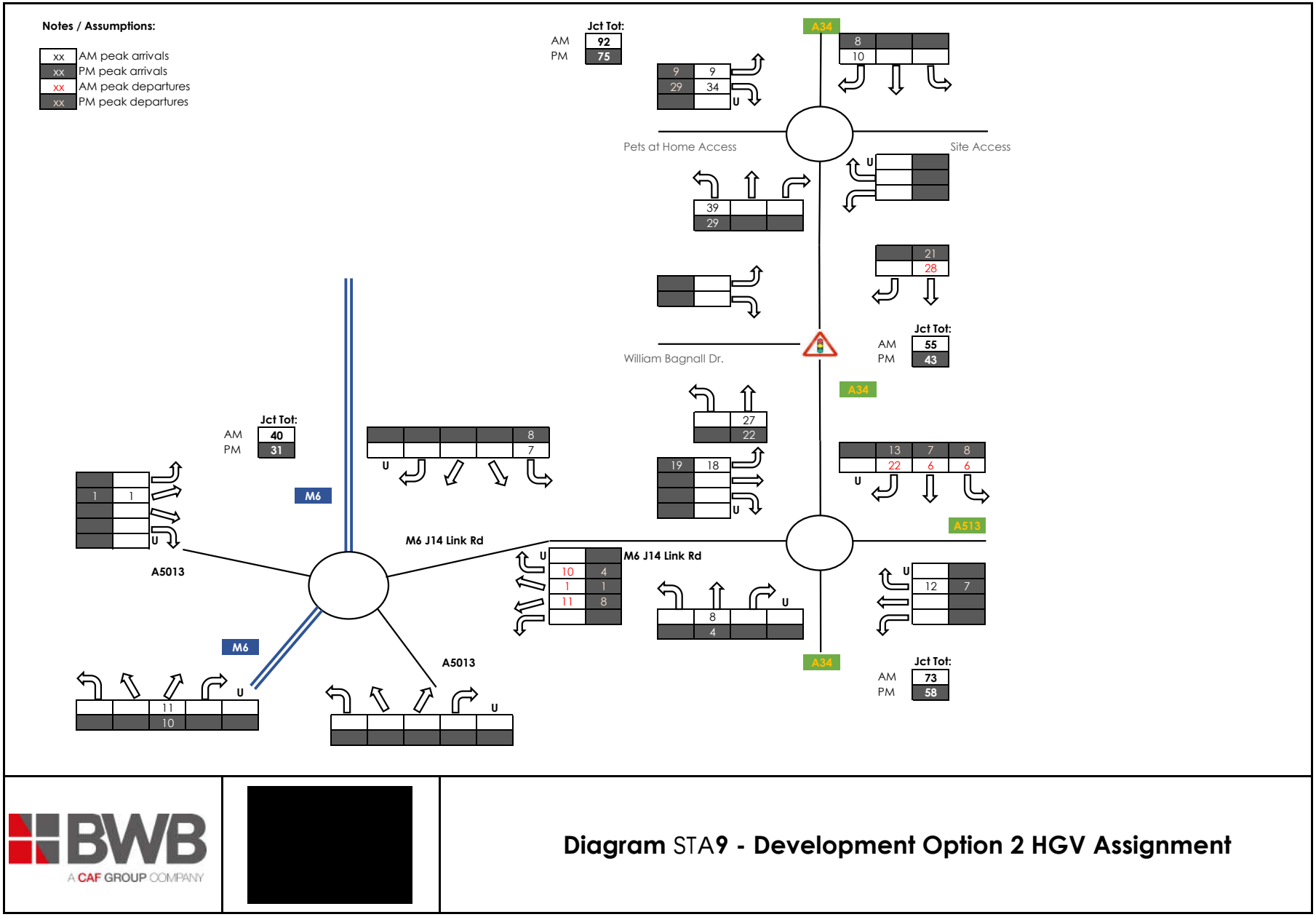
Diagram STA8 - Development Option 2 Light Vehicle Assignment



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[redacted]

Diagram STA9 - Development Option 2 HGV Assignment

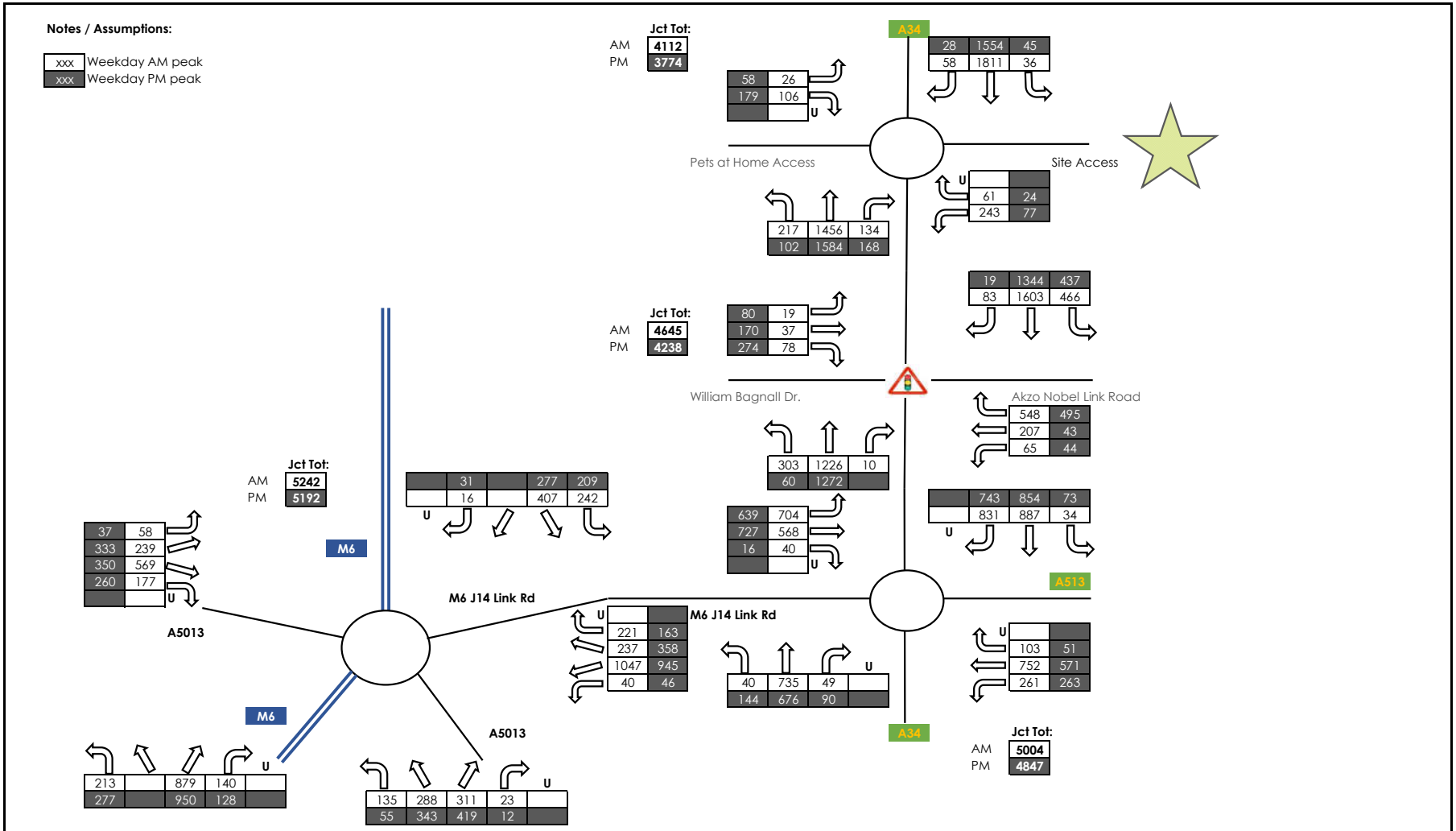

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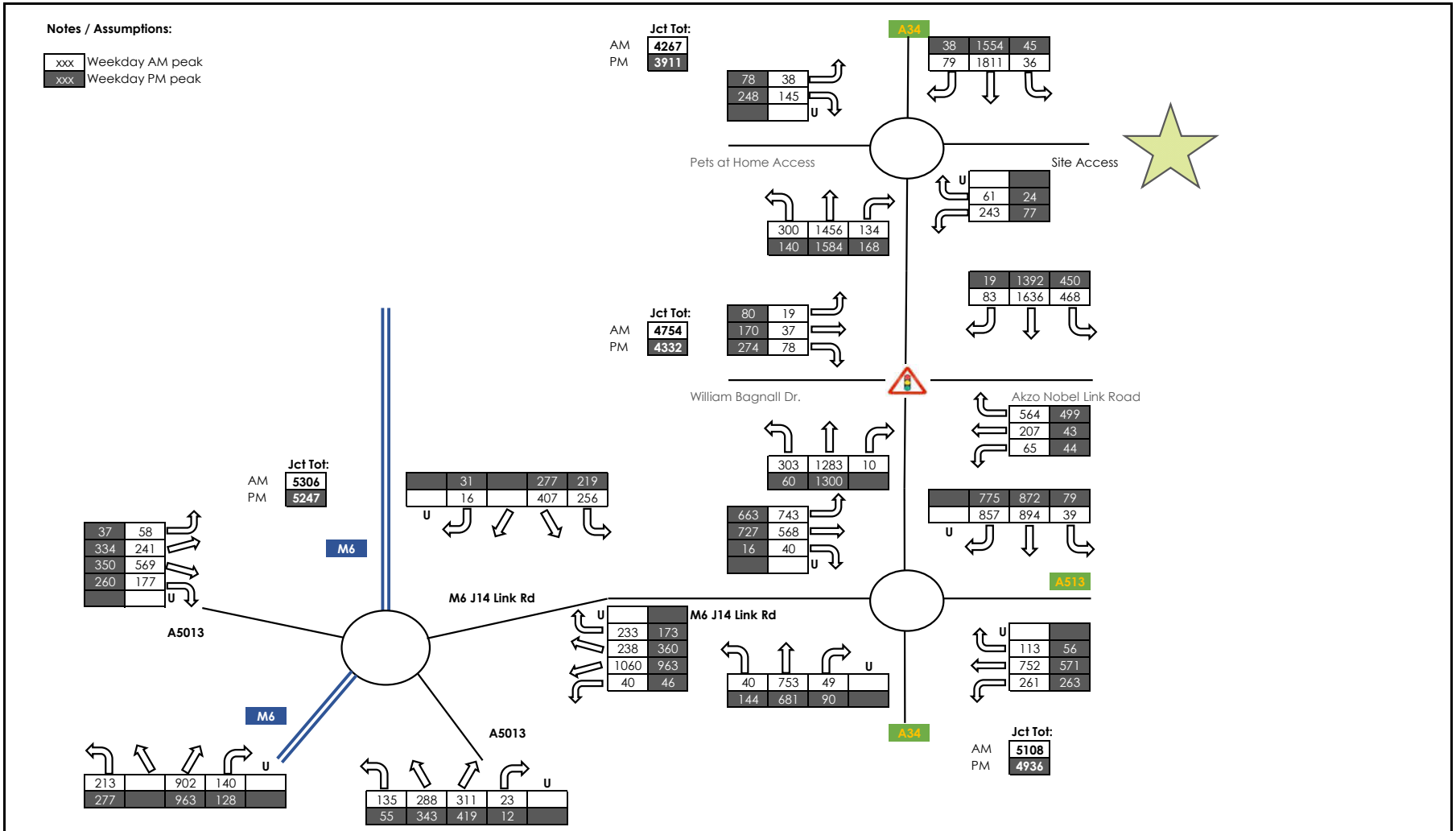
Diagram STA10 - 2040 + Pets at Home + Development Option 1



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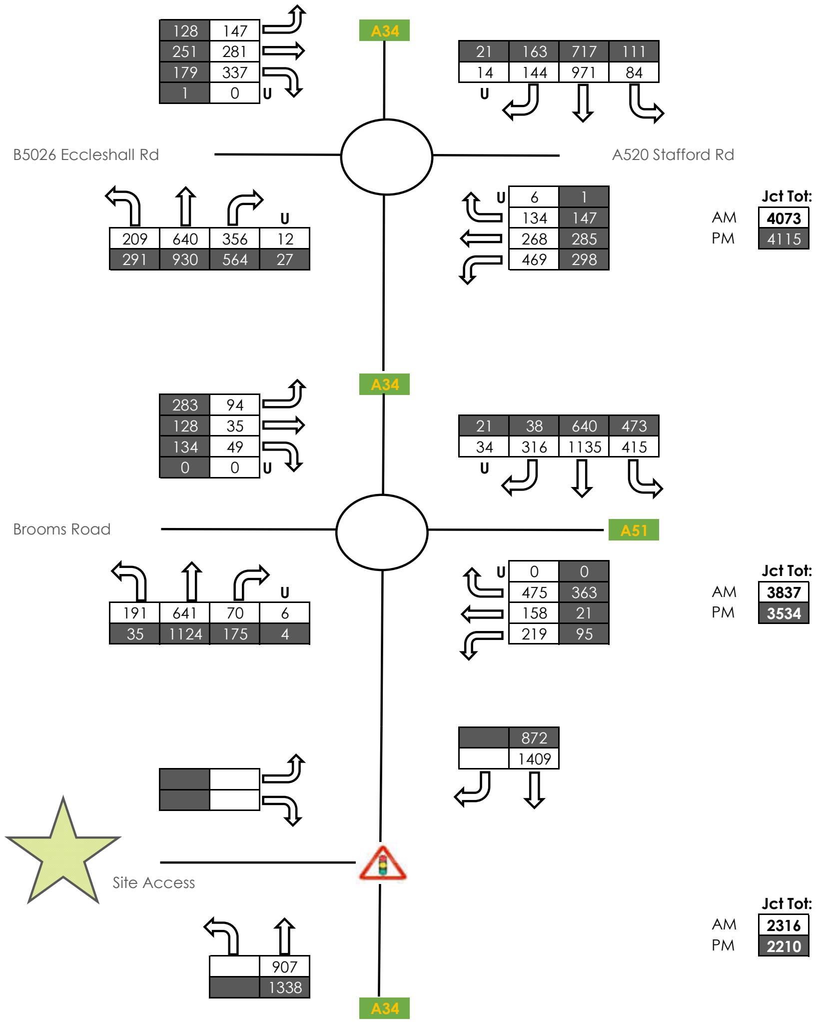
[redacted]

Diagram STA11 - 2040 + Pets at Home + Development Option 2



Notes / Assumptions:

2012 Base Flows from West Of Longhope Drive TAA

(white)	AM
(grey)	PM

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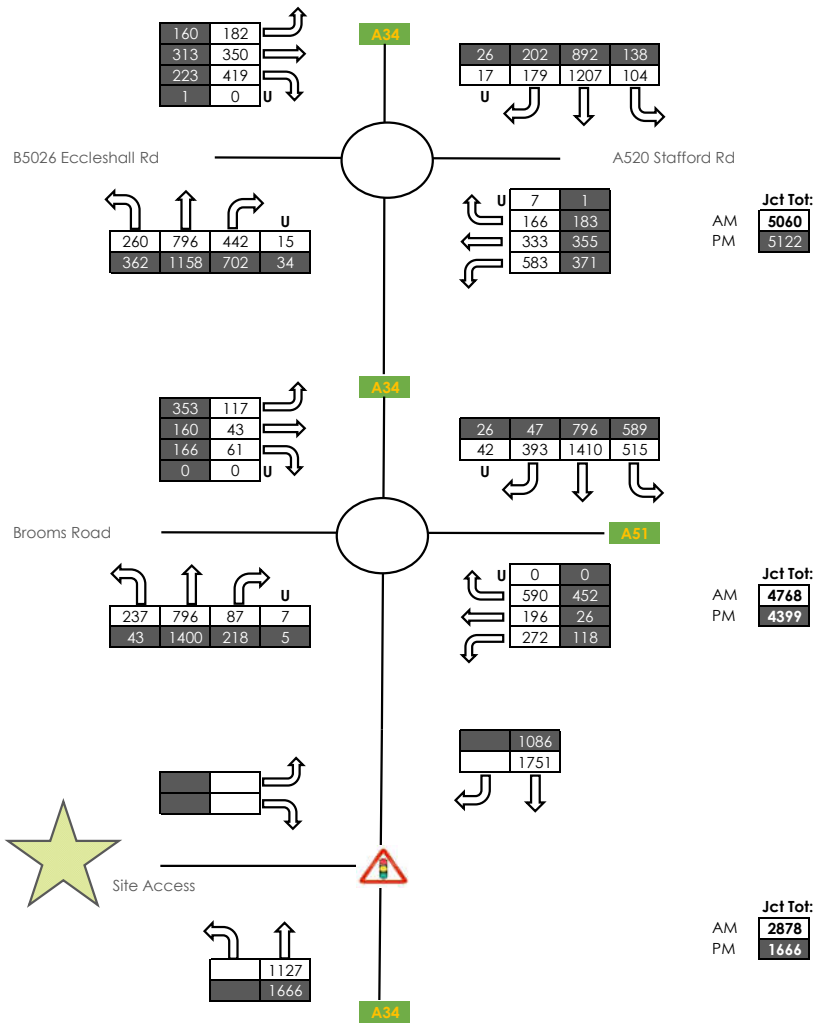
[redacted]

STO1 - 2012 Observed Flows



Notes / Assumptions:

AM
PM

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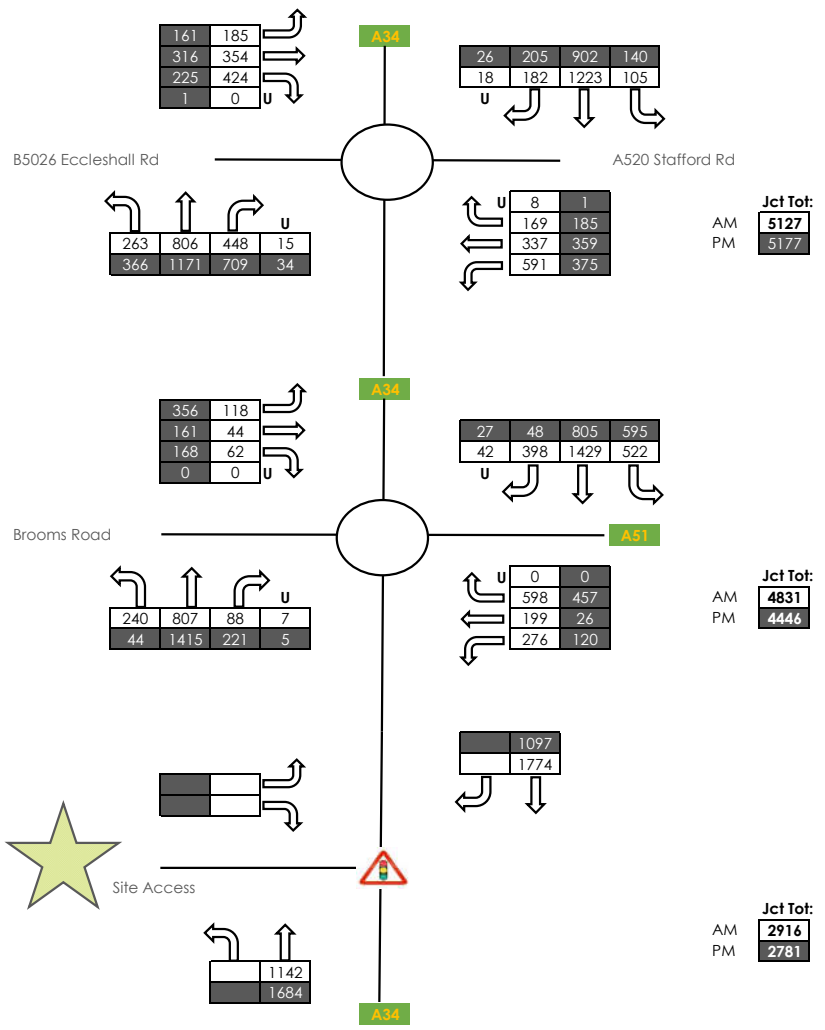
[redacted]

STO2 - 2033 Base Flows



Notes / Assumptions:

AM
PM

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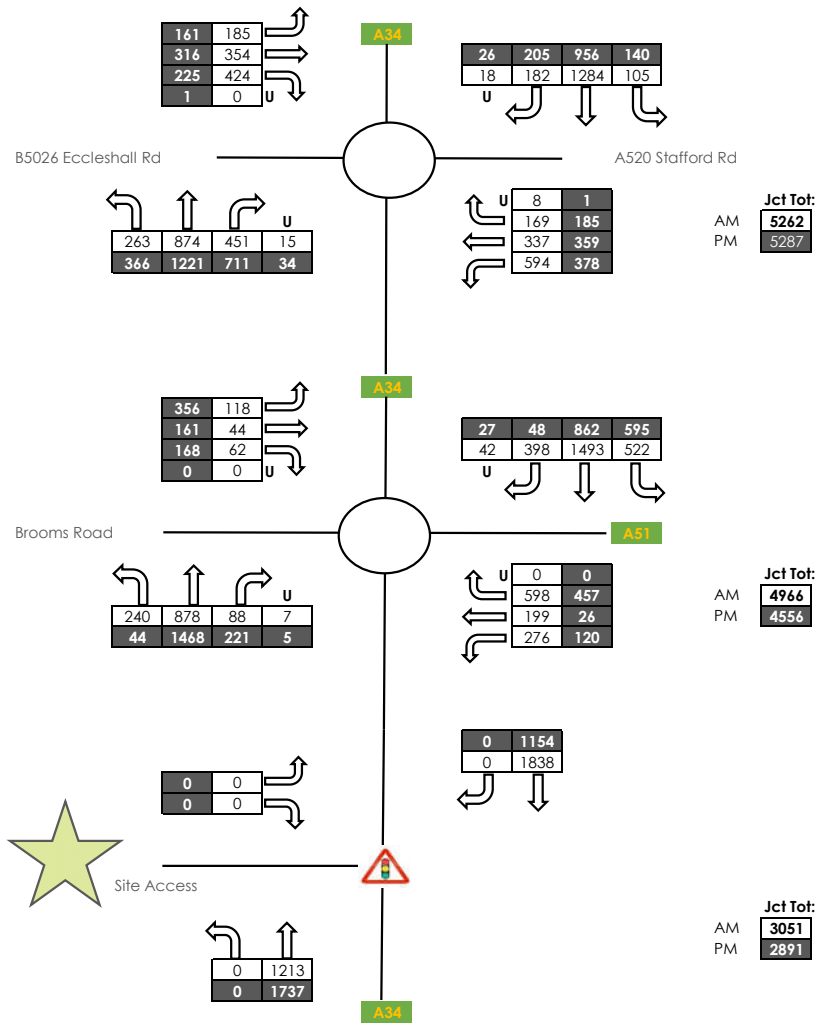
[redacted]

STO3 - 2040 Observed Flows



Notes / Assumptions:

AM
PM

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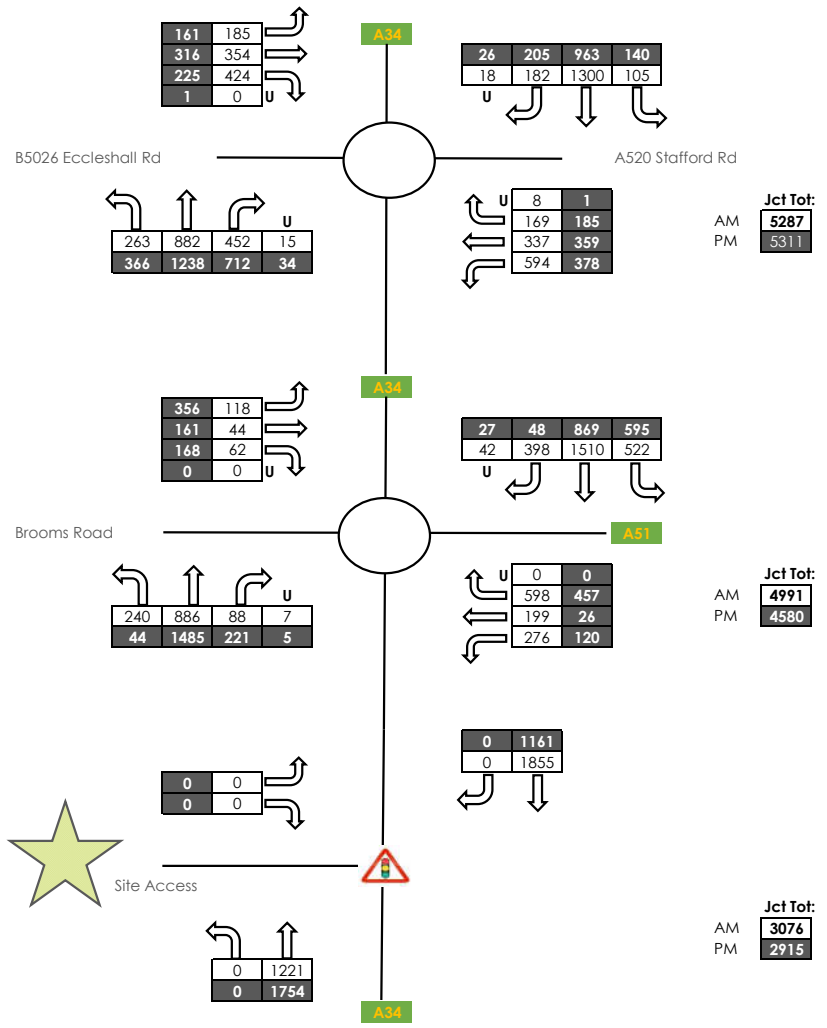
[redacted]

STO4 - 2040 Future Year + Development Option 1



Notes / Assumptions:

AM
PM

[redacted]

STO5 - 2040 Future Year + Development Option 2

APPENDICES

APPENDIX A: TEMPro Growth Factors

Dataset Version: 72
Result Type: Trip ends by time period
Base Year: 2033
Future Year: 2040
Trip Purpose Group: All purposes
Time Period: Weekday AM peak period (0700 - 0959)
Trip End Type: Origin/Destination
Alternative Assumptions Applied: Yes

Growth Factor

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	0.9991	1.0183

Future Year - Base Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	-36	729

Base Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	38,829	40,030

Future Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	38,793	40,759

Level	Area	Local Growth Figure
Authority	Stafford	1.013002843

Dataset Version: 72
Result Type: Trip ends by time period
Base Year: 2033
Future Year: 2040
Trip Purpose Group: All purposes
Time Period: Weekday PM peak period (1600 - 1859)
Trip End Type: Origin/Destination
Alternative Assumptions Applied Yes

Growth Factor

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	1.0125	0.9997

Future Year - Base Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	531	-15

Base Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	42,727	41,045

Future Year

Area Description		All purposes	
Level	Name	Origin	Destination
Authority	Stafford	43,258	41,030

Level	Area	Local Growth Figure
Authority	Stafford	1.010391752

APPENDIX B: TRICS Output Data

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : A - PRIMARY
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	BU	BUCKINGHAMSHIRE	1 days
	HC	HAMPSHIRE	1 days
03	SOUTH WEST		
	BR	BRISTOL CITY	1 days
	CW	CORNWALL	1 days
	SM	SOMERSET	1 days
04	EAST ANGLIA		
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DY	DERBY	1 days
	LE	LEICESTERSHIRE	1 days
	NM	WEST NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	AC	CHESHIRE WEST & CHESTER	1 days
	BP	BLACKPOOL	1 days
	GM	GREATER MANCHESTER	1 days
09	NORTH		
	TW	TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of pupils
Actual Range: 208 to 621 (units:)
Range Selected by User: 200 to 800 (units:)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/14 to 23/05/22

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	3 days
Tuesday	4 days
Wednesday	2 days
Thursday	5 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	15 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	7
Neighbourhood Centre (PPS6 Local Centre)	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

F1(a)	15 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	4 days
10,001 to 15,000	1 days
15,001 to 20,000	4 days
20,001 to 25,000	2 days
25,001 to 50,000	2 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	3 days
125,001 to 250,000	3 days
250,001 to 500,000	7 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	10 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	2 days
No	13 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	15 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 AC-04-A-01 PRIMARY SCHOOL CHESHIRE WEST & CHESTER
WESTON GROVE
CHESTER
UPTON
Edge of Town
Residential Zone
Total Number of pupils: 219
Survey date: MONDAY *17/11/14* *Survey Type: MANUAL*

2 BP-04-A-01 PRIMARY SCHOOL BLACKPOOL
SEVERN ROAD
BLACKPOOL
SOUTH SHORE
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of pupils: 449
Survey date: TUESDAY *27/09/16* *Survey Type: MANUAL*

3 BR-04-A-01 PRIMARY SCHOOL BRISTOL CITY
SCHOOL CLOSE
BRISTOL
WHITCHURCH
Edge of Town
Residential Zone
Total Number of pupils: 208
Survey date: TUESDAY *22/09/15* *Survey Type: MANUAL*

4 BU-04-A-01 PRIMARY SCHOOL BUCKINGHAMSHIRE
LOWER ROAD
NEAR AYLESBURY
STOKE MANDEVILLE
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of pupils: 208
Survey date: WEDNESDAY *01/10/14* *Survey Type: MANUAL*

5 CW-04-A-03 PRIMARY ACADEMY CORNWALL
TREVERBYN RISE
PENRYN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of pupils: 440
Survey date: THURSDAY *28/03/19* *Survey Type: MANUAL*

6 DY-04-A-01 PRIMARY SCHOOL DERBY
VICARAGE ROAD
DERBY
MICKLEOVER
Edge of Town
Residential Zone
Total Number of pupils: 387
Survey date: THURSDAY *25/06/15* *Survey Type: MANUAL*

7 GM-04-A-01 PRIMARY SCHOOL GREATER MANCHESTER
ROCH MILLS CRESCENT
ROCHDALE

Edge of Town
Residential Zone
Total Number of pupils: 457
Survey date: TUESDAY *20/10/15* *Survey Type: MANUAL*

8 HC-04-A-05 PRIMARY SCHOOL HAMPSHIRE
HAVANT ROAD
HAYLING ISLAND

Edge of Town
Residential Zone
Total Number of pupils: 550
Survey date: MONDAY *30/11/15* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9	LE-04-A-02	PRIMARY SCHOOL		LEICESTERSHIRE
	BEAUFORT WAY			
	LEICESTER			
	OADBY			
	Edge of Town			
	Residential Zone			
	Total Number of pupils:		380	
	Survey date: THURSDAY		*30/10/14*	*Survey Type: MANUAL*
10	NM-04-A-02	PRIMARY SCHOOL		WEST NORTHAMPTONSHIRE
	BOOTH LANE NORTH			
	NORTHAMPTON			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of pupils:		400	
	Survey date: THURSDAY		*24/03/16*	*Survey Type: MANUAL*
11	SF-04-A-03	PRIMARY SCHOOL		SUFFOLK
	ENSTONE ROAD			
	LOWESTOFT			
	KIRKLEY			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Number of pupils:		234	
	Survey date: WEDNESDAY		*10/12/14*	*Survey Type: MANUAL*
12	SM-04-A-01	PRIMARY SCHOOL		SOMERSET
	BRIDGWATER ROAD			
	NEAR TAUNTON			
	BATHPOOL			
	Neighbourhood Centre (PPS6 Local Centre)			
	Village			
	Total Number of pupils:		407	
	Survey date: THURSDAY		*27/09/18*	*Survey Type: MANUAL*
13	TW-04-A-02	PRIMARY SCHOOL		TYNE & WEAR
	KELLS LANE			
	GATESHEAD			
	LOW FELL			
	Neighbourhood Centre (PPS6 Local Centre)			
	No Sub Category			
	Total Number of pupils:		416	
	Survey date: FRIDAY		*19/10/18*	*Survey Type: MANUAL*
14	WM-04-A-02	PRIMARY SCHOOL		WEST MIDLANDS
	HAZEL ROAD			
	BIRMINGHAM			
	RUBERY			
	Edge of Town			
	Residential Zone			
	Total Number of pupils:		234	
	Survey date: TUESDAY		*10/11/15*	*Survey Type: MANUAL*
15	WY-04-A-02	PRIMARY SCHOOL		WEST YORKSHIRE
	TOWN STREET			
	LEEDS			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of pupils:		621	
	Survey date: MONDAY		*19/10/15*	*Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

RANK ORDER for Land Use 04 - EDUCATION/A - PRIMARY
TOTAL VEHICLES

Ranking Type: TOTALS Time Range: 08:00-09:00
WARNING: Using 85th and 15th percentile highlighted trip rates in data sets of under 20 surveys is not recommended by TRICS and may be misleading.
15th Percentile = No. 13 GM-04-A-01 Tot: 0.280
85th Percentile = No. 3 TW-04-A-02 Tot: 0.683

Median Values		Mean Values	
Arrivals:	0.308	Arrivals:	0.305
Departures:	0.260	Departures:	0.246
Totals:	0.568	Totals:	0.551

Rank	Site-Ref	Description	Town/City	Area	PUPILS	Day	Date	Trip Rate (Sorted by Totals)		
								Arrivals	Departures	Totals
1	HC-04-A-05	PRIMARY SCHOOL	HAYLING ISLAND	HAMPSHIRE	550	Mon	30/11/15	0.822	0.698	1.520
2	BP-04-A-01	PRIMARY SCHOOL	BLACKPOOL	BLACKPOOL	449	Tue	27/09/16	0.412	0.336	0.748
3	TW-04-A-02	PRIMARY SCHOOL	GATESHEAD	TYNE & WEAR	416	Fri	19/10/18	0.380	0.303	0.683
4	BR-04-A-01	PRIMARY SCHOOL	BRISTOL	BRISTOL CITY	208	Tue	22/09/15	0.375	0.260	0.635
5	NM-04-A-02	PRIMARY SCHOOL	NORTHAMPTON	WEST NORTHAMPTONSHI	400	Thu	24/03/16	0.305	0.305	0.610
6	WY-04-A-02	PRIMARY SCHOOL	LEEDS	WEST YORKSHIRE	621	Mon	19/10/15	0.298	0.290	0.588
7	LE-04-A-02	PRIMARY SCHOOL	LEICESTER	LEICESTERSHIRE	380	Thu	30/10/14	0.324	0.263	0.587
8	BU-04-A-01	PRIMARY SCHOOL	NEAR AYLESBURY	BUCKINGHAMSHIRE	208	Wed	01/10/14	0.308	0.260	0.568
9	SM-04-A-01	PRIMARY SCHOOL	NEAR TAUNTON	SOMERSET	407	Thu	27/09/18	0.310	0.256	0.566
10	WM-04-A-02	PRIMARY SCHOOL	BIRMINGHAM	WEST MIDLANDS	234	Tue	10/11/15	0.231	0.179	0.410
11	AC-04-A-01	PRIMARY SCHOOL	CHESTER	CHESHIRE WEST & CHE	219	Mon	17/11/14	0.196	0.128	0.324
12	SF-04-A-03	PRIMARY SCHOOL	LOWESTOFT	SUFFOLK	234	Wed	10/12/14	0.171	0.132	0.303
13	GM-04-A-01	PRIMARY SCHOOL	ROCHDALE	GREATER MANCHESTER	457	Tue	20/10/15	0.173	0.107	0.280
14	DY-04-A-01	PRIMARY SCHOOL	DERBY	DERBY	387	Thu	25/06/15	0.158	0.119	0.277
15	CW-04-A-03	PRIMARY ACADEM	PENRYN	CORNWALL	440	Thu	28/03/19	0.114	0.052	0.166

This section displays actual (not average) trip rates for each of the survey days in the selected set, and ranks them in order of relative trip rate intensity, for a given time period (or peak period irrespective of time) selected by the user. The count type and direction are both displayed just above the table, along with the rows within the table representing the 85th and 15th percentile trip rate figures (highlighted in bold within the table itself).

The table itself displays details of each individual survey, alongside arrivals, departures and totals trip rates, sorted by whichever of the three directional options has been chosen by the user. As with the preceeding trip rate calculation results table, the trip rates shown are per the calculation factor (e.g. per 100m2 GFA, per employee, per hectare, etc). Note that if the peak period option has been selected (as opposed to a specific chosen time period), the peak period for each individual survey day in the table is also displayed.

RANK ORDER for Land Use 04 - EDUCATION/A - PRIMARY
TOTAL VEHICLES

Ranking Type: TOTALS Time Range: 17:00-18:00
WARNING: Using 85th and 15th percentile highlighted trip rates in data sets of under 20 surveys is not recommended by TRICS and may be misleading.
15th Percentile = No. 13 NM-04-A-02 Tot: 0.010
85th Percentile = No. 3 LE-04-A-02 Tot: 0.090

Median Values		Mean Values	
Arrivals:	0.004	Arrivals:	0.017
Departures:	0.047	Departures:	0.037
Totals:	0.051	Totals:	0.054

Rank	Site-Ref	Description	Town/City	Area	PUPILS	Day	Date	Trip Rate (Sorted by Totals)		
								Arrivals	Departures	Totals
1	HC-04-A-05	PRIMARY SCHOOL	HAYLING ISLAND	HAMPSHIRE	550	Mon	30/11/15	0.051	0.082	0.133
2	WM-04-A-02	PRIMARY SCHOOL	BIRMINGHAM	WEST MIDLANDS	234	Tue	10/11/15	0.034	0.060	0.094
3	LE-04-A-02	PRIMARY SCHOOL	LEICESTER	LEICESTERSHIRE	380	Thu	30/10/14	0.037	0.053	0.090
4	BU-04-A-01	PRIMARY SCHOOL	NEAR AYLESBURY	BUCKINGHAMSHIRE	208	Wed	01/10/14	0.014	0.072	0.086
5	SM-04-A-01	PRIMARY SCHOOL	NEAR TAUNTON	SOMERSET	407	Thu	27/09/18	0.034	0.047	0.081
6	BR-04-A-01	PRIMARY SCHOOL	BRISTOL	BRISTOL CITY	208	Tue	22/09/15	0.005	0.058	0.063
7	CW-04-A-03	PRIMARY ACADEM	PENRYN	CORNWALL	440	Thu	28/03/19	0.016	0.045	0.061
8	SF-04-A-03	PRIMARY SCHOOL	LOWESTOFT	SUFFOLK	234	Wed	10/12/14	0.004	0.047	0.051
9	AC-04-A-01	PRIMARY SCHOOL	CHESTER	CHESHIRE WEST & CHE	219	Mon	17/11/14	0.018	0.032	0.050
10	GM-04-A-01	PRIMARY SCHOOL	ROCHDALE	GREATER MANCHESTER	457	Tue	20/10/15	0.033	0.013	0.046
11	DY-04-A-01	PRIMARY SCHOOL	DERBY	DERBY	387	Thu	25/06/15	0.003	0.013	0.016
12	WY-04-A-02	PRIMARY SCHOOL	LEEDS	WEST YORKSHIRE	621	Mon	19/10/15	0.003	0.008	0.011
13	NM-04-A-02	PRIMARY SCHOOL	NORTHAMPTON	WEST NORTHAMPTONSHI	400	Thu	24/03/16	0.003	0.007	0.010
14	TW-04-A-02	PRIMARY SCHOOL	GATESHEAD	TYNE & WEAR	416	Fri	19/10/18	0.000	0.007	0.007
15	BP-04-A-01	PRIMARY SCHOOL	BLACKPOOL	BLACKPOOL	449	Tue	27/09/16	0.000	0.007	0.007

This section displays actual (not average) trip rates for each of the survey days in the selected set, and ranks them in order of relative trip rate intensity, for a given time period (or peak period irrespective of time) selected by the user. The count type and direction are both displayed just above the table, along with the rows within the table representing the 85th and 15th percentile trip rate figures (highlighted in bold within the table itself).

The table itself displays details of each individual survey, alongside arrivals, departures and totals trip rates, sorted by whichever of the three directional options has been chosen by the user. As with the preceeding trip rate calculation results table, the trip rates shown are per the calculation factor (e.g. per 100m2 GFA, per employee, per hectare, etc). Note that if the peak period option has been selected (as opposed to a specific chosen time period), the peak period for each individual survey day in the table is also displayed.

RANK ORDER for Land Use 04 - EDUCATION/A - PRIMARY
TOTAL VEHICLES

Ranking Type: TOTALS Time Range: 15:00-16:00
WARNING: Using 85th and 15th percentile highlighted trip rates in data sets of under 20 surveys is not recommended by TRICS and may be misleading.
15th Percentile = No. 13 SF-04-A-03 Tot: 0.205
85th Percentile = No. 3 NM-04-A-02 Tot: 0.580

Median Values		Mean Values	
Arrivals:	0.167	Arrivals:	0.180
Departures:	0.299	Departures:	0.249
Totals:	0.466	Totals:	0.430

Rank	Site-Ref	Description	Town/City	Area	PUPILS	Day	Date	Trip Rate (Sorted by Totals)		
								Arrivals	Departures	Totals
1	TW-04-A-02	PRIMARY SCHOOL	GATESHEAD	TYNE & WEAR	416	Fri	19/10/18	0.361	0.435	0.796
2	HC-04-A-05	PRIMARY SCHOOL	HAYLING ISLAND	HAMPSHIRE	550	Mon	30/11/15	0.280	0.509	0.789
3	NM-04-A-02	PRIMARY SCHOOL	NORTHAMPTON	WEST NORTHAMPTONSHI	400	Thu	24/03/16	0.307	0.273	0.580
4	WY-04-A-02	PRIMARY SCHOOL	LEEDS	WEST YORKSHIRE	621	Mon	19/10/15	0.261	0.304	0.565
5	BP-04-A-01	PRIMARY SCHOOL	BLACKPOOL	BLACKPOOL	449	Tue	27/09/16	0.238	0.290	0.528
6	BR-04-A-01	PRIMARY SCHOOL	BRISTOL	BRISTOL CITY	208	Tue	22/09/15	0.212	0.303	0.515
7	SM-04-A-01	PRIMARY SCHOOL	NEAR TAUNTON	SOMERSET	407	Thu	27/09/18	0.241	0.268	0.509
8	WM-04-A-02	PRIMARY SCHOOL	BIRMINGHAM	WEST MIDLANDS	234	Tue	10/11/15	0.167	0.299	0.466
9	LE-04-A-02	PRIMARY SCHOOL	LEICESTER	LEICESTERSHIRE	380	Thu	30/10/14	0.168	0.213	0.381
10	AC-04-A-01	PRIMARY SCHOOL	CHESTER	CHESHIRE WEST & CHE	219	Mon	17/11/14	0.105	0.187	0.292
11	BU-04-A-01	PRIMARY SCHOOL	NEAR AYLESBURY	BUCKINGHAMSHIRE	208	Wed	01/10/14	0.082	0.197	0.279
12	DY-04-A-01	PRIMARY SCHOOL	DERBY	DERBY	387	Thu	25/06/15	0.116	0.160	0.276
13	SF-04-A-03	PRIMARY SCHOOL	LOWESTOFT	SUFFOLK	234	Wed	10/12/14	0.098	0.107	0.205
14	GM-04-A-01	PRIMARY SCHOOL	ROCHDALE	GREATER MANCHESTER	457	Tue	20/10/15	0.018	0.125	0.143
15	CW-04-A-03	PRIMARY ACADEM	PENRYN	CORNWALL	440	Thu	28/03/19	0.052	0.070	0.122

This section displays actual (not average) trip rates for each of the survey days in the selected set, and ranks them in order of relative trip rate intensity, for a given time period (or peak period irrespective of time) selected by the user. The count type and direction are both displayed just above the table, along with the rows within the table representing the 85th and 15th percentile trip rate figures (highlighted in bold within the table itself).

The table itself displays details of each individual survey, alongside arrivals, departures and totals trip rates, sorted by whichever of the three directional options has been chosen by the user. As with the preceeding trip rate calculation results table, the trip rates shown are per the calculation factor (e.g. per 100m2 GFA, per employee, per hectare, etc). Note that if the peak period option has been selected (as opposed to a specific chosen time period), the peak period for each individual survey day in the table is also displayed.

Calculation Reference: AUDIT-714101-221114-1140

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : A - PRIMARY
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	BU	BUCKINGHAMSHIRE	1 days
	HC	HAMPSHIRE	1 days
03	SOUTH WEST		
	BR	BRISTOL CITY	1 days
	CW	CORNWALL	1 days
	SM	SOMERSET	1 days
04	EAST ANGLIA		
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DY	DERBY	1 days
	LE	LEICESTERSHIRE	1 days
	NM	WEST NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	AC	CHESHIRE WEST & CHESTER	1 days
	BP	BLACKPOOL	1 days
	GM	GREATER MANCHESTER	1 days
09	NORTH		
	TW	TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of pupils
Actual Range: 208 to 621 (units:)
Range Selected by User: 200 to 800 (units:)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/14 to 23/05/22

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	3 days
Tuesday	4 days
Wednesday	2 days
Thursday	5 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	15 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	7
Neighbourhood Centre (PPS6 Local Centre)	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	12
Village	2
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

F1(a)	15 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	4 days
10,001 to 15,000	1 days
15,001 to 20,000	4 days
20,001 to 25,000	2 days
25,001 to 50,000	2 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	3 days
125,001 to 250,000	3 days
250,001 to 500,000	7 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	10 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	2 days
No	13 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	15 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 AC-04-A-01 PRIMARY SCHOOL CHESHIRE WEST & CHESTER
WESTON GROVE
CHESTER
UPTON
Edge of Town
Residential Zone
Total Number of pupils: 219
Survey date: MONDAY *17/11/14* *Survey Type: MANUAL*

2 BP-04-A-01 PRIMARY SCHOOL BLACKPOOL
SEVERN ROAD
BLACKPOOL
SOUTH SHORE
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of pupils: 449
Survey date: TUESDAY *27/09/16* *Survey Type: MANUAL*

3 BR-04-A-01 PRIMARY SCHOOL BRISTOL CITY
SCHOOL CLOSE
BRISTOL
WHITCHURCH
Edge of Town
Residential Zone
Total Number of pupils: 208
Survey date: TUESDAY *22/09/15* *Survey Type: MANUAL*

4 BU-04-A-01 PRIMARY SCHOOL BUCKINGHAMSHIRE
LOWER ROAD
NEAR AYLESBURY
STOKE MANDEVILLE
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of pupils: 208
Survey date: WEDNESDAY *01/10/14* *Survey Type: MANUAL*

5 CW-04-A-03 PRIMARY ACADEMY CORNWALL
TREVERBYN RISE
PENRYN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of pupils: 440
Survey date: THURSDAY *28/03/19* *Survey Type: MANUAL*

6 DY-04-A-01 PRIMARY SCHOOL DERBY
VICARAGE ROAD
DERBY
MICKLEOVER
Edge of Town
Residential Zone
Total Number of pupils: 387
Survey date: THURSDAY *25/06/15* *Survey Type: MANUAL*

7 GM-04-A-01 PRIMARY SCHOOL GREATER MANCHESTER
ROCH MILLS CRESCENT
ROCHDALE

Edge of Town
Residential Zone
Total Number of pupils: 457
Survey date: TUESDAY *20/10/15* *Survey Type: MANUAL*

8 HC-04-A-05 PRIMARY SCHOOL HAMPSHIRE
HAVANT ROAD
HAYLING ISLAND

Edge of Town
Residential Zone
Total Number of pupils: 550
Survey date: MONDAY *30/11/15* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9	LE-04-A-02	PRIMARY SCHOOL		LEICESTERSHIRE
	BEAUFORT WAY			
	LEICESTER			
	OADBY			
	Edge of Town			
	Residential Zone			
	Total Number of pupils:		380	
	Survey date: THURSDAY		*30/10/14*	*Survey Type: MANUAL*
10	NM-04-A-02	PRIMARY SCHOOL		WEST NORTHAMPTONSHIRE
	BOOTH LANE NORTH			
	NORTHAMPTON			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of pupils:		400	
	Survey date: THURSDAY		*24/03/16*	*Survey Type: MANUAL*
11	SF-04-A-03	PRIMARY SCHOOL		SUFFOLK
	ENSTONE ROAD			
	LOWESTOFT			
	KIRKLEY			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Number of pupils:		234	
	Survey date: WEDNESDAY		*10/12/14*	*Survey Type: MANUAL*
12	SM-04-A-01	PRIMARY SCHOOL		SOMERSET
	BRIDGWATER ROAD			
	NEAR TAUNTON			
	BATHPOOL			
	Neighbourhood Centre (PPS6 Local Centre)			
	Village			
	Total Number of pupils:		407	
	Survey date: THURSDAY		*27/09/18*	*Survey Type: MANUAL*
13	TW-04-A-02	PRIMARY SCHOOL		TYNE & WEAR
	KELLS LANE			
	GATESHEAD			
	LOW FELL			
	Neighbourhood Centre (PPS6 Local Centre)			
	No Sub Category			
	Total Number of pupils:		416	
	Survey date: FRIDAY		*19/10/18*	*Survey Type: MANUAL*
14	WM-04-A-02	PRIMARY SCHOOL		WEST MIDLANDS
	HAZEL ROAD			
	BIRMINGHAM			
	RUBERY			
	Edge of Town			
	Residential Zone			
	Total Number of pupils:		234	
	Survey date: TUESDAY		*10/11/15*	*Survey Type: MANUAL*
15	WY-04-A-02	PRIMARY SCHOOL		WEST YORKSHIRE
	TOWN STREET			
	LEEDS			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Number of pupils:		621	
	Survey date: MONDAY		*19/10/15*	*Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY
TOTAL VEHICLES
Calculation factor: 1 PUPILS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	374	0.059	15	374	0.020	15	374	0.079
08:00 - 09:00	15	374	0.324	15	374	0.266	15	374	0.590
09:00 - 10:00	15	374	0.030	15	374	0.047	15	374	0.077
10:00 - 11:00	15	374	0.012	15	374	0.012	15	374	0.024
11:00 - 12:00	15	374	0.021	15	374	0.012	15	374	0.033
12:00 - 13:00	15	374	0.020	15	374	0.027	15	374	0.047
13:00 - 14:00	15	374	0.016	15	374	0.023	15	374	0.039
14:00 - 15:00	15	374	0.077	15	374	0.020	15	374	0.097
15:00 - 16:00	15	374	0.193	15	374	0.262	15	374	0.455
16:00 - 17:00	15	374	0.060	15	374	0.094	15	374	0.154
17:00 - 18:00	15	374	0.018	15	374	0.034	15	374	0.052
18:00 - 19:00	15	374	0.011	15	374	0.014	15	374	0.025
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.841			0.831			1.672

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	208 - 621 (units:)
Survey date date range:	01/01/14 - 23/05/22
Number of weekdays (Monday-Friday):	15
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY
OGVS
Calculation factor: 1 PUPILS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	374	0.000	15	374	0.000	15	374	0.000
08:00 - 09:00	15	374	0.000	15	374	0.000	15	374	0.000
09:00 - 10:00	15	374	0.001	15	374	0.000	15	374	0.001
10:00 - 11:00	15	374	0.000	15	374	0.001	15	374	0.001
11:00 - 12:00	15	374	0.000	15	374	0.000	15	374	0.000
12:00 - 13:00	15	374	0.000	15	374	0.000	15	374	0.000
13:00 - 14:00	15	374	0.000	15	374	0.000	15	374	0.000
14:00 - 15:00	15	374	0.000	15	374	0.000	15	374	0.000
15:00 - 16:00	15	374	0.000	15	374	0.000	15	374	0.000
16:00 - 17:00	15	374	0.000	15	374	0.000	15	374	0.000
17:00 - 18:00	15	374	0.000	15	374	0.000	15	374	0.000
18:00 - 19:00	15	374	0.000	15	374	0.000	15	374	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.001			0.001			0.002

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

APPENDIX C: ARCADY Output Data (Site Access Roundabout)

Junctions 9

ARCADY 9 - Roundabout Module

Filename: A34 Site Access (4 arm) Test 6 v02.j9
Path: J:\2022\220583-Redhill Phase 3 Stafford\ProjectDelivery\01-WIP\DesignAndCalculations\JCAs
Report generation date: 16/11/2022 16:54:54

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2040 + PAH + Proposed Development (1M)							
1 - Access (E)	0.9	9.99	0.48	A	0.2	5.10	0.14	A
2 - A34 (S)	6.3	11.80	0.86	B	6.6	12.01	0.86	B
3 - Pets at Home Access	0.3	7.37	0.17	A	0.6	7.92	0.32	A
4 - A34 (N)	6.5	11.58	0.86	B	3.4	6.97	0.76	A
	2040 + PAH + Proposed Development (1.7M)							
1 - Access (E)	1.0	11.03	0.51	B	0.2	5.45	0.14	A
2 - A34 (S)	9.3	16.88	0.90	C	7.8	14.04	0.88	B
3 - Pets at Home Access	0.4	7.98	0.23	A	1.0	9.65	0.45	A
4 - A34 (N)	7.7	13.54	0.88	B	3.8	7.80	0.78	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

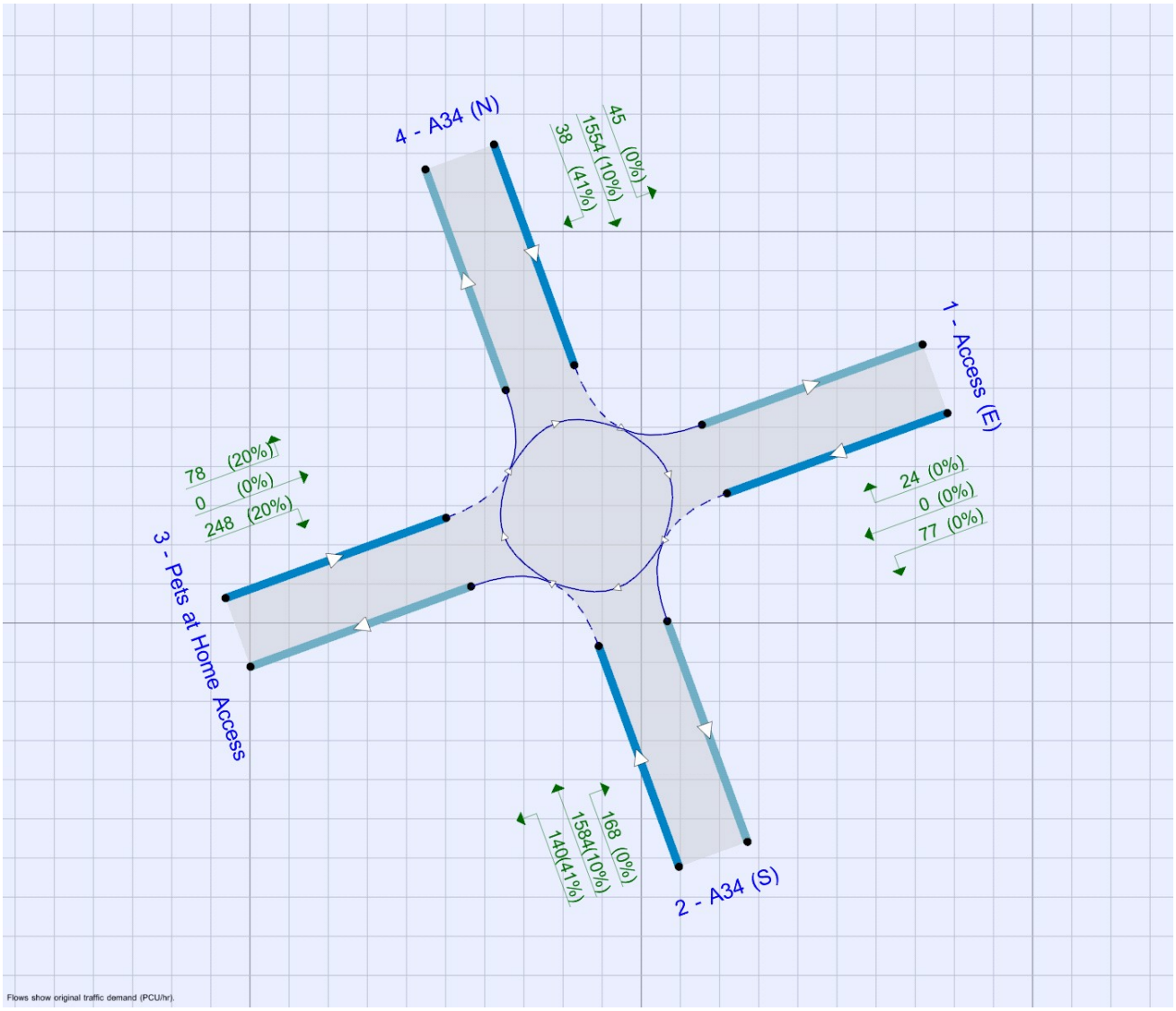
File summary

File Description

Title	
Location	
Site number	
Date	16/10/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	BWB\jordan.farrell
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2040 + PAH + Proposed Development (1M)	AM	ONE HOUR	07:45	09:15	15
D4	2040 + PAH + Proposed Development (1M)	PM	ONE HOUR	16:45	18:15	15
D5	2040 + PAH + Proposed Development (1.7M)	AM	ONE HOUR	07:45	09:15	15
D6	2040 + PAH + Proposed Development (1.7M)	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2040 + PAH + Proposed Development (1M), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Proposed Access	Standard Roundabout		1, 2, 3, 4	11.43	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Access (E)	
2	A34 (S)	
3	Pets at Home Access	
4	A34 (N)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Access (E)	5.00	7.10	8.0	20.0	70.0	35.0	
2 - A34 (S)	7.30	9.00	4.0	23.0	70.0	35.0	
3 - Pets at Home Access	5.00	7.10	8.0	20.0	70.0	36.0	
4 - A34 (N)	7.30	9.00	13.0	30.0	70.0	31.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Access (E)	0.522	1829
2 - A34 (S)	0.614	2403
3 - Pets at Home Access	0.520	1822
4 - A34 (N)	0.651	2608

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2040 + PAH + Proposed Development (1M)	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Access (E)		✓	304	100.000
2 - A34 (S)		✓	1807	100.000
3 - Pets at Home Access		✓	132	100.000
4 - A34 (N)		✓	1905	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	243	0	61
	2 - A34 (S)	134	0	217	1456
	3 - Pets at Home Access	0	106	0	26
	4 - A34 (N)	36	1811	58	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	0	0	0
	2 - A34 (S)	0	0	22	10
	3 - Pets at Home Access	0	50	0	50
	4 - A34 (N)	0	10	22	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:45-08:00	1 - Access (E)	229	229
	2 - A34 (S)	1360	1360
	3 - Pets at Home Access	99	99
	4 - A34 (N)	1434	1434
08:00-08:15	1 - Access (E)	273	273
	2 - A34 (S)	1624	1624
	3 - Pets at Home Access	119	119
	4 - A34 (N)	1713	1713
08:15-08:30	1 - Access (E)	335	335
	2 - A34 (S)	1990	1990
	3 - Pets at Home Access	145	145
	4 - A34 (N)	2097	2097
08:30-08:45	1 - Access (E)	335	335
	2 - A34 (S)	1990	1990
	3 - Pets at Home Access	145	145
	4 - A34 (N)	2097	2097
08:45-09:00	1 - Access (E)	273	273
	2 - A34 (S)	1624	1624
	3 - Pets at Home Access	119	119
	4 - A34 (N)	1713	1713
09:00-09:15	1 - Access (E)	229	229
	2 - A34 (S)	1360	1360
	3 - Pets at Home Access	99	99
	4 - A34 (N)	1434	1434

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Access (E)	0.48	9.99	0.9	A
2 - A34 (S)	0.86	11.80	6.3	B
3 - Pets at Home Access	0.17	7.37	0.3	A
4 - A34 (N)	0.86	11.58	6.5	B

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	229	1481	1056	0.217	228	0.3	4.341	A
2 - A34 (S)	1360	89	2349	0.579	1354	1.5	3.976	A
3 - Pets at Home Access	99	1237	1179	0.084	99	0.1	4.998	A
4 - A34 (N)	1434	180	2491	0.576	1428	1.5	3.709	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	273	1772	904	0.302	273	0.4	5.692	A
2 - A34 (S)	1624	107	2338	0.695	1621	2.5	5.514	A
3 - Pets at Home Access	119	1481	1052	0.113	118	0.2	5.780	A
4 - A34 (N)	1713	215	2468	0.694	1709	2.5	5.195	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	335	2159	702	0.477	333	0.9	9.698	A
2 - A34 (S)	1990	130	2324	0.856	1975	6.1	10.982	B
3 - Pets at Home Access	145	1805	884	0.164	145	0.3	7.304	A
4 - A34 (N)	2097	263	2437	0.861	2082	6.3	10.739	B

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	335	2174	695	0.482	335	0.9	9.988	A
2 - A34 (S)	1990	131	2323	0.856	1989	6.3	11.799	B
3 - Pets at Home Access	145	1817	878	0.166	145	0.3	7.373	A
4 - A34 (N)	2097	264	2436	0.861	2096	6.5	11.583	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	273	1791	894	0.306	275	0.4	5.836	A
2 - A34 (S)	1624	108	2337	0.695	1639	2.6	5.816	A
3 - Pets at Home Access	119	1498	1044	0.114	119	0.2	5.845	A
4 - A34 (N)	1713	217	2467	0.694	1728	2.5	5.484	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	229	1491	1051	0.218	230	0.3	4.388	A
2 - A34 (S)	1360	90	2348	0.579	1365	1.5	4.060	A
3 - Pets at Home Access	99	1247	1174	0.085	100	0.1	5.026	A
4 - A34 (N)	1434	181	2490	0.576	1438	1.5	3.786	A

2040 + PAH + Proposed Development (1M), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Proposed Access	Standard Roundabout		1, 2, 3, 4	9.42	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2040 + PAH + Proposed Development (1M)	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Access (E)		✓	101	100.000
2 - A34 (S)		✓	1854	100.000
3 - Pets at Home Access		✓	237	100.000
4 - A34 (N)		✓	1627	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	77	0	24
	2 - A34 (S)	168	0	102	1584
	3 - Pets at Home Access	0	179	0	58
	4 - A34 (N)	45	1554	28	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	0	0	0
	2 - A34 (S)	0	0	41	10
	3 - Pets at Home Access	0	20	0	20
	4 - A34 (N)	0	10	41	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:45-17:00	1 - Access (E)	76	76
	2 - A34 (S)	1396	1396
	3 - Pets at Home Access	178	178
	4 - A34 (N)	1225	1225
17:00-17:15	1 - Access (E)	91	91
	2 - A34 (S)	1667	1667
	3 - Pets at Home Access	213	213
	4 - A34 (N)	1463	1463
17:15-17:30	1 - Access (E)	111	111
	2 - A34 (S)	2041	2041
	3 - Pets at Home Access	261	261
	4 - A34 (N)	1791	1791
17:30-17:45	1 - Access (E)	111	111
	2 - A34 (S)	2041	2041
	3 - Pets at Home Access	261	261
	4 - A34 (N)	1791	1791
17:45-18:00	1 - Access (E)	91	91
	2 - A34 (S)	1667	1667
	3 - Pets at Home Access	213	213
	4 - A34 (N)	1463	1463
18:00-18:15	1 - Access (E)	76	76
	2 - A34 (S)	1396	1396
	3 - Pets at Home Access	178	178
	4 - A34 (N)	1225	1225

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Access (E)	0.14	5.10	0.2	A
2 - A34 (S)	0.86	12.01	6.6	B
3 - Pets at Home Access	0.32	7.92	0.6	A
4 - A34 (N)	0.76	6.97	3.4	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	76	1321	1140	0.067	76	0.1	3.384	A
2 - A34 (S)	1396	39	2380	0.587	1390	1.5	3.988	A
3 - Pets at Home Access	178	1331	1130	0.158	178	0.2	4.531	A
4 - A34 (N)	1225	260	2439	0.502	1220	1.1	3.242	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	91	1581	1004	0.090	91	0.1	3.941	A
2 - A34 (S)	1667	47	2375	0.702	1663	2.5	5.547	A
3 - Pets at Home Access	213	1593	994	0.214	213	0.3	5.526	A
4 - A34 (N)	1463	311	2405	0.608	1460	1.7	4.185	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	111	1932	821	0.135	111	0.2	5.070	A
2 - A34 (S)	2041	57	2368	0.862	2026	6.3	11.138	B
3 - Pets at Home Access	261	1941	813	0.321	260	0.6	7.797	A
4 - A34 (N)	1791	380	2361	0.759	1785	3.4	6.805	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	111	1939	817	0.136	111	0.2	5.098	A
2 - A34 (S)	2041	57	2368	0.862	2040	6.6	12.005	B
3 - Pets at Home Access	261	1954	806	0.324	261	0.6	7.921	A
4 - A34 (N)	1791	382	2359	0.759	1791	3.4	6.970	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	91	1590	999	0.091	91	0.1	3.967	A
2 - A34 (S)	1667	47	2375	0.702	1682	2.7	5.862	A
3 - Pets at Home Access	213	1611	984	0.216	214	0.3	5.615	A
4 - A34 (N)	1463	314	2403	0.609	1469	1.7	4.273	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	76	1328	1136	0.067	76	0.1	3.397	A
2 - A34 (S)	1396	39	2379	0.587	1400	1.6	4.072	A
3 - Pets at Home Access	178	1341	1125	0.159	179	0.2	4.569	A
4 - A34 (N)	1225	262	2437	0.503	1227	1.1	3.281	A

2040 + PAH + Proposed Development (1.7M), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Proposed Access	Standard Roundabout		1, 2, 3, 4	14.60	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2040 + PAH + Proposed Development (1.7M)	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Access (E)		✓	304	100.000
2 - A34 (S)		✓	1890	100.000
3 - Pets at Home Access		✓	183	100.000
4 - A34 (N)		✓	1926	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	243	0	61
	2 - A34 (S)	134	0	300	1456
	3 - Pets at Home Access	0	145	0	38
	4 - A34 (N)	36	1811	79	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	0	0	0
	2 - A34 (S)	0	0	22	10
	3 - Pets at Home Access	0	50	0	50
	4 - A34 (N)	0	10	22	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:45-08:00	1 - Access (E)	229	229
	2 - A34 (S)	1423	1423
	3 - Pets at Home Access	138	138
	4 - A34 (N)	1450	1450
08:00-08:15	1 - Access (E)	273	273
	2 - A34 (S)	1699	1699
	3 - Pets at Home Access	165	165
	4 - A34 (N)	1731	1731
08:15-08:30	1 - Access (E)	335	335
	2 - A34 (S)	2081	2081
	3 - Pets at Home Access	201	201
	4 - A34 (N)	2121	2121
08:30-08:45	1 - Access (E)	335	335
	2 - A34 (S)	2081	2081
	3 - Pets at Home Access	201	201
	4 - A34 (N)	2121	2121
08:45-09:00	1 - Access (E)	273	273
	2 - A34 (S)	1699	1699
	3 - Pets at Home Access	165	165
	4 - A34 (N)	1731	1731
09:00-09:15	1 - Access (E)	229	229
	2 - A34 (S)	1423	1423
	3 - Pets at Home Access	138	138
	4 - A34 (N)	1450	1450

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Access (E)	0.51	11.03	1.0	B
2 - A34 (S)	0.90	16.88	9.3	C
3 - Pets at Home Access	0.23	7.98	0.4	A
4 - A34 (N)	0.88	13.54	7.7	B

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	229	1525	1033	0.222	228	0.3	4.465	A
2 - A34 (S)	1423	105	2339	0.608	1416	1.7	4.295	A
3 - Pets at Home Access	138	1237	1179	0.117	137	0.2	5.179	A
4 - A34 (N)	1450	209	2472	0.587	1444	1.5	3.837	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	273	1825	877	0.312	273	0.4	5.955	A
2 - A34 (S)	1699	126	2326	0.730	1694	2.9	6.268	A
3 - Pets at Home Access	165	1480	1053	0.156	164	0.3	6.076	A
4 - A34 (N)	1731	250	2445	0.708	1727	2.6	5.495	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	335	2222	670	0.500	333	1.0	10.619	B
2 - A34 (S)	2081	153	2310	0.901	2058	8.7	14.694	B
3 - Pets at Home Access	201	1798	887	0.227	201	0.4	7.858	A
4 - A34 (N)	2121	305	2409	0.880	2102	7.3	12.230	B

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	335	2239	661	0.507	335	1.0	11.034	B
2 - A34 (S)	2081	154	2309	0.901	2078	9.3	16.884	C
3 - Pets at Home Access	201	1816	878	0.229	201	0.4	7.978	A
4 - A34 (N)	2121	307	2408	0.881	2119	7.7	13.545	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	273	1849	864	0.316	275	0.5	6.139	A
2 - A34 (S)	1699	127	2326	0.731	1724	3.1	6.897	A
3 - Pets at Home Access	165	1505	1040	0.158	165	0.3	6.182	A
4 - A34 (N)	1731	253	2443	0.709	1751	2.7	5.890	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	229	1537	1027	0.223	230	0.3	4.520	A
2 - A34 (S)	1423	106	2339	0.608	1428	1.7	4.414	A
3 - Pets at Home Access	138	1248	1174	0.117	138	0.2	5.218	A
4 - A34 (N)	1450	211	2471	0.587	1455	1.6	3.922	A

2040 + PAH + Proposed Development (1.7M), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Proposed Access	Standard Roundabout		1, 2, 3, 4	10.88	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2040 + PAH + Proposed Development (1.7M)	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Access (E)		✓	101	100.000
2 - A34 (S)		✓	1892	100.000
3 - Pets at Home Access		✓	326	100.000
4 - A34 (N)		✓	1637	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	77	0	24
	2 - A34 (S)	168	0	140	1584
	3 - Pets at Home Access	0	248	0	78
	4 - A34 (N)	45	1554	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Access (E)	2 - A34 (S)	3 - Pets at Home Access	4 - A34 (N)
From	1 - Access (E)	0	0	0	0
	2 - A34 (S)	0	0	41	10
	3 - Pets at Home Access	0	20	0	20
	4 - A34 (N)	0	10	41	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:45-17:00	1 - Access (E)	76	76
	2 - A34 (S)	1424	1424
	3 - Pets at Home Access	245	245
	4 - A34 (N)	1232	1232
17:00-17:15	1 - Access (E)	91	91
	2 - A34 (S)	1701	1701
	3 - Pets at Home Access	293	293
	4 - A34 (N)	1472	1472
17:15-17:30	1 - Access (E)	111	111
	2 - A34 (S)	2083	2083
	3 - Pets at Home Access	359	359
	4 - A34 (N)	1802	1802
17:30-17:45	1 - Access (E)	111	111
	2 - A34 (S)	2083	2083
	3 - Pets at Home Access	359	359
	4 - A34 (N)	1802	1802
17:45-18:00	1 - Access (E)	91	91
	2 - A34 (S)	1701	1701
	3 - Pets at Home Access	293	293
	4 - A34 (N)	1472	1472
18:00-18:15	1 - Access (E)	76	76
	2 - A34 (S)	1424	1424
	3 - Pets at Home Access	245	245
	4 - A34 (N)	1232	1232

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Access (E)	0.14	5.45	0.2	A
2 - A34 (S)	0.88	14.04	7.8	B
3 - Pets at Home Access	0.45	9.65	1.0	A
4 - A34 (N)	0.78	7.80	3.8	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	76	1380	1109	0.069	76	0.1	3.485	A
2 - A34 (S)	1424	47	2375	0.600	1418	1.6	4.140	A
3 - Pets at Home Access	245	1331	1130	0.217	244	0.3	4.868	A
4 - A34 (N)	1232	312	2405	0.512	1228	1.1	3.360	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	91	1651	967	0.094	91	0.1	4.107	A
2 - A34 (S)	1701	56	2369	0.718	1696	2.8	5.888	A
3 - Pets at Home Access	293	1592	994	0.295	292	0.5	6.150	A
4 - A34 (N)	1472	373	2365	0.622	1469	1.8	4.418	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	111	2017	776	0.143	111	0.2	5.409	A
2 - A34 (S)	2083	68	2362	0.882	2065	7.4	12.692	B
3 - Pets at Home Access	359	1938	815	0.441	357	0.9	9.409	A
4 - A34 (N)	1802	455	2312	0.780	1794	3.8	7.562	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	111	2026	772	0.144	111	0.2	5.448	A
2 - A34 (S)	2083	68	2362	0.882	2082	7.8	14.044	B
3 - Pets at Home Access	359	1954	806	0.445	359	1.0	9.648	A
4 - A34 (N)	1802	458	2310	0.780	1802	3.8	7.804	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	91	1663	961	0.094	91	0.1	4.139	A
2 - A34 (S)	1701	56	2369	0.718	1721	2.9	6.328	A
3 - Pets at Home Access	293	1615	983	0.298	295	0.5	6.297	A
4 - A34 (N)	1472	377	2362	0.623	1480	1.8	4.537	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Access (E)	76	1388	1104	0.069	76	0.1	3.503	A
2 - A34 (S)	1424	47	2375	0.600	1429	1.7	4.241	A
3 - Pets at Home Access	245	1342	1125	0.218	246	0.3	4.922	A
4 - A34 (N)	1232	314	2403	0.513	1235	1.2	3.407	A

APPENDIX D: PICADY Output Data (Left in, Left out Access)

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Resi Site Access (Priority Option) - advanced mode.j9
Path: J:\2022\220583-Redhill Phase 3 Stafford\ProjectDelivery\01-WIP\DesignAndCalculations\JCAs
Report generation date: 24/11/2022 16:45:17

Summary of junction performance

	AM							PM						
	Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
	2040 + PAH + Dev (1M)													
Stream B-AC	0.3	4.65	0.26	A	0.45	A	132 % [Stream B-AC]	0.1	3.59	0.08	A	0.13	A	633 % [Stream B-AC]
Stream C-AB	0.0	0.00	0.00	A				0.0	0.00	0.00	A			
	2040 + PAH + Dev (1.7M)													
Stream B-AC	0.3	4.71	0.26	A	0.45	A	132 % [Stream B-AC]	0.1	3.65	0.08	A	0.13	A	633 % [Stream B-AC]
Stream C-AB	0.0	0.00	0.00	A				0.0	0.00	0.00	A			

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	16/11/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	BWB\matt.corner
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2040 + PAH + Dev (1M)	AM	ONE HOUR	08:00	09:30	15	✓
D2	2040 + PAH + Dev (1M)	PM	ONE HOUR	17:00	18:30	15	✓
D3	2040 + PAH + Dev (1.7M)	AM	ONE HOUR	08:00	09:30	15	✓
D4	2040 + PAH + Dev (1.7M)	PM	ONE HOUR	17:00	18:30	15	✓
D5	2040 + PAH + Dev (1M) + Stone Phase 1	AM	ONE HOUR	08:00	09:30	15	
D6	2040 + PAH + Dev (1M) + Stone Phase 1	PM	ONE HOUR	17:00	18:30	15	
D7	2040 + PAH + Dev (1.7M) + Stone Phase 1	AM	ONE HOUR	08:00	09:30	15	
D8	2040 + PAH + Dev (1.7M) + Stone Phase 1	PM	ONE HOUR	17:00	18:30	15	
D9	2040 + PAH + Dev (1M) + Stone Total	AM	ONE HOUR	08:00	09:30	15	
D10	2040 + PAH + Dev (1M) + Stone Total	PM	ONE HOUR	17:00	18:30	15	
D11	2040 + PAH + Dev (1.7M) + Stone Total	AM	ONE HOUR	08:00	09:30	15	
D12	2040 + PAH + Dev (1.7M) + Stone Total	PM	ONE HOUR	17:00	18:30	15	

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2040 + PAH + Dev (1M), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	One-way from A to C		0.45	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	132	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	A34 (N)		Major
B	Site Access		Minor
C	A34 (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A34 (S)	7.30				✓	

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane	5.00	70	70

Slope / Intercept / Capacity

Stream Intercept Adjustments

Stream intercept adjustment	Use adjustment	Reason	Direct intercept adjustment (PCU/hr)
B-AC	✓		715

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	642	0.073	0.185	0.116	0.264
1	B-C	802	0.077	0.194	-	-
1	C-B	574	0.139	0.139	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2040 + PAH + Dev (1M)	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A34 (N)		ONE HOUR	✓	1953	100.000
B - Site Access		ONE HOUR	✓	243	100.000
C - A34 (S)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	36	1917
	B - Site Access	0	0	243
	C - A34 (S)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	0	15
	B - Site Access	0	0	0
	C - A34 (S)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.26	4.65	0.3	A	223	334
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					33	50
A-C					1759	2639

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	183	46	1192	0.153	182	0.0	0.2	3.564	A
C-AB	0	0	339	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	27	7			27				
A-C	1443	361			1443				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	218	55	1129	0.194	218	0.2	0.2	3.951	A
C-AB	0	0	294	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	32	8			32				
A-C	1723	431			1723				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	268	67	1042	0.257	267	0.2	0.3	4.645	A
C-AB	0	0	231	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2111	528			2111				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	268	67	1042	0.257	268	0.3	0.3	4.649	A
C-AB	0	0	231	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2111	528			2111				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	218	55	1129	0.194	219	0.3	0.2	3.957	A
C-AB	0	0	294	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	32	8			32				
A-C	1723	431			1723				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	183	46	1192	0.153	183	0.2	0.2	3.571	A
C-AB	0	0	339	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	27	7			27				
A-C	1443	361			1443				

2040 + PAH + Dev (1M), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	One-way from A to C		0.13	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	633	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2040 + PAH + Dev (1M)	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A34 (N)		ONE HOUR	✓	1778	100.000
B - Site Access		ONE HOUR	✓	77	100.000
C - A34 (S)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	45	1733
	B - Site Access	0	0	77
	C - A34 (S)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	0	15
	B - Site Access	0	0	0
	C - A34 (S)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.08	3.59	0.1	A	71	106
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					41	62
A-C					1590	2385

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	58	14	1222	0.047	58	0.0	0.0	3.090	A
C-AB	0	0	360	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	1305	326			1305				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	69	17	1165	0.059	69	0.0	0.1	3.283	A
C-AB	0	0	319	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	1558	389			1558				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	85	21	1086	0.078	85	0.1	0.1	3.593	A
C-AB	0	0	262	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	1908	477			1908				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	85	21	1086	0.078	85	0.1	0.1	3.593	A
C-AB	0	0	262	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	1908	477			1908				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	69	17	1165	0.059	69	0.1	0.1	3.284	A
C-AB	0	0	319	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	1558	389			1558				

18:15 - 18:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	58	14	1222	0.047	58	0.1	0.0	3.091	A
C-AB	0	0	360	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	1305	326			1305				

2040 + PAH + Dev (1.7M), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	One-way from A to C		0.45	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	132	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2040 + PAH + Dev (1.7M)	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A34 (N)		ONE HOUR	✓	1992	100.000
B - Site Access		ONE HOUR	✓	243	100.000
C - A34 (S)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	36	1956
	B - Site Access	0	0	243
	C - A34 (S)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	0	15
	B - Site Access	0	0	0
	C - A34 (S)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.26	4.71	0.3	A	223	334
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					33	50
A-C					1795	2692

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	183	46	1185	0.154	182	0.0	0.2	3.587	A
C-AB	0	0	334	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	27	7			27				
A-C	1473	368			1473				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	218	55	1121	0.195	218	0.2	0.2	3.986	A
C-AB	0	0	288	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	32	8			32				
A-C	1758	440			1758				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	268	67	1032	0.259	267	0.2	0.3	4.703	A
C-AB	0	0	224	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2154	538			2154				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	268	67	1032	0.259	268	0.3	0.3	4.707	A
C-AB	0	0	224	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2154	538			2154				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	218	55	1121	0.195	219	0.3	0.2	3.993	A
C-AB	0	0	288	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	32	8			32				
A-C	1758	440			1758				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	183	46	1185	0.154	183	0.2	0.2	3.594	A
C-AB	0	0	334	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	27	7			27				
A-C	1473	368			1473				

2040 + PAH + Dev (1.7M), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	One-way from A to C		0.13	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	633	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2040 + PAH + Dev (1.7M)	PM	ONE HOUR	17:00	18:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A34 (N)		ONE HOUR	✓	1847	100.000
B - Site Access		ONE HOUR	✓	77	100.000
C - A34 (S)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	45	1802
	B - Site Access	0	0	77
	C - A34 (S)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A34 (N)	B - Site Access	C - A34 (S)
From	A - A34 (N)	0	0	15
	B - Site Access	0	0	0
	C - A34 (S)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.08	3.65	0.1	A	71	106
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					41	62
A-C					1654	2480

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	58	14	1211	0.048	58	0.0	0.1	3.121	A
C-AB	0	0	352	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	1357	339			1357				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	69	17	1151	0.060	69	0.1	0.1	3.325	A
C-AB	0	0	309	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	1620	405			1620				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	85	21	1069	0.079	85	0.1	0.1	3.655	A
C-AB	0	0	250	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	1984	496			1984				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	85	21	1069	0.079	85	0.1	0.1	3.655	A
C-AB	0	0	250	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	1984	496			1984				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	69	17	1151	0.060	69	0.1	0.1	3.326	A
C-AB	0	0	309	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	1620	405			1620				

18:15 - 18:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	58	14	1211	0.048	58	0.1	0.1	3.122	A
C-AB	0	0	352	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	1357	339			1357				

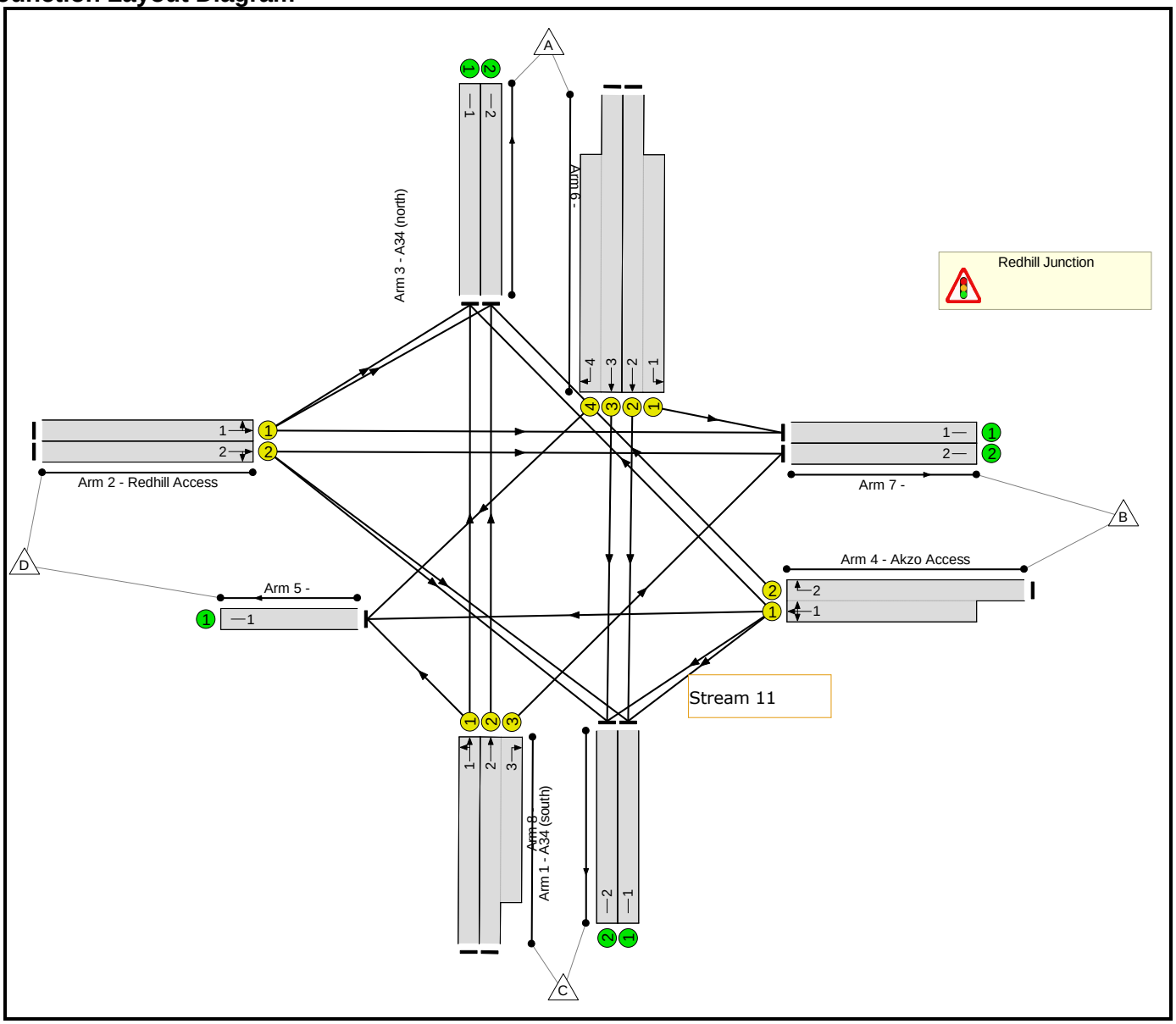
APPENDIX E: LinSig Output Data (A34/William Bagnall Drive Junction)

Full Input Data And Results

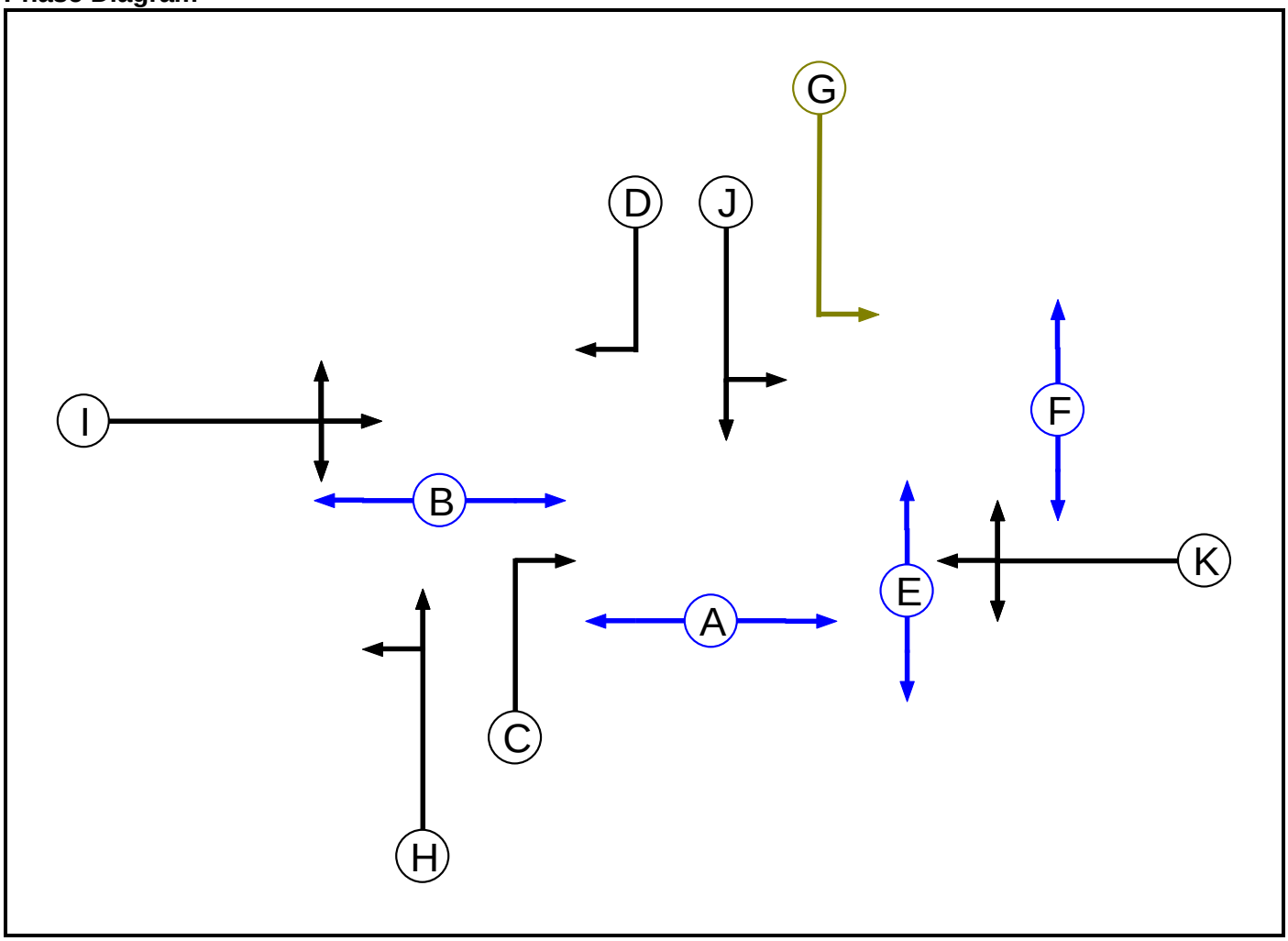
User and Project Details

Project:	**Stafford North Business Park**
Title:	**Redhill Business Park (Committed Layout)**
Location:	Redhill Roundabout Network - Stafford
Additional detail:	
File name:	A34-William Bagnall-Akzo Nobel v4.lsg3x
Author:	[redacted]
Company:	BWB
Address:	Birmingham

Junction Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Pedestrian	1		4	4
B	Pedestrian	1		4	4
C	Traffic	1		7	7
D	Traffic	1		7	7
E	Pedestrian	1		4	4
F	Pedestrian	1		4	4
G	Filter	1	J	4	0
H	Traffic	1		7	7
I	Traffic	1		7	7
J	Traffic	1		7	7
K	Traffic	1		7	7

Full Input Data And Results

Phase Intergreens Matrix

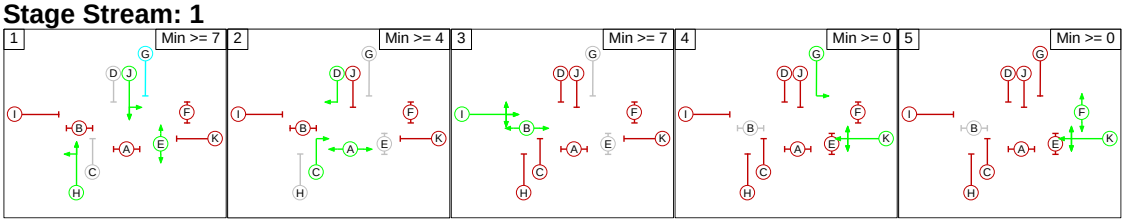
Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I	J	K
A		-	-	-	-	-	-	-	8	8	8
B	-		15	-	-	-	-	15	-	-	-
C	-	5		-	-	5	-	-	5	-	5
D	-	-	-		-	-	-	-	5	-	5
E	-	-	-	-		-	-	-	-	-	9
F	-	-	9	-	-		9	-	9	9	-
G	-	-	-	-	-	9		-	-	-	-
H	-	5	-	-	-	-	-		7	-	5
I	11	-	5	5	-	5	-	5		7	8
J	9	-	-	-	-	5	-	-	5		7
K	7	-	5	5	5	-	-	5	8	5	

Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	E H J
1	2	A C D
1	3	B I
1	4	G K
1	5	F K

Stages Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Full Input Data And Results

Prohibited Stage Changes

Stage Stream: 1

		To Stage				
		1	2	3	4	5
From Stage	1		9	7	9	9
	2	8		8	8	8
	3	15	15		8	8
	4	5	X	X		X
	5	9	9	9	9	

Full Input Data And Results

Give-Way Link Input Data

Junction: Redhill Junction
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: Redhill Junction

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A34 (south))	U	H	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	18.00
											Arm 6 Ahead	Inf
1/2 (A34 (south))	U	H	2	3	60.0	Geom	-	3.50	0.00	N	Arm 6 Ahead	Inf
1/3 (A34 (south))	U	C	2	3	15.1	Geom	-	3.50	0.00	Y	Arm 7 Right	22.00
2/1 (Redhill Access)	U	I	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Left	10.00
											Arm 7 Ahead	Inf
2/2 (Redhill Access)	U	I	2	3	60.0	Geom	-	3.50	0.00	N	Arm 7 Ahead	Inf
											Arm 8 Right	25.00
3/1 (A34 (north))	U	J G	2	3	23.5	Geom	-	3.50	2.00	Y	Arm 7 Left	10.00
3/2 (A34 (north))	U	J	2	3	60.0	Geom	-	3.50	2.00	N	Arm 8 Ahead	Inf
3/3 (A34 (north))	U	J	2	3	60.0	Geom	-	3.50	2.00	N	Arm 8 Ahead	Inf
3/4 (A34 (north))	U	D	2	3	18.1	Geom	-	3.50	2.00	Y	Arm 5 Right	20.50
4/1 (Akzo Access)	U	K	2	3	35.0	Geom	-	3.50	0.00	Y	Arm 5 Ahead	Inf
											Arm 6 Right	24.00
											Arm 8 Left	10.00
4/2 (Akzo Access)	U	K	2	3	60.0	Geom	-	3.50	0.00	N	Arm 6 Right	24.00
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1	U		2	3	60.0	Inf	-	-	-	-	-	-
7/2	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1	U		2	3	60.0	Inf	-	-	-	-	-	-
8/2	U		2	3	60.0	Inf	-	-	-	-	-	-

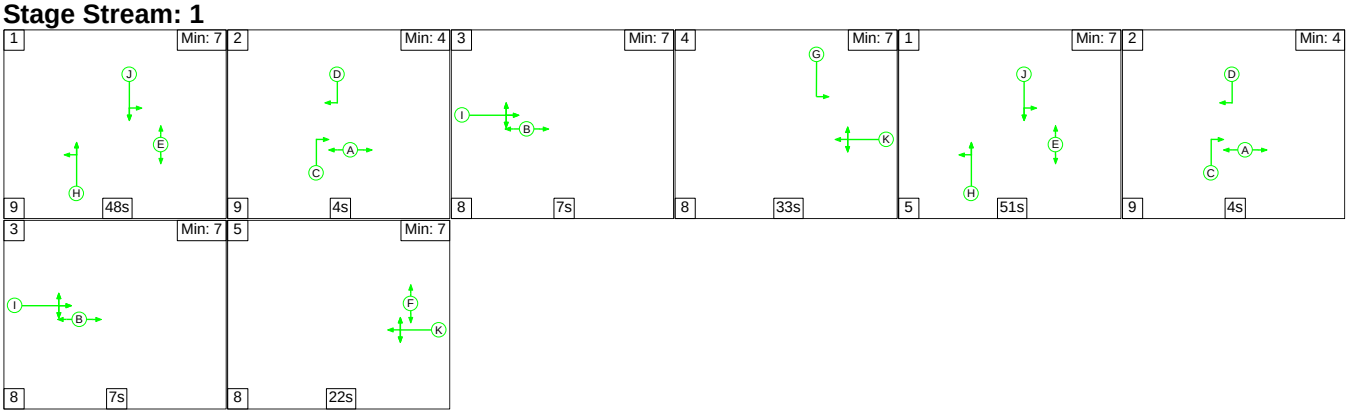
Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2033 + PAH + Development (AM)'	08:00	09:00	01:00	
2: '2033 + PAH + Development (PM)'	08:00	09:00	01:00	
3: '2040 Base (AM)'	08:00	09:00	01:00	
4: '2040 Base (PM)'	17:00	18:00	01:00	
5: '2040 Base + PAH (AM)'	08:00	09:00	01:00	
6: '2040 Base + PAH (PM)'	17:00	18:00	01:00	
7: '2040 + PAH + Development (1m) AM'	08:00	09:00	01:00	
8: '2040 + PAH + Development (1m) PM'	17:00	18:00	01:00	
9: '2040 + PAH + Development (1.7m) AM'	08:00	09:00	01:00	
10: '2040 + PAH + Development (1.7m) PM'	17:00	18:00	01:00	
11: '2040 + PAH + Development (1m) + Stone Phase 1 AM'	08:00	09:00	01:00	
12: '2040 + PAH + Development (1m) + Stone Phase 1 PM'	17:00	18:00	01:00	
13: '2040 + PAH + Development (1.7m) + Stone Phase 1 AM'	08:00	09:00	01:00	
14: '2040 + PAH + Development (1.7m) + Stone Phase 1 PM'	17:00	18:00	01:00	
15: '2040 + PAH + Development (1m) + Stone Total AM'	08:00	09:00	01:00	
16: '2040 + PAH + Development (1m) + Stone Total PM'	17:00	18:00	01:00	
17: '2040 + PAH + Development (1.7m) + Stone Total AM'	08:00	09:00	01:00	
18: '2040 + PAH + Development (1.7m) + Stone Total PM'	17:00	18:00	01:00	
19: '2040 + PAH + Development (1m) AM_A513 Light Vehs through Resi'	08:00	09:00	01:00	
20: '2040 + PAH + Development (1m) PM_A513 Light Vehs through Resi'	17:00	18:00	01:00	
21: '2040 + PAH + Development (1.7m) AM_A513 Light Vehs through Resi'	08:00	09:00	01:00	
22: '2040 + PAH + Development (1.7m) PM_A513 Light Vehs through Resi'	17:00	18:00	01:00	

Scenario 1: '2024 Base AM' (FG3: '2040 Base (AM)', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

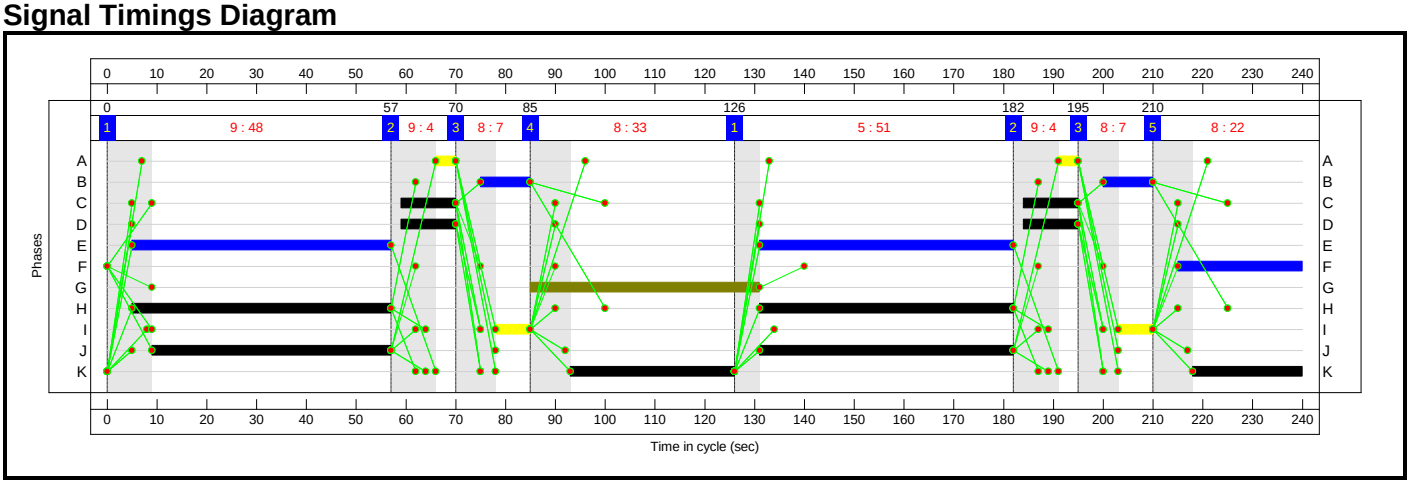


Stage Timings

Stage Stream: 1

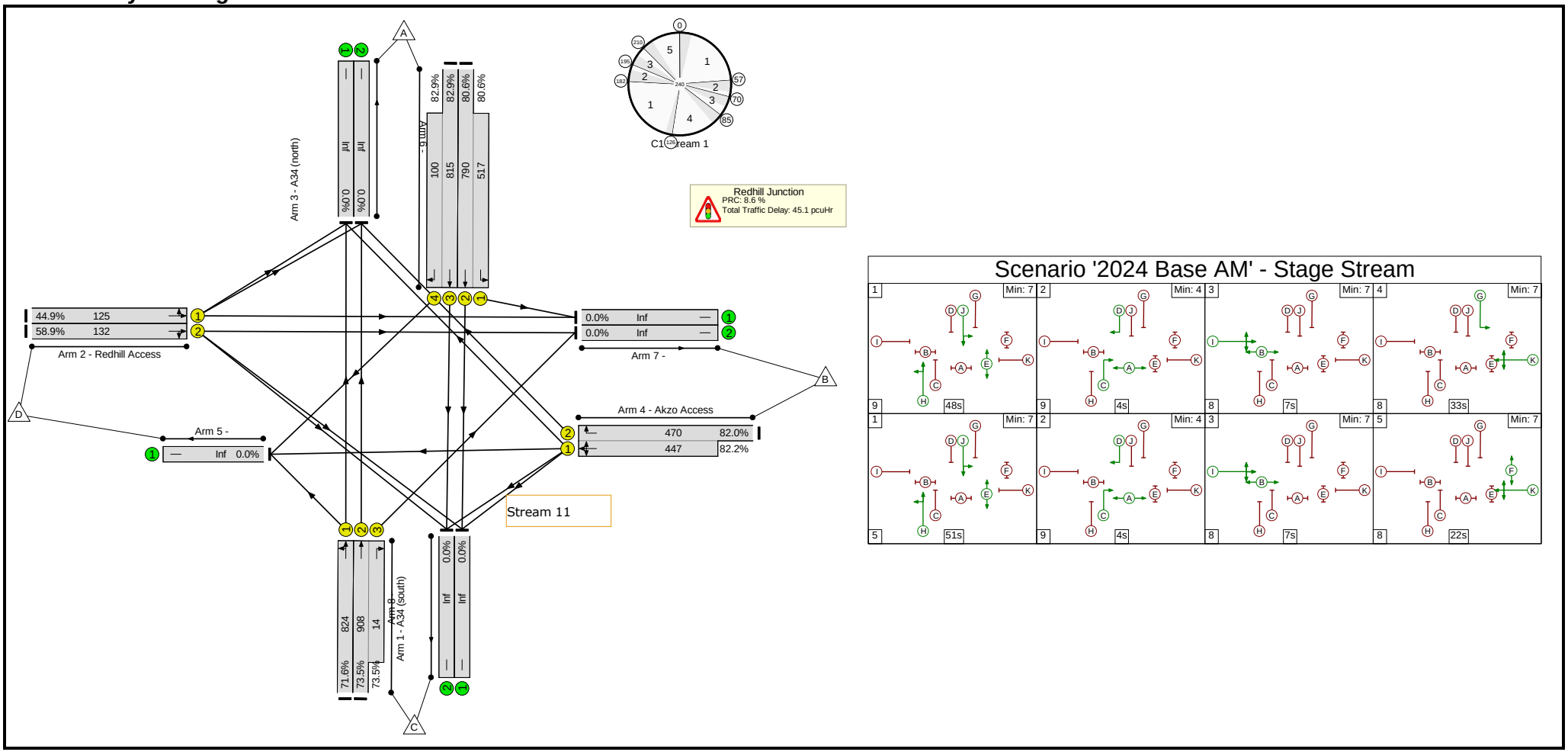
Stage	1	2	3	4	1	2	3	5
Duration	48	4	7	33	51	4	7	22
Change Point	0	57	70	85	126	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.9%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.9%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	103	-	590	1884	824	71.6%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	103:22	-	678	2105:1840	908+14	73.5 : 73.5%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	99:145	46	1054	2021:1636	790+517	80.6 : 80.6%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	99:22	-	758	2021:1753	815+100	82.9 : 82.9%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	55	-	754	1981:1884	470+447	82.0 : 82.2%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	392	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1064	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	708	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	747	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**34.7**	**10.4**	**0.0**	**45.1**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**34.7**	**10.4**	**0.0**	**45.1**	**-**	**-**	**-**	**-**
1/1	590	590	-	-	-	4.6	1.2	-	5.8	35.4	17.4	1.2	18.6
1/2+1/3	678	678	-	-	-	5.3	1.4	-	6.7	35.7	19.9	1.4	21.3
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.9	1.9	0.4	2.3
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.8	2.6	0.7	3.3
3/2+3/1	1054	1054	-	-	-	6.9	2.0	-	8.9	30.4	18.8	2.0	20.8
3/3+3/4	758	758	-	-	-	6.9	2.3	-	9.2	43.7	21.0	2.3	23.4
4/2+4/1	754	754	-	-	-	9.1	2.2	-	11.3	54.0	12.2	2.2	14.5
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	392	392	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1064	1064	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	708	708	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	747	747	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

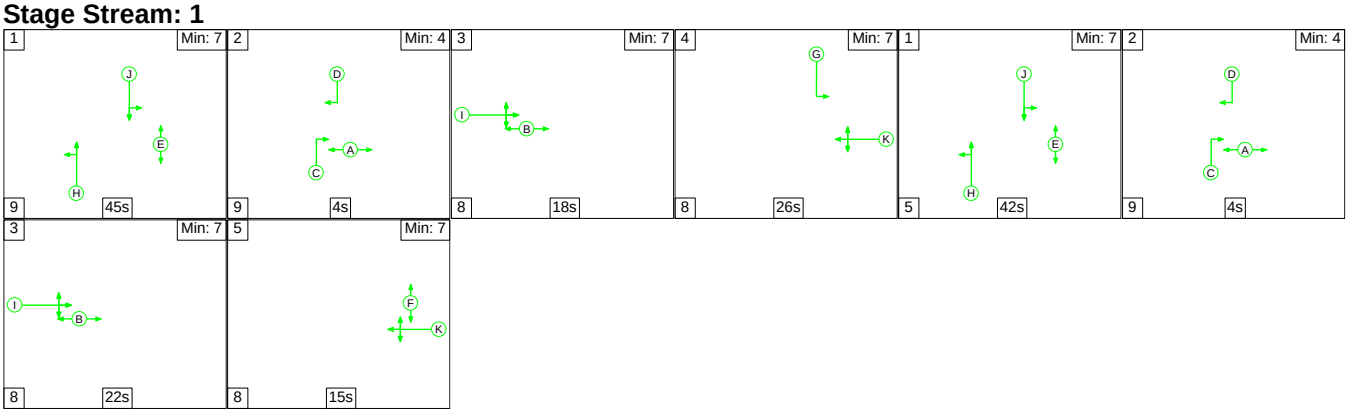
C1 Stream: 1 PRC for Signalled Lanes (%): 8.6 Total Delay for Signalled Lanes (pcuHr): 45.08 Cycle Time (s): 240
PRC Over All Lanes (%): 8.6 Total Delay Over All Lanes(pcuHr): 45.08

Full Input Data And Results

Scenario 2: '2024 Base PM' (FG4: '2040 Base (PM)', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

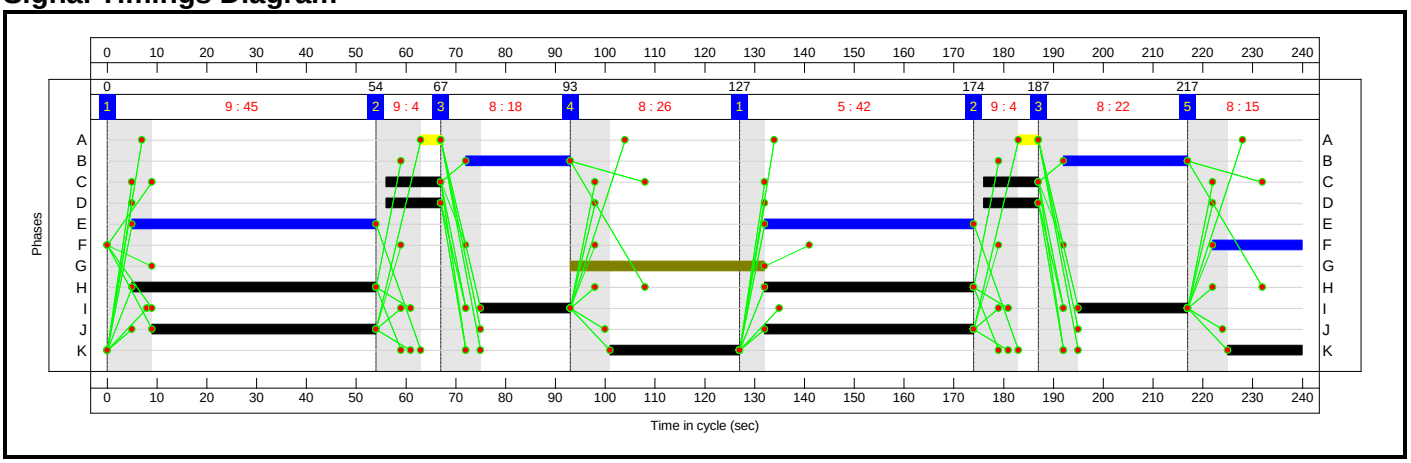


Stage Timings

Stage Stream: 1

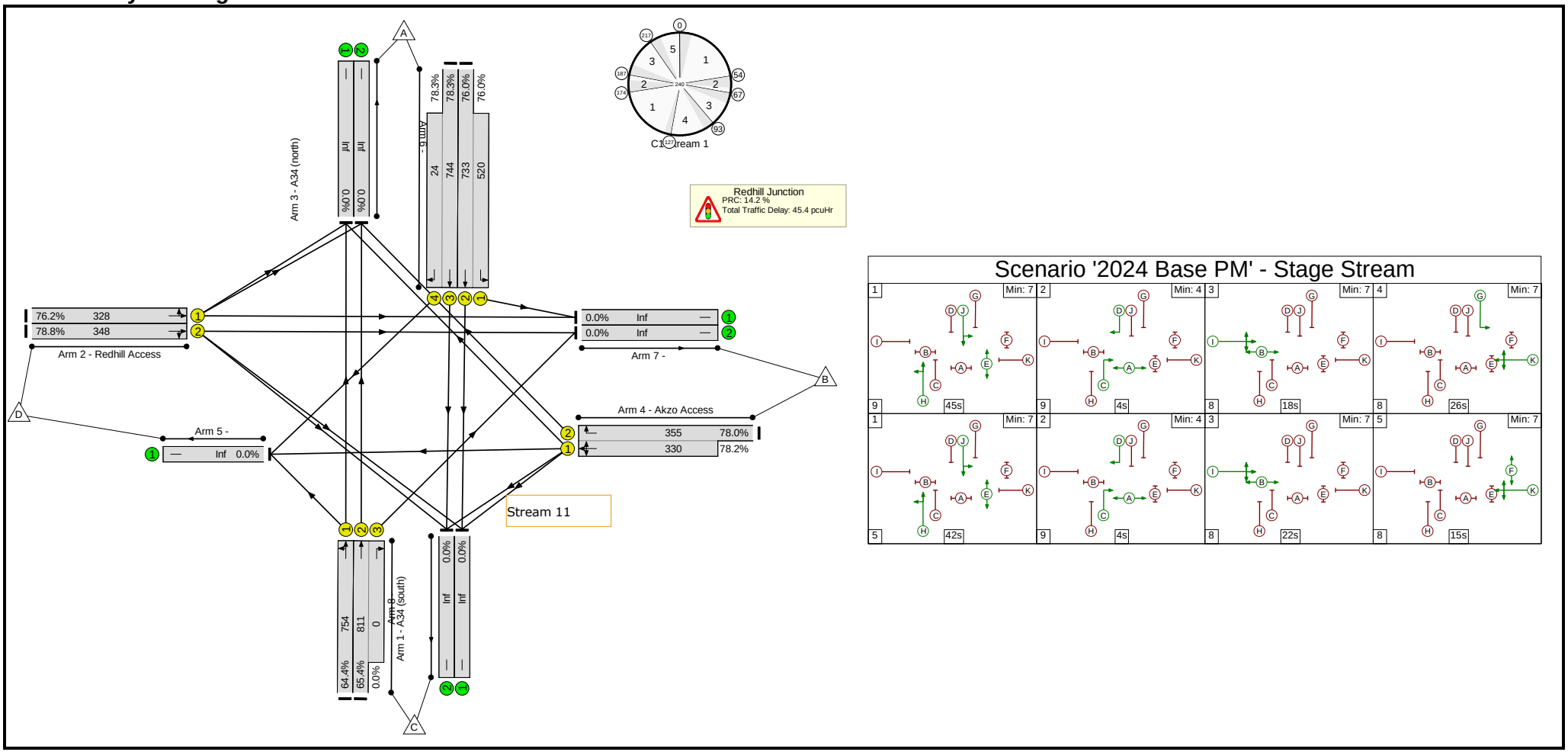
Stage	1	2	3	4	1	2	3	5
Duration	45	4	18	26	42	4	22	15
Change Point	0	54	67	93	127	174	187	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**78.8%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**78.8%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	91	-	485	1945	754	64.4%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	91:22	-	530	2105:1965	811+0	65.4 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	40	-	250	1875	328	76.2%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	40	-	274	1986	348	78.8%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	87:126	39	952	2021:1636	733+520	76.0 : 76.0%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	87:22	-	602	2021:1753	744+24	78.3 : 78.3%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	41	-	535	1981:1842	355+330	78.0 : 78.2%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	636	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	847	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	716	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	742	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**35.2**	**10.2**	**0.0**	**45.4**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**35.2**	**10.2**	**0.0**	**45.4**	**-**	**-**	**-**	**-**
1/1	485	485	-	-	-	4.0	0.9	-	4.9	36.7	13.7	0.9	14.6
1/2+1/3	530	530	-	-	-	4.4	0.9	-	5.4	36.5	15.2	0.9	16.2
2/1	250	250	-	-	-	3.3	1.5	-	4.8	69.3	8.1	1.5	9.6
2/2	274	274	-	-	-	3.6	1.8	-	5.4	70.7	8.9	1.8	10.7
3/2+3/1	952	952	-	-	-	7.2	1.6	-	8.7	33.0	16.4	1.6	18.0
3/3+3/4	602	602	-	-	-	5.7	1.8	-	7.4	44.5	17.5	1.8	19.3
4/2+4/1	535	535	-	-	-	7.0	1.7	-	8.7	58.8	8.9	1.7	10.7
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	636	636	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	847	847	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	716	716	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	742	742	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

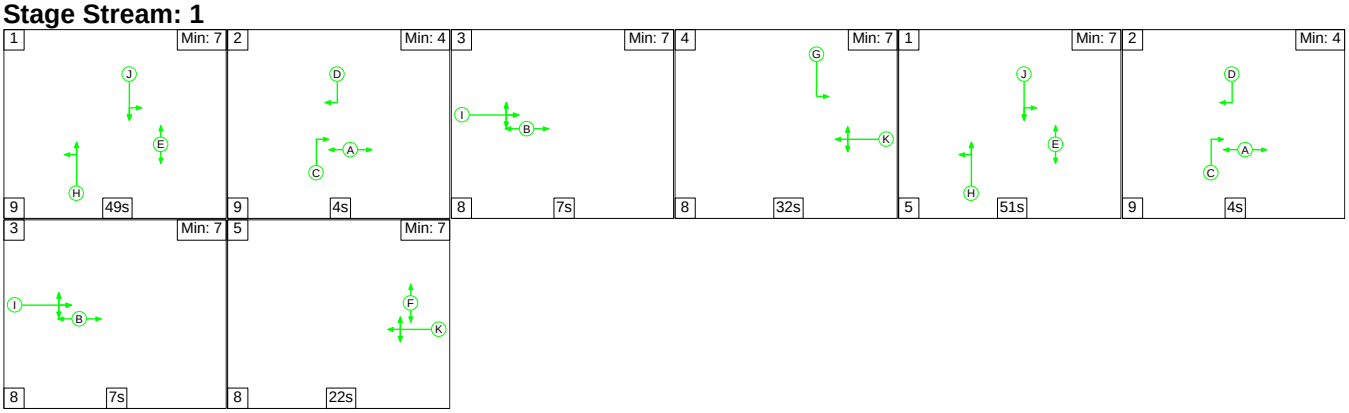
C1 Stream: 1 PRC for Signalled Lanes (%): 14.2 Total Delay for Signalled Lanes (pcuHr): 45.41 Cycle Time (s): 240
PRC Over All Lanes (%): 14.2 Total Delay Over All Lanes(pcuHr): 45.41

Full Input Data And Results

Scenario 3: '2024 Base + PAH AM' (FG5: '2040 Base + PAH (AM)', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

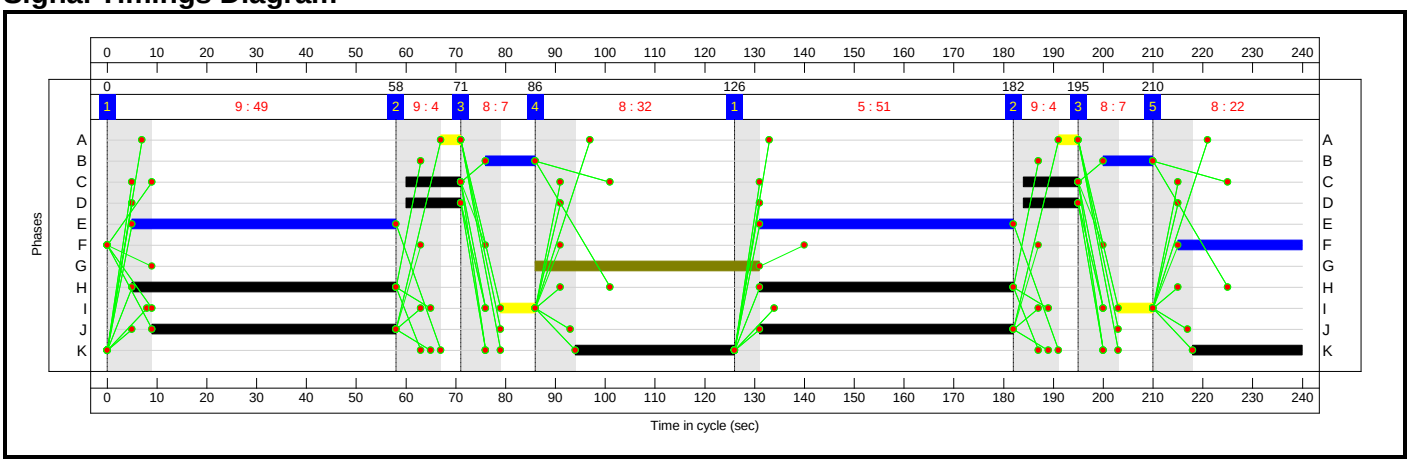


Stage Timings

Stage Stream: 1

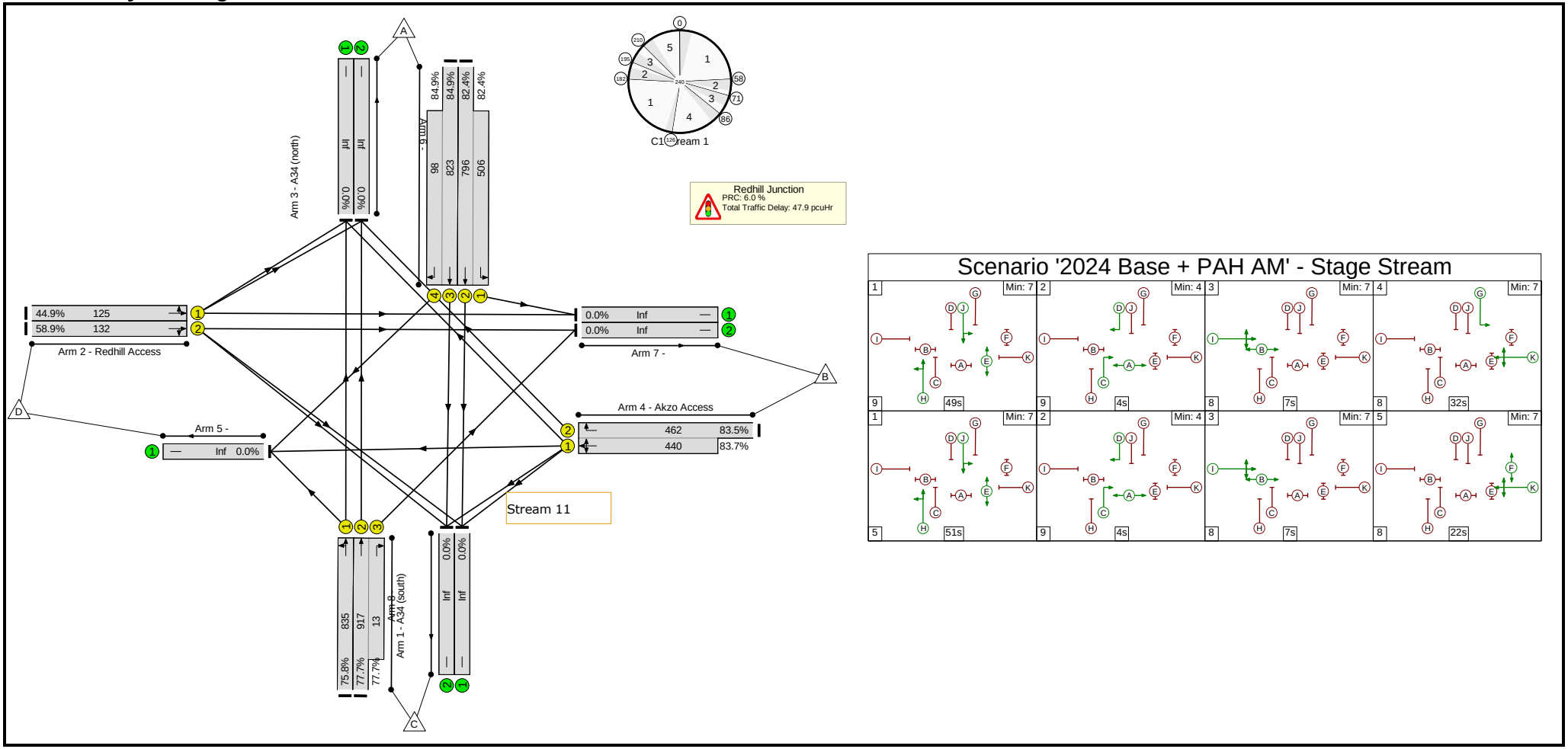
Stage	1	2	3	4	1	2	3	5
Duration	49	4	7	32	51	4	7	22
Change Point	0	58	71	86	126	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.9%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.9%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	104	-	633	1890	835	75.8%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	104:22	-	723	2105:1840	917+13	77.7 : 77.7%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	100:145	45	1073	2021:1636	796+506	82.4 : 82.4%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	100:22	-	782	2021:1753	823+98	84.9 : 84.9%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	54	-	754	1981:1884	462+440	83.5 : 83.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	435	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1109	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	727	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	771	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**36.0**	**11.8**	**0.0**	**47.9**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**36.0**	**11.8**	**0.0**	**47.9**	**-**	**-**	**-**	**-**
1/1	633	633	-	-	-	5.0	1.5	-	6.5	37.1	19.0	1.5	20.5
1/2+1/3	723	723	-	-	-	5.8	1.7	-	7.5	37.3	21.7	1.7	23.4
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.9	1.9	0.4	2.3
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.8	2.6	0.7	3.3
3/2+3/1	1073	1073	-	-	-	7.0	2.3	-	9.3	31.2	19.3	2.3	21.6
3/3+3/4	782	782	-	-	-	7.1	2.7	-	9.8	45.1	22.0	2.7	24.7
4/2+4/1	754	754	-	-	-	9.2	2.5	-	11.6	55.6	12.3	2.5	14.8
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	435	435	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1109	1109	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	727	727	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	771	771	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

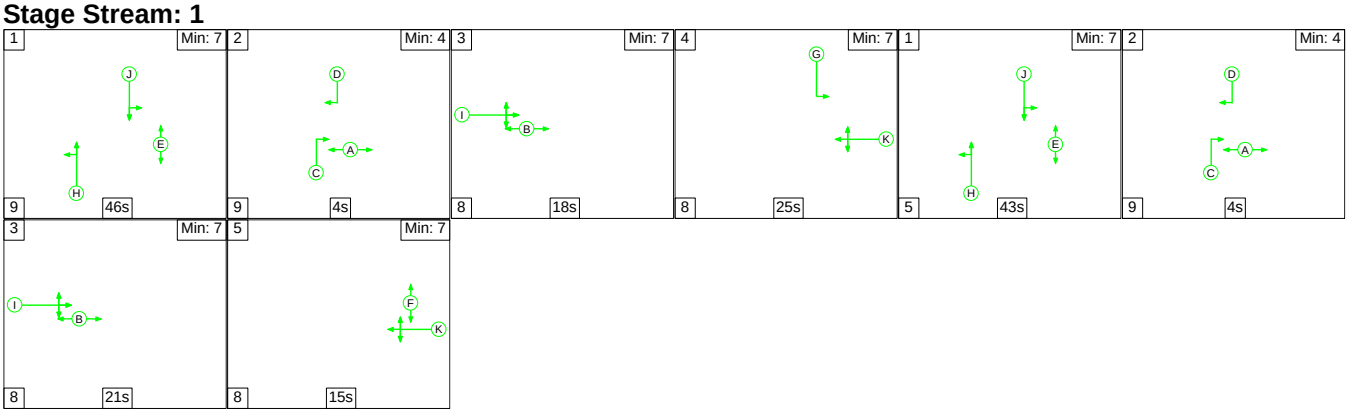
C1 Stream: 1 PRC for Signalled Lanes (%): 6.0 Total Delay for Signalled Lanes (pcuHr): 47.89 Cycle Time (s): 240
PRC Over All Lanes (%): 6.0 Total Delay Over All Lanes(pcuHr): 47.89

Full Input Data And Results

Scenario 4: '2024 Base + PAH PM' (FG6: '2040 Base + PAH (PM)', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

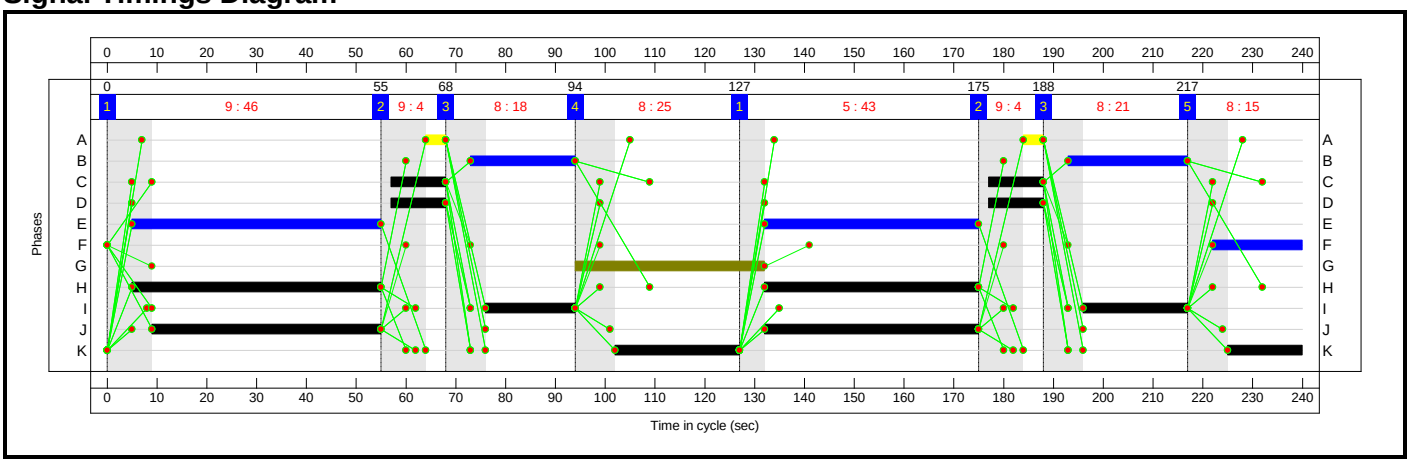


Stage Timings

Stage Stream: 1

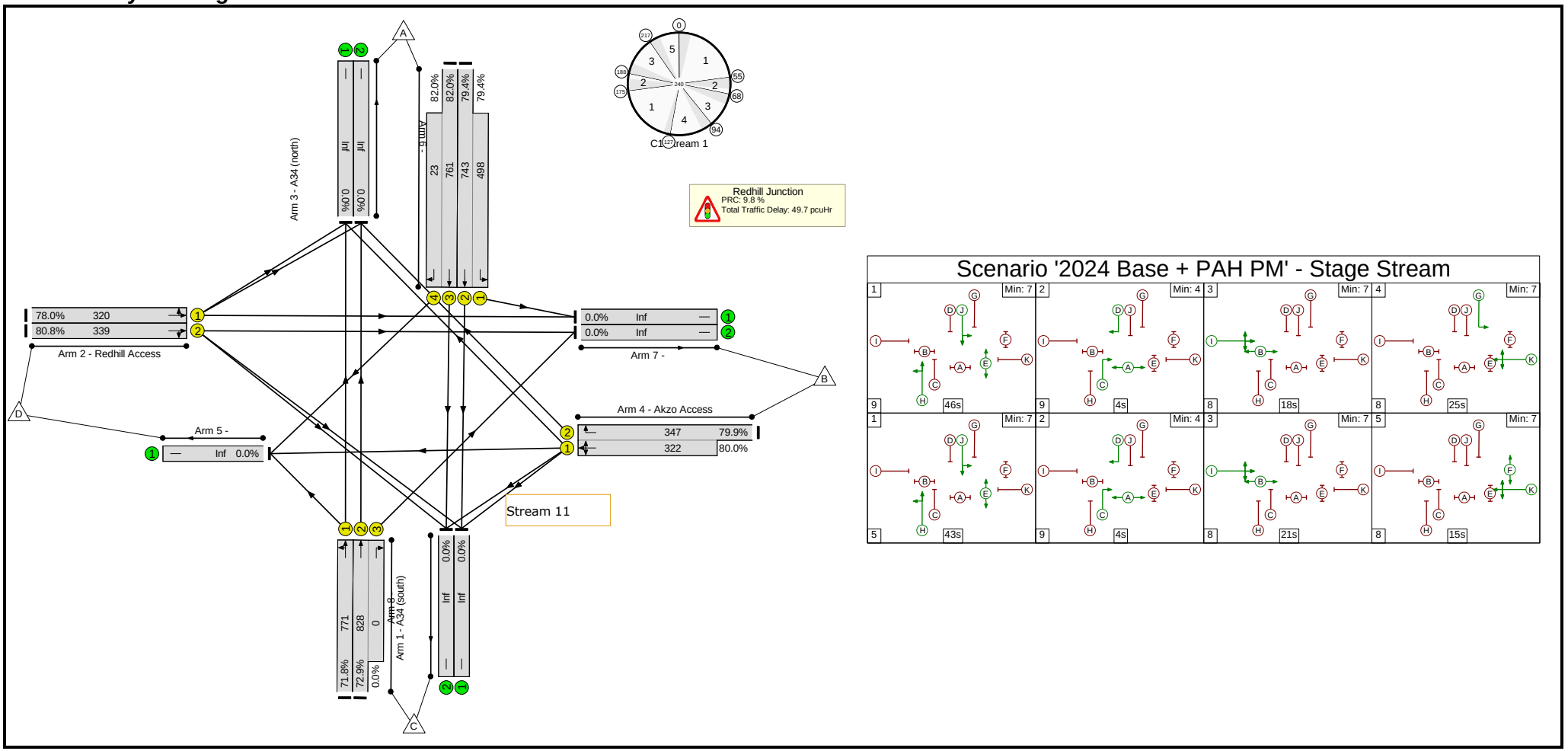
Stage	1	2	3	4	1	2	3	5
Duration	46	4	18	25	43	4	21	15
Change Point	0	55	68	94	127	175	188	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.0%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.0%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	93	-	553	1947	771	71.8%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	93:22	-	604	2105:1965	828+0	72.9 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	39	-	250	1875	320	78.0%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	39	-	274	1986	339	80.8%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	89:127	38	985	2021:1636	743+498	79.4 : 79.4%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	89:22	-	643	2021:1753	761+23	82.0 : 82.0%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	40	-	535	1981:1842	347+322	79.9 : 80.0%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	704	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	921	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	749	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**37.3**	**12.3**	**0.0**	**49.7**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**37.3**	**12.3**	**0.0**	**49.7**	**-**	**-**	**-**	**-**
1/1	553	553	-	-	-	4.7	1.3	-	6.0	38.8	16.3	1.3	17.5
1/2+1/3	604	604	-	-	-	5.2	1.3	-	6.5	38.7	18.0	1.3	19.3
2/1	250	250	-	-	-	3.3	1.7	-	5.0	72.0	8.1	1.7	9.8
2/2	274	274	-	-	-	3.6	2.0	-	5.6	73.9	8.9	2.0	10.9
3/2+3/1	985	985	-	-	-	7.4	1.9	-	9.3	34.0	17.5	1.9	19.4
3/3+3/4	643	643	-	-	-	6.1	2.2	-	8.3	46.3	19.0	2.2	21.2
4/2+4/1	535	535	-	-	-	7.1	1.9	-	9.0	60.6	9.0	1.9	10.9
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	704	704	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	921	921	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	749	749	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

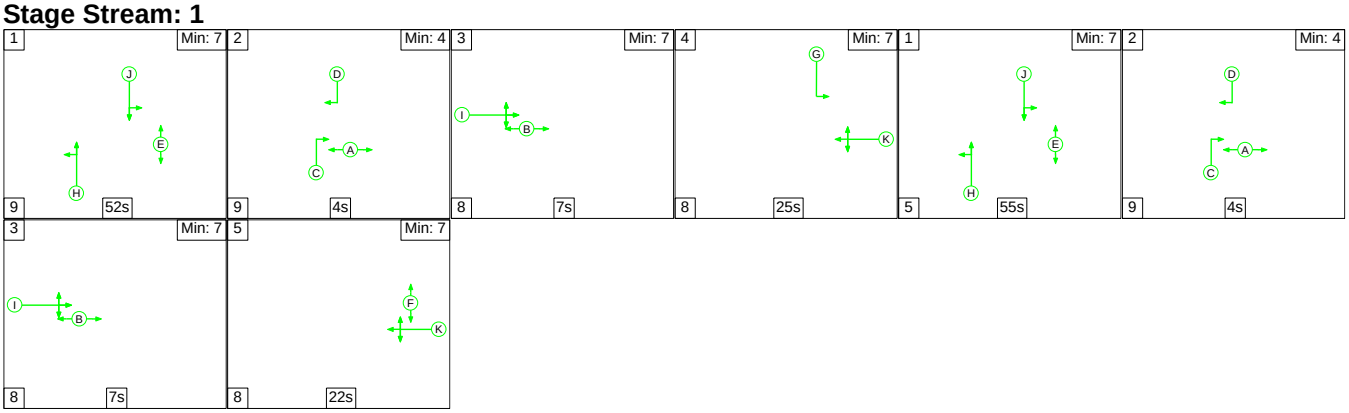
C1 Stream: 1 PRC for Signalled Lanes (%): 9.8 Total Delay for Signalled Lanes (pcuHr): 49.65 Cycle Time (s): 240
PRC Over All Lanes (%): 9.8 Total Delay Over All Lanes(pcuHr): 49.65

Full Input Data And Results

Scenario 5: '2040 PAH + Dev (1m) AM' (FG7: '2040 + PAH + Development (1m) AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

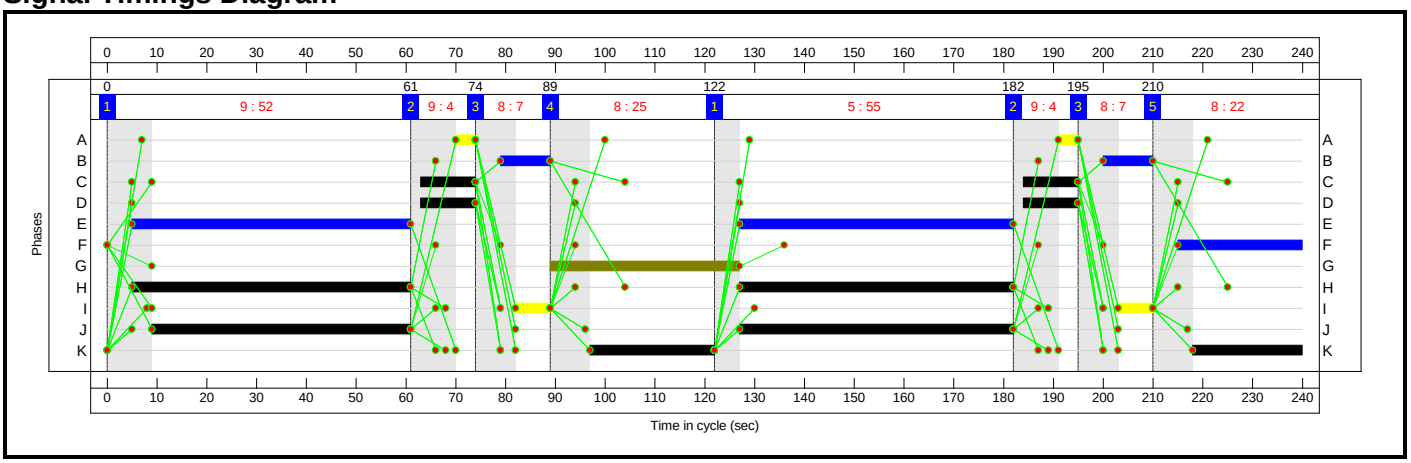


Stage Timings

Stage Stream: 1

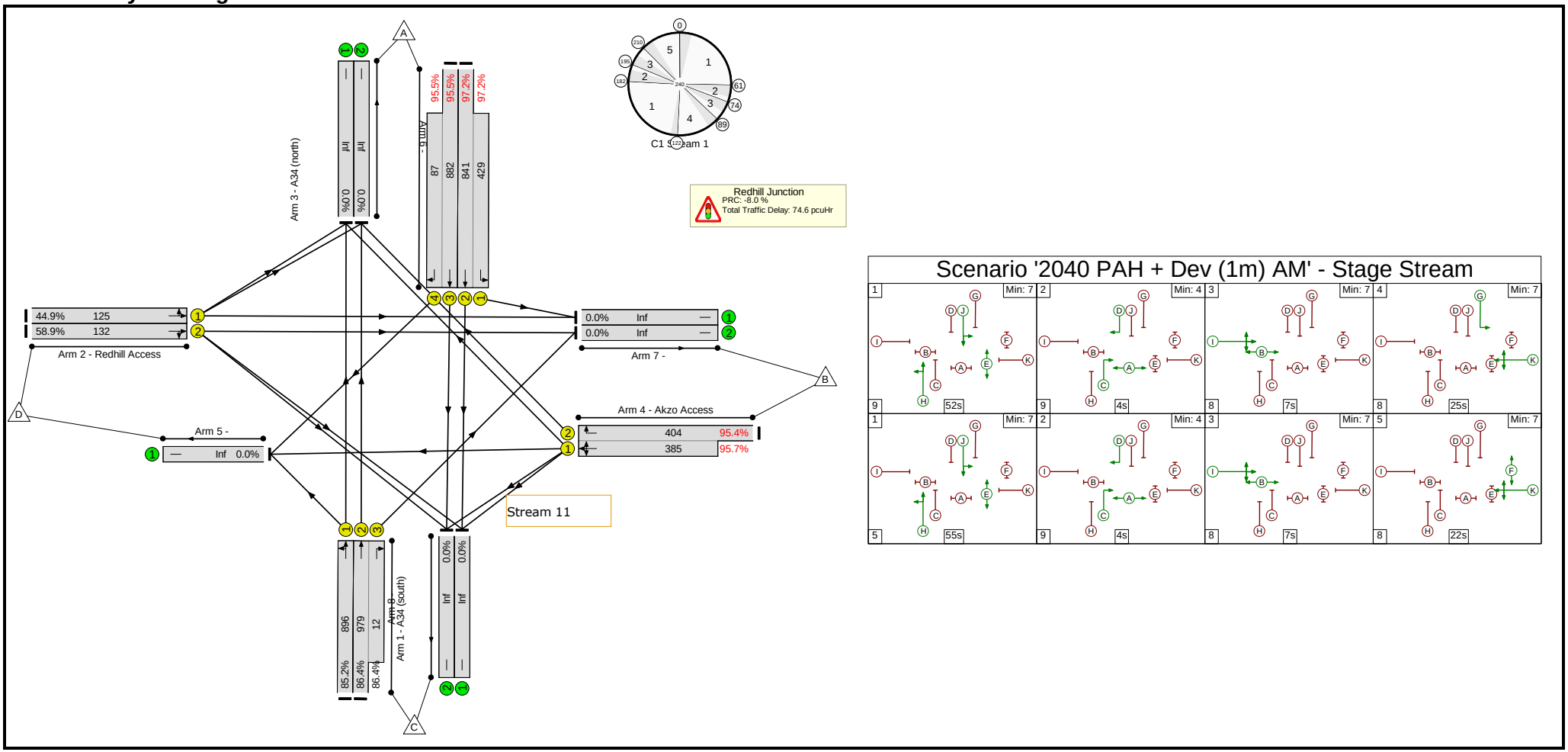
Stage	1	2	3	4	1	2	3	5
Duration	52	4	7	25	55	4	7	22
Change Point	0	61	74	89	122	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**97.2%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**97.2%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	111	-	763	1902	896	85.2%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	111:22	-	856	2105:1840	979+12	86.4 : 86.4%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	107:145	38	1234	2021:1636	841+429	97.2 : 97.2%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	107:22	-	925	2021:1753	882+87	95.5 : 95.5%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	47	-	754	1981:1884	404+385	95.4 : 95.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1242	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	888	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	914	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.6**	**33.0**	**0.0**	**74.6**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.6**	**33.0**	**0.0**	**74.6**	**-**	**-**	**-**	**-**
1/1	763	763	-	-	-	5.9	2.8	-	8.7	41.1	22.9	2.8	25.7
1/2+1/3	856	856	-	-	-	6.8	3.0	-	9.8	41.3	25.7	3.0	28.8
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.5	0.7	3.2
3/2+3/1	1234	1234	-	-	-	8.6	10.8	-	19.4	56.5	27.3	10.8	38.1
3/3+3/4	925	925	-	-	-	8.4	7.8	-	16.2	63.0	28.0	7.8	35.8
4/2+4/1	754	754	-	-	-	9.9	7.5	-	17.4	83.2	12.8	7.5	20.3
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1242	1242	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	888	888	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	914	914	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

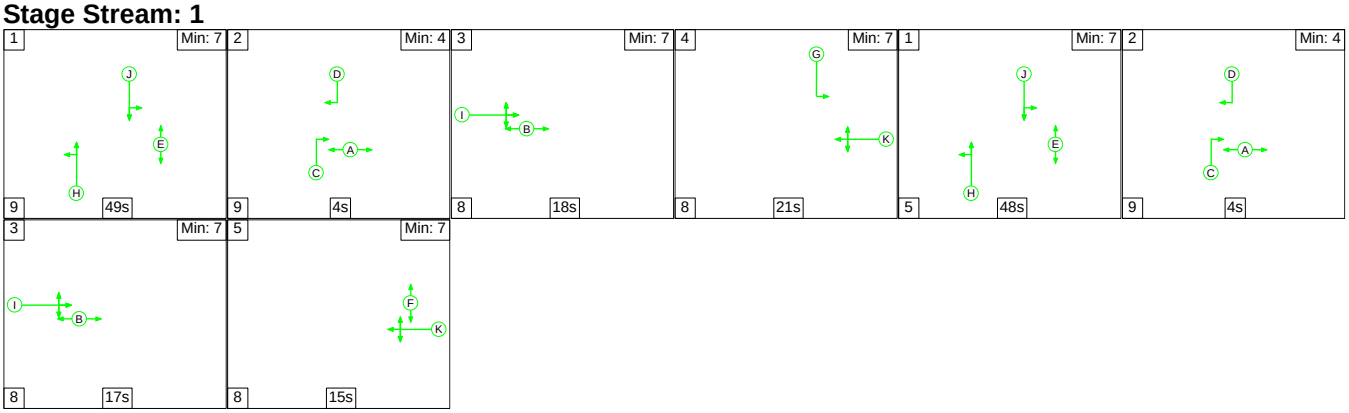
C1 Stream: 1 PRC for Signalled Lanes (%): -8.0 Total Delay for Signalled Lanes (pcuHr): 74.60 Cycle Time (s): 240
PRC Over All Lanes (%): -8.0 Total Delay Over All Lanes(pcuHr): 74.60

Full Input Data And Results

Scenario 6: '2040 PAH + Dev (1m) PM' (FG8: '2040 + PAH + Development (1m) PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

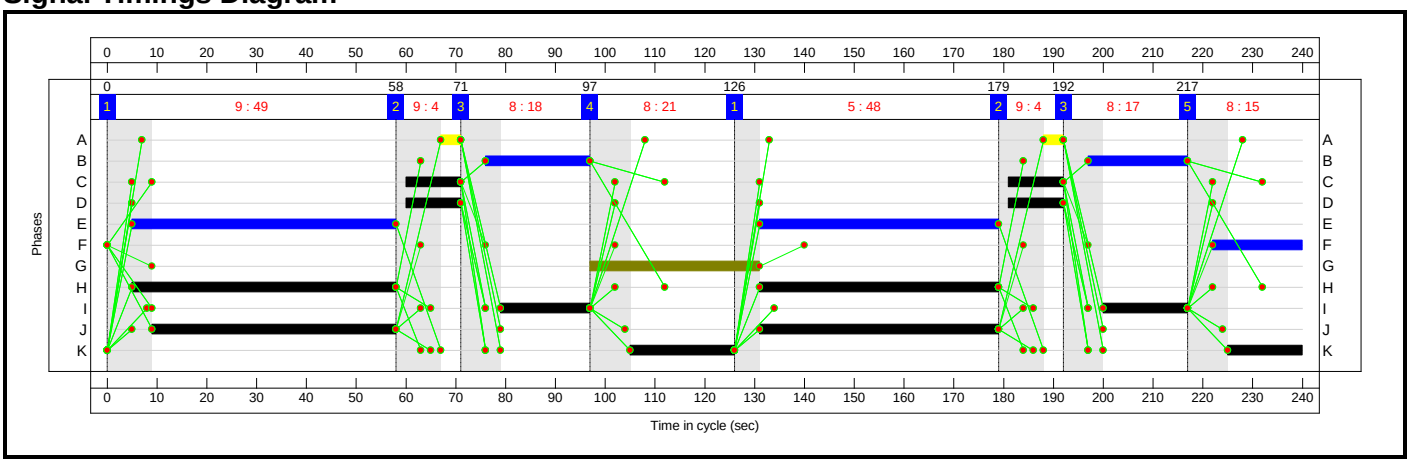


Stage Timings

Stage Stream: 1

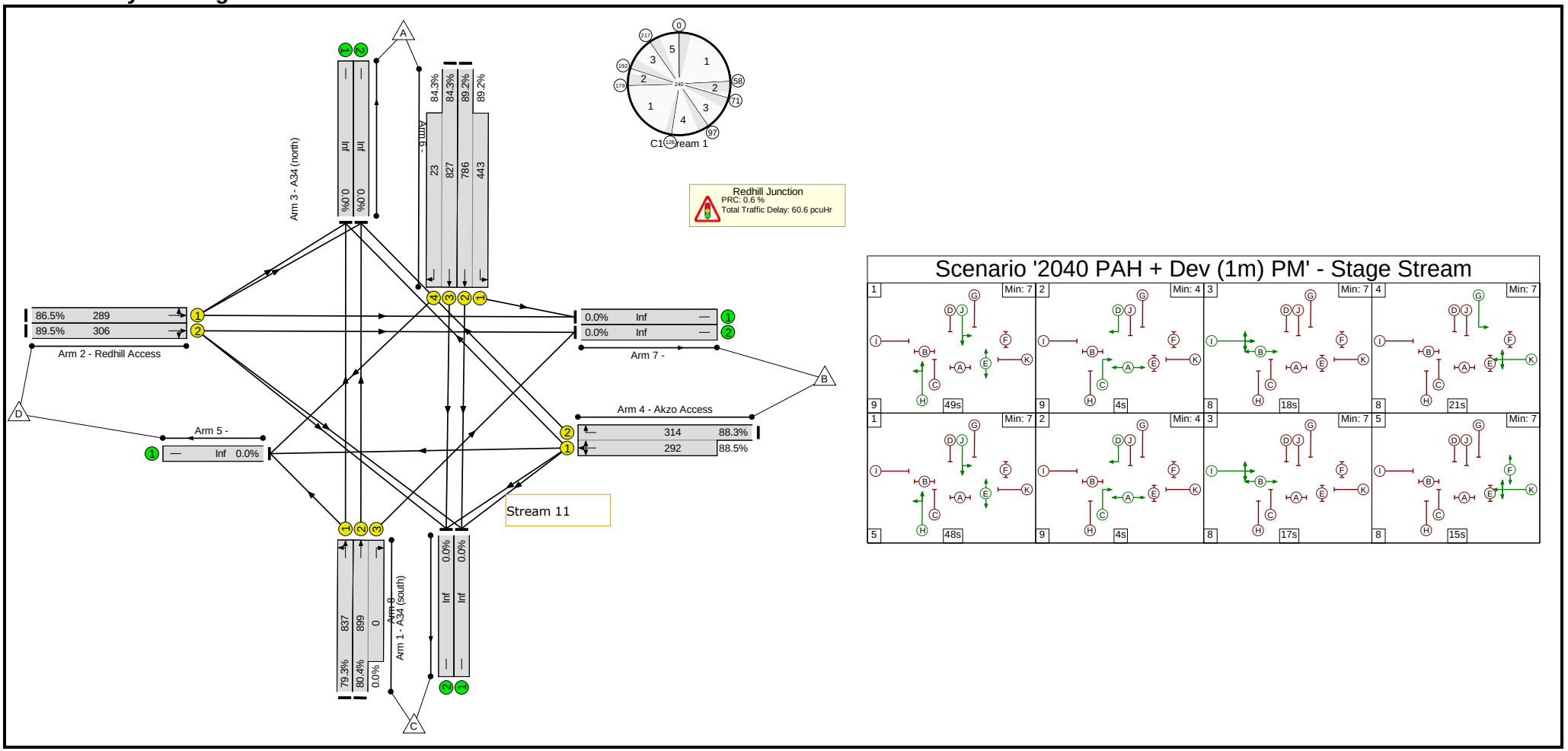
Stage	1	2	3	4	1	2	3	5
Duration	49	4	18	21	48	4	17	15
Change Point	0	58	71	97	126	179	192	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.5%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.5%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	101	-	664	1950	837	79.3%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	101:22	-	722	2105:1965	899+0	80.4 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	35	-	250	1875	289	86.5%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	35	-	274	1986	306	89.5%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	97:131	34	1096	2021:1636	786+443	89.2 : 89.2%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	97:22	-	716	2021:1753	827+23	84.3 : 84.3%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	36	-	535	1981:1842	314+292	88.3 : 88.5%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	815	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1039	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	860	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	856	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**40.5**	**20.1**	**0.0**	**60.6**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**40.5**	**20.1**	**0.0**	**60.6**	**-**	**-**	**-**	**-**
1/1	664	664	-	-	-	5.5	1.9	-	7.4	39.9	20.1	1.9	22.0
1/2+1/3	722	722	-	-	-	6.0	2.0	-	8.0	39.9	22.1	2.0	24.1
2/1	250	250	-	-	-	3.4	2.8	-	6.2	89.8	8.1	2.8	10.9
2/2	274	274	-	-	-	3.8	3.5	-	7.3	95.8	9.0	3.5	12.5
3/2+3/1	1096	1096	-	-	-	8.0	3.9	-	12.0	39.3	21.4	3.9	25.3
3/3+3/4	716	716	-	-	-	6.4	2.6	-	9.0	45.1	21.3	2.6	23.9
4/2+4/1	535	535	-	-	-	7.4	3.5	-	10.8	72.8	9.2	3.5	12.7
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	815	815	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1039	1039	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	860	860	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	856	856	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

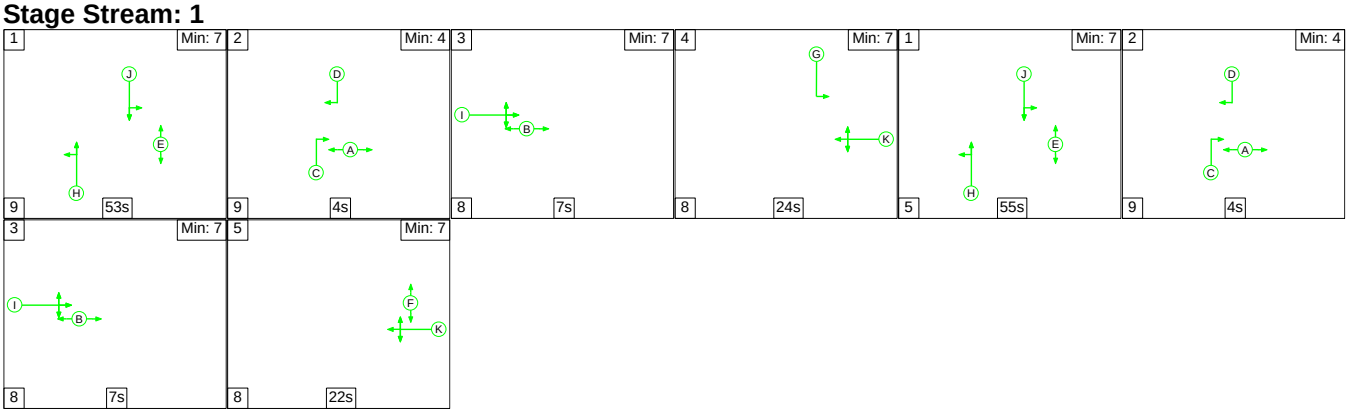
C1 Stream: 1 PRC for Signalled Lanes (%): 0.6 Total Delay for Signalled Lanes (pcuHr): 60.62 Cycle Time (s): 240
PRC Over All Lanes (%): 0.6 Total Delay Over All Lanes(pcuHr): 60.62

Full Input Data And Results

Scenario 7: '2040 PAH + Dev (1.7m) AM' (FG9: '2040 + PAH + Development (1.7m) AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

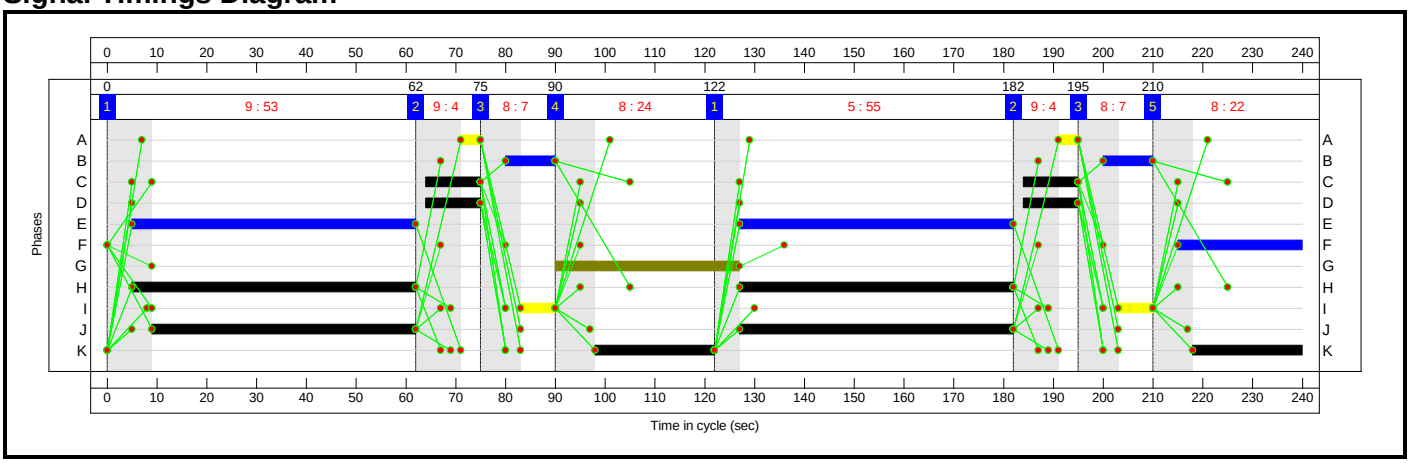


Stage Timings

Stage Stream: 1

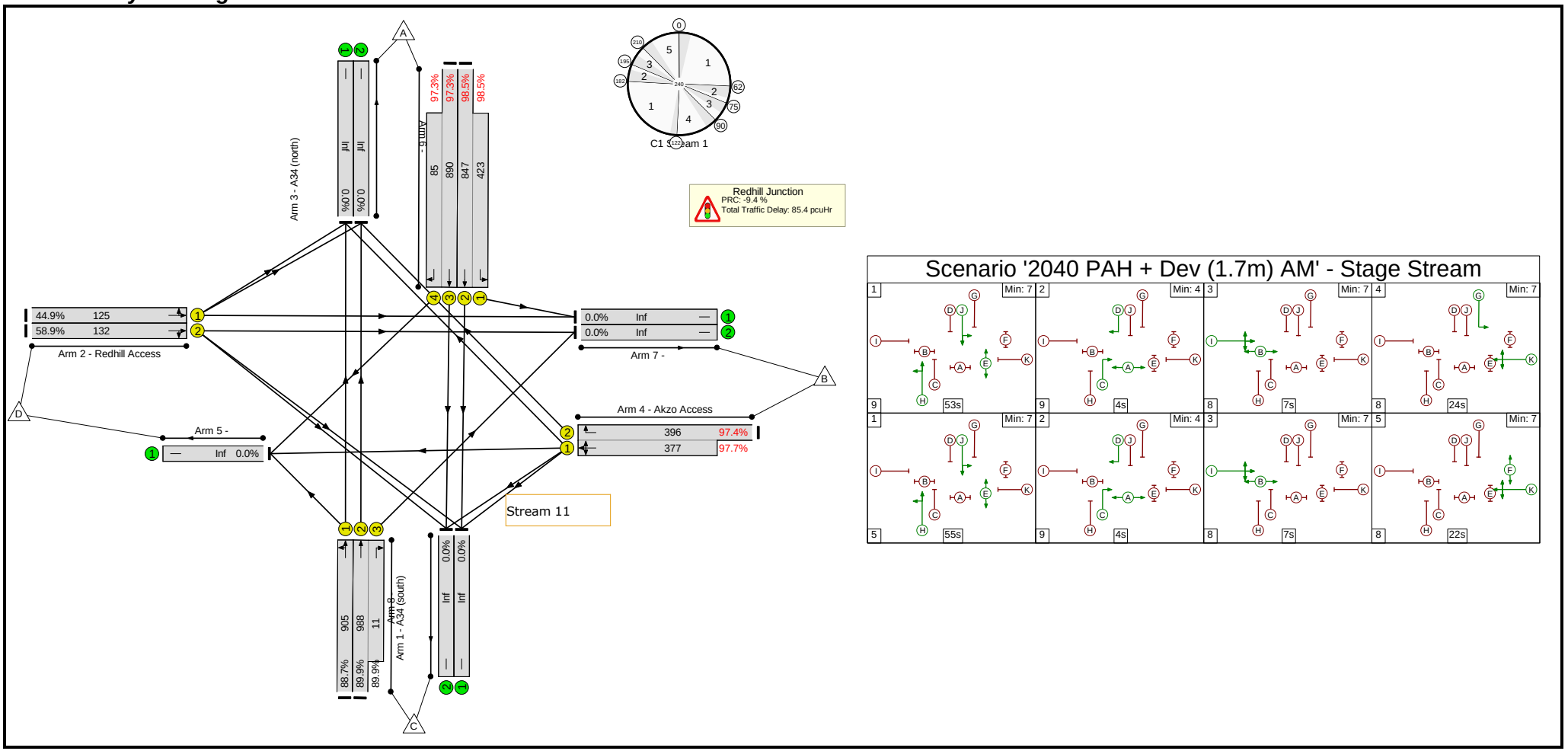
Stage	1	2	3	4	1	2	3	5
Duration	53	4	7	24	55	4	7	22
Change Point	0	62	75	90	122	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**98.5%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**98.5%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	112	-	803	1905	905	88.7%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	112:22	-	898	2105:1840	988+11	89.9 : 89.9%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	108:145	37	1251	2021:1636	847+423	98.5 : 98.5%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	108:22	-	949	2021:1753	890+85	97.3 : 97.3%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	46	-	754	1981:1884	396+377	97.4 : 97.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	605	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1284	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	905	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	938	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**43.1**	**42.3**	**0.0**	**85.4**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**43.1**	**42.3**	**0.0**	**85.4**	**-**	**-**	**-**	**-**
1/1	803	803	-	-	-	6.4	3.7	-	10.1	45.1	24.5	3.7	28.2
1/2+1/3	898	898	-	-	-	7.2	4.1	-	11.3	45.4	27.5	4.1	31.6
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.5	0.7	3.2
3/2+3/1	1251	1251	-	-	-	8.8	13.5	-	22.3	64.2	29.8	13.5	43.3
3/3+3/4	949	949	-	-	-	8.7	10.1	-	18.8	71.1	29.4	10.1	39.5
4/2+4/1	754	754	-	-	-	10.0	9.8	-	19.8	94.5	12.9	9.8	22.6
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	605	605	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1284	1284	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	905	905	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	938	938	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

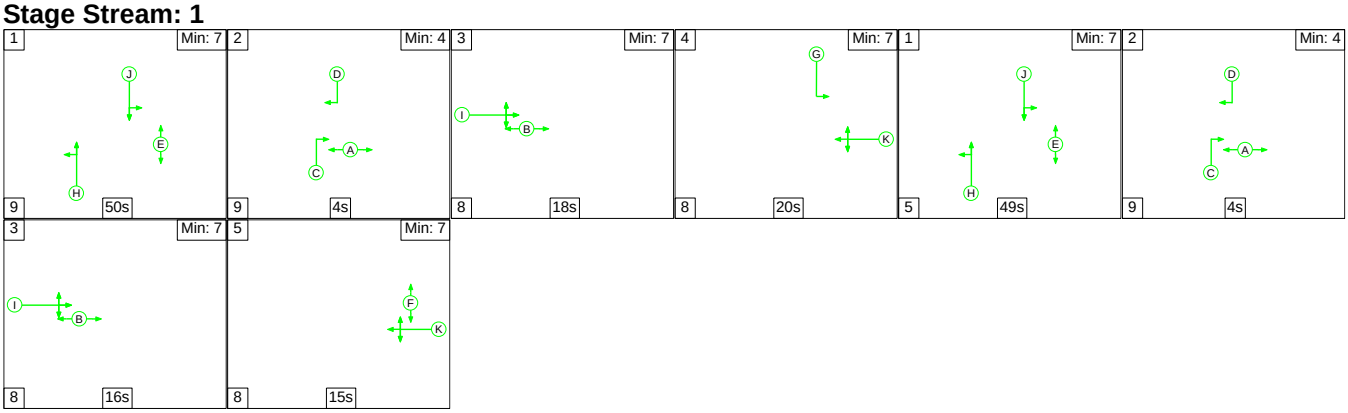
C1 Stream: 1 PRC for Signalled Lanes (%): -9.4 Total Delay for Signalled Lanes (pcuHr): 85.37 Cycle Time (s): 240
PRC Over All Lanes (%): -9.4 Total Delay Over All Lanes(pcuHr): 85.37

Full Input Data And Results

Scenario 8: '2040 PAH + Dev (1.7m) PM' (FG10: '2040 + PAH + Development (1.7m) PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

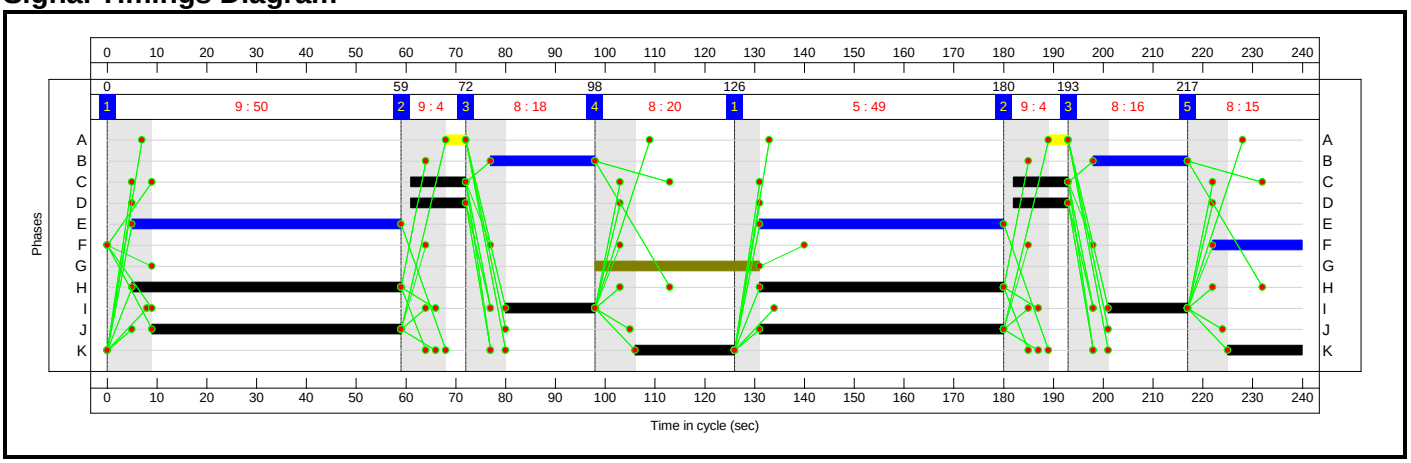


Stage Timings

Stage Stream: 1

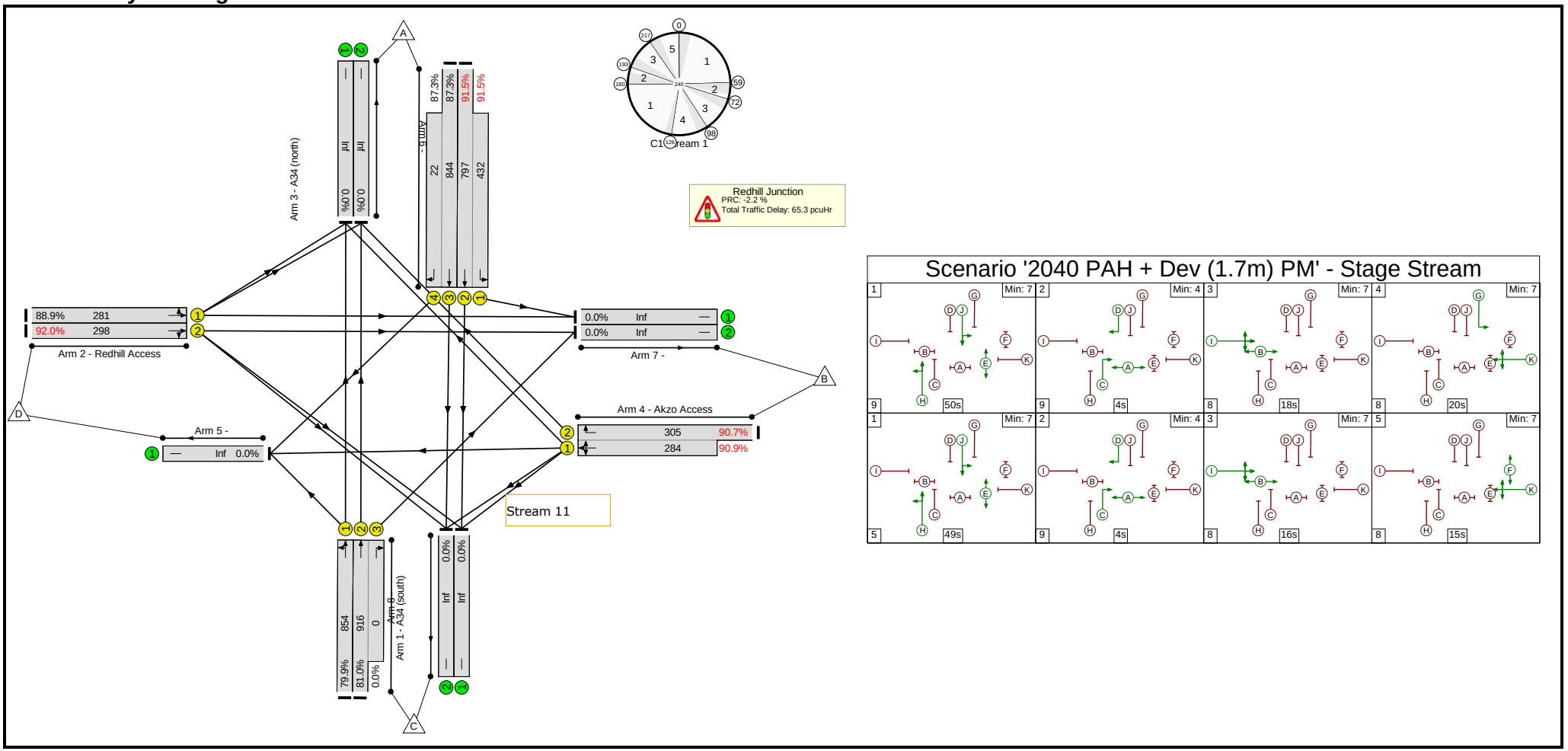
Stage	1	2	3	4	1	2	3	5
Duration	50	4	18	20	49	4	16	15
Change Point	0	59	72	98	126	180	193	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	103	-	682	1951	854	79.9%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	103:22	-	742	2105:1965	916+0	81.0 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	34	-	250	1875	281	88.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	34	-	274	1986	298	92.0%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	99:132	33	1124	2021:1636	797+432	91.5 : 91.5%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	99:22	-	756	2021:1753	844+22	87.3 : 87.3%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	35	-	535	1981:1842	305+284	90.7 : 90.9%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	833	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1059	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	888	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	896	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.3**	**24.0**	**0.0**	**65.3**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.3**	**24.0**	**0.0**	**65.3**	**-**	**-**	**-**	**-**
1/1	682	682	-	-	-	5.5	1.9	-	7.5	39.5	20.6	1.9	22.6
1/2+1/3	742	742	-	-	-	6.1	2.1	-	8.2	39.6	22.7	2.1	24.8
2/1	250	250	-	-	-	3.5	3.3	-	6.8	97.6	8.1	3.3	11.4
2/2	274	274	-	-	-	3.8	4.2	-	8.1	105.9	9.0	4.2	13.2
3/2+3/1	1124	1124	-	-	-	8.2	4.9	-	13.1	42.0	22.5	4.9	27.4
3/3+3/4	756	756	-	-	-	6.7	3.3	-	10.0	47.6	22.9	3.3	26.2
4/2+4/1	535	535	-	-	-	7.4	4.3	-	11.7	78.6	9.4	4.3	13.6
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	833	833	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1059	1059	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	888	888	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	896	896	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

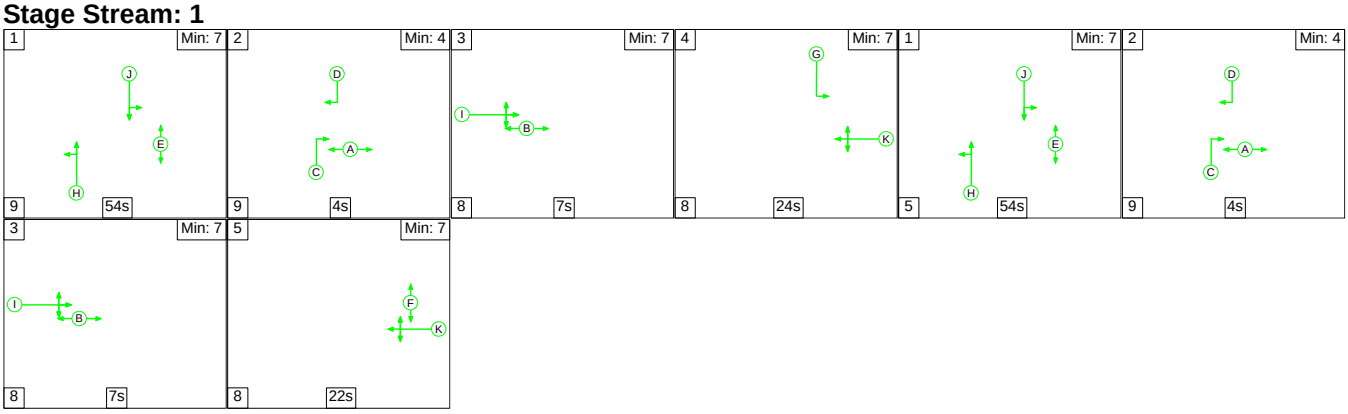
C1 Stream: 1 PRC for Signalled Lanes (%): -2.2 Total Delay for Signalled Lanes (pcuHr): 65.27 Cycle Time (s): 240
PRC Over All Lanes (%): -2.2 Total Delay Over All Lanes(pcuHr): 65.27

Full Input Data And Results

Scenario 9: '2040+ PAH + Dev (1m) + Stone Phase 1 AM' (FG11: '2040 + PAH + Development (1m) + Stone Phase 1 AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

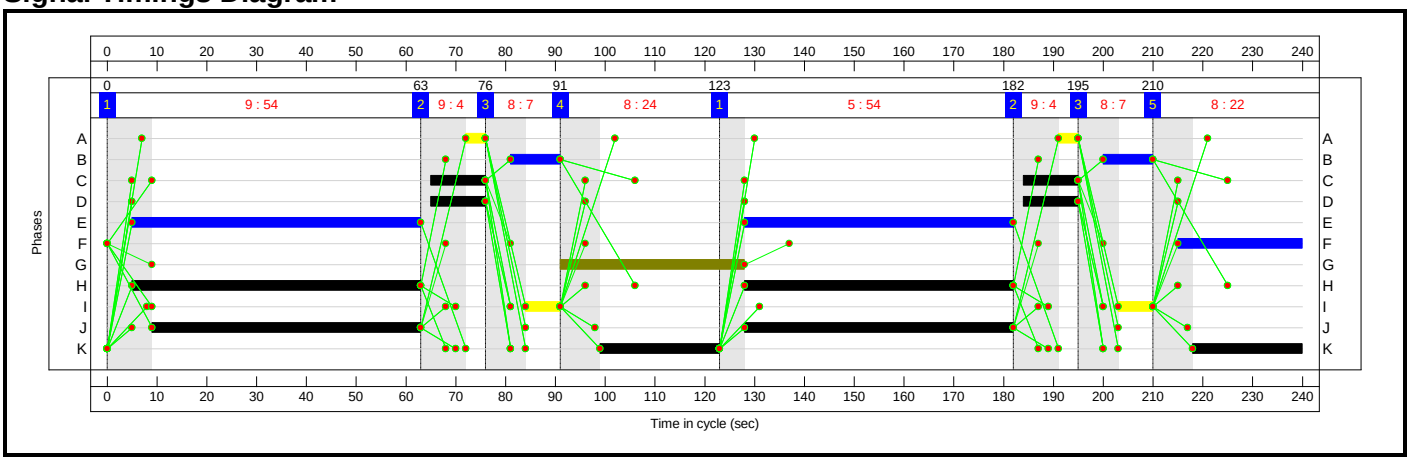


Stage Timings

Stage Stream: 1

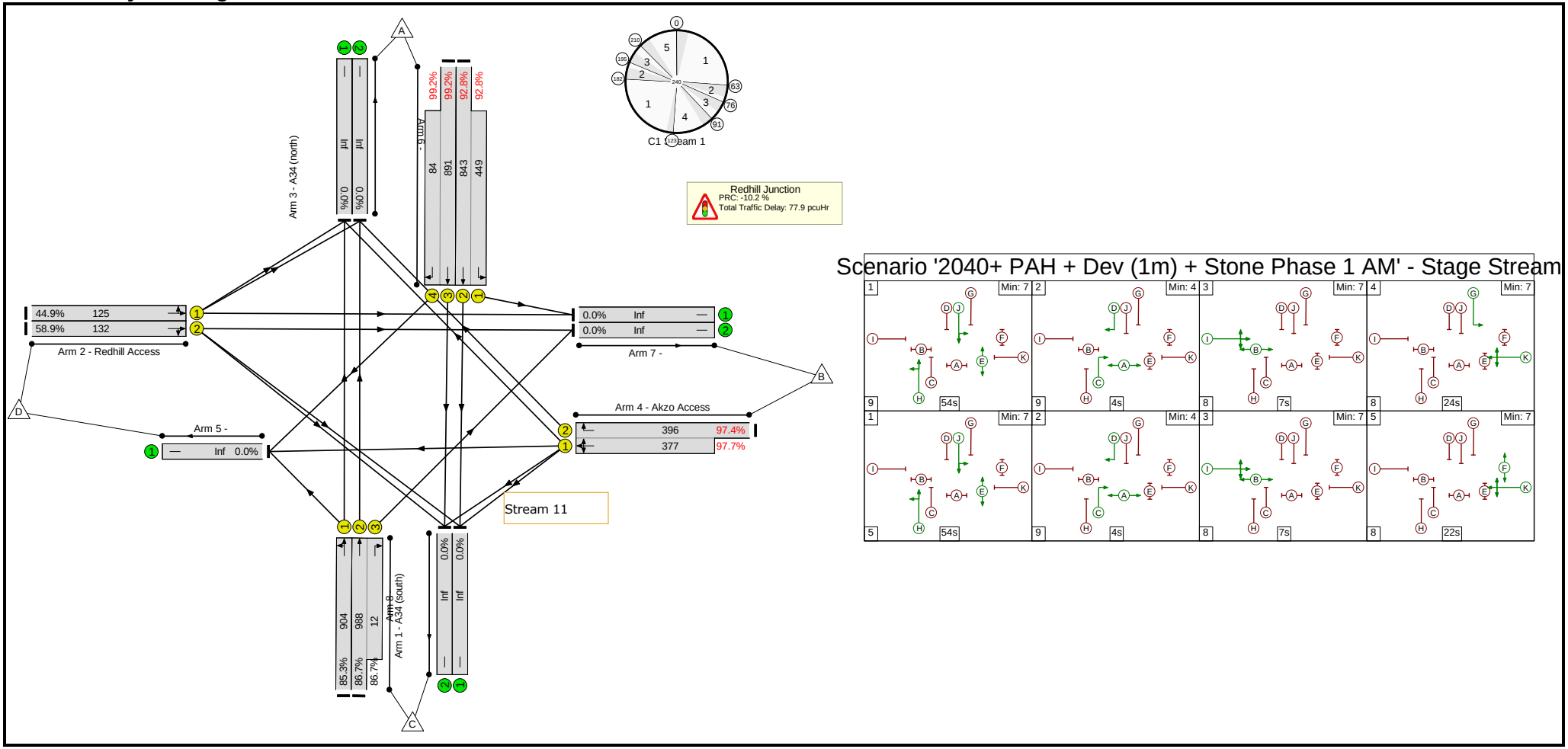
Stage	1	2	3	4	1	2	3	5
Duration	54	4	7	24	54	4	7	22
Change Point	0	63	76	91	123	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**99.2%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**99.2%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	112	-	771	1903	904	85.3%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	112:22	-	867	2105:1840	988+12	86.7 : 86.7%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	108:145	37	1200	2021:1636	843+449	92.8 : 92.8%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	108:22	-	967	2021:1753	891+84	99.2 : 99.2%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	46	-	754	1981:1884	396+377	97.4 : 97.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	573	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1253	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	854	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.6**	**36.3**	**0.0**	**77.9**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.6**	**36.3**	**0.0**	**77.9**	**-**	**-**	**-**	**-**
1/1	771	771	-	-	-	6.0	2.8	-	8.7	40.8	22.9	2.8	25.7
1/2+1/3	867	867	-	-	-	6.8	3.1	-	9.9	41.3	25.8	3.1	29.0
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.5	0.7	3.2
3/2+3/1	1200	1200	-	-	-	7.9	5.8	-	13.7	41.0	23.3	5.8	29.0
3/3+3/4	967	967	-	-	-	8.9	13.7	-	22.7	84.4	30.8	13.7	44.5
4/2+4/1	754	754	-	-	-	10.0	9.8	-	19.8	94.4	13.0	9.8	22.8
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	573	573	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1253	1253	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	854	854	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	956	956	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

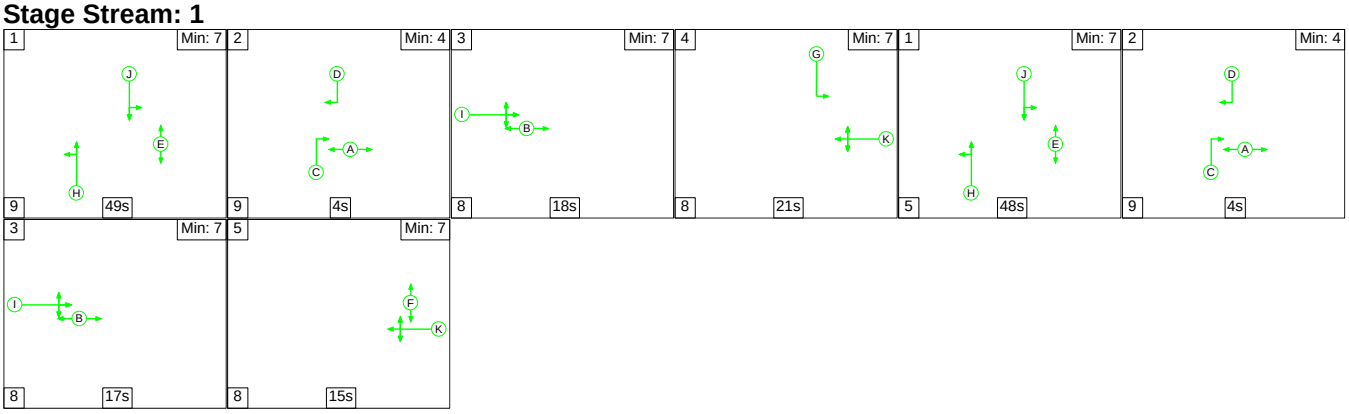
C1 Stream: 1 PRC for Signalled Lanes (%): -10.2 Total Delay for Signalled Lanes (pcuHr): 77.90 Cycle Time (s): 240
PRC Over All Lanes (%): -10.2 Total Delay Over All Lanes(pcuHr): 77.90

Full Input Data And Results

Scenario 10: '2040+ PAH + Dev (1m) + Stone Phase 1 PM' (FG12: '2040 + PAH + Development (1m) + Stone Phase 1 PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

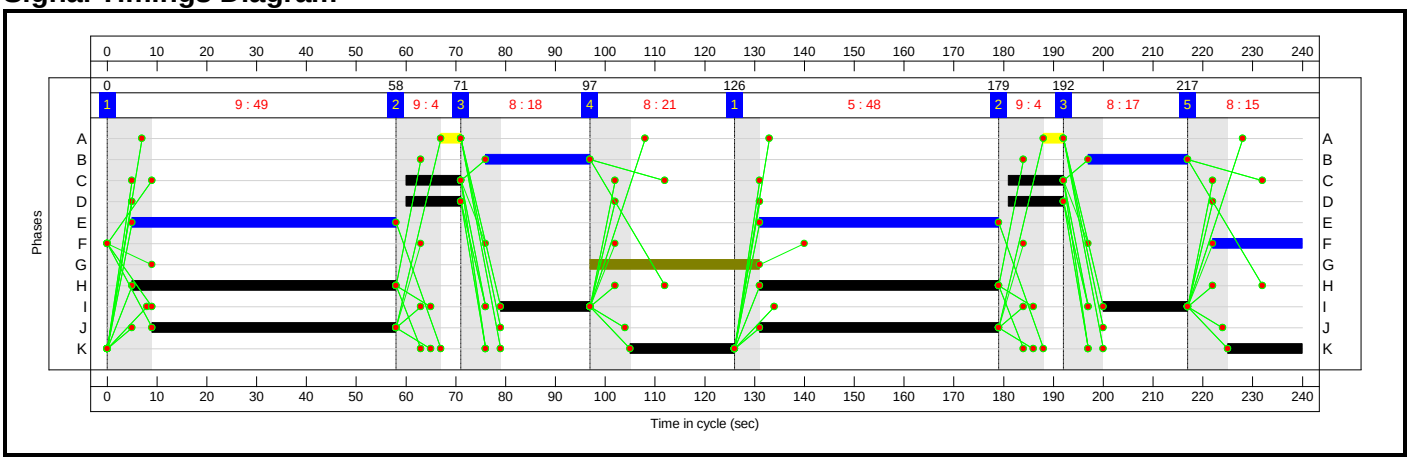


Stage Timings

Stage Stream: 1

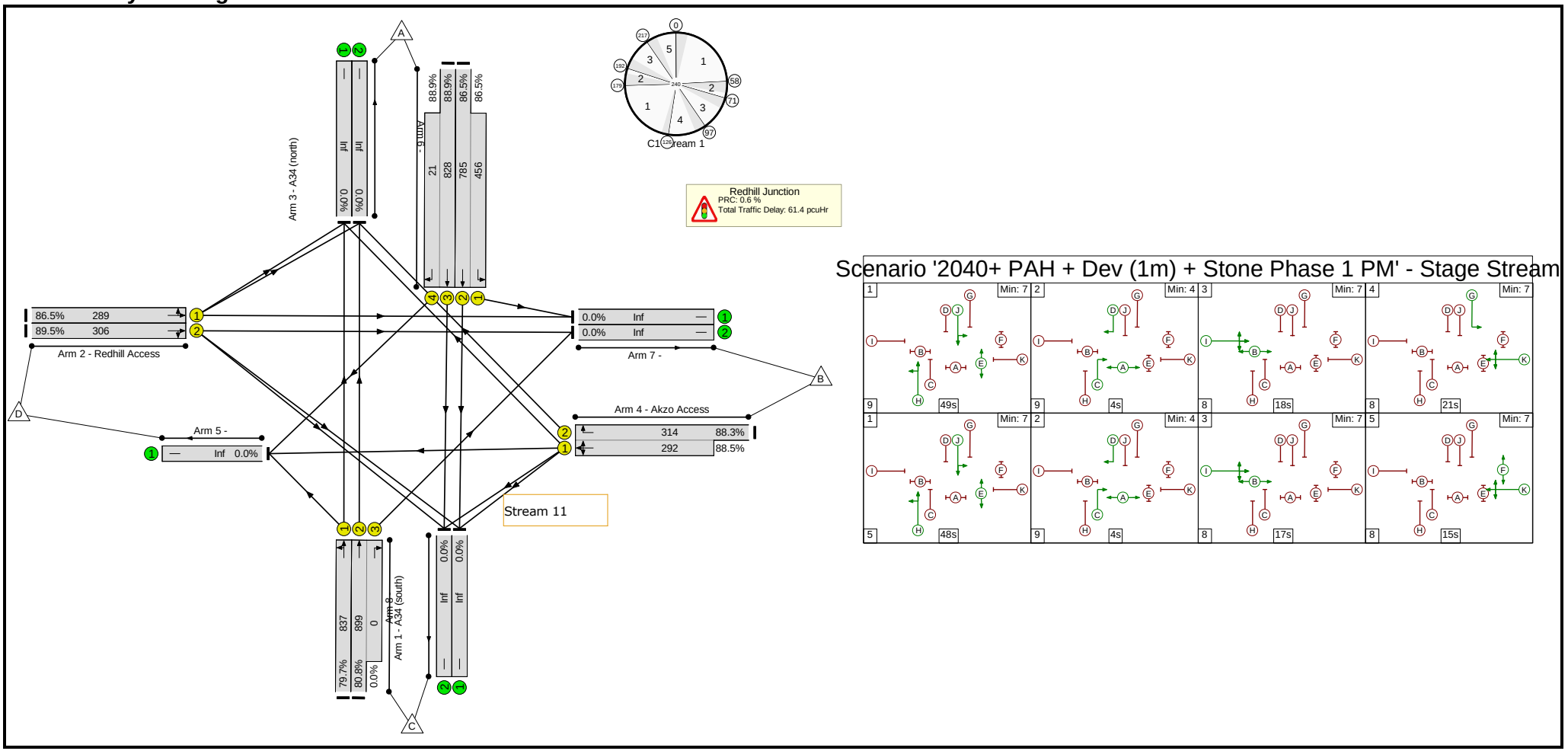
Stage	1	2	3	4	1	2	3	5
Duration	49	4	18	21	48	4	17	15
Change Point	0	58	71	97	126	179	192	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.5%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.5%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	101	-	667	1950	837	79.7%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	101:22	-	726	2105:1965	899+0	80.8 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	35	-	250	1875	289	86.5%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	35	-	274	1986	306	89.5%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	97:131	34	1074	2021:1636	785+456	86.5 : 86.5%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	97:22	-	755	2021:1753	828+21	88.9 : 88.9%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	36	-	535	1981:1842	314+292	88.3 : 88.5%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	818	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1043	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	838	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	895	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**40.8**	**20.6**	**0.0**	**61.4**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**40.8**	**20.6**	**0.0**	**61.4**	**-**	**-**	**-**	**-**
1/1	667	667	-	-	-	5.5	1.9	-	7.4	40.2	20.2	1.9	22.1
1/2+1/3	726	726	-	-	-	6.0	2.1	-	8.1	40.2	22.2	2.1	24.2
2/1	250	250	-	-	-	3.4	2.8	-	6.2	89.8	8.1	2.8	10.9
2/2	274	274	-	-	-	3.8	3.5	-	7.3	95.8	9.0	3.5	12.5
3/2+3/1	1074	1074	-	-	-	7.8	3.1	-	10.9	36.4	20.4	3.1	23.5
3/3+3/4	755	755	-	-	-	6.9	3.7	-	10.6	50.8	23.3	3.7	27.1
4/2+4/1	535	535	-	-	-	7.4	3.5	-	10.8	72.8	9.2	3.5	12.7
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	818	818	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1043	1043	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	838	838	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	895	895	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

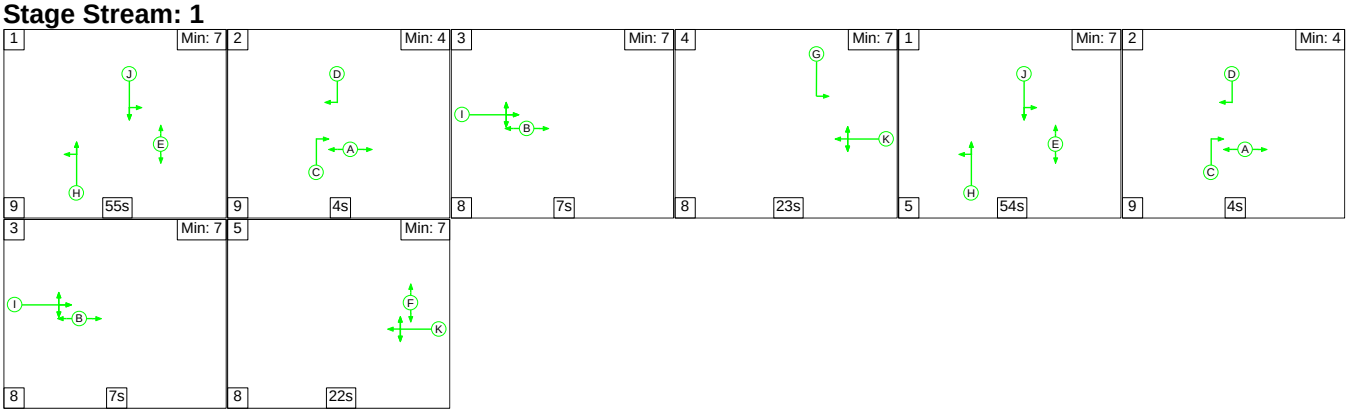
C1 Stream: 1 PRC for Signalled Lanes (%): 0.6 Total Delay for Signalled Lanes (pcuHr): 61.38 Cycle Time (s): 240
PRC Over All Lanes (%): 0.6 Total Delay Over All Lanes(pcuHr): 61.38

Full Input Data And Results

Scenario 11: '2040+ PAH + Dev (1.7m) + Stone Phase 1 AM' (FG13: '2040 + PAH + Development (1.7m) + Stone Phase 1 AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

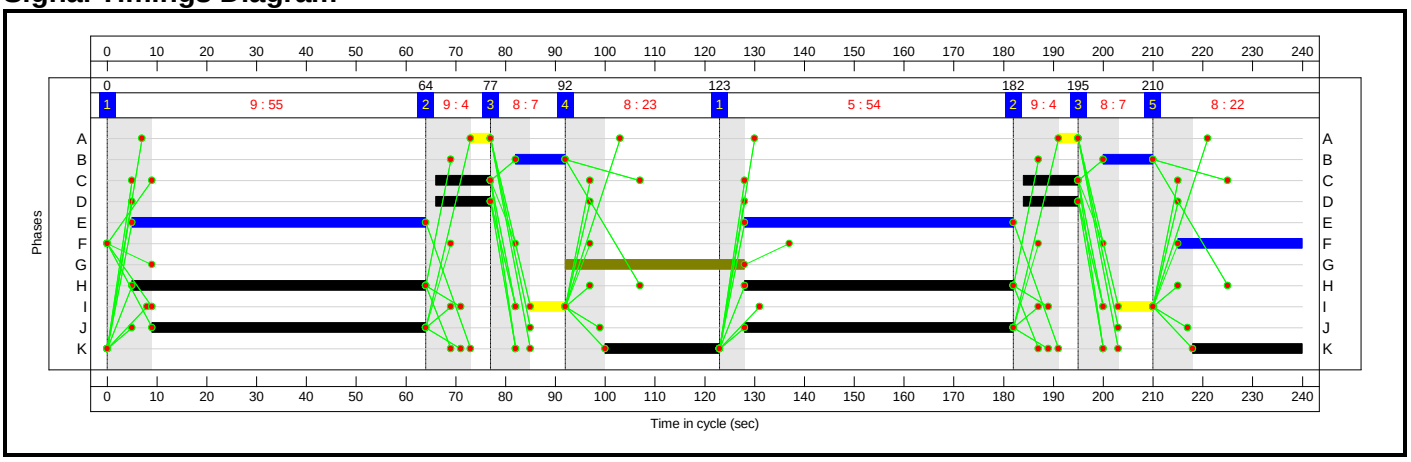


Stage Timings

Stage Stream: 1

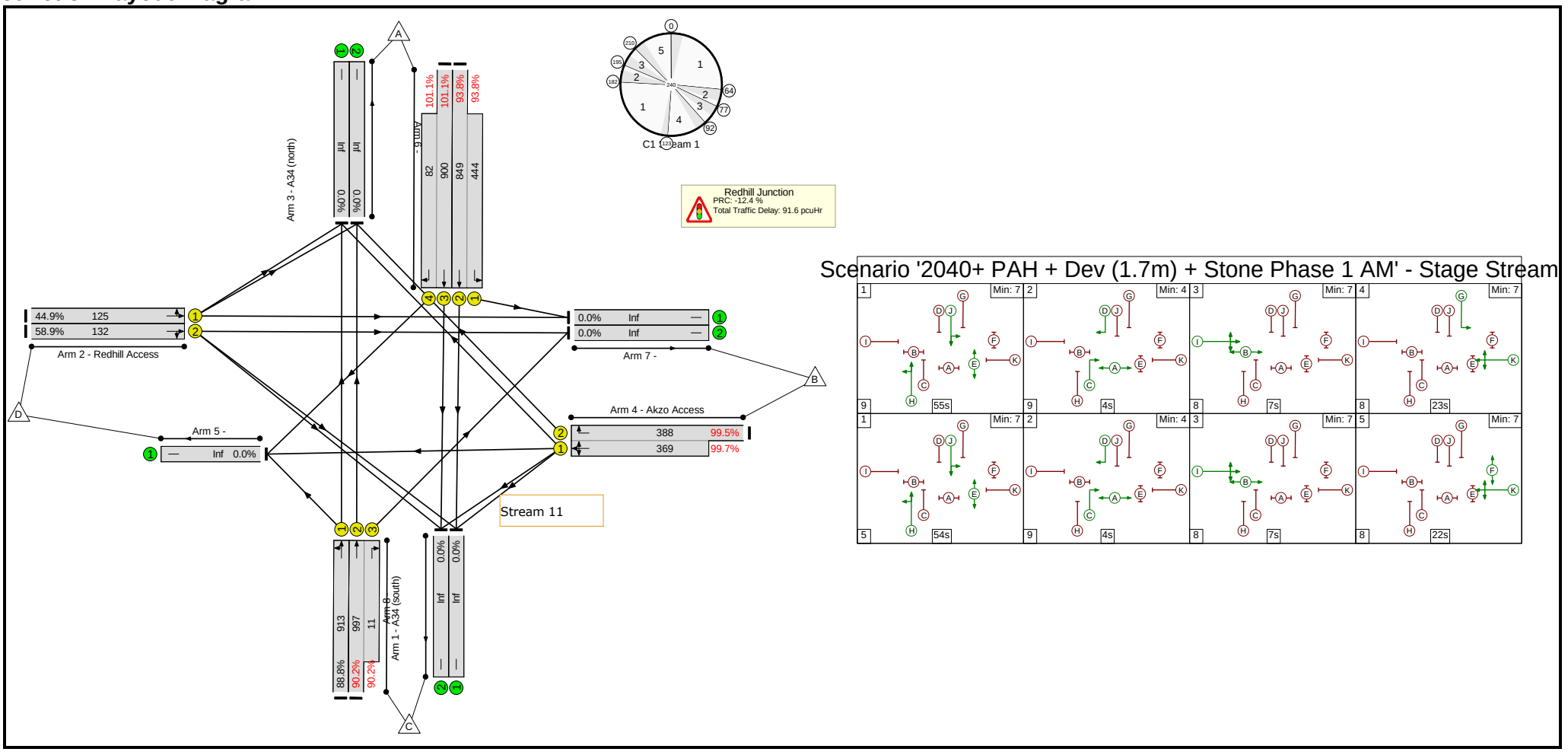
Stage	1	2	3	4	1	2	3	5
Duration	55	4	7	23	54	4	7	22
Change Point	0	64	77	92	123	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.1%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.1%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	113	-	811	1906	913	88.8%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	113:22	-	909	2105:1840	997+11	90.2 : 90.2%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	109:145	36	1214	2021:1636	849+444	93.8 : 93.8%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	109:22	-	993	2021:1753	900+82	101.1 : 101.1%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	45	-	754	1981:1884	388+369	99.5 : 99.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	613	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1295	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	868	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	982	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**44.2**	**47.4**	**0.0**	**91.6**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**44.2**	**47.4**	**0.0**	**91.6**	**-**	**-**	**-**	**-**
1/1	811	811	-	-	-	6.4	3.7	-	10.1	44.7	24.6	3.7	28.3
1/2+1/3	909	909	-	-	-	7.3	4.2	-	11.5	45.6	27.6	4.2	31.8
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.6	0.7	3.3
3/2+3/1	1214	1214	-	-	-	8.0	6.5	-	14.5	43.0	24.8	6.5	31.4
3/3+3/4	993	983	-	-	-	10.5	18.8	-	29.3	106.2	34.2	18.8	53.0
4/2+4/1	754	754	-	-	-	10.1	13.0	-	23.1	110.5	13.1	13.0	26.1
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	613	613	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1295	1295	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	868	868	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	972	972	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

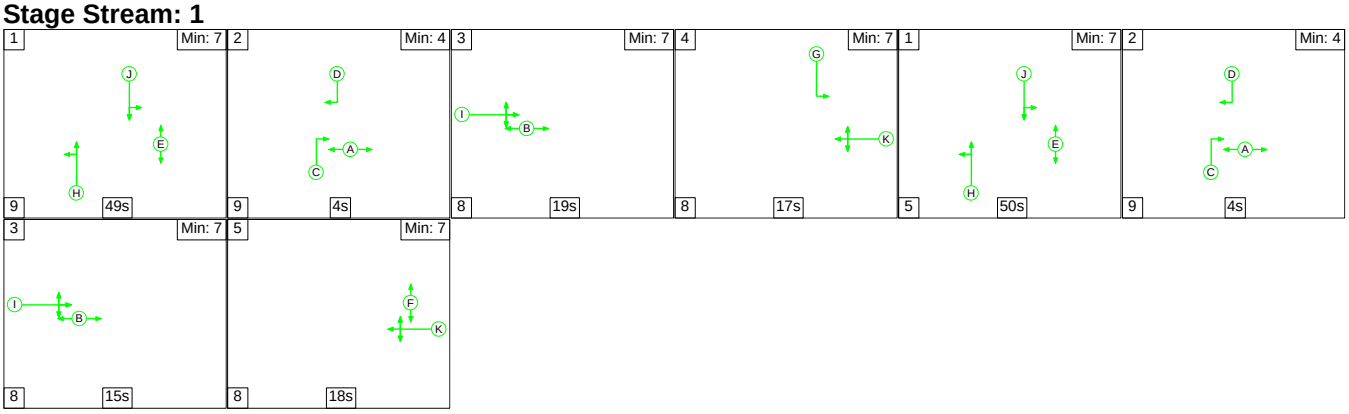
C1 Stream: 1 PRC for Signalled Lanes (%): -12.4 Total Delay for Signalled Lanes (pcuHr): 91.64 Cycle Time (s): 240
PRC Over All Lanes (%): -12.4 Total Delay Over All Lanes(pcuHr): 91.64

Full Input Data And Results

Scenario 12: '2040+ PAH + Dev (1.7m) + Stone Phase 1 PM' (FG14: '2040 + PAH + Development (1.7m) + Stone Phase 1 PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

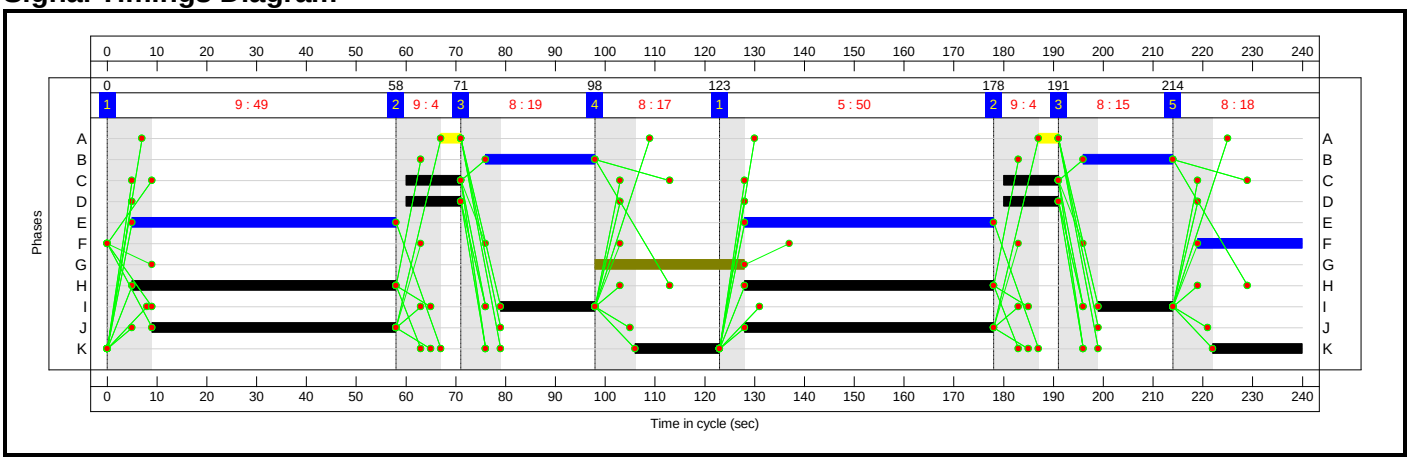


Stage Timings

Stage Stream: 1

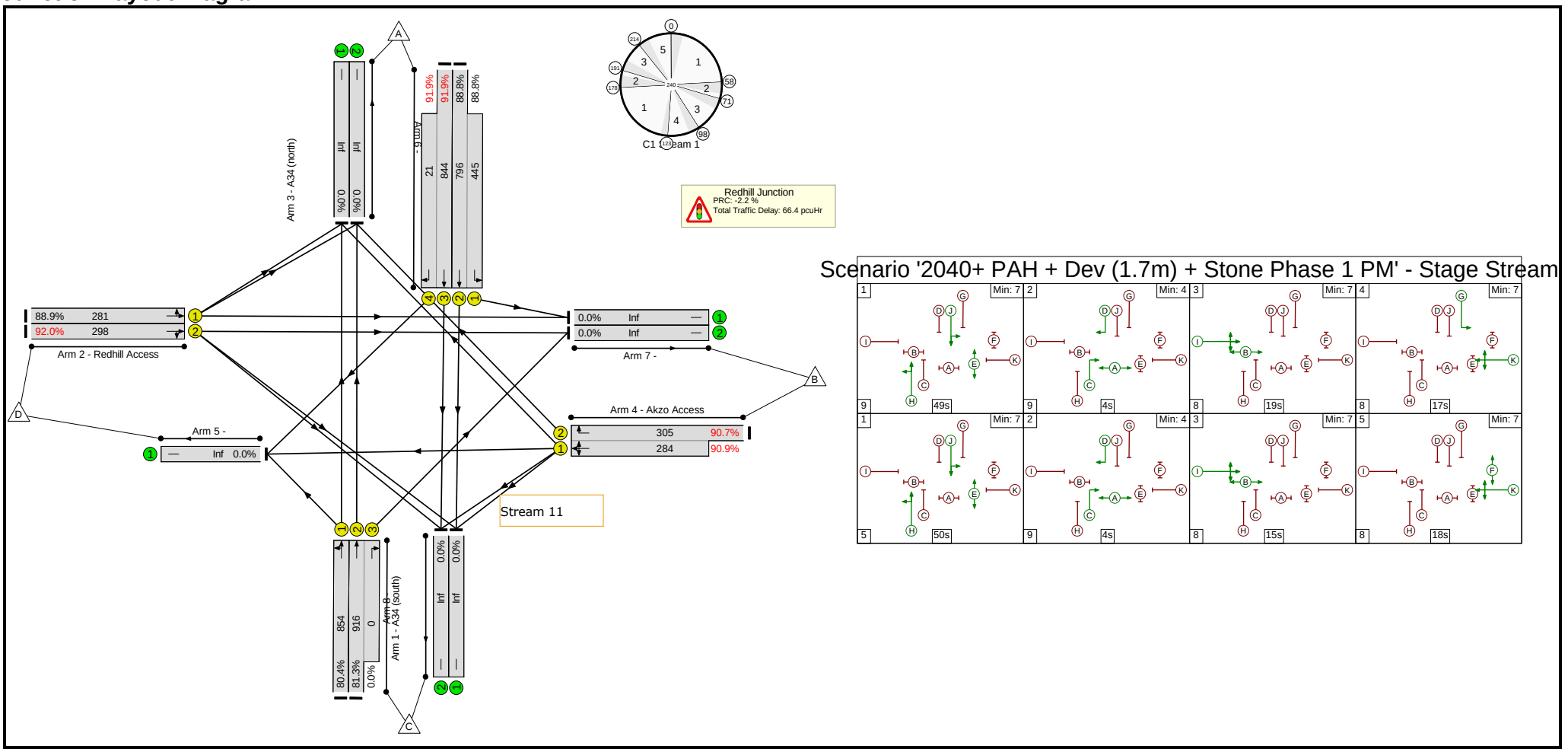
Stage	1	2	3	4	1	2	3	5
Duration	49	4	19	17	50	4	15	18
Change Point	0	58	71	98	123	178	191	214

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	103	-	686	1951	854	80.4%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	103:22	-	745	2105:1965	916+0	81.3 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	34	-	250	1875	281	88.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	34	-	274	1986	298	92.0%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	99:129	30	1102	2021:1636	796+445	88.8 : 88.8%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	99:22	-	795	2021:1753	844+21	91.9 : 91.9%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	35	-	535	1981:1842	305+284	90.7 : 90.9%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	837	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1062	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	866	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	935	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.7**	**24.6**	**0.0**	**66.4**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.7**	**24.6**	**0.0**	**66.4**	**-**	**-**	**-**	**-**
1/1	686	686	-	-	-	5.6	2.0	-	7.6	39.8	20.2	2.0	22.2
1/2+1/3	745	745	-	-	-	6.1	2.1	-	8.2	39.7	22.1	2.1	24.3
2/1	250	250	-	-	-	3.5	3.3	-	6.8	97.6	8.3	3.3	11.6
2/2	274	274	-	-	-	3.8	4.2	-	8.1	105.9	9.1	4.2	13.4
3/2+3/1	1102	1102	-	-	-	8.0	3.8	-	11.8	38.5	21.0	3.8	24.8
3/3+3/4	795	795	-	-	-	7.3	5.0	-	12.3	55.6	24.5	5.0	29.5
4/2+4/1	535	535	-	-	-	7.4	4.3	-	11.7	78.6	9.4	4.3	13.6
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	837	837	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1062	1062	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	866	866	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	935	935	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

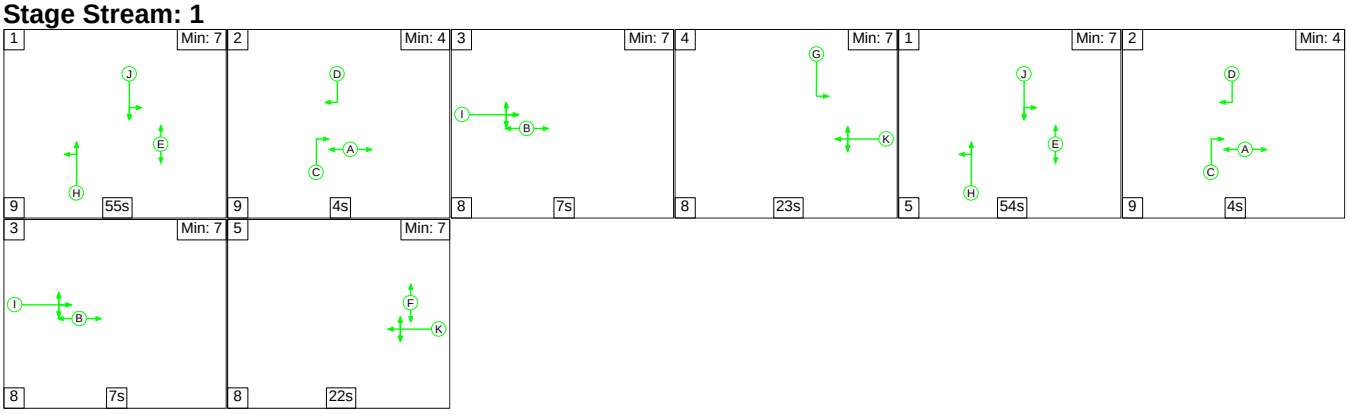
C1 Stream: 1 PRC for Signalled Lanes (%): -2.2 Total Delay for Signalled Lanes (pcuHr): 66.38 Cycle Time (s): 240
PRC Over All Lanes (%): -2.2 Total Delay Over All Lanes(pcuHr): 66.38

Full Input Data And Results

Scenario 13: '2040+ PAH + Dev (1m) + Stone Total AM' (FG15: '2040 + PAH + Development (1m) + Stone Total AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

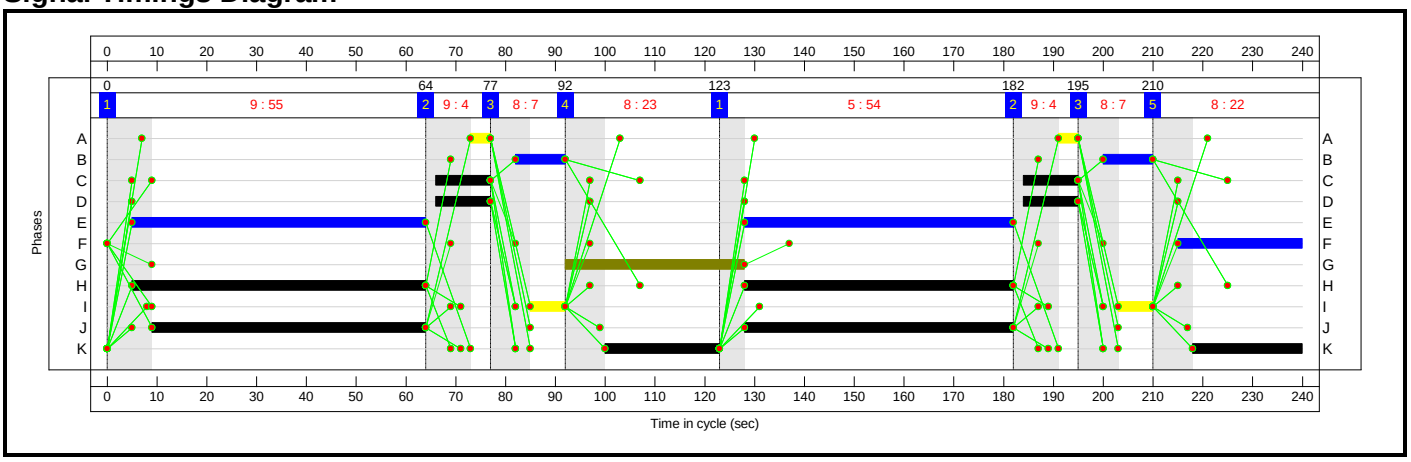


Stage Timings

Stage Stream: 1

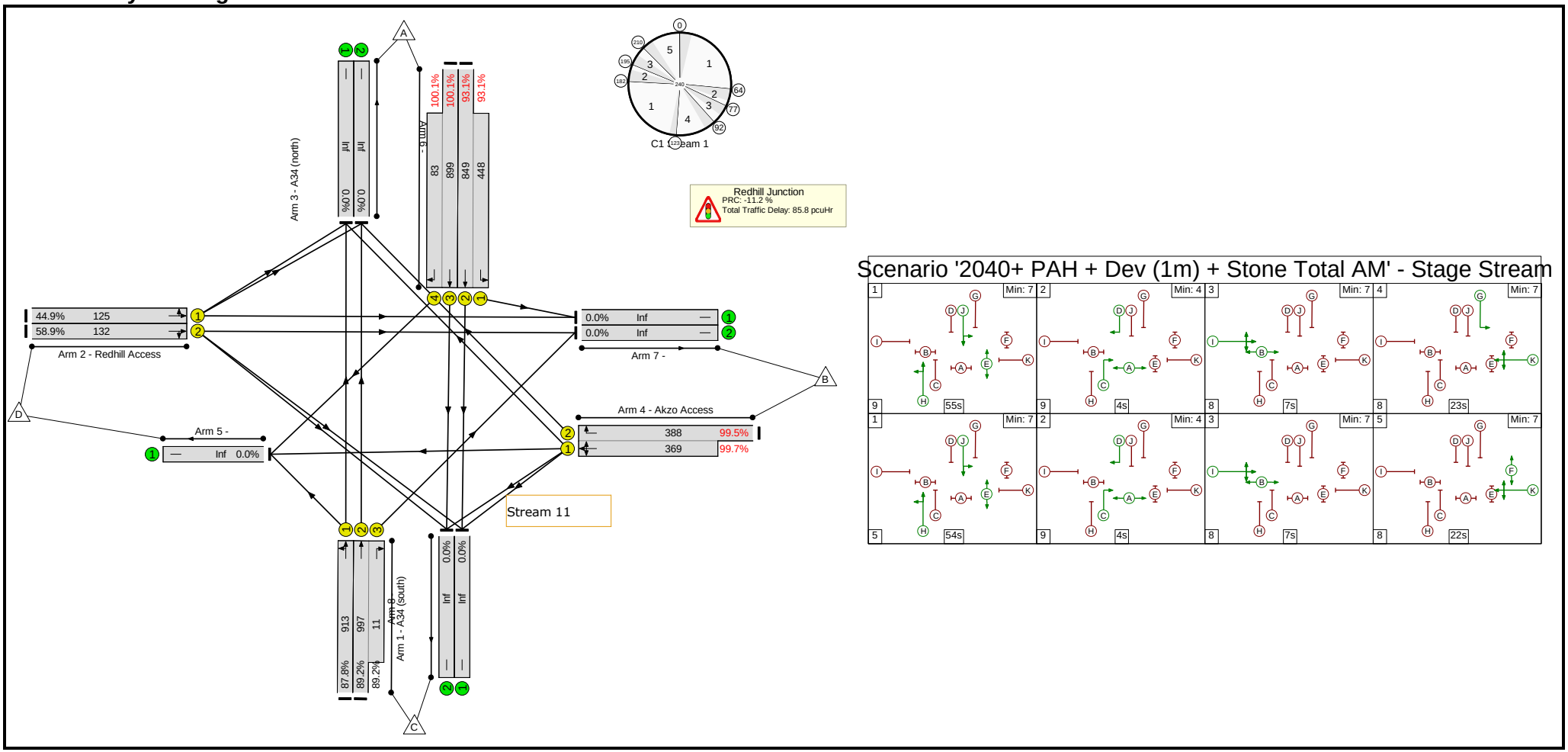
Stage	1	2	3	4	1	2	3	5
Duration	55	4	7	23	54	4	7	22
Change Point	0	64	77	92	123	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**100.1%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**100.1%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	113	-	801	1905	913	87.8%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	113:22	-	899	2105:1840	997+11	89.2 : 89.2%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	109:145	36	1207	2021:1636	849+448	93.1 : 93.1%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	109:22	-	983	2021:1753	899+83	100.1 : 100.1%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	45	-	754	1981:1884	388+369	99.5 : 99.7%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	603	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1285	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	861	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	972	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**42.7**	**43.1**	**0.0**	**85.8**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**42.7**	**43.1**	**0.0**	**85.8**	**-**	**-**	**-**	**-**
1/1	801	801	-	-	-	6.2	3.4	-	9.6	43.3	24.0	3.4	27.4
1/2+1/3	899	899	-	-	-	7.1	3.9	-	11.0	44.0	27.0	3.9	30.9
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.6	0.7	3.3
3/2+3/1	1207	1207	-	-	-	7.9	5.9	-	13.8	41.2	23.8	5.9	29.8
3/3+3/4	983	982	-	-	-	9.3	15.9	-	25.1	92.0	32.0	15.9	47.8
4/2+4/1	754	754	-	-	-	10.1	13.0	-	23.1	110.5	13.1	13.0	26.1
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	603	603	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1285	1285	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	861	861	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	971	971	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

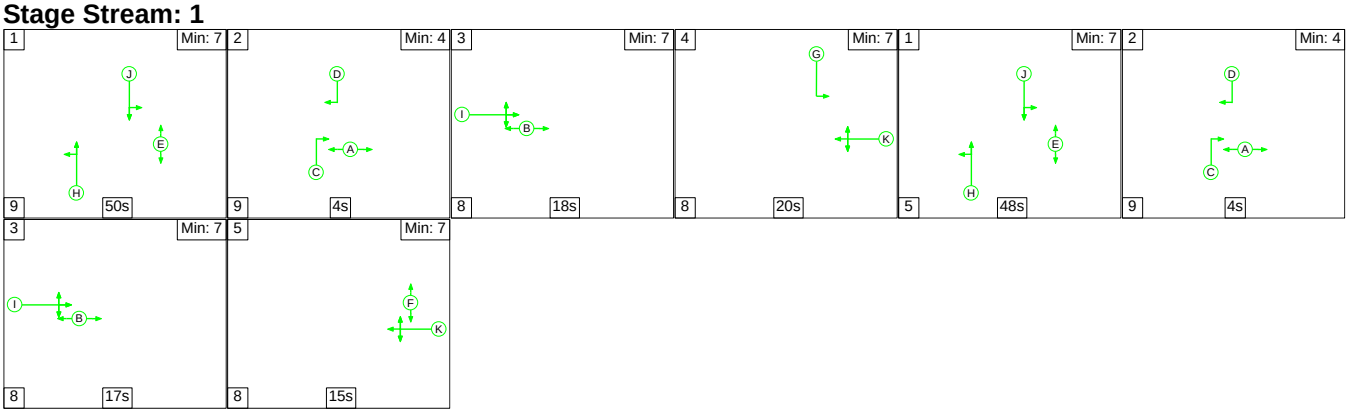
C1 Stream: 1 PRC for Signalled Lanes (%): -11.2 Total Delay for Signalled Lanes (pcuHr): 85.80 Cycle Time (s): 240
PRC Over All Lanes (%): -11.2 Total Delay Over All Lanes(pcuHr): 85.80

Full Input Data And Results

Scenario 14: '2040+ PAH + Dev (1m) + Stone Total PM' (FG16: '2040 + PAH + Development (1m) + Stone Total PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

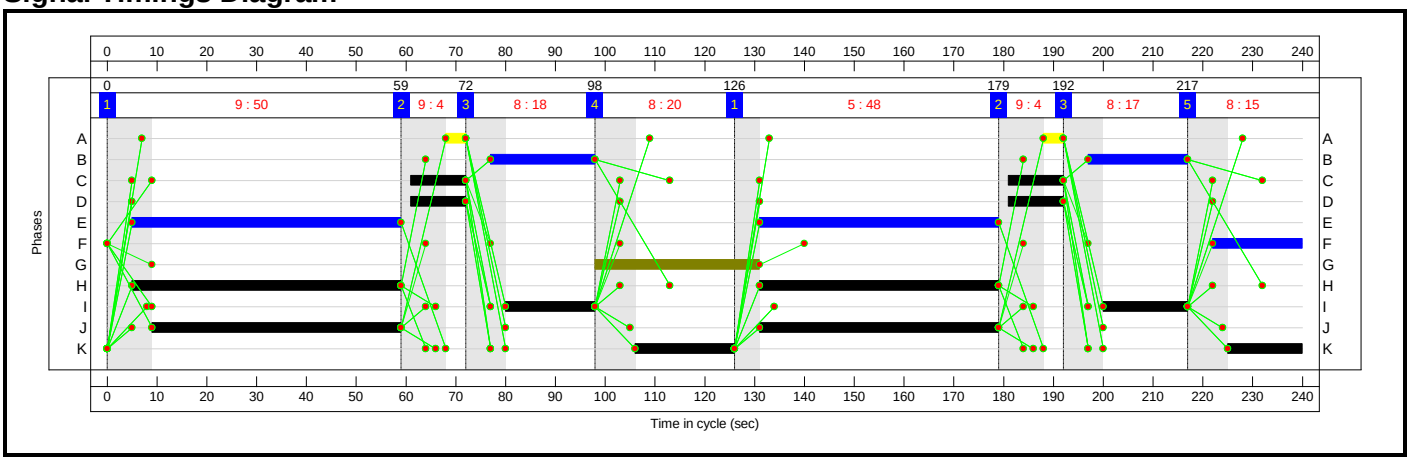


Stage Timings

Stage Stream: 1

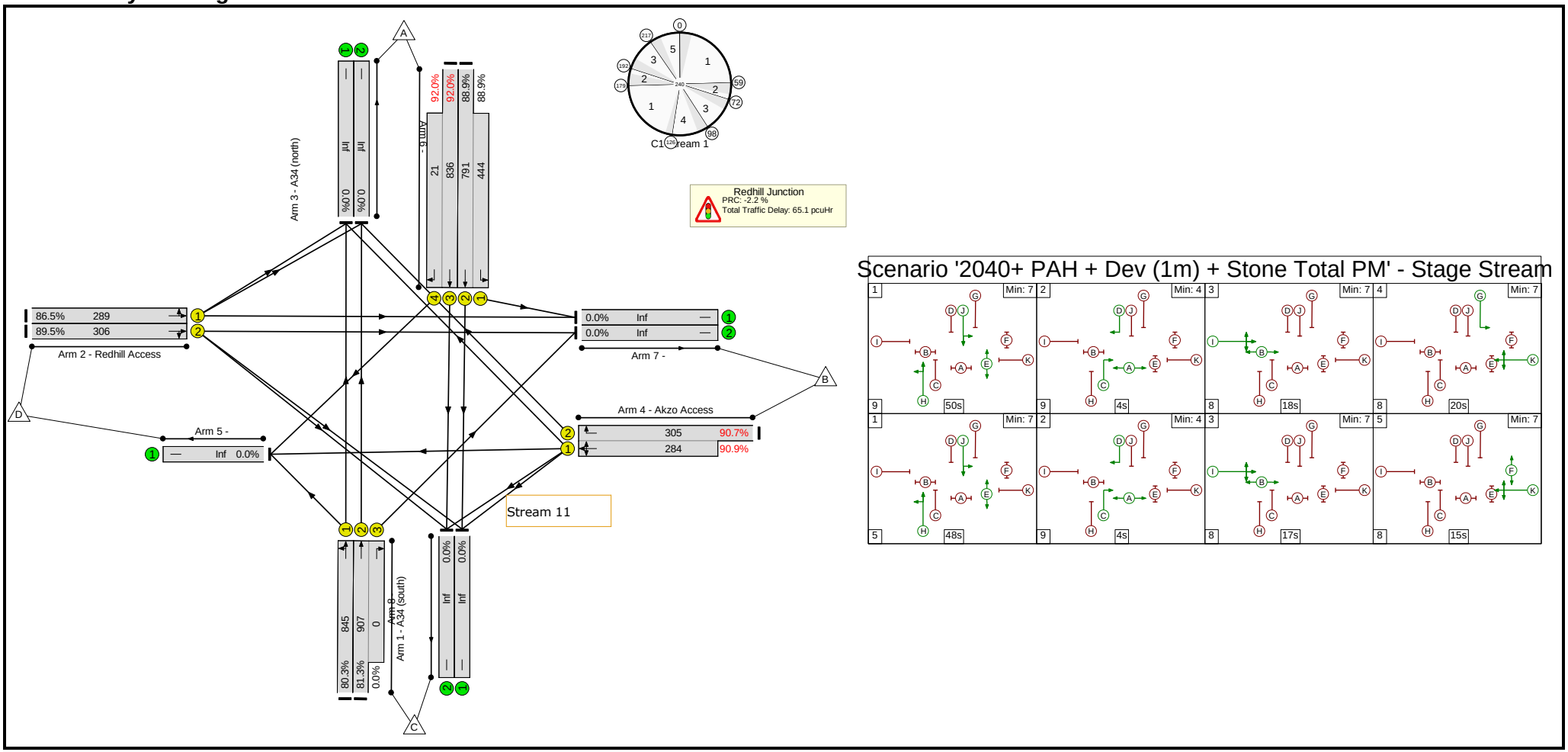
Stage	1	2	3	4	1	2	3	5
Duration	50	4	18	20	48	4	17	15
Change Point	0	59	72	98	126	179	192	217

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**92.0%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	102	-	679	1951	845	80.3%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	102:22	-	738	2105:1965	907+0	81.3 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	35	-	250	1875	289	86.5%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	35	-	274	1986	306	89.5%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	98:131	33	1098	2021:1636	791+444	88.9 : 88.9%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	98:22	-	788	2021:1753	836+21	92.0 : 92.0%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	35	-	535	1981:1842	305+284	90.7 : 90.9%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	830	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1055	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	862	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	928	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.6**	**23.5**	**0.0**	**65.1**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.6**	**23.5**	**0.0**	**65.1**	**-**	**-**	**-**	**-**
1/1	679	679	-	-	-	5.6	2.0	-	7.6	40.2	20.4	2.0	22.4
1/2+1/3	738	738	-	-	-	6.1	2.1	-	8.2	40.2	22.3	2.1	24.5
2/1	250	250	-	-	-	3.4	2.8	-	6.2	89.8	8.1	2.8	10.9
2/2	274	274	-	-	-	3.8	3.5	-	7.3	95.8	9.0	3.5	12.5
3/2+3/1	1098	1098	-	-	-	8.0	3.8	-	11.8	38.6	21.1	3.8	24.9
3/3+3/4	788	788	-	-	-	7.3	5.0	-	12.3	56.2	24.5	5.0	29.5
4/2+4/1	535	535	-	-	-	7.4	4.3	-	11.7	78.6	9.4	4.3	13.6
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	830	830	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1055	1055	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	862	862	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	928	928	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

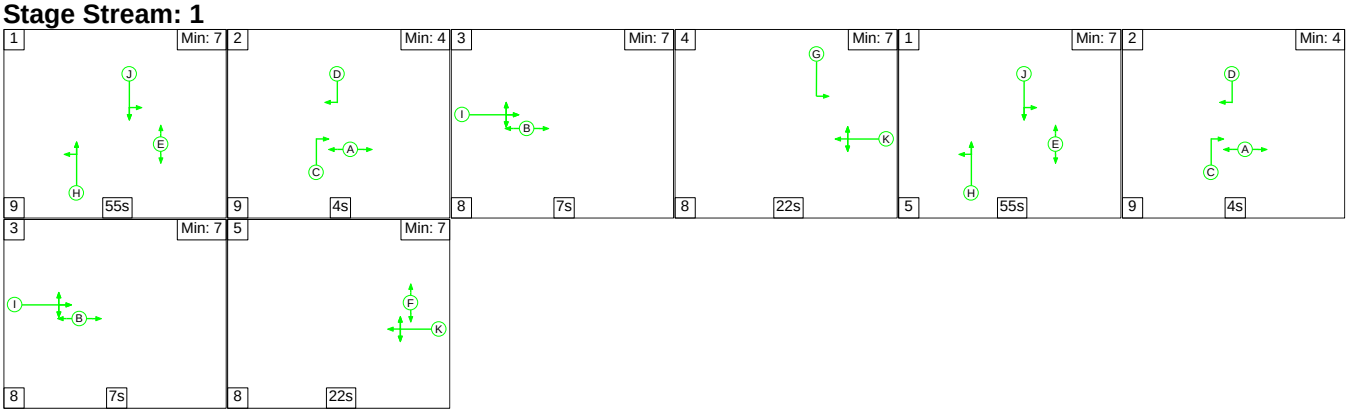
C1 Stream: 1 PRC for Signalled Lanes (%): -2.2 Total Delay for Signalled Lanes (pcuHr): 65.10 Cycle Time (s): 240
PRC Over All Lanes (%): -2.2 Total Delay Over All Lanes(pcuHr): 65.10

Full Input Data And Results

Scenario 15: '2040+ PAH + Dev (1.7m) + Stone Total AM' (FG17: '2040 + PAH + Development (1.7m) + Stone Total AM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

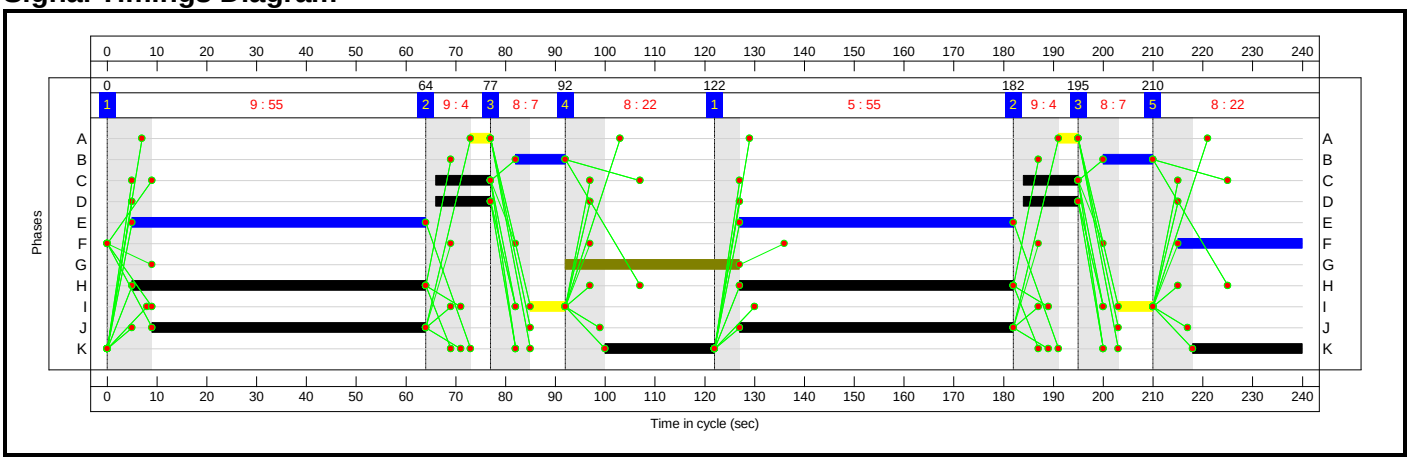


Stage Timings

Stage Stream: 1

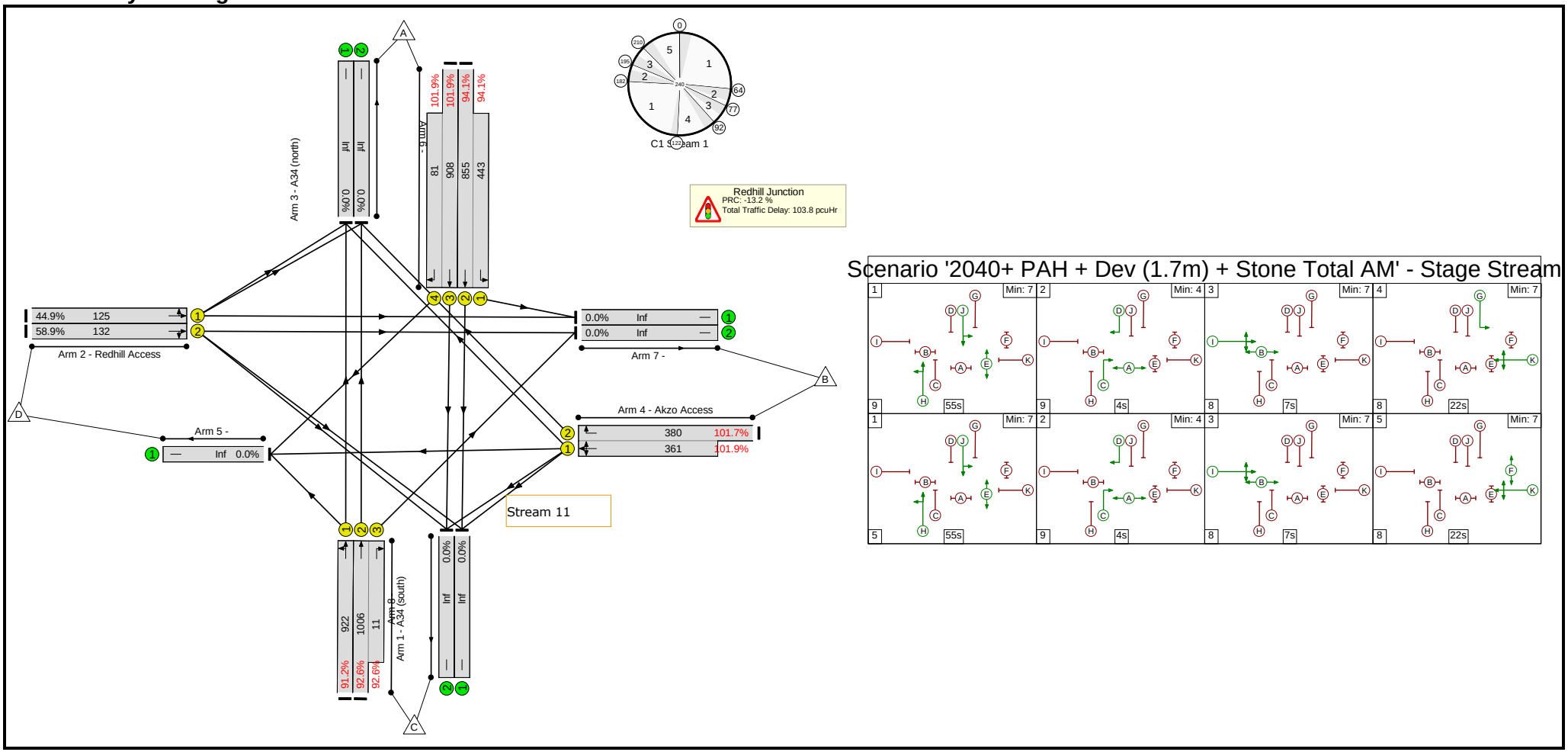
Stage	1	2	3	4	1	2	3	5
Duration	55	4	7	22	55	4	7	22
Change Point	0	64	77	92	122	182	195	210

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.9%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.9%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	114	-	841	1908	922	91.2%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	114:22	-	941	2105:1840	1006+11	92.6 : 92.6%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	110:145	35	1222	2021:1636	855+443	94.1 : 94.1%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	110:22	-	1008	2021:1753	908+81	101.9 : 101.9%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	44	-	754	1981:1884	380+361	101.7 : 101.9%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	643	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1327	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	454	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	876	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	997	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**47.2**	**56.6**	**0.0**	**103.8**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**47.2**	**56.6**	**0.0**	**103.8**	**-**	**-**	**-**	**-**
1/1	841	841	-	-	-	6.7	4.6	-	11.3	48.5	25.7	4.6	30.3
1/2+1/3	941	941	-	-	-	7.6	5.4	-	13.1	49.9	29.1	5.4	34.6
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.6	0.7	3.3
3/2+3/1	1222	1222	-	-	-	8.0	6.8	-	14.8	43.6	25.9	6.8	32.7
3/3+3/4	1008	990	-	-	-	11.4	21.2	-	32.6	116.4	36.4	21.2	57.6
4/2+4/1	754	741	-	-	-	11.5	17.4	-	28.9	138.2	13.5	17.4	30.9
5/1	589	589	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	641	641	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1321	1321	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	875	875	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	979	979	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

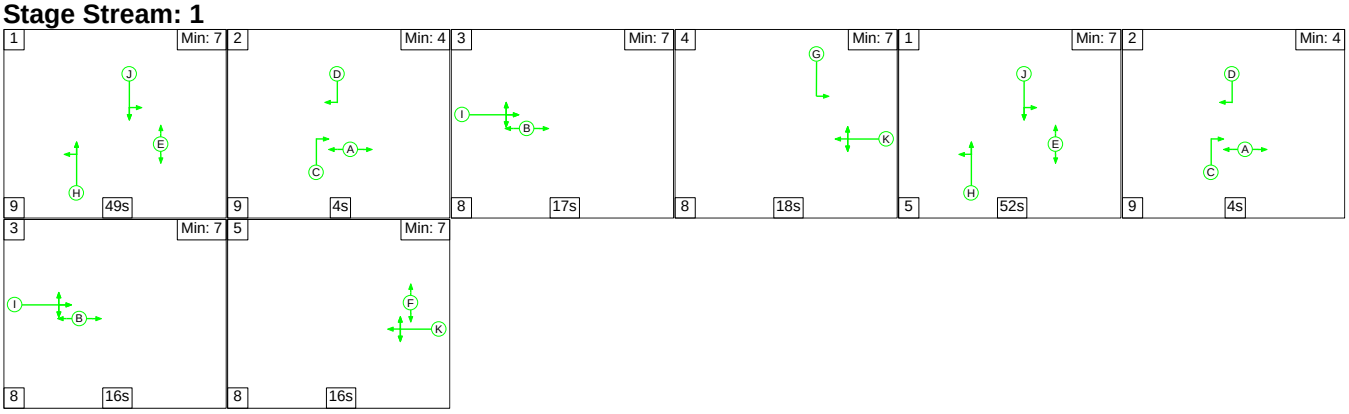
C1 Stream: 1 PRC for Signalled Lanes (%): -13.2 Total Delay for Signalled Lanes (pcuHr): 103.85 Cycle Time (s): 240
PRC Over All Lanes (%): -13.2 Total Delay Over All Lanes(pcuHr): 103.85

Full Input Data And Results

Scenario 16: '2040+ PAH + Dev (1.7m) + Stone Total PM' (FG18: '2040 + PAH + Development (1.7m) + Stone Total PM', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

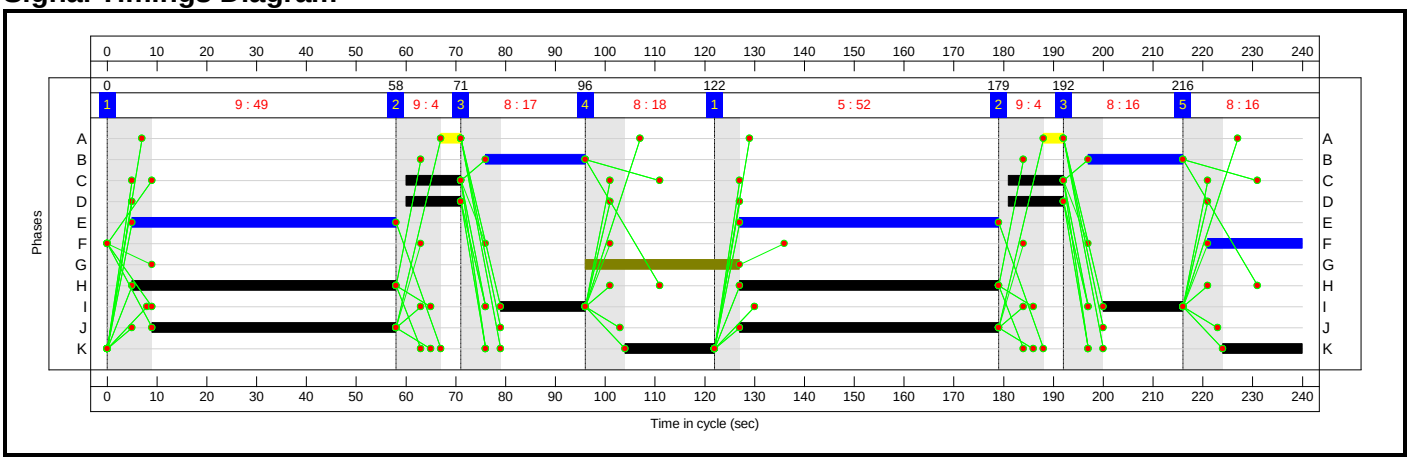


Stage Timings

Stage Stream: 1

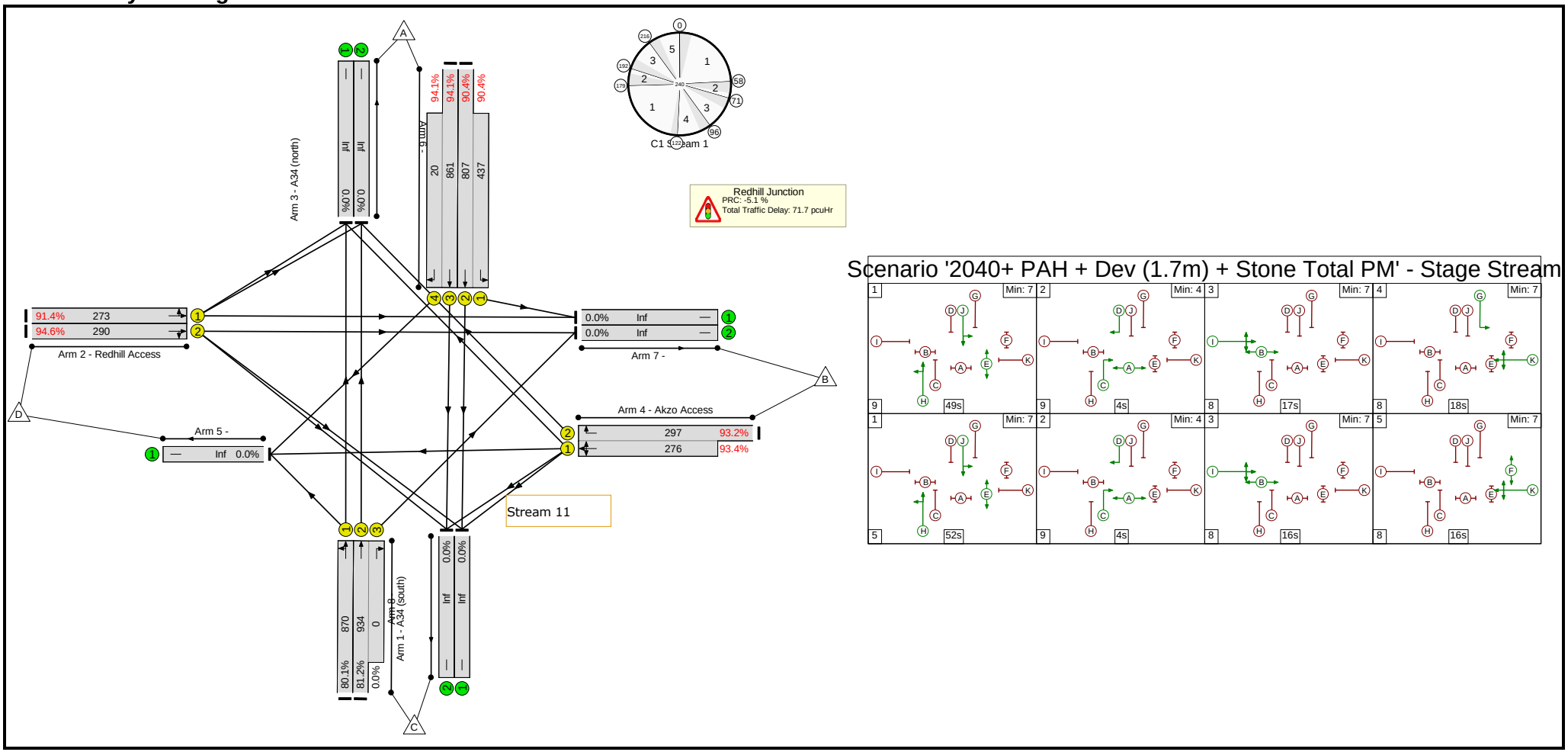
Stage	1	2	3	4	1	2	3	5
Duration	49	4	17	18	52	4	16	16
Change Point	0	58	71	96	122	179	192	216

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**94.6%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**94.6%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	105	-	697	1951	870	80.1%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	105:22	-	758	2105:1965	934+0	81.2 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	33	-	250	1875	273	91.4%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	33	-	274	1986	290	94.6%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	101:132	31	1125	2021:1636	807+437	90.4 : 90.4%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	101:22	-	829	2021:1753	861+20	94.1 : 94.1%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	34	-	535	1981:1842	297+276	93.2 : 93.4%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	848	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1075	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	565	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	889	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	969	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**42.2**	**29.5**	**0.0**	**71.7**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**42.2**	**29.5**	**0.0**	**71.7**	**-**	**-**	**-**	**-**
1/1	697	697	-	-	-	5.6	2.0	-	7.5	38.9	20.3	2.0	22.3
1/2+1/3	758	758	-	-	-	6.1	2.1	-	8.2	38.9	22.3	2.1	24.4
2/1	250	250	-	-	-	3.5	4.0	-	7.5	107.8	8.2	4.0	12.2
2/2	274	274	-	-	-	3.9	5.2	-	9.1	119.7	9.1	5.2	14.3
3/2+3/1	1125	1125	-	-	-	8.1	4.4	-	12.5	39.9	21.9	4.4	26.3
3/3+3/4	829	829	-	-	-	7.6	6.4	-	14.0	60.7	26.1	6.4	32.4
4/2+4/1	535	535	-	-	-	7.5	5.4	-	12.9	86.9	9.2	5.4	14.6
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	848	848	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1075	1075	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	889	889	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	969	969	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

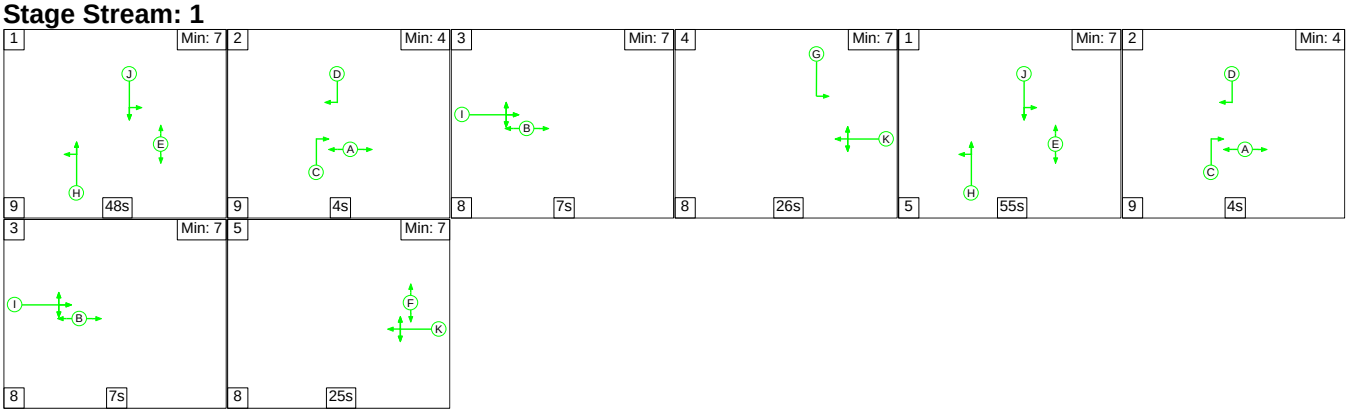
C1 Stream: 1 PRC for Signalled Lanes (%): -5.1 Total Delay for Signalled Lanes (pcuHr): 71.66 Cycle Time (s): 240
PRC Over All Lanes (%): -5.1 Total Delay Over All Lanes(pcuHr): 71.66

Full Input Data And Results

Scenario 17: '2040 PAH + Dev (1m) AM_A513 Light Vehs through Resi' (FG19: '2040 + PAH + Development (1m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

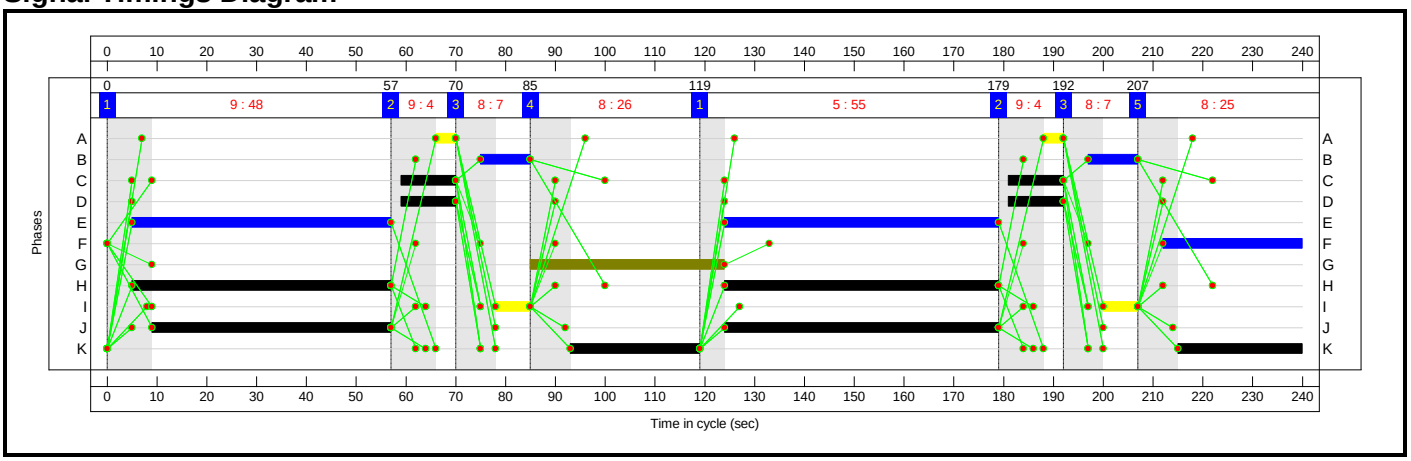


Stage Timings

Stage Stream: 1

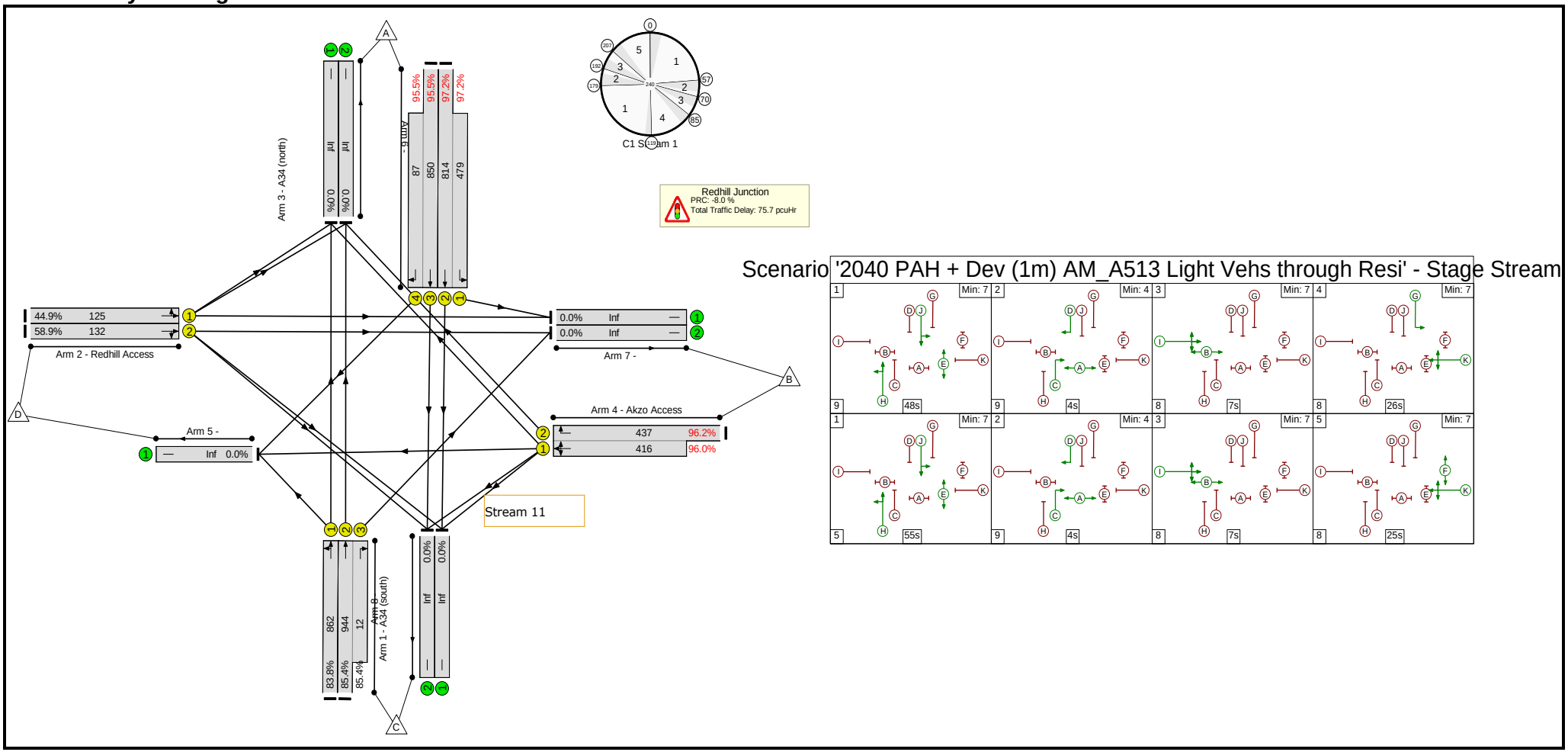
Stage	1	2	3	4	1	2	3	5
Duration	48	4	7	26	55	4	7	25
Change Point	0	57	70	85	119	179	192	207

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**97.2%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**97.2%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	107	-	723	1899	862	83.8%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	107:22	-	816	2105:1840	944+12	85.4 : 85.4%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	103:142	39	1257	2021:1636	814+479	97.2 : 97.2%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	103:22	-	895	2021:1753	850+87	95.5 : 95.5%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	51	-	820	1981:1882	437+416	96.2 : 96.0%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	556	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1237	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	503	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	862	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	884	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**42.4**	**33.3**	**0.0**	**75.7**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**42.4**	**33.3**	**0.0**	**75.7**	**-**	**-**	**-**	**-**
1/1	723	723	-	-	-	5.8	2.5	-	8.3	41.3	21.3	2.5	23.8
1/2+1/3	816	816	-	-	-	6.7	2.8	-	9.5	41.7	24.1	2.8	26.9
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.8	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.6	0.7	3.3
3/2+3/1	1257	1257	-	-	-	9.0	10.9	-	19.9	56.9	27.3	10.9	38.2
3/3+3/4	895	895	-	-	-	8.4	7.7	-	16.1	64.8	27.5	7.7	35.2
4/2+4/1	820	820	-	-	-	10.5	8.3	-	18.8	82.5	14.0	8.3	22.3
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	556	556	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1237	1237	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	503	503	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	862	862	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	884	884	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

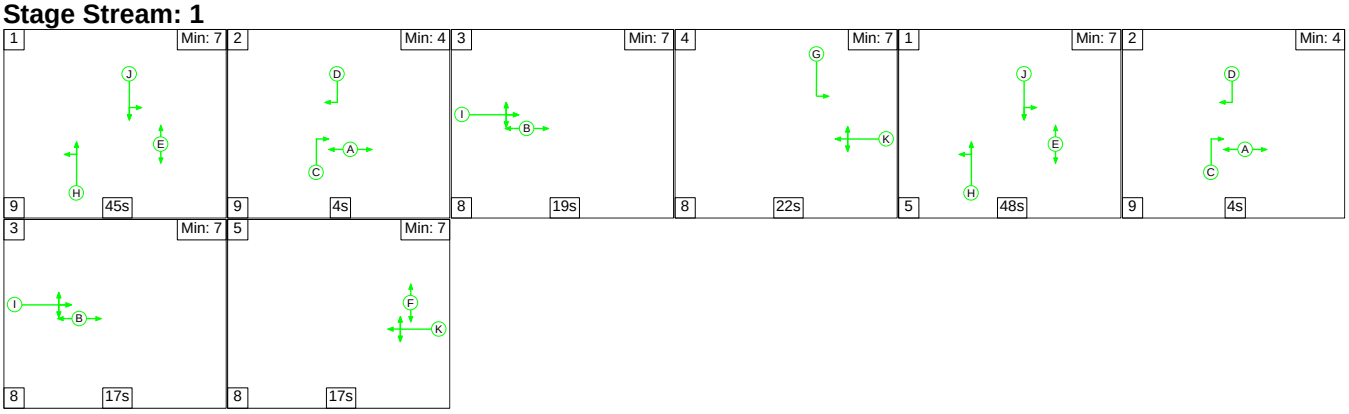
C1 Stream: 1 PRC for Signalled Lanes (%): -8.0 Total Delay for Signalled Lanes (pcuHr): 75.66 Cycle Time (s): 240
PRC Over All Lanes (%): -8.0 Total Delay Over All Lanes(pcuHr): 75.66

Full Input Data And Results

Scenario 18: '2040 PAH + Dev (1m) PM_A513 Light Vehs through Resi' (FG20: '2040 + PAH + Development (1m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

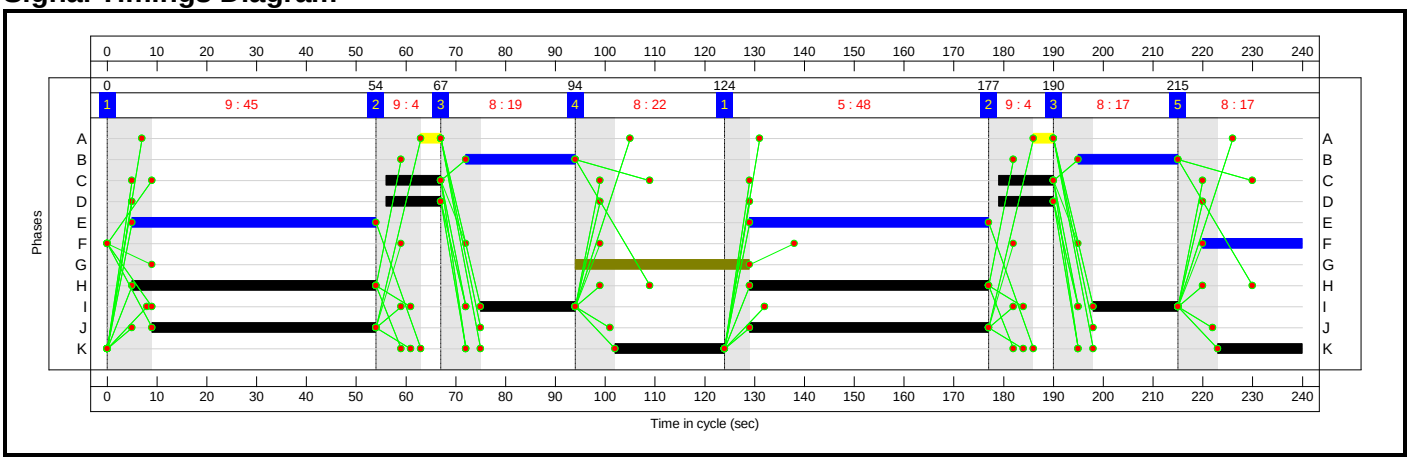


Stage Timings

Stage Stream: 1

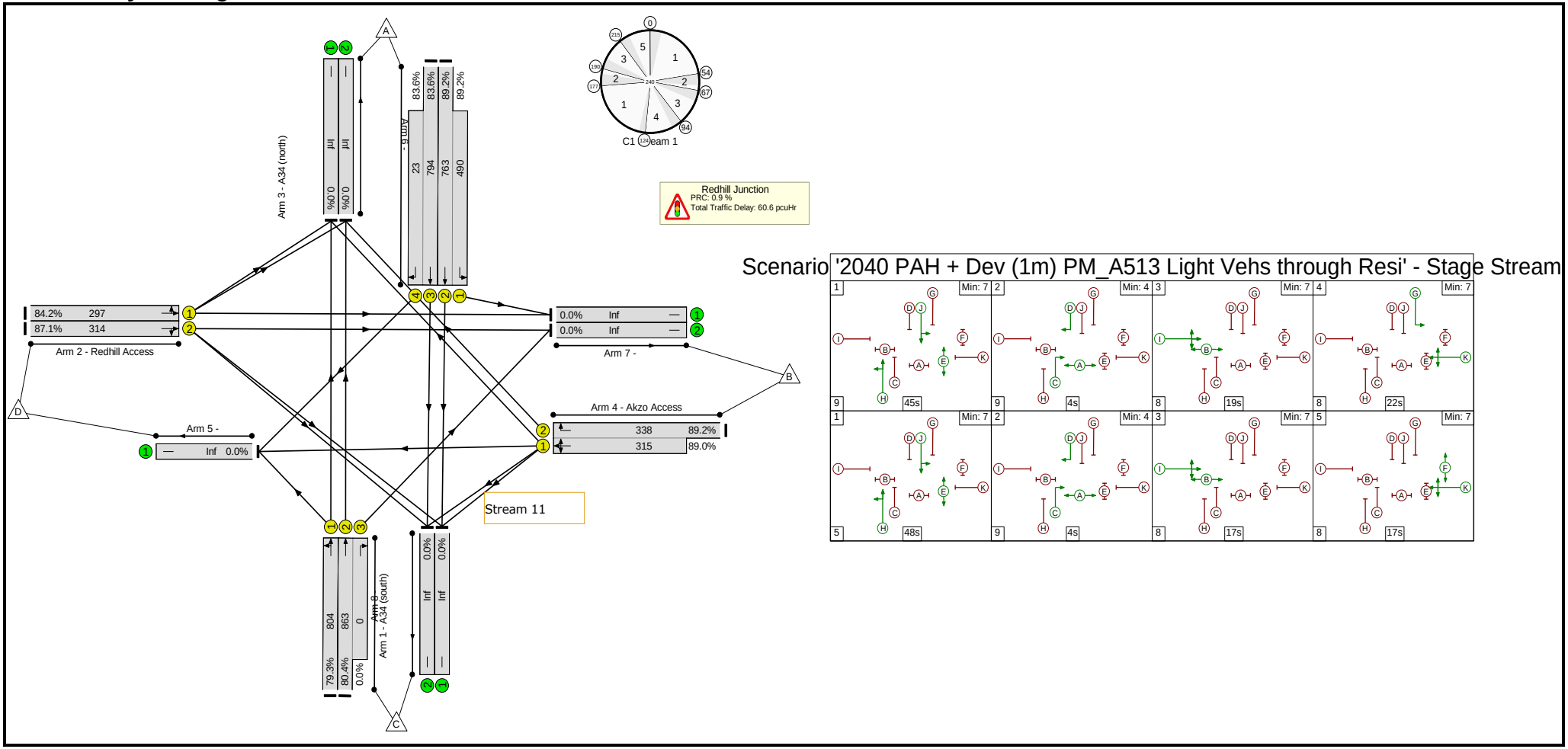
Stage	1	2	3	4	1	2	3	5
Duration	45	4	19	22	48	4	17	17
Change Point	0	54	67	94	124	177	190	215

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.2%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.2%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	97	-	638	1950	804	79.3%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	97:22	-	694	2105:1965	863+0	80.4 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	36	-	250	1875	297	84.2%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	36	-	274	1986	314	87.1%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	93:128	35	1117	2021:1636	763+490	89.2 : 89.2%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	93:22	-	683	2021:1753	794+23	83.6 : 83.6%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	39	-	582	1981:1842	338+315	89.2 : 89.0%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	811	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1036	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	607	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	839	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	823	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**41.3**	**19.3**	**0.0**	**60.6**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**41.3**	**19.3**	**0.0**	**60.6**	**-**	**-**	**-**	**-**
1/1	638	638	-	-	-	5.5	1.9	-	7.3	41.4	19.3	1.9	21.2
1/2+1/3	694	694	-	-	-	6.0	2.0	-	8.0	41.4	21.2	2.0	23.2
2/1	250	250	-	-	-	3.4	2.4	-	5.8	83.9	8.2	2.4	10.6
2/2	274	274	-	-	-	3.8	3.0	-	6.7	88.2	9.1	3.0	12.0
3/2+3/1	1117	1117	-	-	-	8.5	3.9	-	12.4	39.9	21.0	3.9	24.9
3/3+3/4	683	683	-	-	-	6.3	2.5	-	8.7	46.1	20.4	2.5	22.8
4/2+4/1	582	582	-	-	-	7.9	3.7	-	11.6	71.6	10.0	3.7	13.7
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	811	811	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1036	1036	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	607	607	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	839	839	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	823	823	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

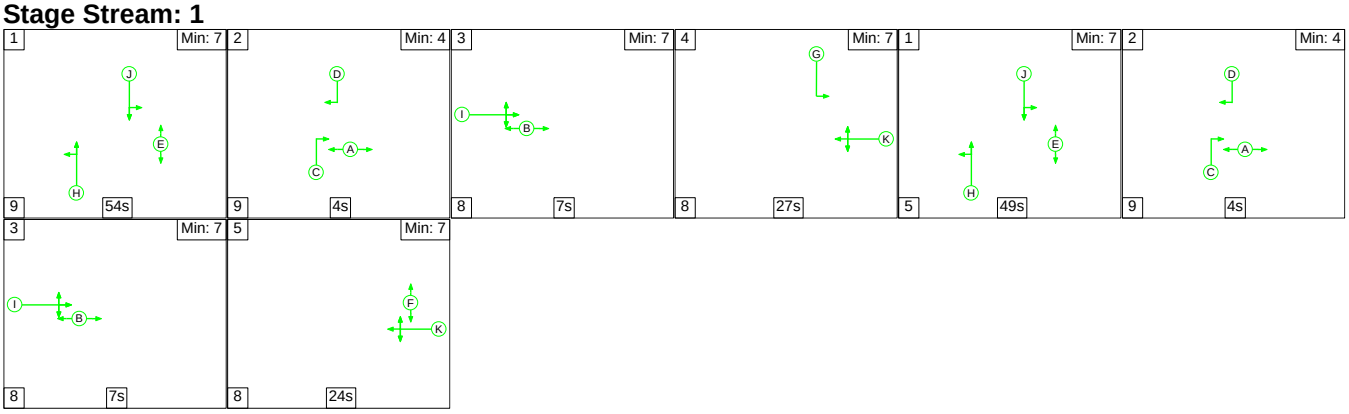
C1 Stream: 1 PRC for Signalled Lanes (%): 0.9 Total Delay for Signalled Lanes (pcuHr): 60.57 Cycle Time (s): 240
PRC Over All Lanes (%): 0.9 Total Delay Over All Lanes(pcuHr): 60.57

Full Input Data And Results

Scenario 19: '2040 PAH + Dev (1.7m) AM_A513 Light Vehs through Resi' (FG21: '2040 + PAH + Development (1.7m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

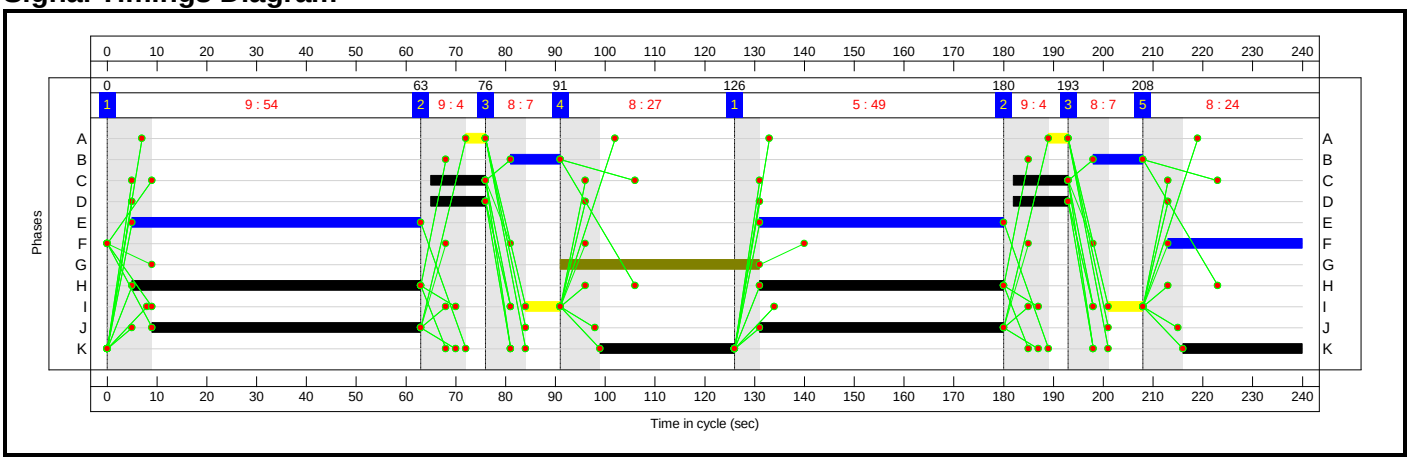


Stage Timings

Stage Stream: 1

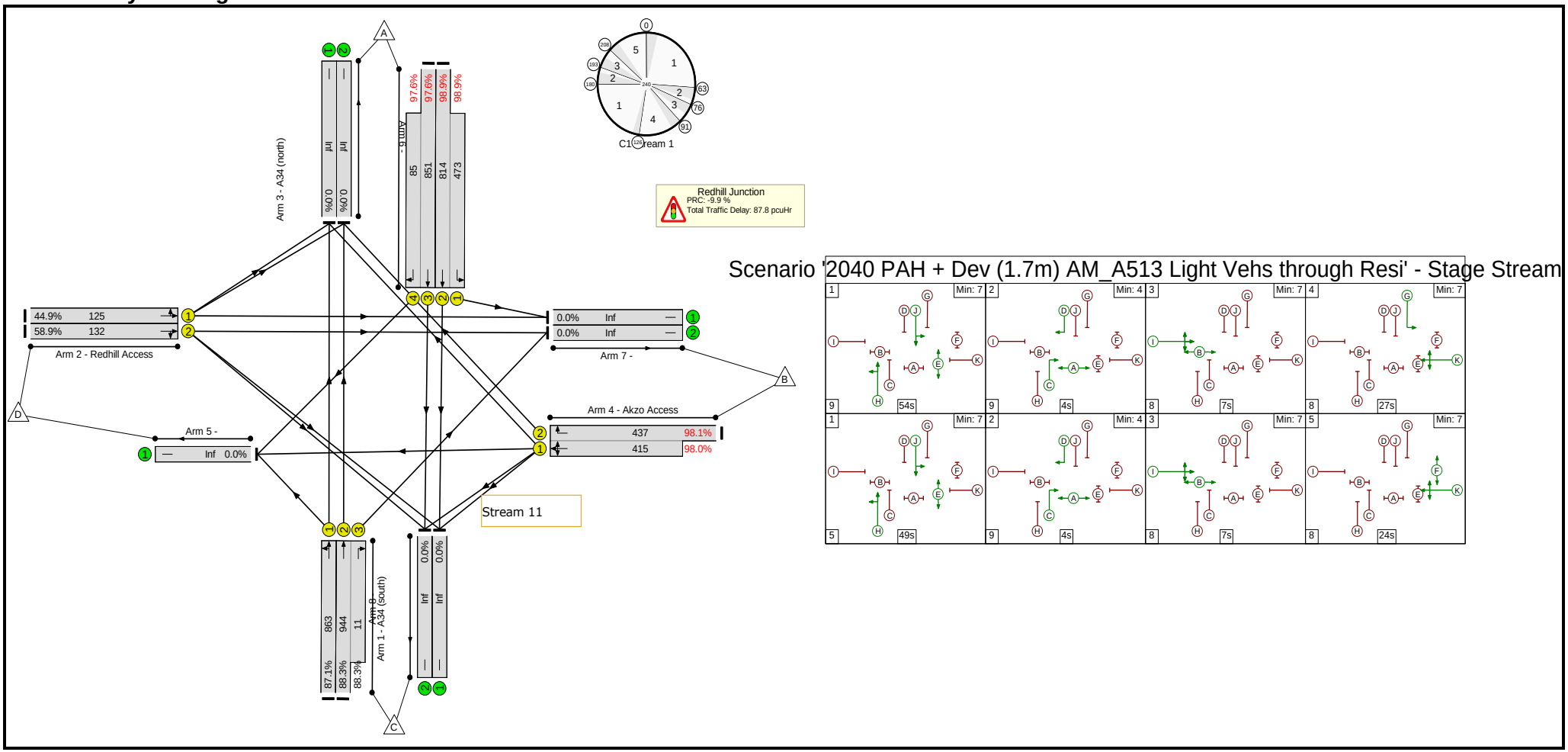
Stage	1	2	3	4	1	2	3	5
Duration	54	4	7	27	49	4	7	24
Change Point	0	63	76	91	126	180	193	208

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**98.9%**
Redhill Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**98.9%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	107	-	752	1901	863	87.1%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	107:22	-	844	2105:1840	944+11	88.3 : 88.3%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	14	-	56	1870	125	44.9%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	14	-	78	1986	132	58.9%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	103:143	40	1273	2021:1636	814+473	98.9 : 98.9%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	103:22	-	914	2021:1753	851+85	97.6 : 97.6%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	51	-	836	1981:1881	437+415	98.1 : 98.0%
5/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	593	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1273	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	505	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	10	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	876	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	903	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**44.0**	**43.8**	**0.0**	**87.8**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**44.0**	**43.8**	**0.0**	**87.8**	**-**	**-**	**-**	**-**
1/1	752	752	-	-	-	6.2	3.2	-	9.4	44.9	23.0	3.2	26.2
1/2+1/3	844	844	-	-	-	7.0	3.5	-	10.6	45.1	25.8	3.5	29.4
2/1	56	56	-	-	-	0.8	0.4	-	1.2	79.9	1.8	0.4	2.2
2/2	78	78	-	-	-	1.2	0.7	-	1.9	86.7	2.6	0.7	3.3
3/2+3/1	1273	1273	-	-	-	9.3	14.6	-	23.9	67.5	28.5	14.6	43.0
3/3+3/4	914	914	-	-	-	8.7	10.5	-	19.2	75.7	28.2	10.5	38.7
4/2+4/1	836	836	-	-	-	10.8	10.8	-	21.7	93.3	14.9	10.8	25.7
5/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1273	1273	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	505	505	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	10	10	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	876	876	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	903	903	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

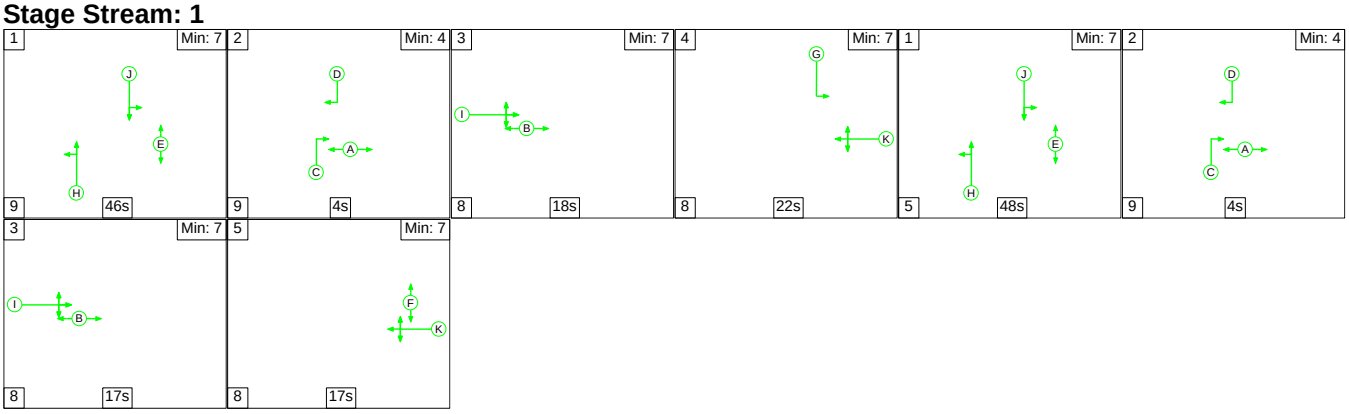
C1 Stream: 1 PRC for Signalled Lanes (%): -9.9 Total Delay for Signalled Lanes (pcuHr): 87.82 Cycle Time (s): 240
PRC Over All Lanes (%): -9.9 Total Delay Over All Lanes(pcuHr): 87.82

Full Input Data And Results

Scenario 20: '2040 PAH + Dev (1.7m) PM_A513 Light Vehs through Resi' (FG22: '2040 + PAH + Development (1.7m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Staging Plan Diagram

Stage Stream: 1

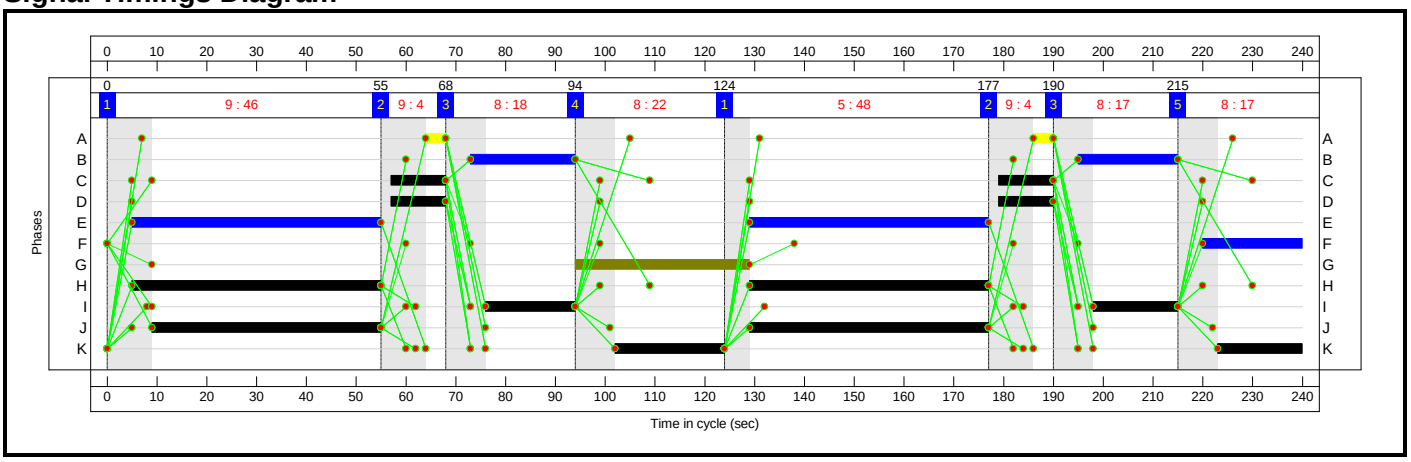


Stage Timings

Stage Stream: 1

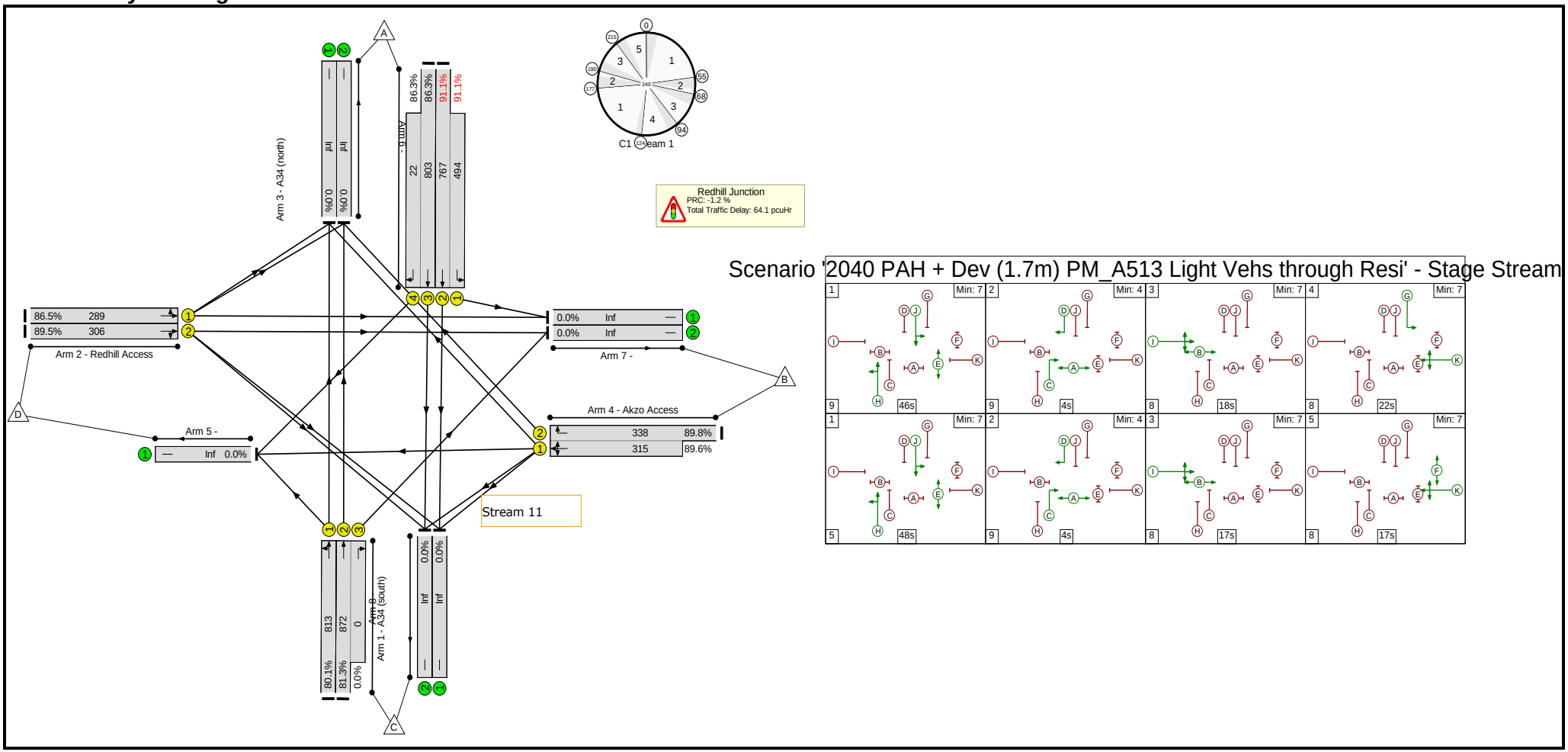
Stage	1	2	3	4	1	2	3	5
Duration	46	4	18	22	48	4	17	17
Change Point	0	55	68	94	124	177	190	215

Signal Timings Diagram



Full Input Data And Results

Junction Layout Diagram



Link Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.1%**
Redhill Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.1%**
1/1	A34 (south) Left Ahead	U	1	N/A	H		2	98	-	651	1950	813	80.1%
1/2+1/3	A34 (south) Ahead Right	U	1	N/A	H C		2	98:22	-	709	2105:1965	872+0	81.3 : 0.0%
2/1	Redhill Access Left Ahead	U	1	N/A	I		2	35	-	250	1875	289	86.5%
2/2	Redhill Access Ahead Right	U	1	N/A	I		2	35	-	274	1986	306	89.5%
3/2+3/1	A34 (north) Left Ahead	U	1	N/A	J	G	2	94:129	35	1149	2021:1636	767+494	91.1 : 91.1%
3/3+3/4	A34 (north) Right Ahead	U	1	N/A	J D		2	94:22	-	712	2021:1753	803+22	86.3 : 86.3%
4/2+4/1	Akzo Access Ahead Right Left	U	1	N/A	K		2	39	-	586	1981:1842	338+315	89.8 : 89.6%
5/1		U	N/A	N/A	-		-	-	-	122	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	826	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1053	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	620	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	0	Inf	Inf	0.0%
8/1		U	N/A	N/A	-		-	-	-	858	Inf	Inf	0.0%
8/2		U	N/A	N/A	-		-	-	-	852	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Business Park (Committed Layout)	**-**	**-**	**0**	**0**	**0**	**42.1**	**22.0**	**0.0**	**64.1**	**-**	**-**	**-**	**-**
Redhill Junction	**-**	**-**	**0**	**0**	**0**	**42.1**	**22.0**	**0.0**	**64.1**	**-**	**-**	**-**	**-**
1/1	651	651	-	-	-	5.6	2.0	-	7.5	41.6	19.7	2.0	21.7
1/2+1/3	709	709	-	-	-	6.1	2.1	-	8.2	41.7	21.7	2.1	23.8
2/1	250	250	-	-	-	3.4	2.8	-	6.2	89.9	8.2	2.8	11.0
2/2	274	274	-	-	-	3.8	3.5	-	7.3	95.8	9.1	3.5	12.6
3/2+3/1	1149	1149	-	-	-	8.7	4.7	-	13.5	42.2	21.6	4.7	26.3
3/3+3/4	712	712	-	-	-	6.6	3.0	-	9.6	48.5	21.5	3.0	24.5
4/2+4/1	586	586	-	-	-	7.9	3.9	-	11.8	72.8	10.0	3.9	14.0
5/1	122	122	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	826	826	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1053	1053	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	620	620	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	858	858	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	852	852	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 Stream: 1 PRC for Signalled Lanes (%): -1.2 Total Delay for Signalled Lanes (pcuHr): 64.15 Cycle Time (s): 240
PRC Over All Lanes (%): -1.2 Total Delay Over All Lanes(pcuHr): 64.15

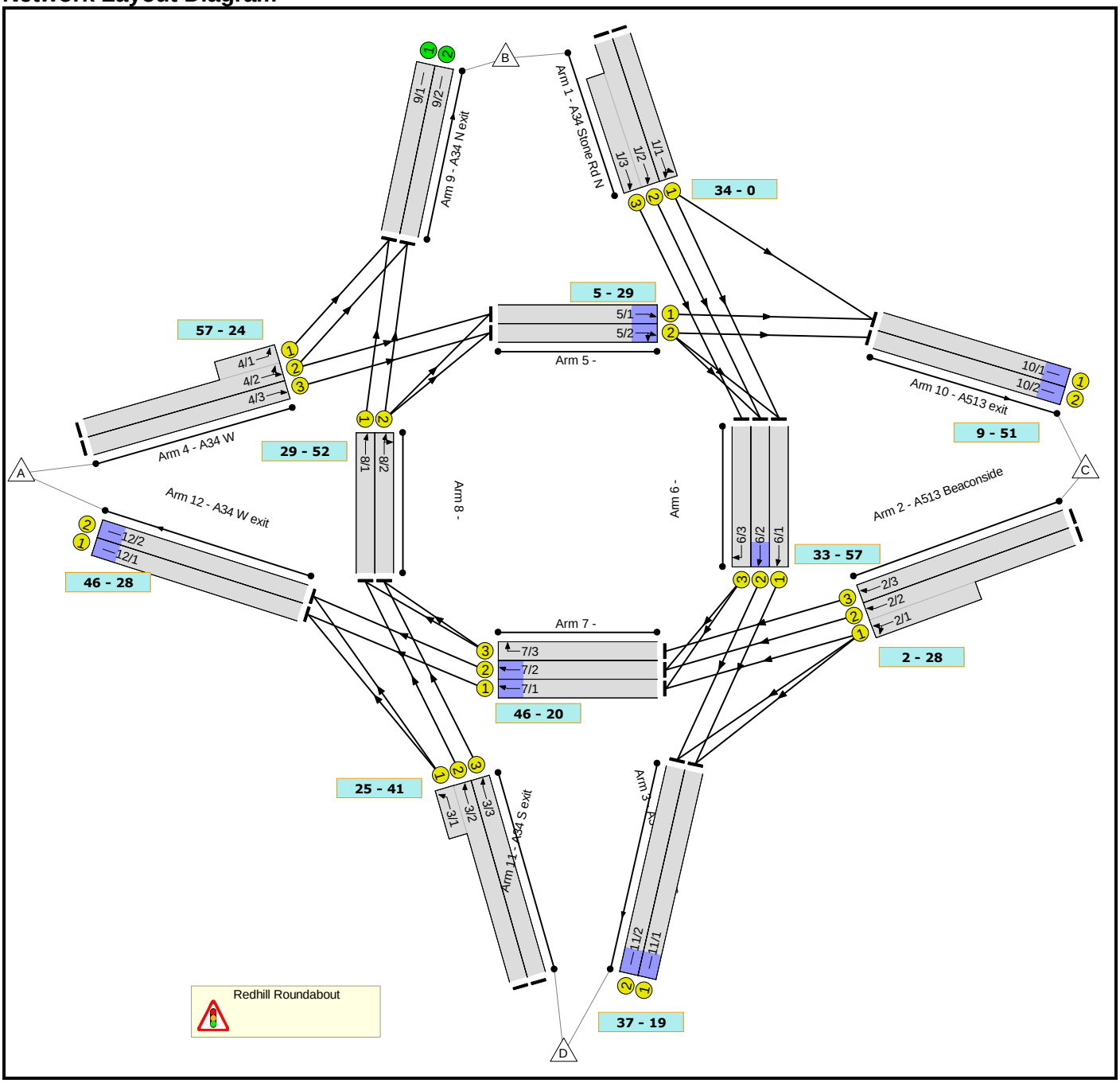
APPENDIX F: LinSig Output Data (Redhill Roundabout)

Full Input Data And Results

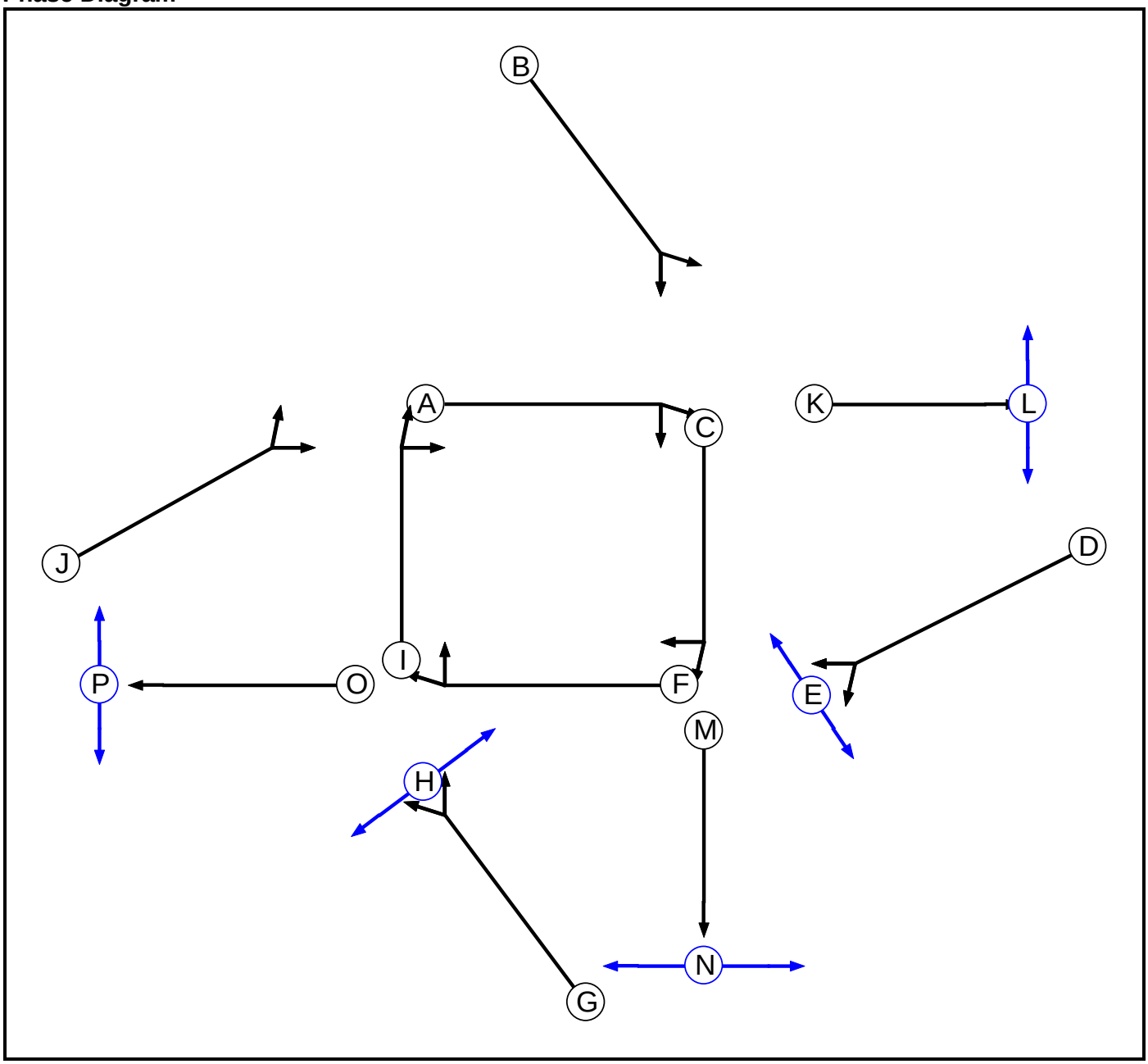
User and Project Details

Project:	**Stafford North Business Park**
Title:	**Redhill Roundabout (Committed Proposed Layout)**
Location:	Stafford
Additional detail:	
File name:	Redhill Roundabout (Signals) - Revised v2.lsg3x
Author:	[redacted]
Company:	BWB
Address:	Birmingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	0
D	Traffic	2		7	7
E	Pedestrian	2		5	5
F	Traffic	3		7	2
G	Traffic	3		7	7
H	Pedestrian	3		5	5
I	Traffic	4		7	2
J	Traffic	4		7	7
K	Traffic	5		7	7
L	Pedestrian	5		5	5
M	Traffic	6		7	7
N	Pedestrian	6		5	5
O	Traffic	7		7	7
P	Pedestrian	7		5	5

Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A		5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-		5	-	-	-	-	-	-	-	-	-	-	-	-
D	-	-	5		5	-	-	-	-	-	-	-	-	-	-	-
E	-	-	-	12		-	-	-	-	-	-	-	-	-	-	-
F	-	-	-	-	-		5	-	-	-	-	-	-	-	-	-
G	-	-	-	-	-	5		5	-	-	-	-	-	-	-	-
H	-	-	-	-	-	-	10		-	-	-	-	-	-	-	-
I	-	-	-	-	-	-	-	-		5	-	-	-	-	-	-
J	-	-	-	-	-	-	-	-	5		-	-	-	-	-	-
K	-	-	-	-	-	-	-	-	-	-		5	-	-	-	-
L	-	-	-	-	-	-	-	-	-	-	8		-	-	-	-
M	-	-	-	-	-	-	-	-	-	-	-	-		5	-	-
N	-	-	-	-	-	-	-	-	-	-	-	-	8		-	-
O	-	-	-	-	-	-	-	-	-	-	-	-	-	-		5
P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	

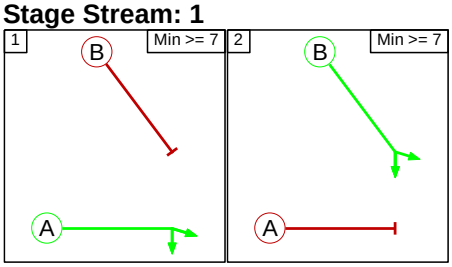
Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C E
2	2	D
3	1	F H
3	2	G
4	1	I
4	2	J
5	1	K
5	2	L
6	1	M
6	2	N
7	1	O
7	2	P

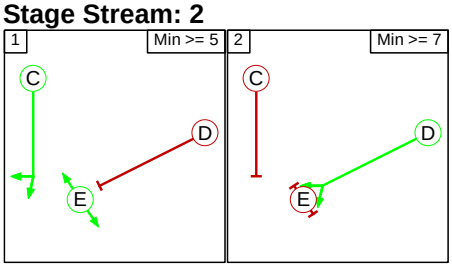
Full Input Data And Results

Stage Diagram

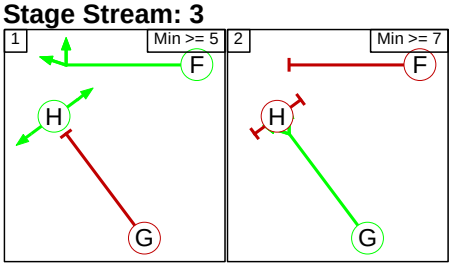
Stage Stream: 1



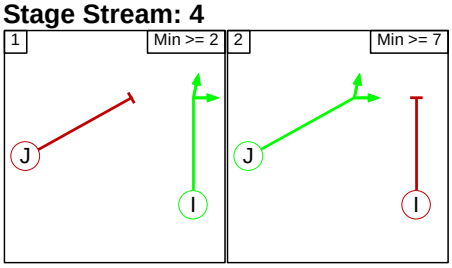
Stage Stream: 2



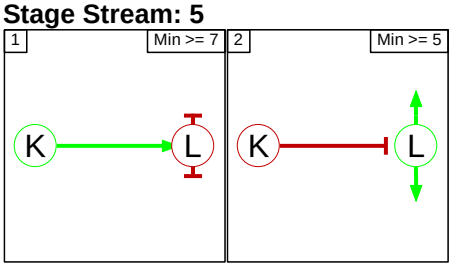
Stage Stream: 3



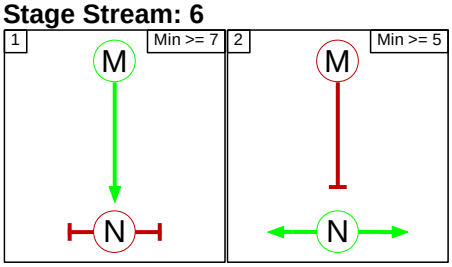
Stage Stream: 4



Stage Stream: 5

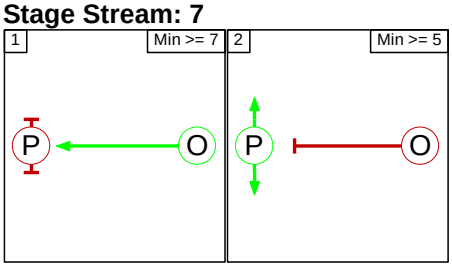


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	C	Losing	7	7

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	F	Losing	5	5

Stage Stream: 4

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	I	Losing	5	5

Stage Stream: 5

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 6

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 7

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Full Input Data And Results

Stage Stream: 2

	To Stage		
		1	2
From Stage	1		12
	2	5	

Stage Stream: 3

	To Stage		
		1	2
From Stage	1		10
	2	5	

Stage Stream: 4

	To Stage		
		1	2
From Stage	1		10
	2	5	

Stage Stream: 5

	To Stage		
		1	2
From Stage	1		5
	2	8	

Stage Stream: 6

	To Stage		
		1	2
From Stage	1		5
	2	8	

Stage Stream: 7

	To Stage		
		1	2
From Stage	1		5
	2	8	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Redhill Roundabout
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: Redhill Roundabout

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A34 Stone Rd N)	U	B	2	3	60.0	User	1900	-	-	-	-	-
1/2 (A34 Stone Rd N)	U	B	2	3	60.0	User	1900	-	-	-	-	-
1/3 (A34 Stone Rd N)	U	B	2	3	15.0	User	1900	-	-	-	-	-
2/1 (A513 Beaconside)	U	D	2	3	9.0	User	1900	-	-	-	-	-
2/2 (A513 Beaconside)	U	D	2	3	60.0	User	1900	-	-	-	-	-
2/3 (A513 Beaconside)	U	D	2	3	60.0	User	1900	-	-	-	-	-
3/1 (A34 Stone Rd S)	U	G	2	3	4.0	User	1900	-	-	-	-	-
3/2 (A34 Stone Rd S)	U	G	2	3	60.0	User	1900	-	-	-	-	-
3/3 (A34 Stone Rd S)	U	G	2	3	60.0	User	1900	-	-	-	-	-
4/1 (A34 W)	U	J	2	3	5.0	User	1900	-	-	-	-	-
4/2 (A34 W)	U	J	2	3	60.0	User	1900	-	-	-	-	-
4/3 (A34 W)	U	J	2	3	60.0	User	1900	-	-	-	-	-
5/1	U	A	2	3	9.4	User	1900	-	-	-	-	-
5/2	U	A	2	3	9.4	User	1900	-	-	-	-	-
6/1	U	C	2	3	7.3	User	1900	-	-	-	-	-
6/2	U	C	2	3	7.3	User	1900	-	-	-	-	-
6/3	U	C	2	3	7.3	User	1900	-	-	-	-	-
7/1	U	F	2	3	9.7	User	1900	-	-	-	-	-
7/2	U	F	2	3	9.7	User	1900	-	-	-	-	-
7/3	U	F	2	3	9.7	User	1900	-	-	-	-	-
8/1	U	I	2	3	9.9	User	1900	-	-	-	-	-
8/2	U	I	2	3	9.9	User	1900	-	-	-	-	-
9/1 (A34 N exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
9/2 (A34 N exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

10/1 (A513 exit)	U	K	2	3	8.5	User	1900	-	-	-	-	-
10/2 (A513 exit)	U	K	2	3	8.5	User	1900	-	-	-	-	-
11/1 (A34 S exit)	U	M	2	3	7.8	User	1900	-	-	-	-	-
11/2 (A34 S exit)	U	M	2	3	7.8	User	1900	-	-	-	-	-
12/1 (A34 W exit)	U	O	2	3	13.2	User	1900	-	-	-	-	-
12/2 (A34 W exit)	U	O	2	3	13.2	User	1900	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2040 Base AM'	08:00	09:00	01:00	
2: '2040 Base PM'	17:00	18:00	01:00	
3: '2040 Base + PAH AM'	08:00	09:00	01:00	
4: '2040 Base + PAH PM'	17:00	18:00	01:00	
5: '2033 + PAH + Dev (AM)'	08:00	09:00	01:00	
6: '2033 + PAH + Dev (PM)'	08:00	09:00	01:00	
7: '2040 + PAH + Dev (1m) AM'	08:00	09:00	01:00	
8: '2040 + PAH + Dev (1m) PM'	17:00	18:00	01:00	
9: '2040 + PAH + Dev (1.7m) AM'	08:00	09:00	01:00	
10: '2040 + PAH + Dev (1.7m) PM'	17:00	18:00	01:00	
11: '2040 + PAH + Dev (1m) + Stone Phase 1 AM'	08:00	09:00	01:00	
12: '2040 + PAH + Dev (1m) + Stone Phase 1 PM'	17:00	18:00	01:00	
13: '2040 + PAH + Dev (1.7m) + Stone Phase 1 AM'	08:00	09:00	01:00	
14: '2040 + PAH + Dev (1.7m) + Stone Phase 1 PM'	17:00	18:00	01:00	
15: '2040 + PAH + Dev (1m) + Stone Total AM'	08:00	09:00	01:00	
16: '2040 + PAH + Dev (1m) + Stone Total PM'	17:00	18:00	01:00	
17: '2040 + PAH + Dev (1.7m) + Stone Total AM'	08:00	09:00	01:00	
18: '2040 + PAH + Dev (1.7m) + Stone Total PM'	17:00	18:00	01:00	
19: '2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi'	08:00	09:00	01:00	
20: '2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi'	17:00	18:00	01:00	
21: '2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi'	08:00	09:00	01:00	
22: '2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi'	17:00	18:00	01:00	

Scenario 1: '2040 Base AM' (FG1: '2040 Base AM', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	538	568	40	1146
	B	613	0	19	823	1455
	C	752	69	0	261	1082
	D	40	657	49	0	746
	Tot.	1405	1264	636	1124	4429

Traffic Lane Flows

Lane	Scenario 1: 2040 Base AM
Junction: Redhill Roundabout	
1/1	425
1/2 (with short)	1030(In) 417(Out)
1/3 (short)	613
2/1 (short)	537
2/2 (with short)	1013(In) 476(Out)
2/3	69
3/1 (short)	40
3/2 (with short)	381(In) 341(Out)
3/3	365
4/1 (short)	396
4/2 (with short)	792(In) 396(Out)
4/3	354
5/1	302
5/2	355
6/1	427
6/2	436
6/3	613
7/1	633
7/2	732
7/3	69
8/1	381
8/2	394
9/1	777
9/2	487
10/1	321
10/2	315
11/1	558
11/2	566
12/1	662
12/2	743

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 2: '2040 Base PM' (FG2: '2040 Base PM', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	468	727	16	1211
	B	626	0	44	788	1458
	C	571	33	0	263	867
	D	144	642	90	0	876
	Tot.	1341	1143	861	1067	4412

Traffic Lane Flows

Lane	Scenario 2: 2040 Base PM
Junction: Redhill Roundabout	
1/1	435
1/2 (with short)	1023(In) 397(Out)
1/3 (short)	626
2/1 (short)	492
2/2 (with short)	834(In) 342(Out)
2/3	33
3/1 (short)	144
3/2 (with short)	488(In) 344(Out)
3/3	388
4/1 (short)	397
4/2 (with short)	795(In) 398(Out)
4/3	416
5/1	399
5/2	434
6/1	396
6/2	408
6/3	626
7/1	575
7/2	622
7/3	33
8/1	373
8/2	392
9/1	770
9/2	373
10/1	443
10/2	418
11/1	532
11/2	535
12/1	663
12/2	678

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 3: '2040 Base + PAH AM' (FG3: '2040 Base + PAH AM', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	579	568	40	1187
	B	640	0	26	830	1496
	C	752	89	0	261	1102
	D	40	679	49	0	768
	Tot.	1432	1347	643	1131	4553

Traffic Lane Flows

Lane	Scenario 3: 2040 Base + PAH AM
Junction: Redhill Roundabout	
1/1	582
1/2 (with short)	914(In) 274(Out)
1/3 (short)	640
2/1 (short)	532
2/2 (with short)	1013(In) 481(Out)
2/3	89
3/1 (short)	40
3/2 (with short)	392(In) 352(Out)
3/3	376
4/1 (short)	395
4/2 (with short)	790(In) 395(Out)
4/3	397
5/1	259
5/2	398
6/1	556
6/2	314
6/3	640
7/1	651
7/2	741
7/3	89
8/1	402
8/2	415
9/1	797
9/2	550
10/1	285
10/2	358
11/1	634
11/2	497
12/1	680
12/2	752

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 4: '2040 Base + PAH PM' (FG4: '2040 Base + PAH PM', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	493	727	16	1236
	B	659	0	63	807	1529
	C	571	42	0	263	876
	D	144	648	90	0	882
	Tot.	1374	1183	880	1086	4523

Traffic Lane Flows

Lane	Scenario 4: 2040 Base + PAH PM
Junction: Redhill Roundabout	
1/1	461
1/2 (with short)	1068(In) 409(Out)
1/3 (short)	659
2/1 (short)	437
2/2 (with short)	834(In) 397(Out)
2/3	42
3/1 (short)	144
3/2 (with short)	489(In) 345(Out)
3/3	393
4/1 (short)	403
4/2 (with short)	806(In) 403(Out)
4/3	430
5/1	394
5/2	439
6/1	405
6/2	418
6/3	659
7/1	580
7/2	650
7/3	42
8/1	380
8/2	400
9/1	783
9/2	400
10/1	457
10/2	423
11/1	543
11/2	543
12/1	681
12/2	693

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 5: '2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi' (FG19: '2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	704	568	40	1312
	B	831	0	34	887	1752
	C	752	103	0	261	1116
	D	40	735	49	0	824
	Tot.	1623	1542	651	1188	5004

Traffic Lane Flows

Lane	Scenario 5: 2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi
Junction: Redhill Roundabout	
1/1	615
1/2 (with short)	1137(In) 306(Out)
1/3 (short)	831
2/1 (short)	514
2/2 (with short)	1013(In) 499(Out)
2/3	103
3/1 (short)	40
3/2 (with short)	419(In) 379(Out)
3/3	405
4/1 (short)	434
4/2 (with short)	867(In) 433(Out)
4/3	445
5/1	212
5/2	445
6/1	581
6/2	346
6/3	831
7/1	772
7/2	811
7/3	103
8/1	435
8/2	452
9/1	869
9/2	673
10/1	246
10/2	405
11/1	690
11/2	498
12/1	799
12/2	824

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 6: '2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi' (FG20: '2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	639	727	16	1382
	B	743	0	73	854	1670
	C	571	51	0	263	885
	D	144	676	90	0	910
	Tot.	1458	1366	890	1133	4847

Traffic Lane Flows

Lane	Scenario 6: 2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi
Junction: Redhill Roundabout	
1/1	547
1/2 (with short)	1123(In) 380(Out)
1/3 (short)	743
2/1 (short)	420
2/2 (with short)	834(In) 414(Out)
2/3	51
3/1 (short)	144
3/2 (with short)	500(In) 356(Out)
3/3	410
4/1 (short)	452
4/2 (with short)	905(In) 453(Out)
4/3	477
5/1	355
5/2	478
6/1	478
6/2	392
6/3	743
7/1	647
7/2	667
7/3	51
8/1	399
8/2	418
9/1	851
9/2	515
10/1	428
10/2	462
11/1	569
11/2	564
12/1	729
12/2	729

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 7: '2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi' (FG21: '2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	743	568	40	1351
	B	857	0	39	894	1790
	C	752	113	0	261	1126
	D	40	753	49	0	842
	Tot.	1649	1609	656	1195	5109

Traffic Lane Flows

Lane	Scenario 7: 2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi
Junction: Redhill Roundabout	
1/1	695
1/2 (with short)	1095(In) 238(Out)
1/3 (short)	857
2/1 (short)	517
2/2 (with short)	1013(In) 496(Out)
2/3	113
3/1 (short)	40
3/2 (with short)	427(In) 387(Out)
3/3	415
4/1 (short)	459
4/2 (with short)	919(In) 460(Out)
4/3	432
5/1	225
5/2	432
6/1	656
6/2	278
6/3	857
7/1	773
7/2	836
7/3	113
8/1	451
8/2	464
9/1	910
9/2	699
10/1	264
10/2	392
11/1	671
11/2	524
12/1	804
12/2	845

Lane Saturation Flows

Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

Scenario 8: '2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi' (FG22: '2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	663	727	16	1406
	B	775	0	79	872	1726
	C	571	56	0	263	890
	D	144	681	90	0	915
	Tot.	1490	1400	896	1151	4937

Traffic Lane Flows

Lane	Scenario 8: 2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi
Junction: Redhill Roundabout	
1/1	586
1/2 (with short)	1140(In) 365(Out)
1/3 (short)	775
2/1 (short)	455
2/2 (with short)	834(In) 379(Out)
2/3	56
3/1 (short)	144
3/2 (with short)	503(In) 359(Out)
3/3	412
4/1 (short)	469
4/2 (with short)	939(In) 470(Out)
4/3	467
5/1	366
5/2	467
6/1	508
6/2	380
6/3	775
7/1	638
7/2	708
7/3	56
8/1	405
8/2	422
9/1	874
9/2	526
10/1	445
10/2	451
11/1	578
11/2	573
12/1	737
12/2	753

Lane Saturation Flows

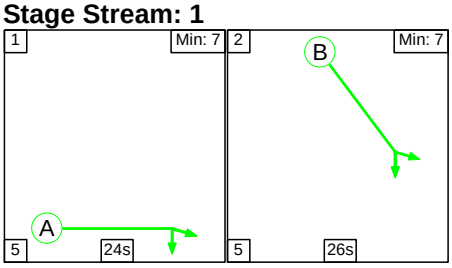
Junction: Redhill Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A34 Stone Rd N Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (A34 Stone Rd N Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (A34 Stone Rd N Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1 (A513 Beaconside Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
2/2 (A513 Beaconside Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
2/3 (A513 Beaconside Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
3/1 (A34 Stone Rd S Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
3/2 (A34 Stone Rd S Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
3/3 (A34 Stone Rd S Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
4/1 (A34 W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (A34 W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (A34 W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1	This lane uses a directly entered Saturation Flow						1900	1900
5/2	This lane uses a directly entered Saturation Flow						1900	1900
6/1	This lane uses a directly entered Saturation Flow						1900	1900
6/2	This lane uses a directly entered Saturation Flow						1900	1900
6/3	This lane uses a directly entered Saturation Flow						1900	1900
7/1	This lane uses a directly entered Saturation Flow						1900	1900
7/2	This lane uses a directly entered Saturation Flow						1900	1900
7/3	This lane uses a directly entered Saturation Flow						1900	1900
8/1	This lane uses a directly entered Saturation Flow						1900	1900
8/2	This lane uses a directly entered Saturation Flow						1900	1900
9/1 (A34 N exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (A34 N exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A513 exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
10/2 (A513 exit Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
11/1 (A34 S exit Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900

11/2 (A34 S exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900
12/1 (A34 W exit Lane 1)	This lane uses a directly entered Saturation Flow	1900	1900
12/2 (A34 W exit Lane 2)	This lane uses a directly entered Saturation Flow	1900	1900

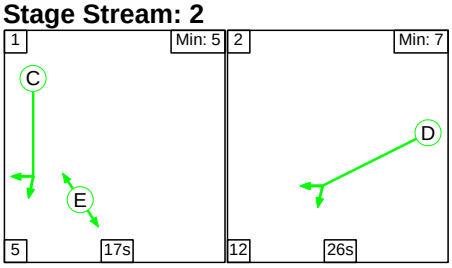
Scenario 1: '2040 Base AM' (FG1: '2040 Base AM', Plan 1: 'Peds')

Stage Sequence Diagram

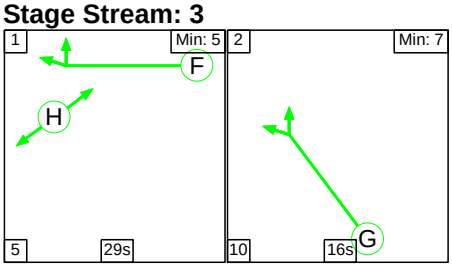
Stage Stream: 1



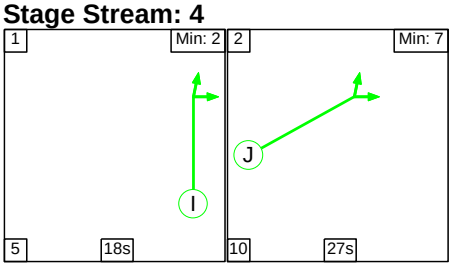
Stage Stream: 2



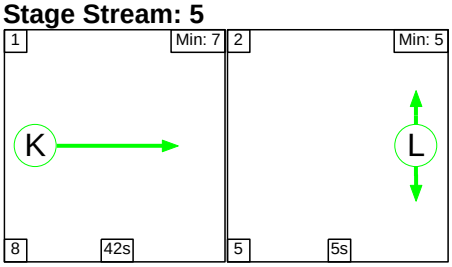
Stage Stream: 3



Stage Stream: 4

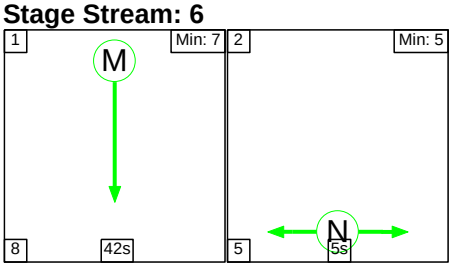


Stage Stream: 5

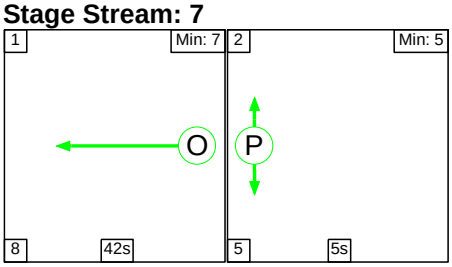


Full Input Data And Results

Stage Stream: 6



Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	24	26
Change Point	0	29

Stage Stream: 2

Stage	1	2
Duration	17	26
Change Point	28	50

Stage Stream: 3

Stage	1	2
Duration	29	16
Change Point	41	15

Stage Stream: 4

Stage	1	2
Duration	18	27
Change Point	24	47

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

Stage Stream: 6

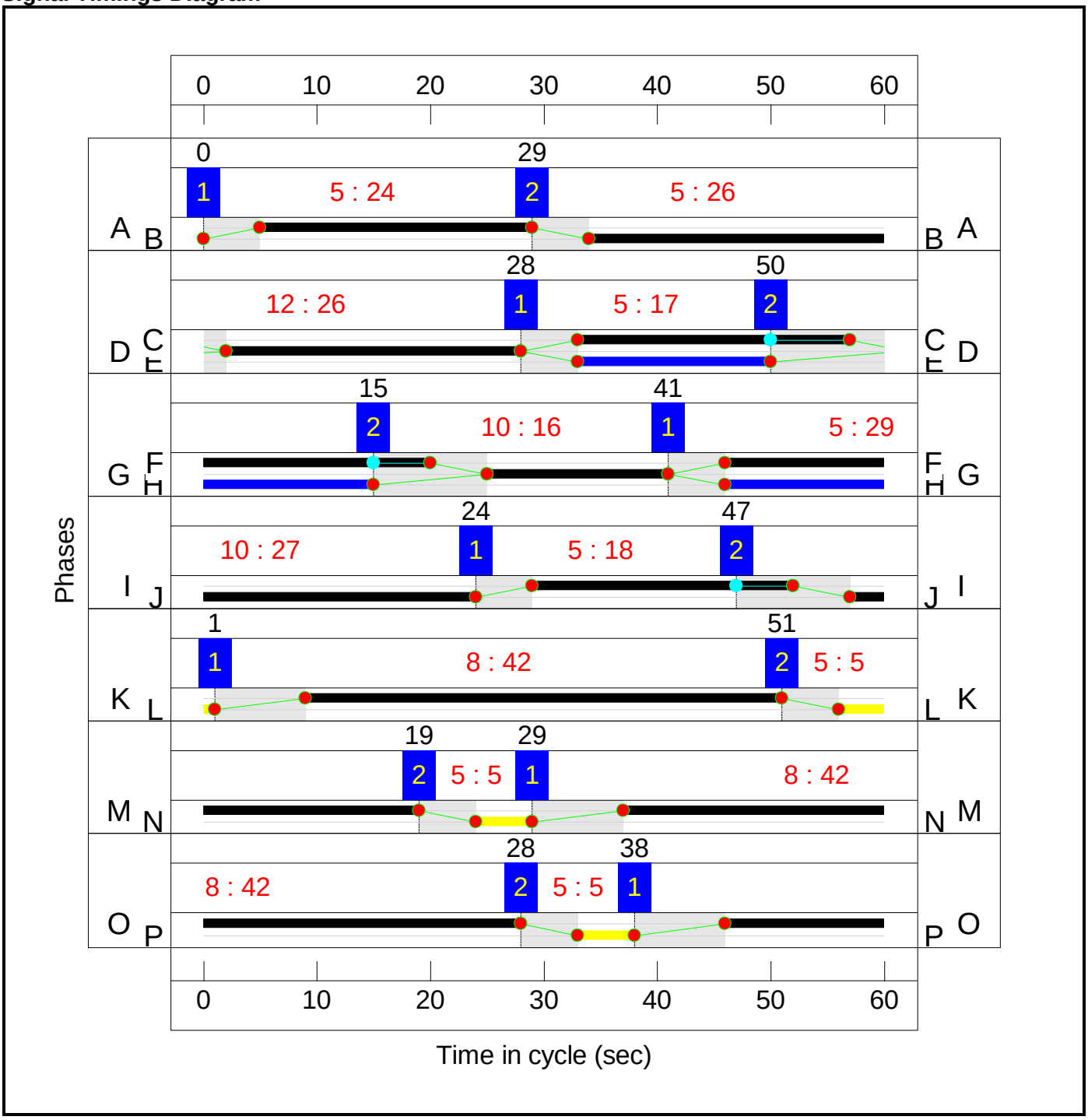
Stage	1	2
Duration	42	5
Change Point	29	19

Full Input Data And Results

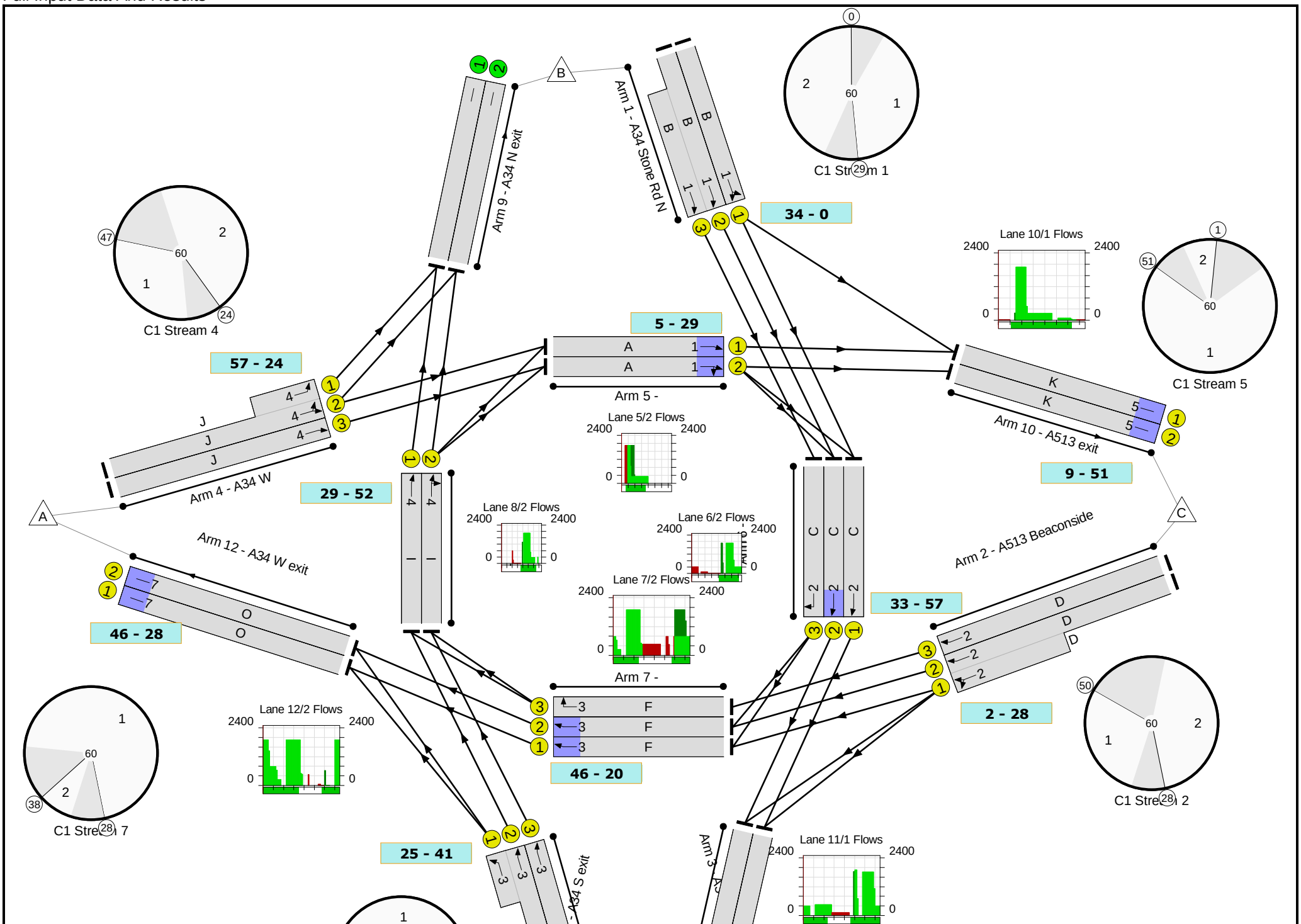
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	38	28

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**77.4%**
Redhill Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**77.4%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	26	-	425	1900	855	49.7%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	26	-	1030	1900:1900	582+855	71.7 : 71.7%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	26	-	1013	1900:1900	627+708	75.9 : 75.9%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	26	-	69	1900	855	8.1%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	16	-	381	1900:1900	495+58	68.9 : 68.9%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	16	-	365	1900	538	67.8%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	27	-	792	1900:1900	601+601	65.9 : 65.9%
4/3	A34 W Ahead	U	4	N/A	J		1	27	-	354	1900	887	39.9%
5/1	Ahead	U	1	N/A	A		1	24	-	302	1900	792	38.1%
5/2	Right Ahead	U	1	N/A	A		1	24	-	355	1900	792	44.8%
6/1	Ahead	U	2	N/A	C		1	24	-	427	1900	792	53.9%
6/2	Ahead	U	2	N/A	C		1	24	-	436	1900	792	55.1%
6/3	Right	U	2	N/A	C		1	24	-	613	1900	792	77.4%
7/1	Ahead	U	3	N/A	F		1	34	-	633	1900	1108	57.1%
7/2	Ahead	U	3	N/A	F		1	34	-	732	1900	1108	66.0%
7/3	Right	U	3	N/A	F		1	34	-	69	1900	1108	6.2%
8/1	Ahead	U	4	N/A	I		1	23	-	381	1900	760	50.1%
8/2	Right Ahead	U	4	N/A	I		1	23	-	394	1900	760	51.8%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	777	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	487	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	321	1900	1362	23.6%
10/2	A513 exit	U	5	N/A	K		1	42	-	315	1900	1362	23.1%
11/1	A34 S exit	U	6	N/A	M		1	42	-	558	1900	1362	41.0%
11/2	A34 S exit	U	6	N/A	M		1	42	-	566	1900	1362	41.6%
12/1	A34 W exit	U	7	N/A	O		1	42	-	662	1900	1362	48.6%
12/2	A34 W exit	U	7	N/A	O		1	42	-	743	1900	1362	54.6%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**20.5**	**15.2**	**0.0**	**35.7**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**20.5**	**15.2**	**0.0**	**35.7**	**-**	**-**	**-**	**-**
1/1	425	425	-	-	-	1.4	0.5	-	1.9	15.9	5.0	0.5	5.5
1/2+1/3	1030	1030	-	-	-	3.6	1.3	-	4.9	17.1	8.2	1.3	9.4
2/2+2/1	1013	1013	-	-	-	3.5	1.6	-	5.0	17.9	6.9	1.6	8.4
2/3	69	69	-	-	-	0.2	0.0	-	0.2	11.7	0.7	0.0	0.7
3/2+3/1	381	381	-	-	-	2.0	1.1	-	3.1	29.0	5.1	1.1	6.2
3/3	365	365	-	-	-	1.9	1.0	-	3.0	29.3	5.4	1.0	6.4
4/2+4/1	792	792	-	-	-	2.4	1.0	-	3.3	15.2	4.4	1.0	5.4
4/3	354	354	-	-	-	1.0	0.3	-	1.4	13.9	3.8	0.3	4.2
5/1	302	302	-	-	-	0.5	0.3	-	0.8	9.2	3.7	0.3	4.0
5/2	355	355	-	-	-	0.2	0.4	-	0.6	6.2	4.1	0.4	4.6
6/1	427	427	-	-	-	0.6	0.6	-	1.2	9.9	1.3	0.6	1.8
6/2	436	436	-	-	-	0.6	0.6	-	1.2	9.9	1.2	0.6	1.9
6/3	613	613	-	-	-	0.7	1.7	-	2.4	14.2	1.4	1.7	3.0
7/1	633	633	-	-	-	0.6	0.7	-	1.2	7.1	4.3	0.7	5.0
7/2	732	732	-	-	-	0.8	1.0	-	1.8	8.7	4.2	1.0	5.2
7/3	69	69	-	-	-	0.1	0.0	-	0.1	6.0	0.3	0.0	0.3
8/1	381	381	-	-	-	0.1	0.5	-	0.6	5.8	0.5	0.5	1.0
8/2	394	394	-	-	-	0.1	0.5	-	0.6	5.6	0.4	0.5	0.9
9/1	777	777	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	487	487	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	321	321	-	-	-	0.0	0.2	-	0.2	1.9	0.1	0.2	0.2
10/2	315	315	-	-	-	0.0	0.2	-	0.2	1.7	0.0	0.2	0.2
11/1	558	558	-	-	-	0.1	0.3	-	0.4	2.8	0.5	0.3	0.9

Full Input Data And Results

11/2	566	566	-	-	-	0.1	0.4	-	0.4	2.8	0.5	0.4	0.9
12/1	662	662	-	-	-	0.1	0.5	-	0.6	3.0	0.5	0.5	0.9
12/2	743	743	-	-	-	0.0	0.6	-	0.6	3.1	0.2	0.6	0.8

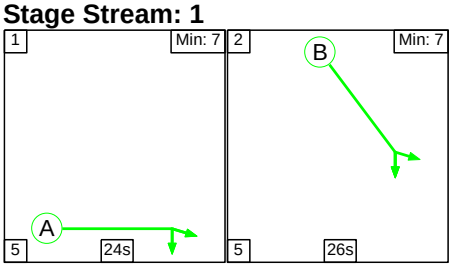
C1	Stream: 1	PRC for Signalled Lanes (%):	25.5	Total Delay for Signalled Lanes (pcuHr):	8.15	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	16.2	Total Delay for Signalled Lanes (pcuHr):	10.06	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	30.7	Total Delay for Signalled Lanes (pcuHr):	9.17	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	36.6	Total Delay for Signalled Lanes (pcuHr):	5.93	Cycle Time (s):	60
C1	Stream: 5	PRC for Signalled Lanes (%):	281.8	Total Delay for Signalled Lanes (pcuHr):	0.32	Cycle Time (s):	60
C1	Stream: 6	PRC for Signalled Lanes (%):	116.5	Total Delay for Signalled Lanes (pcuHr):	0.88	Cycle Time (s):	60
C1	Stream: 7	PRC for Signalled Lanes (%):	64.9	Total Delay for Signalled Lanes (pcuHr):	1.18	Cycle Time (s):	60
		PRC Over All Lanes (%):	16.2	Total Delay Over All Lanes(pcuHr):	35.69		

Full Input Data And Results

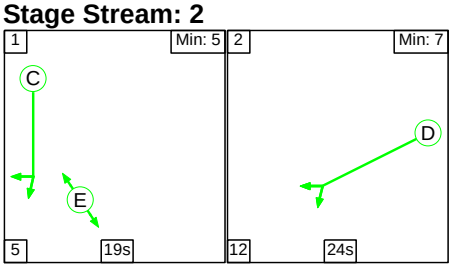
Scenario 2: '2040 Base PM' (FG2: '2040 Base PM', Plan 1: 'Peds')

Stage Sequence Diagram

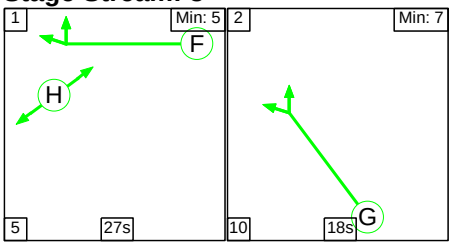
Stage Stream: 1



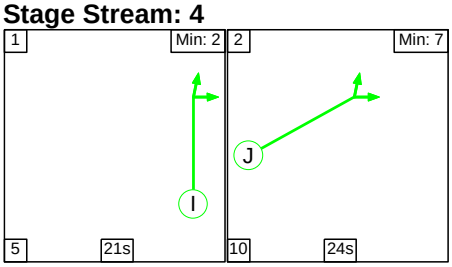
Stage Stream: 2



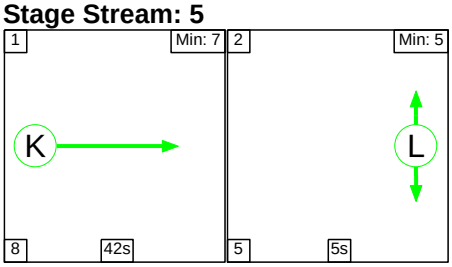
Stage Stream: 3



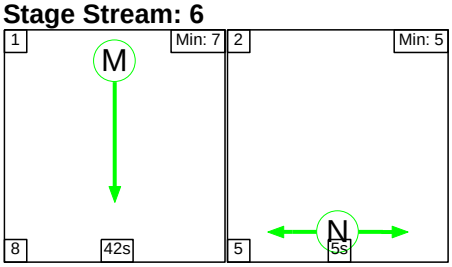
Stage Stream: 4



Stage Stream: 5

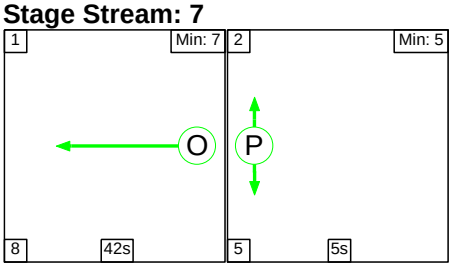


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	24	26
Change Point	0	29

Stage Stream: 2

Stage	1	2
Duration	19	24
Change Point	27	51

Stage Stream: 3

Stage	1	2
Duration	27	18
Change Point	42	14

Stage Stream: 4

Stage	1	2
Duration	21	24
Change Point	24	50

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

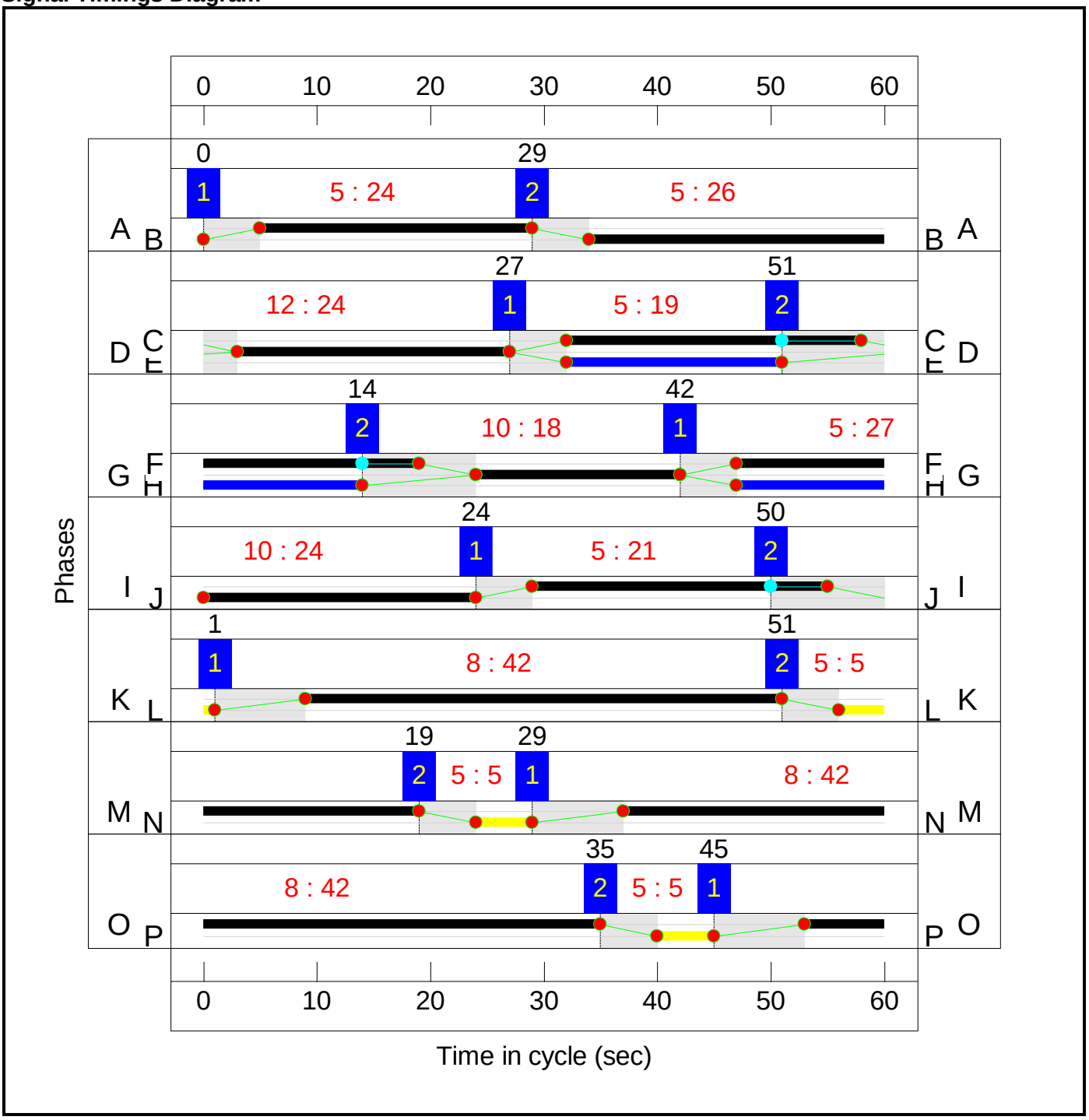
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	29	19

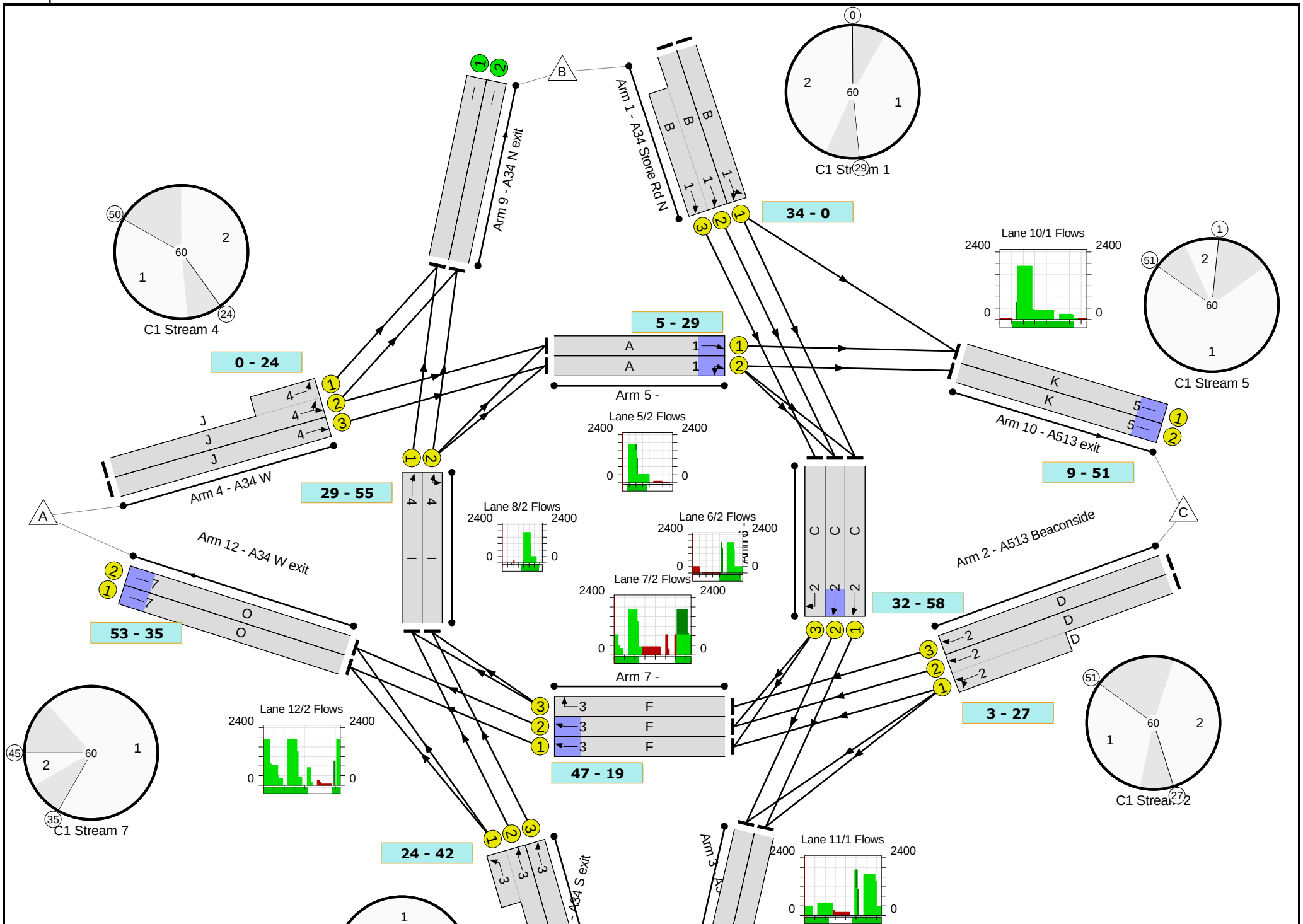
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	45	35

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**73.2%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**73.2%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	26	-	435	1900	855	50.9%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	26	-	1023	1900:1900	542+855	73.2 : 73.2%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	24	-	834	1900:1900	479+689	71.4 : 71.4%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	24	-	33	1900	792	4.2%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	18	-	488	1900:1900	486+203	70.8 : 70.8%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	18	-	388	1900	602	64.5%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	24	-	795	1900:1900	554+552	71.9 : 71.9%
4/3	A34 W Ahead	U	4	N/A	J		1	24	-	416	1900	792	52.5%
5/1	Ahead	U	1	N/A	A		1	24	-	399	1900	792	50.4%
5/2	Right Ahead	U	1	N/A	A		1	24	-	434	1900	792	54.8%
6/1	Ahead	U	2	N/A	C		1	26	-	396	1900	855	46.3%
6/2	Ahead	U	2	N/A	C		1	26	-	408	1900	855	47.7%
6/3	Right	U	2	N/A	C		1	26	-	626	1900	855	73.2%
7/1	Ahead	U	3	N/A	F		1	32	-	575	1900	1045	55.0%
7/2	Ahead	U	3	N/A	F		1	32	-	622	1900	1045	59.5%
7/3	Right	U	3	N/A	F		1	32	-	33	1900	1045	3.2%
8/1	Ahead	U	4	N/A	I		1	26	-	373	1900	855	43.6%
8/2	Right Ahead	U	4	N/A	I		1	26	-	392	1900	855	45.8%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	770	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	373	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	443	1900	1362	32.5%
10/2	A513 exit	U	5	N/A	K		1	42	-	418	1900	1362	30.7%
11/1	A34 S exit	U	6	N/A	M		1	42	-	532	1900	1362	39.1%
11/2	A34 S exit	U	6	N/A	M		1	42	-	535	1900	1362	39.3%
12/1	A34 W exit	U	7	N/A	O		1	42	-	663	1900	1362	48.7%
12/2	A34 W exit	U	7	N/A	O		1	42	-	678	1900	1362	49.8%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**20.8**	**14.6**	**0.0**	**35.5**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**20.8**	**14.6**	**0.0**	**35.5**	**-**	**-**	**-**	**-**
1/1	435	435	-	-	-	1.4	0.5	-	1.9	16.0	5.1	0.5	5.6
1/2+1/3	1023	1023	-	-	-	3.6	1.4	-	5.0	17.5	8.5	1.4	9.9
2/2+2/1	834	834	-	-	-	3.1	1.2	-	4.3	18.6	6.4	1.2	7.7
2/3	33	33	-	-	-	0.1	0.0	-	0.1	12.9	0.3	0.0	0.3
3/2+3/1	488	488	-	-	-	2.3	1.2	-	3.5	25.6	5.2	1.2	6.4
3/3	388	388	-	-	-	1.9	0.9	-	2.8	26.0	5.5	0.9	6.4
4/2+4/1	795	795	-	-	-	2.9	1.3	-	4.1	18.7	4.9	1.3	6.1
4/3	416	416	-	-	-	1.5	0.6	-	2.1	17.9	5.1	0.6	5.6
5/1	399	399	-	-	-	0.6	0.5	-	1.1	9.9	2.9	0.5	3.4
5/2	434	434	-	-	-	0.2	0.6	-	0.8	6.4	0.3	0.6	0.9
6/1	396	396	-	-	-	0.4	0.4	-	0.8	7.6	0.8	0.4	1.3
6/2	408	408	-	-	-	0.4	0.5	-	0.9	7.9	0.9	0.5	1.4
6/3	626	626	-	-	-	0.6	1.4	-	2.0	11.4	1.2	1.4	2.6
7/1	575	575	-	-	-	0.7	0.6	-	1.3	8.1	4.4	0.6	5.0
7/2	622	622	-	-	-	0.7	0.7	-	1.4	8.2	3.8	0.7	4.5
7/3	33	33	-	-	-	0.0	0.0	-	0.1	6.6	0.1	0.0	0.1
8/1	373	373	-	-	-	0.1	0.4	-	0.5	4.5	0.4	0.4	0.8
8/2	392	392	-	-	-	0.0	0.4	-	0.4	4.0	0.1	0.4	0.5
9/1	770	770	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	373	373	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	443	443	-	-	-	0.0	0.2	-	0.3	2.2	0.2	0.2	0.4
10/2	418	418	-	-	-	0.0	0.2	-	0.2	1.9	0.0	0.2	0.2
11/1	532	532	-	-	-	0.1	0.3	-	0.4	2.9	0.5	0.3	0.8

Full Input Data And Results

11/2	535	535	-	-	-	0.1	0.3	-	0.4	2.9	0.5	0.3	0.8
12/1	663	663	-	-	-	0.1	0.5	-	0.5	3.0	0.4	0.5	0.9
12/2	678	678	-	-	-	0.0	0.5	-	0.5	2.9	0.3	0.5	0.8

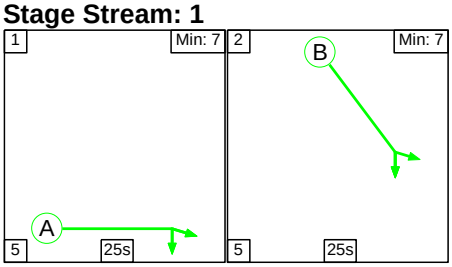
C1	Stream: 1 PRC for Signalled Lanes (%):	22.9	Total Delay for Signalled Lanes (pcuHr):	8.78	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	22.9	Total Delay for Signalled Lanes (pcuHr):	8.13	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	27.0	Total Delay for Signalled Lanes (pcuHr):	9.05	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	25.2	Total Delay for Signalled Lanes (pcuHr):	7.08	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	176.6	Total Delay for Signalled Lanes (pcuHr):	0.49	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	129.1	Total Delay for Signalled Lanes (pcuHr):	0.86	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	80.8	Total Delay for Signalled Lanes (pcuHr):	1.09	Cycle Time (s):	60
	PRC Over All Lanes (%):	22.9	Total Delay Over All Lanes(pcuHr):	35.48		

Full Input Data And Results

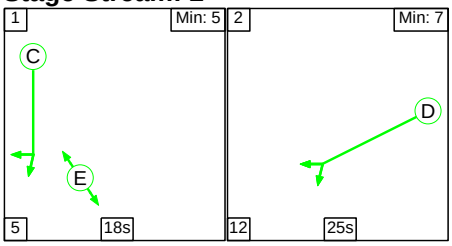
Scenario 3: '2040 Base + PAH AM' (FG3: '2040 Base + PAH AM', Plan 1: 'Peds')

Stage Sequence Diagram

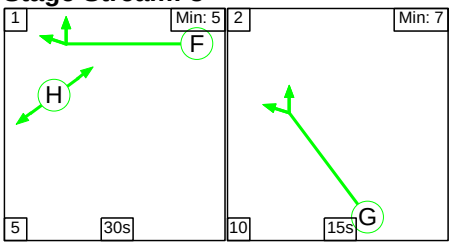
Stage Stream: 1



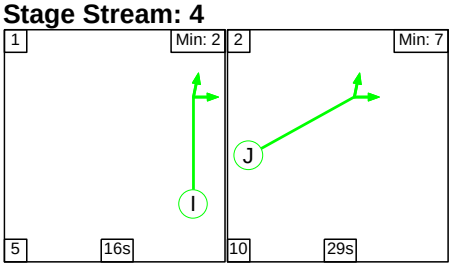
Stage Stream: 2



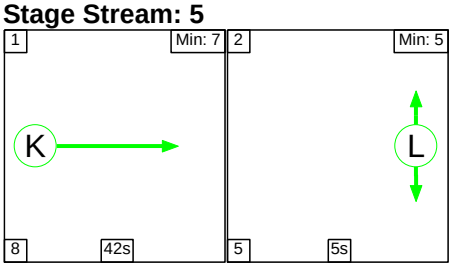
Stage Stream: 3



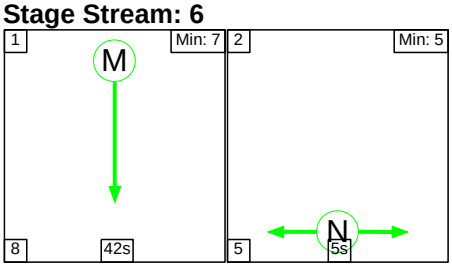
Stage Stream: 4



Stage Stream: 5

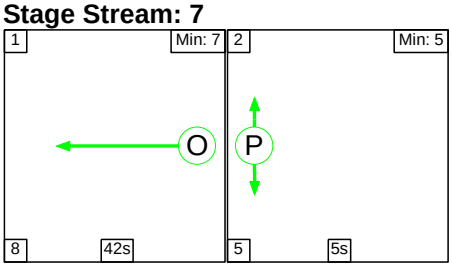


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	25	25
Change Point	0	30

Stage Stream: 2

Stage	1	2
Duration	18	25
Change Point	30	53

Stage Stream: 3

Stage	1	2
Duration	30	15
Change Point	43	18

Stage Stream: 4

Stage	1	2
Duration	16	29
Change Point	25	46

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

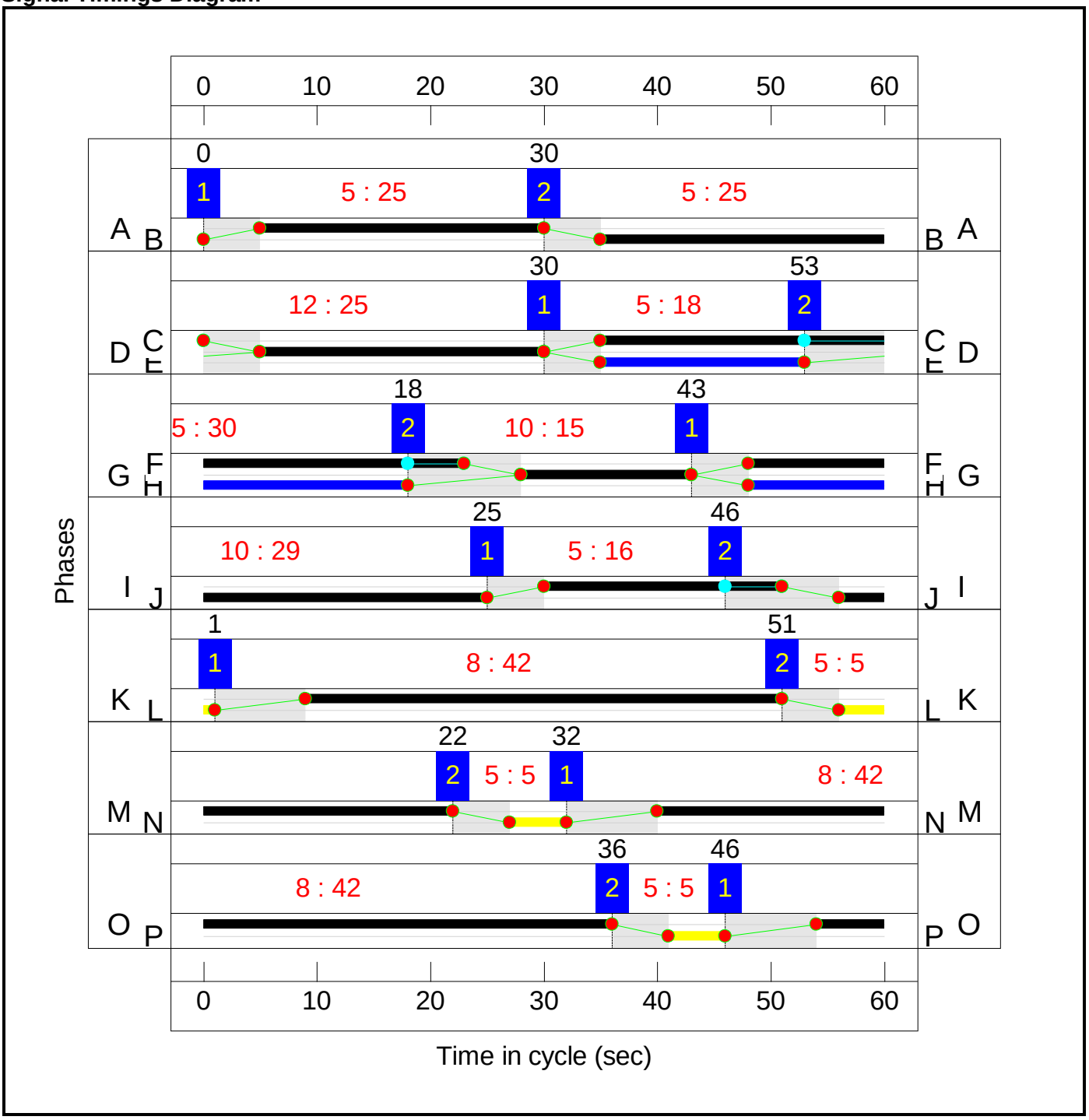
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	32	22

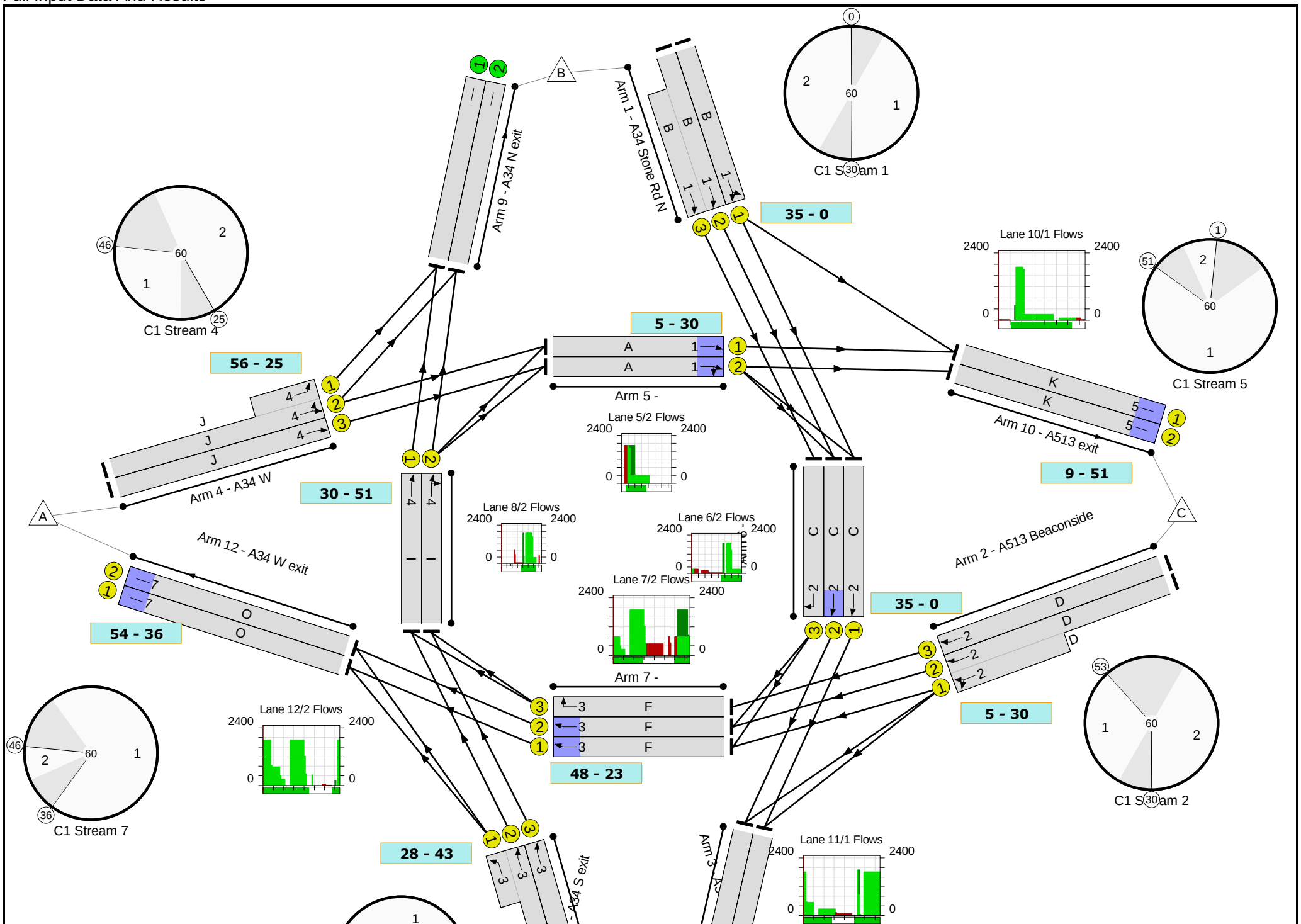
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	46	36

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.7%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.7%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	25	-	582	1900	823	70.7%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	25	-	914	1900:1900	352+823	77.7 : 77.7%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	25	-	1013	1900:1900	624+690	77.1 : 77.1%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	25	-	89	1900	823	10.8%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	15	-	392	1900:1900	467+53	75.3 : 75.3%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	15	-	376	1900	507	74.2%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	29	-	790	1900:1900	632+632	62.5 : 62.5%
4/3	A34 W Ahead	U	4	N/A	J		1	29	-	397	1900	950	41.8%
5/1	Ahead	U	1	N/A	A		1	25	-	259	1900	823	31.5%
5/2	Right Ahead	U	1	N/A	A		1	25	-	398	1900	823	48.3%
6/1	Ahead	U	2	N/A	C		1	25	-	556	1900	823	67.5%
6/2	Ahead	U	2	N/A	C		1	25	-	314	1900	823	38.1%
6/3	Right	U	2	N/A	C		1	25	-	640	1900	823	77.7%
7/1	Ahead	U	3	N/A	F		1	35	-	651	1900	1140	57.1%
7/2	Ahead	U	3	N/A	F		1	35	-	741	1900	1140	65.0%
7/3	Right	U	3	N/A	F		1	35	-	89	1900	1140	7.8%
8/1	Ahead	U	4	N/A	I		1	21	-	402	1900	697	57.7%
8/2	Right Ahead	U	4	N/A	I		1	21	-	415	1900	697	59.6%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	797	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	550	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	285	1900	1362	20.9%
10/2	A513 exit	U	5	N/A	K		1	42	-	358	1900	1362	26.3%
11/1	A34 S exit	U	6	N/A	M		1	42	-	634	1900	1362	46.6%
11/2	A34 S exit	U	6	N/A	M		1	42	-	497	1900	1362	36.5%
12/1	A34 W exit	U	7	N/A	O		1	42	-	680	1900	1362	49.9%
12/2	A34 W exit	U	7	N/A	O		1	42	-	752	1900	1362	55.2%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**21.1**	**17.7**	**0.0**	**38.8**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**21.1**	**17.7**	**0.0**	**38.8**	**-**	**-**	**-**	**-**
1/1	582	582	-	-	-	2.2	1.2	-	3.4	21.3	7.9	1.2	9.1
1/2+1/3	914	914	-	-	-	3.4	1.7	-	5.2	20.3	9.1	1.7	10.8
2/2+2/1	1013	1013	-	-	-	3.7	1.7	-	5.4	19.1	6.9	1.7	8.6
2/3	89	89	-	-	-	0.3	0.1	-	0.3	12.6	0.9	0.1	0.9
3/2+3/1	392	392	-	-	-	2.1	1.5	-	3.6	33.4	5.4	1.5	6.9
3/3	376	376	-	-	-	2.1	1.4	-	3.5	33.6	5.6	1.4	7.0
4/2+4/1	790	790	-	-	-	2.1	0.8	-	2.9	13.2	4.1	0.8	4.9
4/3	397	397	-	-	-	1.0	0.4	-	1.4	12.7	4.1	0.4	4.4
5/1	259	259	-	-	-	0.4	0.2	-	0.6	8.9	3.1	0.2	3.3
5/2	398	398	-	-	-	0.3	0.5	-	0.8	7.0	4.6	0.5	5.1
6/1	556	556	-	-	-	0.4	1.0	-	1.4	9.4	0.8	1.0	1.8
6/2	314	314	-	-	-	0.4	0.3	-	0.7	8.3	1.0	0.3	1.4
6/3	640	640	-	-	-	0.5	1.7	-	2.2	12.3	0.9	1.7	2.6
7/1	651	651	-	-	-	0.6	0.7	-	1.2	6.7	4.4	0.7	5.0
7/2	741	741	-	-	-	0.7	0.9	-	1.6	8.0	3.8	0.9	4.7
7/3	89	89	-	-	-	0.1	0.0	-	0.1	5.6	0.3	0.0	0.4
8/1	402	402	-	-	-	0.2	0.7	-	0.9	8.2	0.8	0.7	1.5
8/2	415	415	-	-	-	0.2	0.7	-	0.9	7.9	0.6	0.7	1.4
9/1	797	797	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	550	550	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	285	285	-	-	-	0.0	0.1	-	0.2	2.1	0.2	0.1	0.3
10/2	358	358	-	-	-	0.0	0.2	-	0.2	1.8	0.0	0.2	0.2
11/1	634	634	-	-	-	0.1	0.4	-	0.5	2.8	0.3	0.4	0.7

Full Input Data And Results

11/2	497	497	-	-	-	0.2	0.3	-	0.4	3.2	0.7	0.3	1.0
12/1	680	680	-	-	-	0.0	0.5	-	0.5	2.7	0.2	0.5	0.7
12/2	752	752	-	-	-	0.0	0.6	-	0.6	3.0	0.1	0.6	0.7

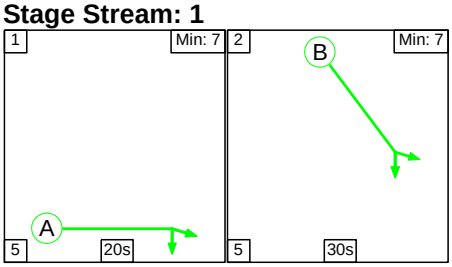
C1	Stream: 1 PRC for Signalled Lanes (%):	15.8	Total Delay for Signalled Lanes (pcuHr):	10.02	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	15.8	Total Delay for Signalled Lanes (pcuHr):	10.05	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	19.5	Total Delay for Signalled Lanes (pcuHr):	10.14	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	44.1	Total Delay for Signalled Lanes (pcuHr):	6.14	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	242.3	Total Delay for Signalled Lanes (pcuHr):	0.34	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	93.3	Total Delay for Signalled Lanes (pcuHr):	0.94	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	63.0	Total Delay for Signalled Lanes (pcuHr):	1.14	Cycle Time (s):	60
	PRC Over All Lanes (%):	15.8	Total Delay Over All Lanes(pcuHr):	38.76		

Full Input Data And Results

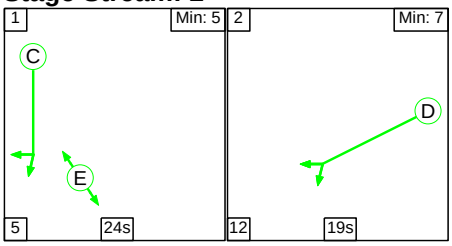
Scenario 4: '2040 Base + PAH PM' (FG4: '2040 Base + PAH PM', Plan 1: 'Peds')

Stage Sequence Diagram

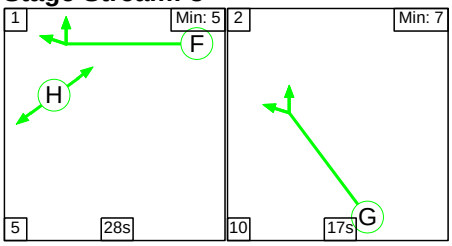
Stage Stream: 1



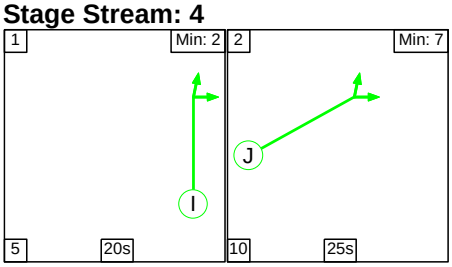
Stage Stream: 2



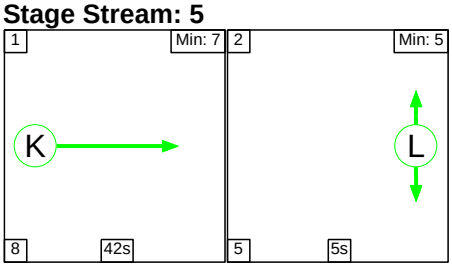
Stage Stream: 3



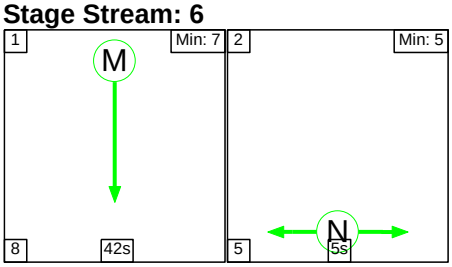
Stage Stream: 4



Stage Stream: 5

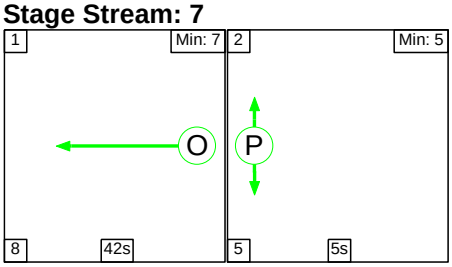


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	20	30
Change Point	0	25

Stage Stream: 2

Stage	1	2
Duration	24	19
Change Point	12	41

Stage Stream: 3

Stage	1	2
Duration	28	17
Change Point	50	23

Stage Stream: 4

Stage	1	2
Duration	20	25
Change Point	26	51

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

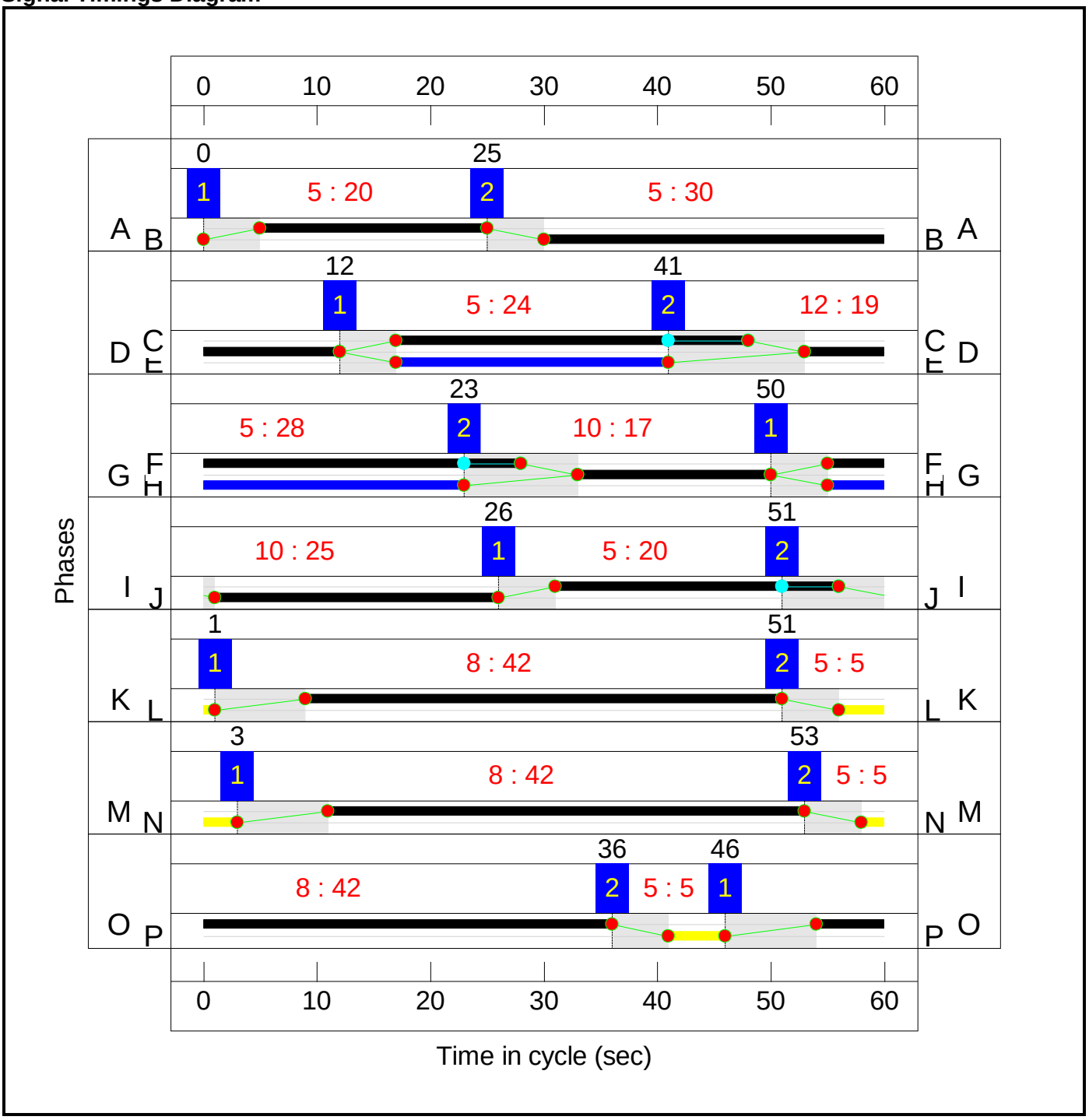
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	3	53

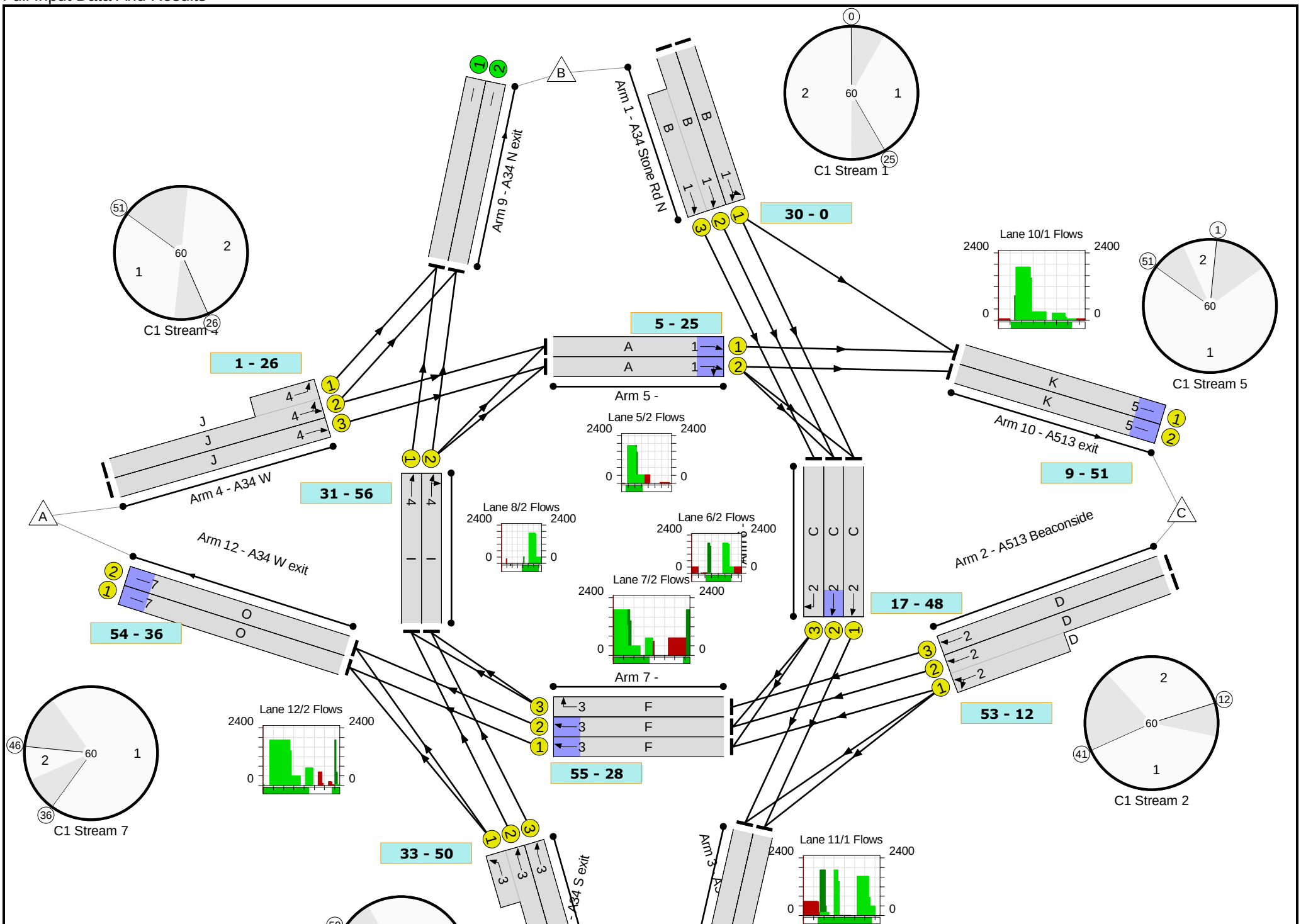
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	46	36

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**74.4%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**74.4%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	30	-	461	1900	982	47.0%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	30	-	1068	1900:1900	595+959	68.7 : 68.7%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	19	-	834	1900:1900	536+590	74.1 : 74.1%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	19	-	42	1900	633	6.6%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	17	-	489	1900:1900	463+193	74.4 : 74.4%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	17	-	393	1900	570	68.9%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	25	-	806	1900:1900	569+569	70.8 : 70.8%
4/3	A34 W Ahead	U	4	N/A	J		1	25	-	430	1900	823	52.2%
5/1	Ahead	U	1	N/A	A		1	20	-	394	1900	665	59.2%
5/2	Right Ahead	U	1	N/A	A		1	20	-	439	1900	665	66.0%
6/1	Ahead	U	2	N/A	C		1	31	-	405	1900	1013	40.0%
6/2	Ahead	U	2	N/A	C		1	31	-	418	1900	1013	41.3%
6/3	Right	U	2	N/A	C		1	31	-	659	1900	1013	65.0%
7/1	Ahead	U	3	N/A	F		1	33	-	580	1900	1077	53.9%
7/2	Ahead	U	3	N/A	F		1	33	-	650	1900	1077	60.4%
7/3	Right	U	3	N/A	F		1	33	-	42	1900	1077	3.9%
8/1	Ahead	U	4	N/A	I		1	25	-	380	1900	823	46.2%
8/2	Right Ahead	U	4	N/A	I		1	25	-	400	1900	823	48.6%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	400	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	457	1900	1362	33.6%
10/2	A513 exit	U	5	N/A	K		1	42	-	423	1900	1362	31.1%
11/1	A34 S exit	U	6	N/A	M		1	42	-	543	1900	1362	39.9%
11/2	A34 S exit	U	6	N/A	M		1	42	-	543	1900	1362	39.9%
12/1	A34 W exit	U	7	N/A	O		1	42	-	681	1900	1362	50.0%
12/2	A34 W exit	U	7	N/A	O		1	42	-	693	1900	1362	50.9%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**24.1**	**15.0**	**0.0**	**39.1**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**24.1**	**15.0**	**0.0**	**39.1**	**-**	**-**	**-**	**-**
1/1	461	461	-	-	-	1.2	0.4	-	1.6	12.7	4.9	0.4	5.3
1/2+1/3	1068	1068	-	-	-	3.0	1.1	-	4.1	13.7	8.1	1.1	9.1
2/2+2/1	834	834	-	-	-	4.0	1.4	-	5.4	23.2	6.2	1.4	7.6
2/3	42	42	-	-	-	0.2	0.0	-	0.2	16.7	0.5	0.0	0.5
3/2+3/1	489	489	-	-	-	2.4	1.4	-	3.8	28.2	5.4	1.4	6.8
3/3	393	393	-	-	-	2.0	1.1	-	3.1	28.6	5.7	1.1	6.8
4/2+4/1	806	806	-	-	-	2.7	1.2	-	3.9	17.6	4.8	1.2	6.0
4/3	430	430	-	-	-	1.5	0.5	-	2.0	17.0	5.1	0.5	5.7
5/1	394	394	-	-	-	0.8	0.7	-	1.5	13.8	3.5	0.7	4.2
5/2	439	439	-	-	-	0.5	1.0	-	1.5	12.3	0.9	1.0	1.8
6/1	405	405	-	-	-	0.7	0.3	-	1.0	9.0	2.0	0.3	2.3
6/2	418	418	-	-	-	0.7	0.4	-	1.0	9.0	2.0	0.4	2.4
6/3	659	659	-	-	-	1.4	0.9	-	2.4	12.9	3.6	0.9	4.5
7/1	580	580	-	-	-	1.1	0.6	-	1.7	10.4	6.3	0.6	6.9
7/2	650	650	-	-	-	0.7	0.8	-	1.5	8.1	3.5	0.8	4.3
7/3	42	42	-	-	-	0.0	0.0	-	0.0	1.7	0.0	0.0	0.0
8/1	380	380	-	-	-	0.2	0.4	-	0.7	6.2	0.6	0.4	1.0
8/2	400	400	-	-	-	0.0	0.5	-	0.5	4.6	0.1	0.5	0.6
9/1	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	400	400	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	457	457	-	-	-	0.0	0.3	-	0.3	2.3	0.2	0.3	0.5
10/2	423	423	-	-	-	0.0	0.2	-	0.2	1.9	0.0	0.2	0.2
11/1	543	543	-	-	-	0.3	0.3	-	0.6	4.2	2.2	0.3	2.5

Full Input Data And Results

11/2	543	543	-	-	-	0.3	0.3	-	0.6	4.0	1.9	0.3	2.3
12/1	681	681	-	-	-	0.3	0.5	-	0.8	4.1	1.6	0.5	2.1
12/2	693	693	-	-	-	0.1	0.5	-	0.6	3.3	0.7	0.5	1.2

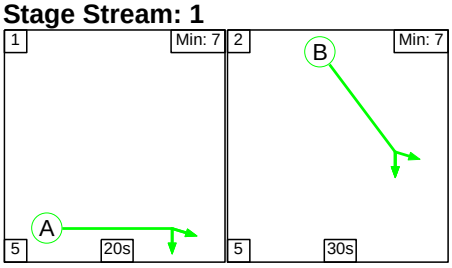
C1	Stream: 1 PRC for Signalled Lanes (%):	30.9	Total Delay for Signalled Lanes (pcuHr):	8.71	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	21.5	Total Delay for Signalled Lanes (pcuHr):	9.99	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	20.9	Total Delay for Signalled Lanes (pcuHr):	10.10	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	27.1	Total Delay for Signalled Lanes (pcuHr):	7.14	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	168.2	Total Delay for Signalled Lanes (pcuHr):	0.52	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	125.7	Total Delay for Signalled Lanes (pcuHr):	1.24	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	76.8	Total Delay for Signalled Lanes (pcuHr):	1.41	Cycle Time (s):	60
	PRC Over All Lanes (%):	20.9	Total Delay Over All Lanes(pcuHr):	39.12		

Full Input Data And Results

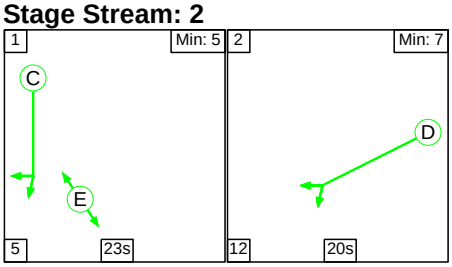
Scenario 5: '2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi' (FG19: '2040 + PAH + Dev (1m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Stage Sequence Diagram

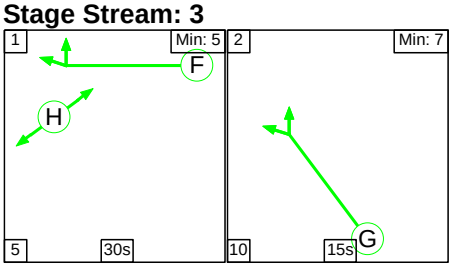
Stage Stream: 1



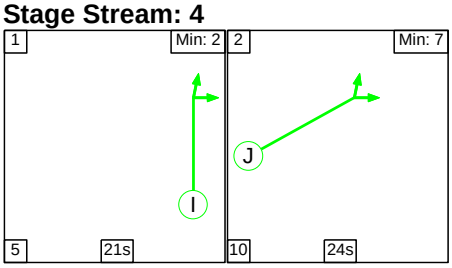
Stage Stream: 2



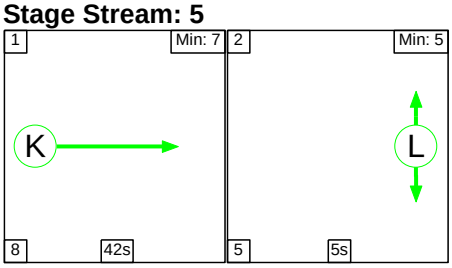
Stage Stream: 3



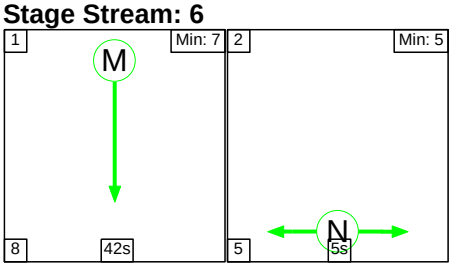
Stage Stream: 4



Stage Stream: 5

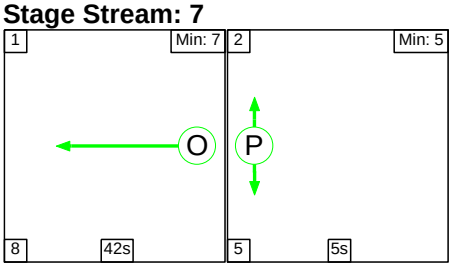


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	20	30
Change Point	0	25

Stage Stream: 2

Stage	1	2
Duration	23	20
Change Point	21	49

Stage Stream: 3

Stage	1	2
Duration	30	15
Change Point	38	13

Stage Stream: 4

Stage	1	2
Duration	21	24
Change Point	23	49

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

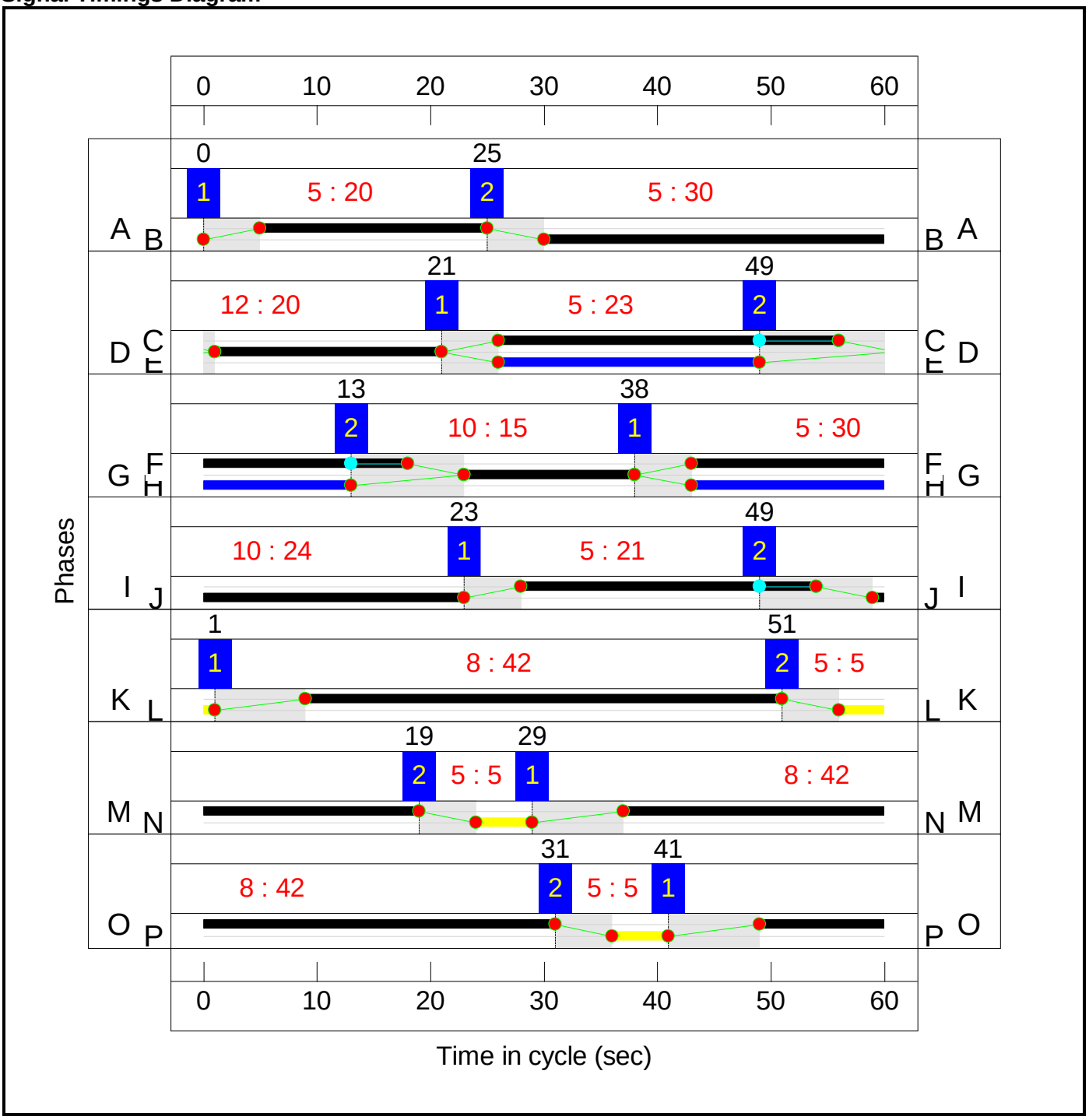
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	29	19

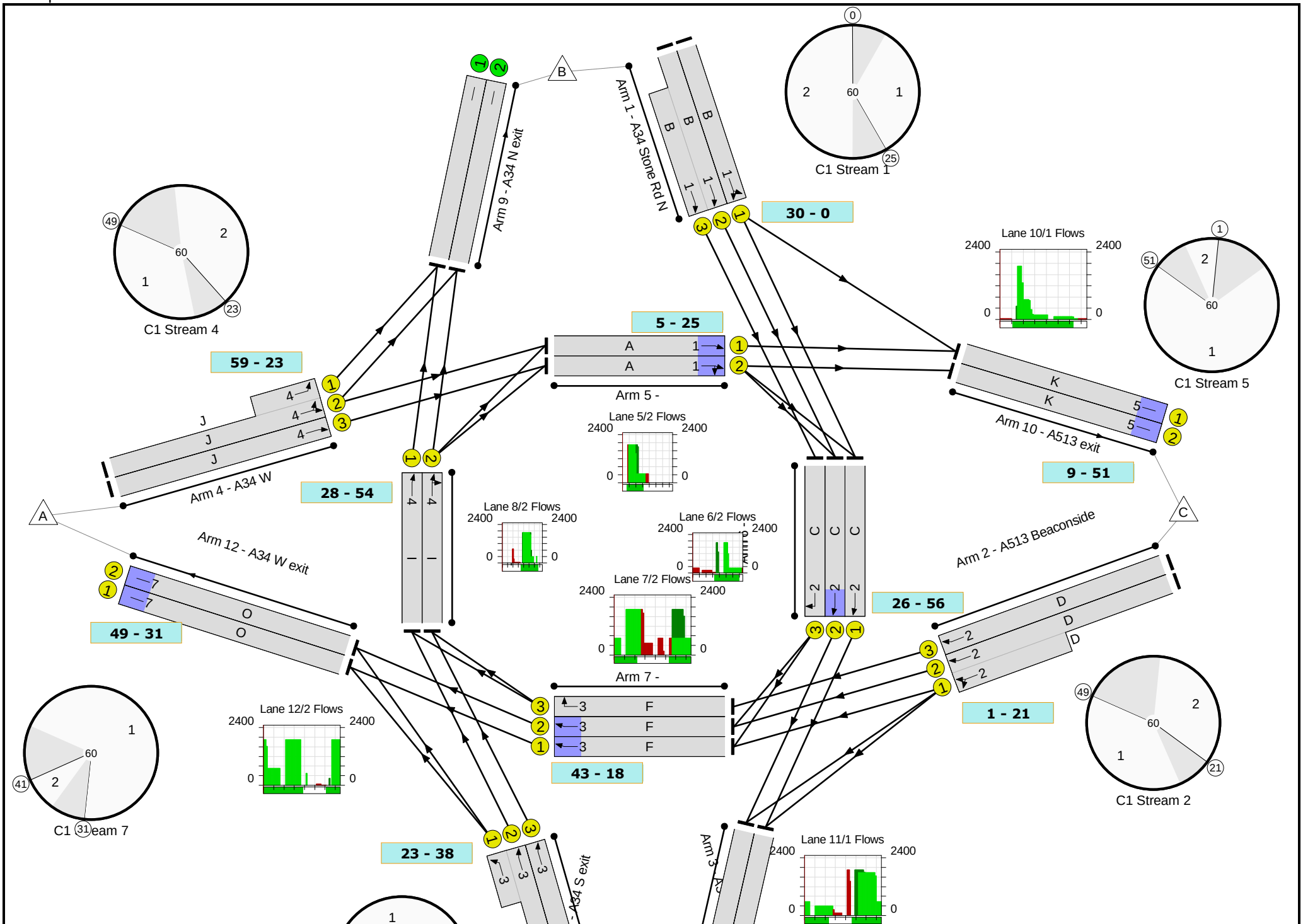
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	41	31

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.7%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.7%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	30	-	615	1900	982	62.6%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	30	-	1137	1900:1900	357+969	85.7 : 85.7%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	20	-	1013	1900:1900	587+604	85.1 : 85.1%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	20	-	103	1900	665	15.5%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	15	-	419	1900:1900	469+50	80.8 : 80.8%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	15	-	405	1900	507	79.9%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	24	-	867	1900:1900	552+554	78.4 : 78.4%
4/3	A34 W Ahead	U	4	N/A	J		1	24	-	445	1900	792	56.2%
5/1	Ahead	U	1	N/A	A		1	20	-	212	1900	665	31.9%
5/2	Right Ahead	U	1	N/A	A		1	20	-	445	1900	665	66.9%
6/1	Ahead	U	2	N/A	C		1	30	-	581	1900	982	59.2%
6/2	Ahead	U	2	N/A	C		1	30	-	346	1900	982	35.2%
6/3	Right	U	2	N/A	C		1	30	-	831	1900	982	84.7%
7/1	Ahead	U	3	N/A	F		1	35	-	772	1900	1140	67.7%
7/2	Ahead	U	3	N/A	F		1	35	-	811	1900	1140	71.1%
7/3	Right	U	3	N/A	F		1	35	-	103	1900	1140	9.0%
8/1	Ahead	U	4	N/A	I		1	26	-	435	1900	855	50.9%
8/2	Right Ahead	U	4	N/A	I		1	26	-	452	1900	855	52.9%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	869	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	673	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	246	1900	1362	18.1%
10/2	A513 exit	U	5	N/A	K		1	42	-	405	1900	1362	29.7%
11/1	A34 S exit	U	6	N/A	M		1	42	-	690	1900	1362	50.7%
11/2	A34 S exit	U	6	N/A	M		1	42	-	498	1900	1362	36.6%
12/1	A34 W exit	U	7	N/A	O		1	42	-	799	1900	1362	58.7%
12/2	A34 W exit	U	7	N/A	O		1	42	-	824	1900	1362	60.5%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**26.1**	**23.8**	**0.0**	**50.0**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**26.1**	**23.8**	**0.0**	**50.0**	**-**	**-**	**-**	**-**
1/1	615	615	-	-	-	1.8	0.8	-	2.6	15.3	7.2	0.8	8.0
1/2+1/3	1137	1137	-	-	-	3.6	2.9	-	6.5	20.6	11.8	2.9	14.7
2/2+2/1	1013	1013	-	-	-	4.9	2.8	-	7.6	27.1	7.6	2.8	10.3
2/3	103	103	-	-	-	0.4	0.1	-	0.5	16.6	1.2	0.1	1.3
3/2+3/1	419	419	-	-	-	2.3	2.0	-	4.4	37.5	6.0	2.0	8.0
3/3	405	405	-	-	-	2.3	1.9	-	4.2	37.6	6.2	1.9	8.1
4/2+4/1	867	867	-	-	-	3.2	1.8	-	5.0	20.7	6.4	1.8	8.2
4/3	445	445	-	-	-	1.6	0.6	-	2.3	18.5	5.6	0.6	6.2
5/1	212	212	-	-	-	0.5	0.2	-	0.7	11.6	1.5	0.2	1.8
5/2	445	445	-	-	-	0.4	1.0	-	1.4	11.3	0.9	1.0	1.9
6/1	581	581	-	-	-	0.6	0.7	-	1.3	8.4	1.5	0.7	2.2
6/2	346	346	-	-	-	0.5	0.3	-	0.7	7.5	1.4	0.3	1.7
6/3	831	831	-	-	-	1.0	2.7	-	3.7	15.9	2.2	2.7	4.9
7/1	772	772	-	-	-	1.0	1.0	-	2.1	9.6	7.1	1.0	8.2
7/2	811	811	-	-	-	1.1	1.2	-	2.3	10.2	4.8	1.2	6.0
7/3	103	103	-	-	-	0.1	0.0	-	0.1	4.7	0.3	0.0	0.3
8/1	435	435	-	-	-	0.2	0.5	-	0.7	6.0	4.8	0.5	5.3
8/2	452	452	-	-	-	0.2	0.6	-	0.7	5.9	7.0	0.6	7.5
9/1	869	869	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	673	673	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	246	246	-	-	-	0.0	0.1	-	0.1	2.0	0.1	0.1	0.2
10/2	405	405	-	-	-	0.0	0.2	-	0.2	1.9	0.0	0.2	0.2
11/1	690	690	-	-	-	0.2	0.5	-	0.7	3.8	1.7	0.5	2.2

Full Input Data And Results

11/2	498	498	-	-	-	0.3	0.3	-	0.5	3.9	1.8	0.3	2.1
12/1	799	799	-	-	-	0.0	0.7	-	0.7	3.3	0.2	0.7	0.9
12/2	824	824	-	-	-	0.0	0.8	-	0.8	3.4	0.1	0.8	0.8

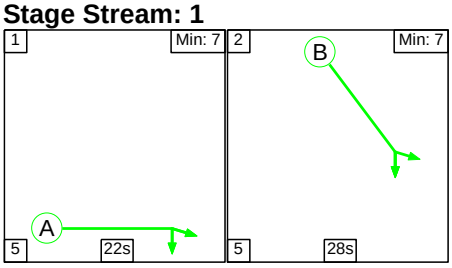
C1	Stream: 1 PRC for Signalled Lanes (%):	5.0	Total Delay for Signalled Lanes (pcuHr):	11.19	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	5.8	Total Delay for Signalled Lanes (pcuHr):	13.84	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	11.4	Total Delay for Signalled Lanes (pcuHr):	13.09	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	14.8	Total Delay for Signalled Lanes (pcuHr):	8.73	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	202.6	Total Delay for Signalled Lanes (pcuHr):	0.34	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	77.6	Total Delay for Signalled Lanes (pcuHr):	1.28	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	48.7	Total Delay for Signalled Lanes (pcuHr):	1.50	Cycle Time (s):	60
	PRC Over All Lanes (%):	5.0	Total Delay Over All Lanes(pcuHr):	49.98		

Full Input Data And Results

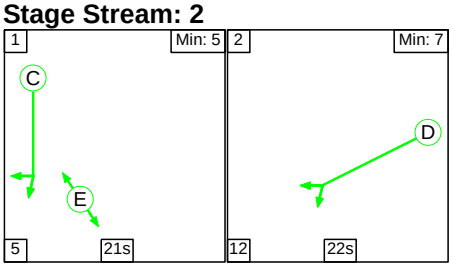
Scenario 6: '2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi' (FG20: '2040 + PAH + Dev (1m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Stage Sequence Diagram

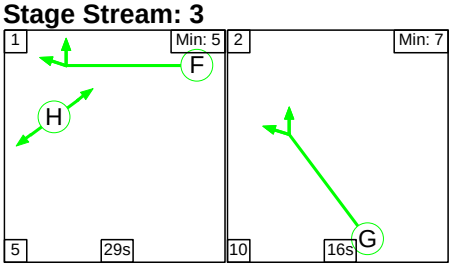
Stage Stream: 1



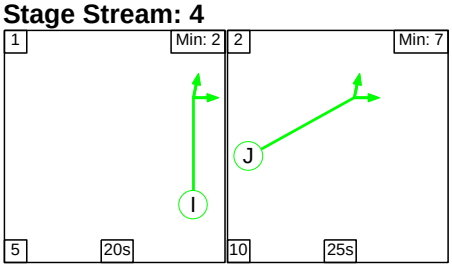
Stage Stream: 2



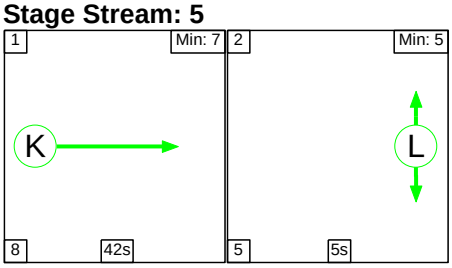
Stage Stream: 3



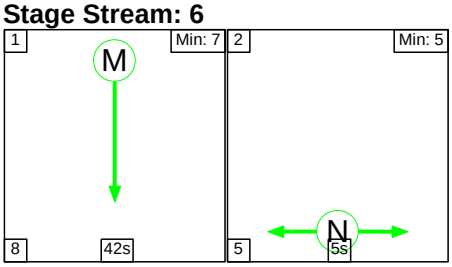
Stage Stream: 4



Stage Stream: 5

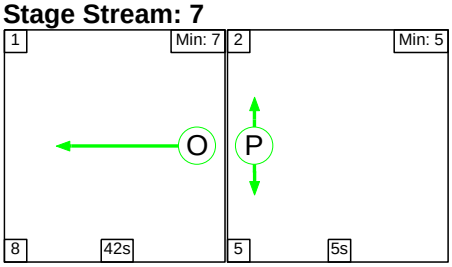


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	22	28
Change Point	0	27

Stage Stream: 2

Stage	1	2
Duration	21	22
Change Point	26	52

Stage Stream: 3

Stage	1	2
Duration	29	16
Change Point	40	14

Stage Stream: 4

Stage	1	2
Duration	20	25
Change Point	24	49

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

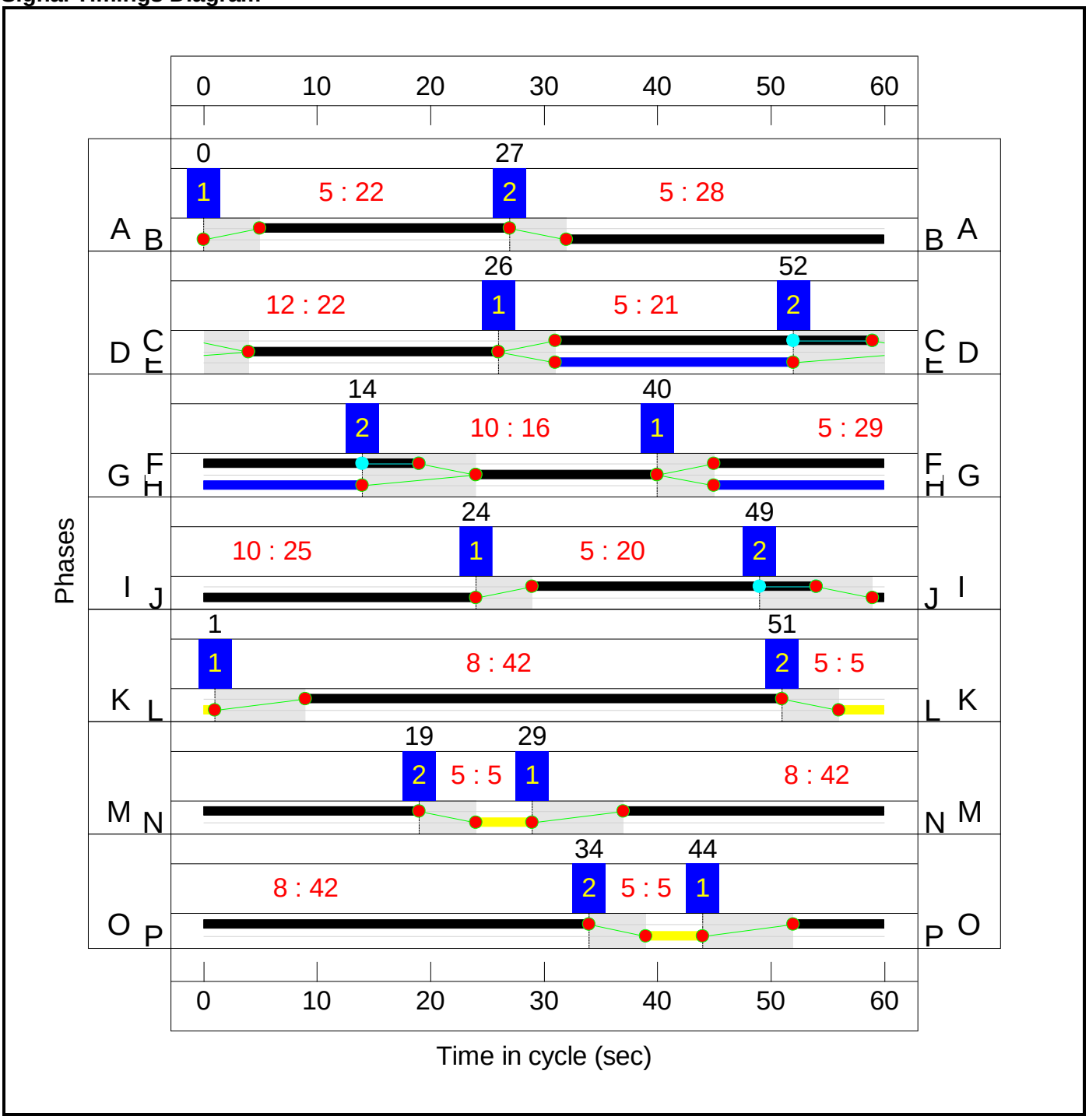
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	29	19

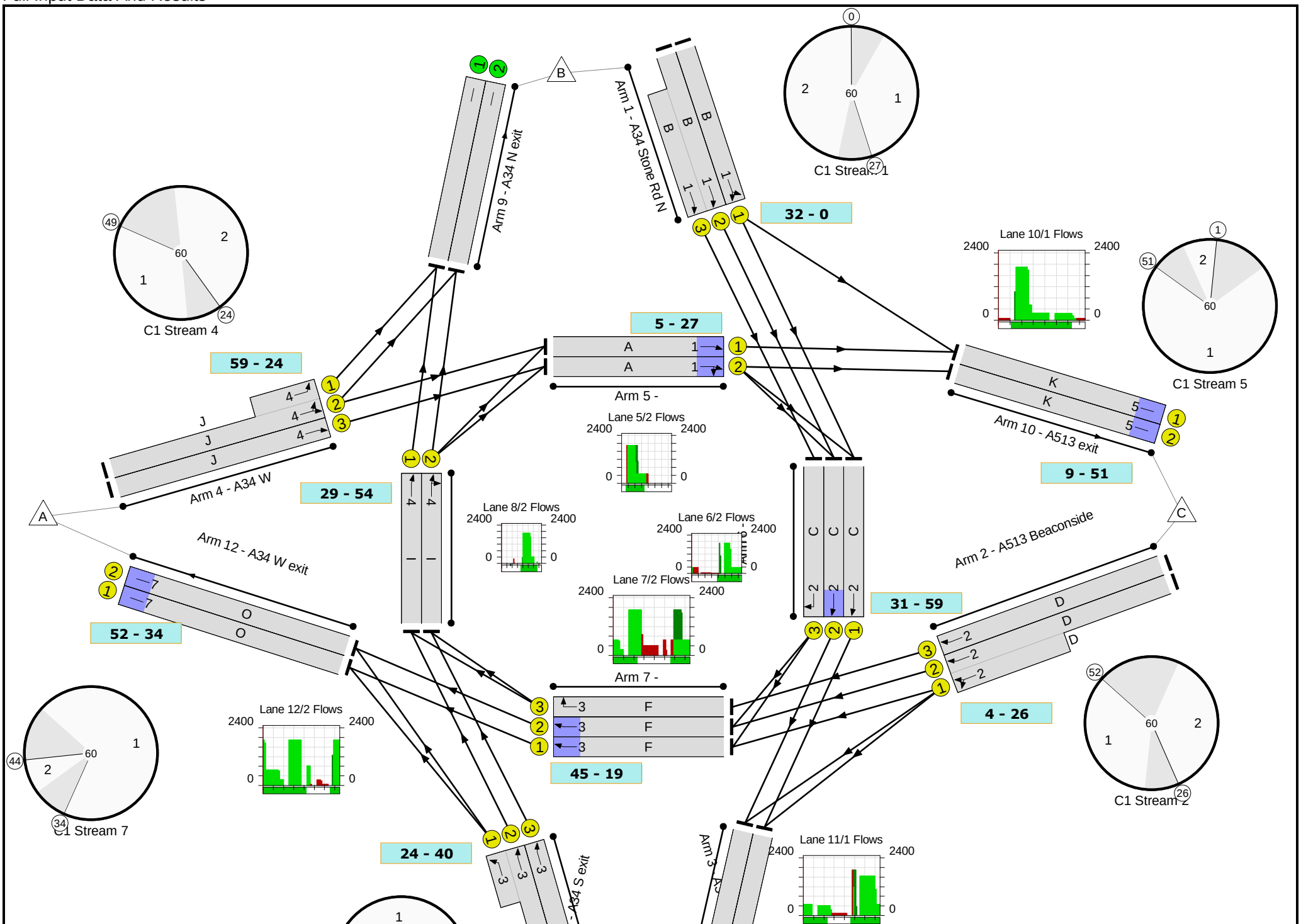
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	44	34

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.9%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.9%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	28	-	547	1900	918	59.6%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	28	-	1123	1900:1900	470+918	80.9 : 80.9%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	22	-	834	1900:1900	627+636	66.1 : 66.1%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	22	-	51	1900	728	7.0%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	16	-	500	1900:1900	443+179	80.4 : 80.4%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	16	-	410	1900	538	76.2%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	25	-	905	1900:1900	569+568	79.5 : 79.5%
4/3	A34 W Ahead	U	4	N/A	J		1	25	-	477	1900	823	57.9%
5/1	Ahead	U	1	N/A	A		1	22	-	355	1900	728	48.7%
5/2	Right Ahead	U	1	N/A	A		1	22	-	478	1900	728	65.6%
6/1	Ahead	U	2	N/A	C		1	28	-	478	1900	918	52.1%
6/2	Ahead	U	2	N/A	C		1	28	-	392	1900	918	42.7%
6/3	Right	U	2	N/A	C		1	28	-	743	1900	918	80.9%
7/1	Ahead	U	3	N/A	F		1	34	-	647	1900	1108	58.4%
7/2	Ahead	U	3	N/A	F		1	34	-	667	1900	1108	60.2%
7/3	Right	U	3	N/A	F		1	34	-	51	1900	1108	4.6%
8/1	Ahead	U	4	N/A	I		1	25	-	399	1900	823	48.5%
8/2	Right Ahead	U	4	N/A	I		1	25	-	418	1900	823	50.8%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	851	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	428	1900	1362	31.4%
10/2	A513 exit	U	5	N/A	K		1	42	-	462	1900	1362	33.9%
11/1	A34 S exit	U	6	N/A	M		1	42	-	569	1900	1362	41.8%
11/2	A34 S exit	U	6	N/A	M		1	42	-	564	1900	1362	41.4%
12/1	A34 W exit	U	7	N/A	O		1	42	-	729	1900	1362	53.5%
12/2	A34 W exit	U	7	N/A	O		1	42	-	729	1900	1362	53.5%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**23.1**	**19.2**	**0.0**	**42.3**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**23.1**	**19.2**	**0.0**	**42.3**	**-**	**-**	**-**	**-**
1/1	547	547	-	-	-	1.7	0.7	-	2.4	16.1	6.5	0.7	7.3
1/2+1/3	1123	1123	-	-	-	3.8	2.1	-	5.9	18.8	10.3	2.1	12.4
2/2+2/1	834	834	-	-	-	3.4	1.0	-	4.4	18.8	5.5	1.0	6.5
2/3	51	51	-	-	-	0.2	0.0	-	0.2	14.4	0.5	0.0	0.6
3/2+3/1	500	500	-	-	-	2.6	2.0	-	4.6	33.0	5.9	2.0	7.9
3/3	410	410	-	-	-	2.2	1.6	-	3.8	33.3	6.2	1.6	7.7
4/2+4/1	905	905	-	-	-	3.2	1.9	-	5.1	20.3	6.8	1.9	8.7
4/3	477	477	-	-	-	1.7	0.7	-	2.4	18.0	6.0	0.7	6.6
5/1	355	355	-	-	-	0.8	0.5	-	1.3	13.1	3.8	0.5	4.3
5/2	478	478	-	-	-	0.3	0.9	-	1.3	9.6	0.8	0.9	1.8
6/1	478	478	-	-	-	0.4	0.5	-	0.9	7.1	0.9	0.5	1.4
6/2	392	392	-	-	-	0.4	0.4	-	0.7	6.7	0.8	0.4	1.2
6/3	743	743	-	-	-	0.6	2.1	-	2.7	13.0	1.2	2.1	3.3
7/1	647	647	-	-	-	0.5	0.7	-	1.2	6.8	4.9	0.7	5.6
7/2	667	667	-	-	-	0.7	0.8	-	1.5	7.9	3.5	0.8	4.2
7/3	51	51	-	-	-	0.1	0.0	-	0.1	5.8	0.2	0.0	0.2
8/1	399	399	-	-	-	0.1	0.5	-	0.6	5.3	4.3	0.5	4.7
8/2	418	418	-	-	-	0.0	0.5	-	0.5	4.6	0.1	0.5	0.6
9/1	851	851	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	515	515	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	428	428	-	-	-	0.0	0.2	-	0.3	2.3	0.3	0.2	0.5
10/2	462	462	-	-	-	0.0	0.3	-	0.3	2.0	0.0	0.3	0.3
11/1	569	569	-	-	-	0.1	0.4	-	0.4	2.8	0.8	0.4	1.2

Full Input Data And Results

11/2	564	564	-	-	-	0.1	0.4	-	0.5	3.1	1.4	0.4	1.8
12/1	729	729	-	-	-	0.1	0.6	-	0.7	3.2	0.5	0.6	1.0
12/2	729	729	-	-	-	0.1	0.6	-	0.6	3.1	0.4	0.6	0.9

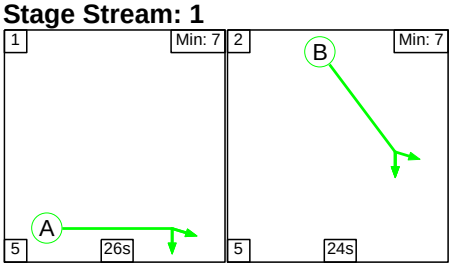
C1	Stream: 1	PRC for Signalled Lanes (%):	11.2	Total Delay for Signalled Lanes (pcuHr):	10.86	Cycle Time (s):	60	
C1	Stream: 2	PRC for Signalled Lanes (%):	11.2	Total Delay for Signalled Lanes (pcuHr):	8.90	Cycle Time (s):	60	
C1	Stream: 3	PRC for Signalled Lanes (%):	12.0	Total Delay for Signalled Lanes (pcuHr):	11.15	Cycle Time (s):	60	
C1	Stream: 4	PRC for Signalled Lanes (%):	13.1	Total Delay for Signalled Lanes (pcuHr):	8.61	Cycle Time (s):	60	
C1	Stream: 5	PRC for Signalled Lanes (%):	165.3	Total Delay for Signalled Lanes (pcuHr):	0.54	Cycle Time (s):	60	
C1	Stream: 6	PRC for Signalled Lanes (%):	115.4	Total Delay for Signalled Lanes (pcuHr):	0.93	Cycle Time (s):	60	
C1	Stream: 7	PRC for Signalled Lanes (%):	68.1	Total Delay for Signalled Lanes (pcuHr):	1.28	Cycle Time (s):	60	
		PRC Over All Lanes (%):	11.2	Total Delay Over All Lanes(pcuHr):	42.27			

Full Input Data And Results

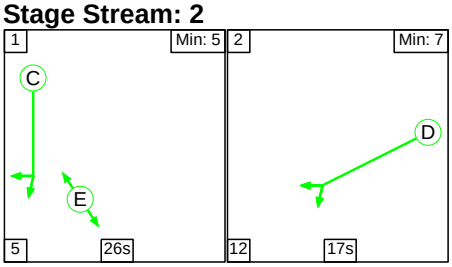
Scenario 7: '2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi' (FG21: '2040 + PAH + Dev (1.7m) AM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Stage Sequence Diagram

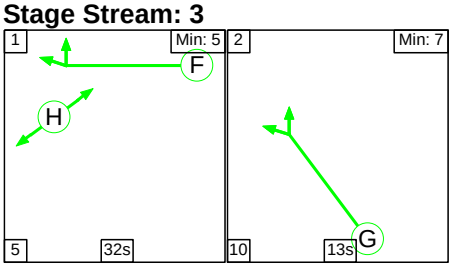
Stage Stream: 1



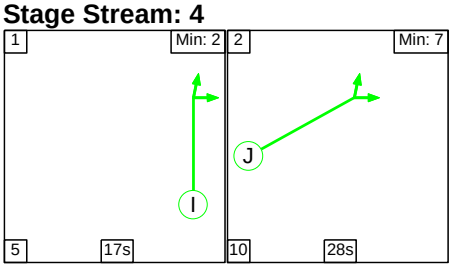
Stage Stream: 2



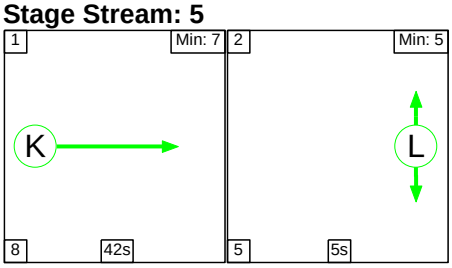
Stage Stream: 3



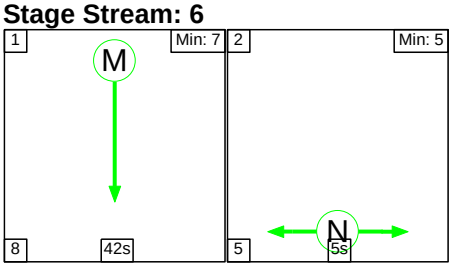
Stage Stream: 4



Stage Stream: 5

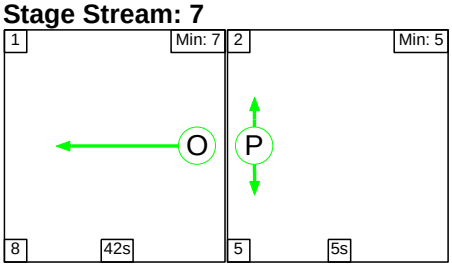


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	26	24
Change Point	0	31

Stage Stream: 2

Stage	1	2
Duration	26	17
Change Point	36	7

Stage Stream: 3

Stage	1	2
Duration	32	13
Change Point	16	53

Stage Stream: 4

Stage	1	2
Duration	17	28
Change Point	49	11

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	46	36

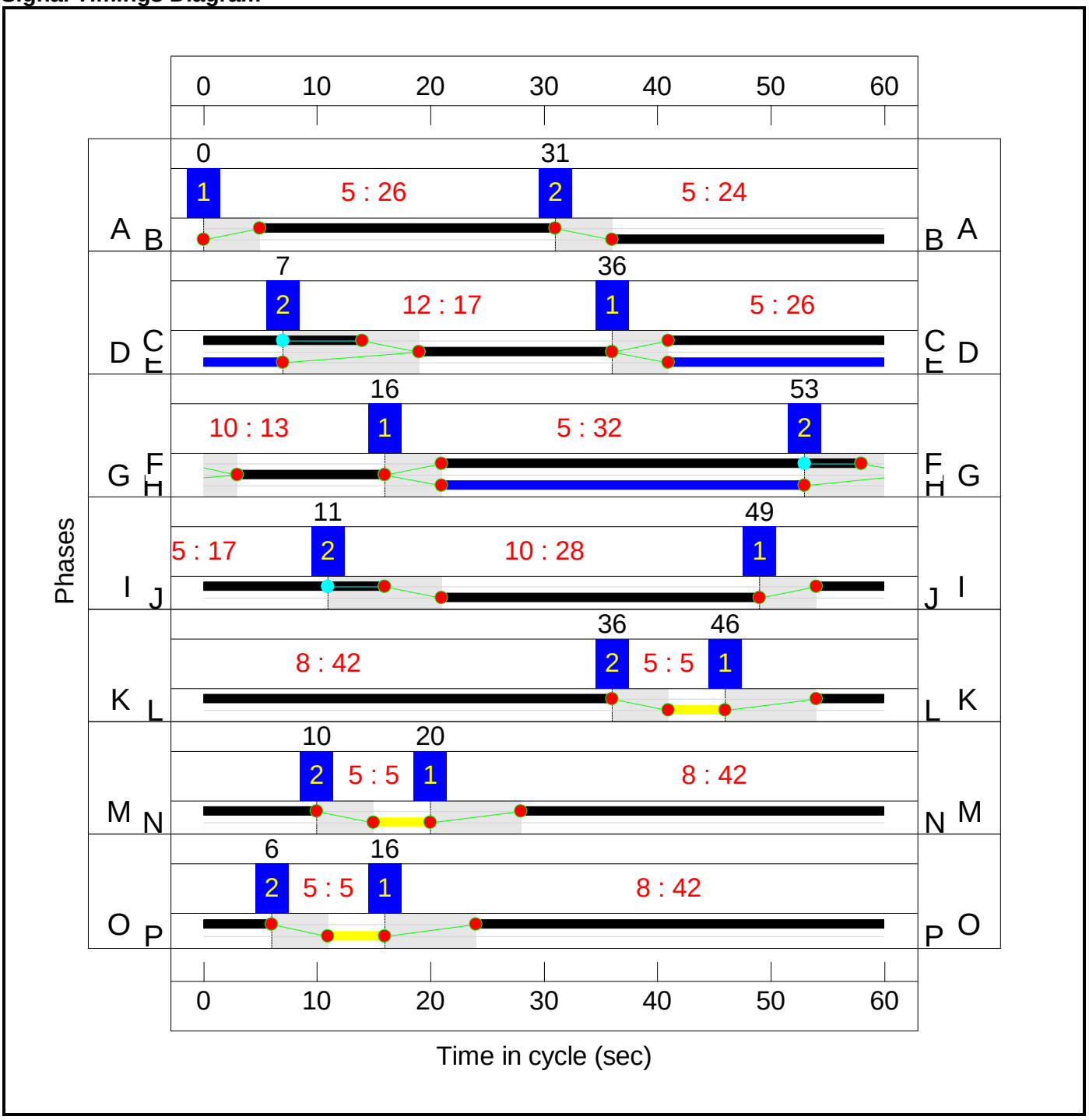
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	20	10

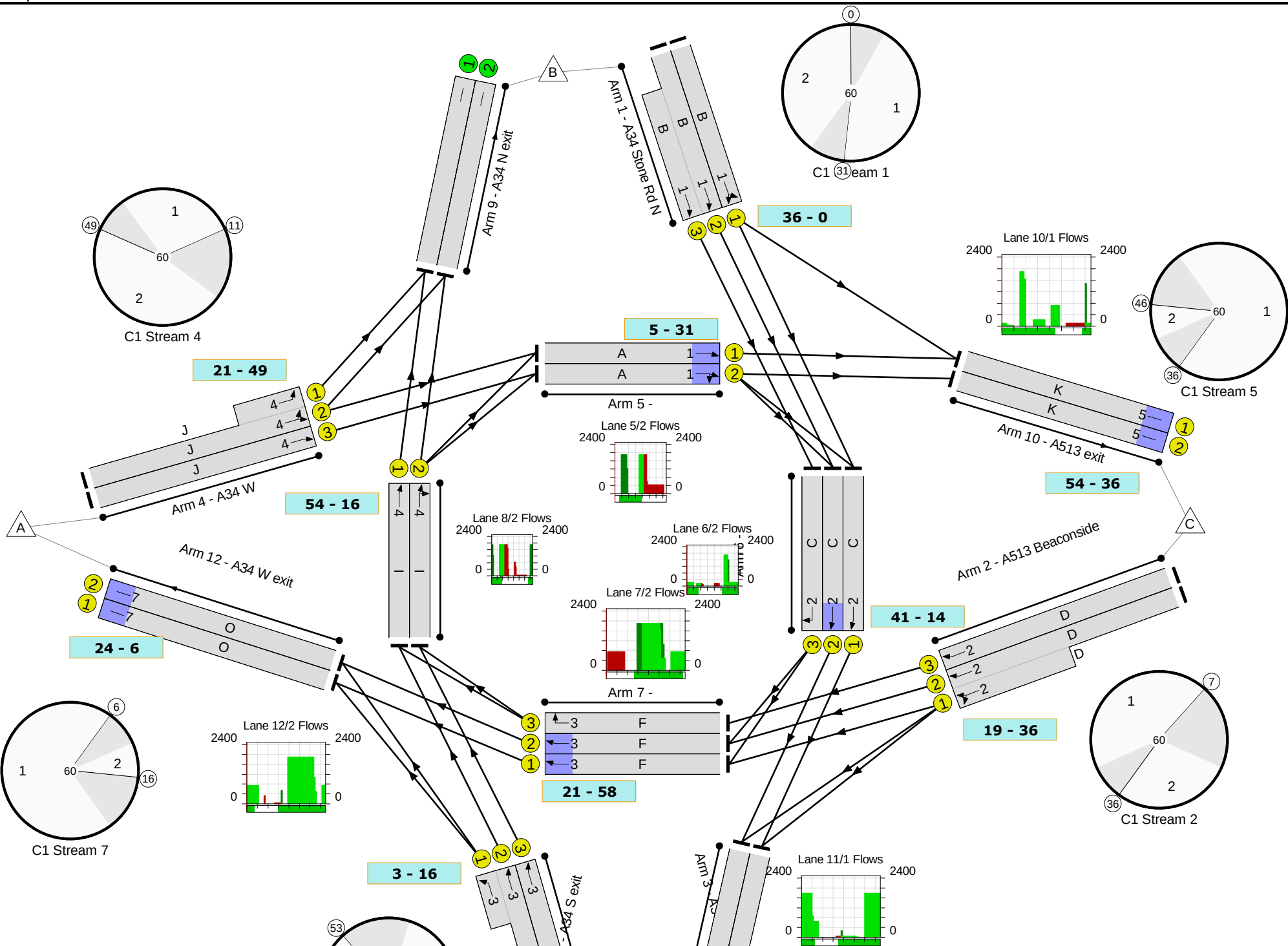
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	16	6

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	-	-	**N/A**	-	-		-	-	-	-	-	-	**108.3%**
Redhill Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**108.3%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	24	-	695	1900	792	87.8%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	24	-	1095	1900:1900	220+792	108.3 : 108.3%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	17	-	1013	1900:1900	534+556	93.0 : 93.0%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	17	-	113	1900	570	19.8%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	13	-	427	1900:1900	412+43	93.9 : 93.9%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	13	-	415	1900	443	93.6%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	28	-	919	1900:1900	617+616	74.6 : 74.6%
4/3	A34 W Ahead	U	4	N/A	J		1	28	-	432	1900	918	47.0%
5/1	Ahead	U	1	N/A	A		1	26	-	225	1900	855	26.3%
5/2	Right Ahead	U	1	N/A	A		1	26	-	432	1900	855	50.5%
6/1	Ahead	U	2	N/A	C		1	33	-	656	1900	1077	60.9%
6/2	Ahead	U	2	N/A	C		1	33	-	278	1900	1077	25.8%
6/3	Right	U	2	N/A	C		1	33	-	857	1900	1077	73.5%
7/1	Ahead	U	3	N/A	F		1	37	-	773	1900	1203	61.0%
7/2	Ahead	U	3	N/A	F		1	37	-	836	1900	1203	67.3%
7/3	Right	U	3	N/A	F		1	37	-	113	1900	1203	9.4%
8/1	Ahead	U	4	N/A	I		1	22	-	451	1900	728	61.9%
8/2	Right Ahead	U	4	N/A	I		1	22	-	464	1900	728	63.7%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	910	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	699	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	264	1900	1362	19.4%
10/2	A513 exit	U	5	N/A	K		1	42	-	392	1900	1362	28.8%
11/1	A34 S exit	U	6	N/A	M		1	42	-	671	1900	1362	49.3%
11/2	A34 S exit	U	6	N/A	M		1	42	-	524	1900	1362	38.5%
12/1	A34 W exit	U	7	N/A	O		1	42	-	804	1900	1362	56.2%
12/2	A34 W exit	U	7	N/A	O		1	42	-	845	1900	1362	60.2%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**34.1**	**78.5**	**0.0**	**112.6**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**34.1**	**78.5**	**0.0**	**112.6**	**-**	**-**	**-**	**-**
1/1	695	695	-	-	-	3.1	3.4	-	6.5	33.5	10.6	3.4	14.0
1/2+1/3	1095	1030	-	-	-	6.2	47.5	-	53.7	176.6	14.7	47.5	62.2
2/2+2/1	1013	1013	-	-	-	5.6	5.7	-	11.4	40.5	8.2	5.7	13.9
2/3	113	113	-	-	-	0.5	0.1	-	0.6	19.6	1.4	0.1	1.5
3/2+3/1	427	427	-	-	-	2.6	5.5	-	8.1	68.6	6.5	5.5	12.0
3/3	415	415	-	-	-	2.6	5.3	-	7.9	68.7	6.7	5.3	12.0
4/2+4/1	919	919	-	-	-	2.7	1.5	-	4.1	16.3	5.5	1.5	7.0
4/3	432	432	-	-	-	1.2	0.4	-	1.7	14.1	4.8	0.4	5.2
5/1	225	225	-	-	-	0.8	0.2	-	1.0	15.6	2.0	0.2	2.2
5/2	432	432	-	-	-	1.9	0.5	-	2.4	20.2	4.0	0.5	4.5
6/1	656	656	-	-	-	0.0	0.8	-	0.8	4.3	0.0	0.8	0.8
6/2	278	278	-	-	-	0.1	0.2	-	0.3	3.6	0.4	0.2	0.5
6/3	792	792	-	-	-	0.0	1.4	-	1.4	6.3	0.0	1.4	1.4
7/1	734	734	-	-	-	1.4	0.8	-	2.2	10.7	5.4	0.8	6.2
7/2	810	810	-	-	-	1.0	1.0	-	2.0	8.9	3.2	1.0	4.3
7/3	113	113	-	-	-	0.0	0.1	-	0.1	1.7	0.0	0.1	0.1
8/1	451	451	-	-	-	1.9	0.8	-	2.8	22.0	3.5	0.8	4.3
8/2	464	464	-	-	-	2.0	0.9	-	2.9	22.3	3.5	0.9	4.4
9/1	910	910	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	699	699	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	264	264	-	-	-	0.0	0.1	-	0.2	2.3	0.4	0.1	0.5
10/2	392	392	-	-	-	0.0	0.2	-	0.2	1.9	0.0	0.2	0.2
11/1	671	671	-	-	-	0.0	0.5	-	0.5	2.6	0.1	0.5	0.5

Full Input Data And Results

11/2	524	524	-	-	-	0.1	0.3	-	0.5	3.1	2.1	0.3	2.4
12/1	765	765	-	-	-	0.1	0.6	-	0.7	3.4	0.5	0.6	1.1
12/2	819	819	-	-	-	0.0	0.8	-	0.8	3.4	0.1	0.8	0.9

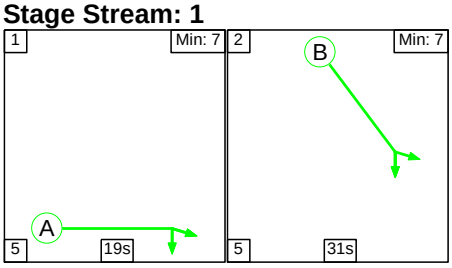
C1	Stream: 1 PRC for Signalled Lanes (%):	-20.3	Total Delay for Signalled Lanes (pcuHr):	63.58	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	-3.3	Total Delay for Signalled Lanes (pcuHr):	14.43	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	-4.3	Total Delay for Signalled Lanes (pcuHr):	20.29	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	20.7	Total Delay for Signalled Lanes (pcuHr):	11.47	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	212.6	Total Delay for Signalled Lanes (pcuHr):	0.37	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	82.6	Total Delay for Signalled Lanes (pcuHr):	0.94	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	49.6	Total Delay for Signalled Lanes (pcuHr):	1.49	Cycle Time (s):	60
	PRC Over All Lanes (%):	-20.3	Total Delay Over All Lanes(pcuHr):	112.56		

Full Input Data And Results

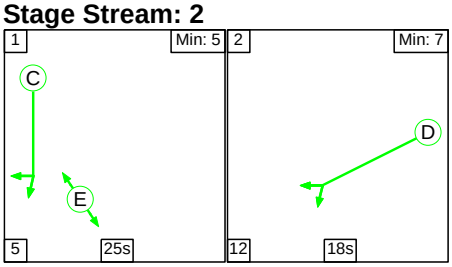
Scenario 8: '2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi' (FG22: '2040 + PAH + Dev (1.7m) PM_A513 Light Vehs through Resi', Plan 1: 'Peds')

Stage Sequence Diagram

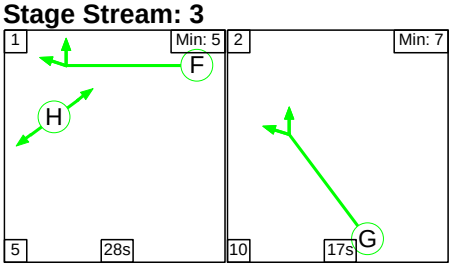
Stage Stream: 1



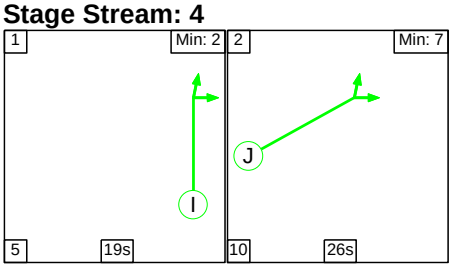
Stage Stream: 2



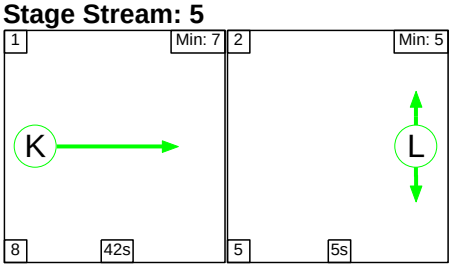
Stage Stream: 3



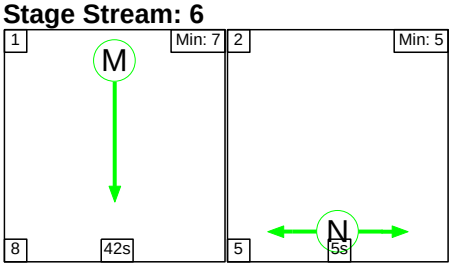
Stage Stream: 4



Stage Stream: 5

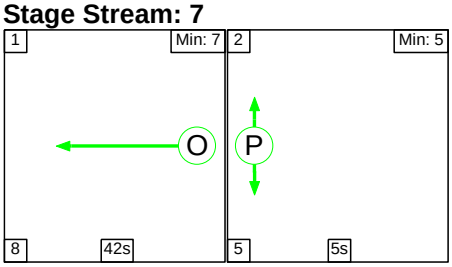


Stage Stream: 6



Full Input Data And Results

Stage Stream: 7



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	19	31
Change Point	0	24

Stage Stream: 2

Stage	1	2
Duration	25	18
Change Point	21	51

Stage Stream: 3

Stage	1	2
Duration	28	17
Change Point	43	16

Stage Stream: 4

Stage	1	2
Duration	19	26
Change Point	26	50

Stage Stream: 5

Stage	1	2
Duration	42	5
Change Point	1	51

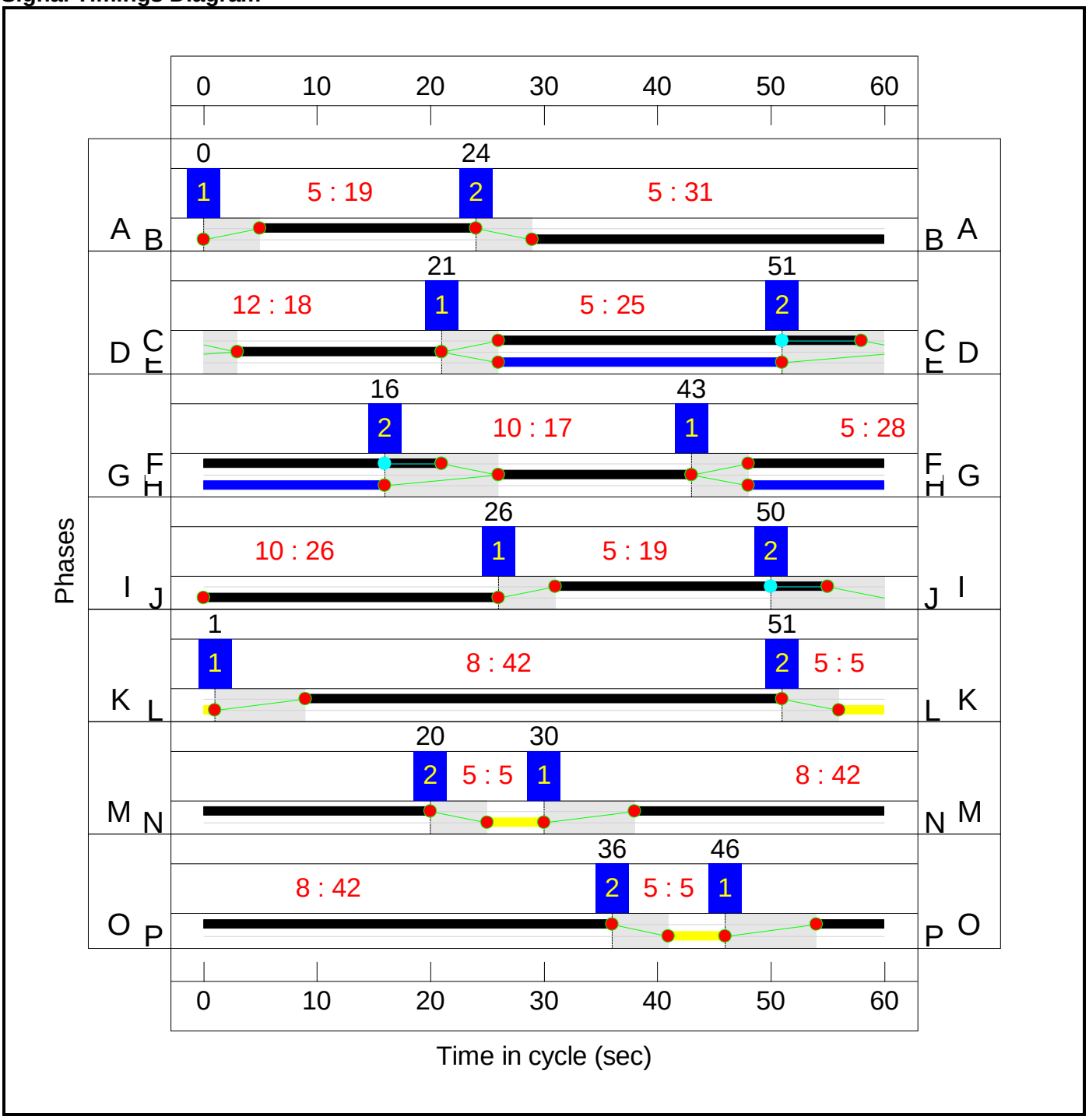
Stage Stream: 6

Stage	1	2
Duration	42	5
Change Point	30	20

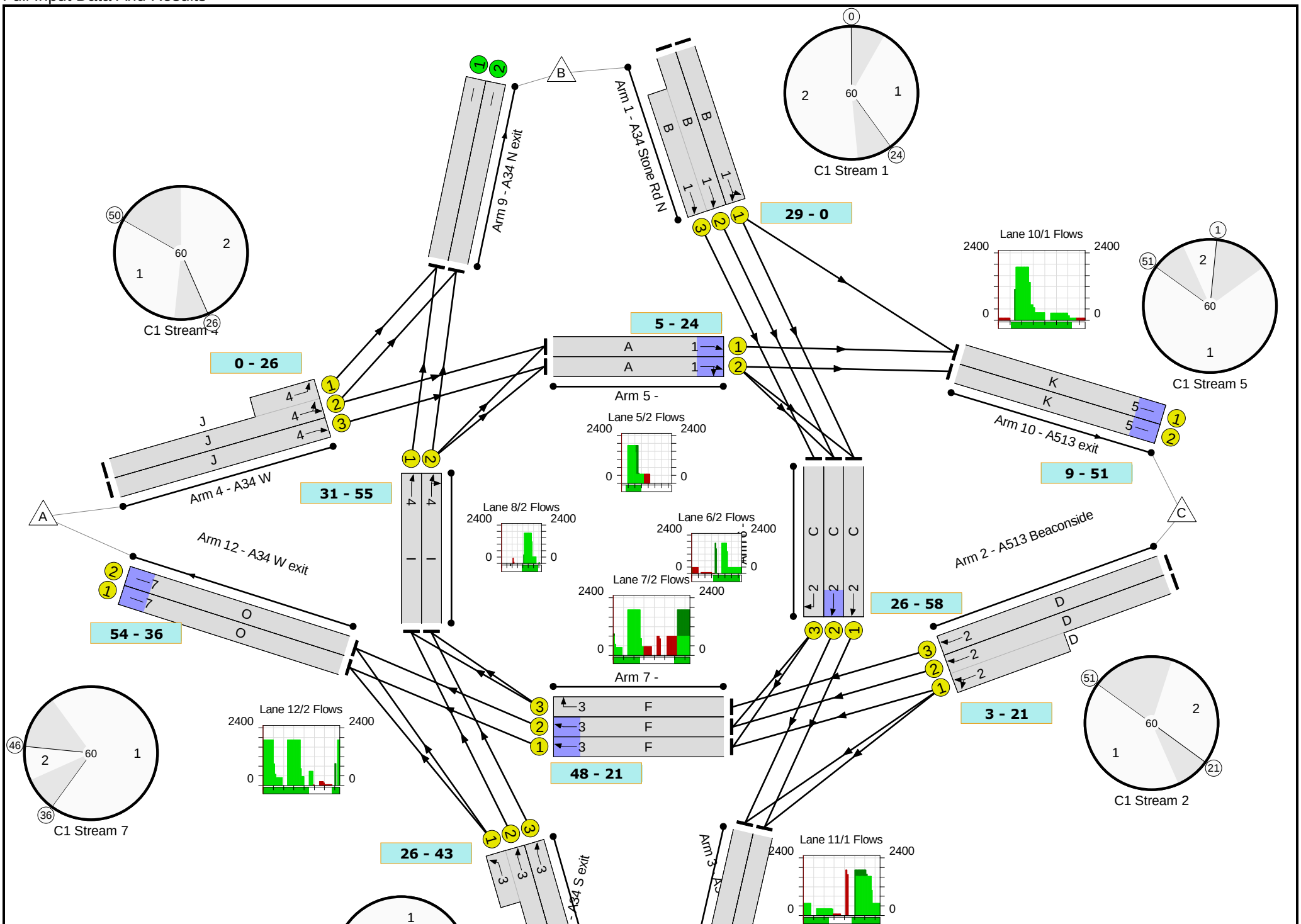
Stage Stream: 7

Stage	1	2
Duration	42	5
Change Point	46	36

Signal Timings Diagram



Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.3%**
Redhill Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.3%**
1/1	A34 Stone Rd N Ahead Left	U	1	N/A	B		1	31	-	586	1900	1013	57.8%
1/2+1/3	A34 Stone Rd N Ahead	U	1	N/A	B		1	31	-	1140	1900:1900	464+986	78.6 : 78.6%
2/2+2/1	A513 Beaconside Ahead Left	U	2	N/A	D		1	18	-	834	1900:1900	479+575	79.2 : 79.2%
2/3	A513 Beaconside Ahead	U	2	N/A	D		1	18	-	56	1900	602	9.3%
3/2+3/1	A34 Stone Rd S Ahead Left	U	3	N/A	G		1	17	-	503	1900:1900	466+187	77.0 : 77.0%
3/3	A34 Stone Rd S Ahead	U	3	N/A	G		1	17	-	412	1900	570	72.3%
4/2+4/1	A34 W Ahead Left	U	4	N/A	J		1	26	-	939	1900:1900	585+584	80.3 : 80.3%
4/3	A34 W Ahead	U	4	N/A	J		1	26	-	467	1900	855	54.6%
5/1	Ahead	U	1	N/A	A		1	19	-	366	1900	633	57.8%
5/2	Right Ahead	U	1	N/A	A		1	19	-	467	1900	633	73.7%
6/1	Ahead	U	2	N/A	C		1	32	-	508	1900	1045	48.6%
6/2	Ahead	U	2	N/A	C		1	32	-	380	1900	1045	36.4%
6/3	Right	U	2	N/A	C		1	32	-	775	1900	1045	74.2%
7/1	Ahead	U	3	N/A	F		1	33	-	638	1900	1077	59.3%
7/2	Ahead	U	3	N/A	F		1	33	-	708	1900	1077	65.8%
7/3	Right	U	3	N/A	F		1	33	-	56	1900	1077	5.2%
8/1	Ahead	U	4	N/A	I		1	24	-	405	1900	792	51.2%
8/2	Right Ahead	U	4	N/A	I		1	24	-	422	1900	792	53.3%

Full Input Data And Results

9/1	A34 N exit	U	N/A	N/A	-		-	-	-	874	Inf	Inf	0.0%
9/2	A34 N exit	U	N/A	N/A	-		-	-	-	526	Inf	Inf	0.0%
10/1	A513 exit	U	5	N/A	K		1	42	-	445	1900	1362	32.7%
10/2	A513 exit	U	5	N/A	K		1	42	-	451	1900	1362	33.1%
11/1	A34 S exit	U	6	N/A	M		1	42	-	578	1900	1362	42.4%
11/2	A34 S exit	U	6	N/A	M		1	42	-	573	1900	1362	42.1%
12/1	A34 W exit	U	7	N/A	O		1	42	-	737	1900	1362	54.1%
12/2	A34 W exit	U	7	N/A	O		1	42	-	753	1900	1362	55.3%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Redhill Roundabout (Committed Proposed Layout)	**-**	**-**	**0**	**0**	**0**	**24.3**	**19.4**	**0.0**	**43.7**	**-**	**-**	**-**	**-**
Redhill Roundabout	**-**	**-**	**0**	**0**	**0**	**24.3**	**19.4**	**0.0**	**43.7**	**-**	**-**	**-**	**-**
1/1	586	586	-	-	-	1.5	0.7	-	2.2	13.7	6.5	0.7	7.2
1/2+1/3	1140	1140	-	-	-	3.2	1.8	-	5.0	15.8	10.1	1.8	11.9
2/2+2/1	834	834	-	-	-	4.2	1.9	-	6.0	26.1	6.7	1.9	8.6
2/3	56	56	-	-	-	0.2	0.1	-	0.3	17.8	0.7	0.1	0.7
3/2+3/1	503	503	-	-	-	2.5	1.6	-	4.1	29.6	5.8	1.6	7.4
3/3	412	412	-	-	-	2.1	1.3	-	3.4	30.0	6.1	1.3	7.3
4/2+4/1	939	939	-	-	-	3.2	2.0	-	5.2	19.8	7.1	2.0	9.1
4/3	467	467	-	-	-	1.6	0.6	-	2.2	16.7	5.6	0.6	6.2
5/1	366	366	-	-	-	1.0	0.7	-	1.7	16.7	3.9	0.7	4.6
5/2	467	467	-	-	-	0.7	1.4	-	2.1	16.3	0.9	1.4	2.3
6/1	508	508	-	-	-	0.4	0.5	-	0.9	6.2	1.0	0.5	1.5
6/2	380	380	-	-	-	0.3	0.3	-	0.6	5.9	0.9	0.3	1.2
6/3	775	775	-	-	-	0.6	1.4	-	2.0	9.5	1.5	1.4	2.9
7/1	638	638	-	-	-	1.0	0.7	-	1.7	9.5	7.3	0.7	8.0
7/2	708	708	-	-	-	0.8	1.0	-	1.7	8.8	4.9	1.0	5.8
7/3	56	56	-	-	-	0.0	0.0	-	0.1	4.1	0.1	0.0	0.1
8/1	405	405	-	-	-	0.2	0.5	-	0.7	6.3	4.4	0.5	4.9
8/2	422	422	-	-	-	0.0	0.6	-	0.6	5.2	0.2	0.6	0.7
9/1	874	874	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	526	526	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	445	445	-	-	-	0.1	0.2	-	0.3	2.4	0.3	0.2	0.5
10/2	451	451	-	-	-	0.0	0.2	-	0.2	2.0	0.0	0.2	0.2
11/1	578	578	-	-	-	0.2	0.4	-	0.6	3.4	1.6	0.4	1.9

Full Input Data And Results

11/2	573	573	-	-	-	0.3	0.4	-	0.6	4.1	1.8	0.4	2.2
12/1	737	737	-	-	-	0.1	0.6	-	0.7	3.3	0.6	0.6	1.2
12/2	753	753	-	-	-	0.0	0.6	-	0.7	3.1	0.3	0.6	0.9

C1	Stream: 1 PRC for Signalled Lanes (%):	14.5	Total Delay for Signalled Lanes (pcuHr):	11.04	Cycle Time (s):	60
C1	Stream: 2 PRC for Signalled Lanes (%):	13.6	Total Delay for Signalled Lanes (pcuHr):	9.86	Cycle Time (s):	60
C1	Stream: 3 PRC for Signalled Lanes (%):	16.8	Total Delay for Signalled Lanes (pcuHr):	11.05	Cycle Time (s):	60
C1	Stream: 4 PRC for Signalled Lanes (%):	12.1	Total Delay for Signalled Lanes (pcuHr):	8.63	Cycle Time (s):	60
C1	Stream: 5 PRC for Signalled Lanes (%):	171.7	Total Delay for Signalled Lanes (pcuHr):	0.54	Cycle Time (s):	60
C1	Stream: 6 PRC for Signalled Lanes (%):	112.0	Total Delay for Signalled Lanes (pcuHr):	1.20	Cycle Time (s):	60
C1	Stream: 7 PRC for Signalled Lanes (%):	62.7	Total Delay for Signalled Lanes (pcuHr):	1.33	Cycle Time (s):	60
	PRC Over All Lanes (%):	12.1	Total Delay Over All Lanes(pcuHr):	43.67		

APPENDIX G: 2012 Traffic Flow Extracts

waterman

Walton Hill, Stone

Addendum Transport Assessment

February 2013

Waterman Transport & Development Limited

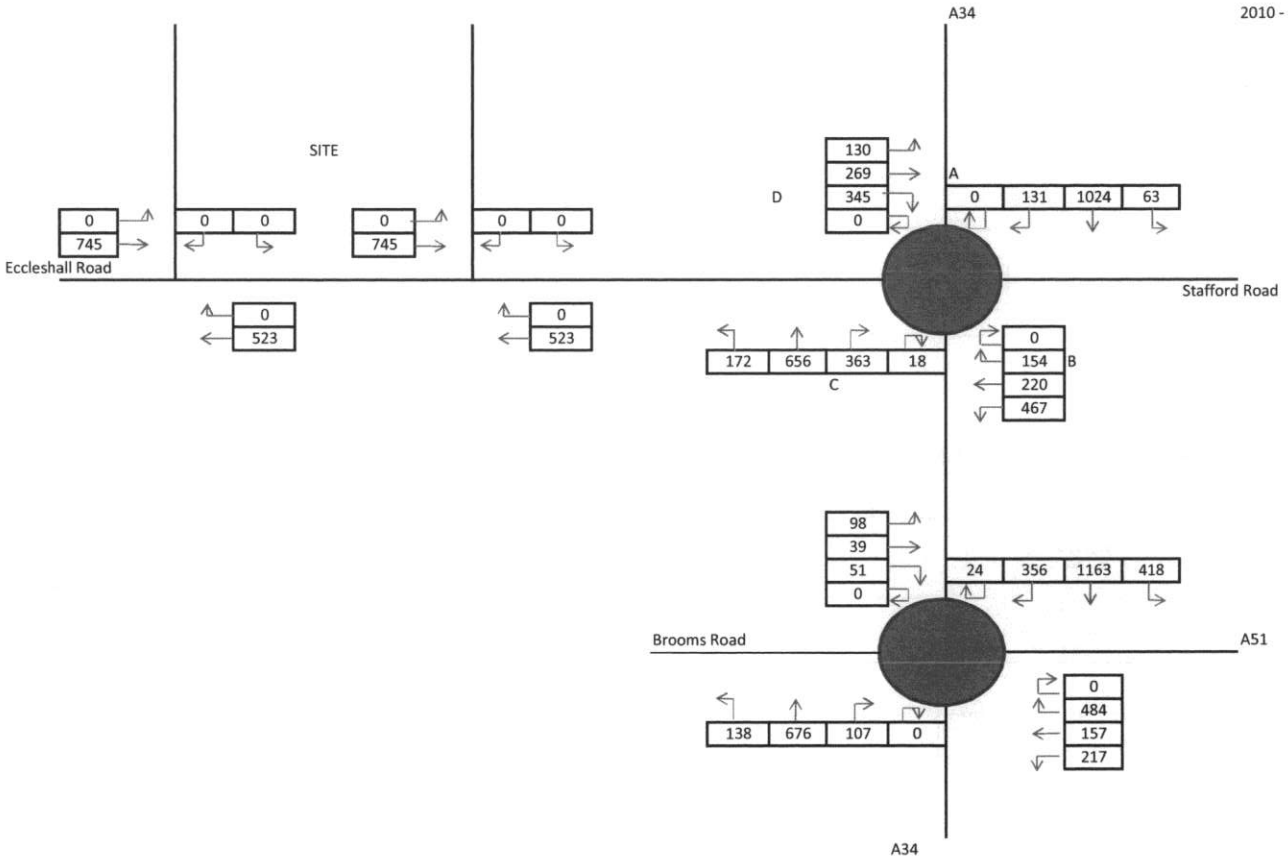
[redacted]

60 years of INNOVATION 2012

Waterman Boreham
Transport Planning

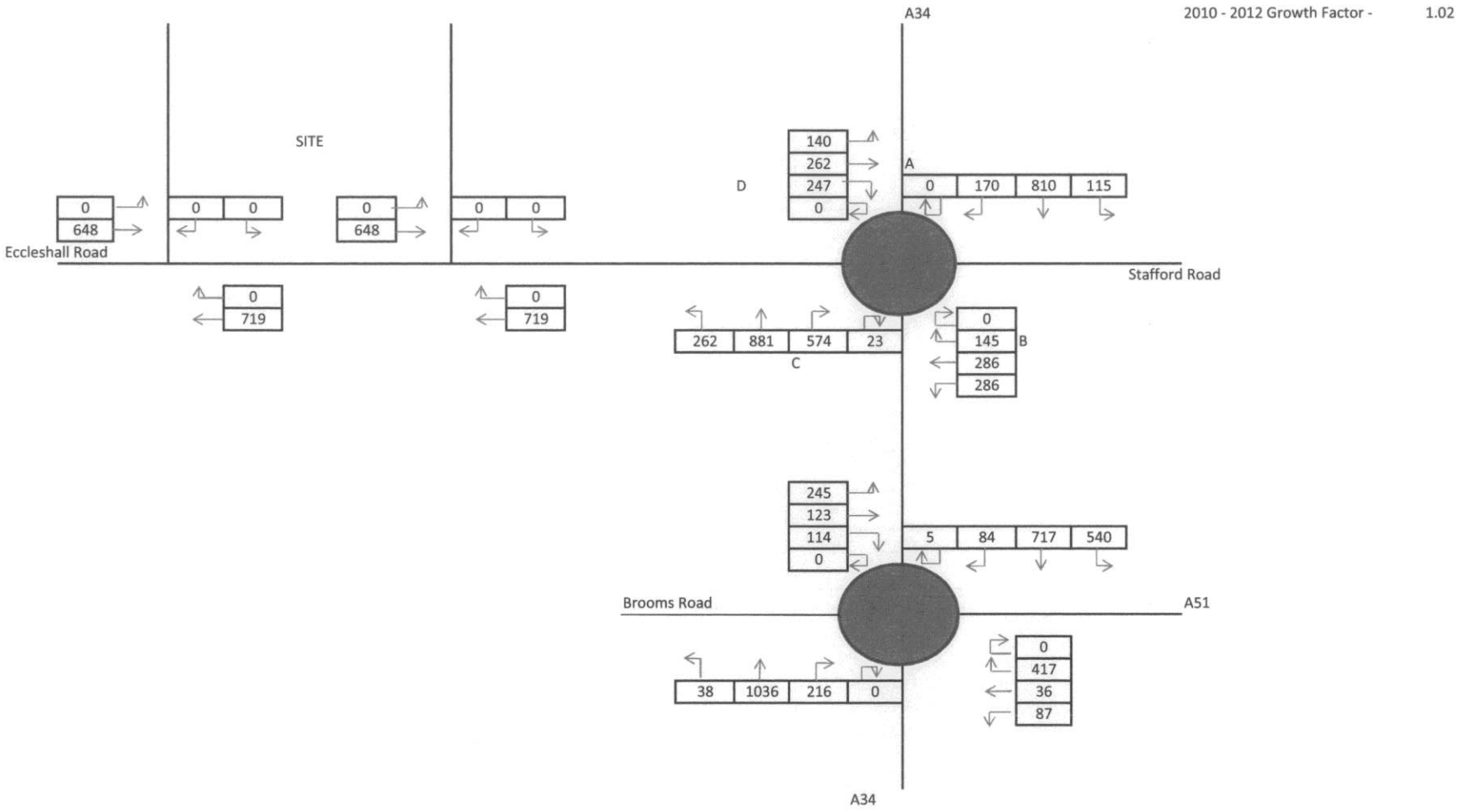
Base 2012 Traffic Flows - AM Peak Hour
TRN10069

2010 - 2012 Growth Factor - 1.02

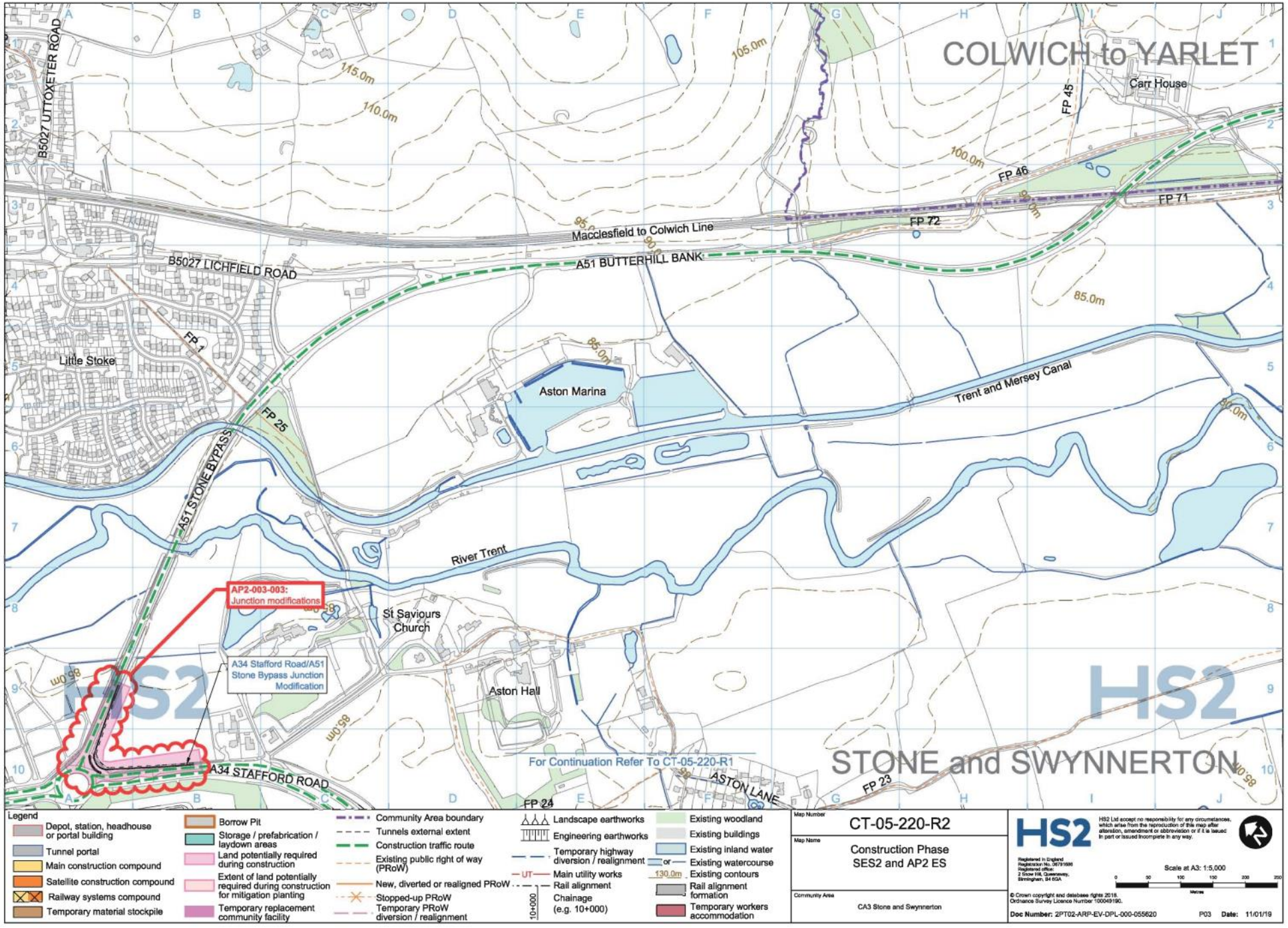


Waterman Boreham
Transport Planning

Base 2012 Traffic Flows - PM Peak Hour
TRN10069



APPENDIX H: HS2 Aston Roundabout Improvements


COLWICH to YARLET
STONE and SWYNNERTON
B5027 UTTOXETER ROAD
B5027 LICHFIELD ROAD
A51 BUTTERHILL BANK
Macclesfield to Colwich Line
A51 STONE BYPASS
A34 STAFFORD ROAD
ASTON LANE
Trent and Mersey Canal
River Trent
Aston Marina
Aston Hall
St Saviours Church
Little Stoke
Carr House
FP 1
FP 23
FP 24
FP 25
FP 45
FP 46
FP 71
FP 72
AP2-003-003: Junction modifications
A34 Stafford Road/A51 Stone Bypass Junction Modification
For Continuation Refer To CT-05-220-R1
115.0m
110.0m
105.0m
100.0m
95.0m
90.0m
85.0m
80.0m
Legend
Depot, station, headhouse or portal building
Tunnel portal
Main construction compound
Satellite construction compound
Railway systems compound
Temporary material stockpile
Borrow Pit
Storage / prefabrication / laydown areas
Land potentially required during construction
Extent of land potentially required during construction for mitigation planting
Temporary replacement community facility
Community Area boundary
Tunnels external extent
Construction traffic route
Existing public right of way (PRoW)
New, diverted or realigned PRoW
Stopped-up PRoW
Temporary PRoW diversion / realignment
Landscape earthworks
Engineering earthworks
Temporary highway diversion / realignment
Main utility works
Rail alignment
Chainage (e.g. 10+000)
Existing woodland
Existing buildings
Existing inland water
Existing watercourse
Existing contours
Rail alignment formation
Temporary workers accommodation
Map Number
CT-05-220-R2
Map Name
Construction Phase
SES2 and AP2 ES
Community Area
CA3 Stone and Swynnerton
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Scale at A3: 1:5,000
Metres
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P03
Date: 11/01/19

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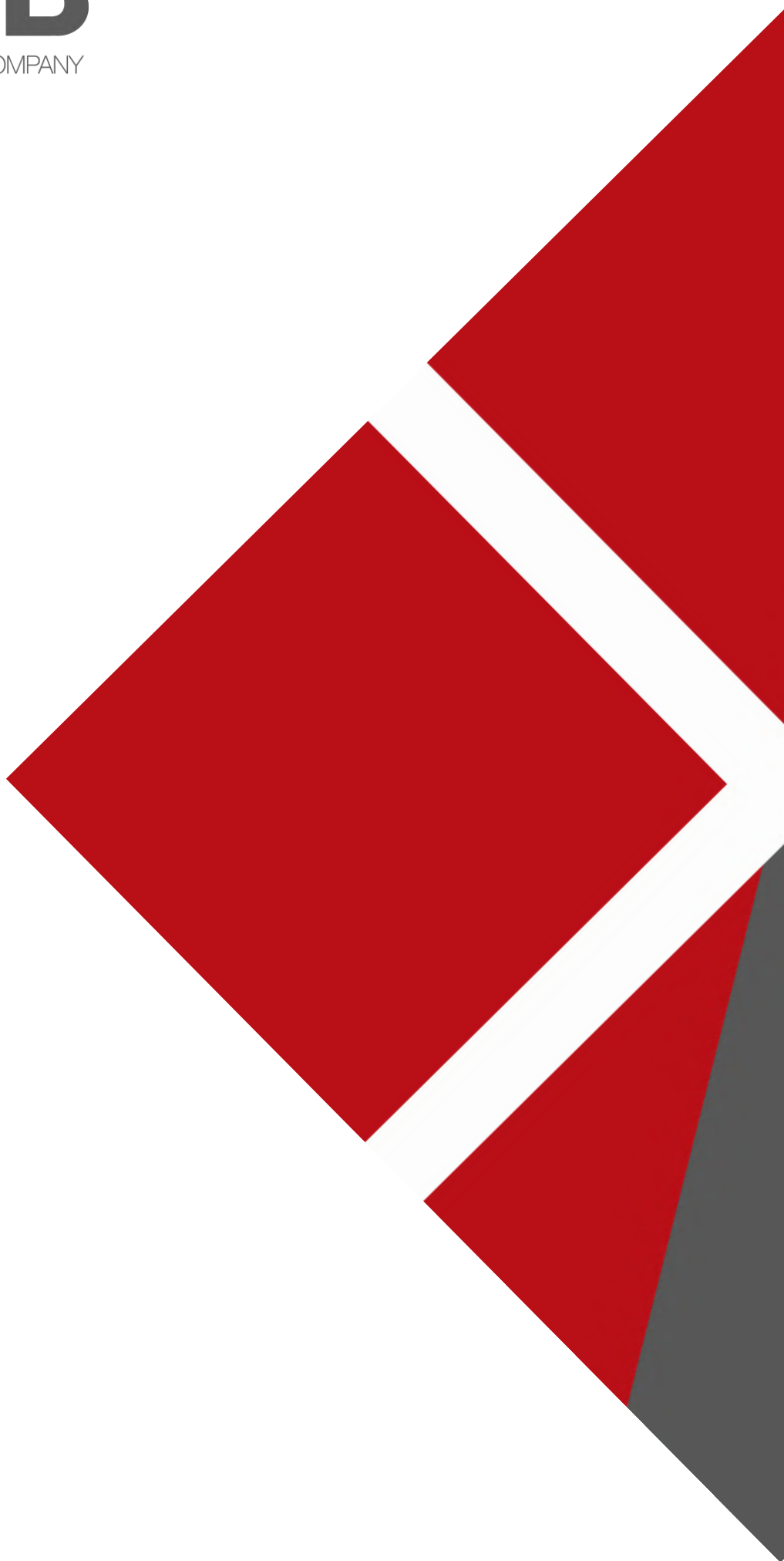

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Landscape statement

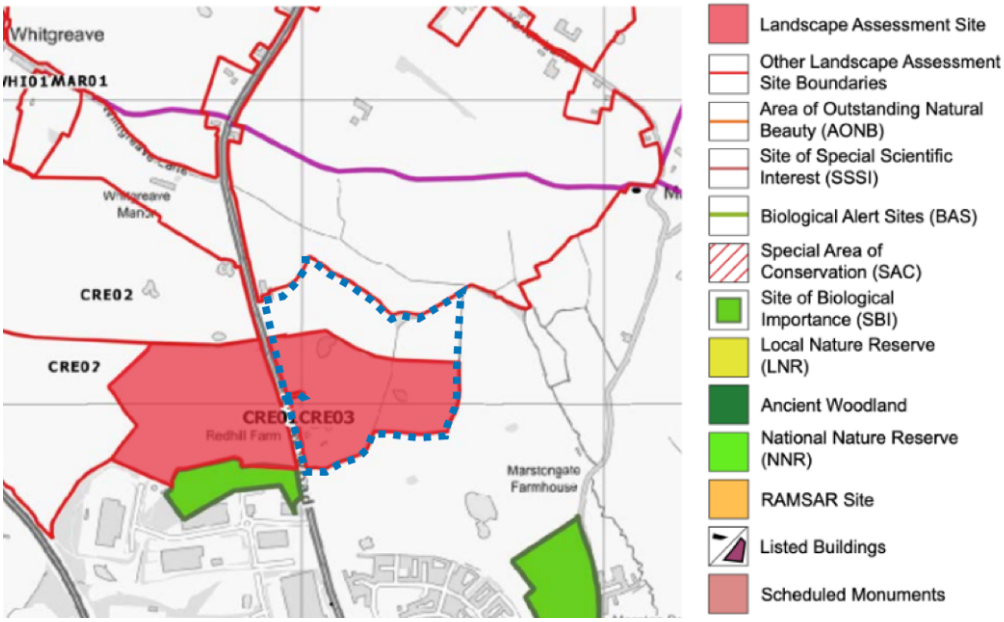
Land to the east of the A34

1. Introduction

1.1 The 'site' is respect of this assessment covers some 29.28 hectares of agricultural land to the immediate east of the A34, adjacent to Redhill Farm and to the north of the (currently being constructed) residential development at Marstongate.

1.2 Part of this land (identified as CRE 01/03) has been assessed by Stafford Borough Council (SBC) as part of their 'Landscape Sensitivity Study', published in October 2022. The SBC study was carried out to provide an evidence base for the ongoing Local Plan 'Site allocation' process.

1.3 As an important point of detail, we note that this subdivision does not follow any existing hedge line so would create awkward field sub-divisions by using 2 full fields and 3 part fields. The diagram below shows the land considered as CR03 (red shading) and the land considered by this report as 'the site' (outlined in blue), which now covers the same suite of fields, but now includes all of them.



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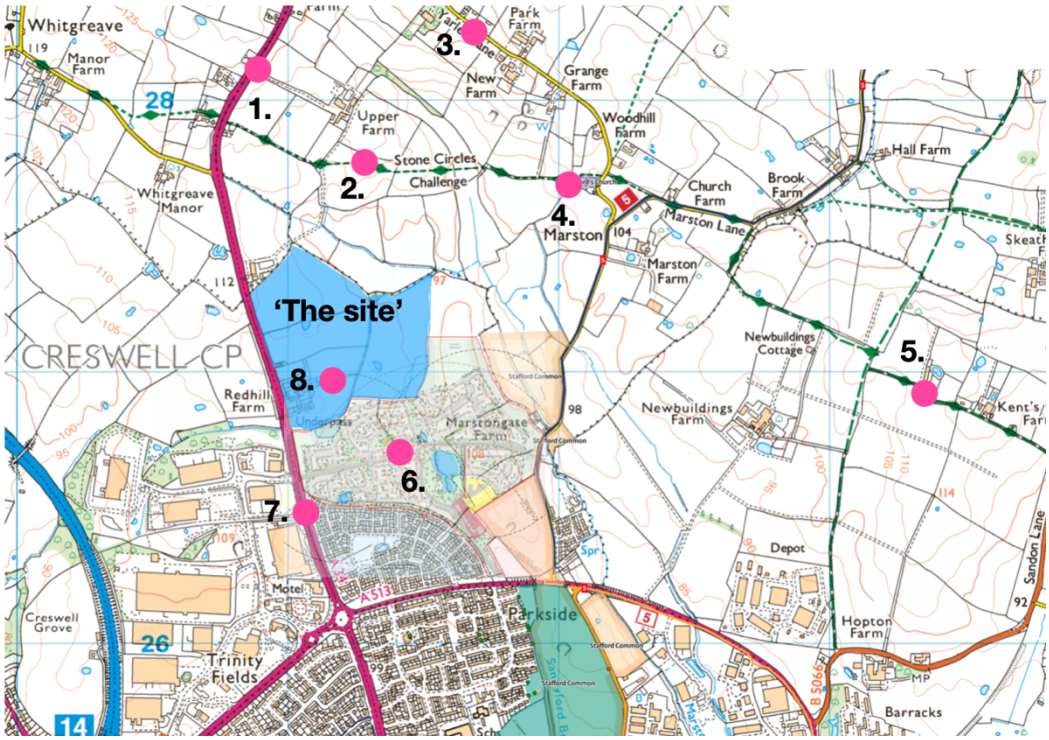
1.4 This 'Landscape Statement' study focuses on the land shaded in blue ('The site') on the plan below. This plan also identifies locations for the photographs included later in the document.

1.5 We identify the specific landscape and visual characteristics of the site and its context, assessing the sensitivity of the local landscape and therefore its ability to accommodate change in the form of proposed development.

1.6 We take a landscape led overview of the likely capacity for residential development on the site. It is important to note that there is a clear difference between 'sensitivity' and 'capacity' in terms of landscape assessment. 'Landscape Sensitivity' is generally a measure of the resilience of a landscape to withstand change from development whereas 'Landscape Capacity' is generally a measure of 'how much'.

1.7 Overall, we make a judgement about whether the amount of change proposed can be accommodated without having unacceptable adverse effects on the character of the landscape (related to landscape character sensitivity), or the way that it is perceived (related to visual sensitivity), and without compromising the values attached to it (related to landscape value).



1.8 Whilst sensitivity is a part of the discussion, this report is looking more at the capacity. We refer to landscape sensitivity as noted in other studies such as the Stafford Borough Council Landscape Sensitivity Assessment and make judgement on visual sensitivity based on our own site visits. We give a 'landscape value' to each site (based on a 5-step grade from High through Moderate to Low) to then be able to combine 'sensitivity' and 'value' to give a rating of 'capacity'.

2. Methodology

2.1 The assessment of landscape and visual impacts has been undertaken in accordance with the following good practice guidelines:

- Guidelines for Landscape & Visual Impact Assessment (GLVIA 3rd Edition)
- Valued Landscapes outside national Designations Landscape Institute Technical Guidance Note TGN 02/21
- Photography and Photomontage in Landscape and Visual Impact Assessment (Landscape Institute Advice Note 01/11)
- Landscape Character Assessment – Guidelines for England and Scotland (The Countryside Agency and Scottish National Heritage, 2002)
- An Approach to Landscape Character Assessment (Natural England)
- An approach to Landscape Sensitivity Assessment (2019 Natural England)

2.2 During the preparation of this report, the following more specific research documents were used –

- National, local and strategic planning policy guidance
- Planning for Landscape Change' (Staffordshire County Council 2008)
- The Plan for Stafford Borough 2011 – 2031 (Stafford Borough Council 2014)
- Staffordshire Landscape Character Assessment Review May 2015
- Historic Landscape Characterisation of Stafford (Staffordshire County Council 2008)

- Stafford Borough Council Landscape Sensitivity Study 2022
- Cannock Chase Views and Setting Guide July 2020
- Cannock Chase Area of Outstanding Natural Beauty Review of the AONB Landscape Character Framework August 2017

3. Study area

3.1 The study area was determined through a series of desk top studies, site visits and knowledge of the wider landscape within which the land in question is located. It is normal practice, depending on the size of the proposed development, to consider circa 5k from the site as beyond this it is usually difficult to locate and identify individual developments. It is more normal to restrict the primary study area to circa 2.5k from the site, although professional judgement will need to be used in each instance.

3.2 In this case, the primary receptor locations are within 2.5k of the site. Cognisant of the value and sensitivity of Cannock Chase AONB, we have visited potential locations further afield, such as Satnall Hill, Broc Hill and Sister Dora's high peak.

3.3 Following our various site visits, these locations were subsequently excluded from the remainder of the study as they are some 10k to the south and the whole of the built-up area of Stafford lies in between these locations and the land in question, to include similar residential development at Marstongate and its close proximity with the settlement boundary.

3.4 Whilst this land does fall within 'Setting Zone I Stafford Centre and Farmland Fringe', because it is so closely associated with the current settlement edge, we do not consider that there would be any impact on Cannock Chase AONB. There is already extensive residential building in this area, so from a distance, it would be difficult to specifically identify this particular site.

4. Baseline

4.1 This section provides important baseline landscape information which needs to be considered.

4.2 **Public Rights of Way**

4.3 There are no PROWs on or crossing the site. The nearest is 'Whitgreave 1 (aka Stone Circles Challenge) which traverses east / west to the north of Whitgreave Lane (see photo 01). At its closest it is some 370m to the north of the proposed site.

4.4 **Listed buildings / SAMs' / Conservation Areas**

4.5 There is a single Grade 2 listed building within the study area. The Church of St Leonard at the southern end of Yarlet Lane, near to its junction with Marston Lane. It sits adjacent to where the Stone Circle Challenge PROW crosses Yarlet Lane.

*Parish church of 1794 by W. Dudley, with vestry added late C19 or early C20. REASONS FOR DESIGNATION: The church of St Leonard, Marston, is listed Grade II for the following principal reasons: * For the architectural interest of a well-preserved small, simple late C18 village church.*

4.6 The Church is approximately 630m to the east of the site boundary.

4.7 There are no Scheduled Ancient Monuments or Conservation Areas in the vicinity of the site.

4.8 **Buildings**

4.9 Redhill Farm buildings, Redhill Farm Bungalow and West View lie to the south-western corner of the site, immediately adjacent to the A34. 'No 74 holding' lies to the immediate north-west of the site.

4.10 Upper Farm sits in open farmland to the north of the site.

4.11 All other residential properties to the north and east sit alongside Yarlet Lane and are generally located between St Leonards Church and Yarlet.

4.12 There is an extensive new residential development to the immediate south of the site. This is part of Stafford Borough Council's planned expansion and is a significant influencing factor on how development may affect this site.

4.13 **Land use**

4.14 The site is in agricultural use and comprises of a five medium sized grass fields surrounded, generally, by hawthorn hedges as described below

4.15 Whilst no specific study has been carried out, it is considered that the land is likely to be Grade 3 agricultural land.

4.16 **Vegetation**

4.17 The five fields are sub-divided / surrounded generally with hawthorn hedges. There are a number that are closely trimmed to circa 1.8m and others that are taller at circa 5-6m.

4.18 As would be typical with farmland in this area, there are no freestanding trees within the fields themselves. There are some larger hedgerow trees. There are fields are surrounded, generally, by 4-5m tall hawthorn hedges with occasional larger oak trees.

4.19 There is a small triangular shaped copse midway along the northern boundary of the site. The eastern boundary abuts Marston Brook which has typical riparian vegetation in the form of willow and alder along its banks.

4.20 There are two ponds on the site and these include a range of individual trees (generally in poor condition) and smaller clumps of hawthorn bushes.

4.21 Some vegetation along the A34 frontage has generally been removed as part of A34 roundabout construction (currently under construction.

4.22 **Topography**

4.23 This area can be described as a broad valley with land sloping (starting at circa 110m AOD) from the A34 in the west downhill to Marston Brook at circa 96m AOD, then back uphill to the east with Yarlet Lane being on the 'ridge'.

4.24 Yarlet lane sits at 125m AOD at its highest (junction with A34), then slopes downhill to Marston Farm at 104m AOD.

4.25 There is another stream (Bullockcroft Brook) that runs east to west on the southernmost boundary of the site.

4.26 The majority of the land in the area, to include the site, gently slopes uphill to the north, culminating in a 'peak' at the north-west corner of the site, which sits at 124m AOD.

4.27 The greater proportion of the proposed site sits between 95m AOD at its lowest in the south-west corner, and 110m AOD to the north-east corner.

4.28 **Landscape designations**

4.29 The site is not covered by any statutory Environment designations that might preclude development. It is not 'Special Landscape Area, 'Strategic Gap' or 'Green Belt'.

5. Landscape assessment

5.1 **Existing landscape character**

5.2 The site lies within National Character Area 61: Shropshire, Cheshire and Staffordshire Plain. According to the Staffordshire Landscape Character Assessment, the landscape character of this area is divided as follows –

- *Regional Character Area 61 Staffordshire Plain*
- *Landscape character – Settled farmlands*
- *Landscape character sub-type - Farmland*

5.3 Away from the published material, this site can be described as being typical farmland. It consists of 5 separate fields associated with Redhill Farm. That is a cluster of farm buildings to the southwest of the site.

5.4 The four fields to the western side share similar characteristics in that they are effectively flat, grazing land. The easternmost field slopes

much more steeply towards the brook and there is a flat zone of some 30m wide running alongside the brook.

5.5 The site (all fields) is now heavily influenced by residential development expanding northwards from Marstongate and this needs to be included as part of the baseline character.

5.6 Whilst the recently constructed PAH is a big building and is clearly visible from the western fields and is part of the baseline. Although it is a distracting factor in the landscape, its colour scheme is very effective in breaking up its mass.

5.7 **Landscape (Character) Sensitivity**

5.8 Redhill Farm buildings together with the other agricultural 'sheds and structures' associated with Upper Farm, New Farm and Top Farm in the area might be functional but are not attractive.

5.9 The 'site' can be divided into two separate main blocks. Firstly, the four fields the lie adjacent to the A34. These are heavily influenced by the busy road. PAH building and the expanding residential to the south. The single field to the east side is less influenced by the A34 or PAH but is heavily influenced by the residential to the south.

5.10 Overall, we concur with the Stafford Borough Council Landscape Sensitivity Study, where, at p35, it says '*The Redhill Strategic Development Site covers an expansive area of land. Site CRE01/03 is considered the least sensitive site within the Strategic Development Site boundary owing in part to its relationship with the existing settlement edge.*

5.11 CRO3 is specifically noted as 'medium' (landscape) sensitivity, which we would agree with. Using fpcr methodology, 'medium' sensitivity can be defined as –

Medium *– Landscape and / or visual characteristics of the assessment site are susceptible to change and / or its values are medium / low through to high / medium and / or it may have some potential to accommodate the relevant type of development in some defined situations without significant character change or adverse effects. Thresholds for significant change are intermediate.*

5.12 Although the CR03 assessment only covers part of the 'site', there is no reason to consider that the other parts of the fields not included, would be any different.

5.13 **Visual sensitivity**

5.14 Whilst not an unattractive landscape, it is affected by the farm buildings at Redhill Farm, the adjacent and busy A34, expanding residential development to the south and the PAH building to the west.

5.15 The SBC / fcpr study notes there are 'Some views from surrounding landscape, though not a particularly prominent site' and concludes 'medium' sensitivity. We would conclude

Medium / Low *– Landscape and / or visual characteristics of the assessment site are resilient and of low susceptibility to change and / or its values are medium / low or low and it can accommodate the relevant type of development in many situations without significant character change or adverse effects. Thresholds for significant change are high.*

5.16 **Landscape value**

5.17 This is not a 'valued landscape' under NPPF or GLVIA3 / TGN 02/21 criteria.

5.18 We consider that the overall site could be properly categorised as '**moderate to low'** in terms of value in that –

- *Does not lie within or adjacent to a designated landscape.*
- *Includes very limited locally distinctive landscape characteristics with some scenic interest or presents limited amenity value by way of views and countryside access.*
- *Presents very few features of historic or ecological interest that contribute to landscape setting and character of the area*
- *Limited tranquillity*
- *Significant human detractors*

5.19 **Landscape capacity**

5.20 It is important to note that there is a clear difference between 'sensitivity' and 'capacity' in terms of landscape assessment and detailed notes on methodology and terminology are included at the rear of this document.

5.21 'Landscape Sensitivity' is generally a measure of the resilience of a landscape to withstand change from development whereas 'Landscape Capacity' is generally a measure of 'how much'. Based on the points raised above, we conclude that the site has '**moderate to high'** capacity as -

- *The area is likely to be able accommodate a significant proportion of development without unacceptable adverse landscape and visual impacts or compromising the values attached to it, taking account of any appropriate mitigation.*

5.22 Whilst the fpcr study only included part of the site that we are assessing, we consider that this conclusion on sensitivity is correct for the whole land parcel.

6. Landscape and visual Impacts – a summary

6.1 Please note that the following is not intended as a fully detailed LVIA but does follow the same broad methodology and uses the same terminology.

6.2 **Physical Impacts**

6.3 Given the type of development (residential) it is proposed to retain the main field structure and therefore as much of the internal vegetation as is possible. With the exception of key access points, all boundary vegetation will remain.

6.4 The ponds will remain, albeit possibly amended in shape.

6.5 Grassland will obviously be lost to the development.

6.6 Any loss of vegetation would be considered as minimal, and any losses would be substantially mitigated through an extensive scheme of on-site planting and habitat management / offsetting.

6.7 Overall, moderate adverse physical effects.

6.8 **Visual impacts**

6.9 As part of our background research, the site and surrounding area was visited on a number of occasions and a selection of viewpoints were chosen as being a good representation of the type and extent of the views into the site.

6.10 It is clear that any views from higher ground to the north, looking south, will include existing residential development.

6.11 Walkers on the 'Stepping Stone Challenge' are in the highest bracket of sensitivity. They will be aware of the development for the 1.4 k as they traverse from the A34 to / from St Leonards Church. The will, at the closest, be some 300m to the north of the northern site boundary. Existing and proposed vegetation will help with screening / filtering these views. We conclude moderate adverse effect on this group of receptors.

6.12 Views from the grounds of St Leonards Church are generally limited by existing vegetation or the Church building. Where views do exist, they would include views of existing residential development. Moderate adverse on this group of receptors.

6.13 Views from the A34 are limited in duration and those receptors are generally road users who are of low sensitivity. Moderate adverse effects.

6.14 Residential receptors to the south will be aware of the proposed housing to the north, but this group would generally be limited to those on the norther boundary only as the remainder of the houses block each other's views. Overall low adverse effect.

View 01. Looking SE from the A34

View 02. Looking south from Stone Circles Challenge PROW

View 03. Looking south from Yarlet Lane.

View 04. From PROW adj St Leonards Church on Yarlet Lane.

View 05. Looking north-west from PROW adj Kents Barn Farm.

View 06. Looking from adjacent housing to the immediate south of the site.

View 07. Looking northwards from A34 / entrance to Redhill Business Park.

View 08. View from within the site looking due south.

6.15 **Landscape character**

6.16 There will be an obvious change in character with the change from agricultural land to a residential development. This is inevitable with any scheme of this nature. Bearing in mind the adjacent, similar uses, then it is our opinion that this an appropriate location as it is extending an existing characteristic and not necessarily creating a new one.

6.17 Development on this site would be a logical extension to the existing settlement edge.

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6.18 **Design & mitigation strategy**

6.19 The SBC / fpcr study concludes, under mitigation, -

Focus development to the south closest to the settlement edge. Establish a landscape buffer to countryside to the north east (and north west depending if site CRE1/03 is to be developed). Retain existing ponds and vegetation and complement with new habitats. Consider adjacent Site of Biological Importance in any development layout as well as the site's relationship with site CRE02 if it comes forward.

6.20 Careful design, of both buildings and landscape are important and can effectively reduce harms further. We have set our overall findings in the following bullet points -

- *Retention of existing field pattern i.e. retention of existing hedgerows where possible.*
- *Do not build right out to the boundaries to allow for suitable buffer zones / margins.*
- *Reinforcement of planting to include significant native woodland blocks to the perimeter.*
- *Retention of existing ponds & associated vegetation.*

6.21 **Assessment summary**

6.22 Our overall assessment can be summarised as follows –

Heading / topic	Description & discussion
Location	• Land to the east of the A34 / Red Hill.
Proposal	• Proposed residential with associated school and retirement living provision.
Broad description	• Overall site to include 5 fields currently in agricultural use.
Elements likely to be a constraint - Conservation Area Public Rights of Way (PROW), Listed Buildings, Tree Protection Orders.	• No CA/s, no SAM. • Stone Circles Challenge PROW crossing 300m to the north of the site. • One listed Building (St Leonards Church – Grade 2) some 600m to the east.
Landscape based planning constraints or designations i.e. AONB, AGLV, Green Belt etc.	• No overarching landscape-based policies.
Landscape features (general)	• A typical agricultural landscape with a variety of trimmed and untrimmed hedges.

	• Two ponds • Small triangular copse to the norther boundary.
Landscape features (specific)	• No specific, notable landscape features
Landscape character	• Open agricultural land. Heavily influenced by PAH and expanding residential development to the immediate south.
Landscape Sensitivity	• Moderate
Visual Sensitivity	• Low to moderate. Heavily influenced by adjacent housing. • Land to the west influenced by PAH • Development would be clearly visible from the PROW to the north and from some residential properties along Yarlet Lane. This is a relatively low number of receptors and, where a view to the south already exists, it already contains the expanding housing at Marstongate.
Landscape Value	• Moderate. As noted elsewhere, the land is already heavily influenced by existing, adjacent development.
Landscape Capacity	• Overall, the site has high capacity for residential development. • Retention of major landform feature to the north is essential as it is a key local feature and provides significant screening from the north. • Any development must include significant perimeter planting to the west and north.
Visual matters	• Perimeter buffer zones are important to help screen the development in respect of more localised / shorter distance views. • Views from the A34 as less sensitive and more readily mitigated.
Design matters	• Retention of existing vegetation, high quality design (both building design and scheme layout / urban design)
Mitigation potential	• Careful siting to minimise impact on existing vegetation & pond features. • Buffer zones to the northern and eastern boundaries are important to respond to more sensitive mid distance residential receptors.
Overall, does the site have development potential	• Yes.

7. Overall conclusions

7.1 This site is, for the most part, already being considered for residential development as it is the least sensitive of the range of options being considered by Stafford Borough Council. It is located immediately adjacent to the already expanding settlement edge.

7.2 Based on our assessment of the wider site included in this report (as opposed to the SBC slightly reduced version) we can see little logic in the sub-division of existing fields as shown. We do not believe there would be any meaningful increase in effects based on the site as proposed here.

7.3 There are important matters such as retention of existing vegetation and provision of appropriate mitigation in the form of new planting and buffer zones that would apply equally to either version.

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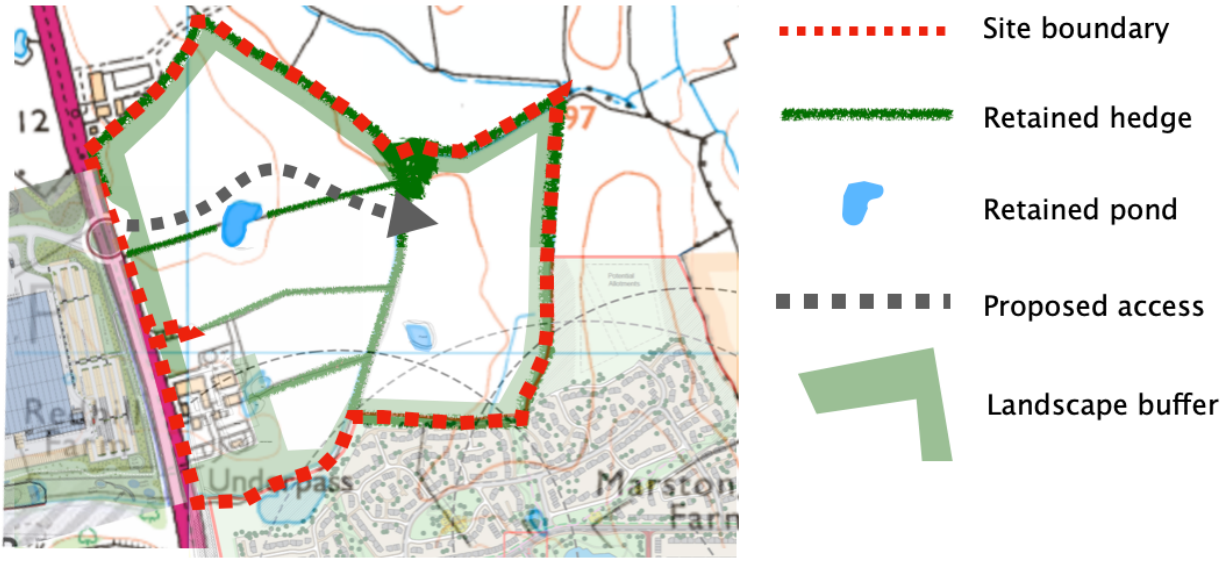
7.4 Overall, it is our belief that we can provide an appropriate quantum of development that will sit well in the wider landscape, will cause minimal visual harm or harm to landscape character, and offers extensive opportunity for the creation of effective landscape infrastructure.

7.5 Any landscape masterplan would need to be based on the following outline 'landscape framework' diagram.



[redacted]
Chartered Landscape Architect
for and on behalf of Potterton Associates Ltd

November 2022

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Methodology notes

This assessment has been carried out by a qualified and experienced Landscape Architect. It has been carried out in cognisance of -

Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3 2013)
An approach to landscape sensitivity assessment (Natural England 2019)
Statements of Heritage Significance: Analysing Significance in Heritage Assets (Historic England October 2019)
The Setting of Heritage Assets (Historic England December 2017)
Heritage England website https://historicengland.org.uk/listing/the-list/

Landscape Sensitivity and Capacity Assessment broadly considers whether a particular landscape would be sensitive to changes from particular types of development in order to facilitate decisions about where development could be directed in a development plan.

It is important to note that that the levels of landscape sensitivity and capacity identified here are, by necessity, generalised statements and are intended to provide an indication of the primary landscape-based issues that would need to be addressed. Landscape sensitivity and capacity levels are not absolute, and it is intended that further analysis would be carried out in relation to specific applications where there are likely to be significant landscape and visual effects, or where there is the potential for cumulative impacts from several developments.

Table 1 Definitions of Landscape (Character) Sensitivity

Landscape Sensitivity	Definition
High	• Key landscape characteristics/features are highly vulnerable to the development type.
Moderate to High	• Many key landscape characteristics/features are vulnerable to development of this type with such change likely to result in a significant change in character. • Great care would be needed in locating and designing any development within the landscape
Moderate	• Some of the key landscape characteristics/features are sensitive to the type of development. • Although the landscape may have some ability to absorb development it is likely some change in character would result. • Considerable care would be needed in locating any development within the landscape.
Moderate to low	• The majority of the landscape characteristics/ features are less likely to be sensitive to this development type. • Although development can potentially be more easily accommodated, care would still be needed in locating and designing development in the landscape.
Low	• Key characteristics / features are less likely to be sensitive to the type of development. • Development can potentially be more easily accommodated without significantly altering the character of the landscape.

Table 2 Definitions of Visual Sensitivity

Visual Sensitivity	Definition
High	• General visibility of the potential development is high due to very limited enclosure, screening or elevated slopes/ridgelines. • Development would be uncharacteristically conspicuous and could not be successfully mitigated. • Provides important views into and out of settlements that could not be mitigated.

Moderate to High	• Limited enclosure, screening or elevated slopes or ridgelines means any development would be relatively visible in the landscape and would be difficult to mitigate. • Development would be perceptible and would alter the balance of features or elements in the view. • Provides views into and out of settlements which are of some importance
Moderate	• The general visibility of any potential development is moderate, with partial enclosure or screening but with some scope for mitigation. • Whilst development may be perceptible it would not significantly alter the balance of features or landscape elements within the view. Views into and out of settlements are of some importance but there is likely to be some scope for appropriate mitigation.
Moderate to low	• General visibility of the potential development is between low and moderate. It would be mostly well screened by existing features e.g. trees, topography, or would be relatively easy to visually mitigate. • Development may be discernible, but impacts would be limited. • Limited contribution to views to and from settlements.
Low	• General visibility of the potential development is low as it would be enclosed, well screened by existing features e.g. trees/topography and only visible from short distances. • Development would not be discernible or would enhance views. • Of little importance to views to and from settlements such that development would not lead to unacceptable visual intrusion into the landscape with or without mitigation.

Table 3 Landscape sensitivity matrix (combining landscape and visual sensitivity)

LANDSCAPE SENSITIVITY						
	High	High	High	High	High	High
	Moderate to high	Moderate to high	Moderate to high	Moderate to high	Moderate to high	High
	Moderate	Moderate	Moderate	Moderate	Moderate to high	High
	Low to moderate	Low to moderate	Low to moderate	Moderate	Moderate to high	High
	Low	Low	Low to moderate	Moderate	Moderate to high	High
		VISUAL SENSITIVITY				

Table 4 Definitions of Landscape Value

Landscape Value	Definition
High	▪ Lies wholly within or adjacent to a designated landscape where scenic value and localised character is very distinctive or is important to the setting of a designated landscape with significant intervisibility between the two. ▪ Includes locally distinctive landscape characteristics of considerable scenic value or provides important amenity value by way of views and countryside access. ▪ Includes prominent features of historic or ecological interest (e.g. taking into account the intactness and integrity of historic landscape features/patterns and nature conservation designations) that contribute to landscape setting and character of the area. ▪ Tranquil with a strong sense of naturalness.
Moderate to High	▪ Lies wholly within a designated landscape where localised character and scenic value is less distinctive, or has become degraded, or; lies adjacent to a designated landscape. ▪ Includes some amenity value by way of views and countryside access (takes into account the intactness and integrity of historic landscape patterns and ecological designations).

	▪ Includes locally distinctive landscape characteristics of scenic value. ▪ Relatively tranquil with a relatively strong sense of naturalness
Moderate	▪ Does not lie within or lies adjacent to a designated landscape where localised character and scenic value is less distinctive or has become degraded. ▪ Includes limited locally distinctive landscape characteristics of some scenic value or provides some amenity value by way of views and countryside access. ▪ Includes some features of historic or ecological interest that contribute to landscape setting and character of the area. ▪ Some detracting elements that affect tranquillity
Moderate to low	▪ Does not lie within or adjacent to a designated landscape. ▪ Includes very limited locally distinctive landscape characteristics with some scenic interest or presents limited amenity value by way of views and countryside access. ▪ Presents very few features of historic or ecological interest that contribute to landscape setting and character of the area ▪ Limited tranquillity ▪ Significant human detractors
Low	▪ Does not lie within or adjacent to a designated landscape. ▪ Does not present locally distinctive landscape characteristics with some scenic interest or does not provide some amenity value by way of views and countryside access. ▪ Does not present features of historic or ecological interest that contribute to landscape setting and character of the area.

Table 5 Landscape Capacity matrix (combining sensitivity & value)

OVERALL LANDSCAPE SENSITIVITY						
	High	High	High	High	High	High
	Moderate to high	Moderate to high	Moderate to high	Moderate to high	Moderate to high	High
	Moderate	Moderate	Moderate	Moderate	Moderate to high	High
	Low to moderate	Low to moderate	Low to moderate	Moderate	Moderate to high	High
	Low	Low	Low to moderate	Moderate	Moderate to high	High
		Low	**Low to moderate**	**Moderate**	**Moderate to high**	**High**
		LANDSCAPE VALUE				

Table 6 Landscape Capacity definitions

Capacity	Definition
High	▪ The area is likely to be able to accommodate the specified type and scale of development without unacceptable landscape and visual impacts or compromising the values attached to it taking account of appropriate mitigation.
Moderate to high	▪ The area is likely to be able accommodate a significant proportion of development without unacceptable adverse landscape and visual impacts or compromising the values attached to it, taking account of any appropriate mitigation
Moderate	▪ This area has an ability to accommodate development in some parts without unacceptable adverse landscape and visual impacts or compromising the values attached to it, taking account of any appropriate mitigation There is a need for each proposal to be considered on its individual merits to ensure there are no unacceptable adverse impacts.
Low to moderate	▪ The area only has potential to be able to accommodate development in limited locations without unacceptable adverse landscape and visual impacts or compromising the values attached to it, taking account of any appropriate mitigation

None / low	▪ The area is unable or only has very limited potential to be able to accommodate the specified type and scale of development without unacceptable adverse landscape and visual effects or compromising the values attached to it, taking account of any appropriate mitigation

SUSTAINABILITY STATEMENT

STOFORD

STAFFORD, STONE ROAD, RESIDENTIAL

STOFORD

Issued by:

Engineering Services Consultancy Ltd

[redacted]

Issue date: 07/12/2022

SUSTAINABILITY STATEMENT

STAFFORD, STONE ROAD, RESIDENTIAL STOFORD

ENGINEERING SERVICES CONSULTANCY LTD

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REV	DATE	ISSUED BY	REVIEWED BY
P1	07 December 2022		

CONTENTS

EXECUTIVE SUMMARY

Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development should acknowledge the global megatrends, such as climate change, and manage the consequential risks and maximise potential opportunities.

The Proposed Development aims to mitigate any negative impacts and target opportunities relating to the environment, economy and society so that an intrinsically sustainable building is delivered.

The Proposed Development has established the following aims:

- Meet the challenges of climate change;
- Conserve and enhance the natural environment;
- Promote sustainable transport;
- Prevent and minimise pollution;
- Reduce waste and encourage reuse and recycling;
- Reduce energy use and greenhouse emissions;
- Reduce water consumption;
- Manage flood risk and promote sustainable drainage measures.

The aims and objectives will be delivered through the implementation of:

- The policies established in Stafford Borough Local Plan 2020-2040*;*
- Approved Document Part L of the Building Regulations (2021);

The Proposed Development will mitigate negative impacts and target opportunities relating to the environment, economy and society so that an intrinsically sustainable building is delivered.

INTRODUCTION

CONTEXT

Sustainable development has been defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainability requires the balance and integration of economic, environmental and social issues.

Through sustainable development, we should be able to make our lives today better without resulting in negative consequences for the future population. The world is currently experiencing a number of global megatrends which pose both risks and opportunities. Sustainable development aims to manage these risks and maximise the opportunities.

In the UK there are a number of sustainability issues which have driven current policy and legislation including:

- Climate change;
- Ecosystem decline;
- Energy and fuel consumption;
- Material and resource scarcity;
- Pollution;
- Population growth;
- Urbanisation;
- Water scarcity.

The Proposed Development aims to mitigate any negative impacts it might have on the environment, economy and society and minimise and consequential risks whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

SITE LOCATION

The proposed development is a 14.45Ha site located off Stone Road, to the north of Stafford.

PROPOSED DEVELOPMENT

The proposed development will be comprised of a mix of housing, apartments and retirement living units:

- General housing
  - x30 1 bed
  - x185 2 bed
  - x246 3bed
  - x154 4+bed
- Apartments
  - x5 1 bed
  - x50 2bed
- Retirement living
  - x10 1 bed
  - x50 2bed

POLICY AND LEGISLATION

NATIONAL

NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework (NPPF) was introduced in March 2012 and was revised on 20th July 2021, following revisions in 2018 and 2019. The NPPF sets out the Government's planning policies for England and how these are to be applied. The framework must be considered when granting planning permission for any new development.

The purpose of the planning system and the NPPS is to help achieve sustainable development by meeting the needs of the present without compromising the ability of future generations to meet their own needs. The NPPF divides sustainable development into three objectives which are both independent and mutually supportive:

- Economic
- Social
- Environmental

These objectives should be delivered though the application and implementation of the NPPF policies. The NPPF aims to drive sustainable development and has been established on the basis of **presumption in favour of a sustainable development.**

CLIMATE CHANGE ACT 2008

The Climate Change Act 2008 was published on 26th November 2008 to:

- Set a target for the reduction of greenhouse gas emissions by 2050;
- Provide a system of carbon budgeting;
- Establish a Committee on Climate Change;
- Establish trading schemes to limit greenhouse gas emissions and encourage activities to reduce of remove greenhouse gases from the atmosphere;
- Reduce domestic waste and encourage recycling.

The Act outlines a target to reduce net UK carbon account by at least 80% by 2050, over the 1990 baseline.

TOWN AND COUNTRY PLANNING ACT 1990

The Town and Country Planning Act was published on 24th May 1990 and consolidates several elements relating to town and country planning.

ENERGY ACT 2013

The Energy Act received Royal Assent on 18th December 2013 and makes provision to:

- Set a decarbonisation target;
- Review the electricity market and encourage low carbon electricity generation or secure supply;
- Establish the Office of Nuclear Regulation;
- Protect the government pipe-line and storage system'
- Ensure domestic supplies of gas and electricity and regulation for consumers;
- Establish energy licencing categories;

- Establish principles for offshore transmission of electricity during a commissioning period;
- Review the integration of smoke and carbon monoxide alarms.

PLANNING AND ENERGY ACT 2008

The Act was adopted on 13th November 2008 and enables local planning authorities to set requirements for energy use and energy efficiency in local plans.

ENVIRONMENTAL PROTECTION ACT 1990

The Environmental Protection Act was published on 1st November 1990 and makes provision for a number of environmental issues including:

- Pollution;
- Waste;
- Hazardous substances.

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

The Act was published on 30th March 2006 and makes provision for bodies concerned with the natural environment and rural communities, in connection with wildlife, SSIs, National Parks and the Broads. The Act establishes laws for rights of way and waterways and provides administrative details for the environment and rural affairs.

BUILDING REGULATIONS

The Building Regulations set out statutory standards developments are to meet. These standards cover measures including energy efficiency, water efficiency, sanitation, fire safety, sound resistance and ventilation.

Part L of the Building Regulations relates to the conservation of fuel and power. Part L covers energy efficiency and sets out the maximum carbon dioxide occupied buildings are to emit. The current 2021 edition came into effect on 15th June 2022.

Part G of the Building Regulations seeks to limit the domestic use of water. The current 2016 edition came into effect on 1st March 2016.

LOCAL

STAFFORD BOROUGH LOCAL PLAN 2020-2040

The Stafford Borough Local Plan 2020-2040 provides policies for the development of Stafford and how planning applications will be handled up to 2040. It is comprised of a series of objectives that have informed the policies in place within the local plan. In terms of sustainability the relevant policies are as follows:

- POLICY 4. Climate change development requirements
- POLICY 9. North of Stafford
- POLICY 24. Homes for life
- POLICY 40. Renewable and low carbon energy
- POLICY 42. Flood risk
- POLICY 43. Sustainable drainage
- POLICY 44. Landscapes
- POLICY 47. Biodiversity
- POLICY 49. Trees
- POLICY 50. Pollution
- POLICY 51. Air quality
- POLICY 52. Transport
- POLICY 53. Parking standards.

DEVELOPMENT AIMS

Following a review of the policies and legislation, the new development aims to:

- Meet the challenges of climate change;
- Conserve and enhance the natural environment;
- Promote sustainable transport;
- Prevent and minimise pollution;
- Reduce waste and encourage reuse and recycling;
- Use appropriate, durable and sustainable materials;
- Reduce energy use and greenhouse emissions;
- Reduce water consumption;
- Manage flood risk and promote sustainable drainage measures;
- Create sustainable communities

SUSTAINABILITY OBJECTIVES

Climate change is perhaps the most significant global sustainability issue as it directly impacts all others. Variability in the climate system occurs naturally, however human activity since pre-industrial times has accelerated change.

There has been an unequivocal warming on the global climate system with unprecedented temperature rises since the mid-1950s. Both the atmosphere and oceans have warmed resulting in:

- Rise in the global mean sea level;
- Ocean acidification;
- Altered precipitation levels - wet areas becoming wetter and dry areas becoming drier;
- Increased extremity and frequency of weather and multi-hazard events;
- Changes to ocean salinity;
- Significant ice loss from glaciers, ice sheets and sea ice;
- Reduced snowfall and snow cover;
- Increased permafrost temperatures;

More than half of the observed increase in global average surface temperature from 1951 to 2010 has been caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic influence, largely caused by fossil fuel combustion.

In the UK, communities are becoming increasingly vulnerable to climate change which has resulted in a drive for sustainable development. Having reviewed the policies and consequently established the targets to achieve a sustainable development, the following objectives have been established:

ENERGY

Demand for energy and fuel continues to increase and is driven by increases in urbanisation, globalisation and population growth. However, global awareness of the impact of fossil fuel combustion on climate change and the rise in energy costs is driving the need for alternative fuel sources which do not release greenhouse gases into the earth's atmosphere.

Fossil Fuels are not only one of the major global sources of greenhouse gases but are also finite sources of energy. There has been an increase in demand for renewable energy sources and more efficient technologies following recognition of the need to drive down energy use. The development will implement this by following the principles of the energy hierarchy.

REDUCE ENERGY DEMAND

The Proposed Development is designed with an enhanced building fabric so that the building's thermal performance is improved. Improved u-values and a low air permeability result in fewer heat and air losses and a reduced need for heating and cooling thereby reducing energy use.

REDUCE ENERGY USE

Energy usage will be reduced through the specification of energy efficient equipment, including LED lighting, efficient heating and cooling systems and automatic controls. The end users will be encouraged to use efficient equipment including energy labelled white goods and office equipment.

USE RENEWABLE OR LOW CARBON TECHNOLOGIES

As per the requirements of Stafford Borough Local Plan Policy 4, residual energy demand will be met through onsite renewable energy schemes, where technically feasible. Where not feasible, the requirement will be met elsewhere by means of offsite renewable energy generation.

WATER

Demand for fresh water is increasing and is largely driven by population growth and urbanisation. Water is required for drinking, sanitation and industry. Extreme weather events, which are rising as a result of climate change, affect water both supply and quality, further enhancing water scarcity. Declines in water scarcity and availability drive up the cost of fresh water.

As per the requirements of Stafford Borough Local Plan Policy 4, the development will incorporate water efficient features and equipment to achieve a maximum water usage of 110 litres per person per day.

FLOODING & DRAINAGE

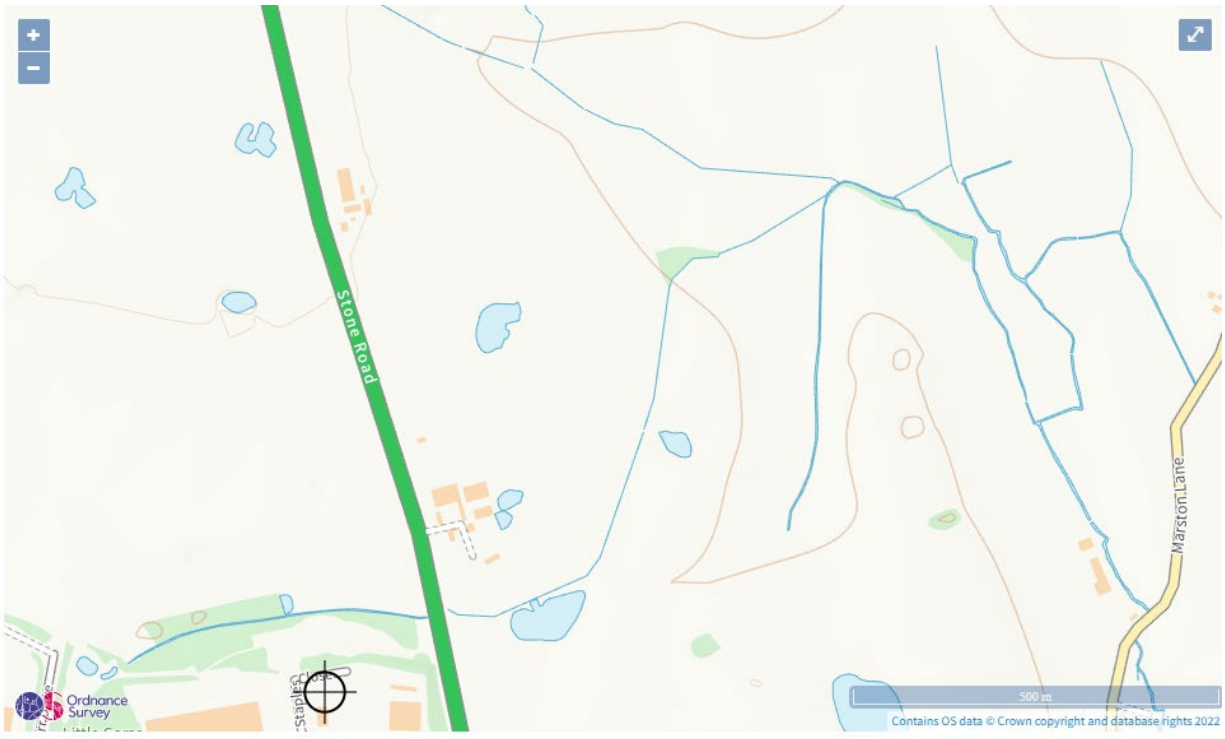
An undeniable risk to many parts of the UK is that of sea level rise and the risk of flooding. It is important that all buildings are protected from flooding from all sources, as per the requirements of Stafford Borough Local Plan Policy 42.

A flood risk assessment will be produced to determine the risk of flooding from all sources, including:

- Fluvial;
- Groundwater;
- Surface water;
- Tidal;
- Artificial sources;
- Sewers.

As per the requirements of Stafford Borough Local Plan Policy 43, the Proposed Development's design incorporates sustainable drainage systems (SuDS) to reduce the impact of the new structure on existing drainage.

The flood risk maps produced by the Environment Agency show the area to be at low risk of flooding from rivers however there are some areas at high risk of flooding from surface water.



Extent of flooding from rivers or the sea

Extent of flooding from surface water

POLLUTION

Increases in productivity and population growth have caused rapid rises in pollution, particularly since the industrial revolution in the 19th century. Pollution has been linked to both environmental degradation and health risks and is mainly derived from three human activities; fossil fuel combustion, use of fertilisers & pesticides, and increased use of chemicals.

Air pollution, largely caused by emissions of nitrogen, sulphur, ozone and particulates, can severely affect human health and can be intoxicating in developed areas. The release of ozone also reduces photosynthesis, thereby reducing the amount of carbon dioxide absorbed by botanical matter.

Water pollution is mainly cause by the run-off of nitrogen and phosphorous from fertilisers in soils and is exacerbated by urbanisation and increase in permeable surfaces. This has resulted in the acidification of freshwater systems and eutrophication.

Urbanisation also increases the levels of vibration and noise pollution as well as visual pollution from light and developments.

As per the requirements of Stafford Borough Local Plan Policies 50 and 51, measures will be taken to minimise pollution and the impact on air quality throughout both construction and operation.

The main contractor will be required to implement best practice pollution prevention measures throughout construction to reduce the potential negative impacts on water, air and land. These measures will be relayed to workers through toolbox talks and will include, but is not limited to:

- Dust suppression;
- Emergency response plan & spill kits;
- Materials management plan;
- Traffic management plan;
- Use of drip trays.

AIR POLLUTION

The following air pollution measures have been specified:

- Low NOx emission heating and hot water systems;
- Low VOC content products, including paints, varnishes & adhesives.

WATER POLLUTION

In order to minimise water pollution, sustainable drainage systems (SUDs) and source control solutions have been specified, including petrol interceptors and oil separators.

NOISE POLLUTION

External background noise levels will be measured, and the Proposed Development will ensure that the post-development levels do not exceed those recorded pre-development by more than +5dB during the day and +3dB at night.

Internal ambient noise levels, sound insulation levels and reverberation times will also be assessed to ensure the building provides appropriate internal acoustics.

VISUAL & LIGHT POLLUTION

External lighting levels will be limited to reduce the overspill of light and lighting will be automatically controlled to prevent operation during daylight house so as to minimise the impact on surrounding neighbourhoods and habitats.

GROUND CONTAMINATION

If any substances are found on site which are hazardous to human health or the environment, the ground shall be remediated in line with the recommendations made by the suitable professional.

WASTE

Construction waste from building sites is accountable for approximately one third of all waste produced in the UK. Waste can be a severe pollutant to the environment if not managed safely. Wherever possible waste should be diverted from landfill, through either reuse of materials or recycling.

CONSTRUCTION WASTE

The waste hierarchy will be implemented to ensure construction waste is managed effectively. Waste will be prevented through efficient design and the use of pre-fabricated materials were available. Where feasible, waste will be re-used on site, including re-using any aggregates. Where re-use is not possible, waste will be collected by a waste management contractor who will be responsible for sorting and segregating waste for recycling or waste recovery. If this is not possible, for example with hazardous waste, the waste shall be sent for disposal. All options will be explored to prevent waste from being sent to landfill.

The main contractor will implement a site waste management plan to ensure this process is carried out throughout the construction phase.

TRANSPORT

It is well known that transport is a major producer of greenhouse gases, which is only amplified by congestion. Measures therefore need to be taken to reduce trip times and encourage the use of sustainable transport modes.

As per the requirements of Stafford Borough Local Plan Policies 52 and 53, the site is intrinsically designed to promote sustainable transport methods through the incorporation of:

- Electric car charge points;
- Footpaths;
- Cycle paths;
- Cycle storage;
- Cyclist facilities.

A site-specific travel plan will be produced which identifies the public transport, pedestrian and cyclist links to the site as well as a number of sustainable transport measures. The end user will be required to implement the recommendations made within the travel plan which will include:

- Car share scheme;
- Display of public transport information;
- Travel plan monitor.

Sustainable transport will also be promoted throughout the construction stage and the negative impacts reduced through the use of local suppliers and labour.

ECOLOGY

A number of businesses are dependent upon the services provided by the world's ecosystems, including provisioning, regulating and cultural services. The degradation of ecosystems will have significant impacts upon the services including both benefits and costs.

Ecosystems are being degraded as a result of an increasing global demand for land, water, energy, food and materials. The resulting impacts include:

- Loss of biodiversity;
- Increase in ocean acidification;
- Reduced productivity of arable land;
- Desertification;
- Habitat decline & fragmentation.

Consequently, natural resources are becoming scarcer, less diverse and therefore more expensive. There are also a number of species that are highly susceptible to climate change. Loss of species will impact upon food chains and habitats and could change an entire ecosystem.

The UK's natural environment is deteriorating, and it is important that species and habitats are protected to prevention further loss and extinction. The Proposed Development aims to limit negative impacts on the natural environment and local biodiversity, ss per the requirements of Stafford Borough Local Plan Policies 47 and 49.

AVOID

Where feasible, the site has been designed to avoid negative impacts and works have been programmed to consider breeding seasons.

PROTECT

Where feasible, features of ecological value will be protected and incorporated into the landscaping design for the Proposed Development.

LIMIT

Any unavoidable negative impacts, such as the removal of hedgerows and trees, will be limited to where absolutely necessary and guidance will be taken from an ecologist.

COMPENSATE

If ecological features are removed, then they will be compensated for through the on-site landscaping.

ENHANCE

The landscaping will be designed to enhance the local biodiversity and will follow the recommendations of the ecologist.

SUSTAINABLE DESIGN

ACCESS

Providing safe access to the site is important for the health and wellbeing of both employees and visitors to the site. The building is designed to allow safe and easy access for all potential users, including pedestrians, cyclists and vehicles. Pedestrian and cycle paths provide safe access to the main entrance of the building and the service yards has separate access to the main car parking.

SECURITY

The site shall be designed securely and seeks to ensure a safe working environment and ensure that the building is safe and accessible. Advice shall be sought from a security professional where considered necessary.

WELLBEING

In order for a building to be truly sustainable it must meet the needs of the current user and also the needs to future/potential users. It is therefore important that the end users feel comfortable within the internal environment. The internal spaces of the building shall be designed with the occupiers in mind so that the building is fit-for-purpose and can be used efficiently. This will be achieved by providing best practice performance and comfort for building occupants, including:

- Zoned lighting with occupant control;
- Zoned heating and cooling systems with occupant control to maximise thermal comfort;
- Natural daylighting;
- Glare control;
- Acoustics.

MANAGEMENT

It is inevitable that any new building, throughout both construction and occupation, will impact upon the existing natural and built environment.

CONSTRUCTION MANAGEMENT

The main contractor will be required to sign up to the Considerate Constructors Scheme and will be required to manage their construction site impacts. This will include:

- Monitoring energy usage;
- Monitoring water consumption;
- Managing sustainable procurement;
- Implementing waste management;
- Toolbox talks and staff training.

All building services will be fully commissioned prior to handover to ensure the installations are performing as they should. The development will be air tested to ensure there are no significant air losses.

OPERATIONAL MANAGEMENT

At handover, the main contractor shall produce a building user guide and provide training for the facilities management team to ensure the building is operated and managed as it was designed to be.

All systems will be recommissioned 12 months following completion to ensure that any defects are rectified so that the building is performing at maximum efficiency.

SUMMARY

The development of Stafford, Stone Road, Residential aims to mitigate any negative impacts it might have on the environment, economy and society and minimise and consequential risks whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

The Proposed Development has established the following aims:

- Meet the challenges of climate change;
- Conserve and enhance the natural environment;
- Promote sustainable transport;
- Prevent and minimise pollution;
- Reduce waste and encourage reuse and recycling;
- Use appropriate, durable and sustainable materials;
- Reduce energy use and greenhouse emissions;
- Reduce water consumption;
- Manage flood risk and promote sustainable drainage measures;
- Create sustainable communities

Sustainability objectives have been established to meet the long term aims and include actions throughout the planning, design, construction and operation phases of the development. These include actions relating to:

- Energy;
- Water;
- Flooding and drainage;
- Pollution;
- Waste;
- Transport;
- Ecology;
- Sustainable design;
- Management.

CONCLUSION

Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The Proposed Development aims to mitigate negative impacts and target opportunities relating to the environment, economy and society. The development has been designed to incorporate several sustainability measures to address the aims and objectives established so that an intrinsically sustainable building is delivered.

With any new building there will be unavoidable negative impacts resulting from energy, water and resource use however the planning, design, construction and operation of the Proposed Development has been and will be managed so that the effect is minimised and mitigated where possible.