PLANNING
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CITY PLAN SERVICES

13 December 2016

Our Ref: 15-200 [JK]

NSW Department of Planning and Environment
23-33 Bridge Street
Sydney NSW 2000

Attention: Brent Devine (Senior Planner)

Dear Brent,

RE: SECOND RESPONSE TO SUBMISSIONS - CAMDEN MEDICAL CAMPUS - SSD_7387

Further to the response to submissions dated 18 October 2016, it is understood that a number of parties/agencies have responded with additional queries. Additional submissions were received from the following agencies:

- Camden Council (CC);
- Rural Fire Service (RFS);
- Department of Primary Industries (DPI); and
- Roads and Maritime Services (RMS).

On behalf of the Applicant, City Plan Strategy & Development has reviewed the various matters raised in these submissions and provides a collated response in the accompanying table at Appendix 1. In responding to the matters raised, CPSD has taken advice from specialist consultants and technical experts and this advice is also attached at Appendices 2-6 for your information. Specifically, these reports include:

- Mott Macdonald, 'Response to traffic issues raised by Council' (Appendix 2a);
- Mott Macdonald, 'SIDRA Modelling - Additional Scenarios' (Appendix 2b);
- Mott Macdonald, 'Camden Medical Campus Council Flood Planning Level Comments' (Appendix 3);
- Acoustic Logic, 'Camden Medical Campus Precinct – NSW Rural Fire Service Request for Additional Information' (Appendix 4); and
- ADE, 'Cover letter response to Council issues' (Appendix 5).

SUITE 6.02, 120 SUSSEX ST, SYDNEY NSW 2000
TEL +61 2 8270 3500 FAX +61 2 8270 3501 WWW.CITYPLAN.COM.AU
CITY PLAN STRATEGY & DEVELOPMENT P/L ABN 58 133 501 774

We trust that the above information assists the DPE in finalising its assessment of the subject application in the near future.

Should you require any further clarification or information in respect to this response, please do not hesitate to contact James Kingston (Project Planner) or Stephen Kerr (Executive Director) on 02 8270 3500.

Yours Sincerely,

Stephen Kerr
Executive Director

Appendix 1

Response to Agency Submissions

Authority/ Submission Author	Issue Raised (refer to respective submission letters for detailed issues)	Response
Camden Council	**Urban Planning**	
As above	1. Council agrees that this is a matter for DPE to carefully assess.	No response required.
As above	2. Council agrees that this is a matter for DPE to carefully assess.	No response required.
As above	3. The DA should be widely notified to property owners and occupiers in the surrounding area with particular regard to the residential properties to the east and south east.	As noted in our previous submission (18 October 2016), this is a matter for the DPE. Nevertheless, we note that prior to lodgement of the SSDA the Proponent undertook a letterbox drop to over 240 homes in the area nominated by Council and no objections were received as a result of that consultative process.
As above	4. Parts of the adjacent riparian corridor are subject to different vegetation management plans (VMPs) dated April 2012 and February 2015. Please refer to point 1 under the heading 'Ecological' for further information.	For abundant caution, the applicant has lodged a Section 96 application to amend DA 277/2012 and ensure that the November 2015 VMP is applicable throughout the entire riparian zone. This will be the case irrespective of previous CC approvals.
As above	5. DPE should ensure that any works proposed within the riparian corridor are consistent with the Oran Park and Turner Road Waterfront Land Strategy 2009.	The subject SSDA does not propose any works within the riparian corridor. This land is on a separate allotment and is not subject to this proposal. Nevertheless, Ecological has advised that the November 2015 VMP is fully compliant with the Oran Park and Turner Road Waterfront Land Strategy 2009.
As above	6. It is recommended that negotiations to relocate Council's existing drainage easement are commenced as a priority. This is to ensure that the applicant has sufficient time to negotiate this issue with Council.	Noted.
As above	7. A minimum 2m wide landscaped buffer along the site's frontage to the riparian corridor is supported.	No response required.
As above	8. The additional perspective image of the proposed development to the riparian corridor is noted. The proposed development's visual impacts for that perspective should be carefully assessed by DPE.	Noted. This is a matter for DPE.
As above	9. It is noted that a separate DA will be lodged for signage. Council recommends that concept signage locations are considered as part of the concept proposal to ensure that they will form an integrated part of the overall development.	As noted in our previous submission (18 October 2016) Signage is not a part of the subject SSDA. A separate DA will be lodged for signage where the merits of such will be addressed at that time. We are confident however, that there is ample opportunity to ensure that future signage will form an integrated part of the overall development,
As above	10. It is recommended that DPE require all lighting to comply with AS 4282 and AS 1158 during the detailed design stage.	This is a matter for DPE.
As above	11. It is recommended that DPE require all glazing to comply with Council's maximum reflectivity recommendation during the detailed design stage.	This matter can be addressed as part of future detailed DAs.
As above	12. DPE should carefully consider allowances for roof mounted equipment. The concept of containing all such equipment internally within appropriately designed plant rooms is supported.	As noted in our previous submission (18 October 2016), "*[t]he plant rooms for the Hospital and the operating theatres are positioned on Level Two. This allows for a roof space that is free of equipment which can facilitate future staged development without*

		unduly affecting hospital operations or the visual massing of the development."
As above	13. The applicant's intent to demonstrate compliance with the Turner Road Development Control Plan 2007 is supported.	No response required.
As above	**Traffic**	
As above	1. Council notes that the Roads and Maritime Services (RMS) has also raised concerns about the submitted traffic modelling. Council questions how that, with an additional 732 vehicles generated by such a significant traffic generating development, a set of traffic signals performs better than demonstrated in other reports that have been submitted to Council. The applicant has advised that their generation is conservative and that trip distribution assumptions and traffic signal optimisation have been undertaken. However a consultant cannot make changes to traffic signal phasing as this is the responsibility of the RMS. Intersections to the east should have modelling undertaken and not simply be appraised. The modelling should be assessed for two lanes on Camden Valley Way as it is unlikely that the third lane would be constructed by the time this hospital is operational. Council still considers it appropriate that a qualified traffic consultant undertake a peer review of the modelling.	New traffic modelling has been undertaken and responses provided at Appendices 2a and 2b. Appendix 2b notes that, " further modelling has been undertaken to better understand the existing and potential future road network performance and support the modelling presented in the Traffic Impact and Parking Statement". Mott MacDonald also note that " The additional analysis was undertaken in response to concerns raised by RMS surrounding the SIDRA modelling scenarios, specifically: ● The lack of existing conditions modelling; and ● The use of the Badgally Road Extension Modelling and Signal Justification Report (Cardno, 2009 – referred to as 'Cardno Report') as a source of future 2026 background traffic volumes given the date of analysis". For detail refer to Appendices 2a and 2b.
As above	2. The traffic report contains information regarding the completed road network and hierarchy of critical roads for the proposed development. However, it does not address the issue that many roads are still being constructed and at what level the network will be constructed to when construction begins on the first and subsequent stages of the proposed development. The applicant should also demonstrate that development consent exists for the delivery of the surrounding road network.	This matter is addressed at Appendix 2a.
As above	3. The response from the applicant only addresses the operational needs of the proposed development and has not addressed the concerns about the increased risk and potential conflicts on the surrounding road network (due to the number of proposed access points). The number of accesses would result in drivers not knowing which access a vehicle is turning into and result in potential rear end crashes and weaving movements from vehicles avoiding cars propped to turn into the proposed development.	This matter is addressed at Appendix 2a.
As above	4. The proposed physical limitation of access from/to The Hermitage Way is noted and supported. However it is not clear in the traffic report that the Hermitage Way is limited to left in/left out only. This should be detailed as part of the concept proposal.	This matter is addressed at Appendix 2.
As above	5. The proposed prohibition of all heavy vehicle access to/from The Hermitage Way is noted and supported.	No response required.
As above	6. The traffic report states an assessment was undertaken and queueing could be accommodated. Evidence is required showing that this is the case. With the level of generation of approximately 10 arrivals at the site per minute in the AM peak hour some queuing would be likely during these busy periods. Evidence is required that all queuing	This matter is addressed at Appendix 2a.

	vehicles can all be accommodated on the site and not queue on the surrounding road network. Suggested improvements in technology in the future is not an acceptable answer to address these matters.	
As above	7. Please refer to point 6 above.	
As above	8. The applicant has satisfactorily addressed this issue.	No response required.
As above	9. The proposed provision of more accessible car parking spaces than is required by the Building Code of Australia is noted and supported. It is noted that AS 2890.1 and AS 2890.6 do not contain rates of parking.	No response required.
As above	10. Car parking provision for each stage must be provided based on the requirements of that stage assessed against the applicable car parking quantum criteria.	Noted.
As above	11. The applicant has satisfactorily addressed this issue.	No response required.
As above	12. The applicant has satisfactorily addressed this issue.	No response required.
As above	13. The applicant has satisfactorily addressed this issue.	No response required.
As above	14. The applicant has satisfactorily addressed this issue.	No response required.
As above	15. As aforementioned, the modelling should be assessed for two lanes on Camden Valley Way as it is unlikely that the third lane would be constructed by the time this hospital is operational.	This matter is addressed at Appendix 2.
As above	16. The proposed design compliance with AS 2890.1 and AS 2890.6 is noted and supported.	No response required.
As above	**Flooding/Engineering**	
As above	1. It is noted that the PMF is wholly contained within the vegetated buffer zone of the South Creek Tributary, meaning that the proposed development is located above the PMF flood level. PMF cross sections and associated heights must be provided as part of the detailed design stage to confirm.	Noted. Will be provided as part of future detailed design.
As above	2. The intended design compliance with Council's Flood Risk Management Policy, the NSW Floodplain Development Manual 2005 and Council's Engineering Specifications is noted and supported.	No response required.
As above	3. There are references in both the environmental impact statement as well as Section 2.5 of the Stormwater and Servicing Strategy (including table 2.12) regarding requirements for a freeboard of 300mm above the 1% AEP and 1.2m above the riparian corridor. These freeboard requirements are not in accordance with Council's Flood Risk Management Policy and should be updated to reflect the requirements of the PMF level (as per Council's Flood Risk Management Policy with respect to 'Critical Utilities and Public Facilities' such as hospitals).	Mott Macdonald have updated their Stormwater Management and Servicing Strategy Report at Appendix 3 to reflect the specifications of Council's Flood Risk Management Policy. Refer to Appendix 3 for detail.
As above	4. The proposed provision of a suitable pump out system for the basement car park is noted and supported.	No response required.
As above	5. The proposed consideration of alternative on site detention systems is noted.	No response required.

As above	6. The proposed realignment of the stormwater pipe in the registered easement should be applied for and approved by Council under an engineering construction certificate prior to any other work being carried out.	Noted.
As above	**Environmental and Public Health**	
As above	1. As basement car parking is proposed, Council requires that a further salinity investigation be undertaken to the depth of the proposed development. It is noted that the proposed basement car park appears to be at a level below the previous filling of the site and so the salinity characteristics of the basement depth would be unknown.	This matter is addressed at Appendix 5. ADE have advised that, "Douglas Partner has carried out the salinity invesitgation and management plan (76510 Dated May 2012) which indicates that the lot consists of materials of slightly to moderately saline. The test pits noted in the report include 8 shallow test pits and 2 deep test pits which have been conducted on the proposed hospital site. These tests as noted in the report conclude that the soils located on the site are Non-Aggressive and Mildly Aggressive between RL 95.000 and the exiting surface levels. The proposed carpark has RL of 99.800 and the filling starts at a RL of 99.950. Therefore the proposed location for the basement carpark will not be affected by the salinity of the soils. Based on the results in the salinity report conducted by Douglas Partners and the FMP and gate checks by ADE we can confirm that no further investigation would be required to determine the foundation requirements for the hospital. Based on the laboratory results of the materials placed in the subject car park area, the materials will not have have any adverse effect on the salinity."
As above	2. Council maintains its previous view that the submitted acoustic report needs to be updated to take account of the issues previously raised in Council's original submission. Whilst the proposed development is only a concept at this stage, further acoustic assessment should to be undertaken at a concept level to prove that the proposed concept development will be capable of compliance with the relevant acoustic criteria.	This matter is addressed in the letter prepared by Acoustic Logic at Appendix 4. This letter notes that the relevant matters have been resolved through consultation with Ryan Pritchard (Executive Planner) on the 16th September 2016 and Kristie White (Environmental Health Specialist) on the 18th November 2016. For detail refer to Appendix 4.
	Council reiterates that the vehicle usage stipulated for The Hermitage Way is very low and needs to be justified by the applicant's traffic engineer.	Refer to discussion of traffic modelling at Appendix 2.
	It is noted that the applicant has assessed sleep disturbance criteria in Table 12 of the submitted acoustic report and advised compliance. However this compliance appears to rely upon the use of a two-step process to assess impact. Council does not accept this process and requires compliance based on background +15dB(A). The criteria for compliance is therefore 58dB(A) and not 50dB(A).	The acoustic report, submitted as part of the original application, accompanies this response to submissions at Appendix 4. This acoustic report assessed sleep disturbance criteria in Section 7.4 and at Table 10. This report specified that "any specific noise source should not exceed the background noise level (L90) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am". The approach specified within the original acoustic report appears consistent with that specified by Council in their submission. Refer to Appendix 4 for detail.

	It is accepted that a construction noise management plan can be submitted as part of a future detailed DA for building construction on the site.	No response required.
As above	3. It is noted that water will be reused for landscaping and that if further reuse is proposed the appropriate risk assessment will be completed at the detailed design stage.	No response required.
As above	4. It is noted that trade waste agreements will be addressed at the detailed design stage.	No response required.
As above	5. It is noted that Environment Protection Authority (EPA) licencing will be addressed at the detailed design stage.	No response required.
As above	6. It is noted that detailed waste management plans will be addressed at the detailed design stage.	No response required.
As above	7. It is noted that cooling tower location and design will be addressed at the detailed design stage. However the proposed building envelopes should make allowance for future cooling towers to ensure that the envelopes reflect the maximum potential height of the proposed development.	It is anticipated that the proposed building envelopes will be capable of accommodating future cooling towers. As noted in our previous submission (18 October 2016), "*[d]etails of this system will be provided as part of the submission of the relevant future DA*".
As above	8. It is noted that NSW Health notification will be addressed at the detailed design stage.	No response required.
As above	9. It is noted that the design of all pools will be addressed at the detailed design stage.	No response required.
As above	10. It is noted that the design of holding rooms and mortuaries will be addressed at the detailed design stage.	No response required.
As above	11. It is noted that the regulation of food sales will be addressed at the detailed design stage.	No response required.
As above	12. It is noted that the design of food premises will be addressed at the detailed design stage.	No response required.
As above	13. It is noted that skin penetration procedures will be addressed at the detailed design stage.	No response required.
As above	14. It is noted that beauty treatments will be addressed at the detailed design stage.	No response required.
As above	15. It is noted that the regulation of health practitioners will be addressed at the detailed design stage.	No response required.
As above	16. It is noted that EPA licencing of any devices that use or emit radiation and/or lasers will be addressed at the detailed design stage.	No response required.
As above	**Ecological**	
As above	1. Council reiterates its previous advice that the only DA approved VMP for the riparian corridor is dated 24 April 2012 and was approved by DA 277/2012. A subsequent construction certificate for part of the development approved by DA 277/2012 adopted a VMP dated February 2015 for part of the riparian corridor. However it is noted that most of the riparian corridor that directly abuts this site is still approved to be revegetated and managed in accordance with the April 2012 VMP. Should the applicant desire for the riparian corridor to be revegetated and managed under a different VMP than a Section 96 Modification application must be lodged with Council for consideration. This will also involve consultation with the Department of Primary Industries Water. This issue is of critical importance to the proposed development as the different VMPs specify different treatments for the riparian corridor that will affect the provision of asset protection zones	As stated in the previous response to submissions the applicant acknowledges that three VMPs are referenced at differing levels as being applicable to the subject site. These include that dated April 2012, February 2015 and November 2015. Although the applicant believes that the February 2015 VMP is applicable to the site, a Section 96 application has been submitted to Camden Council to amend DA-277/2015. The intention of this application is to mitigate any confusion and ensure that the most recent VMP (dated November 2015 and submitted with the original documentation for this SSD) is applicable throughout the entire riparian zone by virtue of DA consent. We trust that this s96 application provides sufficient certainty to allow the DPE to make a determination in respect of this SSD.

	and allowable building footprints for the proposed development. This matter must be fully resolved prior to the determination of the DA.	
As above	**Waste Management**	
As above	1. It is noted that waste management legislative compliance will be addressed at the detailed design stage.	No response required.
As above	2. It is noted that construction waste management plans will be addressed at the detailed design stage.	No response required.
As above	3. It is noted that more detailed waste management plans will be addressed at the detailed design stage.	No response required.
As above	4. Council reiterates its recommendation that the applicant consult with the NSW EPA, Safe Work Australia and NSW Health to seek advice on waste management issues.	Noted.
As above	**Social Planning**	
As above	1. It is noted that seating in outdoor areas will be addressed at the detailed design stage. It is recommended that DPE consider conditioning this requirement as suggested by the applicant.	Noted. Can be conditioned if DPE consider it to be necessary.
As above	2. It is noted that drop off and pick up zones will be addressed at the detailed design stage. It is recommended that DPE consider conditioning this requirement as suggested by the applicant.	Noted. Can be conditioned if DPE consider it to be necessary.
As above	**Section 94 Contributions**	
As above	1. Please refer to point 3 below.	Noted.
As above	2. Please refer to point 3 below.	
As above	3. Council reiterates the requirement for Section 94 contributions to be paid prior to the construction of any part of the proposed development.	
Department of Primary Industries	As committed to by the proponent, all works associated with the project should be consistent with the Oran Park and Turner Road Waterfront Land Strategy 2009. (NSW Government Gazette 17 July 2009, pp 4209-4223).	Noted.
Roads and Maritime Services	Roads and Maritime has reviewed the response to submissions and advises that the traffic modelling comments provided in Roads and Maritime's email response dated 29 September 2016 have not been adequately considered by the proponent. The proponent is relying on outdated traffic modelling within the Cardno 2009 report for a site previously envisaged for bulky goods, as stated in the Environmental Impact Assessment. The proposed Camden Medical Campus would have different traffic impacts compared to a bulky goods development. As previously advised the SIDRA modelling should include current year existing traffic conditions and include a network model. Roads and Maritime does not support the Application in its current form and the applicant is advised to address these matters.	Consultation has been carried out between Mott Macdonald (on behalf of the applicant) and the RMS. This consultation has informed the preparation of an addendum to the Camden Medical Campus Traffic Impact and Parking Assessment to reflect additional scenarios of SIDRA Modelling. Mott MacDonald note at Appendix 2b that "further modelling has been undertaken to better understand the existing and potential future road network performance and support the modelling presented in the Traffic Impact and Parking Statement". Mott MacDonald also note that "The additional analysis was undertaken in response to concerns raised by RMS surrounding the SIDRA modelling scenarios, specifically: ● The lack of existing conditions modelling; and ● The use of the Badgally Road Extension Modelling and Signal Justification Report (Cardno, 2009 – referred to as 'Cardno Report') as a source of future 2026 background traffic volumes given the date of analysis".

		Appendix 2b presents several key findings based on the outcome of this updated SIDRA modelling. These findings "include the following: ● The existing road network performs well and contains spare capacity for traffic volume growth. ● Existing traffic volumes contain high proportions of construction traffic associated with development of the surrounding area and road network construction. The future traffic forecasts therefore estimate particularly high traffic growth, especially for heavy vehicles, and forecasts of heavy vehicles have been adjusted accordingly. ● The future 2031 road network may operate at capacity at Gregory Hills Drive/ Camden Valley Way. This is driven by background traffic and the proposed development has a minimal impact. The intersections of Gregory Hills Drive/ Central Hills Drive and Gregory Hills Drive/ The Hermitage Way are expected to operate effectively in both peak periods. ● The future 2036 road network under a high growth worst case appraisal may operate at capacity at Gregory Hills Drive/ Camden Valley Way (both AM and PM peaks) and Gregory Hills Drive/ The Hermitage Way (PM peak). This is also driven by background traffic and the proposed development has a minimal impact. It is therefore concluded that the analysis confirms the original findings and the proposed development will not adversely impact road network operations." For further detail refer to Appendices 2a and 2b.
Rural Fire Service	Establish the status, extent and affect of the relevant VMPs and consents that apply to the riparian corridor that adjoins the subject site.	As stated in the previous response to submissions the applicant acknowledges that three VMPs are referenced at differing levels as being applicable to the subject site. These include that dated April 2012, February 2015 and November 2015. Although the applicant believes that the February 2015 VMP is applicable to the site, a Section 96 application has been submitted to Camden Council to amend DA-277/2015. The intention of this application is to mitigate any confusion and ensure that the most recent VMP (dated November 2015 and submitted with the original documentation for this SSD) is applicable throughout the entire riparian zone by virtue of DA consent. We trust that this s96 application provides sufficient certainty to allow the DPE to make a determination in respect of this SSD.
As above	It is understood that an approval has been issued for the subdivision of the land which would result in the riparian corridor being located on a separate lot from the subject site. The creation of an APZ over that land would conflict with the provisions of 'Planning for Bushfire Protection 2006' which states that APZs should be wholly within the boundaries of the development site except where exceptional circumstances have been demonstrated. No such circumstances have been set out by the applicant nor has a specific legal mechanism been proposed that clearly demonstrates that the land should be considered as a non-bush fire hazard in perpetuity.	ELA has advised that per the 2015 VMP the land adjacent to the Camden Medical Campus site will be within management zone 1b. ELA has further advised that "[t]he vegetation within the 1b Zone of the Riparian Corridor will feature small trees and shrubs with a grassy understorey, with the following planting regime consistent with an asset protection zone to ensure a bushfire hazard is not created: ● Trees will be planted to allow a crown separation of 2-5 m at maturity. Tree canopy cover will not exceed 15%; and ● Shrub and sedge plantings will be designed as clumps or islands and will not cover more than 20% of the total revegetation area (refer to Section 3.1 of the VMP).

		With the following additional maintenance activities required; ● Mature trees should have lower limbs removed up to a height of 2m above the ground. ● Remove or thin understory plants and shrubs less than 3m in height in order to maintain the clumps of plantings and keep the cover at 20%. ● Prune mature trees where applicable to maintain crown separation. ● Grasses and herbs are to be kept short and where possible green. ● Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. Based on the above information, the riparian corridor will not contain sufficient vegetation or be of a size and shape that supports a bushfire. Further, this the corridor is not currently mapped as bush fire prone and is not required to be mapped as bush fire prone vegetation in accordance with Section 7.1.2 of the Guide for Bush Fire Prone Land Mapping Version 5b. The VMP works and maintenance activities are bonded by Camden Council and are required to be carried out by the owner of the land (Gregory Hills Corporate Park) for a minimum of 5 years. In perpetuity management has not been confirmed. Therefore it is recommended that long term maintenance arrangements of the riparian corridor as a non-hazard vegetation community be confirmed by Camden Council and Gregory Hills Corporate Park in order to clearly demonstrate to the RFS that the land will continue to be a non-bushfire hazard in perpetuity."

Appendix 2a

Mott Macdonald, 'Response to traffic issues raised by Council'

MOTT
MACDONALD

RE: State Significant Development Application SSD 7387 – Notice of Response to Submissions

Director - Social and Other
Infrastructure Assessments
GPO Box 39
Sydney NSW 2001
(via email to
brent.devine@planning.nsw.gov.au)

30 November 2016

Dear Sir,

I refer to the above State Significant Development Application (SSDA) currently being assessed by your department (DPE).

This submission provides a response to Camden Council comments relating to the traffic modelling undertaken for the submission. These responses are intended to clarify the approach undertaken and resolve Council's concerns to facilitate the assessment process.

Our Reference
368851

383 Kent Street
Sydney NSW 2000
PO Box Q1678, QVB
Sydney, NSW 1230
Australia

T +61 (0)2 9098 6800
F +61 (0)2 9098 6810
mottmac.com

The following key aspects should be noted, which explain the overarching reasoning behind the modelling process:

- **The submission is for a concept DA of the final configuration of the site**, and future DAs will be produced to assess development staging and detailed design. The modelling was therefore undertaken based on full development which is expected to only occur beyond 2026 at a minimum when the surrounding road network is complete.
- **A rough staging plan is as follows:**
  - Stage 1: Approximately 140 rooms operational.
  - Stage 2: Approximately 290 rooms operational.
  - Stage 3: Approximately 400 rooms operational.
  - Stage 4: Approximately 450 rooms operational.
  - These stages will be progressively developed over the next 10-15 years, with the second stage expected to be developed between 2025-2028.
- **The modelling approach is based on the Badgally Road Extension Modelling and Signal Justification Report** (Cardno, 2009 – referred to as "Cardno Report") **which supported the development approval of the Turner Road Precinct.** The modelling for this SSDA therefore uses the modelling results presented in the Cardno Report as a benchmark, which is suitable and appropriate given that these results formed the basis for the development approval of this site.
- **Further sensitivity testing was undertaken** in response to RMS consultation, which confirmed that the proposed development will not adversely impact the road network.

Responses to specific Council comments are provided in the following table.

MOTT MACDONALD

Ref.	Comment	Response
1	Council notes that the Roads and Maritime Services (RMS) has also raised concerns about the submitted traffic modelling.	Discussion is being undertaken with RMS to alleviate concerns. Following RMS consultation, sensitivity testing was undertaken and confirmed the findings that the impact of the proposed development on road network operations is expected to be negligible.
	Council questions how that, with an additional 732 vehicles generated by such a significant traffic generating development, a set of traffic signals performs better than demonstrated in other reports that have been submitted to Council.	The 732 trips referred to are the total trips generated by the site, not the additional trips created by the change in land use. Furthermore, these trips are split between inbound and outbound trips and then distributed throughout different areas of the network, resulting in a much smaller amount of trips at any given intersection.
	The applicant has advised that their generation is conservative and that trip distribution assumptions and traffic signal optimisation have been undertaken. However a consultant cannot make changes to traffic signal phasing as this is the responsibility of the RMS.	Improvements in operational performance are attributed to optimised phasing and traffic distribution. The Cardno Report used a fixed cycle time without user-given phase timings, while our analysis involved refinement based on the expected traffic flows. Furthermore, the Cardno Report adopted high level traffic distribution assumptions, which were also refined to provide greater detail. Although RMS may choose to operate the traffic signals differently, the analysis demonstrates that the road network can operate satisfactorily under the proposed arrangement and should be assessed on this basis.
	Intersections to the east should have modelling undertaken and not simply be appraised. The modelling should be assessed for two lanes on Camden Valley Way as it is unlikely that the third lane would be constructed by the time this hospital is operational.	Intersections to the east were modelled, including Gregory Hills Drive/The Hermitage Way/Donovan Boulevard and Gregory Hills Drive/South Spine Road. Modelled intersections were discussed and agreed with RMS prior to submission, with the analysis including more intersections than required by RMS. Refer to response 2 regarding the configuration of Camden Valley Way.
	Council still considers it appropriate that a qualified traffic consultant undertake a peer review of the modelling.	Based on the above the modelling is consistent with the Cardno Report supporting the approval of the precinct and is therefore deemed not to require peer review. Following RMS consultation, sensitivity testing will be introduced in the SIDRA modelling process to demonstrate the robustness of the assessments and proposed arrangements.
2	The traffic report contains information regarding the completed road network and hierarchy of critical roads for the proposed development. However it does not address the issue that many roads are still being constructed and at what level the network will be constructed to when construction begins on the first and subsequent stages of the proposed development. The applicant should also demonstrate that development consent exists for the delivery of the surrounding road network.	Development staging will be considered as part of future DAs. This submission is based on a concept DA involving full development of the site, which is only expected to occur around 2026 when the road network is fully constructed. Furthermore, the road network modelled is consistent with the Cardno Report supporting the precinct approval. Development consent for the delivery of the road network is therefore unnecessary as the layout and assumptions are consistent with the approved modelling for the precinct.
3	The response from the applicant only addresses the operational needs of the proposed development and has not addressed the concerns about the increased risk and potential conflicts on the surrounding road network (due to the number of proposed access points). The number of accesses would result in drivers not knowing which access a vehicle is turning into and result in potential rear end crashes and weaving movements from vehicles avoiding cars propped to turn into the proposed development.	The access points provided are limited to specific user types (general public, emergency vehicles, ambulance drop-off and service vehicles) and are minimised for each user class. It is noted that separated access points are required in order to ensure emergency vehicles have efficient access when required and to minimise conflict between service vehicles and other traffic. Special access points (e.g. emergency) will be clearly marked to avoid confusion.
4	The proposed physical limitation of access from/to The Hermitage Way is noted and supported. However it is not clear in the traffic report that the	Noted. The access at The Hermitage Way is confirmed to be left-in-left-out only.

	Hermitage Way is limited to left in/left out only. This should be detailed as part of the concept proposal.	
5	The proposed prohibition of all heavy vehicle access to/from The Hermitage Way is noted and supported.	Noted
6	The traffic report states an assessment was undertaken and queueing could be accommodated. Evidence is required showing that this is the case. With the level of generation of approximately 10 arrivals at the site per minute in the AM peak hour some queuing would be likely during these busy periods. Evidence is required that all queuing vehicles can all be accommodated on the site and not queue on the surrounding road network. Suggested improvements in technology in the future is not an acceptable answer to address these matters.	A detailed assessment of queuing will be undertaken as part of future DAs. It is noted that this is a concept DA and allows for potential adjustments to the design to accommodate queuing if necessary. By the time the site is fully developed (approximately 2026), it is extremely likely that improvements in boom gate technology (which are already available by suppliers) will allow a higher vehicle throughput.
7	Please refer to point 6 above.	N/A
8	The applicant has satisfactorily addressed this issue.	N/A
9	The proposed provision of more accessible car parking spaces than is required by the Building Code of Australia is noted and supported. It is noted that AS 2890.1 and AS 2890.6 do not contain rates of parking.	Noted
10	Car parking provision for each stage must be provided based on the requirements of that stage assessed against the applicable car parking quantum criteria.	Noted. The car parking requirements of each stage will be considered as part of future DAs.
11	The applicant has satisfactorily addressed this issue.	N/A
12	The applicant has satisfactorily addressed this issue.	N/A
13	The applicant has satisfactorily addressed this issue.	N/A
14	The applicant has satisfactorily addressed this issue.	N/A
15	As aforementioned, the modelling should be assessed for two lanes on Camden Valley Way as it is unlikely that the third lane would be constructed by the time this hospital is operational.	Refer to response 2. The modelling is undertaken for final development of the site and is consistent with the Cardno Report for the precinct approval. The site will not be fully developed when the hospital is first operational. The road network configuration will be reviewed at each stage of development and modified accordingly as part of future detailed DAs.
16	The proposed design compliance with AS 2890.1 and AS 2890.6 is noted and supported.	Noted

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I hope that this provides adequate clarification to explain the modelling process.

Please do not hesitate to contact the undersigned if you seek further information.

Kind Regards,

Matthew Stephens
NSW Transport Engineering Leader
T +61 (0)2 9098 6766
M +61 (0)414 236 130
Matthew.Stephens@mottmac.com

Appendix 2b

Mott Macdonald, 'SIDRA Modelling - Additional Scenarios'

MOTT MACDONALD

SIDRA Modelling - Additional Scenarios

Our Reference
368851

383 Kent Street
Sydney NSW 2000
PO Box Q1678, QVB
Sydney, NSW 1230
Australia

T +61 (0)2 9098 6800
F +61 (0)2 9098 6810
mottmac.com

Addendum to Camden Medical Campus Traffic Impact and Parking Assessment

5 December 2016

To whom it may concern,

Purpose

This letter documents the modelling sensitivity testing undertaken for the Camden Medical Campus, Gregory Hills, as requested by RMS. It supports and confirms the original modelling assessments submitted with the concept DA for the site and should be read in conjunction with the Traffic Impact and Parking Assessment (July, 2016) supporting the concept DA for the site.

The additional analysis was undertaken in response to concerns raised by RMS surrounding the SIDRA modelling scenarios, specifically:

- The lack of existing conditions modelling; and
- The use of the Badgally Road Extension Modelling and Signal Justification Report (Cardno, 2009 – referred to as 'Cardno Report') as a source of future 2026 background traffic volumes given the date of analysis.

It is noted that the Cardno Report was used as the modelling benchmark as it forms the basis of approval for full development of the Turner Road Precinct and was considered appropriate for a concept DA for the site. Future detailed DAs with more comprehensive analysis and modelling would be undertaken and account for staging, evolving traffic patterns and changing road network conditions.

Regardless, further modelling has been undertaken to better understand the existing and potential future road network performance and support the modelling presented in the Traffic Impact and Parking Statement.

Methodology

Modelling Scenarios

The following additional scenarios were modelled in SIDRA as part of this analysis for both AM and PM peak periods, numbered for consistency with the Traffic Impact and Parking Assessment:

- **2016 – 0:** 2016 existing conditions;
- **2031 – 5a:** 2031 without proposed development;
- **2031 – 5b:** 2031 with proposed development;
- **2036 – 6a (sensitivity test):** 2036 without proposed development; and
- **2036 – 6b (sensitivity test):** 2036 with proposed development.

Modelling was undertaken for the following intersections based on discussion with RMS:

- Gregory Hills Drive / Camden Valley Way;
- Gregory Hills Drive / Central Hills Drive; and
- Gregory Hills Drive / The Hermitage Way.

Model Modifications

The following calibration adjustments were made to the original SIDRA models following consultation with RMS. The changes to the models include:

- Modelling the intersections as part of a network;
- Reductions in signal coordination; and
- Adjustments to approach distances and turn bay lengths.

Existing Conditions

Surveys of existing traffic movements at each intersection were undertaken in November 2016. SCATS IDM data was also provided by RMS for weekday AM and PM peak periods (7am – 8am and 5pm – 6pm respectively) at TCS sites 4219, 4378 and 4379 to understand existing signal phasing operations at these intersections. Refer to Appendix B for the SCATS IDM data. The SCATS data was used to guide the setup of the SIDRA models to ensure a realistic representation of existing network operations.

It is noted that the existing road network is under construction and much of the surrounding area still consists of greenfield sites to be developed. For these reasons the observed traffic flows contain a high proportion of construction vehicles and traffic patterns will change dramatically once the road network is completed. The heavy vehicle percentage for future modelling scenarios was capped at 10% to prevent excessive distortion of traffic flows. Refer to Appendix A for an aerial snapshot (November 2016) demonstrating the existing state of the area and construction works.

A summary of the key areas to be developed and future road network improvements are presented in Figure 1.

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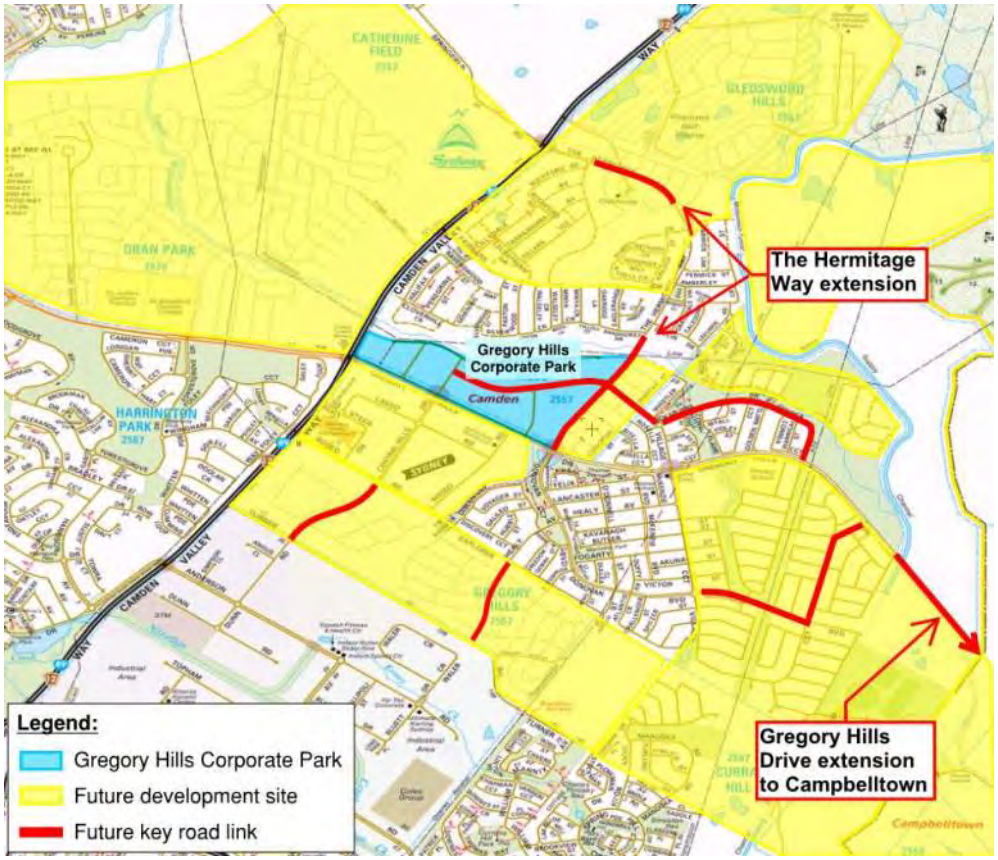
Figure 1: Future Development and Road Network Construction



Source: www.street-directory.com.au 2016

Future Conditions

RMS strategic traffic model forecasts were obtained and analysed for expected growth throughout the road network (refer to Appendix C). Growth factors identified in the RMS forecasts were then applied to the existing traffic volumes to determine projected 2031 and 2036 traffic volume forecasts throughout the road network. Phasing for the future models was modified to optimise operational performance given the changes in traffic flows.

Results

Results of the SIDRA modelling for each scenario are presented in the following tables.

Table 1: Gregory Hills Drive / Camden Valley Way

	AM Peak				PM Peak			
Scenario	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**
2016 - 0	0.87	C	37.4	241	0.89	C	36.8	301
2031 - 5a	1.44	F	95.6	730	1.75	F	122.6	453
2031 - 5b	1.44	F	97.5	730	1.77	F	125.6	453
2036 - 6a	1.71	F	130.4	902	1.96	F	159.8	578
2036 - 6b	1.78	F	133	902	1.98	F	162.6	576

DoS = Degree of Saturation
LoS = Level of Service

The impact of the proposed development for the future scenarios measured by the percentage increase in average delay is presented in Table 2.

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Table 2: Impact of Proposed Development

Scenario	Change in Average Delay – AM Peak	Change in Average Delay – PM Peak
2031 - 5	2%	2%
2036 - 6	2%	2%

Table 1 indicates that the intersection of Gregory Hills Drive/Camden Valley Way is likely to operate at capacity in the future modelled periods (2031 and 2036). This is due to high traffic volume forecasts and high heavy vehicle proportions (up to 18%) for movements accessing Gregory Hills Drive. Scenarios 5b and 6b demonstrate that the proposed development has minimal impact on the operational performance of the intersection, which is mostly driven by background traffic.

Table 3: Gregory Hills Drive / Central Hills Drive

	AM Peak				PM Peak			
Scenario	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**
2016 - 0	0.58	B	26.1	57	0.76	C	31.1	49
2031 - 5a	0.63	B	22.8	226	0.83	B	20.7	263
2031 - 5b	0.67	B	23.6	226	0.89	B	23	276
2036 - 6a	0.76	B	26.4	311	1.34	C	31.9	305
2036 - 6b	0.76	B	26.6	311	1.31	C	35.6	320

DoS = Degree of Saturation
LoS = Level of Service

The impact of the proposed development for the future scenarios measured by the percentage increase in average delay is presented in Table 4.

Table 4: Impact of Proposed Development

Scenario	Change in Average Delay – AM Peak	Change in Average Delay – PM Peak
2031 - 5	4%	11%
2036 - 6	1%	12%

Table 3 indicates that the intersection of Gregory Hills Drive/Central Hills Drive operates acceptably under all scenarios. The addition of the proposed development traffic has little to no impact on the operational performance of this intersection, which operates at LoS B in both AM and PM peak periods under future 2031 conditions.

Table 5: Gregory Hills Drive / The Hermitage Way

	AM Peak				PM Peak			
Scenario	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**	**DoS**	**LoS**	**Avg. Delay (s)**	**95% Queue (m)**
2016 - 0	0.95	C	30.8	67	0.59	C	30.7	66
2031 - 5a	0.77	B	24.9	161	0.91	B	23.3	357
2031 - 5b	0.81	C	29.5	188	0.86	B	24.4	371
2036 - 6a	0.89	C	33.1	234	1.01	C	35.2	499
2036 - 6b	0.97	C	35.2	234	1.16	C	36.2	450

DoS = Degree of Saturation
LoS = Level of Service

The impact of the proposed development for the future scenarios measured by the percentage increase in average delay is presented in Table 6.

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Table 6: Impact of Proposed Development

Scenario	Change in Average Delay – AM Peak	Change in Average Delay – PM Peak
2031 - 5	18%	5%
2036 - 6	6%	3%

The results indicate that the intersection of Gregory Hills Drive/The Hermitage Way operates acceptably under all scenarios. Regardless, the addition of the proposed development traffic has a minimal impact on the operational performance of this intersection, which operates at LoS B in both AM and PM peak periods under future 2031 conditions.

It is noted that road network upgrades are expected to be completed over time before the sensitivity test scenario occurs (2036) as well as improvements in public transport to help manage travel demand.

Construction and Development

Due to rapid development in the surrounding area and the expanding road network, traffic demand patterns are unstable and in flux. Much of the existing traffic is also associated with construction works. As a result there is a large proportion of heavy vehicles (as high as 50%) which is unusually high for the surrounding land uses, and traffic flow patterns will change over time. These factors contribute to the decreased performance of the road network in 2031 and 2036 since the forecast traffic flows are based on existing patterns, and the results presented are deemed conservative on this basis.

Conclusion

Key findings of the assessment include the following:

- The existing road network performs well and contains spare capacity for traffic volume growth.
- Existing traffic volumes contain high proportions of construction traffic associated with development of the surrounding area and road network construction. The future traffic forecasts therefore estimate particularly high traffic growth, especially for heavy vehicles, and forecasts of heavy vehicles have been adjusted accordingly.
- The future 2031 road network may operate at capacity at Gregory Hills Drive/ Camden Valley Way. This is driven by background traffic and the proposed development has a minimal impact. The intersections of Gregory Hills Drive/ Central Hills Drive and Gregory Hills Drive/ The Hermitage Way are expected to operate effectively in both peak periods.
- The future 2036 road network under a high growth worst case appraisal may operate at capacity at Gregory Hills Drive/ Camden Valley Way (both AM and PM peaks) and Gregory Hills Drive/ The Hermitage Way (PM peak). This is also driven by background traffic and the proposed development has a minimal impact.

It is therefore concluded that the analysis confirms the original findings and the proposed development will not adversely impact road network operations.

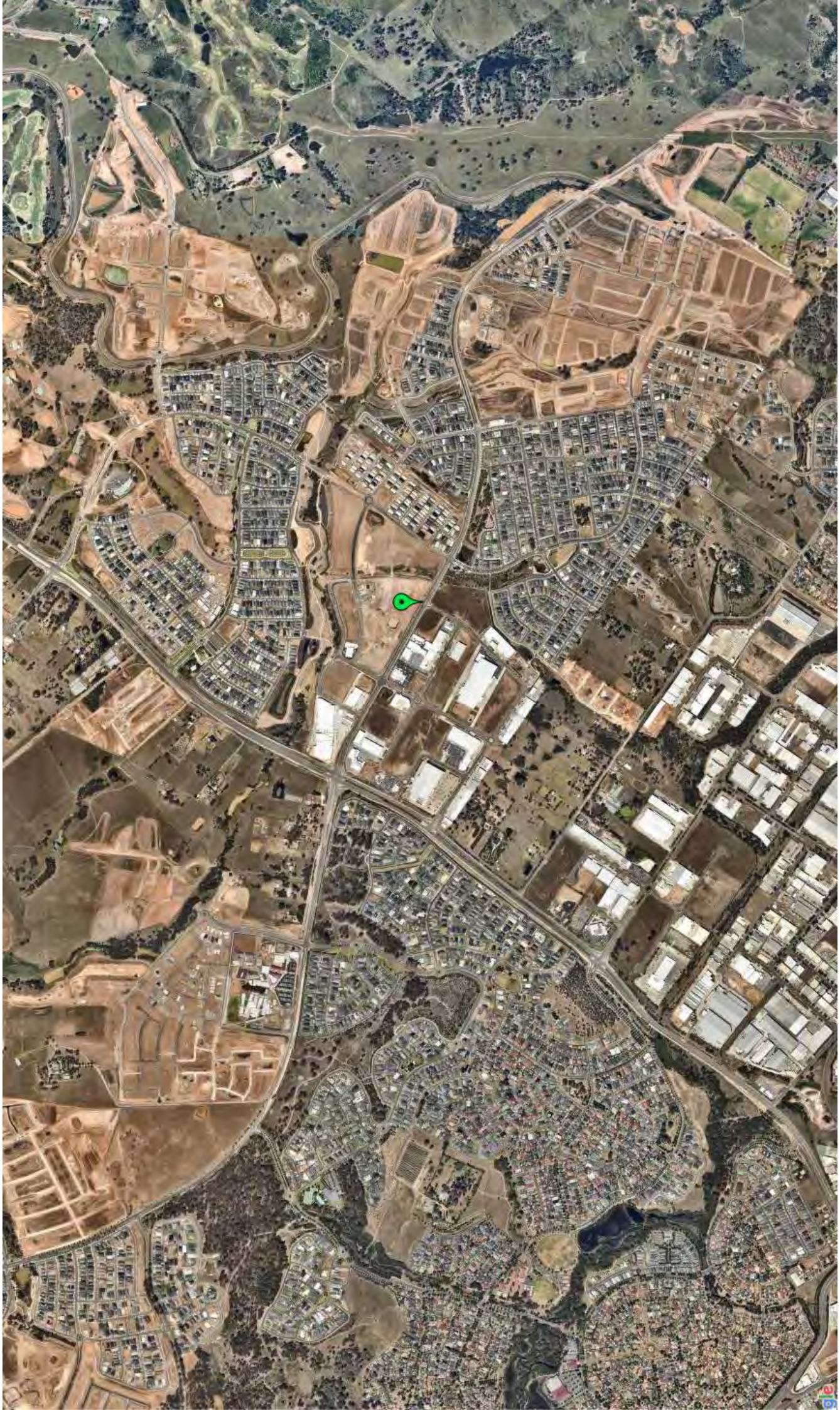
Yours sincerely,

Matthew Stephens
NSW Transport Engineering Leader
T +61 (0)2 9098 6766
M +61 (0)414 236 130
Matthew.Stephens@mottmac.com

Encl.:

- Appendix A – Aerial Snapshot
- Appendix B – SCATS IDM Data
- Appendix C – RMS Strategic Model Forecast Traffic Volumes
- Appendix D – SIDRA Modelling Results

Appendix A – Aerial Snapshot



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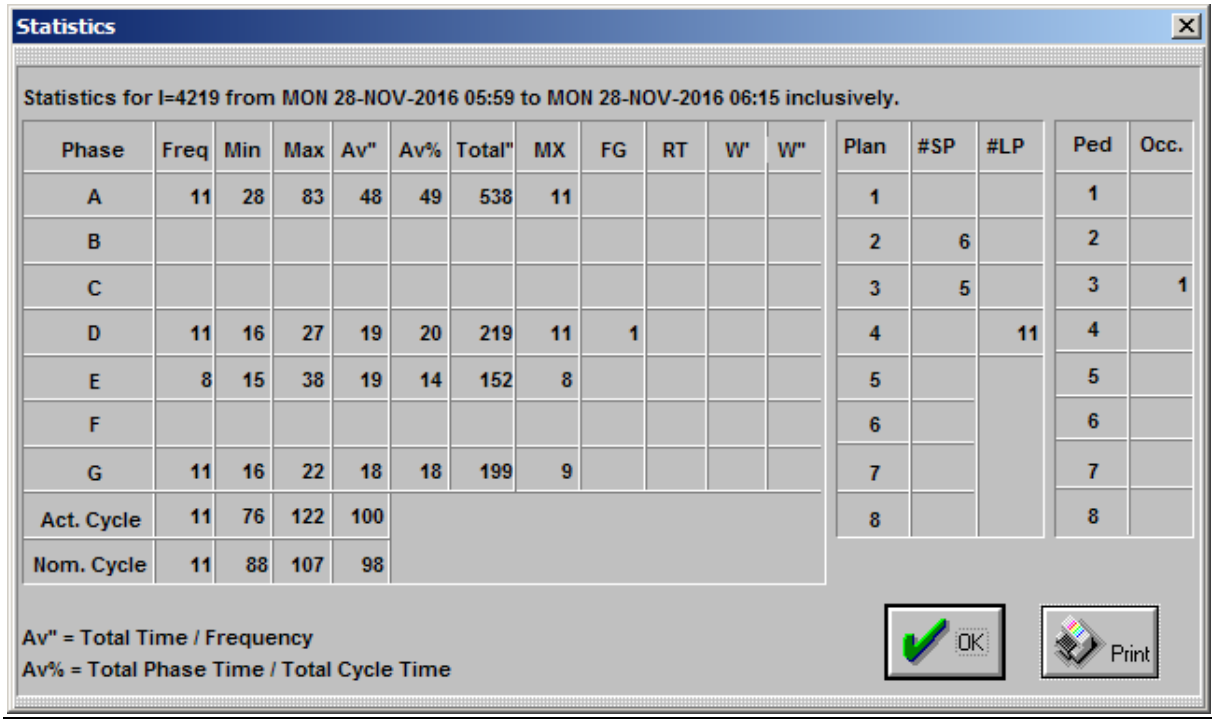
Appendix B – SCATS IDM Data

TCS 4219 – Camden Valley Way, Oran Park Drive & Gregory Hills Drive, Catherine Field

AM Peak 6-10am



Statistics

Statistics for I=4219 from MON 28-NOV-2016 05:59 to MON 28-NOV-2016 06:15 inclusively.

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A	11	28	83	48	49	538	11				
B											
C											
D	11	16	27	19	20	219	11	1			
E	8	15	38	19	14	152	8				
F											
G	11	16	22	18	18	199	9				
Act. Cycle	11	76	122	100							
Nom. Cycle	11	88	107	98							

Plan	#SP	#LP
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

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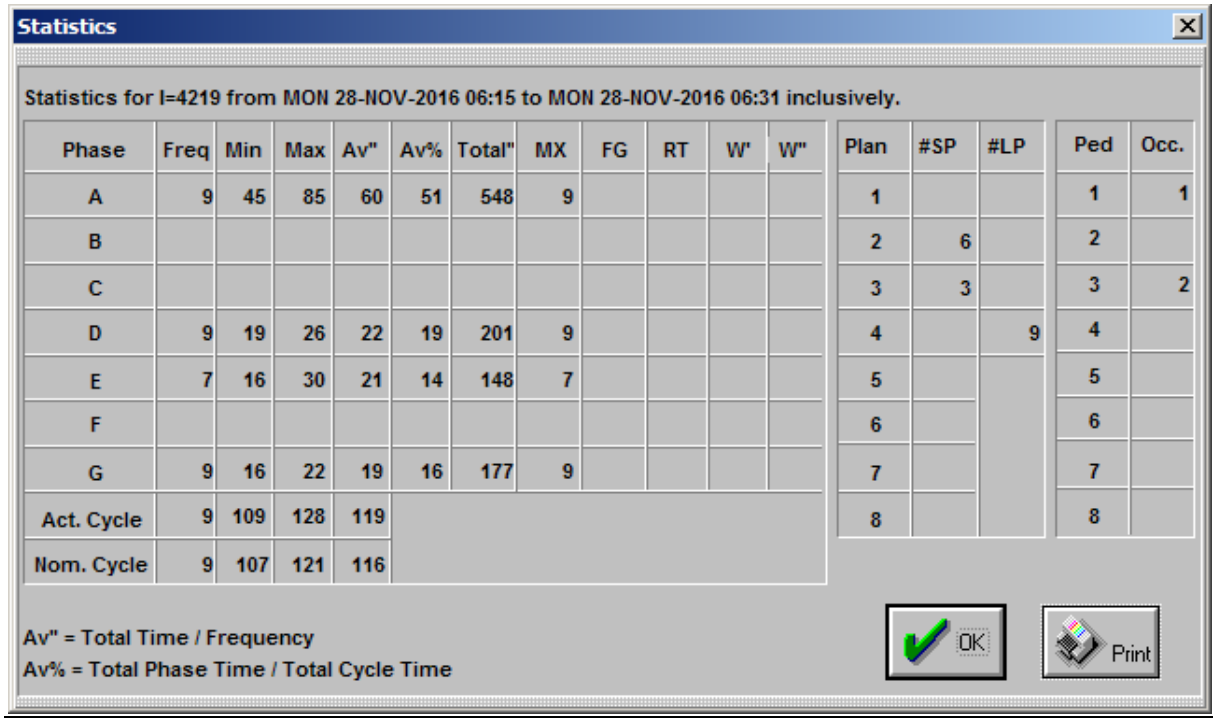
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Statistics for I=4219 from MON 28-NOV-2016 06:15 to MON 28-NOV-2016 06:31 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 9 45 85 60 51 548 9
B
C
D 9 19 26 22 19 201 9
E 7 16 30 21 14 148 7
F
G 9 16 22 19 16 177 9
Act. Cycle 9 109 128 119
Nom. Cycle 9 107 121 116
Plan #SP #LP
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Av" = Total Time / Frequency
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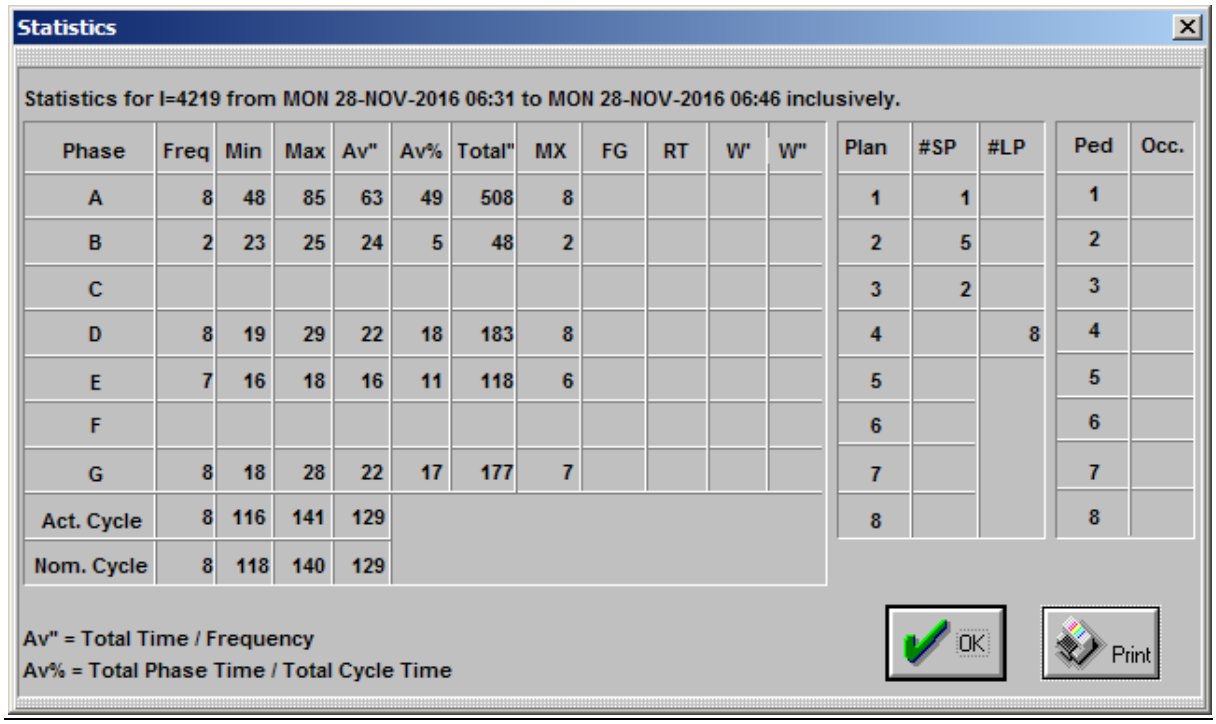
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A 8 48 85 63 49 508 8
B 2 23 25 24 5 48 2
C
D 8 19 29 22 18 183 8
E 7 16 18 16 11 118 6
F
G 8 18 28 22 17 177 7
Act. Cycle 8 116 141 129
Nom. Cycle 8 118 140 129
Plan #SP #LP
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
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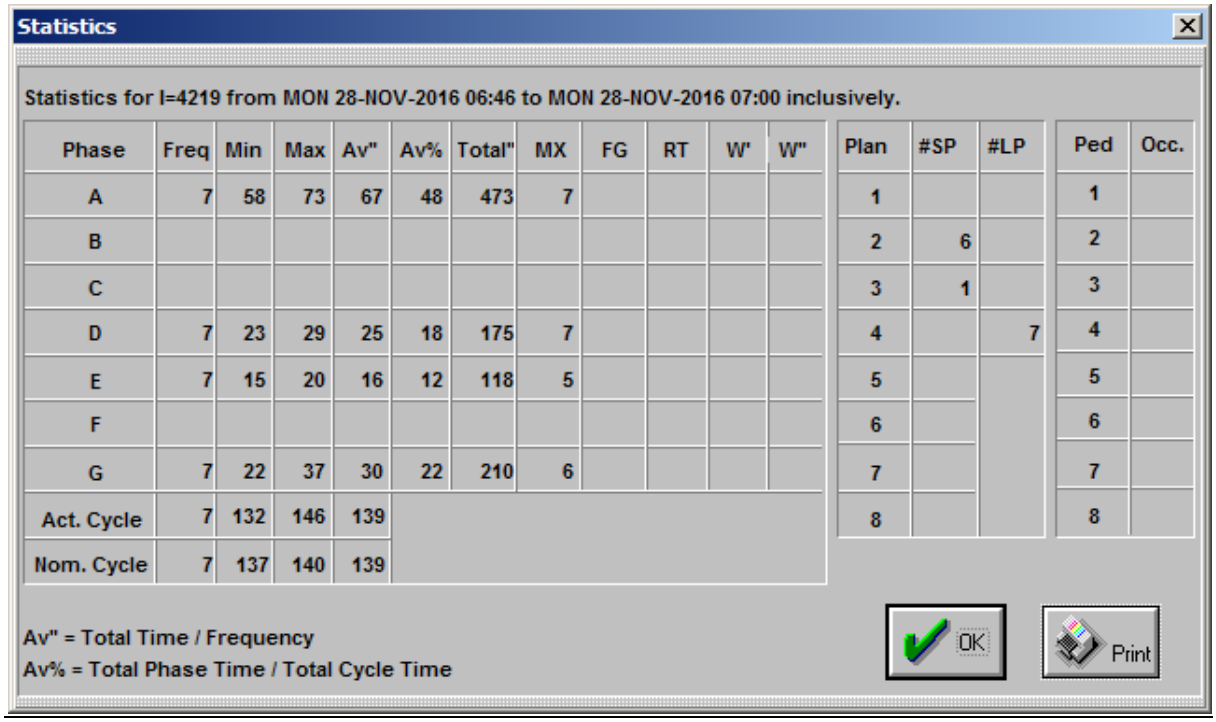

Statistics

Statistics for I=4219 from MON 28-NOV-2016 06:46 to MON 28-NOV-2016 07:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	58	73	67	48	473	7				
B											
C											
D	7	23	29	25	18	175	7				
E	7	15	20	16	12	118	5				
F											
G	7	22	37	30	22	210	6				
Act. Cycle	7	132	146	139							
Nom. Cycle	7	137	140	139							

Plan	#SP	#LP
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

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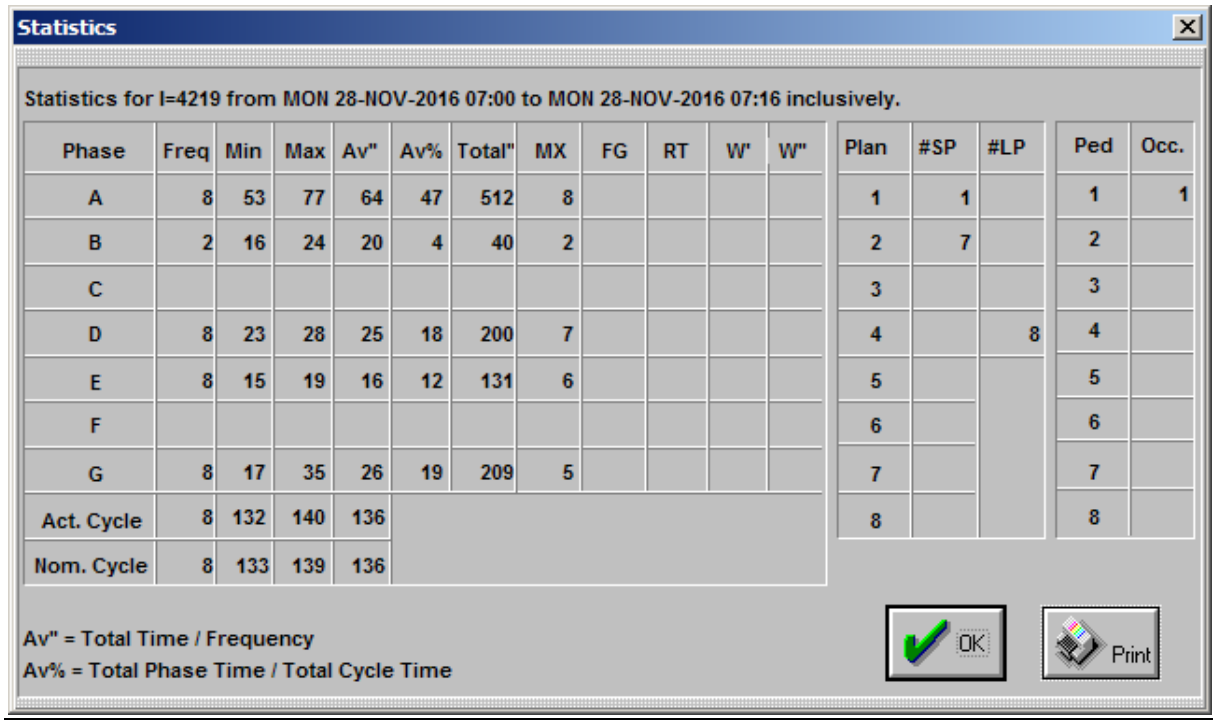

Statistics

Statistics for I=4219 from MON 28-NOV-2016 07:00 to MON 28-NOV-2016 07:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	53	77	64	47	512	8				
B	2	16	24	20	4	40	2				
C											
D	8	23	28	25	18	200	7				
E	8	15	19	16	12	131	6				
F											
G	8	17	35	26	19	209	5				
Act. Cycle	8	132	140	136							
Nom. Cycle	8	133	139	136							

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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

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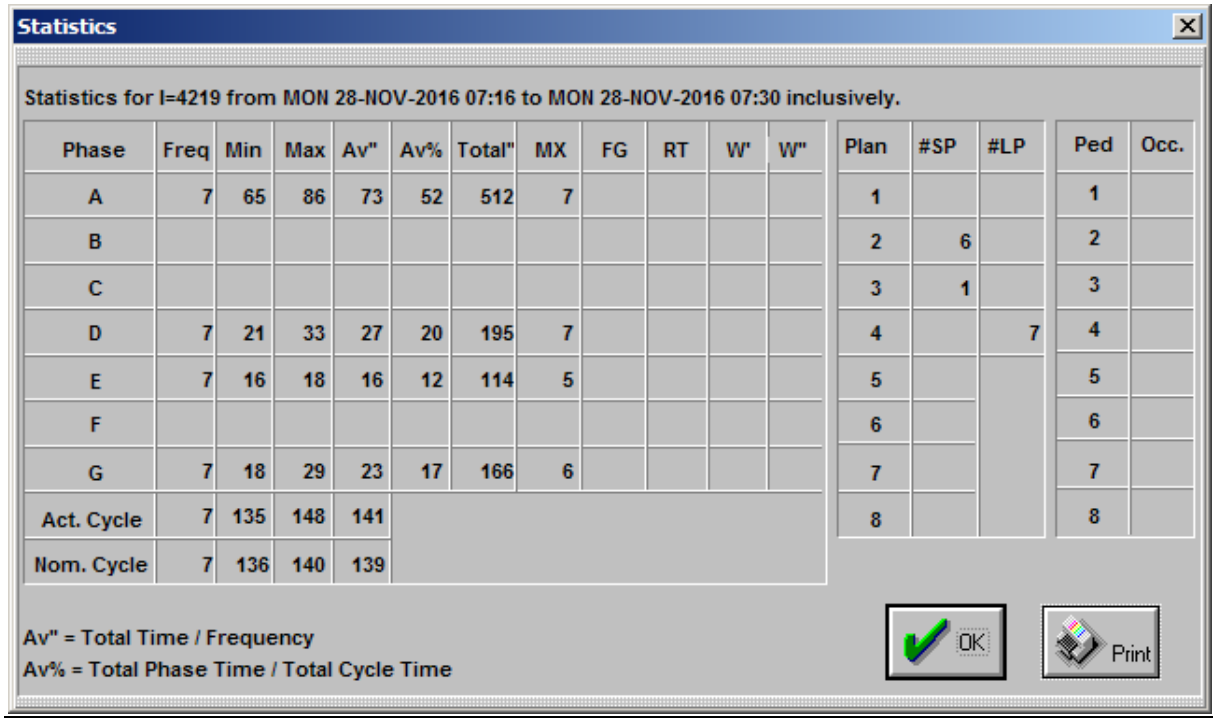

Statistics

Statistics for I=4219 from MON 28-NOV-2016 07:16 to MON 28-NOV-2016 07:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	65	86	73	52	512	7				
B											
C											
D	7	21	33	27	20	195	7				
E	7	16	18	16	12	114	5				
F											
G	7	18	29	23	17	166	6				
Act. Cycle	7	135	148	141							
Nom. Cycle	7	136	140	139							

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Av" = Total Time / Frequency
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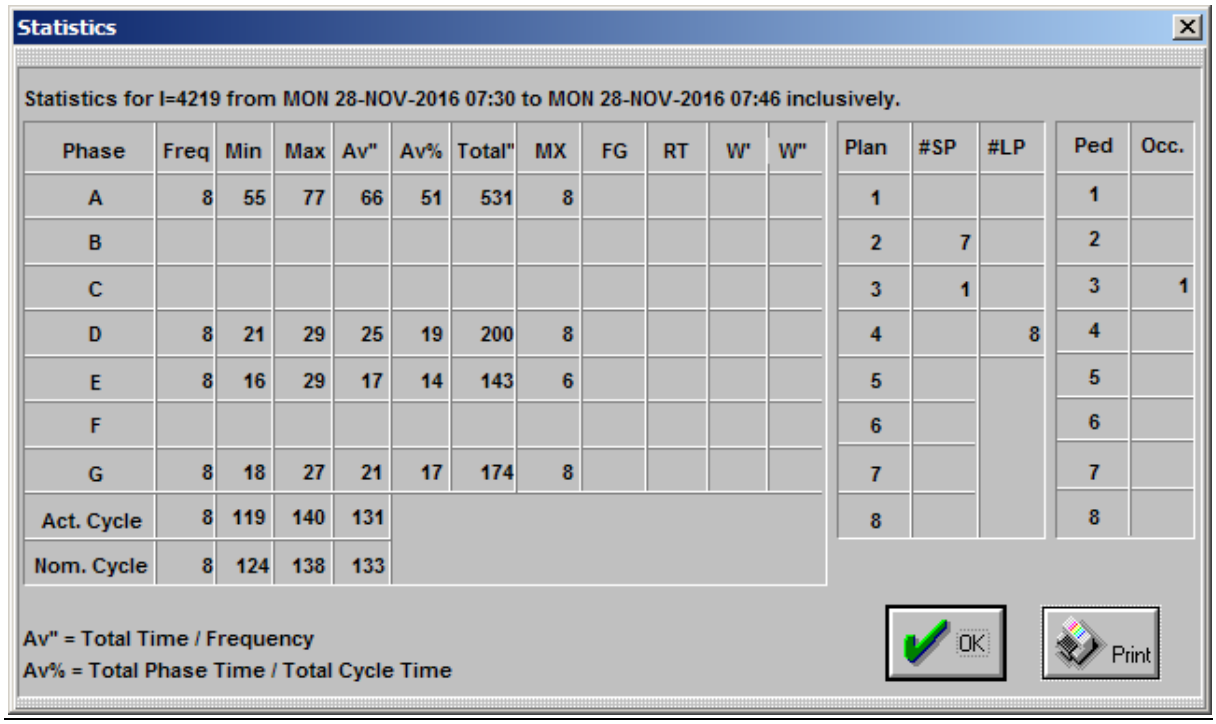

Statistics

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A	8	55	77	66	51	531	8				
B											
C											
D	8	21	29	25	19	200	8				
E	8	16	29	17	14	143	6				
F											
G	8	18	27	21	17	174	8				
Act. Cycle	8	119	140	131							
Nom. Cycle	8	124	138	133							

Plan	#SP	#LP
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Av" = Total Time / Frequency
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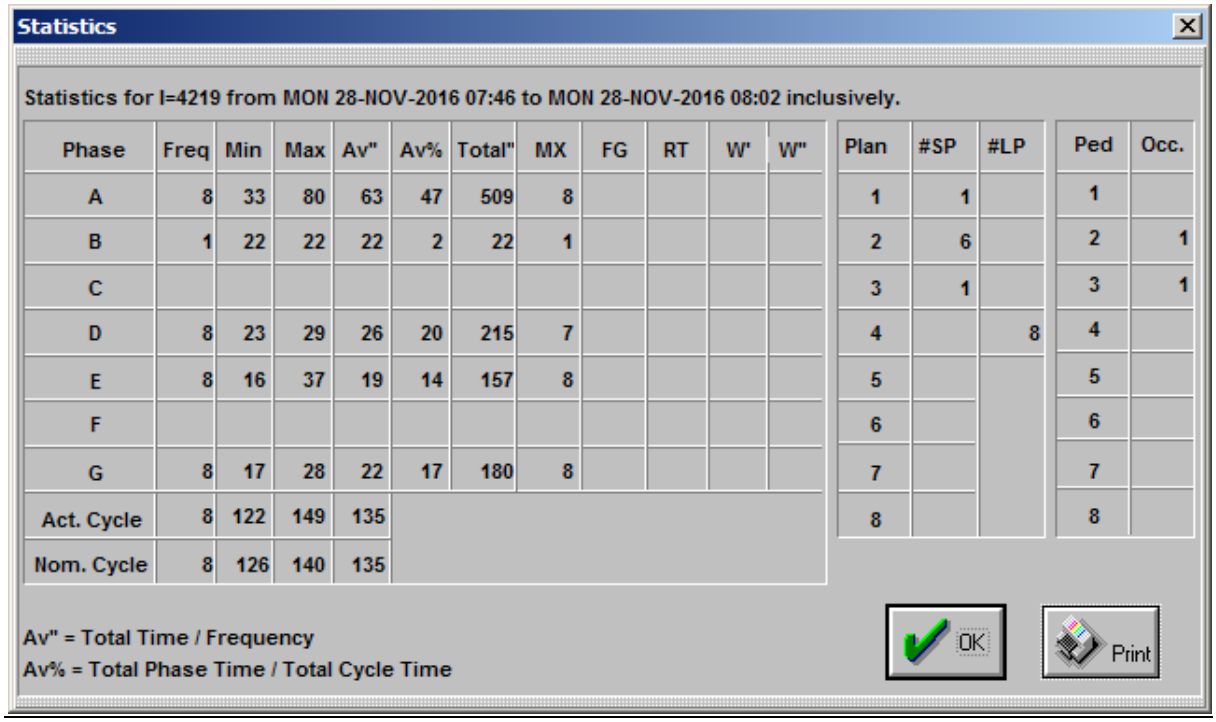
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A 8 33 80 63 47 509 8
B 1 22 22 22 2 22 1
C
D 8 23 29 26 20 215 7
E 8 16 37 19 14 157 8
F
G 8 17 28 22 17 180 8
Act. Cycle 8 122 149 135
Nom. Cycle 8 126 140 135
Plan #SP #LP
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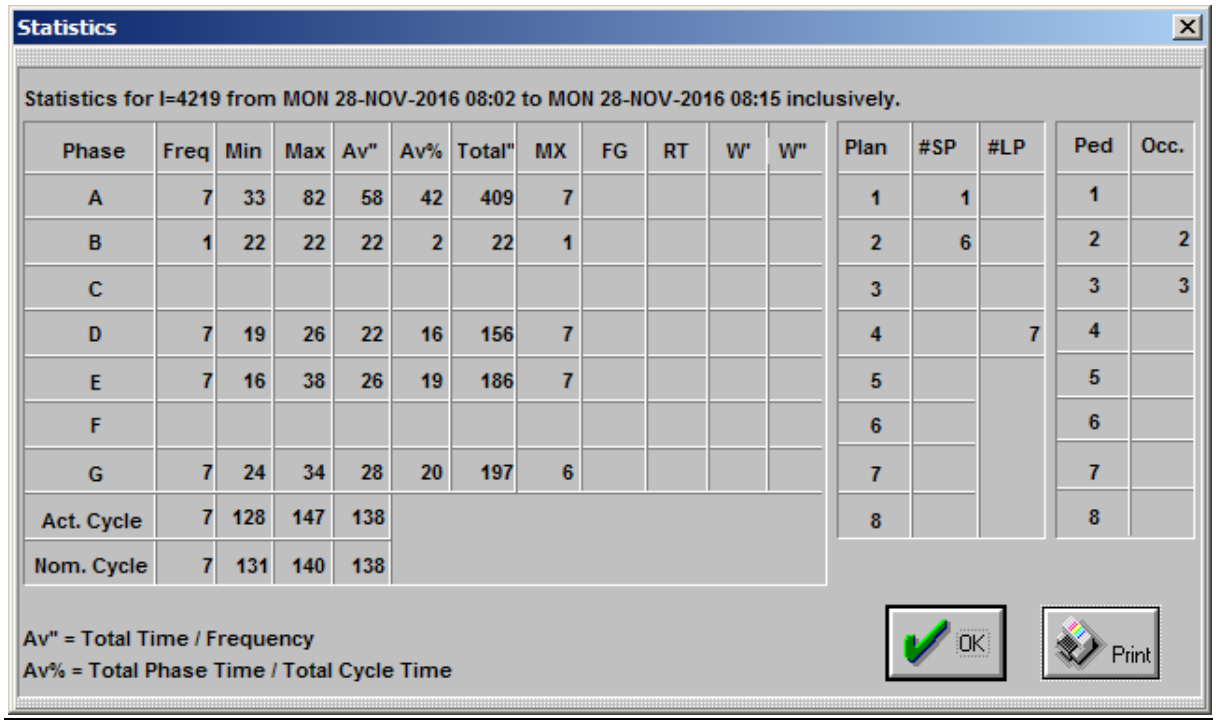
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B 1 22 22 22 2 22 1
C
D 7 19 26 22 16 156 7
E 7 16 38 26 19 186 7
F
G 7 24 34 28 20 197 6
Act. Cycle 7 128 147 138
Nom. Cycle 7 131 140 138
Plan #SP #LP
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Av" = Total Time / Frequency
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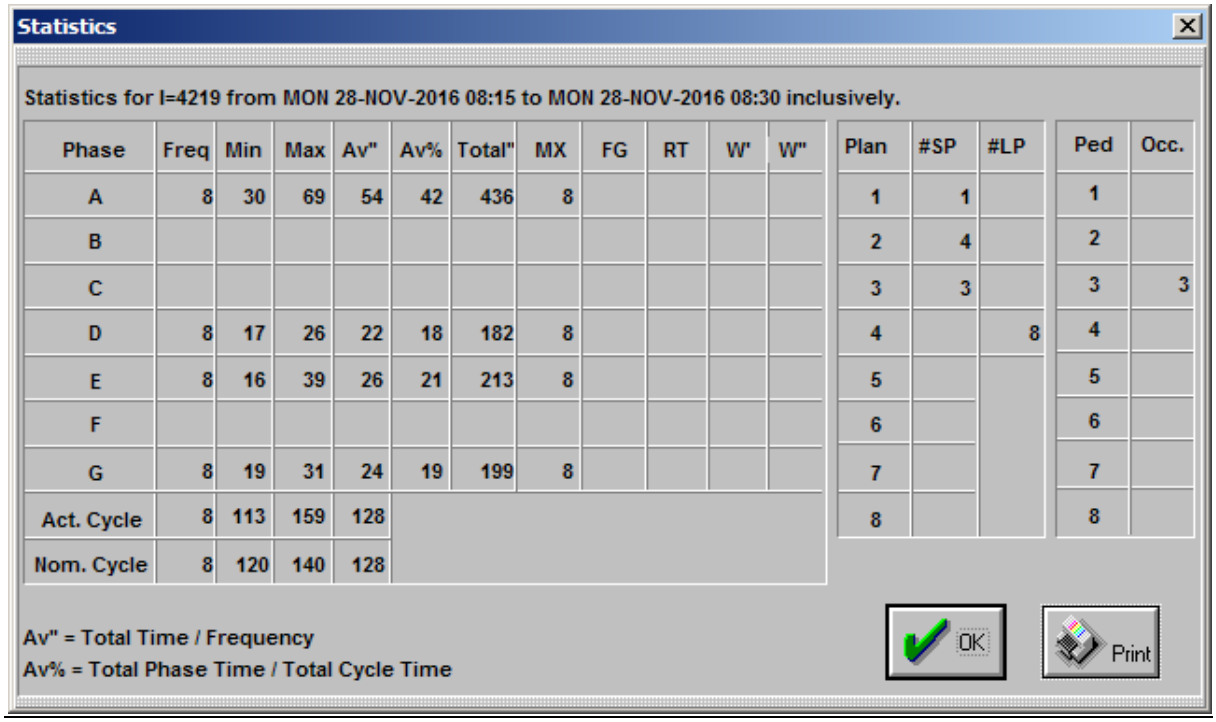

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	30	69	54	42	436	8				
B											
C											
D	8	17	26	22	18	182	8				
E	8	16	39	26	21	213	8				
F											
G	8	19	31	24	19	199	8				
Act. Cycle	8	113	159	128							
Nom. Cycle	8	120	140	128							

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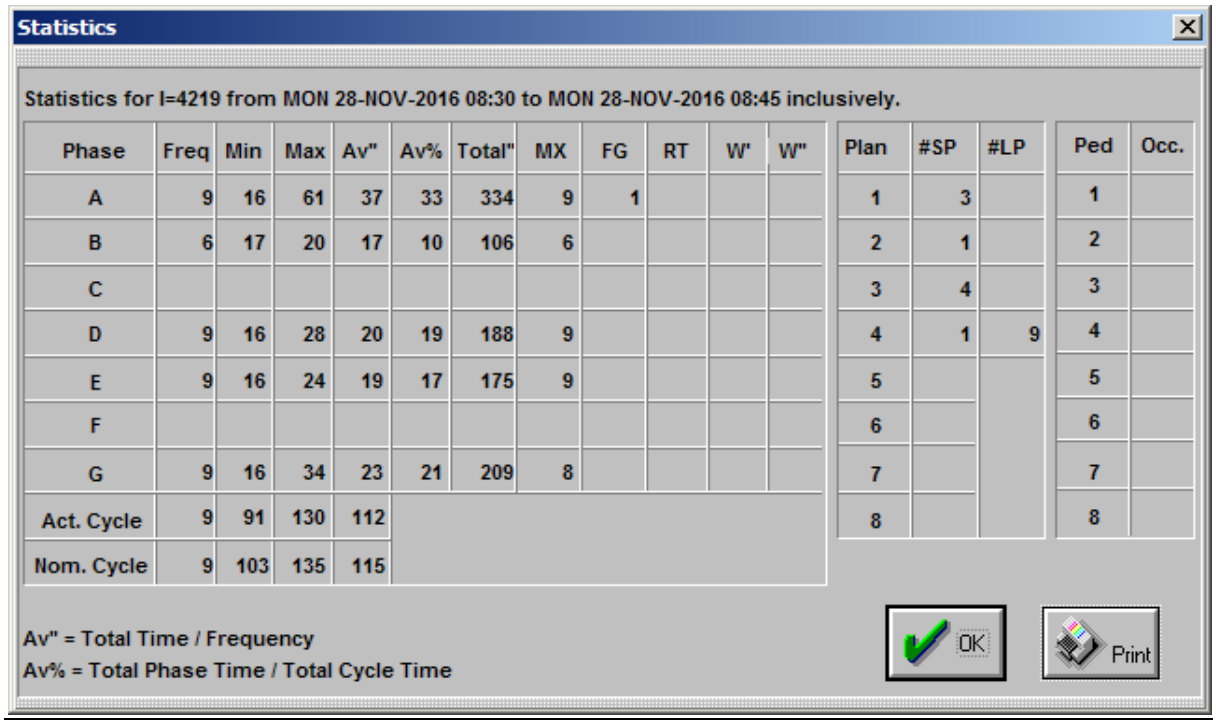

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	16	61	37	33	334	9	1			
B	6	17	20	17	10	106	6				
C											
D	9	16	28	20	19	188	9				
E	9	16	24	19	17	175	9				
F											
G	9	16	34	23	21	209	8				
Act. Cycle	9	91	130	112							
Nom. Cycle	9	103	135	115							

Plan	#SP	#LP
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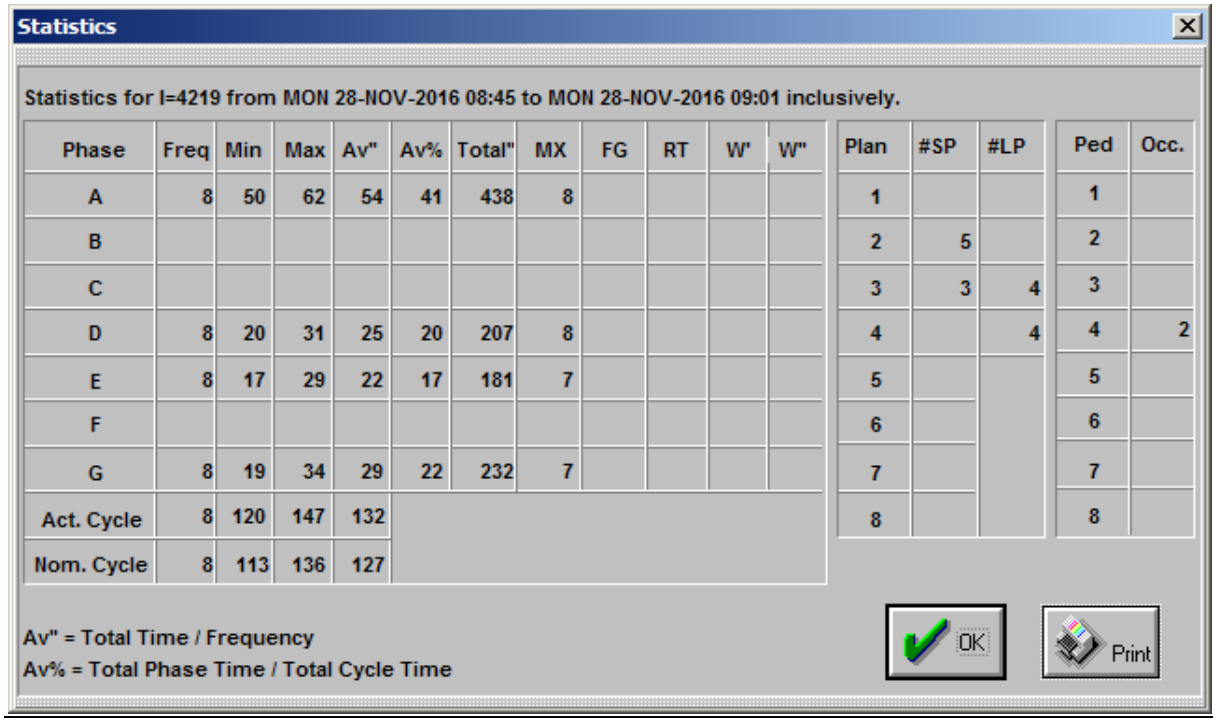

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B											
C											
D	8	20	31	25	20	207	8				
E	8	17	29	22	17	181	7				
F											
G	8	19	34	29	22	232	7				
Act. Cycle	8	120	147	132							
Nom. Cycle	8	113	136	127							

Plan	#SP	#LP
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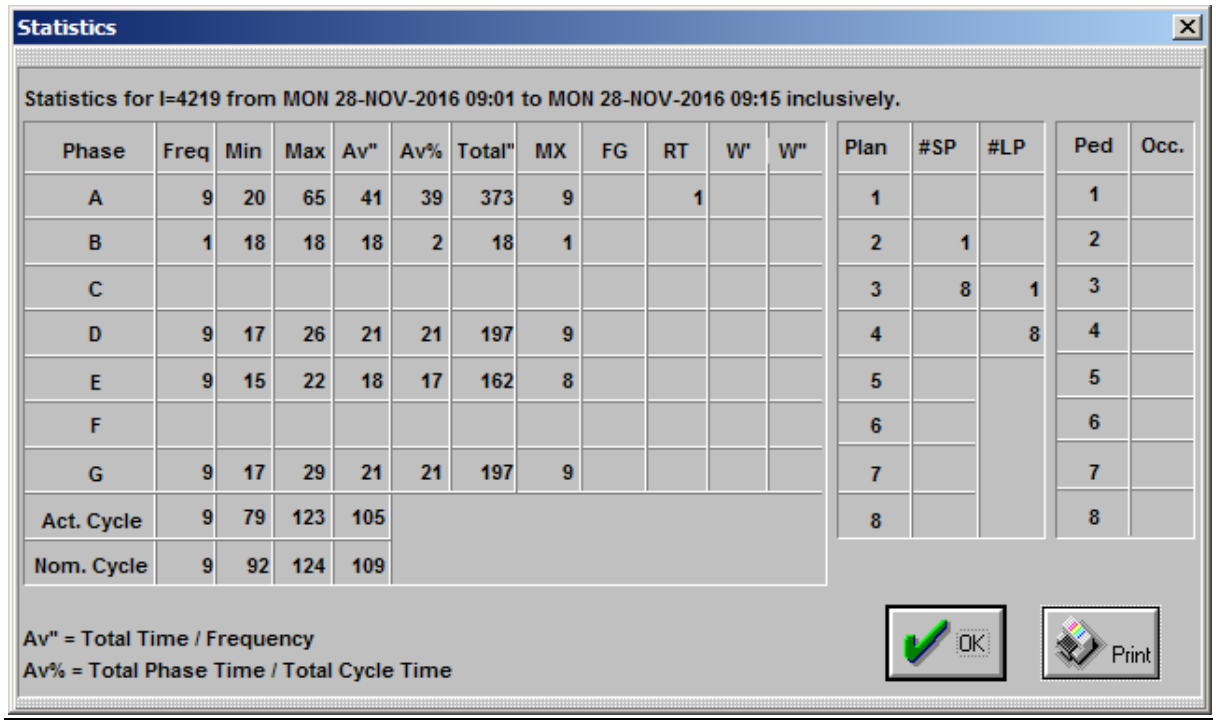
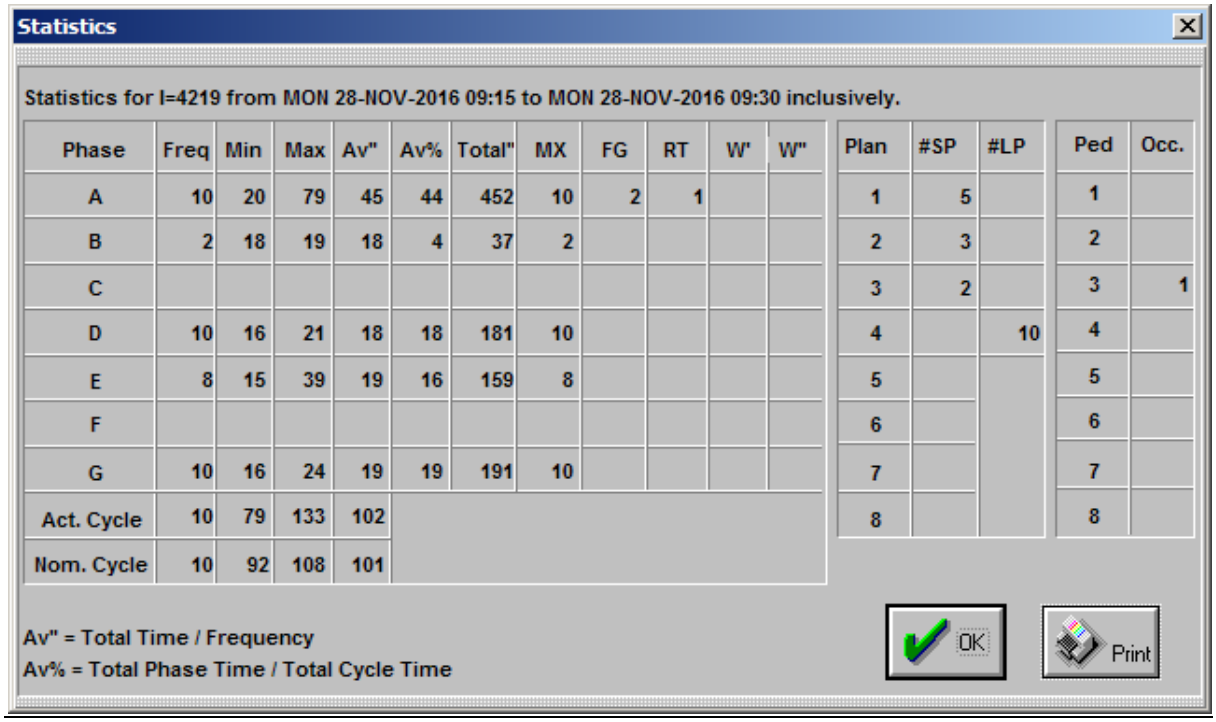
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	20	65	41	39	373	9		1		
B	1	18	18	18	2	18	1				
C											
D	9	17	26	21	21	197	9				
E	9	15	22	18	17	162	8				
F											
G	9	17	29	21	21	197	9				
Act. Cycle	9	79	123	105							
Nom. Cycle	9	92	124	109							

Plan	#SP	#LP
1		
2	1	
3	8	1
4		8
5		
6		
7		
8		

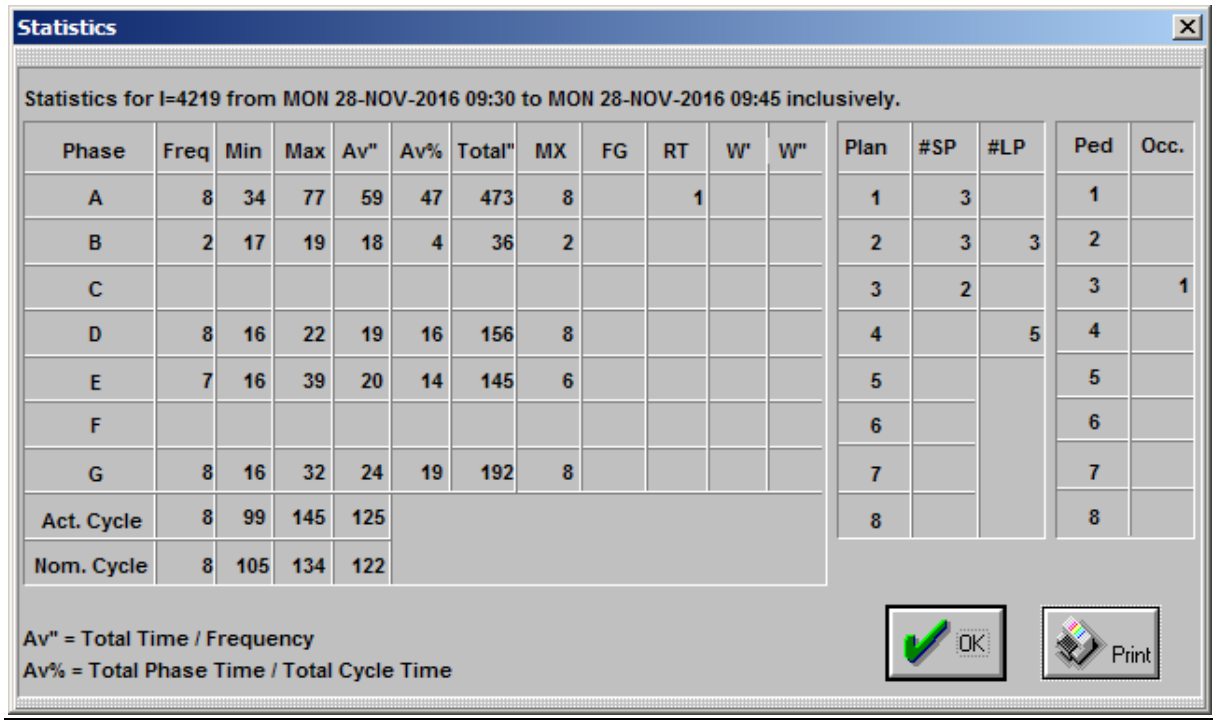
Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	10	20	79	45	44	452	10	2	1		
B	2	18	19	18	4	37	2				
C											
D	10	16	21	18	18	181	10				
E	8	15	39	19	16	159	8				
F											
G	10	16	24	19	19	191	10				
Act. Cycle	10	79	133	102							
Nom. Cycle	10	92	108	101							

Plan	#SP	#LP
1	5	
2	3	
3	2	
4		10
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	1
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	34	77	59	47	473	8		1		
B	2	17	19	18	4	36	2				
C											
D	8	16	22	19	16	156	8				
E	7	16	39	20	14	145	6				
F											
G	8	16	32	24	19	192	8				
Act. Cycle	8	99	145	125							
Nom. Cycle	8	105	134	122							

Plan	#SP	#LP
1	3	
2	3	3
3	2	
4		5
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	1
4	
5	
6	
7	
8	

Statistics

Statistics for I=4219 from MON 28-NOV-2016 09:45 to MON 28-NOV-2016 10:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	27	74	52	48	475	9				
B	2	19	21	20	4	40	2				
C											
D	9	16	21	18	16	164	9				
E	8	16	20	17	14	136	8				
F											
G	8	17	29	22	18	180	8				
Act. Cycle	9	90	133	110							
Nom. Cycle	9	97	126	110							

Plan	#SP	#LP
1		
2	5	4
3	4	
4		5
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

PM Peak 3-7pm

Statistics

Statistics for I=4219 from MON 28-NOV-2016 14:58 to MON 28-NOV-2016 15:16 inclusively.

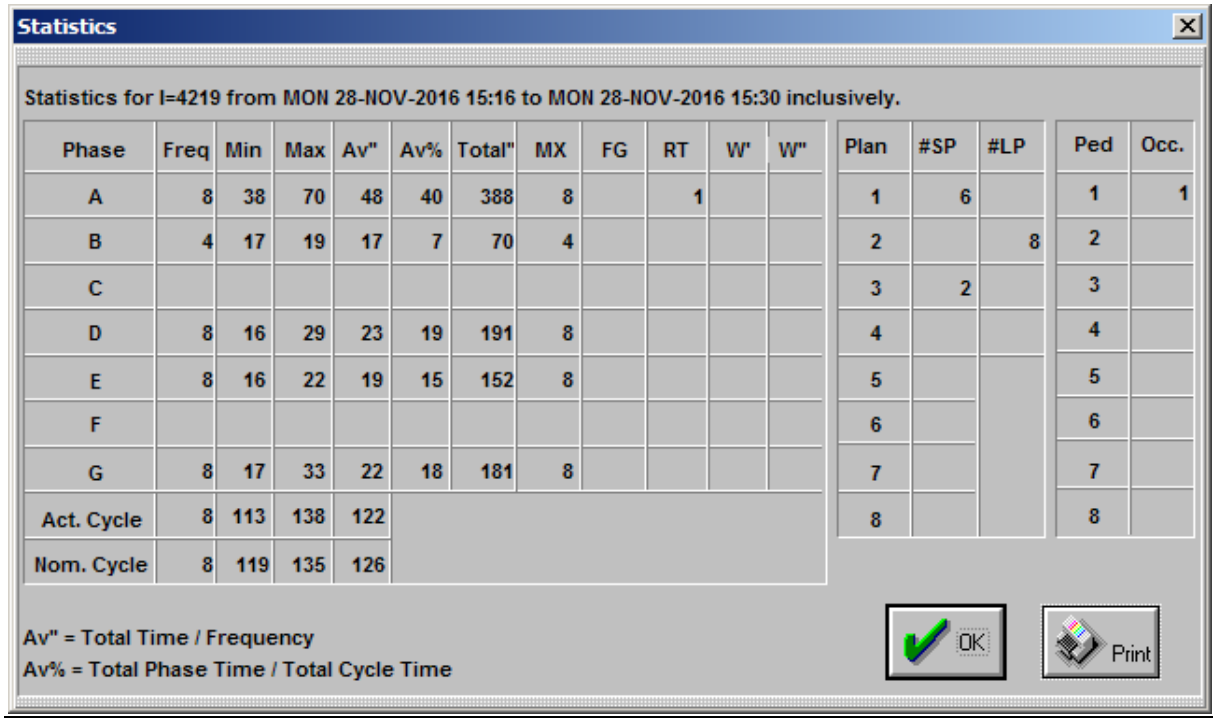
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	18	85	51	40	462	9				
B	4	17	22	18	7	75	4				
C											
D	9	16	25	20	16	185	9				
E	9	16	40	22	17	199	9				
F											
G	9	17	35	25	20	230	9				
Act. Cycle	9	77	150	127							
Nom. Cycle	9	121	138	131							

Plan	#SP	#LP
1	4	
2	5	8
3		
4		1
5		
6		
7		
8		

Ped	Occ.
1	
2	2
3	2
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

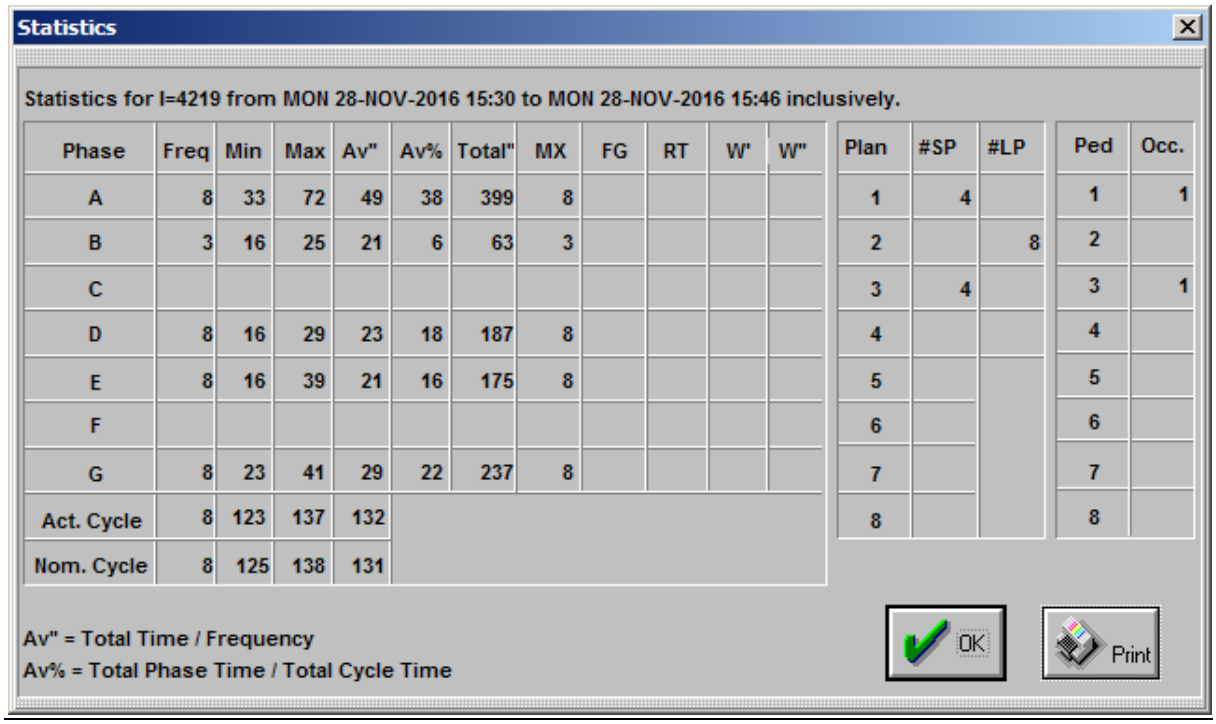
OK Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	38	70	48	40	388	8		1		
B	4	17	19	17	7	70	4				
C											
D	8	16	29	23	19	191	8				
E	8	16	22	19	15	152	8				
F											
G	8	17	33	22	18	181	8				
Act. Cycle	8	113	138	122							
Nom. Cycle	8	119	135	126							

Plan	#SP	#LP
1	6	
2		8
3	2	
4		
5		
6		
7		
8		

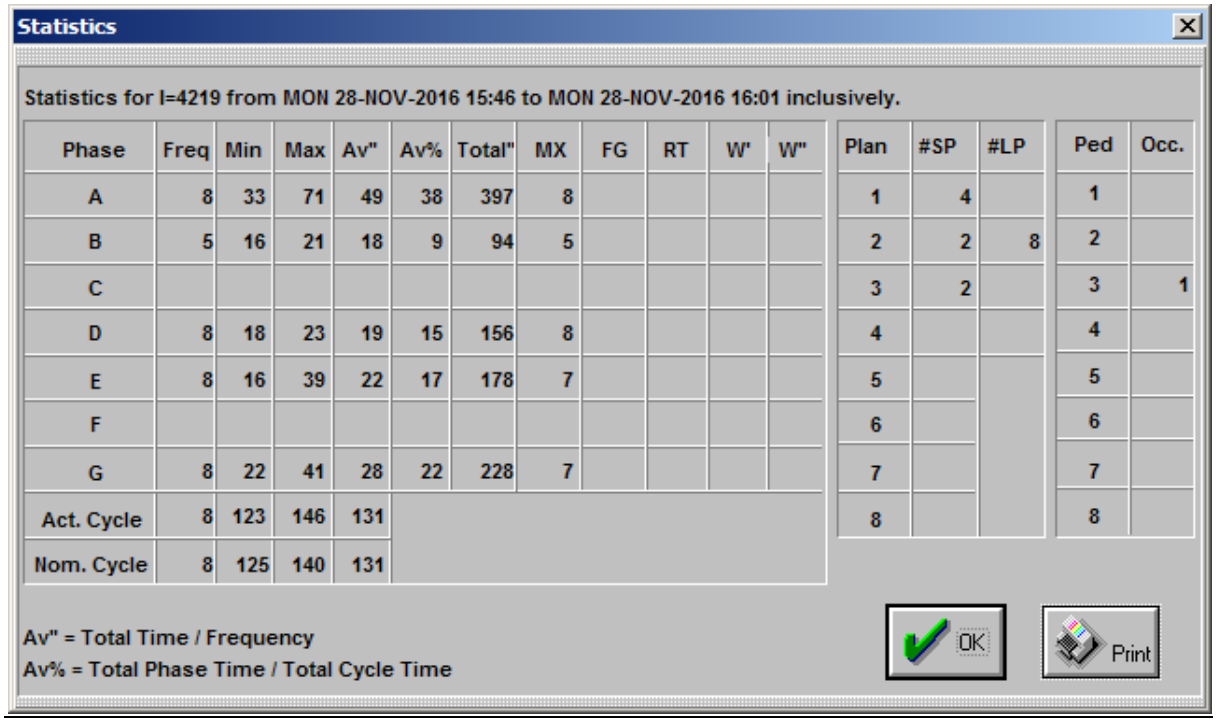
Ped	Occ.
1	1
2	
3	
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	33	72	49	38	399	8				
B	3	16	25	21	6	63	3				
C											
D	8	16	29	23	18	187	8				
E	8	16	39	21	16	175	8				
F											
G	8	23	41	29	22	237	8				
Act. Cycle	8	123	137	132							
Nom. Cycle	8	125	138	131							

Plan	#SP	#LP
1	4	
2		8
3	4	
4		
5		
6		
7		
8		

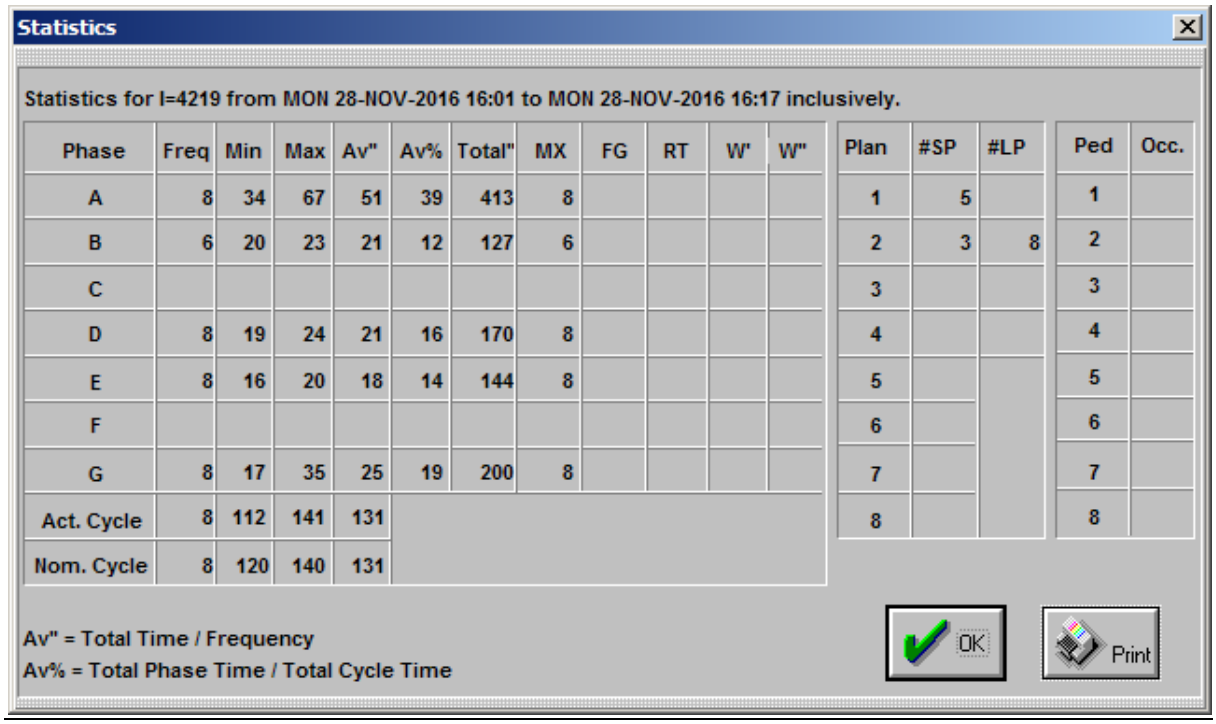
Ped	Occ.
1	1
2	
3	1
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	33	71	49	38	397	8				
B	5	16	21	18	9	94	5				
C											
D	8	18	23	19	15	156	8				
E	8	16	39	22	17	178	7				
F											
G	8	22	41	28	22	228	7				
Act. Cycle	8	123	146	131							
Nom. Cycle	8	125	140	131							

Plan	#SP	#LP
1	4	
2	2	8
3	2	
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	1
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	34	67	51	39	413	8				
B	6	20	23	21	12	127	6				
C											
D	8	19	24	21	16	170	8				
E	8	16	20	18	14	144	8				
F											
G	8	17	35	25	19	200	8				
Act. Cycle	8	112	141	131							
Nom. Cycle	8	120	140	131							

Plan	#SP	#LP
1	5	
2	3	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
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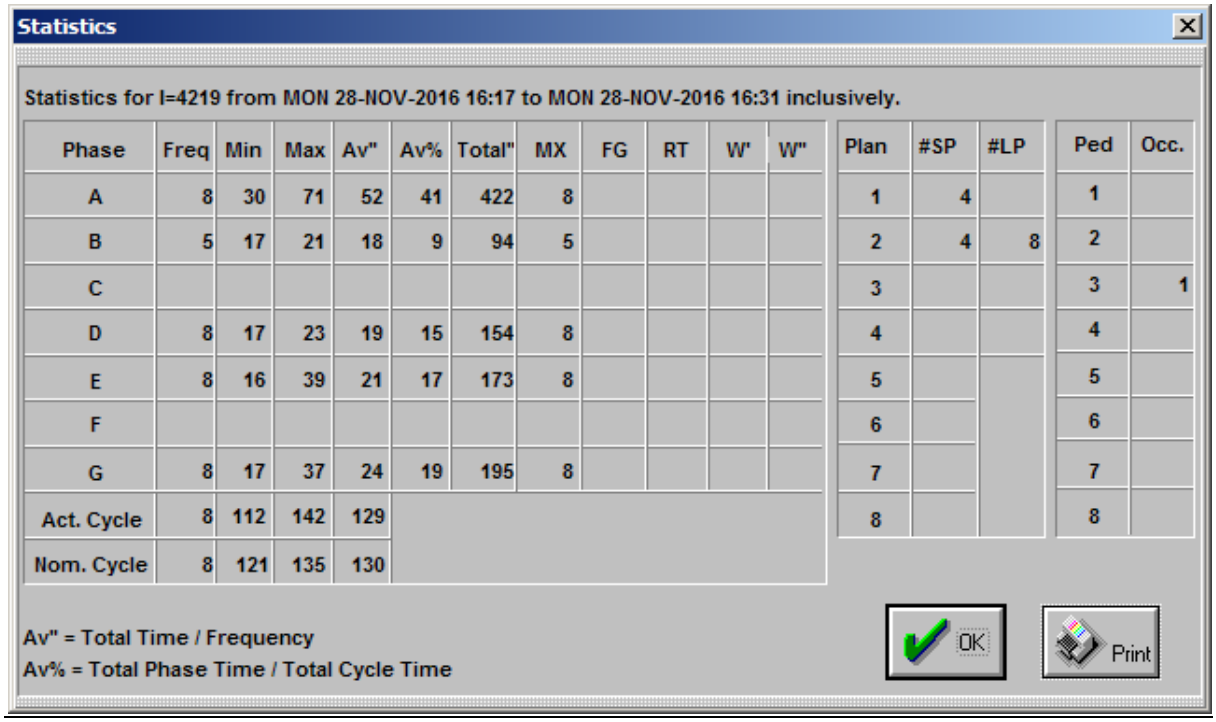
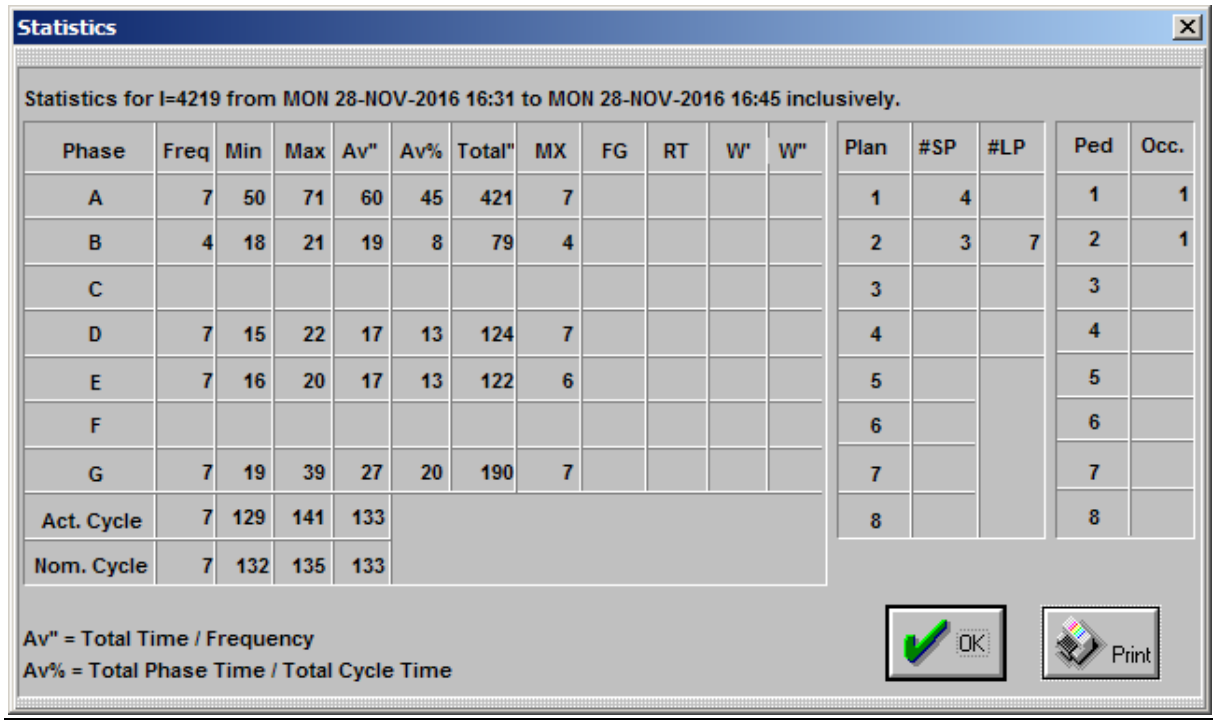
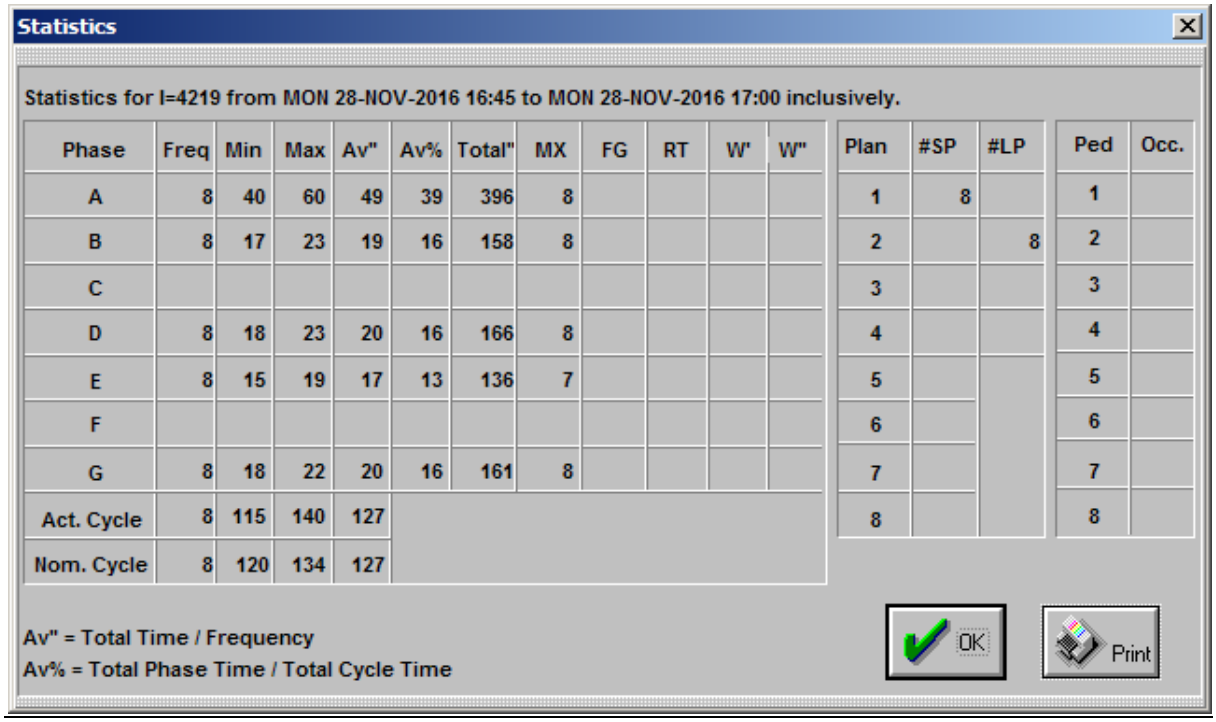
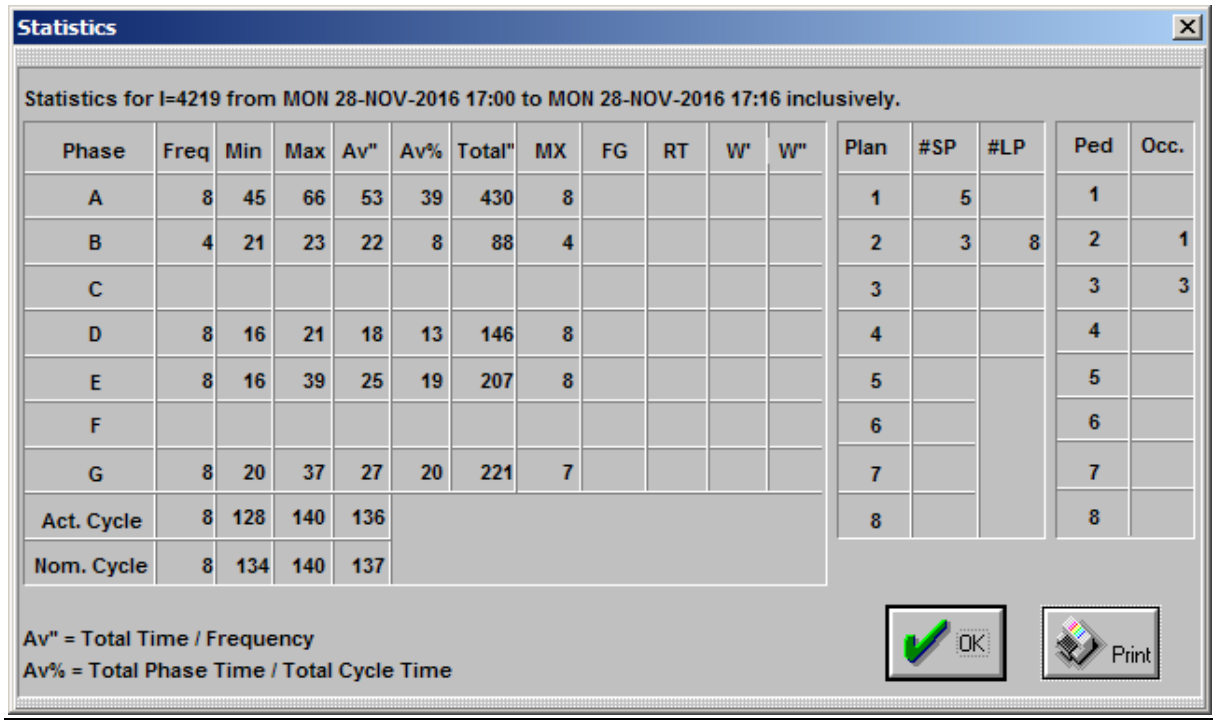
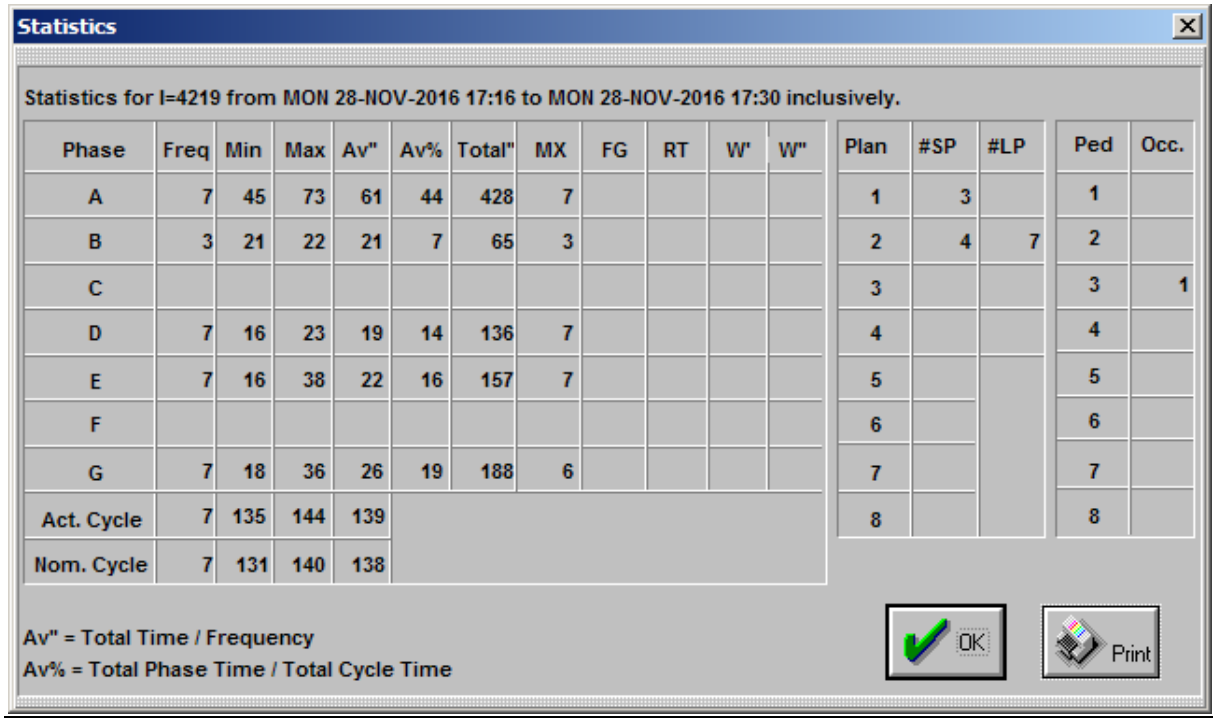
3	
4	
5	
6	
7	
8	


Statistics
Statistics for I=4219 from MON 28-NOV-2016 16:17 to MON 28-NOV-2016 16:31 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 8 30 71 52 41 422 8
B 5 17 21 18 9 94 5
C
D 8 17 23 19 15 154 8
E 8 16 39 21 17 173 8
F
G 8 17 37 24 19 195 8
Act. Cycle 8 112 142 129
Nom. Cycle 8 121 135 130
Plan #SP #LP
1 4
2 4 8
3
4
5
6
7
8
Ped Occ.
1
2
3 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4219 from MON 28-NOV-2016 16:31 to MON 28-NOV-2016 16:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 7 50 71 60 45 421 7
B 4 18 21 19 8 79 4
C
D 7 15 22 17 13 124 7
E 7 16 20 17 13 122 6
F
G 7 19 39 27 20 190 7
Act. Cycle 7 129 141 133
Nom. Cycle 7 132 135 133
Plan #SP #LP
1 4
2 3 7
3
4
5
6
7
8
Ped Occ.
1 1
2 1
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4219 from MON 28-NOV-2016 16:45 to MON 28-NOV-2016 17:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 8 40 60 49 39 396 8
B 8 17 23 19 16 158 8
C
D 8 18 23 20 16 166 8
E 8 15 19 17 13 136 7
F
G 8 18 22 20 16 161 8
Act. Cycle 8 115 140 127
Nom. Cycle 8 120 134 127
Plan #SP #LP
1 8
2 8
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

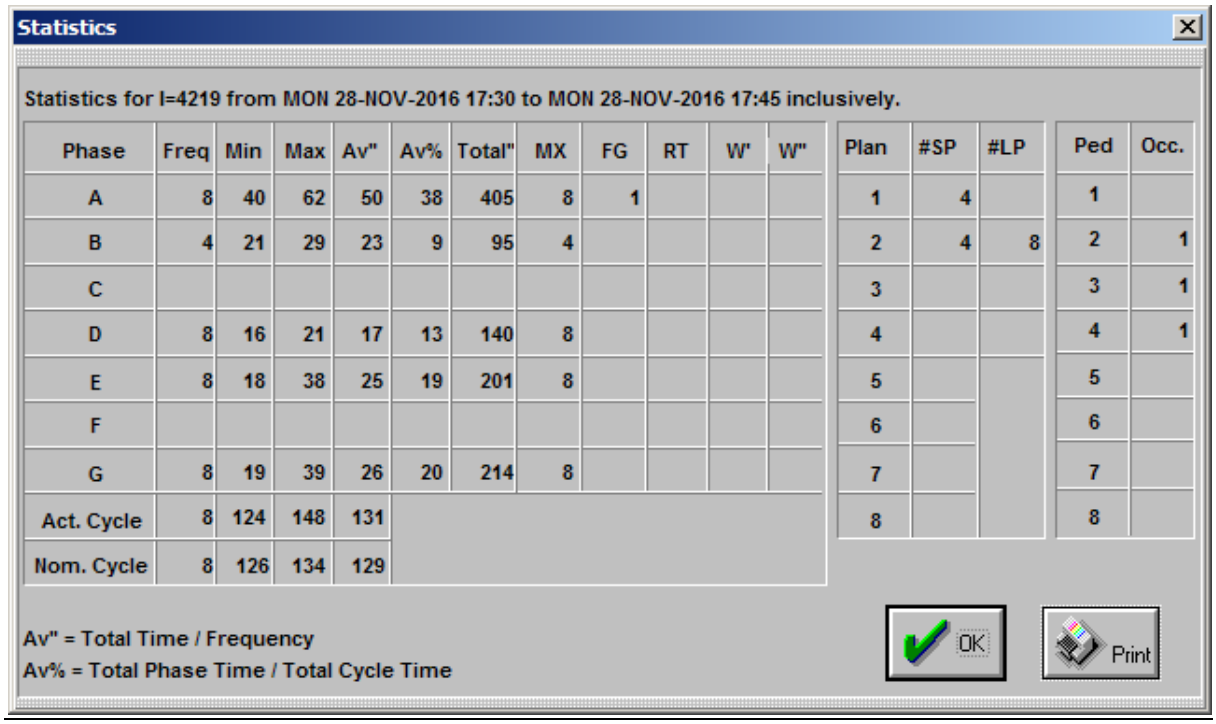

Statistics
Statistics for I=4219 from MON 28-NOV-2016 17:00 to MON 28-NOV-2016 17:16 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 8 45 66 53 39 430 8
B 4 21 23 22 8 88 4
C
D 8 16 21 18 13 146 8
E 8 16 39 25 19 207 8
F
G 8 20 37 27 20 221 7
Act. Cycle 8 128 140 136
Nom. Cycle 8 134 140 137
Plan #SP #LP
1 5
2 3 8
3
4
5
6
7
8
Ped Occ.
1
2 1
3 3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	45	73	61	44	428	7				
B	3	21	22	21	7	65	3				
C											
D	7	16	23	19	14	136	7				
E	7	16	38	22	16	157	7				
F											
G	7	18	36	26	19	188	6				
Act. Cycle	7	135	144	139							
Nom. Cycle	7	131	140	138							

Plan	#SP	#LP
1	3	
2	4	7
3		
4		
5		
6		
7		
8		

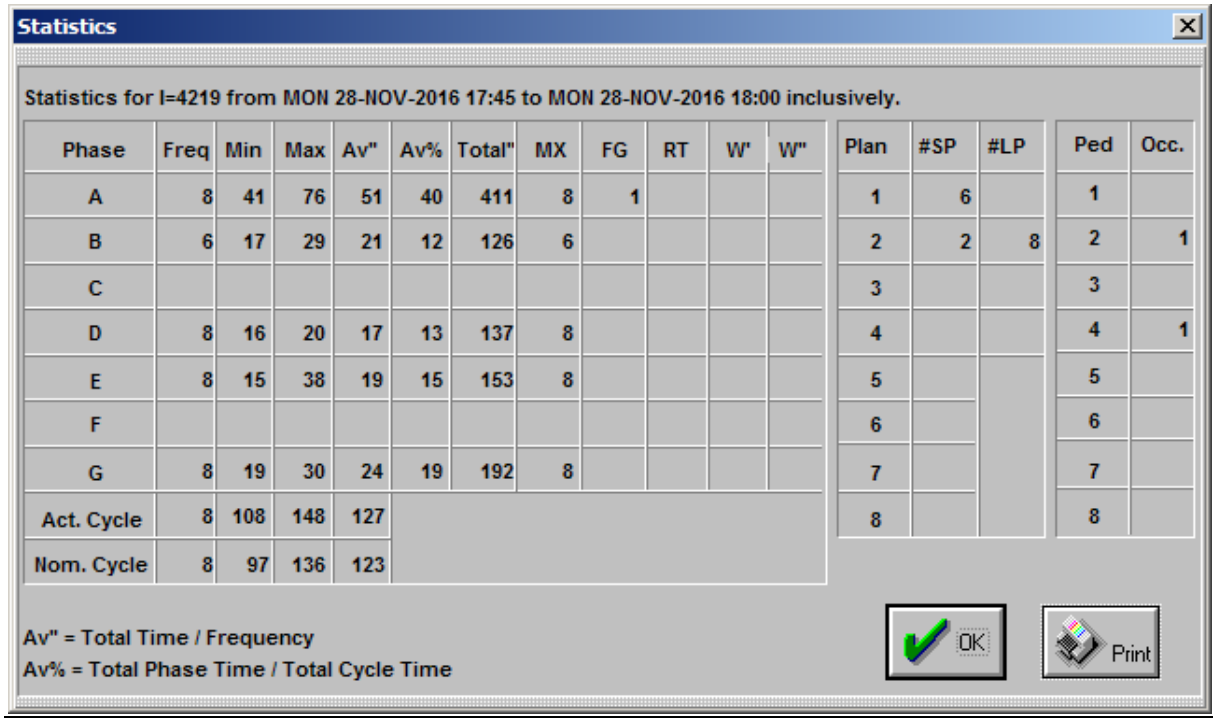
Ped	Occ.
1	
2	
3	1
4	
5	
6	
7	
8	



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	40	62	50	38	405	8	1			
B	4	21	29	23	9	95	4				
C											
D	8	16	21	17	13	140	8				
E	8	18	38	25	19	201	8				
F											
G	8	19	39	26	20	214	8				
Act. Cycle	8	124	148	131							
Nom. Cycle	8	126	134	129							

Plan	#SP	#LP
1	4	
2	4	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	1
3	1
4	1
5	
6	
7	
8	



Statistics

Statistics for I=4219 from MON 28-NOV-2016 17:45 to MON 28-NOV-2016 18:00 inclusively.

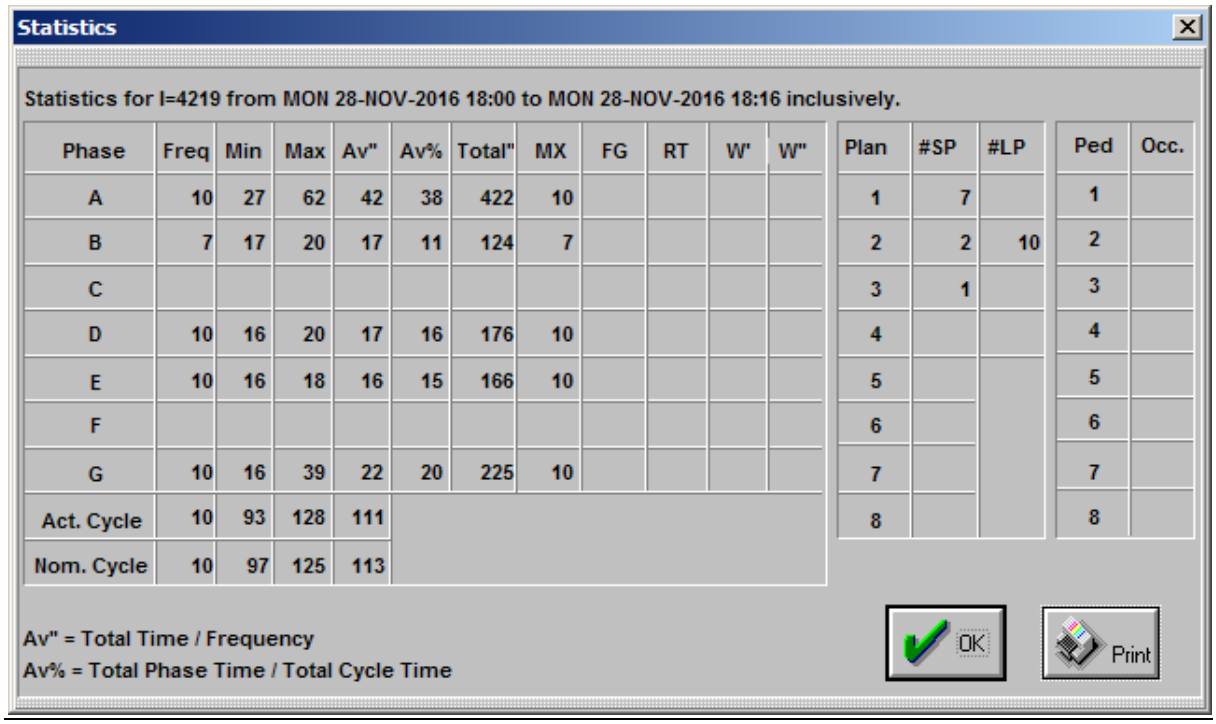
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	41	76	51	40	411	8	1			
B	6	17	29	21	12	126	6				
C											
D	8	16	20	17	13	137	8				
E	8	15	38	19	15	153	8				
F											
G	8	19	30	24	19	192	8				
Act. Cycle	8	108	148	127							
Nom. Cycle	8	97	136	123							

Plan	#SP	#LP
1	6	
2	2	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	1
3	
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=4219 from MON 28-NOV-2016 18:00 to MON 28-NOV-2016 18:16 inclusively.

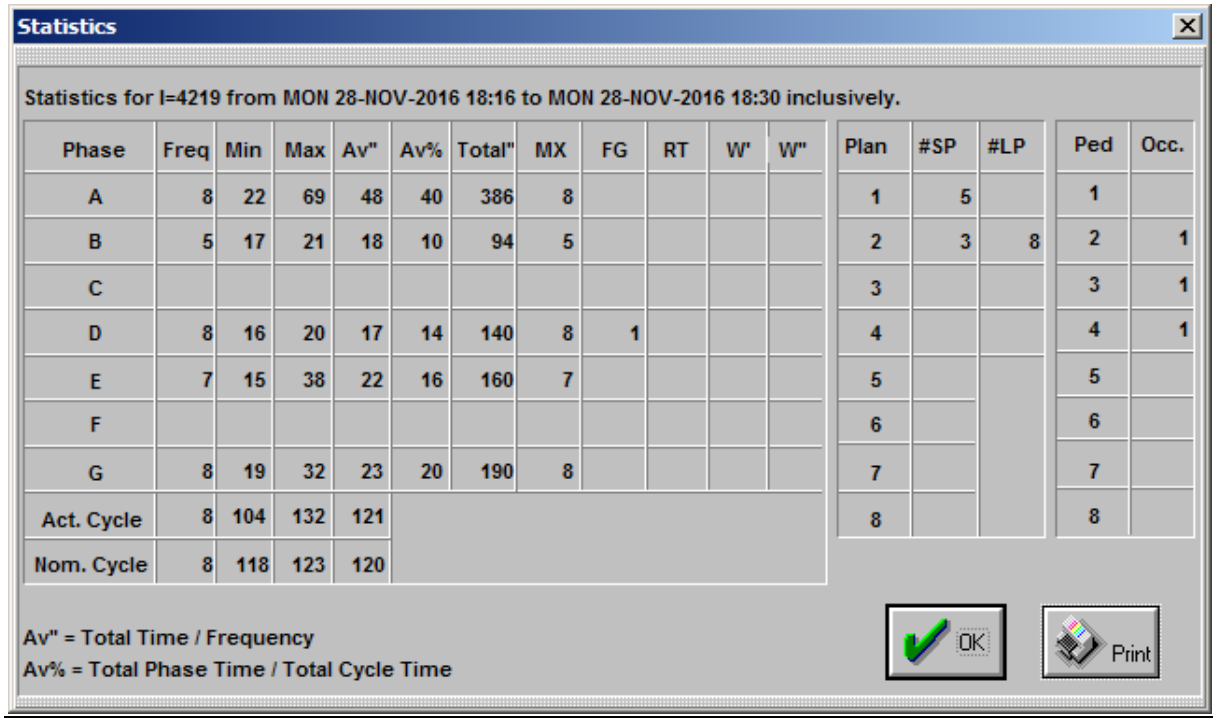
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	10	27	62	42	38	422	10				
B	7	17	20	17	11	124	7				
C											
D	10	16	20	17	16	176	10				
E	10	16	18	16	15	166	10				
F											
G	10	16	39	22	20	225	10				
Act. Cycle	10	93	128	111							
Nom. Cycle	10	97	125	113							

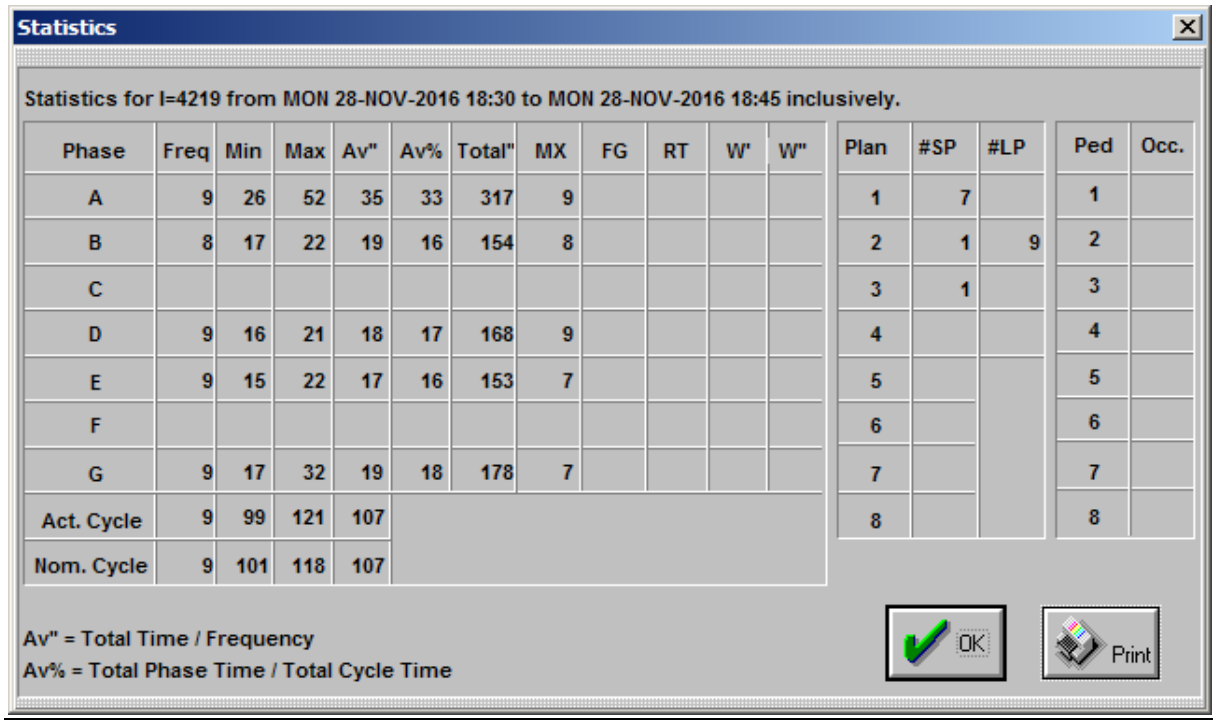
Plan	#SP	#LP
1	7	
2	2	10
3	1	
4		
5		
6		
7		
8		

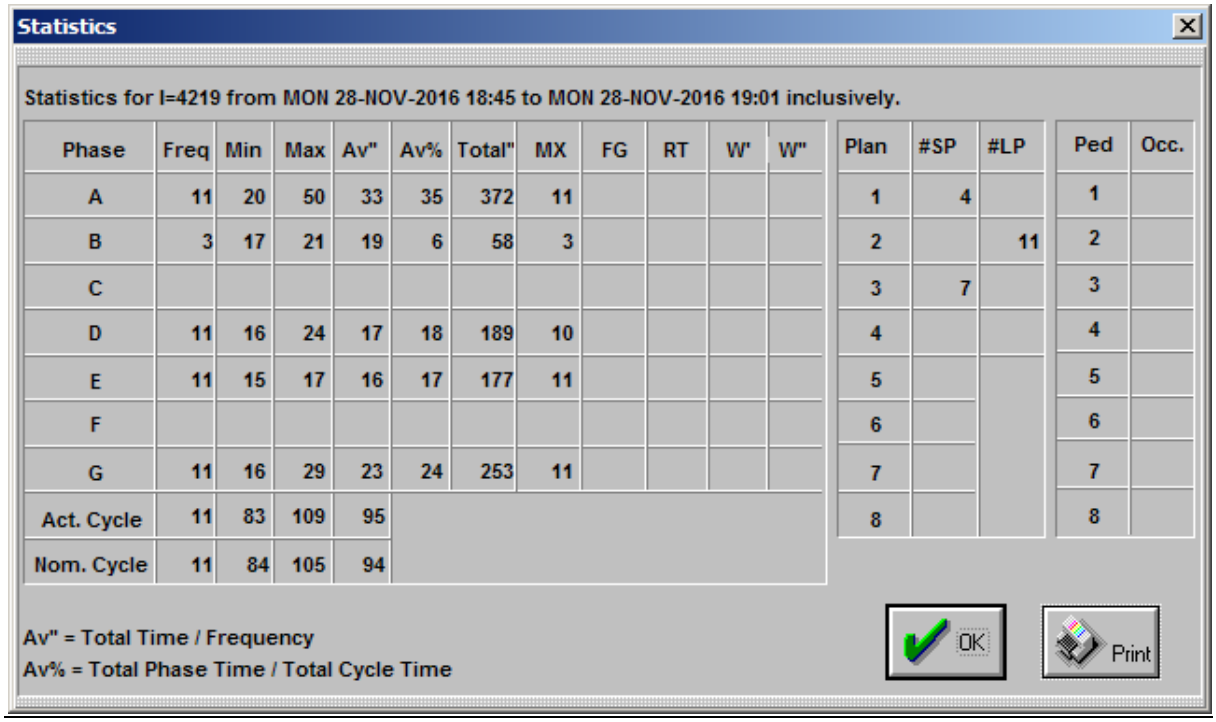
Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

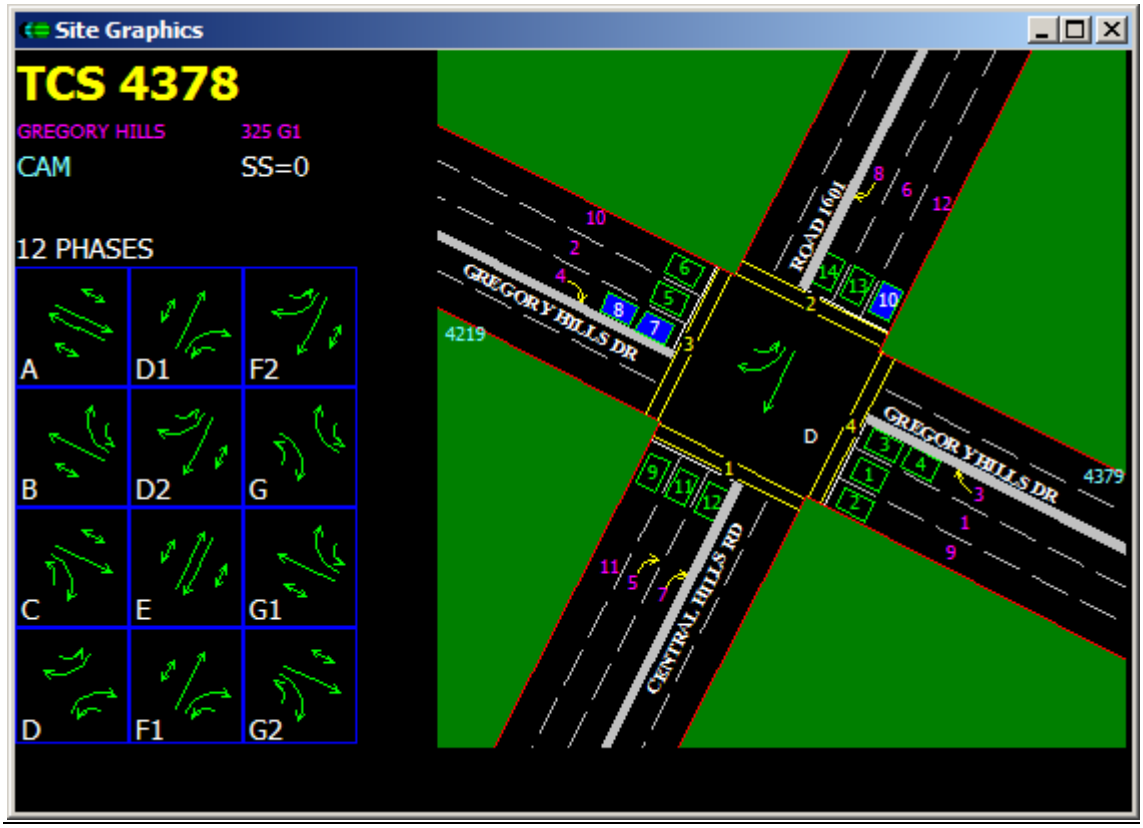
OK Print


Statistics
Statistics for I=4219 from MON 28-NOV-2016 18:16 to MON 28-NOV-2016 18:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 8 22 69 48 40 386 8
B 5 17 21 18 10 94 5
C
D 8 16 20 17 14 140 8 1
E 7 15 38 22 16 160 7
F
G 8 19 32 23 20 190 8
Act. Cycle 8 104 132 121
Nom. Cycle 8 118 123 120
Plan #SP #LP
1 5
2 3 8
3
4
5
6
7
8
Ped Occ.
1
2 1
3 1
4 1
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

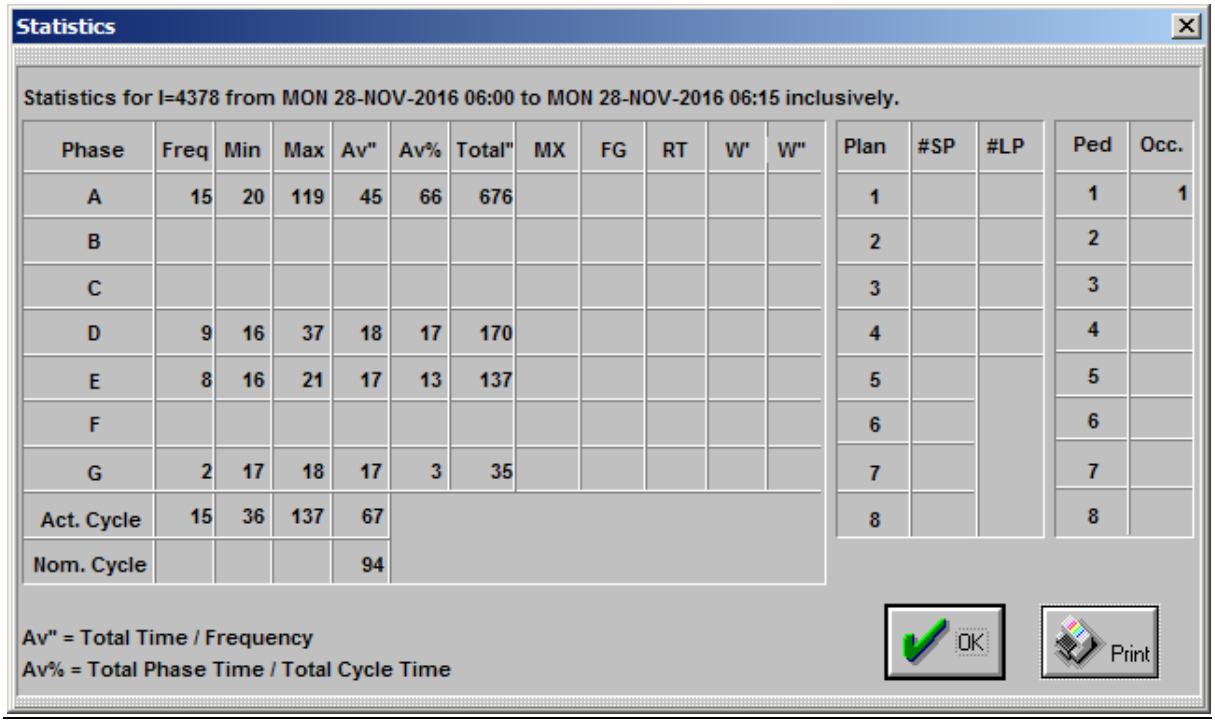

Statistics
Statistics for I=4219 from MON 28-NOV-2016 18:30 to MON 28-NOV-2016 18:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 9 26 52 35 33 317 9
B 8 17 22 19 16 154 8
C
D 9 16 21 18 17 168 9
E 9 15 22 17 16 153 7
F
G 9 17 32 19 18 178 7
Act. Cycle 9 99 121 107
Nom. Cycle 9 101 118 107
Plan #SP #LP
1 7
2 1 9
3 1
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4219 from MON 28-NOV-2016 18:45 to MON 28-NOV-2016 19:01 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 11 20 50 33 35 372 11
B 3 17 21 19 6 58 3
C
D 11 16 24 17 18 189 10
E 11 15 17 16 17 177 11
F
G 11 16 29 23 24 253 11
Act. Cycle 11 83 109 95
Nom. Cycle 11 84 105 94
Plan #SP #LP
1 4
2 11
3 7
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

TCS 4378 – Gregory Hills Drive, Central Hills Road, Gregory Hills



AM Peak 6-10am



Statistics

Statistics for I=4378 from MON 28-NOV-2016 06:00 to MON 28-NOV-2016 06:15 inclusively.

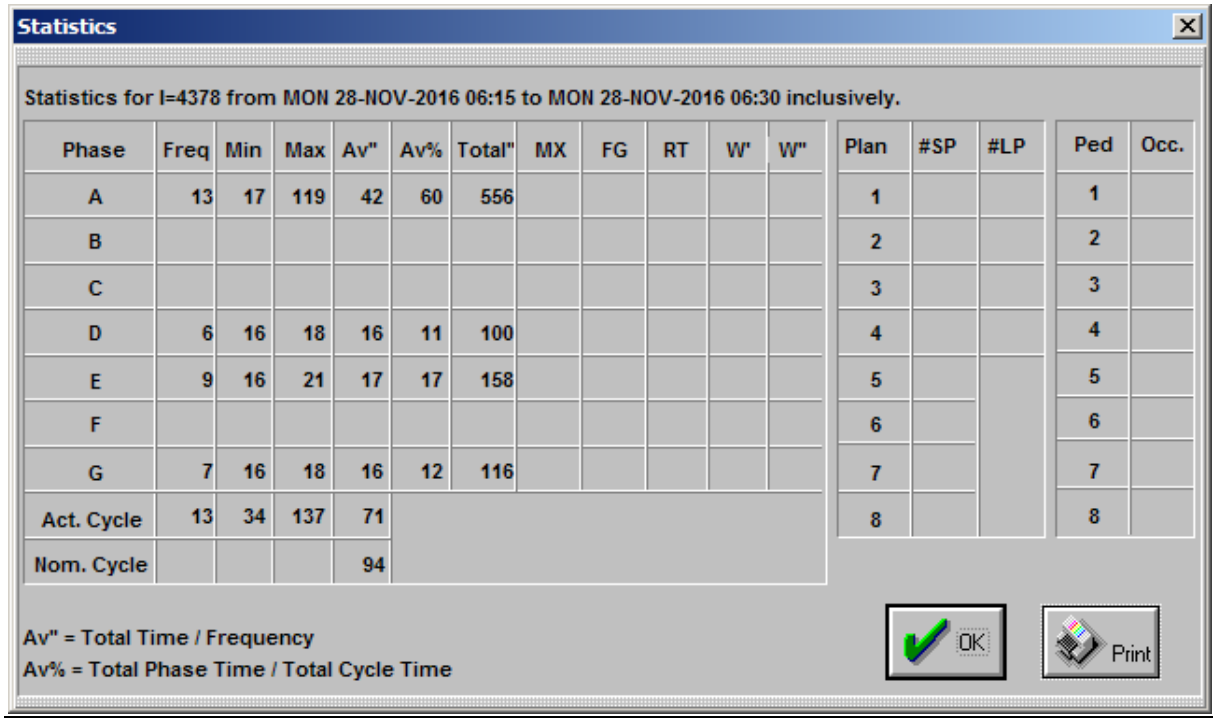
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	15	20	119	45	66	676					
B											
C											
D	9	16	37	18	17	170					
E	8	16	21	17	13	137					
F											
G	2	17	18	17	3	35					
Act. Cycle	15	36	137	67							
Nom. Cycle				94							

Plan	#SP	#LP
1		
2		
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 06:15 to MON 28-NOV-2016 06:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 13 17 119 42 60 556
B
C
D 6 16 18 16 11 100
E 9 16 21 17 17 158
F
G 7 16 18 16 12 116
Act. Cycle 13 34 137 71
Nom. Cycle 94
Plan #SP #LP
1
2
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Ped Occ.
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
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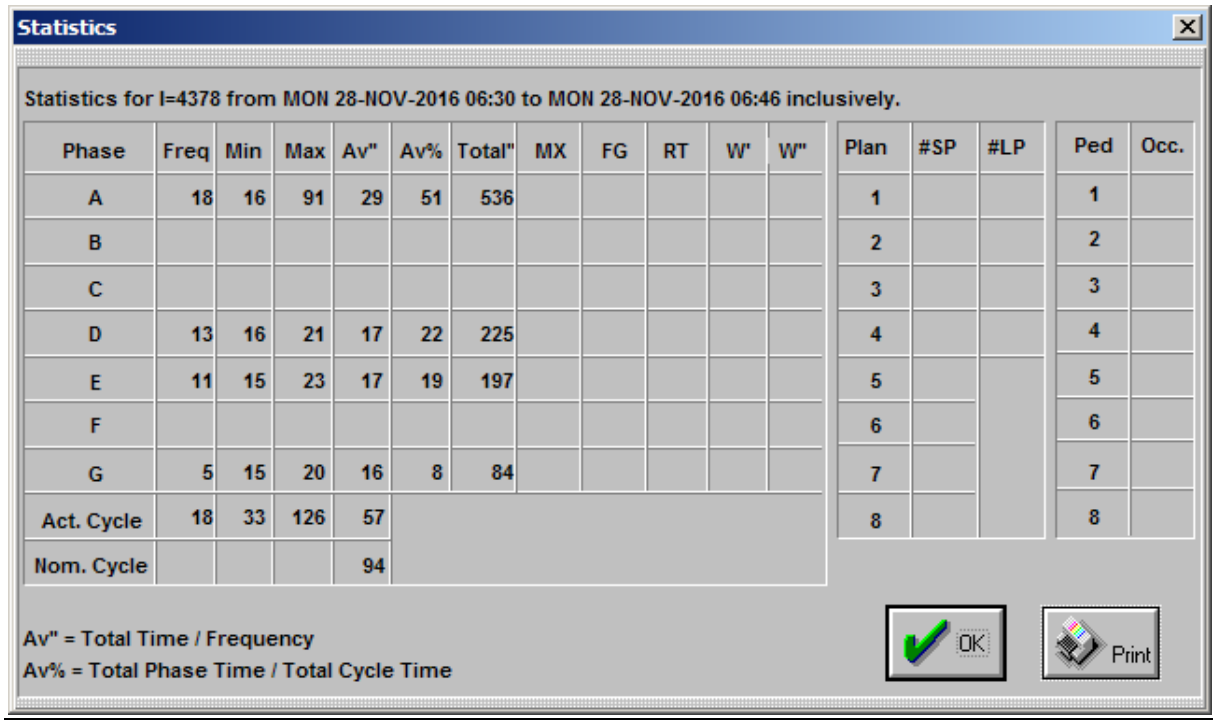
Statistics
Statistics for I=4378 from MON 28-NOV-2016 06:30 to MON 28-NOV-2016 06:46 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 18 16 91 29 51 536
B
C
D 13 16 21 17 22 225
E 11 15 23 17 19 197
F
G 5 15 20 16 8 84
Act. Cycle 18 33 126 57
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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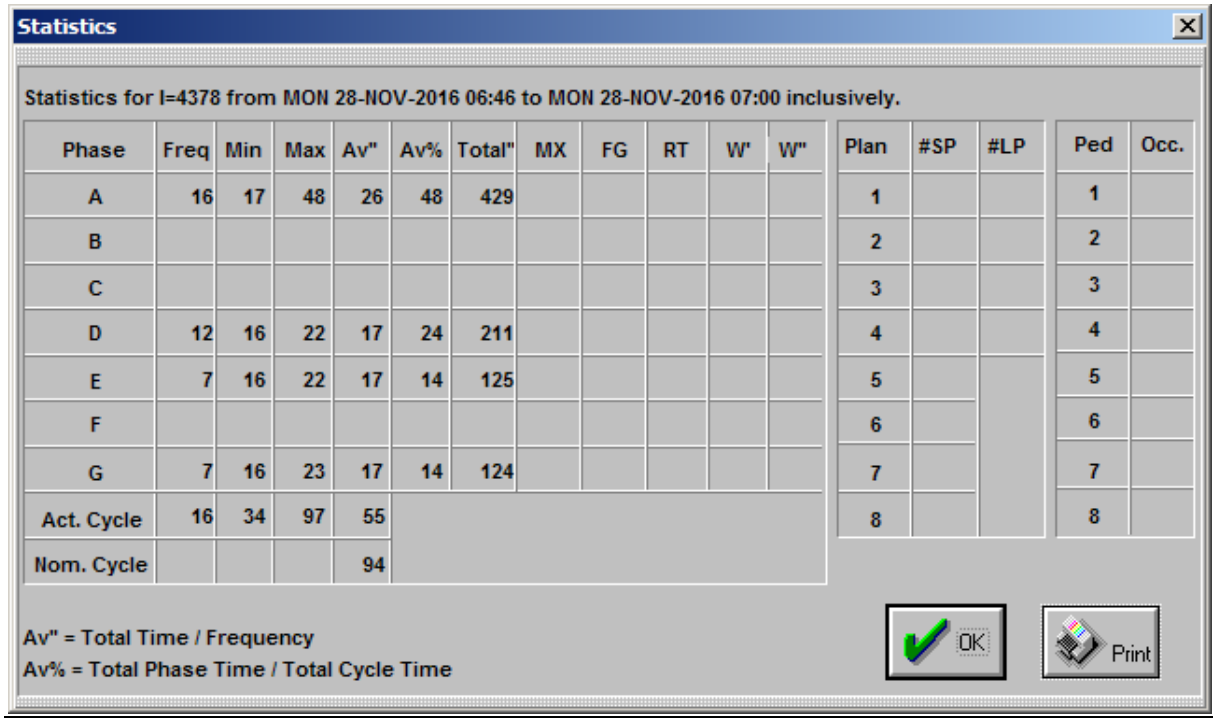
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 06:46 to MON 28-NOV-2016 07:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 17 48 26 48 429
B
C
D 12 16 22 17 24 211
E 7 16 22 17 14 125
F
G 7 16 23 17 14 124
Act. Cycle 16 34 97 55
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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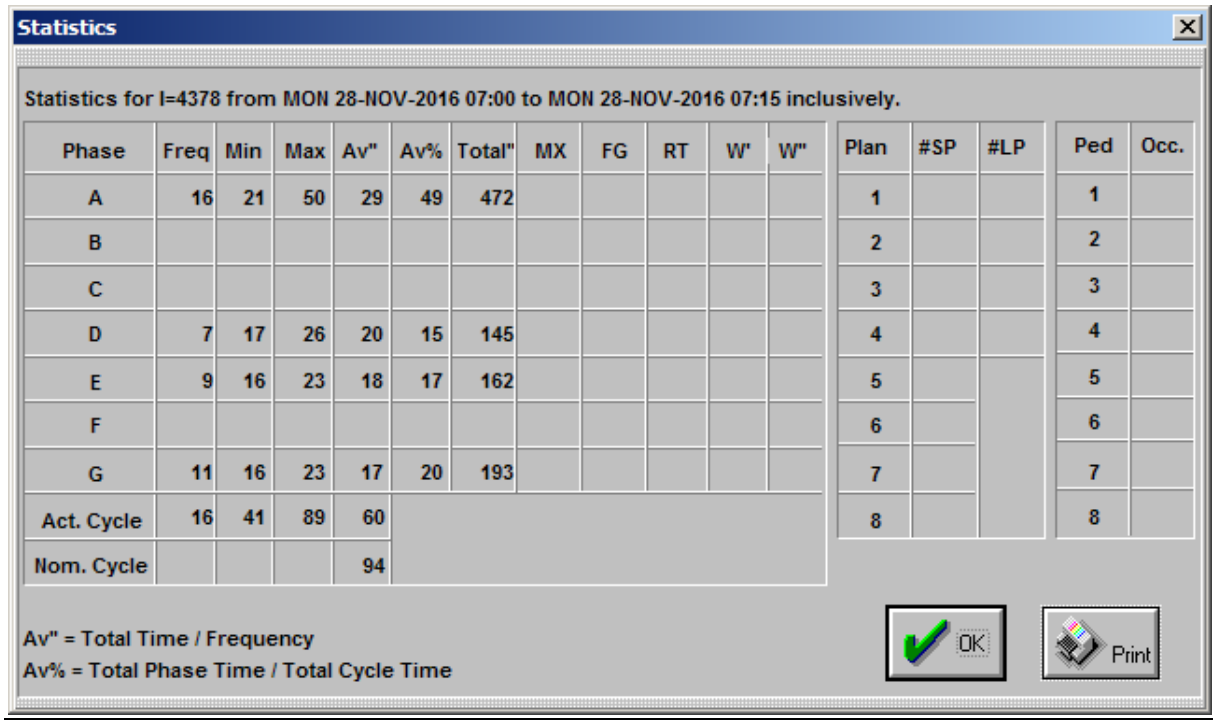
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 07:00 to MON 28-NOV-2016 07:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 21 50 29 49 472
B
C
D 7 17 26 20 15 145
E 9 16 23 18 17 162
F
G 11 16 23 17 20 193
Act. Cycle 16 41 89 60
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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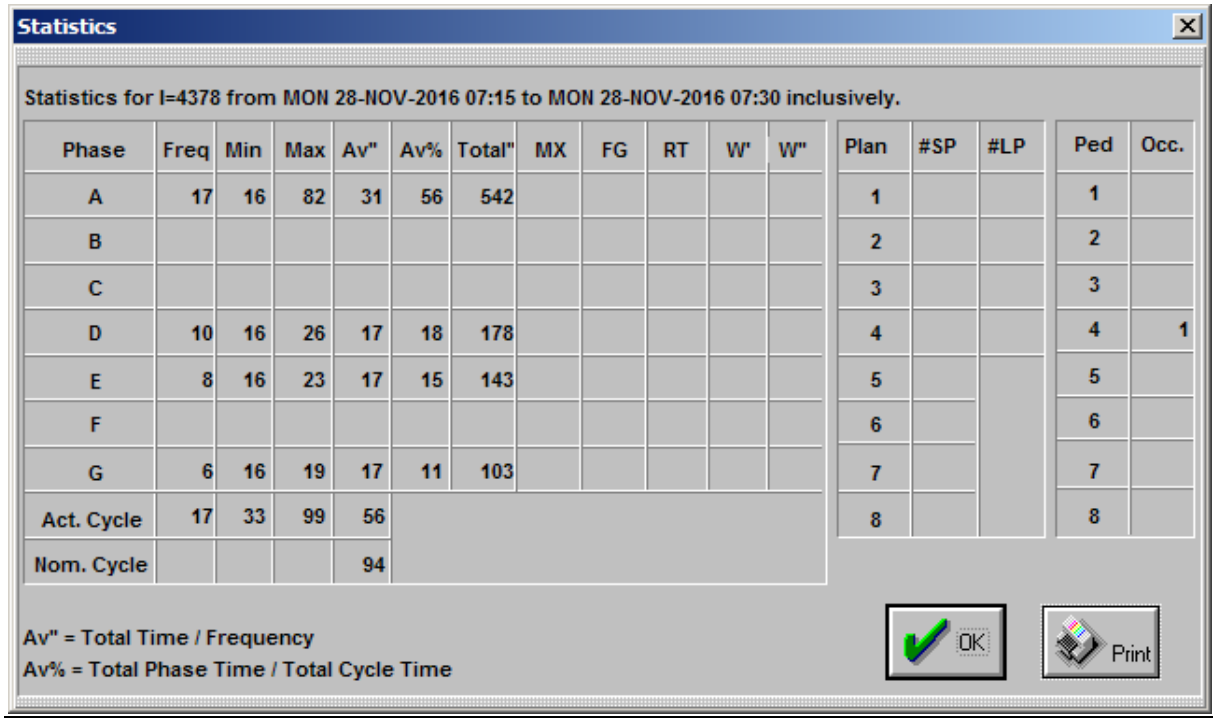
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 07:15 to MON 28-NOV-2016 07:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 16 82 31 56 542
B
C
D 10 16 26 17 18 178
E 8 16 23 17 15 143
F
G 6 16 19 17 11 103
Act. Cycle 17 33 99 56
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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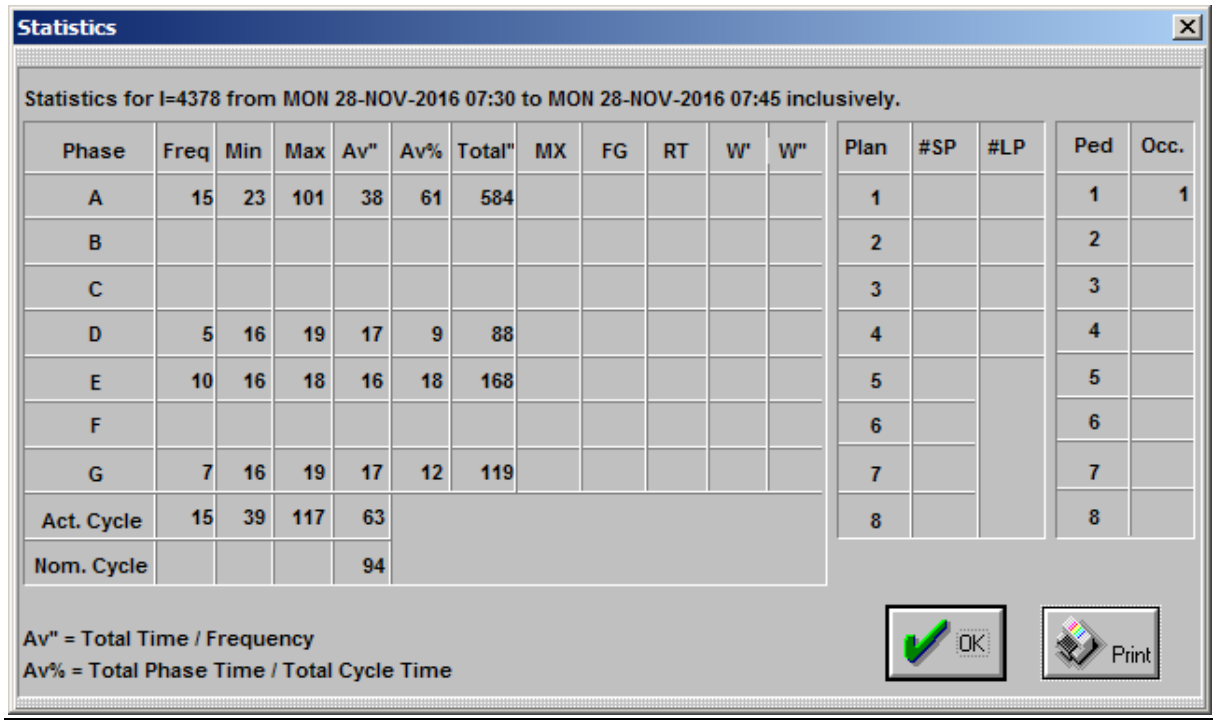
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 07:30 to MON 28-NOV-2016 07:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 15 23 101 38 61 584
B
C
D 5 16 19 17 9 88
E 10 16 18 16 18 168
F
G 7 16 19 17 12 119
Act. Cycle 15 39 117 63
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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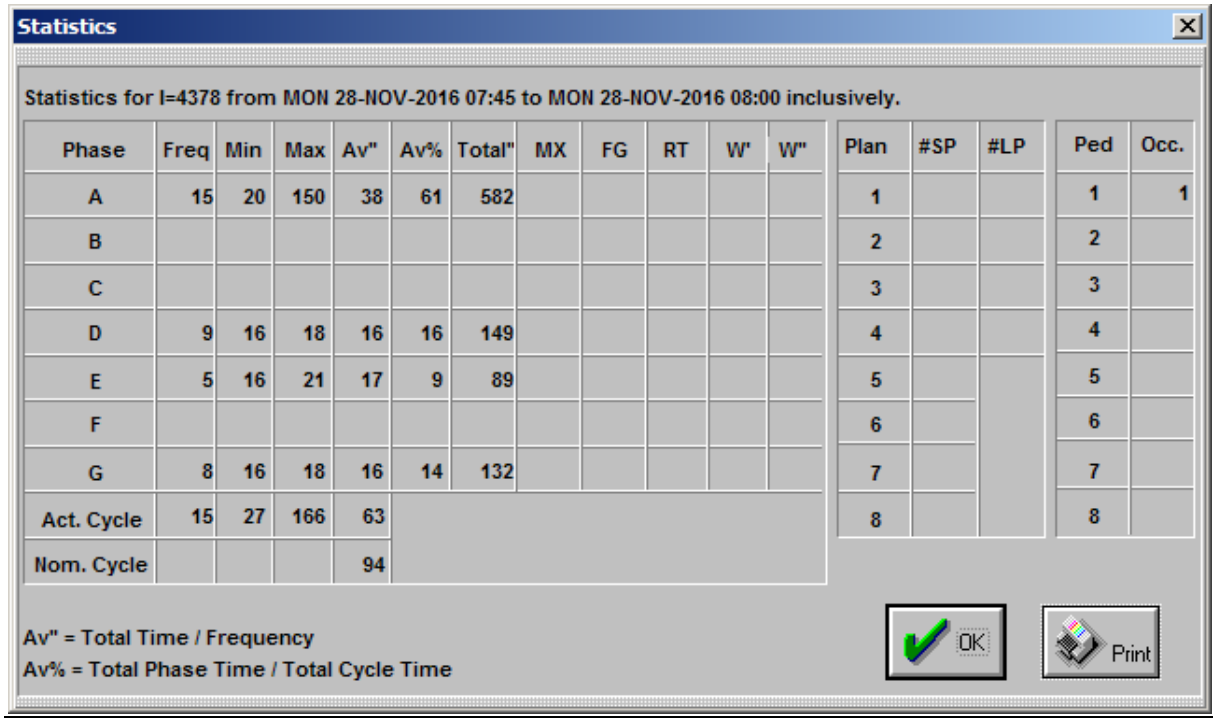
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	15	20	150	38	61	582					
B											
C											
D	9	16	18	16	16	149					
E	5	16	21	17	9	89					
F											
G	8	16	18	16	14	132					
Act. Cycle	15	27	166	63							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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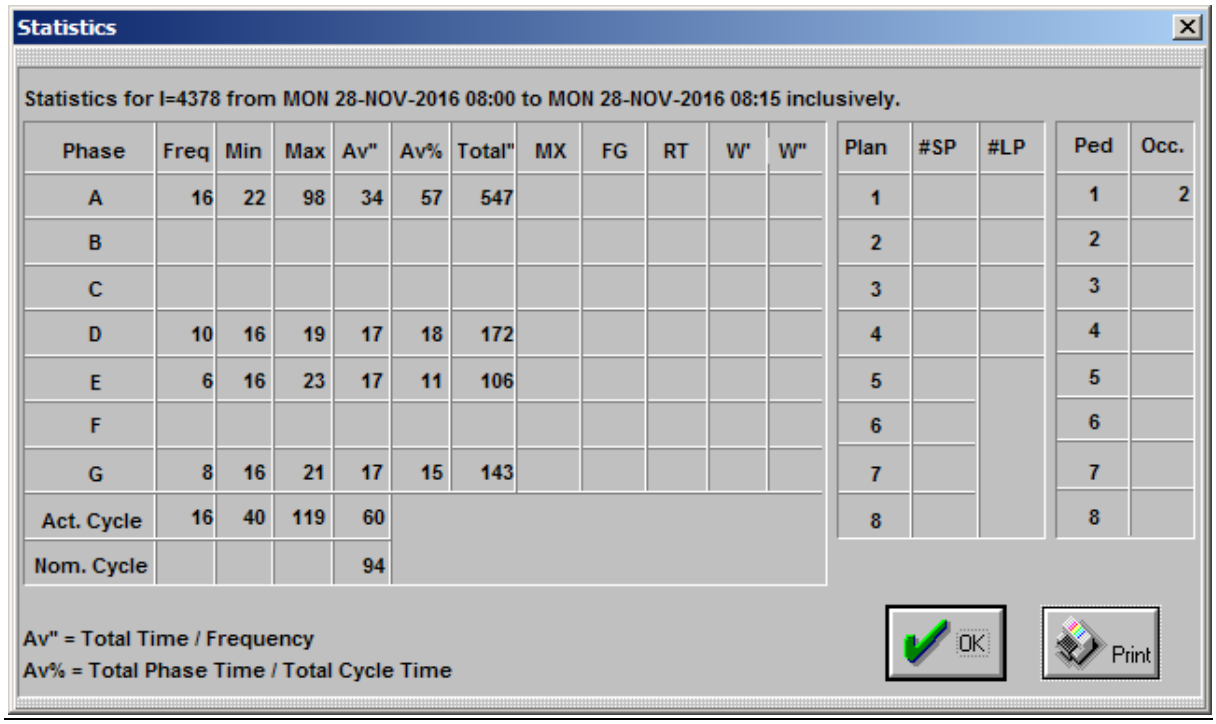

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	16	22	98	34	57	547					
B											
C											
D	10	16	19	17	18	172					
E	6	16	23	17	11	106					
F											
G	8	16	21	17	15	143					
Act. Cycle	16	40	119	60							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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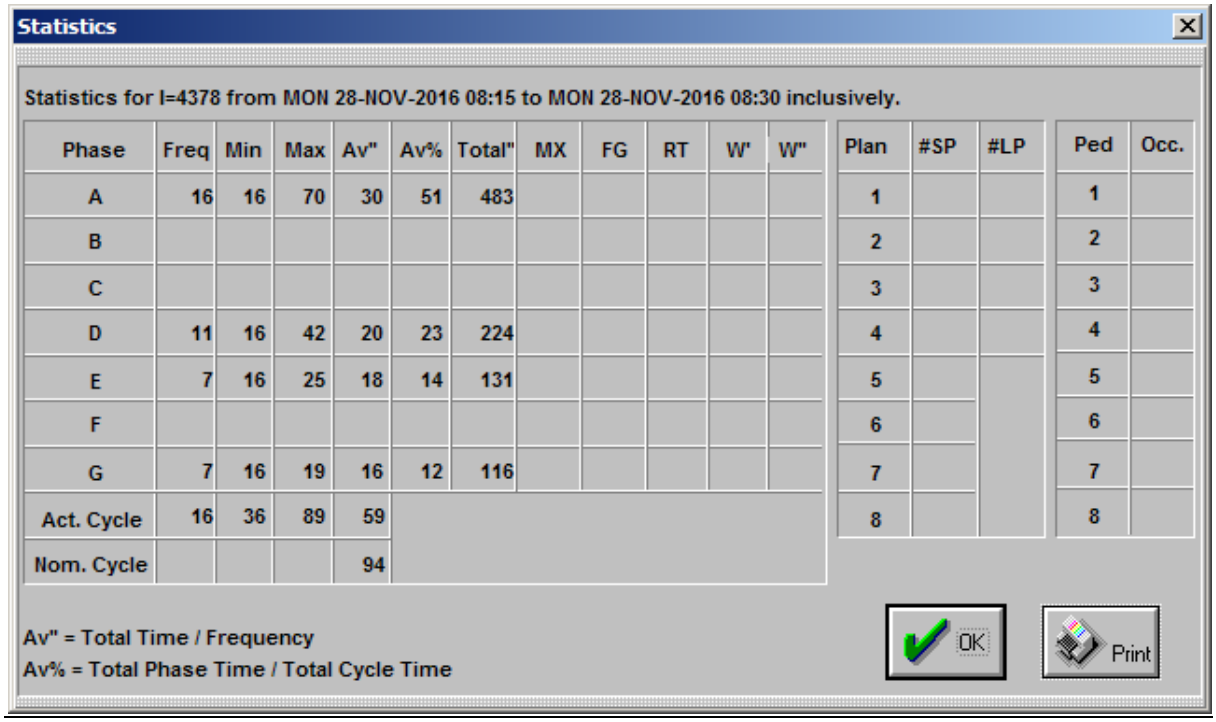
Statistics
Statistics for I=4378 from MON 28-NOV-2016 08:15 to MON 28-NOV-2016 08:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 16 70 30 51 483
B
C
D 11 16 42 20 23 224
E 7 16 25 18 14 131
F
G 7 16 19 16 12 116
Act. Cycle 16 36 89 59
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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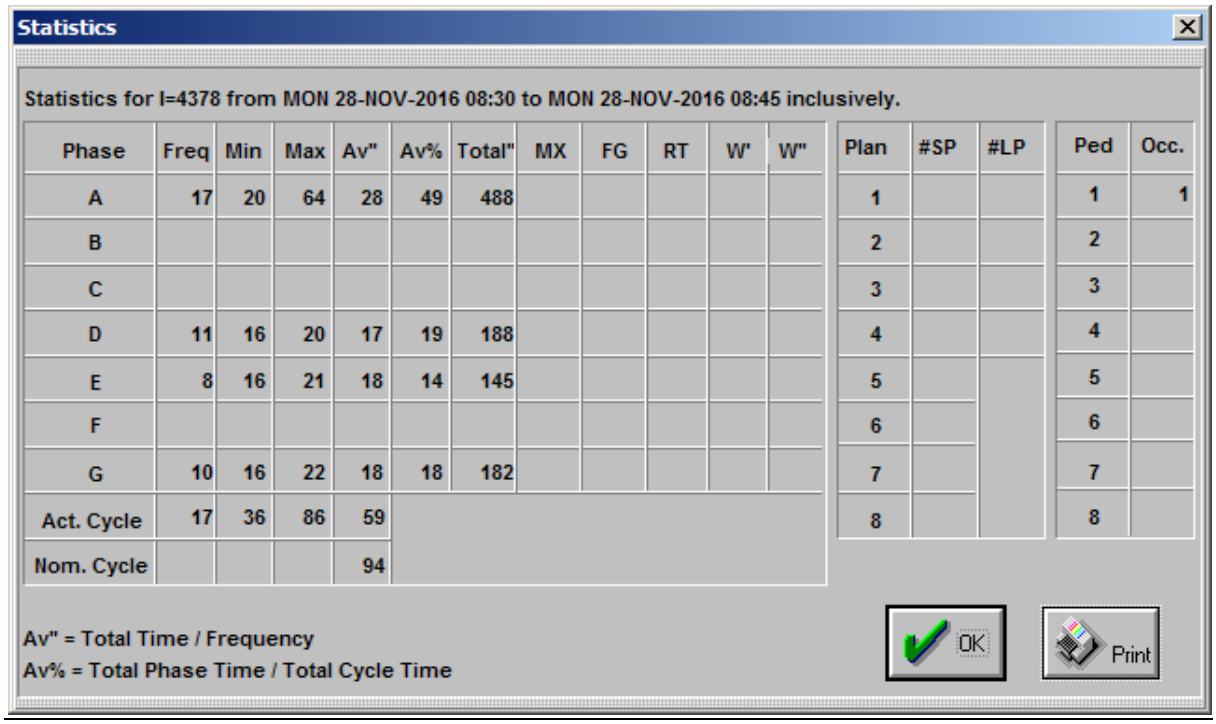
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 08:30 to MON 28-NOV-2016 08:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 20 64 28 49 488
B
C
D 11 16 20 17 19 188
E 8 16 21 18 14 145
F
G 10 16 22 18 18 182
Act. Cycle 17 36 86 59
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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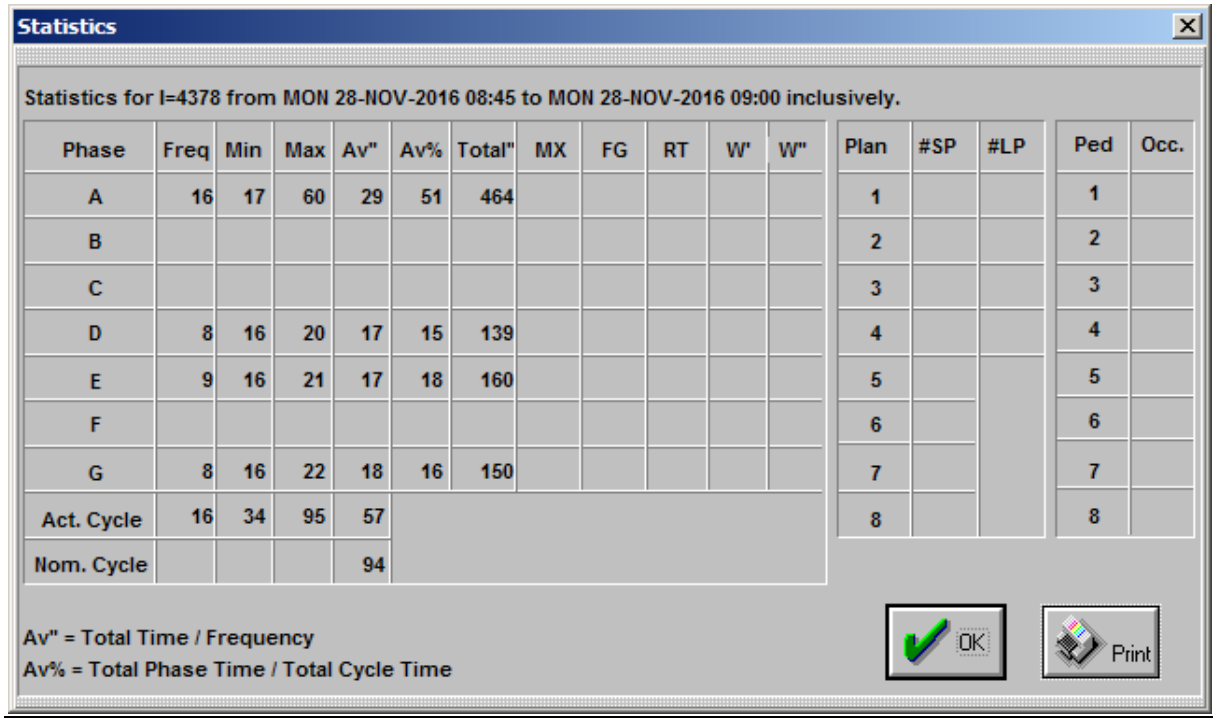
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	16	17	60	29	51	464					
B											
C											
D	8	16	20	17	15	139					
E	9	16	21	17	18	160					
F											
G	8	16	22	18	16	150					
Act. Cycle	16	34	95	57							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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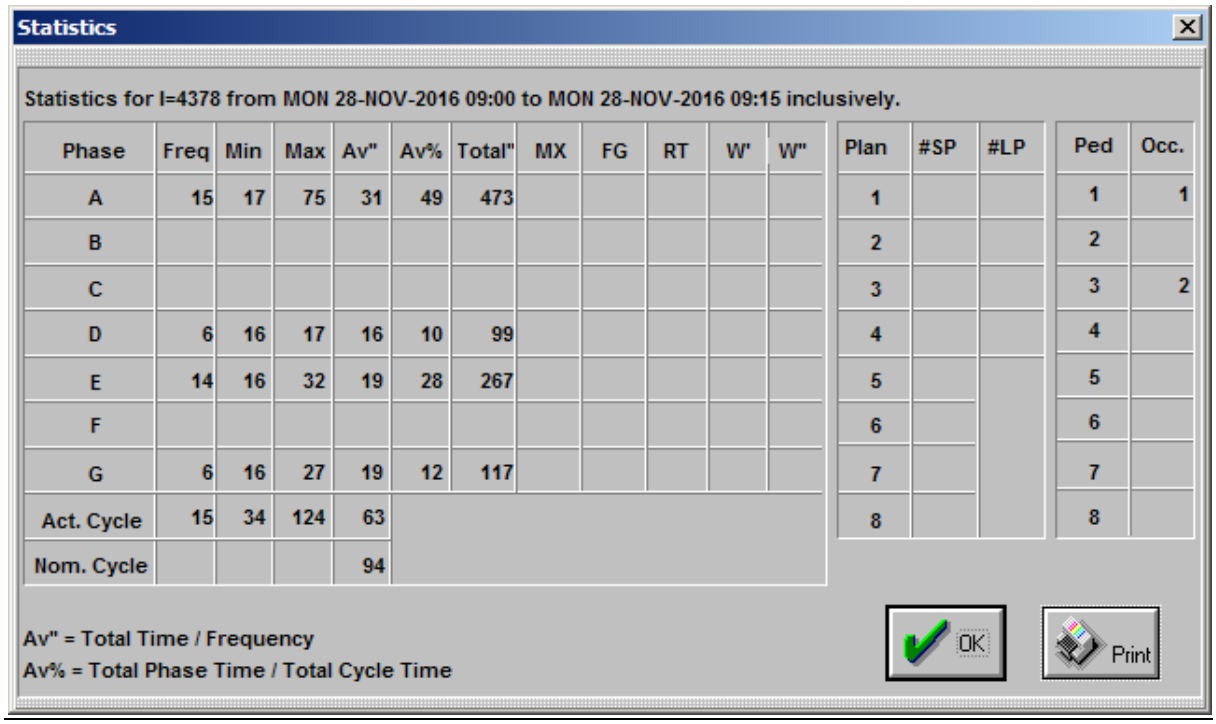

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	15	17	75	31	49	473					
B											
C											
D	6	16	17	16	10	99					
E	14	16	32	19	28	267					
F											
G	6	16	27	19	12	117					
Act. Cycle	15	34	124	63							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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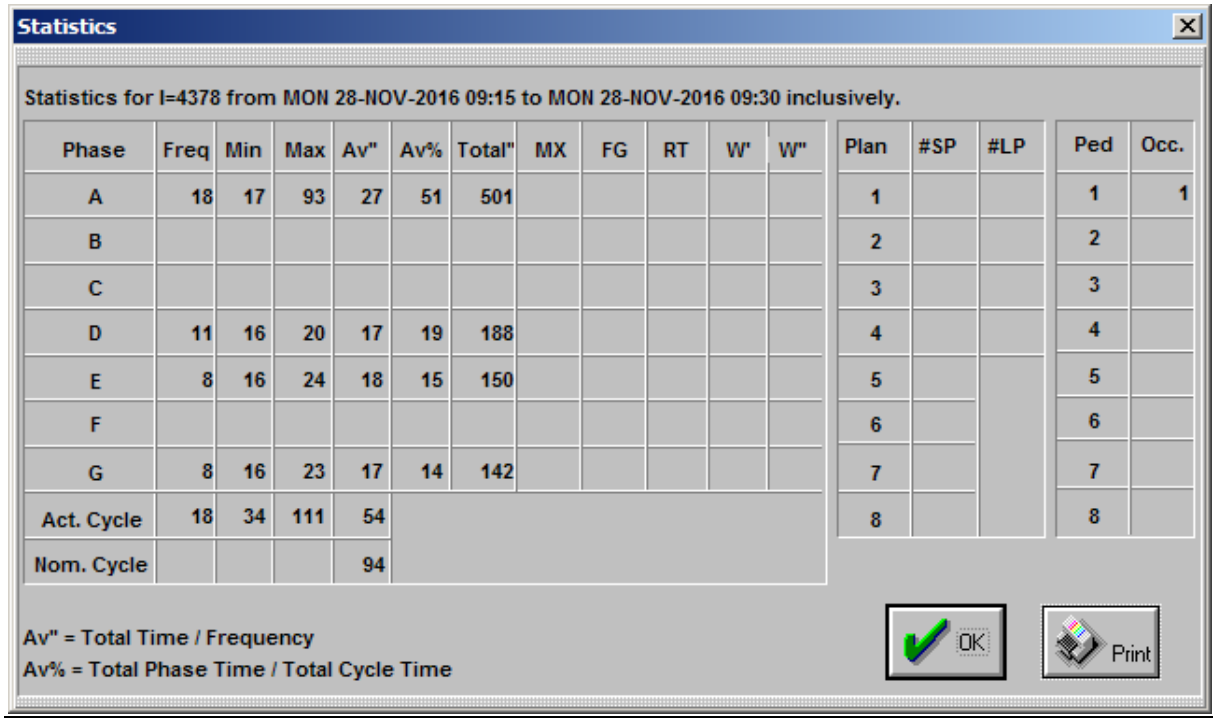

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	17	93	27	51	501					
B											
C											
D	11	16	20	17	19	188					
E	8	16	24	18	15	150					
F											
G	8	16	23	17	14	142					
Act. Cycle	18	34	111	54							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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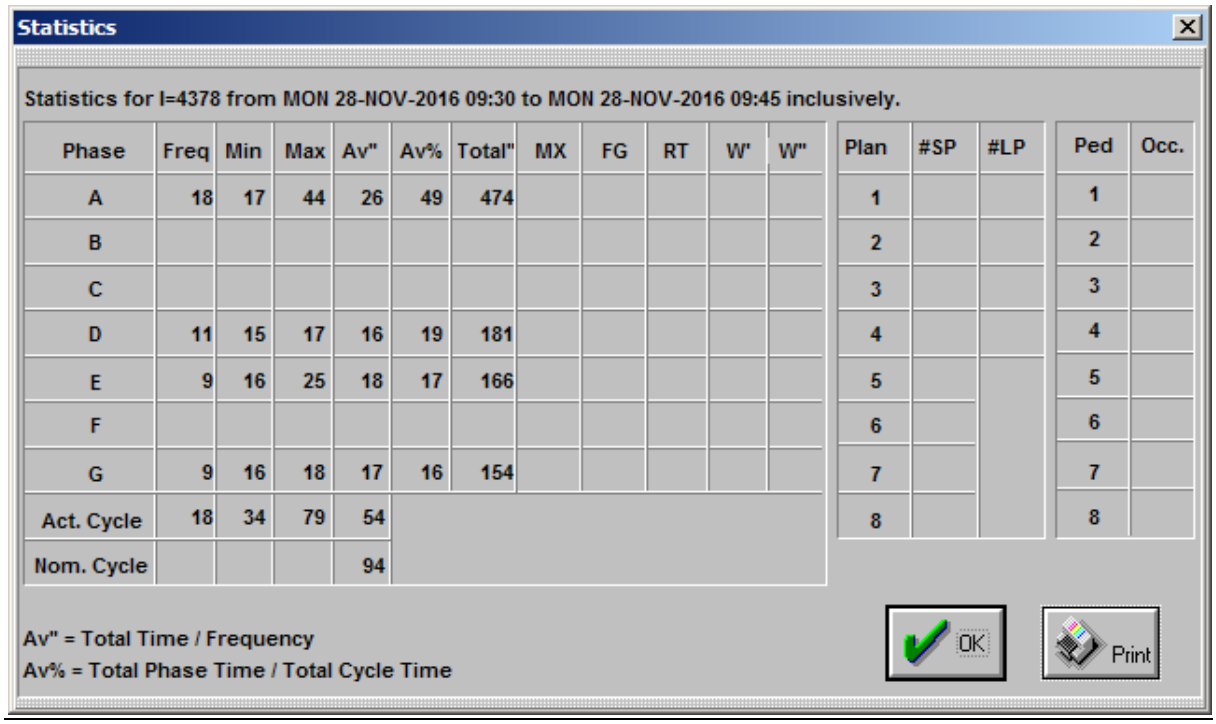

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	17	44	26	49	474					
B											
C											
D	11	15	17	16	19	181					
E	9	16	25	18	17	166					
F											
G	9	16	18	17	16	154					
Act. Cycle	18	34	79	54							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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Statistics

Statistics for I=4378 from MON 28-NOV-2016 09:45 to MON 28-NOV-2016 10:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	16	46	24	49	446					
B											
C											
D	12	16	24	17	23	214					
E	8	16	30	19	17	157					
F											
G	5	17	22	18	10	94					
Act. Cycle	18	34	80	50							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

PM Peak 3-7pm

Statistics

Statistics for I=4378 from MON 28-NOV-2016 15:00 to MON 28-NOV-2016 15:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	14	17	40	25	37	356					
B											
C											
D	12	16	28	19	24	228					
E	8	19	30	21	18	175					
F											
G	10	16	27	19	20	194					
Act. Cycle	14	34	107	68							
Nom. Cycle				94							

Plan	#SP	#LP
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Ped	Occ.
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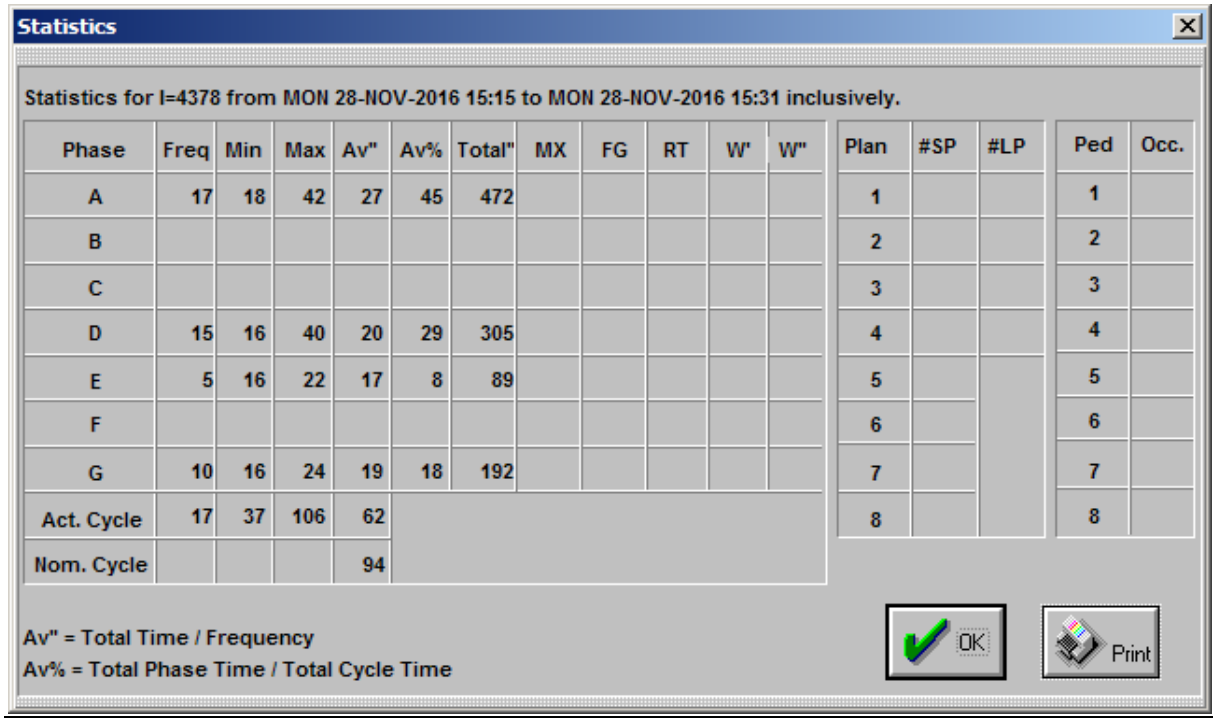
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 15:15 to MON 28-NOV-2016 15:31 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 18 42 27 45 472
B
C
D 15 16 40 20 29 305
E 5 16 22 17 8 89
F
G 10 16 24 19 18 192
Act. Cycle 17 37 106 62
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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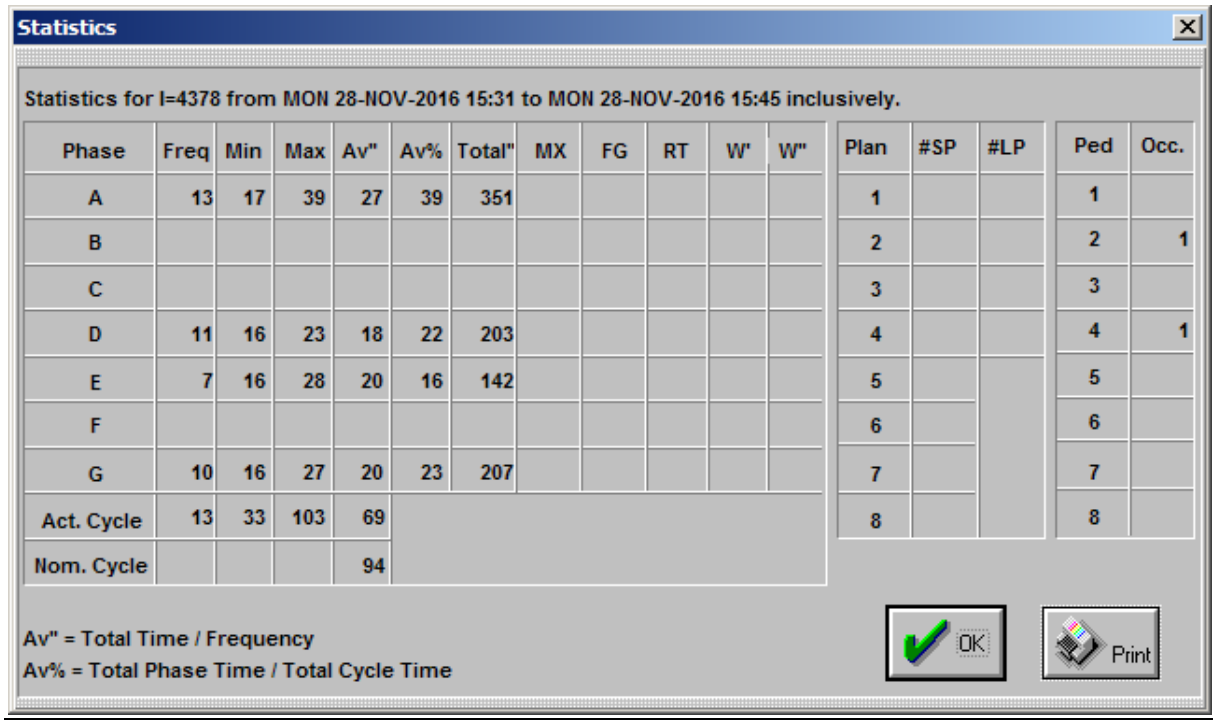
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 15:31 to MON 28-NOV-2016 15:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 13 17 39 27 39 351
B
C
D 11 16 23 18 22 203
E 7 16 28 20 16 142
F
G 10 16 27 20 23 207
Act. Cycle 13 33 103 69
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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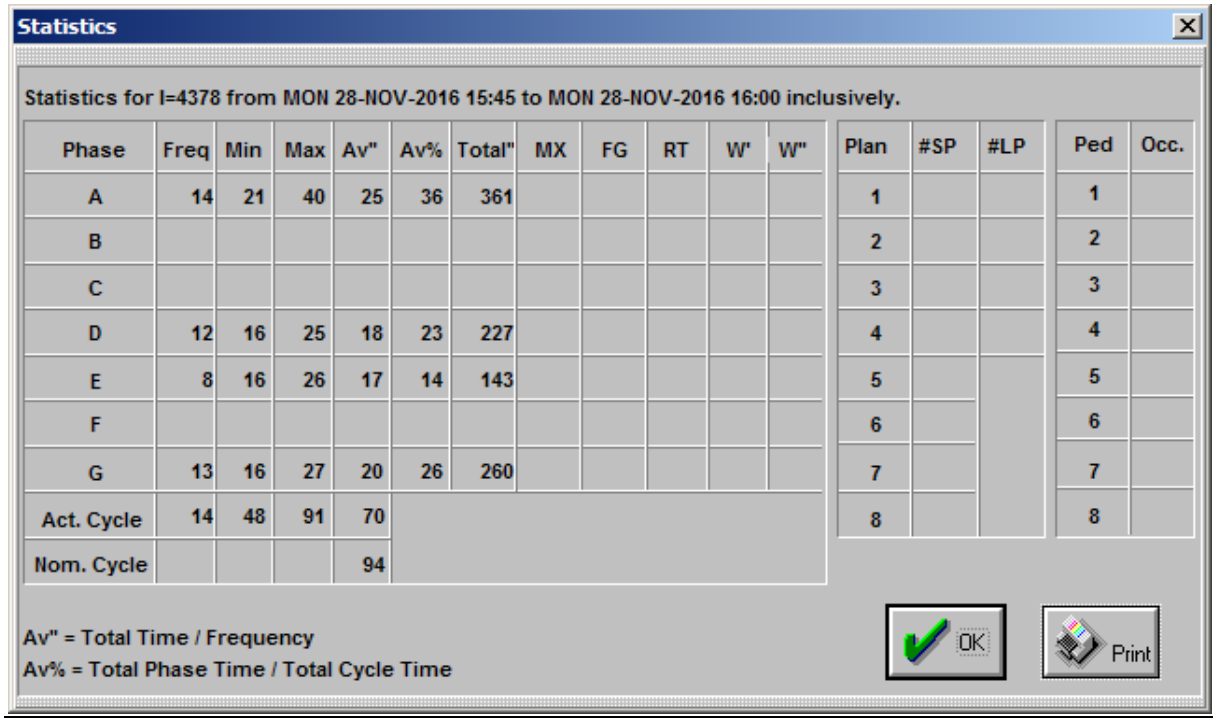
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 15:45 to MON 28-NOV-2016 16:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 21 40 25 36 361
B
C
D 12 16 25 18 23 227
E 8 16 26 17 14 143
F
G 13 16 27 20 26 260
Act. Cycle 14 48 91 70
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
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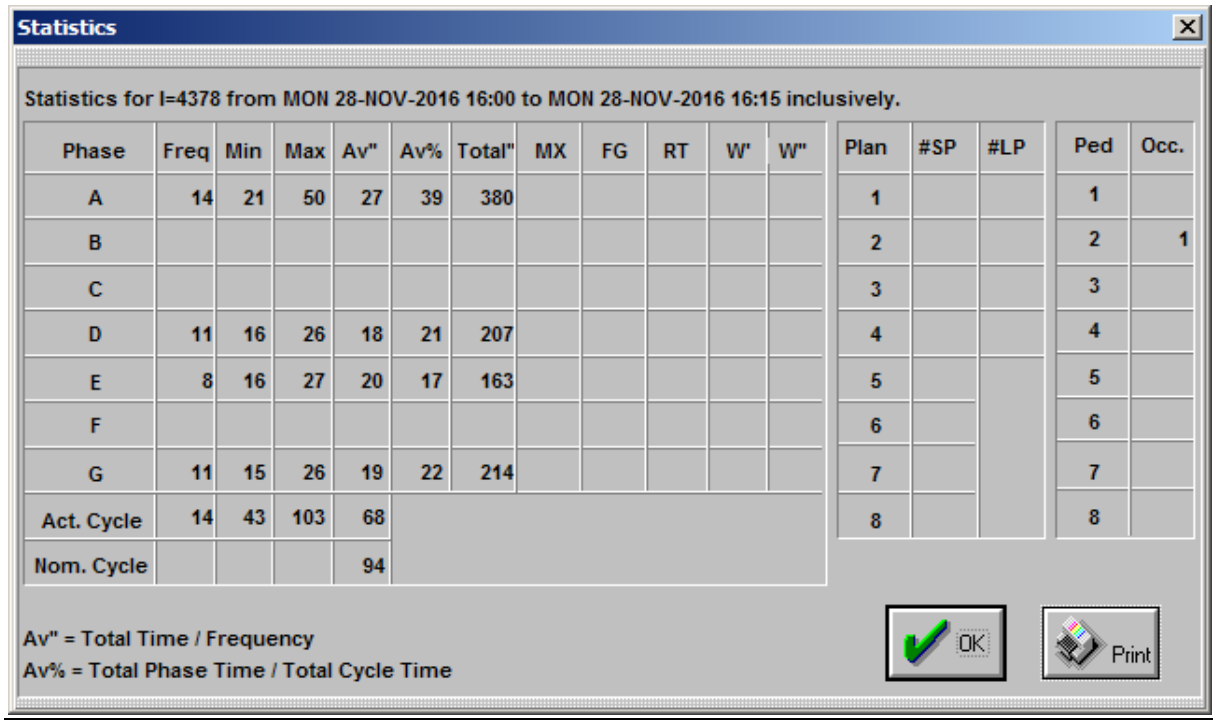
Statistics
Statistics for I=4378 from MON 28-NOV-2016 16:00 to MON 28-NOV-2016 16:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 21 50 27 39 380
B
C
D 11 16 26 18 21 207
E 8 16 27 20 17 163
F
G 11 15 26 19 22 214
Act. Cycle 14 43 103 68
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
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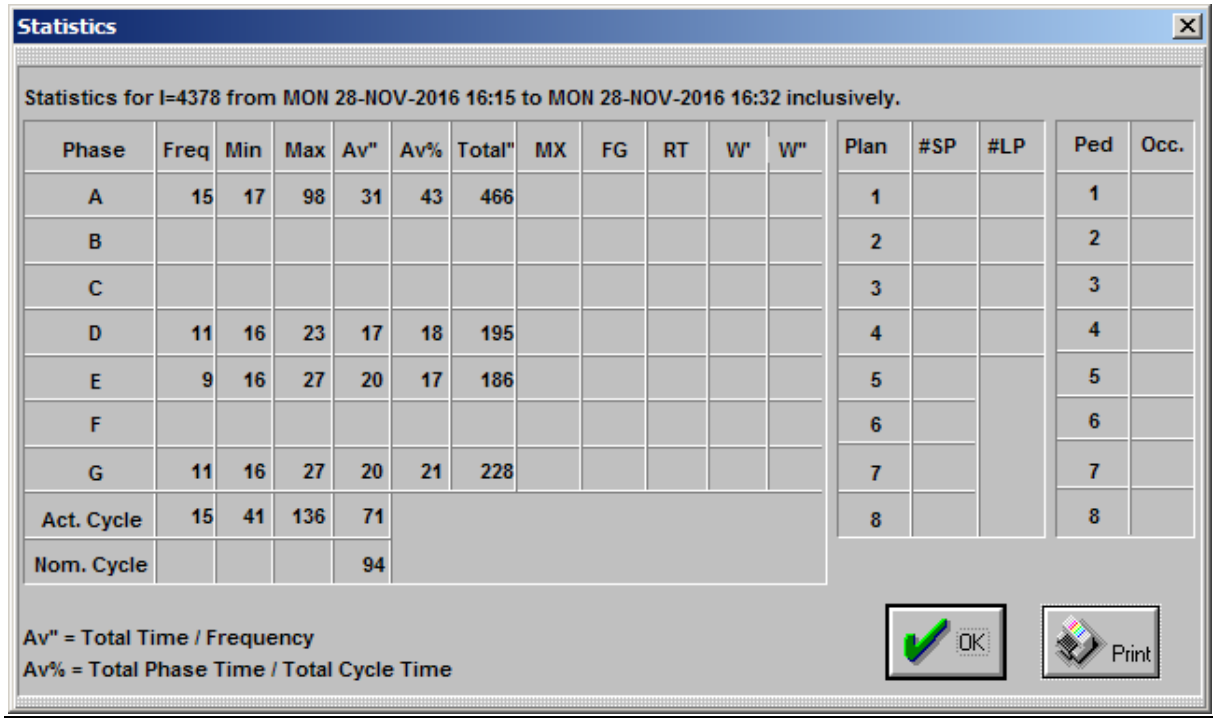
Statistics
Statistics for I=4378 from MON 28-NOV-2016 16:15 to MON 28-NOV-2016 16:32 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 15 17 98 31 43 466
B
C
D 11 16 23 17 18 195
E 9 16 27 20 17 186
F
G 11 16 27 20 21 228
Act. Cycle 15 41 136 71
Nom. Cycle 94
Plan #SP #LP
1
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Ped Occ.
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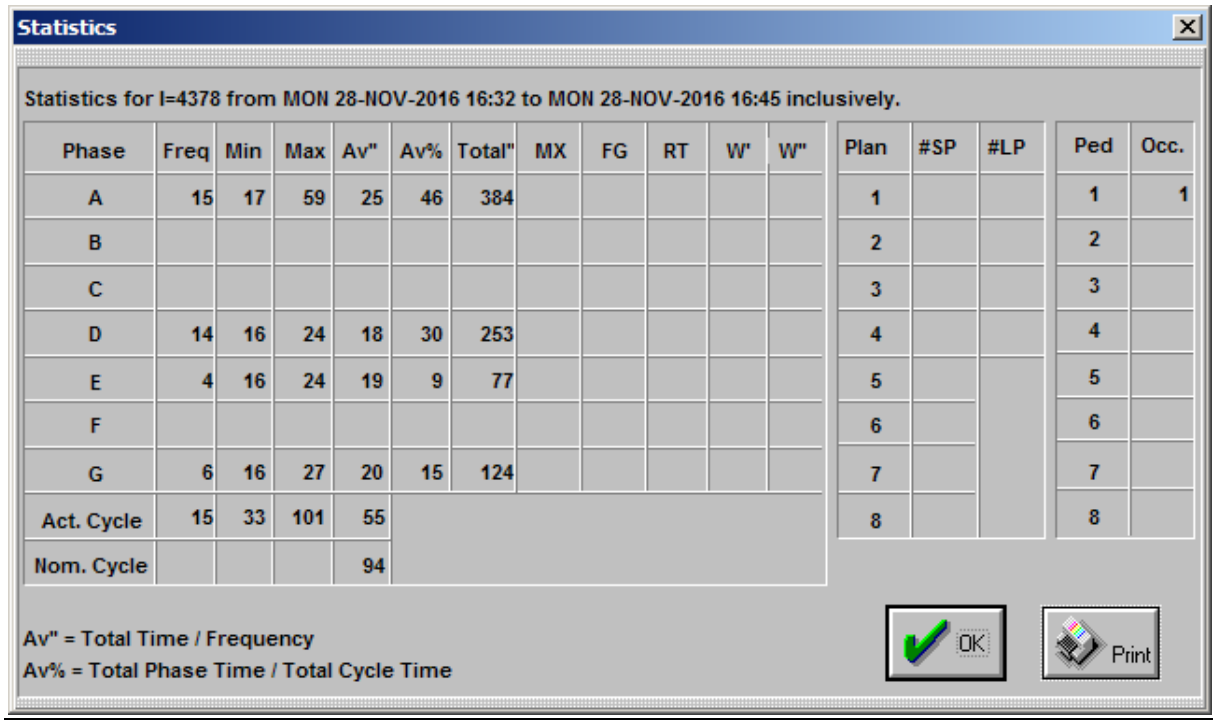
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 16:32 to MON 28-NOV-2016 16:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 15 17 59 25 46 384
B
C
D 14 16 24 18 30 253
E 4 16 24 19 9 77
F
G 6 16 27 20 15 124
Act. Cycle 15 33 101 55
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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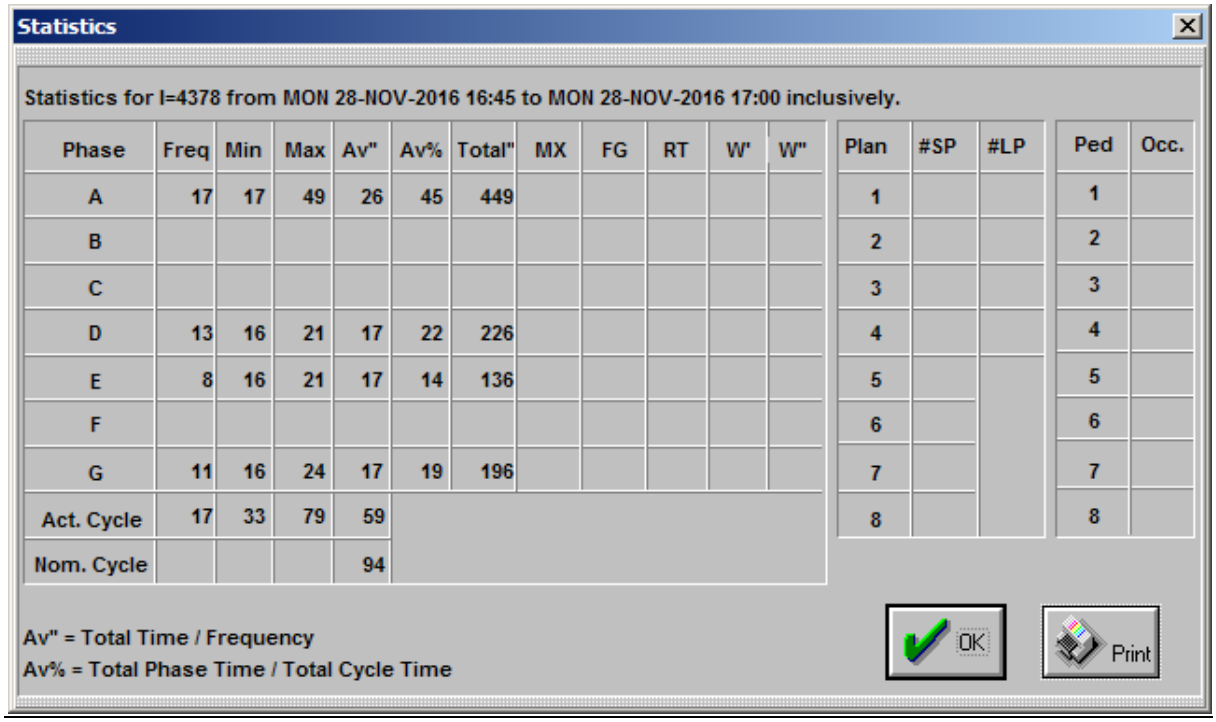
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 16:45 to MON 28-NOV-2016 17:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 17 49 26 45 449
B
C
D 13 16 21 17 22 226
E 8 16 21 17 14 136
F
G 11 16 24 17 19 196
Act. Cycle 17 33 79 59
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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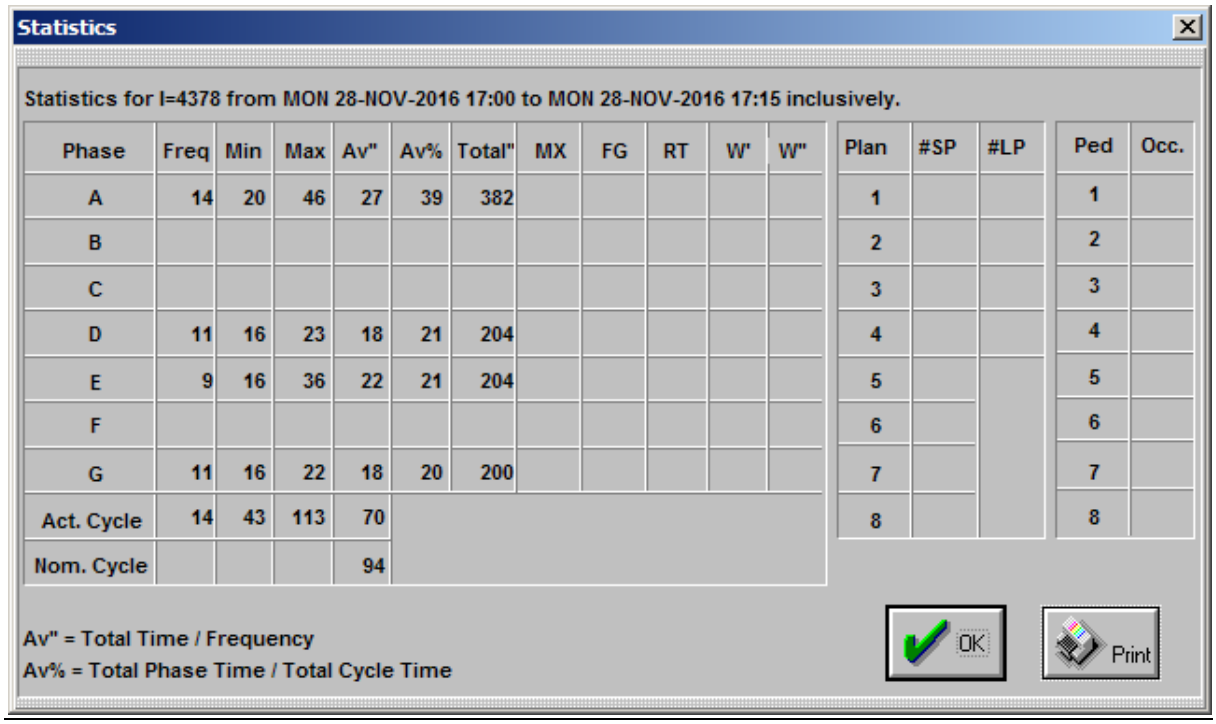
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 17:00 to MON 28-NOV-2016 17:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 20 46 27 39 382
B
C
D 11 16 23 18 21 204
E 9 16 36 22 21 204
F
G 11 16 22 18 20 200
Act. Cycle 14 43 113 70
Nom. Cycle 94
Plan #SP #LP
1
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Ped Occ.
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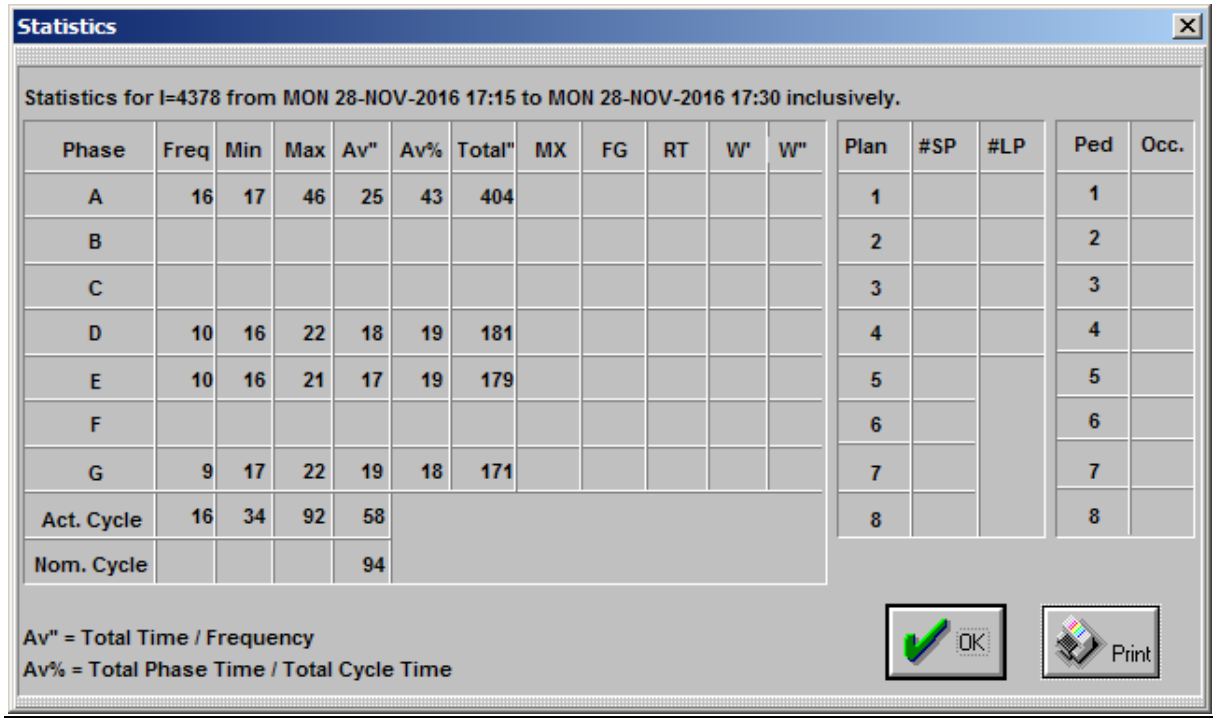
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 17:15 to MON 28-NOV-2016 17:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 17 46 25 43 404
B
C
D 10 16 22 18 19 181
E 10 16 21 17 19 179
F
G 9 17 22 19 18 171
Act. Cycle 16 34 92 58
Nom. Cycle 94
Plan #SP #LP
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Ped Occ.
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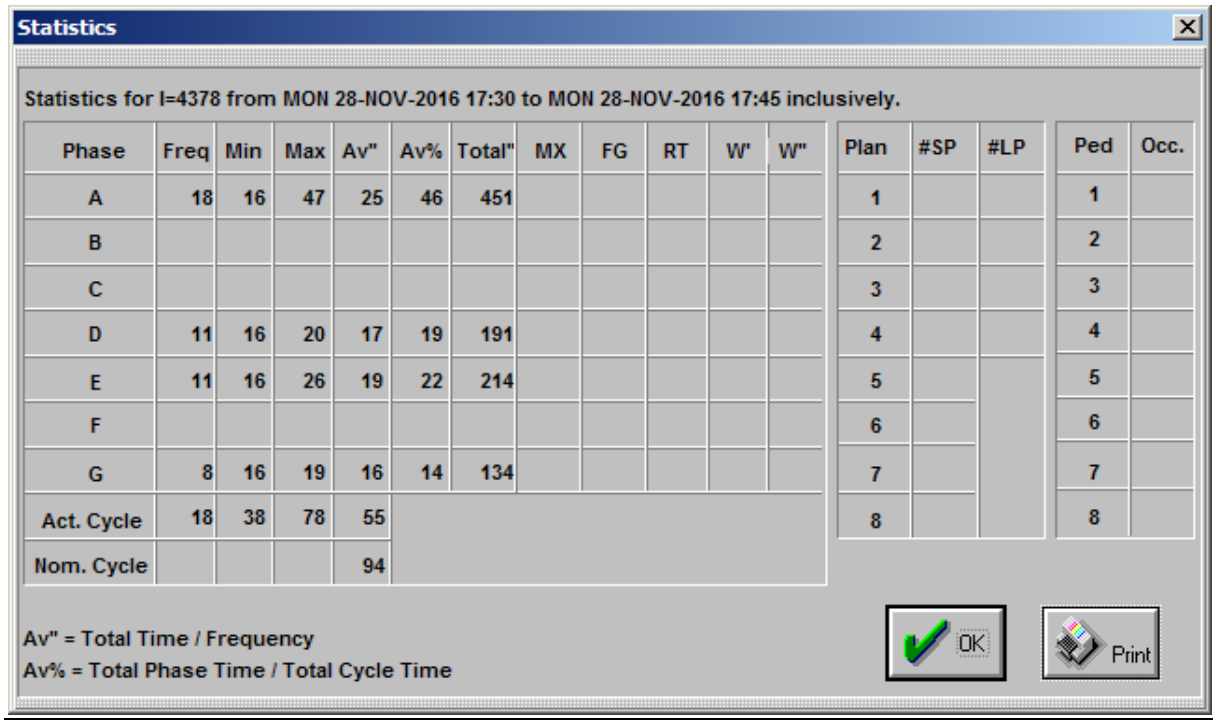
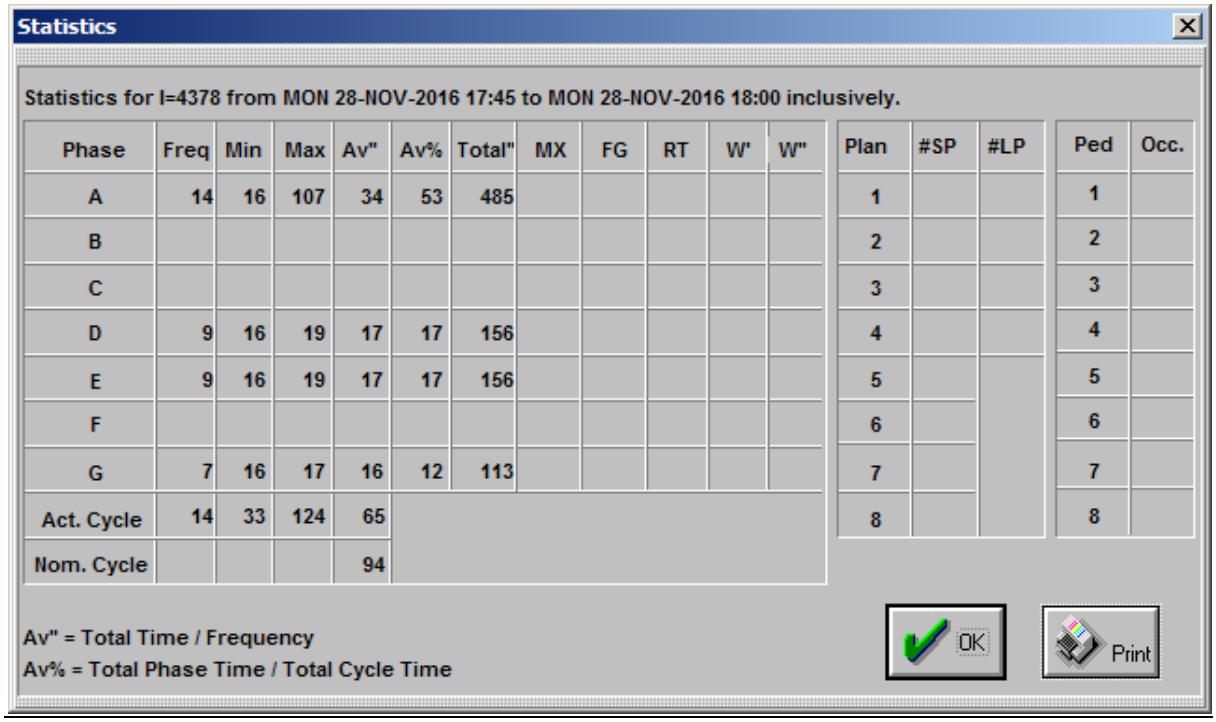
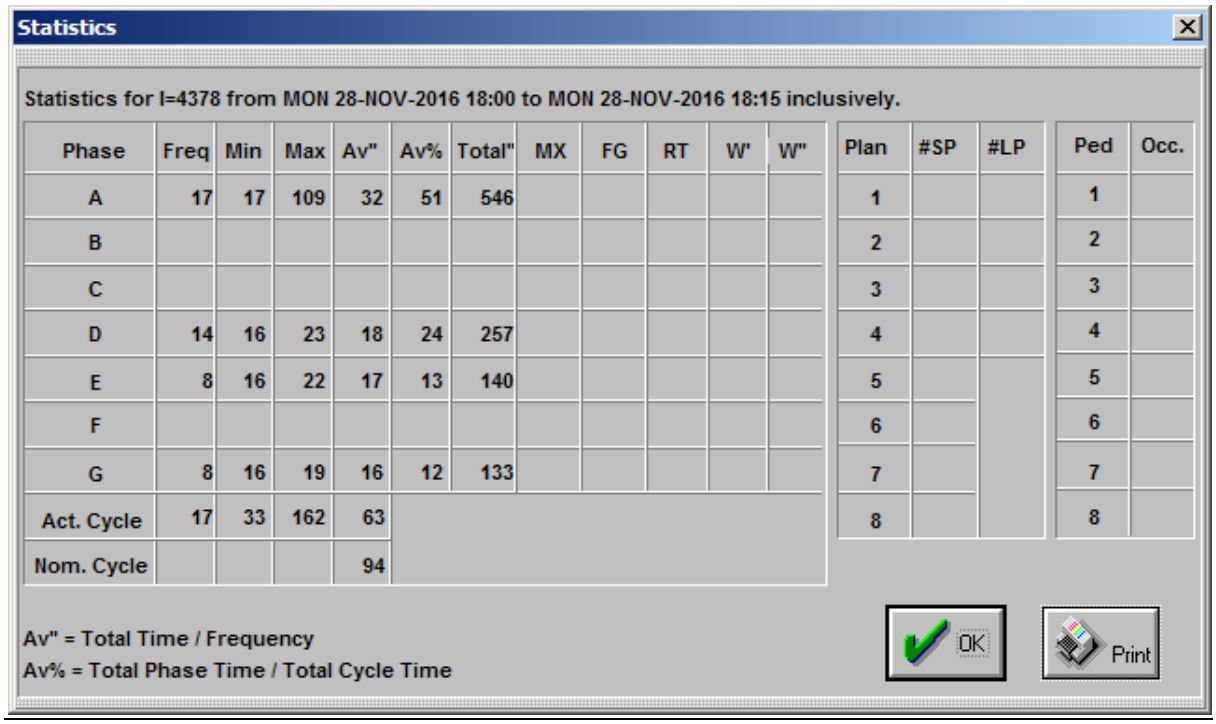
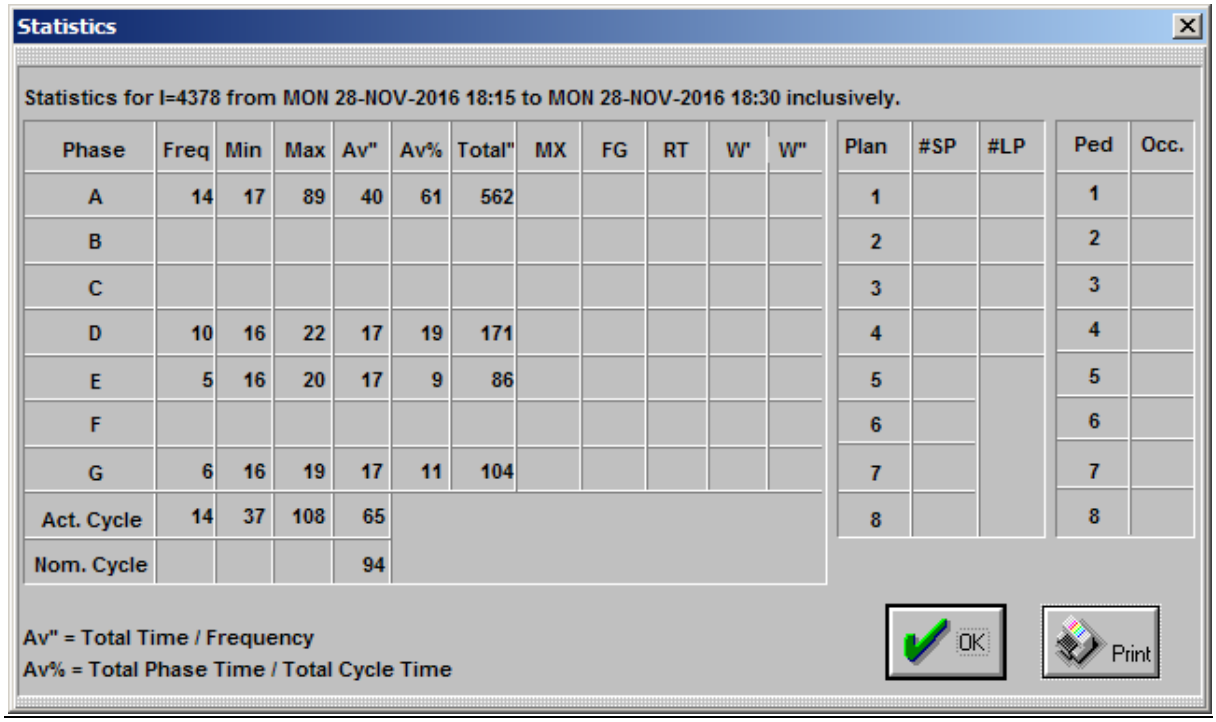
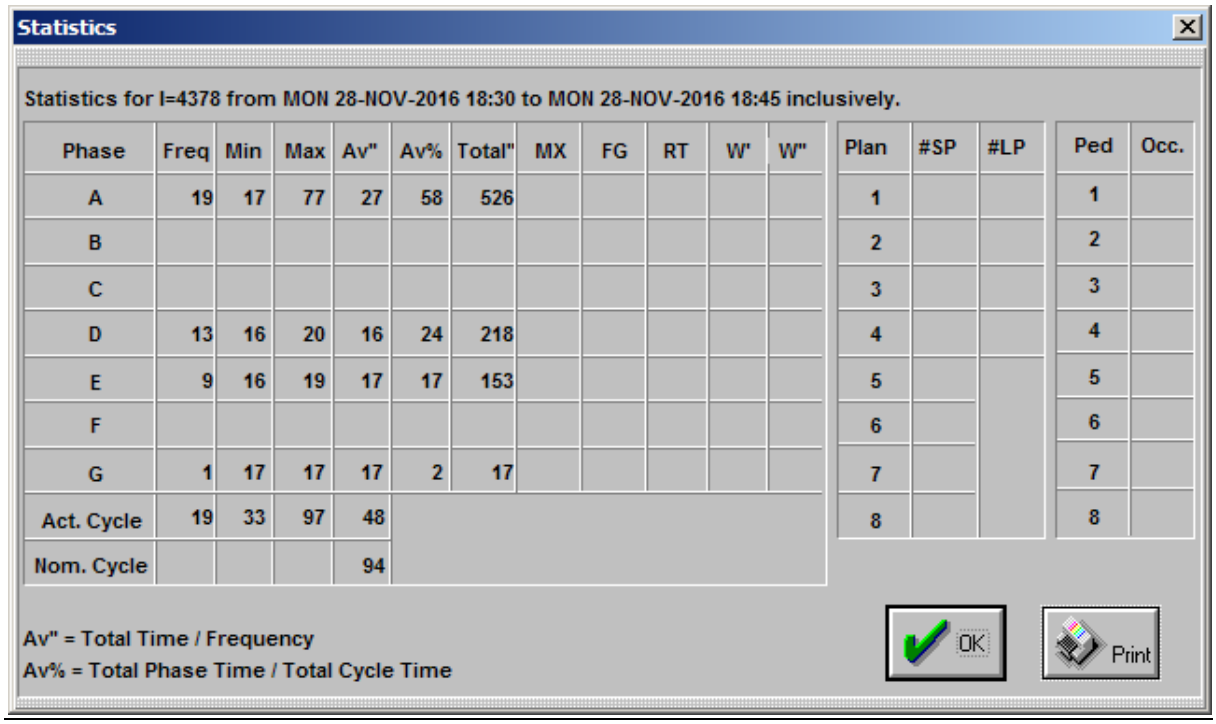
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

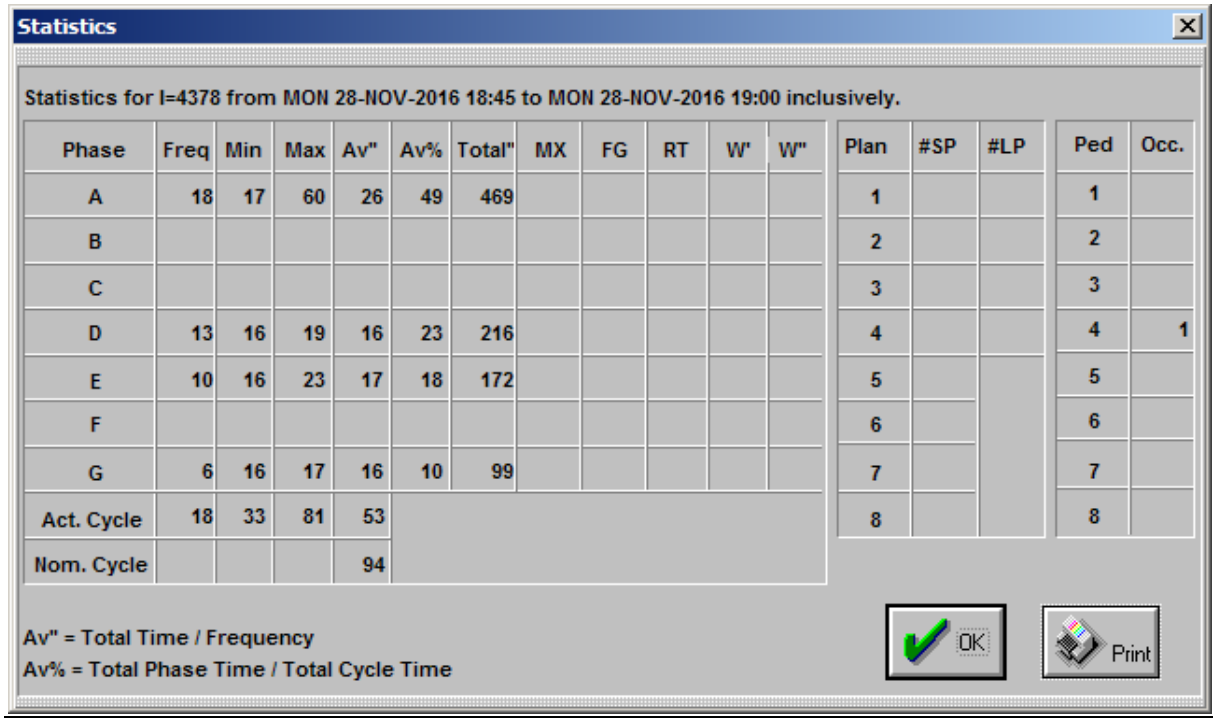

Statistics
Statistics for I=4378 from MON 28-NOV-2016 17:30 to MON 28-NOV-2016 17:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 18 16 47 25 46 451
B
C
D 11 16 20 17 19 191
E 11 16 26 19 22 214
F
G 8 16 19 16 14 134
Act. Cycle 18 38 78 55
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 17:45 to MON 28-NOV-2016 18:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 16 107 34 53 485
B
C
D 9 16 19 17 17 156
E 9 16 19 17 17 156
F
G 7 16 17 16 12 113
Act. Cycle 14 33 124 65
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 18:00 to MON 28-NOV-2016 18:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 17 109 32 51 546
B
C
D 14 16 23 18 24 257
E 8 16 22 17 13 140
F
G 8 16 19 16 12 133
Act. Cycle 17 33 162 63
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

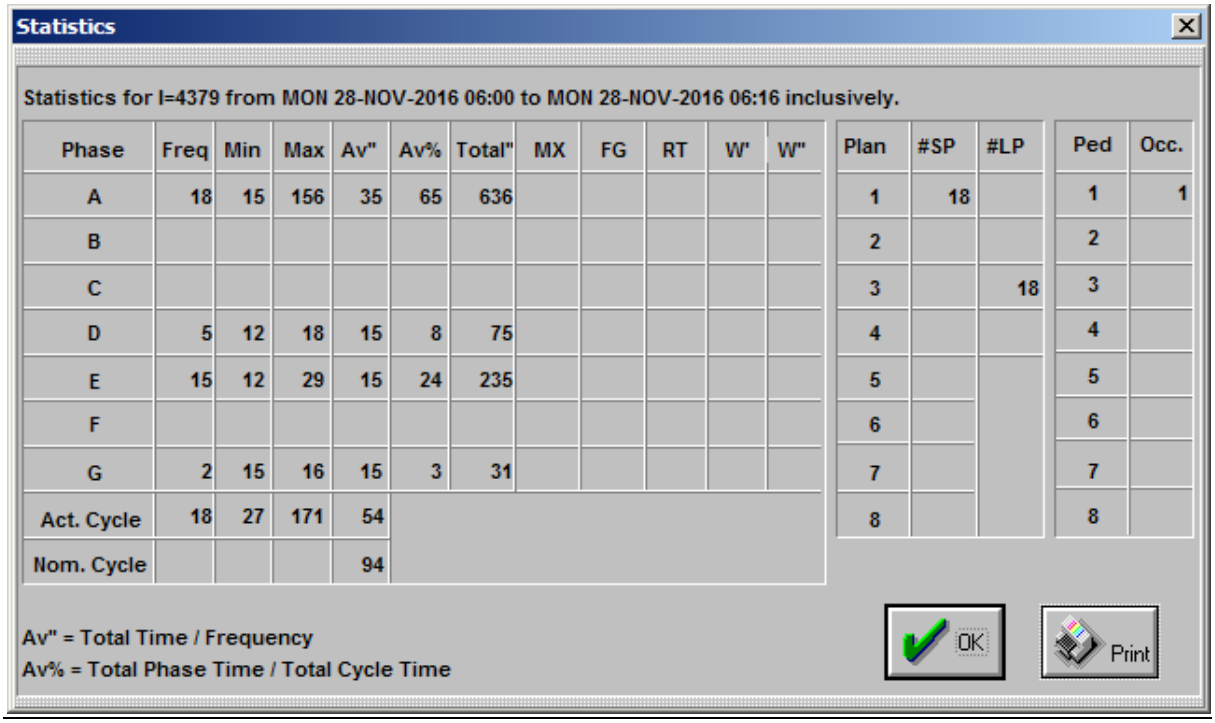

Statistics
Statistics for I=4378 from MON 28-NOV-2016 18:15 to MON 28-NOV-2016 18:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 17 89 40 61 562
B
C
D 10 16 22 17 19 171
E 5 16 20 17 9 86
F
G 6 16 19 17 11 104
Act. Cycle 14 37 108 65
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 18:30 to MON 28-NOV-2016 18:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 19 17 77 27 58 526
B
C
D 13 16 20 16 24 218
E 9 16 19 17 17 153
F
G 1 17 17 17 2 17
Act. Cycle 19 33 97 48
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4378 from MON 28-NOV-2016 18:45 to MON 28-NOV-2016 19:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 18 17 60 26 49 469
B
C
D 13 16 19 16 23 216
E 10 16 23 17 18 172
F
G 6 16 17 16 10 99
Act. Cycle 18 33 81 53
Nom. Cycle 94
Plan #SP #LP
1
2
3
4
5
6
7
8
Ped Occ.
1
2
3
4 1
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

TCS 4379 – Gregory Hills Drive, The Hermitage Way, Donovan Boulevard, Gregory Hills

AM Peak 6-10am



Statistics

Statistics for I=4379 from MON 28-NOV-2016 06:00 to MON 28-NOV-2016 06:16 inclusively.

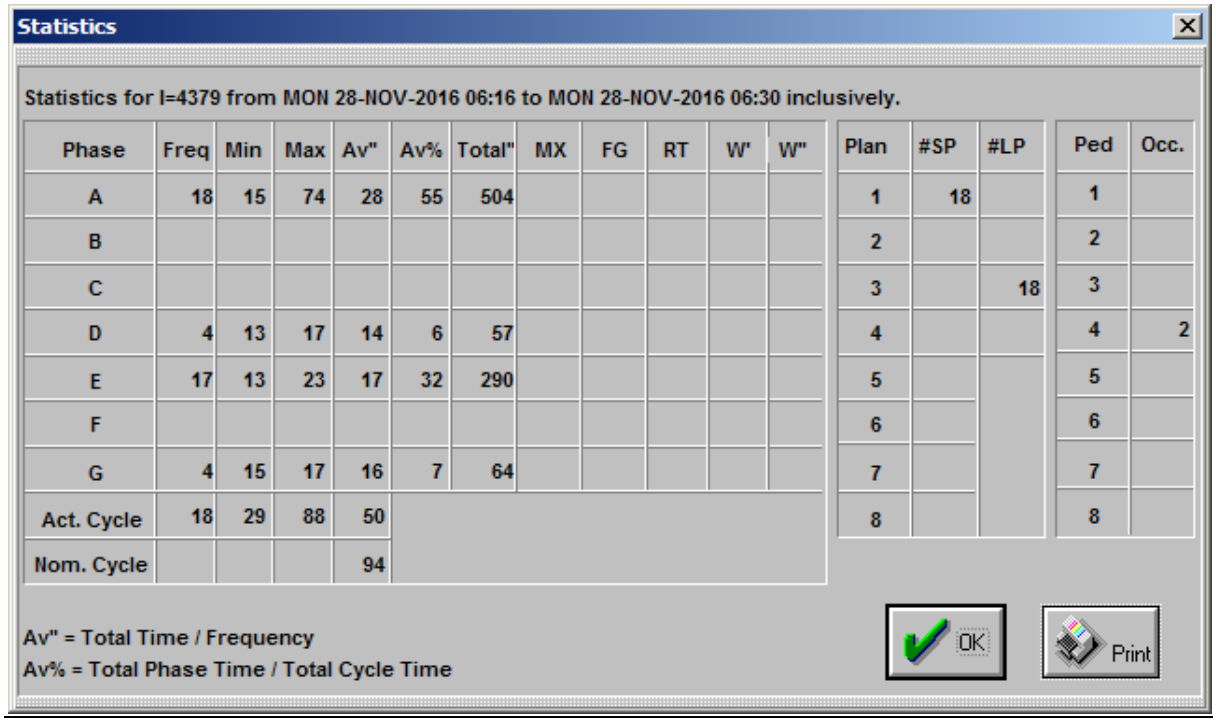
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	15	156	35	65	636					
B											
C											
D	5	12	18	15	8	75					
E	15	12	29	15	24	235					
F											
G	2	15	16	15	3	31					
Act. Cycle	18	27	171	54							
Nom. Cycle				94							

Plan	#SP	#LP
1	18	
2		
3		18
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

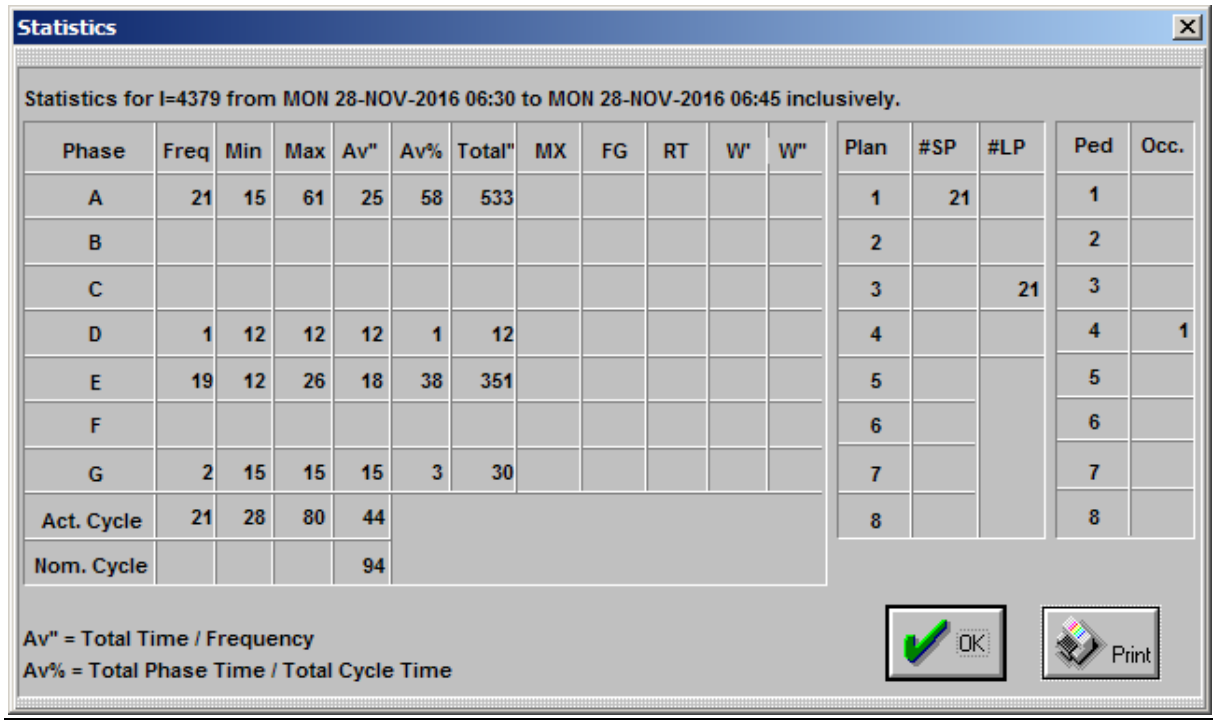
OK Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	15	74	28	55	504					
B											
C											
D	4	13	17	14	6	57					
E	17	13	23	17	32	290					
F											
G	4	15	17	16	7	64					
Act. Cycle	18	29	88	50							
Nom. Cycle				94							

Plan	#SP	#LP
1	18	
2		
3		18
4		
5		
6		
7		
8		

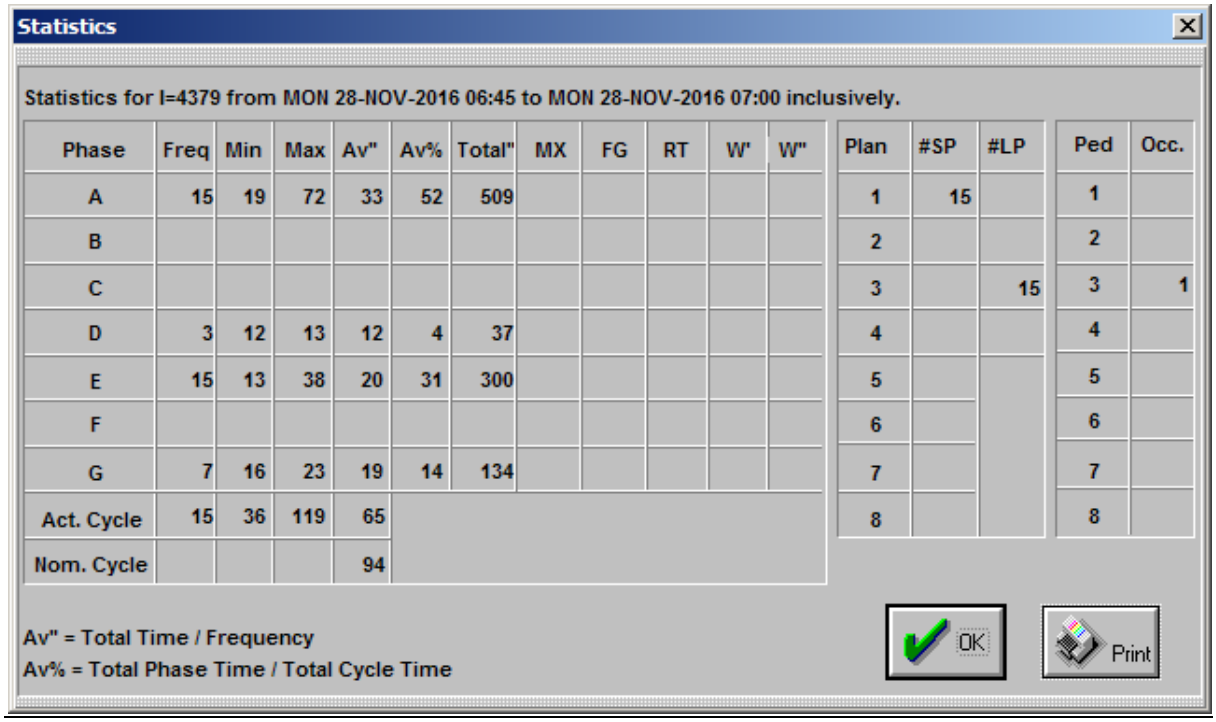
Ped	Occ.
1	
2	
3	
4	2
5	
6	
7	
8	

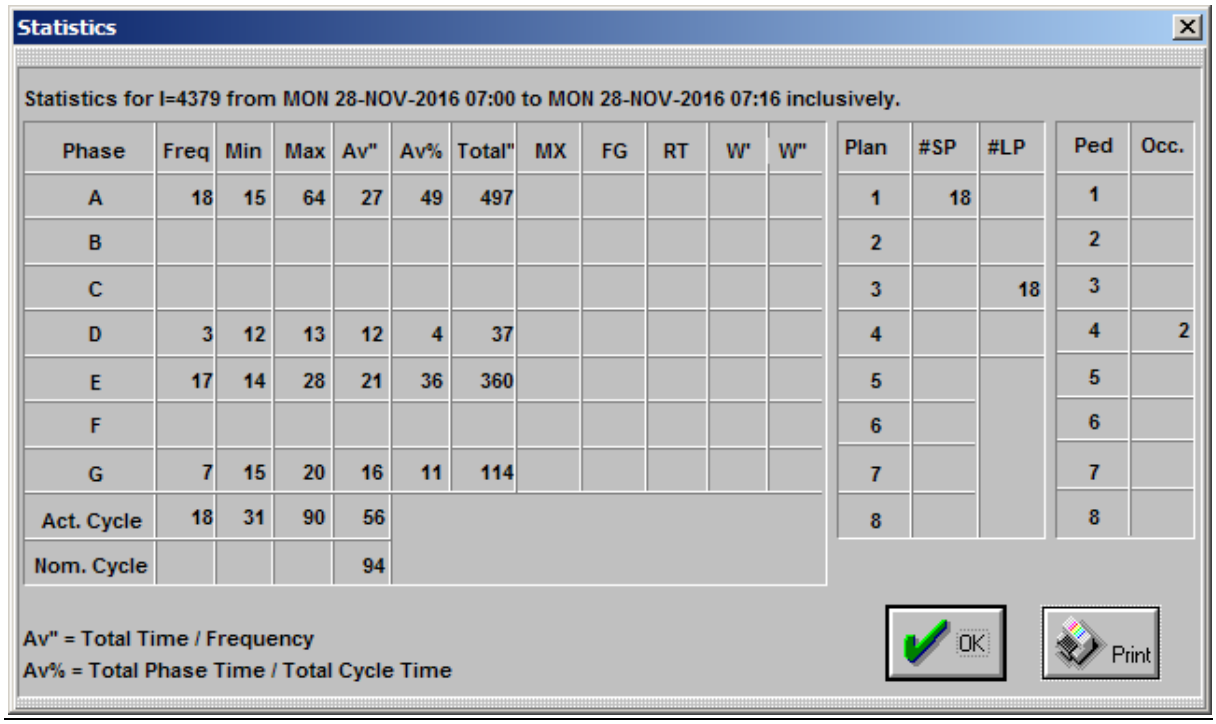


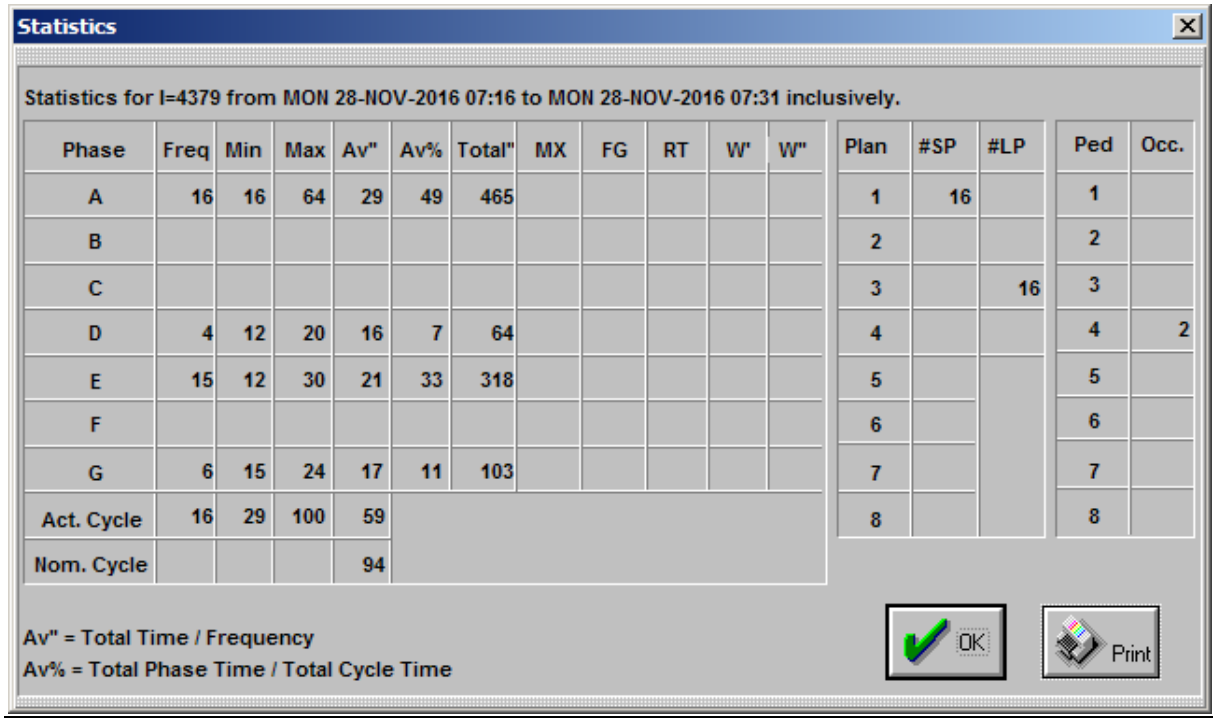
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	21	15	61	25	58	533					
B											
C											
D	1	12	12	12	1	12					
E	19	12	26	18	38	351					
F											
G	2	15	15	15	3	30					
Act. Cycle	21	28	80	44							
Nom. Cycle				94							

Plan	#SP	#LP
1	21	
2		
3		21
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	
4	1
5	
6	
7	
8	


Statistics
Statistics for I=4379 from MON 28-NOV-2016 06:45 to MON 28-NOV-2016 07:00 inclusively.
Phase | Freq | Min | Max | Av" | Av% | Total" | MX | FG | RT | W' | W"
A | 15 | 19 | 72 | 33 | 52 | 509
B
C
D | 3 | 12 | 13 | 12 | 4 | 37
E | 15 | 13 | 38 | 20 | 31 | 300
F
G | 7 | 16 | 23 | 19 | 14 | 134
Act. Cycle | 15 | 36 | 119 | 65
Nom. Cycle | | | | 94
Plan | #SP | #LP
1 | 15
2
3 | 15
4
5
6
7
8
Ped | Occ.
1
2
3 | 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

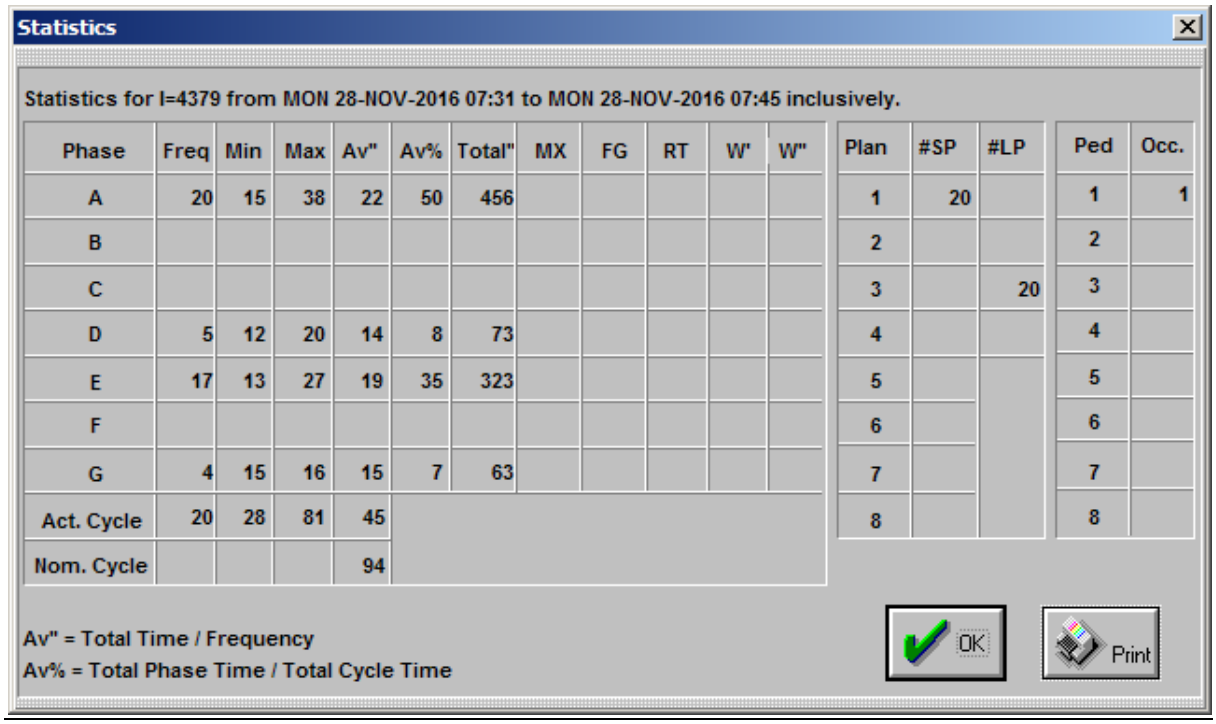

Statistics
Statistics for I=4379 from MON 28-NOV-2016 07:00 to MON 28-NOV-2016 07:16 inclusively.
Phase | Freq | Min | Max | Av" | Av% | Total" | MX | FG | RT | W' | W"
A | 18 | 15 | 64 | 27 | 49 | 497
B
C
D | 3 | 12 | 13 | 12 | 4 | 37
E | 17 | 14 | 28 | 21 | 36 | 360
F
G | 7 | 15 | 20 | 16 | 11 | 114
Act. Cycle | 18 | 31 | 90 | 56
Nom. Cycle | | | | 94
Plan | #SP | #LP
1 | 18
2
3 | 18
4
5
6
7
8
Ped | Occ.
1
2
3
4 | 2
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	16	16	64	29	49	465					
B											
C											
D	4	12	20	16	7	64					
E	15	12	30	21	33	318					
F											
G	6	15	24	17	11	103					
Act. Cycle	16	29	100	59							
Nom. Cycle				94							

Plan	#SP	#LP
1	16	
2		
3		16
4		
5		
6		
7		
8		

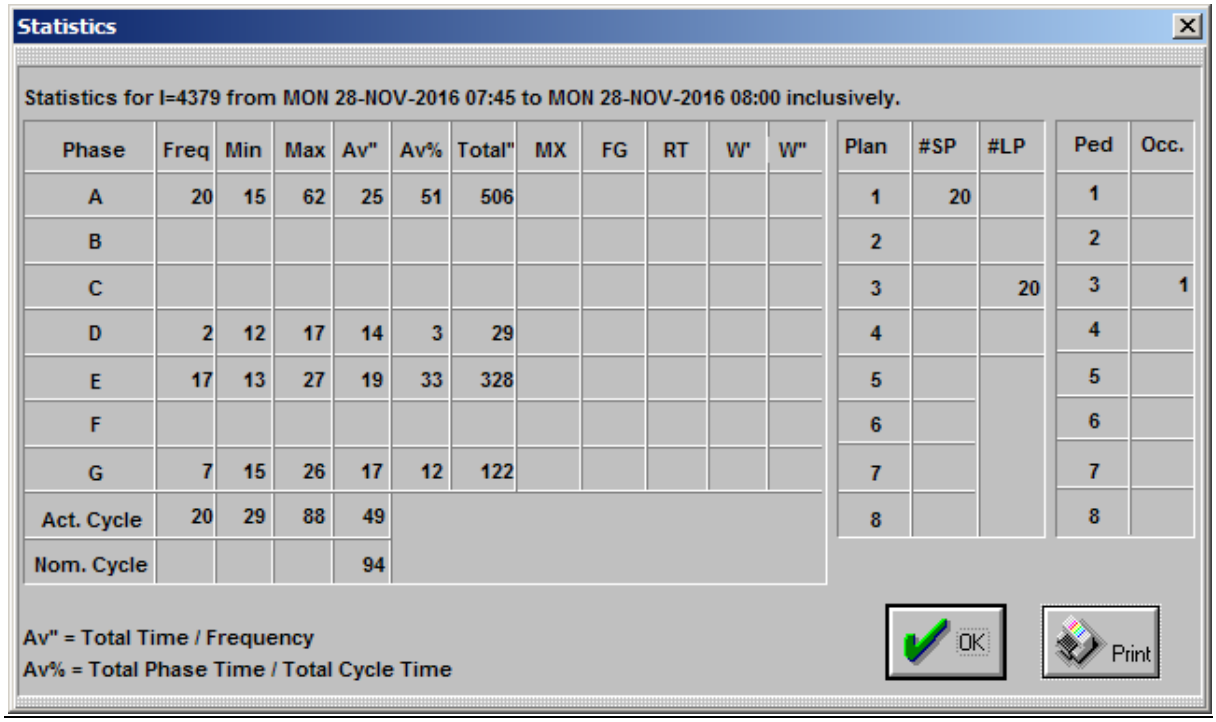
Ped	Occ.
1	
2	
3	
4	2
5	
6	
7	
8	

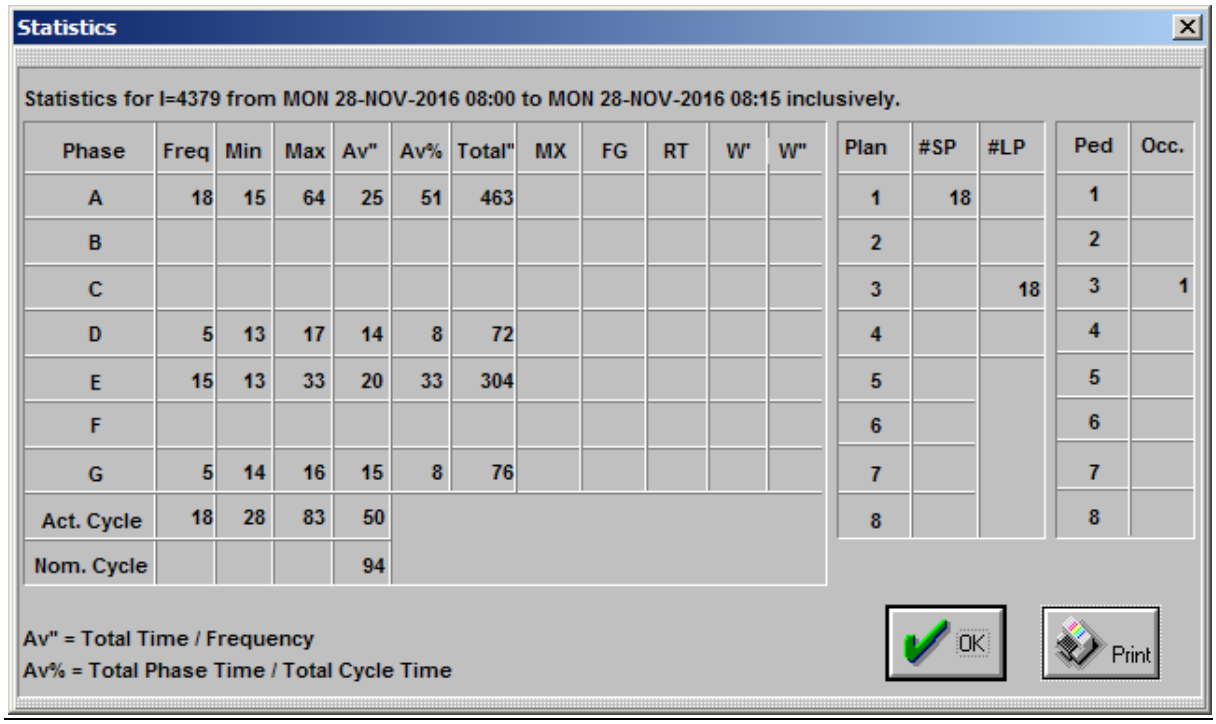


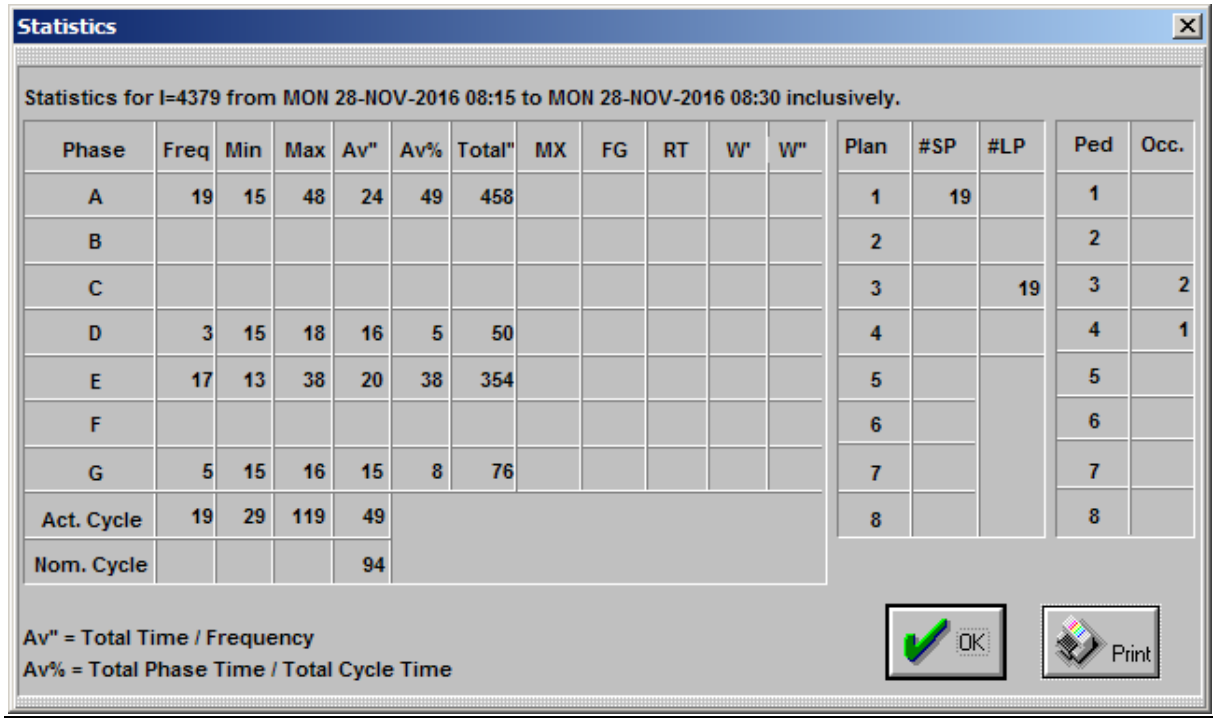
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	20	15	38	22	50	456					
B											
C											
D	5	12	20	14	8	73					
E	17	13	27	19	35	323					
F											
G	4	15	16	15	7	63					
Act. Cycle	20	28	81	45							
Nom. Cycle				94							

Plan	#SP	#LP
1	20	
2		
3		20
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	
3	
4	
5	
6	
7	
8	


Statistics
Statistics for I=4379 from MON 28-NOV-2016 07:45 to MON 28-NOV-2016 08:00 inclusively.
Phase | Freq | Min | Max | Av" | Av% | Total" | MX | FG | RT | W' | W"
A | 20 | 15 | 62 | 25 | 51 | 506
B
C
D | 2 | 12 | 17 | 14 | 3 | 29
E | 17 | 13 | 27 | 19 | 33 | 328
F
G | 7 | 15 | 26 | 17 | 12 | 122
Act. Cycle | 20 | 29 | 88 | 49
Nom. Cycle | | | | 94
Plan | #SP | #LP
1 | 20
2
3 | 20
4
5
6
7
8
Ped | Occ.
1
2
3 | 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

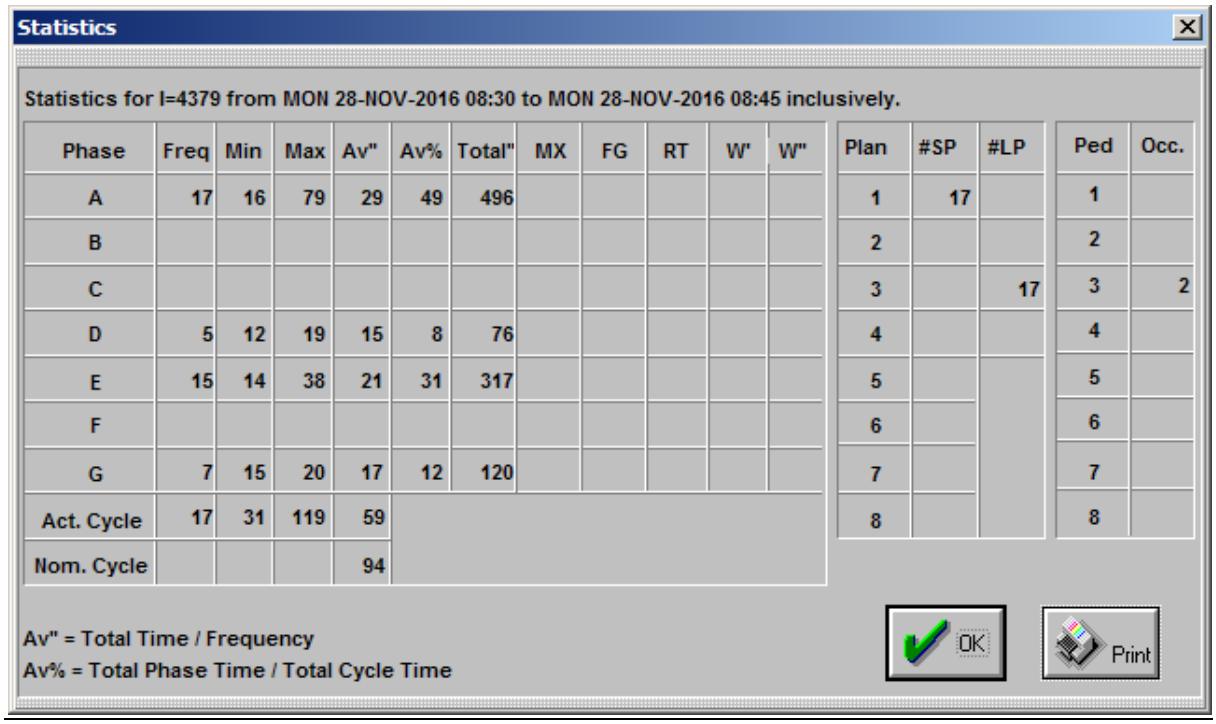

Statistics
Statistics for I=4379 from MON 28-NOV-2016 08:00 to MON 28-NOV-2016 08:15 inclusively.
Phase | Freq | Min | Max | Av" | Av% | Total" | MX | FG | RT | W' | W"
A | 18 | 15 | 64 | 25 | 51 | 463
B
C
D | 5 | 13 | 17 | 14 | 8 | 72
E | 15 | 13 | 33 | 20 | 33 | 304
F
G | 5 | 14 | 16 | 15 | 8 | 76
Act. Cycle | 18 | 28 | 83 | 50
Nom. Cycle | | | | 94
Plan | #SP | #LP
1 | 18
2
3 | 18
4
5
6
7
8
Ped | Occ.
1
2
3 | 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	19	15	48	24	49	458					
B											
C											
D	3	15	18	16	5	50					
E	17	13	38	20	38	354					
F											
G	5	15	16	15	8	76					
Act. Cycle	19	29	119	49							
Nom. Cycle				94							

Plan	#SP	#LP
1	19	
2		
3		19
4		
5		
6		
7		
8		

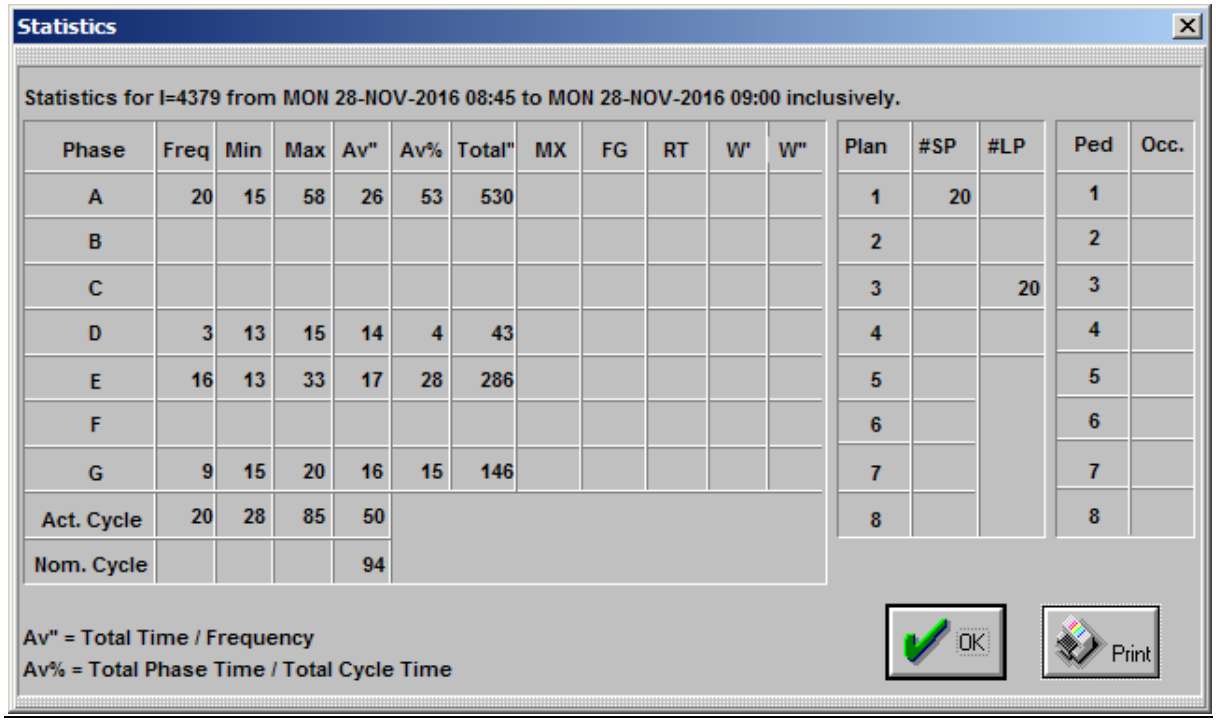
Ped	Occ.
1	
2	
3	2
4	1
5	
6	
7	
8	

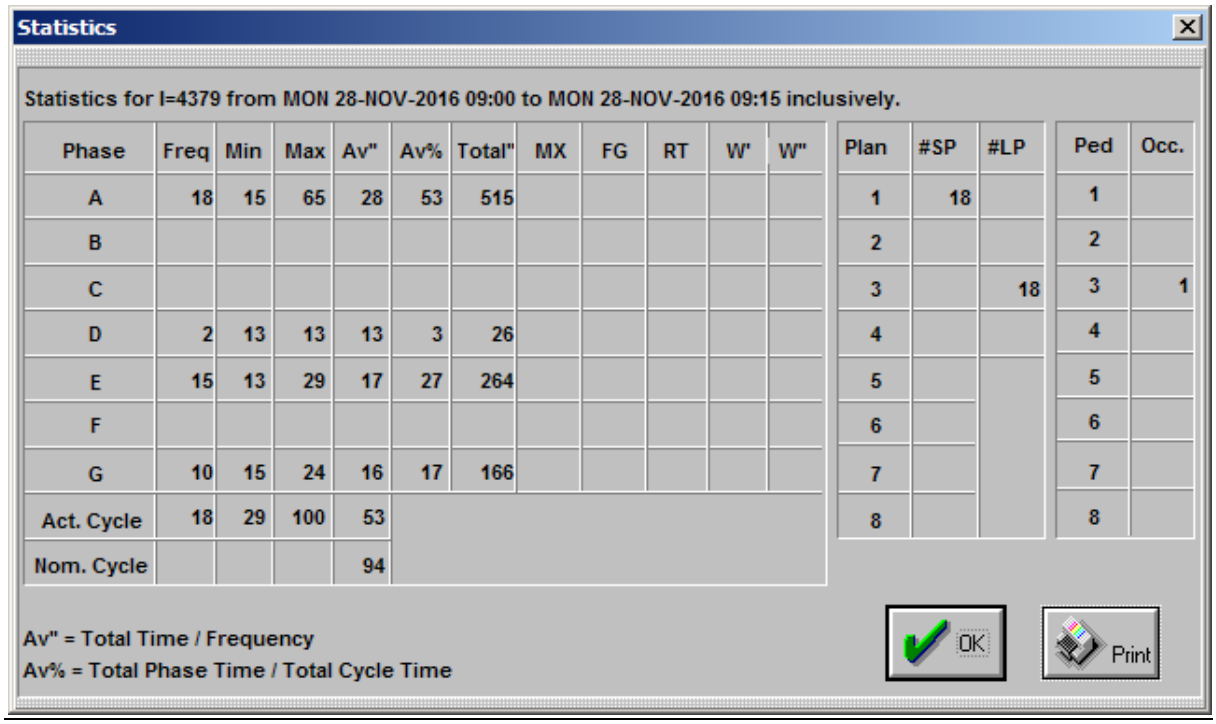


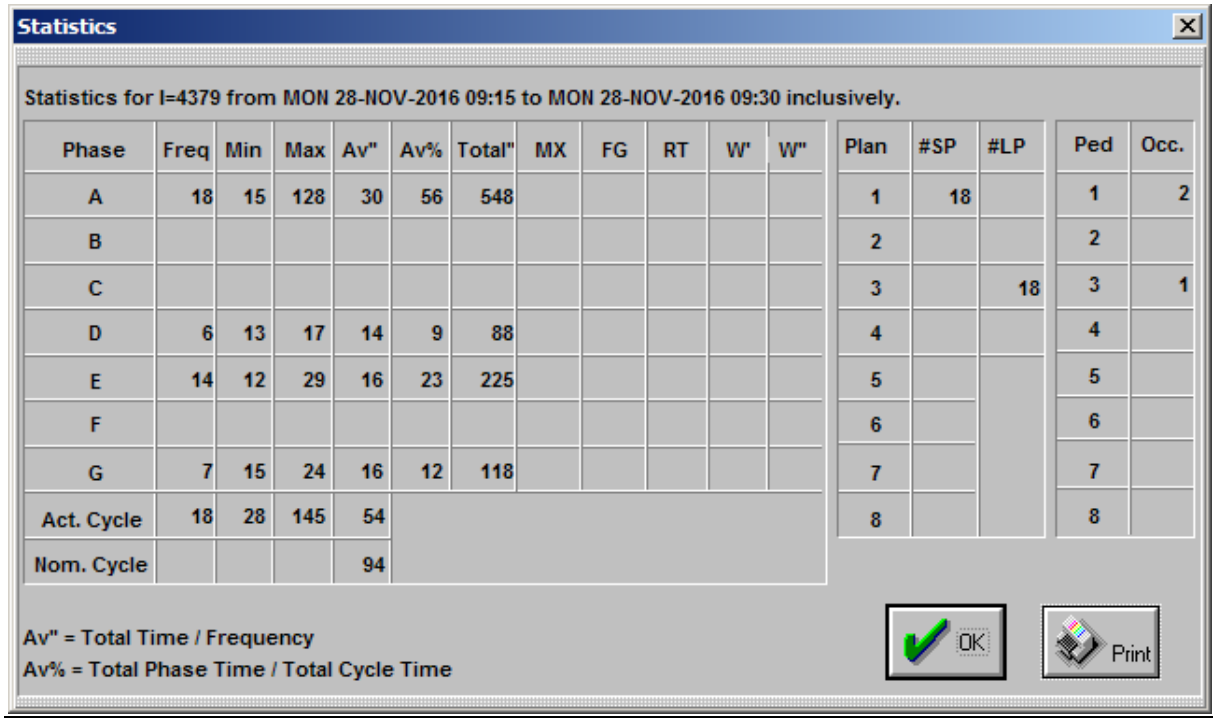
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	17	16	79	29	49	496					
B											
C											
D	5	12	19	15	8	76					
E	15	14	38	21	31	317					
F											
G	7	15	20	17	12	120					
Act. Cycle	17	31	119	59							
Nom. Cycle				94							

Plan	#SP	#LP
1	17	
2		
3		17
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	2
4	
5	
6	
7	
8	


Statistics
Statistics for I=4379 from MON 28-NOV-2016 08:45 to MON 28-NOV-2016 09:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 20 15 58 26 53 530
B
C
D 3 13 15 14 4 43
E 16 13 33 17 28 286
F
G 9 15 20 16 15 146
Act. Cycle 20 28 85 50
Nom. Cycle 94
Plan #SP #LP
1 20
2
3 20
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from MON 28-NOV-2016 09:00 to MON 28-NOV-2016 09:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 18 15 65 28 53 515
B
C
D 2 13 13 13 3 26
E 15 13 29 17 27 264
F
G 10 15 24 16 17 166
Act. Cycle 18 29 100 53
Nom. Cycle 94
Plan #SP #LP
1 18
2
3 18
4
5
6
7
8
Ped Occ.
1
2
3 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Statistics

Statistics for I=4379 from MON 28-NOV-2016 09:15 to MON 28-NOV-2016 09:30 inclusively.

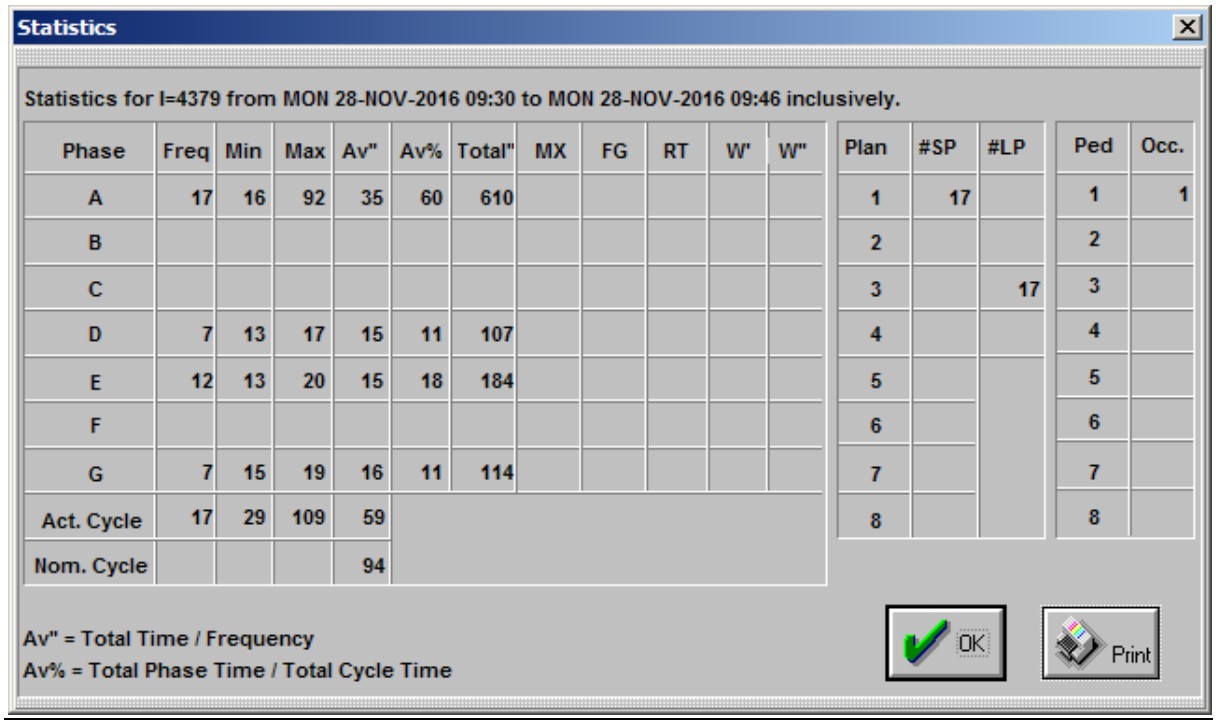
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	18	15	128	30	56	548					
B											
C											
D	6	13	17	14	9	88					
E	14	12	29	16	23	225					
F											
G	7	15	24	16	12	118					
Act. Cycle	18	28	145	54							
Nom. Cycle				94							

Plan	#SP	#LP
1	18	
2		
3		18
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=4379 from MON 28-NOV-2016 09:30 to MON 28-NOV-2016 09:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	17	16	92	35	60	610					
B											
C											
D	7	13	17	15	11	107					
E	12	13	20	15	18	184					
F											
G	7	15	19	16	11	114					
Act. Cycle	17	29	109	59							
Nom. Cycle				94							

Plan	#SP	#LP
1	17	
2		
3		17
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=4379 from MON 28-NOV-2016 09:46 to MON 28-NOV-2016 10:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	15	15	65	36	59	546					
B											
C											
D	2	13	15	14	3	28					
E	15	12	20	15	26	236					
F											
G	7	15	22	16	12	114					
Act. Cycle	15	31	102	61							
Nom. Cycle				94							

Plan	#SP	#LP
1	15	
2		
3		15
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

PM Peak 3-7pm

Data is collected from the 30th for PM Peak as there was a communication error from 28th at 13:50-30th 14:30

Statistics

Statistics for I=4379 from WED 30-NOV-2016 15:00 to WED 30-NOV-2016 15:15 inclusively.

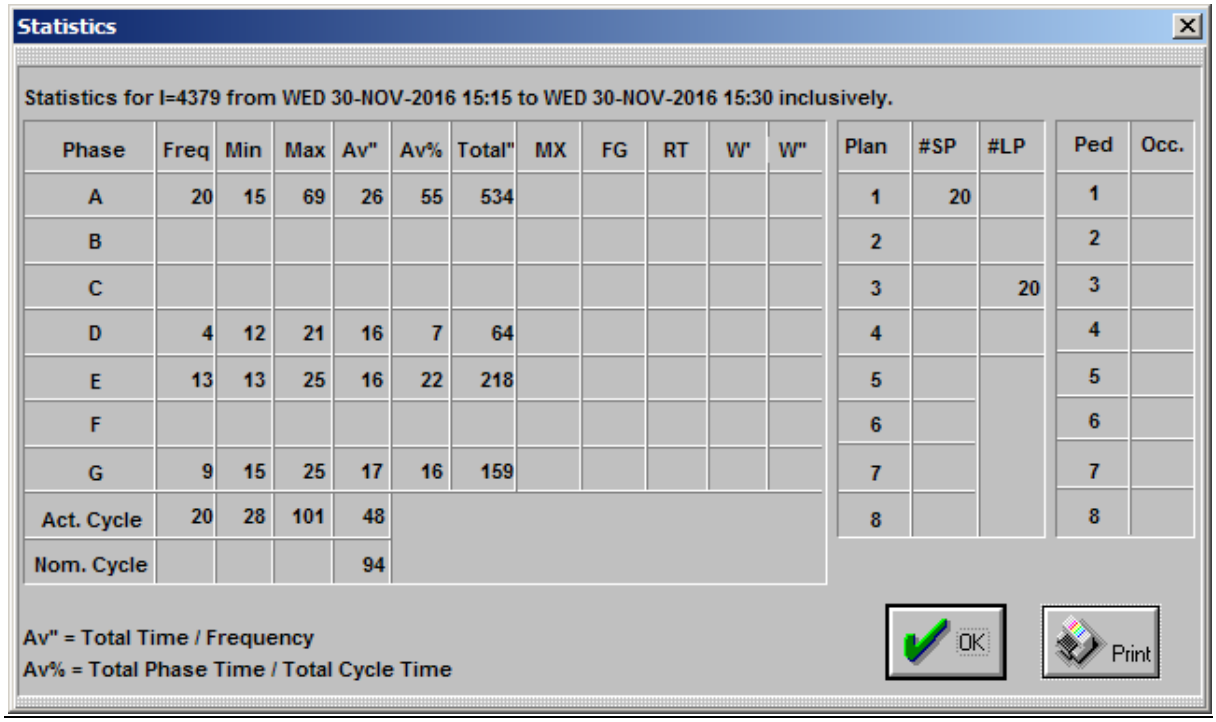
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	17	15	62	34	62	589					
B											
C											
D	4	13	21	15	6	60					
E	12	12	19	16	20	194					
F											
G	6	15	25	18	12	110					
Act. Cycle	17	32	109	56							
Nom. Cycle				94							

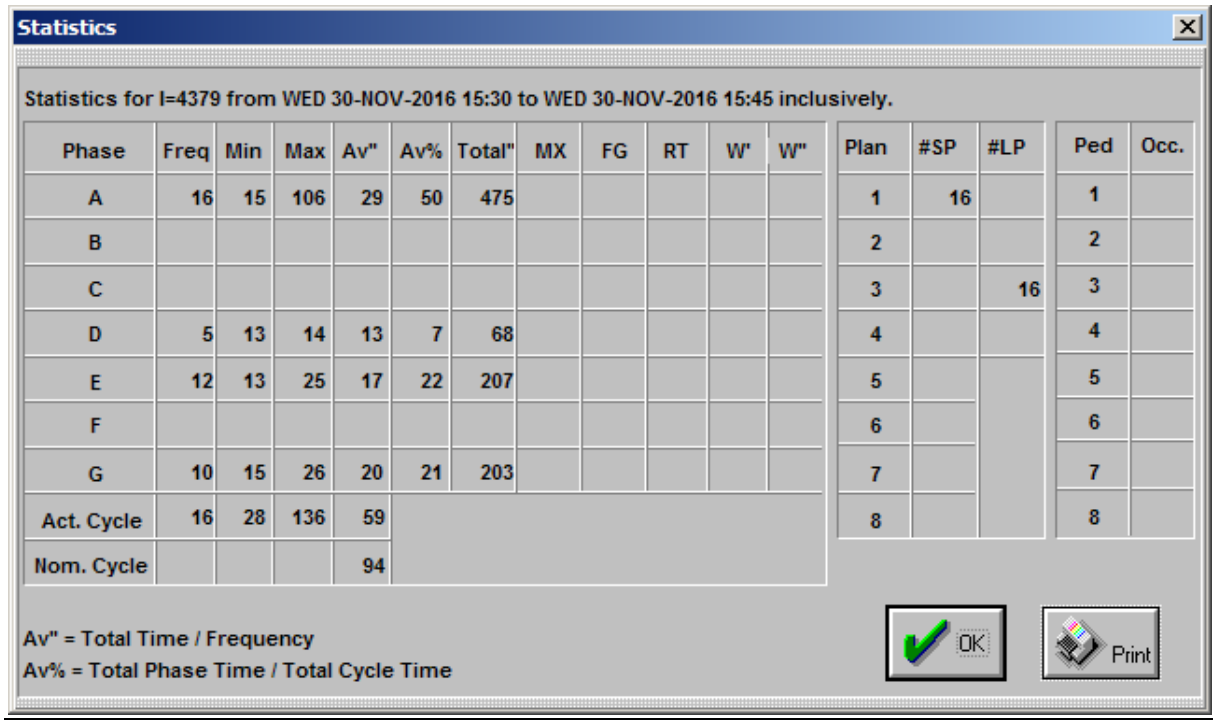
Plan	#SP	#LP
1	17	
2		
3		17
4		
5		
6		
7		
8		

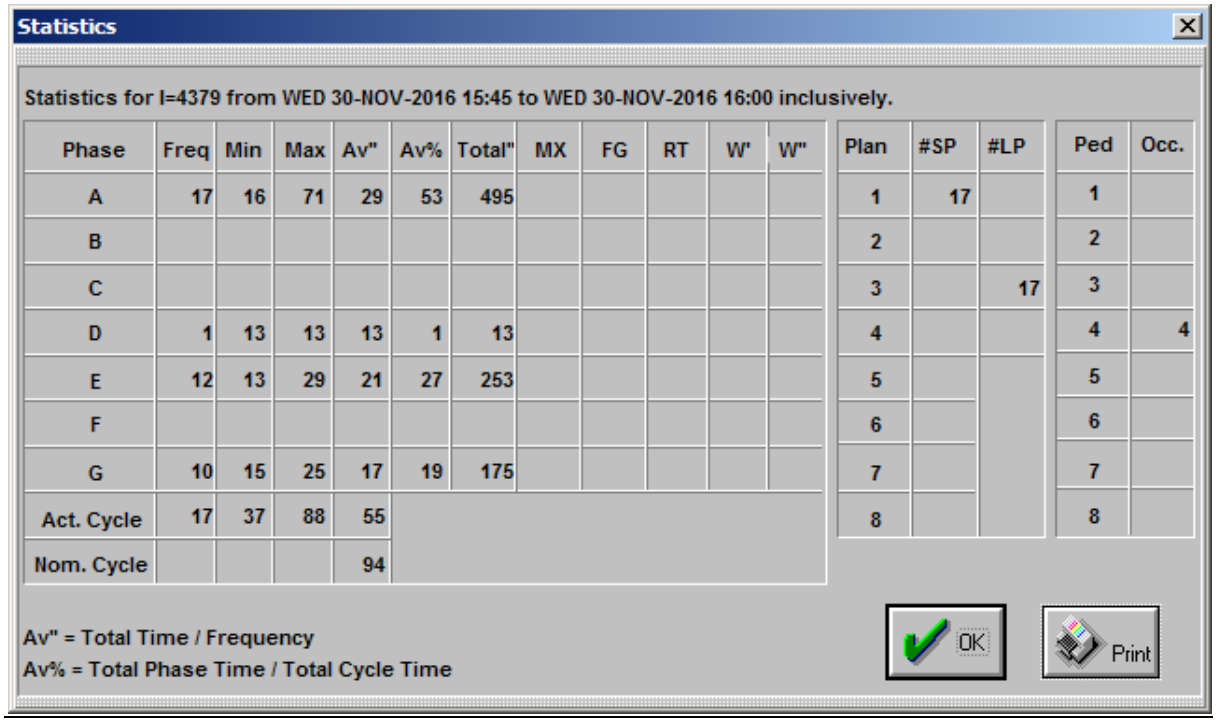
Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	

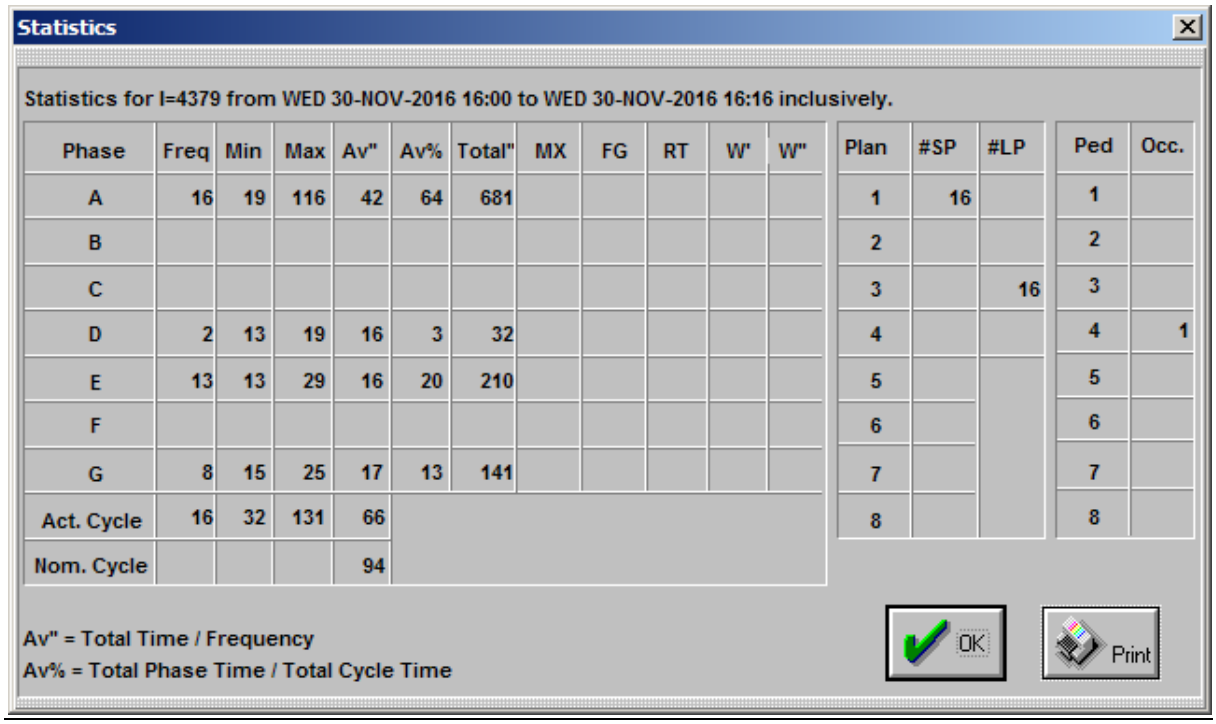
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

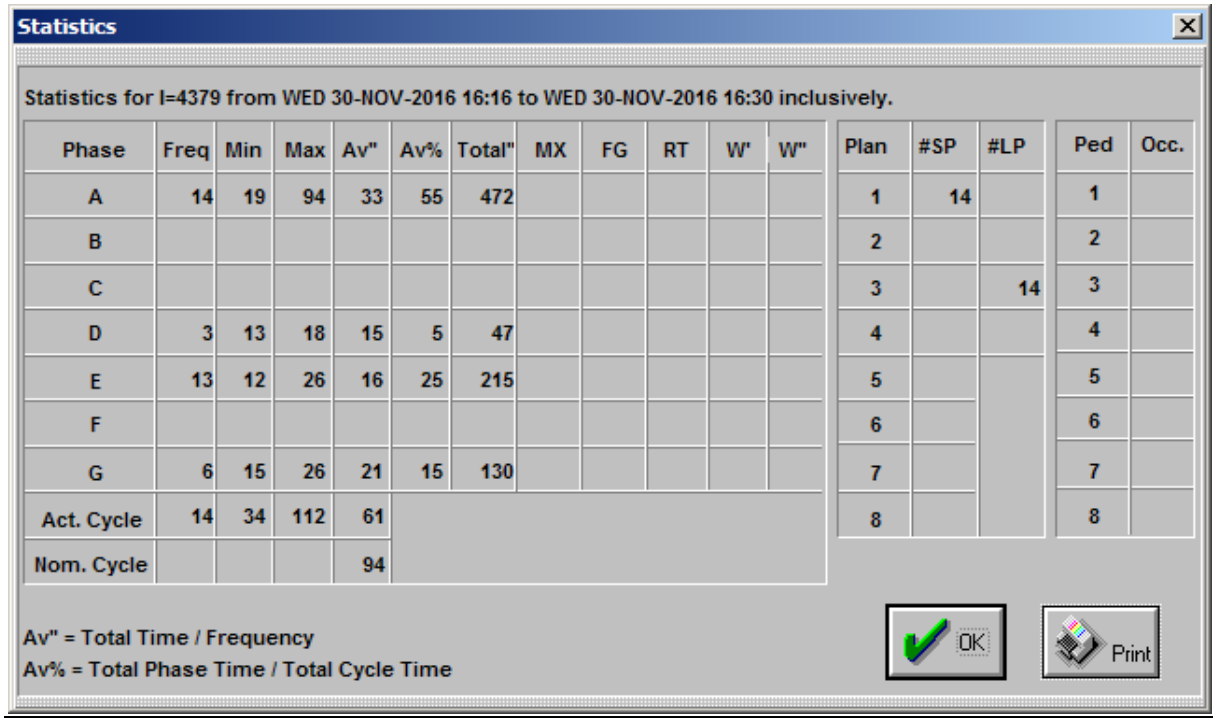
OK Print

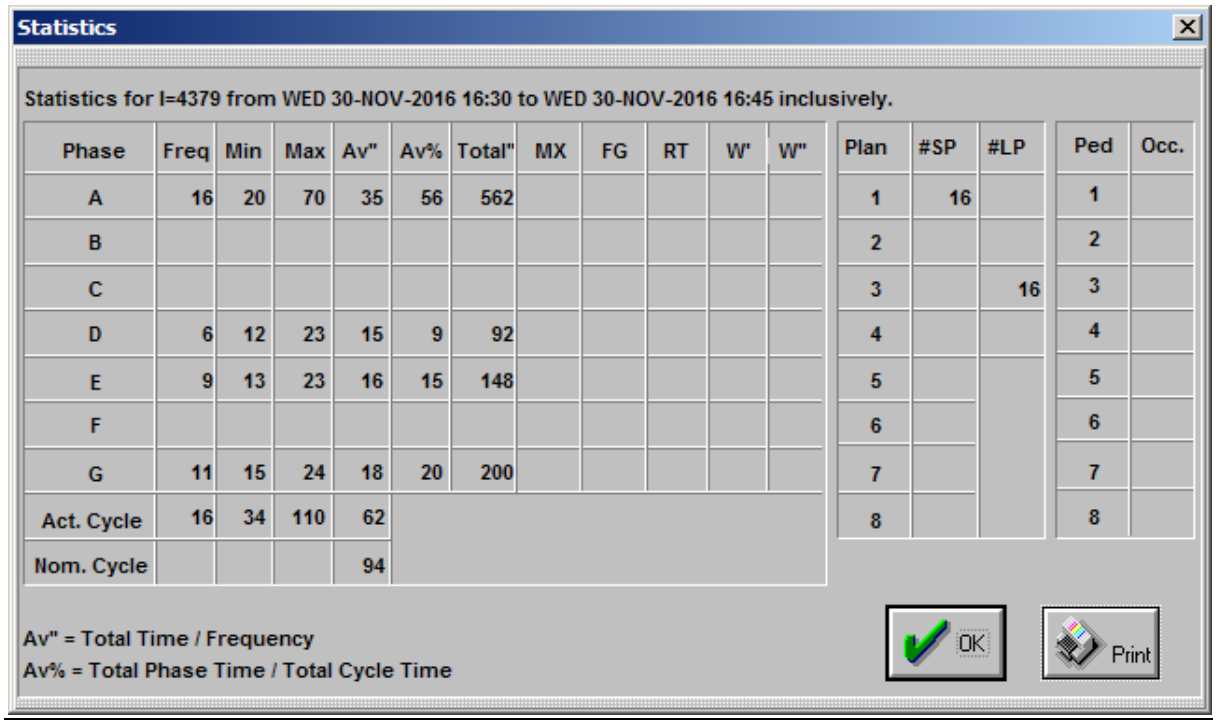

Statistics
Statistics for I=4379 from WED 30-NOV-2016 15:15 to WED 30-NOV-2016 15:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 20 15 69 26 55 534
B
C
D 4 12 21 16 7 64
E 13 13 25 16 22 218
F
G 9 15 25 17 16 159
Act. Cycle 20 28 101 48
Nom. Cycle 94
Plan #SP #LP
1 20
2
3 20
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

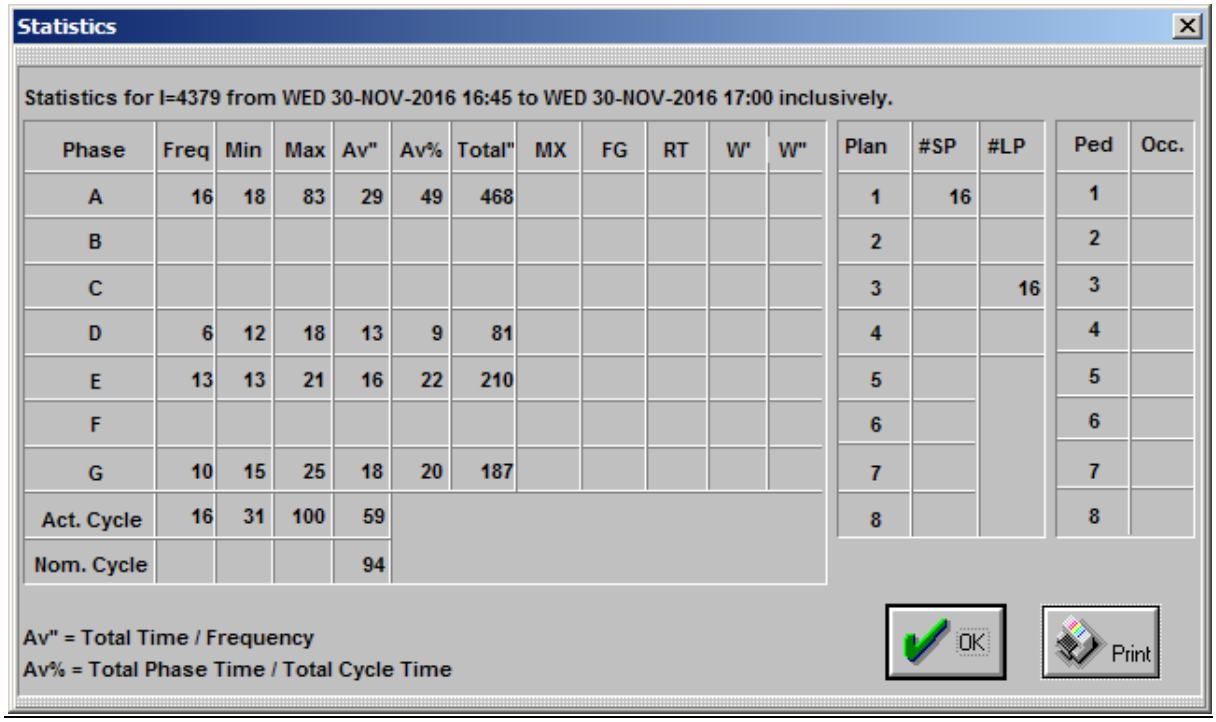

Statistics
Statistics for I=4379 from WED 30-NOV-2016 15:30 to WED 30-NOV-2016 15:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 15 106 29 50 475
B
C
D 5 13 14 13 7 68
E 12 13 25 17 22 207
F
G 10 15 26 20 21 203
Act. Cycle 16 28 136 59
Nom. Cycle 94
Plan #SP #LP
1 16
2
3 16
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 15:45 to WED 30-NOV-2016 16:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 17 16 71 29 53 495
B
C
D 1 13 13 13 1 13
E 12 13 29 21 27 253
F
G 10 15 25 17 19 175
Act. Cycle 17 37 88 55
Nom. Cycle 94
Plan #SP #LP
1 17
2
3 17
4
5
6
7
8
Ped Occ.
1
2
3
4 4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 16:00 to WED 30-NOV-2016 16:16 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 19 116 42 64 681
B
C
D 2 13 19 16 3 32
E 13 13 29 16 20 210
F
G 8 15 25 17 13 141
Act. Cycle 16 32 131 66
Nom. Cycle 94
Plan #SP #LP
1 16
2
3 16
4
5
6
7
8
Ped Occ.
1
2
3
4 1
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 16:16 to WED 30-NOV-2016 16:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 19 94 33 55 472
B
C
D 3 13 18 15 5 47
E 13 12 26 16 25 215
F
G 6 15 26 21 15 130
Act. Cycle 14 34 112 61
Nom. Cycle 94
Plan #SP #LP
1 14
2
3 14
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

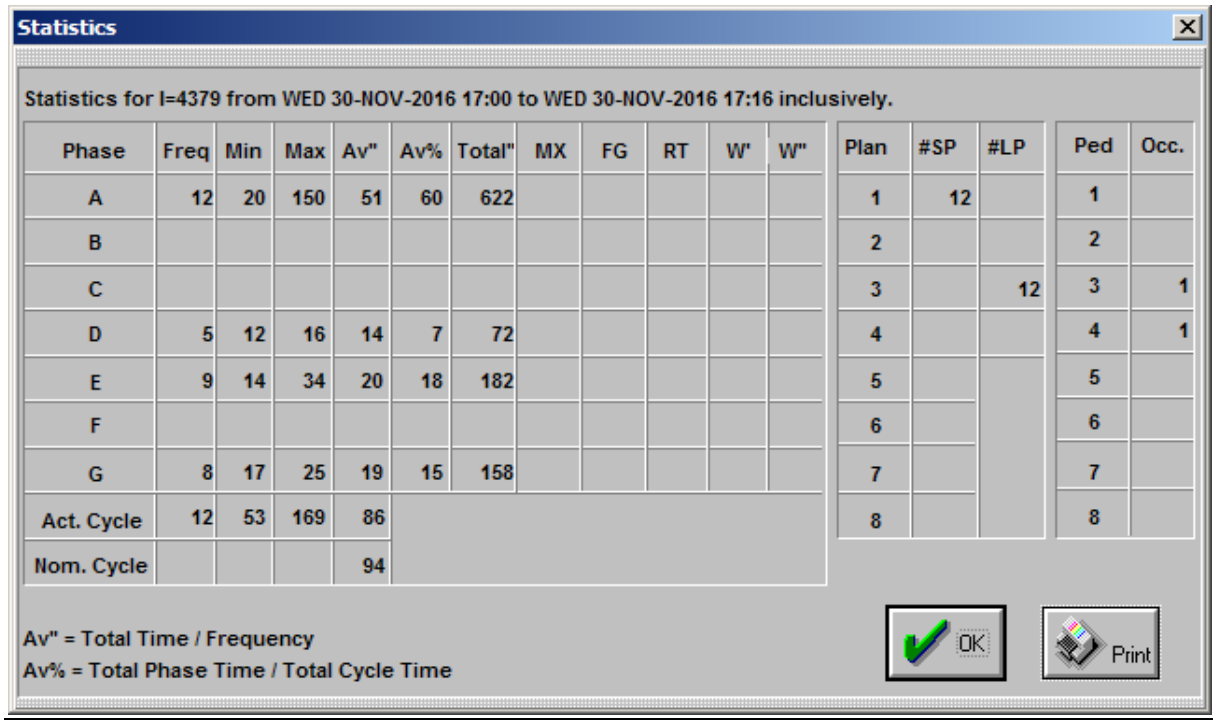

Statistics
Statistics for I=4379 from WED 30-NOV-2016 16:30 to WED 30-NOV-2016 16:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 20 70 35 56 562
B
C
D 6 12 23 15 9 92
E 9 13 23 16 15 148
F
G 11 15 24 18 20 200
Act. Cycle 16 34 110 62
Nom. Cycle 94
Plan #SP #LP
1 16
2
3 16
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print



Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	16	18	83	29	49	468					
B											
C											
D	6	12	18	13	9	81					
E	13	13	21	16	22	210					
F											
G	10	15	25	18	20	187					
Act. Cycle	16	31	100	59							
Nom. Cycle				94							

Plan	#SP	#LP
1	16	
2		
3		16
4		
5		
6		
7		
8		

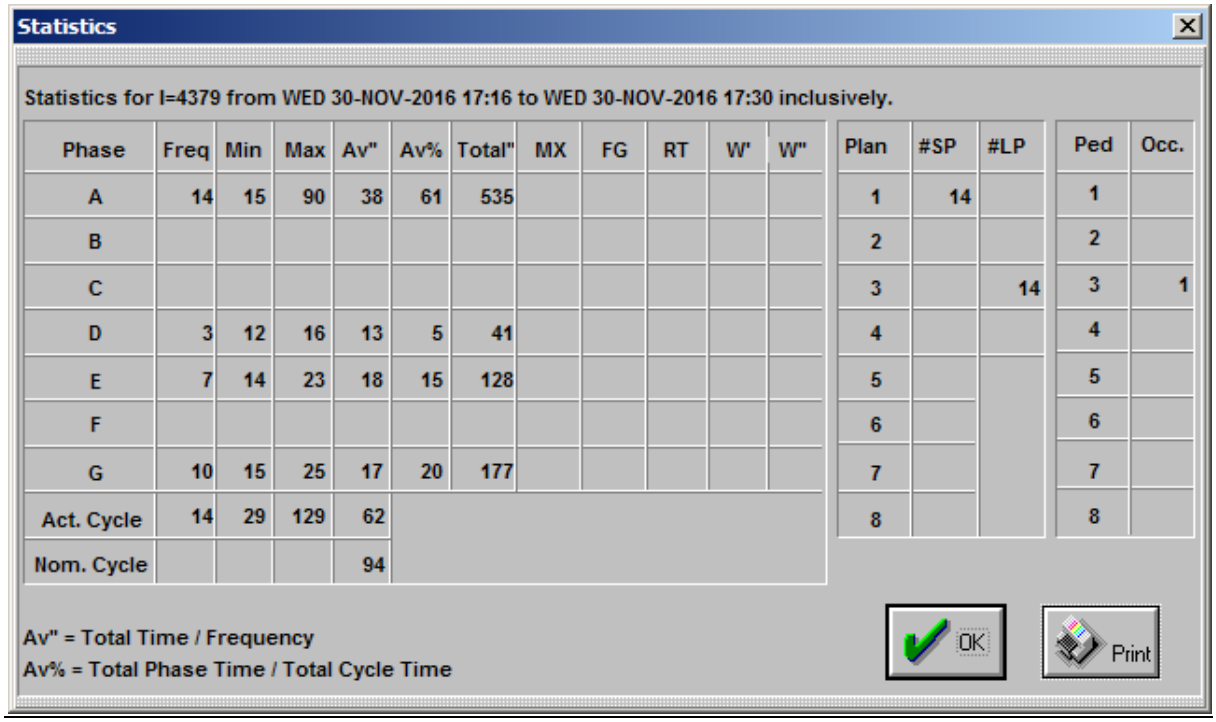
Ped	Occ.
1	
2	
3	
4	
5	
6	
7	
8	

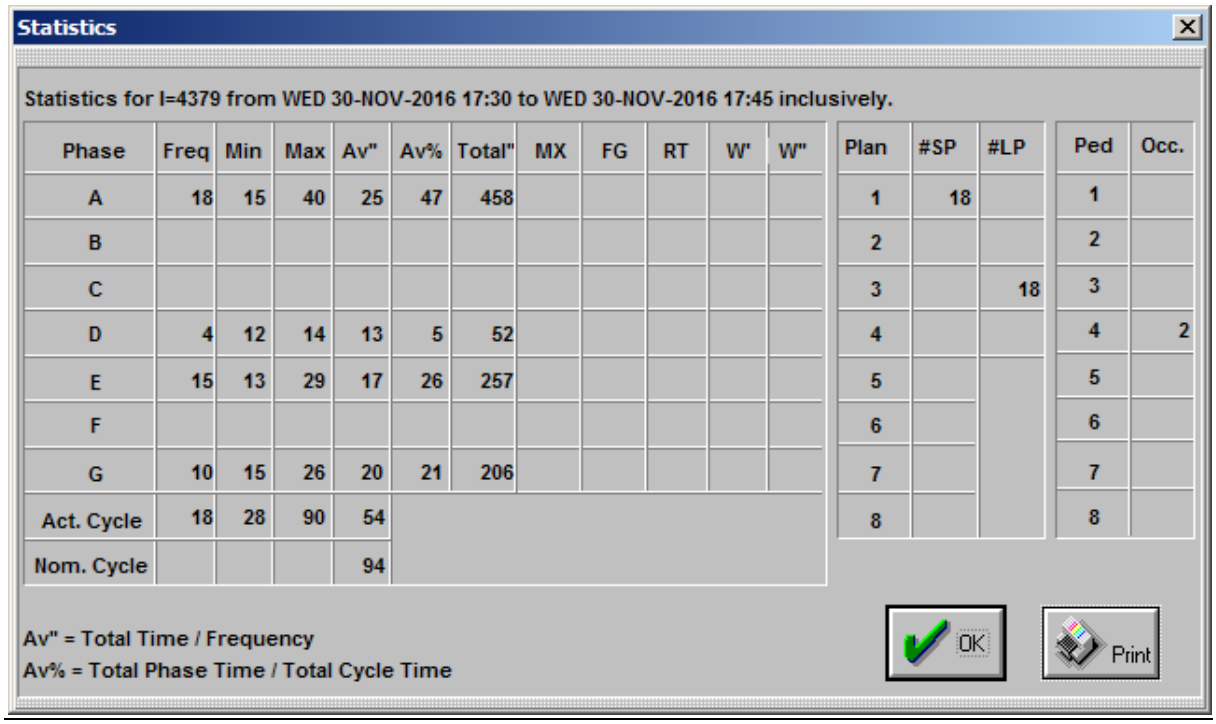


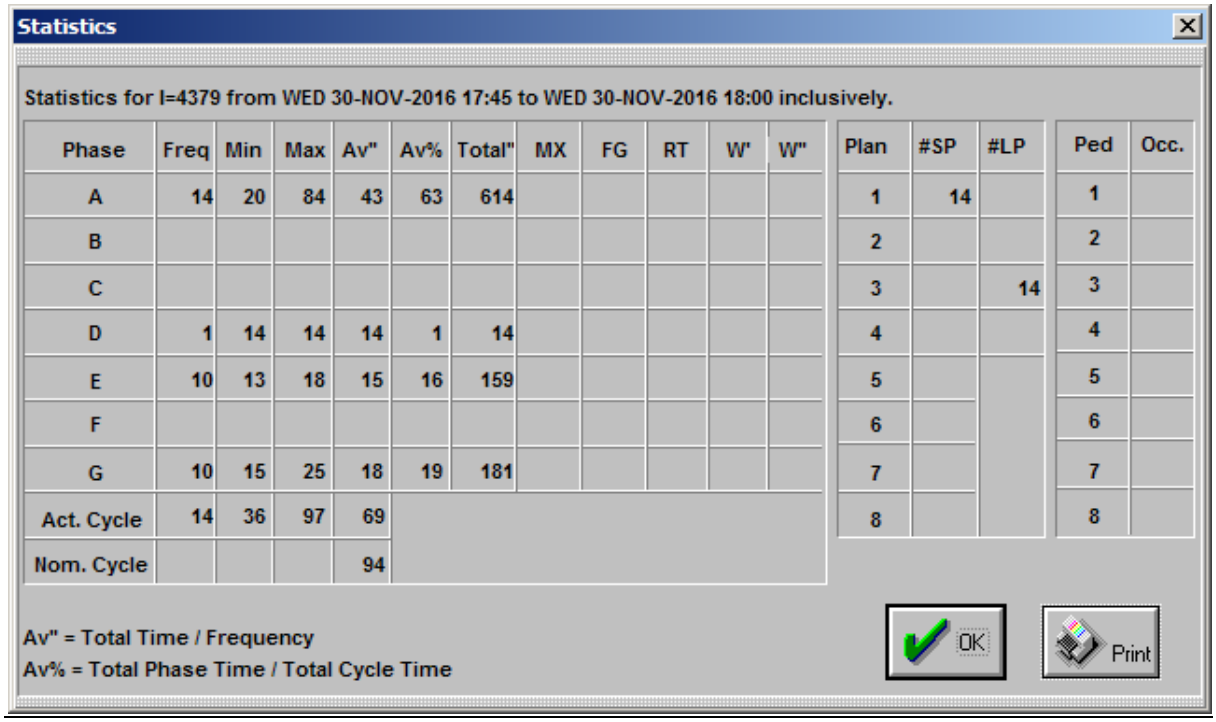
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	12	20	150	51	60	622					
B											
C											
D	5	12	16	14	7	72					
E	9	14	34	20	18	182					
F											
G	8	17	25	19	15	158					
Act. Cycle	12	53	169	86							
Nom. Cycle				94							

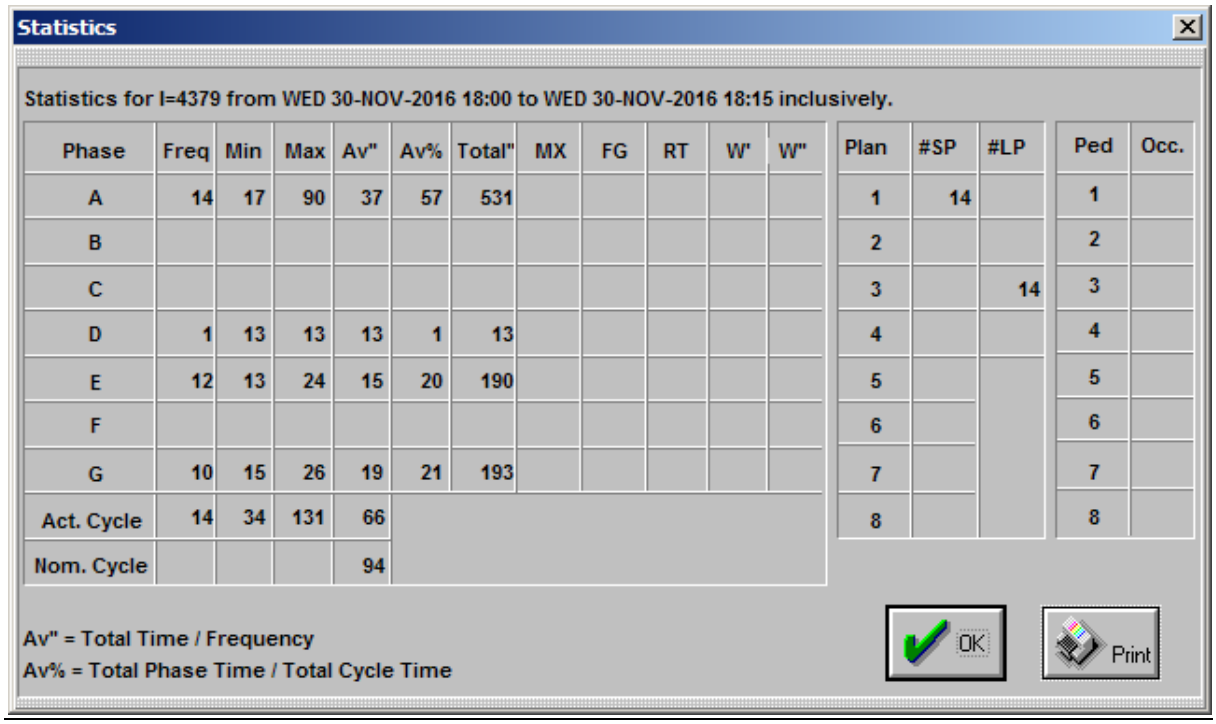
Plan	#SP	#LP
1	12	
2		
3		12
4		
5		
6		
7		
8		

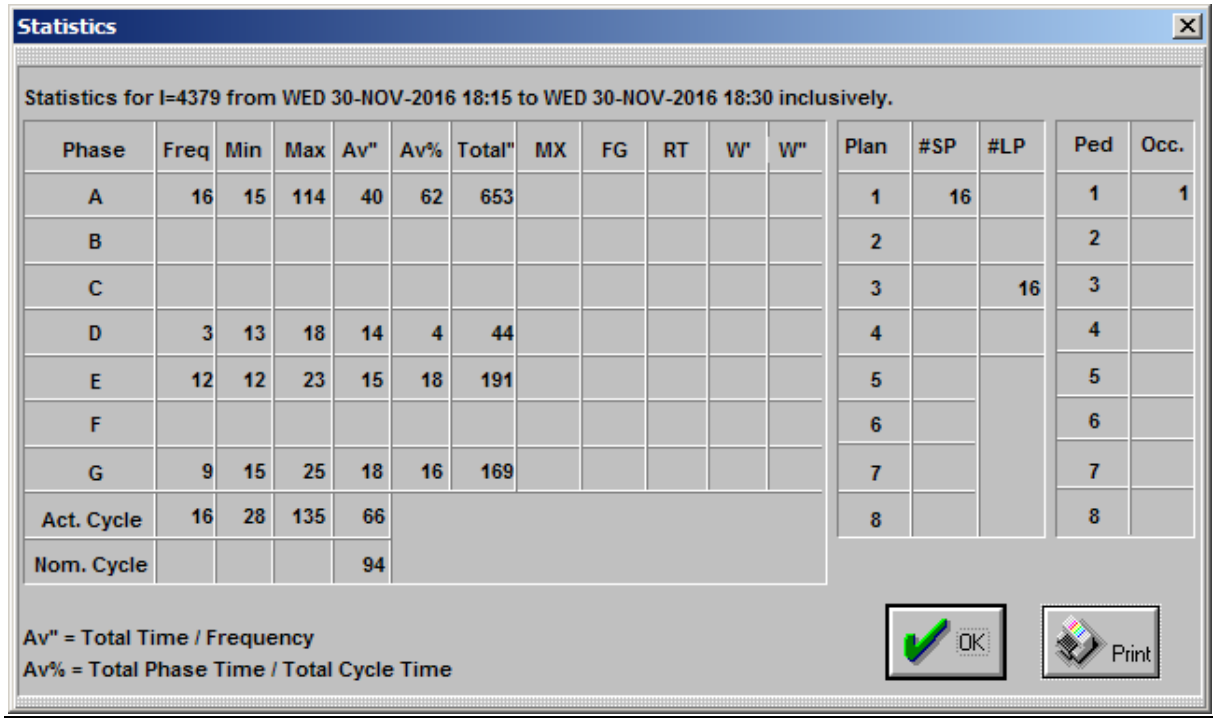
Ped	Occ.
1	
2	
3	1
4	1
5	
6	
7	
8	

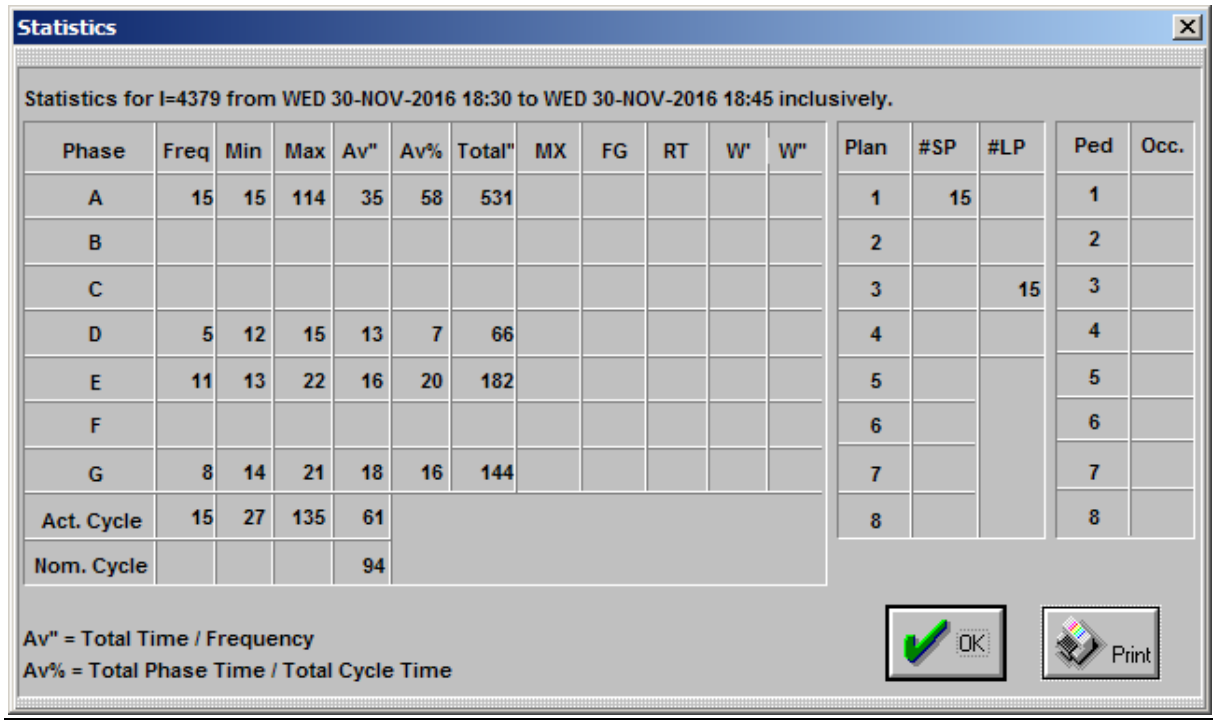

Statistics
Statistics for I=4379 from WED 30-NOV-2016 17:16 to WED 30-NOV-2016 17:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 15 90 38 61 535
B
C
D 3 12 16 13 5 41
E 7 14 23 18 15 128
F
G 10 15 25 17 20 177
Act. Cycle 14 29 129 62
Nom. Cycle 94
Plan #SP #LP
1 14
2
3 14
4
5
6
7
8
Ped Occ.
1
2
3 1
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

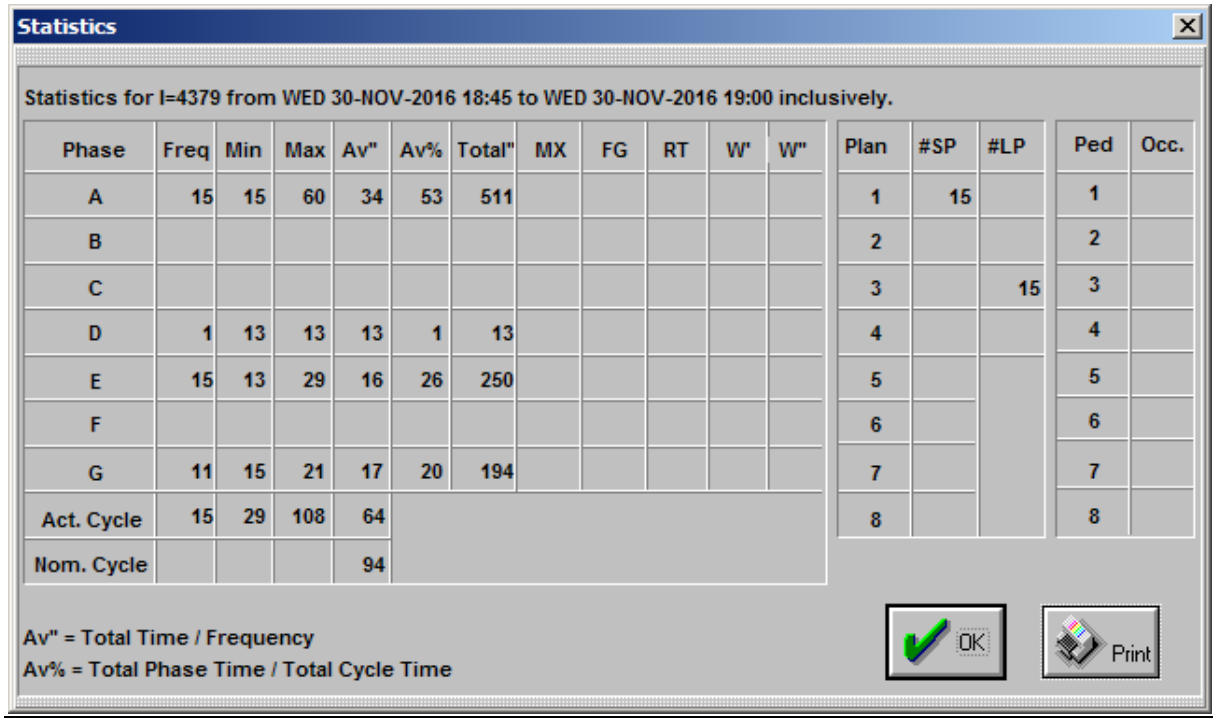

Statistics
Statistics for I=4379 from WED 30-NOV-2016 17:30 to WED 30-NOV-2016 17:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 18 15 40 25 47 458
B
C
D 4 12 14 13 5 52
E 15 13 29 17 26 257
F
G 10 15 26 20 21 206
Act. Cycle 18 28 90 54
Nom. Cycle 94
Plan #SP #LP
1 18
2
3 18
4
5
6
7
8
Ped Occ.
1
2
3
4 2
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 17:45 to WED 30-NOV-2016 18:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 20 84 43 63 614
B
C
D 1 14 14 14 1 14
E 10 13 18 15 16 159
F
G 10 15 25 18 19 181
Act. Cycle 14 36 97 69
Nom. Cycle 94
Plan #SP #LP
1 14
2
3 14
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 18:00 to WED 30-NOV-2016 18:15 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 14 17 90 37 57 531
B
C
D 1 13 13 13 1 13
E 12 13 24 15 20 190
F
G 10 15 26 19 21 193
Act. Cycle 14 34 131 66
Nom. Cycle 94
Plan #SP #LP
1 14
2
3 14
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 18:15 to WED 30-NOV-2016 18:30 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 16 15 114 40 62 653
B
C
D 3 13 18 14 4 44
E 12 12 23 15 18 191
F
G 9 15 25 18 16 169
Act. Cycle 16 28 135 66
Nom. Cycle 94
Plan #SP #LP
1 16
2
3 16
4
5
6
7
8
Ped Occ.
1 1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 18:30 to WED 30-NOV-2016 18:45 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 15 15 114 35 58 531
B
C
D 5 12 15 13 7 66
E 11 13 22 16 20 182
F
G 8 14 21 18 16 144
Act. Cycle 15 27 135 61
Nom. Cycle 94
Plan #SP #LP
1 15
2
3 15
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print


Statistics
Statistics for I=4379 from WED 30-NOV-2016 18:45 to WED 30-NOV-2016 19:00 inclusively.
Phase Freq Min Max Av" Av% Total" MX FG RT W' W"
A 15 15 60 34 53 511
B
C
D 1 13 13 13 1 13
E 15 13 29 16 26 250
F
G 11 15 21 17 20 194
Act. Cycle 15 29 108 64
Nom. Cycle 94
Plan #SP #LP
1 15
2
3 15
4
5
6
7
8
Ped Occ.
1
2
3
4
5
6
7
8
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time
OK
Print

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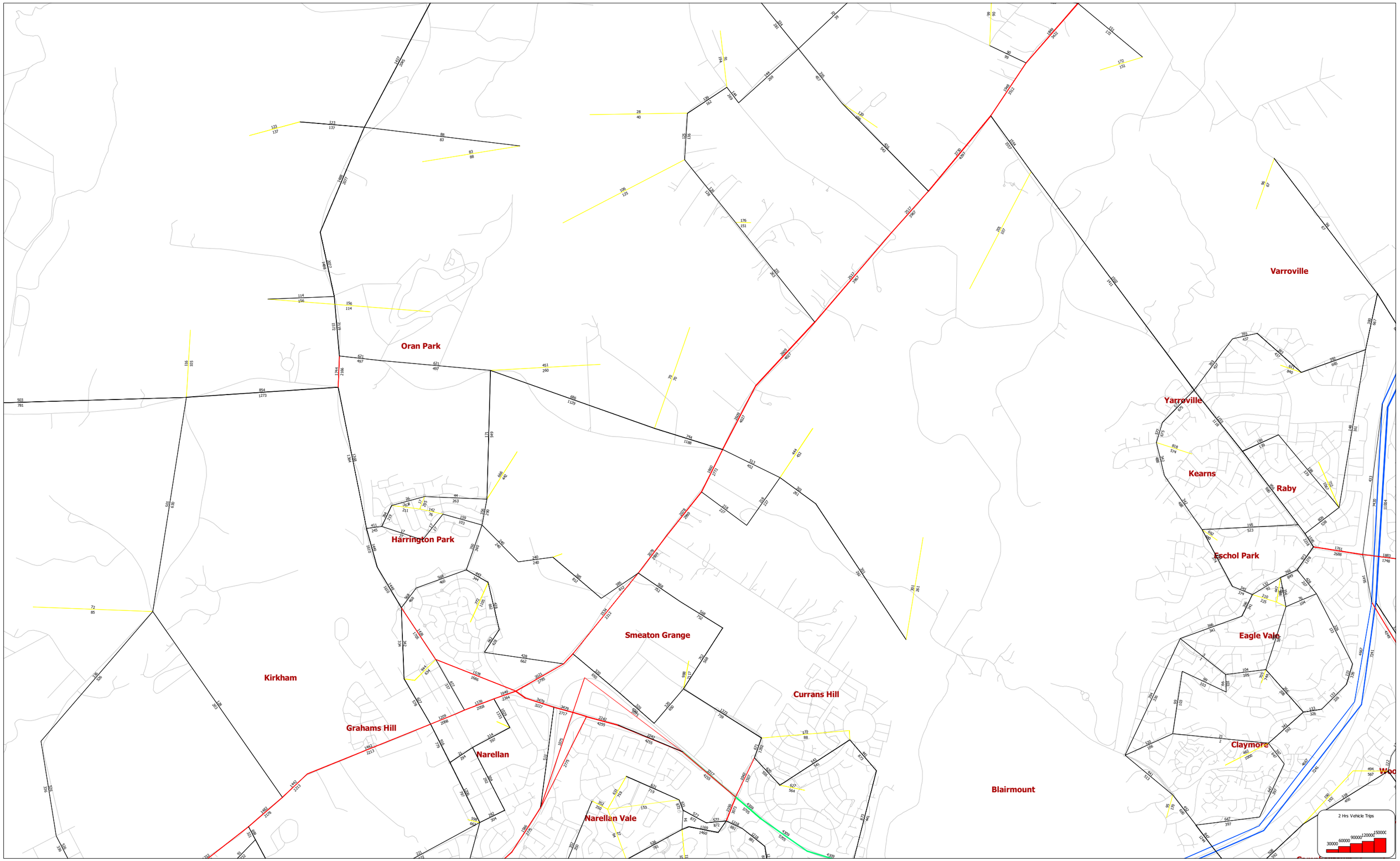
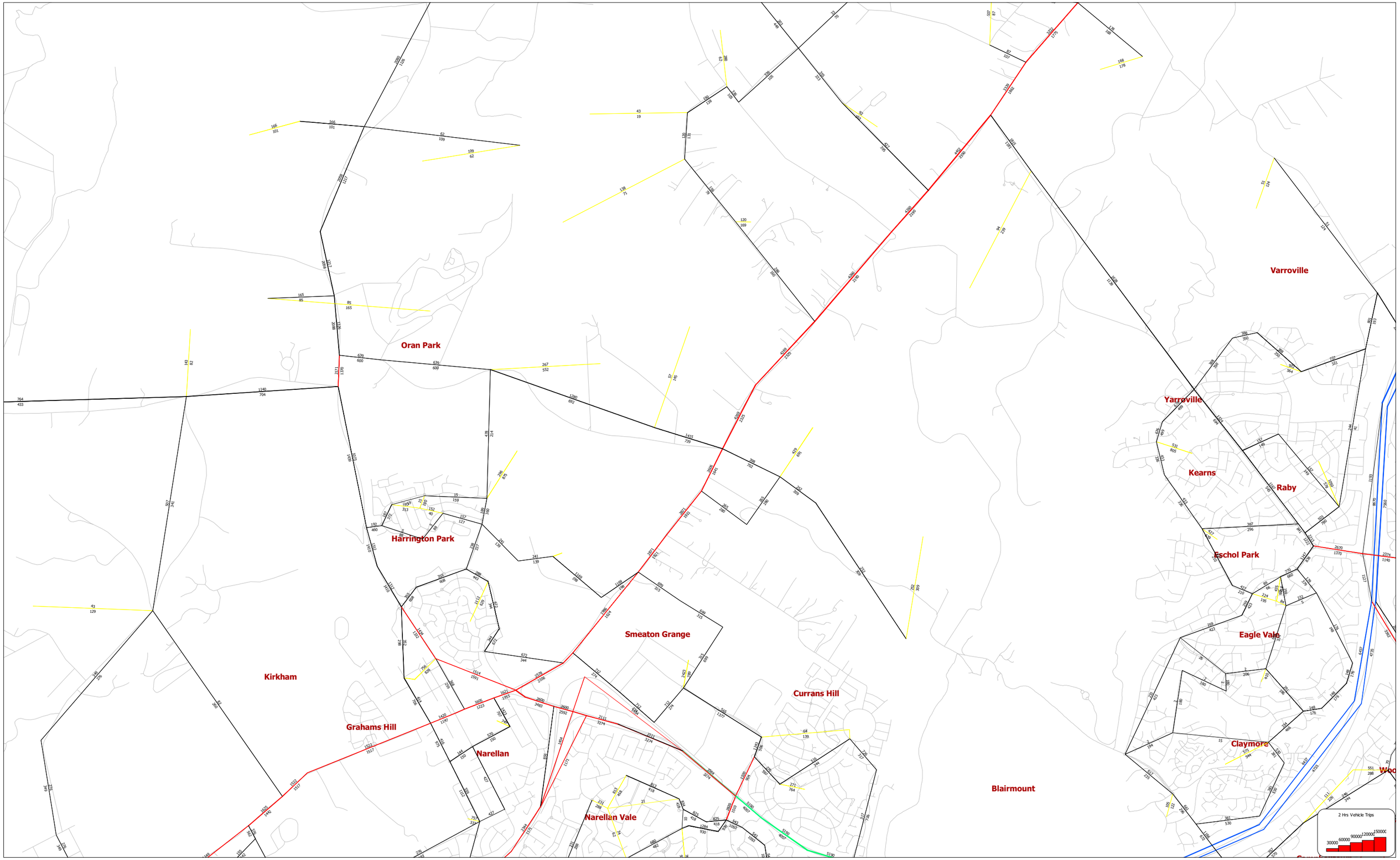
Appendix C – RMS Strategic Model Forecast Traffic Volumes

TRAFFIC VOLUMES__



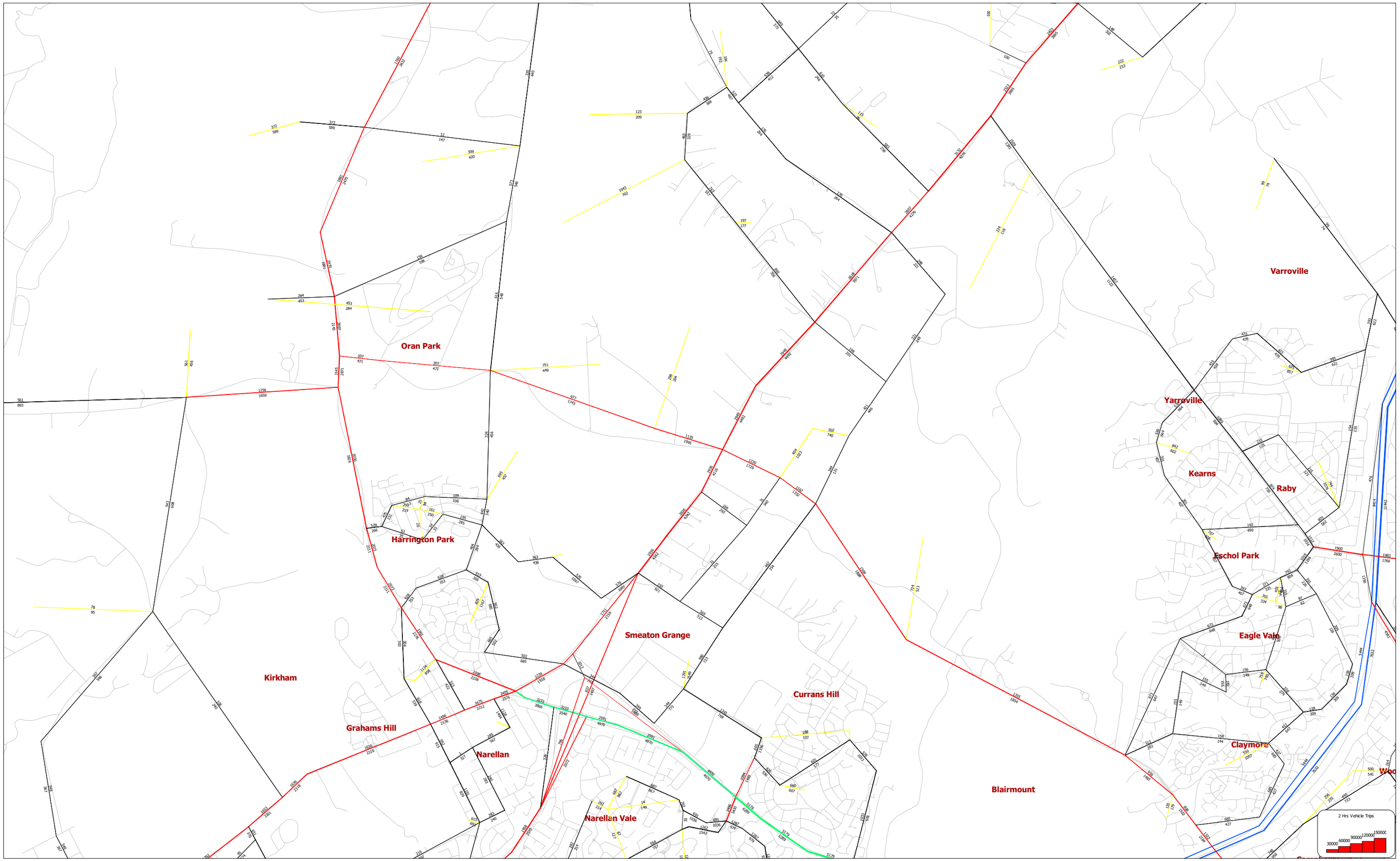
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20150: 2015 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)4-6PM(mf46)
2016-11-30 14:28

TRAFFIC VOLUMES__



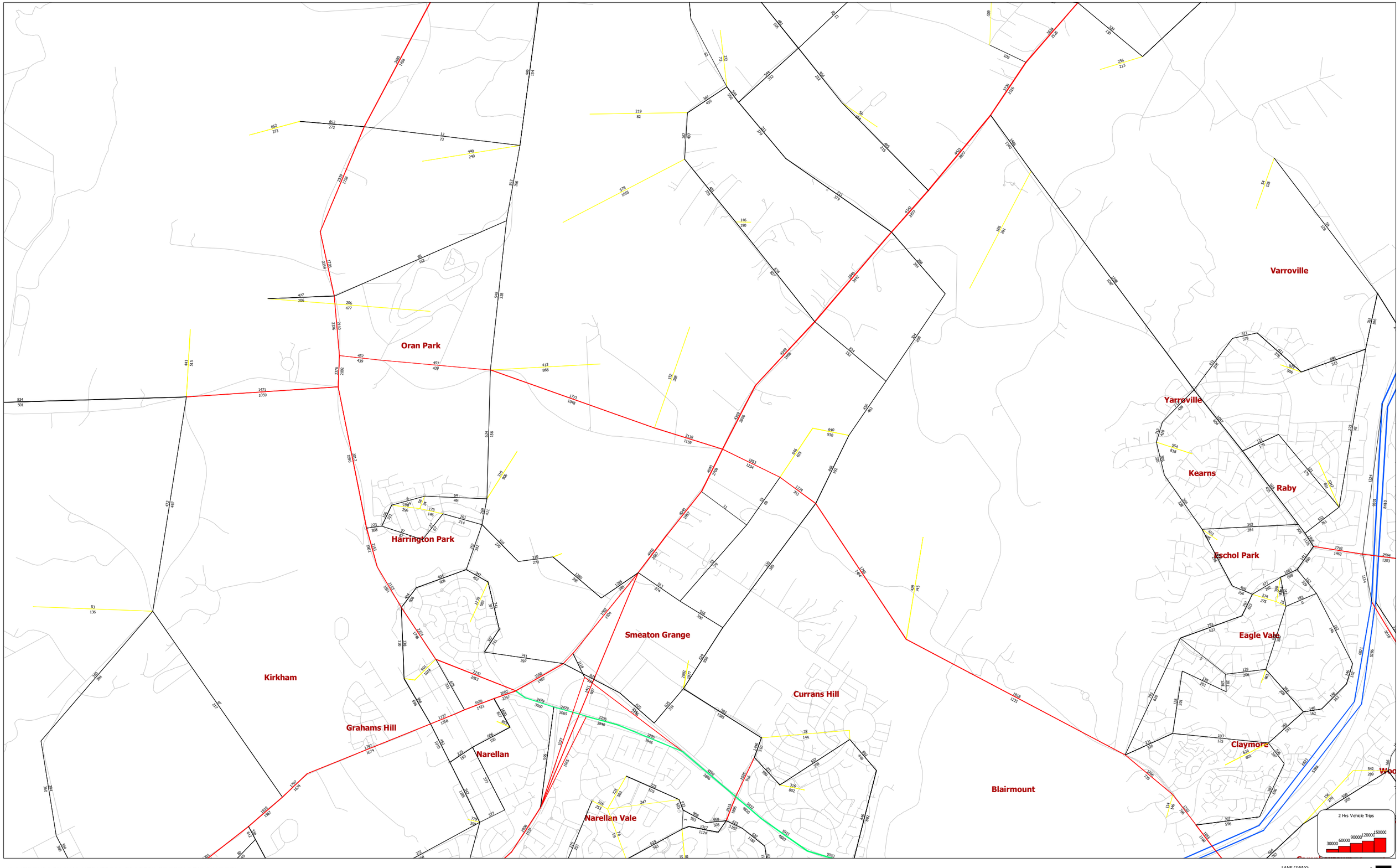
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2015: 2015 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)7-9AM(mf40)
2016-11-30 14:28

TRAFFIC VOLUMES__



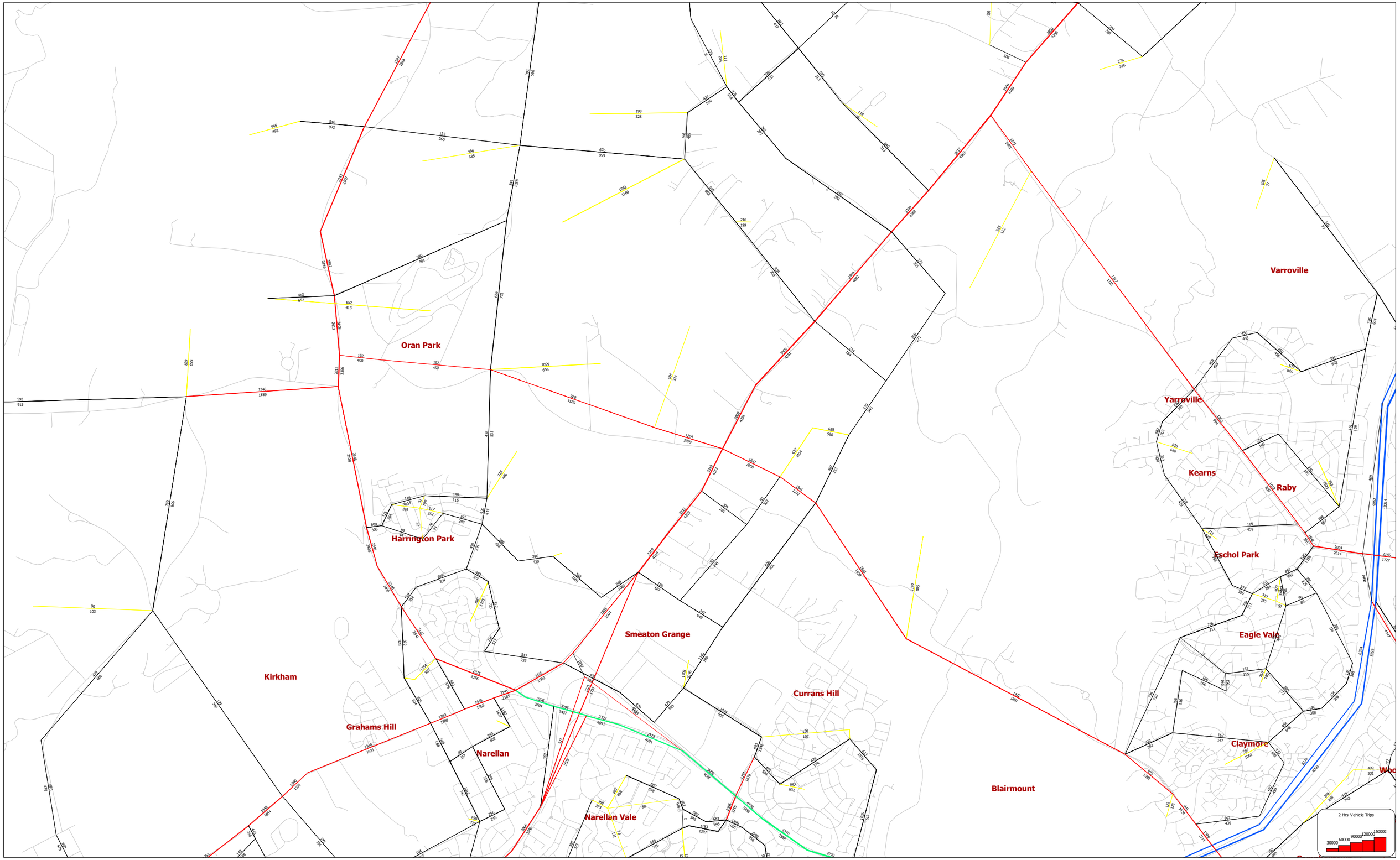
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20210: 2021 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)4-6PM(mf53)
2016-11-30 14:28

TRAFFIC VOLUMES__



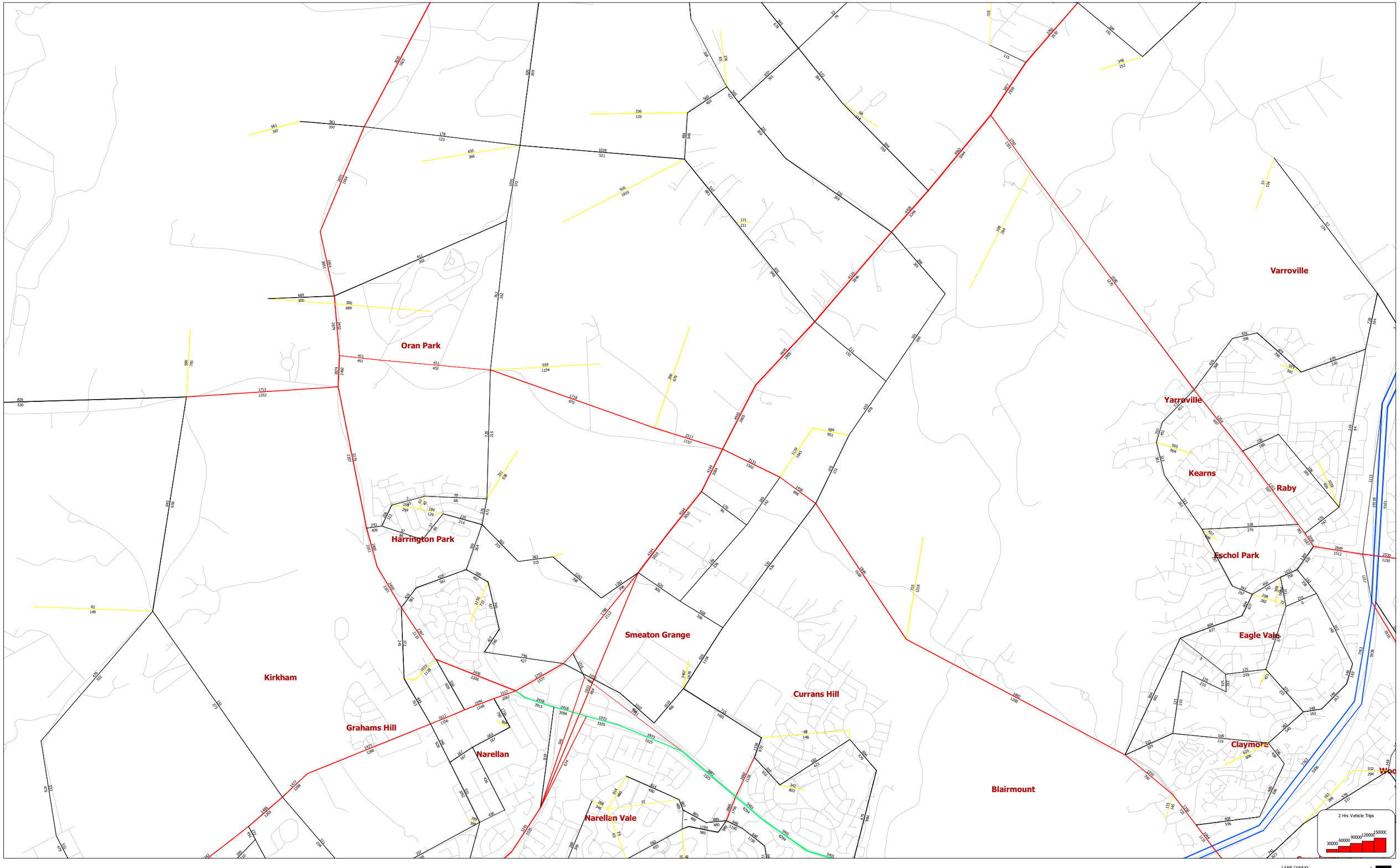
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2021: 2021 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)7-9AM(mf33)
2016-11-30 14:28

TRAFFIC VOLUMES__



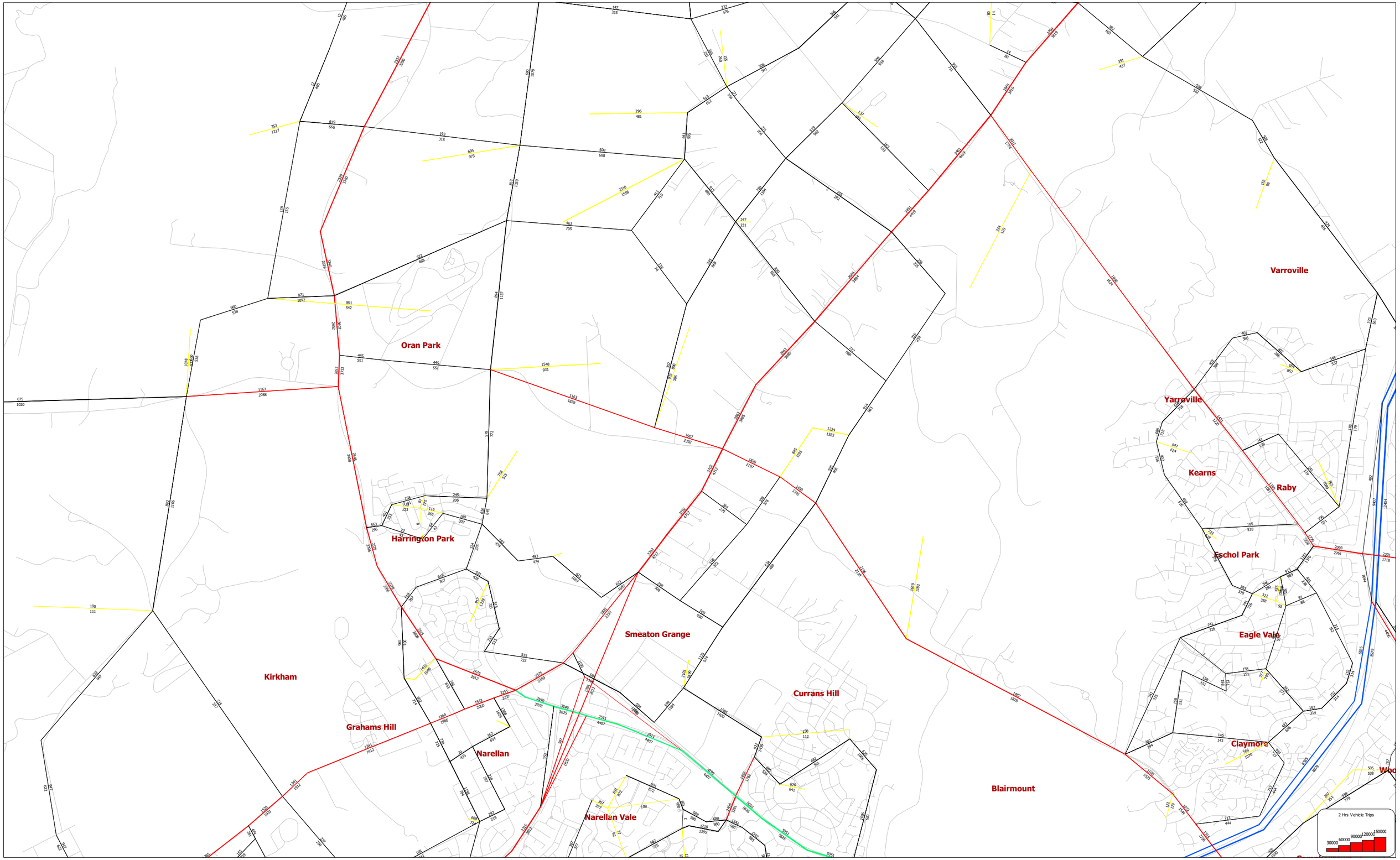
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20260: 2026 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)4-6PM(mf54)
2016-11-30 14:28

TRAFFIC VOLUMES__



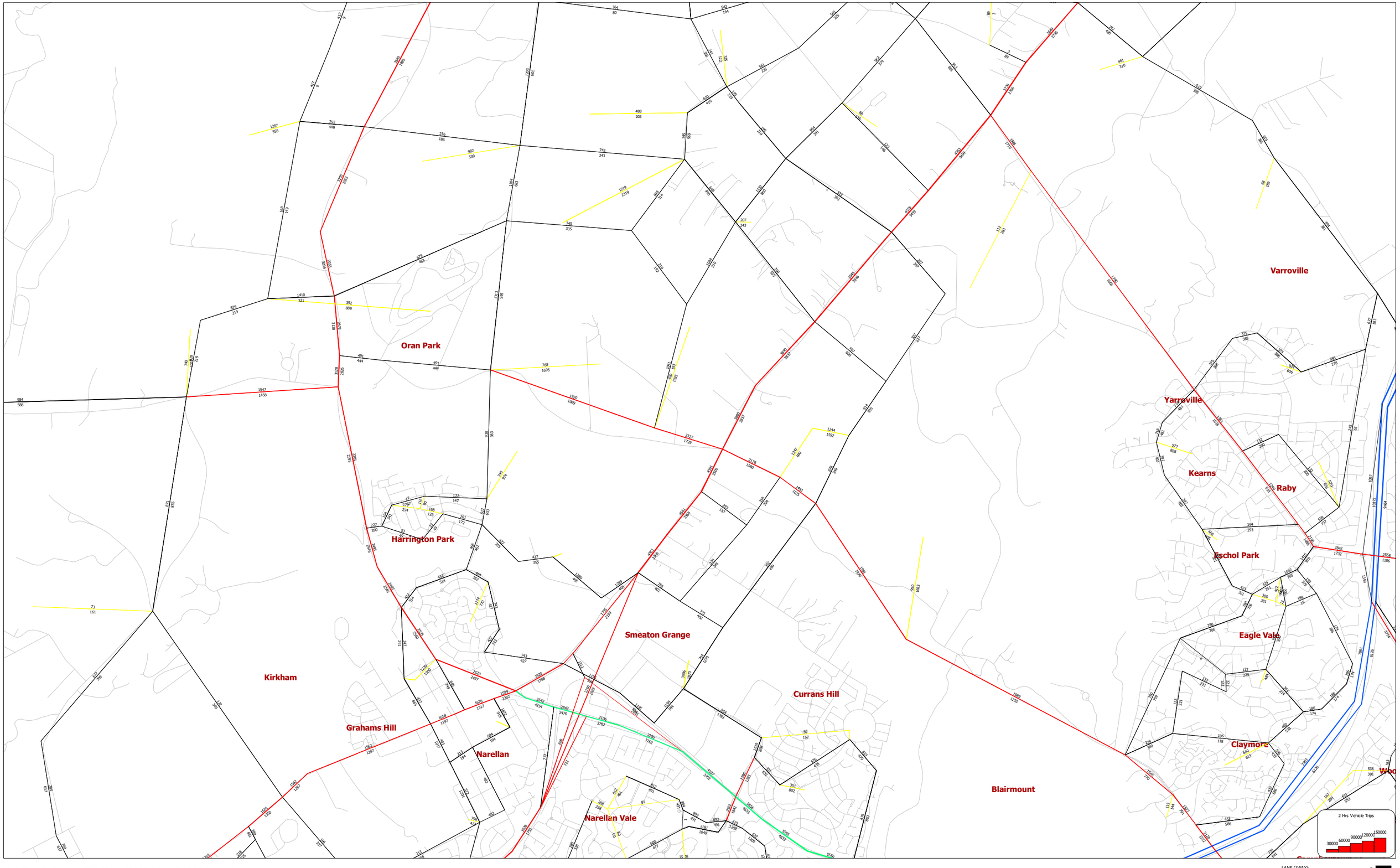
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2026: 2026 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)7-9AM(mf34)
2016-11-30 14:28

TRAFFIC VOLUMES__



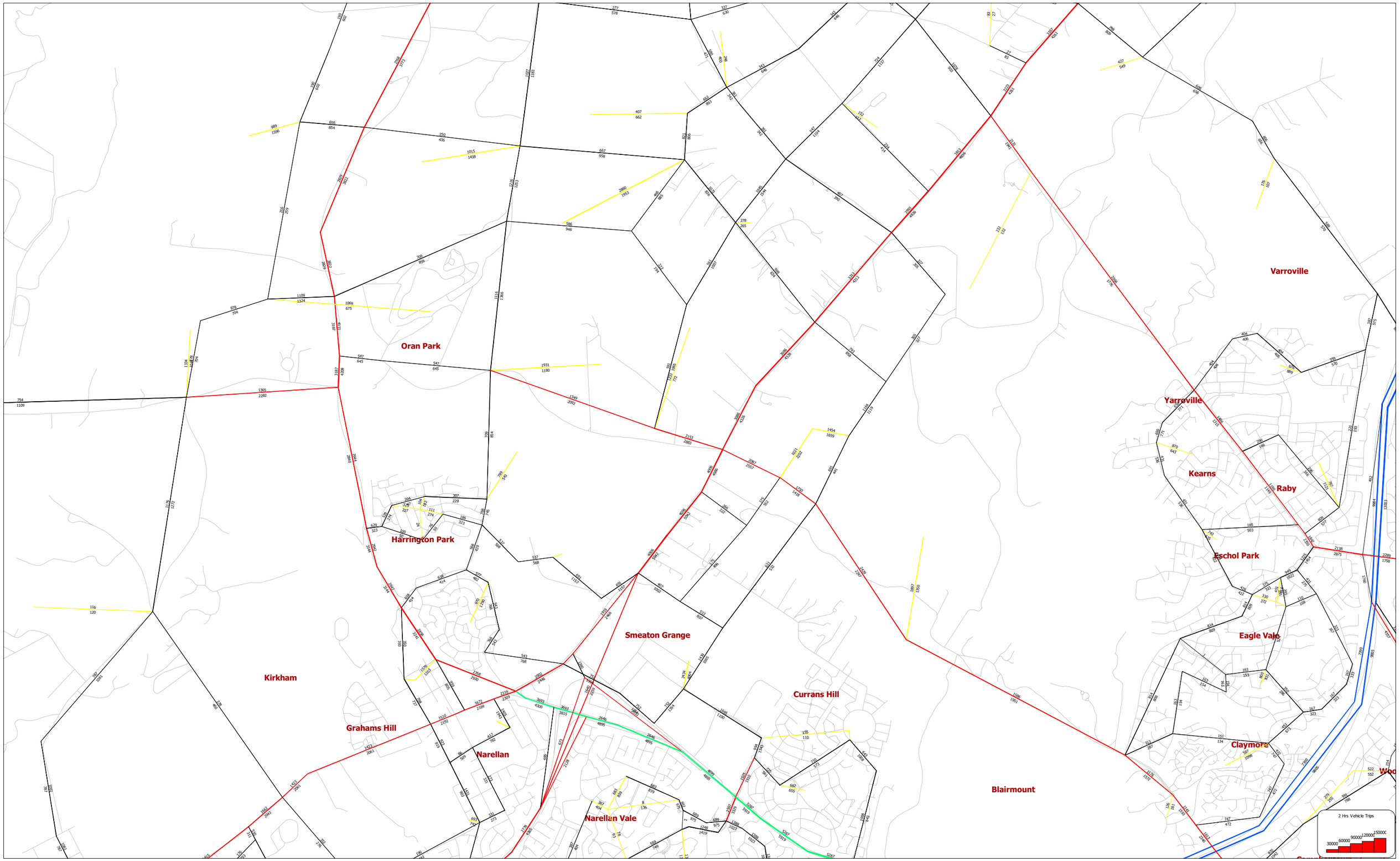
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20310: 2031 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)4-6PM(mf55)
2016-11-30 14:28

TRAFFIC VOLUMES__



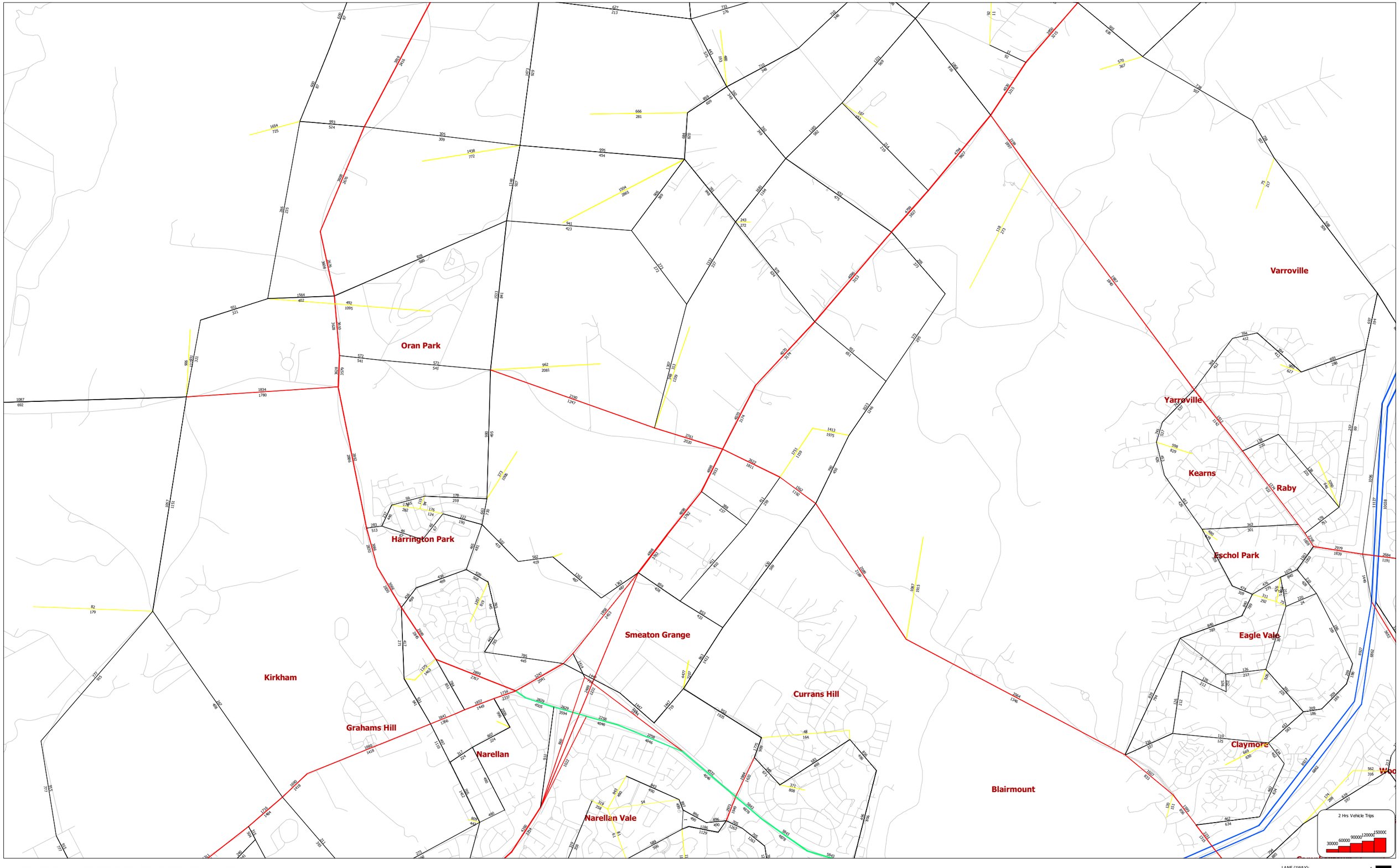
2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2031: 2031 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)7-9AM(mf35)
2016-11-30 14:28

TRAFFIC VOLUMES__



2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20360: 2036 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)4-6PM(mf56)
2016-11-30 14:28

TRAFFIC VOLUMES__



2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2036: 2036 SYDNEY TRAFFIC FORECASTING MODEL(ALU14V4)7-9AM(mf36)
2016-11-30 14:28

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Appendix D – SIDRA Modelling Results

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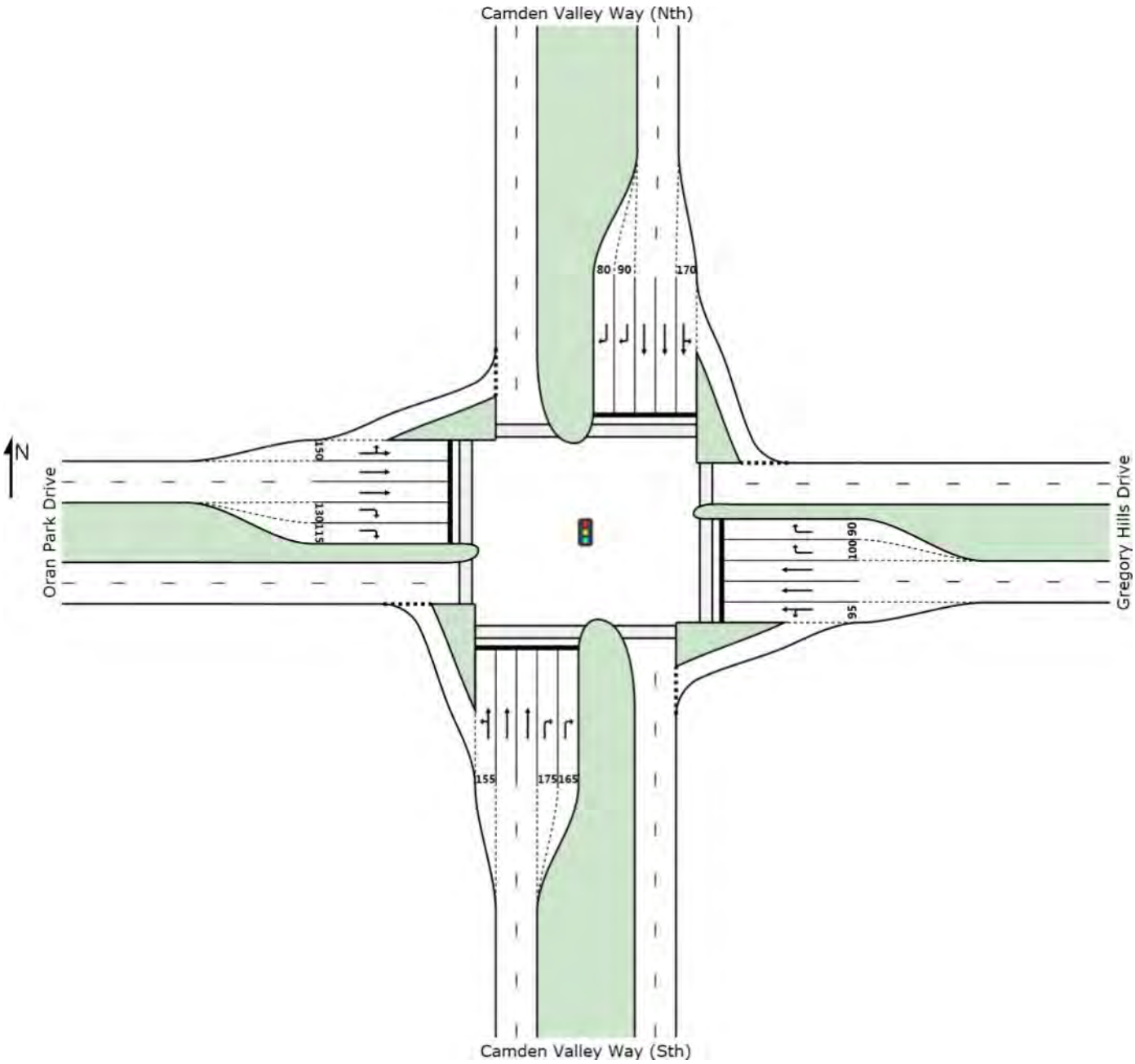
Scenario 0 – 2016 Existing Conditions

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	131	16.8	131	16.8	0.170	13.5	LOS A	3.2	31.2	0.35	0.48	58.5
2	T1	1355	6.7	1355	6.7	0.848	22.1	LOS B	33.7	239.8	0.77	0.73	56.5
3	R2	74	21.6	74	21.6	0.172	65.4	LOS E	2.3	18.8	0.91	0.74	17.8
Approach		1560	8.3	1560	8.3	0.848	23.2	LOS B	33.7	239.8	0.74	0.71	54.5
East: Gregory Hills Drive													
4	L2	80	15.0	80	15.0	0.073	11.3	LOS A	1.3	10.6	0.31	0.65	51.7
5	T1	90	7.8	90	7.8	0.183	58.4	LOS E	2.8	20.6	0.92	0.70	34.1
6	R2	407	7.1	407	7.1	0.869	80.9	LOS F	15.2	113.1	1.00	0.93	30.4
Approach		577	8.3	577	8.3	0.869	67.8	LOS E	15.2	113.1	0.89	0.85	32.2
North: Camden Valley Way (Nth)													
7	L2	185	13.0	185	13.0	0.136	8.4	LOS A	1.4	10.5	0.16	0.65	64.9
8	T1	789	9.3	789	9.3	0.534	28.8	LOS C	16.9	127.8	0.68	0.60	51.9
9	R2	338	8.9	338	8.9	0.698	71.6	LOS F	11.4	86.1	1.00	0.84	36.4
Approach		1312	9.7	1312	9.7	0.698	37.0	LOS C	16.9	127.8	0.69	0.67	46.6
West: Oran Park Drive													
10	L2	763	2.1	763	2.1	0.810	33.3	LOS C	33.8	241.2	0.90	0.94	49.3
11	T1	80	20.0	80	20.0	0.242	59.0	LOS E	4.0	27.7	0.93	0.71	26.2
12	R2	203	7.4	203	7.4	0.435	67.8	LOS E	6.5	48.4	0.96	0.79	31.0
Approach		1046	4.5	1046	4.5	0.810	42.0	LOS C	33.8	241.2	0.91	0.89	43.7
All Vehicles		4495	7.8	4495	7.8	0.869	37.4	LOS C	33.8	241.2	0.79	0.76	45.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	41.7	LOS E	0.2	0.2	0.77	0.77
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	41.7	LOS E	0.2	0.2	0.77	0.77
All Pedestrians		211	53.0	LOS E			0.87	0.87

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

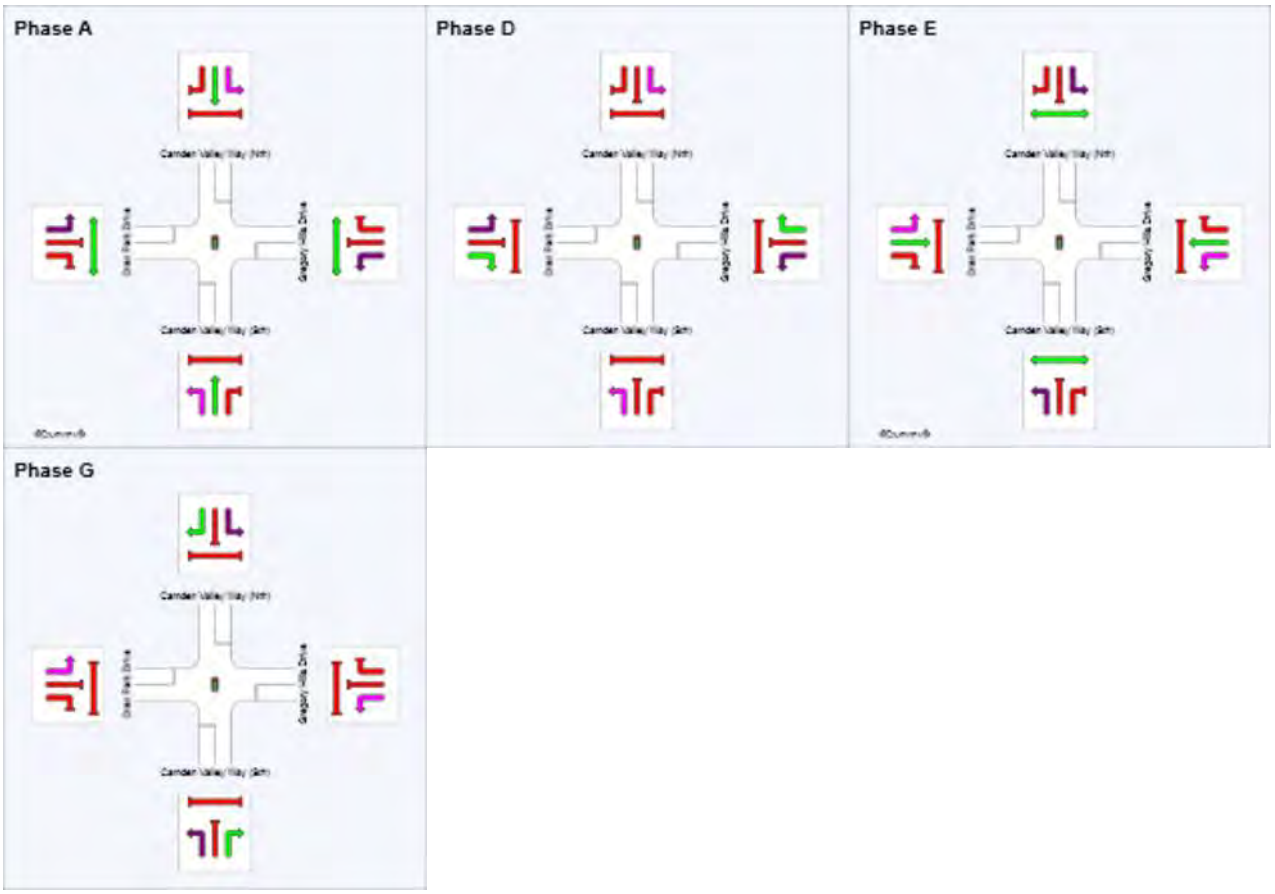
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS - No phase B
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

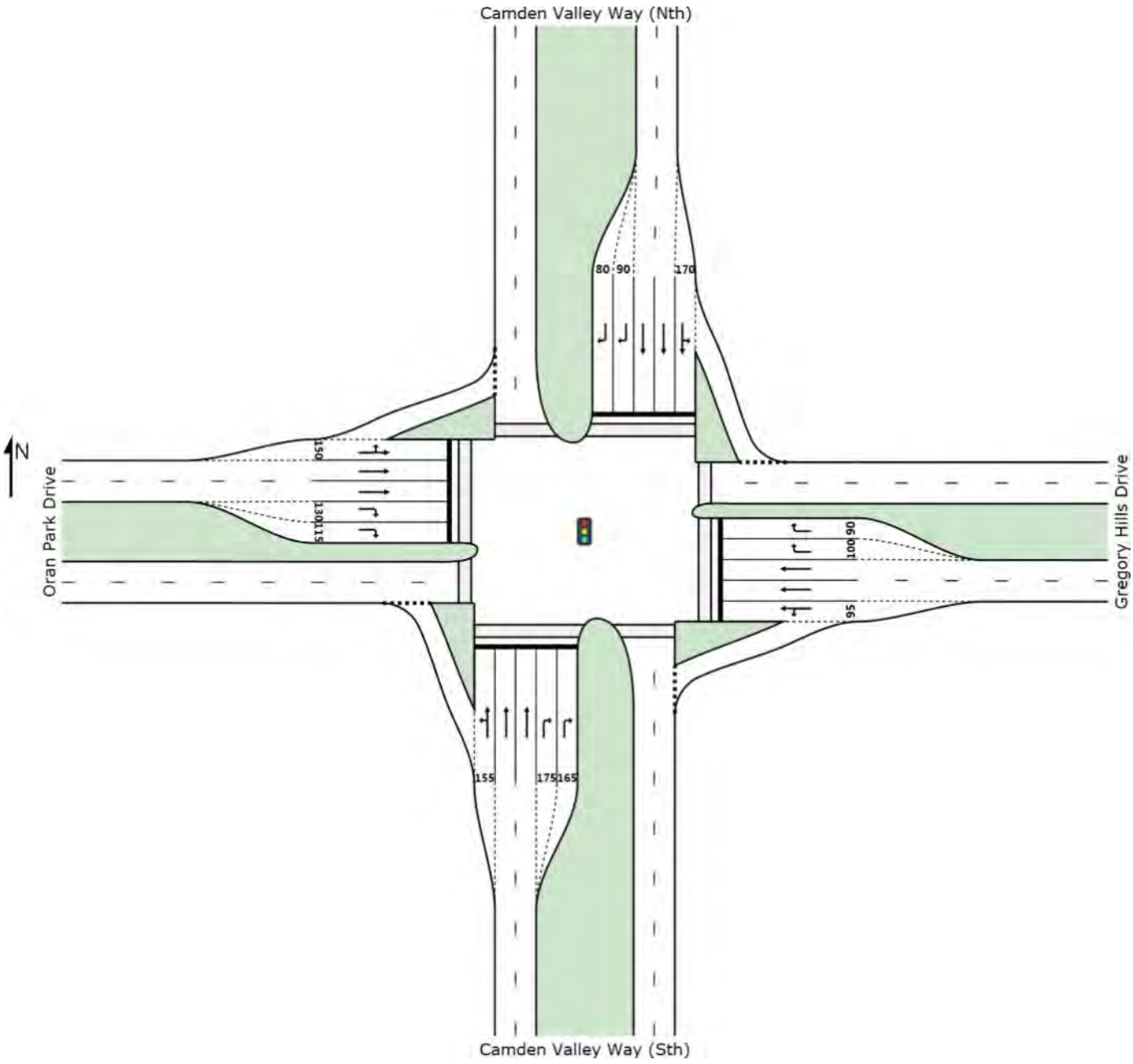
Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	64	89	114
Green Time (sec)	58	19	19	20
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	64	25	25	26
Phase Split	46 %	18 %	18 %	19 %



SITE LAYOUT

Site: PM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	189	2.1	189	2.1	0.157	12.8	LOS A	3.6	25.7	0.35	0.69	57.4
2	T1	864	3.6	864	3.6	0.765	34.5	LOS C	24.0	173.1	0.87	0.77	48.6
3	R2	143	4.2	143	4.2	0.563	78.6	LOS F	5.0	36.0	1.00	0.77	15.4
Approach		1196	3.4	1196	3.4	0.765	36.4	LOS C	24.0	173.1	0.80	0.75	45.2
East: Gregory Hills Drive													
4	L2	85	7.1	85	7.1	0.097	21.4	LOS B	2.6	19.5	0.52	0.70	44.8
5	T1	118	3.4	118	3.4	0.175	52.6	LOS D	3.4	24.7	0.89	0.68	35.9
6	R2	231	2.6	231	2.6	0.814	82.4	LOS F	8.5	60.7	1.00	0.88	30.2
Approach		434	3.7	434	3.7	0.814	62.4	LOS E	8.5	60.7	0.88	0.79	33.2
North: Camden Valley Way (Nth)													
7	L2	361	5.0	361	5.0	0.254	9.0	LOS A	4.0	29.3	0.23	0.67	63.8
8	T1	1389	3.6	1389	3.6	0.844	25.6	LOS B	41.7	301.2	0.74	0.70	54.0
9	R2	708	1.8	708	1.8	0.850	50.0	LOS D	16.5	117.3	1.00	0.93	43.1
Approach		2458	3.3	2458	3.3	0.850	30.2	LOS C	41.7	301.2	0.74	0.76	50.3
West: Oran Park Drive													
10	L2	398	4.3	398	4.3	0.340	14.7	LOS B	10.0	72.9	0.46	0.72	59.6
11	T1	100	3.0	100	3.0	0.279	53.6	LOS D	5.8	40.3	0.91	0.71	27.8
12	R2	246	5.3	246	5.3	0.891	88.1	LOS F	9.5	69.2	1.00	0.93	26.8
Approach		744	4.4	744	4.4	0.891	44.2	LOS D	10.0	72.9	0.70	0.79	41.3
All Vehicles		4832	3.5	4832	3.5	0.891	36.8	LOS C	41.7	301.2	0.76	0.77	45.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	33.0	LOS D	0.1	0.1	0.69	0.69
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	55.0	LOS E	0.2	0.2	0.89	0.89
All Pedestrians		211	54.1	LOS E			0.87	0.87

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

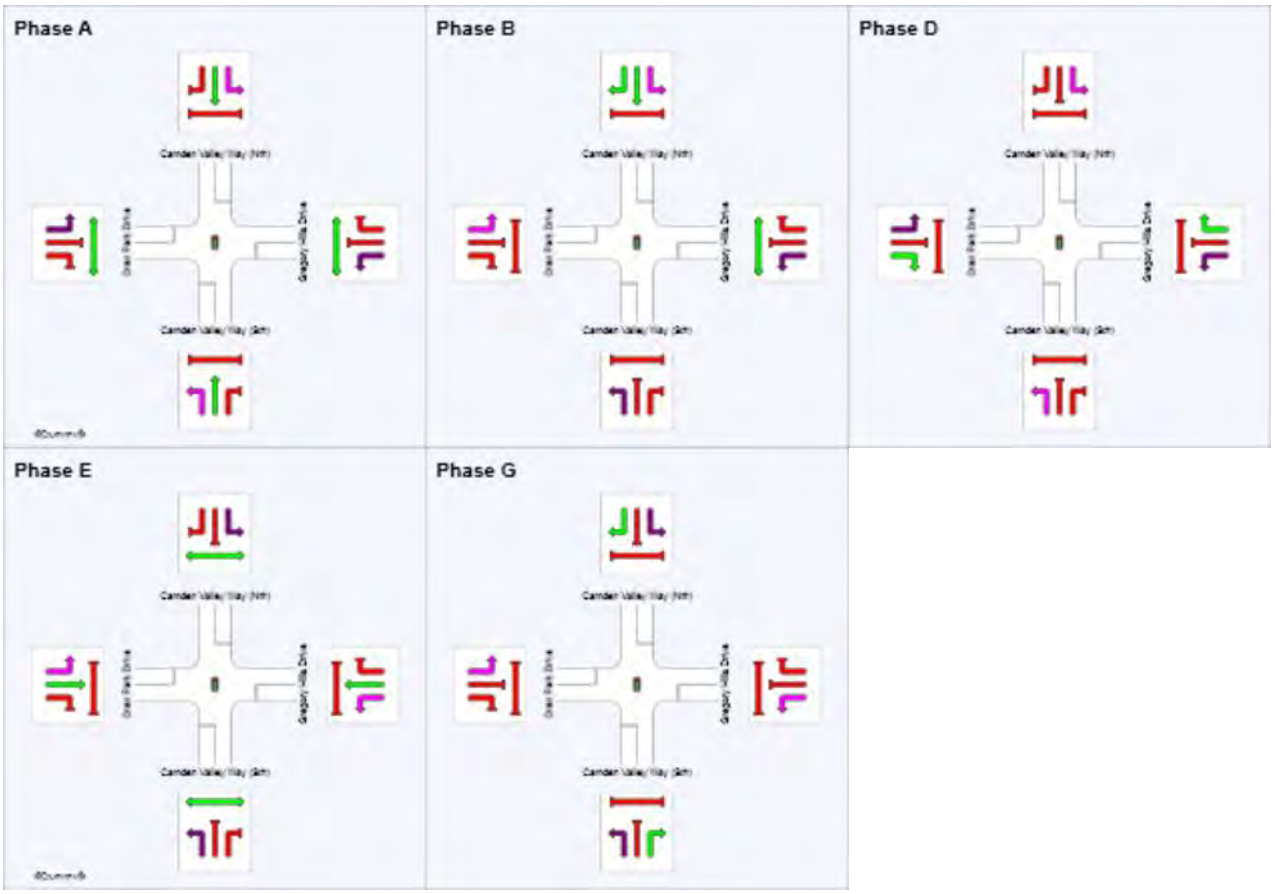
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, D, E, G
Output Sequence: A, B, D, E, G

Phase Timing Results

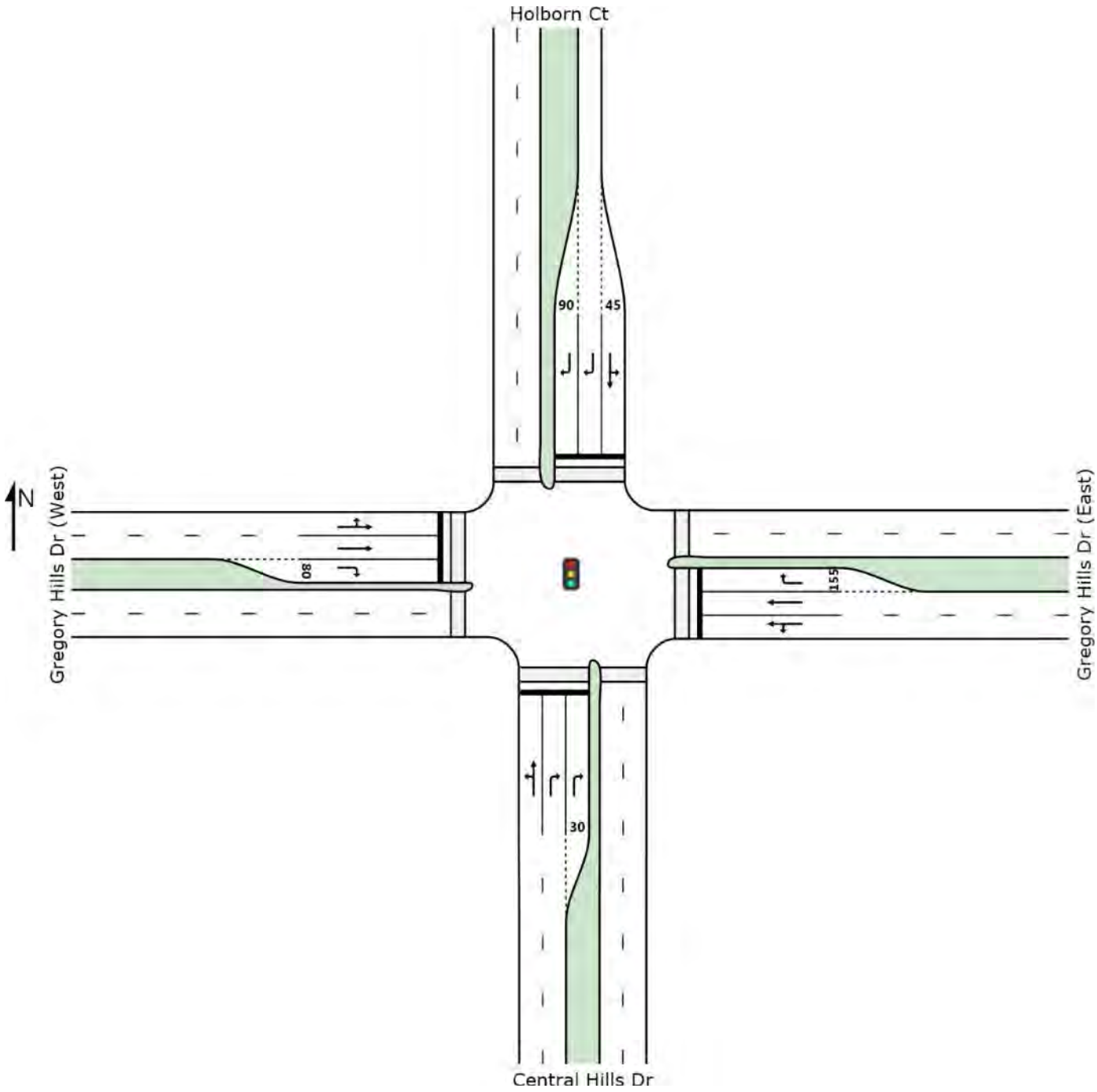
Phase	A	B	D	E	G
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	48	76	93	124
Green Time (sec)	42	22	11	25	10
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	48	28	17	31	16
Phase Split	34 %	20 %	12 %	22 %	11 %



SITE LAYOUT

Site: AM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	86	8.1	86	8.1	0.493	41.3	LOS C	2.8	20.8	0.98	0.81	10.0
2	T1	5	0.0	5	0.0	0.493	35.7	LOS C	2.8	20.8	0.98	0.81	19.0
3	R2	37	21.6	37	21.6	0.345	41.8	LOS C	0.6	5.2	1.00	0.69	10.0
Approach		128	11.7	128	11.7	0.493	41.2	LOS C	2.8	20.8	0.98	0.77	10.4
East: Gregory Hills Dr (East)													
4	L2	18	16.7	18	16.7	0.561	30.6	LOS C	5.4	40.9	0.95	0.79	38.2
5	T1	480	7.7	480	7.7	0.561	21.8	LOS B	7.6	56.8	0.92	0.77	39.1
6	R2	11	0.0	11	0.0	0.059	34.2	LOS C	0.3	2.2	0.93	0.67	34.9
Approach		509	7.9	509	7.9	0.561	22.4	LOS B	7.6	56.8	0.92	0.77	38.9
North: Holborn Ct													
7	L2	8	12.5	8	12.5	0.087	26.2	LOS B	0.3	2.1	0.95	0.65	19.6
8	T1	3	0.0	3	0.0	0.087	20.5	LOS B	0.3	2.1	0.95	0.65	26.3
9	R2	19	21.1	19	21.1	0.176	41.1	LOS C	0.3	2.6	1.00	0.66	13.5
Approach		30	16.7	30	16.7	0.176	35.1	LOS C	0.3	2.6	0.98	0.66	15.9
West: Gregory Hills Dr (West)													
10	L2	7	14.3	7	14.3	0.235	26.1	LOS B	1.9	15.7	0.86	0.69	38.4
11	T1	189	21.7	189	21.7	0.235	18.8	LOS B	2.6	21.9	0.83	0.66	36.8
12	R2	98	14.3	98	14.3	0.581	37.4	LOS C	3.0	23.8	1.00	0.80	28.1
Approach		294	19.0	294	19.0	0.581	25.2	LOS B	3.0	23.8	0.89	0.71	32.9
All Vehicles		961	12.1	961	12.1	0.581	26.1	LOS B	7.6	56.8	0.92	0.75	32.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	2	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		5	24.3	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

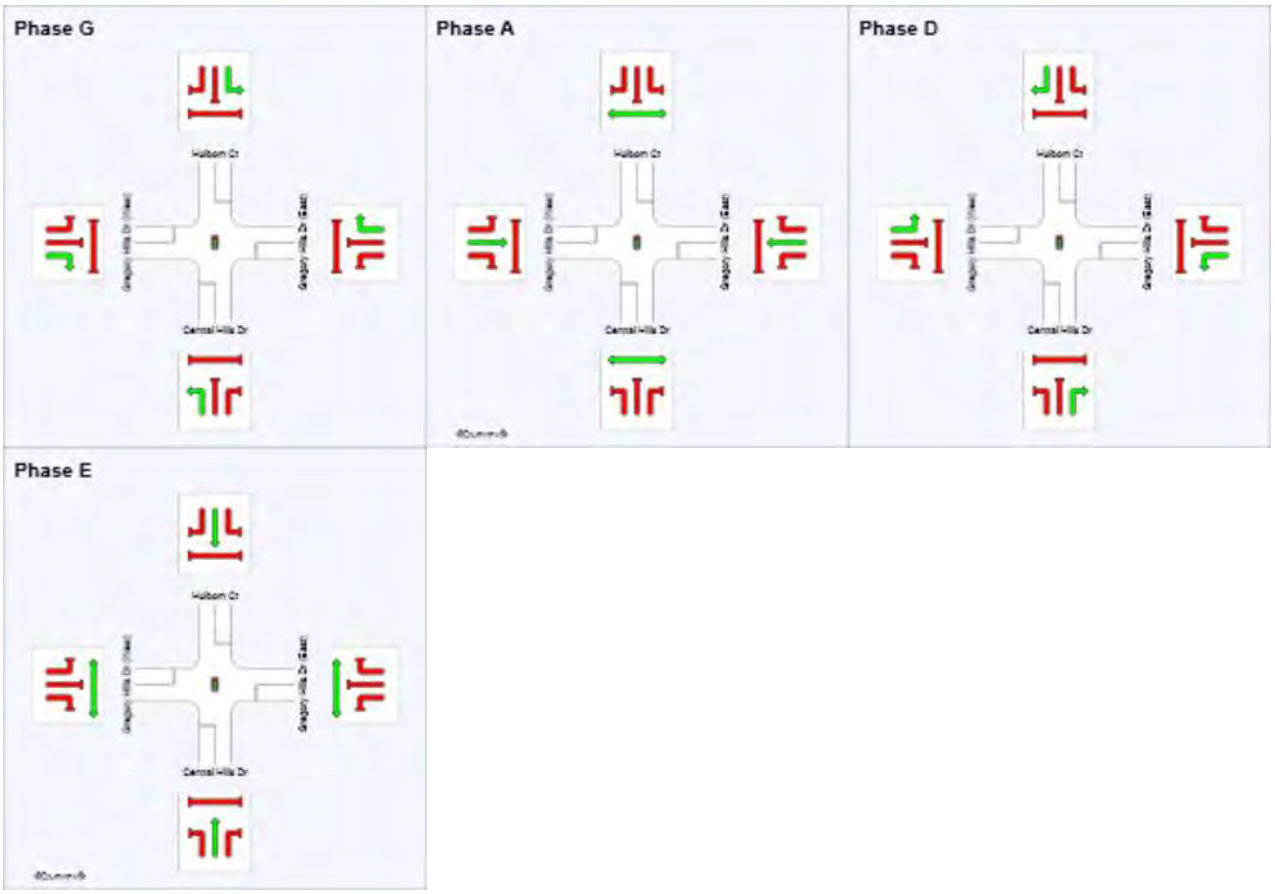
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: G, A, D, E
Output Sequence: G, A, D, E

Phase Timing Results

Phase	G	A	D	E
Reference Phase	No	Yes	No	No
Phase Change Time (sec)	48	0	23	31
Green Time (sec)	6	17	2	11
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	12	23	8	17
Phase Split	20 %	38 %	13 %	28 %

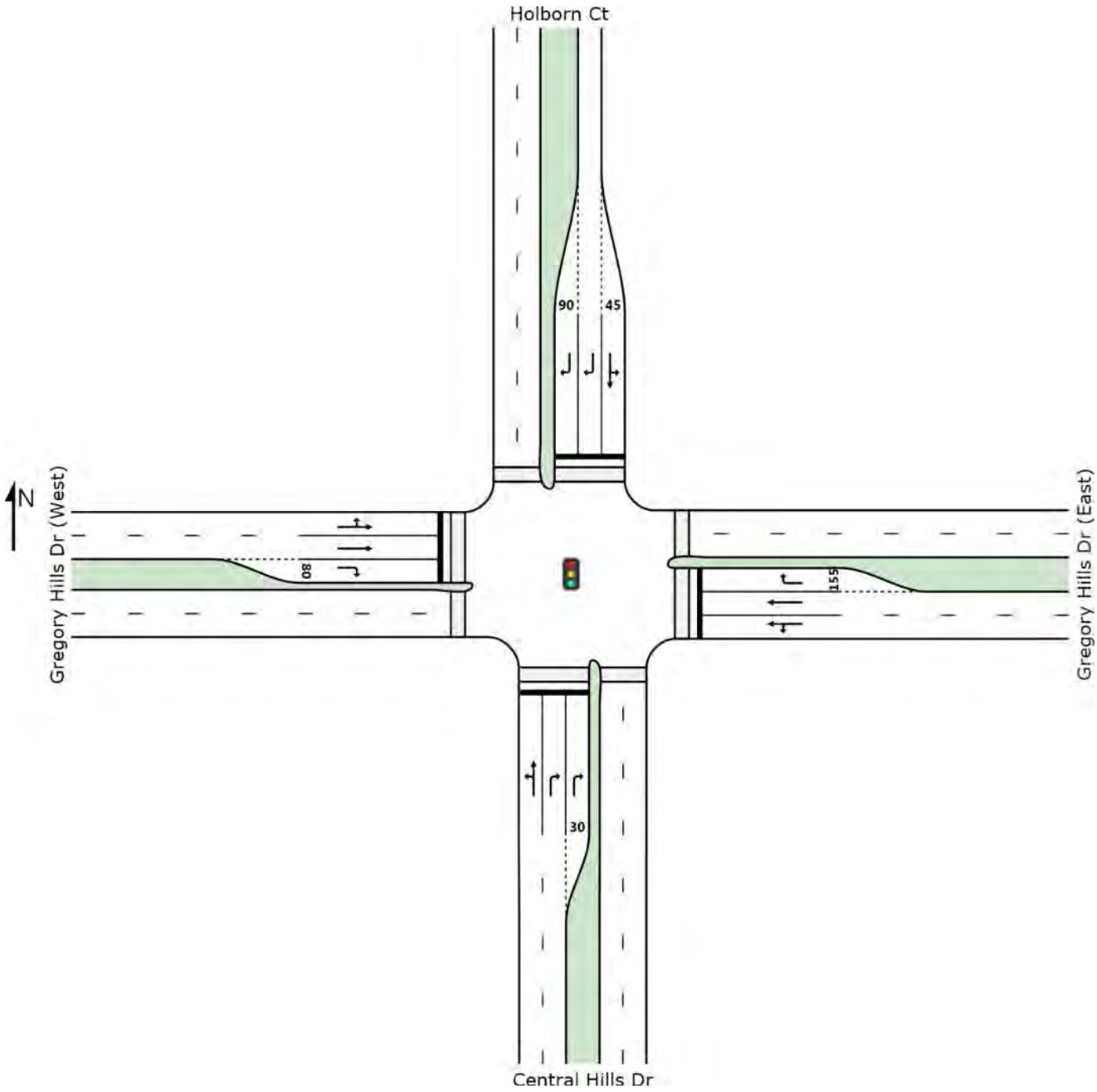


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	156	0.6	156	0.6	0.702	44.4	LOS D	5.4	38.3	1.00	0.90	9.3
2	T1	5	0.0	5	0.0	0.702	38.9	LOS C	5.4	38.3	1.00	0.90	18.0
3	R2	86	2.3	86	2.3	0.141	29.5	LOS C	1.1	8.0	0.89	0.72	13.2
Approach		247	1.2	247	1.2	0.702	39.1	LOS C	5.4	38.3	0.96	0.84	10.6
East: Gregory Hills Dr (East)													
4	L2	25	8.0	25	8.0	0.597	28.1	LOS B	2.4	18.0	1.00	0.79	39.3
5	T1	259	5.8	259	5.8	0.597	25.2	LOS B	5.4	39.7	0.98	0.80	36.4
6	R2	5	0.0	5	0.0	0.023	32.7	LOS C	0.1	0.9	0.91	0.64	35.6
Approach		289	5.9	289	5.9	0.597	25.6	LOS B	5.4	39.7	0.98	0.80	36.6
North: Holborn Ct													
7	L2	1	0.0	1	0.0	0.030	24.8	LOS B	0.1	0.9	0.91	0.60	22.3
8	T1	5	0.0	5	0.0	0.030	19.3	LOS B	0.1	0.9	0.91	0.60	29.2
9	R2	32	3.1	32	3.1	0.053	29.0	LOS C	0.4	2.9	0.87	0.68	17.5
Approach		38	2.6	38	2.6	0.053	27.6	LOS B	0.4	2.9	0.87	0.67	19.1
West: Gregory Hills Dr (West)													
10	L2	5	0.0	5	0.0	0.698	33.8	LOS C	6.8	49.2	0.99	0.87	34.7
11	T1	441	4.5	441	4.5	0.698	27.7	LOS B	6.8	49.2	0.99	0.87	30.2
12	R2	160	3.1	160	3.1	0.755	38.5	LOS C	5.2	37.1	1.00	0.89	27.9
Approach		606	4.1	606	4.1	0.755	30.6	LOS C	6.8	49.2	0.99	0.87	29.5
All Vehicles		1180	3.9	1180	3.9	0.755	31.1	LOS C	6.8	49.2	0.98	0.84	27.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P2	East Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P3	North Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P4	West Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
All Pedestrians		211	24.4	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

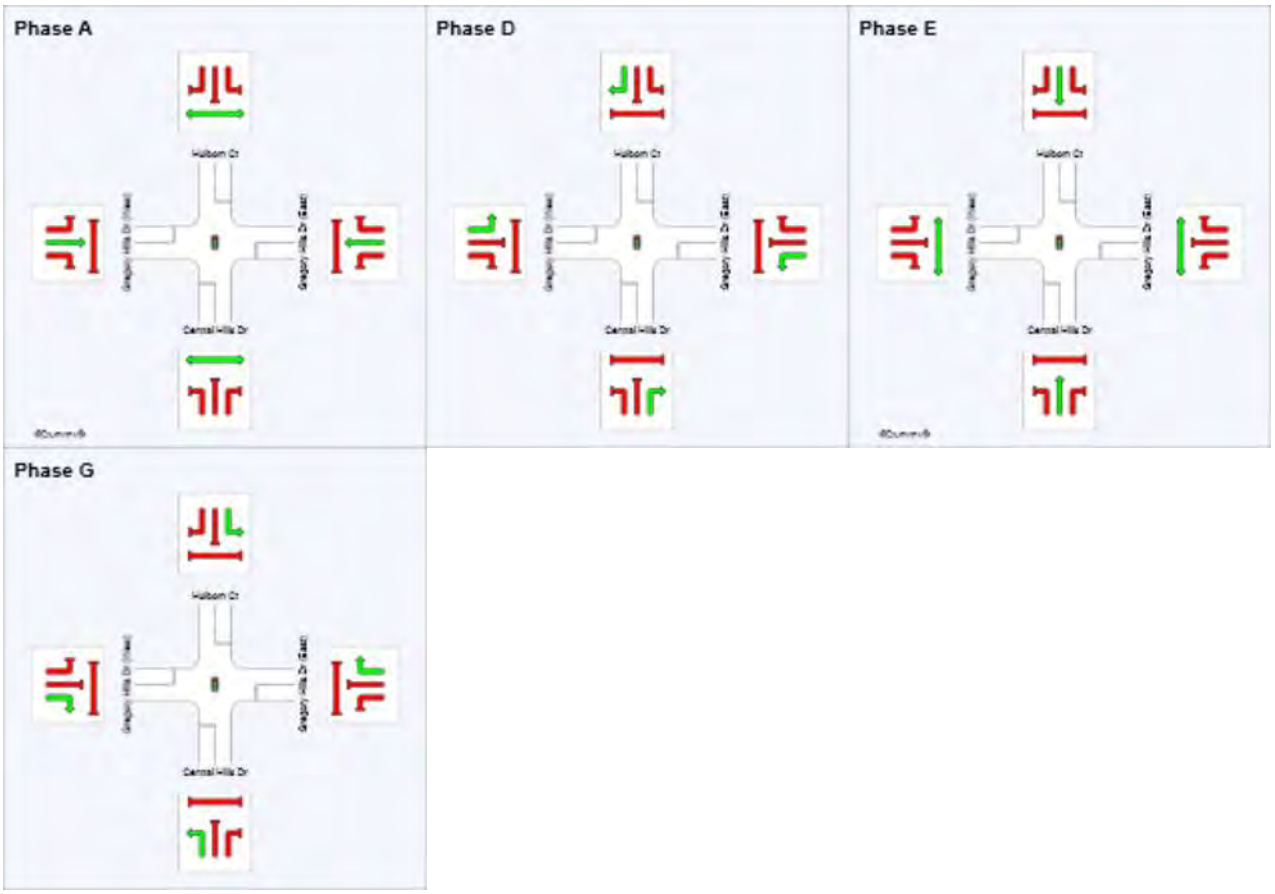
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	16	32	47
Green Time (sec)	10	10	9	7
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	16	16	15	13
Phase Split	27 %	27 %	25 %	22 %

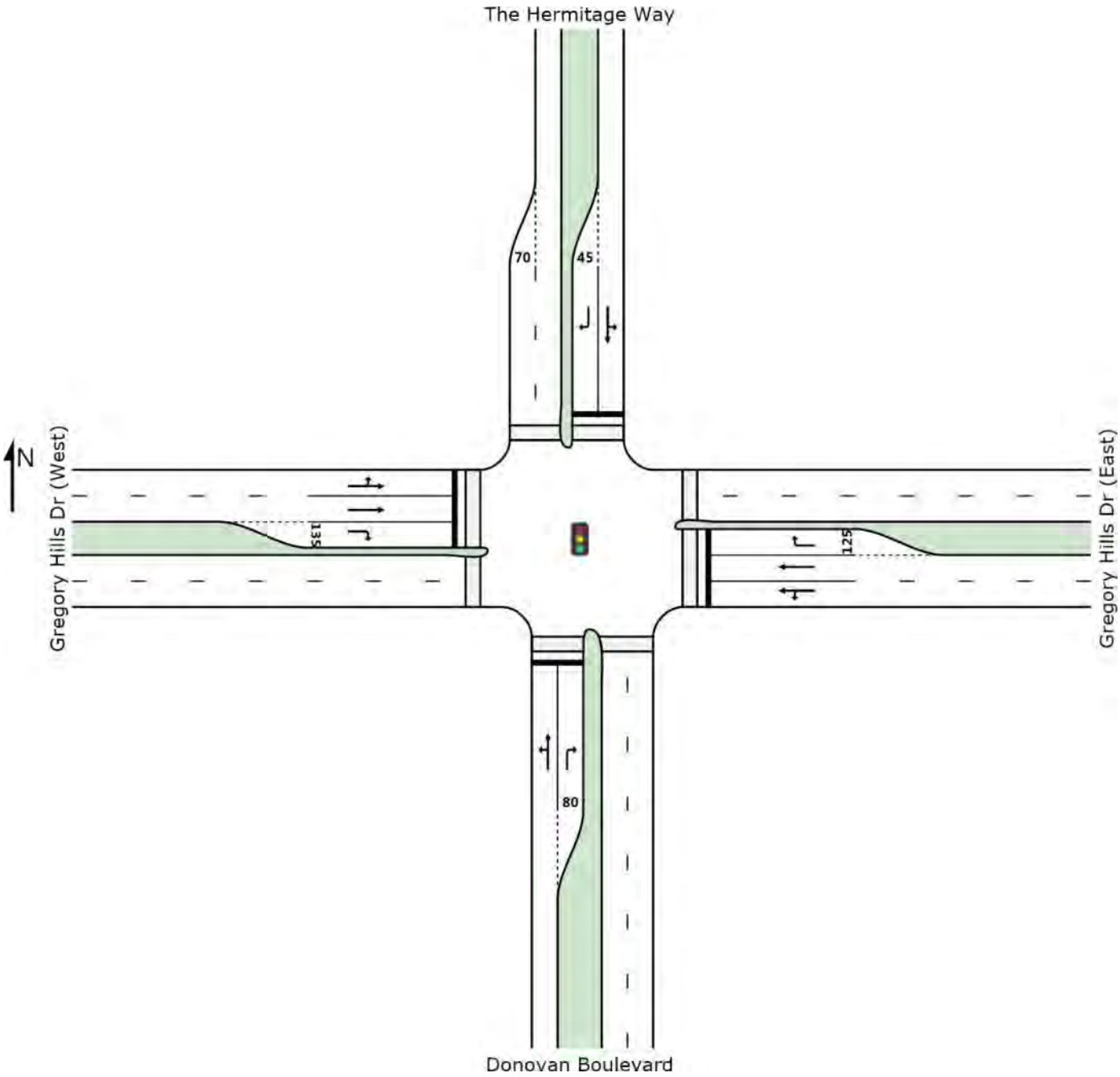


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	300	3.0	300	3.0	0.765	39.4	LOS C	9.3	67.1	0.99	0.92	22.2
2	T1	1	0.0	1	0.0	0.765	33.8	LOS C	9.3	67.1	0.99	0.92	32.1
3	R2	1	0.0	1	0.0	0.032	42.2	LOS C	0.0	0.2	1.00	0.57	34.5
Approach		302	3.0	302	3.0	0.765	39.4	LOS C	9.3	67.1	0.99	0.92	22.3
East: Gregory Hills Dr (East)													
4	L2	2	0.0	2	0.0	0.325	28.4	LOS B	3.1	23.8	0.88	0.71	44.2
5	T1	239	11.3	239	11.3	0.325	22.6	LOS B	3.1	23.9	0.89	0.71	38.3
6	R2	1	0.0	1	0.0	0.003	27.0	LOS B	0.0	0.2	0.82	0.60	41.5
Approach		242	11.2	242	11.2	0.325	22.6	LOS B	3.1	23.9	0.89	0.71	38.4
North: The Hermitage Way													
7	L2	3	0.0	3	0.0	0.039	25.0	LOS B	0.1	0.8	0.94	0.62	43.3
8	T1	2	0.0	2	0.0	0.039	19.4	LOS B	0.1	0.8	0.94	0.62	40.0
9	R2	26	19.2	26	19.2	0.945	52.4	LOS D	1.0	8.5	1.00	0.89	18.5
Approach		31	16.1	31	16.1	0.945	47.6	LOS D	1.0	8.5	0.99	0.85	22.2
West: Gregory Hills Dr (West)													
10	L2	17	17.6	17	17.6	0.376	28.7	LOS C	0.7	5.4	0.99	0.71	41.4
11	T1	137	23.4	137	23.4	0.376	23.4	LOS B	3.4	28.7	0.91	0.72	48.7
12	R2	88	18.2	88	18.2	0.265	29.5	LOS C	2.3	18.4	0.88	0.76	40.0
Approach		242	21.1	242	21.1	0.376	26.0	LOS B	3.4	28.7	0.91	0.74	44.9
All Vehicles		817	11.3	817	11.3	0.945	30.8	LOS C	9.3	67.1	0.94	0.80	34.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	8	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		12	24.3	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

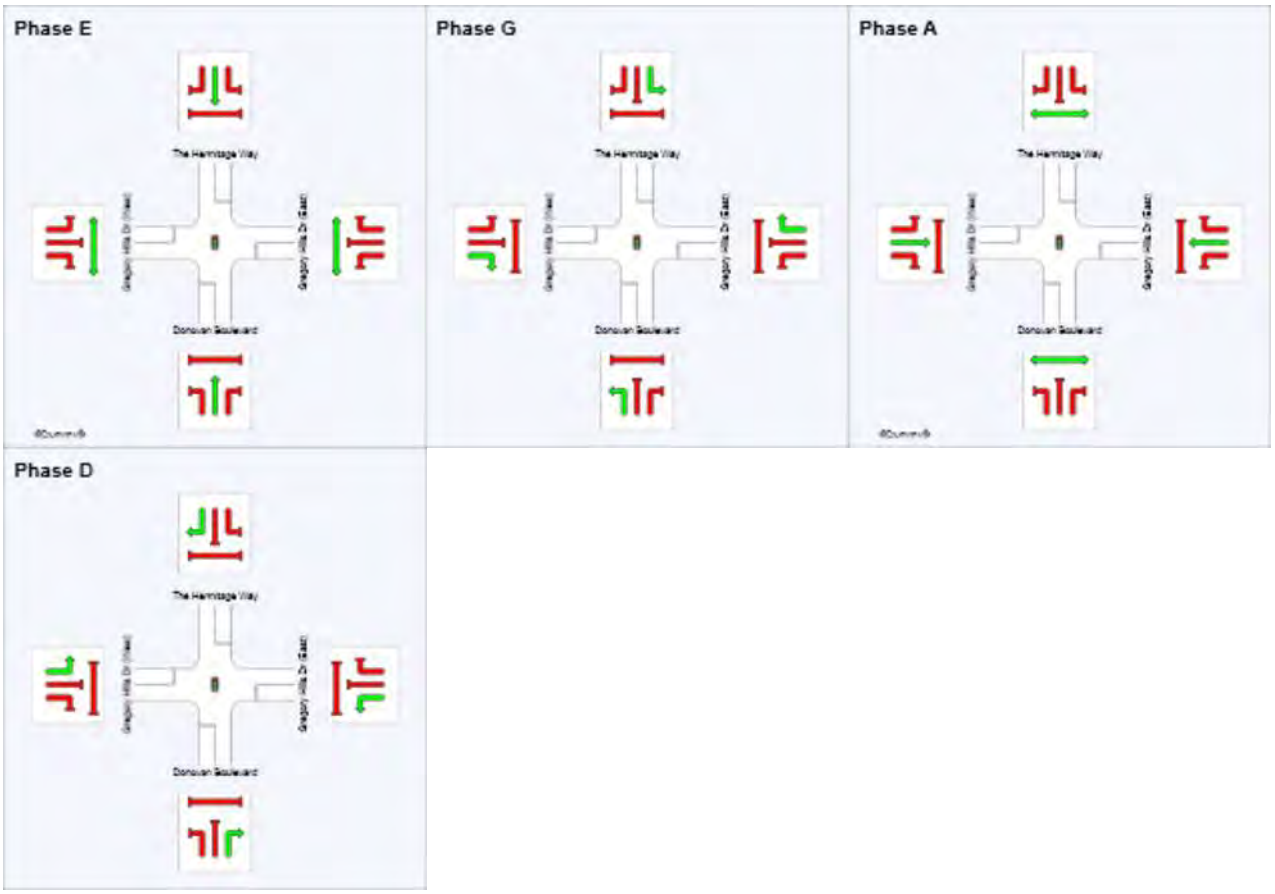
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: E, G, A, D
Output Sequence: E, G, A, D

Phase Timing Results

Phase	E	G	A	D
Reference Phase	No	No	Yes	No
Phase Change Time (sec)	25	42	0	18
Green Time (sec)	11	12	12	1
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	18	18	7
Phase Split	28 %	30 %	30 %	12 %

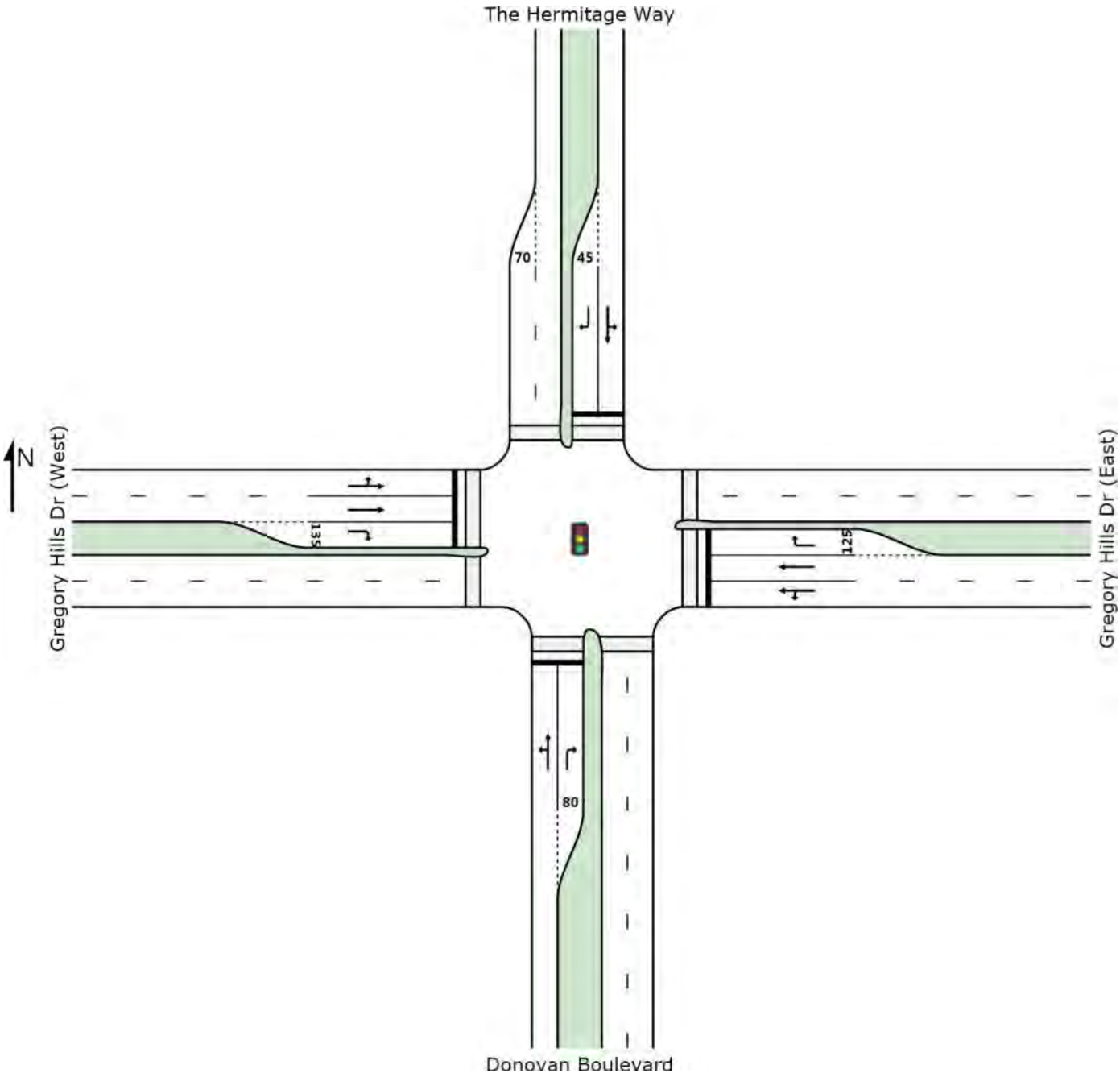


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 70 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	117	1.7	117	1.7	0.223	32.9	LOS C	3.4	24.4	0.80	0.77	24.8
2	T1	1	0.0	1	0.0	0.223	27.4	LOS B	3.4	24.4	0.80	0.77	34.8
3	R2	3	0.0	3	0.0	0.028	41.3	LOS C	0.1	0.7	0.96	0.62	34.9
Approach		121	1.7	121	1.7	0.223	33.1	LOS C	3.4	24.4	0.81	0.76	25.3
East: Gregory Hills Dr (East)													
4	L2	1	0.0	1	0.0	0.291	34.5	LOS C	2.7	20.8	0.91	0.71	40.9
5	T1	172	10.5	172	10.5	0.291	28.7	LOS C	2.7	20.8	0.92	0.71	34.1
6	R2	2	50.0	2	50.0	0.005	26.3	LOS B	0.0	0.5	0.73	0.62	40.8
Approach		175	10.9	175	10.9	0.291	28.7	LOS C	2.7	20.8	0.92	0.71	34.3
North: The Hermitage Way													
7	L2	1	0.0	1	0.0	0.027	29.0	LOS C	0.1	0.8	0.94	0.60	42.1
8	T1	3	0.0	3	0.0	0.027	23.4	LOS B	0.1	0.8	0.94	0.60	38.9
9	R2	17	0.0	17	0.0	0.159	42.4	LOS C	0.6	4.2	0.98	0.69	21.3
Approach		21	0.0	21	0.0	0.159	39.1	LOS C	0.6	4.2	0.97	0.67	25.1
West: Gregory Hills Dr (West)													
10	L2	28	7.1	28	7.1	0.591	33.9	LOS C	1.7	12.4	1.00	0.76	39.6
11	T1	206	2.9	206	2.9	0.591	30.6	LOS C	6.0	43.1	0.98	0.79	44.5
12	R2	303	4.6	303	4.6	0.584	30.1	LOS C	9.1	66.3	0.91	0.82	39.9
Approach		537	4.1	537	4.1	0.591	30.5	LOS C	9.1	66.3	0.94	0.81	41.7
All Vehicles		854	5.0	854	5.0	0.591	30.7	LOS C	9.1	66.3	0.92	0.78	38.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	29.3	LOS C	0.0	0.0	0.91	0.91
P2	East Full Crossing	3	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	1	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	2	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		7	29.3	LOS C			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

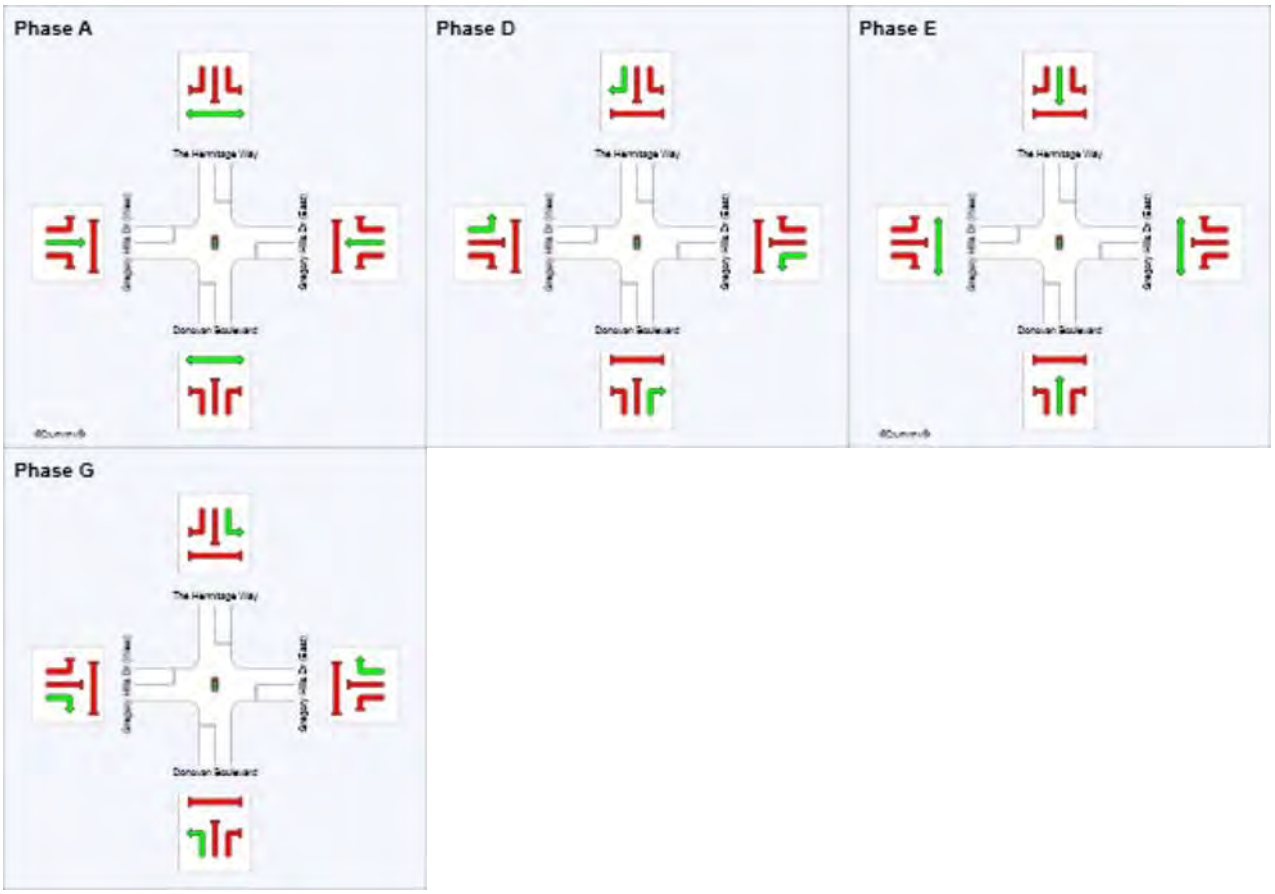
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 70 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	17	27	44
Green Time (sec)	11	4	11	20
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	10	17	26
Phase Split	24 %	14 %	24 %	37 %



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

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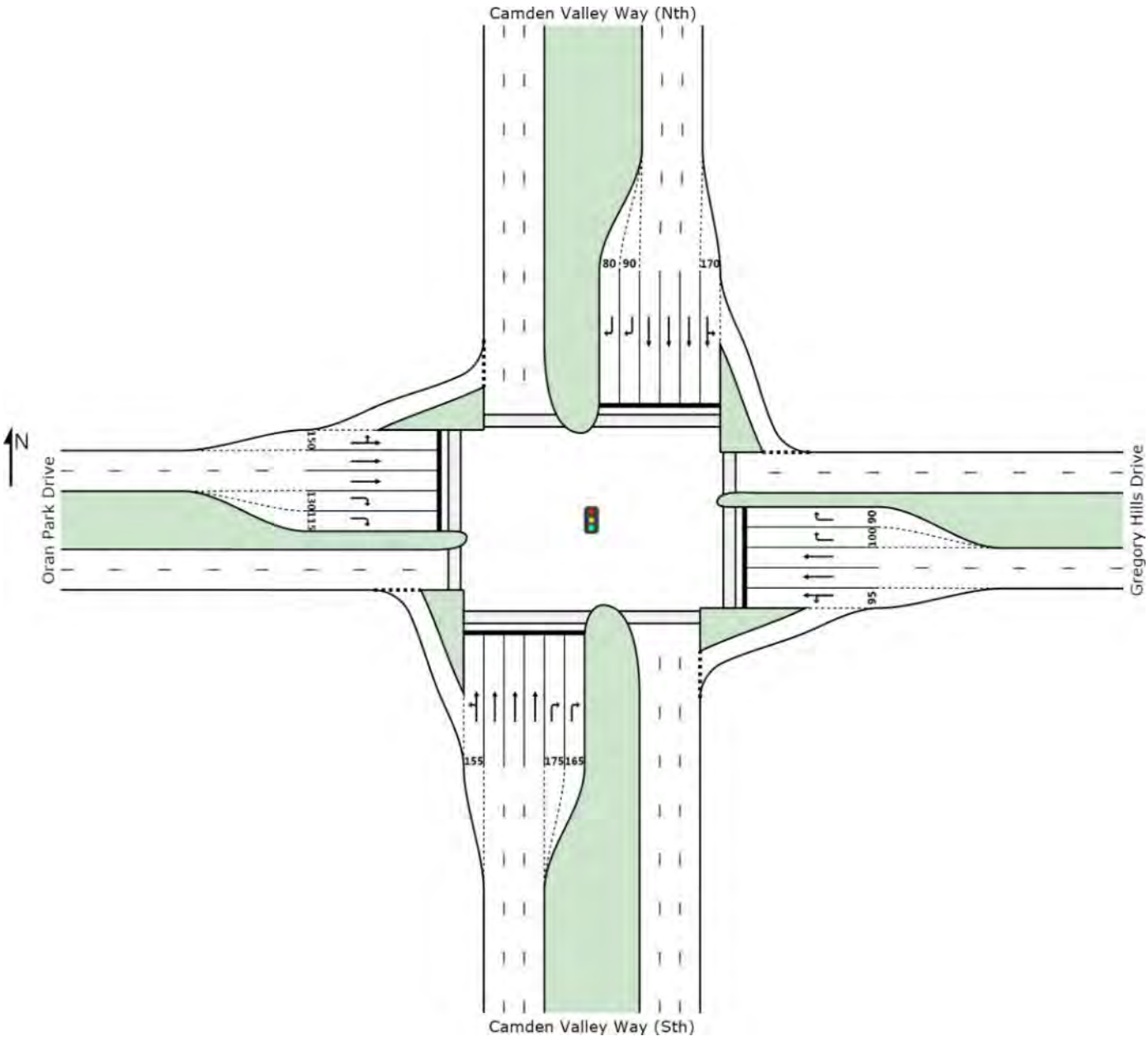
Scenario 5a – 2031 Without Development

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	260	12.7	260	12.7	0.229	14.1	LOS A	5.8	44.8	0.39	0.70	55.5
2	T1	2190	6.3	2190	6.3	1.049	69.0	LOS E	67.5	498.1	1.00	1.14	34.9
3	R2	302	12.3	302	12.3	0.678	72.2	LOS F	10.2	79.0	1.00	0.83	16.5
Approach		2752	7.6	2752	7.6	1.049	64.2	LOS E	67.5	498.1	0.94	1.07	34.5
East: Gregory Hills Drive													
4	L2	430	10.7	430	10.7	0.391	13.9	LOS A	10.7	81.6	0.45	0.72	50.1
5	T1	233	7.3	233	7.3	0.646	58.5	LOS E	13.9	97.4	0.98	0.81	34.1
6	R2	639	6.7	639	6.7	1.435	284.7	LOS F	44.3	327.7	1.00	1.36	12.4
Approach		1302	8.1	1302	8.1	1.435	154.8	LOS F	44.3	327.7	0.81	1.05	18.0
North: Camden Valley Way (Nth)													
7	L2	358	10.9	358	10.9	0.325	16.6	LOS B	9.7	74.5	0.46	0.72	54.6
8	T1	1159	8.5	1159	8.5	0.547	31.6	LOS C	17.4	130.9	0.72	0.63	50.3
9	R2	417	8.2	417	8.2	0.900	85.5	LOS F	16.1	120.4	1.00	0.94	33.3
Approach		1934	8.8	1934	8.8	0.900	40.4	LOS C	17.4	130.9	0.73	0.71	44.6
West: Oran Park Drive													
10	L2	969	2.1	969	2.1	1.312	180.7	LOS F	102.5	729.9	1.00	1.25	20.6
11	T1	475	11.4	475	11.4	1.259	181.5	LOS F	50.6	354.0	0.99	1.31	12.6
12	R2	281	6.8	281	6.8	0.631	70.8	LOS F	9.4	69.4	1.00	0.81	30.4
Approach		1725	5.4	1725	5.4	1.312	163.0	LOS F	102.5	729.9	1.00	1.20	19.1
All Vehicles		7713	7.5	7713	7.5	1.435	95.6	LOS F	102.5	729.9	0.88	1.00	27.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	44.1	LOS E	0.2	0.2	0.79	0.79
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	44.1	LOS E	0.2	0.2	0.79	0.79
All Pedestrians		211	54.2	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

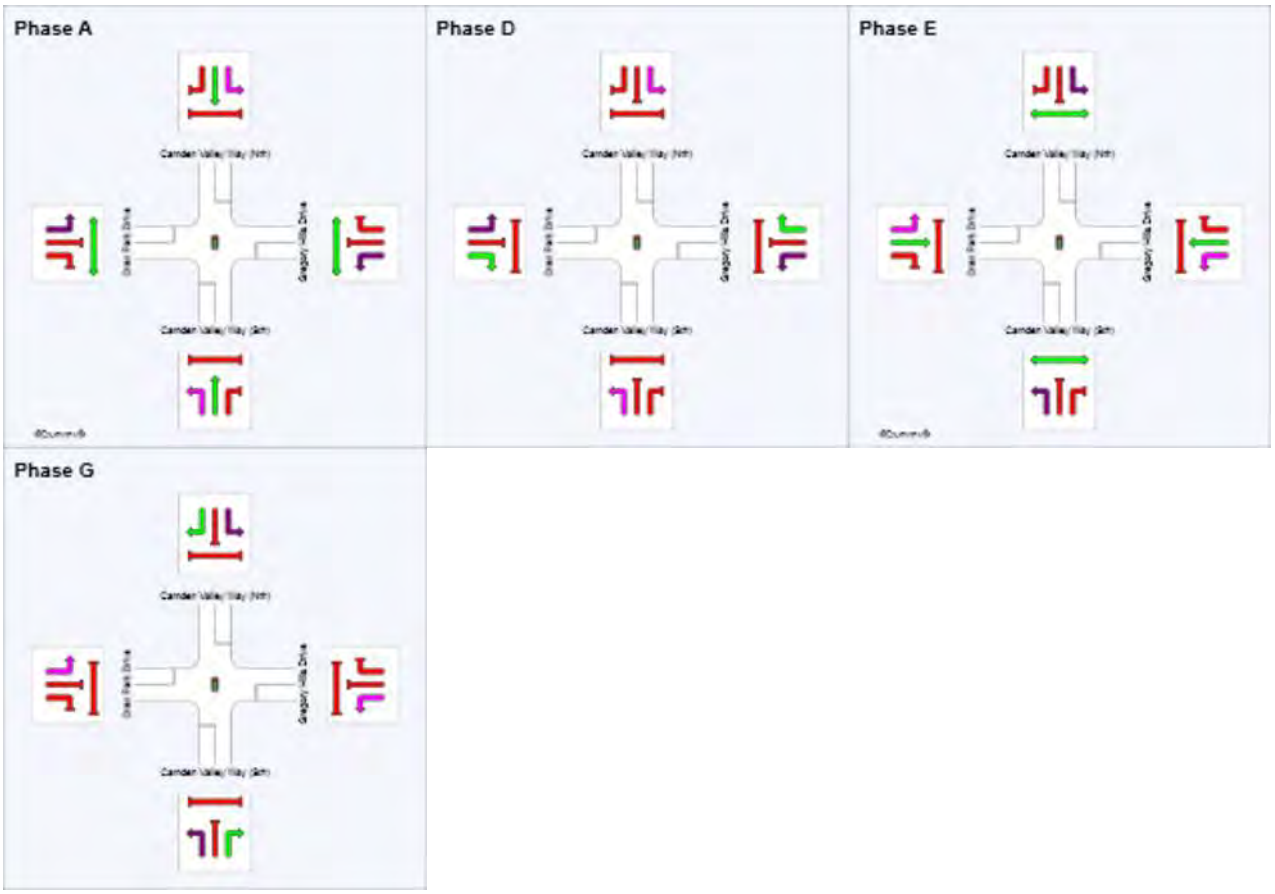
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS - No phase B
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	61	85	115
Green Time (sec)	55	18	24	19
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	61	24	30	25
Phase Split	44 %	17 %	21 %	18 %

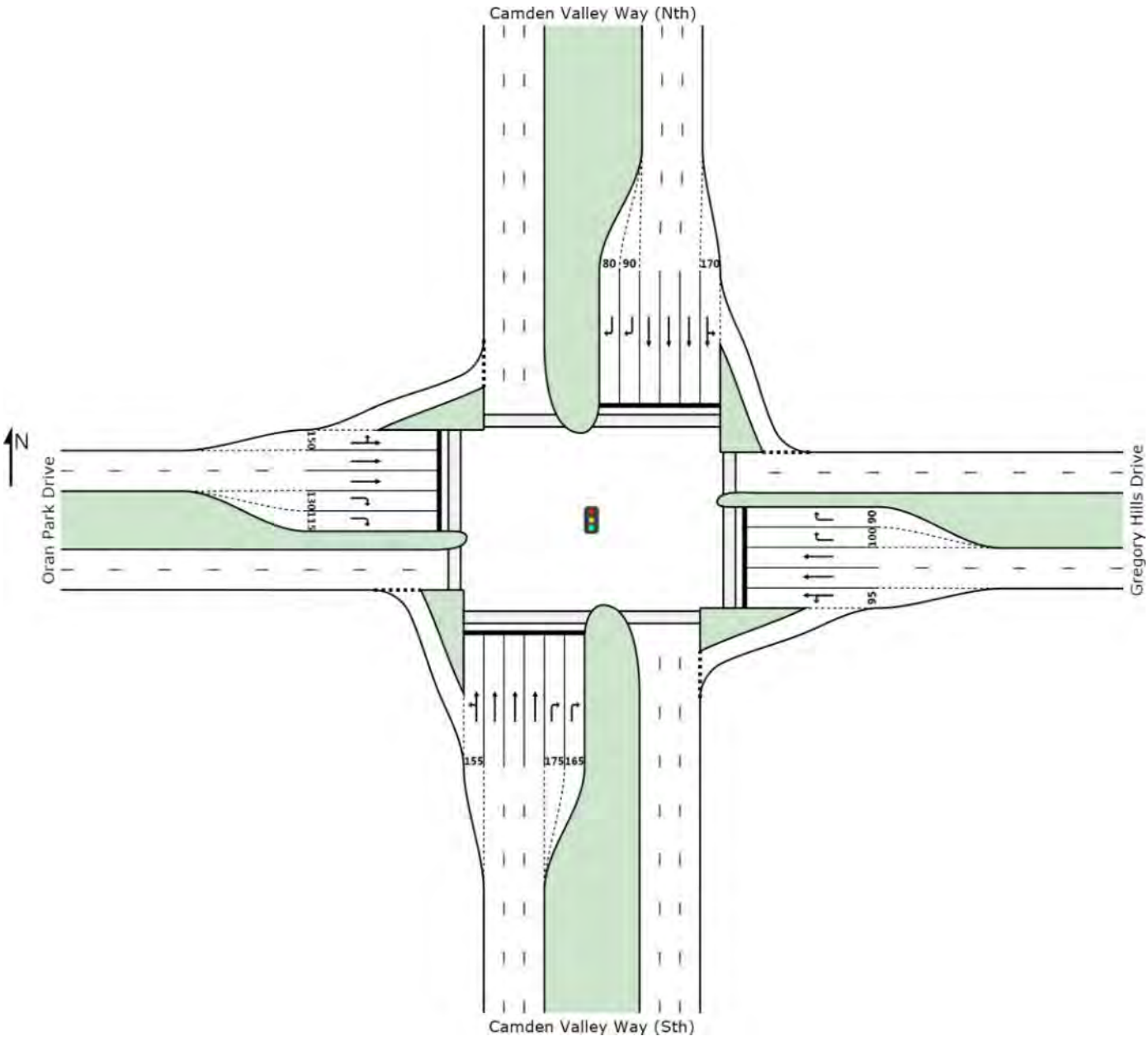


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	343	2.0	343	2.0	0.294	17.4	LOS B	9.4	66.7	0.48	0.73	53.7
2	T1	1947	3.4	1947	3.4	1.025	66.0	LOS E	56.8	409.5	1.00	1.10	35.8
3	R2	450	4.0	450	4.0	1.106	143.6	LOS F	22.6	163.5	1.00	1.08	9.2
Approach		2740	3.4	2740	3.4	1.106	72.7	LOS F	56.8	409.5	0.94	1.05	31.2
East: Gregory Hills Drive													
4	L2	641	6.6	641	6.6	0.665	20.6	LOS B	24.7	182.8	0.68	0.80	45.5
5	T1	515	3.3	515	3.3	1.194	171.7	LOS F	28.7	206.6	1.00	1.24	17.1
6	R2	865	2.5	865	2.5	1.523	322.6	LOS F	63.3	453.0	1.00	1.42	11.2
Approach		2021	4.0	2021	4.0	1.523	188.3	LOS F	63.3	453.0	0.90	1.18	15.5
North: Camden Valley Way (Nth)													
7	L2	430	4.7	430	4.7	0.347	15.6	LOS B	10.0	73.0	0.42	0.74	55.7
8	T1	1593	3.5	1593	3.5	0.698	27.4	LOS B	27.3	197.1	0.72	0.64	52.8
9	R2	773	1.8	773	1.8	1.238	164.9	LOS F	32.7	232.7	1.00	1.16	22.2
Approach		2796	3.2	2796	3.2	1.238	63.6	LOS E	32.7	232.7	0.75	0.80	36.2
West: Oran Park Drive													
10	L2	742	4.0	742	4.0	0.972	75.1	LOS F	48.6	351.8	1.00	1.13	35.3
11	T1	757	2.9	757	2.9	1.748	418.6	LOS F	61.5	441.1	1.00	1.62	5.5
12	R2	368	4.9	368	4.9	0.664	67.9	LOS E	12.1	88.3	0.99	0.83	31.3
Approach		1867	3.7	1867	3.7	1.748	212.9	LOS F	61.5	441.1	1.00	1.27	14.4
All Vehicles		9424	3.5	9424	3.5	1.748	122.6	LOS F	63.3	453.0	0.89	1.05	22.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	38.7	LOS D	0.2	0.2	0.74	0.74
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	49.8	LOS E	0.2	0.2	0.84	0.84
All Pedestrians		211	54.3	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

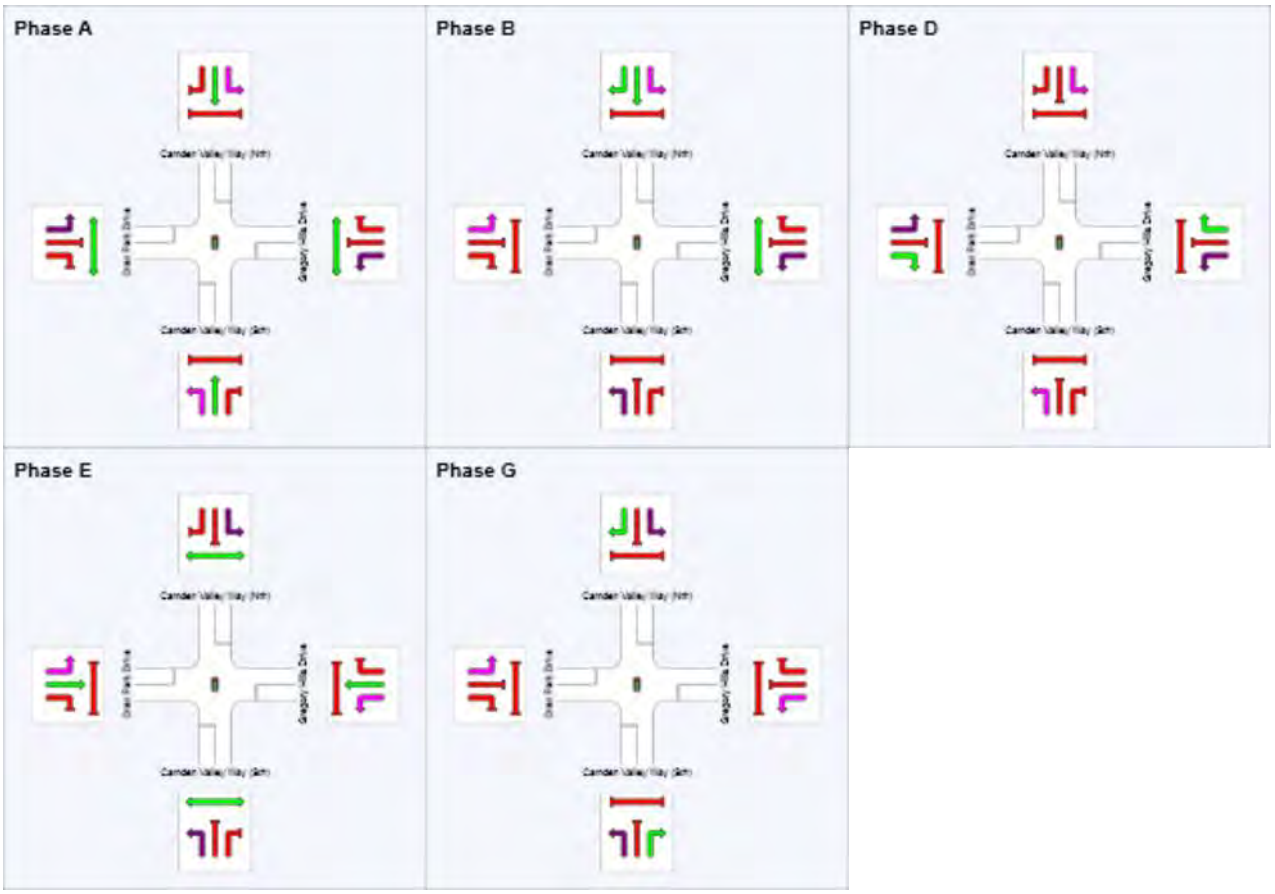
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, D, E, G
Output Sequence: A, B, D, E, G

Phase Timing Results

Phase	A	B	D	E	G
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	54	68	96	118
Green Time (sec)	48	8	22	16	16
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	54	14	28	22	22
Phase Split	39 %	10 %	20 %	16 %	16 %



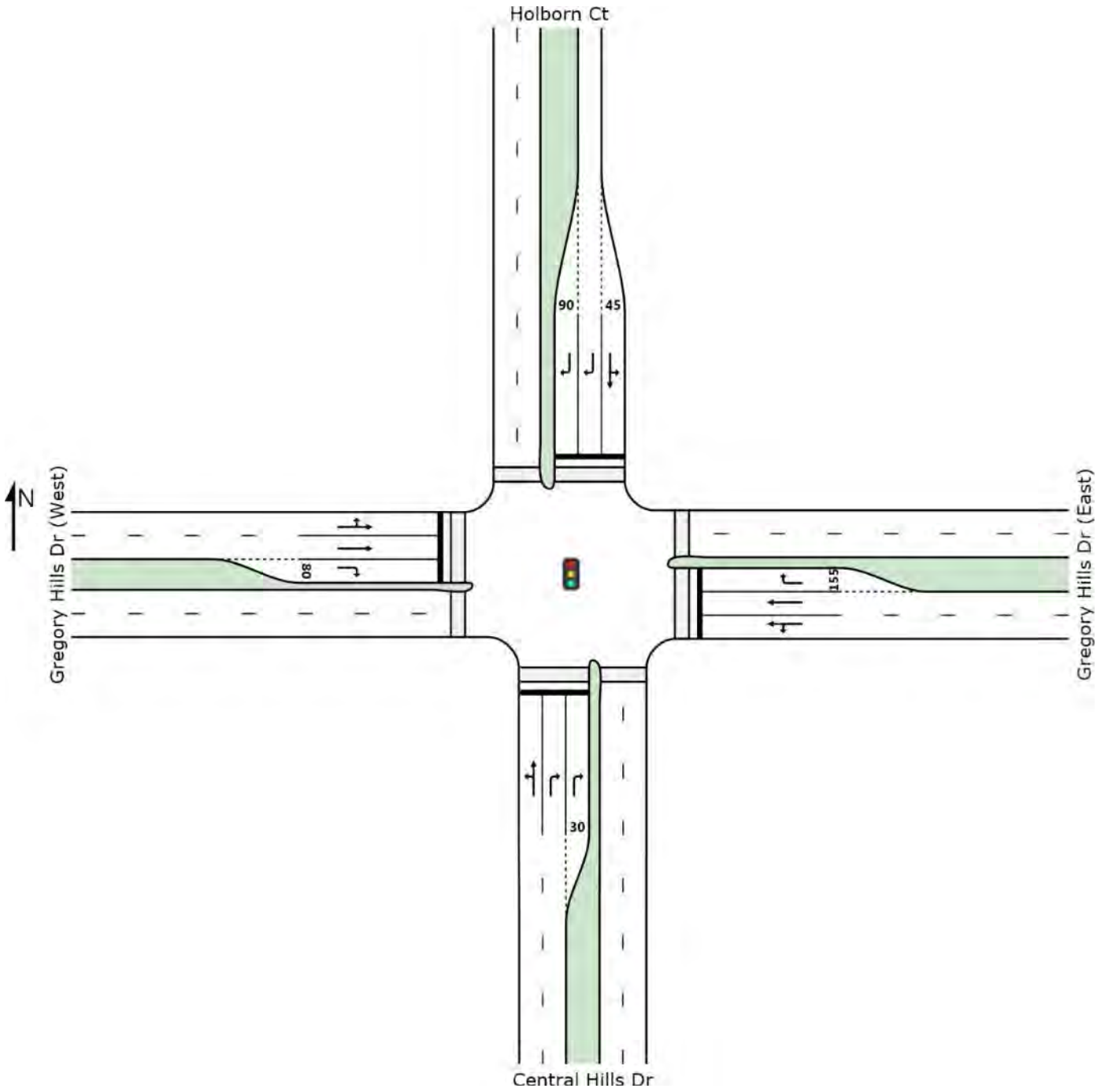
Normal Movement		Permitted/Opposed	
Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane	
Stopped Movement		Turn On Red	
Other Movement Class Running		Other Movement Class Stopped	
Mixed Running & Stopped Movement Classes			
Undetected Movement		Phase Transition Applied	

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 5 - 2031 Base Year\Scenario 5a - 161208 2031 Without Development.sip6

MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	91	7.7	91	7.7	0.379	63.4	LOS E	6.5	47.8	0.94	0.78	6.9
2	T1	13	0.0	13	0.0	0.379	57.8	LOS E	6.5	47.8	0.94	0.78	14.0
3	R2	50	18.0	50	18.0	0.425	83.4	LOS F	1.8	14.7	1.00	0.71	5.4
Approach		154	10.4	154	10.4	0.425	69.4	LOS E	6.5	47.8	0.96	0.76	7.0
East: Gregory Hills Dr (East)													
4	L2	221	10.4	221	10.4	0.631	24.5	LOS B	29.6	222.7	0.68	0.69	41.5
5	T1	1193	7.7	1193	7.7	0.631	18.3	LOS B	30.3	226.3	0.69	0.66	41.5
6	R2	113	0.0	113	0.0	0.297	18.8	LOS B	3.4	23.7	0.63	0.75	44.0
Approach		1527	7.5	1527	7.5	0.631	19.2	LOS B	30.3	226.3	0.68	0.67	41.7
North: Holborn Ct													
7	L2	16	25.0	16	25.0	0.092	63.5	LOS E	1.2	9.9	0.91	0.70	9.6
8	T1	4	0.0	4	0.0	0.092	57.6	LOS E	1.2	9.9	0.91	0.70	14.1
9	R2	21	9.5	21	9.5	0.169	81.3	LOS F	0.7	5.7	1.00	0.67	7.7
Approach		41	14.6	41	14.6	0.169	72.0	LOS F	1.2	9.9	0.95	0.69	8.9
West: Gregory Hills Dr (West)													
10	L2	228	10.1	214	10.8	0.575	23.0	LOS B	24.7	191.1	0.64	0.66	39.7
11	T1	962	12.3	903	13.1	0.575	16.0	LOS B	24.7	191.1	0.61	0.58	38.7
12	R2	208	12.0	195	12.8	0.674	43.0	LOS D	10.9	84.7	1.00	0.95	26.0
Approach		1398	11.9	1311 N1	12.7	0.674	21.2	LOS B	24.7	191.1	0.67	0.65	35.9
All Vehicles		3120	9.7	3033 N1	10.0	0.674	23.3	LOS B	30.3	226.3	0.70	0.66	35.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	2	16.5	LOS B	0.0	0.0	0.49	0.49
P2	East Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	17.0	LOS B	0.0	0.0	0.49	0.49
P4	West Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		5	35.7	LOS D			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

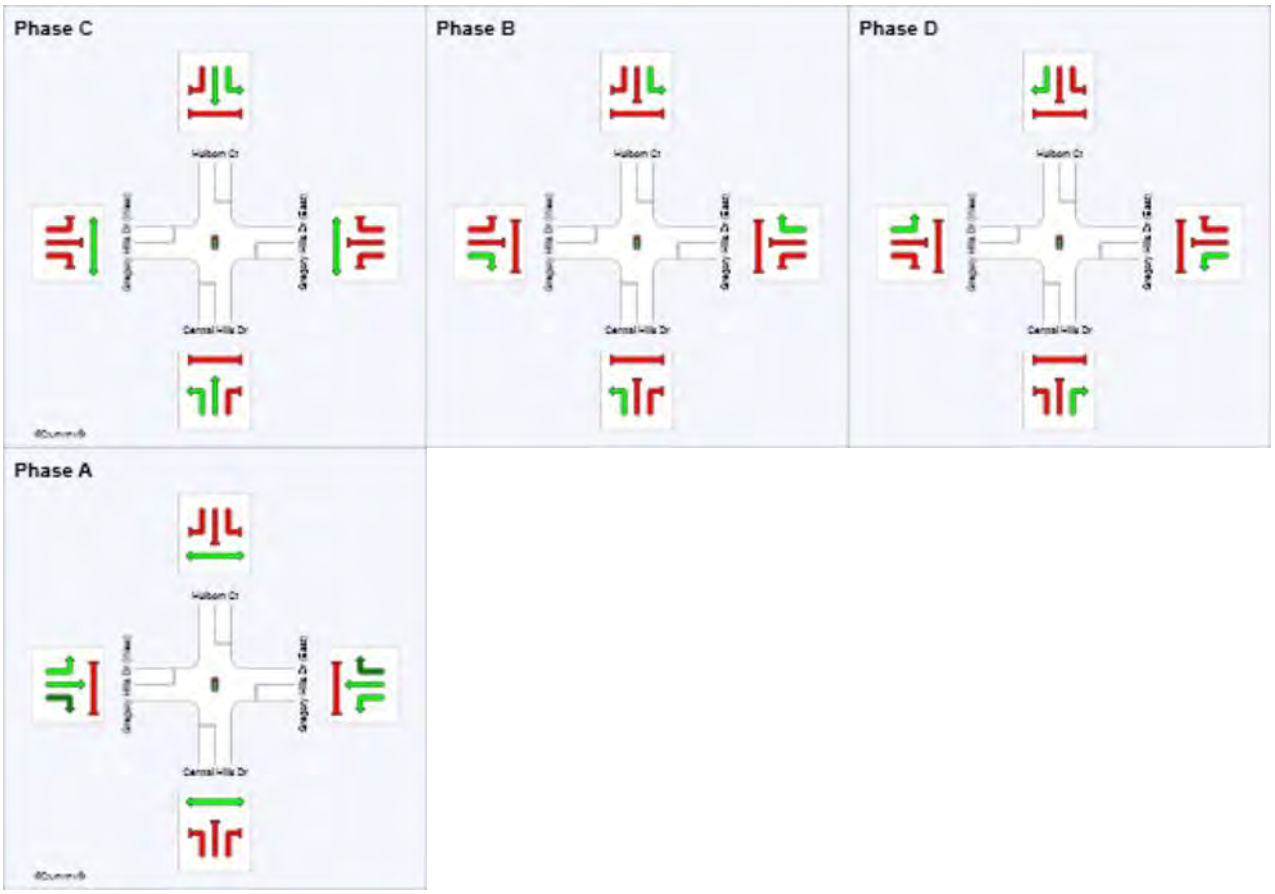
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	91	108	129	0
Green Time (sec)	11	15	5	85
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	21	11	91
Phase Split	12 %	15 %	8 %	65 %

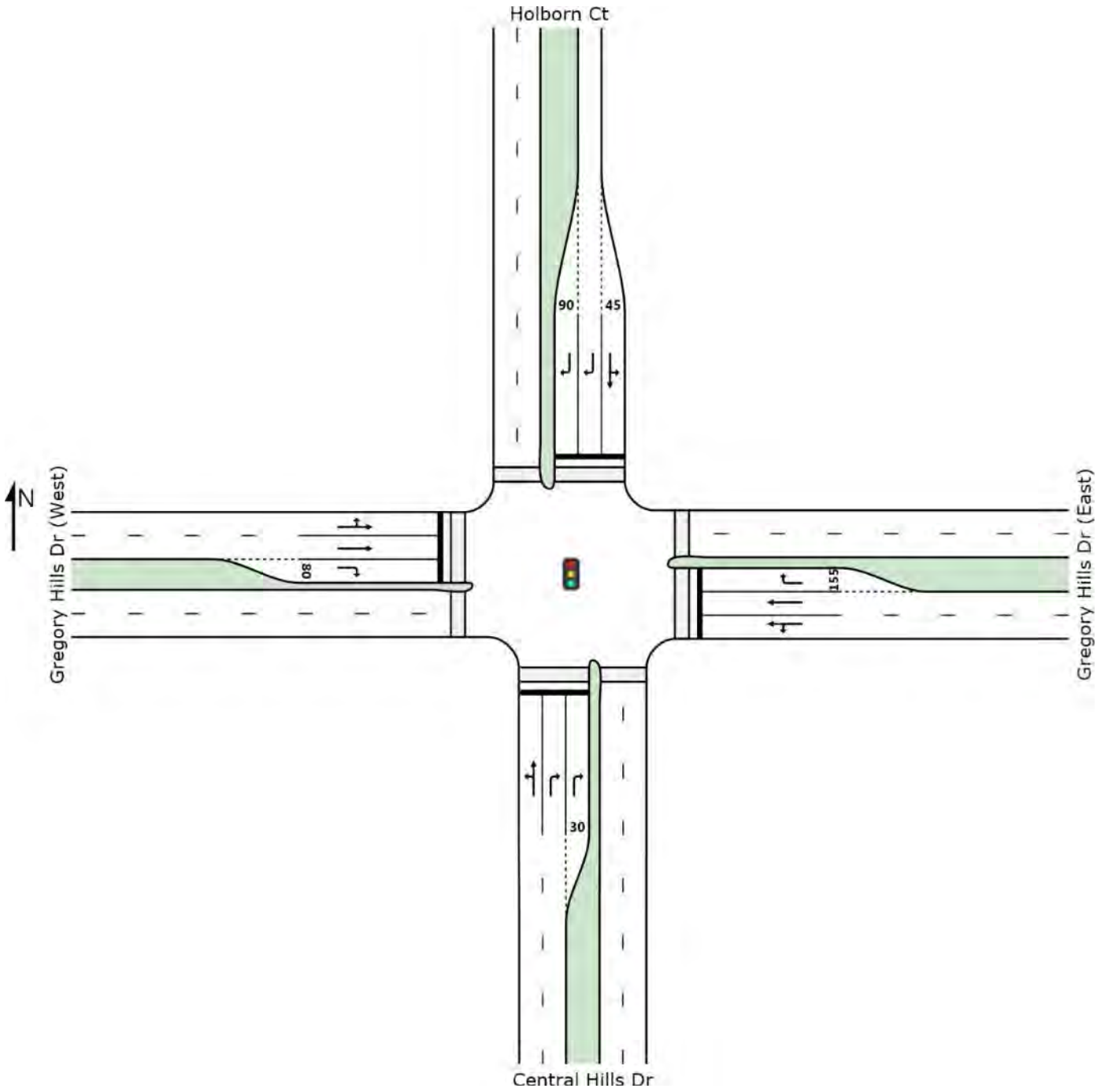


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	110	0.9	110	0.9	0.460	61.5	LOS E	6.8	48.2	0.96	0.79	7.0
2	T1	5	0.0	5	0.0	0.460	56.0	LOS D	6.8	48.2	0.96	0.79	14.2
3	R2	16	0.0	16	0.0	0.140	76.8	LOS F	0.5	3.7	1.00	0.66	5.9
Approach		131	0.8	131	0.8	0.460	63.2	LOS E	6.8	48.2	0.97	0.77	7.2
East: Gregory Hills Dr (East)													
4	L2	236	8.1	236	8.1	0.551	17.9	LOS B	21.7	160.1	0.56	0.61	46.8
5	T1	998	5.8	998	5.8	0.551	12.0	LOS A	21.7	160.1	0.57	0.56	47.7
6	R2	111	0.0	111	0.0	0.660	35.8	LOS C	6.0	41.7	0.97	0.87	34.2
Approach		1345	5.7	1345	5.7	0.660	15.0	LOS B	21.7	160.1	0.60	0.60	45.7
North: Holborn Ct													
7	L2	38	0.0	38	0.0	0.241	63.3	LOS E	2.8	19.9	0.95	0.74	9.6
8	T1	10	0.0	10	0.0	0.241	57.8	LOS E	2.8	19.9	0.95	0.74	14.0
9	R2	84	3.6	84	3.6	0.831	84.5	LOS F	3.3	24.1	1.00	0.85	7.4
Approach		132	2.3	132	2.3	0.831	76.4	LOS F	3.3	24.1	0.98	0.81	8.4
West: Gregory Hills Dr (West)													
10	L2	250	0.0	209	0.0	0.725	20.9	LOS B	36.4	262.5	0.70	0.69	42.7
11	T1	1746	4.5	1459	4.7	0.725	13.8	LOS A	36.4	262.5	0.65	0.63	41.4
12	R2	242	3.3	202	3.4	0.833	43.9	LOS D	12.2	87.8	0.96	0.96	25.8
Approach		2238	3.9	1870[N1]	4.1	0.833	17.9	LOS B	36.4	262.5	0.69	0.67	38.6
All Vehicles		3846	4.4	3478[N1]	4.8	0.833	20.7	LOS B	36.4	262.5	0.68	0.65	37.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	12.5	LOS B	0.1	0.1	0.44	0.44
P2	East Full Crossing	53	59.3	LOS E	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	13.0	LOS B	0.1	0.1	0.45	0.45
P4	West Full Crossing	53	59.3	LOS E	0.2	0.2	0.96	0.96
All Pedestrians		211	36.0	LOS D			0.70	0.70

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

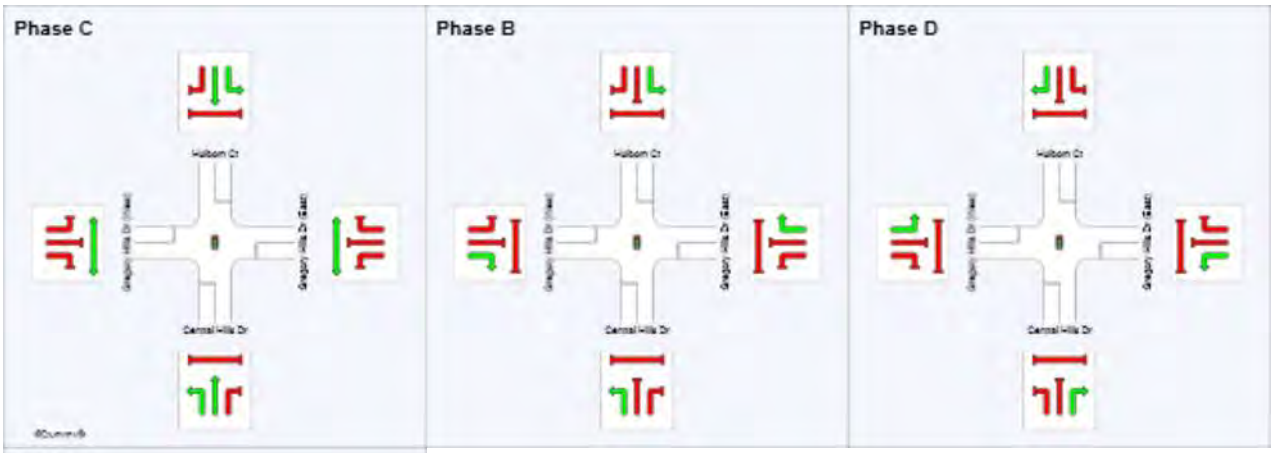
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	92	109	120	0
Green Time (sec)	11	5	4	86
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	11	10	92
Phase Split	13 %	8 %	8 %	71 %

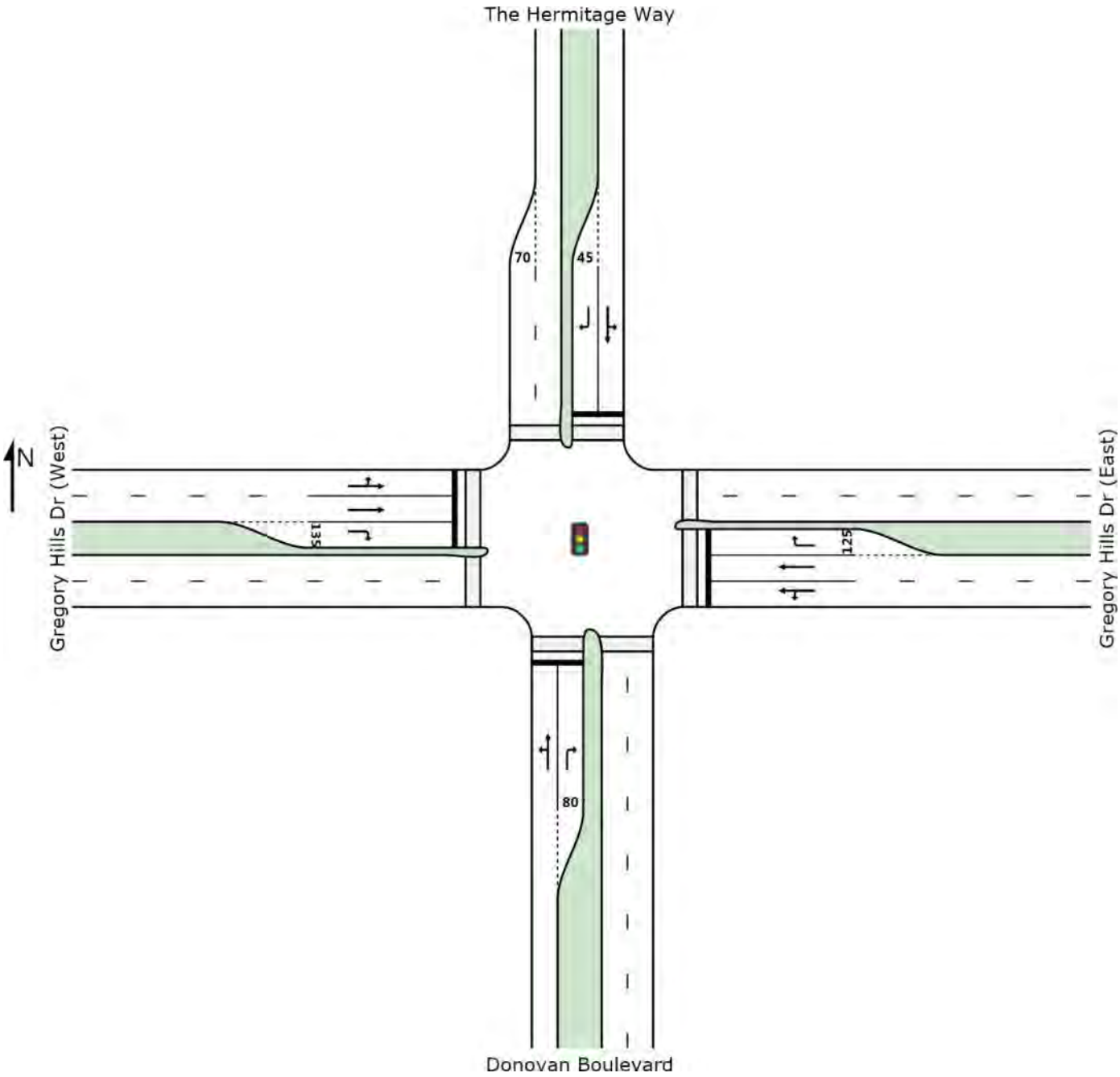


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	332	3.0	332	3.0	0.765	40.7	LOS C	16.4	117.2	0.98	0.89	22.0
2	T1	48	0.0	48	0.0	0.765	35.1	LOS C	16.4	117.2	0.98	0.89	31.9
3	R2	80	0.0	80	0.0	0.199	32.2	LOS C	2.8	19.4	0.82	0.73	38.6
Approach		460	2.2	460	2.2	0.765	38.6	LOS C	16.4	117.2	0.95	0.87	26.8
East: Gregory Hills Dr (East)													
4	L2	56	0.0	56	0.0	0.726	28.5	LOS B	21.1	159.7	0.88	0.79	43.8
5	T1	1110	10.3	1110	10.3	0.726	22.5	LOS B	21.2	161.2	0.89	0.79	38.2
6	R2	164	0.0	164	0.0	0.588	22.5	LOS B	3.9	27.2	0.86	0.79	44.1
Approach		1330	8.6	1330	8.6	0.726	22.7	LOS B	21.2	161.2	0.88	0.79	39.5
North: The Hermitage Way													
7	L2	5	0.0	5	0.0	0.016	33.1	LOS C	0.2	1.6	0.78	0.62	38.7
8	T1	2	0.0	2	0.0	0.016	27.6	LOS B	0.2	1.6	0.78	0.62	35.4
9	R2	27	18.5	27	18.5	0.154	33.9	LOS C	0.9	7.3	0.96	0.70	24.6
Approach		34	14.7	34	14.7	0.154	33.4	LOS C	0.9	7.3	0.92	0.69	28.2
West: Gregory Hills Dr (West)													
10	L2	105	11.4	99	12.1	0.595	26.9	LOS B	15.6	121.2	0.81	0.74	44.2
11	T1	887	12.1	840	12.7	0.595	20.7	LOS B	15.8	122.4	0.81	0.73	50.2
12	R2	132	15.2	125	16.0	0.596	25.5	LOS B	3.0	23.9	0.92	0.80	42.1
Approach		1124	12.4	1065 N1	13.1	0.596	21.9	LOS B	15.8	122.4	0.83	0.74	48.7
All Vehicles		2948	9.1	2889 N1	9.3	0.765	25.1	LOS B	21.2	161.2	0.87	0.78	41.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	24.9	LOS C	0.0	0.0	0.74	0.74
P2	East Full Crossing	8	39.2	LOS D	0.0	0.0	0.93	0.93
P3	North Full Crossing	1	22.1	LOS C	0.0	0.0	0.70	0.70
P4	West Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
All Pedestrians		12	36.4	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

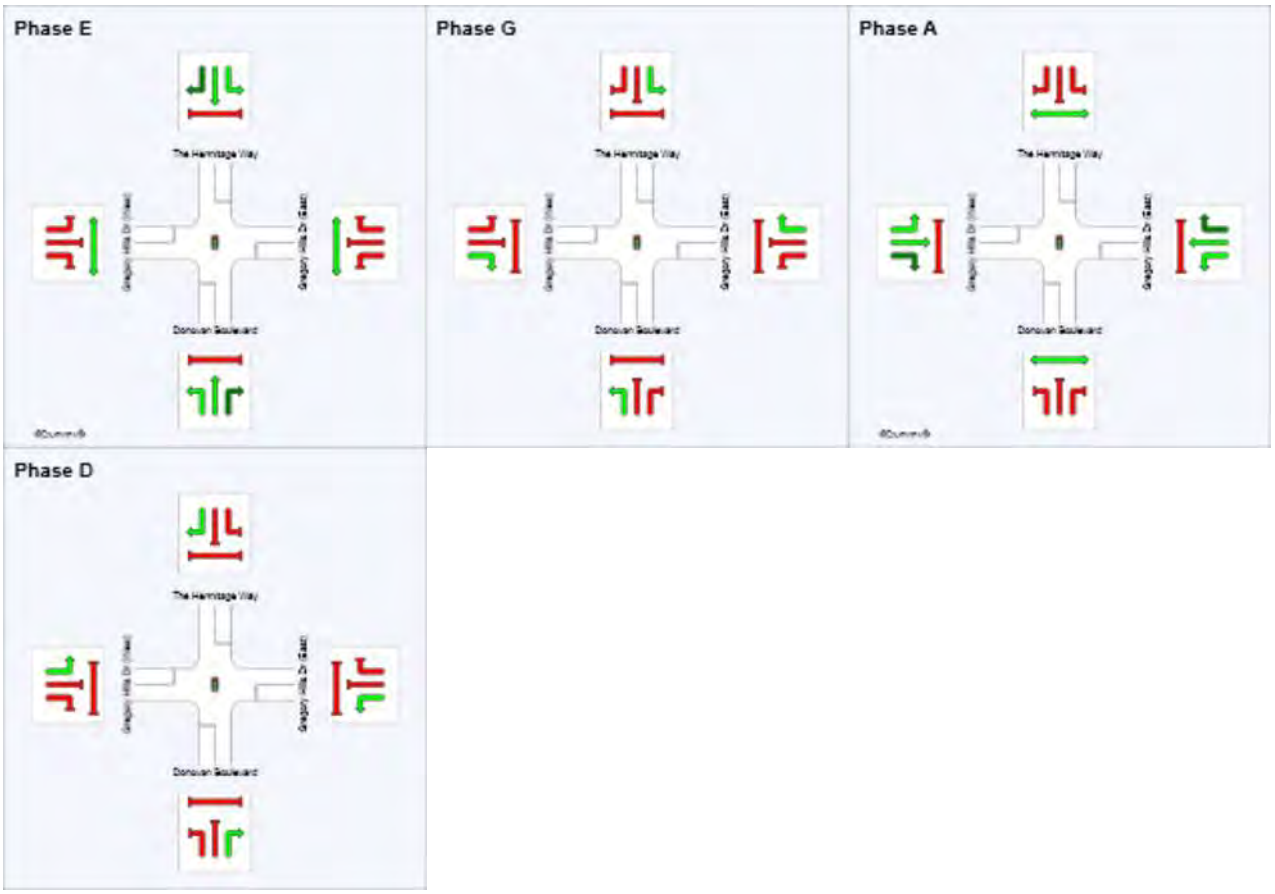
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: E, G, A, D
Output Sequence: E, G, A, D

Phase Timing Results

Phase	E	G	A	D
Reference Phase	No	No	Yes	No
Phase Change Time (sec)	56	79	0	45
Green Time (sec)	17	5	39	5
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	23	11	45	11
Phase Split	26 %	12 %	50 %	12 %

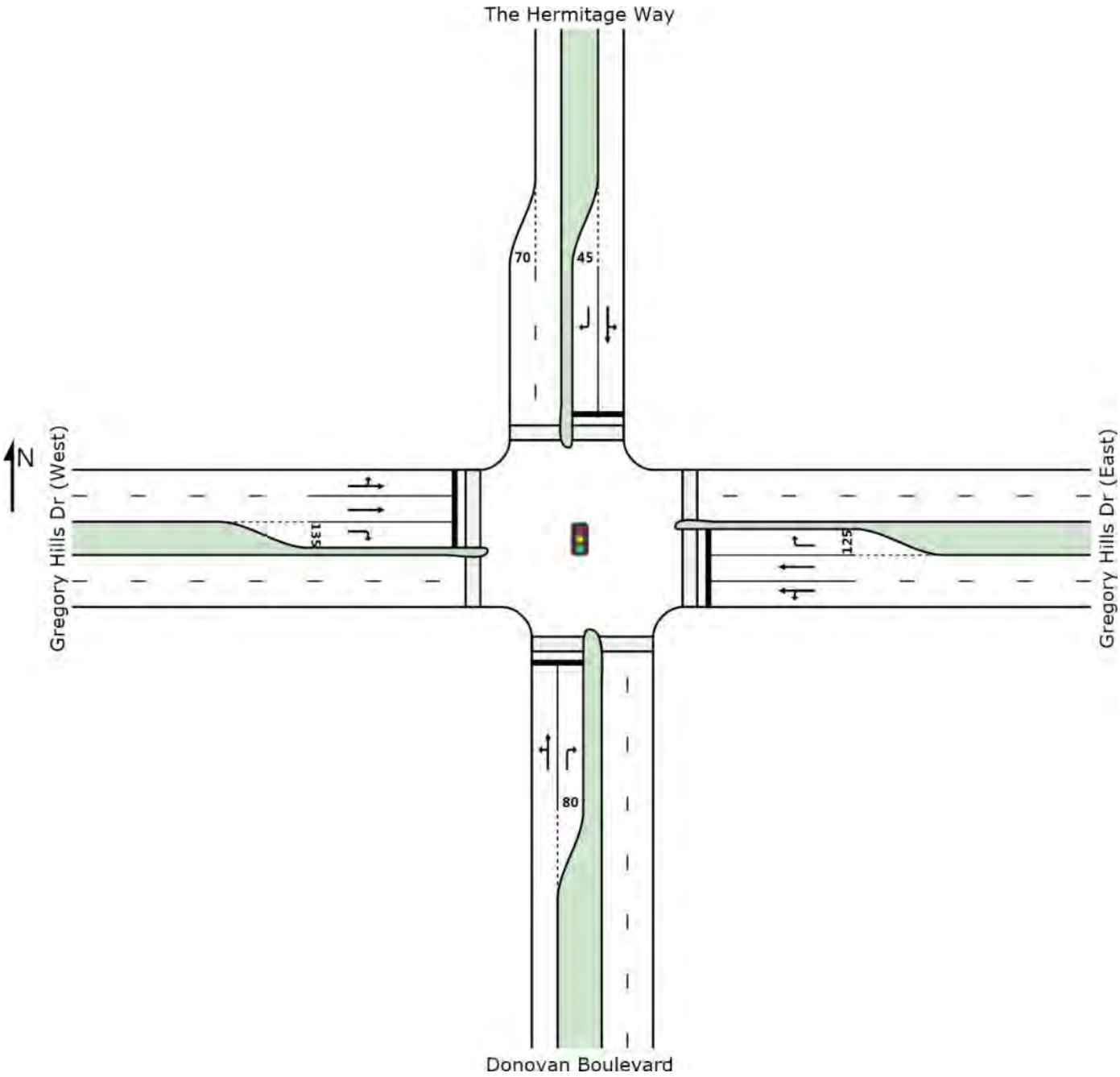


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	137	1.5	137	1.5	0.704	71.1	LOS F	11.5	81.3	1.00	0.84	14.9
2	T1	32	0.0	32	0.0	0.704	65.5	LOS E	11.5	81.3	1.00	0.84	23.6
3	R2	54	0.0	54	0.0	0.372	86.0	LOS F	4.2	29.3	0.98	0.85	23.6
Approach		223	0.9	223	0.9	0.704	73.9	LOS F	11.5	81.3	1.00	0.84	19.0
East: Gregory Hills Dr (East)													
4	L2	53	0.0	53	0.0	0.419	16.6	LOS B	15.5	117.1	0.48	0.46	52.2
5	T1	1001	10.1	1001	10.1	0.419	10.4	LOS A	15.8	119.8	0.48	0.45	50.3
6	R2	158	10.8	158	10.8	0.711	47.0	LOS D	9.5	72.4	1.00	0.96	32.9
Approach		1212	9.7	1212	9.7	0.711	15.5	LOS B	15.8	119.8	0.55	0.52	45.6
North: The Hermitage Way													
7	L2	2	0.0	2	0.0	0.030	68.3	LOS E	0.3	2.2	0.93	0.63	27.7
8	T1	3	0.0	3	0.0	0.030	62.8	LOS E	0.3	2.2	0.93	0.63	24.7
9	R2	17	0.0	17	0.0	0.124	78.5	LOS F	1.3	8.9	0.95	0.68	13.8
Approach		22	0.0	22	0.0	0.124	75.5	LOS F	1.3	8.9	0.94	0.67	16.8
West: Gregory Hills Dr (West)													
10	L2	305	7.2	268	7.3	0.809	22.8	LOS B	49.2	356.6	0.77	0.76	46.7
11	T1	1680	2.9	1478	2.9	0.809	14.3	LOS A	49.2	356.6	0.66	0.64	54.7
12	R2	395	4.6	347	4.6	0.908	53.5	LOS D	25.1	182.4	1.00	1.01	31.0
Approach		2380	3.7	2093 N1	3.8	0.908	21.9	LOS B	49.2	356.6	0.73	0.71	48.3
All Vehicles		3837	5.4	3550 N1	5.9	0.908	23.3	LOS B	49.2	356.6	0.69	0.66	44.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	13.3	LOS B	0.0	0.0	0.44	0.44
P2	East Full Crossing	3	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	11.6	LOS B	0.0	0.0	0.41	0.41
P4	West Full Crossing	2	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		7	49.4	LOS E			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

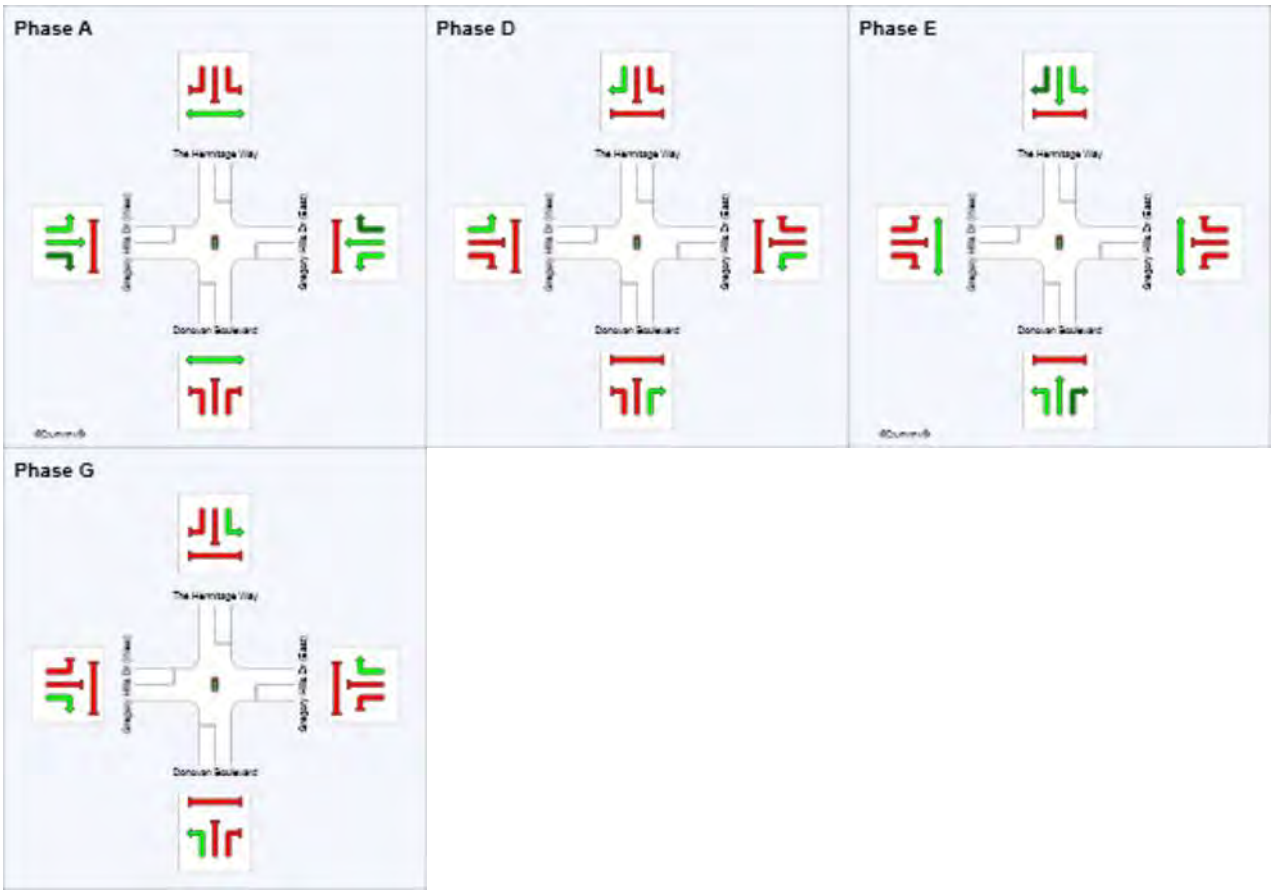
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	101	106	123
Green Time (sec)	95	1	11	11
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	99	7	17	17
Phase Split	71 %	5 %	12 %	12 %



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

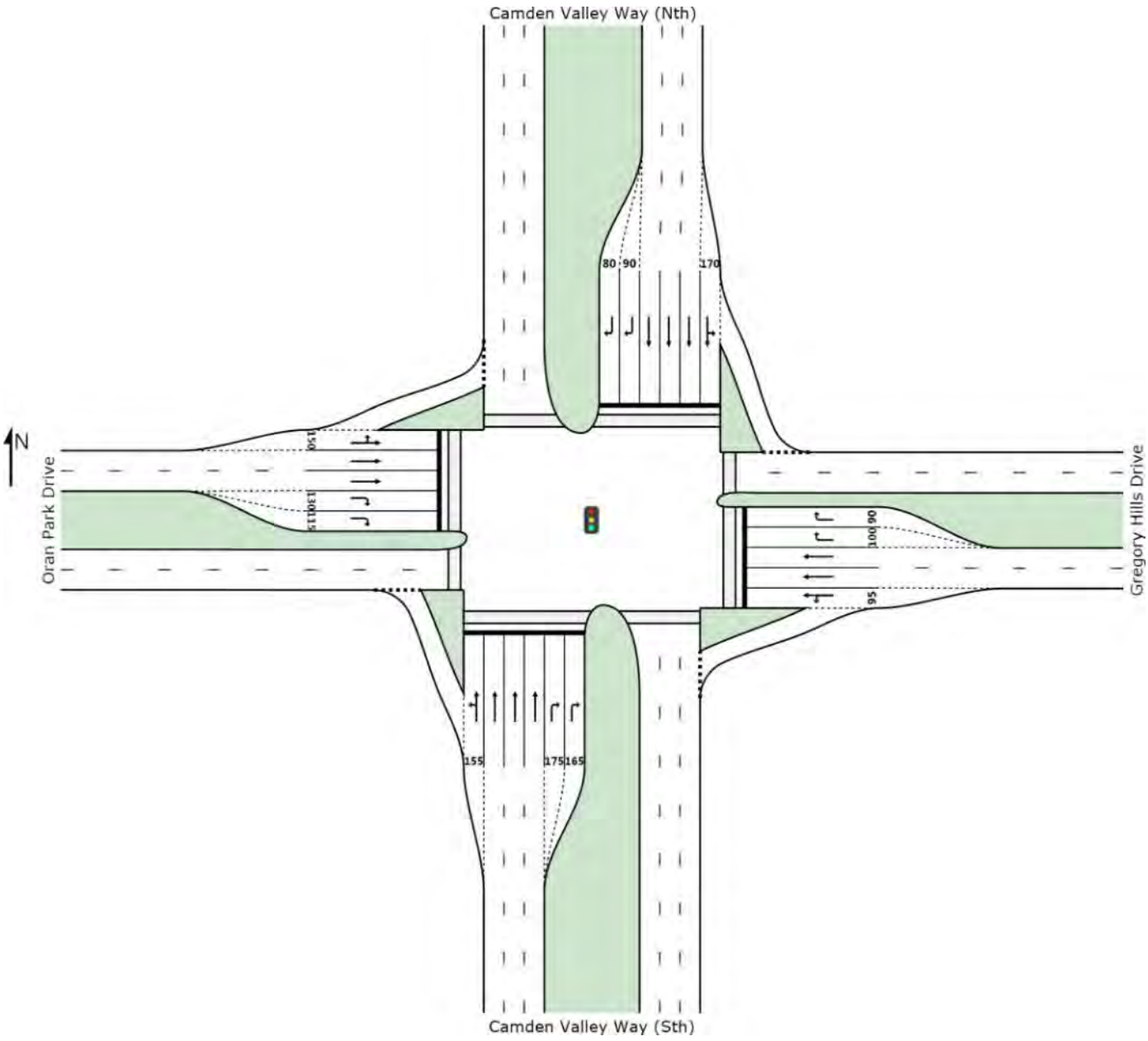
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Scenario 5b – 2031 With Development

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	260	12.7	260	12.7	0.230	14.2	LOS A	5.8	45.1	0.39	0.70	55.5
2	T1	2190	6.3	2190	6.3	1.049	69.2	LOS E	67.6	498.5	1.00	1.14	34.9
3	R2	317	11.7	317	11.7	0.708	73.0	LOS F	10.8	83.4	1.00	0.84	16.4
Approach		2767	7.5	2767	7.5	1.049	64.4	LOS E	67.6	498.5	0.94	1.07	34.3
East: Gregory Hills Drive													
4	L2	435	10.6	435	10.6	0.395	14.0	LOS A	10.9	82.9	0.45	0.72	50.1
5	T1	240	7.1	240	7.1	0.667	58.7	LOS E	14.4	101.0	0.98	0.81	34.1
6	R2	639	6.7	639	6.7	1.435	284.7	LOS F	44.3	327.7	1.00	1.36	12.4
Approach		1314	8.1	1314	8.1	1.435	153.8	LOS F	44.3	327.7	0.82	1.05	18.1
North: Camden Valley Way (Nth)													
7	L2	377	10.3	377	10.3	0.343	16.9	LOS B	10.5	80.1	0.47	0.72	54.4
8	T1	1159	8.5	1159	8.5	0.547	31.6	LOS C	17.4	130.9	0.72	0.63	50.3
9	R2	417	8.2	417	8.2	0.900	85.5	LOS F	16.1	120.4	1.00	0.94	33.3
Approach		1953	8.8	1953	8.8	0.900	40.3	LOS C	17.4	130.9	0.73	0.71	44.7
West: Oran Park Drive													
10	L2	969	2.1	969	2.1	1.312	180.7	LOS F	102.5	729.9	1.00	1.25	20.6
11	T1	499	10.8	499	10.8	1.331	210.5	LOS F	57.0	399.1	0.99	1.38	11.3
12	R2	281	6.8	281	6.8	0.631	70.8	LOS F	9.4	69.4	1.00	0.81	30.4
Approach		1749	5.3	1749	5.3	1.331	171.5	LOS F	102.5	729.9	1.00	1.22	18.3
All Vehicles		7783	7.4	7783	7.4	1.435	97.5	LOS F	102.5	729.9	0.88	1.01	26.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	44.1	LOS E	0.2	0.2	0.79	0.79
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	44.1	LOS E	0.2	0.2	0.79	0.79
All Pedestrians		211	54.2	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

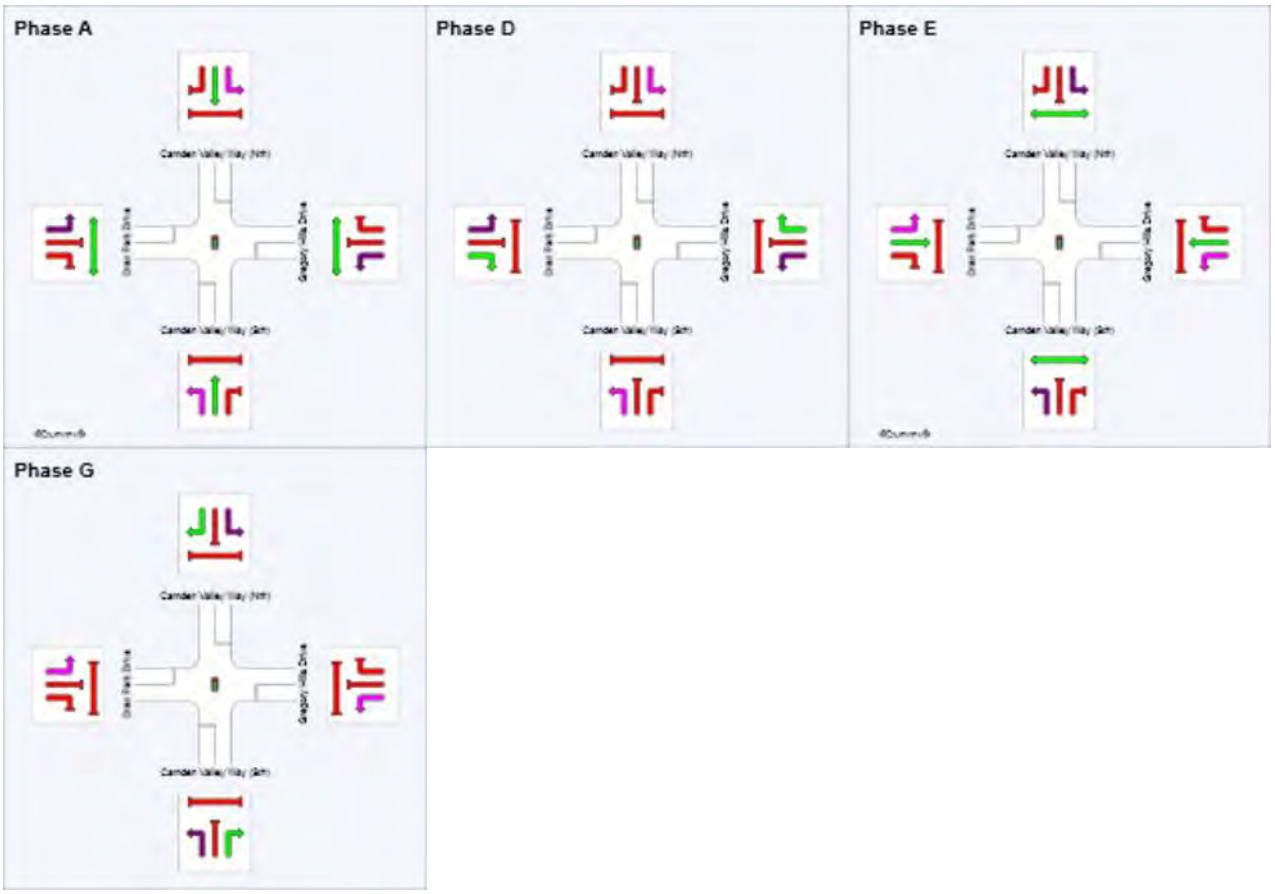
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS - No phase B
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	61	85	115
Green Time (sec)	55	18	24	19
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	61	24	30	25
Phase Split	44 %	17 %	21 %	18 %

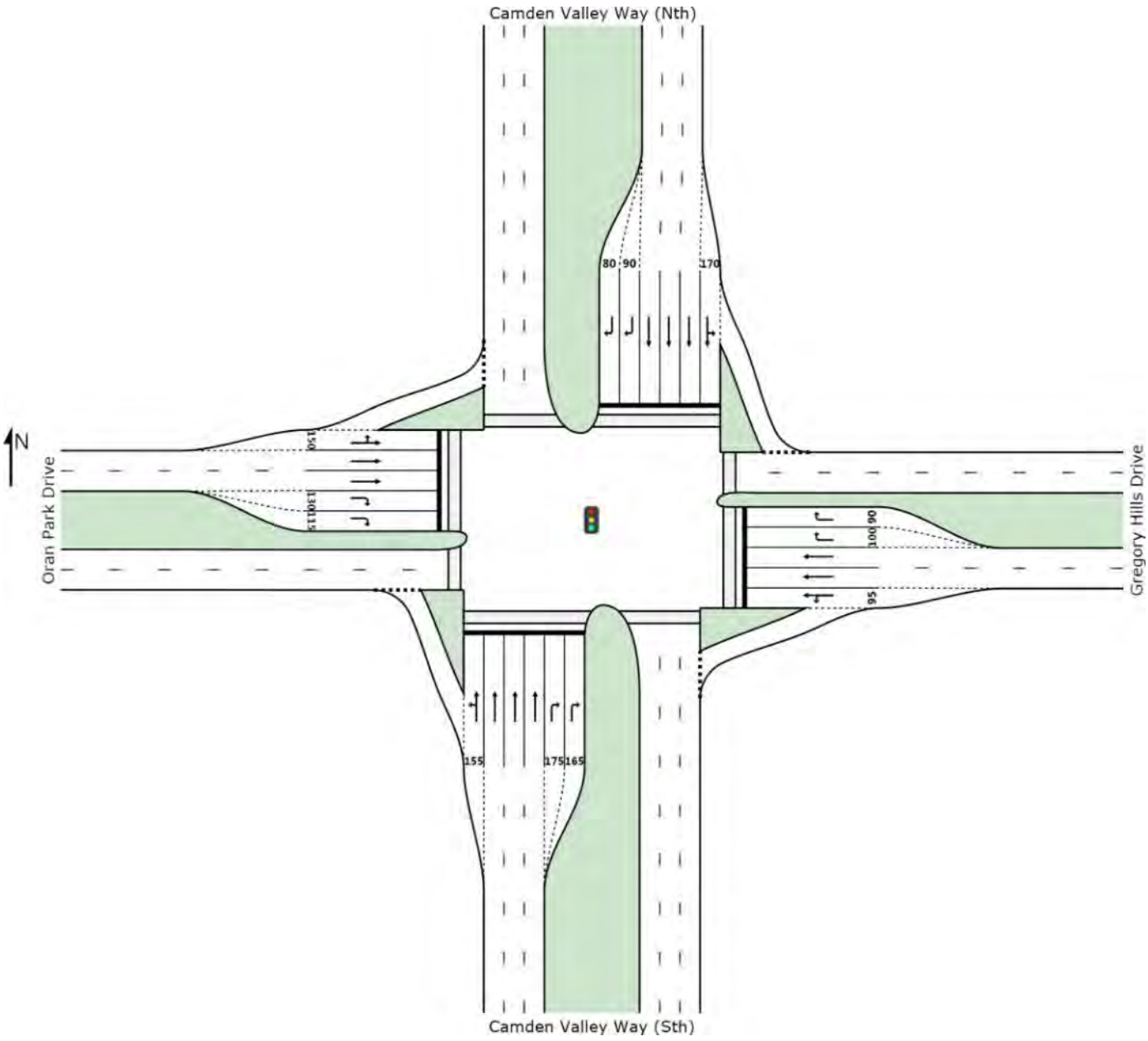


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	343	2.0	343	2.0	0.294	17.4	LOS B	9.4	66.7	0.48	0.73	53.7
2	T1	1947	3.4	1947	3.4	1.025	66.0	LOS E	56.8	409.5	1.00	1.10	35.8
3	R2	455	4.0	455	4.0	1.118	148.3	LOS F	23.2	167.8	1.00	1.09	9.0
Approach		2745	3.4	2745	3.4	1.118	73.6	LOS F	56.8	409.5	0.94	1.05	31.0
East: Gregory Hills Drive													
4	L2	660	6.4	660	6.4	0.685	20.9	LOS B	26.0	192.1	0.70	0.81	45.3
5	T1	548	3.1	548	3.1	1.268	203.7	LOS F	33.0	237.1	1.00	1.30	15.0
6	R2	865	2.5	865	2.5	1.523	322.6	LOS F	63.3	453.0	1.00	1.42	11.2
Approach		2073	3.9	2073	3.9	1.523	195.1	LOS F	63.3	453.0	0.90	1.19	15.1
North: Camden Valley Way (Nth)													
7	L2	437	4.6	437	4.6	0.353	15.7	LOS B	10.2	74.2	0.42	0.74	55.7
8	T1	1593	3.5	1593	3.5	0.698	27.4	LOS B	27.3	197.1	0.72	0.64	52.8
9	R2	773	1.8	773	1.8	1.238	164.9	LOS F	32.7	232.7	1.00	1.16	22.2
Approach		2803	3.2	2803	3.2	1.238	63.5	LOS E	32.7	232.7	0.75	0.80	36.3
West: Oran Park Drive													
10	L2	742	4.0	742	4.0	0.972	75.1	LOS F	48.6	351.8	1.00	1.13	35.3
11	T1	766	2.9	766	2.9	1.768	427.7	LOS F	62.7	449.8	1.00	1.63	5.4
12	R2	368	4.9	368	4.9	0.664	67.9	LOS E	12.1	88.3	0.99	0.83	31.3
Approach		1876	3.7	1876	3.7	1.768	217.7	LOS F	62.7	449.8	1.00	1.27	14.1
All Vehicles		9497	3.5	9497	3.5	1.768	125.6	LOS F	63.3	453.0	0.89	1.05	22.1

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	38.7	LOS D	0.2	0.2	0.74	0.74
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	49.8	LOS E	0.2	0.2	0.84	0.84
All Pedestrians		211	54.3	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

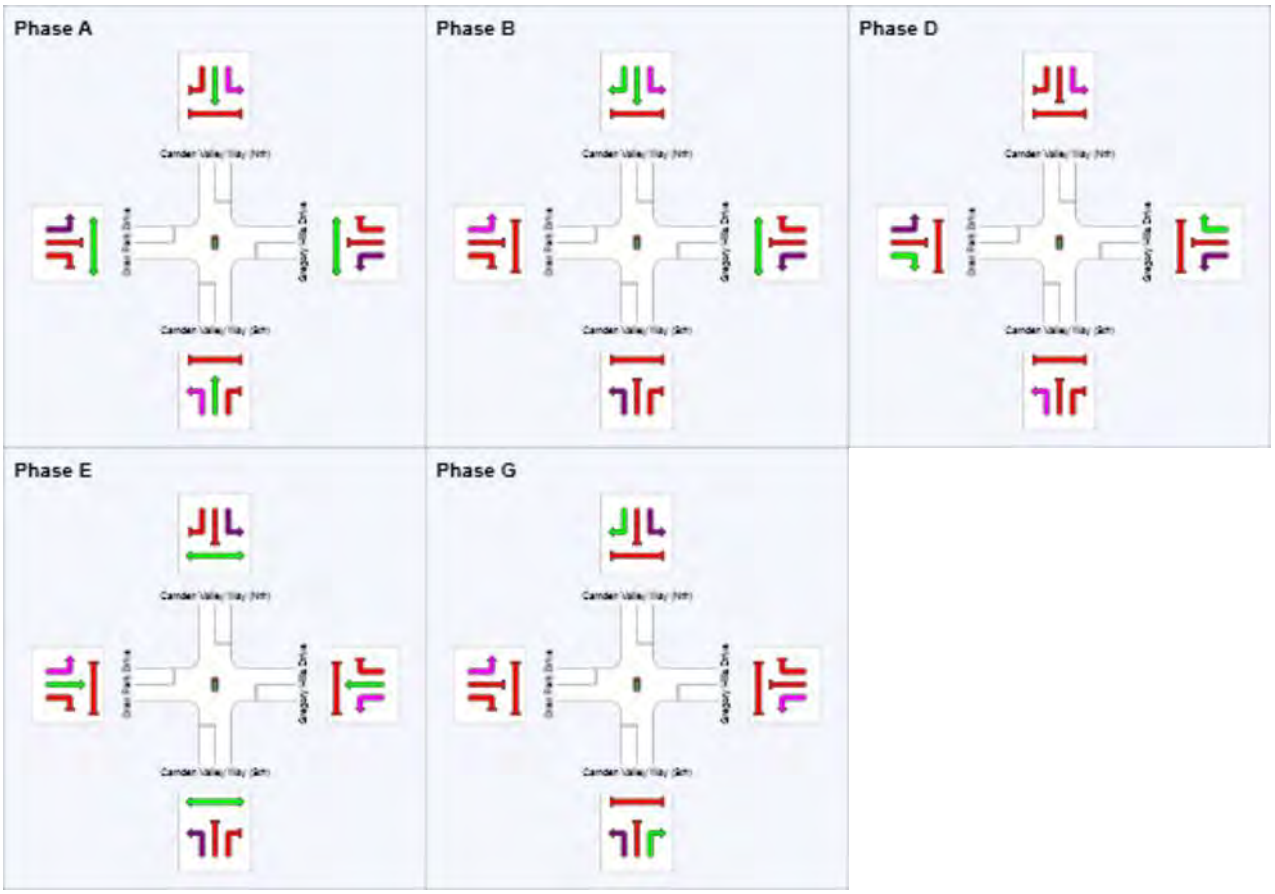
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, D, E, G
Output Sequence: A, B, D, E, G

Phase Timing Results

Phase	A	B	D	E	G
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	54	68	96	118
Green Time (sec)	48	8	22	16	16
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	54	14	28	22	22
Phase Split	39 %	10 %	20 %	16 %	16 %



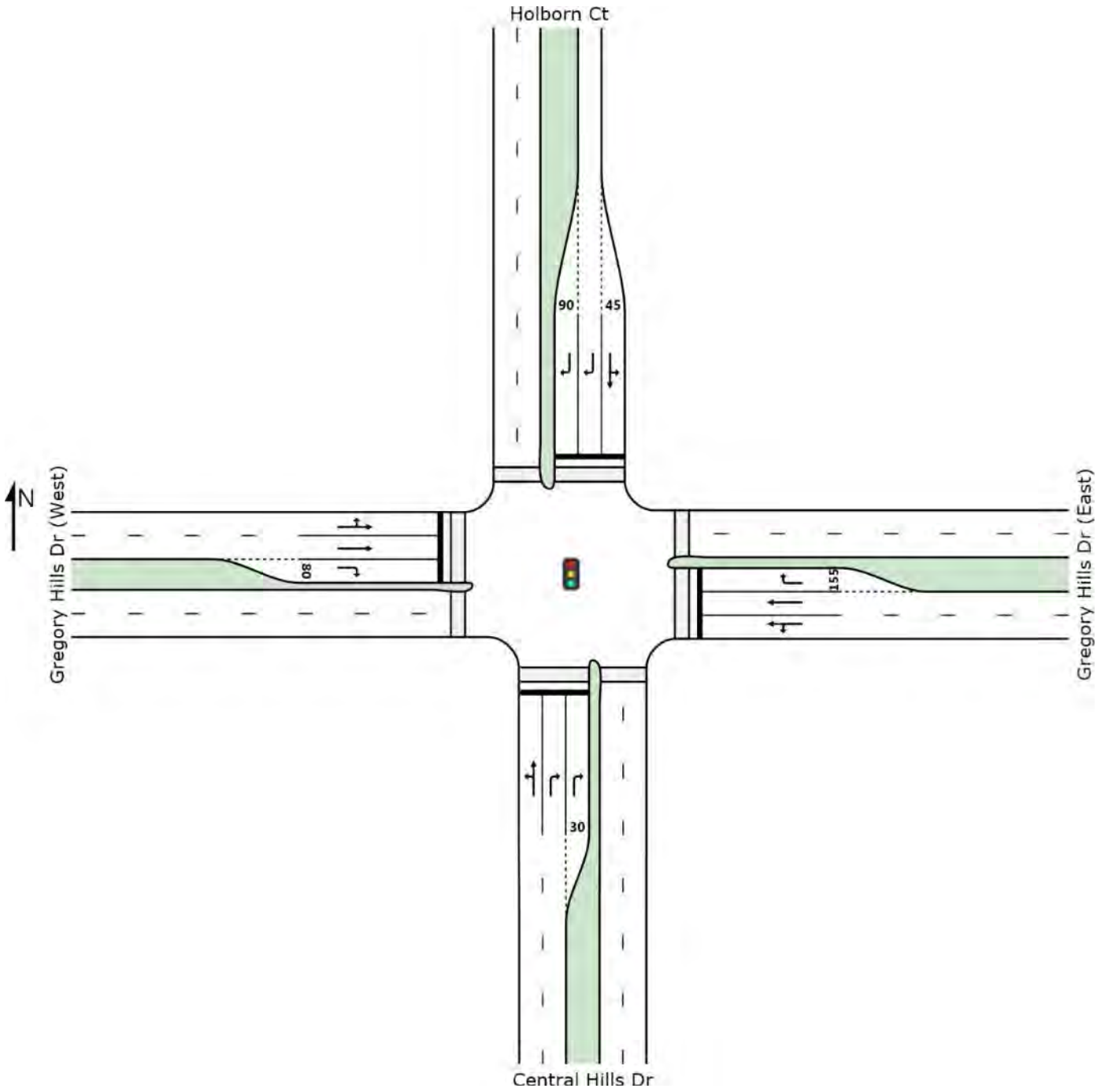
Normal Movement		Permitted/Opposed	
Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane	
Stopped Movement		Turn On Red	
Other Movement Class Running		Other Movement Class Stopped	
Mixed Running & Stopped Movement Classes			
Undetected Movement		Phase Transition Applied	

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	91	7.7	91	7.7	0.379	63.4	LOS E	6.5	47.8	0.94	0.78	6.9
2	T1	13	0.0	13	0.0	0.379	57.8	LOS E	6.5	47.8	0.94	0.78	14.0
3	R2	50	18.0	50	18.0	0.425	83.4	LOS F	1.8	14.7	1.00	0.71	5.4
Approach		154	10.4	154	10.4	0.425	69.4	LOS E	6.5	47.8	0.96	0.76	7.0
East: Gregory Hills Dr (East)													
4	L2	221	10.4	221	10.4	0.631	24.5	LOS B	29.6	222.7	0.68	0.69	41.5
5	T1	1193	7.7	1193	7.7	0.631	18.3	LOS B	30.3	226.3	0.69	0.66	41.5
6	R2	113	0.0	113	0.0	0.309	20.1	LOS B	3.6	25.4	0.66	0.76	43.1
Approach		1527	7.5	1527	7.5	0.631	19.3	LOS B	30.3	226.3	0.68	0.67	41.6
North: Holborn Ct													
7	L2	14	14.3	14	14.3	0.082	64.1	LOS E	1.1	8.4	0.91	0.69	9.5
8	T1	4	0.0	4	0.0	0.082	58.4	LOS E	1.1	8.4	0.91	0.69	14.0
9	R2	36	11.1	36	11.1	0.293	82.3	LOS F	1.3	9.9	1.00	0.70	7.6
Approach		54	11.1	54	11.1	0.293	75.8	LOS F	1.3	9.9	0.97	0.69	8.5
West: Gregory Hills Dr (West)													
10	L2	241	9.5	222	10.3	0.592	23.3	LOS B	25.9	200.0	0.65	0.67	39.5
11	T1	1007	11.7	931	12.7	0.592	16.3	LOS B	25.9	200.0	0.62	0.59	38.4
12	R2	208	12.0	192	13.0	0.665	42.2	LOS C	10.7	83.1	1.00	0.94	26.3
Approach		1456	11.4	1345 N1	12.3	0.665	21.1	LOS B	25.9	200.0	0.68	0.65	35.9
All Vehicles		3191	9.5	3080 N1	9.8	0.665	23.6	LOS B	30.3	226.3	0.70	0.67	35.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	2	16.5	LOS B	0.0	0.0	0.49	0.49
P2	East Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	17.0	LOS B	0.0	0.0	0.49	0.49
P4	West Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		5	35.7	LOS D			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

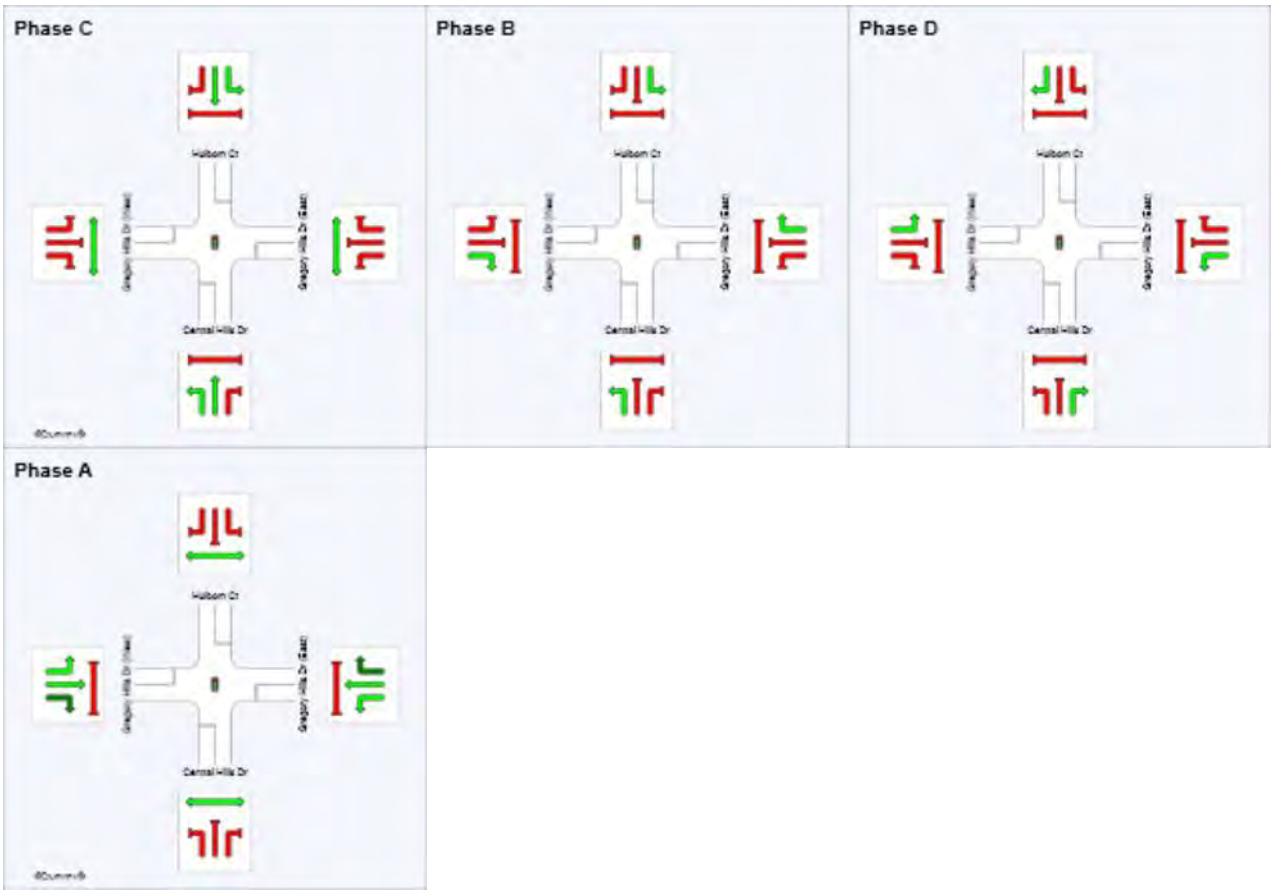
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	91	108	129	0
Green Time (sec)	11	15	5	85
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	21	11	91
Phase Split	12 %	15 %	8 %	65 %

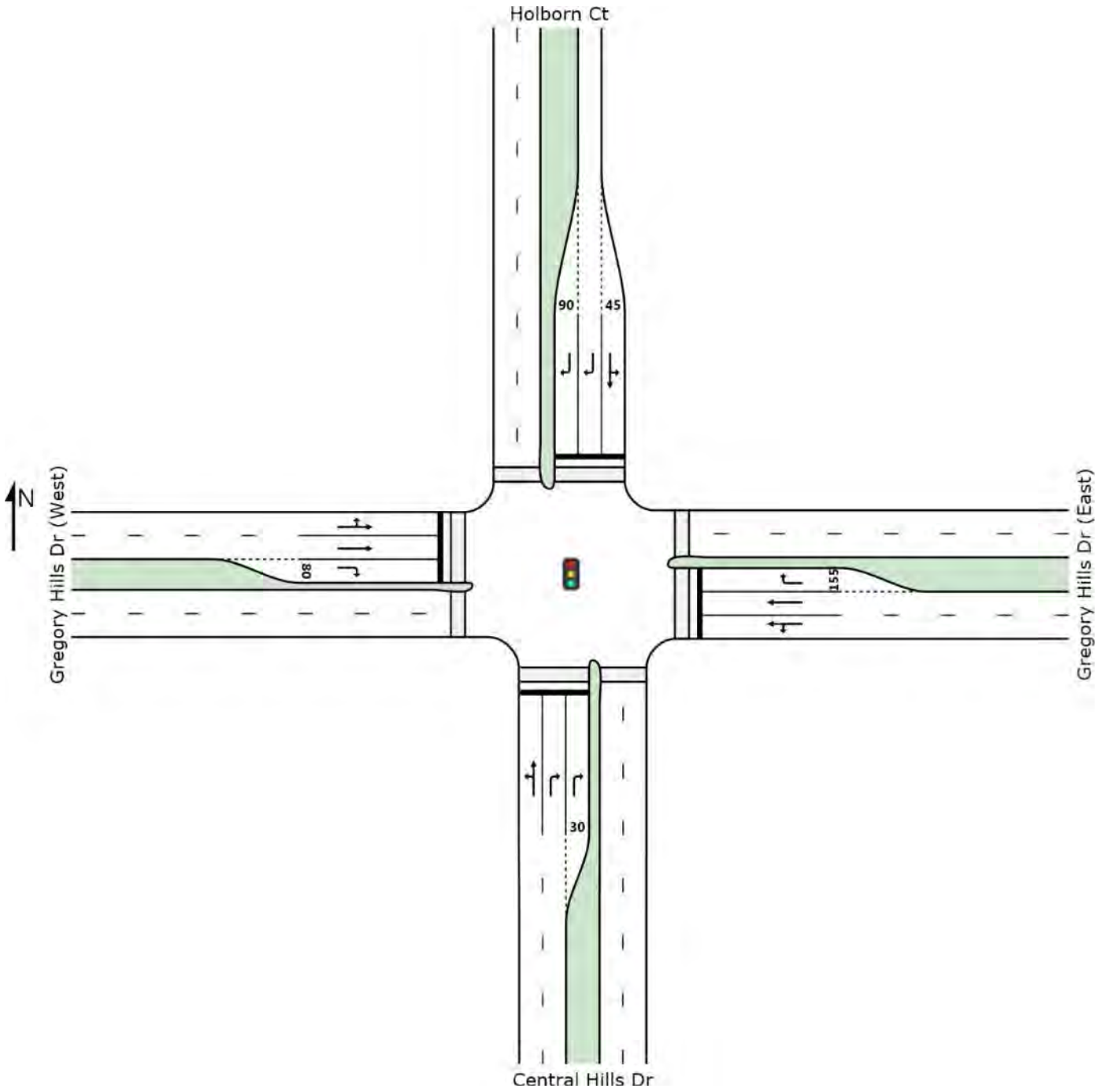


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	110	0.9	110	0.9	0.460	61.5	LOS E	6.8	48.2	0.96	0.79	7.0
2	T1	5	0.0	5	0.0	0.460	56.0	LOS D	6.8	48.2	0.96	0.79	14.2
3	R2	16	0.0	16	0.0	0.093	72.8	LOS F	0.5	3.6	0.98	0.66	6.1
Approach		131	0.8	131	0.8	0.460	62.7	LOS E	6.8	48.2	0.96	0.77	7.2
East: Gregory Hills Dr (East)													
4	L2	236	8.1	236	8.1	0.564	19.0	LOS B	22.7	167.9	0.59	0.63	45.8
5	T1	998	5.8	998	5.8	0.564	13.1	LOS A	22.7	167.9	0.59	0.58	46.4
6	R2	111	0.0	111	0.0	0.675	39.1	LOS C	6.2	43.5	1.00	0.88	32.7
Approach		1345	5.7	1345	5.7	0.675	16.3	LOS B	22.7	167.9	0.63	0.61	44.4
North: Holborn Ct													
7	L2	38	0.0	38	0.0	0.241	63.3	LOS E	2.8	19.9	0.95	0.74	9.6
8	T1	10	0.0	10	0.0	0.241	57.8	LOS E	2.8	19.9	0.95	0.74	14.0
9	R2	136	2.2	136	2.2	0.888	85.1	LOS F	5.4	38.7	1.00	0.91	7.4
Approach		184	1.6	184	1.6	0.888	79.1	LOS F	5.4	38.7	0.99	0.87	8.1
West: Gregory Hills Dr (West)													
10	L2	254	0.0	210	0.0	0.743	22.4	LOS B	38.2	275.6	0.73	0.72	41.5
11	T1	1761	4.5	1462	4.7	0.743	15.2	LOS B	38.2	275.6	0.69	0.65	39.9
12	R2	242	3.3	201	3.5	0.849	48.3	LOS D	12.8	92.3	0.99	0.98	24.4
Approach		2257	3.9	1874 N1	4.0	0.849	19.5	LOS B	38.2	275.6	0.72	0.69	37.1
All Vehicles		3917	4.3	3534 N1	4.8	0.888	23.0	LOS B	38.2	275.6	0.71	0.68	35.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	13.4	LOS B	0.1	0.1	0.45	0.45
P2	East Full Crossing	53	59.3	LOS E	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	13.9	LOS B	0.1	0.1	0.46	0.46
P4	West Full Crossing	53	59.3	LOS E	0.2	0.2	0.96	0.96
All Pedestrians		211	36.5	LOS D			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

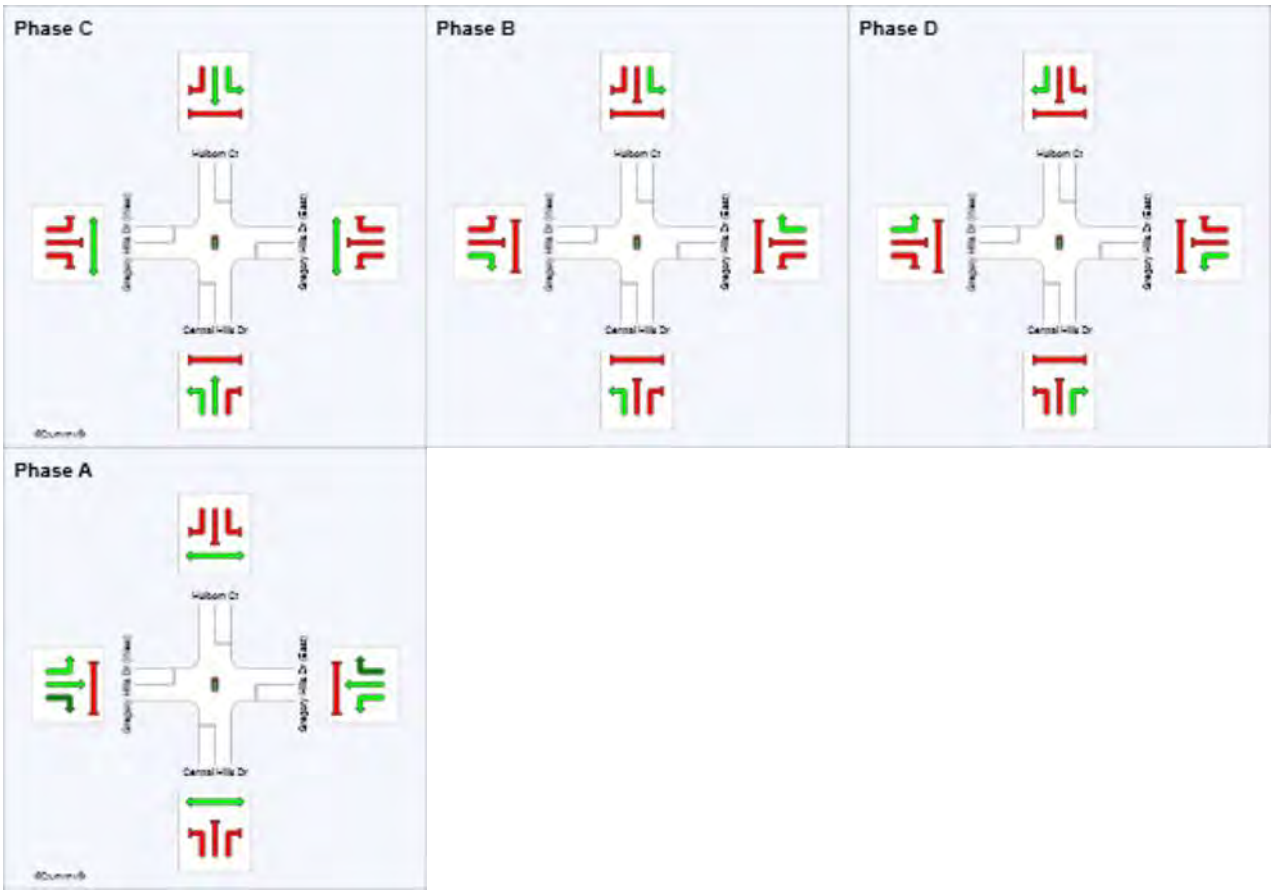
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	90	107	118	0
Green Time (sec)	11	5	6	84
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	11	12	90
Phase Split	13 %	8 %	9 %	69 %

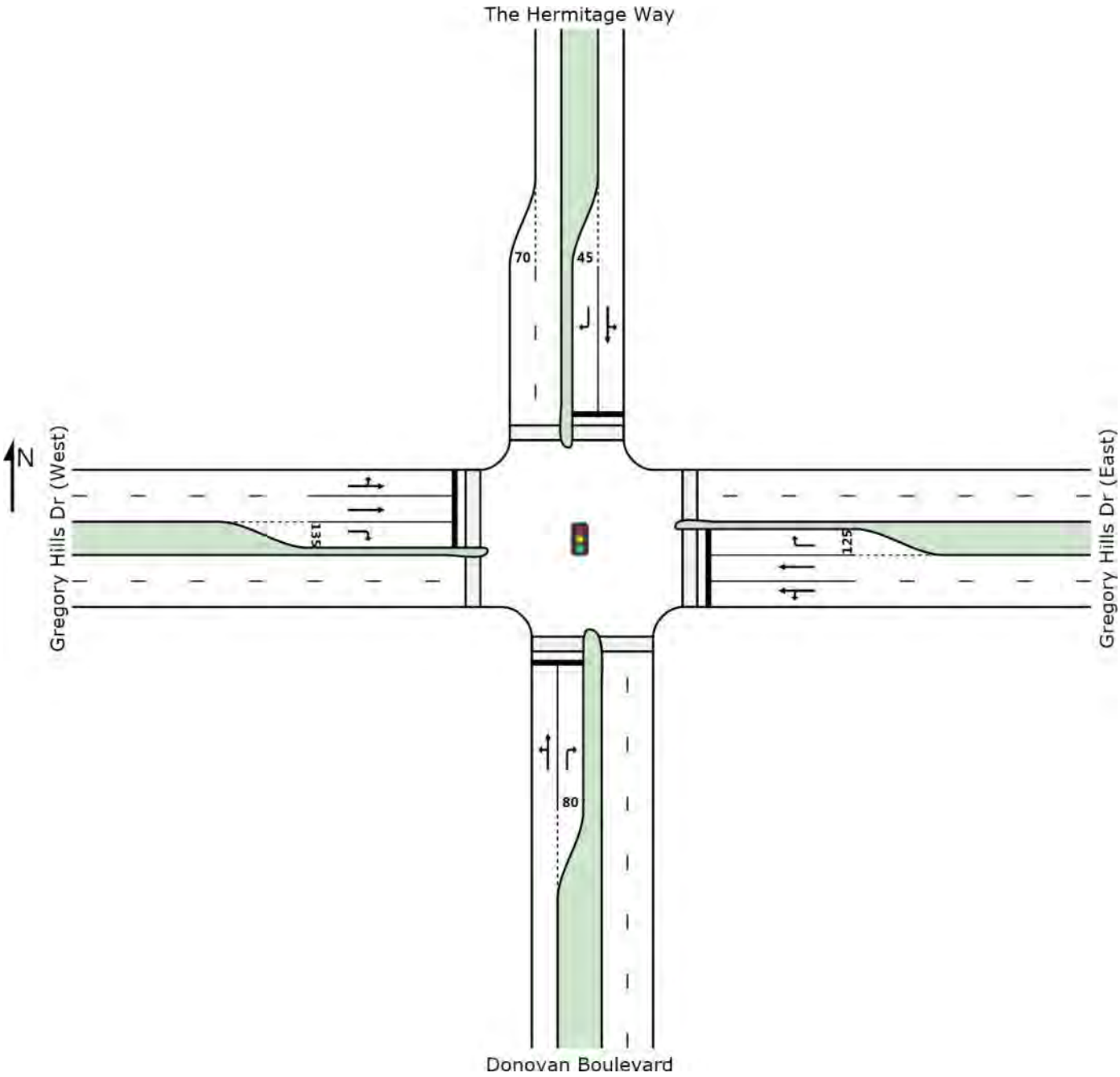


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	332	3.0	332	3.0	0.797	42.3	LOS C	17.8	127.1	0.99	0.92	21.6
2	T1	67	0.0	67	0.0	0.797	36.8	LOS C	17.8	127.1	0.99	0.92	31.4
3	R2	80	0.0	80	0.0	0.204	32.2	LOS C	2.8	19.4	0.82	0.73	38.6
Approach		479	2.1	479	2.1	0.797	39.9	LOS C	17.8	127.1	0.96	0.89	26.6
East: Gregory Hills Dr (East)													
4	L2	56	0.0	56	0.0	0.809	36.0	LOS C	24.8	187.3	0.95	0.91	39.8
5	T1	1110	10.3	1110	10.3	0.809	29.9	LOS C	24.8	187.3	0.96	0.91	33.2
6	R2	198	0.0	198	0.0	0.596	23.2	LOS B	4.6	32.2	0.91	0.81	43.6
Approach		1364	8.4	1364	8.4	0.809	29.2	LOS C	24.8	188.1	0.95	0.90	35.4
North: The Hermitage Way													
7	L2	13	0.0	13	0.0	0.049	34.4	LOS C	0.7	5.0	0.80	0.65	38.4
8	T1	8	0.0	8	0.0	0.049	28.9	LOS C	0.7	5.0	0.80	0.65	35.1
9	R2	27	18.5	27	18.5	0.091	31.5	LOS C	0.9	7.3	0.79	0.68	25.6
Approach		48	10.4	48	10.4	0.091	31.9	LOS C	0.9	7.3	0.80	0.67	31.8
West: Gregory Hills Dr (West)													
10	L2	138	8.7	129	9.3	0.673	30.5	LOS C	17.5	134.8	0.88	0.80	42.0
11	T1	887	12.1	829	12.9	0.673	24.4	LOS B	17.5	134.8	0.88	0.79	47.8
12	R2	132	15.2	124	16.2	0.460	25.1	LOS B	2.8	22.2	0.92	0.79	42.3
Approach		1157	12.0	1081 N1	12.9	0.673	25.2	LOS B	17.5	135.3	0.89	0.79	46.5
All Vehicles		3048	8.8	2972 N1	9.0	0.809	29.5	LOS C	24.8	188.1	0.93	0.85	38.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	28.0	LOS C	0.0	0.0	0.79	0.79
P2	East Full Crossing	8	39.2	LOS D	0.0	0.0	0.93	0.93
P3	North Full Crossing	1	24.9	LOS C	0.0	0.0	0.74	0.74
P4	West Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
All Pedestrians		12	36.9	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

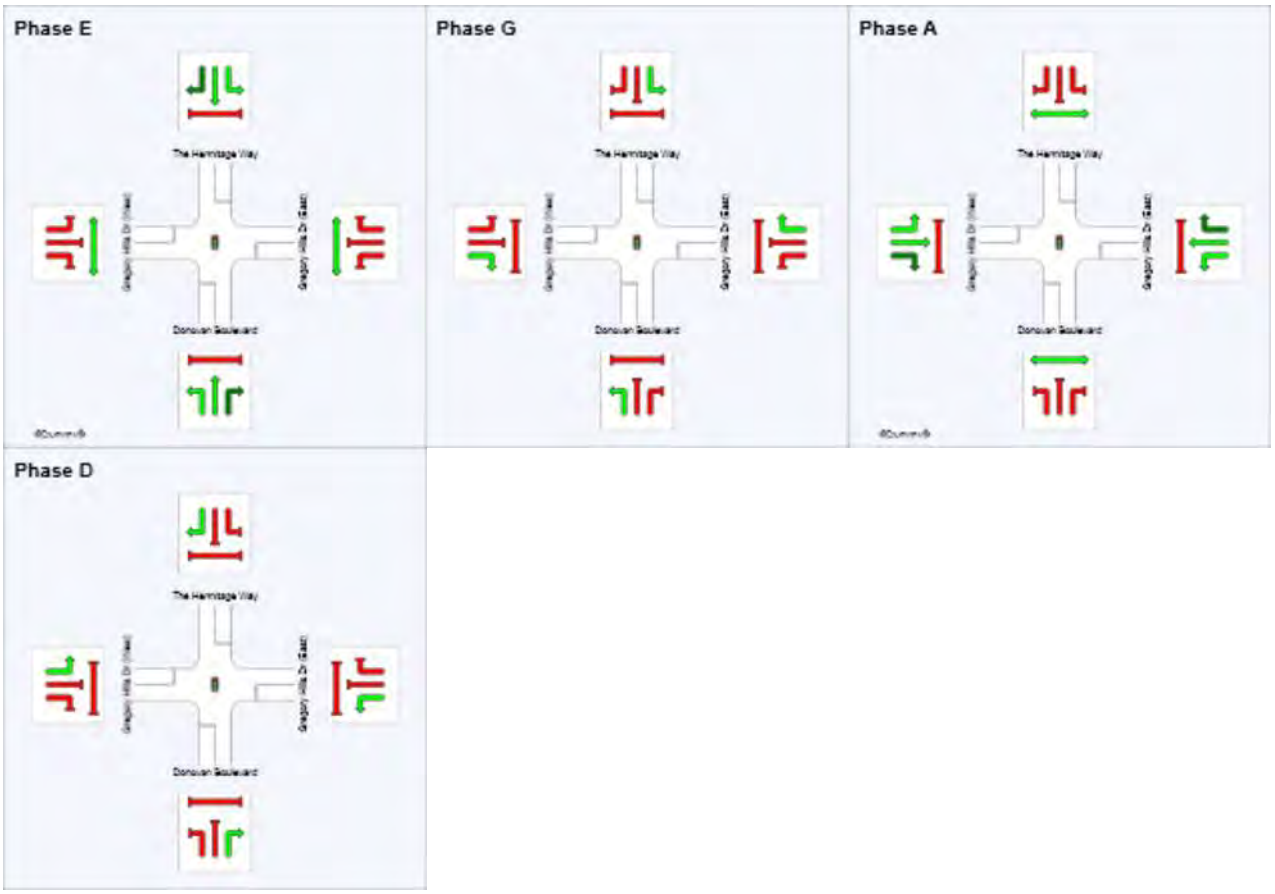
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: E, G, A, D
Output Sequence: E, G, A, D

Phase Timing Results

Phase	E	G	A	D
Reference Phase	No	No	Yes	No
Phase Change Time (sec)	52	75	0	41
Green Time (sec)	17	9	35	5
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	23	15	41	11
Phase Split	26 %	17 %	46 %	12 %

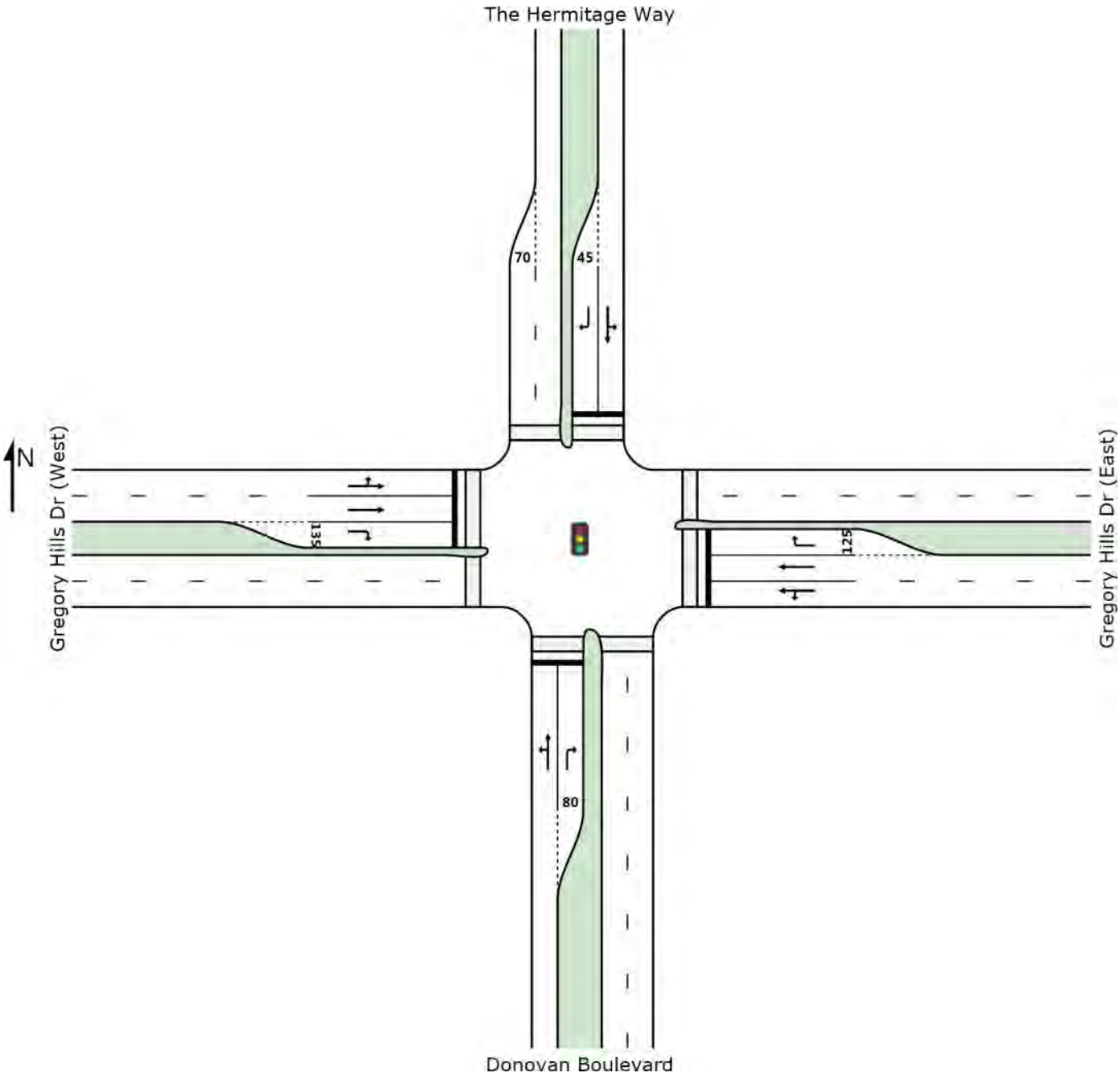


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	137	1.5	137	1.5	0.754	72.9	LOS F	12.2	86.1	1.00	0.87	14.7
2	T1	38	0.0	38	0.0	0.754	67.4	LOS E	12.2	86.1	1.00	0.87	23.3
3	R2	54	0.0	54	0.0	0.518	89.3	LOS F	4.2	29.3	1.00	0.85	23.0
Approach		229	0.9	229	0.9	0.754	75.9	LOS F	12.2	86.1	1.00	0.86	18.7
East: Gregory Hills Dr (East)													
4	L2	53	0.0	53	0.0	0.428	17.5	LOS B	16.2	122.5	0.50	0.48	51.5
5	T1	1001	10.1	1001	10.1	0.428	11.4	LOS A	16.5	125.2	0.50	0.47	49.0
6	R2	170	10.0	170	10.0	0.690	47.2	LOS D	9.7	73.9	1.00	0.96	32.9
Approach		1224	9.6	1224	9.6	0.690	16.6	LOS B	16.5	125.2	0.57	0.54	44.6
North: The Hermitage Way													
7	L2	32	0.0	32	0.0	0.333	70.5	LOS F	3.9	27.5	0.97	0.75	27.0
8	T1	28	0.0	28	0.0	0.333	65.0	LOS E	3.9	27.5	0.97	0.75	24.1
9	R2	17	0.0	17	0.0	0.124	78.5	LOS F	1.3	8.9	0.95	0.68	13.8
Approach		77	0.0	77	0.0	0.333	70.3	LOS E	3.9	27.5	0.97	0.74	23.3
West: Gregory Hills Dr (West)													
10	L2	316	7.0	277	7.0	0.824	24.3	LOS B	51.2	371.0	0.80	0.79	45.7
11	T1	1680	2.9	1470	2.9	0.824	16.4	LOS B	51.2	371.0	0.69	0.67	53.1
12	R2	395	4.6	346	4.6	0.861	42.0	LOS C	22.4	162.8	1.00	0.98	34.9
Approach		2391	3.7	2092 N1	3.8	0.861	21.7	LOS B	51.2	371.0	0.76	0.73	48.4
All Vehicles		3921	5.3	3622 N1	5.8	0.861	24.4	LOS B	51.2	371.0	0.71	0.68	43.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	14.2	LOS B	0.0	0.0	0.45	0.45
P2	East Full Crossing	3	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	12.4	LOS B	0.0	0.0	0.42	0.42
P4	West Full Crossing	2	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		7	49.6	LOS E			0.81	0.81

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

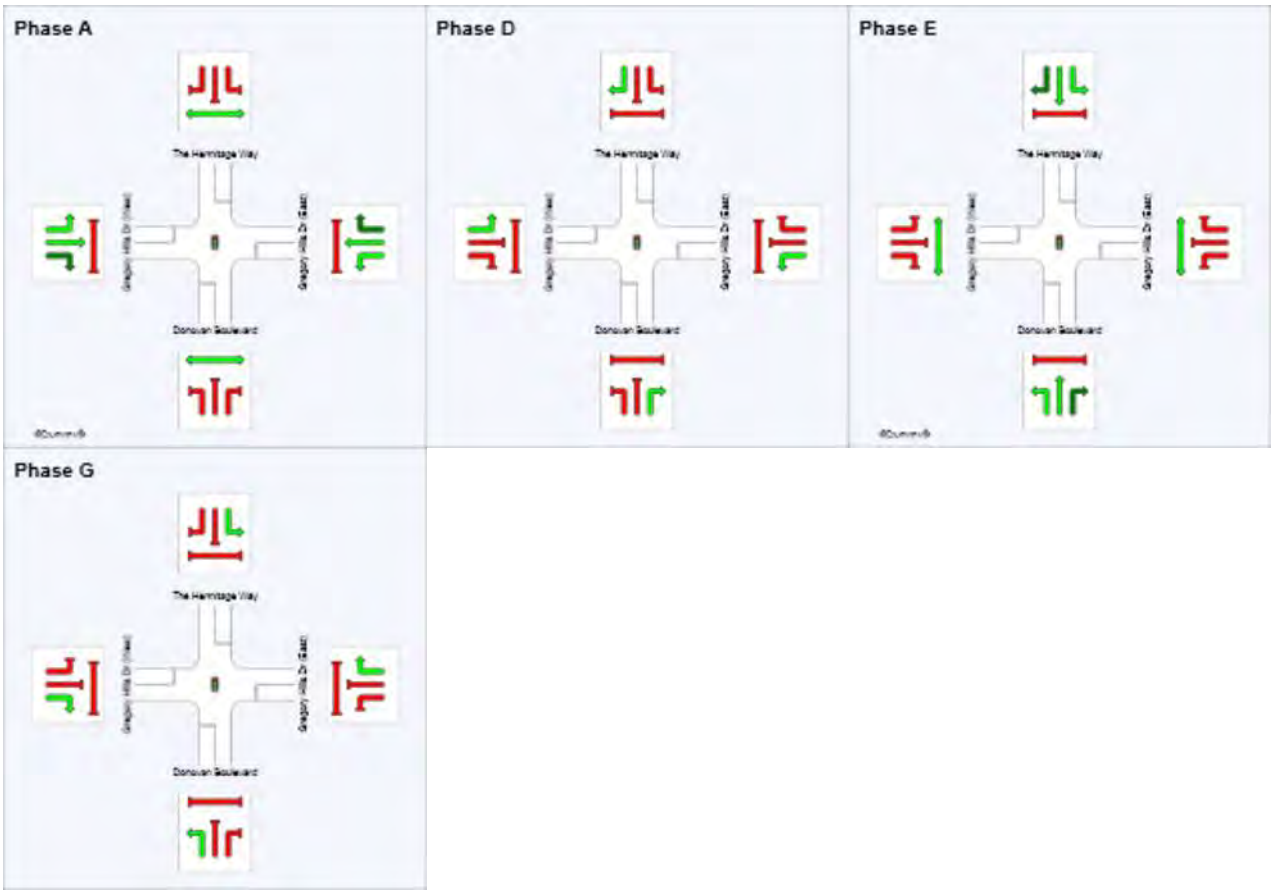
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	99	104	121
Green Time (sec)	93	1	11	13
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	97	7	17	19
Phase Split	69 %	5 %	12 %	14 %



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

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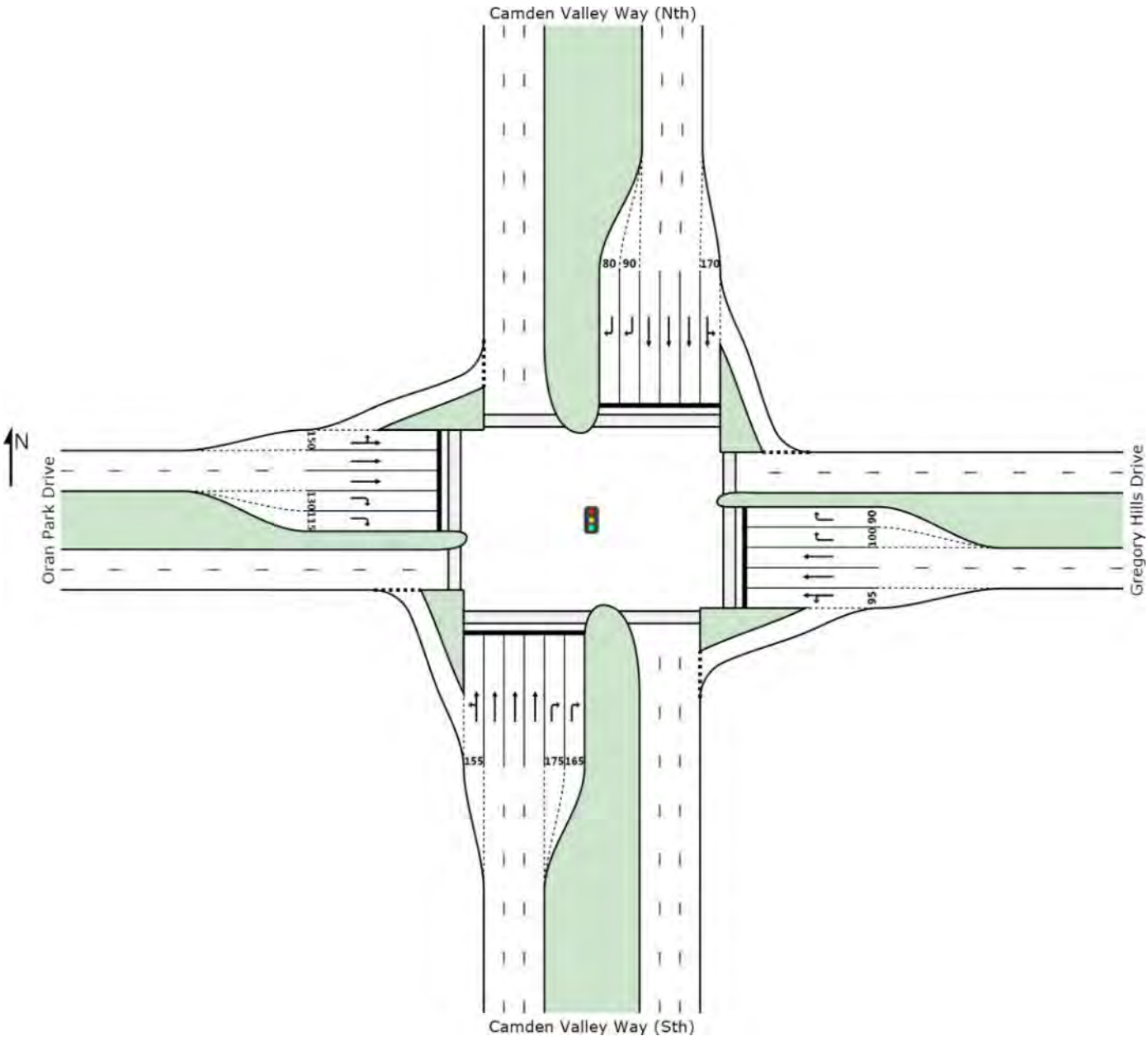
Scenario 6a – 2036 Without Development

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	280	12.5	280	12.5	0.253	15.4	LOS B	6.9	53.1	0.42	0.71	54.5
2	T1	2330	6.3	2330	6.3	1.134	104.0	LOS F	81.3	600.2	1.00	1.28	27.1
3	R2	342	12.0	342	12.0	0.809	78.2	LOS F	12.3	95.2	1.00	0.89	15.5
Approach		2952	7.6	2952	7.6	1.134	92.6	LOS F	81.3	600.2	0.94	1.18	27.5
East: Gregory Hills Drive													
4	L2	525	10.5	525	10.5	0.501	17.0	LOS B	16.4	125.2	0.56	0.75	47.6
5	T1	271	7.4	271	7.4	0.721	59.4	LOS E	16.6	115.9	0.99	0.84	33.9
6	R2	696	6.6	696	6.6	1.479	304.1	LOS F	49.6	367.1	1.00	1.39	11.8
Approach		1492	8.1	1492	8.1	1.479	158.6	LOS F	49.6	367.1	0.84	1.07	17.6
North: Camden Valley Way (Nth)													
7	L2	423	10.6	423	10.6	0.393	19.0	LOS B	12.1	92.6	0.51	0.77	52.4
8	T1	1290	8.4	1290	8.4	0.620	33.7	LOS C	20.8	155.9	0.77	0.68	49.1
9	R2	440	8.2	440	8.2	1.002	107.8	LOS F	19.3	144.6	1.00	1.01	29.2
Approach		2153	8.8	2153	8.8	1.002	45.9	LOS D	20.8	155.9	0.76	0.76	42.1
West: Oran Park Drive													
10	L2	1065	2.1	1065	2.1	1.442	239.5	LOS F	126.6	902.1	1.00	1.33	16.8
11	T1	668	10.9	668	10.9	1.709	361.3	LOS F	95.4	668.0	0.99	1.66	8.1
12	R2	314	7.0	314	7.0	0.670	70.8	LOS F	10.5	78.3	1.00	0.83	30.4
Approach		2047	5.7	2047	5.7	1.709	253.4	LOS F	126.6	902.1	1.00	1.36	13.3
All Vehicles		8644	7.5	8644	7.5	1.709	130.4	LOS F	126.6	902.1	0.89	1.10	21.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	44.9	LOS E	0.2	0.2	0.80	0.80
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	44.9	LOS E	0.2	0.2	0.80	0.80
All Pedestrians		211	54.6	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

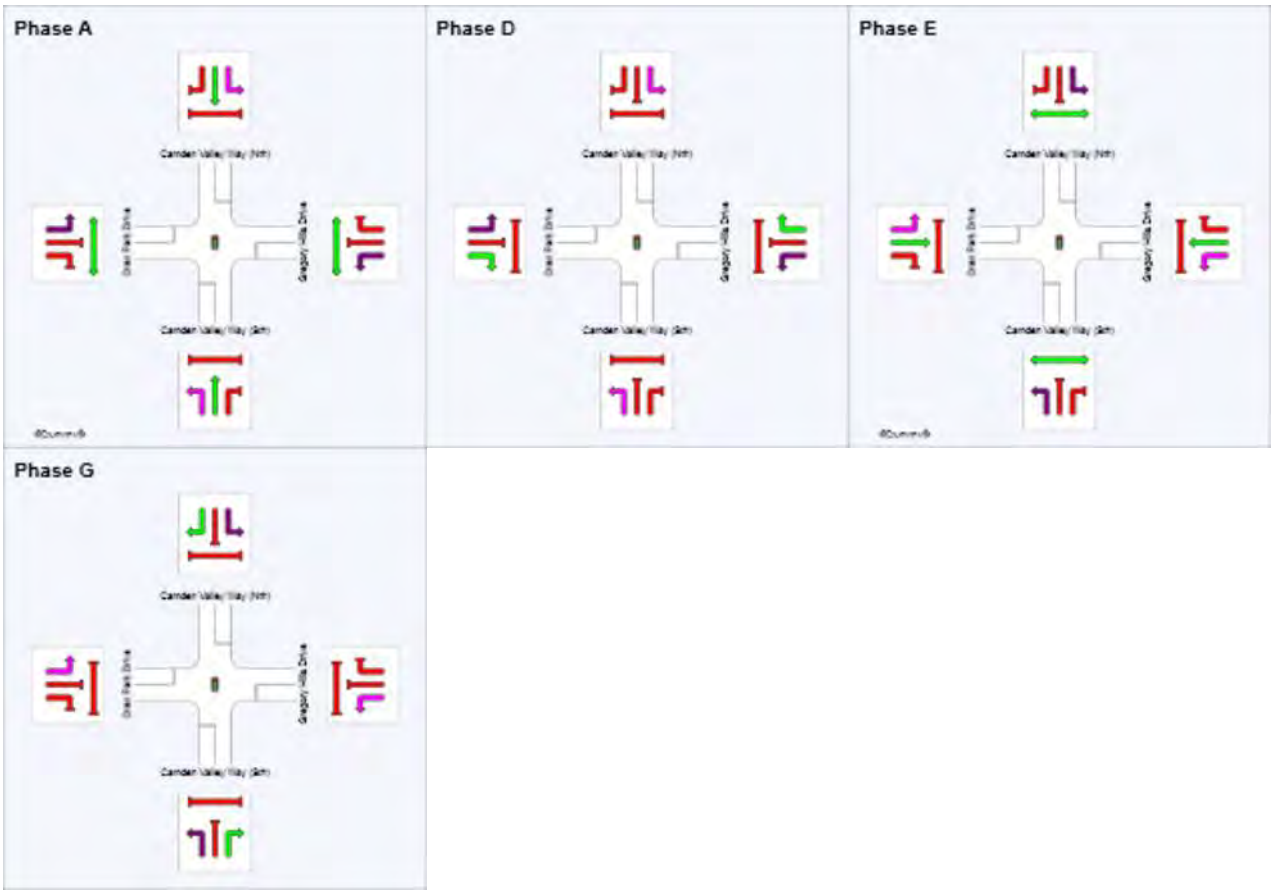
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS - No phase B
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	60	85	116
Green Time (sec)	54	19	25	18
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	60	25	31	24
Phase Split	43 %	18 %	22 %	17 %

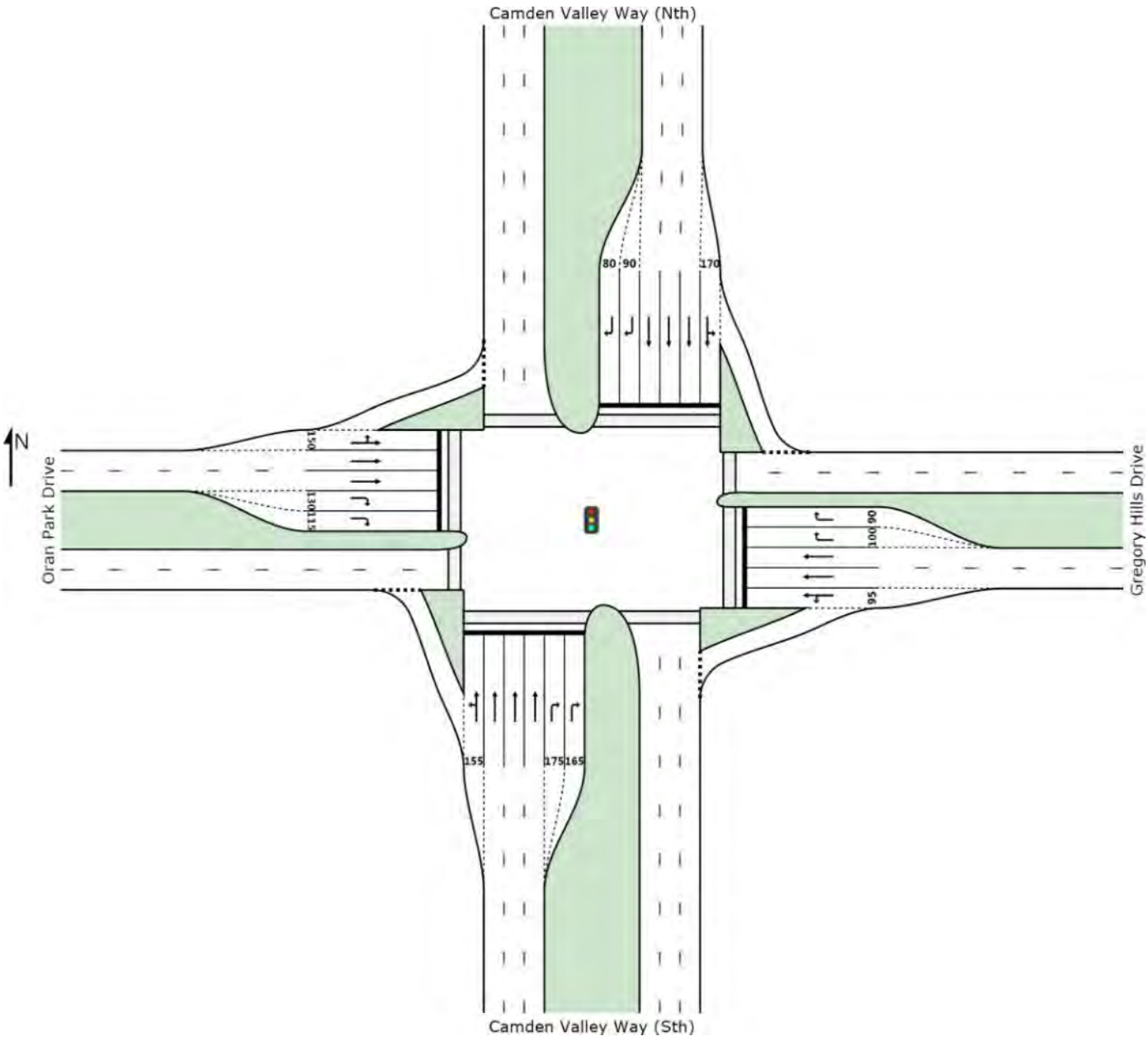


Normal Movement
Slip/Bypass-Lane Movement
Stopped Movement
Other Movement Class Running
Mixed Running & Stopped Movement Classes
Undetected Movement
Permitted/Opposed
Opposed Slip/Bypass-Lane
Turn On Red
Other Movement Class Stopped
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



Organisation: MOTT MACDONALD | Created: 09 December 2016 09:55:39
Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 6 - 2036 Sensitivity Test\Scenario 6a - 161208 2036 Without Development v2.sip6

MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	367	2.2	367	2.2	0.322	18.5	LOS B	10.6	75.7	0.51	0.74	52.9
2	T1	2109	3.5	2109	3.5	1.150	116.2	LOS F	73.4	528.8	1.00	1.28	25.2
3	R2	496	4.0	496	4.0	1.219	190.7	LOS F	28.5	206.4	1.00	1.16	7.2
Approach		2972	3.4	2972	3.4	1.219	116.6	LOS F	73.4	528.8	0.94	1.20	22.9
East: Gregory Hills Drive													
4	L2	762	6.6	754	6.6	0.815	27.5	LOS B	35.3	261.0	0.85	0.88	41.1
5	T1	601	3.3	595	3.3	1.298	216.6	LOS F	36.9	265.4	1.00	1.34	14.3
6	R2	1003	2.5	992	2.5	1.746	423.6	LOS F	80.9	578.1	1.00	1.53	8.9
Approach		2366	4.0	2341 N1	4.0	1.746	243.4	LOS F	80.9	578.1	0.95	1.27	12.6
North: Camden Valley Way (Nth)													
7	L2	478	4.8	478	4.8	0.391	16.6	LOS B	11.4	83.3	0.45	0.76	54.7
8	T1	1734	3.5	1734	3.5	0.770	29.7	LOS C	32.4	233.3	0.78	0.70	51.4
9	R2	820	1.8	820	1.8	1.261	175.2	LOS F	36.1	256.9	1.00	1.18	21.3
Approach		3032	3.2	3032	3.2	1.261	67.0	LOS E	36.1	256.9	0.79	0.84	35.2
West: Oran Park Drive													
10	L2	815	4.0	815	4.0	1.033	71.4	LOS F	59.6	432.0	1.00	1.05	36.3
11	T1	904	2.9	904	2.9	1.964	516.2	LOS F	79.1	567.3	1.00	1.75	4.5
12	R2	393	5.1	393	5.1	0.710	69.2	LOS E	13.2	96.3	1.00	0.85	30.9
Approach		2112	3.7	2112	3.7	1.964	261.4	LOS F	79.1	567.3	1.00	1.31	12.1
All Vehicles		10482	3.6	10457 N1	3.6	1.964	159.8	LOS F	80.9	578.1	0.91	1.13	18.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	39.5	LOS D	0.2	0.2	0.75	0.75
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	51.5	LOS E	0.2	0.2	0.86	0.86
All Pedestrians		211	54.9	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

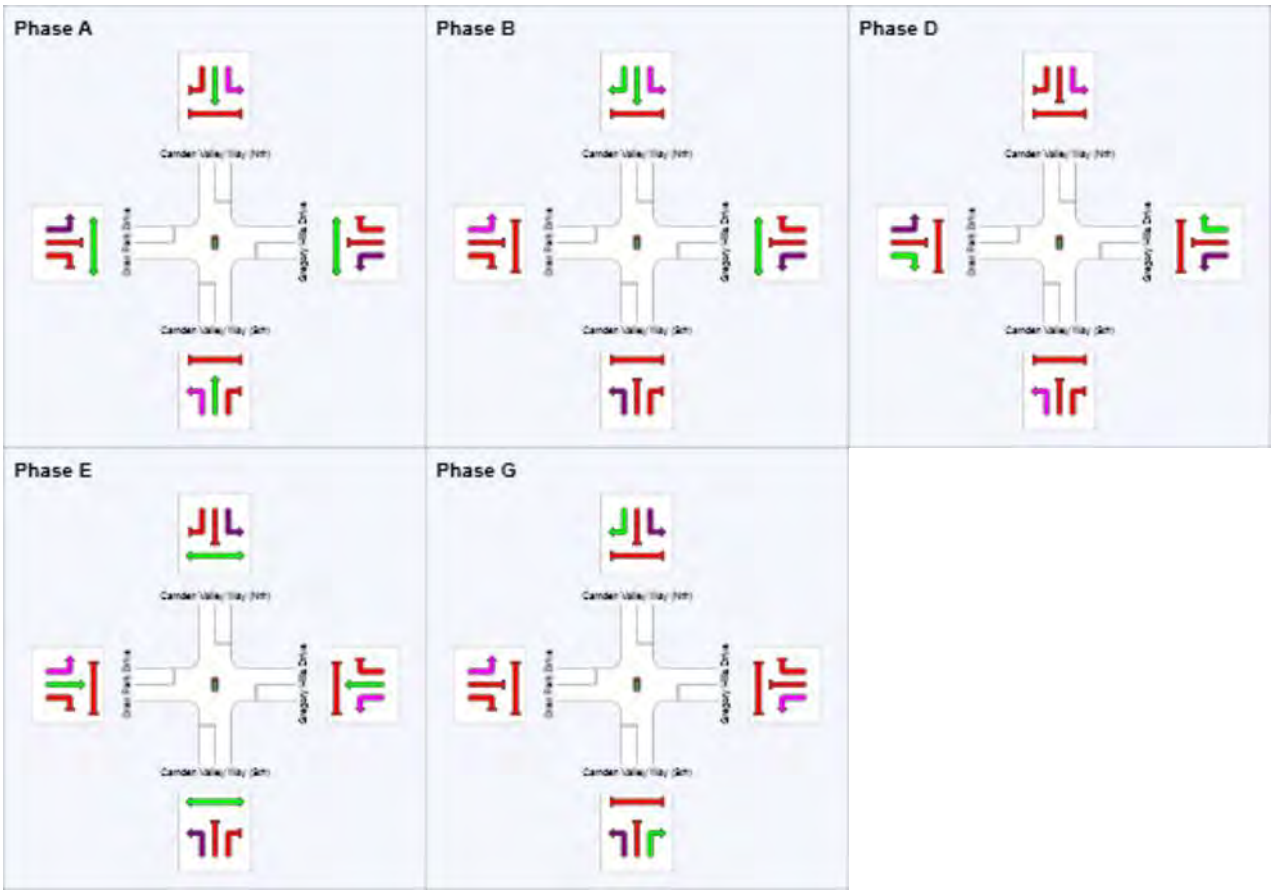
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, D, E, G
Output Sequence: A, B, D, E, G

Phase Timing Results

Phase	A	B	D	E	G
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	52	67	95	118
Green Time (sec)	46	9	22	17	16
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	52	15	28	23	22
Phase Split	37 %	11 %	20 %	16 %	16 %



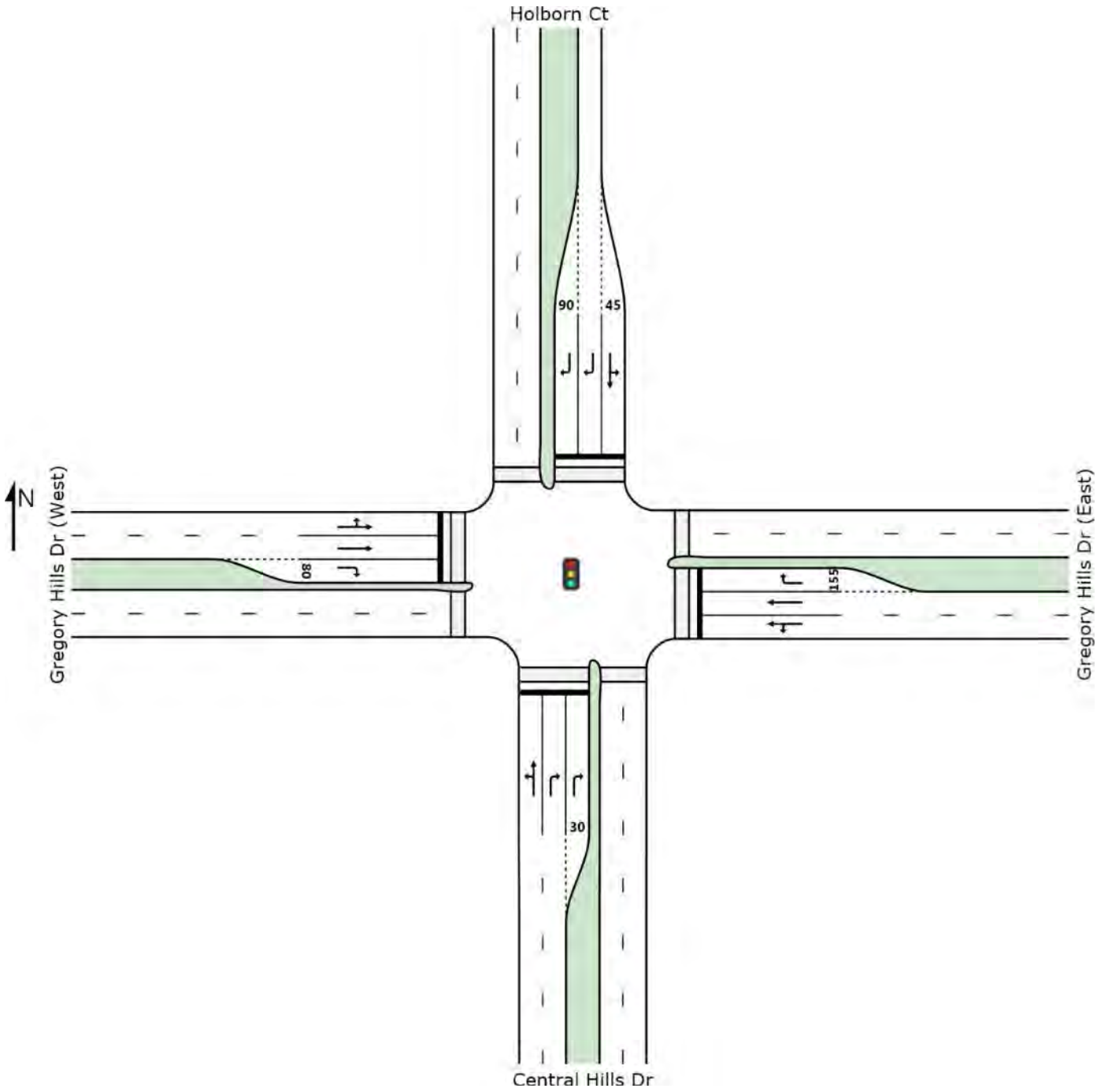
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class Running	Other Movement Class Stopped
Mixed Running & Stopped Movement Classes	
Undetected Movement	Phase Transition Applied

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



Organisation: MOTT MACDONALD | Created: 09 December 2016 09:53:32
Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 6 - 2036 Sensitivity Test\Scenario 6a - 161208 2036 Without Development v2.sip6

MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	98	8.2	98	8.2	0.507	67.4	LOS E	7.8	58.0	0.98	0.79	6.6
2	T1	23	0.0	23	0.0	0.507	61.8	LOS E	7.8	58.0	0.98	0.79	13.4
3	R2	67	16.4	67	16.4	0.705	87.7	LOS F	2.6	20.4	1.00	0.79	5.2
Approach		188	10.1	188	10.1	0.705	74.0	LOS F	7.8	58.0	0.98	0.79	6.9
East: Gregory Hills Dr (East)													
4	L2	272	10.3	272	10.3	0.763	27.2	LOS B	41.4	310.8	0.79	0.77	39.6
5	T1	1371	7.7	1371	7.7	0.763	20.2	LOS B	41.4	310.8	0.76	0.72	39.8
6	R2	138	0.0	138	0.0	0.391	23.8	LOS B	5.5	38.6	0.77	0.80	40.6
Approach		1781	7.5	1781	7.5	0.763	21.6	LOS B	41.4	310.8	0.77	0.74	39.8
North: Holborn Ct													
7	L2	16	12.5	16	12.5	0.097	64.3	LOS E	1.3	9.7	0.91	0.70	9.5
8	T1	5	0.0	5	0.0	0.097	58.6	LOS E	1.3	9.7	0.91	0.70	14.0
9	R2	26	19.2	26	19.2	0.279	84.6	LOS F	1.0	7.8	1.00	0.68	7.4
Approach		47	14.9	47	14.9	0.279	74.9	LOS F	1.3	9.7	0.96	0.69	8.7
West: Gregory Hills Dr (West)													
10	L2	286	10.1	243	11.9	0.640	24.1	LOS B	29.2	227.4	0.68	0.70	38.8
11	T1	1165	11.9	995	14.0	0.640	16.9	LOS B	29.2	227.4	0.64	0.62	37.8
12	R2	237	11.8	202	13.8	0.753	61.9	LOS E	12.3	96.5	1.00	1.01	20.7
Approach		1688	11.6	1441 N1	13.6	0.753	24.5	LOS B	29.2	227.4	0.70	0.68	33.4
All Vehicles		3704	9.6	3457 N1	10.3	0.763	26.4	LOS B	41.4	310.8	0.75	0.72	33.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	2	16.5	LOS B	0.0	0.0	0.49	0.49
P2	East Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	17.0	LOS B	0.0	0.0	0.49	0.49
P4	West Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		5	35.7	LOS D			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

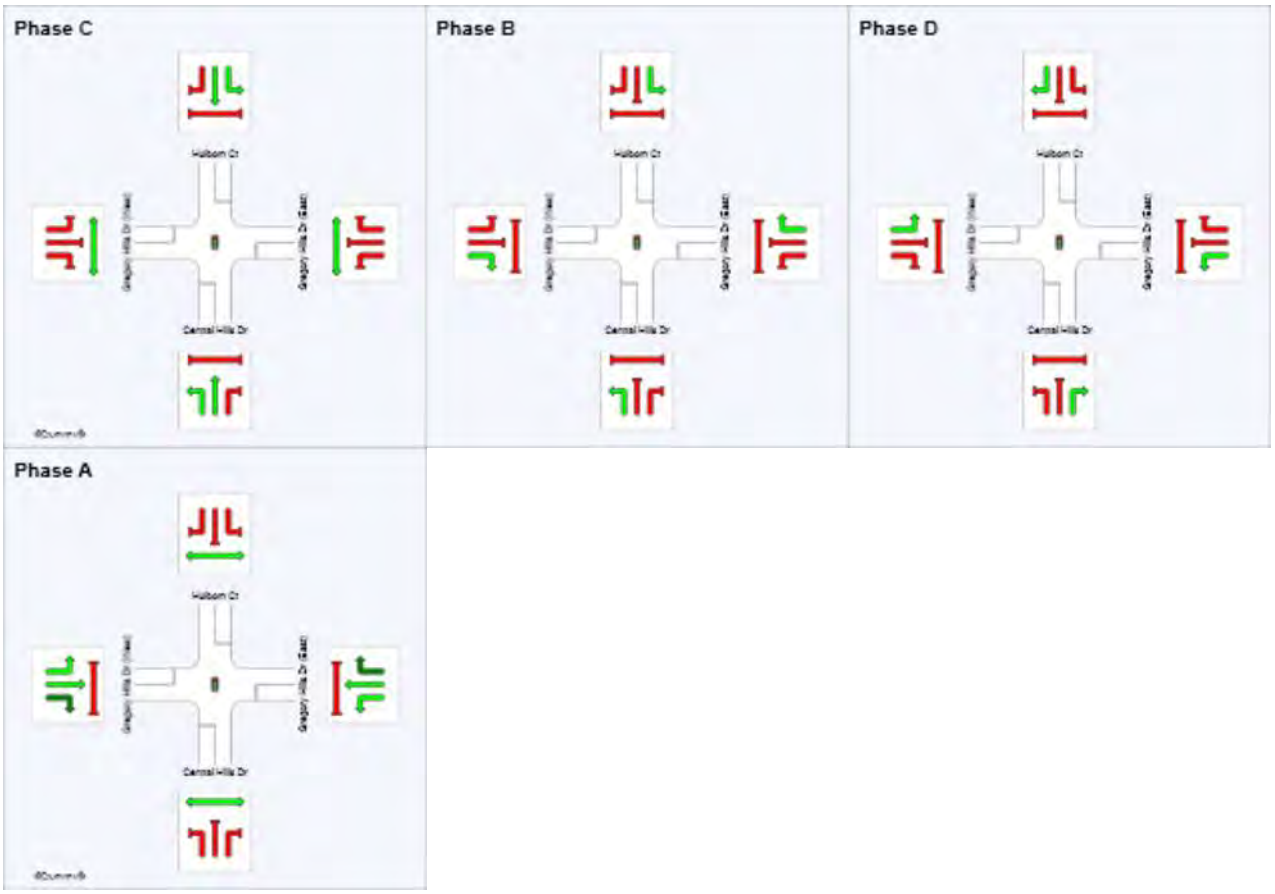
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	91	108	130	0
Green Time (sec)	11	16	4	85
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	22	10	91
Phase Split	12 %	16 %	7 %	65 %

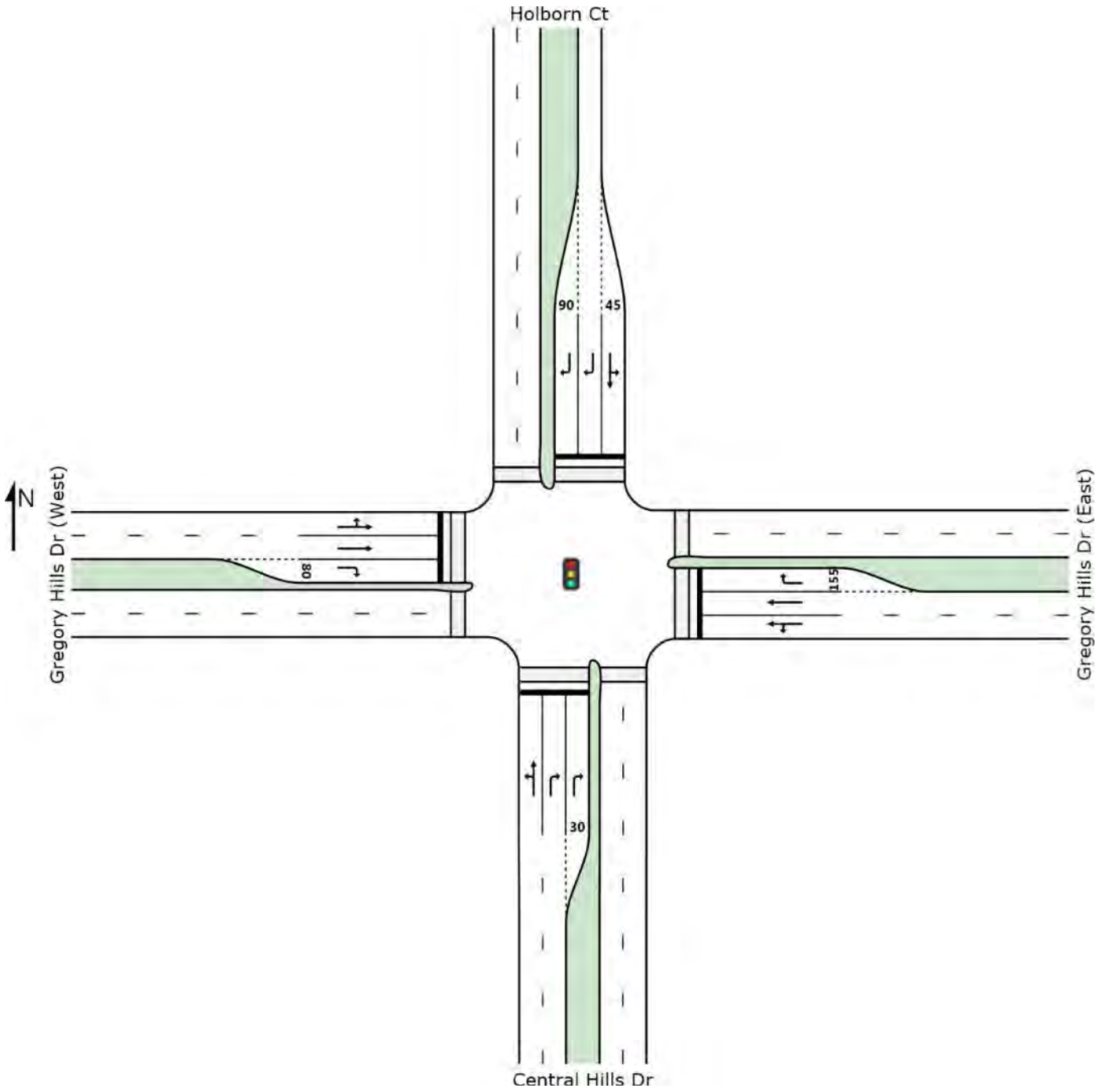


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



Organisation: MOTT MACDONALD | Created: 09 December 2016 09:55:39
Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 6 - 2036 Sensitivity Test\Scenario 6a - 161208 2036 Without Development v2.sip6

MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	140	0.7	140	0.7	0.643	69.9	LOS E	9.7	68.3	1.00	0.82	6.3
2	T1	5	0.0	5	0.0	0.643	64.3	LOS E	9.7	68.3	1.00	0.82	12.8
3	R2	61	1.6	61	1.6	0.585	85.6	LOS F	2.3	16.3	1.00	0.74	5.3
Approach		206	1.0	206	1.0	0.643	74.4	LOS F	9.7	68.3	1.00	0.80	6.1
East: Gregory Hills Dr (East)													
4	L2	252	7.9	252	7.9	0.636	18.4	LOS B	29.5	218.0	0.59	0.62	46.5
5	T1	1054	5.8	1054	5.8	0.636	12.2	LOS A	29.5	218.0	0.59	0.59	47.3
6	R2	119	0.0	119	0.0	0.889	79.5	LOS F	9.7	68.1	1.00	1.03	21.7
Approach		1425	5.7	1425	5.7	0.889	19.0	LOS B	29.5	218.0	0.62	0.63	42.0
North: Holborn Ct													
7	L2	59	0.0	59	0.0	0.378	69.9	LOS E	4.6	32.5	0.97	0.76	8.8
8	T1	12	0.0	12	0.0	0.378	64.4	LOS E	4.6	32.5	0.97	0.76	12.9
9	R2	111	2.7	111	2.7	1.341	248.6	LOS F	9.1	65.1	1.00	1.08	2.7
Approach		182	1.6	182	1.6	1.341	178.5	LOS F	9.1	65.1	0.99	0.96	3.9
West: Gregory Hills Dr (West)													
10	L2	299	0.0	235	0.0	0.759	20.5	LOS B	42.2	304.5	0.70	0.70	43.0
11	T1	2011	4.5	1588	4.8	0.759	13.3	LOS A	42.2	304.5	0.65	0.62	42.0
12	R2	258	3.1	204	3.3	1.038	107.9	LOS F	19.9	143.0	1.00	1.11	13.8
Approach		2568	3.9	2027 N1	4.1	1.038	23.6	LOS B	42.2	304.5	0.69	0.68	33.9
All Vehicles		4381	4.2	3840 N1	4.8	1.341	31.9	LOS C	42.2	304.5	0.70	0.68	29.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	11.2	LOS B	0.1	0.1	0.40	0.40
P2	East Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	11.6	LOS B	0.1	0.1	0.41	0.41
P4	West Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		211	37.8	LOS D			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

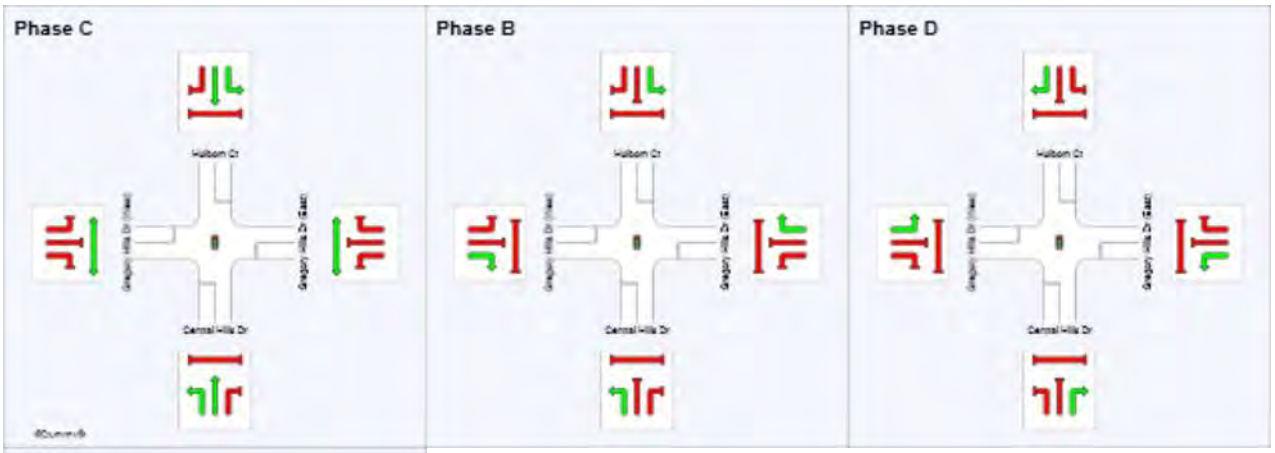
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

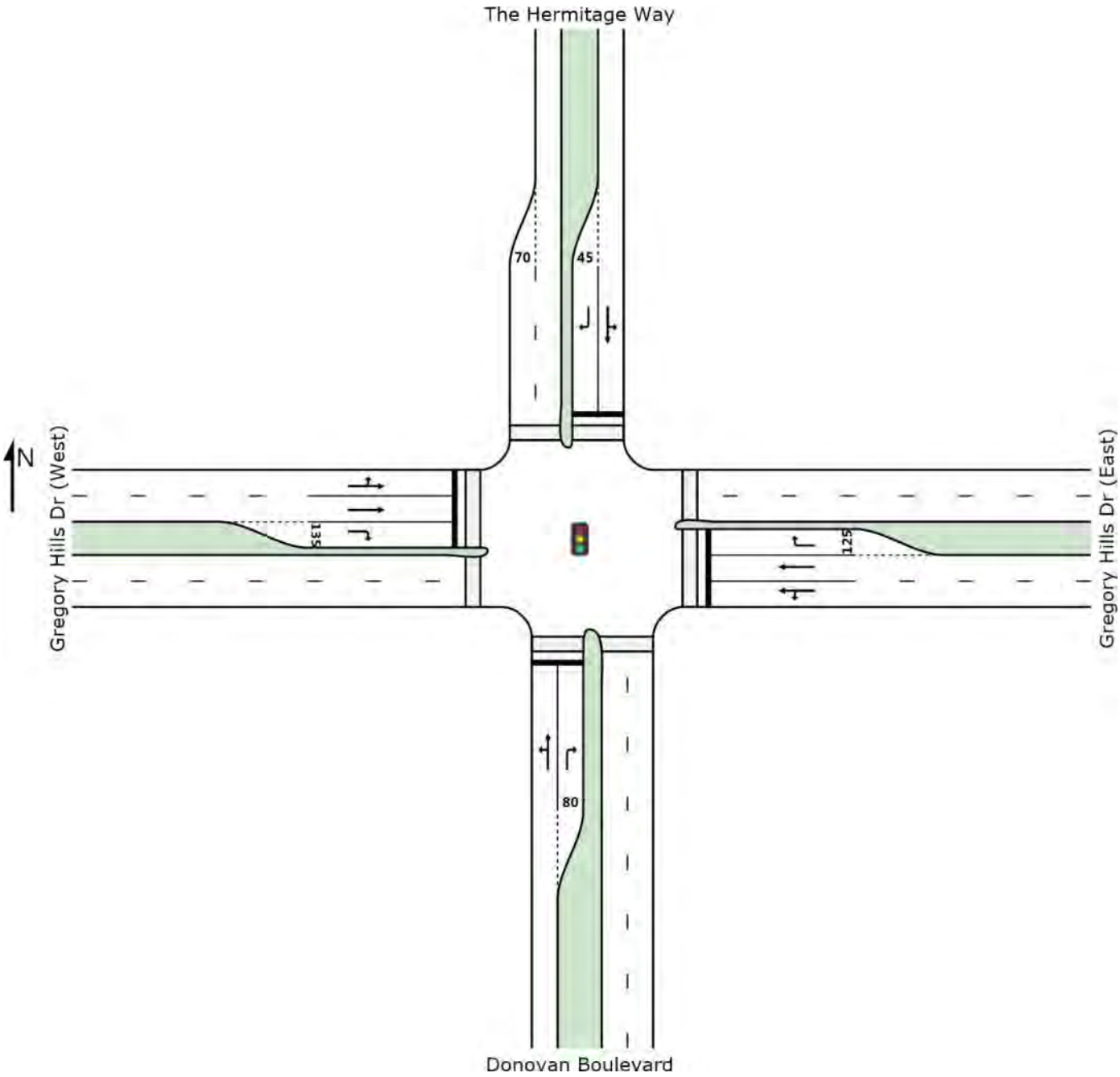
Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	103	120	130	0
Green Time (sec)	11	4	4	97
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	10	10	103
Phase Split	12 %	7 %	7 %	74 %



SITE LAYOUT

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 6 - 2036 Sensitivity Test\Scenario 6a - 161208 2036 Without Development v2.sip6

MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	349	2.9	349	2.9	0.888	51.3	LOS D	21.4	153.0	1.00	1.00	19.0
2	T1	74	0.0	74	0.0	0.888	45.7	LOS D	21.4	153.0	1.00	1.00	28.5
3	R2	123	0.0	123	0.0	0.321	33.9	LOS C	4.5	31.3	0.86	0.75	37.8
Approach		546	1.8	546	1.8	0.888	46.6	LOS D	21.4	153.0	0.97	0.94	25.1
East: Gregory Hills Dr (East)													
4	L2	64	0.0	64	0.0	0.874	41.9	LOS C	31.0	233.9	0.99	1.01	37.1
5	T1	1233	10.2	1233	10.2	0.874	35.8	LOS C	31.0	233.9	0.99	1.01	30.2
6	R2	187	0.0	187	0.0	0.532	22.0	LOS B	4.2	29.5	0.87	0.80	44.4
Approach		1484	8.5	1484	8.5	0.874	34.3	LOS C	31.0	234.2	0.98	0.99	32.6
North: The Hermitage Way													
7	L2	10	0.0	10	0.0	0.025	31.6	LOS C	0.4	2.7	0.76	0.65	39.1
8	T1	2	0.0	2	0.0	0.025	26.0	LOS B	0.4	2.7	0.76	0.65	35.8
9	R2	30	16.7	30	16.7	0.104	32.4	LOS C	1.0	8.2	0.81	0.69	25.2
Approach		42	11.9	42	11.9	0.104	31.9	LOS C	1.0	8.2	0.80	0.68	30.2
West: Gregory Hills Dr (West)													
10	L2	110	10.9	95	12.7	0.620	29.2	LOS C	15.7	122.8	0.85	0.76	42.8
11	T1	931	11.9	804	13.8	0.620	23.0	LOS B	15.8	123.6	0.85	0.76	48.7
12	R2	135	15.6	117	17.9	0.458	26.3	LOS B	2.6	20.7	0.94	0.78	41.6
Approach		1176	12.2	1016 N1	14.2	0.620	24.0	LOS B	15.8	123.6	0.86	0.76	47.4
All Vehicles		3248	8.8	3088 N1	9.2	0.888	33.1	LOS C	31.0	234.2	0.93	0.90	36.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	27.2	LOS C	0.0	0.0	0.78	0.78
P2	East Full Crossing	8	39.2	LOS D	0.0	0.0	0.93	0.93
P3	North Full Crossing	1	24.2	LOS C	0.0	0.0	0.73	0.73
P4	West Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
All Pedestrians		12	36.8	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

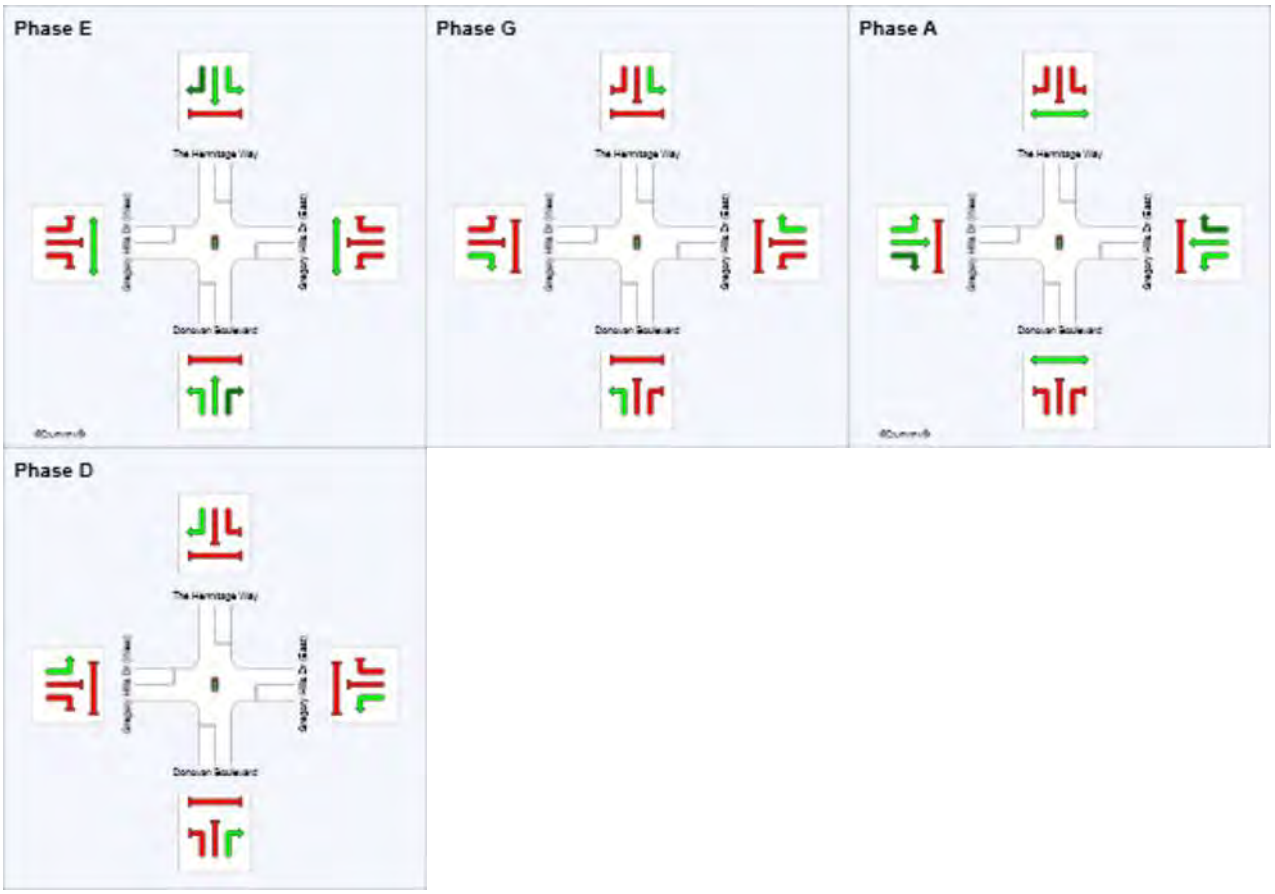
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: E, G, A, D
Output Sequence: E, G, A, D

Phase Timing Results

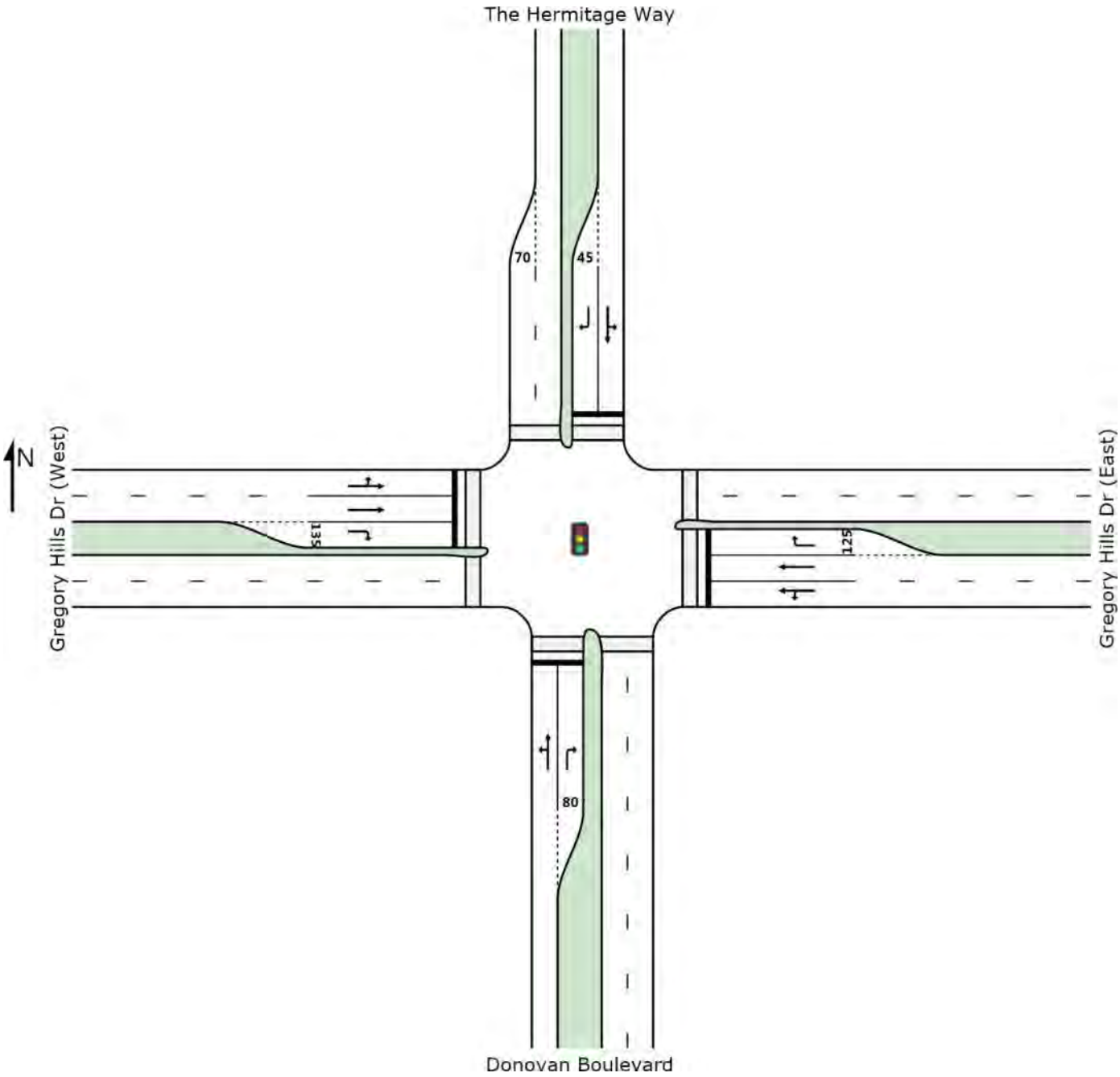
Phase	E	G	A	D
Reference Phase	No	No	Yes	No
Phase Change Time (sec)	53	75	0	42
Green Time (sec)	16	9	36	5
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	22	15	42	11
Phase Split	24 %	17 %	47 %	12 %



SITE LAYOUT

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



Organisation: MOTT MACDONALD | Created: 09 December 2016 09:55:40
Project: \\mottmac\project\Sydney\Projects\36xxxx\366044\04 Working\02 Documents\Traffic\BGC-Medical Precinct-E&L-Health Hub combined analysis \SIDRA\Scenario 6 - 2036 Sensitivity Test\Scenario 6a - 161208 2036 Without Development v2.sip6

MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	145	1.4	145	1.4	0.772	68.8	LOS E	12.3	87.2	1.00	0.88	15.4
2	T1	44	0.0	44	0.0	0.772	63.2	LOS E	12.3	87.2	1.00	0.88	24.1
3	R2	75	0.0	75	0.0	0.514	69.8	LOS E	4.8	33.4	1.00	0.77	26.7
Approach		264	0.8	264	0.8	0.772	68.1	LOS E	12.3	87.2	1.00	0.85	20.8
East: Gregory Hills Dr (East)													
4	L2	57	0.0	57	0.0	0.466	19.1	LOS B	17.5	131.6	0.56	0.53	50.2
5	T1	1066	10.0	1066	10.0	0.466	11.7	LOS A	17.5	131.6	0.54	0.50	48.6
6	R2	170	10.6	170	10.6	1.011	72.2	LOS F	14.4	109.9	1.00	1.01	26.2
Approach		1293	9.7	1293	9.7	1.011	20.0	LOS B	17.5	131.6	0.60	0.57	41.6
North: The Hermitage Way													
7	L2	1	0.0	1	0.0	0.023	63.8	LOS E	0.2	1.6	0.93	0.61	29.0
8	T1	3	0.0	3	0.0	0.023	58.3	LOS E	0.2	1.6	0.93	0.61	26.0
9	R2	17	0.0	17	0.0	0.129	67.1	LOS E	1.0	7.2	0.96	0.70	15.5
Approach		21	0.0	21	0.0	0.129	65.7	LOS E	1.0	7.2	0.95	0.68	18.0
West: Gregory Hills Dr (West)													
10	L2	381	7.1	325	7.1	0.927	44.9	LOS D	68.7	498.6	0.98	1.00	35.4
11	T1	2091	2.9	1784	2.9	0.927	31.6	LOS C	68.7	498.6	0.81	0.84	43.8
12	R2	420	4.5	358	4.5	0.960	73.3	LOS F	23.5	171.2	1.00	1.07	26.1
Approach		2892	3.7	2467[N1]	3.7	0.960	39.4	LOS C	68.7	498.6	0.86	0.90	39.2
All Vehicles		4470	5.2	4045[N1]	5.8	1.011	35.2	LOS C	68.7	498.6	0.79	0.79	38.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	13.4	LOS B	0.0	0.0	0.45	0.45
P2	East Full Crossing	3	59.1	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	1	9.2	LOS A	0.0	0.0	0.38	0.38
P4	West Full Crossing	2	59.1	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		7	45.5	LOS E			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

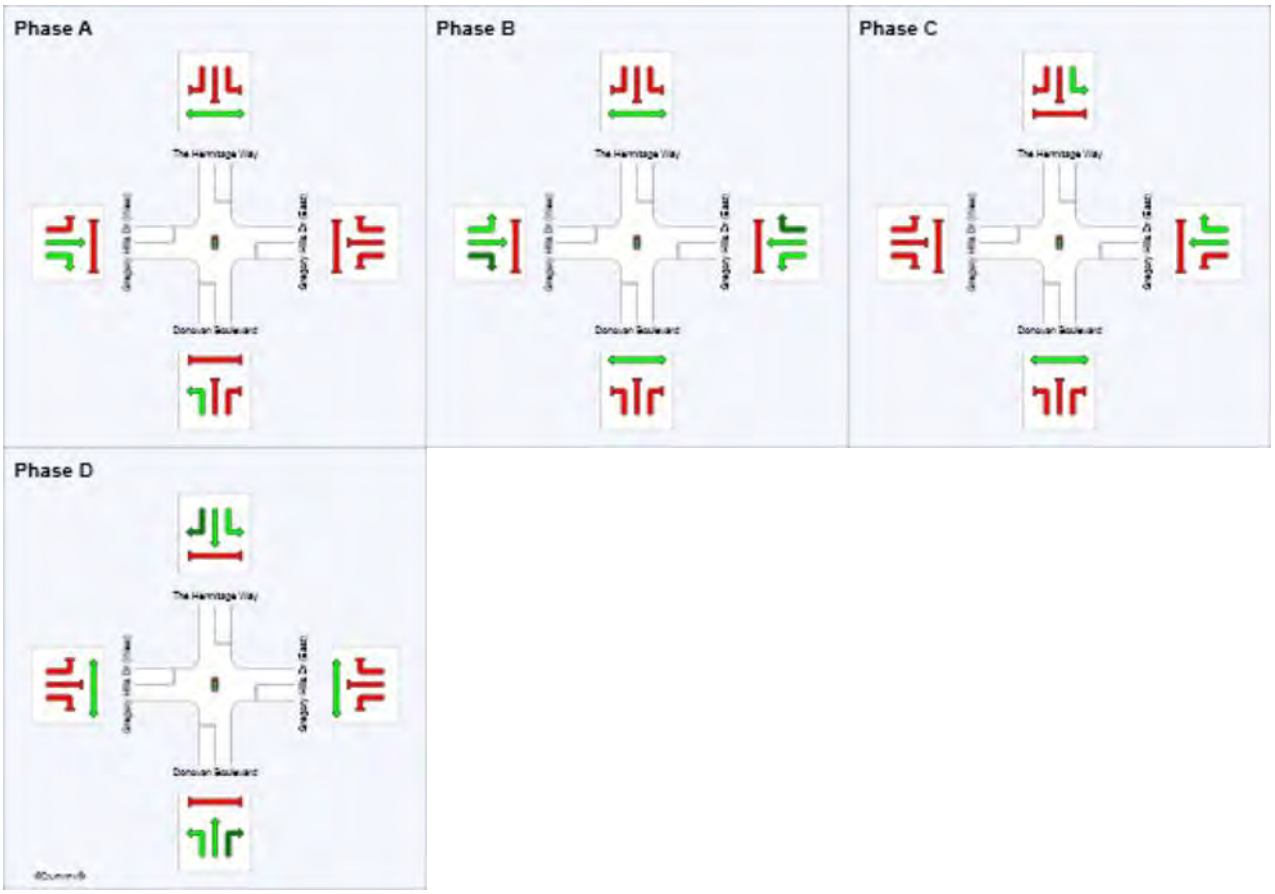
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Leading Right Turn - Copy
Movement Class: All Movement Classes
Input Sequence: A, B, C, D
Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	20	99	113
Green Time (sec)	14	73	8	11
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	20	79	14	17
Phase Split	15 %	61 %	11 %	13 %



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

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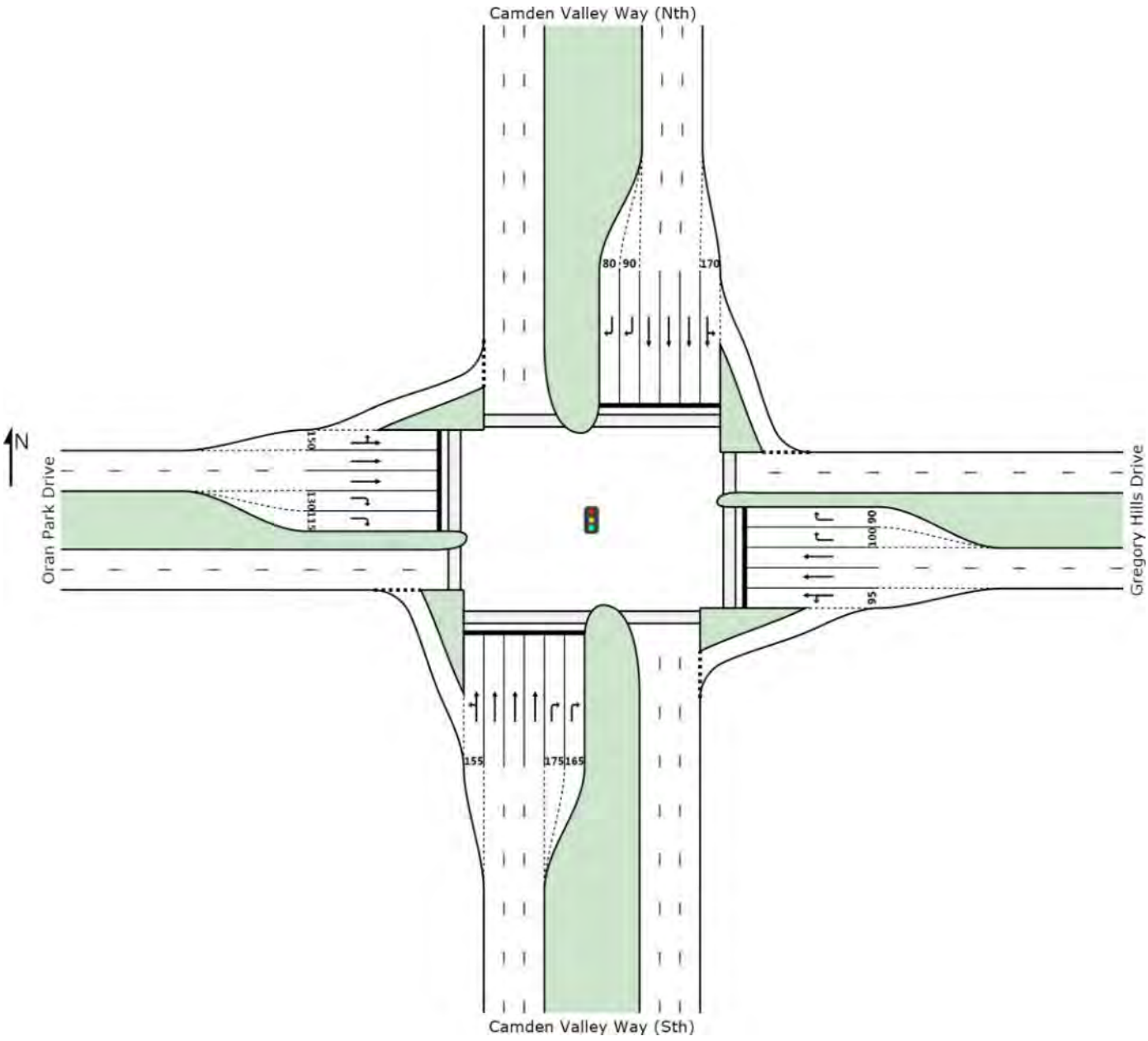
Scenario 6b – 2036 With Development

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	280	12.5	280	12.5	0.255	15.7	LOS B	7.0	54.2	0.42	0.71	54.3
2	T1	2330	6.3	2330	6.3	1.135	104.1	LOS F	81.4	600.6	1.00	1.29	27.1
3	R2	357	11.5	357	11.5	0.840	80.3	LOS F	13.1	101.0	1.00	0.90	15.2
Approach		2967	7.5	2967	7.5	1.135	92.9	LOS F	81.4	600.6	0.95	1.18	27.4
East: Gregory Hills Drive													
4	L2	530	10.4	530	10.4	0.505	17.1	LOS B	16.7	127.0	0.56	0.76	47.5
5	T1	279	7.2	279	7.2	0.744	60.2	LOS E	17.3	121.0	0.99	0.85	33.6
6	R2	696	6.6	696	6.6	1.479	304.1	LOS F	49.6	367.1	1.00	1.39	11.8
Approach		1505	8.0	1505	8.0	1.479	157.8	LOS F	49.6	367.1	0.84	1.07	17.6
North: Camden Valley Way (Nth)													
7	L2	442	10.2	442	10.2	0.411	19.6	LOS B	12.7	96.8	0.52	0.78	51.9
8	T1	1290	8.4	1290	8.4	0.620	33.7	LOS C	20.8	155.9	0.77	0.68	49.1
9	R2	440	8.2	440	8.2	1.002	107.8	LOS F	19.3	144.6	1.00	1.01	29.2
Approach		2172	8.7	2172	8.7	1.002	45.8	LOS D	20.8	155.9	0.76	0.76	42.1
West: Oran Park Drive													
10	L2	1065	2.1	1065	2.1	1.442	239.5	LOS F	126.6	902.1	1.00	1.33	16.8
11	T1	691	10.6	691	10.6	1.775	389.4	LOS F	101.8	712.5	0.99	1.70	7.6
12	R2	314	7.0	314	7.0	0.670	70.8	LOS F	10.5	78.3	1.00	0.83	30.4
Approach		2070	5.7	2070	5.7	1.775	263.9	LOS F	126.6	902.1	1.00	1.38	12.8
All Vehicles		8714	7.5	8714	7.5	1.775	133.0	LOS F	126.6	902.1	0.89	1.11	21.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	44.9	LOS E	0.2	0.2	0.80	0.80
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	44.9	LOS E	0.2	0.2	0.80	0.80
All Pedestrians		211	54.6	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Camden Valley Way

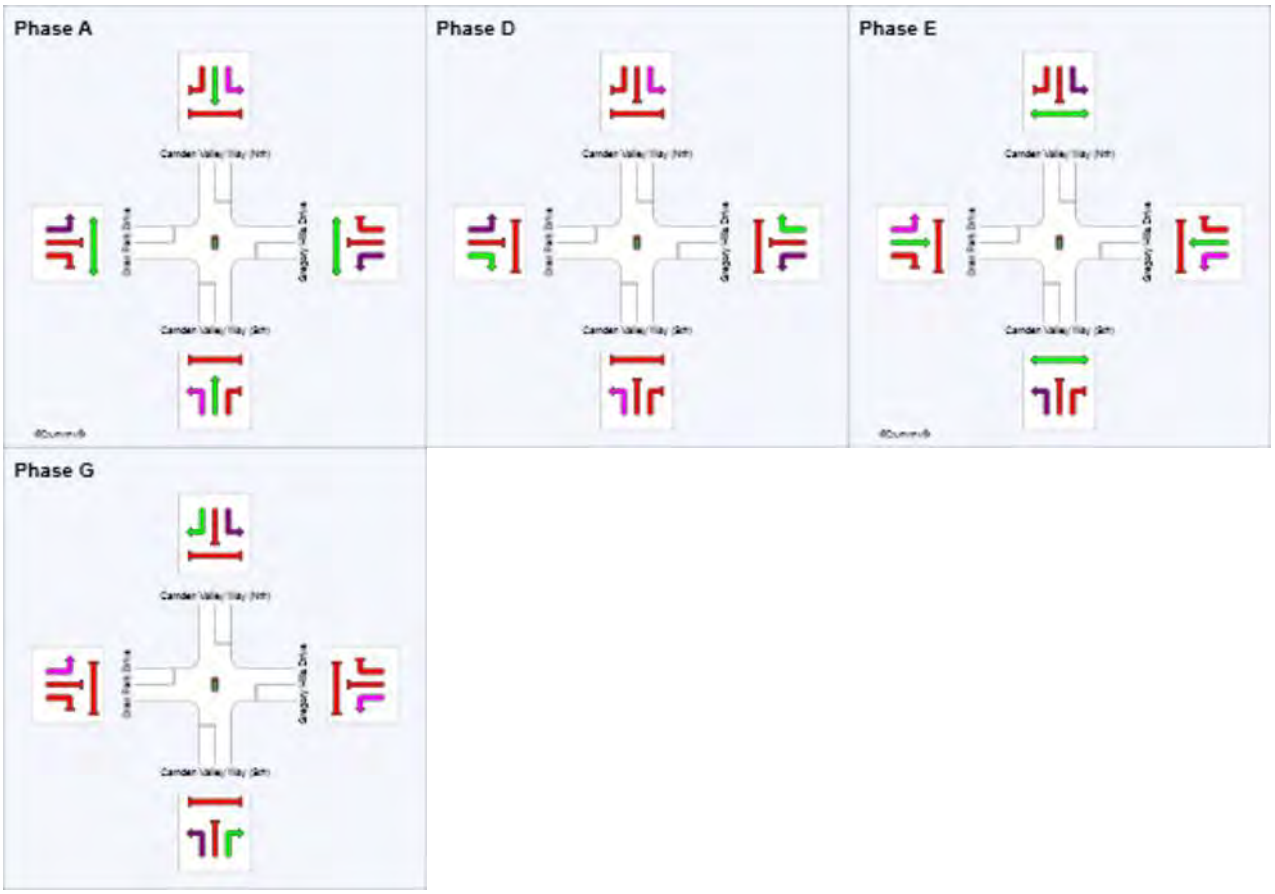
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS - No phase B
Movement Class: All Movement Classes
Input Sequence: A, D, E, G
Output Sequence: A, D, E, G

Phase Timing Results

Phase	A	D	E	G
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	60	85	116
Green Time (sec)	54	19	25	18
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	60	25	31	24
Phase Split	43 %	18 %	22 %	17 %

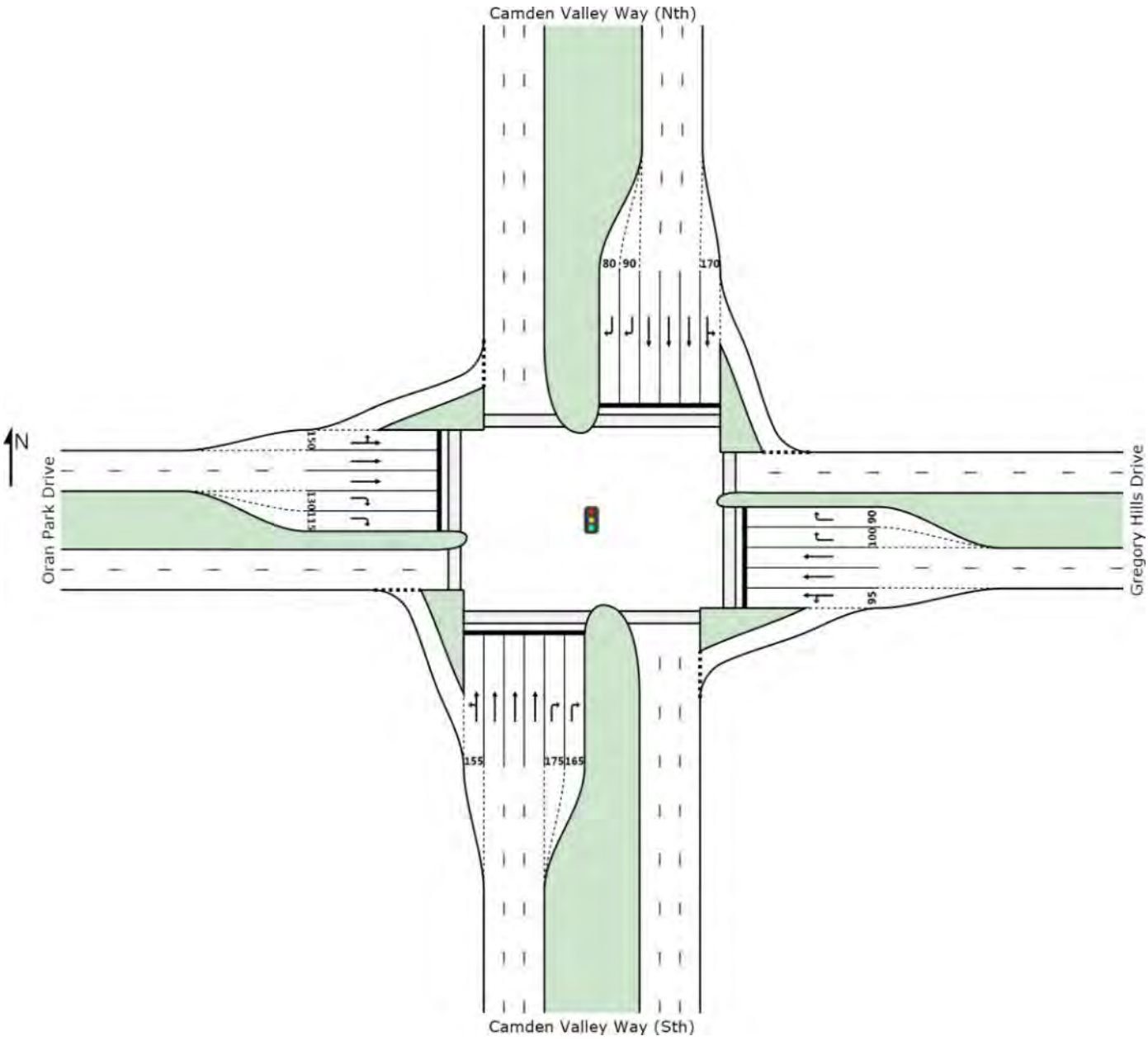


Normal Movement
Slip/Bypass-Lane Movement
Stopped Movement
Other Movement Class Running
Mixed Running & Stopped Movement Classes
Undetected Movement
Permitted/Opposed
Opposed Slip/Bypass-Lane
Turn On Red
Other Movement Class Stopped
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Camden Valley Way

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Camden Valley Way (Sth)													
1	L2	367	2.2	367	2.2	0.322	18.5	LOS B	10.6	75.7	0.51	0.74	52.9
2	T1	2109	3.5	2109	3.5	1.150	116.2	LOS F	73.4	528.8	1.00	1.28	25.2
3	R2	501	4.0	501	4.0	1.231	195.8	LOS F	29.2	211.0	1.00	1.17	7.0
Approach		2977	3.4	2977	3.4	1.231	117.5	LOS F	73.4	528.8	0.94	1.20	22.7
East: Gregory Hills Drive													
4	L2	781	6.4	770	6.4	0.833	29.3	LOS C	37.0	273.0	0.87	0.90	40.1
5	T1	635	3.1	626	3.2	1.364	246.0	LOS F	41.0	295.0	1.00	1.40	12.9
6	R2	1003	2.5	989	2.5	1.740	420.9	LOS F	80.4	574.8	1.00	1.53	8.9
Approach		2419	3.9	2385 N1	4.0	1.740	248.5	LOS F	80.4	574.8	0.96	1.29	12.4
North: Camden Valley Way (Nth)													
7	L2	485	4.7	485	4.7	0.396	16.7	LOS B	11.6	84.5	0.45	0.77	54.6
8	T1	1734	3.5	1734	3.5	0.770	29.7	LOS C	32.4	233.3	0.78	0.70	51.4
9	R2	820	1.8	820	1.8	1.261	175.2	LOS F	36.1	256.9	1.00	1.18	21.3
Approach		3039	3.2	3039	3.2	1.261	66.9	LOS E	36.1	256.9	0.79	0.84	35.2
West: Oran Park Drive													
10	L2	815	4.0	815	4.0	1.033	71.4	LOS F	59.6	432.0	1.00	1.05	36.3
11	T1	913	2.8	913	2.8	1.983	524.8	LOS F	80.3	576.0	1.00	1.75	4.5
12	R2	393	5.1	393	5.1	0.710	69.2	LOS E	13.2	96.3	1.00	0.85	30.9
Approach		2121	3.7	2121	3.7	1.983	266.2	LOS F	80.3	576.0	1.00	1.32	11.9
All Vehicles		10556	3.5	10522 N1	3.5	1.983	162.6	LOS F	80.4	576.0	0.91	1.14	18.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	39.5	LOS D	0.2	0.2	0.75	0.75
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	51.5	LOS E	0.2	0.2	0.86	0.86
All Pedestrians		211	54.9	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Camden Valley Way

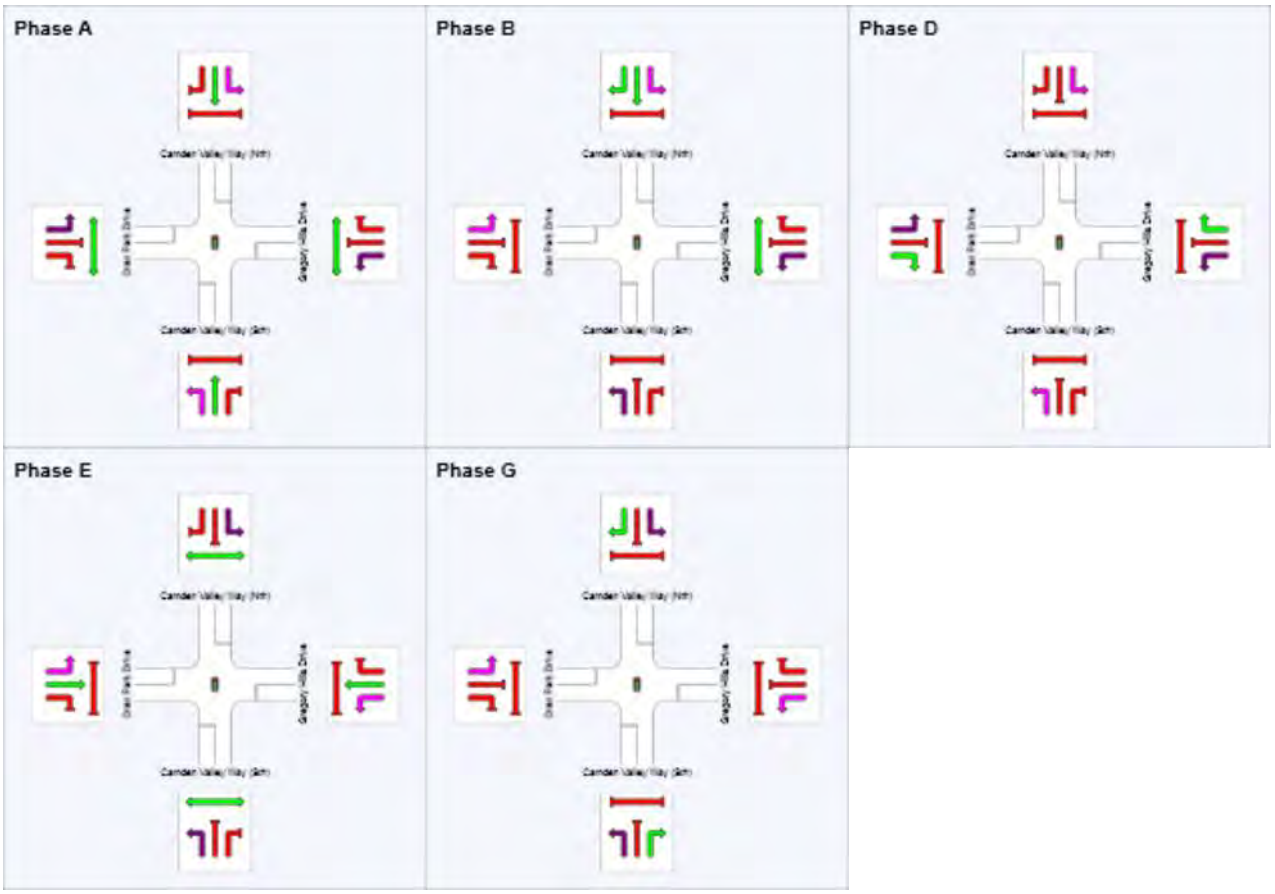
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, D, E, G
Output Sequence: A, B, D, E, G

Phase Timing Results

Phase	A	B	D	E	G
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	52	67	95	118
Green Time (sec)	46	9	22	17	16
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	52	15	28	23	22
Phase Split	37 %	11 %	20 %	16 %	16 %



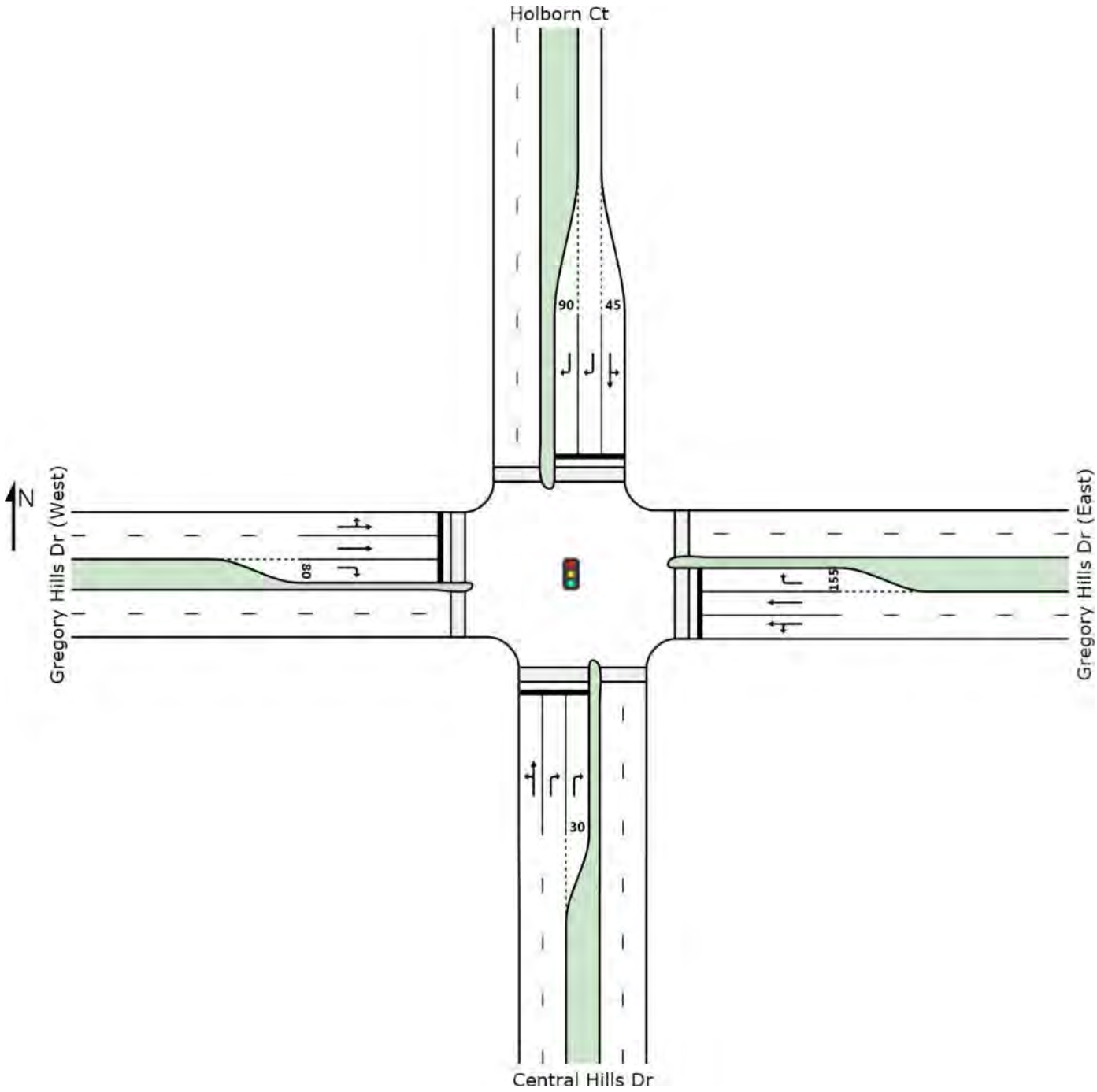
Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class Running	Other Movement Class Stopped
Mixed Running & Stopped Movement Classes	
Undetected Movement	Phase Transition Applied

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

SITE LAYOUT

Site: AM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	98	8.2	98	8.2	0.507	67.4	LOS E	7.8	58.0	0.98	0.79	6.6
2	T1	23	0.0	23	0.0	0.507	61.8	LOS E	7.8	58.0	0.98	0.79	13.4
3	R2	67	16.4	67	16.4	0.705	87.7	LOS F	2.6	20.4	1.00	0.79	5.2
Approach		188	10.1	188	10.1	0.705	74.0	LOS F	7.8	58.0	0.98	0.79	6.9
East: Gregory Hills Dr (East)													
4	L2	272	10.3	272	10.3	0.763	27.2	LOS B	41.4	310.8	0.79	0.77	39.6
5	T1	1371	7.7	1371	7.7	0.763	20.2	LOS B	41.4	310.8	0.76	0.72	39.8
6	R2	138	0.0	138	0.0	0.400	25.4	LOS B	5.8	40.8	0.80	0.81	39.6
Approach		1781	7.5	1781	7.5	0.763	21.7	LOS B	41.4	310.8	0.77	0.74	39.7
North: Holborn Ct													
7	L2	16	12.5	16	12.5	0.097	64.3	LOS E	1.3	9.7	0.91	0.70	9.5
8	T1	5	0.0	5	0.0	0.097	58.6	LOS E	1.3	9.7	0.91	0.70	14.0
9	R2	39	12.8	39	12.8	0.401	85.0	LOS F	1.4	11.2	1.00	0.70	7.4
Approach		60	11.7	60	11.7	0.401	77.3	LOS F	1.4	11.2	0.97	0.70	8.4
West: Gregory Hills Dr (West)													
10	L2	299	9.7	252	11.5	0.655	24.4	LOS B	30.4	236.4	0.69	0.70	38.6
11	T1	1210	11.5	1024	13.6	0.655	17.2	LOS B	30.4	236.4	0.65	0.62	37.5
12	R2	237	11.8	201	14.0	0.747	61.2	LOS E	12.1	95.2	1.00	1.01	20.8
Approach		1746	11.2	1476 N1	13.3	0.747	24.4	LOS B	30.4	236.4	0.71	0.69	33.5
All Vehicles		3775	9.4	3505 N1	10.2	0.763	26.6	LOS B	41.4	310.8	0.76	0.72	33.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	2	16.5	LOS B	0.0	0.0	0.49	0.49
P2	East Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	1	17.0	LOS B	0.0	0.0	0.49	0.49
P4	West Full Crossing	1	64.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		5	35.7	LOS D			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/Central Hills Dr

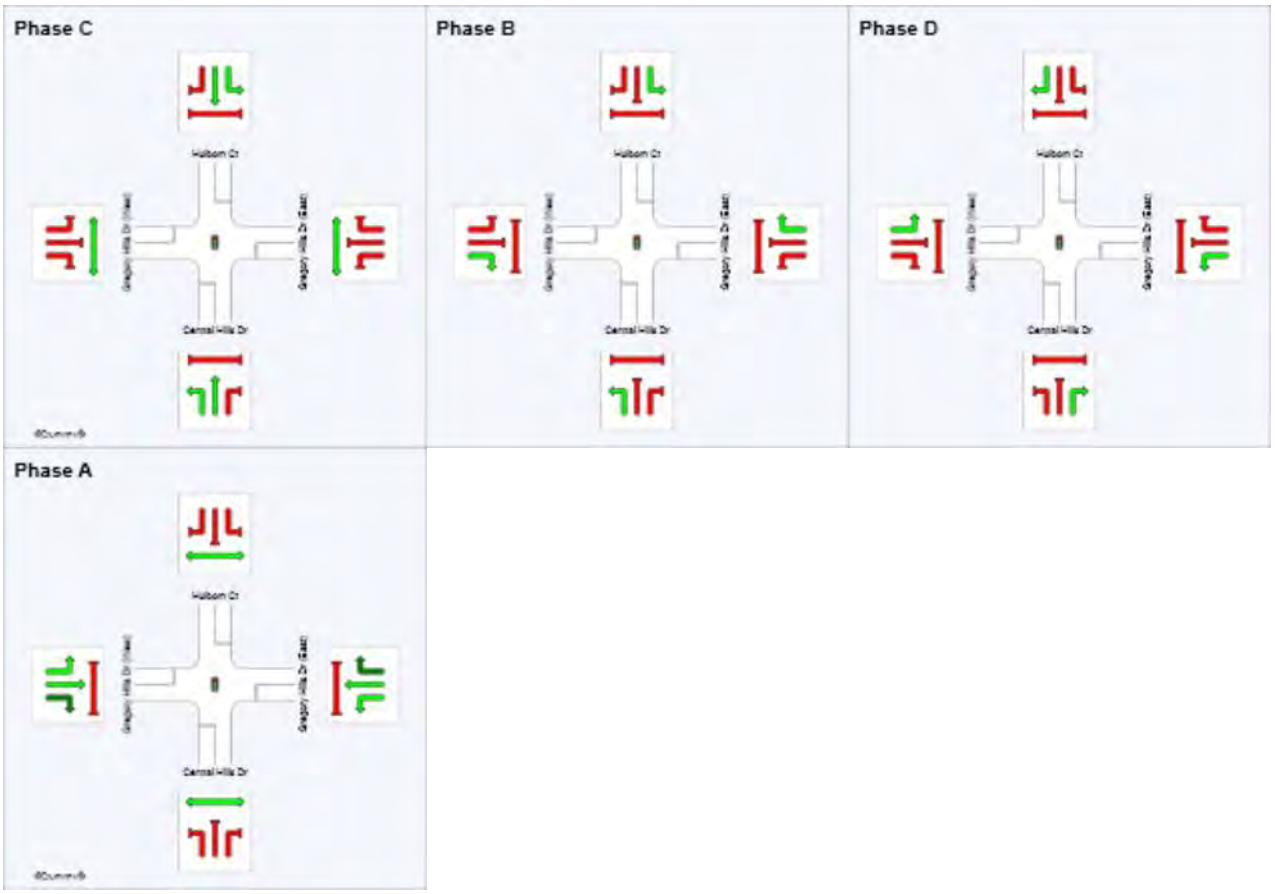
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	91	108	130	0
Green Time (sec)	11	16	4	85
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	22	10	91
Phase Split	12 %	16 %	7 %	65 %

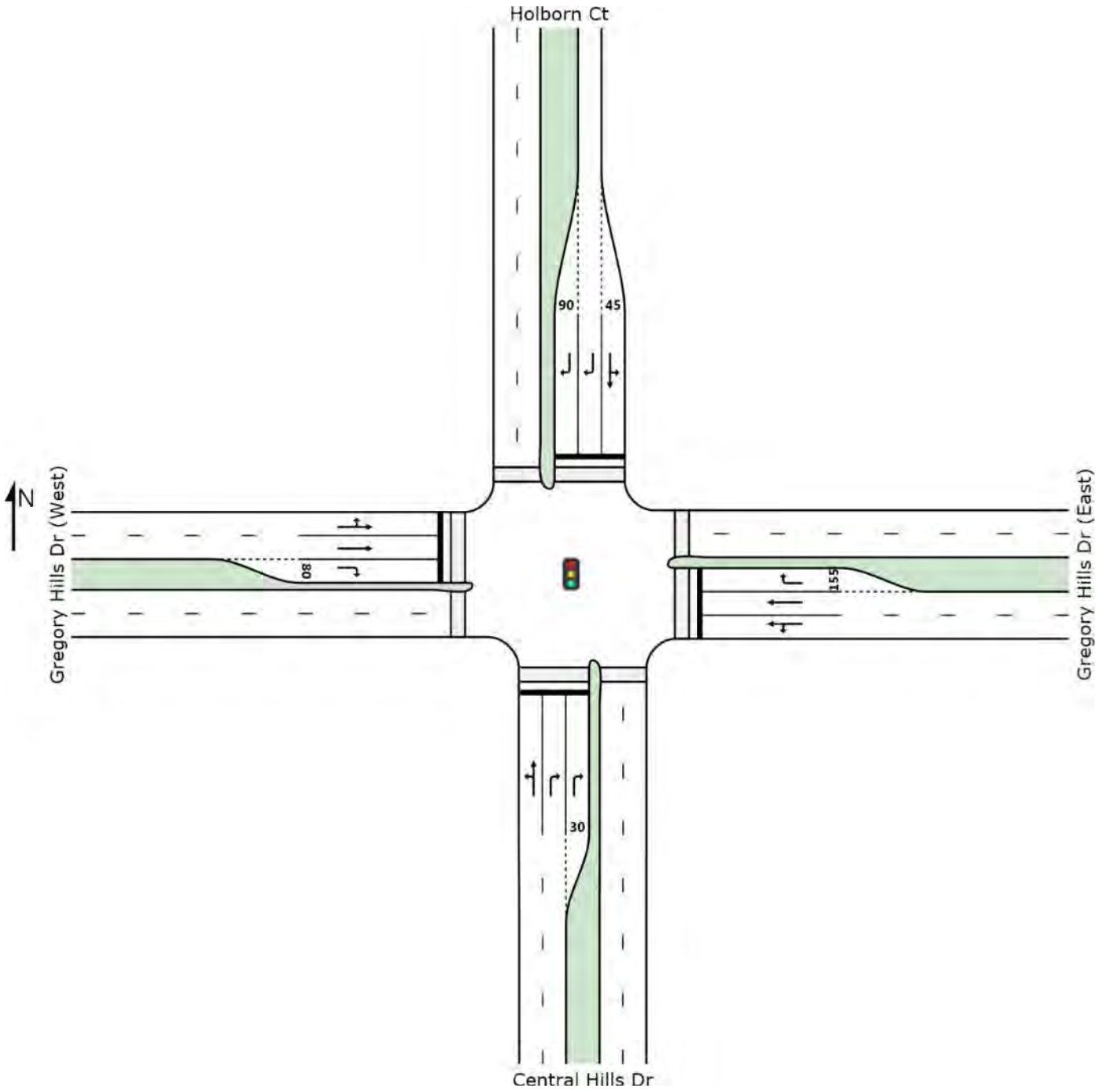


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/Central Hills Dr

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Hills Dr													
1	L2	140	0.7	140	0.7	0.643	69.9	LOS E	9.7	68.3	1.00	0.82	6.3
2	T1	5	0.0	5	0.0	0.643	64.3	LOS E	9.7	68.3	1.00	0.82	12.8
3	R2	61	1.6	61	1.6	0.388	80.7	LOS F	2.2	15.4	1.00	0.72	5.6
Approach		206	1.0	206	1.0	0.643	72.9	LOS F	9.7	68.3	1.00	0.79	6.2
East: Gregory Hills Dr (East)													
4	L2	252	7.9	252	7.9	0.647	19.6	LOS B	30.8	227.2	0.61	0.64	45.5
5	T1	1054	5.8	1054	5.8	0.647	13.4	LOS A	30.8	227.2	0.62	0.61	46.0
6	R2	119	0.0	119	0.0	0.906	84.7	LOS F	9.8	68.9	1.00	1.03	20.8
Approach		1425	5.7	1425	5.7	0.906	20.4	LOS B	30.8	227.2	0.65	0.65	40.8
North: Holborn Ct													
7	L2	59	0.0	59	0.0	0.374	69.9	LOS E	4.6	32.5	0.97	0.76	8.8
8	T1	12	0.0	12	0.0	0.374	64.3	LOS E	4.6	32.5	0.97	0.76	13.0
9	R2	164	1.8	164	1.8	1.308	232.5	LOS F	12.9	91.7	1.00	1.14	2.9
Approach		235	1.3	235	1.3	1.308	183.1	LOS F	12.9	91.7	0.99	1.03	3.8
West: Gregory Hills Dr (West)													
10	L2	304	0.0	238	0.0	0.772	21.8	LOS B	44.3	320.0	0.73	0.72	41.9
11	T1	2027	4.5	1591	4.7	0.772	14.5	LOS B	44.3	320.0	0.68	0.65	40.6
12	R2	258	3.1	202	3.3	1.057	115.0	LOS F	20.1	144.6	1.00	1.12	13.1
Approach		2589	3.8	2031 N1	4.0	1.057	25.4	LOS B	44.3	320.0	0.71	0.70	32.6
All Vehicles		4455	4.2	3897 N1	4.7	1.308	35.6	LOS C	44.3	320.0	0.72	0.71	27.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	12.0	LOS B	0.1	0.1	0.42	0.42
P2	East Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	12.5	LOS B	0.1	0.1	0.42	0.42
P4	West Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		211	38.3	LOS D			0.69	0.69

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/Central Hills Dr

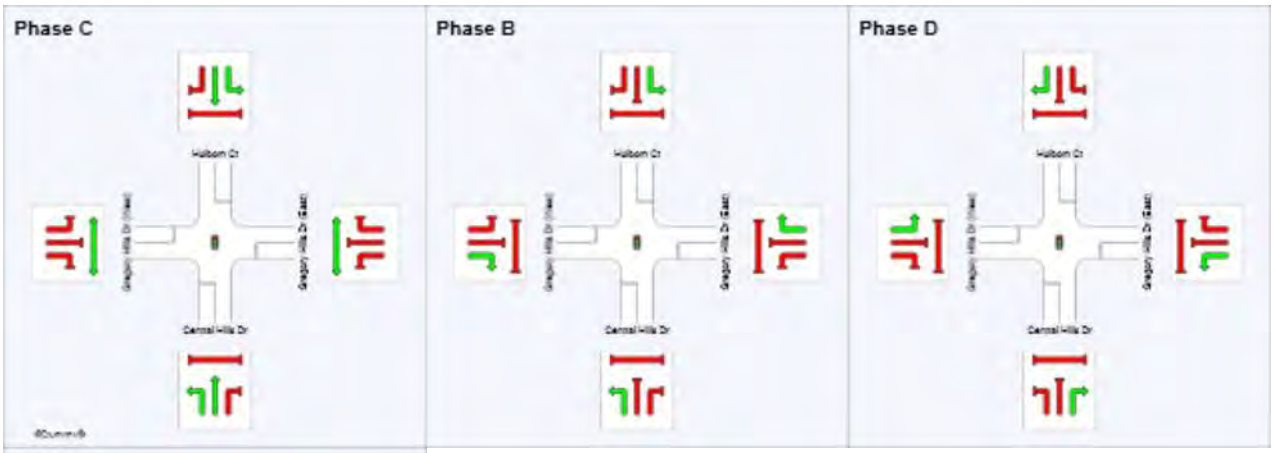
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: C, B, D, A
Output Sequence: C, B, D, A

Phase Timing Results

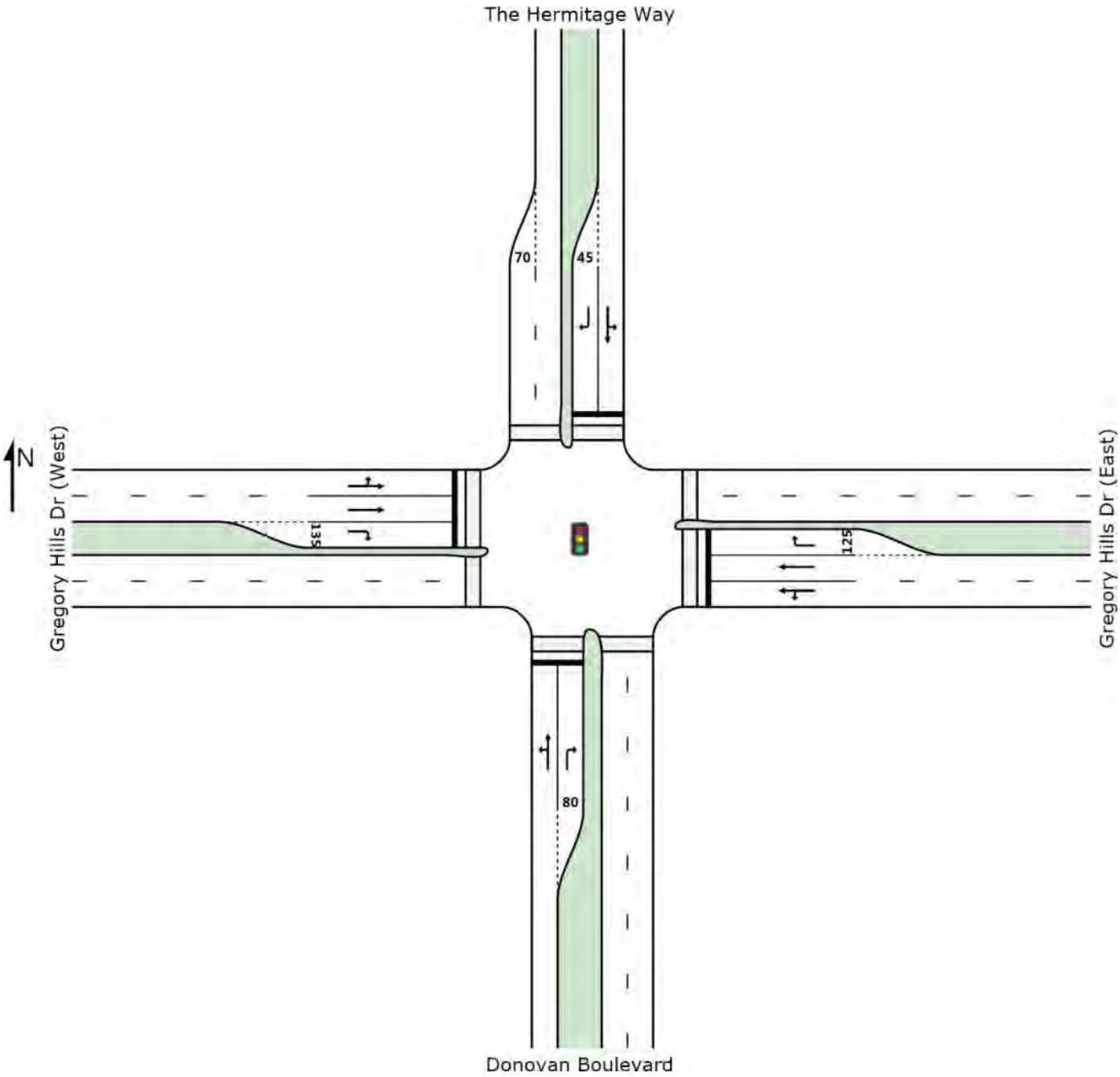
Phase	C	B	D	A
Reference Phase	No	No	No	Yes
Phase Change Time (sec)	101	118	128	0
Green Time (sec)	11	4	6	95
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	10	12	101
Phase Split	12 %	7 %	9 %	72 %



SITE LAYOUT

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	349	2.9	349	2.9	0.967	66.3	LOS E	25.9	185.0	1.00	1.10	15.8
2	T1	93	0.0	93	0.0	0.967	60.7	LOS E	25.9	185.0	1.00	1.10	24.7
3	R2	123	0.0	123	0.0	0.330	34.0	LOS C	4.5	31.3	0.87	0.75	37.8
Approach		565	1.8	565	1.8	0.967	58.3	LOS E	25.9	185.0	0.97	1.02	22.1
East: Gregory Hills Dr (East)													
4	L2	64	0.0	64	0.0	0.874	41.9	LOS C	31.0	233.9	0.99	1.01	37.1
5	T1	1233	10.2	1233	10.2	0.874	35.8	LOS C	31.0	233.9	0.99	1.01	30.2
6	R2	221	0.0	221	0.0	0.637	22.9	LOS B	5.2	36.1	0.91	0.82	43.8
Approach		1518	8.3	1518	8.3	0.874	34.2	LOS C	31.0	234.2	0.98	0.99	32.8
North: The Hermitage Way													
7	L2	18	0.0	18	0.0	0.061	34.5	LOS C	0.9	6.2	0.81	0.67	38.1
8	T1	8	0.0	8	0.0	0.061	29.0	LOS C	0.9	6.2	0.81	0.67	34.8
9	R2	30	16.7	30	16.7	0.105	32.4	LOS C	1.0	8.2	0.81	0.69	25.2
Approach		56	8.9	56	8.9	0.105	32.6	LOS C	1.0	8.2	0.81	0.68	32.0
West: Gregory Hills Dr (West)													
10	L2	143	8.4	122	9.9	0.632	29.3	LOS C	16.2	126.1	0.85	0.77	42.6
11	T1	931	11.9	797	13.9	0.632	23.2	LOS B	16.2	126.1	0.86	0.76	48.5
12	R2	135	15.6	116	18.0	0.455	26.3	LOS B	2.5	20.6	0.94	0.78	41.6
Approach		1209	11.9	1035 N1	13.9	0.632	24.2	LOS B	16.2	126.8	0.87	0.77	47.1
All Vehicles		3348	8.5	3174 N1	9.0	0.967	35.2	LOS C	31.0	234.2	0.94	0.92	35.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	27.2	LOS C	0.0	0.0	0.78	0.78
P2	East Full Crossing	8	39.2	LOS D	0.0	0.0	0.93	0.93
P3	North Full Crossing	1	24.2	LOS C	0.0	0.0	0.73	0.73
P4	West Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
All Pedestrians		12	36.8	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: AM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

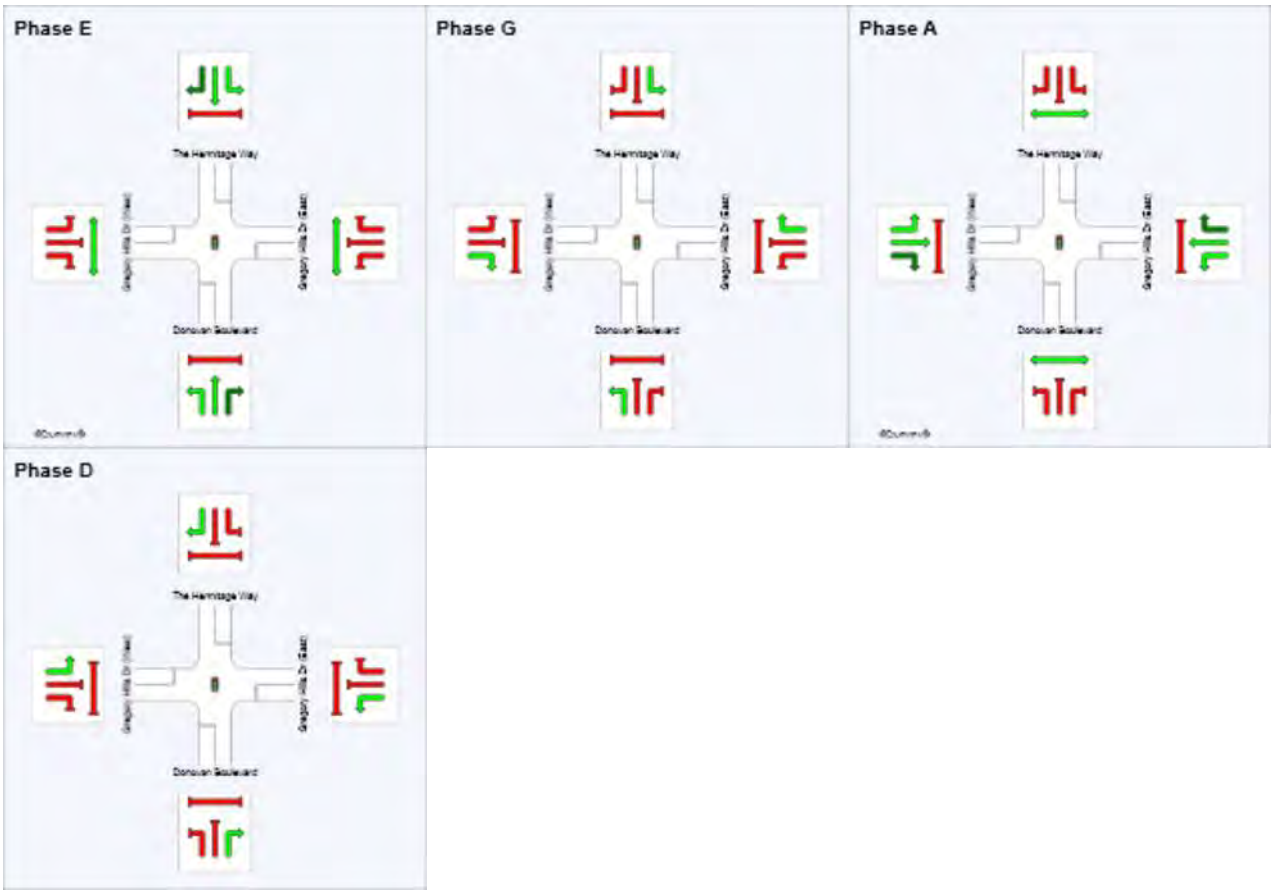
Network: AM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 90 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Split Phasing
Movement Class: All Movement Classes
Input Sequence: E, G, A, D
Output Sequence: E, G, A, D

Phase Timing Results

Phase	E	G	A	D
Reference Phase	No	No	Yes	No
Phase Change Time (sec)	53	75	0	42
Green Time (sec)	16	9	36	5
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	22	15	42	11
Phase Split	24 %	17 %	47 %	12 %

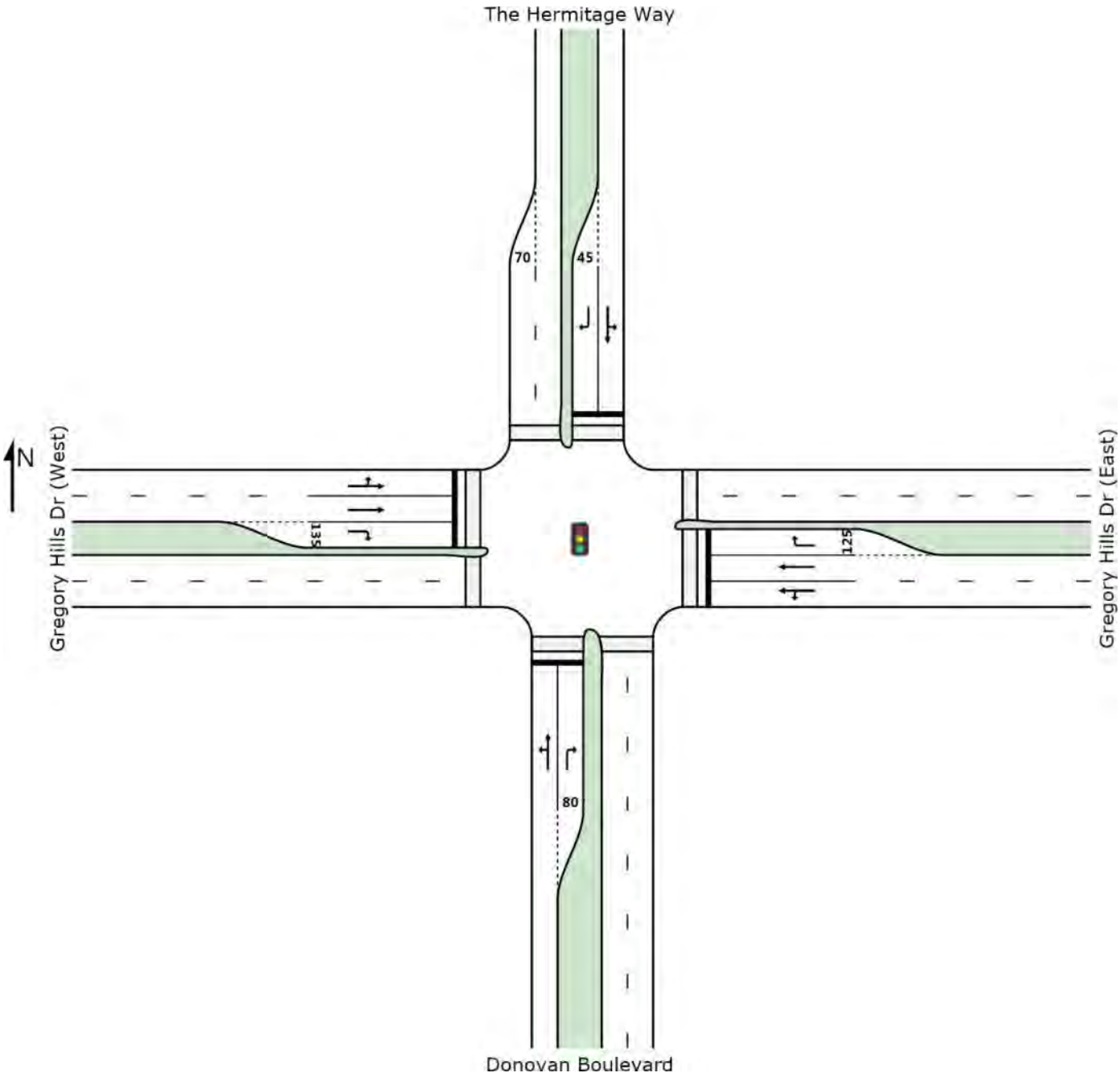


Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes
Undetected Movement
Phase Transition Applied

SITE LAYOUT

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Donovan Boulevard													
1	L2	145	1.4	145	1.4	0.837	72.7	LOS F	13.3	93.8	1.00	0.93	14.8
2	T1	50	0.0	50	0.0	0.837	67.1	LOS E	13.3	93.8	1.00	0.93	23.4
3	R2	75	0.0	75	0.0	0.564	70.6	LOS F	4.8	33.8	1.00	0.78	26.5
Approach		270	0.7	270	0.7	0.837	71.1	LOS F	13.3	93.8	1.00	0.89	20.3
East: Gregory Hills Dr (East)													
4	L2	57	0.0	57	0.0	0.444	17.0	LOS B	16.0	120.7	0.51	0.49	51.8
5	T1	1066	10.0	1066	10.0	0.444	9.7	LOS A	16.0	120.7	0.49	0.46	51.2
6	R2	182	9.9	182	9.9	1.162	134.2	LOS F	19.5	148.0	1.00	1.13	17.5
Approach		1305	9.6	1305	9.6	1.162	27.4	LOS B	19.5	148.0	0.56	0.55	36.5
North: The Hermitage Way													
7	L2	31	0.0	31	0.0	0.299	64.8	LOS E	3.5	24.4	0.96	0.74	28.4
8	T1	27	0.0	27	0.0	0.299	59.2	LOS E	3.5	24.4	0.96	0.74	25.3
9	R2	17	0.0	17	0.0	0.129	67.1	LOS E	1.0	7.2	0.96	0.70	15.5
Approach		75	0.0	75	0.0	0.299	63.3	LOS E	3.5	24.4	0.96	0.73	24.8
West: Gregory Hills Dr (West)													
10	L2	393	6.9	334	6.9	0.896	34.3	LOS C	62.0	449.5	0.93	0.92	40.0
11	T1	2091	2.9	1775	2.9	0.896	22.7	LOS B	62.0	449.5	0.77	0.77	48.8
12	R2	420	4.5	357	4.5	1.070	104.6	LOS F	29.8	216.4	1.00	1.13	20.9
Approach		2904	3.7	2466 N1	3.7	1.070	36.1	LOS C	62.0	449.5	0.82	0.84	40.7
All Vehicles		4554	5.1	4116 N1	5.7	1.162	36.2	LOS C	62.0	449.5	0.75	0.75	37.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	1	11.6	LOS B	0.0	0.0	0.42	0.42
P2	East Full Crossing	3	59.1	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	1	8.9	LOS A	0.0	0.0	0.37	0.37
P4	West Full Crossing	2	59.1	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		7	45.2	LOS E			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: PM End - Gregory Hills Dr/The Hermitage Way/Donovan Blvd

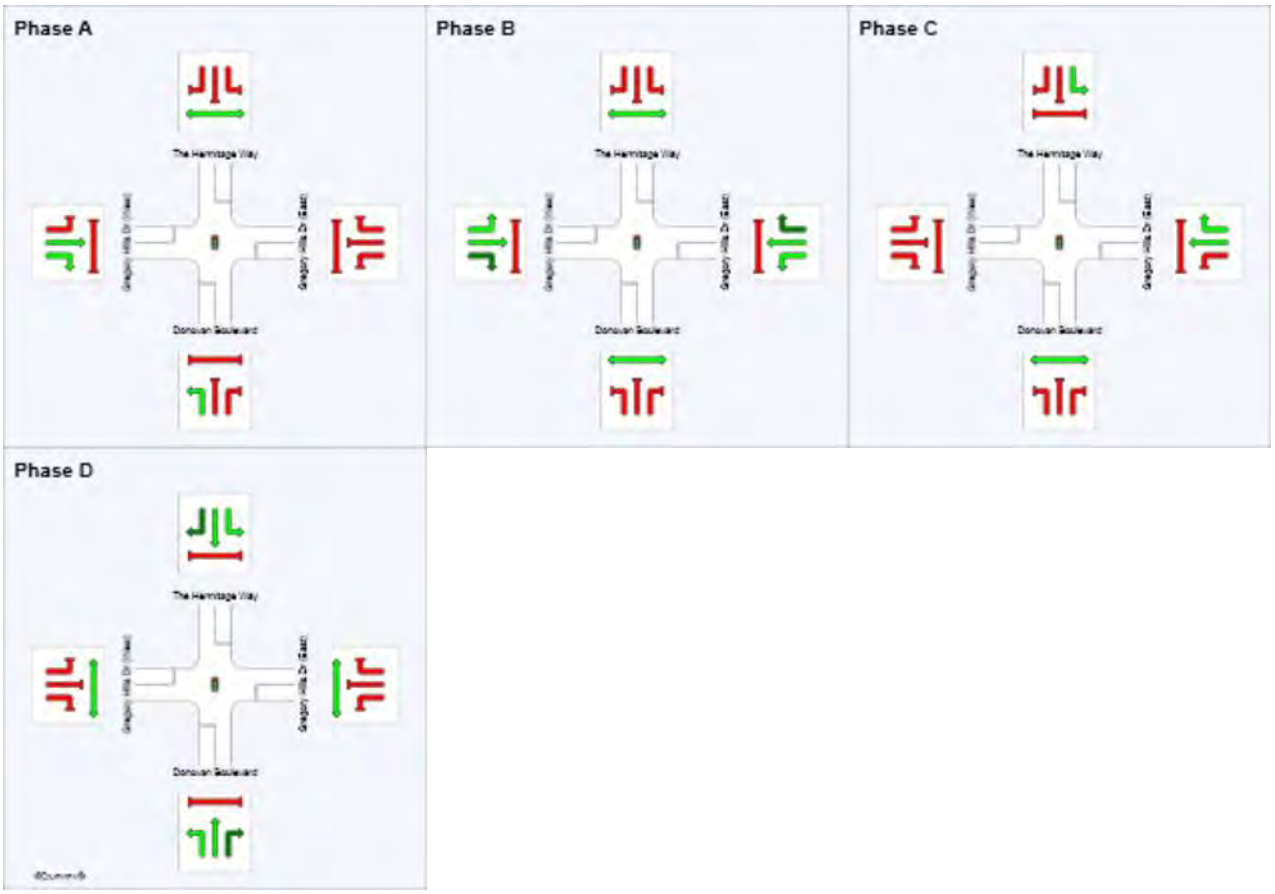
Network: PM Network

Scenario 3 - Full Development - RMS Trip Generation
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Leading Right Turn
Movement Class: All Movement Classes
Input Sequence: A, B, C, D
Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	16	100	113
Green Time (sec)	10	78	7	11
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	16	84	13	17
Phase Split	12 %	65 %	10 %	13 %



Normal Movement
Slip/Bypass-Lane Movement
Stopped Movement
Other Movement Class Running
Mixed Running & Stopped Movement Classes
Undetected Movement
Permitted/Opposed
Opposed Slip/Bypass-Lane
Turn On Red
Other Movement Class Stopped
Phase Transition Applied

Appendix 3

Mott Macdonald, 'Camden Medical Campus Council Flood Planning Level Comments'

MOTT MACDONALD

Brent Devine
Planning Services
GPO Box 39
Sydney NSW 2001

Your Reference
368851

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383 Kent Street
Sydney NSW 2000
PO Box Q1678, QVB
Sydney, NSW 1230
Australia

T +61 (0)2 9098 6800
F +61 (0)2 9098 6810
mottmac.com

Camden Medical Campus Council Flood Planning Level Comments

21 November 2016

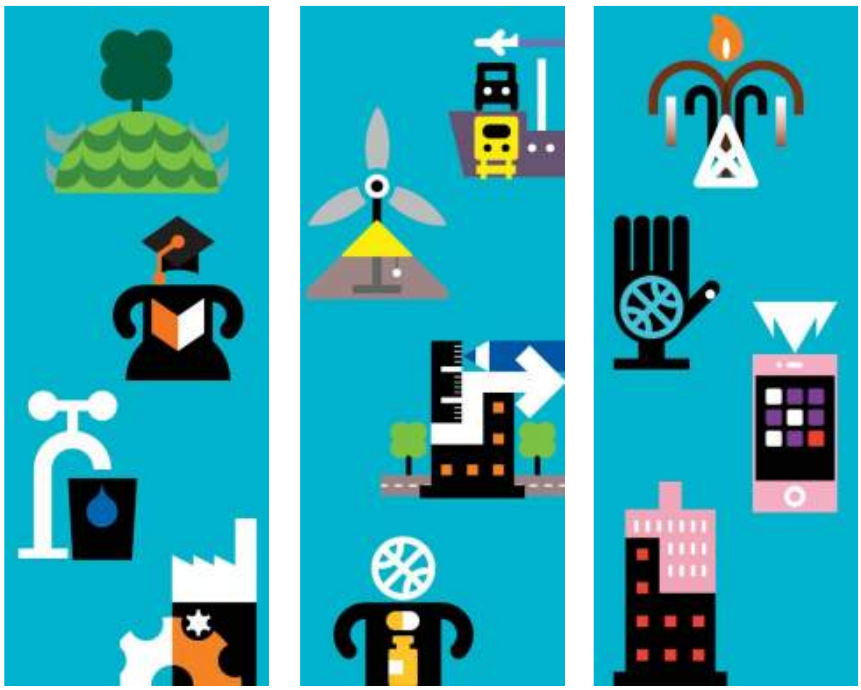
Dear Sir,

This letter has been prepared in response to the SSD submission received from Camden Council on the 10th November 2016, specifically Item 3 in the Flooding/Engineering section. As requested the Stormwater and Servicing Strategy report has been amended in response to this query. Specifically, the flood planning levels have been amended in accordance with Camden Council Flood Risk Management Policy and PMF levels added to show that the floor levels are in accordance with this policy and initial advice received from Council received in response to the initial SEARS Application. This additional information addresses the outstanding information requested.

If you have any queries, please do not hesitate to contact the undersigned.

Kind Regards

Sean Reilly
Senior Civil Engineer
sean.reilly@mottmac.com



Camden Medical Campus

Stormwater Management and Servicing Strategy Report

November 2016

Mott MacDonald

Camden Medical Campus

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Mott MacDonald, L10, 383 Kent Street, Sydney NSW 2000, Australia
PO Box Q1678, QVB Sydney NSW 1230, Australia
T +61 (0)2 9098 6800 **F** +61 (0)2 9098 6801 **W** www.mottmac.com

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C	21.11.2016	S. Reilly	C. Avis	C. Avis	Section 2.5 amended

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Contents

1 Introduction

1.1 Purpose of Report

This Stormwater Management and Servicing Strategy Report has been prepared by Mott MacDonald (MM) as part of the EIS submission for the proposed Camden Medical Campus located on Lot number 846 within the Gregory Hills Corporate Park development. This report describes the proposed stormwater management measures and review of the servicing strategy for the proposed site. The report has been prepared in response to SEARS Application specifically items10, 14 and 15.

1.2 Site Location and Description

The site is located on Lot number 846 within the Gregory Hills Corporate Park development at Gregory Hills. The proposed site is bounded by the South Creek Tributary Way to the west, Digitaria Drive to the north, the Hermitage Way to the east and a proposed future medical centre to the south. The site generally has a fall from east to west with all of the site runoff directed towards the South Creek Tributary.

1.3 Basis of Report

The engineering detail in this report has been developed based on the following documentation:

- Existing site survey undertaken by Burton and Field Surveyors.
- Draft DP plan prepared by Burton and Field Surveyors.
- Civil engineering documentation prepared by Mott MacDonald for the Stage 3 to 6 Gregory Hills Corporate Park Development Application, DA 997/2014.
- Civil Engineering documentation for Stage 4 of Gregory Hills Corporate Park prepared by Mott MacDonald.
- Civil Engineering documentation for the South Creek Tributary works in the Gregory Hills Corporate Park site prepared by Mott MacDonald.
- Civil engineering DA drawings for Stage 2 of the Gregory Hills Corporate Park development prepared by Mott MacDonald submitted as DA 864/2014.
- Civil Engineering documentation for Stage 2 of Gregory Hills Corporate Park prepared by Mott MacDonald.
- Sydney Water drawings for Stage 4 of Gregory Hills Corporate Park prepared by Mott MacDonald.
- Civil engineering documentation prepared by Tribeca Homes for the residential Development to the east of the proposed site.

2 Stormwater Management

2.1 Design Philosophy

The stormwater drainage for the site has been designed in accordance with the following criteria that has been approved by council and is consistent with the overall estate design philosophy.

Approved Overall Estate Drainage Criteria:

- Road network drainage system designed to convey the 10 year ARI storm event runoff from the road areas as well as the detained flows from each of the individual development lots.
- Outlet pipes from each of the lots designed to convey the detained 10 year ARI storm event runoff from the lots. This is as a result of detention being required on each of the individual development lots so that the peak flow from the post developed site (including compensatory storage for the adjacent road area) does not exceed the pre developed flows for all storm events from the 1 year to the 100 year ARI storm events.

Proposed Site Drainage Criteria:

- Internal drainage system designed to convey the 10 year ARI storm event runoff from the site.
- Detention provided so that the peak flow from the post developed site (including compensatory storage for the adjacent road area) does not exceed the pre developed flows for all storm events from the 1 year to the 100 year ARI storm events. In accordance with detention sizing provided as part of the approved DA 997/2014.

To achieve this design criteria, drainage is proposed to collect runoff from the carpark and building areas discharging via a detention tank into the proposed external mains system in Digitaria Drive. The proposed drainage layout is shown on MM drawing numbers CA-0130 to CA-0134

2.2 Onsite Detention

The Turner Road Precinct Development Control Plan 2007 requires that the development attenuates the 100 year ARI peak post development flow back to the pre-development flow rates. In accordance with Camden Council Engineering Design Specification on site detention shall manage peak discharges for all storms up to the 100 year ARI event.

As documented in the "*Civil Engineering Report – Stage 3 to 6 Development Application, Mott MacDonald, March 2015*" which was prepared by Mott MacDonald as part of the DA submission, the basis for the lot based detention design for the Gregory Hills Corporate Park site is as follows:

- The general principles of on-site detention for each commercial lot are as approved in the development consent 277/2012 and 997/2014. The development consent states that "*if necessary an on-site detention system must be provided to restrict stormwater discharges from the site to pre*

development flows in accordance with Camden Council's current Engineering Design Specifications".

- The detention volume for each lot has been designed to provide compensatory detention for the adjacent road frontage including the proportion of Gregory Hills Drive adjacent to the site.
- The calculated proportion of adjacent road area that each individual lot provides compensatory storage for was taken as the percentage of the total lot area of each individual lot.
- Each lot was modelled so that the peak flow from the post developed site (including flows that bypass the detention basin from the adjacent road area) does not exceed the pre developed flows for all storm events from the 1 year to the 100 year ARI storm events.
- The assumed depth of the proposed detention tanks are taken as 1m.

From the calculations undertaken as part of the DA submission the following detention requirements have been calculated for Lot 846:

Detention Volume = **1,375 m^3**

Orifice Diameter = **390 mm**

The following catchment data was used to calculate the detention volume required for the site.

Table 2.1: Lot 846 – Input Data

Item	Value
Pre Developed (Total) Area	5.175 ha
Lot Area	4.145 ha
Percentage of Total Lot Area	26.77%
Adjacent Road Area	1.030 ha

Source: *Civil Engineering Report – Stage 3 to 6 Development Application, Mott MacDonald, March 2015*

With the following allowable discharge required from the site:

Table 2.2: Lot 846 - Detention Calculations DRAINS Output

Storm Event	Pre Developed Flow (m^3/s)	Post Developed Pipe Flow from Site (m^3/s)	Post Developed Overland Flow from Site (m^3/s)	Post Developed Flow Bypassing Detention (m^3/s)	Total Post Developed Flow (m^3/s)
1 year	0.396	0.189	0	0.207	0.396
10 year	1.270	0.275	0.008	0.367	0.650
100 year	2.070	0.310	0.910	0.513	1.733

Source: *Civil Engineering Report – Stage 3 to 6 Development Application, Mott MacDonald, March 2015*

Due to the layout of the site which results in not all of the runoff being able to be directed through the proposed detention system these calculations have been revisited as shown in Section 2.3.8.

2.3 Stormwater Modelling

Modelling of the proposed stormwater system was undertaken using the DRAINS software package. The following parameters were used in the model.

2.3.1 Hydrologic Parameters

The Intensity-Frequency-Duration (IFD) information from Camden Councils Engineering Design Specification was used. The proposed stormwater drainage system was analysed for a range of durations (between 5 minutes to 2 hours) to ascertain the effectiveness of the proposed system under multiple design rainfall scenarios.

Table 2.3 lists the loss parameters utilised in the DRAINS model. These parameters are as outlined in the Camden Council Engineering Design Specification.

Table 2.3: DRAINS Model Loss Parameters

Parameter	Value
Impervious (Paved) Depression Storage	1 mm
Pervious (Grassed) Depression Storage	5 mm
Soil Type	3

2.3.2 Pit Inlet Capacities

For all pits throughout the development, the pit capacity relationships within *DRAINS* were adopted. These relationships are based on published results of scale model testing. For the 100 year storm event a blockage factor of 50% was applied on all pits as per Camden Council requirements.

2.3.3 Pipe and Pit Friction Losses

A Manning's friction coefficient of 0.013 was adopted for reinforced concrete pipes and 0.009 for uPVC pipes as specified by Camden Council.

Pit loss values were derived from the Missouri chart as set out in the Camden Council Engineering Design Specification and are summarised in the DRAINS Input data.

2.3.4 Pipes

Proposed pipes were graded at a minimum slope of 1%, with a desirable minimum cover of 600mm over the pipe.

2.3.5 Catchments

Catchment areas for each pit are shown in the DRAINS Input data attached in Appendix A and on the Catchment Plan, MM drawing number CA-0210.

The DRAINS Input data in Appendix A lists the areas for each catchment and the adopted pervious and impervious percentages.

2.3.6 Overland Flow Paths

Typical cross-sections based on the gutter shape and pavement type were input to DRAINS representing the overland flow paths. Slopes were derived from the proposed pit surface levels.

2.3.7 Tailwater Levels

The tailwater level at the connection point to the downstream drainage system was set at the HGL level from the Stage 4 Gregory Hills Corporate Park design.

2.3.8 Detention

Using the design criteria as discussed in Section 2.2 the detention volume for the site was revisited due to areas of the site not able to be drained through the proposed detention system. The tank was sized to satisfy the following:

The post developed flow from the site including the flows bypassing detention + The external post developed flows from the public domain areas = The predeveloped flows for all flows from the 1 year to the 100 year storm event.

To meet these requirements it is proposed to install a detention tank with a high early discharge pit. The high early discharge pit has been utilised to provide a detention system with a smaller storage volume requirement but still however meeting the site discharge requirements. As a result the following detention system is proposed:

- Detention Volume = **1,000 m^3**
- Orifice diameter for low flows = **340mm**
- Weir level = **RL 98.8**
- Outlet pipe diameter for high flows = **600mm**

The detention system is proposed to be an underground tank. Other options include utilising storage in the pipe system by upsizing the pipe size within the site. This can be investigated further during the detailed design phase.

The outflows from the site utilising the detention system as specified above are summarised in Section 2.3.9.

2.3.9 Results

The model was run to provide 150mm freeboard at all the pits during the 10 year ARI storm event. The results from the DRAINS model are attached in Appendix A. The total outflows from the site are summarised below against the required outflows as identified in Section 2.2.

Table 2.4: DRAINS Output

Storm Event	Pre Developed Flow (m3/s)	Post Developed Flow Bypassing OSD from external to site (m3/s)	Post Developed Flow Piped from Site (m3/s)	Post Developed Overland Flow from OSD (m3/s)	Post Developed Flow Bypassing OSD from Site (m3/s)	Total Post Developed Flow (m3/s)
1 year	0.396	0.207	0.160	0	0.025	0.392
10 year	1.27	0.367	0.542	0	0.067	0.976
100 year	2.07	0.513	0.985	0.287	0.214	1.999

2.4 Stormwater Quality Management

As part of this development it is proposed to provide an onsite water quality management system to meet the requirements in accordance with Camden Councils guidelines as summarised in Table 2.5 below:

Table 2.5: Camden Council Water Quality Targets

Pollutant	% Reduction in Pollutant Loads
Gross Pollutants (>5mm)	90%
Total Suspended Solids	85%
Total Phosphorus	65%
Total Nitrogen	45%

Source: Camden Council Engineering Design Specification

The above objectives are expressed as the reduction in pollutant loads required, compared to the proposed development with no stormwater control measures.

As approved in the Gregory Hills Corporate Park Development Consent for the whole estate, a development condition shall be imposed on all private lot developments to manage water quality onsite prior to discharging flows into the public domain system. The runoff within the public domain is being treated with a separate at source treatment on the public domain roads prior to entry into the piped system.

2.4.1 Proposed Treatments

To achieve the required pollutant reductions to satisfy Camden Councils requirements, the following water quality treatment train is proposed. A HumeGard® GPT will be used as the primary treatment followed by a JellyFish® filter as a tertiary treatment device. The proposed treatment train is discussed in more detail in the following sections.

2.4.1.1 HumeGard® Gross Pollutant Trap (GPT)

For primary treatment of the stormwater runoff, a HumeGard® Gross Pollutant Trap is to be provided. The HumeGard is a pollution control device specifically designed to remove gross pollutants and coarse sediments in residential and commercial developments. The MUSIC node from Hume's was used for this model with the input data as summarised below.

Table 2.6: HumeGard® GPT MUSIC Input Parameters

Pollutant	Input	Output	Adopted Rate
Suspended Solids (mg/L)	500	295	41%
Phosphorus (mg/L)	5	3.3	34%
Nitrogen (mg/L)	5	3.8	24%
Gross Pollutants (kg/ML)	15	2.2	85%

Source: *Humes*

2.4.1.2 HumeCeptor® Oil and Silt Arrestor

For secondary treatment of the stormwater runoff, a HumeCeptor® oil and silt arrestor is to be provided. The HumeCeptor is a pollution control device specifically designed to remove Total Suspended Solids and hydrocarbons from runoff. The MUSIC node from Hume's was used for this model with the input data as summarised below.

Table 2.7: HumeCeptor® MUSIC Input Parameters

Pollutant	Input	Output	Adopted Rate
Suspended Solids (mg/L)	500.3	100.3	80%
Phosphorus (mg/L)	4.998	3.519	30%
Nitrogen (mg/L)	5.0	3.5	30%
Gross Pollutants (kg/ML)	15.1	14.9	1.3%

Source: *Humes*

2.4.1.3 JellyFish® Filter

The JellyFish® filter are to be provided to be used as a final treatment device for stormwater runoff from the proposed development. Using filtration cartridges the JellyFish® filter is able to capture a high level of

stormwater pollutants including total suspended solids, total nitrogen, total phosphorous, total copper and total zinc. In developing the MUSIC model for the proposed development, a JellyFish® JF3000-16-4 cartridge system by Hume's with a treatable flow rate of 88L/s has been proposed as an end-of-line treatment prior to discharge. The position of the JellyFish® system has been proposed to maximise flows and allow easy access for maintenance. The MUSIC node from Hume's was used for this model with the input data as summarised below.

Table 2.8: JellyFish® Filter MUSIC Input Parameters

Pollutant	Input	Output	Adopted Rate
Suspended Solids (mg/L)	200	22	89%
Phosphorus (mg/L)	0.4	0.14	65%
Nitrogen (mg/L)	7	3.2	54%
Gross Pollutants (kg/ML)	100	1	99%

Source: *Humes*

2.4.2 Water Quality Modelling

A MUSIC (Version 6) model was created for the site to ensure the treatment measures provided onsite achieve the pollutant removal objectives as set by Camden Council. The following methodology and parameters were incorporated in the MUSIC model:

- The MUSIC model's default pluviograph data for Sydney 6 minute interval was utilised within the model. This was deemed acceptable for the site since the years utilised had both wet and dry periods and were close to the site.
- A MUSIC model was setup to represent the post developed site. The site was split up into 3 sub catchments representing the landscaped area, the carpark and sealed footpath area and the roofed areas.

Table 2.9: MUSIC Post-Developed Catchments

Post-Developed Region	Area (Ha)
Roof water discharging to water quality treatment	1.928 ha
Sealed road and footpath discharging to water quality treatment	1.354 ha
Landscaping discharging to water quality treatment	0.681 ha
Landscaping Bypass	0.121 ha
Sealed road and footpath bypass	0.060 ha

For the MUSIC catchment plan, refer to MM drawing number CA-0220.

- Pollutant concentration parameters used within the model were based on the recommended model defaults for different land use categories as specified in the MUSIC modeling guidelines prepared for the Sydney Catchment Authority (SCA). These are summarised in the following table:

Table 2.10: Post-Development Areas – MUSIC Node Classification

MUSIC Node	Category
Roof	"Roof Area"
Hardstand	"Roads"
Landscaping	"Pervious"

Source: NSW MUSIC modeling guidelines.

- A treatment train was designed to incorporate a series of treatment nodes including a HumeGard, HumeCeptor and a JellyFish Filter. The effectiveness of the proposed treatments is summarised in Section 2.4.3.

2.4.3 MUSIC Results

The following results were achieved within the model.

Table 2.11: MUSIC Results of Total Site

Pollutant	Post – Development (kg/yr)		Removal Rate (%)	Target Removal (%)
	Untreated	Residual		
Suspended Solids	11,800	781	93.4	85
Phosphorus	20.2	5.36	73.4	65
Nitrogen	111	73.4	66.7	45
Gross Pollutants	1130	36.2	96.8	90

According to the results of the MUSIC analysis the water quality treatment train provided will provide adequate treatment for the proposed development runoff from the proposed development in accordance with the water quality targets as set out by Camden Council.

2.5 Flooding

As part of the design works for the proposed South Creek Tributary a HEC-RAS model was prepared to determine the flood levels within the proposed creek alignment. The design of the creek tributary is as documented in the "*Civil Engineering Report – South Creek Tributary CC, Mott MacDonald, September 2015*". A plan summarising the results from the HEC-RAS model taken from the above mentioned report is attached in Appendix B. As per council requirements a minimum freeboard of 600mm is required above the 100 year ARI flood level for all habitable floor levels in accordance with Camden Councils Flood Risk Management Policy. Further to this advice was received from council in response to the initial SEARS application stating that the site was to have a minimum freeboard of 2.3m above the riparian corridor.

Table 2.12: Flooding Levels – 100 Year ARI

Location	Minimum Creek Surface Level RL (m)	100 Year Flood Level RL (m)	Minimum Allowable Floor Level with 600mm Freeboard (m)	Minimum Allowable Floor Level 2.3m above Creek Level (m)	PMF Flood Level RL (m)
North western corner of the site	95.22	95.99	96.59	97.52	98.48
South western corner of the site	97.19	97.85	98.45	99.49	98.74

Source: *Civil Engineering Report – Tributary CC, Mott MacDonald, September 2015*

The proposed finished floor level for the site is RL 102.50 which is acceptable in accordance with council's requirements. The proposed basement located adjacent to the north eastern corner of the site is to be located at RL 99.50 this is also above the required freeboard level and 1.02m above the PMF level and is acceptable. The proposed multi deck carpark has a minimum proposed level of RL 100.55 in the south western corner of the site, which is above the minimum allowable floor level.

3 Servicing Strategy

The following section provides a summary of the proposed servicing strategy for the site. It is noted that the servicing infrastructure as discussed below is currently under construction and will be in place well before construction commences on the subject site.

3.1 Water

A 150mm diameter DICL water main is to be constructed as part of the Stage 4 works of the Gregory Hills Corporate Park development on the northern side of Digitaria Drive. 2 x 150mm diameter tees are to be constructed off this main to provide a connection point to Lot 846 in the north western corner of the site, for both potable water and fire services. The design of these works has been undertaken by Mott MacDonald as the water servicing coordinators for the proposed development. A 150mm diameter PVC is also located on the eastern side of the Hermitage Way, with connection also being able to be provided to this pipe if required. Connections provided to the site are sufficient for the proposed hospital site, with no amplification required. This is to be confirmed by Sydney Water during the detailed design stage.

3.2 Sewer

An existing 375mm diameter PVC main runs within the South Creek tributary along the western boundary of the subject site. As part of the Stage 4 works of the Gregory Hills Corporate Park development, a 225mm diameter PVC pipe with terminal maintenance shaft is to be provided off the 375mm diameter main for the connection of Lot 846. The design of these works has been undertaken by Mott MacDonald as the water servicing coordinators for the proposed development. Connections provided to the site are sufficient for the proposed hospital site, with no amplification required. This is to be confirmed by Sydney Water during the detailed design stage.

3.3 Electricity

An underground electrical network is to be constructed as part of the Stage 4 works of the Gregory Hills Corporate Park development within Digitaria Drive and the Hermitage Way on both sides of the road. The design of these works has been undertaken by Estate Power Design Pty Ltd with allowance made for the connection of Lot 846. An electrical substation is to be provided for the hospital site along Digitaria Drive. The size and location of this substation is to be confirmed during the detailed design phase once the usage requirements for the site have been determined.

3.4 Gas

A 110mm gas main is located along the eastern boundary of the site on the eastern side of the Hermitage Way. Connection to this main is proposed for the site. Connection requirements are to be determined during the detailed design phase once usage requirements have been determined.

3.5 Telecommunications

An underground telecommunications network is to be constructed as part of the Stage 4 works of the Gregory Hills Corporate Park development within Digitaria Drive and the Hermitage way on both sides of the road. Connection to these cables is proposed for this development.

Appendices

Appendix A. Drains Input/Output

DRAINS Input

PIT / NODE DETAILS — Version 13

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is
PitD2	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		4	102		0	0.5	294186.711	6233223.072	No	218	1 x Ku	No	New
PitD1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	1.5	101.7	0.1	0	0.5	294173.057	6233231.069	No	217	1 x Ku	No	New
PitA3	OnGrade	Dummy	GPT		0.5	99.7		0	0.5	294147.371	6233265.109	Yes	91	1 x Ku	No	New
PitA2	OnGrade	Junction	JP		0.5	99.4		0	0.5	294147.032	6233269.285	Yes	92	1 x Ku	No	New
PitA1	OnGrade	Junction	JP		0.5	99.2		0	0.5	294146.987	6233273.891	Yes	34298752	1 x Ku	No	New
PitA0	OnGrade	Junction	JP		0.5	99		0	0.5	294147.099	6233279.977	Yes	154	1 x Ku	No	Existing
NOut	Node					98.7		0		294146.97	6233281.982		93		No	
NBypass1	Node					100		0		294155.461	6233281.909		241		No	
NByp2B3Out	Node					100		0		294243.851	6233276.221		242		No	
NBypassSum	Node					99		0		294053.968	6233156.728		289		No	
NBypassOut	Node					98		0		293980.089	6233156.714		290		No	
PitG1	OnGrade	Dummy	UNLIMITED		4	101		0	0.5	294183.801	6233260.734	No	312	1 x Ku	No	New
NRoof5	Node					110		0		294185.468	6233270.471		348		No	
PitB1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	1.5	99.5	0.15	0	0.5	294185.365	6233273.513	No	207	1 x Ku	No	New
NRoof4	Node					110		0		294294.674	6233242.382		475		No	
PitB5	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	0.5	101.12	0.1	0	0.5	294294.306	6233251.766	No	429	1 x Ku	No	New
PitB4	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	100.68		0	0.5	294259.377	6233262.091	No	416	1 x Ku	No	New
PitB3	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	100.5		0	0.5	294243.713	6233266.068	No	387	1 x Ku	No	New
PitB2	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	0.5	99.5	0.1	0	0.5	294210.313	6233270.08	No	361	1 x Ku	No	New
NByp3B5Out	Node					100		0		294281.492	6233266.26		512		No	
NByp4B6B7	Node					100		0		294320.503	6233256.345		537		No	
PitB8	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		4	102.3		0	0.5	294362.263	6233224.818	No	560	1 x Ku	No	New
PitB7	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	101.86		0	0.5	294330.687	6233241.799	No	548	1 x Ku	No	New
PitB6	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	101.6		0	0.5	294311.761	6233247.181	No	523	1 x Ku	No	New
PitH1	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		4	102		0	0.5	294191.404	6233147.913	No	606	1 x Ku	No	New
PitA7	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	101.8		0	0.5	294179.888	6233130.358	No	604	1 x Ku	No	New
PitA6	OnGrade	Junction	JP		2	102		0	0.5	294161.018	6233140.422	Yes	590	1 x Ku	No	New
PitA5	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	0.5	101.55	0.25	0	0.5	294162.052	6233184.849	No	580	1 x Ku	No	New
NBypass5	Node					100		0		294139.8	6233195.582		652		No	
NRoof1	Node					110		0		294164.475	6233130.225		168265		No	
NRoof2	Node					110		0		294168.766	6233214.782		168277		No	
NByp7E2Out	Node					100		0		294238.239	6233021.741		168315		No	
PitC3	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	102.34	0.1	0	0.5	294268.761	6233083.524	No	168356	1 x Ku	No	New
PitC2	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	102.3		0	0.5	294261.905	6233087.021	No	168355	1 x Ku	No	New
PitC1	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	102.1		0	0.5	294244.918	6233095.993	No	168354	1 x Ku	No	New
PitA9	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	102		0	0.5	294235.868	6233100.7	No	168263	1 x Ku	No	New
PitA8	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	0.5	101.6	0.2	0	0.5	294199.128	6233119.965	No	605	1 x Ku	No	New
PitM1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	101.7	0.15	0	0.5	294266.684	6233126.519	No	168394	1 x Ku	No	New
PitJ1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	101.77	0.1	0	0.5	294262.23	6233135.736	No	168417	1 x Ku	No	New
PitA11	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	2	101.77	0.15	0	0.5	294258.166	6233137.93	No	168418	1 x Ku	No	New
PitA10	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		1.5	101.95		0	0.5	294243.7	6233116.474	No	168419	1 x Ku	No	New
PitF2	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	102.12	0.12	0	0.5	294321.871	6233179.027	No	168500	1 x Ku	No	New
PitF1	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	102.24		0	0.5	294312.05	6233175.505	No	168499	1 x Ku	No	New
PitA13	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	102.22		0	0.5	294285.298	6233161.96	No	168486	1 x Ku	No	New
PitA12	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		0.5	102		0	0.5	294271.425	6233150.875	No	168473	1 x Ku	No	New
PitK1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	102.9	0.1	0	0.5	294309.856	6233168.082	No	168540	1 x Ku	No	New
PitA15	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	102.7		0	0.5	294323.104	6233160.361	No	168539	1 x Ku	No	New
PitA14	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		2	103		0	0.5	294309.635	6233143.538	No	168526	1 x Ku	No	New
PitL1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	102.9	0.1	0	0.5	294333.019	6233154.997	No	168541	1 x Ku	No	New
PitA16	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		4	102.4		0	0.5	294333.669	6233173.771	No	168542	1 x Ku	No	New
NRoof3	Node					110		0		294192.105	6233134.191		252700		No	
PitN1	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	5	4	100.1	0.2	0	0.5	294148.233	6233106.174	No	4899836	1 x Ku	No	New
NBypass6	Node					100		0		294144.778	6233073.761		5102305		No	
PitE3	Sag	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade	2	4	101.17	0.1	0	0.5	294221.268	6233023.254	No	16955448	1 x Ku	No	New
PitE2	OnGrade	NSW Dept. of Housing RM7 Inlet, 3% crossfall-1% grade	RM.7 Grated Accessway Pit at 1% longitudinal grade		1.5	101.25		0	0.5	294227.201	6233045.604	No	168338	1 x Ku	No	New
PitE1	OnGrade	Junction	JP		1.5	102.44		0	0.5	294227.272	6233069.941	Yes	168324	1 x Ku	No	New

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length(m)	id
OSDA4	97.61	1		Orifice		340	97.78			294155.884	6233252.372	No			89
	97.88	750													
	99.5	750													
	99.51	1													
	100	1													
	101.8	1													
OSDWeir	97.6	1		Culvert	0.5					294153.72	6233255.618	No			8371174
	100	1													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%) %	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFactor	Rainfall Multiplier
CatD2	PitD2	0.0474	100	0	0	5	10	0										0				1
CatD1	PitD1	0.0762	100	0	0	5	10	0										0				1
CatA4	OSDA4	0.1022	100	0	0	5	10	0										0				1
CatBypass1	NBypass1	0.0374	100	0	0	5	10	0										0				1
CatBypass2	NByp2B3Out	0.0028	100	0	0	5	0	0										0				1
CatG1	PitG1	0.0115	100	0	0	5	10	0										0				1
CatRoof5	NRoof5	0.372	100	0	0	5	10	0										0				1
CatB1	PitB1	0.0501	0	100	0	5	10	0										0				1
CatRoof4	NRoof4	0.3928	100	0	0	5	10	0										0				1
CatB5	PitB5	0.0498	0	100	0	5	10	0										0				1
CatB4	PitB4	0.0569	89	11	0	5	10	0										0				1
CatB3	PitB3	0.092	87	13	0	5	10	0										0				1
CatB2	PitB2	0.022	0	100	0	5	10	0										0				1
CatBypass3	NByp3B5Out	0.0083	83	17	0	5	10	0										0				1
CatBypass4	NByp4B6B7	0.0144	60	40	0	5	10	0										0				1
CatB8	PitB8	0.1268	0	100	0	5	10	0										0				1
CatB7	PitB7	0.0058	100	0	0	5	10	0										0				1
CatB6	PitB6	0.0369	100	0	0	5	10	0										0				1

CatH1	PitH1	0.0866	100	0	0	5	10	0									0		1
CatA7	PitA7	0.0393	79	21	0	5	10	0									0		1
CatA5	PitA5	0.1408	100	0	0	5	10	0									0		1
CatBypass5	NBypass5	0.0339	0	100	0	5	10	0									0		1
CatRoof1	NRoof1	0.4707	100	0	0	5	10	0									0		1
CatRoof2	NRoof2	0.2338	100	0	0	5	10	0									0		1
CatBypass7	NByp7E2Out	0.0109	39	61	0	5	10	0									0		1
CatC3	PitC3	0.0633	0	100	0	5	10	0									0		1
CatC2	PitC2	0.1739	91	9	0	5	10	0									0		1
CatC1	PitC1	0.0483	81	19	0	5	10	0									0		1
CatA9	PitA9	0.0656	74	26	0	5	10	0									0		1
CatA8	PitA8	0.1012	82	18	0	5	10	0									0		1
CatM1	PitM1	0.1282	88	12	0	5	10	0									0		1
CatJ1	PitJ1	0.0199	0	100	0	5	10	0									0		1
CatA11	PitA11	0.0394	100	0	0	5	10	0									0		1
CatA10	PitA10	0.0156	100	0	0	5	10	0									0		1
CatF2	PitF2	0.0486	93	7	0	5	10	0									0		1
CatF1	PitF1	0.01	100	0	0	5	10	0									0		1
CatA13	PitA13	0.0238	100	0	0	5	10	0									0		1
CatA12	PitA12	0.025	78	22	0	5	10	0									0		1
CatK1	PitK1	0.0294	0	100	0	5	10	0									0		1
CatA15	PitA15	0.0286	94	6	0	5	10	0									0		1
CatA14	PitA14	0.0037	100	0	0	5	10	0									0		1
CatL1	PitL1	0.0309	0	100	0	5	10	0									0		1
CatA16	PitA16	0.0288	100	0	0	5	10	0									0		1
CatRoof3	NRoof3	0.4591	100	0	0	5	10	0									0		1
CatN1	PitN1	0.0988	0	100	0	5	10	0									0		1
CatBypass6	NBypass6	0.0734	0	100	0	5	10	0									0		1
CatE3	PitE3	0.0391	0	100	0	5	10	0									0		1
CatE2	PitE2	0.0688	45	43	0	5	10	0									0		1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
PipeD2-D1	PitD2	PitD1	18.4	101.37	101.07	1.63	RCP	300	300	0.013	New	1	PitD1	0					
PipeD1-A4	PitD1	OSDA4	4.9	101.05	101	1.02	RCP	300	300	0.013	NewFixed	1	OSDA4	0					
P OSD	OSDA4	OSDWeir	2	97.61	97.6	0.5	RCP	450	450	0.013	NewFixed	1	OSDWeir	2					
Pipe A4-A3	OSDWeir	PitA3	2	97.6	97.59	0.5	RCP	600	600	0.013	NewFixed	1	PitA3	2					
PipeA3-A2	PitA3	PitA2	2	97.55	97.54	0.5	RCP	600	600	0.013	New	1	PitA2	0					
PipeA2-A1	PitA2	PitA1	2	97.46	97.45	0.5	RCP	600	600	0.013	New	1	PitA1	0					
PipeA1-A0	PitA1	PitA0	2	97.39	97.38	0.5	RCP	600	600	0.013	New	1	PitA0	0					
PipeA0-NOut	PitA0	NOut	10	97.36	97.26	1	RCP	750	750	0.013	Existing	1	NOut	0					
PipeG1-A4	PitG1	OSDA4	10	98.1	98	1	RCP	300	300	0.013	NewFixed	1	OSDA4	0					
PipeRoof5-B1	NRoof5	PitB1	5	98.35	98.3	1	RCP	375	375	0.013	New	1	PitB1	1					
PipeB1-A4	PitB1	OSDA4	24.6	98.34	98.09	1.02	RCP	600	600	0.013	NewFixed	1	OSDA4	0					
PipeRoof4-B5	NRoof4	PitB5	10	100.58	100.48	1	RCP	375	375	0.013	New	1	PitB5	10					
PipeB5-B4	PitB5	PitB4	42.2	100.33	99.59	1.75	RCP	450	450	0.013	New	1	PitB4	0					
PipeB4-B3	PitB4	PitB3	21.6	99.51	99.29	1.02	RCP	525	525	0.013	New	1	PitB3	0					
PipeB3-B2	PitB3	PitB2	25.3	99.27	98.63	2.53	RCP	525	525	0.013	New	1	PitB2	0					
PipeB2-B1	PitB2	PitB1	24.6	98.61	98.36	1.02	RCP	525	525	0.013	New	1	PitB1	0					
PipeB8-B7	PitB8	PitB7	29.7	101.67	100.93	2.49	RCP	300	300	0.013	New	1	PitB7	0					
PipeB7-B6	PitB7	PitB6	17.4	100.91	100.67	1.38	RCP	300	300	0.013	New	1	PitB6	0					
PipeB6-B5	PitB6	PitB5	19.8	100.65	100.45	1.01	RCP	300	300	0.013	New	1	PitB5	0					
PipeH1-A7	PitH1	PitA7	20.6	101.2	100.87	1.6	RCP	300	300	0.013	New	1	PitA7	0					
PipeA7-A6	PitA7	PitA6	21	99.04	98.83	1	RCP	600	600	0.013	New	1	PitA6	0					
PipeA6-A5	PitA6	PitA5	34.7	98.81	98.46	1.01	RCP	675	675	0.013	New	1	PitA5	0					
PipeA5-A4	PitA5	OSDA4	47.7	98.44	97.96	1.01	RCP	675	675	0.013	NewFixed	1	OSDA4	0					
PipeRoof1-A6	NRoof1	PitA6	5	98.94	98.89	1	RCP	375	375	0.013	New	1	PitA6	1					
PipeRoof2-A4	NRoof2	OSDA4	2	98.05	98.03	1	RCP	375	375	0.013	NewFixed	1	OSDA4	2					
PipeC3-C2	PitC3	PitC2	9.9	101.41	101.31	1.01	RCP	300	300	0.013	New	1	PitC2	0					
PipeC2-C1	PitC2	PitC1	19.7	101.29	101.09	1.02	RCP	300	300	0.013	New	1	PitC1	0					
PipeC1-A9	PitC1	PitA9	9.2	100.39	100.29	1.09	RCP	375	375	0.013	New	1	PitA9	0					
PipeA9-A8	PitA9	PitA8	41.4	99.7	99.29	0.99	RCP	600	600	0.013	New	1	PitA8	0					
PipeA8-A7	PitA8	PitA7	21.2	99.27	99.06	0.99	RCP	600	600	0.013	New	1	PitA7	0					
PipeM1-C1	PitM1	PitC1	35.6	100.77	100.41	1.01	RCP	300	300	0.013	New	1	PitC1	0					
PipeJ1-A11	PitJ1	PitA11	2.8	100.84	100.81	1.07	RCP	300	300	0.013	New	1	PitA11	0					
PipeA11-A10	PitA11	PitA10	16.8	100.37	100.2	1.01	RCP	375	375	0.013	New	1	PitA10	0					
PipeA10-A9	PitA10	PitA9	25.7	100.18	99.92	1.01	RCP	375	375	0.013	New	1	PitA9	0					
PipeF2-F1	PitF2	PitF1	11.9	101.19	101.07	1.01	RCP	300	300	0.013	New	1	PitF1	0					
PipeF1-A13	PitF1	PitA13	27	101.05	100.78	1	RCP	300	300	0.013	New	1	PitA13	0					
PipeA13-A12	PitA13	PitA12	16.5	100.75	100.58	1.03	RCP	300	300	0.013	New	1	PitA12	0					
PipeA12-A11	PitA12	PitA11	16.6	100.56	100.39	1.02	RCP	300	300	0.013	New	1	PitA11	0					
PipeK1-A15	PitK1	PitA15	10	101.97	101.77	2	RCP	300	300	0.013	New	1	PitA15	0					
PipeA15-A14	PitA15	PitA14	18.3	101.26	101.07	1.04	RCP	300	300	0.013	New	1	PitA14	0					
PipeA14-A13	PitA14	PitA13	27.4	101.05	100.77	1.02	RCP	300	300	0.013	New	1	PitA13	0					
PipeL1-A15	PitL1	PitA15	9.6	101.97	101.77	2.08	RCP	300	300	0.013	New	1	PitA15	0					
PipeA16-A15	PitA16	PitA15	18.3	101.47	101.28	1.04	RCP	300	300	0.013	New	1	PitA15	0					
PipeRoof3-A7	NRoof3	PitA7	2	100.92	100.9	1	RCP	375	375	0.013	New	1	PitA7	2					
PipeN1-A6	PitN1	PitA6	19.5	99.47	99.27	1.03	RCP	300	300	0.013	New	1	PitA6	0					
PipeE3-E2	PitE3	PitE2	22.8	100.54	100.31	1.01	RCP	300	300	0.013	New	1	PitE2	0					
PipeE2-E1	PitE2	PitE1	23.1	100.29	100.06	1	RCP	300	300	0.013	New	1	PitE1	0					
PipeE1-A9	PitE1	PitA9	31.7	100.04	99.72	1.01	RCP	300	300	0.013	New	1	PitA9	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Service (m)	Chg (m)	Bottom Elev (m)	Height of Service (m)	Chg (m)	Bottom Elev (m)	Height of Service (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storms (m)	SafeDepth Minor Storms (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %		id
OFD2	PitD2	PitD1	0.1				Dummy	0.2	0.05	0.6	1	0	577	18.4

OFD1	PitD1	OSDA4	0.1				Dummy	0.2	0.05	0.6	1	0	573	10
OF OSD	OSDA4	OSDWeir	0.1	98.8	5	1.704	Dummy	0.2	0.05	0.6	1	0	8371194	1
OFA4	OSDWeir	NOut	0.1	100	5	1.704	Dummy	0.2	0.05	0.6	1	0	24862794	13
Bypass1	NBypass1	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	298	10
Bypass2	NByp2B3Out	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	408	10
BypassTotal	NBypassSum	NBypassOut	0.1				Dummy	0.2	0.05	0.6	1	0	292	10
OFB1	PitB1	NBypassSum	0.2				Dummy	0.2	0.05	0.6	1	0	454	20
OFB5	PitB5	NByp3B5Out	0.2				Dummy	0.2	0.05	0.6	1	0	520	25
OFB4	PitB4	PitB3	0.2				Dummy	0.2	0.05	0.6	1	0	508	22
OFB3	PitB3	NByp2B3Out	0.1				Dummy	0.2	0.05	0.6	1	0	446	5
OFB2	PitB2	PitB1	0.2				Dummy	0.2	0.05	0.6	1	0	378	24.6
Bypass3	NByp3B5Out	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	517	10
Bypass4	NByp4B6B7	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	544	10
OFB8	PitB8	PitB7	0.2				Dummy	0.2	0.05	0.6	1	0	562	30
OFB7	PitB7	NByp4B6B7	0.1				Dummy	0.2	0.05	0.6	1	0	556	5
OFB6	PitB6	NByp4B6B7	0.1				Dummy	0.2	0.05	0.6	1	0	542	5
OFH1	PitH1	PitA8	0.2				Dummy	0.2	0.05	0.6	1	0	635	30
OFA7	PitA7	PitA8	0.2				Dummy	0.2	0.05	0.6	1	0	647	21.2
OFA5	PitA5	OSDA4	0.4				Dummy	0.2	0.05	0.6	1	0	339397	50
Bypass5	NBypass5	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	657	5
Bypass7	NByp7E2Out	NBypassSum	0.6				Dummy	0.2	0.05	0.6	1	0	168321	80
OFC3	PitC3	PitC2	0.1				Dummy	0.2	0.05	0.6	1	0	168402	9.9
OFC2	PitC2	PitC1	0.2				Dummy	0.2	0.05	0.6	1	0	168408	19.7
OFC1	PitC1	PitM1	0.4				Dummy	0.2	0.05	0.6	1	0	168395	35.6
OFA9	PitA9	PitA8	0.3				Dummy	0.2	0.05	0.6	1	0	339404	41.4
OFA8	PitA8	PitA7	0.2				Dummy	0.2	0.05	0.6	1	0	649	21.2
OFM1	PitM1	PitJ1	0.1				Dummy	0.2	0.05	0.6	1	0	168467	12
OFJ1	PitJ1	PitA11	0.1				Dummy	0.2	0.05	0.6	1	0	168457	2.8
OFA11	PitA11	PitJ1	0.1				Dummy	0.2	0.05	0.6	1	0	168452	2.8
OFA10	PitA10	PitA11	0.1				Dummy	0.2	0.05	0.6	1	0	168429	16.8
OFF1	PitF1	PitF2	0.1				Dummy	0.2	0.05	0.6	1	0	168517	11.9
OFA13	PitA13	PitA12	0.1				Dummy	0.2	0.05	0.6	1	0	168494	16.5
OFA12	PitA12	PitA11	0.1				Dummy	0.2	0.05	0.6	1	0	168483	16.6
OFK1	PitK1	PitF1	0.1				Dummy	0.2	0.05	0.6	1	0	168562	8
OFA15	PitA15	PitA16	0.1				Dummy	0.2	0.05	0.6	1	0	168591	18.3
OFA14	PitA14	PitA13	0.2				Dummy	0.2	0.05	0.6	1	0	168535	27.4
OFL1	PitL1	PitA16	0.2				Dummy	0.2	0.05	0.6	1	0	168576	21
OFA16	PitA16	PitF2	0.1				Dummy	0.2	0.05	0.6	1	0	168594	10
OFN1	PitN1	NBypassSum	0.1				Dummy	0.2	0.05	0.6	1	0	4899877	10
Bypass6	NBypass6	NBypassSum	0.5				Dummy	0.2	0.05	0.6	1	0	4899879	50
OFE3	PitE3	NBypassSum	0.6				Dummy	0.2	0.05	0.6	1	0	16955486	60
OFE2	PitE2	NByp7E2Out	0.2				Dummy	0.2	0.05	0.6	1	0	168351	20

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover (m)	Cover (m)	
PipeD2-D1	RCP	300	0.6	0.3	Unsafe
PipeD1-A4	RCP	300	0.6	-3.72	Unsafe
P OSD	RCP	450	0.6	-0.49	Unsafe
Pipe A4-A3	RCP	600	0.6	-0.64	Unsafe
PipeA3-A2	RCP	600	0.6	1.22	
PipeA2-A1	RCP	600	0.6	1.11	
PipeA1-A0	RCP	600	0.6	0.98	
PipeA0-NOut	RCP	750	0.6	0.63	
PipeG1-A4	RCP	300	0.6	-0.72	Unsafe
PipeRoof5-B1	RCP	375	0.6	0.79	
PipeB1-A4	RCP	600	0.6	-1.12	Unsafe
PipeRoof4-B5	RCP	375	0.6	0.23	Unsafe
PipeB5-B4	RCP	450	0.6	0.3	Unsafe
PipeB4-B3	RCP	525	0.6	0.6	
PipeB3-B2	RCP	525	0.6	0.3	Unsafe
PipeB2-B1	RCP	525	0.6	0.32	Unsafe
PipeB8-B7	RCP	300	0.6	0.3	Unsafe
PipeB7-B6	RCP	300	0.6	0.6	
PipeB6-B5	RCP	300	0.6	0.34	Unsafe
PipeH1-A7	RCP	300	0.6	0.47	Unsafe
PipeA7-A6	RCP	600	0.6	2.12	
PipeA6-A5	RCP	675	0.6	2.36	
PipeA5-A4	RCP	675	0.6	-1.08	Unsafe
PipeRoof1-A6	RCP	375	0.6	2.7	
PipeRoof2-A4	RCP	375	0.6	-0.83	Unsafe
PipeC3-C2	RCP	300	0.6	0.6	
PipeC2-C1	RCP	300	0.6	0.68	
PipeC1-A9	RCP	375	0.6	1.3	
PipeA9-A8	RCP	600	0.6	1.66	
PipeA8-A7	RCP	600	0.6	1.69	
PipeM1-C1	RCP	300	0.6	0.6	
PipeJ1-A11	RCP	300	0.6	0.6	
PipeA11-A10	RCP	375	0.6	0.99	
PipeA10-A9	RCP	375	0.6	1.36	
PipeF2-F1	RCP	300	0.6	0.6	
PipeF1-A13	RCP	300	0.6	0.86	
PipeA13-A12	RCP	300	0.6	1.09	
PipeA12-A11	RCP	300	0.6	1.05	
PipeK1-A15	RCP	300	0.6	0.6	
PipeA15-A14	RCP	300	0.6	1.11	
PipeA14-A13	RCP	300	0.6	1.12	
PipeL1-A15	RCP	300	0.6	0.6	
PipeA16-A15	RCP	300	0.6	0.6	
PipeRoof3-A7	RCP	375	0.6	0.49	Unsafe
PipeN1-A6	RCP	300	0.6	0.3	Unsafe
PipeE3-E2	RCP	300	0.6	0.3	Unsafe
PipeE2-E1	RCP	300	0.6	0.63	
PipeE1-A9	RCP	300	0.6	1.95	

DRAINS Output - 1 Year ARI Storm Event

DRAINS results prepared from Version 2016.03

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
PitD2	101.48		0.011		0.52	0.001	Inlet Capacity
PitD1	101.19	101.75	0.019	1.2	0.51	0	Inlet Capacity
PitA3	97.84		0		1.86		None
PitA2	97.75		0		1.65		None
PitA1	97.68		0		1.52		None
PitA0	97.6		0		1.4		None
NOut	97.45		0				
PitG1	98.5		0.003		2.5		None
NRoof5	98.67		0.088				
PitB1	98.66	99.51	0.004	0.2	0.84	0	Inlet Capacity
NRoof4	100.77		0.093				
PitB5	100.54	101.13	0.004	0.2	0.58	0	Inlet Capacity
PitB4	99.73		0.012		0.95	0.001	Inlet Capacity
PitB3	99.49		0.021		1.01	0.004	Inlet Capacity
PitB2	98.85	99.5	0.002	0.1	0.65	0	Inlet Capacity
PitB8	101.77		0.01		0.53	0	Inlet Capacity
PitB7	100.98		0.002		0.88	0	None
PitB6	100.75		0.009		0.85	0	Inlet Capacity
PitH1	101.31		0.021		0.69	0.004	Inlet Capacity
PitA7	99.47		0.008		2.33	0	None
PitA6	99.24		0		2.76		None
PitA5	98.85	101.62	0.033	0.7	2.7	0	Inlet Capacity
NRoof1	99.26		0.111				
NRoof2	98.49		0.055				
PitC3	101.48	102.35	0.005	0.3	0.86	0	Inlet Capacity
PitC2	101.41		0.038		0.89	0.013	Inlet Capacity
PitC1	100.61		0.022		1.49	0.005	Inlet Capacity
PitA9	99.96		0.012		2.04	0.001	Inlet Capacity
PitA8	99.55	101.66	0.026	0.7	2.05	0	Inlet Capacity
PitM1	100.96	101.77	0.032	1.2	0.74	0	Inlet Capacity
PitJ1	100.87	101.77	0.002	0.1	0.9	0	Inlet Capacity
PitA11	100.53	101.79	0.009	0.4	1.24	0	Inlet Capacity
PitA10	100.34		0.004		1.61	0	None
PitF2	101.27	102.15	0.011	0.5	0.85		Inlet Capacity
PitF1	101.14		0.002		1.1	0	None
PitA13	100.89		0.006		1.33	0	None
PitA12	100.7		0.005		1.3	0	None
PitK1	102.01	102.91	0.002	0.1	0.89	0	Inlet Capacity
PitA15	101.35		0.006		1.35	0	None
PitA14	101.16		0.001		1.84	0	None
PitL1	102.02	102.91	0.002	0.1	0.88	0	Inlet Capacity
PitA16	101.54		0.007		0.86	0	None
NRoof3	101.13		0.109				
PitN1	99.54	100.12	0.008	0.2	0.56	0	Inlet Capacity
PitE3	100.59	101.18	0.003	0.1	0.58	0	Inlet Capacity
PitE2	100.37		0.009		0.88	0	Inlet Capacity
PitE1	100.13		0		2.31		None

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CatD2	0.011	0.011	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatD1	0.018	0.018	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA4	0.024	0.024	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatBypass1	0.009	0.009	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatBypass2	0.001	0.001	0	5	0	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatG1	0.003	0.003	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatRoof5	0.088	0.088	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB1	0.004	0	0.004	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatRoof4	0.093	0.093	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB5	0.004	0	0.004	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatB4	0.012	0.012	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB3	0.02	0.019	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB2	0.002	0	0.002	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatBypass3	0.002	0.002	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatBypass4	0.002	0.002	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB8	0.01	0	0.01	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatB7	0.001	0.001	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatB6	0.009	0.009	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatH1	0.021	0.021	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA7	0.008	0.007	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA5	0.033	0.033	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatBypass5	0.003	0	0.003	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatRoof1	0.111	0.111	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatRoof2	0.055	0.055	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatBypass7	0.001	0.001	0.001	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatC3	0.005	0	0.005	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatC2	0.038	0.037	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatC1	0.01	0.009	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA9	0.012	0.011	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA8	0.021	0.02	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatM1	0.028	0.027	0.001	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatJ1	0.002	0	0.002	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatA11	0.009	0.009	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA10	0.004	0.004	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatF2	0.011	0.011	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatF1	0.002	0.002	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA13	0.006	0.006	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA12	0.005	0.005	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatK1	0.002	0	0.002	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatA15	0.006	0.006	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatA14	0.001	0.001	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatL1	0.002	0	0.002	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatA16	0.007	0.007	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatRoof3	0.109	0.109	0	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
CatN1	0.008	0	0.008	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatBypass6	0.006	0	0.006	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatE3	0.003	0	0.003	5	10	0	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
CatE2	0.009	0.007	0.002	5	10	0	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1

Outflow Volumes for Total Catchment (3.34 impervious + 0.79 pervious = 4.14 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 1 year, 5 minutes storm, average 87.8 mm/h, Zone 1	302.65	211.17 (69.8%)	211.17 (86.3%)	0.00 (0.0%)
AR&R 1 year, 10 minutes storm, average 67.3 mm/h, Zone 1	463.97	344.36 (74.2%)	341.55 (91.1%)	2.81 (3.2%)
AR&R 1 year, 15 minutes storm, average 56.2 mm/h, Zone 1	581.17	448.67 (77.2%)	436.27 (92.9%)	12.40 (11.1%)
AR&R 1 year, 20 minutes storm, average 48.9 mm/h, Zone 1	674.24	531.32 (78.8%)	511.49 (93.9%)	19.83 (15.3%)

AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1	753.25	600.24 (79.7%)	575.34 (94.5%)	24.90 (17.2%)
AR&R 1 year, 30 minutes storm, average 39.7 mm/h, Zone 1	821.08	654.90 (79.8%)	630.17 (95.0%)	24.73 (15.7%)
AR&R 1 year, 45 minutes storm, average 31.8 mm/h, Zone 1	986.54	798.54 (80.9%)	763.89 (95.8%)	34.65 (18.3%)
AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1	1116.84	912.81 (81.7%)	869.20 (96.3%)	43.61 (20.4%)
AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1	1290.6	1053.54 (81.6%)	1009.63 (96.8%)	43.91 (17.7%)
AR&R 1 year, 2 hours storm, average 17.3 mm/h, Zone 1	1431.18	1171.89 (81.9%)	1123.24 (97.1%)	48.65 (17.7%)
AR&R 1 year, 3 hours storm, average 13.2 mm/h, Zone 1	1638.14	1335.19 (81.5%)	1290.52 (97.5%)	44.67 (14.2%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
PipeD2-D1	0.01	1.06	101.429	101.187	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeD1-A4	0.027	1.73	101.132	101.108	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
P OSD	0.16	1.01	98.065	98.059	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
Pipe A4-A3	0.16	1.42	97.853	97.843	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
PipeA3-A2	0.16	1.44	97.799	97.793	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
PipeA2-A1	0.16	1.44	97.709	97.703	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
PipeA1-A0	0.16	1.44	97.639	97.633	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
PipeA0-NOut	0.16	1.79	97.552	97.452	AR&R 1 year, 1 hour storm, average 27 mm/h, Zone 1
PipeG1-A4	0.003	0.04	98.499	98.493	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeRoof5-B1	0.088	0.88	98.671	98.662	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB1-A4	0.218	2.74	98.535	98.493	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeRoof4-B5	0.093	1.61	100.775	100.674	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB5-B4	0.106	2.04	100.493	99.754	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB4-B3	0.117	1.76	99.691	99.487	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB3-B2	0.131	2.44	99.426	98.853	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB2-B1	0.131	1.76	98.808	98.662	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeB8-B7	0.009	1.19	101.72	100.984	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeB7-B6	0.011	1.06	100.971	100.746	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeB6-B5	0.017	1.16	100.728	100.544	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeH1-A7	0.017	3.5	101.236	100.947	AR&R 1 year, 20 minutes storm, average 48.9 mm/h, Zone 1
PipeA7-A6	0.275	2.32	99.302	99.242	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA6-A5	0.382	4.81	98.995	98.852	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA5-A4	0.408	2.33	98.771	98.493	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeRoof1-A6	0.111	1.11	99.259	99.242	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeRoof2-A4	0.055	0.5	98.495	98.493	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeC3-C2	0.005	0.76	101.455	101.415	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeC2-C1	0.027	1.29	101.392	101.199	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeC1-A9	0.073	2.72	100.499	100.455	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA9-A8	0.151	2.75	99.849	99.548	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA8-A7	0.165	1.58	99.508	99.467	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeM1-C1	0.03	1.22	100.885	100.613	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeJ1-A11	0.001	0.64	100.862	100.838	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeA11-A10	0.045	3.52	100.435	100.343	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA10-A9	0.05	2.28	100.274	100.057	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeF2-F1	0.01	4.93	101.21	101.136	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeF1-A13	0.012	0.94	101.122	100.891	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA13-A12	0.031	3.7	100.803	100.7	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA12-A11	0.037	1.52	100.673	100.529	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeK1-A15	0.002	1.04	101.992	101.801	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeA15-A14	0.015	1.68	101.315	101.164	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeA14-A13	0.015	1	101.128	100.891	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeL1-A15	0.002	0.74	101.997	101.8	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeA16-A15	0.007	1.05	101.516	101.354	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeRoof3-A7	0.109	1.67	101.134	101.114	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
PipeN1-A6	0.007	3.87	99.489	99.326	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeE3-E2	0.004	0.79	100.575	100.366	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeE2-E1	0.011	1.81	100.332	100.131	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
PipeE1-A9	0.01	0.89	100.106	99.959	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OFD2	0.001	0.001	0.256	0.006	0	1.95	0.14	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFD1	0	0	0.256	0	0	0	0	
OF OSD	0	0	0.256	0	0	0	0	
OFA4	0	0	0.256	0	0	0	0	
Bypass1	0.009	0.009	0.256	0.014	0	4.64	0.27	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
Bypass2	0.005	0.005	0.256	0.011	0	3.74	0.23	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
BypassTotal	0.025	0.025	0.256	0.021	0.01	7.03	0.34	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
OFB1	0	0	0.256	0	0	0	0	
OFB5	0	0	0.256	0	0	0	0	
OFB4	0.001	0.001	0.256	0.007	0	2.25	0.15	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFB3	0.004	0.004	0.256	0.01	0	3.44	0.24	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFB2	0	0	0.256	0	0	0	0	
Bypass3	0.002	0.002	0.256	0.008	0	2.54	0.18	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
Bypass4	0.003	0.003	0.256	0.009	0	2.84	0.21	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFB8	0	0	0.256	0	0	0	0	
OFB7	0	0	0.256	0	0	0	0	
OFB6	0	0	0.256	0	0	0	0	
OFH1	0.004	0.004	0.256	0.01	0	3.44	0.23	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFA7	0	0	0.256	0	0	0	0	
OFA5	0	0	0.256	0	0	0	0	
Bypass5	0.003	0.003	0.256	0.009	0	2.84	0.21	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
Bypass7	0.002	0.002	0.256	0.008	0	2.54	0.17	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
OFC3	0	0	0.256	0	0	0	0	
OFC2	0.013	0.013	0.256	0.017	0	5.54	0.27	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFC1	0.005	0.005	0.256	0.011	0	3.74	0.22	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFA9	0.001	0.001	0.256	0.007	0	2.25	0.15	AR&R 1 year, 25 minutes storm, average 43.7 mm/h, Zone 1
OFA8	0	0	0.256	0	0	0	0	
OFM1	0	0	0.256	0	0	0	0	
OFJ1	0	0	0.256	0	0	0	0	
OFA11	0	0	0.256	0	0	0	0	
OFA10	0	0	0.256	0	0	0	0	
OFF1	0	0	0.256	0	0	0	0	
OFA13	0	0	0.256	0	0	0	0	
OFA12	0	0	0.256	0	0	0	0	
OFK1	0	0	0.256	0	0	0	0	
OFA15	0	0	0.256	0	0	0	0	
OFA14	0	0	0.256	0	0	0	0	
OFL1	0	0	0.256	0	0	0	0	
OFA16	0	0	0.256	0	0	0	0	
OFN1	0	0	0.256	0	0	0	0	
Bypass6	0.006	0.006	0.256	0.012	0	4.04	0.23	AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1
OFE3	0	0	0.256	0	0	0	0	
OFE2	0	0	0.256	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSDA4	98.49	529.7	0.16	0.16	0
OSDWeir	98.06	0.5	0.16	0.16	0

CONTINUITY CHECK for AR&R 1 year, 1.5 hours storm, average 20.8 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
PitD2	14.32	14.3	0	0.1
PitD1	37.32	37.25	0	0.2
OSDA4	1015.73	1012.4	3.34	0
OSDWeir	1012.4	1012.17	0.23	0
PitA3	1012.17	1012.11	0	0
PitA2	1012.11	1012.04	0	0
PitA1	1012.04	1011.96	0	0
PitA0	1011.96	1011.74	0	0
NOut	1011.74	1011.74	0	0
NBypass1	11.3	11.3	0	0
NByp2B3Out	1.96	1.96	0	0
NBypassSum	25.95	25.95	0	0
NBypassOut	25.95	25.95	0	0
PitG1	3.47	3.45	0	0.6
NRoof5	112.35	112.33	0	0
PitB1	296.51	293.46	0	1
NRoof4	118.63	118.64	0	0
PitB5	141.29	141.06	0	0.2
PitB4	156.7	156.62	0	0.1
PitB3	181.45	181.23	0	0.1
PitB2	181.33	181.41	0	0
NByp3B5Out	2.16	2.16	0	0
NByp4B6B7	2.93	2.93	0	0
PitB8	7.02	6.98	0	0.6
PitB7	8.73	8.77	0	-0.5
PitB6	19.92	19.9	0	0.1
PitH1	26.15	26.14	0	0.1
PitA7	397.75	397.12	0	0.2
PitA6	544.65	543.58	0	0.2
PitA5	586.1	580.28	0	1
NBypass5	1.88	1.88	0	0
NRoof1	142.16	142.09	0	0
NRoof2	70.61	70.44	0	0.2
NByp7E2Out	1.67	1.67	0	0
PitC3	3.5	3.46	0	1.1
PitC2	52.12	52.14	0	0
PitC1	100.31	100.12	0	0.2
PitA9	196.85	197.3	0	-0.2
PitA8	224.64	224.24	0	0.2
PitM1	35.87	35.84	0	0.1
PitJ1	1.1	1.09	0	0.6
PitA11	64.37	64.46	0	-0.1
PitA10	69.17	68.98	0	0.3
PitF2	13.84	13.8	0	0.3
PitF1	16.82	16.78	0	0.2
PitA13	45.26	45.34	0	-0.2
PitA12	51.53	51.38	0	0.3
PitK1	1.63	1.64	0	-1.1
PitA15	20.22	20.2	0	0.1
PitA14	21.31	21.3	0	0.1
PitL1	1.71	1.7	0	0.4
PitA16	8.7	8.65	0	0.5
NRoof3	138.65	138.81	0	-0.1
PitN1	5.47	5.44	0	0.5
NBypass6	4.06	4.06	0	0
PitE3	2.16	2.16	0	0.1
PitE2	13.15	13.06	0	0.7
PitE1	13.05	13.09	0	-0.3

Run Log for 368851 2016 run at 14:38:39 on 27/4/2016

No water upwelling from any pit. Freeboard was adequate at all pits.
Flows were safe in all overflow routes.

The following detention basins have little effect (less than 2%) in reducing peak discharge: OSDWeir You might consider upsizing these, or removing them from the model.

DRAINS Output - 10 Year ARI Storm Event

DRAINS results prepared from Version 2016.03

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
PitD2	101.5		0.019		0.5	0.003	Inlet Capacity
PitD1	101.24	101.77	0.033	2.2	0.46	0	Inlet Capacity
PitA3	98.19		0		1.51		None
PitA2	98.08		0		1.32		None
PitA1	97.97		0		1.23		None
PitA0	97.82		0		1.18		None
NOut	97.63		0				
PitG1	98.93		0.004		2.07		None
NRoof5	98.97		0.145				
PitB1	98.97	99.53	0.012	0.5	0.53	0	Inlet Capacity
NRoof4	100.85		0.153				
PitB5	100.64	101.15	0.012	0.7	0.48	0	Inlet Capacity
PitB4	99.82		0.021		0.86	0.004	Inlet Capacity
PitB3	99.57		0.038		0.93	0.012	Inlet Capacity
PitB2	99.02	99.51	0.005	0.3	0.48	0	Inlet Capacity
PitB8	101.83		0.031		0.47	0.009	Inlet Capacity
PitB7	101.04		0.01		0.82	0	Inlet Capacity
PitB6	100.81		0.014		0.79	0.002	Inlet Capacity
PitH1	101.33		0.034		0.67	0.01	Inlet Capacity
PitA7	100.05		0.014		1.75	0.002	Inlet Capacity
PitA6	99.62		0		2.38		None
PitA5	99.12	101.65	0.055	1.1	2.43	0	Inlet Capacity
NRoof1	99.67		0.184				
NRoof2	98.93		0.091				
PitC3	101.54	102.38	0.016	1	0.8	0	Inlet Capacity
PitC2	101.45		0.065		0.85	0.035	Inlet Capacity
PitC1	100.74		0.052		1.36	0.021	Inlet Capacity
PitA9	100.3		0.023		1.7	0.005	Inlet Capacity
PitA8	100.12	101.7	0.053	1.4	1.48	0	Inlet Capacity
PitM1	101.08	101.81	0.068	2.6	0.62	0	Inlet Capacity
PitJ1	100.9	101.78	0.005	0.3	0.87	0	Inlet Capacity
PitA11	100.63	101.81	0.016	0.6	1.14	0	Inlet Capacity
PitA10	100.46		0.006		1.49	0	None
PitF2	101.31	102.17	0.019	1	0.81		Inlet Capacity
PitF1	101.16		0.004		1.08	0	None
PitA13	100.98		0.009		1.24	0	Inlet Capacity
PitA12	100.78		0.009		1.22	0	Inlet Capacity
PitK1	102.04	102.92	0.007	0.4	0.86	0	Inlet Capacity
PitA15	101.42		0.011		1.28	0.001	Inlet Capacity
PitA14	101.23		0.001		1.77	0	None
PitL1	102.05	102.92	0.008	0.4	0.85	0	Inlet Capacity
PitA16	101.58		0.012		0.82	0.001	Inlet Capacity
NRoof3	101.24		0.179				
PitN1	99.66	100.16	0.024	0.7	0.44	0	Inlet Capacity
PitE3	100.64	101.2	0.01	0.2	0.53	0	Inlet Capacity
PitE2	100.43		0.019		0.82	0.004	Inlet Capacity
PitE1	100.37		0		2.07		None

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CatD2	0.019	0.019	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatD1	0.03	0.03	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA4	0.04	0.04	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatBypass1	0.015	0.015	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatBypass2	0.001	0.001	0	5	0	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatG1	0.004	0.004	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatRoof5	0.145	0.145	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB1	0.012	0	0.012	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatRoof4	0.153	0.153	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB5	0.012	0	0.012	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatB4	0.021	0.02	0.001	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB3	0.034	0.031	0.003	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB2	0.005	0	0.005	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatBypass3	0.003	0.003	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatBypass4	0.005	0.003	0.001	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB8	0.031	0	0.031	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatB7	0.002	0.002	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatB6	0.014	0.014	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatH1	0.034	0.034	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA7	0.014	0.012	0.002	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA5	0.055	0.055	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatBypass5	0.008	0	0.008	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatRoof1	0.184	0.184	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatRoof2	0.091	0.091	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatBypass7	0.003	0.002	0.002	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatC3	0.016	0	0.016	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatC2	0.065	0.062	0.004	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatC1	0.017	0.015	0.002	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA9	0.023	0.019	0.004	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA8	0.036	0.032	0.004	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatM1	0.047	0.044	0.003	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatJ1	0.005	0	0.005	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatA11	0.015	0.015	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA10	0.006	0.006	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatF2	0.018	0.018	0.001	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatF1	0.004	0.004	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA13	0.009	0.009	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA12	0.009	0.008	0.001	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatK1	0.007	0	0.007	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatA15	0.011	0.01	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatA14	0.001	0.001	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatL1	0.008	0	0.008	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatA16	0.011	0.011	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatRoof3	0.179	0.179	0	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
CatN1	0.024	0	0.024	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatBypass6	0.018	0	0.018	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatE3	0.01	0	0.01	5	10	0	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
CatE2	0.019	0.012	0.007	5	10	0	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1

Outflow Volumes for Total Catchment (3.34 impervious + 0.79 pervious = 4.14 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 10 year, 5 minutes storm, average 145.3 mm/h, Zone 1	500.85	392.22 (78.3%)	371.36 (91.7%)	20.86 (21.7%)
AR&R 10 year, 10 minutes storm, average 111.1 mm/h, Zone 1	765.93	641.81 (83.8%)	585.59 (94.6%)	56.22 (38.3%)
AR&R 10 year, 15 minutes storm, average 92.7 mm/h, Zone 1	958.62	822.43 (85.8%)	741.32 (95.7%)	81.10 (44.1%)
AR&R 10 year, 20 minutes storm, average 80.7 mm/h, Zone 1	1112.7	966.58 (86.9%)	865.86 (96.3%)	100.73 (47.2%)

AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1	1242.66	1084.27 (87.3%)	970.88 (96.7%)	113.38 (47.6%)
AR&R 10 year, 30 minutes storm, average 65.5 mm/h, Zone 1	1354.69	1184.85 (87.5%)	1061.43 (96.9%)	123.43 (47.5%)
AR&R 10 year, 45 minutes storm, average 52.4 mm/h, Zone 1	1625.62	1431.87 (88.1%)	1280.39 (97.5%)	151.47 (48.6%)
AR&R 10 year, 1 hour storm, average 44.4 mm/h, Zone 1	1836.58	1622.76 (88.4%)	1450.89 (97.7%)	171.87 (48.8%)
AR&R 10 year, 1.5 hours storm, average 34.4 mm/h, Zone 1	2134.41	1886.86 (88.4%)	1691.58 (98.1%)	195.28 (47.7%)
AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1	2357.77	2083.67 (88.4%)	1872.11 (98.2%)	211.56 (46.8%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
PipeD2-D1	0.015	1.18	101.441	101.239	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeD1-A4	0.045	1.76	101.167	101.143	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
P OSD	0.202	1.27	98.594	98.486	AR&R 10 year, 1.5 hours storm, average 34.4 mm/h, Zone 1
Pipe A4-A3	0.542	1.92	98.205	98.19	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA3-A2	0.542	2.02	98.136	98.08	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA2-A1	0.542	2.08	98.007	97.971	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA1-A0	0.542	2.29	97.858	97.861	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA0-NOut	0.542	2.5	97.729	97.629	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeG1-A4	0.004	0.06	98.926	98.926	AR&R 10 year, 15 minutes storm, average 92.7 mm/h, Zone 1
PipeRoof5-B1	0.145	1.31	98.973	98.973	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB1-A4	0.386	1.36	98.94	98.926	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeRoof4-B5	0.153	1.78	100.853	100.754	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB5-B4	0.2	2.41	100.563	99.825	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB4-B3	0.216	2.11	99.761	99.572	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB3-B2	0.239	2.88	99.484	99.017	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB2-B1	0.245	1.45	98.991	98.973	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeB8-B7	0.022	1.54	101.748	101.043	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeB7-B6	0.032	1.41	101.017	100.814	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeB6-B5	0.042	1.36	100.786	100.638	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeH1-A7	0.025	3.9	101.244	100.963	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA7-A6	0.489	1.73	99.752	99.624	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA6-A5	0.671	2.02	99.403	99.123	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA5-A4	0.738	2.13	99.068	98.926	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeRoof1-A6	0.183	1.66	99.661	99.624	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeRoof2-A4	0.091	0.83	98.928	98.926	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeC3-C2	0.014	0.99	101.488	101.454	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeC2-C1	0.045	1.46	101.424	101.233	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeC1-A9	0.135	2.55	100.571	100.529	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA9-A8	0.28	1.1	100.209	100.125	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA8-A7	0.325	1.15	100.099	100.047	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeM1-C1	0.063	1.5	100.943	100.744	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeJ1-A11	0.005	1.51	100.866	100.854	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA11-A10	0.087	2.18	100.516	100.456	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA10-A9	0.1	1.75	100.372	100.3	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeF2-F1	0.018	4.15	101.223	101.165	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeF1-A13	0.021	1.1	101.146	100.978	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA13-A12	0.061	3.37	100.841	100.783	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA12-A11	0.069	1.5	100.745	100.631	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeK1-A15	0.007	2.5	101.996	101.817	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA15-A14	0.034	1.66	101.359	101.226	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeA14-A13	0.032	1.24	101.169	100.978	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeL1-A15	0.007	1.04	102.016	101.816	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeA16-A15	0.011	0.92	101.537	101.417	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeRoof3-A7	0.179	1.84	101.236	101.21	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeN1-A6	0.028	0.75	99.626	99.624	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeE3-E2	0.01	1	100.601	100.427	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
PipeE2-E1	0.026	1.27	100.388	100.367	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
PipeE1-A9	0.034	0.48	100.361	100.3	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OFD2	0.003	0.003	0.256	0.01	0	3.44	0.19	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFD1	0	0	0.256	0	0	0	0	
OF OSD	0.381	0.381	0.256	0.059	0.04	15.76	0.73	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
OFA4	0	0	0.256	0	0	0	0	
Bypass1	0.015	0.015	0.256	0.018	0.01	5.84	0.29	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
Bypass2	0.014	0.014	0.256	0.017	0	5.54	0.29	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
BypassTotal	0.067	0.067	0.256	0.03	0.01	10.02	0.44	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFB1	0	0	0.256	0	0	0	0	
OFB5	0	0	0.256	0	0	0	0	
OFB4	0.004	0.004	0.256	0.011	0	3.74	0.21	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFB3	0.012	0.012	0.256	0.016	0	5.24	0.3	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFB2	0	0	0.256	0	0	0	0	
Bypass3	0.003	0.003	0.256	0.009	0	3.14	0.2	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
Bypass4	0.006	0.006	0.256	0.013	0	4.34	0.23	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFB8	0.009	0.009	0.256	0.014	0	4.64	0.27	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
OFB7	0	0	0.256	0	0	0	0	
OFB6	0.002	0.002	0.256	0.008	0	2.54	0.19	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFH1	0.01	0.01	0.256	0.015	0	4.94	0.28	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFA7	0.002	0.002	0.256	0.008	0	2.54	0.17	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFA5	0	0	0.256	0	0	0	0	
Bypass5	0.008	0.008	0.256	0.014	0	4.64	0.26	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
Bypass7	0.007	0.007	0.256	0.013	0	4.34	0.23	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFC3	0	0	0.256	0	0	0	0	
OFC2	0.035	0.035	0.256	0.024	0.01	7.93	0.37	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFC1	0.021	0.021	0.256	0.019	0.01	6.44	0.34	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFA9	0.005	0.005	0.256	0.011	0	3.74	0.23	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFA8	0	0	0.256	0	0	0	0	
OFM1	0	0	0.256	0	0	0	0	
OFJ1	0	0	0.256	0	0	0	0	
OFA11	0	0	0.256	0	0	0	0	
OFA10	0	0	0.256	0	0	0	0	
OFF1	0	0	0.256	0	0	0	0	
OFA13	0	0	0.256	0	0	0	0	
OFA12	0	0	0.256	0	0	0	0	
OFK1	0	0	0.256	0	0	0	0	
OFA15	0.001	0.001	0.256	0.006	0	1.95	0.13	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFA14	0	0	0.256	0	0	0	0	
OFL1	0	0	0.256	0	0	0	0	
OFA16	0.001	0.001	0.256	0.006	0	1.95	0.18	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1
OFN1	0	0	0.256	0	0	0	0	
Bypass6	0.018	0.018	0.256	0.018	0.01	6.14	0.32	AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1
OFE3	0	0	0.256	0	0	0	0	
OFE2	0.004	0.004	0.256	0.01	0	3.44	0.2	AR&R 10 year, 25 minutes storm, average 72.1 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSDA4	98.93	854.5	0.582	0.202	0.381
OSDWeir	98.49	0.9	0.542	0.542	0

CONTINUITY CHECK for AR&R 10 year, 2 hours storm, average 28.5 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
PitD2	26.54	26.5	0	0.2
PitD1	69.18	68.93	0	0.3
OSDA4	1995.81	1988.8	7.03	0
OSDWeir	1988.8	1988.47	0.33	0
PitA3	1988.47	1988.59	0	0
PitA2	1988.59	1988.44	0	0
PitA1	1988.44	1988.36	0	0
PitA0	1988.36	1988.26	0	0
NOut	1988.26	1988.26	0	0
NBypass1	20.94	20.94	0	0
NByp2B3Out	6.23	6.23	0	0
NBypassSum	71.95	71.95	0	0
NBypassOut	71.95	71.95	0	0
PitG1	6.44	6.4	0	0.7
NRoof5	208.32	208.64	0	-0.2
PitB1	590.06	588.05	0	0.3
NRoof4	219.97	219.92	0	0
PitB5	290.46	289.72	0	0.3
PitB4	319.75	319.53	0	0.1
PitB3	367.54	366.98	0	0.2
PitB2	368.18	368.06	0	0
NByp3B5Out	4.23	4.23	0	0
NByp4B6B7	6.73	6.73	0	0
PitB8	33.81	33.75	0	0.2
PitB7	36.99	37.07	0	-0.2
PitB6	57.68	57.56	0	0.2
PitH1	48.5	48.26	0	0.5
PitA7	785.6	784.47	0	0.1
PitA6	1074.25	1070.98	0	0.3
PitA5	1149.83	1144.41	0	0.5
NBypass5	9.04	9.04	0	0
NRoof1	263.59	263.79	0	-0.1
NRoof2	130.93	130.8	0	0.1
NByp7E2Out	5.2	5.2	0	0
PitC3	16.88	16.78	0	0.6
PitC2	109.57	109.54	0	0
PitC1	206.51	206.03	0	0.2
PitA9	409.59	409.14	0	0.1
PitA8	464.85	464.45	0	0.1
PitM1	72.86	72.61	0	0.3
PitJ1	5.31	5.28	0	0.5
PitA11	134.18	134.08	0	0.1
PitA10	142.82	142.97	0	-0.1
PitF2	26.3	26.16	0	0.5
PitF1	31.76	31.67	0	0.3
PitA13	94.58	94.39	0	0.2
PitA12	106.78	106.83	0	-0.1
PitK1	7.84	7.89	0	-0.7
PitA15	47.59	47.49	0	0.2
PitA14	49.51	49.58	0	-0.1
PitL1	8.24	8.2	0	0.5
PitA16	16.18	16.07	0	0.7
NRoof3	257.1	257.39	0	-0.1
PitN1	26.35	26.28	0	0.2
NBypass6	19.57	19.57	0	0
PitE3	10.43	10.49	0	-0.6
PitE2	35.72	35.36	0	1
PitE1	34.32	34.44	0	-0.4

Run Log for 368851 2016 run at 14:41:05 on 27/4/2016

No water upwelling from any pit. Freeboard was adequate at all pits.
The maximum flow exceeded the safe value in the following overflow routes: OF OSD

The following detention basins have little effect (less than 2%) in reducing peak discharge: OSDWeir You might consider upsizing these, or removing them from the model.
The following detention basins have little effect (less than 2%) in reducing peak discharge: OSDWeir You might consider upsizing these, or removing them from the model.

DRAINS Output - 100 Year ARI Storm Even

DRAINS results prepared from Version 2016.03

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
PitD2	101.52		0.027		0.48	0.006	Inlet Capacity
PitD1	101.28	101.79	0.05	3.4	0.42	0	Inlet Capacity
PitA3	99.13		0		0.57		None
PitA2	98.77		0		0.63		None
PitA1	98.41		0		0.79		None
PitA0	98.05		0		0.95		None
NOut	97.81		0.287				
PitG1	99.12		0.007		1.88		None
NRoof5	99.48		0.214				
PitB1	99.44	99.55	0.02	0.8	0.06	0	Inlet Capacity
NRoof4	100.99		0.226				
PitB5	100.72	101.17	0.02	1.3	0.4	0	Inlet Capacity
PitB4	99.92		0.03		0.76	0.008	Inlet Capacity
PitB3	99.77		0.056		0.73	0.024	Inlet Capacity
PitB2	99.6	99.58	0.009	2.6	-0.1	0	Outlet System
PitB8	101.85		0.051		0.45	0.02	Inlet Capacity
PitB7	101.08		0.023		0.78	0.005	Inlet Capacity
PitB6	100.86		0.021		0.74	0.004	Inlet Capacity
PitH1	101.38		0.05		0.62	0.02	Inlet Capacity
PitA7	101.07		0.02		0.73	0.004	Inlet Capacity
PitA6	100.44		0		1.56		None
PitA5	99.67	101.68	0.081	1.5	1.88	0	Inlet Capacity
NRoof1	100.54		0.271				
NRoof2	99.12		0.134				
PitC3	101.65	102.4	0.025	1.7	0.69	0	Inlet Capacity
PitC2	101.62		0.094		0.68	0.062	Inlet Capacity
PitC1	101.54		0.086		0.56	0.054	Inlet Capacity
PitA9	101.34		0.032		0.66	0.009	Inlet Capacity
PitA8	101.18	101.73	0.083	2.1	0.42	0	Inlet Capacity
PitM1	101.75	101.85	0.122	4.3	-0.05	0.06	Outlet System
PitJ1	101.82	101.87	0.067	4.3	-0.05	0.044	Outlet System
PitA11	101.81	101.89	0.064	2.9	-0.04	0	Outlet System
PitA10	101.58		0.009		0.37	0	Inlet Capacity
PitF2	102.18	102.22	0.033	3.1	-0.06		Outlet System
PitF1	102.17		0.006		0.07	0	None
PitA13	102.19		0.014		0.03	0.002	Inlet Capacity
PitA12	101.97		0.014		0.03	0.002	Inlet Capacity
PitK1	102.44	102.93	0.012	0.7	0.46	0	Inlet Capacity
PitA15	102.39		0.016		0.31	0.002	Inlet Capacity
PitA14	102.32		0.002		0.68	0	None
PitL1	102.44	102.93	0.012	0.8	0.46	0	Inlet Capacity
PitA16	102.39		0.019		0.01	0.008	Inlet Capacity
NRoof3	101.35		0.264				
PitN1	100.3	100.3	0.04	4.3	-0.2	0.079	Outlet System
PitE3	101.26	101.27	0.016	1.7	-0.09	0.01	Outlet System
PitE2	101.25		0.028		0	0.058	Outlet System
PitE1	101.33		0		1.11		None

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CatD2	0.027	0.027	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatD1	0.044	0.044	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA4	0.059	0.059	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatBypass1	0.021	0.021	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatBypass2	0.002	0.002	0	5	0	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatG1	0.007	0.007	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatRoof5	0.214	0.214	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatB1	0.02	0	0.02	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatRoof4	0.226	0.226	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatB5	0.02	0	0.02	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatB4	0.03	0.029	0.001	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatB3	0.048	0.046	0.002	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatB2	0.009	0	0.009	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatBypass3	0.004	0.004	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatBypass4	0.007	0.005	0.002	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatB8	0.051	0	0.051	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatB7	0.003	0.003	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatB6	0.021	0.021	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatH1	0.05	0.05	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA7	0.02	0.016	0.003	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatA5	0.081	0.081	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatBypass5	0.014	0	0.014	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatRoof1	0.271	0.271	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatRoof2	0.134	0.134	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatBypass7	0.005	0.002	0.003	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatC3	0.025	0	0.025	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatC2	0.094	0.091	0.003	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatC1	0.024	0.021	0.004	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatA9	0.032	0.026	0.007	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatA8	0.051	0.048	0.003	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatM1	0.068	0.065	0.003	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatJ1	0.008	0	0.008	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatA11	0.023	0.023	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA10	0.009	0.009	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatF2	0.027	0.026	0.001	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatF1	0.006	0.006	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA13	0.014	0.014	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA12	0.012	0.01	0.002	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
CatK1	0.012	0	0.012	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatA15	0.016	0.015	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatA14	0.002	0.002	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatL1	0.012	0	0.012	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatA16	0.017	0.017	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatRoof3	0.264	0.264	0	5	10	0	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
CatN1	0.04	0	0.04	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatBypass6	0.029	0	0.029	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatE3	0.016	0	0.016	5	10	0	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
CatE2	0.028	0.016	0.011	5	10	0	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1

Outflow Volumes for Total Catchment (3.34 impervious + 0.79 pervious = 4.14 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1	754.56	644.80 (85.5%)	576.40 (94.5%)	68.40 (47.3%)
AR&R 100 year, 10 minutes storm, average 167.3 mm/h, Zone 1	1153.38	1027.74 (89.1%)	898.73 (96.4%)	129.01 (58.3%)
AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1	1442.58	1303.80 (90.4%)	1132.46 (97.1%)	171.34 (61.9%)
AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1	1673.88	1523.85 (91.0%)	1319.40 (97.5%)	204.45 (63.7%)
AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1	1866.57	1703.76 (91.3%)	1475.13 (97.8%)	228.63 (63.9%)
AR&R 100 year, 30 minutes storm, average 98.4 mm/h, Zone 1	2035.13	1861.87 (91.5%)	1611.36 (98.0%)	250.52 (64.2%)
AR&R 100 year, 45 minutes storm, average 78.7 mm/h, Zone 1	2441.54	2242.87 (91.9%)	1939.82 (98.3%)	303.05 (64.7%)
AR&R 100 year, 1 hour storm, average 66.7 mm/h, Zone 1	2759.01	2540.20 (92.1%)	2196.40 (98.5%)	343.81 (65.0%)
AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1	3207.81	2956.50 (92.2%)	2559.11 (98.7%)	397.39 (64.6%)

AR&R 100 year, 2 hours storm, average 42.9 mm/h, Zone 1 | 3549.07 | 3271.39 (92.2%) | 2834.94 (98.8%) | 436.46 (64.1%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
PipeD2-D1	0.021	1.3	101.453	101.285	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeD1-A4	0.062	1.92	101.19	101.174	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
P OSD	0.203	1.27	100.09	100.104	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
Pipe A4-A3	0.985	3.48	99.177	99.125	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeA3-A2	0.985	3.48	98.816	98.766	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeA2-A1	0.985	3.48	98.457	98.407	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeA1-A0	0.985	3.48	98.097	98.047	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeA0-NOut	0.985	3.15	97.859	97.815	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeG1-A4	0.007	0.09	99.117	99.116	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeRoof5-B1	0.214	1.94	99.477	99.439	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeB1-A4	0.545	1.93	99.232	99.116	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeRoof4-B5	0.227	2.16	100.986	100.818	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeB5-B4	0.281	2.81	100.601	99.916	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeB4-B3	0.31	2.05	99.856	99.769	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeB3-B2	0.33	1.77	99.692	99.597	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeB2-B1	0.337	1.56	99.55	99.439	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeB8-B7	0.03	1.68	101.76	101.08	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
PipeB7-B6	0.048	1.54	101.045	100.858	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
PipeB6-B5	0.062	1.45	100.823	100.715	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeH1-A7	0.036	1.82	101.297	101.073	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeA7-A6	0.637	2.25	100.627	100.439	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeA6-A5	0.869	2.43	99.963	99.672	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeA5-A4	0.945	2.64	99.532	99.116	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeRoof1-A6	0.278	2.52	100.535	100.439	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeRoof2-A4	0.135	1.22	99.122	99.116	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeC3-C2	0.024	0.44	101.628	101.623	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeC2-C1	0.059	0.83	101.609	101.544	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
PipeC1-A9	0.166	1.51	101.391	101.341	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeA9-A8	0.356	1.26	101.258	101.175	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA8-A7	0.399	1.41	101.137	101.073	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeM1-C1	0.09	1.28	101.641	101.544	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeJ1-A11	0.04	0.57	101.81	101.81	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeA11-A10	0.146	1.32	101.665	101.584	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA10-A9	0.151	1.36	101.483	101.341	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeF2-F1	0.037	0.52	102.175	102.173	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeF1-A13	0.04	0.56	102.172	102.185	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
PipeA13-A12	0.093	1.32	102.074	101.969	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA12-A11	0.099	1.4	101.932	101.81	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeK1-A15	0.015	0.22	102.435	102.387	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA15-A14	0.059	0.84	102.345	102.324	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA14-A13	0.061	0.87	102.282	102.185	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeL1-A15	0.017	0.25	102.43	102.387	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeA16-A15	0.042	0.59	102.387	102.387	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
PipeRoof3-A7	0.275	2.54	101.349	101.255	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
PipeN1-A6	0.075	1.07	100.3	100.439	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
PipeE3-E2	0.037	0.52	101.257	101.25	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
PipeE2-E1	0.052	0.73	101.25	101.335	AR&R 100 year, 15 minutes storm, average 139.5 mm/h, Zone 1
PipeE1-A9	0.054	0.77	101.333	101.341	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OFD2	0.006	0.006	7.665	0.013	0	4.34	0.23	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFD1	0	0	7.665	0	0	0	0	
OF OSD	1.515	1.515	7.665	0.104	0.11	24.74	1.06	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
OFA4	0.287	0.287	7.665	0.053	0.04	14.51	0.67	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
Bypass1	0.021	0.021	7.665	0.02	0.01	6.74	0.32	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
Bypass2	0.026	0.026	7.665	0.021	0.01	7.03	0.35	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
BypassTotal	0.214	0.214	7.665	0.046	0.03	13.25	0.63	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFB1	0	0	7.665	0	0	0	0	
OFB5	0	0	7.665	0	0	0	0	
OFB4	0.008	0.008	7.665	0.014	0	4.64	0.25	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFB3	0.024	0.024	7.665	0.021	0.01	7.03	0.33	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFB2	0	0	7.665	0	0	0	0	
Bypass3	0.004	0.004	7.665	0.01	0	3.44	0.24	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
Bypass4	0.015	0.015	7.665	0.018	0.01	5.84	0.29	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFB8	0.02	0.02	7.665	0.019	0.01	6.44	0.33	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
OFB7	0.005	0.005	7.665	0.011	0	3.74	0.23	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
OFB6	0.004	0.004	7.665	0.011	0	3.74	0.21	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFH1	0.02	0.02	7.665	0.019	0.01	6.44	0.32	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFA7	0.004	0.004	7.665	0.01	0	3.44	0.22	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFA5	0	0	7.665	0	0	0	0	
Bypass5	0.014	0.014	7.665	0.017	0	5.54	0.29	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
Bypass7	0.062	0.062	7.665	0.029	0.01	9.73	0.44	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFC3	0	0	7.665	0	0	0	0	
OFC2	0.062	0.062	7.665	0.029	0.01	9.73	0.44	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFC1	0.054	0.054	7.665	0.028	0.01	9.43	0.41	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFA9	0.009	0.009	7.665	0.015	0	4.94	0.25	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFA8	0	0	7.665	0	0	0	0	
OFM1	0.06	0.06	7.665	0.029	0.01	9.73	0.42	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFJ1	0.044	0.044	7.665	0.026	0.01	8.53	0.4	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFA11	0	0	7.665	0	0	0	0	
OFA10	0	0	7.665	0	0	0	0	
OFF1	0	0	7.665	0	0	0	0	
OFA13	0.002	0.002	7.665	0.008	0	2.54	0.16	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFA12	0.002	0.002	7.665	0.008	0	2.54	0.16	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFK1	0	0	7.665	0	0	0	0	
OFA15	0.002	0.002	7.665	0.009	0	2.84	0.19	AR&R 100 year, 5 minutes storm, average 218.9 mm/h, Zone 1
OFA14	0	0	7.665	0	0	0	0	
OFL1	0	0	7.665	0	0	0	0	
OFA16	0.008	0.008	7.665	0.014	0	4.64	0.25	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFN1	0.079	0.079	7.665	0.032	0.01	10.38	0.47	AR&R 100 year, 1.5 hours storm, average 51.7 mm/h, Zone 1
Bypass6	0.029	0.029	7.665	0.022	0.01	7.33	0.36	AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1
OFE3	0.01	0.01	7.665	0.015	0	4.94	0.26	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1
OFE2	0.058	0.058	7.665	0.028	0.01	9.43	0.43	AR&R 100 year, 25 minutes storm, average 108.3 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSDA4	99.12	997.1	1.717	0.203	1.515
OSDWeir	100.1	2.5	1.272	0.985	0.287

CONTINUITY CHECK for AR&R 100 year, 20 minutes storm, average 121.4 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
PitD2	18.71	18.64	0	0.4
PitD1	48.71	48.46	0	0.5
OSDA4	1409.98	1265.23	144.75	0
OSDWeir	1265.23	1264.28	0.95	0
PitA3	1264.28	1264.36	0	0
PitA2	1264.36	1264.15	0	0
PitA1	1264.15	1263.87	0	0
PitA0	1263.87	1263.53	0	0

NOut	1263.53	1263.53	0	0
NBypass1	14.76	14.76	0	0
NByp2B3Out	13.08	13.08	0	0
NBypassSum	89.11	89.11	0	0
NBypassOut	89.11	89.11	0	0
PitG1	4.54	4.55	0	-0.3
NRoof5	146.82	146.87	0	0
PitB1	422.06	417.25	0	1.1
NRoof4	155.03	154.9	0	0.1
PitB5	214.31	213.11	0	0.6
PitB4	234.71	234.21	0	0.2
PitB3	268.88	268.38	0	0.2
PitB2	262.08	262.28	0	-0.1
NByp3B5Out	3.08	3.08	0	0
NByp4B6B7	8.09	8.09	0	0
PitB8	32.68	32.6	0	0.2
PitB7	34.89	34.99	0	-0.3
PitB6	48.07	48.28	0	-0.4
PitH1	34.18	34.19	0	0
PitA7	564.84	562.89	0	0.3
PitA6	767.33	762.64	0	0.6
PitA5	818.21	807.41	0	1.3
NBypass5	8.74	8.74	0	0
NRoof1	185.77	185.71	0	0
NRoof2	92.27	91.98	0	0.3
NByp7E2Out	14.92	14.92	0	0
PitC3	16.31	16.49	0	-1.1
PitC2	82.98	82.9	0	0.1
PitC1	158.29	157.8	0	0.3
PitA9	296.59	296.14	0	0.2
PitA8	344.72	344.4	0	0.1
PitM1	70.81	70.51	0	0.4
PitJ1	18.05	18.4	0	-2
PitA11	114.57	114.26	0	0.3
PitA10	120.42	120.85	0	-0.4
PitF2	19.78	19.71	0	0.4
PitF1	23.66	23.59	0	0.3
PitA13	71.42	71.62	0	-0.3
PitA12	80.74	80.62	0	0.1
PitK1	7.58	7.6	0	-0.3
PitA15	37.81	37.73	0	0.2
PitA14	38.45	38.44	0	0
PitL1	7.96	8.01	0	-0.6
PitA16	12.11	12.21	0	-0.9
NRoof3	181.19	181.4	0	-0.1
PitN1	25.46	25.88	0	-1.6
NBypass6	18.91	18.91	0	0
PitE3	10.08	10.37	0	-2.9
PitE2	28.22	28.04	0	0.6
PitE1	16.51	16.72	0	-1.3

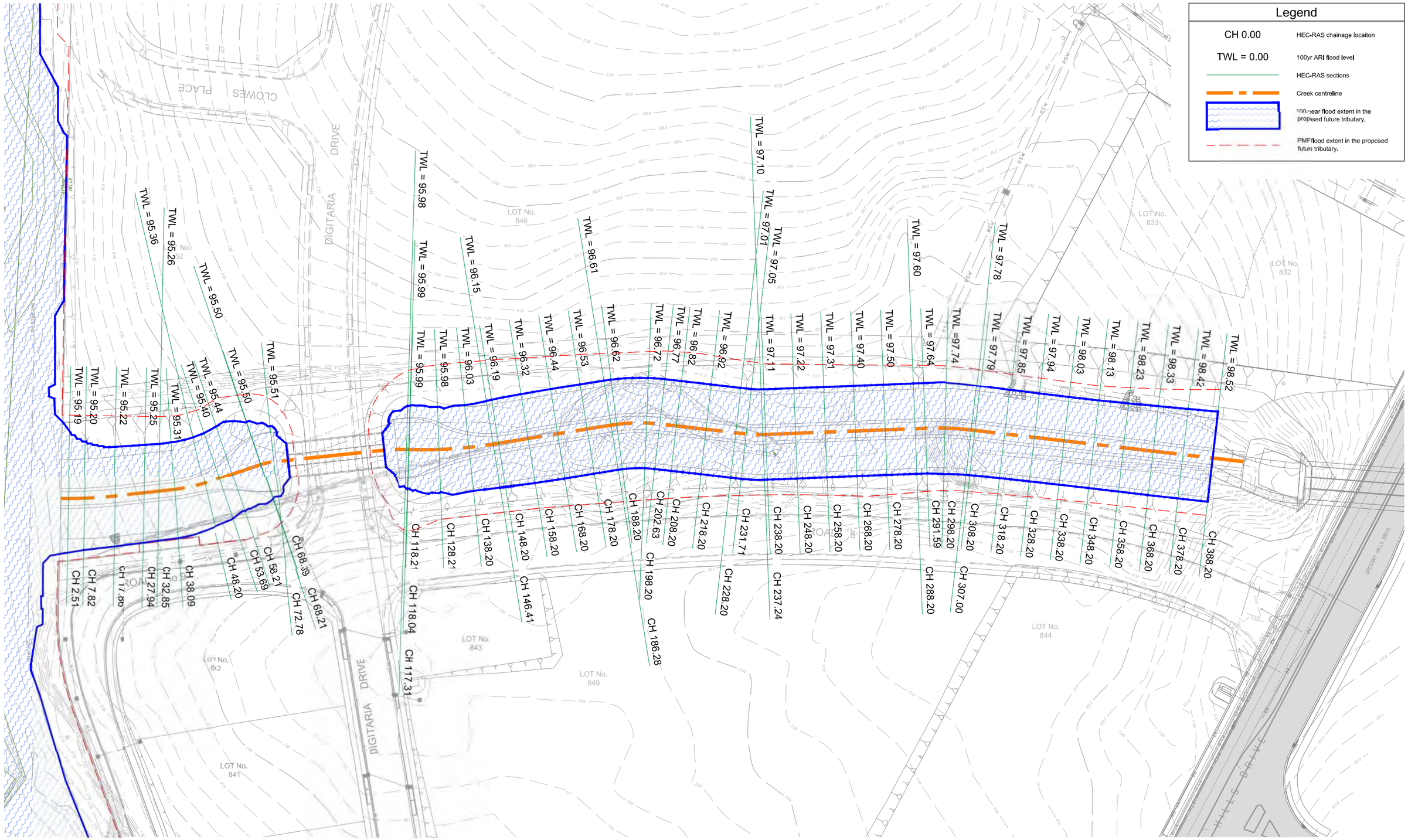
Run Log for 368851 2016 run at 14:43:38 on 27/4/2016

Upwelling occurred at PitE3 PitN1 PitE2 PitB2
Freeboard was less than 0.15m at PitA16 PitF2 PitF1 PitA13 PitA12 PitA11 PitJ1 PitM1 PitB1
Flows were safe in all overflow routes.

The following detention basins have little effect (less than 2%) in reducing peak discharge: OSDWeir You might consider upsizing these, or removing them from the model.

The following overflow routes carried water uphill (adding energy): OF OSD OFM1 OFJ1
These results may be invalid. You should check for water flowing round in circles at these locations. You may need to reformulate the model.

Appendix B. Flooding Plan



Issued for information

Rev	Amendment / Reason For Issue	Date	Drawing Completed by	Designed & Checked by	Verified by X=Not verified	Issue Authorised (*)
P1	Issued for information	28.08.15	MMc	GC	SR	CJA

4 0 10 20 40
PLAN Scale 1:600 @ A1

NORTH

Mott MacDonald
ABN 13 134 120 353
Level 10, 383 Kent Street, PO Box Q1678, Sydney NSW 1230
T+61 (0)2 9098 6800 www.mottmac.com.au

Project: Gregory Hills Corporate Park South Creek Tributary Works

Client: Gregory Hills Development Company Pty Ltd

Architect/Project Manager: Gregory Hills Development Company Pty Ltd

Drawing Title: HEC-RAS Sections

Drawing No.: MMD-343049-C-SK-075

Sheet: Of

Rev: P1

300mm A1 SHEET
200mm
100mm
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Date : 28-8-15 Time : 7:33am Plotted By : nc15164 Filename : P:\parramatta\Projects\343xxx\343049\04 working\Civil\Autocad\Sketches\MMD-343049-C-SK075.dwg

Appendix 4

Acoustic Logic, 'Camden Medical Campus Precinct – NSW Rural Fire Service Request for Additional Information'

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

20160742.1/2211A/R0/MF

22/11/2016

Gregory Hills Corporate Park Pty Ltd

PO Box 119

OATLANDS NSW 2117

CAMDEN MEDICAL CAMPUS PRECINCT, GLEDSWOOD HILLS - ACOUSTIC DISCUSSION - COUNCILS RFI'S - 22-11-2016

This letter has been drafted by Acoustic Logic in regards to the request for further information regarding the Concept Development Application to NSW Department of Planning and Camden Council regarding the proposed Camden Medical Precinct.

Comments which are discussed in this letter will address acoustic items which have been raised in the Camden Council letter to the Director of Social and Other Infrastructure Assessments, dated 10th November 2016.

This is a supplementary letter to accompany the previous Development Application report and acoustic discussion letter associated with the Concept Development Application which has previously been provided to Department of Planning/Camden Council.

We note that items which are contained in the Acoustic Report and Acoustic Discussion paper have been discussed on numerous occasions verbally with Ryan Pritchard (Executive Planner) on the 16th September 2016 and Kristie White (Environmental Health Specialist) on the 18th November 2016. In both of these conversations held with council assessment officer's items which were discussed either in the Development Application Report or the Acoustic Discussion Letter were agreed by council.

Therefore, justification is sought as to why the items are being raised.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Matthew Furlong

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

20160742.1/0710A/R0/MF

07/10/2016

Gregory Hills Corporate Park Pty Ltd
PO Box 119
OATLANDS NSW 2117

Camden Medical Campus Precinct, Gledswood Hills - Acoustic Discussion - Councils RFI's

This letter has been drafted by Acoustic Logic in regards to the request for further information regarding the Concept Development Application to Council for the Camden Medical Precinct.

Please refer to the acoustic comments in red below.

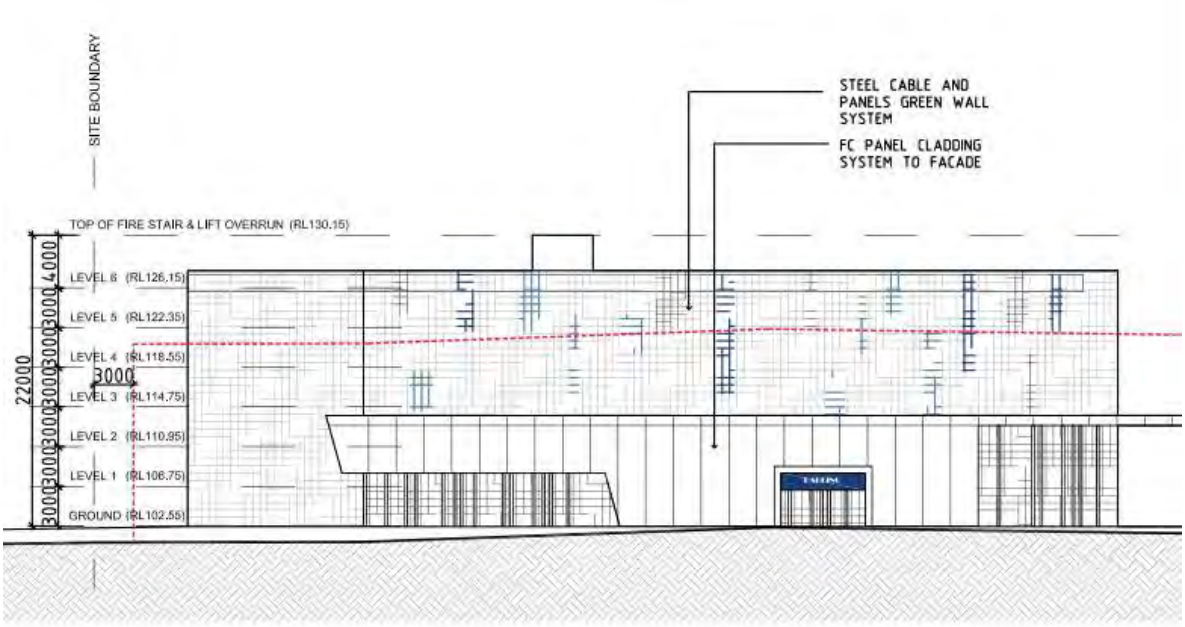
The acoustic report submitted is considered inadequate as it fails to assess the following:

- *Noise from mechanical plant to be installed associated with the premises.*
    - We note that the application to council is for a concept D.A, as so information regarding equipment selections and locations are unknown at this stage. Hence, a detailed assessment has not been carried out. However, in section 7 of the submitted report we have outlined the acoustic criteria which is applicable and noise levels which when either designed/installed will need to be complied with.
- *Noise from the multi-level car park.*

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343



- As shown above the proposed multistorey car park is fully enclosed by FC panel cladding system to facades therefore shall not result any noise issues to receivers.

- *cumulative noise from the open car park and the multi-level car park.*
  - Cumulative noise levels form open carpark have been addressed in Section 7.6.
- *Noise from loading docks.*
  - We note that the application council is a concept D.A, as so information regarding truck sizes, number of trucks and hours of deliveries are unknown at this stage and have not been assessed in the report. This would typically take place at the detailed D.A stages.
- *Council officers questions the stated 66 vehicles using The Hermitage Way in the morning AM peak time in 2026 as this seems very low.*
  - This is the actual traffic volumes have been provided to Acoustic Logic by the Traffic Engineer Mott McDonald.
- *The assessment of noise from the car park has only been based on 50% use of the open car park. Council Officers consider this to be an underestimate.*
  - Open car park has a capacity of 211 spaces, predictions for the open car park are based on 50% of these possible spaces either being occupied/entering and vacated/leaving per hour. We note that this does not mean that there will only be a maximum of 50% occupied. This means that in the space of 1 hour 50% of the vehicles would enter and leave in the same hour. In our experience, even in health projects this is very much conservative.
- *regarding the sleep disturbance criteria emergence test, Council officers do not agree with the two-step process where minimum internal noise levels below 50-55dB(A) are unlikely to awaken people. Council only accepts the L1- background 15dB(A)*

- Acoustic Logic already assessed sleeping disturbance based on this requirement of “BG +15dB(A)”, please refer to Table 10 of the submitted acoustic report.

- *A construction noise management plan should be provided.*
  - We note that the application to council is a concept D.A, as so information regarding excavation/demolition methodologies are unknown at this stage. Hence, a detailed assessment has not been carried out. Typically, this is carried out at CC stage

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Matthew Furlong

Camden Medical Campus Precinct, Gledswood Hills

Concept DA Acoustic Assessment

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

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3	29/06/2016	20160742.1/2906A/R3/MF	MF		GW

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1 INTRODUCTION

This report presents our environmental noise and vibration assessment for the concept development application for the medical precinct located at Gregory Hills Corporate Park. The major noise issues related to the proposed development are below:

- External noise intrusion into the proposed development shall comply with the requirements of Australian Standard AS:2107:2000 and NSW Road Noise Policy.
- Vibration produced from the operation of the proposed site shall comply with the requirements of NSW EPA's document "Assessing Vibration: A Technical Guideline 2006".
- Noise emission from the project site shall comply with the requirements of NSW EPA Industrial Noise Policy.

We note that the engagement for Acoustic Logic is to undertake an acoustic feasibility study. This study is to ensure that the concept for the proposed precinct is a viable option for the client but also for the surrounding neighbours. During the length of this project separate detailed development applications will be submitted to ensure detailed design is compliant with the requirements in which need to be applied.

The purpose of this report is to respond to the NSW Department of Planning and Environment's letter SSD 7387, SEARs for Camden Medical Campus Precinct. In particular, item number eight, Noise and Vibration.

> *8. Noise and Vibration*
>
> *Identify the main noise and vibration generating sources and outline measures to minimise and mitigate potential noise and vibration impacts on surrounding occupiers of land.*
>
> → *Relevant Policies and Guidelines:*
>
> - *NSW Industrial Noise Policy (EPA);*
> - *Assessing Vibration: A Technical Guideline 2006*

This assessment has been based on architectural drawings provided by Health Projects International, dated 1st June 2016, revision Concept DA.

2 SITE DESCRIPTION

The proposed private hospital is to be located at Gregory Hills Corporate Park. Proposed site is surrounded by the following developments;

- North of the proposed site is Digitara Drive, which is a proposed road to service the project site but also surrounding developments. Further north of the project site is existing residential housing.

- East of the proposed site is The Hermitage Way, this is an existing road which carries a medium volume of traffic. Further this is existing low density residential housing.

- South of the proposed site is Gregory Hills Drive, which carries a high volume of traffic. Further this is proposed commercial developments.

- West of the proposed site is a Riparian Zone which will be used as a drainage reserve for the local environment, further this is a proposed road known as Road 8, further this is proposed commercial buildings.

The concept development proposal is to construct a Medical precinct on the site which will include a basement level for 76 vehicles, a five level hospital building which will contain patient rooms and mixed medical commercial suites. Additionally, to the south of the main hospital building will be a five level multi storey parking station. Located on the eastern boundary on ground level will be an external open air car park containing 210 spaces. Along the western boundary of the site will be an additional open air 25 car parking station. Hospital services including ambulance drop off, loading dock and base building services will be located along the northern boundary of the building and boundary line. A proposed ground floor layout can be found in Figure 2. A site map can be found in Figure 1.

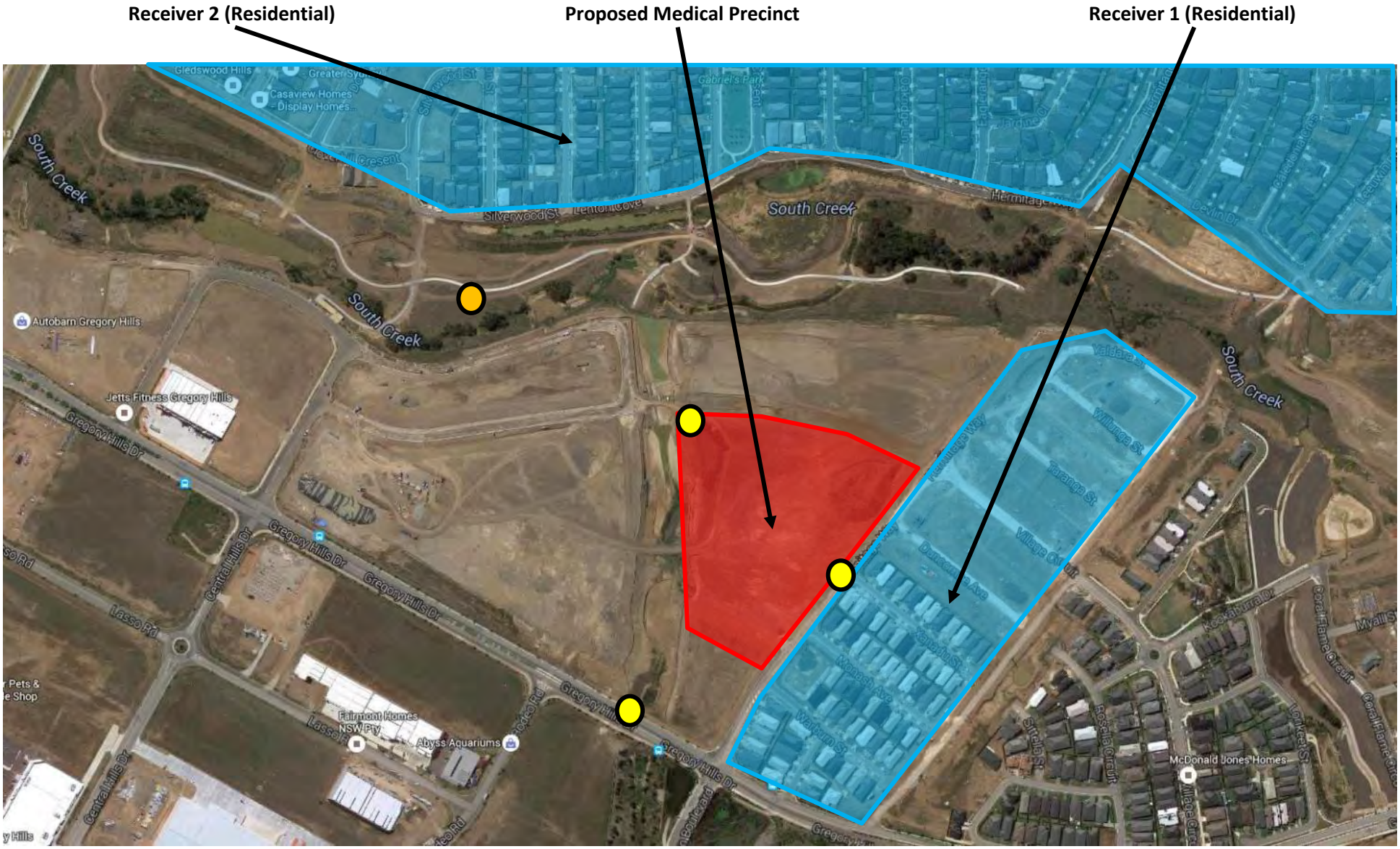


Figure 1 – Site Map

Attended Noise Measurement

Unattended Noise Measurement

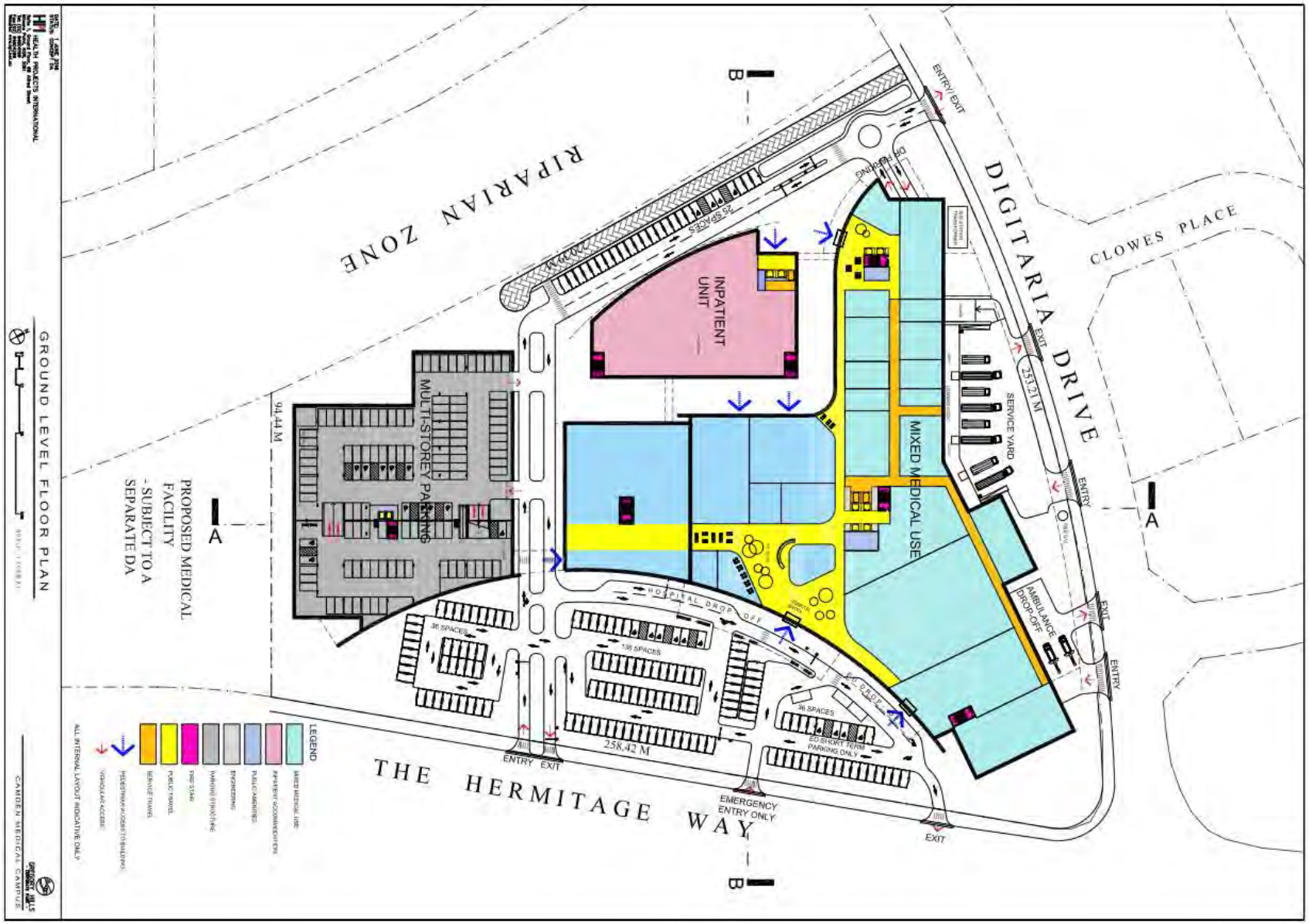


Figure 2 – Proposed Medical Precinct Development Ground Floor Plan

3 NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals. The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source. Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; like traffic noise.

4 EXTERNAL NOISE INTRUSION ASSESSMENT

This section of the report details the acoustic assessment of traffic noise intrusion to the proposed commercial development.

4.1 ACOUSTIC CRITERIA

4.1.1 Australian Standard AS 2107:2000

Australian Standard AS2107 recommends the following design sound level for each of the following spaces internally.

Space /Activity Type	Satisfactory Noise Level dB(A) $L_{Aeq(1hour)}$
Wards	35
Surgeries	40
Operating Theatres	40
Office Areas	40
Nurses Station	40
Laboratories	45
Kitchens	50
Consulting Rooms	40
Corridors and Lobby Spaces	40

4.1.2 NSW Road Noise Policy

Table 4 from the NSW Road Noise Policy states the following.

Table 4 Road traffic noise assessment criteria for non-residential land uses affected by proposed road projects and traffic generating developments

Existing sensitive land use	Assessment criteria – dB(A)		Additional considerations
	Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)	
1. School classrooms	$L_{Aeq, (1\ hour)}$ 40 (internal) when in use	–	In the case of buildings used for education or health care, noise level criteria for spaces other than classrooms and wards may be obtained by interpolation from the 'maximum' levels shown in Australian Standard 2107:2000 (Standards Australia 2000).
2. Hospital wards	$L_{Aeq, (1\ hour)}$ 35 (internal)	$L_{Aeq, (1\ hour)}$ 35 (internal)	
3. Places of worship	$L_{Aeq, (1\ hour)}$ 40 (internal)	$L_{Aeq, (1\ hour)}$ 40 (internal)	The criteria are internal, i.e. the inside of a church. Areas outside the place of worship, such as a churchyard or cemetery, may also be a place of worship. Therefore, in determining appropriate criteria for such external areas, it should be established what in these areas may be affected by road traffic noise. For example, if there is a church car park between a church and the road, compliance with the internal criteria inside the church may be sufficient. If, however, there are areas between the church and the road where outdoor services may take place such as weddings and funerals, external criteria for these areas are appropriate. As issues such as speech intelligibility may be a consideration in these cases, the passive recreation criteria (see point 5) may be applied.

4.1.3 Summary of Internal Noise Criteria

Table 1 – Internal Noise Criteria Summary

Space /Activity Type	Satisfactory Noise Level dB(A)$L_{Aeq(1hour)}$
Wards	35 (Day and Night)
Surgeries	40
Operating Theatres	40
Office Areas	40
Nurses Station	40
Laboratories	45
Kitchens	50
Consulting Rooms	40
Corridors and Lobby Spaces	40

4.2 FUTURE TRAFFIC NOISE IMPACTS

4.2.1 Estimated Traffic Volumes

Traffic noise emitted from future roads has been predicted based on expected traffic movements. Traffic volumes used in the assessment are based on information provided in the Traffic Impact and Parking Assessment prepared by Mott MacDonald, dated 17th June 2016. The data for predicted future traffic flow numbers along Digitaria Drive, The Hermitage Way and Gregory Hills Drive in the vicinity of the site are summarised in the following table.

Table 2 – Traffic Volumes on Future Roads

Road	Vehicles per Hour	
	2026 (Full Development) AM Peak	2026 (Full Development) PM Peak
Digitaria Drive	299	587
The Hermitage Way	66	871
Gregory Hills Drive	1395	1708

4.2.2 Predicted Future Traffic Noise Levels

4.2.2.1 Peak Hour Noise Level dB(A)$L_{eq\ 1\ hour}$

Traffic noise predictions have been carried out by CORTN programme and predicted traffic volume above. The predicted traffic noise levels during peak traffic hours are been presented below:

Table 3 –Predicted Traffic Noise Levels-Peak Hour

Location	Predicted Mean Traffic Noise Level During Peak Hour (day time period)
Northern Façade (along Digitaria Drive)	62 dB(A) $L_{eq,\ 1\ hour}$
Western Façade (along The Hermitage Way)	63dB(A) $L_{eq,\ 1\ hour}$
Southern Façade (along Gregory Hills Drive)	61dB(A) $L_{eq,\ 1\ hour}$

5 EVALUATION OF NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows and doors and roof, as these are relatively light building elements that offer less resistance to the transmission of sound. **All external walls are likely to be of masonry construction subject to future detailed design and will not require acoustic upgrading.**

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the measured level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Calculations were performed taking into account the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and the likely room sound absorption characteristics. In this way the likely interior noise levels can be predicted.

In all cases, the selected glazing type (refer to Section 5.1) reduces internal noise levels to within the nominated criteria for the various space types.

We note, as this report is for a feasibility study all base building facades and constructions are indicative only.

5.1 RECOMMENDED GLAZING

Refer to Table 4 for recommended glazing assemblies for this project to achieve the internal traffic noise requirements. All external windows and doors listed are required to be fitted with Q-lon type acoustic seals. (**Mohair Seals are unacceptable**).

The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not take into account other requirements such as structural, safety or other considerations. These additional considerations may require the glazing thickness to be increased beyond the acoustic requirement.

Table 4 – Recommended Glazing Construction

Façade	Space	Glazing	Acoustic Seals
All	Lobby	6.38mm Laminate	Yes
West	All Spaces	6.38mm Laminate	
East		10.38mm Laminate	
North		10.38mm Laminate	
South		6.38mm Laminated	

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the STC rating of the glazing assembly below the values nominated in the table above. **Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.**

Table 5 – Minimum STC of Glazing (with Acoustic Seals)

Glazing Assembly	Acoustic Seals	Minimum STC of Installed Window
6.38mm Laminate	Yes	31
10.38mm Laminate	Yes	33

5.2 EXTERNAL DOORS

Any glass door should be constructed using glazing thickness set out in Table above. Full perimeter acoustic seals around the doors are required. It will be acoustically acceptable if thicker glazing is required for structural or comfort purposes, the glazing recommended in Table above is a minimum requirement.

5.3 ROOF / CEILING CONSTRUCTION

Proposed construction for the external roof will composed of concrete elements, this will be sufficient in satisfying acoustic requirements. If any penetration is required through the external roof for services, ensure all gaps in the penetration have been sealed with acoustic sealant.

5.4 EXTERNAL WALLS

Proposed construction for the external walls will composed of either concrete or masonry elements, this will be sufficient in satisfying acoustic requirements. If any penetration is required through the external walls for services, ensure all gaps in the penetration have been sealed with acoustic sealant. Light weight walls shall be acoustically reviewed by this office before construction.

5.5 MECHANICAL VENTILATION

With respect to natural ventilation of the internal spaces, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" dictates that:

- *"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."*

With windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (ie – allowable level in any internal spaces becomes 45dB(A), and 50dB(A) in living rooms).

All internal spaces of the whole development will require to have their windows closed in order to meet acoustic requirements. A mechanical engineer is to confirm if supplementary ventilation (to meet Australian Standard AS1668.2 requirements) will be required to these rooms.

6 VIBRATION ASSESSMENT

This section of the report will discuss the impacts from vibration emitting from the project site to the surrounding receivers of the project site.

6.1 VIBRATION CRITERIA

Vibration impacts which has been assessed in this report, will be assessed against the requirements of the NSW EPA Document - Assessing Vibration: Technical Guideline 2006.

6.1.1 NSW EPA Document - Assessing Vibration: Technical Guideline 2006

Table 2.2 below shows the maximum RMS values for exposure to continuous or impulsive vibration.

Table 2.2 Preferred and maximum weighted rms values for continuous and impulsive vibration acceleration (m/s²) 1–80 Hz

Location	Assessment period[1]	Preferred values		Maximum values	
		z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous vibration					
Critical areas[2]	Day- or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day- or night-time	0.020	0.014	0.040	0.028
Workshops	Day- or night-time	0.04	0.029	0.080	0.058
Impulsive vibration					
Critical areas[2]	Day- or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day- or night-time	0.64	0.46	1.28	0.92
Workshops	Day- or night-time	0.64	0.46	1.28	0.92

1 Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am

2 Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specified above. Stipulation of such criteria is outside the scope of this policy, and other guidance documents (e.g. relevant standards) should be referred to. Source: BS 6472–1992

6.2 DICSUSSION

As detailed design of any mechanical plant is not known at this stage, a detailed review cannot be undertaken at Concept D.A Stage. A detailed assessment should be carried out at future D.A or CC stages to ensure compliance with the requirements above.

7 EXTERNAL NOISE EMISSION

7.1 NOISE RECEIVERS

Nearest residential receivers are located to the immediate east and north of the project, see figure 1.

7.2 BACKGROUND NOISE MONITORING

Background noise levels for the site were obtained using an unattended noise logger.

The unattended monitoring was conducted using an Acoustic Research Laboratory's noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted.

The unattended measurement was conducted from the 20th May 2016 to 27th May 2016. Refer to the aerial photo in Figure 1 afore for the noise monitor location.

The measured background noise levels are summarised in Table 6 below.

Table 6 - Measured Rating Background Noise Levels

Location	Day Noise Level 7am to 6pm dB(A) L_{90}	Evening Noise Level 6pm to 10pm dB(A) L_{90}	Night Noise Level 10pm to 7am dB(A) L_{90}
Gregory Hills Commercial Precinct See Figure 1	44	39	35

7.3 NOISE EMISSION OBJECTIVES

Noise emissions from the development will have to achieve the following requirements.

7.3.1 NSW EPA Industrial Noise Policy

The NSW EPA Industrial Noise Policy, has two criteria which need to be satisfied namely Intrusiveness and Amenity. These are described below:

- *Intrusiveness Criteria* - This guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

- *Amenity Criteria* - This guideline is intended to limit the absolute noise level from all "industrial" noise sources such as mechanical plant to a level that is consistent with the general environment.

The EPA's Industrial Noise Policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

7.3.1.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor do not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Section 5.1. Noise emissions from the site should comply with the noise levels presented in Table 7 below when measured at nearby property boundary.

Table 7 - Intrusiveness Noise Emission Goals

Location	Period/Time	Intrusiveness Noise Emission Goal dB(A) $L_{eq(15min)}$
Nearby Residences (North and East of Proposed Site)	Day (7am-6pm)	49
	Evening (6pm-10pm)	44
	Night (10pm-7am)	40

7.3.1.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The NSW EPA Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different areas. They are rural, suburban, urban and urban/industrial interface. This site is categorised by urban receivers.

For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

Table 8 - Amenity Noise Emission Goals

Location	Period/Time	Amenity Noise Emission Goal dB(A) $L_{eq(Period)}$
Nearby Residences –urban Receiver	Day (7am-6pm)	60
	Evening(6pm-10pm)	55
	Night(10pm-7am)	45

7.3.2 Resultant Project Noise Emission Criteria

Based on the requirements stated in the sections above, Table 9 provides a summary of the assessment criteria applicable to the future residential development at the proposed site. The assessment criteria are also based on the background noise monitoring data conducted at the proposed development location.

Table 9 - Environmental Noise Emission Criteria

Time Period	Assessment Background Noise Level dB(A)L_{90}	Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria Background + 5 dB(A) L_{eq}(15min)	EPA Criteria for Sleep Disturbance dB(A) L_{eq}(15min)
Day	44	60	49	N/A
Evening	39	55	44	N/A
Night	35	45	40	50

7.4 SLEEP AROUSAL ASSESSMENT

Potential sleep arousal impacts should be considered for noise generated before 7am or after 10pm.

Short duration, intermittent noise events (such as cars driving into the car park) are typically assessed for potential sleep disturbance.

Potential impacts are assessed using the recommended procedure in the Application Notes to the EPA Industrial Noise Policy. As recommended in the Application Notes, when assessing potential sleep arousal impacts, a two stage test is carried out:

- Step 1 - An “emergence” test is first carried out. That is, the L_1 noise level of any specific noise source should not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident’s bedroom window between the hours of 10pm and 7am. If the noise events are within this, then sleep arousal impacts are unlikely and no further analysis is needed. This is consistent with the Noise Guide for Local Government. The guideline level is set out below.

Table 10 - Sleep Arousal (Emergence Criteria)

Location	Background Noise Level (10pm-7am) dB(A)$_{L90}$	Emergence Level dB(A) $L_{1(1min)}$
Gregory Hills Commercial Precinct See Figure 1	35	50

- Step 2 - If there are noise events that could exceed the emergence level, then an assessment of sleep arousal impact is required to be carried out taking into account the level and frequency of noise events during the night, existing noise sources, etc. This test takes into account the noise level and number of occurrences of each event with the potential to create a noise disturbance. As is recommended in the explanatory notes of the EPA Industrial Noise Policy, this more detailed sleep arousal test is conducted using the guidelines in the EPA Road Noise Policy. Most relevantly, the Road Noise Policy states:

  For the research on sleep disturbance to date it can be concluded that:

  - *Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep.*

  - *One to two noise events per night with maximum internal noise levels of 65-70dB(A) are not likely to affect health and wellbeing significantly.*

The internal noise level guidelines have also been adopted in this assessment.

7.5 MECHANICAL PLANT

Detailed plant selection has not been undertaken at this stage, as plant selections have not been determined. Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels. Satisfactory levels will be achievable through appropriate plant selection and location and, if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures. Noise emissions from all mechanical services plant to the closest residential receiver should comply with the noise emission criteria in Section 5.2 of this report.

7.6 CAR PARK NOISE

7.6.1 Ground Level Open Car Park (The Hermitage Way)

This section of the report presents our assessment of operational noise emissions from the proposed outdoor car park.

7.6.1.1 Noise Sources

Noise emissions at the nearest residences will be predicted based on the following assumptions:

The potential noise source associated with the use of the driveway and carpark is listed in Table 11 below, also listed is the noise emission levels for each activity. The emission levels have been obtained from noise measurements carried out at similar facilities.

Noise measurements were obtained using a Norsonic SA 110 with (serial number 24692) or CEL-593 Type 1 sound level analysers (serial number C1. T 116962), set to fast response. The sound level analysers were calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

Table 11 – Noise Source Emission Levels

Noise Source	Sound Power Level dB(A)	Type of Noise Source
Car Manoeuvring	84	Quasi-Steady
Car Start	65 dB(A) L_1 @ 7m	Instantaneous
Door Slamming	68 dB(A) L_1 @ 7m	Instantaneous

7.6.1.2 Predicted Noise Emissions

Noise levels are predicted at the property boundaries of the nearest residential receivers, and is shown below in the following tables. All predictions are based on the assumption that the acoustic treatments and management controls outlined in Section 7.6.1.3 are adopted.

7.6.1.2.1 Predicted Noise Levels

Noise emission from the operation of the driveway, car park and ambulance has been predicted based on the noise level data presented in Section 7.6.1.1, and the assumptions presented below.

- The car park can hold a maximum of 211 vehicles at any one time.
- Calculations are based on up to 50% of car park spaces occupied or vacated during one-hour time period (day time).

The predicted noise levels at the nearest residential receivers are presented in the table below.

Table 12 - Predicted External Open Air Car Park Noise Level (The Hermitage Way)

Receiver	Predicted Noise Level	Criteria	Compliance
Receiver 1 and 2 (See figure 1)	42 dB(A)L_{eq}	Day – 49 dB(A)L_{eq}	Yes
	42 dB(A)L_{eq}	Evening- 44 dB(A)L_{eq}	Yes
	39 dB(A)L_{eq}	Night – 40 dB(A)L_{eq}	Yes*

*No detailed traffic movement data available at this stage, it is reasonably assume that the vehicle movements during night time period will be half of day time period.

Door slamming/ car start noise emission during night time period has been predicted below.

Table 13 –Sleeping Disturbance Noise Prediction

Receiver	Predicted Noise Level	Criteria	Compliance
Receiver 1 and 2 (See figure 1)	Door Slamming- 49 dB(A)L_{Max}	50 dB(A)$L_{1, 1min}$	Yes
	Car Start-46 dB(A)L_{Max}		

7.6.1.3 Discussion

Detailed assessment has been undertaken to predict the noise emissions from the movements of the external open air car park located along the eastern and western boundary. We note, from site investigations details regarding the existing receivers building height and boundary fence have been taken into account. Based off the boundary permitter fence at a height of 1.8m high, compliance can be achieved.

Additionally, management controls should be enforced to ensure existing acoustic amenity is achieved. Installing signs at all entry and exit points to the site reminding visitors and motorist too cautious of their noise when on site at all times.

7.6.2 Ambulance Noise

- With respect to noise from ambulances, being an emergency vehicle, ambulance noise is not subject to the noise emission requirements of the Industrial Noise Policy, however, we note:
    - Sirens to ambulances are not typically used within the site. Typically, the only exception to this would be for a short duration burst to alert motorists within the site. We would expect this would not typically be necessary during night time periods, as there will be much fewer motorists on the site at this time.
    - The Ambulance Bay is located over 100m away from the residences. Noise from an ambulance idling in the ambulance bay would not be expected to be audible at these residences.

8 CONCLUSION

This report provides the results of our acoustic assessment of the feasibility of the proposed medical precinct on the amenity of future tenants and surrounding neighbours within the proposed site at Gregory Hills Corporate Park.

Provided that the treatments set out in section 5 of this report are employed, internal noise levels shall comply with the requirements below:

- Australian Standard AS: 2107:2000 and;
- NSW Road Noise Policy and;
- SEARs.

Vibration emissions criteria has been setup in this report to satisfy the requirements from NSW EPA Assessing Vibration: Technical Guideline 2016 and SEARs. A detailed vibration assessment for the plant servicing the proposed development will be determined at CC stage.

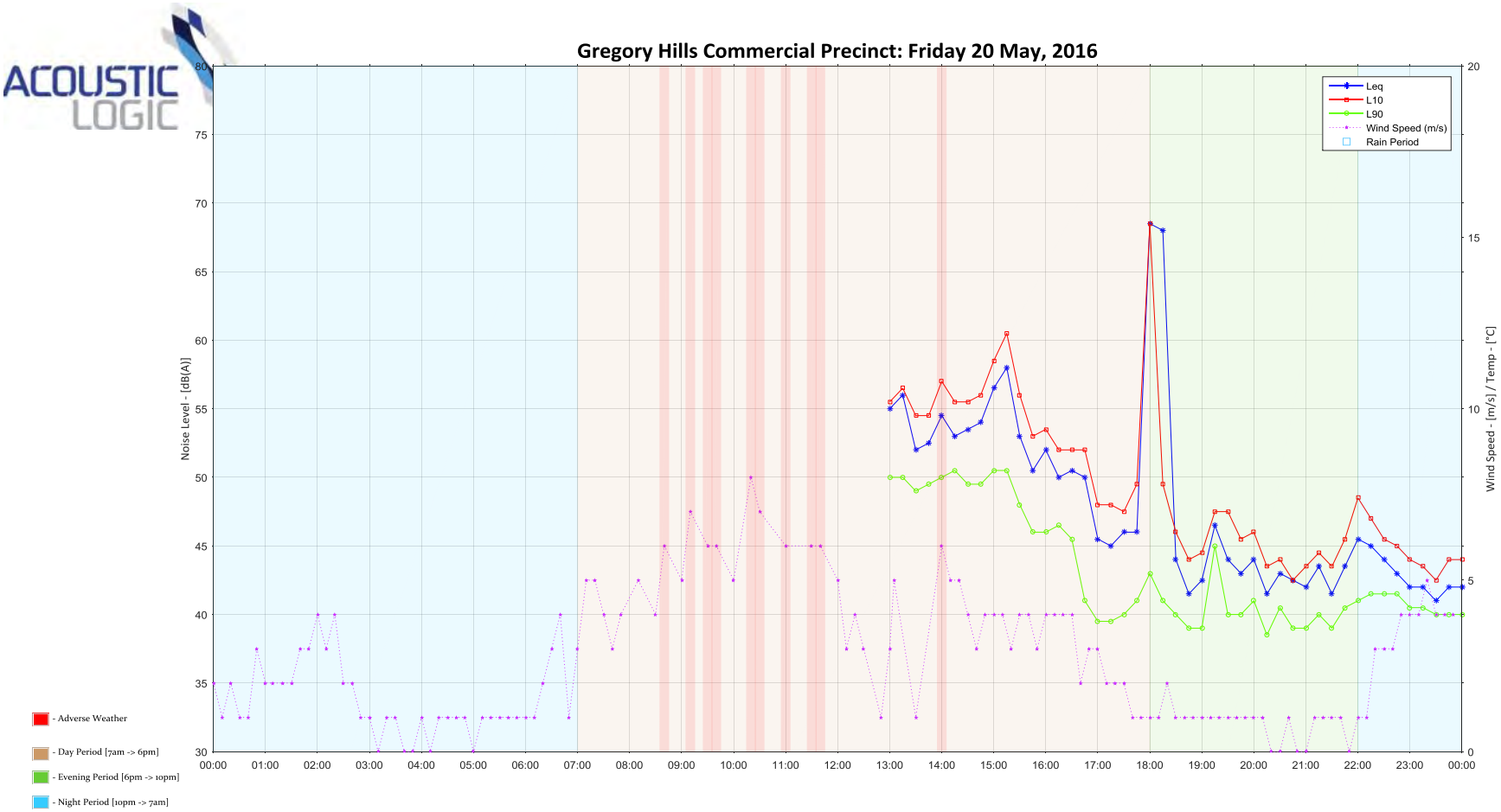
External noise emissions criteria have been setup in this report to satisfy the requirements from NSW EPA Industrial Noise Policy and SEARs, noise control for the carpark has been recommended in Section 6.5 of this report while the detailed acoustic controls measure for the plant service the proposed development will be determined at CC stage.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Matthew Furlong

APPENDIX A – UNATTENDED NOISE MONITOR DATA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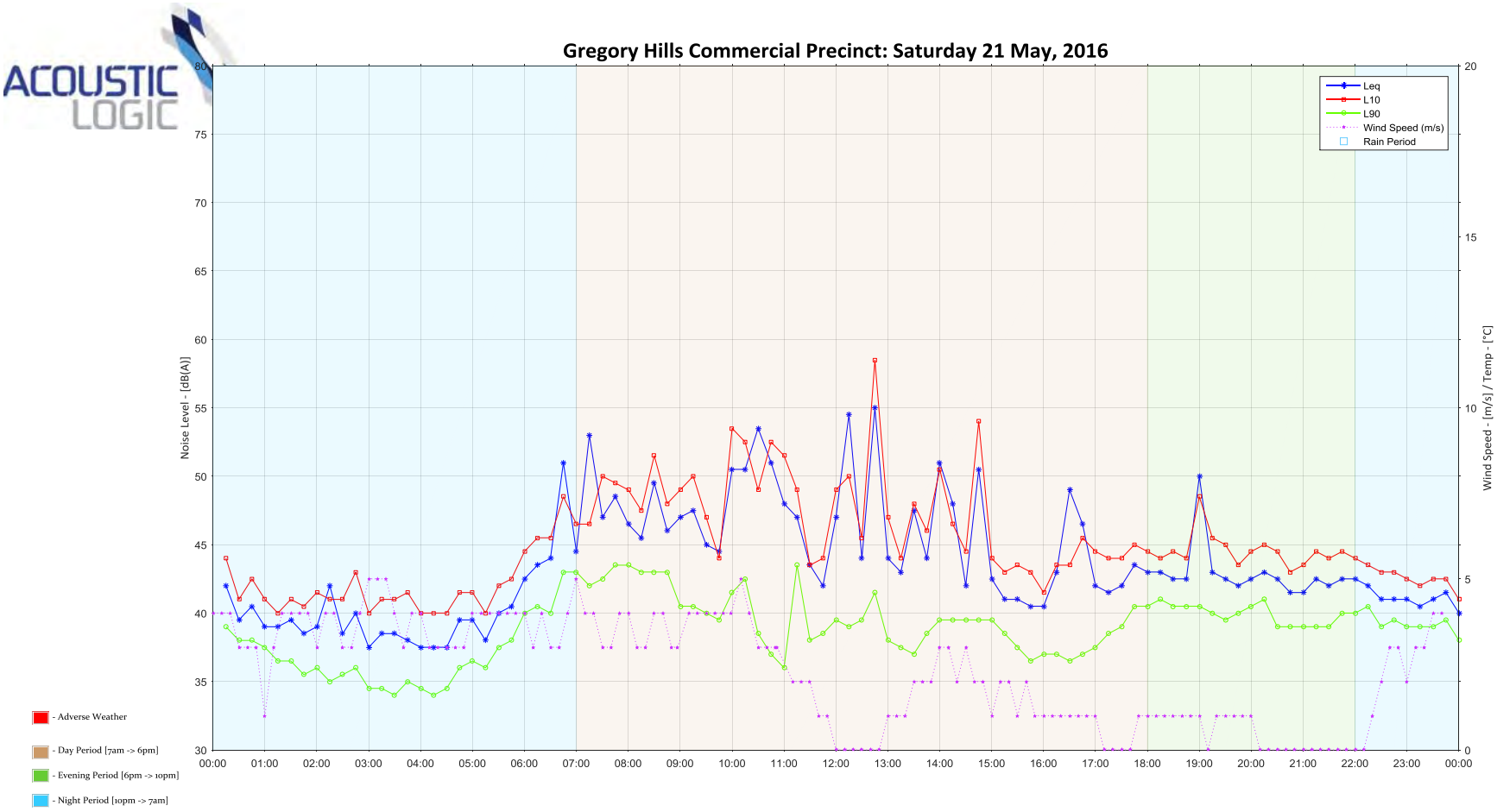
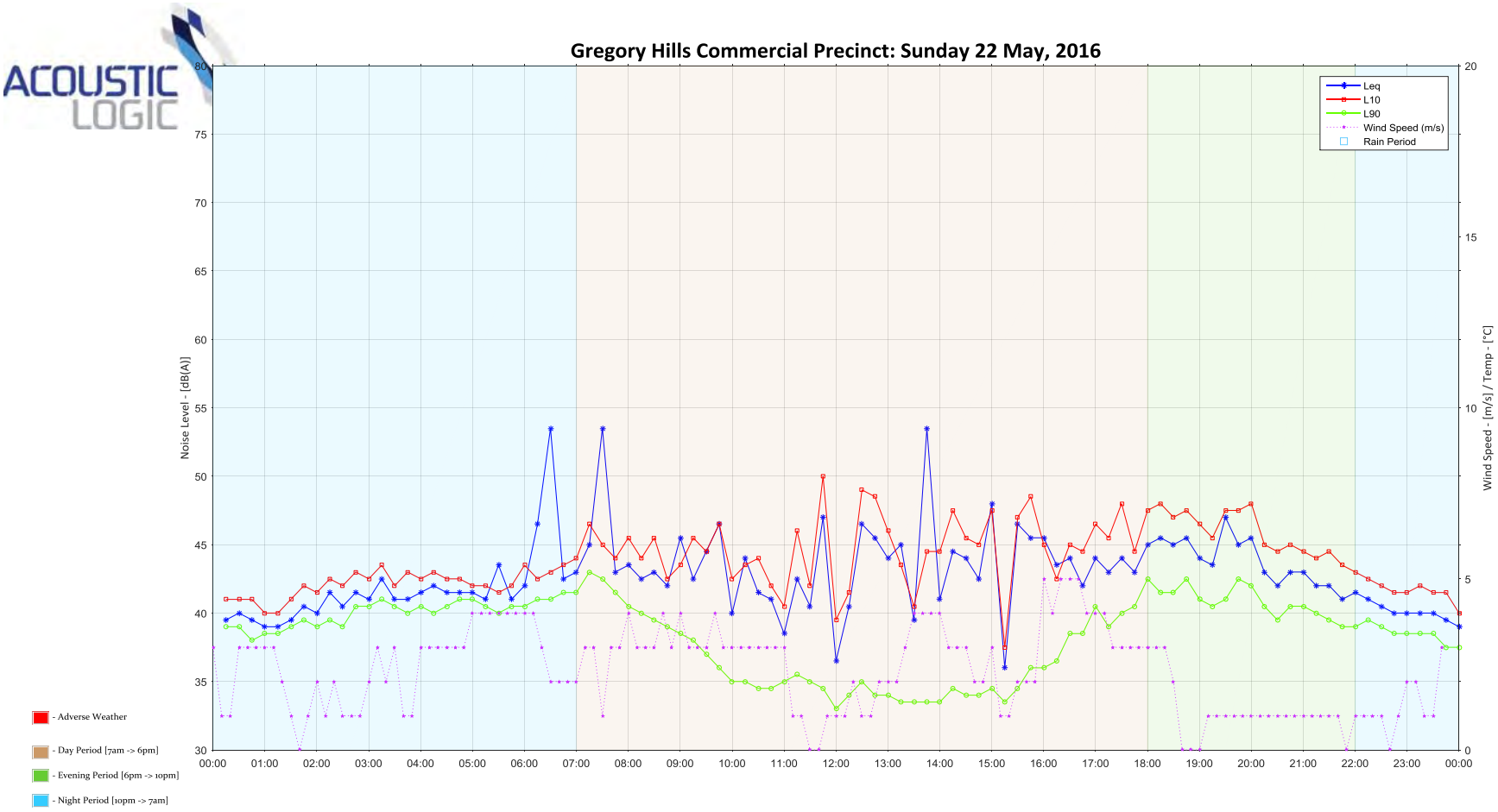
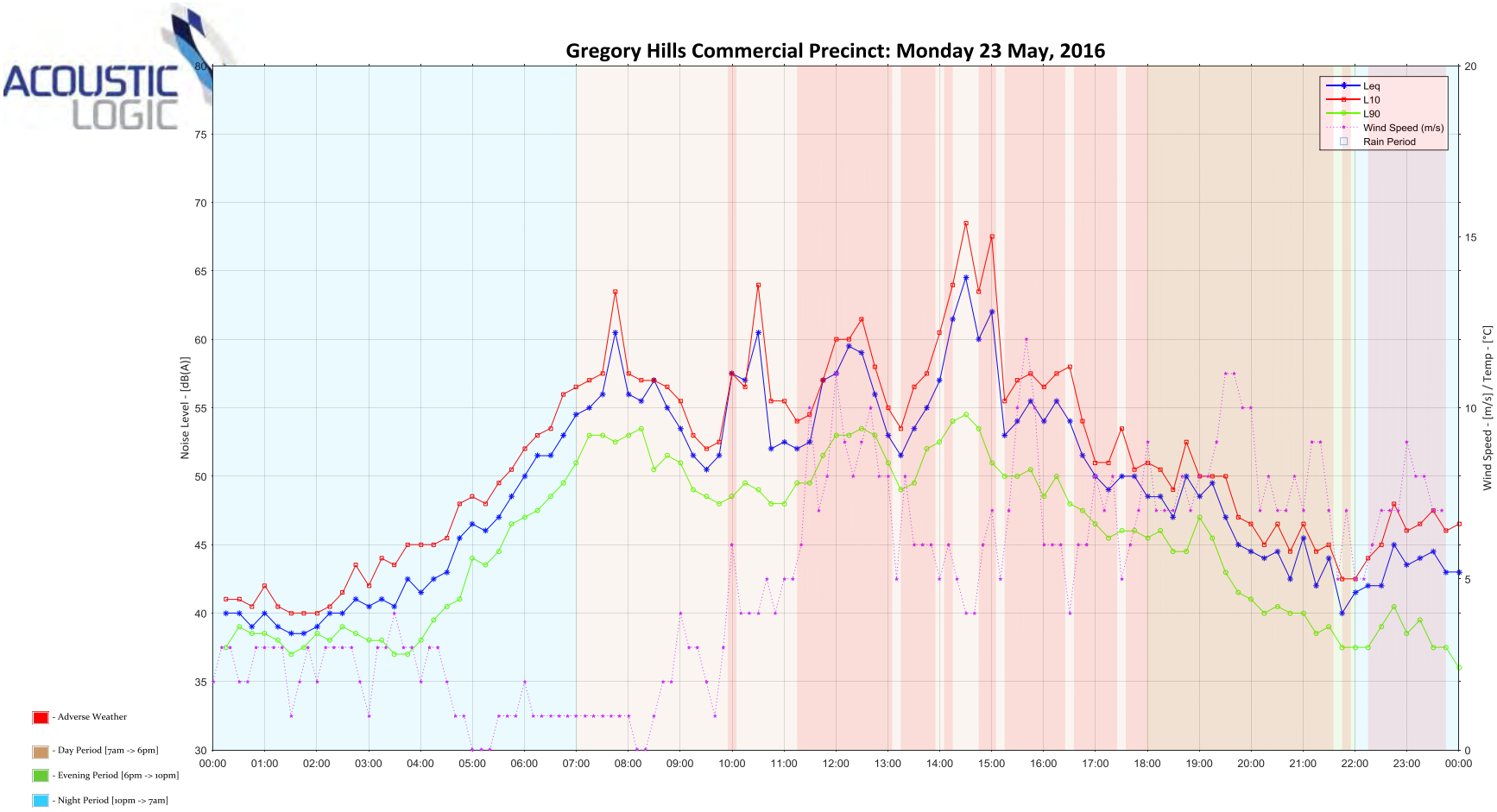
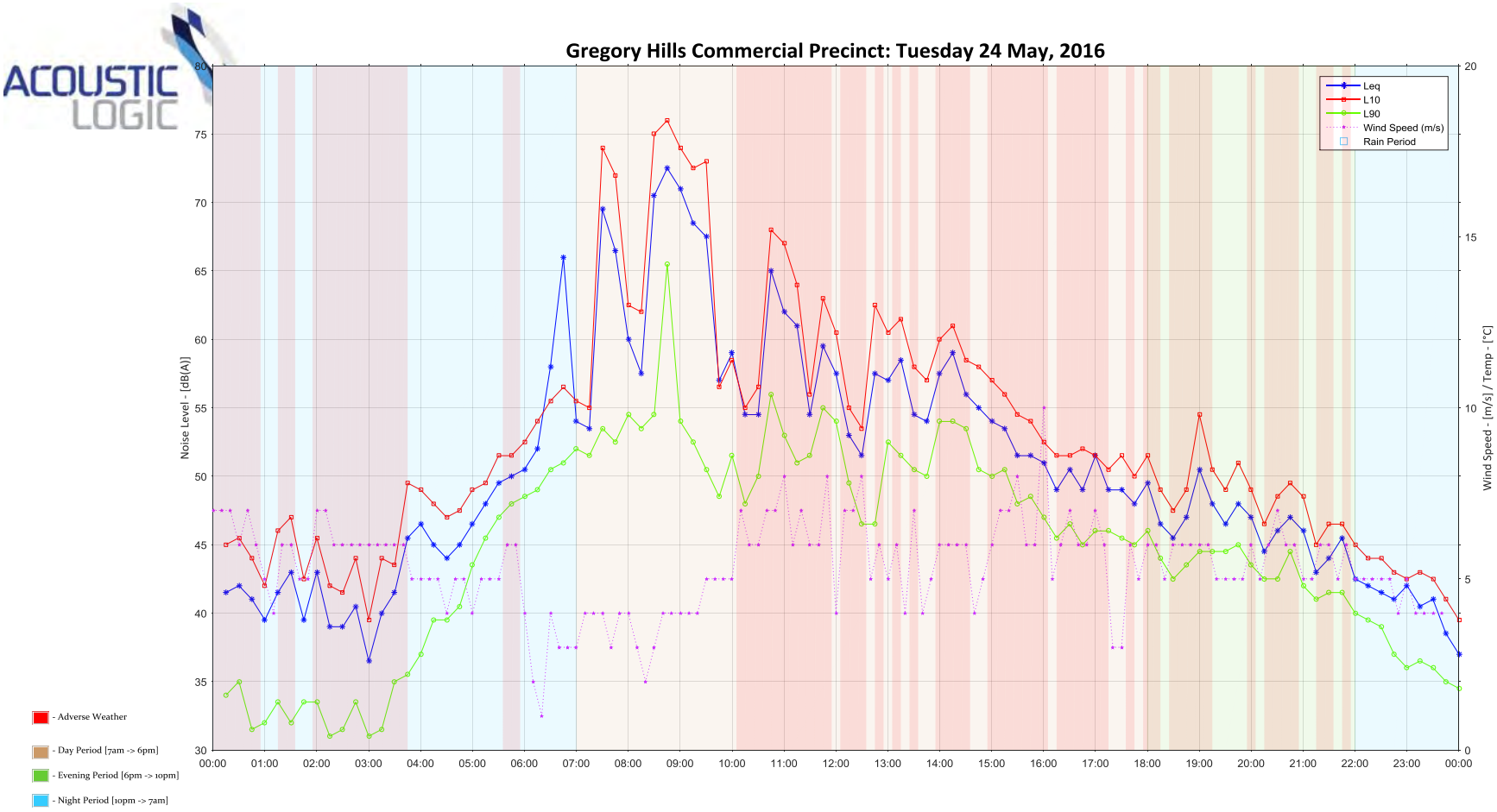
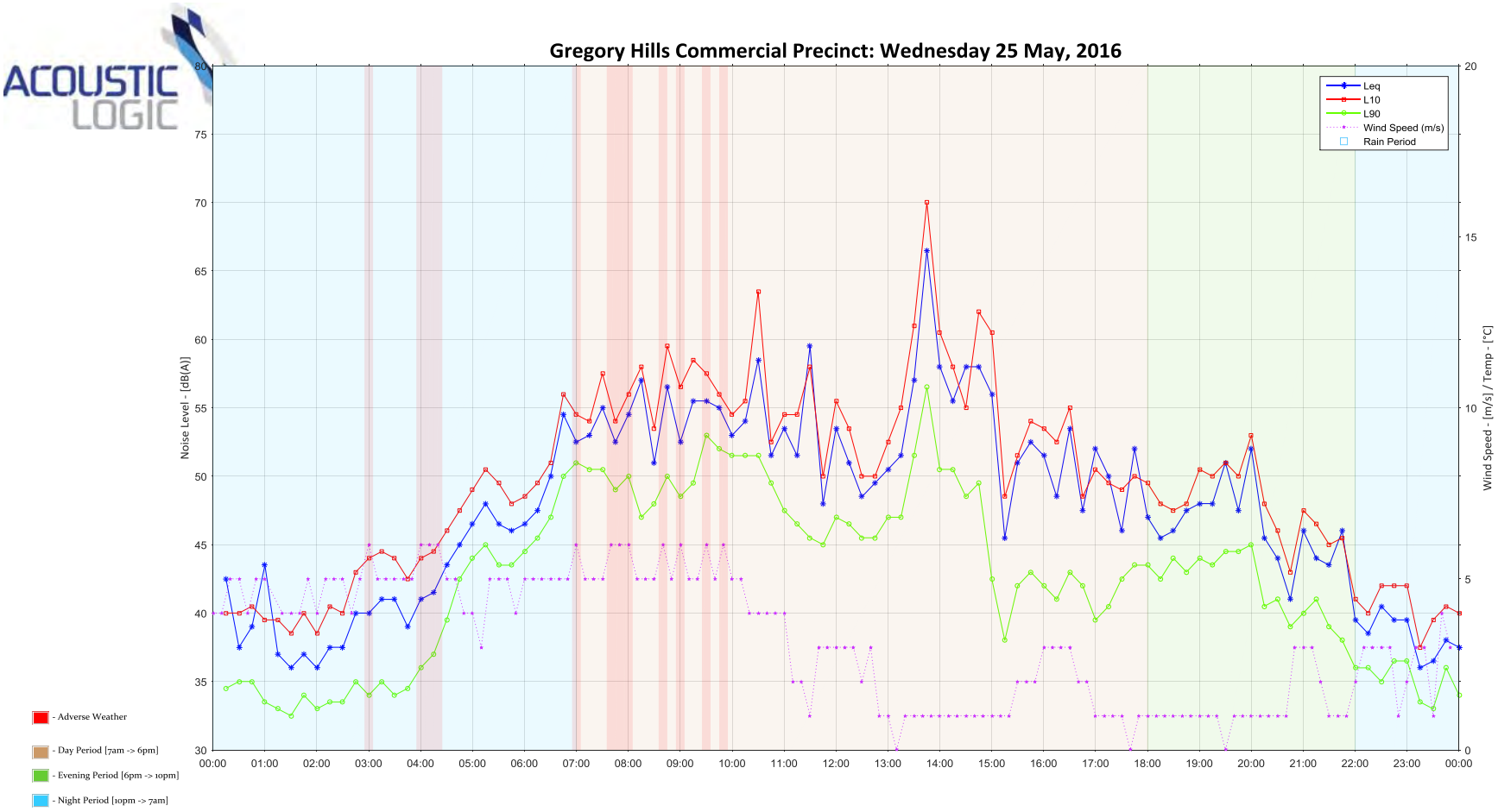
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

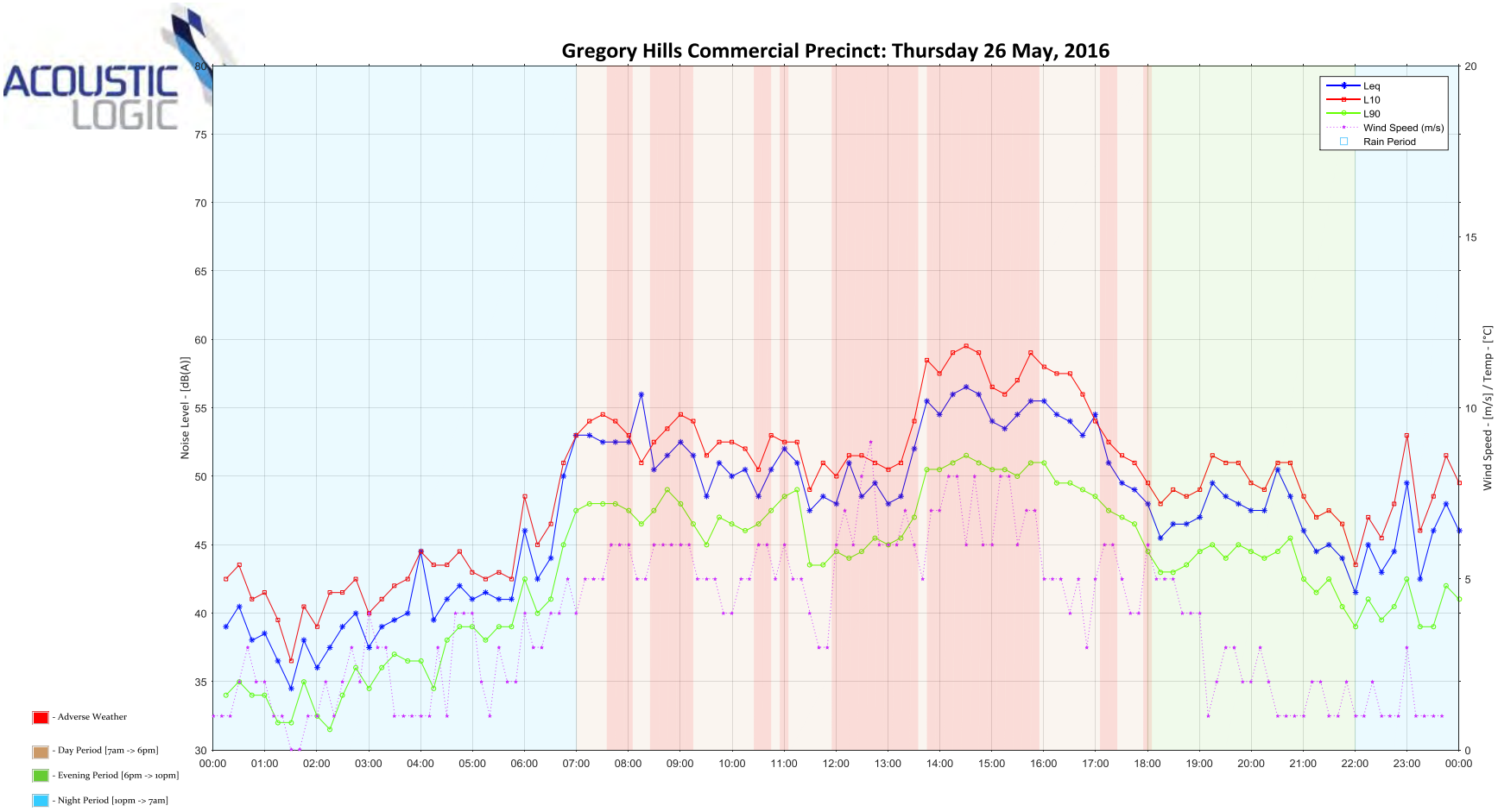

Gregory Hills Commercial Precinct: Saturday 21 May, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

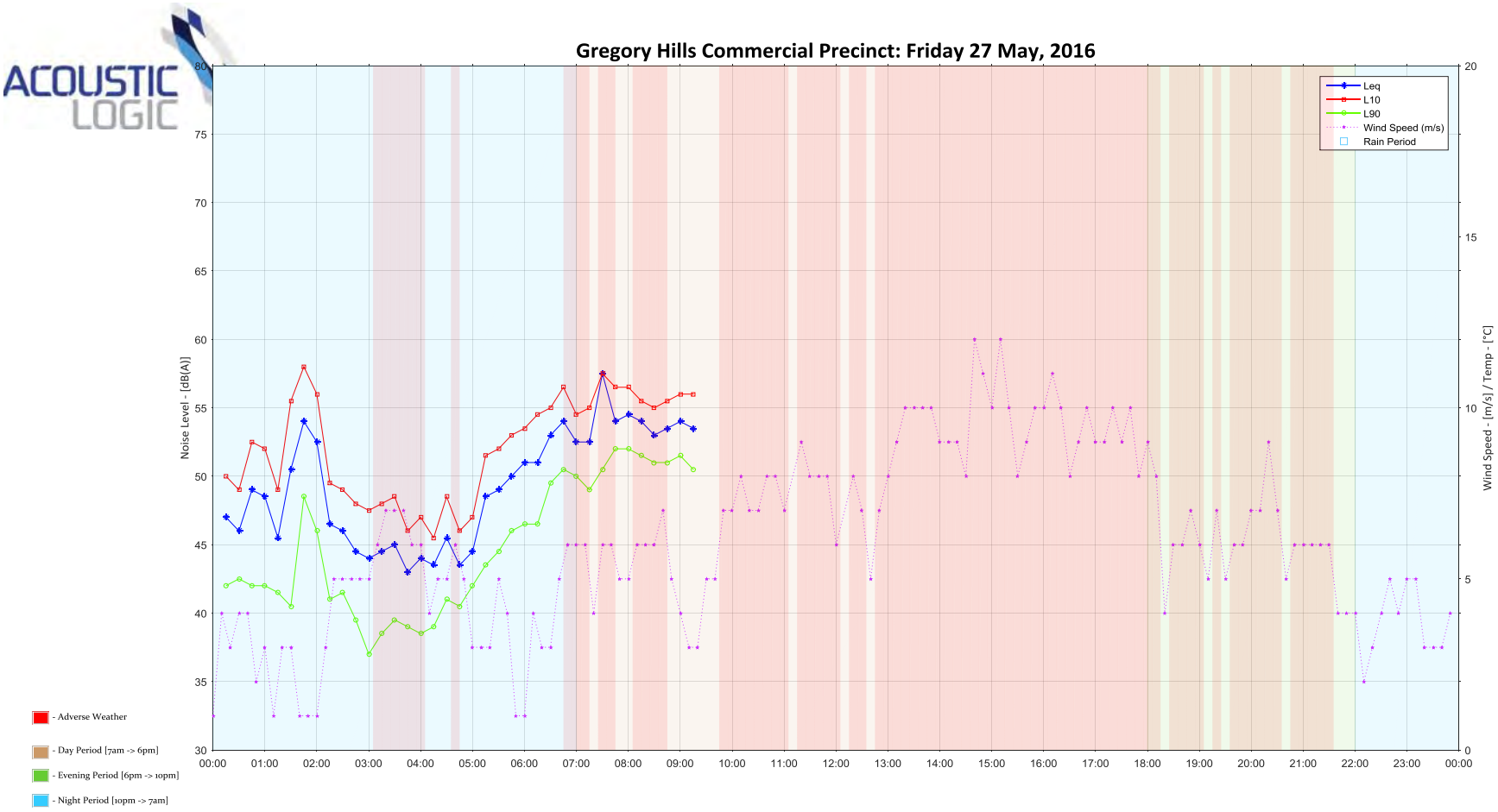

Gregory Hills Commercial Precinct: Sunday 22 May, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Gregory Hills Commercial Precinct: Monday 23 May, 2016
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Gregory Hills Commercial Precinct: Tuesday 24 May, 2016
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Gregory Hills Commercial Precinct: Wednesday 25 May, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Gregory Hills Commercial Precinct: Thursday 26 May, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


Gregory Hills Commercial Precinct: Friday 27 May, 2016
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

Appendix 5

ADE, 'Cover letter response to Council issues'

STC-307-11093 / SAL1 / v4 final

Site Address: **Hermitage Way, Gledswood Hills NSW,**
Subject Area: **Digitaria Drive Gledswood Hills NSW**

Date: 25.11.2016

Richard Harris

Gregory Hills Corporate Park

Dear Richard,

A.D. Envirotech Australia Pty Ltd (ADE) was commissioned by Gregory Hills Corporate Park Pty Ltd (GHCP) to provide level 1 inspection and geotechnical testing in accordance with AS 3798-2007 'Guidelines on earthworks for commercial and residential developments', as the Geotechnical Inspection and Testing Authority (GITA).

The gate checks carried out on materials imported into GHCP has been completed in accordance with ADE Report 'Fill Management Protocol, Ref: 6908.Lot 701, DP1154772, Gregory Hills Drove, Gledswood Hills NSW.FMP1 v1 final', dated 29th November 2013 (GHCP FMP).

Douglas Partner has carried out the salinity invesitgation and management plan (76510 Dated May 2012) which indicates that the lot consists of materials of slightly to moderately saline. The test pits noted in the report include 8 shallow test pits and 2 deep test pits which have been conducted on the proposed hospital site. These tests as noted in the report conclude that the soils located on the site are Non- Aggresive and Mildy Aggressive between RL 95.000 and the exiting surface levels.

The proposed carpark has RL of 99.800 and the filling starts at a RL of 99.950. Therefore the proposed location for the basement carpark will not be affected by the salinity of the soils. Based on the results in the salinity report conducted by Douglas Partners and the FMP and gate checks by ADE we can confirm that no further investigation would be required to determine the foundation requirements for the hospital.

Based on the laboratory results of the materials placed in the subject car park area, the materials will not have have any adverse effect on the salinity.

Yours sincerely,

Bikesh Deoju,

Geotechnical Engineer
A.D. Envirotech Pty Ltd

b. deoju@adenvirotech.com.au