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August 19, 2021

Hon. Loretta Taylor Chairperson of the Town of Cortlandt Planning Board and Members of the Planning Board Town Hall 1 Heady Street Cortlandt Manor, NY 10567

Re: Overlook Terrace Site Plan Application and Referral from Town Board of Proposed Zoning Text Amendments <u>119 Oregon Road, SBL 23.11-1-12 ("Property")</u>

Dear Chairperson Taylor and Members of the Planning Board:

On behalf of NRP Group (the "Applicant"), contract-vendee of the above-referenced Property we are writing to update you that the Applicant met with Town staff and consultants during the week of August 2 to discuss the technical review for the proposed 135-unit active adult residential rental community. Based on the discussion with Town staff, the Applicant is in the process of updating the full-size site plan drawings and supporting analysis for review.

As the plan revisions are in progress, we enclose 12 copies the following materials for your ongoing consideration:

Tab

- 1. Responses to traffic and parking comments, prepared by Provident Design Engineers (PDE)
- 2. Responses to comments from Michael Preziosi, Director of Technical Services (DOTS), prepared by Divney Tung Schwalbe, LLP
- 3. Responses to comments from Chris Kehoe, Deputy Director DOTS Planning Division, prepared by Divney Tung Schwalbe, LLP
- 4. Responses to SWPPP comments from HVEA, prepared by Divney Tung Schwalbe, LLP



Hon. Loretta Taylor and Members of the Planning Board Re: <u>Overlook Terrace – 119 Oregon Road</u>

August 19, 2021 Page 2

Additional detailed responses to certain comments will be submitted for review as the site development plan review process continues.

We look forward to continuing our review of the Project with the Planning Board.

Very truly yours,

DIVNEY TUNG SCHWALBE, LLP

Matthew N. Steinberg, AICP Associate

Enclosures File: 858



Memorandum

То:	Chris Kehoe, AICP – Deputy Director, Planning
From:	Carlito Holt, P.E., PTOE Managing Partner
Subject:	Traffic Comment Responses – Overlook Terrace Town of Cortlandt, New York
Date:	August 19, 2021
CC:	D. Ward – NRP Group N. Williams – St. Katherine's Group J. Schwalbe – Divney, Tung, Schwalbe D. Steinmetz – Zarin & Steinmetz
Project No.:	21-022

Provident Design Engineering, PLLC (PDE) has prepared this response to the comments regarding Overlook Terrace. The following documents contained comments related to traffic and parking:

- Memorandum dated July 23, 2021 prepared by HVEA Engineers
- Memorandum dated July 23, 2021 prepared by Michael Preziosi, Director of Technical Services
- Memorandum dated July 28, 2021 prepared by Chris Kehoe, Director of

Copies of each Memorandum are contained in Attachment A for ease of reference. The following are responses to the relevant outstanding comments pertaining to traffic and parking, in order in which they appeared in each associated Memorandum:

HVEA MEMORANDUM

Previous Comment 5:

The HVEA Memorandum incorrectly stated the Donnelly Place approach would operate at failing Levels of Service. Based upon the updated analysis contained herein this approach will operate at a Level of Service "B" and "D" during the Peak AM and Peak PM Hours, respectively with no more than a 1.2 second increase in delay from No-Build to Build Conditions, during either of the Peak Hours. Based on the foregoing, it is the opinion of PDE that the Donnelly Place access as proposed is acceptable. Providing a new curb cut between the two existing curb cuts cannot be performed by the Applicant, since they do not control the property needed to create this access. The overflow parking area accessed from Oregon Road for the eastern property on Donnelly Place will not be impacted by the proposed Project.

Overlook Terrace Traffic Response Memo August 16, 2021 Page 2 of 4

Previous Comment 6:

The Applicant has revised the Eton Downs access to allow right-turn exit-only access with full emergency access still provided at this location. This will allow residents the ability to exit the site via Eton Downs Road in order to make the left-turn exiting movement under the protection of the traffic signal. The updated traffic analysis contained herein demonstrates that acceptable Levels of Service will be maintained with the revised access scheme.

Additional Comments 1 and 2:

The updated traffic analysis has been revised with the following parameters:

- The phasing conflicts at Oregon Road/Eton Downs/Heady/Pumphouse have been resolved
- Calculated Peak Hour Factors (PHF) were utilized for all study locations
- The Oregon Road/Eton Downs/Heady/Pumphouse traffic signal demonstrated semi-actuated operations based upon field investigations and thus has been analyzed with that controller type
- The trip distributions have been revised to reflect a 50/50 split for project-generated traffic along Oregon Road

With the adjusted parameters noted above, the updated traffic analysis indicates essentially the same Level of Service findings contained in the original report. The proposed Project would still not create any significant incremental traffic impacts within the study area.

It is noted that a pedestrian crossing does not exist along this portion of Oregon Road. A crossing would be beneficial for existing pedestrians in the area, as well as pedestrians anticipated from the proposed Project to cross to/from the sidewalk on the north side of Oregon Road, as well as to access the Bee Line Bus Stops. In order to provide pedestrian crossings at the signalized intersection of Oregon Road/Eton Downs/Heady/Pumphouse, a full traffic signal upgrade would be required at this intersection. This improvement would cost upwards of \$500,000. The proposed Project, with its limited incremental impacts, would not warrant that significant of an improvement.

Based on the foregoing, PDE has prepared three Conceptual Improvement Plans (see Attachment B), as follows:

<u>Concept Plan CP-1</u> – Proposed Rapid Rectangular Flashing Beacon (RRFB) pedestrian crossing to be installed at proposed site driveway intersection. This improvement would be implemented by the Applicant and would provide a much safer pedestrian crossing for both existing and project-generated pedestrian traffic in the area. The pedestrian crossing sign would illuminate with a flashing beacon when pedestrians were crossing to alert drivers to stop and allow pedestrians to safely cross. This improvement would cost approximately \$20,000 to \$30,000.



Overlook Terrace Traffic Response Memo August 16, 2021 Page 3 of 4

<u>Concept Plan CP-2</u> – Proposed pedestrian crossings on the eastern leg of Oregon Road and the Pumphouse Road leg of the signalized intersection. This improvement would include a new traffic signal system to be installed with associated pedestrian traffic signals. This improvement would cost approximately \$500,000.

<u>Concept Plan CP-3</u> – This would be the same improvement as CP-2, with the exception that a dedicated left-turn lane would be provided along the westbound approach of Oregon Road. This improvement would cost approximately \$750,000. It is noted that the extent of Right-of-Way availability for this improvement is unknown.

The Level of Service Tables contained in Attachment C outline the results with each improvement alternative (Capacity Analysis Worksheets are contained in Attachment D). As can be seen in the Level of Service Tables, acceptable Levels of Service can be maintained under any improvement alternative. Although the proposed Project does not warrant implementation of CP-2 or CP-3, a Fair-share Financial Contribution analysis was conducted for this location. When considering the total Project-generated traffic at this location compared to the existing background traffic, the Fair-share Percentage would equate to 3% of the total cost of improvements (see Attachment E). When applying this percentage to the improvement costs associate with CP-2 or CP-3, a Fair-share Financial Contribution of \$15,000 to \$22,500 would be required.

Based on the foregoing, the CP-1 improvement to be implemented by the Applicant would offset the Fair-share impacts of the proposed Project. Although this improvement would fully offset the Applicant's Fair-share responsibility, the Applicant is willing to go above and beyond and provide an additional Financial Contribution by designing the preferred improvement alternative at the intersection of Oregon Road/Eton Downs/Heady/Pumphouse. These design services could cost approximately \$50,000 to \$60,000. This design would allow the Town to have a shovel-ready Project when capital funding became available to implement the proposed improvement. Additionally, the design could be utilized by the Town in Grant Applications to seek alternative funding. PDE will provide a formal Scope and Fee for the design of the improvements to be reviewed and confirmed by the Town.

Additional Comment 3:

The Jacobs Hill Apartments provide a total of 121 off-street parking spaces. Based upon the observed Average Peak Parking Demand a total of 42 parking spaces were unoccupied (35% of total parking provided). Based upon the Maximum Peak Parking Demand observed at any time during the two-week period, a total of 32 parking spaces were unoccupied (26% of total parking provided). Based on the foregoing, this data continues to support the Parking Ratio to be provided for the proposed Project.



Overlook Terrace Traffic Response Memo August 16, 2021 Page 4 of 4

PREZIOSI MEMORANDUM

Comments 5a and 5b:

See response to HVEA Additional Comments 1 and 2 above.

Comment 5c:

See response to HVEA Previous Comment 6 above.

KEHOE MEMORANDUM

Comment 6:

The Project Team has reviewed the operating and parking conditions for the Springvale Apartment Complex. It is noted that this site is not a very comparable use to the proposed Project based upon the size (total of 401 units), as well as the style which is a Garden-style Cluster Apartment development. Although the use is not a directly comparable, PDE conducted a survey of the site. Based upon the survey it was determined that the site provides a total of 478 off-street parking spaces. The parking demand observed during the survey conducted by PDE (10:00 PM on a weeknight) was 374 parked vehicles. The observed parking demand equates to a parking ratio of 0.93 parked vehicles per unit. The 104 unoccupied parking spaces represents 22% of the total parking provided. This data further supports the parking ratio to be provided by the proposed Project.

Q:\PROJECTS-21\21-022 Cortlandt Senior Living\Letter\2021-08-19_21-022_Cortlandt Senior Living - PDE Response to Memos.docx



ATTACHMENT A

REVIEW MEMORANDA



Mr. Chris Kehoe AICP, Deputy Director

Traffic Impact Study dated 6/23/2021

Town of Cortlandt, New York

Town of Cortlandt, Planning Division

Cortlandt Manor, NY 10567

Overlook Terrace

July 23, 2021

1 Heady Street

Re:

DECEIVE JUL 2 8 2021 *PS 2021 - 1* DEPT. OF TECHNICAL SERVICES PLANNING DIVISION

Copies Planning Boor CA.C. A.R.C. Applicant I. Carlilo Holt I. Carin + Skinnetz, 659. Sent 1/28/21

Dear Mr. Kehoe:

HVEA has received the following documents associated with the referenced project:

• Traffic Impact Study Proposed Senior Living Facility 119 Oregon Road dated June 23, 2021 - prepared by Provident Design Engineering, PLC.

Comments are provided on previous design issues as well as the current report information. Responses to previous comments are first discussed, followed by additional comments:

Previous Comment:

 The existing traffic volumes were gathered via historical data extrapolated from smartphone technology because of COVID-19 pandemic impacts on traffic patterns. It is recommended that manual traffic counts be obtained for more accurate volumes and turning counts.

Response:

The applicant obtained field counts as requested.

Previous Comment:

2. The traffic analysis should encompass intersections from Pump House Road to the intersection of Locust Ave. The intersections of Oregon Road/Pump House/Heady/Eton, Oregon/Site Drive, Oregon/Gallows/Donnelly, and Oregon/Locust should have an existing vs. proposed ETC LOS analysis comparison performed.

Response:

- The applicant expanded the traffic study as requested.

Previous Comment:

3. The analysis presented in the April 27 memo applies traffic generated volumes based on NJDOT trip generation rates for a banquet hall based on the number of seats at the

facility to the existing condition. Trip generation from the existing facility may not have a strong correlation to the AM and PM peak hours under consideration and it is not recommended that the NJDOT values be applied to the AM/PM peak traffic counts. This facility has been closed for sufficient time period that manual traffic counts should be used without consideration of the previous development.

Response:

- The applicant did not include estimated counts generated from a banquet hall in the existing condition. This is consistent with what was requested.

Previous Comment:

4. It is recommended that proposed volumes be calculated for Land Use Category 221 – Multifamily Housing (0.44 trips per dwelling unit PM peak hour) in addition to Land Use Category 252 (0.26 trips per dwelling unit PM peak hour) to best understand the range of potential traffic impacts.

Response:

 The applicant increased the generation rates as requested, showing a comparison between the two land use categories. The traffic analysis used an average between the two rates. We had expected that the high and low values be carried through the capacity analysis, but the average condition may be adequate to assess impacts.

Previous Comment:

5. The 4/27 memo states that Donnelly Place will be terminated on the East end to provide a more controlled intersection with Oregon Road. This is contrary to our understanding that Donnelly Place would be terminated at the West end. Donnelly Place at the western end has a skewed entrance at Oregon Road and there is a wide asphalt apron on Oregon Road that accommodates the combined entrance of Donnely Place and the Site driveway. This existing situation has the potential for uncontrolled access type movements/conflicts and unexpected driver behavior situations.

Response:

The Applicant clarified the closure point in the report submission to be on the west side on Donnelly Place. It should be noted that the LOS of the intersection that the properties on Donnelly Place will have access is shown to operate at LOS F. This may be a concern to property owners on Donnelly Place. The merits of creating a driveway to Oregon Road across the grass in the middle of the Donnelly Place segment and closing both ends of Donnelly Place should be discussed with the Town. An additional item to note is that there could be a historically sensitive resource in the subject grass area. Further, the property at the eastern end of Donnelly Place appears to have overflow parking accessed directly from Oregon Road.

Previous Comment:

6. It is recommended that the residents of the proposed facility be provided access to Oregon Road westbound with a protected left turn movement at the signalized intersection with Eton Downs Road. The proposed emergency service access driveway to Eton Downs Road could be upgraded to full access. The proposed Site Drive could be used for right turns only from/to Oregon Road eastbound and possibly left turns in from Oregon Road westbound. Consideration for a westbound left turn auxiliary lane on Oregon Road should be evaluated.

Response:

The applicant evaluated this option on page 21 of the traffic study, which is described as the 'Alternative Access Scheme'. The applicant states that the site generated traffic could be accommodated at Eton Downs Road, but it is not recommended because this access could invite cut through traffic from Oregon Road to Eton Downs Road. The applicant analyzed the level of service of the Eton Downs signal to be LOS A, but field observations have shown westbound traffic queues extending back from the signal, which could create the temptation for a cut through.

Thus, we are comparing the potential safety benefit of a protected left turn against the potential safety problems created by a path to avoid a traffic signal.

We are still in favor of providing access to the protected left turn on the Eton Downs Road approach to the signal. We feel that the potential safety benefits associated with providing the protected left outweigh the cut through concern. This is a preference is partially driven by a sensitivity to senior drivers, but also by a philosophy of providing access to protected left turns where possible. The applicant could consider roadway surface treatment measures to discourage cut throughs. Left turns to the site in from Oregon Road westbound could be restricted by a directional channelized island at the entrance that dictated right turns in and out.

Previous Comment:

7. Based on consultation with the Town Planning Office, a 1% traffic growth rate should be utilized.

Response:

- The applicant utilized the specified growth rate.

Additional Comments:

- 1. Traffic Analysis:
- The program analysis printouts indicate phase conflict errors at the Oregon Road & Pump House Road intersection existing condition that appear to invalidate the analysis.
 Specifically, the conflicts with phases 6 with 8. The operation of phase 6 as modeled should be verified with field conditions. The use of split phasing with phase 6 should also be discussed.
- The applicant used the default value for PHF whereas collected counts could be used to determine the actual peak hour factor.
- The consultant treated the existing signal as at Oregon Road & Pump House Road as semi-actuated, which is consistent with our observations of the signal controller but no detection equipment on the sideroads was observed. The Town does not have any records or documents that indicate the signal is semi-actuated. It must be determined if the signal is equipped with functional actuation and the analysis must correspond to the current operation.
- There is a need to address pedestrian access to and through the Oregon Road & Pump House Road intersection. After addressing signal analysis comments stated above, it would be beneficial to ascertain the impacts of adding pedestrian movement phases to the Pump House/Eton Downs signal. It recommended that pedestrians cross Oregon Road before Eton Downs at the signal and then cross Pump House Road to continue on the sidewalk system. A second crosswalk is recommended across Oregon Road on the west side of Pump House Road to access Heady Street.
- 2. Additional Traffic Condition comments:
 - It should be noted that the Arrival/Departure distribution is significantly weighted to the west (80% to Peekskill City direction) based on forecasted destination. The existing Oregon Road traffic volume split is approximately 50-50. Additional justification for this distribution split is required.
- 3. Parking
- The parking ratio proposed is 1.08 parking spaces per unit. We confirmed that this rate exceeds the ITE recommendations for land use codes 221 and 252 (0.75 and 0.61 respectively). The applicant reported that based on observing two weeks of activity at Jacobs Hill Apartments that the Parking Demand Ratio was found to be 0.77 on average and 0.86 at the highest. It would be beneficial to know what the actual parking to unit ratio was at Jacobs Hill Apartments.

If you have any questions or require additional information, feel free to contact our office.

Sincerely,

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Brendan Fitzgerald, P.E. HVEA Engineers

cc: Michael Preziosi, P.E. Michelle Robbins, AICP



TOWN OF CORTLANDT DEPARTMENT OF TECHNICAL SERVICES

Michael Preziosi, P.E. Director - D.O.T.S

Chris Kehoe, AICP Deputy Director – Planning Town Hall, 1 Heady Street Cortlandt Manor, NY 10567 Main #: 914-734-1060 Town Supervisor Linda D. Puglisi

Town Board Richard H. Becker Debra A. Carter James F. Creighton Francis X. Farrell

REVIEW MEMORANDUM

То:	Town of Cortlandt Town Board Town of Cortlandt Planning Board
Cc:	Chris Kehoe, AICP – Deputy Director – Planning, Department of Technical Services Tom Wood, ESQ. – Town Attorney Michael Cunningham, ESQ. – Asst. Town Attorney
From:	Michael Preziosi, P.E. – Director, Department of Technical Services
Date:	July 23, 2021
RE:	PLANNING BOARD CASE 2021-01 "Overlook Terrace – 119 Oregon Road"

The documents listed below were reviewed as part of the Planning Board Application 2021-01 "Overlook Terrace – 119 Oregon Road"

- Expanded Environmental Assessment form prepared by DTS dated June 2021
- "Overlook Terrace" Site Plan Application Drawings prepared by DTS dated revised June 23, 2021
- Storm Water Pollution Prevention Plan, prepared by DTS dated June 2021
- Traffic Impact Study prepared by Provident Design Engineering, dated last revised June 23, 2021

The following comments shall be addressed satisfactorily by the Applicant prior to the Chairperson endorsing the development plan. Please note that many of these items are technical in nature but once addressed shall limit the need for further review during the building permit application by Engineering.

- 1. Demographic notes are missing from the drawings.
- 2. A table of all third party required permits (Army Corp / DEC / DOT / Town / etc....) shall be provided on the revised drawings.

- 3. Consideration should be given to create a landscape buffer between the proposed curb line and sidewalks to soften the hardscape and provide for improved pedestrian accommodations around the building. There is ample space onsite.
- 4. Pedestrian accommodation should be considered along Oregon Road to connect to the existing sidewalk infrastructure. Currently only a walking trail to a proposed bus shelter is shown. Pedestrians may elect to cross Oregon Road to walk to the convenience store / gas station and towards Peekskill. Details for crosswalk, pedestrian accommodations, drop curbs and details of the same should be provided. All work within Oregon Road, shall follow NYSDOT Standards and Specifications.
- 5. The Traffic Impact Study prepared by Provident Design Engineering, dated last revised June 23, 2021 will be reviewed more thoroughly by the Town's traffic consultant HVEA. I offer the following comments:
 - a. While the report concludes no significant adverse traffic impacts are expected for the intersection, the traffic light at the intersection of Eton Down's / Pumphouse / Heady Street and Oregon Road is antiquated and appears to be pre-timed. A general observation of the intersection during the peak hour will demonstrate that due to current geometry of this intersection and lack of turning lanes along Oregon Road, vehicles will backup and queue as far back as Locust Avenue.
 - b. It is recommended that as part of this Application, intersection improvements including but not limited to an updated traffic signal and phasing plan with consideration provided for geometric improvements be considered as a condition of the zoning petition. At minimum recommendations, plans and specifications should be provided which can then be developed into construction documents for a future capital project.
 - c. The report analyzes an alternative access scheme that restricts left turns from the project driveway and re-directs these vehicles to Eton Downs Road. The conclusion of the Applicant's Consultant is this alternative is not recommended. One of the reasons provided is that this connection could promote "cut through" traffic. This could be easily rectified by making this connection "exit" only. Further consideration shall be provided to address the Planning Board's comment.
- 6. The proposed grading plan will require the complete clearing of the entire site in order to accommodate the construction of the proposed facility. The south of the site will be retained by a 10-ft high retaining wall. The rear (southern slope) will be graded 2H:1V. The Applicant is increasing the severity of the slope. A Steep Slope Analysis and Findings Statement was included in the EAF. It shall be revised as follows:
 - a. 1.4 acres of steep slope exist onsite. The following steep slope thresholds shall be used; 15-25%, 25-35%, >35%. A revised written narrative addressing 259-6 shall be prepared in addition to revised drawings. The Applicant must clearly summarize impacted steep slopes vs site wide steep slopes.
 - b. EAF Figure No. I-1 and I-2 identify existing and proposed steep slopes. Based on the proposed grading plan, the applicant is proposing to create approximately .8 acres of steep slopes in excess of 15%.

- c. All slopes greater than 4H:1V shall be stabilized with erosion control matting / blanketing and planted. Plans must delineate areas requiring such stabilization.
- d. Earthwork quantities are missing. Applicant shall evaluate and balance cuts and fills to the maximum extent practical. The geotechnical report indicates the majority of existing fill that was brought onsite is not suitable for structural use.
- e. A 10-ft high retaining wall is proposed. A cross section through the site shall be provided. Additional comments to follow.
- f. Section 259-6 (H) is mostly advisory. Bullet points 11-15 shall be added on the site plan as notes.
- 7. Notes on the site demolition plan shall be revised to reflect the following:
 - a. Applicant shall file a demolition permit with the Department of Technical Services Code Enforcement Division prior to the removal of any structure.
 - b. Prior to any demolition occurring in Town right-of-way (Donnelly Place and the Oval) a road opening permit shall be filed and obtained through the Department of Environmental Services.
 - c. All structures shall be tested for lead, asbestos and other hazardous materials in accordance with the NYS Uniform Fire Prevention and Building Code and NYCRRR by a licensed and certified tester. All hazardous materials shall be properly abated and lawfully disposed of offsite.
 - d. All onsite existing wastewater septic systems shall be abandoned in accordance with the Westchester County Department of Health Guidelines and generally accepted engineering best practice. All material shall be lawfully disposed of off-site.
 - e. All asphalt pavement removed from the site and Donnelly Place right-of-way shall be lawfully disposed of off-site and not mixed with other construction debris.
 - f. All imported fill material shall be unrestricted residential use in accordance with NYSDEC soil objective clean-up requirements. No recycled material shall be used as fill within areas that will be planted, grassed and otherwise stabilized.
 - g. All existing utilities (water services, sanitary, telecommunications, power, etc...) shall be excavated and removed from the site. All existing water services shall be cut and capped as close to the curb stop as reasonably practical. The Town of Cortlandt DES Water Division shall be contacted to inspect said work.
 - h. Applicant shall clarify if blasting is proposed as part of this project. If so, preliminary geotechnical investigations shall be submitted as part of this application and a listing of all properties within 1000-ft of the proposed limits of blasting shall be established. It is recommended that all blasting requirements be included in the approval (including pre and post blast survey), noticing requirements, seismic monitoring and processing of rock. Otherwise general notes related to

blasting shall be removed from the plan set and a note indicating "No blasting, no rock crushing or processing of material is proposed onsite. All debris will be lawfully disposed of off-site.

- 8. The 75-ft wide roadway dedicated to the Town of Cortlandt will revert to the Applicant. This shall be noted in any findings statement and resolutions of approval.
- 9. Applicant shall demonstrate to the satisfaction of the Town Board with consultation by Town Counsel that the all deed restrictions (noted on Filed Map 5001 and as referenced on the Alta Survey) have been released.
- 10. Applicant shall also clarify why portions of the property are restricted from development and noted as "park area".
- 11. Applicant is referred to Chapter 33 of the NYS Building Code, Safeguards During Construction. Requirements shall be incorporated into the submitted plan set.
- 12. The Applicant is referred to 2020 Fire Code of NYS, Chapter 5 Fire Services Features. A swept path analysis for all emergency apparatus shall be provded. The design vehicles are as follows.
 - a. HQ—L- 35 length is 42'2" (506") with a turning radius of 22.9 Degrees. To deploy stabilizer jacks a minimum 16- 18 feet for full deployment and 12' for short-jack deployment;
 - b. E-252 from HQ- Length is 31' 11" (383") with a turning radius of 23.8 degrees; E-256 out of Hollowbrook Station: Length is 32' (384") with a turning radius of 23.5 degrees.
 - c. Plans must adequately demonstrate that an aerial apparatus can setup and meet the required hose pulls.
 - d. Plans shall be revised to include fire lanes and striping details of the same.
- 13. A site wide photometric analysis shall be prepared and submitted for review.

Utility Comments

- 14. As part of this application a water main extension is proposed, looping Oregon Road to Eton Downs through the project site. The existing water main through the site is proposed to be abandoned in place. A water main extension fees shall be provided prior to the approval and endorsement of the plans by the Town of Cortlandt in accordance with the Town's Master Fee schedule. The existing water main shall be removed from the site once the new main is placed into service.
 - a. Since the main will be dedicated to the Town of Cortlandt shop submittals shall be provided to the Town of Cortlandt for review and approval prior to installation for all water mains and appurtenances.

- b. This water main as proposed will be dedicated as public. The Town of Cortlandt will be required to make application to the Westchester County Department of Health. All permitting fees and submittal costs shall be borne by the NRP Group.
- c. Applicant shall coordinate with DES Water in regards to proposed water main tie-in locations. Multiple water mains (existing) are shown in Oregon Road and Eton Downs. It is recommended that mains be connected with a tee, 3-8" MJxMJ resilient wedge gate valves. Plans shall be revised to differentiate existing water main (size and type) versus proposed and existing water main to be demolished.
- d. All water main pipe shall be "Tyton Joint" with push on (rubber gasket) and 2 bronze wedges per joint, class 54 double cement lined ductile iron pipe, class 350 as manufactured by United States Pipe and Foundry Company, made in the U.S.A., or approved equal.
- e. All fittings shall be mechanical joint with retainer glands, cement lined, ductile iron pipe as manufactured by United States Pipe and Foundry Company, made in the U.S.A. or approved equal.
- f. The pipe and fittings shall be cement mortar lined to twice the standard thickness in accordance with ANSI A21.4 (AWWA C104) except as noted. All changes in pipe directions, requiring fittings both vertical and horizontal, shall be secured with retainer glands and thrust blocked with concrete against undisturbed earth.
- g. The mechanical joint restraint system shall incorporate a restraining mechanism in the follower gland, which shall impart a multiple welding action against the pipe. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. Retainer glands shall be "Megalug" as manufactured by Ebaa Iron, Inc., or approved equal.
- h. Gate valves shall be Mueller, iron body, non-rising stem conventional packing, resilient seated, mechanical joint with retainer glands, pressure class 350, opening left (CCW) and operation shall be by 2" square wrench nut.
- i. All drawings shall be revised to indicate size and type of all water main, hydrants and appurtenances.
- j. The water main layout plan shall call out all horizontal bends. Stationing shall be provided in 100ft increments.
- k. A water main profile is required. All vertical bends separation to wastewater sources, etc... shall be shown.
- I. Since this is a new water main, all horizontal and vertical separation distances shall be met unless otherwise justified by the design engineer to be infeasible.
- m. Fire service shall be sized to meet the hydraulic demand of the required fire suppression system. The EAF indicates a flow test was performed on March 9, 2020. Sprinkler design may be deferred until a building permit application is filed.

- n. Corporation Stop shall be Mueller B-2500N (pressure rating 300 psi). Ground key models are preferable.
- o. Curb Valve shall be Mueller Mark II Oirseal (min pressure rating 175 psi) H-15209N, or B-25209N with no drain ports depending on operating pressure of main.
- p. Curb boxes shall be Mueller Model No. H-10314, 4 ½' full extension, or approved equal and Made in the U.S.A. If needed, Stainless Steel extension rods within the curb boxes shall be furnished and installed.
- q. A reduced backflow preventer shall be provided for the potable water supply in accordance with applicable State, County and Local laws.
- r. A reduced backflow preventer shall be provided for proposed irrigation in accordance with applicable State, County and Local laws. It is recommended that irrigation be disconnecting from the public supply and an onsite well be utilized for said purposes.
- s. A double check detector assembly shall be provided for the fire service. Device shall be tamper proof. If a bypass is proposed it shall be metered.
- t. All water services and fire services shall be metered.
- u. Fire hydrants shall be "Mueller" Super Centurion 350, (or approved equal), with safety breakaway flange, 3-way, opening left (CCW). The pumper nozzle shall be 5 1/4"; the two hose nozzles shall be 2 ½". Bodies shall be painted yellow, caps red. Detail shall be revised accordingly.
- v. All utility easements shall be 20-ft minimum. Utilities shall run as close to the centerline as possible. Easement shall be submitted for review and approval prior to the submittal of any plans to the WCDOH. All easements shall be filed with the Westchester County Clerk - Division of Land Records.
- w. Westchester County DOH requirements for testing and disinfection shall be provided on final drawings.
- 15. As part of this application, the subject premises is proposing to connected to the Town's sanitary infrastructure at the intersection of Eton Downs and Oregon Road. The Applicant is advised that the proposed sewer connections from facilities within that are design to carry in excess of 2,500 gallons per day flow requires Departmental of Health approval for its private sewer connection and must be designed in accordance with 10-States Standards.
- 16. Applicant shall provide a detail to connect to the Town's sanitary manhole near Oregon Road. Applicant shall clarify if a drop invert is proposed.
- 17. Sanitary profiles shall be provided. A sanitary main shall be sloped at 2% unless determined to be determined to be infeasible by the design engineer. At minimum the slope of the main shall meet the required minimum scouring velocity published in the 10 States Standard.

- 18. Figure No. G2 shall be revised to provide RIM elevations. Manholes 1-12 shall be opened and visually inspected by the design professional and witnessed by the Town.
- 19. Maximum sanitary flow shall be set at 75% of the pipe diameter. Between manholes 8 and 12 as identified in EAF Figure No. G2 average daily flow and peaking periods will exceed this. In addition due to the shallow slope of the existing main, it is recommended that inflow and infiltration requirements be set at three to one (3:1) offset ratio for non-affordable units and one to one (1:1) for non-affordable units.
- 20. The Engineer shall field verify the actual rims and inverts in which the existing pipe slopes are less than 1%. Information was noted as taken from a partial as-built. There may be discrepancies with actual field conditions.

Landscape Comments

- 21. Demolition and landscape plans do not seem to match the June 4, 2021 report prepared by the Town's Consultant Bartlett Tree Expert. Plans shall be revised to call out all specimen, protected and trees of significance (e.g. White Pine #1240, Silver Maple #1230, American Smoke #1306, Catapla (#1314). Applicant shall comment and provide response related to preserving these trees.
- 22. The total number of trees proposed for removal is still outstanding. The Bartlett Study indicates 598 trees onsite. The plans do not indicate the total number of trees >4-inches proposed for removal.
- 23. Applicant shall comment and provide response on quality of trees and restorative efforts required to be undertaken for all pines along Eton Downs.
- 24. The storm water basins shall be planted in accordance with the NYSDEC Storm Water Design Manual. Trees, shrubs and wetland plants shall be provided for the bio-retention basins, in addition to the proposed grass mixes.
- 25. Slope plantings are noted as typical, but not shown. A minimum number of trees and shrubs shall be provided. The construction sequence plan shall incorporate landscaping in order to ensure installation in a timely and effective manner.
- 26. When determining the actual number of trees required to be replanted, the Planning Board shall consider the following factors:
 - a. Approximately 8 acres are proposed for disturbance. At minimum the total number of trees required to be mitigated is 349 trees. Each protected tree that is to be removed shall be replaced by at least 1 1/2 times the number (rounded up) of the same trees as removed. On slopes of 25% or greater, two trees shall be planted for each tree proposed to be removed.
 - b. Pollinator species, grasses and meadow mixes shall be specified to be seeded, annually for a period of no less than 3-years and be incorporated into an annual monitoring plan. The variety of pollinator species shall meet or exceed those as recommended by the NYSDEC.

- c. All deciduous plantings shall be 3-inch caliper at DBH and all evergreens 6-8 ft in height from finished grade.
- d. The following equivalent ratios may be used in lieu of planting a tree:
 - i. 3:1 Understory trees (minimum 1" caliper)
 - ii. 10:1 Small maturing trees (<4-ft in height) and shrubs (2 gallon minimum)
- e. Every effort shall be made to re-plant the required number of trees onsite. In the event that this quantity cannot be re-planted, off-site mitigation or payment in-lieu may be provided.
- f. The revised reforestation plan will be submitted to the Town's Conservation Advisory Council for final comment.
- g. It is recommended that trees along the perimeter of the property outside along the periphery of the limits of disturbance be preserved if these trees after a risk assessment are determined to be healthy.

Storm Water Comments

Please note, the Town's Consultant (HVEA) will provide additional comments under separate cover.

- 27. A revised Notice of Intent is required in order to obtain coverage under the SPDES General Permit for Construction Activity based upon the response to comment letter(s).
- 28. Applicant is advised that controls will need to be modified to accommodate corrections made to the site plan in response to this comment letter.
- 29. The SWPPP shall be revised to meet all requirements of the NYS Storm Water Design Manual. The project shall be classified as redevelopment (NYSDEC SWDM Ch. 9). Approximately 8 acres is proposed for disturbance with 2.5 acres proposed as impervious. This is an increase from pre-existing conditions by approximately 0.2 acres.
- 30. New impervious surfaces shall be sized in accordance with Chapter 4 of the SWDM. Redevelopment shall meet the sizing criteria outline in Chapter 9.3 of the SWDM.
- 31. The SWPPP must clearly demonstrate the post development peak flow rate(s) and velocities have not increased from the pre-developed condition. There is extensive re-grading shown which will alter the surface hydrology, including importation of fill material.
- 32. Underdrains, curtain drains and similar subsurface conveyance shall drain to daylight and not to any water quality structures or storm water best management practices. The amount of flow is unknown and may lead to these devices not functioning as intended hampering detention and water quality treatment. The plans indicate multiple overland channels and graded swales that will re-direct runoff from the rear of the property to the Town's infrastructure in Oregon Road and Donnelly Place.

- 33. The SWPPP proposes to meet water quality controls with a bio-retention basin and extended detention pond. Discharge from the site is being routed towards existing Town infrastructure at Donnelly Place. The SWPPP does not evaluate the existing Town infrastructure (downstream) nor comments on its suitability to effectively convey storm water runoff from this site. Typically, storm catch basins and infrastructure located within a right-of-way is constructed to capture and convey runoff from the roadway and shoulders to a storm water outfall.
- 34. The SWPPP should consider practices that infiltrate runoff reduction volumes and water quality volumes in order to recharge the aquifer. Consideration for off-site discharge may be provided if there is no other feasible alternative. It is unclear if subsurface investigations were performed in the area of the proposed best management practices. The geo-technical report does indicate that the site is influenced by ground water at an average depth of 10-ft. Infiltration practices may be possible.
- 35. The bio-retention and extended detention basin, details shall be revised to include proposed plant material.
- 36. The applicant shall request a 5-acre waiver as they are proposing to disturb a total of 8 acres. Typically it is recommended that soil disturbance be kept at less than 5 acres at any one time.
- 37. A construction sequencing plan shall include various stages of construction (e.g., clearing, erosion controls, access road construction, staging, installation, restoration, plantings, and pollinator soil stabilization). All employee parking and material storage shall be revised to limit unnecessary tree removal and disturbance to steep slopes.
- 38. Site maintenance and good housekeeping protocol shall include fugitive dust control and watering requirements.
- 39. The SWPPP shall include copies of maintenance easements during and after construction in accordance with Town Code Chapter 262-9.
- 40. Recycled material is not recommended for onsite use. Only earthen material or natural stone is permitted to be used as fill. If recycled material is proposed, it must be noted on the plans and its intended use confirmed to be consistent with NYSDEC's beneficial use determinations.
- 41. Applicant shall clarify how much fill is proposed to be brought to the site. All fill shall be tested in accordance with NYSDEC rules and regulations and shall be certified as unrestricted for residential use, certified by a professional engineer prior to importation on site.

Detail Comments

- 42. A significant number of details are missing. These include but are not limited to a dumpster enclosure, emergency access gate with knox box, site amenities, foundations (e.g. light poles), bollards, site signage, wayfinding, pedestal or free standing signs for the facility name etc....
- 43. Station the proposed roadway and provide a centerline profile in intervals not to exceed 50-ft.

- 44. Sidewalk details shall be revised to demonstrate a maximum cross slope of 1.5%. It is recommended curb ramp details have a maximum slope of 1:13.
- 45. Storm frames and grates shall be pedestrian safe along curbs, parking lots and walkways. Any public infrastructure shall be manufactured domestically.
- 46. All trench details shall be revised to provide magnetic tracer tape, specific to the pipe type. If bury depth is greater than 6-ft multiple layers shall be provided no greater than 2-ft from finished grade and no closer than 2-ft to the pipe.
- 47. Sanitary sewer manhole shall be revised to include boot seal (e.g. Kor N-Seal), bitumastic coating. Manhole diameter shall be 36" minimum. There are conflicting details presented on the site detail sheets SP 6.1 and SP 6.4.
- 48. The Redi Rock retaining wall details shall be noted as a deferred design. Based on the geotechnical assessment existing fill is not sufficient and structural fill is proposed. Excess material will be lawfully disposed of off-site or used onsite based on the soil properties.
 - a. A final detail and cross section at maximum retained height shall be provided.
 - b. Computations demonstrating that all factors of safety for sliding, overturning and settlement shall be submitted along with an engineer's certification stating such prior to final approval.
 - c. Engineer shall comment if a global stability analysis is warranted due to the proposed wall height and 2H:1V soil backfill and its imposed surcharges.
 - d. A cross section (N/S) of the site from Eaton Downs though the building shall be submitted with the analysis.

Revised plans will be forwarded to the Town's Department of Environmental Services, Fire Advisory Board and Conservation Advisory Council for review and comment. Be advised that additional comments may arise during the review of the construction documents for the building permit.

Signed this 23rd Day of July 2021 by

Michael Presion, P.E.

Michael Preziosi, P.E. Director - Dept. of Technical Services

CC: Myles Monaghan, NRP Group Jerry Schwalbe, P.E., DTS DOTS – Director of Code Enforcement DES Director



Michael Preziosi, P.E. Director – D.O.T.S

Chris Kehoe, AICP Deputy Director – Planning

Planning Staff Michelle Robbins, AICP Rosemary Boyle-Lasher TOWN OF CORTLANDT DEPARTMENT OF TECHNICAL SERVICES PLANNING DIVISION

> Town Hall, 1 Heady Street Cortlandt Manor, NY 10567 Main #: 914-734-1080

Town Supervisor Linda D. Puglisi

Town Board Richard Becker Debra A. Carter James F. Creighton Francis X. Farrell

MEMORANDUM

- TO: Planning Board Members
- FROM: Chris Kehoe, AICP, Deputy Director C^{1/L} Department of Technical Services, Planning Division
- SUBJECT: PB 2021-1 Application of <u>NRP Properties</u>, <u>LLC</u> for Site Development Plan approval, a Special Permit and for Tree Removal and Steep Slope Permits for a proposed 135unit active adult residential community to be located on an approximately 8.7-acre parcel of property at 119 Oregon Road. Drawings latest revised dated June 23, 2021.
- DATE: July 28, 2021
- 1. The Planning Division conducted a review of the subject application consisting of the following:

A 16-page set of drawings entitled "Site Plan Application Drawings, Overlook Terrace" prepared by Divney, Tung & Schwalbe, LLP latest revision dated June 23, 2021.

Expanded Environmental Assessment Form dated June 2021.

- 2. Based on a review of the above-mentioned drawing and expanded EAF application, the following information as required by Chapter 307-71 of the Town of Cortlandt (Zoning) and other regulations should be submitted for the subject application unless waived by the Planning Board at the applicant's request.
 - a. The subject drawing (SP-1) shows the proposed location and height of the proposed parking lot light fixtures and proposed wall mounted fixtures. Drawing SP 6.5 shows the proposed lighting details. It is suggested that the applicant analyze the use of a more traditional/historic looking light fixture. A photometric plan is also required.

(continued on page 2)

- b. The subject drawing should be revised to show a garbage enclosure with sufficient space for garbage and recycling. The applicant is advised the Town will not provide garbage/recycling pick-up to the site and a note confirming the same shall be added to the subject site plan.
- c. The subject drawing shall show the existing and proposed location, height and design of all fences. Drawing SP 6.2 shows a detail of the proposed retaining wall at the rear of the proposed building which varies from 8' to 10' in height. The applicant shall submit additional details/renderings showing proposed colors and treatment of the wall.
- d. The subject drawing shall show the location, height and design of all existing and proposed signs.
- e. A complete set of elevation drawings, with the proposed color and materials, shall be submitted for referral to the Town's Architectural Advisory Council (AAC) for their review and comment. The submitted information has already been provided to the AAC for their preliminary review.
- 3. The applicant is proposing a 135-unit active adult residential community at the site of the Colonial Terrace catering facility. The facility is proposed to have 96 one-bedroom and 39 two-bedroom units. The building is proposed to be approximately 125,000 sq. ft. All units are proposed to be affordable. The subject property is approximately 8.7 acres in size and is zoned CC, community commercial. The proposed facility is not permitted by the existing CC zoning and the applicant has proposed a zoning amendment to permit an active adult residential community in a CC zone pursuant to a Special Permit issued by the Town Board. The language of the proposed special permit requires that for a parcel to be eligible for the proposed Active Adult Residential Community Special Permit the parcel must be at least 8 acres in size, front on and has a primary access on a state road or on Oregon Rd., which will connect to public water and sewer systems and have a maximum building footprint of 135,000 sq. ft. The maximum density is proposed to be 17 units per acre.

The Town Board is Lead Agent for the project and has held a public hearing on the proposed zoning text amendment at their July 21st meeting at which time they closed the public hearing with the intent of adopting a Negative Declaration for the proposed zoning text amendment and adopting the amendment at their August 10th meeting. The Planning Board is responsible for the review of the proposed site plan and all environmental permits. The Planning Board has already reviewed the proposed zoning text amendments and provided comments back to the Town Board in a memo dated April 7, 2021.

4. The applicant shall clarify for the Planning Board if they intend to work with Westchester County to ensure the proposed affordable units meet the Westchester County Planning Department's definition of affordable.

(continued on page 3)

- 5. The proposed site plan calls for the demolition of the existing building on site and the construction of a 3-story, 125,000 sq. ft. building. The main access to the facility will still be from Oregon Road. A second egress, gated and for emergency use only, is proposed to Eton Downs Rd. The building will have two courtyards located at the rear of the building. The site will have 146 proposed parking spaces located in the front of the proposed facility and on both sides. A service road will continue around the entire facility.
- 6. The applicant has completed a traffic study done by Provident Engineering dated June 23, 2021. The study is included in the Expanded EAF. The study has been sent to the Town's traffic consultant, HVEA for their review and comment. The subject site plan shows parking for 146 spaces, a ratio of 1.08 spaces per unit. The applicant analyzed parking at Jacobs Hill for a two-week period and found an average parking demand of .77 and a peak parking demand of .86. It is recommended the applicant provide to the Planning Board an analysis of the parking at the Springvale Apartment Complex for further comparison.

The applicant is proposing to enhance the existing Westchester County Bee-Line bus stop(s) located on Oregon Rd. The applicant shall provide correspondence from the Westchester County Department of Transportation regarding the proposed enhancements.

7. Trees on the subject property were inventoried and a report dated June 4, 2021 was submitted by Town consulting arborist, Bartlett Tree Experts. The report was previously transmitted to the Planning Board on June 21, 2021. The report did find three (3) protected trees and several specimen trees as per Chapter 283 (Trees) of the Town Code. The report specifically mentions tree #1306 (American Smoke Tree) #1314 (Catalpa) as significant trees. Both are slated for removal. In addition, the site, in its current condition, is home to several large trees, both deciduous and evergreen which help define the "historic" character of the site, specifically the very large trees that line the main entrance way into the property from Oregon Rd. According to the tree report there are 598 regulated trees on the subject site. A proposed landscape plan SP-4 has been submitted showing 53 Shade Trees, 20 Evergreen Trees and 35 Ornamental Trees to be planted. In addition, plantings are proposed for the building foundation, stormwater basins and areas of slopes. Trees to be preserved and trees to be removed shall be noted on the landscape plan and calculated. The subject drawing shows shade trees of 2-1/2" caliper to be planted along the entrance drive from Oregon Rd. It is recommended that larger caliper trees be planted along this entranceway given the existing allee of trees that exist on the site now and are slated for removal.

A re-planting plan that meets Chapter 283 (Trees) is required to be submitted. The revised landscape plan shall be referred to the Town's Conservation Advisory Council (CAC) for their review and comment.

8. As per section 307-22 of the Zoning Code parking areas with parking for 30 or more cars require landscaped areas comprised of a minimum of 5% of the total area within the perimeter of the parking area. The subject drawing shall be revised to show the required landscaping.

(continued on page 4)

- 9. The Expanded EAF contains a Fiscal Analysis of the existing facility (Colonial Terrace) and the proposed facility showing existing and estimated tax generation. This analysis has been referred to the Town Assessor for review and comment.
- 10. Section 265-11 (Subdivision) of the Town Code requires the reservation of land suitable for playgrounds or other recreational facilities <u>or</u> the deposit of moneys, currently \$6,000/unit, shall be deposited into a recreation fund in-lieu of such reservation of land. The applicant shall provide information to the Planning Board on how they intend to meet these requirements.
- 11. Appendix 1 of the Expanded Environmental Assessment Form provides a sustainability narrative for the proposed project. The applicant is proposing to seek LEED Homes v4 certification for the project. Green initiatives include solar PV systems on the roof to offset electricity purchase from the grid, electric heat pump technology for domestic hot water, low flow fixtures and the use of environmentally preferred products with field verification and testing as per LEED protocols. The applicant shall confirm whether any of the solar power produced by the proposed panels will be put back into the grid or will only be used by the facility.
- 12. The subject proposal will impact approximately 1.4 acres of regulated steep slope. The applicant submitted the required Steep Slope analysis as per Chapter 259-6 of the Town Code. The applicant shall submit the required colored steep slope drawing showing areas of steep slope 15% to 25%, 25% to 30% and greater than 30%.
- 13. The applicant has referred the proposed project to the NYS Office of Parks, Recreation and Historic Preservation Office (OPRHP) for review and comment. OPRHP responded by a letter dated April 14, 2021 (included in the Expanded EAF) that stated "It is the opinion of the OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Register of Historic Places will be impacted by this project". The Town's Historic Resources Advisory Council (HRAC) has indicated an interest in working with the applicant to create a "history wall" in the new facility to commemorate the history of the Colonial Terrace, similar to what was done at the Hollowbrook Golf Club. The applicant shall provide additional information to the Planning Board on their progress at preserving items from Colonial Terrace and their plans for a display.
- 14. The applicant has submitted a Stormwater Pollution Prevention Plan (SWPPP) for review by the Town Engineering Division and the Town's Environmental Consultant, HVEA Engineering.

(continued on page 5)

- 15. Enclosed is an aerial view(s) of the subject site. The subject drawing set was previously given to the Planning Board.
- 16. Referrals of this application include, the Town Engineering Division, the Fire Advisory Board, the Conservation Advisory Council, the Town Department of Environmental Services, the Town Assessor, the Code Enforcement Division, and Westchester County as well as all interested and involved agencies.

CRK/crk Attachments

cc: Linda D. Puglisi, Town Supervisor Members of the Town Board Michael Preziosi, P.E., Director of Technical Services Thomas Wood, Esq., Town Attorney Michael Cunningham, Esq., Deputy Town Attorney Gerhard Schwalbe, P.E., Divney, Tung & Schwalbe David Steinmetz, Esq. NRP Group, LLC



ATTACHMENT B

CONCEPT PLANS





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Pedestrian Crosswalk Cortlandt, Westchester County, NY Project No. 21-022 August 2021 Scale As Shown

Figure No. CP-1



Provident design engineering

7 SKYLINE DRIVE, HAWTHORNE, NEW YORK 10532 TEL: (914) 592-4040 WWW.PDERESULTS.COM

© PROVIDENT DESIGN ENGINEERING, PLLC

New Traffic Signal

Cortlandt, Westchester County, NY

Project No. 21-022 August 2021 Scale As Shown

Figure No. CP-2





7 SKYLINE DRIVE, HAWTHORNE, NEW YORK 10532 TEL: (914) 592-4040 WWW.PDERESULTS.COM

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Left Turn Lane Concept

Cortlandt, Westchester County, NY

Project No. 21-022 August 2021 Scale As Shown

Figure No. CP-3

ATTACHMENT C

LEVEL OF SERVICE TABLES

				TABLE C-1							
PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE											
Oregon Road & Clara Rd/Smith Rd											
			PEAK AM HOUR			PEAK PM HOUR					
APPROACH		2021	2024	2024	2021	2024	2024				
		EXISTING	NO-BUILD BUILD		EXISTING	NO-BUILD	BUILD				
		LOS DELAY (sec)									
Clara Ct											
NB	LTR	с 16.5	с 16.9	с 17.3	с 19.1	с 19.8	с 20.8				
Smith Rd											
SB	LTR	b 14.4	b 14.9	с 15.4	с 16.4	с 16.8	с 17.8				
Oregon Ro	Oregon Road										
EB	LTR	a 8.2	a 8.2	a 8.3	a 8.4	a 8.4	a 8.6				
WB	LTR	a 8.1	a 8.1	a 8.1	a 8.5	a 8.6	a 8.6				

	TABLE C-2												
	PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE												
	Oregon Rd & Pump House Rd / Heady St / Eton Downs												
				PEAK	AM HOUR					PEAK	PM HOUR		
	ľ	2021	2024	2024	2021	2024	2024	2021	2024	2024	2021	2024	2024
APPROACH		EXISTING	NO-BUILD	BUILD	BUILD WITH IMPROVEMENTS 1 (Pedestrian Crossing)	BUILD WITH IMPROVEMENTS 2 (New Traffic Signal)	BUILD WITH IMPROVEMENTS 3 (New Traffic Signal + Left-Turn Lane)	EXISTING	NO-BUILD	BUILD	BUILD WITH IMPROVEMENTS 1 (Pedestrian Crossing)	BUILD WITH IMPROVEMENTS 2 (New Traffic Signal)	BUILD WITH IMPROVEMENTS 3 (New Traffic Signal + Left-Turn Lane)
		LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS
II		DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)
Heady Str	reet	D	P	D	D	D	P	P	D	D		D	D
NB	LTR	D 38.3	D 38.7	D 39.4	D 39.4	D 42.7	D 47.2	D 40.0	D 40.1	D 41.5	D 41.5	D 43.6	D 48.7
Eton Dow	ns						. <u> </u>			· · ·	· · ·	• • • •	
NWB	LTR	A 0.3	A 0.4	A 0.6	A	A 0.8	A 0.6	A 1.5	A	A	A 3.1	A 3.4	A 0.9
Pump Ho	use Road	0.3	0.4	0.6	0.6	0.8	0.6	1.5	1.5	3.1	3.1	3.4	0.9
SB	LTR	D 41.0	D 41.1	D 44.2	D 44.2	D 44.8	D 51.4	D 43.2	D 43.4	D 47.4	D 47.4	D 50.4	E 58.5
Oregon R	oad												
EB	LTR	B 16.9	B 17.1	B 17.9	B 17.9	B 17.8	B 18.2	C 21.4	C 21.9	C 23.7	C 23.7	C 22.5	C 24.6
	L	N/A	N/A	N/A	N/A	N/A	B 13.6	N/A	N/A	N/A	N/A	N/A	B 14.4
WB	(L)TR	B 18.2	B 18.6	B 19.7	B 19.7	B 19.4	B 17.0	C 23.8	C 24.6	C 26.9	C 26.9	C 25.2	C 20.8
	OUTDALL	B	B	B	B	В	B	C	C 24.0	C 20.5	C	C	20.0 C
	OVERALL	18.2	18.6	19.7	19.7	19.4	16.9	23.8	24.6	26.9	26.9	25.2	20.6
INTER	SECTION	B 18.6	B 18.9	B 19.6	B 19.6	B 19.6	B 18.9	C 23.6	C 24.3	C 26.2	C 26.3	C 25.3	С 24.7

				TABLE C-3									
PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE													
Oregon Road & Healthcare Driveway													
			PEAK AM HOUR		PEAK PM HOUR								
APPROACH		2021	2024	2024	2021	2024	2024						
		EXISTING	NO-BUILD	BUILD	EXISTING	NO-BUILD	BUILD						
		LOS DELAY (sec)											
Healthcar	e Driveway												
SB	LR	b 13.6	b 13.8	b 13.9	с 19.4	с 20.1	с 20.7						
Oregon R	oad												
EB	LT	LT a a 8.3 8.3		a 8.3	a 8.5	a 8.6	a 8.6						
WB	B TR a a a 0.0		a 0.0	a 0.0	a 0.0	a 0.0							
TABLE C-4													
---	--	-------------	-------------	-------------	-------------	-------------	-------------	--	--	--	--	--	--
	PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE												
Oregon Road & Gallows Hill Rd/Donnelly Pl													
	PEAK AM HOUR PEAK PM HOUR												
		2021	2024	2024	2021	2024	2024						
APP	ROACH	EXISTING	NO-BUILD	BUILD	EXISTING	NO-BUILD	BUILD						
		LOS	LOS	LOS	LOS	LOS	LOS						
		DELAY (sec)											
Donnelly I	PI												
NB	LTR	b	b	b	d	d	d						
ND	LIK	14.2	14.6	14.9	28.3	29.7	30.9						
Gallows H	Iill Rd												
SB	LTR	f	f	f	f	f	f						
56	LIK	53.7	64.8	72.3	198.1	241.7	265.0						
Oregon R	oad												
EB	LTR	а	а	а	а	а	а						
ED		8.4	8.4	8.4	9.5	9.6	9.7						
WB	LTR	а	а	а	а	а	а						
W D	LIK	8.0	8.0	8.0	8.5	8.6	8.6						

				TABLE C-5									
	PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE												
Oregon Rd & Locust Ave													
PEAK AM HOUR PEAK PM HOUR													
		2021	2024	2024	2021	2024	2024						
APP	ROACH	EXISTING	NO-BUILD	BUILD	EXISTING	NO-BUILD	BUILD						
		LOS	LOS	LOS	LOS	LOS	LOS						
		DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)	DELAY (sec)						
Locust Av	ve .												
NB	LTR	С	С	С	С	D	D						
T UD	LIK	27.8	28.0	27.9	34.3	35.1	35.5						
Oregon R	oad												
EB	LTR	В	В	В	В	С	С						
ED	2110	13.0	13.4	13.4	19.9	21.3	22.0						
	L	А	А	А	А	В	В						
		6.9	7.1	7.1	9.9	10.5	10.8						
WB	TR	А	А	А	A	А	А						
		6.1	6.2	6.2	7.4	7.6	7.7						
	OVERALL	A	A	A	A	Α	А						
		6.2	6.3	6.3	7.7	7.9	8.0						
INTER	SECTION	В	В	В	В	В	В						
		12.4	12.6	12.6	17.2	18.1	18.4						

		Oreg	on Dood & Site Driver		PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE												
		Oregon Road & Site Driveway															
		PEAK AM HOUR			PEAK PM HOUR												
Ē	2021	2024	2024	2021	2024	2024											
АСН	EXISTING	NO-BUILD	BUILD	EXISTING	NO-BUILD	BUILD											
	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)	LOS DELAY (sec)											
y																	
I R	-	-	b	-	-	b											
LK	-	-	10.9	-	-	13.2											
TR	-	-	а	-	-	а											
	-	-	0.0	-	-	0.0											
LT	-	-	a 8 2	-	-	a 9.1											
y	LR TR	ACH EXISTING LOS DELAY (sec) LR -	ACH EXISTING NO-BUILD LOS LOS DELAY (sec) DELAY (sec) LR	ACHEXISTINGNO-BUILDBUILDLOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LR $ b$ 10.9TR $ a$ 0.0	ACHEXISTINGNO-BUILDBUILDEXISTINGLOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LR $ -$ TR $ -$ LT $ -$	ACHEXISTINGNO-BUILDBUILDEXISTINGNO-BUILDLOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LOS DELAY (sec)LR $-$ $ -$ $ -$ $ -$ $-$ TR $-$ $ -$ $ -$ $ -$ $-$ LT $ -$ $ -$ $ -$ 											

ATTACHMENT D

CAPACITY ANALYSIS WORKSHEETS

Lanes, V	'olumes, Timings	
1: Heady	v Street/Pump House Road & Eton Downs & Oregon F	₹oad

-	•	-	7	\mathbf{F}	۶.	4	+	*	1	Ť	1	۴
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			\$		
Traffic Volume (vph)	2	332	17	19	7	6	365	55	4	1	4	1
Future Volume (vph)	2	332	17	19	7	6	365	55	4	1	4	1
Ideal Flow (vphpl) 1	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987					0.983			0.932		
Flt Protected							0.999			0.980		
Satd. Flow (prot)	0	1839	0	0	0	0	1829	0	0	1701	0	0
Flt Permitted		0.999					0.986					
Satd. Flow (perm)	0	1837	0	0	0	0	1805	0	0	1736	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	346	18	20	7	6	380	57	4	1	4	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	386	0	0	0	0	450	0	0	10	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		- ingini
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
		CI+Ex			Cl+Ex	CI+Ex	CI+Ex			CI+Ex		
Detector 1 Channel		-			-		-					
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					CI+Ex			CI+Ex		
Detector 2 Channel		0 . 1 .					0 . 1 .			••• =••		
Detector 2 Extend (s)		0.0					0.0			0.0		
()	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2	_			6	6	6		3	Ŭ		
Detector Phase	2	2			6	6	6		3	3		
Switch Phase	_	_			Ű.	Ű.	Ŭ.		Ű	Ŭ.		
	40.0	40.0			40.0	40.0	40.0		5.0	5.0		

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L.	Ŧ	1	F	*	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	-	-	4	-		M			
Traffic Volume (vph)	50	1	3	2	1	23	3	10	
Future Volume (vph)	50	1	3	2	1	23	3	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.995	1.00	1.00	0.954	1.00	1.00	
Flt Protected			0.956			0.968			
Satd. Flow (prot)	0	0	1772	0	0	1720	0	0	
Flt Permitted	0	U	0.737	U	U	0.968	U	U	
Satd. Flow (perm)	0	0	1366	0	0	1720	0	0	
Right Turn on Red	0	U	1000	Yes	U	1120	U	Yes	
Satd. Flow (RTOR)			1	100		108		100	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	52	1	3	2	0.50	24	3	10	
Shared Lane Traffic (%)	52	1	5	2	1	24	5	10	
Lane Group Flow (vph)	0	0	58	0	0	38	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Leit	Leit	0	rugitt	Leit	12	Night	rtight	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	1.00	60	1.00	9	60	60	60	60	
Number of Detectors	13	1	2	3	1	1	00	00	
Detector Template	Left	Left	Z Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	20	20	001		20	20			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex			
Detector 1 Channel	UTEX								
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)	0.0	0.0	0.0 94		0.0	0.0			
			94 6						
Detector 2 Size(ft)			o Cl+Ex						
Detector 2 Type Detector 2 Channel									
			0.0						
Detector 2 Extend (s)	Perm	Perm	NA		Dorm	Perm			
Turn Type Protected Phases	Feini	Feili	NA 4		Perm	Feilli			
Protected Phases Permitted Phases	4	Α	4		7	7			
Detector Phase	4	4	4		7 7	7 7			
	4	4	4		1	1			
Switch Phase	E 0	50	50		20	20			
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0			

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM BH

Lanes, Volumes, Timings 1: Heady Street/Pump House Road & Eton Downs & Oregon Road 08/13/202									12/2021			
1: Heady Street/Pl		lse Ro	ad & E	ton D	owns a	s Oreg				•	08/	
	٦	-	\neg	\rightarrow		-	-	•	1	T	1	۴ ۱
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag									Lead	Lead		
Lead-Lag Optimize?									Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			Max	Max	Max		None	None		
Walk Time (s)	7.0	7.0			7.0	7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0			0	0	0		0	0		
Act Effct Green (s)	U	40.6			U	0	40.6		U	6.1		
Actuated g/C Ratio		0.49					0.49			0.07		
v/c Ratio		0.49					0.49			0.07		
		17.4					18.8			39.0		
Control Delay												
Queue Delay		0.0					0.0			0.0		
Total Delay		17.4					18.8			39.0		
LOS		B					B			D		
Approach Delay		17.4					18.8			39.0		
Approach LOS	40.0	B			40.0	40.0	B		7.0	D		
90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.2	7.2		
90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		
70th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
70th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
50th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
30th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
30th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
10th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
10th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
Stops (vph)		234					288			12		
Fuel Used(gal)		4					4			0		
CO Emissions (g/hr)		287					292			11		
NOx Emissions (g/hr)		56					57			2		
VOC Emissions (g/hr)		67					68			3		
Dilemma Vehicles (#)		0					0			0		
Queue Length 50th (ft)		121					149			4		
Queue Length 95th (ft)		266					323			22		
Internal Link Dist (ft)		438					196			85		
Turn Bay Length (ft)												
Base Capacity (vph)		905					889			513		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.43					0.51			0.02		

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM

Lanes, Volumes, Tim	ings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

	1	L,	ŧ	~	£	*	•	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%			
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0			
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0			
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0			
Lost Time Adjust (s)			0.0			0.0			
Total Lost Time (s)			5.0			5.0			
Lead/Lag	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Recall Mode	None	None	None		Max	Max			
Walk Time (s)	7.0	7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)	0	0	0		0	0			
Act Effct Green (s)	U	U	8.8		U	18.3			
Actuated g/C Ratio			0.11			0.22			
v/c Ratio			0.40			0.08			
Control Delay			43.9			0.00			
Queue Delay			0.0			0.0			
Total Delay			43.9			0.0			
LOS			-5.5 D			0.5 A			
Approach Delay			43.9			0.3			
Approach LOS						0.5 A			
90th %ile Green (s)	13.1	13.1	13.1		18.0	18.0			
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
70th %ile Green (s)	10.0	10.0	10.0		18.0	18.0			
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
50th %ile Green (s)	8.7	8.7	8.7		18.0	18.0			
50th %ile Term Code	Gap		Gap		MaxR	MaxR			
30th %ile Green (s)	- Gaρ 7.4	Gap 7.4	θαρ 7.4		18.0	18.0			
30th %ile Term Code	Gap				MaxR	MaxR			
10th %ile Green (s)	0.0	Gap 0.0	Gap 0.0		18.0	18.0			
()	Skip	Skip	Skip			MaxR			
10th %ile Term Code	Зкір	Зкір	Зкір 49		MaxR				
Stops (vph)						0			
Fuel Used(gal)			1			0			
CO Emissions (g/hr)			63 12			5 1			
NOx Emissions (g/hr)						1			
VOC Emissions (g/hr)			15			1			
Dilemma Vehicles (#)			0			0			
Queue Length 50th (ft)			28			0			
Queue Length 95th (ft)			72			0			
Internal Link Dist (ft)			227			150			
Turn Bay Length (ft)			000			107			
Base Capacity (vph)			320			465			
Starvation Cap Reductn			0			0			
Spillback Cap Reductn			0			0			
Storage Cap Reductn			0			0			
Reduced v/c Ratio			0.18			0.08			

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM BH

Intersection Summary							
Area Type: Other							
Cycle Length: 121							
Actuated Cycle Length: 82.3							
Natural Cycle: 125							
Control Type: Semi Act-Uncoord							
Maximum v/c Ratio: 0.51							
Intersection Signal Delay: 19.3	Intersection LOS: B						
Intersection Capacity Utilization 55.4%	ICU Level of Service B						
Analysis Period (min) 15							
90th %ile Actuated Cycle: 98.3							
70th %ile Actuated Cycle: 83							
50th %ile Actuated Cycle: 81.7							
30th %ile Actuated Cycle: 80.4							
10th %ile Actuated Cycle: 68							

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	d ø3	Ø4	* Ø7
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

	-	\mathbf{r}	4	+	1	1				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	¢Î		٢	↑	¥					
Traffic Volume (veh/h)	384	141	32	360	116	20				
Future Volume (veh/h)	384	141	32	360	116	20				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)	Ű	1.00	1.00	Ű	1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No	No					
Lanes Open During Work Zon										
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	409	150	34	383	123	21				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence		-	No	-	No	-				
Cap, veh/h	717	263	502	1221	309	53				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.55	0.55	0.06	0.65	0.21	0.21				
Unsig. Movement Delay	0.00	0.00	0.00	0.00	0.21	0.21				
Ln Grp Delay, s/veh	0.0	13.0	6.9	6.1	27.8	0.0				
Ln Grp LOS	A	B	A	A	C	A				
Approach Vol, veh/h	559	2		417	145					
Approach Delay, s/veh	13.0			6.2	27.8					
Approach LOS	B			A	C					
	2		•			_	•	_	•	
Timer:		1	2	3	4	5	6	7	8	
Assigned Phs			2	3	4				8	
Case No			12.0	1.2	8.0				4.0	
Phs Duration (G+Y+Rc), s			20.0	7.4	44.6				52.0	
Change Period (Y+Rc), s			5.0	3.0	5.0				5.0	
Max Green (Gmax), s			15.0	9.0	35.0				47.0	
Max Allow Headway (MAH), s	i		3.8	3.8	5.3				5.2	
Max Q Clear (g_c+l1), s			7.1	2.5	16.8				8.4	
Green Ext Time (g_e), s			0.2	0.0	3.6				2.6	
Prob of Phs Call (p_c)			1.00	0.49	1.00				1.00	
Prob of Max Out (p_x)			0.00	0.02	0.00				0.00	
Left-Turn Movement Data										
Assigned Mvmt			5	3	7					
Mvmt Sat Flow, veh/h			1485	1781	0					
Through Movement Data			1100		Ŭ					
			0		A				0	
Assigned Mvmt			2		4				8	
Mvmt Sat Flow, veh/h			12		1305				1870	
Right-Turn Movement Data										
Assigned Mvmt			12		14				18	
Mvmt Sat Flow, veh/h			254		479				0	
Left Lane Group Data										
Assigned Mvmt		0	5	3	7	0	0	0	0	
Lane Assignment			L+T+RL ((Pr/Pm)						

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	145	34	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1750	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	5.1	0.5	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	5.1	0.5	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	850	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	41.6	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	39.6	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.85	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	365	502	0	0	0	0	0	
V/C Ratio (X)	0.00	0.40	0.07	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	365	615	0.00	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	24.6	6.8	0.00	0.00	0.00	0.0	0.00	
Incr Delay (d2), s/veh	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	27.8	6.9	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	27.0	0.5	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.0	2.4	0.2	0.0	0.00	0.00	0.0	0.00	
%ile Storage Ratio (RQ%)	0.00	0.15	0.2	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.13	0.00	0.00	0.00	0.00	0.0	0.00	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	383	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
, , , , , , , , , , , , , , , , ,	0.0	0.0	5.0	5.0	5.0	5.0	5.0	J.L	

Scenario 1 Existing AM 7:30 am 05/19/2021 Existing AM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	
Initial Q (Qb), veh	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data		- 10						- 10	
Assigned Mvmt	0	12	0	14	0	0	0	18	
Lane Assignment	<u>^</u>	^	^	T+R	^	^	^	<u>^</u>	
Lanes in Grp	0	0	0	1	0	0	0	0	
Grp Vol (v), veh/h	0	0	0	559	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	0	0	1784	0	0	0	0	
Q Serve Time (g_s), s	0.0	0.0	0.0	14.8	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	14.8	0.0	0.0	0.0	0.0	
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.14	0.00	0.27	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	0	0	980	0	0	0	0	
V/C Ratio (X)	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	0	0	980	0	0	0	0	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/In	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/In	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary									
HCM 6th Ctrl Delay		12.4							
HCM 6th LOS		н <u>г</u> .4							
		2							

Notes

User approved volume balancing among the lanes for turning movement.

1

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		\$			\$			÷			÷		
Traffic Vol, veh/h	8	331	1	1	356	2	7	1	2	14	1	18	
Future Vol, veh/h	8	331	1	1	356	2	7	1	2	14	1	18	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	9	376	1	1	405	2	8	1	2	16	1	20	

Major/Minor I	Major1		Ν	Major2			Minor1			Minor2			
Conflicting Flow All	407	0	0	377	0	0	814	804	377	804	803	406	
Stage 1	-	-	-	-	-	-	395	395	-	408	408	-	
Stage 2	-	-	-	-	-	-	419	409	-	396	395	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1152	-	-	1181	-	-	297	316	670	301	317	645	
Stage 1	-	-	-	-	-	-	630	605	-	620	597	-	
Stage 2	-	-	-	-	-	-	612	596	-	629	605	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1152	-	-	1181	-	-	285	313	670	297	314	645	
Mov Cap-2 Maneuver	-	-	-	-	-	-	285	313	-	297	314	-	
Stage 1	-	-	-	-	-	-	624	599	-	614	596	-	
Stage 2	-	-	-	-	-	-	591	595	-	619	599	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0.2		_	0			16.5			14.4		_	
HCM LOS	0.2			0			10.5 C			B			
							U			U			
Minor Lane/Major Mvm		3Ln1	EBL	EBT	EBR	WBL	WBT		SBLn1				
				EDI	CDR	VVDL	VVD1	VDR					

	NDLIII	LDL	LDI				SDLITT	
Capacity (veh/h)	325	1152	-	- 11	31 -	. <u>-</u>	422	
HCM Lane V/C Ratio	0.035	0.008	-	- 0.0)1 -	-	0.089	
HCM Control Delay (s)	16.5	8.2	0	- 8	.1 0	- 1	14.4	
HCM Lane LOS	С	А	А	-	A A	-	В	
HCM 95th %tile Q(veh)	0.1	0	-	-	0 -		0.3	

Int Delay, s/veh

12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Vol, veh/h	23	320	1	1	378	65	3	2	6	195	1	41	
Future Vol, veh/h	23	320	1	1	378	65	3	2	6	195	1	41	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	24	340	1	1	402	69	3	2	6	207	1	44	

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	471	0	0	341	0	0	850	862	341	832	828	437
Stage 1	-	-	-	-	-	-	389	389	-	439	439	-
Stage 2	-	-	-	-	-	-	461	473	-	393	389	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1091	-	-	1218	-	-	280	293	701	288	306	620
Stage 1	-	-	-	-	-	-	635	608	-	597	578	-
Stage 2	-	-	-	-	-	-	581	558	-	632	608	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1091	-	-	1218	-	-	254	285	701	278	297	620
Mov Cap-2 Maneuver	-	-	-	-	-	-	254	285	-	278	297	-
Stage 1	-	-	-	-	-	-	618	592	-	581	577	-
Stage 2	-	-	-	-	-	-	539	557	-	607	592	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			14.2			53.7		
HCM LOS							В			F		
Minor Lane/Major Mvr	nt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)		402	1091	_	-	1218	-	_	307			

Capacity (veh/h)	402	1091	-	- 12	18	-	-	307
HCM Lane V/C Ratio	0.029	0.022	-	- 0.0	01	-	-	0.821
HCM Control Delay (s)	14.2	8.4	0	-	8	0	-	53.7
HCM Lane LOS	В	А	А	-	А	А	-	F
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	6.9

94

2

1

94

2

409

94

2

454

Peak Hour Factor

Heavy Vehicles, %

Mvmt Flow

08/12/2021

Intersection Int Delay, s/veh 0 Movement EBL EBT WBT WBR SBL SBR Y Lane Configurations đ ₽ 427 384 1 Traffic Vol, veh/h 1 3 1 Future Vol, veh/h 1 384 427 3 1 1 0 Conflicting Peds, #/hr 0 0 0 0 0 Sign Control Stop Stop Free Free Free Free RT Channelized -None -None -None Storage Length 0 _ -_ --Veh in Median Storage, # -0 0 -0 -Grade, % 0 0 0 ---

94

2

1

94

2

3

94

2

1

N A · /N A·						
	Major1		lajor2		Minor2	1-1
Conflicting Flow All	457	0	-	0	867	456
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	411	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1104	-	-	-	323	604
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	323	604
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	669	-
· ·						
Approach	EB		WB		SB	
Approach						
HCM Control Delay, s	0		0		13.6	
HCM LOS					В	
Minor Lane/Major Mvn	nt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)		1104	-	-	_	421
HCM Lane V/C Ratio		0.001	-	-	-	0.005
HCM Control Delay (s))	8.3	0	-	-	13.6
HCM Lane LOS	/	A	Ă	-	-	B
HCM 95th %tile Q(veh	l)	0	-	-	_	0
	7					5

Int Delay, s/veh	0						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	l
Lane Configurations	el 🗧			ب ا	Y		
Traffic Vol, veh/h	384	0	0	422	0	0)
Future Vol, veh/h	384	0	0	422	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop	,
RT Channelized	-	None	-	None	-	None	;
Storage Length	-	-	-	-	0	-	
Veh in Median Storage,	# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	į
Heavy Vehicles, %	2	2	2	2	2	2	,
Mvmt Flow	417	0	0	459	0	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0			0	876	417
Stage 1	-		· -	-	417	-
Stage 2	-		· -	-	459	-
Critical Hdwy	-		4.12	-	6.42	6.22
Critical Hdwy Stg 1	-			-	5.42	-
Critical Hdwy Stg 2	-			-	5.42	-
Follow-up Hdwy	-		2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-		1142	-	319	636
Stage 1	-		· -	-	665	-
Stage 2	-			-	636	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver			1142	-	319	636
Mov Cap-2 Maneuver	•			-	319	-
Stage 1	-		· -	-	665	-
Stage 2	-			-	636	-
Approach	EB	}	WB		NB	
HCM Control Delay, s	; ()	0		0	
HCM LOS					A	
Miner Long (Maier May	+		ГОТ			
Minor Lane/Major Mvr	m	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		-			1142	-
HCM Lane V/C Ratio		-		-	-	-
HCM Control Delay (s	5)	0		-	0	-
HCM Lane LOS	b)	A		-	A	-
HCM 95th %tile Q(vel	n)	-		-	0	-

Lanes, V	'olumes, Timings	
1: Heady	v Street/Pump House Road & Eton Downs & Oregon F	₹oad

	۶	-	-*	\mathbf{F}	۲	4	←	•	•	Ť	1	۴
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			\$		
Traffic Volume (vph)	2	342	17	19	7	6	376	57	5	1	5	1
Future Volume (vph)	2	342	17	19	7	6	376	57	5	1	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987					0.983			0.932		
Flt Protected							0.999			0.980		
Satd. Flow (prot)	0	1839	0	0	0	0	1829	0	0	1701	0	0
Flt Permitted		0.999					0.986					
Satd. Flow (perm)	0	1837	0	0	0	0	1805	0	0	1736	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	356	18	20	7	6	392	59	5	1	5	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	396	0	0	0	0	464	0	0	12	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0	Ű	Ŭ			0	Ŭ		0	J	Ŭ
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			Cl+Ex	CI+Ex	CI+Ex			Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		Cl+Ex					Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2	_			6	6	6		3			
Detector Phase	2	2			6	6	6		3	3		
Switch Phase	_	_			-	-						
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM BH

Lanes, Volu	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

1	Ļ	ţ	~	Ŧ	•	*	4	
SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
-	_		-					
51	1		2	1		3	10	
	-							
1100	1.00		1.00	1.00		1.00	1.00	
0	0		0	0		0	0	
, , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , ,		, ,			•	•	
0	0		0	0		0	0	
, , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , ,					•		
		1			108			
		30						
0.96	0.96		0.96	0.96		0.96	0.96	
				1				
			_	·		Ū		
0	0	59	0	0	39	0	0	
			, igni					
					-			
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
						60		
1	1	2		1	1			
Left	Left	Thru		Left	Left			
				20				
0				0				
0	0	0		0	0			
20	20	6		20	20			
		CI+Ex		CI+Ex				
0.0	0.0	0.0		0.0	0.0			
0.0	0.0	0.0		0.0	0.0			
0.0	0.0	0.0		0.0	0.0			
		94						
		6						
		CI+Ex						
		0.0						
Perm	Perm	NA		Perm	Perm			
		4						
4	4			7	7			
4	4	4		7	7			
				·				
	Left 20 0 20 Cl+Ex 0.0 0.0 0.0 Perm	51 1 51 1 1900 1900 1.00 1.00 0 0 0 0 0 0 0 0 0 0 0 0 1.00 1.00 53 1 0 0 No No Left Left 1.00 1.00 15 60 1 1 Left Left 20 20 0 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.00 0.0 1.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0	51 1 3 51 1 3 1900 1900 1900 1.00 1.00 0.995 0.995 0.956 0 0 0 1772 0.736 0 1772 0.736 0 1364 1 30 307 7.0 0.96 0.96 0 0 1364 0 0 1364 0 0 1364 0 0 90 0.96 0.96 0.96 53 1 3 0 0 59 No No No Left Left Left 1.00 1.00 1.00 15 60 11 1 2 20 10 0 0 0 0 0 0 0 0 0	51 1 3 2 51 1 3 2 1900 1900 1900 1900 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0 0 1772 0 0 0 1772 0 0 0 1364 0 0 0 1364 0 0 0 1364 0 0 0 1364 0 0 0 1364 0 0 0 1364 0 0 0 307 7.0 0.96 0.96 0.96 0.96 53 1 3 2 0 0 59 0 No No No No Left Left Left Right 0 0 0 0 0 0 0 0 0.0 0.0 0.0 0	51 1 3 2 1 1900 1900 1900 1900 1900 1900 1000 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0 0 1772 0 0 0 0 0 1364 0 0 0 0 0 1364 0 0 0 0 0 1364 0 0 0 0 0 1364 0 0 0 30307 - - 7.0 - - 0.96 0.96 0.96 0.96 0.96 53 1 3 2 1 0 0 59 0 0 0 0 0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Image: second	1 3 2 1 24 3 51 1 3 2 1 24 3 1900 1900 1900 1900 1900 1900 1900 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.956 0.965 0.965 0.968 0 0 0 0 1772 0 0 1722 0 0 0 1364 0 0 1722 0 0 0 1364 0 0 1722 0 -7.0 -52 -7.0 -52 -7.0 -52 0.96 <td>51 1 3 2 1 24 3 10 1900 100 1</td>	51 1 3 2 1 24 3 10 1900 100 1

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM BH

1: Heady Street/Pump House Road & Eton Downs & Oregon Road											/80	13/2021
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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag		0.0					0.0		Lead	Lead		
Lead-Lag Optimize?									Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			Max	Max	Max		None	None		
Walk Time (s)	7.0	7.0			7.0	7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0			0	0	0		0	0		
Act Effct Green (s)	U	40.6			0	0	40.6		0	6.2		
. ,		0.49					0.49			0.2		
Actuated g/C Ratio v/c Ratio		0.49					0.49			0.08		
		17.7					19.3			39.4		
Control Delay												
Queue Delay		0.0					0.0			0.0		
Total Delay		17.7					19.3			39.4		
LOS		B					B			D		
Approach Delay		17.7					19.3			39.4		
Approach LOS	40.0	B			40.0	40.0	B		7.4	D		
90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.4	7.4		
90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		
70th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
70th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
50th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
30th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
30th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
10th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
10th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
Stops (vph)		242					300			13		
Fuel Used(gal)		4					4			0		
CO Emissions (g/hr)		296					305			13		
NOx Emissions (g/hr)		58					59			2		
VOC Emissions (g/hr)		69					71			3		
Dilemma Vehicles (#)		0					0			0		
Queue Length 50th (ft)		126					156			5		
Queue Length 95th (ft)		277					337			24		
Internal Link Dist (ft)		438					196			85		
Turn Bay Length (ft)												
Base Capacity (vph)		904					888			513		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.44					0.52			0.02		
		0.11					0.02			0.02		

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM ΒH

Synchro 11 Report Page 3

Lanes, Volumes, Timings 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

08/13/2021

Lanes, Volumes, Tim	ings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

	1	L,	ŧ	~	Ŧ	*	•	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%			
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0			
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0			
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0			
Lost Time Adjust (s)			0.0			0.0			
Total Lost Time (s)			5.0			5.0			
Lead/Lag	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Recall Mode	None	None	None		Max	Max			
Walk Time (s)	7.0	7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)	0	0	0		0	0			
Act Effct Green (s)	U	U	8.9		U	18.2			
Actuated g/C Ratio			0.11			0.22			
v/c Ratio			0.40			0.08			
Control Delay			44.0			0.00			
Queue Delay			0.0			0.0			
Total Delay			44.0			0.0			
LOS			0 D			A A			
Approach Delay			44.0			0.4			
Approach LOS			0 D			0.4 A			
90th %ile Green (s)	13.3	13.3	13.3		18.0	18.0			
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
70th %ile Green (s)	10.1	10.1	10.1		18.0	18.0			
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
50th %ile Green (s)	8.8	8.8	8.8		18.0	18.0			
50th %ile Term Code			Gap		MaxR	MaxR			
30th %ile Green (s)	Gap 7.5	Gap 7.5	бар 7.5		18.0	18.0			
30th %ile Term Code	Gap				MaxR	MaxR			
10th %ile Green (s)	0.0	Gap 0.0	Gap 0.0		18.0	18.0			
()	Skip	Skip	Skip			MaxR			
10th %ile Term Code	Зкір	Зкір	Sкір 50		MaxR				
Stops (vph)						0			
Fuel Used(gal)			1			0			
CO Emissions (g/hr)			65			5 1			
NOx Emissions (g/hr)			13			1			
VOC Emissions (g/hr)			15			1			
Dilemma Vehicles (#)			0			0			
Queue Length 50th (ft)			28			0			
Queue Length 95th (ft)			73			0			
Internal Link Dist (ft)			227			150			
Turn Bay Length (ft)						107			
Base Capacity (vph)			319			465			
Starvation Cap Reductn			0			0			
Spillback Cap Reductn			0			0			
Storage Cap Reductn			0			0			
Reduced v/c Ratio			0.18			0.08			

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM BH

Intersection Summa	ry	
Area Type:	Other	
Cycle Length: 121		
Actuated Cycle Leng	gth: 82.4	
Natural Cycle: 125		
Control Type: Semi	Act-Uncoord	
Maximum v/c Ratio:	0.52	
Intersection Signal I	Delay: 19.6	Intersection LOS: B
Intersection Capacit	y Utilization 55.3%	ICU Level of Service B
Analysis Period (mir	า) 15	
90th %ile Actuated (Cycle: 98.7	
70th %ile Actuated (Cycle: 83.1	
50th %ile Actuated (Cycle: 81.8	

30th %ile Actuated Cycle: 80.5 10th %ile Actuated Cycle: 68

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

<u></u> ø₂	≜ ø3	Ø4	* Ø7
45 s	29 s	24 s	23 s
* Ø6			
45 s			

08/13/2021

	-	\mathbf{r}	1	-	•	1				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	4Î		٢	1	¥					
Traffic Volume (veh/h)	396	145	33	371	119	20				
Future Volume (veh/h)	396	145	33	371	119	20				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)	•	1.00	1.00	•	1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No	No					
Lanes Open During Work Zone										
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	421	154	35	395	127	21				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence		_	No	-	No	-				
Cap, veh/h	716	262	491	1221	311	51				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.55	0.55	0.06	0.65	0.21	0.21				
Unsig. Movement Delay	0.00	0.00	0.00	0.00	0.21	0.21				
Ln Grp Delay, s/veh	0.0	13.4	7.1	6.2	28.0	0.0				
Ln Grp LOS	A	B	A	A	C	A				
Approach Vol, veh/h	575	-	71	430	149					
Approach Delay, s/veh	13.4			6.3	28.0					
Approach LOS	В			A	C					
	_				-					
		4	<u>^</u>	<u>^</u>	4	_			<u>^</u>	
Timer:		1	2	3	4	5	6	7	8	
Assigned Phs		1	2	3	4	5	6	7	8	
Assigned Phs Case No		1	2 12.0	3 1.2	4 8.0	5	6	7	8 4.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s		1	2 12.0 20.0	3 1.2 7.5	4 8.0 44.5	5	6	7	8 4.0 52.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s		1	2 12.0 20.0 5.0	3 1.2 7.5 3.0	4 8.0 44.5 5.0	5	6	7	8 4.0 52.0 5.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s		1	2 12.0 20.0 5.0 15.0	3 1.2 7.5 3.0 9.0	4 8.0 44.5 5.0 35.0	5	6	7	8 4.0 52.0 5.0 47.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s		1	2 12.0 20.0 5.0 15.0 3.8	3 1.2 7.5 3.0 9.0 3.8	4 8.0 44.5 5.0 35.0 5.3	5	6	7	8 4.0 52.0 5.0 47.0 5.2	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s		1	2 12.0 20.0 5.0 15.0 3.8 7.3	3 1.2 7.5 3.0 9.0 3.8 2.5	4 8.0 44.5 5.0 35.0 5.3 17.5	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+11), s Green Ext Time (g_e), s		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c)		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+11), s Green Ext Time (g_e), s		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x)		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.50 0.02	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.50 0.02	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+l1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Mvmt Sat Flow, veh/h		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2 2 12	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0 7 0 4 1306	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt		1	2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2 2 12 2 12	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0 7 0 4 1306 4	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00 0.00 8 1870	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h			2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2 2 12	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0 7 0 4 1306	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+11), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Left Lane Group Data			2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2 12 2 12 12 12 247	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3 1781	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0 7 0 4 1306 4 1306				8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h			2 12.0 20.0 5.0 15.0 3.8 7.3 0.2 1.00 0.00 5 1493 2 2 12 2 12	3 1.2 7.5 3.0 9.0 3.8 2.5 0.0 0.50 0.02 3 1781	4 8.0 44.5 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0 7 0 4 1306 4	5	6	7	8 4.0 52.0 5.0 47.0 5.2 8.7 2.7 1.00 0.00 0.00 8 1870	

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

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Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	149	35	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1751	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	5.3	0.5	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	5.3	0.5	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	838	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	41.5	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	24.0	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	39.5	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.85	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	365	491	0	0	0	0	0	
V/C Ratio (X)	0.00	0.41	0.07	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	365	602	0.00	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	24.7	7.0	0.00	0.00	0.00	0.00	0.00	
Incr Delay (d2), s/veh	0.0	3.4	0.1	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	28.0	7.1	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	20.0	0.2	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.0	2.4	0.2	0.0	0.00	0.00	0.00	0.00	
%ile Storage Ratio (RQ%)	0.00	0.15	0.2	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.15	0.00	0.00	0.00	0.00	0.00	0.00	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	395	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	

Scenario 3 No-Build AM 7:30 am 05/19/2021 No-Build AM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data		40							
Assigned Mvmt	0	12	0	14	0	0	0	18	
Lane Assignment	_			T+R					
Lanes in Grp	0	0	0	1	0	0	0	0	
Grp Vol (v), veh/h	0	0	0	575	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	0	0	1784	0	0	0	0	
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.14	0.00	0.27	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	0	0	978	0	0	0	0	
V/C Ratio (X)	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	0	0	978	0	0	0	0	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/In	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary									
HCM 6th Ctrl Delay		12.6							
HCM 6th LOS		12.0 B							
		U							

Notes

User approved volume balancing among the lanes for turning movement.

1

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Vol, veh/h	8	341	1	1	367	2	7	1	2	15	1	18	
Future Vol, veh/h	8	341	1	1	367	2	7	1	2	15	1	18	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	9	388	1	1	417	2	8	1	2	17	1	20	

Major/Minor	Major1			Jaiar?			Minor1			Minor2			
				Major2				000			007	440	
Conflicting Flow All	419	0	0	389	0	0	838	828	389	828	827	418	
Stage 1	-	-	-	-	-	-	407	407	-	420	420	-	
Stage 2	-	-	-	-	-	-	431	421	-	408	407	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1140	-	-	1170	-	-	286	306	659	290	307	635	
Stage 1	-	-	-	-	-	-	621	597	-	611	589	-	
Stage 2	-	-	-	-	-	-	603	589	-	620	597	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1140	-	-	1170	-	-	274	303	659	286	304	635	
Mov Cap-2 Maneuver	-	-	-	-	-	-	274	303	-	286	304	-	
Stage 1	-	-	-	-	-	-	615	591	-	605	588	-	
Stage 2	-	-	-	-	-	-	582	588	-	611	591	-	
A mara a ah										00			
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0.2			0			16.9			14.9			
HCM LOS							С			В			
Minor Lane/Major Mvn	nt N	BLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)		314	1140	-	-	1170	-	-	404				
HCM Lane V/C Ratio		0.036	0.008	-	-	0.001	-	-	0.096				

HCM Control Delay (s)	16.9	8.2	0	-	8.1	0	-	14.9
HCM Lane LOS	С	Α	А	-	А	А	-	В
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

Int Delay, s/veh

15.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Vol, veh/h	24	330	1	1	390	67	3	2	6	201	1	42	
Future Vol, veh/h	24	330	1	1	390	67	3	2	6	201	1	42	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	26	351	1	1	415	71	3	2	6	214	1	45	

Major/Minor	Major1		N	Major2			Minor1		l	Minor2			
Conflicting Flow All	486	0	0	352	0	0	880	892	352	861	857	451	
Stage 1	-	-	-	-	-	-	404	404	-	453	453	-	
Stage 2	-	-	-	-	-	-	476	488	-	408	404	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	0.010	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1077	-	-	1207	-	-	268	281	692	276	295	608	
Stage 1	-	-	-	-	-	-	623	599	-	586	570	-	
Stage 2	-	-	-	-	-	-	570	550	-	620	599	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1077	-	-	1207	-	-	242	272	692	266	286	608	
Mov Cap-2 Maneuver	-	-	-	-	-	-	242	272	-	266	286	-	
Stage 1	-	-	-	-	-	-	604	581	-	568	569	-	
Stage 2	-	-	-	-	-	-	527	549	-	594	581	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0.6			0			14.6			64.8			
HCM LOS							В			F			
Minor Lane/Major Mvn	nt N	IBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				

Minor Lane/Major Mvmt	NBLn1	EBL	FRI	FRK	WBL	WRI	WBK S	SBLn1	
Capacity (veh/h)	387	1077	-	-	1207	-	-	295	
HCM Lane V/C Ratio	0.03	0.024	-	-	0.001	-	-	0.88	
HCM Control Delay (s)	14.6	8.4	0	-	8	0	-	64.8	
HCM Lane LOS	В	Α	А	-	Α	А	-	F	
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	7.9	

Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		ب	et P		Y	
Traffic Vol, veh/h	1	396	440	3	1	1
Future Vol, veh/h	1	396	440	3	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# -	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	421	468	3	1	1

Major/Minor	Major1	Ν	/lajor2		Minor2	
Conflicting Flow All	471	0	-	0	893	470
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	423	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	
Pot Cap-1 Maneuver	1091	-	-	-	312	594
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver		-	-	-	312	594
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	661	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		13.8	
HCM LOS					В	
Minor Lane/Major Mvr	nt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)		1091	-	-	-	409
HCM Lane V/C Ratio		0.001	-	-	-	0.005
HCM Control Delay (s	.)	8.3	0	-	-	13.8
		0.0				
HCM Lane LOS)	0.0 A	Ă	-	-	В

Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	el el			÷	Y	
Traffic Vol, veh/h	396	0	0	435	0	0
Future Vol, veh/h	396	0	0	435	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	430	0	0	473	0	0

Major/Minor	Major1	Ν	/lajor2	ľ	/linor1	
Conflicting Flow All	0	0	430	0	903	430
Stage 1	-	0	-50	-	430	430
Stage 2	-		_	_	473	-
Critical Hdwy	-	_	4.12	-		6.22
Critical Hdwy Stg 1	-	-	4.12	-	5.42	0.22
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218		3.518	
Pot Cap-1 Maneuver	-	-	1129	-	308	625
		-	1129		506 656	020
Stage 1	-	-	-	-	627	
Stage 2	-	-	-	-	027	-
Platoon blocked, %	-	-	1100	-	200	COF
Mov Cap-1 Maneuver		-	1129	-	308	625
Mov Cap-2 Maneuver		-	-	-	308	-
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	627	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		0	
HCM LOS	-				A	
						MOT
Minor Lane/Major Mvn	nt N	BLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		-	-	-	1129	-
HCM Lane V/C Ratio		-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS		А	-	-	Α	-
HCM 95th %tile Q(veh	ı)	-	-	-	0	-

Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

	۶	+	7	7	۲	•	┥	•	•	Ť	1	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			÷		
Traffic Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Future Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					1.00			0.99		
Frt		0.987					0.983			0.932		
Flt Protected							0.999			0.980		
Satd. Flow (prot)	0	1835	0	0	0	0	1821	0	0	1676	0	0
Flt Permitted	Ţ	0.998	Ū	•	Ţ	•	0.987	Ţ	•		•	Ū
Satd. Flow (perm)	0	1831	0	0	0	0	1799	0	0	1710	0	0
Right Turn on Red	Ŭ	1001	Ŭ	No	Ŭ	Ū	1100	No	Ŭ	1110	Ű	Yes
Satd. Flow (RTOR)				110				NO		1		100
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	10	11.0		2		2	0.5	10		5.0	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.90	363	18	20	0.90	0.90	405	0.90 59	0.90	0.90	0.90	0.90
Adj. Flow (vph)	Z	303	10	20	1	0	405	59	J	I	J	1
Shared Lane Traffic (%)	0	402	0	0	0	0	477	0	0	12	0	0
Lane Group Flow (vph)	0	403	0	0	0		477	0	0		0	0
Enter Blocked Intersection	No	No	No	No	No							
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane	4.00	4.00	4 0 0	4.00	4.00	1 00	4 00	4 0 0	4.00	4 00	4.00	4.00
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	-	60	9	60	15	_	9	15	_	9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			Cl+Ex	CI+Ex	CI+Ex		Cl+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2				6	6	6		3	-		
Detector Phase	2	2			6	6	6		3	3		
	2	2			0	σ	D		ა	ა		

Scenario 05 Build AM 7:30 am 05/19/2021 Build AM BH

Lanes, Volu	mes, Timings
1: Heady St	reet/Pump House Road & Eton Downs & Oregon Road

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Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	-	-	4	-		M			
Traffic Volume (vph)	51	1	3	2	1	37	3	10	
Future Volume (vph)	51	1	3	2	1	37	3	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Frt			0.995			0.967			
Flt Protected			0.956			0.964			
Satd. Flow (prot)	0	0	1772	0	0	1708	0	0	
Flt Permitted	Ū	Ŭ	0.736	Ū	Ŭ	0.964	Ű	Ŭ	
Satd. Flow (perm)	0	0	1348	0	0	1700	0	0	
Right Turn on Red	Ű	Ŭ	1010	Yes	Ŭ	1100	Ű	Yes	
Satd. Flow (RTOR)			1	100		108		100	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)	4		1.0		2	0.2	10	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	53	1	3	2	0.00	39	3	10	
Shared Lane Traffic (%)	55	1	5	2	1	55	5	10	
Lane Group Flow (vph)	0	0	59	0	0	53	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Leit	Leit	0	Tagin	Len	12	Night	rtight	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	1.00	60	1.00	1.00	60	60	60	60	
Number of Detectors	15	1	2	3	1	1	00	00	
Detector Template	Left	Left	∠ Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
	20	20	001		20	20			
Trailing Detector (ft) Detector 1 Position(ft)	0	0	0		0	0			
. ,	20	20	6		20	20			
Detector 1 Size(ft)	ZU CI+Ex	20 Cl+Ex	o Cl+Ex		CI+Ex	ZU CI+Ex			
Detector 1 Type Detector 1 Channel	UI+EX	UI+EX	OI+EX			UI+EX			
	0.0	0.0	0.0		0.0	0.0			
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)			94 6						
Detector 2 Size(ft)									
Detector 2 Type			CI+Ex						
Detector 2 Channel			0.0						
Detector 2 Extend (s)	Derre	Derm	0.0		Derree	Derm			
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases	1	4	4		7	7			
Permitted Phases	4	4	A		7	7			
Detector Phase	4	4	4		7	7			

Scenario 05 Build AM 7:30 am 05/19/2021 Build AM BH

Lanes, Volumes,	Timings													
1: Heady Street/F	1: Heady Street/Pump House Road & Eton Downs & Oregon Road													
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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2		
Switch Phase														
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0				
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0				
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0				
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%				
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0				
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0				
Lost Time Adjust (s)		0.0					0.0			0.0				
Total Lost Time (s)		5.0					5.0			5.0				
Lost Time Adjust (s)	2.0	0.0			2.0	2.0	0.0		2.0	0.0				

Total Split (%)	37.2%	37.2%	37.2%	37.2%	37.2%	24.0%	24.0%	
Maximum Green (s)	40.0	40.0	40.0	40.0	40.0	24.0	24.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	
Total Lost Time (s)		5.0			5.0		5.0	
Lead/Lag						Lead	Lead	
Lead-Lag Optimize?						Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	Max	Max	Max	Max	Max	None	None	
Act Effct Green (s)		40.6			40.6		6.2	
Actuated g/C Ratio		0.49			0.49		0.08	
v/c Ratio		0.45			0.54		0.09	
Control Delay		17.9			19.7		39.4	
Queue Delay		0.0			0.0		0.0	
Total Delay		17.9			19.7		39.4	
LOS		В			В		D	
Approach Delay		17.9			19.7		39.4	
Approach LOS		В			В		D	
90th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	7.5	7.5	
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Gap	Gap	
70th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
50th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
30th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
10th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
Stops (vph)		248			313		13	
Fuel Used(gal)		4			5		0	
CO Emissions (g/hr)		304			318		13	
NOx Emissions (g/hr)		59			62		2	
VOC Emissions (g/hr)		70			74		3	
Dilemma Vehicles (#)		0			0		0	
Queue Length 50th (ft)		128			162		5	
Queue Length 95th (ft)		283			352		24	
Internal Link Dist (ft)		438			196		85	
Turn Bay Length (ft)								
Base Capacity (vph)		900			884		505	
Starvation Cap Reductn		0			0		0	
Spillback Cap Reductn		0			0		0	
Storage Cap Reductn		0			0		0	
Reduced v/c Ratio		0.45			0.54		0.02	

Scenario 05 Build AM 7:30 am 05/19/2021 Build AM ΒH

Intersection Summary		
Area Type: Othe	er	
Cycle Length: 121		
Actuated Cycle Length: 82.5		
Natural Cycle: 125		
Control Type: Semi Act-Uncoord	d	
Maximum v/c Ratio: 0.54		
Intersection Signal Delay: 19.6		Intersection LOS: B
Intersection Capacity Utilization	55.3%	ICU Level of Service B
Analysis Period (min) 15		
90th %ile Actuated Cycle: 98.9		
70th %ile Actuated Cycle: 83.2		
50th %ile Actuated Cycle: 81.8		
30th %ile Actuated Cycle: 80.5		
10th %ile Actuated Cycle: 68		

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ ø3	Ø4	107
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

₋anes, Volumes, Timings	
I: Heady Street/Pump House Road & Eton Downs & Oregon Roa	ıd

	1	L.	Ļ	~	Ŧ	*	*	4			
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2			
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0					
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%					
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0					
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0					
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0					
Lost Time Adjust (s)			0.0			0.0					
Total Lost Time (s)			5.0			5.0					
Lead/Lag	Lag	Lag	Lag								
Lead-Lag Optimize?	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Recall Mode	None	None	None		Max	Max					
Act Effct Green (s)			8.9			18.3					
Actuated g/C Ratio			0.11			0.22					
v/c Ratio			0.40			0.12					
Control Delay			44.2			0.6					
Queue Delay			0.0			0.0					
Total Delay			44.2			0.6					
LOS			D			A					
Approach Delay			44.2			0.6					
Approach LOS			D			A					
90th %ile Green (s)	13.4	13.4	13.4		18.0	18.0					
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
70th %ile Green (s)	10.2	10.2	10.2		18.0	18.0					
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
50th %ile Green (s)	8.8	8.8	8.8		18.0	18.0					
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
30th %ile Green (s)	7.5	7.5	7.5		18.0	18.0					
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
10th %ile Green (s)	0.0	0.0	0.0		18.0	18.0					
10th %ile Term Code	Skip	Skip	Skip		MaxR	MaxR					
Stops (vph)			50			0					
Fuel Used(gal)			1			0					
CO Emissions (g/hr)			65			7					
NOx Emissions (g/hr)			13			1					
VOC Emissions (g/hr)			15			2					
Dilemma Vehicles (#)			0			0					
Queue Length 50th (ft)			28			0					
Queue Length 95th (ft)			73			3					
Internal Link Dist (ft)			227			150					
Turn Bay Length (ft)											
Base Capacity (vph)			315			460					
Starvation Cap Reductn			0			0					
Spillback Cap Reductn			0			0					
Storage Cap Reductn			0			0					
Reduced v/c Ratio			0.19			0.12					

Scenario 05 Build AM 7:30 am 05/19/2021 Build AM BH

Intersection Summary

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Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	¢Î,		۲	↑	Y					
Traffic Volume (veh/h)	406	148	33	376	120	20				
Future Volume (veh/h)	406	148	33	376	120	20				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)	•	1.00	1.00	•	1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No	No					
Lanes Open During Work Zone										
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	423	154	34	392	125	21				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence		_	No	-	No	-				
Cap, veh/h	719	262	489	1221	310	52				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.55	0.55	0.06	0.65	0.21	0.21				
Unsig. Movement Delay	0.00	0.00	0.00	0.00	0.21	0.21				
Ln Grp Delay, s/veh	0.0	13.4	7.1	6.2	27.9	0.0				
Ln Grp LOS	A	В	A	A	C	A				
Approach Vol, veh/h	577	2		426	147					
Approach Delay, s/veh	13.4			6.3	27.9					
Approach LOS	В			A	C					
Timer:		1	0			F	6	7	8	
Limer.										
			2	3	4	5	0	1		
Assigned Phs			2	3	4	5	0	1	8	
Assigned Phs Case No			2 12.0	3 1.2	4 8.0	5	U	1	8 4.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s			2 12.0 20.0	3 1.2 7.4	4 8.0 44.6	5	0	1	8 4.0 52.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s			2 12.0 20.0 5.0	3 1.2 7.4 3.0	4 8.0 44.6 5.0	5	0	1	8 4.0 52.0 5.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s			2 12.0 20.0 5.0 15.0	3 1.2 7.4 3.0 9.0	4 8.0 44.6 5.0 35.0	5	0	1	8 4.0 52.0 5.0 47.0	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s			2 12.0 20.0 5.0 15.0 3.8	3 1.2 7.4 3.0 9.0 3.8	4 8.0 44.6 5.0 35.0 5.3	5	0	1	8 4.0 52.0 5.0 47.0 5.2	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s			2 12.0 20.0 5.0 15.0 3.8 7.2	3 1.2 7.4 3.0 9.0 3.8 2.5	4 8.0 44.6 5.0 35.0 5.3 17.5	5	0	1	8 4.0 52.0 5.0 47.0 5.2 8.6	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7	5	0		8 4.0 52.0 5.0 47.0 5.2 8.6 2.7	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c)			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00	5	0		8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7	5	0		8 4.0 52.0 5.0 47.0 5.2 8.6 2.7	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c)			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00	5		,	8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x)			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00	5			8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00	5			8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7	5			8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7	5			8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0				8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489 2	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0				8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Mvmt Sat Flow, veh/h			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489 2	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0				8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+11), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489 2 2 12	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0 7 0 4 1308				8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+I1), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Left Lane Group Data			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489 2 12 2 12 12 12 250	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3 1781	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 0 7 0 4 1308 4 1308				8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00 0.00	
Assigned Phs Case No Phs Duration (G+Y+Rc), s Change Period (Y+Rc), s Max Green (Gmax), s Max Allow Headway (MAH), s Max Q Clear (g_c+11), s Green Ext Time (g_e), s Prob of Phs Call (p_c) Prob of Phs Call (p_c) Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h			2 12.0 20.0 5.0 15.0 3.8 7.2 0.2 1.00 0.00 5 1489 2 12 2 12	3 1.2 7.4 3.0 9.0 3.8 2.5 0.0 0.49 0.02 3 1781	4 8.0 44.6 5.0 35.0 5.3 17.5 3.7 1.00 0.00 7 7 0 7 0 4 1308 4	0	0	0	8 4.0 52.0 5.0 47.0 5.2 8.6 2.7 1.00 0.00 0.00	

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HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	147	34	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1751	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	5.2	0.5	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	5.2	0.5	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	836	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	41.6	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	24.1	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	39.6	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.85	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	365	489	0	0	0	0	0	
V/C Ratio (X)	0.00	0.40	0.07	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	365	602	0	0	0	0	0	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	24.6	7.0	0.0	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	3.3	0.1	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	27.9	7.1	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	2.1	0.1	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/In	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.15	0.08	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
. ,									
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	392	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	
1st-Term Q (Q1), veh/In	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	
2nd-Term Q (Q2), veh/In	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	

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3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data	^							10	
Assigned Mvmt	0	12	0	14	0	0	0	18	
Lane Assignment				T+R	_			_	
Lanes in Grp	0	0	0	1	0	0	0	0	
Grp Vol (v), veh/h	0	0	0	577	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	0	0	1785	0	0	0	0	
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.14	0.00	0.27	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	0	0	981	0	0	0	0	
V/C Ratio (X)	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	0	0	981	0	0	0	0	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/In	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary		10.0							
HCM 6th Ctrl Delay		12.6							
HCM 6th LOS		В							
N1 (

Notes

User approved volume balancing among the lanes for turning movement.

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Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		\$			\$			\$			÷		
Traffic Vol, veh/h	8	347	1	1	380	2	7	1	2	15	1	18	
Future Vol, veh/h	8	347	1	1	380	2	7	1	2	15	1	18	
Conflicting Peds, #/hr	10	0	0	0	0	10	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	9	394	1	1	432	2	8	1	2	17	1	20	

Major/Minor	Major1		١	Major2			Minor1			Minor2			
Conflicting Flow All	444	0	0	395	0	0	859	859	395	859	858	443	
Stage 1	-	-	-	-	-	-	413	413	-	445	445	-	
Stage 2	-	-	-	-	-	-	446	446	-	414	413	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1116	-	-	1164	-	-	277	294	654	277	294	615	
Stage 1	-	-	-	-	-	-	616	594	-	592	575	-	
Stage 2	-	-	-	-	-	-	591	574	-	616	594	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1105	-	-	1164	-	-	265	288	654	270	288	609	
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	288	-	270	288	-	
Stage 1	-	-	-	-	-	-	610	588	-	581	569	-	
Stage 2	-	-	-	-	-	-	569	568	-	607	588	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0.2			0			17.3			15.4			
HCM LOS	0.2			J			C			C			
							J			Ű			
	.1 N	IDI1		ГОТ					001-1				
Minor Lane/Major Mvm	It N	IBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)		304	1105	-	-	1164	-	-	384				
HCM Lane V/C Ratio		0.037	0 008	-	-	0 001	-	-	0 101				

HCM Lane V/C Ration	0.037	0.008	-	- 0.00)1 -	-	0.101	
HCM Control Delay	(s) 17.3	8.3	0	- 8	.1 0	-	15.4	
HCM Lane LOS	С	Α	А	-	A A	-	С	
HCM 95th %tile Q(v	eh) 0.1	0	-	-	0 -	-	0.3	

Int Delay, s/veh

16.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
				VVDL		WDIX	NDL		NDIX	ODL		ODIX	
Lane Configurations		- 4 >											
Traffic Vol, veh/h	24	343	1	1	396	67	3	2	6	201	1	42	
Future Vol, veh/h	24	343	1	1	396	67	3	2	6	201	1	42	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	26	365	1	1	421	71	3	2	6	214	1	45	

Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	492	0	0	366	0	0	900	912	366	881	877	457	
Stage 1	-	-	-	-	-	-	418	418	-	459	459	-	
Stage 2	-	-	-	-	-	-	482	494	-	422	418	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-		5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1071	-	-	1193	-	-	259	274	679	267	287	604	
Stage 1	-	-	-	-	-	-	612	591	-	582	566	-	
Stage 2	-	-	-	-	-	-	565	546	-	609	591	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1071	-	-	1193	-	-	234	266	679	257	278	604	
Mov Cap-2 Maneuver	-	-	-	-	-	-	234	266	-	257	278	-	
Stage 1	-	-	-	-	-	-	594	573	-	565	565	-	
Stage 2	-	-	-	-	-	-	522	545	-	583	573	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s				0			14.9			72.3			
HCM LOS							В			F			
Minor Lane/Major Mvn	nt I	VBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)		377	1071	-	-	1193	-	-	285				

Capacity (veh/h)	377 1071	-	- 1193	-	- 285	
HCM Lane V/C Ratio	0.031 0.024	-	- 0.001	-	- 0.911	
HCM Control Delay (s)	14.9 8.4	0	- 8	0	- 72.3	
HCM Lane LOS	B A	А	- A	А	- F	
HCM 95th %tile Q(veh)	0.1 0.1	-	- 0	-	- 8.4	

Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		ا	et -		Y	
Traffic Vol, veh/h	1	402	453	3	1	1
Future Vol, veh/h	1	402	453	3	1	1
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# -	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	414	467	3	1	1

Major/Minor	Major1	Ν	lajor2	1	Vinor2	
Conflicting Flow All	476	0	-	0	891	475
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	416	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1086	-	-	-	313	590
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver		-	-	-	309	587
Mov Cap-2 Maneuver	• -	-	-	-	309	-
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	662	-
Approach	EB		WB		SB	
HCM Control Delay, s	s 0		0		13.9	
HCM LOS					В	
Minor Lane/Major Mvr	mt	EBL	EBT	WBT	WBR :	SBLn1
Capacity (veh/h)		1080	-	-	-	405
HCM Lane V/C Ratio		0.001	-	-	-	0.005
HCM Control Delay (s	6)	8.3	0	-	-	13.9
HCM Lane LOS		А	А	-	-	В
HCM 95th %tile Q(veh	h)	0	-	-	-	0

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ef 👘			÷	Y	
Traffic Vol, veh/h	396	6	6	435	0	13
Future Vol, veh/h	396	6	6	435	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage,	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	430	7	7	473	0	14

Major/Minor	Major1	Ν	Major2	1	Minor1	
Conflicting Flow All	0	0	437	0	921	434
Stage 1	-	-		-	434	404
Stage 1	_	_	_	_	487	_
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	_	_	4.12	-	5.42	0.22
		-	-		5.42	-
Critical Hdwy Stg 2	-	-	-	-		-
Follow-up Hdwy	-	-	2.218	-	3.518	
Pot Cap-1 Maneuver	-	-	1123	-	300	622
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	618	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver		-	1123	-	298	622
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	613	-
Annroach	EB		WB		NB	
Approach						
HCM Control Delay, s	0		0.1		10.9	
HCM LOS					В	
Minor Lane/Major Mvr	nt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		622	_	_	1123	_
		0.000			0.000	

Capacity (ven/n)	622	-	- 1123	-
HCM Lane V/C Ratio	0.023	-	- 0.006	-
HCM Control Delay (s)	10.9	-	- 8.2	0
HCM Lane LOS	В	-	- A	А
HCM 95th %tile Q(veh)	0.1	-	- 0	-

Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

	۶	+	7	7	۲	•	┥	•	•	Ť	1	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			÷		
Traffic Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Future Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					0.99			0.99		
Frt		0.987					0.983			0.932		
Flt Protected							0.999			0.980		
Satd. Flow (prot)	0	1835	0	0	0	0	1817	0	0	1676	0	0
Flt Permitted	Ţ	0.998	Ū	•	Ţ	•	0.987	Ţ	•		•	
Satd. Flow (perm)	0	1831	0	0	0	0	1795	0	0	1710	0	0
Right Turn on Red	Ŭ	1001	Ŭ	No	Ŭ	Ū	1100	No	Ŭ	1110	Ű	Yes
Satd. Flow (RTOR)				NO				NO		1		100
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	10	11.0		2		2	0.5	10		5.0	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.90	363	18	20	0.90	0.90	405	0.90 59	0.90	0.90	0.90	0.90
Adj. Flow (vph)	Z	303	10	20	1	0	405	59	J	I	J	I
Shared Lane Traffic (%)	0	402	0	0	0	0	477	0	0	12	0	0
Lane Group Flow (vph)	0	403	0	0	0		477	0	0		0	0
Enter Blocked Intersection	No	No	No	No	No							
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	-	60	9	60	15	_	9	15	_	9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			Cl+Ex	CI+Ex	CI+Ex		CI+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		Cl+Ex					CI+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2				6	6	6		3	-		
Detector Phase	2	2			6	6	6		3	3		
	2	2			0	σ	D		ა	ა		

Scenario 07 AM Build w/ Improvement Scenario 1 7:30 am 05/19/2021 Build w/ Impr 1 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L.	Ļ	~	r	•	•	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	-	-	4	-		M			_
Traffic Volume (vph)	51	1	3	2	1	37	3	10	
Future Volume (vph)	51	1	3	2	1	37	3	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Frt			0.995			0.967			
Flt Protected			0.956			0.964			
Satd. Flow (prot)	0	0	1772	0	0	1708	0	0	
Flt Permitted	U	Ŭ	0.736	Ű	Ŭ	0.964	Ū	Ŭ	
Satd. Flow (perm)	0	0	1348	0	0	1700	0	0	
Right Turn on Red	Ű	Ŭ	1010	Yes	Ŭ	1100	Ű	Yes	
Satd. Flow (RTOR)			1			108			
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)	4		1.0		2	0.2	10	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	53	1	3	2	1	39	3	10	
Shared Lane Traffic (%)			Ŭ,	_			J		
Lane Group Flow (vph)	0	0	59	0	0	53	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	_011	_510	0		_5/(12			
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane									
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	60		9	60	60	60	60	
Number of Detectors	1	1	2	-	1	1			
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	0	0	0		0	0			
Detector 1 Position(ft)	0	0	0		Ŭ Û	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	Cl+Ex	CI+Ex		Cl+Ex	CI+Ex			
Detector 1 Channel									
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)			94						
Detector 2 Size(ft)			6						
Detector 2 Type			CI+Ex						
Detector 2 Channel									
Detector 2 Extend (s)			0.0						
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases			4						
Permitted Phases	4	4			7	7			
Detector Phase	4	4	4		7	7			
	ſ		•						

Scenario 07 AM Build w/ Improvement Scenario 1 7:30 am 05/19/2021 Build w/ Impr 1 BH

Lanes, Volumes, 7	ïmings
1: Heady Street/Pu	Imp House Road & Eton Downs & Oregon Road

Isane Group EBL EBT EBR EBR EBR WBL WBL WBR NBL NBT NBR NBR Switch Phase 45.0 45.0 45.0 45.0 45.0 29.0 29.0 Total Split (s) 45.0 45.0 45.0 45.0 45.0 29.0 29.0 Total Split (s) 37.2% 37.2% 37.2% 37.2% 27.4 0% 24.0% 24.0% Valuer Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Immunicitation (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 S.0 S.0 Immunicitation (s) 3.0 3.0 3.0 S.0 S.0 S.0 S.0 S.0 S.0 S.0 S.0 <t< th=""><th></th><th>۶</th><th>-</th><th>ľ</th><th>*</th><th>5</th><th>4</th><th>ł</th><th>•</th><th>1</th><th>1</th><th>1</th><th>*1</th></t<>		۶	-	ľ	*	5	4	ł	•	1	1	1	*1
Switch Phase Vinimum Initial (s) 40.0 40.0 40.0 40.0 40.0 40.0 40.0 40.0 5.0 Minimum Spire Total Spir (s) 45.0 45.0 45.0 45.0 45.0 29.0 28.0 Total Spir (s) 37.2% 37.2% 37.2% 37.2% 27.2% 27.2% 37.2% 37.2% 27.2% 27.2% 27.2% 27.2% 37.2%	Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Minimum Split (a) 45.0 45.0 45.0 45.0 29.0 Total Split (s) 45.0 45.0 45.0 45.0 45.0 29.0 Total Split (s) 47.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 40.0 24.0 Vellow Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 Lest Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 Total Lost Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Lead-Lag Optimize? Yees Yees Yees Yees Yees Vehick Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max Max Max Vehick Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 <td></td>													
Total Split (s) 45.0 45.0 45.0 45.0 29.0 Total Split (s) 37.2% 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 24.0 24.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Al-Red Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0 Lead Lag Optimize? Velice Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lead/Lag Optimize? Verice Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Vehice Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Tesh Don Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 Pedestina Calls (#/m) 6 6 6 6 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
Total Split (s) 45.0 45.0 45.0 45.0 45.0 29.0 Total Split (%) 37.2% 37.2% 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 40.0 24.0 24.0 Veltow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Al-Red Time (s) 2.0	Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%) 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 24.0 24.0 Vellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 5.0 5.0 Lead-Lag Optimize? Yes Yes Yes Yes Vehicid Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max None None Wakt Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dort Wak (s) 11.0 11.0 11.0 11.0 Theodytical (thin) 6 6 6 Control Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay 17.9 19.7 39.4 0.0 0.0 0.0 0.0 <t< td=""><td> ,</td><td>45.0</td><td>45.0</td><td></td><td></td><td>45.0</td><td>45.0</td><td>45.0</td><td></td><td>29.0</td><td>29.0</td><td></td><td></td></t<>	,	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Maximum Green (s) 40.0 40.0 40.0 40.0 24.0 24.0 Yelkow Time (s) 3.0 <t< td=""><td></td><td>37.2%</td><td>37.2%</td><td></td><td></td><td>37.2%</td><td>37.2%</td><td>37.2%</td><td></td><td>24.0%</td><td>24.0%</td><td></td><td></td></t<>		37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 </td <td></td> <td></td> <td>40.0</td> <td></td> <td></td> <td></td> <td>40.0</td> <td></td> <td></td> <td>24.0</td> <td></td> <td></td> <td></td>			40.0				40.0			24.0			
Lost Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Optimize?		3.0	3.0			3.0	3.0	3.0		3.0	3.0		
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Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#hr) 6 6 6 6 6 6 Acturated g/C Ratio 0.49 0.049 0.08 0.09 0.01 0.										Lead	Lead		
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50th %ile Term Code MaxR MaxR MaxR MaxR MaxR MaxR Skip Skip 30th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0 30th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 10th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip Stops (vph) 248 313 13 13 13 Fuel Used(gal) 4 5 0 0 0 CO Emissions (g/hr) 59 62 2 2 VOC Emissions (g/hr) 70 74 3 3 Dilemma Vehicles (#) 0<	50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0					
30th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0 30th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 0.0 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 0.0 10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0 0.0 10th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip Stops (vph) 248 313 13 13 13 Fuel Used(gal) 4 5 0 </td <td></td> <td>MaxR</td> <td>MaxR</td> <td></td> <td></td> <td>MaxR</td> <td>MaxR</td> <td>MaxR</td> <td></td> <td>Skip</td> <td>Skip</td> <td></td> <td></td>		MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
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10th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0 10th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip Stops (vph) 248 313 13 13 Fuel Used(gal) 4 5 0 CO Emissions (g/hr) 304 318 13 NOx Emissions (g/hr) 59 62 2 VOC Emissions (g/hr) 70 74 3 Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 128 162 5 Queue Length 95th (ft) 283 352 24 Internal Link Dist (ft) 438 196 85 Turn Bay Length (ft) 882 505 5 Starvation Cap Reductn 0 0 0 0	30th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
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CO Emissions (g/hr) 304 318 13 NOx Emissions (g/hr) 59 62 2 VOC Emissions (g/hr) 70 74 3 Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 128 162 5 Queue Length 95th (ft) 283 352 24 Internal Link Dist (ft) 438 196 85 Turn Bay Length (ft) 882 505 505 Starvation Cap Reductn 0 0 0	Fuel Used(gal)		4					5			0		
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Queue Length 50th (ft) 128 162 5 Queue Length 95th (ft) 283 352 24 Internal Link Dist (ft) 438 196 85 Turn Bay Length (ft) 900 882 505 Starvation Cap Reductn 0 0 0			70					74			3		
Queue Length 95th (ft) 283 352 24 Internal Link Dist (ft) 438 196 85 Turn Bay Length (ft) 882 505 Starvation Cap Reductn 0 0 0	Dilemma Vehicles (#)		0					0			0		
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Base Capacity (vph) 900 882 505 Starvation Cap Reductn 0 0 0	()												
Starvation Cap Reductn 0 0 0			900					882			505		
											0		

Scenario 07 AM Build w/ Improvement Scenario 1 7:30 am 05/19/2021 Build w/ Impr 1 BH

₋anes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Ro	ad

	1	L.	Ļ	~	Ŧ	*	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0			
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%			
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0			
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0			
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0			
Lost Time Adjust (s)			0.0			0.0			
Total Lost Time (s)			5.0			5.0			
Lead/Lag	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Recall Mode	None	None	None		Max	Max			
Walk Time (s)									
Flash Dont Walk (s)									
Pedestrian Calls (#/hr)									
Act Effct Green (s)			8.9			18.3			
Actuated g/C Ratio			0.11			0.22			
v/c Ratio			0.40			0.12			
Control Delay			44.2			0.6			
Queue Delay			0.0			0.0			
Total Delay			44.2			0.6			
LOS			D			А			
Approach Delay			44.2			0.6			
Approach LOS			D			А			
90th %ile Green (s)	13.4	13.4	13.4		18.0	18.0			
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
70th %ile Green (s)	10.2	10.2	10.2		18.0	18.0			
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
50th %ile Green (s)	8.8	8.8	8.8		18.0	18.0			
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
30th %ile Green (s)	7.5	7.5	7.5		18.0	18.0			
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
10th %ile Green (s)	0.0	0.0	0.0		18.0	18.0			
10th %ile Term Code	Skip	Skip	Skip		MaxR	MaxR			
Stops (vph)			50			0			
Fuel Used(gal)			1			0			
CO Emissions (g/hr)			65			7			
NOx Emissions (g/hr)			13			1			
VOC Emissions (g/hr)			15			2			
Dilemma Vehicles (#)			0			0			
Queue Length 50th (ft)			28			0			
Queue Length 95th (ft)			73			3			
Internal Link Dist (ft)			227			150			
Turn Bay Length (ft)									
Base Capacity (vph)			315			460			
Starvation Cap Reductn			0			0			
Spillback Cap Reductn			0			0			
			-						

Scenario 07 AM Build w/ Improvement Scenario 1 7:30 am 05/19/2021 Build w/ Impr 1 BH

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Road	

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.45					0.54			0.02		
Intersection Summary												
Area Type:	Other											
Cycle Length: 121												
Actuated Cycle Length: 82	.5											
Natural Cycle: 125												
Control Type: Semi Act-Un	ncoord											
Maximum v/c Ratio: 0.54												
Intersection Signal Delay:	19.6			Ir	ntersectior	n LOS: B						
Intersection Capacity Utiliz	ation 55.3%			10	CU Level o	of Service	в					
Analysis Period (min) 15												
90th %ile Actuated Cycle:	98.9											
70th %ile Actuated Cycle:	83.2											
50th %ile Actuated Cycle:	81.8											
30th %ile Actuated Cycle:	80.5											
10th %ile Actuated Cycle:	68											

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ ø3	Ø4	* Ø7
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

Lanes, \	/olumes, Tim	ings					
1: Heady	y Street/Pum	b House	Road 8	ton .	Downs &	Oregon I	Road

	۶	-	7	\mathbf{F}	۶.	4	-	•	•	Ť	*	4
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					4			\$		
Traffic Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Future Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					0.99			0.98		
Frt		0.987					0.983			0.932		
Flt Protected							0.999			0.980		
Satd. Flow (prot)	0	1835	0	0	0	0	1817	0	0	1676	0	0
Flt Permitted		0.999					0.987					
Satd. Flow (perm)	0	1833	0	0	0	0	1795	0	0	1710	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	10			2		2		10			4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	363	18	20	7	6	405	59	5	1	5	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	403	0	0	0	0	477	0	0	12	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	CI+Ex	CI+Ex		CI+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					Cl+Ex			CI+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	D	0.0			D	P	0.0		P	0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases	•	2			•	•	6		•	3		
Permitted Phases	2	2			6	6	6		3	-		
Detector Phase	2	2			6	6	6		3	3		

Scenario 09 AM Build w/ Improvement Scenario 2 7:30 am 05/19/2021 Build w/ Impr 2 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L.	Ŧ	~	r	*	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	-	-	4	-		M			
Traffic Volume (vph)	51	1	3	2	1	37	3	10	
Future Volume (vph)	51	1	3	2	1	37	3	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Frt			0.995			0.967			
Flt Protected			0.956			0.964			
Satd. Flow (prot)	0	0	1772	0	0	1708	0	0	
Flt Permitted	U	U	0.736	0	U	0.964	0	0	
Satd. Flow (perm)	0	0	1347	0	0	1699	0	0	
Right Turn on Red	U	U	10-11	Yes	U	1033	0	Yes	
Satd. Flow (RTOR)			1	163		105		163	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			230 5.2			
Confl. Peds. (#/hr)	4		7.0		2	J.Z	10	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	4 0.96	
Adj. Flow (vph)	0.90 53	0.90	0.90	0.90	0.90	0.90 39	0.90	0.90	
Shared Lane Traffic (%)	55	I	3	2	1	29	3	10	
Lane Group Flow (vph)	0	0	59	0	0	53	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left			
Median Width(ft)	Leit	Leit	Len 0	Right	Leit	12	Right	Right	
Link Offset(ft)			0			75			
			16			16			
Crosswalk Width(ft)			10			01			
Two way Left Turn Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Headway Factor		1.00	1.00		1.00 60		1.00	1.00	
Turning Speed (mph)	15 1	60	2	9		60 1	60	60	
Number of Detectors		1			1				
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	0	0	0		0	0			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel	0.0	0.0	0.0		0.0	0.0			
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)			94						
Detector 2 Size(ft)			6						
Detector 2 Type			CI+Ex						
Detector 2 Channel			~ ~						
Detector 2 Extend (s)	-	-	0.0		-	_			
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases			4		_	_			
Permitted Phases	4	4	·		7	7			
Detector Phase	4	4	4		7	7			

Scenario 09 AM Build w/ Improvement Scenario 2 7:30 am 05/19/2021 Build w/ Impr 2 BH

Lanes, Volumes, Tim	lings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

Switch Phase Minimum Initial (s) 40.0 40.0 40.0 5.0	<u>NBT NBR</u> 5.0 29.0	NBR2
Switch Phase Minimum Initial (s) 40.0 40.0 40.0 5.0		
Minimum Split (s) 45.0 45.0 45.0 45.0 29.0 2		
	29.0	
	.2%	
	24.0	
Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	
All-Red Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0	2.0	
Lost Time Adjust (s) 0.0 0.0	0.0	
Total Lost Time (s) 5.0 5.0	5.0	
	ead	
•	Yes	
Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	
	one	
Walk Time (s) 7.0 7.0 7.0		
Flash Dont Walk (s) 11.0 11.0 11.0		
Pedestrian Calls (#/hr) 6 6 6		
Act Effct Green (s) 44.7 44.7	6.2	
).07	
).10	
	12.7	
Queue Delay 0.0 0.0	0.0	
	12.7	
LOS B B	D	
Approach Delay 17.8 19.4 4	12.7	
Approach LOS B B	D	
90th %ile Green (s) 44.0 44.0 44.0 7.6	7.6	
90th %ile Term Code MaxR MaxR MaxR MaxR MaxR Gap (Gap	
70th %ile Green (s) 44.0 44.0 44.0 0.0	0.0	
70th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip S	Skip	
50th %ile Green (s) 44.0 44.0 44.0 0.0	0.0	
50th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip S	Skip	
30th %ile Green (s) 44.0 44.0 44.0 0.0	0.0	
30th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip S	Skip	
10th %ile Green (s) 44.0 44.0 44.0 0.0	0.0	
10th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip S	Skip	
Stops (vph) 239 302	13	
Fuel Used(gal) 4 4	0	
CO Emissions (g/hr) 299 312	13	
NOx Emissions (g/hr) 58 61	3	
VOC Emissions (g/hr) 69 72	3	
Dilemma Vehicles (#) 0 0	0	
Queue Length 50th (ft) 129 163	6	
Queue Length 95th (ft) 302 376	27	
Internal Link Dist (ft) 438 196	85	
Turn Bay Length (ft)		
	477	
Starvation Cap Reductn 0 0	0	
Spillback Cap Reductn 0 0	0	

Scenario 09 AM Build w/ Improvement Scenario 2 7:30 am 05/19/2021 Build w/ Impr 2 BH

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Roac	l

	1	L.	Ļ	~	Ł	•	*	4			
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2			
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0					
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (%)	19.2%	19.2%	19.2%		18.4%	18.4%					
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0					
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0					
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0					
Lost Time Adjust (s)			0.0			0.0					
Total Lost Time (s)			5.0			5.0					
Lead/Lag	Lag	Lag	Lag								
Lead-Lag Optimize?	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Recall Mode	None	None	None		Max	Max					
Walk Time (s)	7.0	7.0	7.0								
Flash Dont Walk (s)	11.0	11.0	11.0								
Pedestrian Calls (#/hr)	2	2	2								
Act Effct Green (s)			9.8			18.3					
Actuated g/C Ratio			0.11			0.21					
v/c Ratio			0.39			0.12					
Control Delay			44.8			0.8					
Queue Delay			0.0			0.0					
Total Delay			44.8			0.8					
LOS			D			А					
Approach Delay			44.8			0.8					
Approach LOS			D			Α					
90th %ile Green (s)	18.0	18.0	18.0		18.0	18.0					
90th %ile Term Code	Ped	Ped	Ped		MaxR	MaxR					
70th %ile Green (s)	10.4	10.4	10.4		18.0	18.0					
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
50th %ile Green (s)	9.0	9.0	9.0		18.0	18.0					
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
30th %ile Green (s)	7.6	7.6	7.6		18.0	18.0					
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					_
10th %ile Green (s)	0.0	0.0	0.0		18.0	18.0					
10th %ile Term Code	Skip	Skip	Skip		MaxR	MaxR					_
Stops (vph)			49			0					
Fuel Used(gal)			1			0					_
CO Emissions (g/hr)			65			7					
NOx Emissions (g/hr)			13			1					_
VOC Emissions (g/hr)			15			2					
Dilemma Vehicles (#)			0			0					_
Queue Length 50th (ft)			30			0					
Queue Length 95th (ft)			75			3					
Internal Link Dist (ft)			227			150					
Turn Bay Length (ft)						100					
Base Capacity (vph)			298			438					
Starvation Cap Reductn			0			0					
Spillback Cap Reductn			0			0					

Scenario 09 AM Build w/ Improvement Scenario 2 7:30 am 05/19/2021 Build w/ Impr 2 BH

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Road	

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.43					0.52			0.03		
Intersection Summary												
Area Type:	Other											
Cycle Length: 125												
Actuated Cycle Length: 87	' .5											
Natural Cycle: 125												
Control Type: Actuated-Ur	ncoordinated											
Maximum v/c Ratio: 0.52												
Intersection Signal Delay:	19.6			lr	ntersectior	LOS: B						
Intersection Capacity Utiliz	zation 55.3%			10	CU Level o	of Service	В					
Analysis Period (min) 15												
90th %ile Actuated Cycle:												
70th %ile Actuated Cycle:	87.4											
50th %ile Actuated Cycle:	86											
30th %ile Actuated Cycle:	84.6											
10th %ile Actuated Cycle:	72											

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ ø3	Ø4	1 07
49 s	29 s	24 s	23 s
₩ Ø6			
49 s			

Intersection Summary

Lanes, \	/olumes, Tim	ings					
1: Heady	y Street/Pum	b House	Road 8	ton .	Downs &	Oregon I	Road

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$				ħ.	el el			÷		
Traffic Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Future Volume (vph)	2	348	17	19	7	6	389	57	5	1	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					0.99			0.98		
Frt		0.987					0.981			0.932		
Flt Protected						0.950				0.980		
Satd. Flow (prot)	0	1835	0	0	0	1770	1814	0	0	1675	0	0
Flt Permitted		0.999				0.421						
Satd. Flow (perm)	0	1833	0	0	0	784	1814	0	0	1709	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	10			2		2		10			4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	363	18	20	7	6	405	59	5	1	5	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	403	0	0	0	13	464	0	0	12	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12	Ŭ	Ŭ			12	Ŭ		0	Ŭ	Ŭ
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	CI+Ex			Cl+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					CI+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			pm+pt	pm+pt	NA		Perm	NA		
Protected Phases		2			1	1	6			3		
Permitted Phases	2				6	6	6		3			
Detector Phase	2	2			1	1	6		3	3		
	L	L					v		~	v		

Scenario 11 AM Build w/ Improvement Scenario 3 7:30 am 05/19/2021 Build w/ Impr 3 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L.	Ļ	~	r	*	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations			4	•=		M			_
Traffic Volume (vph)	51	1	3	2	1	37	3	10	
Future Volume (vph)	51	1	3	2	1	37	3	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Frt			0.995			0.967			
Flt Protected			0.956			0.964			
Satd. Flow (prot)	0	0	1772	0	0	1706	0	0	
Flt Permitted	Ű	Ŭ	0.736	Ū	Ŭ	0.964	Ű	Ŭ	
Satd. Flow (perm)	0	0	1346	0	0	1696	0	0	
Right Turn on Red	Ű	Ŭ	1010	Yes	Ŭ	1000	Ű	Yes	
Satd. Flow (RTOR)			1	100		133		100	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)	4		1.0		2	0.2	10	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	53	1	3	2	1	39	3	10	
Shared Lane Traffic (%)	00		U	~		00	U	10	
Lane Group Flow (vph)	0	0	59	0	0	53	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Lon	Lon	0	rugitt	Lon	12	rtight	rugni	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	60	1.00	9	60	60	60	60	
Number of Detectors	13	1	2	J	1	1	00	00	
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	0	0	0		0	0			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	CI+Ex	Cl+Ex		CI+Ex	CI+Ex			
Detector 1 Channel									
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)	0.0	0.0	94		0.0	0.0			
Detector 2 Size(ft)			6						
Detector 2 Type			Cl+Ex						
Detector 2 Channel									
Detector 2 Extend (s)			0.0						
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases			4						
Permitted Phases	4	4	4		7	7			
Detector Phase	4	4	4		7	7			
	4	4	4		1	1			

Scenario 11 AM Build w/ Improvement Scenario 3 7:30 am 05/19/2021 Build w/ Impr 3 BH

1: Heady Street/Pu	0	use Ro	ad & E	Eton D	owns &	k Oreg	on Roa	ad			08/	13/2021
	٦	-	7	7	۶.	4	ł	*	1	1	1	م
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Switch Phase												
Minimum Initial (s)	40.0	40.0			5.0	5.0	40.0		5.0	5.0		
Minimum Split (s)	45.0	45.0			9.5	9.5	45.0		29.0	29.0		
Total Split (s)	49.5	49.5			9.5	9.5	59.0		29.0	29.0		
Total Split (%)	36.7%	36.7%			7.0%	7.0%	43.7%		21.5%	21.5%		
Maximum Green (s)	44.5	44.5			5.0	5.0	54.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.5	3.5	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			1.0	1.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0				0.0	0.0			0.0		
Total Lost Time (s)		5.0				4.5	5.0			5.0		
Lead/Lag	Lag	Lag			Lead	Lead			Lead	Lead		
Lead-Lag Optimize?	Yes	Yes			Yes	Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			None	None	Max		None	None		
Walk Time (s)	Max	max			None	Tiono	7.0		Nono	Tiono		
Flash Dont Walk (s)							11.0					
Pedestrian Calls (#/hr)							6					
Act Effct Green (s)		53.2				55.3	54.7			6.3		
Actuated g/C Ratio		0.54				0.56	0.56			0.06		
v/c Ratio		0.41				0.03	0.46			0.00		
Control Delay		18.2				13.6	17.0			47.2		
Queue Delay		0.0				0.0	0.0			0.0		
Total Delay		18.2				13.6	17.0			47.2		
LOS		10.2 B				B	ни.0 В			чт.2 D		
Approach Delay		18.2				U	16.9			47.3		
Approach LOS		10.2 B					10.5 B			чт.5 D		
90th %ile Green (s)	44.5	44.5			5.0	5.0	54.0		7.8	7.8		
90th %ile Term Code	MaxR	MaxR			Max	Max	MaxR		Gap	Gap		
70th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
70th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
50th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
50th %ile Term Code	Hold	Hold			Skip	Skip	MaxR			Skip		
30th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		Skip 0.0	0.0		
30th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
10th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
10th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
Stops (vph)	TIOIU	228			Зкір	<u> 6</u>	260		Зкір	13		
Fuel Used(gal)		4				0	200			0		
CO Emissions (g/hr)		297				6	275			14		
NOx Emissions (g/hr)		58				1	53			3		
		69				1	64			3		
VOC Emissions (g/hr) Dilemma Vehicles (#)		09				0	04			0		
		131				3				7		
Queue Length 50th (ft)		346				3 17	158 355			29		
Queue Length 95th (ft)		346 438				17				29 85		
Internal Link Dist (ft)		430					196			00		
Turn Bay Length (ft)		005				400	1014			105		
Base Capacity (vph)		995				493	1014			425		
Starvation Cap Reductn		0				0	0			0		
Spillback Cap Reductn		0				0	0			0		

Lanes, Volumes, Timings . . . \sim _ _

Scenario 11 AM Build w/ Improvement Scenario 3 7:30 am 05/19/2021 Build w/ Impr 3 BH

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Roa	ad

	1	L.	ŧ	~	F	*	*	4		
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2		
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0				
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0				
Total Split (s)	24.0	24.0	24.0		23.0	23.0				
Total Split (%)	17.8%	17.8%	17.8%		17.0%	17.0%				
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0				
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0				
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0				
Lost Time Adjust (s)			0.0			0.0				
Total Lost Time (s)			5.0			5.0				
Lead/Lag	Lag	Lag	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Recall Mode	None	None	None		Max	Max				
Walk Time (s)	7.0	7.0	7.0							
Flash Dont Walk (s)	11.0	11.0	11.0							
Pedestrian Calls (#/hr)	2	2	2							
Act Effct Green (s)			10.2			18.2				
Actuated g/C Ratio			0.10			0.19				
v/c Ratio			0.42			0.12				
Control Delay			51.4			0.6				
Queue Delay			0.0			0.0				
Total Delay			51.4			0.6				
LOS			D			А				
Approach Delay			51.4			0.6				
Approach LOS			D			А				
90th %ile Green (s)	18.0	18.0	18.0		18.0	18.0				
90th %ile Term Code	Ped	Ped	Ped		MaxR	MaxR				
70th %ile Green (s)	11.0	11.0	11.0		18.0	18.0				
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
50th %ile Green (s)	9.5	9.5	9.5		18.0	18.0				
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
30th %ile Green (s)	8.0	8.0	8.0		18.0	18.0				
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
10th %ile Green (s)	0.0	0.0	0.0		18.0	18.0				
10th %ile Term Code	Skip	Skip	Skip		MaxR	MaxR				
Stops (vph)			50			0				
Fuel Used(gal)			1			0				
CO Emissions (g/hr)			71			7				
NOx Emissions (g/hr)			14			1				
VOC Emissions (g/hr)			16			2				
Dilemma Vehicles (#)			0			0				
Queue Length 50th (ft)			34			0				
Queue Length 95th (ft)			82			0				
Internal Link Dist (ft)			227			150				
Turn Bay Length (ft)			007			10.1				
Base Capacity (vph)			265			424				
Starvation Cap Reductn			0			0				
Spillback Cap Reductn			0			0				

Scenario 11 AM Build w/ Improvement Scenario 3 7:30 am 05/19/2021 Build w/ Impr 3 BH

Lanes, Volur	nes, Timings	
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road	ł

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0				0	0			0		
Reduced v/c Ratio		0.41				0.03	0.46			0.03		
Intersection Summary												
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 9	7.9											
Natural Cycle: 135												
Control Type: Actuated-U	ncoordinated											
Maximum v/c Ratio: 0.46												
Intersection Signal Delay:	18.9			Ir	ntersectior	n LOS: B						
Intersection Capacity Utili	zation 55.3%			10	CU Level o	of Service	B					
Analysis Period (min) 15												
90th %ile Actuated Cycle:	117.8											
70th %ile Actuated Cycle:	98											
50th %ile Actuated Cycle:	96.5											
30th %ile Actuated Cycle:	95											
10th %ile Actuated Cycle:	82											

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

€ Ø1 →Ø2	↑ ø3	Ø4	1 07
9.5 s 49.5 s	29 s	24 s	23 s
₩ Ø6			
59 s			

Lanes, Volumes, Tir	nings
1: Heady Street/Pun	np House Road & Eton Downs & Oregon Road

	۶	+	ľ	*	£	4	┥	*	•	Ť	1	4
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					4			\$		
Traffic Volume (vph)	3	447	24	3	19	4	444	56	6	3	1	1
Future Volume (vph)	3	447	24	3	19	4	444	56	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992					0.986			0.975		
Flt Protected							0.998			0.973		
Satd. Flow (prot)	0	1848	0	0	0	0	1833	0	0	1767	0	0
Flt Permitted		0.998					0.968					
Satd. Flow (perm)	0	1844	0	0	0	0	1778	0	0	1816	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	466	25	3	20	4	463	58	6	3	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	497	0	0	0	0	545	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		- ingini
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane										-		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type		CI+Ex			Cl+Ex	CI+Ex	CI+Ex			CI+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					CI+Ex			CI+Ex		
Detector 2 Channel		••• =••					0. =/			••• =••		
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2	_			6	6	6		3	Ŭ		
Detector Phase	2	2			6	6	6		3	3		
Switch Phase	_	_			Ű	Ŭ	Ŭ,		Ű	Ŭ		
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
	.0.0	.0.0			.0.0	.0.0	.0.0		0.0	0.0		

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L.	Ŧ	~	F	•	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations			4	•==		M			
Traffic Volume (vph)	90	3	2	8	1	19	6	29	
Future Volume (vph)	90	3	2	8	1	19	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.990	1.00	1.00	0.915	1.00	1.00	
Flt Protected			0.957			0.982			
Satd. Flow (prot)	0	0	1765	0	0	1674	0	0	
Flt Permitted	U	0	0.738	U	U	0.982	U	U	
Satd. Flow (perm)	0	0	1361	0	0	1674	0	0	
Right Turn on Red	U	0	1001	Yes	U	1074	U	Yes	
Satd. Flow (RTOR)			3	163		108		163	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0.90 94	0.90	0.90	0.90	0.90	20	0.90	0.90 30	
Shared Lane Traffic (%)	34	J	2	U	1	20	U	30	
Lane Group Flow (vph)	0	0	107	0	0	57	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Leil	Leit	Len 0	Nynt	Leit	12	Nynt	Nynt	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	1.00	60	1.00	9	60	60	60	60	
Number of Detectors	13	1	2	3	1	1	00	00	
Detector Template	Left	Left	Z Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	20	20	001		20	20			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex			
Detector 1 Channel	OFEX								
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)	0.0	0.0	0.0 94		0.0	0.0			
Detector 2 Size(ft)			94						
Detector 2 Type			CI+Ex						
Detector 2 Channel									
Detector 2 Extend (s)			0.0						
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases	Felli	Peilli	NA 4		Peilli	Feilli			
Protected Phases Permitted Phases	4	Λ	4		7	7			
Detector Phase	4	4	4		7 7	7 7			
	4	4	4		1	1			
Switch Phase	E 0	5.0	50		20	20			
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0			

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

Lanes, Volumes, T	•		I O T			0	D -	1			0.04	13/2021
1: Heady Street/Pu		lse Ro			owns a	s Oreg	jon Roa				00/	
	٠	-	\neg	\rightarrow	•	1	-	•	1	Ť	1	۴۹ –
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag		0.0					0.0		Lead	Lead		
Lead-Lag Optimize?									Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			Max	Max	Max		None	None		
Walk Time (s)	7.0	7.0			7.0	7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0			0	0	0		0	0		
Act Effct Green (s)	U	40.3			U	0	40.3		U	6.1		
Actuated g/C Ratio		0.46					0.46			0.07		
v/c Ratio		0.40					0.40			0.07		
		22.7					25.3			41.3		
Control Delay												
Queue Delay		0.0					0.0			0.0		
Total Delay		22.7					25.3			41.3		
LOS		C					С			D		
Approach Delay		22.7					25.3			41.3		
Approach LOS	40.0	C			40.0	40.0	C		7.0	D		
90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.3	7.3		
90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		
70th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
70th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
50th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
30th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
30th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
10th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
10th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
Stops (vph)		346					392			12		
Fuel Used(gal)		6					6			0		
CO Emissions (g/hr)		422					418			12		
NOx Emissions (g/hr)		82					81			2		
VOC Emissions (g/hr)		98					97			3		
Dilemma Vehicles (#)		0					0			0		
Queue Length 50th (ft)		183					211			5		
Queue Length 95th (ft)		395					#467			24		
Internal Link Dist (ft)		438					196			85		
Turn Bay Length (ft)												
Base Capacity (vph)		848					817			502		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.59					0.67			0.02		

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM ΒH

Lanes, Volumes, Tim	ings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

	1	L,	Ŧ	~	£	*	•	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%			
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0			
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0			
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0			
Lost Time Adjust (s)			0.0			0.0			
Total Lost Time (s)			5.0			5.0			
Lead/Lag	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Recall Mode	None	None	None		Max	Max			
Walk Time (s)	7.0	7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)	0	0	0		0	0			
Act Effct Green (s)	Ū	•	12.0		Ŭ	18.2			
Actuated g/C Ratio			0.14			0.21			
v/c Ratio			0.57			0.13			
Control Delay			47.2			1.4			
Queue Delay			0.0			0.0			
Total Delay			47.2			1.4			
LOS			D			A			
Approach Delay			47.2			1.4			
Approach LOS			D			A			
90th %ile Green (s)	18.5	18.5	18.5		18.0	18.0			
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
70th %ile Green (s)	13.7	13.7	13.7		18.0	18.0			
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
50th %ile Green (s)	11.7	11.7	11.7		18.0	18.0			
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
30th %ile Green (s)	9.8	9.8	9.8		18.0	18.0			
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
10th %ile Green (s)	7.3	7.3	7.3		18.0	18.0			
10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
Stops (vph)	Gap	Gap	90		IVIANIN	1			
Fuel Used(gal)			2			0			
CO Emissions (g/hr)			121			8			
NOx Emissions (g/hr)			24			2			
VOC Emissions (g/hr)			24			2			
Dilemma Vehicles (#)			20			0			
			52			0			
Queue Length 50th (ft)			52 117			5			
Queue Length 95th (ft)			227			5 150			
Internal Link Dist (ft)			221			150			
Turn Bay Length (ft)			000			400			
Base Capacity (vph)			299			432			
Starvation Cap Reductn			0			0			
Spillback Cap Reductn			0			0			
Storage Cap Reductn			0			0			
Reduced v/c Ratio			0.36			0.13			

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

Intersection Summary		
Area Type: Other		
Cycle Length: 121		
Actuated Cycle Length: 87.7		
Natural Cycle: 125		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.67		
Intersection Signal Delay: 25.2	Intersection LOS: C	
Intersection Capacity Utilization 67.6%	ICU Level of Service C	
Analysis Period (min) 15		
90th %ile Actuated Cycle: 103.8		
70th %ile Actuated Cycle: 86.7		
50th %ile Actuated Cycle: 84.7		
30th %ile Actuated Cycle: 82.8		
10th %ile Actuated Cycle: 80.3		
# 95th percentile volume exceeds capacity, queu	e may be longer.	
Queue shown is maximum after two cycles		

Queue shown is maximum after two cycles.

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ø3	Ø4	107
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

	-	\mathbf{i}	4	←	1	1				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	÷		1	<u> </u>	Y					
Traffic Volume (veh/h)	558	147	57	538	164	55				
Future Volume (veh/h)	558	147	57	538	164	55				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)	Ţ	1.00	1.00	•	1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No	No					
Lanes Open During Work Zon										
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	581	153	59	560	171	57				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence			No		No					
Cap, veh/h	748	197	397	1221	269	90				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.52	0.52	0.09	0.65	0.21	0.21				
Unsig. Movement Delay										
Ln Grp Delay, s/veh	0.0	19.9	9.9	7.4	34.3	0.0				
Ln Grp LOS	A	В	A	А	С	A				
Approach Vol, veh/h	734			619	229					
Approach Delay, s/veh	19.9			7.7	34.3					
Approach LOS	В			А	С					
Timer:		1	2	3	4	5	6	7	8	
Assigned Phs			2	3	4	5	0	1	8	
Case No			12.0	1.2	8.0				4.0	
Phs Duration (G+Y+Rc), s			20.0	9.2	42.8				52.0	
Change Period (Y+Rc), s			5.0	3.0	42.0 5.0				52.0	
Max Green (Gmax), s			15.0	9.0	35.0				47.0	
Max Allow Headway (MAH), s			3.9	3.8	5.3				5.2	
Max Q Clear (g_c+l1), s			10.7	2.9	25.5				12.7	
Green Ext Time (g_e), s			0.3	0.0	3.6				4.2	
Prob of Phs Call (p_c)			1.00	0.69	1.00				1.00	
Prob of Max Out (p_x)			0.00	0.05	0.00				0.00	
			0.00	0.00	0.00				0.00	
Left-Turn Movement Data										
Assigned Mvmt			5	3	7					
Mvmt Sat Flow, veh/h			1291	1781	0					
Through Movement Data										
Assigned Mvmt			2		4				8	
Mvmt Sat Flow, veh/h			8		1427				1870	
Right-Turn Movement Data										
Assigned Mvmt			12		14				18	
Mvmt Sat Flow, veh/h			430		376				0	
Left Lane Group Data										
Assigned Mvmt		0	5	3	7	0	0	0	0	
Lane Assignment		Ű	L+T+RL (•		,		Ŭ	,	

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	229	59	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1728	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	8.7	0.9	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	8.7	0.9	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	723	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	39.8	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	37.8	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.75	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	360	397	0	0	0	0	0	
V/C Ratio (X)	0.00	0.64	0.15	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	360	466	0.00	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	26.0	9.8	0.00	0.00	0.00	0.0	0.00	
Incr Delay (d2), s/veh	0.0	8.3	0.2	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	34.3	9.9	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	3.4	0.3	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.00	4.2	0.3	0.0	0.00	0.00	0.00	0.00	
%ile Storage Ratio (RQ%)	0.00	0.26	0.15	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.20	0.15	0.00	0.00	0.00	0.00	0.00	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	560	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data									
Assigned Mvmt	0	12	0	14	0	0	0	18	
Lane Assignment	U	12	U	T+R	U	U	U	10	
Lanes in Grp	0	0	0	1	0	0	0	0	
Grp Vol (v), veh/h	0	0	0	734	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	0	0	1803	0	0	0	0	
Q Serve Time (g_s), s	0.0	0.0	0.0	23.5	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	23.5	0.0	0.0	0.0	0.0	
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.25	0.00	0.21	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0.00	0.20	0.00	946	0.00	0.00	0.00	0.00	
V/C Ratio (X)	0.00	0.00	0.00	0.78	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	0.00	0.00	946	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.7	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	19.9	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/In	0.0	0.0	0.0	9.9	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary									
HCM 6th Ctrl Delay		17.2							
HCM 6th LOS		В							
Notoo									

Notes

User approved volume balancing among the lanes for turning movement.

0.8

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
	EDL		EDK	VVDL		VVDR	INDL		NDK	SDL		SDK	
Lane Configurations		- 4 2-			- 4 >			- 4 >			- 4 >		
Traffic Vol, veh/h	15	487	6	8	440	4	2	1	2	10	1	22	
Future Vol, veh/h	15	487	6	8	440	4	2	1	2	10	1	22	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	16	529	7	9	478	4	2	1	2	11	1	24	

Major/Minor	Major1		Major	2		Minor1			Minor2			
Conflicting Flow All	482	0	0 53	<u> 6</u> 0	0	1076	1065	533	1064	1066	480	
Stage 1	-	-	-		-	565	565	-	498	498	-	
Stage 2	-	-	-		-	511	500	-	566	568	-	
Critical Hdwy	4.12	-	- 4.12	2 -	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-		-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-		-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	- 2.21	3 -	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1081	-	- 103	2 -	-	197	223	547	201	222	586	
Stage 1	-	-	-		-	510	508	-	554	544	-	
Stage 2	-	-	-		-	545	543	-	509	506	-	
Platoon blocked, %		-	-	-	-							
Mov Cap-1 Maneuver	1081	-	- 103	2 -	-	184	216	547	194	215	586	
Mov Cap-2 Maneuver	-	-	-		-	184	216	-	194	215	-	
Stage 1	-	-	-		-	499	497	-	542	537	-	
Stage 2	-	-	-		-	515	536	-	495	495	-	
Approach	EB		WE	3		NB			SB			
HCM Control Delay, s	0.2		0.2	2		19.1			16.4			
HCM LOS						С			С			

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR \$	SBLn1	
Capacity (veh/h)	261	1081	-	-	1032	-	-	352	
HCM Lane V/C Ratio	0.021	0.015	-	-	800.0	-	-	0.102	
HCM Control Delay (s)	19.1	8.4	0	-	8.5	0	-	16.4	
HCM Lane LOS	С	А	А	-	А	А	-	С	
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3	

21

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4	TIDI(4		001	4	0.0.1	
Traffic Vol, veh/h	53	527	1	1	517	218	2	2	2	132	1	20	
Future Vol, veh/h	53	527	1	1	517	218	2	2	2	132	1	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	,# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	55	549	1	1	539	227	2	2	2	138	1	21	

766			Major2			Minor1			Minor2			
100	0	0	550	0	0	1326	1428	550	1317	1315	653	
-	-	-	-	-	-	660	660	-	655	655	-	
-	-	-	-	-	-	666	768	-	662	660	-	
4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
-	-	-	-	-	-			-			-	
-	-	-	-	-	-			-			-	
	-	-		-	-							
847	-	-	1020	-	-			535			467	
-	-	-	-	-	-			-			-	
-	-	-	-	-	-	449	411	-	451	460	-	
	-	-		-	-							
847	-	-	1020	-	-						467	
-	-	-	-	-	-			-			-	
-	-	-	-	-	-			-			-	
-	-	-	-	-	-	427	410	-	405	417	-	
EB			WB			NB			SB			
0.9			0			28.3			198.1			
						D			F			
nt N	VBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
	161	847	-	-	1020	-	-	135				
		0.065	-	-		-	-					
			0	-		0						
	D	A	A	-	A	A	-	F				
)	0.1	0.2	-	-	0	-	-	9.4				
oacity	\$: De	elay exc	eeds 30)0s	+: Com	putatio	n Not D	efined	*: All	major	volume i	in platoon
	- 2.218 847 - - 847 - - - - - -	 4.12 - 2.218 - 847 - 847 - 847 - 847 - 	4.12 2.218 847 847 	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	- $ 4.12$ $ 2.218$ $ 2.218$ $ 847$ $ 1020$ $ 847$ $ 1020$ $ 847$ $ 1020$ $ 0.9$ 0 0 $ 0.039$ 0.065 $-$	- - - - 666 4.12 - 7.12 - 7.12 - - - - 6.12 - - 2.218 - 3.518 847 - 1020 - 133 - - - - 449 - - - - 449 - - - - 449 - - - - 449 - - - - 449 - - - - 117 - - - - 117 - - - - 410 - - - - 427 EB WB NB NB D 0.9 0 28.3 D D 161 847 - - 1020 - 0.0.039 0.065 - 0.001 - 28.3 9.5 0 </td <td>- - - - 666 768 4.12 - - 7.12 6.52 - - - 6.12 5.52 2.218 - 2.218 - 3.518 4.018 847 - 1020 - 133 135 - - - - 449 411 - - - - 449 411 - - - - 449 411 - - - - 449 411 - - - - 117 122 - - - - 117 122 - - - - 117 122 - - - - 410 417 - - - - 427 410 EB WB WB WB WB WB 0.039 0.065 - 0.001 - - 0.0.1</td> <td>- - - - 666 768 - 4.12 - - 7.12 6.52 6.22 - - - - 6.12 5.52 - - - 2.218 - 3.518 4.018 3.318 847 - 1020 - - 133 135 535 - - - - 449 411 - - - - - 449 411 - - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535</td> <td>- - - - 666 768 - 662 4.12 - - 7.12 6.52 6.22 7.12 - - - 6.12 5.52 - 6.12 - - - - 6.12 5.52 - 6.12 2.218 - 2.218 - - 3.518 4.018 3.318 3.518 847 - 1020 - - 133 135 535 - 134 - - - - 449 411 - 451 - - - - - 122 535 - 122 - - - - - 117 122 535 - 122 - - - - 117 122 - 122 - - - - 410 417 - 412 - - - - 427 410 405</td> <td>- - - - 666 768 - 662 660 4.12 - - 7.12 6.52 6.22 7.12 6.52 - - - 6.12 5.52 - 6.12 5.52 2.218 - 2.218 - - 6.12 5.52 - 6.12 5.52 2.218 - 1020 - 133 135 535 -134 158 847 - 1020 - 133 135 535 -134 158 - - - - 449 411 - 451 460 - - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 <td>- - - - 666 768 - 662 660 - 4.12 - 4.12 - - 7.12 6.52 6.22 7.12 6.52 6.22 - - - - 6.12 5.52 - 6.12 5.52 - 2.218 - 2.218 - 3.518 4.018 3.318 3.518 4.018 3.318 847 - 1020 - - 133 135 535 - 134 158 467 - - - - 449 411 - 451 460 - - - - - - 117 122 535 -122 143 467 - - - - 117 122 535 -122 143 467 - - - 117 122 535 -122 143 467 - - - 117 122 53 -122</td></td>	- - - - 666 768 4.12 - - 7.12 6.52 - - - 6.12 5.52 2.218 - 2.218 - 3.518 4.018 847 - 1020 - 133 135 - - - - 449 411 - - - - 449 411 - - - - 449 411 - - - - 449 411 - - - - 117 122 - - - - 117 122 - - - - 117 122 - - - - 410 417 - - - - 427 410 EB WB WB WB WB WB 0.039 0.065 - 0.001 - - 0.0.1	- - - - 666 768 - 4.12 - - 7.12 6.52 6.22 - - - - 6.12 5.52 - - - 2.218 - 3.518 4.018 3.318 847 - 1020 - - 133 135 535 - - - - 449 411 - - - - - 449 411 - - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535 - - - - 117 122 535	- - - - 666 768 - 662 4.12 - - 7.12 6.52 6.22 7.12 - - - 6.12 5.52 - 6.12 - - - - 6.12 5.52 - 6.12 2.218 - 2.218 - - 3.518 4.018 3.318 3.518 847 - 1020 - - 133 135 535 - 134 - - - - 449 411 - 451 - - - - - 122 535 - 122 - - - - - 117 122 535 - 122 - - - - 117 122 - 122 - - - - 410 417 - 412 - - - - 427 410 405	- - - - 666 768 - 662 660 4.12 - - 7.12 6.52 6.22 7.12 6.52 - - - 6.12 5.52 - 6.12 5.52 2.218 - 2.218 - - 6.12 5.52 - 6.12 5.52 2.218 - 1020 - 133 135 535 -134 158 847 - 1020 - 133 135 535 -134 158 - - - - 449 411 - 451 460 - - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 - - - - 117 122 535 -122 143 <td>- - - - 666 768 - 662 660 - 4.12 - 4.12 - - 7.12 6.52 6.22 7.12 6.52 6.22 - - - - 6.12 5.52 - 6.12 5.52 - 2.218 - 2.218 - 3.518 4.018 3.318 3.518 4.018 3.318 847 - 1020 - - 133 135 535 - 134 158 467 - - - - 449 411 - 451 460 - - - - - - 117 122 535 -122 143 467 - - - - 117 122 535 -122 143 467 - - - 117 122 535 -122 143 467 - - - 117 122 53 -122</td>	- - - - 666 768 - 662 660 - 4.12 - 4.12 - - 7.12 6.52 6.22 7.12 6.52 6.22 - - - - 6.12 5.52 - 6.12 5.52 - 2.218 - 2.218 - 3.518 4.018 3.318 3.518 4.018 3.318 847 - 1020 - - 133 135 535 - 134 158 467 - - - - 449 411 - 451 460 - - - - - - 117 122 535 -122 143 467 - - - - 117 122 535 -122 143 467 - - - 117 122 535 -122 143 467 - - - 117 122 53 -122

Scenario 2 Existing PM 4:30 pm 05/19/2021 Existing PM BH

08/12	2/2021
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Intersection						
Int Delay, s/veh	0.2					
		FDT	MOT		0.01	000
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		- କୀ	- î÷		۰¥	
Traffic Vol, veh/h	2	598	527	4	7	3
Future Vol, veh/h	2	598	527	4	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	
Storage Length	-	-	-	-	0	-
Veh in Median Storage	. # -	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	616	543	4	7	3
	_	010	0.0			•

Major/Minor	Major1	Ν	/lajor2	I	Minor2		
Conflicting Flow All	547	0	-	0	1165	545	5
Stage 1	-	-	-	-	545	-	-
Stage 2	-	-	-	-	620	-	
Critical Hdwy	4.12	-	-	-	6.42	6.22)
Critical Hdwy Stg 1	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	-	3.518		
Pot Cap-1 Maneuver	1022	-	-	-	215	538	\$
Stage 1	-	-	-	-	581	-	-
Stage 2	-	-	-	-	536	-	-
Platoon blocked, %		-	-	-			
Mov Cap-1 Maneuver		-	-	-	214	538	\$
Mov Cap-2 Maneuver	· -	-	-	-	214	-	-
Stage 1	-	-	-	-	579	-	-
Stage 2	-	-	-	-	536	-	-
Approach	EB		WB		SB		
HCM Control Delay, s	; O		0		19.4		
HCM LOS					С		
Minor Lane/Major Mvr	mt	EBL	EBT	WBT	WBR :	SBLn1	
Capacity (veh/h)		1022	-	-	-	261	
HCM Lane V/C Ratio		0.002	-	-	-	0.039	
HCM Control Delay (s	5)	8.5	0	-	-	19.4	ł
HCM Lane LOS	,	А	А	-	-	С	;
						0.1	

Int Delay, s/veh	0						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	ef 👘			ب	Y		
Traffic Vol, veh/h	605	0	0	539	0	0)
Future Vol, veh/h	605	0	0	539	0	0)
Conflicting Peds, #/hr	0	0	0	0	0	0)
Sign Control	Free	Free	Free	Free	Stop	Stop)
RT Channelized	-	None	-	None	-	None	ļ
Storage Length	-	-	-	-	0	-	
Veh in Median Storage,	# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	2
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	658	0	0	586	0	0)

Major/Minor M	Major1	Ν	Major2		Minor1	
Conflicting Flow All	0	0	658	0		658
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	586	-
Critical Hdwy	-	-	4.12	-		6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	930	-	192	464
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	556	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	930	-	192	464
Mov Cap-2 Maneuver	-	-	-	-	192	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	556	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		0	
HCM LOS	Ū		U		Ă	
					7.	
						MOT
Minor Lane/Major Mvm	t I	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		-	-	-	930	-
HCM Lane V/C Ratio		-	-	-	-	-
HCM Control Delay (s)		0	-	-	0	-
HCM Lane LOS		A	-	-	A	-
HCM 95th %tile Q(veh)		-	-	-	0	-

Lanes, V	'olumes, Timings	
1: Heady	v Street/Pump House Road & Eton Downs & Oregon F	₹oad

	۶	+	7	\mathbf{F}	۶.	4	+	*	•	Ť	*	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			\$		
Traffic Volume (vph)	3	460	25	3	19	5	458	58	6	3	1	1
Future Volume (vph)	3	460	25	3	19	5	458	58	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992					0.986			0.975		
Flt Protected							0.998			0.973		
Satd. Flow (prot)	0	1848	0	0	0	0	1833	0	0	1767	0	0
Flt Permitted	•	0.998	•	•	•	•	0.967	•	•		•	
Satd. Flow (perm)	0	1844	0	0	0	0	1776	0	0	1816	0	0
Right Turn on Red	v	1011	Ū	No	v	Ū	1110	No	v	1010	Ū	Yes
Satd. Flow (RTOR)				110						1		100
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.90	479	26	0.90	20	0.90	477	0.90 60	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	479	20	3	20	5	477	00	0	3	I	1
Shared Lane Traffic (%)	0	E 1 1	0	0	0	0	500	٥	0	11	٥	0
Lane Group Flow (vph)	0	511	0	0	0	0	562	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			CI+Ex	CI+Ex	Cl+Ex		CI+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		Cl+Ex					Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2	_			6	6	6		3	,		
Detector Phase	2	2			6	6	6		3	3		
Switch Phase	2	2			U	U	U		J	0		
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
	10.0	10.0			10.0	10.0	10.0		0.0	0.0		

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM BH
Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	×	L.	Ŧ	~	F	•	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	0011	001	4	0011		M			
Traffic Volume (vph)	93	3	2	8	1	19	6	29	
Future Volume (vph)	93	3	2	8	1	19	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.990	1.00	1.00	0.915	1.00	1.00	
Fit Protected			0.990			0.915			
	0	0	1765	0	0	1674	0	0	
Satd. Flow (prot) Flt Permitted	U	U	0.738	U	U	0.982	U	U	
	0	0		0	0		0	0	
Satd. Flow (perm)	0	0	1361	0	0	1674	0	0	
Right Turn on Red			0	Yes		400		Yes	
Satd. Flow (RTOR)			3			108			
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	97	3	2	8	1	20	6	30	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	0	110	0	0	57	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)			0			12			
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane									
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	60		9	60	60	60	60	
Number of Detectors	1	1	2		1	1			
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	0	0	0		0	0			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	Cl+Ex	CI+Ex		Cl+Ex	CI+Ex			
Detector 1 Channel									
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)	0.0	0.0	94		0.0	0.0			
Detector 2 Size(ft)			6						
Detector 2 Type			Cl+Ex						
Detector 2 Channel									
Detector 2 Extend (s)			0.0						
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases	Feilli	Feilii	NA 4		Felli	Feilli			
	1	Α	4		7	7			
Permitted Phases	4	4	A		7	7			
Detector Phase	4	4	4		7	7			
Switch Phase	E O	E O	E O		2.0	2.0			
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0			

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM BH

Lane Group EBL EBT EBR EBR2 WBL WBT WBR NBL NBT NBR NBI Minimum Split (s) 45.0 45.0 45.0 45.0 45.0 45.0 29.0 24.0%	1: Heady Street/Pu	ump Hou	use Ro	ad & E	ton D	owns a	& Oreg	jon Roa	ad			08/	13/2021
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		≯	-	-*	$\mathbf{\hat{z}}$	5	4	+	*	•	Ť	1	۴
Total Split (s) 45.0 45.0 45.0 45.0 45.0 29.0 29.0 Total Split (%) 37.2% 37.2% 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 24.0 24.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 <td>Lane Group</td> <td>EBL</td> <td>EBT</td> <td>EBR</td> <td>EBR2</td> <td>WBL2</td> <td>WBL</td> <td>WBT</td> <td>WBR</td> <td>NBL</td> <td>NBT</td> <td>NBR</td> <td>NBR2</td>	Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Total Split (s) 45.0 45.0 45.0 45.0 45.0 29.0 29.0 Total Split (%) 37.2% 37.2% 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 24.0 24.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 <td>Minimum Split (s)</td> <td>45.0</td> <td>45.0</td> <td></td> <td></td> <td>45.0</td> <td>45.0</td> <td>45.0</td> <td></td> <td>29.0</td> <td>29.0</td> <td></td> <td></td>	Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%) 37.2% 37.2% 37.2% 37.2% 37.2% 24.0% 24.0% Maximum Green (s) 40.0 40.0 40.0 40.0 40.0 24.0 24.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 1.0	,												
Maximum Green (s) 40.0 40.0 40.0 40.0 40.0 24.0 24.0 Yellow Time (s) 3.0 <													
Yellow Time (s) 3.0													
All-Red Time (s) 2.0 <th2.0< th=""></th2.0<>													
Lost Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Lead Lead Lead Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#/hr) 0													
Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Lead Lead Lead Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#/hr) 0 0 0 0 0 0 Act Effet Green (s) 40.3 6.1 40.3 6.1 40.3 6.1 Actuated g/C Ratio 0.46 0.07 0.0 0.00 0.00 0.0 </td <td></td> <td>2.0</td> <td></td> <td></td> <td></td> <td>2.0</td> <td>2.0</td> <td></td> <td></td> <td>2.0</td> <td></td> <td></td> <td></td>		2.0				2.0	2.0			2.0			
Lead/Lag Lead Lead Lead Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#/hr) 0 0 0 0 0 0 0 Actuated g/C Ratio 0.46 0.46 0.07 0.0 0.0 0.0 0.0 0.0 Vc Ratio 0.60 0.69 0.09 0.0													
Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0			0.0					0.0		l ead			
Vehicle Extension (s) 3.0 Recall Mode Max Ma	•												
Recall Mode Max Max Max Max Max Max Max None None Walk Time (s) 7.0		3.0	3.0			3.0	3.0	3.0					
Walk Time (s) 7.0 <													
Flash Dont Walk (s) 11.0 <th1< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th1<>													
Pedestrian Calls (#/hr) 0	. ,												
Act Effct Green (s) 40.3 6.1 Actuated g/C Ratio 0.46 0.07 v/c Ratio 0.60 0.69 0.09 Control Delay 23.3 26.2 41.5 Queue Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 QUEUE Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C D D Approach Delay 23.3 26.2 41.5 OS C D D Approach LOS C D D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Actuated g/C Ratio 0.46 0.07 v/c Ratio 0.60 0.69 0.09 Control Delay 23.3 26.2 41.5 Queue Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 QUEUE Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 OS C C D Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3		0				0	0			0			
v/c Ratio 0.60 0.69 0.09 Control Delay 23.3 26.2 41.5 Queue Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 OS C C D Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Control Delay 23.3 26.2 41.5 Queue Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 OS C C D Approach Delay 23.3 26.2 41.5 OS C C D Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Queue Delay 0.0 0.0 0.0 Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 OU C D D Approach Delay 23.3 26.2 41.5 OU C D D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Total Delay 23.3 26.2 41.5 LOS C C D Approach Delay 23.3 26.2 41.5 Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3	-												
LOS C D Approach Delay 23.3 26.2 41.5 Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Approach Delay 23.3 26.2 41.5 Approach LOS C C D 90th %ile Green (s) 40.0 40.0 40.0 7.3 7.3													
Approach LOS C D 90th %ile Green (s) 40.0 40.0 40.0 40.0 7.3 7.3	LOS												
90th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 7.3 7.3	Approach Delay		23.3					26.2			41.5		
	Approach LOS		С					С			D		
	90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.3	7.3		
90th %ile Term Code MaxR MaxR MaxR MaxR MaxR Gap Gap	90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		
70th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0	70th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
70th %ile Term Code MaxR MaxR MaxR MaxR MaxR MaxR Skip Skip	70th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
50th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0	50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0					
50th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip		MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
30th %ile Green (s) 40.0 40.0 40.0 40.0 40.0 0.0 0.0			40.0										
30th %ile Term Code MaxR MaxR MaxR MaxR MaxR MaxR Skip Skip													
10th %ile Green (s) 40.0 40.0 40.0 40.0 0.0 0.0													
10th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip													
Stops (vph) 361 404 12		mante				maxit	in and it			Ontp			
Fuel Used(gal) 6 6 0													
CO Emissions (g/hr) 441 439 12											-		
NOx Emissions (g/hr) 86 85 2													
VOC Emissions (g/hr) 102 102 3													
Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 191 222 5	()												
o ()													
Queue Length 95th (ft) 413 #517 25 Intermed Link Dict (ft) 409 400 85													
Internal Link Dist (ft) 438 196 85	()		438					196			85		
Turn Bay Length (ft)			0.40					6 4 4			5 00		
Base Capacity (vph)846814500													
Starvation Cap Reductn 0 0 0	•												
Spillback Cap Reductn 0 0 0													
Storage Cap Reductn 0 0 0			-								-		
Reduced v/c Ratio 0.60 0.69 0.02	Reduced v/c Ratio		0.60					0.69			0.02		

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM ΒH

Synchro 11 Report Page 3

Lanes, Volumes, Timings 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

08/13/2021

Lanes, Volumes, Tim	ings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

	1	L.	Ļ	~	£	*	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (s)	24.0	24.0	24.0		23.0	23.0			
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%			
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0			
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0			
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0			
Lost Time Adjust (s)			0.0			0.0			
Total Lost Time (s)			5.0			5.0			
Lead/Lag	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Recall Mode	None	None	None		Max	Max			
Walk Time (s)	7.0	7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0			
Pedestrian Calls (#/hr)	0	0	0		0	0			
Act Effct Green (s)	-	-	12.2		-	18.2			
Actuated g/C Ratio			0.14			0.21			
v/c Ratio			0.58			0.13			
Control Delay			47.4			1.4			
Queue Delay			0.0			0.0			
Total Delay			47.4			1.4			
LOS			D			A			
Approach Delay			47.4			1.4			
Approach LOS			D			A			
90th %ile Green (s)	18.9	18.9	18.9		18.0	18.0			
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
70th %ile Green (s)	13.9	13.9	13.9		18.0	18.0			
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
50th %ile Green (s)	11.9	11.9	11.9		18.0	18.0			
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
30th %ile Green (s)	10.0	10.0	10.0		18.0	18.0			
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
10th %ile Green (s)	7.4	7.4	7.4		18.0	18.0			
10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR			
Stops (vph)	Oup	Cup	93		Maxit	1			
Fuel Used(gal)			2			0			
CO Emissions (g/hr)			125			8			
NOx Emissions (g/hr)			24			2			
VOC Emissions (g/hr)			29			2			
Dilemma Vehicles (#)			0			0			
Queue Length 50th (ft)			54			0			
Queue Length 95th (ft)			120			5			
Internal Link Dist (ft)			227			150			
Turn Bay Length (ft)						100			
Base Capacity (vph)			298			431			
Starvation Cap Reductn			230			401			
Spillback Cap Reductn			0			0			
Storage Cap Reductn			0			0			
Reduced v/c Ratio			0.37			0.13			
			0.57			0.15			

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM BH

Intersection Summary		
Area Type: Other		
Cycle Length: 121		
Actuated Cycle Length: 87.9		
Natural Cycle: 125		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.69		
Intersection Signal Delay: 25.9	Intersection LOS: C	
Intersection Capacity Utilization 69.5%	ICU Level of Service C	
Analysis Period (min) 15		
90th %ile Actuated Cycle: 104.2		
70th %ile Actuated Cycle: 86.9		
50th %ile Actuated Cycle: 84.9		
30th %ile Actuated Cycle: 83		
10th %ile Actuated Cycle: 80.4		
# 95th percentile volume exceeds capacity, queu	e may be longer.	
Queue shown is maximum after two cycles		

Queue shown is maximum after two cycles.

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ø3	Ø4	1 07
45 s	29 s	24 s	23 s
₩ø6			
45 s			

	-	$\mathbf{\hat{v}}$	4	+	•	۲				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	4		5	†	Y					
Traffic Volume (veh/h)	575	152	59	554	169	57				
Future Volume (veh/h)	575	152	59	554	169	57				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)		1.00	1.00		1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No	No					
Lanes Open During Work Zone					-					
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	599	158	61	577	176	59				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence		_	No		No	_				
Cap, veh/h	746	197	383	1221	268	90				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.52	0.52	0.09	0.65	0.21	0.21				
Unsig. Movement Delay	0.02	0.02	0.00	0.00	0.21	0.21				
Ln Grp Delay, s/veh	0.0	21.3	10.5	7.6	35.1	0.0				
Ln Grp LOS	A	C	B	A	D	A				
Approach Vol, veh/h	757	Ū	-	638	236					
Approach Delay, s/veh	21.3			7.9	35.1					
Approach LOS	C			A	D					
			•			_	•	_	•	
Timer:		1	2	3	4	5	6	7	8	
Assigned Phs			2	3	4				8	
Case No			12.0	1.2	8.0				4.0	
Phs Duration (G+Y+Rc), s			20.0	9.3	42.7				52.0	
Change Period (Y+Rc), s			5.0	3.0	5.0				5.0	
Max Green (Gmax), s			15.0	9.0	35.0				47.0	
Max Allow Headway (MAH), s			3.9	3.8	5.3				5.2	
Max Q Clear (g_c+l1), s			11.0	2.9	26.9				13.2	
Green Ext Time (g_e), s			0.3	0.0	3.4				4.3	
Prob of Phs Call (p_c)			1.00	0.70	1.00				1.00	
Prob of Max Out (p_x)			0.00	0.06	0.00				0.00	
Left-Turn Movement Data										
Assigned Mvmt			5	3	7					
Mvmt Sat Flow, veh/h			1289	1781	0					
			1205	1701	0					
Through Movement Data										
Assigned Mvmt			2		4				8	
Mvmt Sat Flow, veh/h			7		1426				1870	
Right-Turn Movement Data										
Assigned Mvmt			12		14				18	
Mvmt Sat Flow, veh/h			432		376				0	
Left Lane Group Data										
Assigned Mvmt		0	5	3	7	0	0	0	0	
Lane Assignment			L+T+RL ((Pr/Pm)						

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	236	61	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1728	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	9.0	0.9	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	9.0	0.9	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	708	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	39.7	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	12.8	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	37.7	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.75	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	360	383	0	0	0	0	0	
V/C Ratio (X)	0.00	0.66	0.16	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	360	448	0	0	0	0	0	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	26.1	10.3	0.0	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	9.0	0.2	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	35.1	10.5	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	3.5	0.3	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.0	4.4	0.3	0.0	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.27	0.17	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0	0.0	0.0	0.0	0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	577	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	
1st-Term Q (Q1), veh/In	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	
2nd-Term Q (Q2), veh/In	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
· · · ·									

Scenario 4 No-Build PM 4:30 pm 05/19/2021 No-Build PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data									
Assigned Mvmt	0	12	0	14	0	0	0	18	
Lane Assignment	U	12	0	T+R	U	U	0	10	
Lanes in Grp	0	0	0	1	0	0	0	0	
Grp Vol (v), veh/h	0	0	0	757	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	0	0	1803	0	0	0	0	
Q Serve Time (g_s), s	0.0	0.0	0.0	24.9	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	24.9	0.0	0.0	0.0	0.0	
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.25	0.00	0.0	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0.00	0.20	0.00	943	0.00	0.00	0.00	0.00	
V/C Ratio (X)	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	0.00	0.00	943	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.00	0.00	14.1	0.00	0.00	0.00	0.00	
Incr Delay (d2), s/veh	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary									
· · · · · · · · · · · · · · · · · · ·		18.1							
HCM 6th Ctrl Delay HCM 6th LOS		16.1 B							
		D							

Notes

User approved volume balancing among the lanes for turning movement.

0.8

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Vol, veh/h	16	502	6	8	453	5	2	1	2	10	1	23	
Future Vol, veh/h	16	502	6	8	453	5	2	1	2	10	1	23	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	17	546	7	9	492	5	2	1	2	11	1	25	

Major/Minor I	Major1			Major2			Minor1			Minor2			
	-			-				4000			4400	405	
Conflicting Flow All	497	0	0	553	0	0	1110	1099	550	1098	1100	495	
Stage 1	-	-	-	-	-	-	584	584	-	513	513	-	
Stage 2	-	-	-	-	-	-	526	515	-	585	587	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1067	-	-	1017	-	-	187	212	535	190	212	575	
Stage 1	-	-	-	-	-	-	498	498	-	544	536	-	
Stage 2	-	-	-	-	-	-	535	535	-	497	497	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1067	-	-	1017	-	-	173	205	535	184	205	575	
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	205	-	184	205	-	
Stage 1	-	-	-	-	-	-	487	487	-	531	530	-	
Stage 2	-	-	-	-	-	-	505	529	-	483	486	-	
Approach	EB						ND			SB			
Approach				WB			NB						
HCM Control Delay, s	0.3			0.1			19.8			16.8			
HCM LOS							С			С			
Minor Lane/Major Mvm	nt N	VBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)		248	1067	-	-	1017	-	-	343				
HCM Lane V/C Ratio		0.022	0.016	-	-	0.009	-	-	0.108				

	0.022	0.010	-	- 0.00	9 -	- (0.100
HCM Control Delay (s)	19.8	8.4	0	- 8.	6 0	-	16.8
HCM Lane LOS	С	Α	А		A A	-	С
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0 -	-	0.4

Intersection

Int Delay, s/veh

25.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		\$			÷			÷			\$		
Traffic Vol, veh/h	54	543	1	1	533	224	2	2	2	136	1	20	
Future Vol, veh/h	54	543	1	1	533	224	2	2	2	136	1	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	56	566	1	1	555	233	2	2	2	142	1	21	

Major/Minor	Major1			Major2		1	Minor1			Minor2				
Conflicting Flow All	788	0	0	567	0	0	1364	1469	567	1355	1353	672		
Stage 1	-	-	-	-	-	-	679	679	-	674	674	-		
Stage 2	-	-	-	-	-	-	685	790	-	681	679	-		
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22		
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	0.12	5.52	-		
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318		
Pot Cap-1 Maneuver	831	-	-	1005	-	-	125	127	523	~ 127	150	456		
Stage 1	-	-	-	-	-	-	441	451	-	444	454	-		
Stage 2	-	-	-	-	-	-	438	402	-	440	451	-		
Platoon blocked, %		-	-		-	-								
Mov Cap-1 Maneuver	831	-	-	1005	-	-	110	114	523	~ 115	135	456		
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	114	-	~ 115	135	-		
Stage 1	-	-	-	-	-	-	398	407	-	400	453	-		
Stage 2	-	-	-	-	-	-	416	401	-	393	407	-		
Approach	EB			WB			NB			SB				
HCM Control Delay, s	0.9			0			29.7			241.7				
HCM LOS							D			F				
Minor Lane/Major Mvn	nt I	VBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)		152	831	-	-	1005	-	-	127					
HCM Lane V/C Ratio		0.041	0.068	-	-	0.001	-	-	1.288					
HCM Control Delay (s)	29.7	9.6	0	-	8.6	0	-	241.7					
HCM Lane LOS		D	А	А	-	А	А	-	F					
HCM 95th %tile Q(veh	I)	0.1	0.2	-	-	0	-	-	10.4					
Notes														
~: Volume exceeds ca	pacity	\$: De	elay exc	ceeds 30)0s	+: Com	putatio	n Not D	efined	*: All	major	volume i	n platoon	

08/12/20	21
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Intersection						
Int Delay, s/veh	0.2					
		FOT	MOT		0.01	000
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		- କୀ	e î -		۰¥	
Traffic Vol, veh/h	2	617	543	5	7	3
Future Vol, veh/h	2	617	543	5	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	· ·	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage	. # -	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	636	560	5	7	3
	2	000	000	U		0

Major/Minor	Major1	Ν	/lajor2		Minor2	
Conflicting Flow All	565	0	-	0	1203	563
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	640	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	
Pot Cap-1 Maneuver	1007	-	-	-	204	526
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver		-	-	-	203	526
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	525	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		20.1	
HCM LOS					С	
Minor Lane/Major Mvr	nt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)		1007				249
HCM Lane V/C Ratio		0.002	-	-		0.041
HCM Control Delay (s	:)	8.6	0	-	-	20.1
HCM Lane LOS	')	A	Ă	-	-	C
HCM 95th %tile Q(veh	ר)	0	-	-	-	0.1
	.,	•				J

Intersection

Int Delay, s/veh	0						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	el el			ب	Y		
Traffic Vol, veh/h	623	0	0	555	0	0)
Future Vol, veh/h	623	0	0	555	0	0)
Conflicting Peds, #/hr	0	0	0	0	0	0)
Sign Control	Free	Free	Free	Free	Stop	Stop)
RT Channelized	-	None	-	None	-	None)
Storage Length	-	-	-	-	0	-	
Veh in Median Storage	,# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	2
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	677	0	0	603	0	0	

Major/Minor	Major1	Ν	/lajor2		Minor1	
Conflicting Flow All	0	0	677	0		677
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	603	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	915	-	183	453
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	546	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	915	-	183	453
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	546	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		0	
HCM LOS	•		•		A	
N 4' 1 /N 4 - ' N 4			FDT			
Minor Lane/Major Mvm	nt IN	IBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)		-	-	-	915	-
HCM Lane V/C Ratio		-	-	-	-	-
HCM Control Delay (s)		0	-	-	0	-
HCM Lane LOS	`	А	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

	۶	+	7	\mathbf{F}	۶.	4	+	*	•	Ť	*	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			\$		
Traffic Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Future Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					1.00					
Frt		0.993					0.986			0.975		
Flt Protected		0.000					0.998			0.973		
Satd. Flow (prot)	0	1850	0	0	0	0	1827	0	0	1767	0	0
Flt Permitted	Ŭ	0.998	Ŭ	Ű	Ŭ	Ű	0.966	Ŭ	Ŭ		Ŭ	Ĵ
Satd. Flow (perm)	0	1846	0	0	0	0	1768	0	0	1816	0	0
Right Turn on Red	U	10-10	U	No	U	U	1100	No	U	1010	U	Yes
Satd. Flow (RTOR)				110				NO		1		103
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	8	11.0					0.5	8		5.0		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
		494	0.96		0.96			0.96 60			0.90	0.90
Adj. Flow (vph)	3	494	20	3	20	5	488	60	6	3	1	-
Shared Lane Traffic (%)	0	500	0	0	0	0	670	0	0	44	0	0
Lane Group Flow (vph)	0	526	0	0	0	0	573	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		0					0			0		
Link Offset(ft)		0					0			50		_
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	CI+Ex			Cl+Ex	CI+Ex	Cl+Ex		CI+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		Cl+Ex					Cl+Ex			CI+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2	_			6	6	6		3	Ŭ,		
Detector Phase	2	2			6	6	6		3	3		
	4	4			v	Ŭ	0		0			

Scenario 06 Build PM 4:30 pm 05/19/2021 Build PM BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L,	Ļ	~	F	•	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations	-	-	4	-		M			
Traffic Volume (vph)	93	3	2	8	1	29	6	29	
Future Volume (vph)	93	3	2	8	1	29	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Frt			0.990			0.927			
Flt Protected			0.957			0.977			
Satd. Flow (prot)	0	0	1765	0	0	1645	0	0	
Flt Permitted	Ű	Ŭ	0.738	Ű	Ŭ	0.977	Ű	Ŭ	
Satd. Flow (perm)	0	0	1361	0	0	1645	0	0	
Right Turn on Red	Ű	Ŭ	1001	Yes	Ŭ	1010	Ű	Yes	
Satd. Flow (RTOR)			3	100		108		100	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)			1.0			0.2		8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	97	3	2	8	0.00	30	6	30	
Shared Lane Traffic (%)	51	U	2	0		00	0	00	
Lane Group Flow (vph)	0	0	110	0	0	67	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Lon	Lon	0	rugitt	Lon	12	rtight	rugni	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	60	1.00	9	60	60	60	60	
Number of Detectors	13	1	2	5	1	1	00	00	
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	20	20	0		20	20			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	CI+Ex	Cl+Ex		CI+Ex	CI+Ex			
Detector 1 Channel									
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)	0.0	0.0	0.0 94		0.0	0.0			
Detector 2 Size(ft)			94						
Detector 2 Type			o Cl+Ex						
Detector 2 Channel									
Detector 2 Extend (s)			0.0						
	Dorm	Dorm	0.0 NA		Dorm	Dorm			
Turn Type Protected Phases	Perm	Perm			Perm	Perm			
	1	1	4		7	7			
Permitted Phases	4	4	A		7	7			
Detector Phase	4	4	4		7	7			

Scenario 06 Build PM 4:30 pm 05/19/2021 Build PM BH

Lanes, Volumes, 1: Heady Street/P	0	use Ro	ad & E	Eton D	owns a	& Oreg	jon Roa	ad			08/	13/2021
	٦	-	-*	\mathbf{F}	5	4	+	*	1	Ť	1	۴
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Switch Phase												
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag									Lead	Lead		
Lead-Lag Optimize?									Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			Max	Max	Max		None	None		
Act Effct Green (s)		40.3					40.3			6.1		
Actuated g/C Ratio		0.46					0.46			0.07		
v/c Ratio		0.62					0.71			0.09		
Control Delay		23.7					26.9			41.5		
Queue Delay		0.0					0.0			0.0		
Total Delay		23.7					26.9			41.5		
LOS		С					С			D		
Approach Delay		23.7					26.9			41.5		
Approach LOS		С					С			D		
90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.3	7.3		
90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		

Lead/Lag						Lead	Lead	
Lead-Lag Optimize?						Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	Max	Max	Max	Max	Max	None	None	
Act Effct Green (s)		40.3			40.3		6.1	
Actuated g/C Ratio		0.46			0.46		0.07	
v/c Ratio		0.62			0.71		0.09	
Control Delay		23.7			26.9		41.5	
Queue Delay		0.0			0.0		0.0	
Total Delay		23.7			26.9		41.5	
LOS		С			С		D	
Approach Delay		23.7			26.9		41.5	
Approach LOS		С			С		D	
90th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	7.3	7.3	
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Gap	Gap	
70th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
50th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
30th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
10th %ile Green (s)	40.0	40.0	40.0	40.0	40.0	0.0	0.0	
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR	MaxR	Skip	Skip	
Stops (vph)		375			412		12	
Fuel Used(gal)		7			6		0	
CO Emissions (g/hr)		458			452		12	
NOx Emissions (g/hr)		89			88		2	
VOC Emissions (g/hr)		106			105		3	
Dilemma Vehicles (#)		0			0		0	
Queue Length 50th (ft)		199			229		5	
Queue Length 95th (ft)		428			#536		25	
Internal Link Dist (ft)		438			196		85	
Turn Bay Length (ft)								
Base Capacity (vph)		847			811		500	
Starvation Cap Reductn		0			0		0	
Spillback Cap Reductn		0			0		0	
Storage Cap Reductn		0			0		0	
Reduced v/c Ratio		0.62			0.71		0.02	

Scenario 06 Build PM 4:30 pm 05/19/2021 Build PM BH

Intersection Summary		
Area Type: Other		
Cycle Length: 121		
Actuated Cycle Length: 87.9		
Natural Cycle: 125		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 26.2	Intersection LOS: C	
Intersection Capacity Utilization 71.1%	ICU Level of Service C	
Analysis Period (min) 15		
90th %ile Actuated Cycle: 104.2		
70th %ile Actuated Cycle: 86.9		
50th %ile Actuated Cycle: 84.9		
30th %ile Actuated Cycle: 83		
10th %ile Actuated Cycle: 80.4		
# 95th percentile volume exceeds capacity,		
Queue shown is maximum after two cycle	S.	

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ ø3	Ø4	1 07
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Roac	l

	1	L.	Ļ	~	Ŧ	•	*	4			
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2			
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0					
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (%)	19.8%	19.8%	19.8%		19.0%	19.0%					
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0					
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0					
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0					
Lost Time Adjust (s)			0.0			0.0					
Total Lost Time (s)			5.0			5.0					
Lead/Lag	Lag	Lag	Lag								
Lead-Lag Optimize?	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Recall Mode	None	None	None		Max	Max					
Act Effct Green (s)			12.2			18.2					
Actuated g/C Ratio			0.14			0.21					
v/c Ratio			0.58			0.16					
Control Delay			47.4			3.1					
Queue Delay			0.0			0.0					
Total Delay			47.4			3.1					
LOS			D			A					
Approach Delay			47.4			3.1					
Approach LOS			D			A					
90th %ile Green (s)	18.9	18.9	18.9		18.0	18.0					
90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
70th %ile Green (s)	13.9	13.9	13.9		18.0	18.0					
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
50th %ile Green (s)	11.9	11.9	11.9		18.0	18.0					
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
30th %ile Green (s)	10.0	10.0	10.0		18.0	18.0					
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
10th %ile Green (s)	7.4	7.4	7.4		18.0	18.0					
10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
Stops (vph)		P	93			3					
Fuel Used(gal)			2			0					
CO Emissions (g/hr)			125			12					
NOx Emissions (g/hr)			24			2					
VOC Emissions (g/hr)			29			3					
Dilemma Vehicles (#)			0			0					
Queue Length 50th (ft)			54			0					
Queue Length 95th (ft)			120			13					
Internal Link Dist (ft)			227			150					
Turn Bay Length (ft)											
Base Capacity (vph)			298			425					
Starvation Cap Reductn			0			0					
Spillback Cap Reductn			0			0					
Storage Cap Reductn			0			0					
Reduced v/c Ratio			0.37			0.16					
			0.01			0.10					

Scenario 06 Build PM 4:30 pm 05/19/2021 Build PM BH

Intersection Summary

	-	\mathbf{r}	4	-	1	1				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	1		1	1	Y					
Traffic Volume (veh/h)	583	154	59	565	172	57				
Future Volume (veh/h)	583	154	59	565	172	57				
Number	4	14	3	8	5	12				
Initial Q, veh	0	0	0	0	0	0				
Ped-Bike Adj (A_pbT)	Ŭ	0.99	1.00	Ű	1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No	1.00	1.00	No	No	1.00				
Lanes Open During Work Zon										
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870				
Adj Flow Rate, veh/h	607	160	61	589	179	59				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				
Percent Heavy Veh, %	2	2	2	2	2	2				
Opposing Right Turn Influence		_	Yes	_	Yes	_				
Cap, veh/h	745	196	375	1221	270	89				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				
Prop Arrive On Green	0.52	0.52	0.09	0.65	0.21	0.21				
Unsig. Movement Delay	0.02	0.02	0.00	0.00	•.= .	•				
Ln Grp Delay, s/veh	0.0	22.0	10.8	7.7	35.5	0.0				
Ln Grp LOS	A	C	В	A	D	A				
Approach Vol, veh/h	767	-	_	650	239					
Approach Delay, s/veh	22.0			8.0	35.5					
Approach LOS	C			A	D					
		1	C	2	Λ	F	6	7	0	
Timer:			2	3	4	5	6	7	8	
Assigned Phs			2	3	4				8	
Case No			12.0	1.2	8.0				4.0	
Phs Duration (G+Y+Rc), s			20.0	9.3	42.7				52.0	
Change Period (Y+Rc), s			5.0	3.0	5.0				5.0	
Max Green (Gmax), s			15.0	9.0	35.0				47.0	
Max Allow Headway (MAH), s			3.9	3.8	5.3				5.2	
Max Q Clear (g_c+l1), s			11.1 0.3	2.9	27.5				13.5	
Green Ext Time (g_e), s Prob of Phs Call (p_c)			0.5							
				0.0	3.2				4.4	
			1.00	0.70	1.00				1.00	
Prob of Max Out (p_x)										
			1.00	0.70	1.00				1.00	
Prob of Max Out (p_x)			1.00	0.70	1.00	_	_		1.00	
Prob of Max Out (p_x) Left-Turn Movement Data			1.00 0.00	0.70 0.06	1.00 0.00				1.00	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt			1.00 0.00 5	0.70 0.06	1.00 0.00 7				1.00	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h			1.00 0.00 5	0.70 0.06	1.00 0.00 7				1.00	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data			1.00 0.00 5 1295	0.70 0.06	1.00 0.00 7 0				1.00 0.00	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt			1.00 0.00 5 1295 2	0.70 0.06	1.00 0.00 7 0				1.00 0.00 8	
Prob of Max Out (p_x) <u>Left-Turn Movement Data</u> Assigned Mvmt Mvmt Sat Flow, veh/h <u>Through Movement Data</u> Assigned Mvmt Mvmt Sat Flow, veh/h			1.00 0.00 5 1295 2	0.70 0.06	1.00 0.00 7 0				1.00 0.00 8	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data			1.00 0.00 5 1295 2 7	0.70 0.06	1.00 0.00 7 0 4 1425				1.00 0.00 8 1870	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Left Lane Group Data			1.00 0.00 5 1295 2 7 2 7 12 427	0.70 0.06 3 1781	1.00 0.00 7 0 4 1425 14 376				1.00 0.00 8 1870 18 0	
Prob of Max Out (p_x) Left-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Through Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h Right-Turn Movement Data Assigned Mvmt Mvmt Sat Flow, veh/h		0	1.00 0.00 5 1295 2 7 7 12	0.70 0.06 3 1781	1.00 0.00 7 0 4 1425 14	0	0	0	1.00 0.00 8 1870 18	

Scenario 6 Build PM 4:30 pm 05/19/2021 Build PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

Lanes in Grp	0	1	1	0	0	0	0	0	
Grp Vol (v), veh/h	0	239	61	0	0	0	0	0	
Grp Sat Flow (s), veh/h/ln	0	1729	1781	0	0	0	0	0	
Q Serve Time (g_s), s	0.0	9.1	0.9	0.0	0.0	0.0	0.0	0.0	
Cycle Q Clear Time (g_c), s	0.0	9.1	0.9	0.0	0.0	0.0	0.0	0.0	
Perm LT Sat Flow (s_l), veh/h/ln	0	0	700	0	0	0	0	0	
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0	
Perm LT Eff Green (g_p), s	0.0	0.0	39.7	0.0	0.0	0.0	0.0	0.0	
Perm LT Serve Time (g_u), s	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	
Perm LT Q Serve Time (g_ps), s	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	
Time to First Blk (g_f), s	0.0	0.0	0.0	37.7	0.0	0.0	0.0	0.0	
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop LT Inside Lane (P_L)	0.00	0.75	1.00	0.00	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	360	375	0	0	0	0	0	
V/C Ratio (X)	0.00	0.66	0.16	0.00	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0.00	360	441	0.00	0.00	0.00	0.00	0.00	
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	26.2	10.6	0.0	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	9.3	0.2	0.0	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	35.5	10.8	0.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	3.6	0.3	0.0	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	
%ile Back of Q (50%), veh/ln	0.0	4.5	0.3	0.0	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.28	0.17	0.00	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.20	0.0	0.00	0.00	0.00	0.0	0.00	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Middle Lane Group Data									
Assigned Mvmt	0	2	0	4	0	0	0	8	
Lane Assignment								Т	
Lanes in Grp	0	0	0	0	0	0	0	1	
Grp Vol (v), veh/h	0	0	0	0	0	0	0	589	
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	1870	
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	1221	
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	1221	
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Scenario 6 Build PM 4:30 pm 05/19/2021 Build PM BH

HCM 6th Signalized Intersection Capacity Analysis 15: Locust Ave & Oregon Rd

08/12/2021

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Right Lane Group Data									
	0	12	0	14	0	0	0	18	
Assigned Mvmt	U	12	0	T+R	0	0	0	10	
Lane Assignment Lanes in Grp	0	0	0	1+R	0	0	0	0	
Grp Vol (v), veh/h	0 0	0 0	0 0	767 1800	0 0	0 0	0 0	0 0	
Grp Sat Flow (s), veh/h/ln									
Q Serve Time (g_s), s	0.0 0.0	0.0 0.0	0.0 0.0	25.5	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	
Cycle Q Clear Time (g_c), s				25.5					
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Prop RT Outside Lane (P_R)	0.00	0.25	0.00	0.21	0.00	0.00	0.00	0.00	
Lane Grp Cap (c), veh/h	0	0	0	942	0	0	0	0	
V/C Ratio (X)	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	
Avail Cap (c_a), veh/h	0	0	0	942	0	0	0	0	
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	
Uniform Delay (d1), s/veh	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	
Incr Delay (d2), s/veh	0.0	0.0	0.0	7.7	0.0	0.0	0.0	0.0	
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	0.0	0.0	0.0	22.0	0.0	0.0	0.0	0.0	
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	
%ile Back of Q (50%), veh/In	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0	
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Intersection Summary									
HCM 6th Ctrl Delay		18.4							
HCM 6th LOS		В							
NT /									

Notes

User approved volume balancing among the lanes for turning movement.

0.9

Intersection

Int Delay, s/veh

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Vol, veh/h	16	516	6	8	463	5	2	1	2	10	1	23	
Future Vol, veh/h	16	516	6	8	463	5	2	1	2	10	1	23	
Conflicting Peds, #/hr	16	0	4	4	0	16	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	,# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	17	561	7	9	503	5	2	1	2	11	1	25	

Major/Minor	Major1		ſ	Major2			Minor1			Minor2			
Conflicting Flow All	524	0	0	572	0	0	1140	1145	569	1140	1146	522	
Stage 1	-	-	-		-	-	603	603	-	540	540		
Stage 2	-	-	-	-	-	-	537	542	-	600	606	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1043	-	-	1001	-	-	178	200	522	178	199	555	
Stage 1	-	-	-	-	-	-	486	488	-	526	521	-	
Stage 2	-	-	-	-	-	-	528	520	-	488	487	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1027	-	-	997	-	-	164	189	520	169	188	547	
Mov Cap-2 Maneuver	-	-	-	-	-	-	164	189	-	169	188	-	
Stage 1	-	-	-	-	-	-	472	474	-	505	506	-	
Stage 2	-	-	-	-	-	-	496	505	-	473	473	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	0.3			0.1			20.8			17.8			
HCM LOS							С			С			
Minor Lane/Major Mvm	it N	BLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)		234	1027	-	-	997	-	-	319				

Capacity (ven/n)	204	1027	-	- 9	97	-	-	219	
HCM Lane V/C Ratio	0.023 0	.017	-	- 0.0	09	-	-	0.116	
HCM Control Delay (s)	20.8	8.6	0	- 8	8.6	0	-	17.8	
HCM Lane LOS	С	А	А	-	А	А	-	С	
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.4	

Intersection

Int Delay, s/veh

27.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4		-	4		
Traffic Vol, veh/h	54	553	1	1	547	224	2	2	2	136	1	20	
Future Vol, veh/h	54	553	1	1	547	224	2	2	2	136	1	20	
Conflicting Peds, #/hr	0	0	2	2	0	0	2	0	0	0	0	2	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None										
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage,	# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	56	576	1	1	570	233	2	2	2	142	1	21	

Major/Minor	Major1		N	/lajor2		1	Minor1		l	Minor2				
Conflicting Flow All	803	0	0	579	0	0	1393	1496	579	1380	1380	689		
Stage 1	-	-	-	-	-	-	691	691	-	689	689	-		
Stage 2	-	-	-	-	-	-	702	805	-	691	691	-		
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22		
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-		
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318		
Pot Cap-1 Maneuver	821	-	-	995	-	-	119	123	515		144	446		
Stage 1	-	-	-	-	-	-	435	446	-	436	446	-		
Stage 2	-	-	-	-	-	-	429	395	-	435	446	-		
Platoon blocked, %		-	-		-	-								
Mov Cap-1 Maneuver	821	-	-	993	-	-	104	110	514	~ 110	129	445		
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	110	-	~ 110	129	-		
Stage 1	-	-	-	-	-	-	391	401	-	392	445	-		
Stage 2	-	-	-	-	-	-	406	394	-	388	401	-		
Approach	EB			WB			NB			SB				
HCM Control Delay, s	0.9			0			30.9			265				
HCM LOS							D			F				
Minor Lane/Major Mvn	nt I	VBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)		145	821	-	-	993	-	-	122					
HCM Lane V/C Ratio		0.043	0.069	-	-	0.001	-	-	1.341					
HCM Control Delay (s))	30.9	9.7	0	-	8.6	0	-	265					
HCM Lane LOS		D	A	A	-	A	A	-	F					
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	10.8					
Notes														
~: Volume exceeds ca	pacity	\$: De	elay exc	eeds 30)0s ·	+: Com	putatio	n Not D	efined	*: All	major	volume i	in platoon	

Scenario 06 Build PM 4:30 pm 05/19/2021 Build PM BH

Intersection						
Int Delay, s/veh	0.2					
•			MOT		0.51	
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		- सी	- î÷		۰¥	
Traffic Vol, veh/h	2	631	553	5	7	3
Future Vol, veh/h	2	631	553	5	7	3
Conflicting Peds, #/hr	2	0	0	2	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	•	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage	, # -	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	651	570	5	7	3

Major/Minor	Major1	Ν	lajor2		Vinor2	
Conflicting Flow All	577	0	-	0		581
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	655	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	
Pot Cap-1 Maneuver	996	-	-	-	196	514
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver		-	-	-	195	510
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	516	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		20.7	
HCM LOS					С	
Minor Lane/Major Mvn	nt	EBL	EBT	WBT	WBR :	SBLn1
Capacity (veh/h)		994	-	-	-	239
HCM Lane V/C Ratio		0.002	-	-	-	0.043
HCM Control Delay (s)	8.6	0	-	-	20.7
HCM Lane LOS		А	А	-	-	С
HCM 95th %tile Q(veh)	0	_	_	_	0.1

Intersection

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	el el			ب	Y	
Traffic Vol, veh/h	623	14	14	555	0	10
Future Vol, veh/h	623	14	14	555	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage	# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	677	15	15	603	0	11

Major/Minor	Major1	A	Acier?		Minor1		
	Major1		/lajor2		Minor1		
Conflicting Flow All	0	0	692	0	1318	685	5
Stage 1	-	-	-	-	685	-	-
Stage 2	-	-	-	-	633	-	-
Critical Hdwy	-	-	4.12	-	6.42	6.22	2
Critical Hdwy Stg 1	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318	8
Pot Cap-1 Maneuver	-	-	903	-	173	448	
Stage 1	-	-	-	-	500	-	
Stage 2	-	_	_	-	529	-	_
Platoon blocked, %	-	-		-			
Mov Cap-1 Maneuver	-	_	903	-	169	448	8
Mov Cap-2 Maneuver	-	-	-	-	169	-	
Stage 1	-	_	-	-	500	-	
Stage 2	<u>-</u>		_	_	516	_	
Oldye z					510		
Approach	EB		WB		NB		
HCM Control Delay, s	0		0.2		13.2		
HCM LOS					В		
							_
Minor Lane/Major Mvn	nt N	BLn1	EBT	EBR	WBL	WBT	Γ
Capacity (veh/h)		448	-	-	903	-	-
HCM Lane V/C Ratio		0.024	-	-	0.017	-	-
HCM Control Delay (s))	13.2	-	-	9.1	0)
HCM Lane LOS		В	-	-	А	А	A

0.1

_

-

0.1

HCM 95th %tile Q(veh)

Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

	≯	-	74	7	۲.	•	+	•	•	Ť	*	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			÷		
Traffic Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Future Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.993					0.986			0.975		
Flt Protected							0.998			0.973		
Satd. Flow (prot)	0	1850	0	0	0	0	1824	0	0	1767	0	0
Flt Permitted		0.998					0.966					
Satd. Flow (perm)	0	1846	0	0	0	0	1766	0	0	1816	0	0
Right Turn on Red	-		-	No	-	-		No	-		-	Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	8	11.0					0.0	8		0.0		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	494	26	3	20	5	488	60	6	3	1	0.00
Shared Lane Traffic (%)	U	-0-	20	U	20	U	-100	00	U	U		
Lane Group Flow (vph)	0	526	0	0	0	0	573	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)	Lon	0	rugni	rugin	Lon	Lon	0	rugin	Lon	0	rtight	rtigrit
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane		10					10			10		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	1.00	1.00	60	9	60	15	1.00	9	15	1.00	9	60
Number of Detectors	1	2	00	9	1	1	2	9	1	2	9	00
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	20	0			20	20	0		20	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	CI+Ex			CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
2 ()	0.0	0.0 94			0.0	0.0	0.0 94		0.0	94		
Detector 2 Position(ft) Detector 2 Size(ft)		94					94			94 6		
· · · · · · · · · · · · · · · · · · ·		CI+Ex					CI+Ex			CI+Ex		
Detector 2 Type		CI+EX					CI+EX			CI+EX		
Detector 2 Channel		0.0					0.0			0.0		
Detector 2 Extend (s)	Derm	0.0			Derre	Derree	0.0		Derree	0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases	0	2			^	<u>^</u>	6		2	3		
Permitted Phases	2	0			6	6	6		3	0		
Detector Phase	2	2			6	6	6		3	3		

Scenario 08 PM Build w/ Improvement Scenario 1 4:30 pm 05/19/2021 Build w/ Impr 1 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L,	Ļ	~	F	•	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations			4	•=		M			
Traffic Volume (vph)	93	3	2	8	1	29	6	29	
Future Volume (vph)	93	3	2	8	1	29	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Frt			0.990			0.927			
Flt Protected			0.957			0.977			
Satd. Flow (prot)	0	0	1765	0	0	1645	0	0	
Flt Permitted	0	0	0.738	0	U	0.977	0	U	
Satd. Flow (perm)	0	0	1361	0	0	1645	0	0	
Right Turn on Red	U	0	1001	Yes	U	10-10	0	Yes	
Satd. Flow (RTOR)			3	163		108		163	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)			7.0			0.2		8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0.90 97	0.90	0.90	0.90	0.90	30	0.90	30	
Shared Lane Traffic (%)	91	3	2	0	1	30	0	30	
Lane Group Flow (vph)	0	0	110	0	0	67	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left		Left	Left	Right	Right	
Median Width(ft)	Leit	Leit	Len 0	Right	Leit	12	Right	Right	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
()			10			10			
Two way Left Turn Lane Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	1.00	1.00 60	1.00	1.00	1.00 60	60	60	1.00 60	
Number of Detectors	15	1	2	9	00	1	00	00	
Detector Template	Left	Left	∠ Thru		Left	Left			
•	20	20	100		20	20			
Leading Detector (ft) Trailing Detector (ft)	20	20							
	0	0	0		0	0 0			
Detector 1 Position(ft)	20	20	6		20	20			
Detector 1 Size(ft)		20 Cl+Ex	о CI+Ex						
Detector 1 Type	Cl+Ex	UI+EX	UI+EX		Cl+Ex	CI+Ex			
Detector 1 Channel	0.0	0.0	0.0		0.0	0.0			
Detector 1 Extend (s)	0.0	0.0							
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)			94 6						
Detector 2 Size(ft)									
Detector 2 Type			CI+Ex						
Detector 2 Channel			0.0						
Detector 2 Extend (s)	Derm	Derm	0.0		Deres	Deer			
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases	1		4		7	7			
Permitted Phases	4	4	4		7	7			
Detector Phase	4	4	4		7	7			

Scenario 08 PM Build w/ Improvement Scenario 1 4:30 pm 05/19/2021 Build w/ Impr 1 BH

Lanes, Volumes, Tim	lings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

	٦	-	ľ	*	5	4	ł	*	1	1	1	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Switch Phase												
Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
Minimum Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (s)	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%)	37.2%	37.2%			37.2%	37.2%	37.2%		24.0%	24.0%		
Maximum Green (s)	40.0	40.0			40.0	40.0	40.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag									Lead	Lead		
Lead-Lag Optimize?									Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			Max	Max	Max		None	None		
Walk Time (s)					7.0	7.0	7.0					
Flash Dont Walk (s)					11.0	11.0	11.0					
Pedestrian Calls (#/hr)					6	6	6					
Act Effct Green (s)		40.3			-	-	40.3			6.1		
Actuated g/C Ratio		0.46					0.46			0.07		
v/c Ratio		0.62					0.71			0.09		
Control Delay		23.7					26.9			41.5		
Queue Delay		0.0					0.0			0.0		
Total Delay		23.7					26.9			41.5		
LOS		С					C			D		
Approach Delay		23.7					26.9			41.5		
Approach LOS		C					C			D		
90th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		7.3	7.3		
90th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Gap	Gap		
70th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
70th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
50th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
50th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
30th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
30th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
10th %ile Green (s)	40.0	40.0			40.0	40.0	40.0		0.0	0.0		
10th %ile Term Code	MaxR	MaxR			MaxR	MaxR	MaxR		Skip	Skip		
Stops (vph)		375					412		e p	12		
Fuel Used(gal)		7					6			0		
CO Emissions (g/hr)		458					453			12		
NOx Emissions (g/hr)		89					88			2		
VOC Emissions (g/hr)		106					105			3		
Dilemma Vehicles (#)		0					0			0		
Queue Length 50th (ft)		199					229			5		
Queue Length 95th (ft)		428					#536			25		
Internal Link Dist (ft)		438					196			85		
Turn Bay Length (ft)		100					100			00		
Base Capacity (vph)		847					810			500		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
		Ū					Ū			0		

Scenario 08 PM Build w/ Improvement Scenario 1 4:30 pm 05/19/2021 Build w/ Impr 1 BH

₋anes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Ro	ad

Lane Group SBL2 SBL SBT SBR NWL2 NWL NWR NWR2 Switch Phase		1	L.	ţ	~	Ŧ	•	*	4			
Minimum Initial (s) 5.0 5.0 3.0 3.0 Minimum Spiti (s) 24.0 24.0 23.0 23.0 Total Spiti (s) 19.8% 19.8% 19.0% 3.0 3.0 Maximum Green (s) 19.0 19.0 18.0 18.0 18.0 18.0 Velow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lead Lag August (s) 0.0 0.0 1.0 1.0 1.0 Lead/Lag Optimize? Yes Yes Yes Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode None None None Max Max Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay	Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2			
Minimum Initial (s) 5.0 5.0 3.0 3.0 Minimum Spiti (s) 24.0 24.0 23.0 23.0 Total Spiti (s) 19.8% 19.8% 19.0% 3.0 3.0 Maximum Green (s) 19.0 19.0 18.0 18.0 18.0 18.0 Velow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lead Lag August (s) 0.0 0.0 1.0 1.0 1.0 Lead/Lag Optimize? Yes Yes Yes Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode None None None Max Max Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Control Delay											 	
Minimum Split (s) 24.0 24.0 23.0 Total Split (%) 19.8% 19.8% 19.0% 19.0% Maximum Green (s) 19.0 19.0 18.0 19.0% Maximum Green (s) 19.0 19.0 18.0 19.0% Maximum Green (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead-Lag Optimize? Yes Yes Yes Vehide Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Waki Time (s) 12.2 18.2 Actuated gi(Rht) Actuated gi(Ratio 0.14 0.21 v/c Ratio 0.0 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 Queue Delay 13.9 18.0 18.0 Oth Wale Green (s) 13.9 13.9 <td< td=""><td></td><td>5.0</td><td>5.0</td><td>5.0</td><td></td><td>3.0</td><td>3.0</td><td></td><td></td><td></td><td></td><td></td></td<>		5.0	5.0	5.0		3.0	3.0					
Total Split (\$) 24.0 24.0 23.0 23.0 Total Split (\$) 19.8% 19.8% 19.0% 19.0% 19.0% Maximum Green (s) 13.0 19.0 19.0 18.0 18.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Last Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Optimize? Yes Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Walk Time (s) Extension (s) 3.0 3.0 3.0 Eash Dont Walk (s) Extension (s) 12.2 18.2 Actuated µC Ratio 0.58 0.16 Control Delay 47.4 3.1 0.0 0.0 100 100 Vic Ratio 0.58 0.16 0.0 100 100 100 Oth Sulis Green (s)												
Total Spin (%) 19.8% 19.0% 19.0% Maximum Green (s) 19.0 19.0 18.0 18.0 Vellow Time (s) 2.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 0.0 10.0 10.0 Total Lost Time (s) 5.0 5.0 5.0 10.0 10.0 Lead-Lag Optimize? Yes <												
Maximum Green (s) 19.0 19.0 18.0 18.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 LarRed Time (s) 2.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 0.0 1.0 LeadLag Optimize? Yes Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Walk Time (s) 12.2 18.2 Actuated giC Rato 0.14 0.21 Ver Ratio 0.55 0.16 Control Delay 47.4 3.1 Control Delay 47.4 3.1 Cueue Delay 0.0 0.0 Oth %ile Green (s) 18.9 18.9 18.0 18.0 18.0 90th %ile Green (s) 18.9 18.9 18.0 18.0 18.0 90th %ile Green (s) 11.9 18.0 18.0 18.0 18.0												
Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 2.0 Lead-Lag Uptimize? Yes Yes Yes Yes Yes Lead-Lag Optimize? Yes Yes Yes Yes Yes Recall Mode None None None Max Max Walk Time (s) 2.0 2.0 1.8.2 Actentic Green (s) 1.2.2 1.8.2 Actuated g/C Rato 0.14 0.21 vic Ratio 0.00 0.0 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Oth %ile Term Code Gap Gap Max Max Max Oth %ile Term Code Gap Gap Gap Max Max Oth %ile Term Code Gap Gap Gap Max Max Oth %ile Term Code Gap Ga												
All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 Load Lag Time (s) 5.0 5.0 Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Vehicle Extension (s) 12.2 18.2 Actuated g(C Ratio 0.14 0.21 Vic Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 0.0 Oth %ile Green (s) 18.9 18.9 18.0 18.0 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 <												
Total Lost Time (s) 5.0 5.0 Lead/Lag Optimize? Yes Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Walk Time (s) Pedestrian Calls (#thr)	All-Red Time (s)	2.0	2.0			2.0	2.0					
Lead-Lag Lag Lag Lag Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Walk Time (s) Max Max Pedestrian Calls (#hr) Act Effct Green (s) 12.2 18.2 Actuated gC Ratio 0.14 0.21 Outrout Delay 47.4 3.1	Lost Time Adjust (s)			0.0			0.0					
Lead-Lag Lag Lag Lag Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Walk Time (s) Max Max Pedestrian Calls (#hr) Act Effct Green (s) 12.2 18.2 Actuated gC Ratio 0.14 0.21 Outrout Delay 47.4 3.1	Total Lost Time (s)			5.0			5.0					
Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode None None None Max Max Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#hr) Act Effct Green (s) 12.2 18.2 Act Effct Green (s) 0.14 0.21 v/c Ratio 0.16 Control Delay 47.4 3.1 Cueue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach LOS D A Approach LOS D A 90th %ile Green (s) 18.9 18.9 18.0 18.0 18.0 90th %ile Green (s) 13.9 3.9 13.9 13.0 18.0 18.0 90th %ile Green (s) 11.9 11.9 18.0 18.0 18.0 18.0 90th %ile Green (s) 11.9 11.9 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0 18.0		Lag	Lag	Lag								
Recall Mode None None Max Max Walk Time (s) <td>Lead-Lag Optimize?</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Lead-Lag Optimize?	Yes	Yes	Yes								
Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) Act Effct Green (s) 12.2 18.2 Actuated g/C Ratio 0.14 0.21 v/c Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 Oblt %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 11.9 11.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 50th %ile Green (s) 11.9 11.9 18.0 18.0 50th %ile Green (s) 11.9 11.9 18.0 18.0 50th %ile Green (s) 7.4 7.4 18.0 18.0 50th %ile Green (s) 7.4 7.4 18.0 18.0 10th %	Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Flash Dont Walk (s) Pedestrian Calls (#hrh) Act Effc Green (s) 12.2 18.2 Actuated g/C Ratio 0.14 0.21 vic Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 POth %ile Green (s) 18.9 18.0 90th %ile Term Code Gap Gap Mike Green (s) 13.9 13.9 18.0 90th %ile Term Code Gap Gap Gap Soth %ile Green (s) 11.9 11.9 18.0 Soth %ile Green (s) 10.0 10.0 18.0 Soth %ile Green (s) 10.0 10.0 18.0 Soth %ile Green (s) 10.0 10.0 18.0 Soth %ile Green (s) 7.4 7.4 7.4 18.0 Soth %ile Green (s) 7.4 7.4	Recall Mode	None	None	None		Max	Max					
Pedestrian Calls (#/hr) Act Efcl Green (s) 12.2 18.2 Actuated g/C Ratio 0.14 0.21 v/c Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 LOS D A 90th %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 11.9 11.9 18.0 18.0 90th %ile Green (s) 11.9 11.9 18.0 18.0 90th %ile Green (s) 10.0 10.0 18.0 18.0 90th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 90th %ile Green (s) 7.4 7.4 18.0 18.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Walk Time (s)											
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Act Effct Green (s) 12.2 18.2 Actuated g/C Ratio 0.14 0.21 v/c Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 QS D A Approach LOS D A 90th %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 70th %ile Green (s) 13.9 13.9 18.0 18.0 70th %ile Green (s) 11.9 11.9 18.0 18.0 70th %ile Green (s) 11.9 11.9 18.0 18.0 50th %ile Term Code Gap Gap Gap MaxR 30th %ile Term Code Gap Gap Gap MaxR 30th %ile Term Code Gap Gap MaxR MaxR 30th %ile Term Code Gap Gap MaxR MaxR	Pedestrian Calls (#/hr)											
vic Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 LOS D A Optomach LOS D A 90th %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 11.9 11.9 11.9 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 1				12.2			18.2					
v/c Ratio 0.58 0.16 Control Delay 47.4 3.1 Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 DO A Mproach LOS D A 90th %ile Green (s) 18.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 11.9 11.9 11.9 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 18.0 10th %ile Green (s) 10.0 10.0 18.0 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0	Actuated g/C Ratio			0.14			0.21					
Queue Delay 0.0 0.0 Total Delay 47.4 3.1 LOS D A Approach Delay 47.4 3.1 Approach LOS D A 90th %ile Green (s) 18.9 18.9 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 90th %ile Green (s) 13.9 13.9 18.0 18.0 70th %ile Green (s) 11.9 11.9 18.0 18.0 50th %ile Green (s) 11.9 11.9 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 50th %ile Green (s) 10.0 10.0 18.0 18.0 30th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 10.0 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.4 7.4 7.4 18.0 <td></td> <td></td> <td></td> <td>0.58</td> <td></td> <td></td> <td>0.16</td> <td></td> <td></td> <td></td> <td></td> <td></td>				0.58			0.16					
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90th %ile Term Code Gap Gap Gap MaxR MaxR 70th %ile Green (s) 13.9 13.9 13.9 18.0 18.0 70th %ile Term Code Gap Gap Gap MaxR MaxR 50th %ile Green (s) 11.9 11.9 11.9 18.0 18.0 50th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Green (s) 10.0 10.0 18.0 18.0 30th %ile Green (s) 10.0 10.0 18.0 18.0 30th %ile Green (s) 7.4 7.4 7.4 18.0 10th %ile Green (s) 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR Stops (vph) 93 3 3 3 Fuel Used(gal) 2 0 0 0 CO Emissions (g/hr) 24 2 0 0 Queue Length S0th (ft) 54 0 0 0 <td>Approach LOS</td> <td></td> <td></td> <td>D</td> <td></td> <td></td> <td>А</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Approach LOS			D			А					
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70th %ile Term Code Gap Gap Gap MaxR MaxR 50th %ile Green (s) 11.9 11.9 11.9 18.0 18.0 50th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Green (s) 10.0 10.0 18.0 18.0 30th %ile Green (s) 7.4 7.4 7.4 18.0 10th %ile Green (s) 7.4 7.4 7.4 18.0 10th %ile Term Code Gap Gap Gap MaxR 10th %ile Green (s) 7.4 7.4 7.4 18.0 10th %ile Term Code Gap Gap Gap MaxR 10th %ile Term Code Gap Gap Gap MaxR 10th %ile Term Code Gap Gap Gap MaxR Stops (yph) 93 3 3 Fuel Used(gal) 2 0 0 CO Emissions (g/hr) 125 12 0 Nox Emissions (g/hr) 29 3 3 Dilemma Vehicles (#) 0 0 0 <	90th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
50th %ile Green (s) 11.9 11.9 11.9 18.0 18.0 50th %ile Term Code Gap Gap Gap MaxR MaxR 30th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 3 5 Fuel Used(gal) 2 0	70th %ile Green (s)	13.9	13.9	13.9		18.0	18.0					
50th %ile Term Code Gap Gap Gap MaxR MaxR 30th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 3 Fuel Used(gal) 2 0 0 0 CO Emissions (g/hr) 125 12 0 0 Nox Emissions (g/hr) 29 3 3 0 Queue Length 50th (ft) 54 0 0 0 Queue Length 95th (ft) 120 13 1 1 1 1 1 1 <td>70th %ile Term Code</td> <td>Gap</td> <td>Gap</td> <td>Gap</td> <td></td> <td>MaxR</td> <td>MaxR</td> <td></td> <td></td> <td></td> <td></td> <td></td>	70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
30th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 Fuel Used(gal) 2 0 0 0 CO Emissions (g/hr) 125 12 0 NOx Emissions (g/hr) 24 2 0 VOC Emissions (g/hr) 29 3 3 Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 54 0 0 Queue Length 95th (ft) 120 13 1 Internal Link Dist (ft) 227 150 1 Turn Bay Length (ft) 298 425 3 Starvation Cap Reductn 0 0 0	50th %ile Green (s)	11.9	11.9	11.9		18.0	18.0					
30th %ile Green (s) 10.0 10.0 10.0 18.0 18.0 30th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 Fuel Used(gal) 2 0 0 0 CO Emissions (g/hr) 125 12 0 NOx Emissions (g/hr) 24 2 0 VOC Emissions (g/hr) 29 3 3 Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 54 0 0 Queue Length 95th (ft) 120 13 1 Internal Link Dist (ft) 227 150 1 Turn Bay Length (ft) 298 425 3 Starvation Cap Reductn 0 0 0	50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 Fuel Used(gal) 2 0 0 CO Emissions (g/hr) 125 12 NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	30th %ile Green (s)	10.0		10.0		18.0	18.0					
10th %ile Green (s) 7.4 7.4 7.4 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 3 3 Fuel Used(gal) 2 0 0 CO Emissions (g/hr) 125 12 NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
Stops (vph) 93 3 Fuel Used(gal) 2 0 CO Emissions (g/hr) 125 12 NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0						18.0	18.0					
Fuel Used(gal) 2 0 CO Emissions (g/hr) 125 12 NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
CO Emissions (g/hr) 125 12 NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	Stops (vph)			93			3					
NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	Fuel Used(gal)			2			0					
NOx Emissions (g/hr) 24 2 VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0	CO Emissions (g/hr)			125			12					
VOC Emissions (g/hr) 29 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 54 0 Queue Length 95th (ft) 120 13 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 298 425 Starvation Cap Reductn 0 0				24			2					
Queue Length 50th (ft)540Queue Length 95th (ft)12013Internal Link Dist (ft)227150Turn Bay Length (ft)298425Base Capacity (vph)298425Starvation Cap Reductn00				29			3					
Queue Length 95th (ft)12013Internal Link Dist (ft)227150Turn Bay Length (ft)298425Base Capacity (vph)298425Starvation Cap Reductn00				0			0					
Internal Link Dist (ft) 227 150 Turn Bay Length (ft) Base Capacity (vph) 298 425 Starvation Cap Reductn 0 0	Queue Length 50th (ft)			54			0					
Turn Bay Length (ff)Base Capacity (vph)298Starvation Cap Reductn000	Queue Length 95th (ft)			120			13					
Turn Bay Length (ft)Base Capacity (vph)298Starvation Cap Reductn000	• • • • • •			227			150					
Base Capacity (vph)298425Starvation Cap Reductn00												
Starvation Cap Reductn 0 0				298			425					
	Spillback Cap Reductn			0			0					

Scenario 08 PM Build w/ Improvement Scenario 1 4:30 pm 05/19/2021 Build w/ Impr 1 BH

Lanes, V	′olumes, Tim	ings					
1: Heady	/ Street/Pum	p House	Road &	Eton	Downs	& Oregon	Road

	۶	+	7	*	۲.	4	+	*	1	1	1	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.62					0.71			0.02		
Intersection Summary												
Area Type: C	Other											
Cycle Length: 121												
Actuated Cycle Length: 87.9												
Natural Cycle: 125												
Control Type: Semi Act-Unco	ord											
Maximum v/c Ratio: 0.71												
Intersection Signal Delay: 26.	.3			Ir	ntersectior	n LOS: C						
Intersection Capacity Utilizati	on 71.1%			IC	CU Level o	of Service	С					
Analysis Period (min) 15												
90th %ile Actuated Cycle: 10-	4.2											
70th %ile Actuated Cycle: 86	.9											
50th %ile Actuated Cycle: 84	.9											
30th %ile Actuated Cycle: 83												
10th %ile Actuated Cycle: 80	.4											
# 95th percentile volume ex	ceeds cap	bacity, qu	eue may	be longe	er.							
Queue shown is maximum	n after two	cycles.										

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

		Ø4	1 07
45 s	29 s	24 s	23 s
₩ Ø6			
45 s			

Intersection	Summary

Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

	≯	-	74	\mathbf{F}	۲	•	+	•	•	Ť	1	م
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$					\$			÷		
Traffic Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Future Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.993					0.986			0.975		
Flt Protected							0.998			0.973		
Satd. Flow (prot)	0	1850	0	0	0	0	1824	0	0	1767	0	0
Flt Permitted	-	0.998	-	-	-	-	0.966	-	-		-	
Satd. Flow (perm)	0	1846	0	0	0	0	1765	0	0	1816	0	0
Right Turn on Red	•		Ū	No	· ·	•		No	•		•	Yes
Satd. Flow (RTOR)										1		100
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	8	11.0					0.0	8		0.0		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	494	26	0.50	20	0.30	488	60	0.30	0.30	0.30	0.30
Shared Lane Traffic (%)	5	434	20	J	20	5	400	00	0	5	1	1
Lane Group Flow (vph)	0	526	0	0	0	0	573	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right		Left	Left	Left	Right	Left	Left	Right	
Median Width(ft)	Leit	Len 0	Right	Right	Leit	Leit	Leit 0	Right	Leit	Len 0	Right	Right
Link Offset(ft)		0					0			50		
		16					16			50 16		
Crosswalk Width(ft)		10					10			10		
Two way Left Turn Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00
Headway Factor		1.00	60				1.00			1.00		1.00
Turning Speed (mph)	15 1	2	60	9	60	15	2	9	15	2	9	60
Number of Detectors					1	1			1			
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			CI+Ex	CI+Ex	CI+Ex		Cl+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		CI+Ex					CI+Ex			CI+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0					0.0			0.0		
Turn Type	Perm	NA			Perm	Perm	NA		Perm	NA		
Protected Phases		2					6			3		
Permitted Phases	2				6	6	6		3			
Detector Phase	2	2			6	6	6		3	3		

Scenario 10 PM Build w/ Improvement Scenario 2 4:30 pm 05/19/2021 Build w/ Impr 2 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

	1	L,	Ļ	~	Ŧ	•	*	4	
Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations			4	•=		M			
Traffic Volume (vph)	93	3	2	8	1	29	6	29	
Future Volume (vph)	93	3	2	8	1	29	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	
Frt			0.990			0.927			
Flt Protected			0.957			0.977			
Satd. Flow (prot)	0	0	1765	0	0	1644	0	0	
Flt Permitted	0	0	0.738	U	U	0.977	0	0	
Satd. Flow (perm)	0	0	1361	0	0	1644	0	0	
Right Turn on Red	0	0	1301	Yes	0	1044	0	Yes	
Satd. Flow (RTOR)			3	165		105		165	
			30			30			
Link Speed (mph)			30 307			230			
Link Distance (ft)			307 7.0			230 5.2			
Travel Time (s)			7.0			J.Z		0	
Confl. Peds. (#/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	97	3	2	8	1	30	6	30	
Shared Lane Traffic (%)	0	0	110	0	0	67	0	0	
Lane Group Flow (vph) Enter Blocked Intersection	0	0	110	0	0	67	0	0	
	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)			0			12			
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane	4 00	4 00	4.00	4.00	4.00	4 00	4.00	4 00	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	60	•	9	60	60	60	60	
Number of Detectors	1	1	2		1	1			
Detector Template	Left	Left	Thru		Left	Left			
Leading Detector (ft)	20	20	100		20	20			
Trailing Detector (ft)	0	0	0		0	0			
Detector 1 Position(ft)	0	0	0		0	0			
Detector 1 Size(ft)	20	20	6		20	20			
Detector 1 Type	CI+Ex	Cl+Ex	CI+Ex		Cl+Ex	CI+Ex			
Detector 1 Channel									
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0			
Detector 2 Position(ft)			94						
Detector 2 Size(ft)			6						
Detector 2 Type			CI+Ex						
Detector 2 Channel			_						
Detector 2 Extend (s)			0.0						
Turn Type	Perm	Perm	NA		Perm	Perm			
Protected Phases			4						
Permitted Phases	4	4			7	7			
Detector Phase	4	4	4		7	7			

Scenario 10 PM Build w/ Improvement Scenario 2 4:30 pm 05/19/2021 Build w/ Impr 2 BH

Lanes, Volumes, Tim	lings
1: Heady Street/Pum	p House Road & Eton Downs & Oregon Road

Jane Group EBL EBT EBR EBR EBR WBL WBL WBR NBL NBT NBR NBR Switch Phases		٦	-	ľ	*	5	4	ł	*	1	1	1	*1
Switch Phase Ninimum Single Unified (s) 40.0	Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Minimum Split (s) 45.0 45.0 45.0 45.0 45.0 28.0 Total Split (s) 49.0 49.0 49.0 49.0 49.0 49.0 49.0 20.0	Switch Phase												
Minimum Split (s) 45.0 45.0 45.0 45.0 45.0 28.0 Total Split (s) 49.0 49.0 49.0 49.0 49.0 49.0 49.0 20.0	Minimum Initial (s)	40.0	40.0			40.0	40.0	40.0		5.0	5.0		
Total Split (\$) 49.0 49.0 49.0 49.0 29.0 29.0 Total Split (\$) 39.2% 39.2% 39.2% 39.2% 39.2% 23.2% 23.2% 23.2% Maximum Green (s) 44.0 44.0 44.0 44.0 44.0 24.0 24.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 Lead/Lag Optimize? Yelso Yelso Yelso Yelso Yelso Yelso Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max None None Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Vehicle Extension (s) 44.4 6.2 Vehicle Extension (s) 44.4 6.48 0.07	()	45.0	45.0			45.0	45.0	45.0		29.0	29.0		
Total Split (%) 39.2% 39.2% 39.2% 23.2% 23.2% 23.2% Maximum Green (s) 44.0 44.0 44.0 44.0 24.0 24.0 Vellow Time (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 Lead-Lag Optimize? Yes Yes Yes Yes Yes Yes Recall Mode Max Max Max Nav None None None Waik Time (s) 7.0 7.0 7.0 7.0 7.0 Total Lost (fth) 6	• • • • •												
Maximum Green (s) 44.0 44.0 44.0 44.0 24.0 24.0 Yellow Time (s) 3.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>													
All-Red Time (s) 2.0 <td></td> <td>44.0</td> <td>44.0</td> <td></td> <td></td> <td>44.0</td> <td>44.0</td> <td>44.0</td> <td></td> <td>24.0</td> <td></td> <td></td> <td></td>		44.0	44.0			44.0	44.0	44.0		24.0			
All-Red Time (s) 2.0 <td>()</td> <td></td>	()												
Lost Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Optimize? Lead Lead Lead Recall Mode Max Max Max None Wehice Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 Tot Feedestrin Calls (#hr) 6 6 6 Act Effet Green (s) 44.4 6.4 6.2 Actuated g/C Ratio 0.48 0.048 0.07 vic Ratio 0.59 0.68 0.09 Control Delay 0.0 </td <td>()</td> <td></td>	()												
Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Waik Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 11.0 Packstin Calls (#hr) 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7													
LeadLag Optimize? Lead Lead Lead Lead Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 T.0 T.0 Pedestrian Calls (#hr) 6 6 6 6 6 Act Effct Green (s) 44.4 44.4 6.2 6 6 Act atted gC Ratio 0.48 0.048 0.07 v/c 7.0 7.0 Control Delay 22.5 25.2 43.6 6 6 6 LOS C C D D 0 </td <td> ,</td> <td></td>	,												
Lead-Lag Optimize? Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode Max Max Max Max None None Walk Time (s) 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#/hr) 6 6 6 6 6 Actuated glC Ratio 0.48 0.44 6.2 43.6 0.07 Vic Ratio 0.59 0.68 0.09 0.0 0 0.0 0 <	,									Lead			
Vehicle Extension (s) 3.0	•												
Recall Mode Max Max <th< td=""><td></td><td>3.0</td><td>3.0</td><td></td><td></td><td>3.0</td><td>3.0</td><td>3.0</td><td></td><td></td><td></td><td></td><td></td></th<>		3.0	3.0			3.0	3.0	3.0					
Walk Time (s) 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 Pedestrian Calls (#/hr) 6 6 6 6 Act Effet Green (s) 44.4 44.4 6.2 Actuated g/C Ratio 0.48 0.07 v/c Ratio 0.09 Control Delay 22.5 25.2 43.6 Cueue Delay 0.0 0.0 0.0 Total Delay 22.5 25.2 43.6 LOS C D D 0 Approach Delay 22.5 25.2 43.6 Oth %ile Green (s) 44.0 44.0 44.0 7.4 7.4 90th %ile Green (s) 44.0 44.0 44.0 44.0 44.0 7.4 7.4 90th %ile Term Code MaxR <maxr< td=""> MaxR<maxr< td=""> MaxR MaxR Skip Skip 90th %ile Green (s) 44.0 44.0 44.0 40.0 0.0 0.0</maxr<></maxr<>													
Flash Dont Walk (s) 11.0 11.0 11.0 11.0 Pedestrian Calls (#hr) 6 6 6 Act Effc Green (s) 44.4 6.2 Actuated g/C Ratio 0.48 0.48 0.07 v/c Ratio 0.59 0.68 0.09 Control Delay 22.5 25.2 43.6 Queue Delay 0.0 0.0 0.0 Total Delay 22.5 25.2 43.6 LOS C C D Approach Delay 22.5 25.2 43.6 Opto Sile Green (s) 44.0 44.0 44.0 7.4 7.4 90th %ile Green (s) 44.0 44.0 44.0 7.4 7.4 90th %ile Green (s) 44.0 44.0 44.0 0.0 0.0 0.0 90th %ile Term Code MaxR MaxR MaxR MaxR Kap Skip Skip 90th %ile Term Code MaxR MaxR MaxR MaxR MaxR Skip Skip 90th %ile Term Code MaxR MaxR MaxR													
Pedestrian Calls (#/hr) 6 6 6 Act Effct Green (s) 44.4 44.4 6.2 Actuated g/C Ratio 0.48 0.07 v/c Ratio 0.59 0.68 0.09 Control Delay 22.5 25.2 43.6 Queue Delay 0.0 0.0 0.0 Total Delay 22.5 25.2 43.6 LOS C C D Approach Delay 22.5 25.2 43.6 Obl' %ile Green (s) 44.0 44.0 44.0 7.4 7.4 90th %ile Green (s) 44.0 44.0 44.0 44.0 0.0 0.0 90th %ile Green (s) 44.0 44.0 44.0 40.0 0.0 0.0 90th %ile Green (s) 44.0 44.0 44.0 44.0 0.0 0.0 0.0 90th %ile Green (s) 44.0 44.0 44.0 44.0 0.0 0.0 0.0 90th %ile Green (s) 44.0 44.0	· · · · · · · · · · · · · · · · · · ·												
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Scenario 10 PM Build w/ Improvement Scenario 2 4:30 pm 05/19/2021 Build w/ Impr 2 BH

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Road	l

Lane Group SBL2 SBL SBT NWL2 NWL NWR NWR2 Switch Phase		1	L.	ŧ	~	Ŧ	*	*	4		
Minimum Initial (s) 5.0 5.0 3.0 3.0 Minimum Spiti (s) 24.0 24.0 23.0 23.0 Total Spiti (s) 19.2% 19.2% 18.4% 18.4% Maximum Green (s) 19.0 19.0 18.0 18.0 Velow Time (s) 3.0 3.0 3.0 3.0 Lost Time Aquest (s) 0.0 0.0 1.0 1.0 Total Spiti (s) 3.0 3.0 3.0 3.0 3.0 Lead/Lag Lag	Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2		
Minimum Split (a) 24.0 24.0 24.0 23.0 Total Split (s) 19.2% 19.2% 18.4% 18.4% Maximum Green (s) 19.0 19.0 18.0 18.0 Vallow Time (s) 2.0 2.0 2.0 2.0 Last Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 3.0 3.0 3.0 3.0 Lead-Lag Optimize? Yes Yes Yes Yes Vehice Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Max Walk Time (s) 7.0 7.0 7.0 Total Split (String (String) 10.1 11.0 Pedestran Call Kith 2 2 2 2 2 Act Eff Green (s) 11.0 11.0 11.0 11.0 11.0 Pedestran Call Kith 2 2 2 2 12.5 16.1 Actitated gift Grein (s) 14.2 <td>Switch Phase</td> <td></td>	Switch Phase										
Total Split (\$) 24.0 24.0 23.0 Total Split (%) 19.2% 19.2% 19.2% 18.4% Maximum Green (s) 13.0 19.0 18.0 18.0 Yellow Time (s) 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Last Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 5.0 Lead/Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Walk Time (s) 7.0 7.0 7.0 Total Station Vehicle Extension (s) 3.0 3.0 3.0 3.0 Vehicle Extension (s) 11.0 11.0 11.0 11.0 Person Diver Vehicle Station 0.14 0.20 0.0 0.0 Vic Ratio 0.59 0.16 0.0 0.0 0.0 Otablelay 50.4 3.4 Approach LoS D A <td>Minimum Initial (s)</td> <td>5.0</td> <td>5.0</td> <td>5.0</td> <td></td> <td>3.0</td> <td>3.0</td> <td></td> <td></td> <td></td> <td>1</td>	Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0				1
Total Split (\$) 24.0 24.0 23.0 Total Split (%) 19.2% 19.2% 19.2% 18.4% 18.4% Maximum Green (s) 13.0 13.0 3.0 3.0 3.0 All-Red Time (s) 3.0 3.0 3.0 3.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 0.0 Total Lost Time (s) 5.0 5.0 2.0 Lead/Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Vehicle Extension (s) 11.0 11.0 11.0 11.0 Pedestrian Calls (#hr) 2 2	()	24.0		24.0		23.0	23.0				
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Maximum Green (s) 19.0 19.0 18.0 18.0 Yellow Time (s) 3.0 3.0 3.0 3.0 3.0 Last Time Adjust (s) 0.0 0.0 0.0 Lost Time Adjust (s) 5.0 5.0 Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 Recall Mode None None Max Max Max Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Vehicle Extension (s) 1.0 11.0 11.0 11.0 Pedestrian Calls (#/nr) 2 2 - - Act Effet Green (s) 12.5 18.1 - - Act Effet Green (s) 0.14 0.20 - - Outeu Delay 50.4 3.4 - - Outeu Delay 50.4 3.4 - - Outeu Delay 50.4		19.2%	19.2%	19.2%		18.4%	18.4%				
All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) 0.0 0.0 Lost Time Adjust (s) 5.0 5.0 Lead-Lag Optimize? Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 Recall Mode None None Max Walk Time (s) 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 Pedestrian Calls (#/hr) 2 2 2 ActLred g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 LOS D A Soft %ile Green (s) 19.0 19.0 18.0 Soft %ile Green (s) 19.0 19.0 18.0 Soft %ile Green (s) 10.2 10.2 18.0 Soft %ile Green (s) 10.2 10.2 18.0 Soft %ile Green (s) 10.2 10.2 18.0	,	19.0	19.0	19.0		18.0	18.0				1
Lost Time Adjust (s) 0.0 0.0 Total Lost Time (s) 5.0 5.0 Lead-Lag Optimize? Yes Yes Venicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None Max Max Walk Time (s) 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 Pedestrian Calls (#hr) 2 2 - - - Act Lated g/C Ratio 0.14 0.20 vic Ratio 0.59 0.016 Control Delay 50.4 3.4 - - - Oueue Delay 0.0 0.0 0.0 - - Outo Belay 50.4 3.4 - - - Obt Wise Green (s) 19.0 19.0 18.0 18.0 - - Oth %ile Green (s) 19.0 19.0 18.0 18.0 - - Oth %ile Green (s) 10.2 10.2 10.2 18.0 1	Yellow Time (s)	3.0	3.0	3.0		3.0	3.0				
Total Lost Time (s) 5.0 5.0 Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 Recall Mode None None None Max Walk Time (s) 7.0 7.0 7.0 Total Lost Flash Dont Walk (s) 11.0 11.0 11.0 Pedestrian Calls(#thr) 2 2 Act Effct Green (s) 12.5 18.1 Actuated giC Ratio 0.14 0.20 Vc Ratio 0.14 0.20 Vc Ratio 0.16 Control Delay 50.4 3.4 Outrou Delay 50.4 3.4 Approach Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Obth Wile Term Code Max Max Max Max Max 70th Wile Green (s) 19.0 19.0 18.0 18.0 18.0 70th Wile Term Code Gap Gap Gap Max Max	All-Red Time (s)	2.0	2.0	2.0		2.0	2.0				1
Lead/Lag Lag Lag <thlag< th=""> Lag <thlag< th=""> <thlag< <="" td=""><td>Lost Time Adjust (s)</td><td></td><td></td><td>0.0</td><td></td><td></td><td>0.0</td><td></td><td></td><td></td><td></td></thlag<></thlag<></thlag<>	Lost Time Adjust (s)			0.0			0.0				
Lead-Lag Optimize? Yes Yes Yes Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None None Max Max Walk Time (s) 7.0 7.0 7.0 Total (star) Total (star) Pedestrian Calls (#hr) 2 2 Z Act Effct Green (s) 12.5 18.1 Actuated g/C Ratio 0.14 0.20 V/c Ratio 0.0 0.0 Control Delay 50.4 3.4 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 LOS D A Oth %ile Green (s) 19.0 19.0 18.0 18.0 Total Delay 50.4 3.4 Oth %ile Green (s) 19.0 19.0 18.0 18.0 Total Delay 18.0 18.0 Oth %ile Green (s) 12.2 12.2 18.0 18.0 18.0 16.0 10.0 10.1 <td>Total Lost Time (s)</td> <td></td> <td></td> <td>5.0</td> <td></td> <td></td> <td>5.0</td> <td></td> <td></td> <td></td> <td>1</td>	Total Lost Time (s)			5.0			5.0				1
Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Recall Mode None None None Max Max Walk Time (s) 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 Pedestrian Calls (#hr) 2 2 Act Effet Green (s) 12.5 18.1 Actated g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach LOS D A Opth %ile Green (s) 19.0 19.0 18.0 18.0 Oth %ile Green (s) 14.4 14.4 18.0 18.0 Oth %ile Green (s) 12.2 12.2 18.0 18.0 Oth %ile Green (s) 10.2 10.2 10.2 18.0 18.0 Oth %ile Term Code Gap Gap Gap<	Lead/Lag	Lag	Lag	Lag							
Recall Mode None None None Max Max Walk Time (s) 7.0 7.0 7.0 7.0 7.0 Flash Dort Walk (s) 11.0 11.0 7.0 7.0 7.0 Pedestrian Calls (#hr) 2 2 2 7.0 7.0 Act Lafted Green (s) 11.0 11.0 7.0 7.0 7.0 Ve Ratio 0.59 0.16 7.0 7.0 7.0 Control Delay 50.4 3.4 7.0 7.0 7.0 Oute Delay 50.4 3.4 7.0 7.0 7.0 7.0 Total Delay 50.4 3.4 7.0 7.0 7.0 7.0 7.0 Oth Sile Green (s) 19.0 19.0 18.0 18.0 7.0 7.0 7.0 7.0 Oth Sile Green (s) 12.2 12.2 12.2 18.0 18.0 7.0 7.6 7.6 7.6 18.0 18.0 7.0 7.0 7.0 <td>Lead-Lag Optimize?</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Lead-Lag Optimize?	Yes	Yes	Yes							
Waik Time (s) 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 Pedestrian Calls (#hr) 2 2 2 Act Effc Green (s) 12.5 18.1 Actaded g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 100 Oblt %ile Green (s) 19.0 19.0 18.0 900 19.0 18.0 18.0 900th %ile Green (s) 19.4 14.4 14.8 18.0 100 18.0 900th %ile Term Code Gap Gap Gap Max Max Max Max 900th %ile Term Code Gap Gap Gap Max Max <t< td=""><td>Vehicle Extension (s)</td><td>3.0</td><td>3.0</td><td>3.0</td><td></td><td>3.0</td><td>3.0</td><td></td><td></td><td></td><td></td></t<>	Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Flash Dont Walk (s) 11.0 11.0 11.0 Pedestrian Calls (#hr) 2 2 Act Effc Green (s) 12.5 18.1 Actuated g/C Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Polt %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 12.2 12.2 18.0 90th %ile Green (s) 10.2 10.2 18.0 90th %ile Green (s) 12.2 12.2 18.0 18.0 90th %ile Green (s) 10.2 10.2 18.0 18.0 90th %ile Green (s) 10.2 10.2 18.0 18.0 90th %ile Green (s) 10.2 10.2 10.2 10.0 <tr< td=""><td>Recall Mode</td><td>None</td><td>None</td><td>None</td><td></td><td>Max</td><td>Max</td><td></td><td></td><td></td><td></td></tr<>	Recall Mode	None	None	None		Max	Max				
Pedestrian Calls (#/hr) 2 2 2 Act Effct Green (s) 12.5 18.1 Actuated g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 12.2 12.2 18.0 90th %ile Green (s) 12.2 12.2 18.0 18.0 90th %ile Green (s) 10.2 10.2 18.0 18.0 90th %ile Green (s) 10.2 10.2 18.0 18.0 90th %ile Green (s) 7.6 7.6 18.0 18.0 90th %ile Green (s) 7.6 7.6 18.0 13. </td <td>Walk Time (s)</td> <td>7.0</td> <td>7.0</td> <td>7.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Walk Time (s)	7.0	7.0	7.0							
Act Effct Green (s) 12.5 18.1 Actuated g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Poth %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 14.4 14.4 18.0 70th %ile Green (s) 12.2 12.2 18.0 70th %ile Green (s) 12.2 12.2 18.0 90th %ile Fram Code Gap Gap Gap 30th %ile Green (s) 10.2 10.2 18.0 30th %ile Fram Code Gap Gap Gap 30th %ile Fram Code Gap Gap MaxR 30th %ile Fram Code Gap Gap MaxR 30th %ile Fram Code Gap Gap MaxR	Flash Dont Walk (s)	11.0	11.0	11.0							1
Actuated g/C Ratio 0.14 0.20 v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Oth Wile Green (s) 19.0 19.0 18.0 90th Wile Green (s) 19.0 19.0 18.0 70th Wile Green (s) 14.4 14.4 18.0 70th Wile Green (s) 12.2 12.2 12.2 18.0 50th Wile Green (s) 10.2 10.2 18.0 18.0 50th Wile Green (s) 10.2 10.2 18.0 18.0 50th Wile Green (s) 10.2 10.2 18.0 18.0 50th Wile Green (s) 7.6 7.6 7.6 18.0 18.0 50th Wile Green (s) 7.6 7.6 18.0 18.0	Pedestrian Calls (#/hr)	2	2	2							
v/c Ratio 0.59 0.16 Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 LOS D A Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 14.4 14.4 18.0 70th %ile Green (s) 12.2 12.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 18.0 18.0 10th %ile Green (s) 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 18.0	Act Effct Green (s)			12.5			18.1				1
Control Delay 50.4 3.4 Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 18.0 70th %ile Green (s) 12.2 12.2 12.2 18.0 50th %ile Green (s) 12.2 12.2 18.0 18.0 50th %ile Term Code Gap Gap Gap MaxR 30th %ile Green (s) 10.2 10.2 18.0 18.0 30th %ile Term Code Gap Gap Gap Gap Gap 30th %ile Term Code Gap Gap Gap MaxR MaxR 30th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph)	Actuated g/C Ratio			0.14			0.20				
Queue Delay 0.0 0.0 Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 19.0 19.0 18.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 18.0 70th %ile Term Code Gap Gap Gap Gap MaxR 50th %ile Green (s) 12.2 12.2 18.0 18.0 300 50th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 18.0 18.0 300 30th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Green (s)				0.59			0.16				1
Total Delay 50.4 3.4 LOS D A Approach Delay 50.4 3.4 Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Green (s) 14.4 14.4 18.0 90th %ile Green (s) 14.4 14.4 18.0 70th %ile Green (s) 12.2 12.2 12.2 12.2 12.2 12.2 18.0 50th %ile Term Code Gap Gap Gap 50th %ile Green (s) 10.2 10.2 18.0 50th %ile Term Code Gap Gap Gap 30th %ile Green (s) 7.6 7.6 18.0 30th %ile Term Code Gap Gap Gap MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap MaxR MaxR	Control Delay			50.4			3.4				
LOS D A Approach Delay 50.4 3.4 Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Term Code Max Max MaxR 70th %ile Green (s) 14.4 14.4 18.0 70th %ile Green (s) 14.4 14.4 18.0 70th %ile Green (s) 12.2 12.2 18.0 50th %ile Green (s) 12.2 12.2 18.0 50th %ile Green (s) 10.2 10.2 10.2 50th %ile Green (s) 7.6 7.6 18.0 50th %ile Green (s) 7.6 7.6 18.0 50th %ile Green (s) 7.6 7.6 18.0 30th %ile Green (s) 7.6 7.6 18.0 18.0 30th %ile Green (s) 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 18.0 18.0 <	Queue Delay			0.0			0.0				1
LOS D A Approach Delay 50.4 3.4 Approach LOS D A 90th %ile Green (s) 19.0 19.0 18.0 90th %ile Term Code Max Max MaxR 70th %ile Green (s) 14.4 14.4 18.0 90th %ile Term Code Gap Gap Gap 70th %ile Green (s) 12.2 12.2 18.0 50th %ile Term Code Gap Gap MaxR 30th %ile Green (s) 10.2 10.2 18.0 30th %ile Green (s) 7.6 7.6 18.0 10th %ile Green (s) 7.6 7.6	Total Delay			50.4			3.4				
Approach LOS D A 90th %ile Green (s) 19.0 19.0 19.0 18.0 18.0 90th %ile Green (s) 14.4 14.4 14.4 18.0 18.0 70th %ile Green (s) 14.4 14.4 14.4 18.0 18.0 70th %ile Green (s) 12.2 12.2 12.2 18.0 18.0 50th %ile Term Code Gap Gap Gap MaxR MaxR 50th %ile Green (s) 10.2 10.2 18.0 18.0 18.0 50th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 30th %ile Green (s) 7.6 7.6 18.0 18.0 10.1 10th %ile Green (s) 7.6 7.6 18.0 18.0 10.1 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10.1 10th %ile Green (s) 7.6 7.6 7.6 1				D			А				1
90th %ile Green (s) 19.0 19.0 19.0 18.0 18.0 90th %ile Term Code Max	Approach Delay			50.4			3.4				
90th %ile Term Code Max	Approach LOS			D			А				
70th %ile Green (s) 14.4 14.4 14.4 18.0 18.0 70th %ile Term Code Gap Gap Gap Gap MaxR MaxR 50th %ile Green (s) 12.2 12.2 12.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 10.2 10.2 10.0 18.0 18.0 30th %ile Green (s) 10.2 10.2 18.0 18.0 30th %ile Green (s) 10.2 10.2 18.0 18.0 30th %ile Green (s) 7.6 7.6 7.6 18.0 10th %ile Green (s) 7.6 7.6 18.0 18.0 Stops (vph) 93 4 10 10 10 Fuel Used(gal) 2 <td>90th %ile Green (s)</td> <td>19.0</td> <td>19.0</td> <td>19.0</td> <td></td> <td>18.0</td> <td>18.0</td> <td></td> <td></td> <td></td> <td></td>	90th %ile Green (s)	19.0	19.0	19.0		18.0	18.0				
70th %ile Term Code Gap Gap Gap MaxR MaxR 50th %ile Green (s) 12.2 12.2 12.2 18.0 18.0 50th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 30th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 4 Fuel Used(gal) 2 0 CO Emissions (g/hr) 130 13 13 Nox Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 3 3 3 Dilemma Vehicles (#) 0 0 0 0 0 Queue Length 50th (ft) 124 16 16 16 16 Internal Link Dist (ft)	90th %ile Term Code	Max	Max	Max		MaxR	MaxR				
50th %ile Green (s) 12.2 12.2 12.2 18.0 18.0 50th %ile Term Code Gap Gap Gap MaxR MaxR 30th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 7.6 7.6 Voc Emissions (g/hr) 130 13 13 13 Nox Emissions (g/hr) 30 3 <t< td=""><td>70th %ile Green (s)</td><td>14.4</td><td>14.4</td><td>14.4</td><td></td><td>18.0</td><td>18.0</td><td></td><td></td><td></td><td></td></t<>	70th %ile Green (s)	14.4	14.4	14.4		18.0	18.0				
50th %ile Term Code Gap Gap Gap MaxR MaxR 30th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Term Code Gap Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 4 Fuel Used(gal) 2 0 NOx Emissions (g/hr) 130 13	70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
30th %ile Green (s) 10.2 10.2 10.2 18.0 18.0 30th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 4 Fuel Used(gal) 2 0 0 CO Emissions (g/hr) 130 13 13 NOx Emissions (g/hr) 25 2 0 VOC Emissions (g/hr) 30 3 3 Dilemma Vehicles (#) 0 0 0 Queue Length 50th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	50th %ile Green (s)	12.2	12.2	12.2		18.0	18.0				
30th %ile Term Code Gap Gap Gap MaxR MaxR 10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 4 Fuel Used(gal) 2 0 CO Emissions (g/hr) 130 13 NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 577 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turm Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
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10th %ile Green (s) 7.6 7.6 7.6 18.0 18.0 10th %ile Term Code Gap Gap Gap MaxR MaxR Stops (vph) 93 4 Fuel Used(gal) 2 0 CO Emissions (g/hr) 130 13 NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
Stops (vph) 93 4 Fuel Used(gal) 2 0 CO Emissions (g/hr) 130 13 NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	10th %ile Green (s)					18.0	18.0				
Fuel Used(gal) 2 0 CO Emissions (g/hr) 130 13 NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR				
CO Emissions (g/hr) 130 13 NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	Stops (vph)			93			4				
NOx Emissions (g/hr) 25 2 VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	Fuel Used(gal)			2			0				
VOC Emissions (g/hr) 30 3 Dilemma Vehicles (#) 0 0 Queue Length 50th (ft) 57 0 Queue Length 95th (ft) 124 16 Internal Link Dist (ft) 227 150 Turn Bay Length (ft) 285 407 Starvation Cap Reductn 0 0	CO Emissions (g/hr)			130			13				
Dilemma Vehicles (#)00Queue Length 50th (ft)570Queue Length 95th (ft)12416Internal Link Dist (ft)227150Turn Bay Length (ft)285407Base Capacity (vph)285407Starvation Cap Reductn00				25			2				1
Queue Length 50th (ft)570Queue Length 95th (ft)12416Internal Link Dist (ft)227150Turn Bay Length (ft)285407Base Capacity (vph)285407Starvation Cap Reductn00	VOC Emissions (g/hr)			30			3				
Queue Length 95th (ft)12416Internal Link Dist (ft)227150Turn Bay Length (ft)285407Base Capacity (vph)285407Starvation Cap Reductn00				0			0				1
Internal Link Dist (ft) 227 150 Turn Bay Length (ft) Base Capacity (vph) 285 407 Starvation Cap Reductn 0 0	Queue Length 50th (ft)			57			0				
Turn Bay Length (ff)Base Capacity (vph)285Starvation Cap Reductn000	Queue Length 95th (ft)			124			16				1
Turn Bay Length (ft)Base Capacity (vph)285Starvation Cap Reductn000				227			150				
Base Capacity (vph)285407Starvation Cap Reductn00											1
Starvation Cap Reductn 0 0				285			407				
											1
	Spillback Cap Reductn			0			0				

Scenario 10 PM Build w/ Improvement Scenario 2 4:30 pm 05/19/2021 Build w/ Impr 2 BH

Lanes, V	/olumes, Tim	ings			
1: Heady	/ Street/Pum	p House Roa	id & Eton [Downs &	Oregon Road

	≯	+	7	*	۲	4	+	*	1	1	1	*
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.59					0.68			0.02		
Intersection Summary												
Area Type: O	ther											
Cycle Length: 125												
Actuated Cycle Length: 92.2												
Natural Cycle: 125												
Control Type: Actuated-Unco	ordinated											
Maximum v/c Ratio: 0.68												
Intersection Signal Delay: 25.	3			lr	ntersectior	n LOS: C						
Intersection Capacity Utilization	on 71.1%			IC	CU Level o	of Service	С					
Analysis Period (min) 15												
90th %ile Actuated Cycle: 108	8.4											
70th %ile Actuated Cycle: 91.	.4											
50th %ile Actuated Cycle: 89.	.2											
30th %ile Actuated Cycle: 87.	.2											
10th %ile Actuated Cycle: 84.	.6											
# 95th percentile volume ex	# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum												

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

	↑ø3	Ø4	1 07
49 s	29 s	24 s	23 s
₩ Ø6			
49 s			

0.16

0.39

Reduced v/c Ratio

Intersection Summary
Lanes, ∖	olumes, Timings	
1: Heady	Street/Pump House Road & Eton Downs & Oregon R	load

08/13/2021

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations		\$				ħ.	el el			÷		
Traffic Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Future Volume (vph)	3	474	25	3	19	5	468	58	6	3	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99					
Frt		0.993					0.984			0.975		
Flt Protected						0.950				0.973		
Satd. Flow (prot)	0	1850	0	0	0	1770	1823	0	0	1767	0	0
Flt Permitted		0.998				0.330						
Satd. Flow (perm)	0	1846	0	0	0	615	1823	0	0	1816	0	0
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)										1		
Link Speed (mph)		30					30			30		
Link Distance (ft)		518					276			165		
Travel Time (s)		11.8					6.3			3.8		
Confl. Peds. (#/hr)	8							8				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	494	26	3	20	5	488	60	6	3	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	526	0	0	0	25	548	0	0	11	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			0		
Link Offset(ft)		0					0			50		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		60	9	60	15		9	15		9	60
Number of Detectors	1	2			1	1	2		1	2		
Detector Template	Left	Thru			Left	Left	Thru		Left	Thru		
Leading Detector (ft)	20	100			20	20	100		20	100		
Trailing Detector (ft)	0	0			0	0	0		0	0		
Detector 1 Position(ft)	0	0			0	0	0		0	0		
Detector 1 Size(ft)	20	6			20	20	6		20	6		
Detector 1 Type	CI+Ex	Cl+Ex			Cl+Ex	Cl+Ex	CI+Ex		CI+Ex	Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(ft)		94					94			94		
Detector 2 Size(ft)		6					6			6		
Detector 2 Type		Cl+Ex					CI+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	_	0.0					0.0		_	0.0		
Turn Type	Perm	NA			pm+pt	pm+pt	NA		Perm	NA		
Protected Phases		2			1	1	6			3		
Permitted Phases	2	_			6	6	6		3			
Detector Phase	2	2			1	1	6		3	3		

Scenario 12 PM Build w/ Improvement Scenario 3 4:30 pm 05/19/2021 Build w/ Impr 3 BH

Lanes, Volur	nes, Timings
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road

08/13/2021

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Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2	
Lane Configurations			4	•=		M			
Traffic Volume (vph)	93	3	2	8	1	29	6	29	
Future Volume (vph)	93	3	2	8	1	29	6	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	
Frt			0.990			0.927			
Flt Protected			0.957			0.977			
Satd. Flow (prot)	0	0	1765	0	0	1642	0	0	
Flt Permitted	0	0	0.738	0	U	0.977	0	0	
Satd. Flow (perm)	0	0	1361	0	0	1642	0	0	
Right Turn on Red	U	0	1001	Yes	U	1042	U	Yes	
Satd. Flow (RTOR)			2	163		133		163	
Link Speed (mph)			30			30			
Link Distance (ft)			307			230			
Travel Time (s)			7.0			5.2			
Confl. Peds. (#/hr)			1.0			0.2		8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	97	0.90	0.90	0.90	0.90	30	0.90	30	
Shared Lane Traffic (%)	91	3	2	0	1	30	0	30	
Lane Group Flow (vph)	0	0	110	0	0	67	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right	
Median Width(ft)	Leit	Leit	0	Nyn	Leit	12	Nyn	Night	
Link Offset(ft)			0			75			
Crosswalk Width(ft)			16			16			
Two way Left Turn Lane			10			10			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	1.00	1.00 60	1.00	1.00	1.00 60	60	1.00 60	1.00 60	
Number of Detectors	15	1	2	9	00	1	00	00	
Detector Template	Left	Left	∠ Thru		Left	Left			
	20	20	100		20	20			
Leading Detector (ft) Trailing Detector (ft)	20	20							
	0	0	0		0	0 0			
Detector 1 Position(ft)	20	20	0 6		20	20			
Detector 1 Size(ft) Detector 1 Type	ZU CI+Ex	20 Cl+Ex	o Cl+Ex		CI+Ex	ZU CI+Ex			
Detector 1 Type Detector 1 Channel	UI+EX	UI+EX	OI+EX			UI+EX			
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0			
	0.0	0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0 94		0.0	0.0			
Detector 2 Position(ft)			94						
Detector 2 Size(ft)			o Cl+Ex						
Detector 2 Type Detector 2 Channel									
			0.0						
Detector 2 Extend (s)	Dorre	Darm	0.0 NA		Dorre	Dorm			
Turn Type	Perm	Perm			Perm	Perm			
Protected Phases	4	4	4		7	7			
Permitted Phases	4	4	Α		7	7			
Detector Phase	4	4	4		7	7			

Scenario 12 PM Build w/ Improvement Scenario 3 4:30 pm 05/19/2021 Build w/ Impr 3 BH

Lanes, Volumes, Ti 1: Heady Street/Pu	•	use Ro	ad & E	Eton D	owns &	k Oreg	jon Roa	ad			08/	13/2021
	•	-	~	\mathbf{F}	•	4	•	•	1	Ť	~	۴
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Switch Phase												
Minimum Initial (s)	40.0	40.0			5.0	5.0	40.0		5.0	5.0		
Minimum Split (s)	45.0	45.0			9.5	9.5	45.0		29.0	29.0		
Total Split (s)	49.5	49.5			9.5	9.5	59.0		29.0	29.0		
Total Split (%)	36.7%	36.7%			7.0%	7.0%	43.7%		21.5%	21.5%		
Maximum Green (s)	44.5	44.5			5.0	5.0	54.0		24.0	24.0		
Yellow Time (s)	3.0	3.0			3.5	3.5	3.0		3.0	3.0		
All-Red Time (s)	2.0	2.0			1.0	1.0	2.0		2.0	2.0		
Lost Time Adjust (s)		0.0				0.0	0.0			0.0		
Total Lost Time (s)		5.0				4.5	5.0			5.0		
Lead/Lag	Lag	Lag			Lead	Lead			Lead	Lead		
Lead-Lag Optimize?	Yes	Yes			Yes	Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		
Recall Mode	Max	Max			None	None	Max		None	None		
Walk Time (s)							7.0					
Flash Dont Walk (s)							11.0					
Pedestrian Calls (#/hr)							6					
Act Effct Green (s)		50.7				54.8	54.3			6.2		
Actuated g/C Ratio		0.49				0.53	0.53			0.06		
v/c Ratio		0.58				0.07	0.57			0.10		
Control Delay		24.6				14.4	20.8			48.7		
Queue Delay		0.0				0.0	0.0			0.0		
Total Delay		24.6				14.4	20.8			48.7		
LOS		C				В	С			D		
Approach Delay		24.6					20.6			48.7		
Approach LOS		C					С			D		
90th %ile Green (s)	44.5	44.5			5.0	5.0	54.0		7.5	7.5		
90th %ile Term Code	MaxR	MaxR			Max	Max	MaxR		Gap	Gap		
70th %ile Green (s)	44.5	44.5			5.0	5.0	54.0		0.0	0.0		
70th %ile Term Code	MaxR	MaxR			Max	Max	MaxR		Skip	Skip		
50th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
50th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
30th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
30th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
10th %ile Green (s)	54.0	54.0			0.0	0.0	54.0		0.0	0.0		
10th %ile Term Code	Hold	Hold			Skip	Skip	MaxR		Skip	Skip		
Stops (vph)		361			- "P	12	350			12		
Fuel Used(gal)		7				0	5			0		
CO Emissions (g/hr)		459				13	370			13		
NOx Emissions (g/hr)		89				3	72			3		
VOC Emissions (g/hr)		106				3	86			3		
Dilemma Vehicles (#)		0				0	0			0		
Queue Length 50th (ft)		205				7	219			6		
Queue Length 95th (ft)		486				26	445			27		
Internal Link Dist (ft)		438				_•	196			85		
Turn Bay Length (ft)							100					
Base Capacity (vph)		911				384	962			427		
Starvation Cap Reductn		0				0	0			0		
Spillback Cap Reductn		0				0	0			0		

Scenario 12 PM Build w/ Improvement Scenario 3 4:30 pm 05/19/2021 Build w/ Impr 3 ΒH

Synchro 11 Report Page 3

Lanes, Volumes, Timings	
1: Heady Street/Pump House Road & Eton Downs & Oregon Roac	l

08/13/2021

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Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2			
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0		3.0	3.0					
Minimum Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (s)	24.0	24.0	24.0		23.0	23.0					
Total Split (%)	17.8%	17.8%	17.8%		17.0%	17.0%					
Maximum Green (s)	19.0	19.0	19.0		18.0	18.0					
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0					
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0					
Lost Time Adjust (s)			0.0			0.0					
Total Lost Time (s)			5.0			5.0					
Lead/Lag	Lag	Lag	Lag								
Lead-Lag Optimize?	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Recall Mode	None	None	None		Max	Max					
Walk Time (s)	7.0	7.0	7.0								
Flash Dont Walk (s)	11.0	11.0	11.0								
Pedestrian Calls (#/hr)	2	2	2								
Act Effct Green (s)			13.2			18.1					
Actuated g/C Ratio			0.13			0.18					
v/c Ratio			0.63			0.17					
Control Delay			58.5			0.9					
Queue Delay			0.0			0.0					
Total Delay			58.5			0.9					
LOS			E			А					
Approach Delay			58.5			0.9					
Approach LOS			E			Α					
90th %ile Green (s)	19.0	19.0	19.0		18.0	18.0					
90th %ile Term Code	Max	Max	Max		MaxR	MaxR					
70th %ile Green (s)	15.4	15.4	15.4		18.0	18.0					
70th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
50th %ile Green (s)	13.2	13.2	13.2		18.0	18.0					
50th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
30th %ile Green (s)	11.0	11.0	11.0		18.0	18.0					
30th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
10th %ile Green (s)	8.1	8.1	8.1		18.0	18.0					
10th %ile Term Code	Gap	Gap	Gap		MaxR	MaxR					
Stops (vph)			96			0					
Fuel Used(gal)			2			0					
CO Emissions (g/hr)			143			9					
NOx Emissions (g/hr)			28			2					
VOC Emissions (g/hr)			33			2					
Dilemma Vehicles (#)			0			0					
Queue Length 50th (ft)			66			0					
Queue Length 95th (ft)			137			0					
Internal Link Dist (ft)			227			150					
Turn Bay Length (ft)			0- ·								
Base Capacity (vph)			254			398					
Starvation Cap Reductn			0			0					
Spillback Cap Reductn			0			0					

Scenario 12 PM Build w/ Improvement Scenario 3 4:30 pm 05/19/2021 Build w/ Impr 3 BH

Synchro 11 Report Page 4

Lanes, Volur	nes, Timings	
1: Heady Str	eet/Pump House Road & Eton Downs & Oregon Road	ł

08/13/2021

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Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Storage Cap Reductn		0				0	0			0		
Reduced v/c Ratio		0.58				0.07	0.57			0.03		
Intersection Summary												
Area Type:	Other											
Cycle Length: 135												
Actuated Cycle Length: 10	2.8											
Natural Cycle: 135												
Control Type: Actuated-Un	ncoordinated											
Maximum v/c Ratio: 0.63												
Intersection Signal Delay:	24.7			Ir	ntersectior	LOS: C						
Intersection Capacity Utiliz	ation 59.3%			10	CU Level o	of Service	В					
Analysis Period (min) 15												
90th %ile Actuated Cycle:	118.5											
70th %ile Actuated Cycle:	102.4											
50th %ile Actuated Cycle:	100.2											
30th %ile Actuated Cycle:	98											
10th %ile Actuated Cycle:	95.1											

Splits and Phases: 1: Heady Street/Pump House Road & Eton Downs & Oregon Road

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9.5 s 49.5 s	29 s	24 s	23 s
₩ Ø6			
59 s			

Intersection Summa	arv
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ATTACHMENT E

FAIR SHARE PERCENT CALCULATIONS



7 SKYLINE DRIVE, HAWTHORNE, NEW YORK 10532 TEL: (914) 592-4040 WWW.PDERESULTS.COM

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SHEET NO. 1 OF 1
PROJECT NO. 21-022
DATE 08/13/21
BY BH
снк'р СН

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AM	l Bui	ld S	cena	ario	Tot	al T	raff	ic =	962															
	l Bui										ffic	= 32												
ΡIV	1 Bui	ild S	cen	ario	Tot	al T	raff	ic =	1.23	35														
	1 Bui										ffic	= 34	1											
32/	/962	2 = 0	.033	326	= 3.	33%	6																	
<u> </u>																								
34	/1,2	35 =	= 0.0	0275	53 =	2.7	'5 %																	
The	e ave	erag	e of	the	se 2	2 pe	rcei	ntag	ges i	s eq	ual	to 3	.049	% or	· roı	und	ed 3	%						
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Fair Share Calculation

SUBJECT

ATTACHMENT F

UPDATED TRAFFIC VOLUME FIGURES





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Cosimo Reale, CPESC Mark J. Shogren, P.E. Matthew N. Steinberg, AICP

August 19, 2021

Hon. Loretta Taylor Chairperson of the Town of Cortlandt Planning Board and Members of the Planning Board Town Hall 1 Heady Street Cortlandt Manor, NY 10567

Re: Overlook Terrace <u>119 Oregon Road</u>

Dear Chairperson Taylor and Members of the Planning Board:

On behalf of NRP Group (the Applicant) we offer the following responses to a comment memo prepared by Michael Preziosi, P.E., DOTS Director, dated July 23, 2021, for your consideration.

1.	Comment:	Demographic notes are missing from the drawings.					
	Response:	The following demographic notes will be added to the site plan					
		drawing set:					
	School District	Lakeland Central School District					
	Police Protection	Westchester County Police, Cortlandt Town Hall, 1 Heady Street, Cortlandt Manor					
		New York State Police, Cortlandt Station, 1 Memorial Drive, Croton on Hudson					
	Fire Protection	Mohegan Fire District, Hollowbrook Fire Station, 1130 Oregon Road, Cortlandt					
		Manor					
	Emergency Medical Services	Mohegan VFA VAC, 1975 East Main Street (Rt 6) Mohegan Lake, NY					
		Cortlandt Regional Paramedics, 1980 Crompond Road, Cortlandt Manor					
	Hospital	NewYork-Presbyterian Hudson Valley Hospital, 1980 Crompond Road, Cortlandt					
		Manor					
	Library	John C. Hart Memorial Library, 1130 East Main Street, Shrub Oak					

Comment: A table of all third party required permits (Army Corp / DEC / DOT / Town / etc....) shall be provided on the revised drawings.
Response: The following table of required permits will be included on the site plan drawing set cover sheet.

Hon. Loretta Taylor and Members of the Planning Board Re: <u>DOTS Director Comments – Overlook Terrace</u>

Agency	Status	Approval Date	Proposed/Approved Activities
Town of Cortlandt			
Town Board	Pending	Pending	Zoning Ordinance Amendment
Planning Board	Pending	Pending	Site Development Plan; Special Permit; Steep Slope Permit, Tree Removal Permit
DOTS Code Enforcement Division	Pending	Pending	Demolition and Building Permits
DOTS Engineering Division	Pending	Pending	Sanitary Sewer Connection; MS4 SWPPP Approval
DES Water Division	Pending	Pending	Water Main Relocation (onsite); Water Backflow (fire and domestic)
Weschester County Department of Health (DOH)	Pending	Pending	Sanitary Sewer and Water Connection Permits
NYS Department of Environmental Conservation (DEC)	Pending	Pending	SPDES Permit for Stormwater Discharge During Construction
NYS Housing and Community Renewal (HCR)	Pending	Pending	Funding
NYS Historic Preservation Office (SHPO)	Complete	4/14/2021	Letter of No Effect Issued

3.	Comment:	Consideration should be given to create a landscape buffer between
		the proposed curb line and sidewalks to soften the hardscape and
		provide for improved pedestrian accommodations around the
		building. There is ample space onsite.
	Response:	The walk placed at the curb line will allow senior residents to
		access the walk from their parking space. A landscape strip
		between the curb and the walk will be a concern in the winter
		months and possible snow accumulation. It will be easier to
		maintain the walk if it is located adjacent to the curb line.
4.	Comment:	Pedestrian accommodation should be considered along Oregon
		Road to connect to the existing sidewalk infrastructure. Currently
		only a walking trail to a proposed bus shelter is shown. Pedestrians
		only a waiking train to a proposed bus sheller is shown. I each this
		may elect to cross Oregon Road to walk to the convenience store /
		may elect to cross Oregon Road to walk to the convenience store /
		may elect to cross Oregon Road to walk to the convenience store / gas station and towards Peekskill. Details for crosswalk, pedestrian
		may elect to cross Oregon Road to walk to the convenience store / gas station and towards Peekskill. Details for crosswalk, pedestrian accommodations, drop curbs and details of the same should be
	Response:	may elect to cross Oregon Road to walk to the convenience store / gas station and towards Peekskill. Details for crosswalk, pedestrian accommodations, drop curbs and details of the same should be provided. All work within Oregon Road, shall follow NYSDOT

Hon. Loretta Taylor and Members of the Planning Board	d
Re: DOTS Director Comments – Overlook Terrace	

5a.	Comment:	The Traffic Impact Study prepared by Provident Design Engineering, dated last revised June 23, 2021 will be reviewed more thoroughly by the Town's traffic consultant HVEA. I offer the following comments:
		While the report concludes no significant adverse traffic impacts are expected for the intersection, the traffic light at the intersection of Eton Down's / Pumphouse / Heady Street and Oregon Road is antiquated and appears to be pre-timed. A general observation of the intersection during the peak hour will demonstrate that due to current geometry of this intersection and lack of turning lanes along Oregon Road, vehicles will backup and queue as far back as Locust Avenue.
	Response:	See Provident Design Engineering (PDE) response under separate cover.
5b.	Comment:	It is recommended that as part of this Application, intersection improvements including but not limited to an updated traffic signal and phasing plan with consideration provided for geometric improvements be considered as a condition of the zoning petition. At minimum recommendations, plans and specifications should be provided which can then be developed into construction documents for a future capital project.
	Response:	See Provident Design Engineering (PDE) response under separate cover.
5c.	Comment:	The report analyzes an alternative access scheme that restricts left turns from the project driveway and re-directs these vehicles to Eton Downs Road. The conclusion of the Applicant's Consultant is this alternative is not recommended. One of the reasons provided is that this connection could promote "cut through" traffic. This could be easily rectified by making this connection "exit" only. Further consideration shall be provided to address the Planning Board's comment.

	•	Members of the Planning Board ments – Overlook Terrace	August 19, 2021 Page 4
	Response:	See Provident Design Engineering (Pacover.	DE) response under separate
6a.	Comment:	The proposed grading plan will require entire site in order to accommodate the facility. The south of the site will be ret retaining wall. The rear (southern slop The Applicant is increasing the severit Analysis and Findings Statement was shall be revised as follows:	e construction of the proposed tained by a 10-ft high pe) will be graded 2H:1V. y of the slope. A Steep Slope
	Response:	1.4 acres of steep slope exist onsite. The thresholds shall be used; 15-25%, 25-33 written narrative addressing 259-6 sh to revised drawings. The Applicant ma impacted steep slopes vs site wide steep s Based on Town Code Chapter 259-6, updated to reflect 15-25%, 25-30% an	5%, >35%. A revised all be prepared in addition ust clearly summarize clopes. the slope analysis will be
		Where steep slopes are being created, sustainable ground cover planting, shr stabilization fabric over any slope 3:1	ubs and seed mixes with a
6b.	Comment:	EAF Figure No. I-1 and I-2 identify e. slopes. Based on the proposed grading p proposing to create approximately .8 au 15%.	lan, the applicant is
	Response:	The slope analysis will be updated and excess of 15% will be confirmed.	l the amount of slopes in
6с.	Comment:	All slopes greater than 4H:1V shall be control matting / blanketing and plan areas requiring such stabilization.	
	Response:	Plans and details will note that planted than or equal to 3:1 will include an er	

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		accordance with the NYSDEC 2016 Stand for Sediment and Erosion Control, Page 4. sediment control plan will note these slope	5. The erosion and	
6d.	Comment:	Earthwork quantities are missing. Applican balance cuts and fills to the maximum exter geotechnical report indicates the majority of brought onsite is not suitable for structural	nt practical. The f existing fill that was	
	Response:	The site design will balance cut and fills as a Updated earthwork calculations will be sub with the revised site plan package. Excess fi unsuitable fill, will be removed from the sit and disposed of in accordance with all local	much as possible. omitted to the Town ill material, including te during construction	
6e.	Comment:	A 10-ft high retaining wall is proposed. A c site shall be provided. Additional comments	-	
	Response:	A cross section through the site will be pro	-	
6f.	Comment:	Section 259-6 (H) is mostly advisory. Bullet added on the site plan as notes.	-	
	Response:	These notes will be provided on the site pla	in drawings.	
7a.	Comment:	Notes on the site demolition plan shall be re following:	vised to reflect the	
	Description	Applicant shall file a demolition permit wit Technical Services – Code Enforcement Div removal of any structure.	1 V	
	Response:	Comment noted		
7b.	Comment:	Prior to any demolition occurring in Town Place and the Oval) a road opening permit obtained through the Department of Enviro	shall be filed and	
	Response:	Comment noted		

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7c.	Comment:	All structures shall be tested for lead, asbestos and other hazardous materials in accordance with the NYS Uniform Fire Prevention and Building Code and NYCRRR by a licensed and certified tester. All hazardous materials shall be properly abated and lawfully disposed of offsite.
	Response:	Comment noted
7d.	Comment:	All onsite existing wastewater septic systems shall be abandoned in accordance with the Westchester County Department of Health Guidelines and generally accepted engineering best practice. All material shall be lawfully disposed of off-site.
	Response:	Comment noted
7e.	Comment:	All asphalt pavement removed from the site and Donnelly Place right-of-way shall be lawfully disposed of off-site and not mixed with other construction debris.
	Response:	Comment noted
7f.	Comment:	All imported fill material shall be unrestricted residential use in accordance with NYSDEC soil objective clean-up requirements. No recycled material shall be used as fill within areas that will be planted, grassed and otherwise stabilized.
	Response:	Comment noted
7g.	Comment:	All existing utilities (water services, sanitary, telecommunications, power, etc) shall be excavated and removed from the site. All existing water services shall be cut and capped as close to the curb stop as reasonably practical. The Town of Cortlandt DES – Water Division shall be contacted to inspect said work.
	Response:	Comment noted
7h.	Comment:	Applicant shall clarify if blasting is proposed as part of this project. If so, preliminary geotechnical investigations shall be submitted as part of this application and a listing of all properties within 1000- ft of the proposed limits of blasting shall be established. It is

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	Response:	recommended that all blasting requirements be included in the approval (including pre and post blast survey), noticing requirements, seismic monitoring and processing of rock. Otherwise general notes related to blasting shall be removed from the plan set and a note indicating "No blasting, no rock crushing or processing of material is proposed onsite. All debris will be lawfully disposed of off-site. Comment noted. Blasting is not anticipated based on the soil
		boring information.
8.	Comment:	The 75-ft wide roadway dedicated to the Town of Cortlandt will revert to the Applicant. This shall be noted in any findings statement and resolutions of approval.
	Response:	Comment noted
9.	Comment:	Applicant shall demonstrate to the satisfaction of the Town Board with consultation by Town Counsel that the all deed restrictions (noted on Filed Map 5001 and as referenced on the Alta Survey) have been released.
	Response:	Comment noted
10.	Comment:	Applicant shall also clarify why portions of the property are restricted from development and noted as "park area".
	Response:	Comment noted
11.	Comment:	Applicant is referred to Chapter 33 of the NYS Building Code, Safeguards During Construction. Requirements shall be incorporated into the submitted plan set.
	Response:	Safeguards to be implemented during construction will be included in the site plan set.
12a.	Comment:	The Applicant is referred to 2020 Fire Code of NYS, Chapter 5 – Fire Services Features. A swept path analysis for all emergency apparatus shall be provided. The design vehicles are as follows.

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		HQ—L- 35 length is 42'2" (506") wi Degrees. To deploy stabilizer jacks a n deployment and 12' for short-jack dep	ninimum 16- 18 feet for full
		E-252 from HQ- Length is 31' 11" (3 23.8 degrees; E-256 out of Hollowbrod (384") with a turning radius of 23.5	ok Station: Length is 32'
		Plans must adequately demonstrate t setup and meet the required hose pulls	
	Response:	A swept path analysis for the request (L35 and E-252 fire apparatus vehicl prepared and submitted. The site has accommodate the turn movements or	ed emergency vehicle access les as confirmed) will be s been designed to
12d.	Comment:	Plans shall be revised to include fire l the same.	anes and striping details of
	Response:	The required fire lane designations ar with the Town's fire inspector and in drawings.	0 0
13.	Comment:	A site wide photometric analysis shall for review.	be prepared and submitted
	Response:	The photometric analysis will be prepresed site plan drawing set.	pared and submitted in the
<u>Utilit</u>	ty Comments		
14a.	Comment:	As part of this application a water ma looping Oregon Road to Eton Downs existing water main through the site place. A water main extension fees sha approval and endorsement of the plan accordance with the Town's Master F water main shall be removed from the placed into service.	through the project site. The is proposed to be abandoned in all be provided prior to the as by the Town of Cortlandt in See schedule. The existing

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	Response:	Since the main will be dedicated to the Town of Cortlandt shop submittals shall be provided to the Town of Cortlandt for review and approval prior to installation for all water mains and appurtenances. Comment Noted. Once the design is accepted by the Town, the final design plans and reports will be submitted to the Westchester County Department of Health for approval of a public water main extension.
14b.	Comment:	This water main as proposed will be dedicated as public. The Town of Cortlandt will be required to make application to the Westchester County Department of Health. All permitting fees and submittal costs shall be borne by the NRP Group.
	Response:	Comment noted.
14c.	Comment:	Applicant shall coordinate with DES – Water in regards to proposed water main tie-in locations. Multiple water mains (existing) are shown in Oregon Road and Eton Downs. It is recommended that mains be connected with a tee, 3-8" MJxMJ resilient wedge gate valves. Plans shall be revised to differentiate existing water main (size and type) versus proposed and existing water main to be demolished. Connection details will be coordinated with the Town of
	Response:	Confidential defails will be coordinated with the Town of Cortlandt DES.
14d.	Comment:	All water main pipe shall be "Tyton Joint" with push on (rubber gasket) and 2 bronze wedges per joint, class 54 double cement lined ductile iron pipe, class 350 as manufactured by United States Pipe and Foundry Company, made in the U.S.A., or approved equal.
	Response:	Comment Noted
14e.	Comment:	All fittings shall be mechanical joint with retainer glands, cement lined, ductile iron pipe as manufactured by United States Pipe and Foundry Company, made in the U.S.A. or approved equal.

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	Response:	Comment Noted	
14f.	Comment:	The pipe and fittings shall be cement morta standard thickness in accordance with ANS C104) except as noted. All changes in pipe a fittings both vertical and horizontal, shall glands and thrust blocked with concrete aga	SI A21.4 (AWWA lirections, requiring be secured with retainer
	Response:	Commented noted.	
14g.	Comment:	The mechanical joint restraint system shall restraining mechanism in the follower glan multiple welding action against the pipe. G manufactured of ductile iron conforming to Retainer glands shall be "Megalug" as man Iron, Inc., or approved equal.	d, which shall impart a Flands shall be ASTM A536-80.
	Response:	Comment noted.	
14h.	Comment:	Gate valves shall be Mueller, iron body, non conventional packing, resilient seated, mech retainer glands, pressure class 350, opening operation shall be by 2" square wrench nut. Comment noted.	anical joint with
	Response:	Comment noted.	
14i.	Comment:	All drawings shall be revised to indicate siz main, bydrants and appurtenances.	e and type of all water
	Response:	Comment noted.	
14j.	Comment: Response:	The water main layout plan shall call out a Stationing shall be provided in 100- ft incr Comment noted.	
		Comment noted.	
14k.	Comment:	A water main profile is required. All vertice wastewater sources, etc shall be shown.	al bends separation to
	Response:	Comment noted.	

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141.	Comment:	Since this is a new water main, all horizontal and vertical separation distances shall be met unless otherwise justified by the design engineer to be infeasible.
	Response:	Comment noted.
14m.	Comment:	Fire service shall be sized to meet the hydraulic demand of the required fire suppression system. The EAF indicates a flow test was performed on March 9, 2020. Sprinkler design may be deferred until a building permit application is filed.
	Response:	Comment noted. Adequate pressure and flow were found based on the 2020 flow test. Fire service and sprinkler design will be coordinated with the Town.
14n.	Comment:	Corporation Stop shall be Mueller B-2500N (pressure rating 300 psi). Ground key models are preferable.
	Response:	Comment noted.
140.	Comment:	Curb Valve shall be Mueller Mark II Oirseal (min pressure rating 175 psi) H-15209N, or B-25209N with no drain ports depending on operating pressure of main.
	Response:	Comment noted.
14p.	Comment:	Curb boxes shall be Mueller Model No. H-10314, 4 ½ full extension, or approved equal and Made in the U.S.A. If needed, Stainless Steel extension rods within the curb boxes shall be furnished and installed.
	Response:	Comment noted.
14q.	Comment:	A reduced backflow preventer shall be provided for the potable water supply in accordance with applicable State, County and Local laws.
	Response:	Comment noted.
14r.	Comment:	A reduced backflow preventer shall be provided for proposed irrigation in accordance with applicable State, County and Local

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	Response:	laws. It is recommended that irrigation be disconnecting from the public supply and an onsite well be utilized for said purposes. Comment noted.
14s.	Comment:	A double check detector assembly shall be provided for the fire service. Device shall be tamper proof. If a bypass is proposed it shall be metered.
	Response:	Comment noted.
14t.	Comment: Response:	<i>All water services and fire services shall be metered.</i> Comment noted.
14u.	Comment:	Fire hydrants shall be "Mueller" Super Centurion 350, (or approved equal), with safety breakaway flange, 3-way, opening left (CCW). The pumper nozzle shall be 5 1/4"; the two hose nozzles shall be 2 ½". Bodies shall be painted yellow, caps red. Detail shall be revised accordingly.
	Response:	Comment noted. The detail will be revised and submitted.
14v.	Comment: Response:	All utility easements shall be 20-ft minimum. Utilities shall run a close to the centerline as possible. Easement shall be submitted for review and approval prior to the submittal of any plans to the WCDOH. All easements shall be filed with the Westchester Count Clerk - Division of Land Records. Comment noted.
	Response.	Comment noted.
14w.	Comment:	Westchester County DOH requirements for testing and disinfection shall be provided on final drawings.
	Response:	Comment noted.
15.	Comment:	As part of this application, the subject premises is proposing to connected to the Town's sanitary infrastructure at the intersection of Eton Downs and Oregon Road. The Applicant is advised that th proposed sewer connections from facilities within that are design to carry in excess of 2,500 gallons per day flow requires Departmenta

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		of Health approval for its private sew	er connection and must be
		designed in accordance with 10-State.	
	Response:	Comment noted. It is anticipated that	t the sanitary sewer service
		will require approval from the Westc	hester County Department of
		Health.	
6.	Comment:	Applicant shall provide a detail to connect to the Town's sanitary	
		manhole near Oregon Road. Applicat	nt shall clarify if a drop inver
		is proposed.	
	Response:	A drop connection, if required, will b	be verified.
7.	Comment:	Sanitary profiles shall be provided. A sanitary main shall b	
		at 2% unless determined to be determ	ined to be infeasible by the
		design engineer. At minimum the slop	pe of the main shall meet the
		required minimum scouring velocity	published in the 10 States
		Standard.	
	Response:	Due to the low cover conditions and	possible other utilities
		located at the Town sewer, the sewer	•
		2% slope. Scouring velocities will be	reviewed to meet 10 State
		Standards.	
8.	Comment:	Figure No. G2 shall be revised to prov	ride RIM elevations.
		Manholes 1-12 shall be opened and vi	
		professional and witnessed by the Tow	
	Response:	Additional information on the existir	c ,
		provided. Each manhole was inspected	*
		Town Department of Public Works a	
		DES will be undertaken to verify the	connection requirements wil
		be adequate.	
9.	Comment:	Maximum sanitary flow shall be set a	nt 75% of the pipe diameter.
		Between manholes 8 and 12 as identi	fied in EAF Figure No. G2
		average daily flow and peaking period	ds will exceed this. In addition
		due to the shallow slope of the existing	main, it is recommended
		that inflow and infiltration requiren	nents be set at three to one

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		(3:1) offset ratio for non-affordable 1 non-affordable units.	units and one to one (1:1) for	
Response:		Additional review with DES will be	undertaken to verify the	
		connection requirements will be ade	quate and to determine the	
		required Inflow and Infiltration mit	igation requirements have	
		been provided.		
20.	Comment:	The Engineer shall field verify the ac	tual rims and inverts in which	
		the existing pipe slopes are less than I	1%. Information was noted as	
		taken from a partial as-built. There actual field conditions.	may be discrepancies with	
	Response:	The survey information will be revie	ewed with DES.	
Land	lscape Comments			
21.	Comment:	Comment: Demolition and landscape plans do not seem to ma		
		2021 report prepared by the Town's (Consultant Bartlett Tree	
		Expert. Plans shall be revised to call	out all specimen, protected and	
		trees of significance (e.g. White Pine	#1240, Silver Maple #1230,	
		American Smoke #1306, Catapla (7	#1314). Applicant shall	
		comment and provide response relate	d to preserving these trees.	
	Response:	The specimen, protected and signific	cant trees noted by Bartlett	
		will be flagged on a new plan sheet f	for Tree Protection and	
		Preservation. Due to the proposed	locations of the building and	
		parking, and due to the grading requ	uired to accommodate these	
		improvements, it is not feasible to p	reserve trees 1240, 1306 and	
		1314. However, grading adjustmen	nts are being reviewed to try to	
		preserve tree 1230, the 70" Silver M	laple in the front yard which	
		will remain a landscaped area for the	e proposed project.	
22.	Comment:	The total number of trees proposed fo	r removal is still outstanding.	
		The Bartlett Study indicates 598 tre	es onsite. The plans do not	
		indicate the total number of trees >4	4-inches proposed for removal.	
	Response:	The 598 trees included in the Bartle	tt study included over 200	
		trees offsite – particularly on the pro	pperty east of the project site.	
		There are 393 trees onsite per the 12	2/23/20 Gallas surveyed tree	

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		locations. Per the Gallas survey and mo approximately 280 trees will be removed approximately 7 trees will be removed way. These numbers will be confirmed revised plan set along with a tree remo	ed from the site and in the Eton Downs right of d with the issuance of a
23.	Comment:	Applicant shall comment and provide r and restorative efforts required to be un	
	Response:	<i>Eton Downs.</i> To improve the growing condition for Downs, the Applicant proposes to cut stump dead and pioneer plants, and ren plants.	invasive vines, cut and
24.	Comment:	The storm water basins shall be planted NYSDEC Storm Water Design Manu wetland plants shall be provided for the addition to the proposed grass mixes.	al. Trees, shrubs and
	Response:	In accordance with the NYSDEC Storn flood tolerant, native trees, shrubs and northwest bioretention basin. Flood to shrubs, as well as a stormwater basin so the northeast stormwater pond.	grasses will be added to the olerant, native grasses and
25.	Comment:	Slope plantings are noted as typical, bu number of trees and shrubs shall be pro sequence plan shall incorporate landsca installation in a timely and effective m	vided. The construction ping in order to ensure
	Response:	Erosion control shrubs are proposed of spacing of 4' on center to stabilize and the nature of the 3:1 slope, trees are no However, the revised landscape plan w proposed disturbed areas south of the less steep. The construction sequence landscape installation.	n the rear south slope at a colonize the slope. Due to ot proposed on the slope. vill include trees within the slope where the grades are

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26a.	Comment:	When determining the actual number of trees required to be replanted, the Planning Board shall consider the following factors:
		Approximately 8 acres are proposed for disturbance. At minimum the total number of trees required to be mitigated is 349 trees. Each protected tree that is to be removed shall be replaced by at least 1
		1/2 times the number (rounded up) of the same trees as removed.
		On slopes of 25% or greater, two trees shall be planted for each tree
		proposed to be removed.
	Response:	Per the proposed plan, a total of 8.73 acres are proposed to be
		disturbed (7.91 on site and 0.46 offsite on Eton Downs). Per the
		Town Code, this will require the planting of 365 trees. The
		disturbance area will be confirmed with the revised plan set.
		2 protected Cornus florida trees will be removed and 3 Cornus
		florida species will be planted. Approximately 40 trees will be removed from slopes of 25% or greater requiring the planting of
		80 trees. The final number of trees to be removed on 25% or
		greater slopes and required planting mitigation will be confirmed
		with the revised plan set.
26b.	Comment:	Pollinator species, grasses and meadow mixes shall be specified to be
		seeded, annually for a period of no less than 3-years and be
		incorporated into an annual monitoring plan. The variety of
		pollinator species shall meet or exceed those as recommended by the NYSDEC.
	Response:	Notes on the revised plans will indicate that seed mixes shall be
	-	seeded annually for a period of three years.
26c.	Comment:	All deciduous plantings shall be 3-inch caliper at DBH and all
		evergreens 6-8 ft in height from finished grade.
	Response:	The proposed landscape plan will include a mixture of shade tree
		sizes with 4 $1/2$ "-5" caliper trees along the entry drive, 3"-3 $\frac{1}{2}$ "
		caliper trees in the landscaped and east/west buffer areas, and 2 1/2"

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Storm Water Comments

Please note, the Town's Consultant (HVEA) will provide additional comments under separate cover.

27.	Comment:	A revised Notice of Intent is required in order to obtain coverage under the SPDES General Permit for Construction Activity based
		upon the response to comment letter(s).
	Response:	Comment noted.
28.	Comment:	Applicant is advised that controls will need to be modified to
		accommodate corrections made to the site plan in response to this
		comment letter.
	Response:	Comment noted.
29.	Comment:	The SWPPP shall be revised to meet all requirements of the NYS
		Storm Water Design Manual. The project shall be classified as
		redevelopment (NYSDEC SWDM Ch. 9). Approximately 8 acres is
		proposed for disturbance with 2.5 acres proposed as impervious. This
		is an increase from pre-existing conditions by approximately 0.2
		acres.
	Response:	Comment noted.
30.	Comment:	New impervious surfaces shall be sized in accordance with Chapter
		4 of the SWDM. Redevelopment shall meet the sizing criteria
		outline in Chapter 9.3 of the SWDM.
	Response:	Design has included these requirements.
31.	Comment:	The SWPPP must clearly demonstrate the post development peak
		flow rate(s) and velocities have not increased from the pre-developed
		condition. There is extensive re-grading shown which will alter the
		surface hydrology, including importation of fill material.
	Response:	Stormwater Hydraulic conditions have been provided. Based on
		further discussion with DES, the design will include additional
		stormwater storage to reduce the peak flow rates as it exits the
		property. Additional review will be coordinated with DES.
32.	Comment:	Underdrains, curtain drains and similar subsurface conveyance

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		shall drain to daylight and not to any water quality structures or storm water best management practices. The amount of flow is unknown and may lead to these devices not functioning as intended hampering detention and water quality treatment. The plans
		indicate multiple overland channels and graded swales that will re-direct runoff from the rear of the property to the Town's
	Response:	<i>infrastructure in Oregon Road and Donnelly Place.</i> Subsurface underdrains and offsite runoff will be designed to bypass the stormwater managements systems. Additional review of the site details will be coordinated with DES.
33.	Comment:	The SWPPP proposes to meet water quality controls with a bio- retention basin and extended detention pond. Discharge from the site is being routed towards existing Town infrastructure at Donnelly Place. The SWPPP does not evaluate the existing Town infrastructure (downstream) nor comments on its suitability to effectively convey storm water runoff from this site. Typically, storm catch basins and infrastructure located within a right-of-way is constructed to capture and convey runoff from the roadway and shoulders to a storm water outfall.
	Response:	The stormwater design has been designed such that the peak rate of runoff will be at or lower than currently exists. Based on further discussion with DES, the design will also include additional onsite stormwater storage to further reduce the peak flow rates as it exits the property. Additional review will be coordinated with DES.
34.	Comment:	The SWPPP should consider practices that infiltrate runoff reduction volumes and water quality volumes in order to recharge the aquifer. Consideration for off-site discharge may be provided if there is no other feasible alternative. It is unclear if subsurface investigations were performed in the area of the proposed best management practices. The geo-technical report does indicate that the site is influenced by ground water at an average depth of 10-ft. Infiltration practices may be possible.

Hon. Loretta Taylor and Members of the Planning Board August 19, 2021 Re: DOTS Director Comments – Overlook Terrace Page 20 **Response:** Additional test pits and perc tests will be undertaken to determine if infiltration practices can be provided. 35. Comment: The bio-retention and extended detention basin, details shall be revised to include proposed plant material. **Response:** The basin details will be revised to include the proposed plant material. 36. Comment: The applicant shall request a 5-acre waiver as they are proposing to disturb a total of 8 acres. Typically it is recommended that soil disturbance be kept at less than 5 acres at any one time. **Response:** A 5-acre waiver will be requested for at least part of the construction period due to the amount of earthwork required. 37. Comment: A construction sequencing plan shall include various stages of construction (e.g., clearing, erosion controls, access road construction, staging, installation, restoration, plantings, and pollinator soil stabilization). All employee parking and material storage shall be revised to limit unnecessary tree removal and disturbance to steep slopes. Response: A sequencing plan will be provided. 38. Comment: Site maintenance and good housekeeping protocol shall include fugitive dust control and watering requirements. Response: Comment noted. 39. Comment: The SWPPP shall include copies of maintenance easements during and after construction in accordance with Town Code Chapter 262-9. **Response:** Comment noted. 40. Comment: Recycled material is not recommended for onsite use. Only earthen material or natural stone is permitted to be used as fill. If recycled material is proposed, it must be noted on the plans and its intended use confirmed to be consistent with NYSDEC's beneficial use

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	Response:	<i>determinations.</i> Comment noted. Any recycled material, if used, will be certified meeting DEC beneficial reuse requirements or that is meets clean fill requirements.
41.	Comment:	Applicant shall clarify how much fill is proposed to be brought to the site. All fill shall be tested in accordance with NYSDEC rules and regulations and shall be certified as unrestricted for residential use, certified by a professional engineer prior to importation on site.
	Response:	Comment noted.
Deta	il Comments	
42.	Comment:	A significant number of details are missing. These include but are not limited to a dumpster enclosure, emergency access gate with knox box, site amenities, foundations (e.g. light poles), bollards, site signage, wayfinding, pedestal or free standing signs for the facility name etc
	Response:	Additional details will be provided where needed.
43.	Comment:	Station the proposed roadway and provide a centerline profile in intervals not to exceed 50-ft.
	Response:	This will be included for the driveways and parking area drive aisles.
44.	Comment:	Sidewalk details shall be revised to demonstrate a maximum cross slope of 1.5%. It is recommended curb ramp details have a maximum slope of 1:13.
	Response:	Comment noted.
45.	Comment:	Storm frames and grates shall be pedestrian safe along curbs, parking lots and walkways. Any public infrastructure shall be manufactured domestically.
	Response:	Comment noted.

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46.	Comment:	All trench details shall be revised to provide magnetic tracer tape, specific to the pipe type. If bury depth is greater than 6-ft multiple layers shall be provided no greater than 2-ft from finished grade and no closer than 2-ft to the pipe.
	Response:	The details will be revised to include tape requirements.
47.	Comment:	Sanitary sewer manhole shall be revised to include boot seal (e.g. Kor N-Seal), bitumastic coating. Manhole diameter shall be 36" minimum. There are conflicting details presented on the site detail sheets SP 6.1 and SP 6.4.
	Response:	The details will be revised as requested.
48a.	Comment:	The Redi Rock retaining wall details shall be noted as a deferred design. Based on the geotechnical assessment existing fill is not sufficient and structural fill is proposed. Excess material will be lawfully disposed of off-site or used onsite based on the soil properties.
		A final detail and cross section at maximum retained height shall be provided.
	Response:	The retaining wall design plans prepared and stamped by a Professional Engineer will be provided at the time of Building Permit Application. All soil export will be disposed of off-site in accordance with local and state regulations.
48b.	Comment:	Computations demonstrating that all factors of safety for sliding, overturning and settlement shall be submitted along with an engineer's certification stating such prior to final approval.
	Response:	The retaining wall design plans prepared and stamped by a Professional Engineer will be provided at the time of Building Permit Application.
48c.	Comment:	Engineer shall comment if a global stability analysis is warranted due to the proposed wall height and 2H:1V soil backfill and its imposed surcharges.

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	Response:	The retaining wall design plans prepared an Professional Engineer will be provided at th Permit Application.	1 2
48d.	Comment:	A cross section (N/S) of the site from Eaton 1 building shall be submitted with the analyst	e
	Response:	This cross section will be provided.	

We look forward to continuing our review of the Project with the Planning Board.

Very truly yours,

DIVNEY TUNG SCHWALBE, LLP

Gerhard M. Schwalbe, P.E. Partner

File 858

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August 19, 2021

Hon. Loretta Taylor Chairperson of the Town of Cortlandt Planning Board and Members of the Planning Board Town Hall 1 Heady Street Cortlandt Manor, NY 10567

Re: Overlook Terrace 119 Oregon Road

Dear Chairperson Taylor and Members of the Planning Board:

On behalf of NRP Group (the Applicant) we offer the following responses to a comment memo prepared by Chris Kehoe, AICP, Deputy Directory, DOTS Planning Division, dated July 28, 2021, for your consideration.

1.	Comment:	The Planning Division conducted a review of the subject application consisting of the following:
		A 16-page set of drawings entitled "Site Plan Application Drawings, Overlook Terrace" prepared by Divney, Tung & Schwalbe, LLP latest revision dated June 23, 2021.
	Response:	Expanded Environmental Assessment Form dated June 2021. Comment noted.
2a.	Comment:	Based on a review of the above-mentioned drawing and expanded EAF application, the following information as required by Chapter 307-71 of the Town of Cortlandt (Zoning) and other regulations should be submitted for the subject application unless waived by the Planning

Hon. Loretta Taylor and Members of the Planning Board
Re: Planning Division Comments - Overlook Terrace

Board at the applicant's request.

		a. The subject drawing (SP-1) shows the proposed location and height of the proposed parking lot light fixtures and proposed wall mounted fixtures. Drawing SP 6.5 shows the proposed lighting details. It is suggested that the applicant analyze the use of a more traditional/historic looking light fixture. A photometric plan is also required.
	Response:	A photometric plan will be prepared and submitted for review. The Applicant is reviewing options for the requested traditional light fixtures and will submit representative samples.
2b.	Comment:	The subject drawing should be revised to show a garbage enclosure with sufficient space for garbage and recycling. The applicant is advised the Town will not provide garbage/recycling pick-up to the site and a note confirming the same shall be added to the subject site plan.
	Response:	An exterior garbage enclosure is not proposed, as all trash and recycling will be collected internally and will be wheeled outside in large bins to be picked up by a private contractor. The Applicant acknowledges that the Town will not provide garbage/recycling pickup and will contract a private refuse and recycling carter. A note will be added to drawing SP-1.
2c.	Comment:	The subject drawing shall show the existing and proposed location, height and design of all fences. Drawing SP 6.2 shows a detail of the proposed retaining wall at the rear of the proposed building which varies from 8' to 10' in height. The applicant shall submit additional details/renderings showing proposed colors and treatment of the wall.
	Response:	Fence details will be provided in the plan set. The proposed rear retaining wall will be a precast concrete modular wall system with a natural stone appearance. Representative images of the proposed wall will be submitted.
2d.	Comment:	The subject drawing shall show the location, height and design of all existing and proposed signs.
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2e.

3.

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Respons	The existing and proposed sign locations, height and design will be submitted to the Town with the revised site plan package.
. Comme	nt: A complete set of elevation drawings, with the proposed color and materials, shall be submitted for referral to the Town's Architectural Advisory Council (AAC) for their review and comment. The submitted information has already been provided to the AAC for their preliminary review.
Respons	Architectural plans and elevations with color and material selections will be submitted to the Town with the revised site plan package.
Comme	nt: The applicant is proposing a 135-unit active adult residential community at the site of the Colonial Terrace catering facility. The facility is proposed to have 96 one-bedroom and 39 two-bedroom units. The building is proposed to be approximately 125,000 sq. ft. All units are proposed to be affordable. The subject property is approximately 8. 7 acres in size and is zoned CC, community commercial. The proposed facility is not permitted by the existing CC zoning and the applicant has proposed a zoning amendment to permit an active adult residential community in a CC zone pursuant to a Special Permit issued by the Town Board. The language of the proposed special permit requires that for a parcel to be eligible for the proposed Active Adult Residential Community Special Permit the parcel must be at least 8 acres in size, front on and has a primary access on a state road or on Oregon Rd., which will connect to public water and sewer systems and have a maximum building footprint of 135,000 sq. ft. The maximum density is proposed to be 17 units per acre.

The Town Board is Lead Agent for the project and has held a public hearing on the proposed zoning text amendment at their July 21st meeting at which time they closed the public hearing with the intent of adopting a Negative Declaration for the proposed zoning text amendment and adopting the amendment at their August 10th meeting. The Planning Board is responsible for the review of the

		proposed site plan and all environmental permits. The Planning Board
		has already reviewed the proposed zoning text amendments and
		provided comments back to the Town Board in a memo dated April 7,
		2021.
	Response:	Comment noted.
4.	Comment:	The applicant shall clarify for the Planning Board if they intend to
		work with Westchester County to ensure the proposed affordable units
		meet the Westchester County Planning Department's definition of
		affordable.
	Response:	The Applicant intends to work with Westchester County to ensure the
		affordable units meet their program requirements. It is the Applicant's understanding that the County definition of affordable housing is a unit with a rent that is affordable to households that earn 60% AMI
		and below, which is approximately \$60,000 per year for a two-person
		household. Of the total 135 units at Overlook Terrace, 127 units
		(94%) will be affordable to households earning 60% AMI and below.
5.	Comment:	The proposed site plan calls for the demolition of the existing building
		on site and the construction of a 3-story, 125,000 sq. ft. building. The
		main access to the facility will still be from Oregon Road. A second
		egress, gated and for emergency use only, is proposed to Eton Downs Rd.
		The building will have two courtyards located at the rear of the
		building. The site will have 146 proposed parking spaces located in the
		front of the proposed facility and on both sides. A service road will
		continue around the entire facility.
	Response:	Comment noted. To clarify, the road at the rear of the building is a fire
		access drive (for emergency use only), not a service road. One way
		egress to Eton Downs with a right turn only restriction is being
		considered. The site plan will reflect any driveway changes when
		submitted.
6.	Comment:	The applicant has completed a traffic study done by Provident
		Engineering dated June 23, 2021. The study is included in the

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Expanded EAF. The study has been sent to the Town's traffic consultant, HVEA for their review and comment. The subject site plan shows parking for 146 spaces, a ratio of l.08 spaces per unit. The applicant analyzed parking at Jacobs Hill for a two-week period and found an average parking demand of . 77 and a peak parking demand of .86. It is recommended the applicant provide to the Planning Board an analysis of the parking at the Springvale Apartment Complex for further comparison.

The applicant is proposing to enhance the existing Westchester County
Bee-Line bus stop(s) located on Oregon Rd. The applicant shall provide
correspondence from the Westchester County Department of
Transportation regarding the proposed enhancements.Response:The Applicant is initiating discussions with WCDOT and when
comments on the proposed application are received from the
Westchester County Department of Transportation, they will be shared
with the Town.

7. **Comment:** Trees on the subject property were inventoried and a report dated June 4, 2021 was submitted by Town consulting arborist, Bartlett Tree Experts. The report was previously transmitted to the Planning Board on June 21, 2021. The report did find three (3) protected trees and several specimen trees as per Chapter 283 (Trees) of the Town Code. The report specifically mentions tree #1306 (American Smoke Tree) #1314 (Catalpa) as significant trees. Both are slated for removal. In addition, the site, in its current condition ~ is home to several large trees, both deciduous and evergreen which help define the "historic" character of the site, specifically the very large trees that line the main entrance way into the property from Oregon Rd. According to the tree report there are 598 regulated trees on the subject site. A proposed landscape plan SP-4 has been submitted showing 53 Shade Trees, 20 Evergreen Trees and 35 Ornamental trees to be planted. In addition, plantings are proposed for the building foundation, storm water basins and areas of slopes. Trees to be preserved and trees to be removed shall be noted on the landscape plan

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and calculated. The subject drawing shows shade trees of 2-1/2" caliper to be planted along the entrance drive from Oregon Rd. It is recommended that larger caliper trees be planted along this entranceway given the existing allee of trees that exist on the site now and are slated for removal.

A re-planting plan that meets Chapter 283 (Trees) is required to be
submitted. The revised landscape plan shall be referred to the Town's
Conservation Advisory Council (CAC) for their review and comment.Response:The 598 trees included in the Bartlett study included over 200 trees
offsite – particularly on the property east of the project site. There are
393 trees onsite per the 12/23/20 Gallas surveyed tree locations. Per
the Gallas survey and most recent site plan, approximately 280 trees
will be removed from the site and approximately 7 trees will be
removed in the Eton Downs right of way. These numbers will be
confirmed with the issuance of a revised plan set.

Per the proposed plan, a total of 8.73 acres are proposed to be disturbed (7.91 on site and 0.46 offsite on Eton Downs). Per the Town Code, this will require the planting of 365 trees. The disturbance area will be confirmed with the revised plan set.

There are 2 protected Cornus florida trees as well as an American Smoketree and a Catalpa tree that will be removed with the proposed development as they are located within the proposed parking lots or building area. The proposed landscape plan will include the planting of 3 Cornus florida trees. As the Smoketree and Catalpa tree are not native to this area, they are not included in the proposed plant list however several native species are including oak, maple, linden, sweet gum and black gum.

The proposed landscape plan will include a mixture of shade tree sizes with 4 1/2"-5" caliper trees along the entry drive, 3"-3 $\frac{1}{2}$ " caliper trees in the landscaped and east/west buffer areas, and 2 $\frac{1}{2}$ " – 3" caliper trees

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Re: Planning Division Comments - Overlook Terrace

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to fill in the south wooded area. The plant list will include ornamental, understory and evergreen trees in the 6' to 8' height range.

Using a combination of primarily native shade, ornamental, understory, and evergreen trees, and deciduous and evergreen shrub planting, we anticipate meeting the Town's planting requirement. If the requirement cannot be achieved with onsite planting, a combination of planting and fee in lieu of planting will be used to meet the Town requirements. A tree removal and preservation plan as well as an updated landscape plan will be included with the revised plan set.

- 8. Comment: As per section 307-22 of the Zoning Code parking areas with parking for 30 or more cars require landscaped areas comprised of a minimum of 5% of the total area within the perimeter of the parking area. The subject drawing shall be revised to show the required landscaping.
 Response: Tree, shrub and perennial plantings in the planted islands within the parking area meet the minimum 5% requirement of the total parking area.
- 9. Comment: The Expanded EAF contains a Fiscal Analysis of the existing facility (Colonial Terrace) and the proposed facility showing existing and estimated tax generation. This analysis has been referred to the Town Assessor for review and comment.
 Response: Comment noted.

10. Comment: Section 265-11 (Subdivision) of the Town Code requires the reservation of land suitable for playgrounds or other recreational facilities or the deposit of moneys, currently \$6,000/unit, shall be deposited into a recreation fund in-lieu of such reservation of land. The applicant shall provide information to the Planning Board on how they intend to meet these requirements.

Response: The Applicant's counsel and the Town Attorney's office are discussing the appropriate fee in lieu structure, particularly given the fact that this is an age restricted AND affordable rental apartment complex. The

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Applicant will comply with the final determination made with regard to this fee.

11.	Comment:	Appendix 1 of the Expanded Environmental Assessment Form provides a sustainability narrative for the proposed project. The applicant is proposing to seek LEED Homes v4 certification for the project. Green initiatives include solar PV systems on the roof to offset electricity purchase from the grid, electric heat pump technology for domestic hot water, low flow fixtures and the use of environmentally preferred products with field verification and testing as per LEED protocols. The applicant shall confirm whether any of the solar power produced by the proposed panels will be put back into the grid or will only be used by the facility.
	Response:	The Applicant is studying the design of the solar panel system and will confirm whether the power produced by the proposed panels will be put back into the grid or will be used onsite by the proposed facility.
12.	Comment:	The subject proposal will impact approximately 1.4 acres of regulated steep slope. The applicant submitted the required Steep Slope analysis as per Chapter 259-6 of the Town Code. The applicant shall submit the required colored steep slope drawing showing areas of steep slope 15% to 25%, 25% to 30% and greater than 30%.
	Response:	The steep slope analysis maps will be prepared and submitted to show 15-25%, 25%-30% and greater than 30% as requested.
13.	Comment:	The applicant has referred the proposed project to the NYS Office of Parks, Recreation and Historic Preservation Office (OPRHP) for review and comment. OPRHP responded by a letter dated April 14, 2021 (included in the Expanded EAF) that stated "It is the opinion of the OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Register of Historic Places will be impacted by this project". The Town's Historic Resources Advisory Council (HRAC) has indicated an interest in working with the applicant to create a "history wall" in

		the new facility to commemorate the history of the Colonial Terrace, similar to what was done at the Hollowbrook Golf Club. The applicant shall provide additional information to the Planning Board on their progress at preserving items from Colonial Terrace and their plans for a display.
	Response:	The applicant welcomes the opportunity to collaborate with the Town's Historic Resources Advisory Council (HRAC) in the development of the "Colonial Terrace Commemorative Display", which will be featured prominently in the residential lobby of the new building. The display will feature archival photographs and memorabilia, much of which is currently on display throughout the Colonial Terrace property and has been documented in the applicant's site assessments. The applicant has also spoken with the Van Cortlandtville Historical Society about collaborating with them to conduct a review of potential archival materials at the property and would welcome their feedback on incorporating them into the lobby display.
14.	Comment:	The applicant has submitted a Storm water Pollution Prevention Plan (SWPPP) for review by the Town Engineering Division and the Town's Environmental Consultant, HVEA Engineering.
	Response:	Comment noted.
15.	Comment:	Enclosed is an aerial view(s) of the subject site. The subject drawing set was previously given to the Planning Board.
	Response:	Comment noted.
16.	Comment:	Referrals of this application include, the Town Engineering Division, the Fire Advisory Board, the Conservation Advisory Council, the Town Department of Environmental Services, the Town Assessor, the Code Enforcement Division, and Westchester County as well as all interested and involved agencies.
	Response:	Comment noted.



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We look forward to continuing our review of the Project with the Planning Board.

Very truly yours,

DIVNEY TUNG SCHWALBE, LLP

Matthew N. Steinberg, AICP Associate

Enclosures File: 858

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August 19, 2021

Hon. Loretta Taylor Chairperson of the Town of Cortlandt Planning Board and Members of the Planning Board Town Hall 1 Heady Street Cortlandt Manor, NY 10567

Overlook Terrace Re: 119 Oregon Road

Dear Chairperson Taylor and Members of the Planning Board:

On behalf of NRP Group (the Applicant) we offer the following responses to a comment memo by HVEA Engineers, dated July 26, 2021, regarding the Overlook Terrace SWPPP for your consideration.

1.	Comment:	A Notice of Intent is critical to the review process in understanding how the project's stormwater requirements are being met, how reductions are being credited, etc. A Notice of Intent should be included in the submission for review to verify hydrologic calculations and practice credits.
	Response:	A Notice of Intent will be provided.
2.	Comment:	Table 3 giving the on-site summary for stormwater quality measures shows different values for existing impervious area and total site areas. The water quality volume (WQV) value in the table reflects a total site area of 9.33 acres, with 2.41 acres existing impervious as opposed to the 2.26 acres existing impervious that Table 3 shows. It is my understanding that the WQV was calculated based on the total site area instead of the disturbed area. Therefore, Table 3 should be revised

	Response:	to show the correct values being utilized. Calculating WQV based on the limits of disturbance results in a higher required WQV. The water quality volume proposed exceeds the minimum requirements for both the total disturbance area and the total site area. Table 3 will be updated to clarify.
3.	Comment:	The project proposes a direct connection to the existing drainage system on Donnelly Place. The existing drainage system on Donnelly is comprised of 15" diameter pipes in the area of connection. The Donnelly drainage system should be analyzed to determine if there is adequate capacity for the proposed flows.
	Response:	The berm on the proposed stormwater basin will be raised slightly to provide additional stormwater storage onsite. This increased storage volume will further reduce the peak rate of flow leaving the site for the 1-, 10-, 25-, and 100-year storm events. Stormwater currently drains from the site overland to a storm basin located on Donnelly Place. Currently stormwater flows that exceed the capacity of the drain pipes flow along the roadway gutter on Donnelly Place and Oregon Road to an unnamed stream just north of Gallows Hill Road. With a reduction in the rate of flow leaving the site, the frequency of these flows along the roadway will be reduced. The final details of the connections will be further reviewed with the Town Engineer.
4.	Comment:	Silt fence should be parallel to the contours. Some of the silt fence runs appear to be perpendicular to the contours, which would result in concentrated flows.
	Response:	Silt fence layout will be revised to parallel slopes.
5.	Comment:	The erosion and sediment control plan shows temporary sediment traps in the future bioretention basin area. If there is any chance of infiltrative soil, it will likely be plugged by fines if the basin is used as a trap during construction. The detail should outline the sequence of construction to show bow the area will be utilized in the temporary condition before being brought to its final condition as a bioretention basin.

	Response:	At the end of the construction the sediment trap at the bioretention site will be excavated approximately three (3) feet deep to install the stone base course and filter material. The accumulated sediment will be removed at that time. These requirements will be included on the construction details.
6.	Comment:	There is no planting plan shown for the bioretention basin. Bioretention basins should include a mix of tree species, shrub species, and herbaceous plants spaced in accordance with the NYSDEC Stormwater Management Design Manual.
	Response:	The landscape plan will show trees, shrubs and basin grasses planted in the bioretention basin in accordance with the design manual.
7.	Comment:	Page 11 of the SWPPP states that the contractor will prepare a detailed construction phasing plan. The SWPPP should revise the anticipated general sequence to include temporary stormwater controls and drainage, as well as approximate areas of disturbance during each phase to ensure no more than 5 acres are disturbed at one time.
	Response:	The construction sequence will be expanded in the SWPPP. A 5-acre waiver will be requested for at least part of the construction period due to the amount of earthwork required. The details of the phasing and disturbance limits will be provided and included in the SWPPP for review and approval by the Town Engineer.
8.	Comment:	The table summary values for the Pond Pack Models for Existing and Proposed Conditions in the Appendix vary from the design flow summary values for peak flows in Table 4. The summary table should be revised to show the updated values.
	Response:	The PondPack modeling and Table 4 will be revised.
9.	Comment:	Detention Basin Outlet Control Structure detail does not show an emergency spillway from the practice. Will the constructed basin have an emergency spillway area?
	Response:	The stormwater basins will have emergency overflows lined with stone rip-rap. The plans and details will be updated.

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10.	Comment:	Side slopes of bioretention basin are 3:1 and should therefore receive
		rolled erosion control product. Rolled erosion to be used on all slopes 3:1
		or steeper in accordance with the NYSDEC Blue Book.
	Response:	The plans and planting details will note that erosion control fabric is
		required on planted and seeded slopes greater than or equal to 3:1.

We look forward to continuing our review of the Project with the Planning Board.

Very truly yours,

DIVNEY TUNG SCHWALBE, LLP

Gerhard M. Schwalbe, P.E. Partner

File: 858