Appendix F:
Traffic Impact Analysis

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KUNZMAN ASSOCIATES, INC.

VANGUARD UNIVERSITY
CAMPUS MASTER PLAN

TRAFFIC IMPACT ANALYSIS

October 25, 2017

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

VANGUARD UNIVERSITY
CAMPUS MASTER PLAN

TRAFFIC IMPACT ANALYSIS

October 25, 2017

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TABLE OF CONTENTS

I. FINDINGS 2
- A. Existing Traffic Conditions 2
- B. Traffic Impacts 2
- C. Mitigation Measures 3
- D. Construction Traffic 4

II. CONGESTION MANAGEMENT PROGRAM METHODOLOGY 5
- A. County Congestion Management Program 5
- B. Prescribed Methodology for a Traffic Impact Analysis 6
- C. Mitigation Measures 7

III. PROJECT DESCRIPTION 8
- A. Location 8
- B. Proposed Development 8

IV. EXISTING TRAFFIC CONDITIONS 11
- A. Surrounding Street System 11
- B. Existing Travel Lanes and Intersection Controls 11
- C. Existing Average Daily Traffic Volumes 11
- D. Existing Levels of Service 12
- E. Existing General Plan Circulation Element 12
- F. Transit Service 12
- G. Bicycle Network 13
- H. Pedestrian Network 13

V. PROJECT TRAFFIC 25
- A. Trip Generation 25
- B. Trip Distribution 26
- C. Trip Assignment 26
- D. Modal Split 26

VI. EXISTING PLUS PROJECT TRAFFIC CONDITIONS 39
- A. Method of Projection 39
- B. Existing Plus Project Average Daily Traffic Volumes 39
- C. Existing Plus Project Levels of Service 39
- D. Traffic Signal Warrant Analysis 40

VII. OPENING YEAR (2020) TRAFFIC CONDITIONS 45
- A. Method of Projection 45
- B. Opening Year (2020) Average Daily Traffic Volumes 45
- C. Opening Year (2020) Intersection Levels of Service 45
- D. Traffic Signal Warrant Analysis 46

VIII. RECOMMENDATIONS 58
- A. Site Access 58
- B. Roadway Improvements 58

APPENDICES

Appendix A – Glossary of Transportation Terms

Appendix B – Vanguard University Campus Master Plan Executive Summary

Appendix C – Vanguard University Campus Site Plans and Artist Renderings

Appendix D – Intersection Turning Movement Count Worksheets

Appendix E– Explanation and Calculation of Intersection Capacity Utilization/Delay

LIST OF TABLES

Table 1. Existing Intersection Levels of Service 14
Table 2. Project Trip Generation 27
Table 3. Existing Plus Project Intersection Levels of Service 41
Table 4. Opening Year (2020) Without Project Intersection Levels of Service..... 50
Table 5. Opening Year (2020) With Project Intersection Levels of Service 51

LIST OF FIGURES

Figure 1. Project Location Map 9
Figure 2. Site Plan 10
Figure 3. Existing Through Travel Lanes and Intersection Controls 15
Figure 4. Existing Average Daily Traffic Volumes 16
Figure 5. Existing Morning Peak Hour Intersection Turning Movement Volumes 17
Figure 6. Existing Evening Peak Hour Intersection Turning Movement Volumes 18
Figure 7. City of Costa Mesa General Plan Circulation Element 19
Figure 8. City of Costa Mesa General Plan Roadway Cross-Sections 20
Figure 9. Orange County Transportation Authority System Map 21
Figure 10. City of Costa Mesa General Plan Transit Corridors Map 22
Figure 11. City of Costa Mesa General Plan Conceptual Bicycle Master Plan 23
Figure 12. Existing Pedestrian Facilities 24
Figure 13. Existing Outbound Trip Distribution – Morning Peak Hour 28
Figure 14. Existing Inbound Trip Distribution – Morning Peak Hour 29
Figure 15. Existing Outbound Trip Distribution – Evening Peak Hour 30
Figure 16. Existing Inbound Trip Distribution – Evening Peak Hour 31
Figure 17. Project Outbound Trip Distribution – Morning Peak Hour 32
Figure 18. Project Inbound Trip Distribution – Morning Peak Hour 33
Figure 19. Project Inbound Trip Distribution – Evening Peak Hour 34
Figure 20. Project Outbound Trip Distribution – Evening Peak Hour 35
Figure 21. Project Average Daily Traffic Volumes 36
Figure 22. Project Morning Peak Hour Intersection Turning Movement Volumes 37
Figure 23. Project Evening Peak Hour Intersection Turning Movement Volumes 38
Figure 24. Existing Plus Project Average Daily Traffic Volumes 42
Figure 25. Existing Plus Project Morning Peak Hour Intersection Turning Movement Volumes 43
Figure 26. Existing Plus Project Evening Peak Hour Intersection Turning Movement Volumes 44
Figure 27. Opening Year (2020) Without Project Average Daily Traffic Volumes 52
Figure 28. Opening Year (2020) With Project Average Daily Traffic Volumes 53
Figure 29. Opening Year (2020) Without Project Morning Peak Hour Intersection Turning Movement Volumes 54
Figure 30. Opening Year (2020) Without Project Evening Peak Hour Intersection Turning Movement Volumes 55
Figure 31. Opening Year (2020) With Project Morning Peak Hour Intersection Turning Movement Volumes 56
Figure 32. Opening Year (2020) With Project Evening Peak Hour Intersection Turning Movement Volumes 57
Figure 33. Circulation Recommendations 59

VANGUARD UNIVERSITY
CAMPUS MASTER PLAN

TRAFFIC IMPACT ANALYSIS

This report contains the traffic impact analysis for the proposed Vanguard University Campus Master Plan project. The project site is located south of Fair Drive between Vanguard Way and Newport Boulevard South in the City of Costa Mesa. The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community.

The traffic impact analysis contains documentation of Existing traffic conditions, trips generated by the project, distribution of the project trips to roads outside the project, determination of Existing Plus Project[1] traffic conditions, and an analysis of Opening Year (2020) traffic conditions without and with the project. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

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[1] The existing plus project conditions has been analyzed to comply with the Sunnyvale West Neighborhood Association v. City of Sunnyvale CEQA court case. This scenario assumes the full development of the proposed project and full absorption of the proposed project trips on the circulation system at the present time.

I. FINDINGS

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

A. Existing Traffic Conditions

1. The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community. Morning and evening peak hour intersection turning movement counts were obtained at each project driveway to determine the existing trip generation for the existing land use.

2. The study area includes the following intersections:

Study Intersections	Jurisdiction
Vanguard Way (NS) at:	
Morristown Lane (EW) - #1	City of Costa Mesa
Civic Center (NS) at:	
Fair Drive (EW) - #2	City of Costa Mesa
Project Access (NS) at:	
Fair Drive (EW) - #3	City of Costa Mesa
Newport Boulevard South (NS) at:	
Project North Driveway (EW) - #4	City of Costa Mesa
Project Central Driveway (EW) - #5	City of Costa Mesa
Project South Driveway (EW) - #6	City of Costa Mesa

3. The study intersections currently operate at acceptable Levels of Service during the peak hours for Existing traffic conditions.

B. Traffic Impacts

1. The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community.

2. The existing project site currently generates a total of approximately 5,208 daily vehicle trips, 436 of which currently occur during the morning peak hour and 507 of which currently occur during the evening peak hour.

3. The proposed development is projected to generate a total of approximately 6,569 daily vehicle trips, 550 of which will occur during the morning peak hour and 640 of which will occur during the evening peak hour.

4. The proposed development compared to the existing development is projected to generate a total of approximately 1,361 more daily vehicle trips, 114 more of which

will occur during the morning peak hour and 133 more of which will occur during the evening peak hour.

5. The signalized study intersection is projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions. The unsignalized study intersections are projected to operate at acceptable Levels of Service during the peak hours using the Intersection Delay Method, except for the intersection of Newport Boulevard South at Project Central Driveway which is projected to operate at an unacceptable Level of Service during the evening peak hour. However, this unsignalized study intersection is projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions using the Intersection Capacity Utilization methodology.

6. The study intersections are projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) Without Project traffic conditions.

7. The signalized study intersection is projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) With Project traffic conditions. The unsignalized study intersections are projected to operate at acceptable Levels of Service during the peak hours using the Intersection Delay Method, except for the intersections of Newport Boulevard South at Project North Driveway and Newport Boulevard South at Project Central Driveway which are projected to operate at unacceptable Levels of Service during the evening peak hour. However, these unsignalized study intersections are projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) With Project traffic conditions using the Intersection Capacity Utilization methodology.

C. Mitigation Measures

The following measures are recommended to mitigate the impact of the project on traffic circulation:

1. Site-specific circulation and access recommendations are depicted on Figure 33.

2. Construct Vanguard Way from Morristown Lane to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

3. Construct Fair Drive from Civic Center to Newport Boulevard South at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

4. Construct Newport Boulevard South from Fair Drive to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

5. Sufficient on-site parking shall be provided to meet City of Costa Mesa parking code requirements.

6. On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project. Circulation within the project site should allow relatively free flow of vehicular traffic volumes with no constrictions.

7. Sight distance at project accesses shall comply with standard California Department of Transportation and City of Costa Mesa sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

8. As is the case for any roadway design, the City of Costa Mesa should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

D. Construction Traffic

Compared to the project trip generation, construction of the proposed project is expected to generate significantly less trips. The traffic impacts of construction activity will be minor and temporary. To further lessen the impact of construction trips, any temporary traffic controls used around the construction area should adhere to the standards set forth in the California Manual of Uniform Traffic Control Devices (2012) and construction activities should adhere to applicable local ordinances.

II. CONGESTION MANAGEMENT PROGRAM METHODOLOGY

This section discusses the County Congestion Management Program. The purpose, prescribed methodology, and definition of a significant traffic impact are discussed.

A. County Congestion Management Program

The Congestion Management Program is a result of Proposition 111 which was a statewide initiative approved by the voters in June, 1990. The proposition allowed for a nine cent per gallon State gasoline tax increase over a five year period.

Proposition 111 explicitly stated that the new gas tax revenues were to be used to fix existing traffic problems and was not to be used to promote future development. For a City to get its share of the Proposition 111 gas tax, it has to follow certain procedures specified by the State Legislature. The legislation requires that a traffic impact analysis be prepared for new development. The traffic impact analysis is prepared to monitor and fix traffic problems caused by new development.

The Legislature requires that adjacent jurisdictions use a standard methodology for conducting a traffic impact analysis. To assure that adjacent jurisdictions use a standard methodology in preparing traffic impact analyses, one common procedure is that all Cities within a County, and the County agency itself, adopt and use one standard methodology for conducting traffic impact analyses.

Although each County has developed standards for preparing traffic impact analyses, traffic impact analysis requirements do vary in detail from one County to another, but not in overall intent or concept. The general approach selected by each County for conducting traffic impact analyses has common elements.

The general approach for conducting a traffic impact analysis is that existing weekday peak hour traffic volumes are counted and the percent of roadway capacity currently used is determined. Then the project trips are added and the percent of roadway capacity used is again determined. If the new project adds trips to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level which is no worse than before the project trips were added.

If the project size is below a certain minimum threshold level, then a project does not have to have a traffic impact analysis prepared, once it is shown or agreed that the project is below the minimum threshold. In Orange County a project needs a traffic impact analysis if it generates more than 200 daily trips. If a project is bigger than the minimum threshold size, then a traffic impact analysis is required.

B. Prescribed Methodology for a Traffic Impact Analysis

The City of Costa Mesa has established Level of Service D as the minimum acceptable Level of Service for its arterial roadway system. Roadway facilities operating at Level of Service E or F are considered deficient.

If a project increases the Intersection Capacity Utilization for a signalized intersection by more than 1 percent and achieves unacceptable Level of Service E or F, then a significant impact has occurred and feasible improvements must be identified that will mitigate the intersection Level of Service to an acceptable Level of Service D or better.

The City of Costa Mesa does not have significant impact criteria for unsignalized intersections.

In the City of Costa Mesa the technique used to calculate Intersection Capacity Utilization for a signalized intersection is as follows. Lane capacity is 1,600 vehicles per lane per hour of green time for through and turn lanes. A total yellow clearance time of 4 percent is added.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix E). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

Although the following study intersections are unsignalized intersections, the intersections have been analyzed utilizing both the Intersection Delay and Intersection Capacity Utilization methodologies to show the difference between the Level of Service methodologies, when the delay methodology shows the intersection operating at an unacceptable Level of Service during either or both peak hours:

Newport Boulevard South (NS) at:
- Project North Driveway (EW) - #4
- Project Central Driveway (EW) - #5

It is recommended that due to the nature of the unsignalized intersections along Newport Boulevard South, the Intersection Capacity Utilization methodology should take precedence. Due to relatively high southbound traffic volumes on Newport Boulevard South (the roadway is one-way only in the southbound direction), minimal conflicting turning movements on this roadway causes a significant delay for these traffic movements creating a situation that is not able to be mitigated without the installation of a traffic signal. This occurs even though these intersections have relatively low minor street movements that would not warrant traffic signals and the only movements consist of southbound through/right and eastbound right turning movements. The Intersection Delay methodology does not account for acceptable gaps created on Newport Boulevard South for traffic volumes to enter/exit the existing driveways due to the traffic signal located north of these intersections on Newport Boulevard South at Fair Drive. This traffic signal produces periodic gaps in traffic volumes for downstream traffic volumes as they are fulfilling their traffic cycles which allow for the creation of gaps to occur. The intersection Capacity Utilization methodology is preferred as it does not single out the most minimalistic

movements in relation to total traffic volumes utilizing that intersection to then assess the entire intersection performance.

Project trips are generated by conducting morning and evening peak hour intersection turning movement counts at the existing driveways and comparing this data to the existing and future full-time equivalent student information. To determine the trip distributions for the proposed project, peak hour intersection turning movement counts of the existing directional distribution of trips for existing driveways of the site, and other additional information on future development including proposed parking lot/garage locations and access for the master plan were reviewed. The Traffic Impact Analysis has to be prepared by a licensed Traffic Engineer.

This report has been prepared in accordance with the traffic impact analysis requirements except as noted. The traffic impact analysis not only examined the Congestion Management Program system of roads and intersections, but also other roads and intersections.

The existing outbound/inbound traffic volumes were removed from the study intersections with the inbound/outbound project generated trips added to the study intersections, and a full intersection analysis was conducted.

C. Mitigation Measures

If a project is large enough to require that a traffic impact analysis be prepared, and if the project adds trips to an intersection above a minimum threshold, and if the intersection is operating at above an acceptable level of operation, then the project must mitigate its traffic impact.

Traffic mitigation can be in many forms including adding lanes. Lanes can sometimes be obtained through restriping or elimination of parking, and sometimes require spot roadway widening.

III. PROJECT DESCRIPTION

This section discusses the project's location and proposed development. Figure 1 shows the project location map and Figure 2 illustrates the site plan.

A. Location

The project site is located south of Fair Drive between Vanguard Way and Newport Boulevard South in the City of Costa Mesa.

B. Proposed Development

The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community.

The following is a summary of the associated projects to be developed as part of the master plan:

A. Gym/Events Center: Replaces existing gymnasium providing adequate facilities for Vanguard's athletics/ program.
B. Student Center: Removes the existing Café and Cove / Bookstore and replaces them with a Student Center.
C. Maintenance & Operations / Warehousing: Relocated maintenance and operations to the southwest corner of the University.
D. Stem & Kinesiology: Replaces antiquated Science, Technology, Engineering, Mathematics, and Kinesiology facilities on campus.
E. Multi-Disciplinary Academic Building: New academic facility south of Scott Academic Center and west of Health Academic Center.
F. Learning Resource Center: New Learning Resource Center along the south edge of the campus core.
G. Student Housing: New Student Housing facility east of the new Learning Resource Center.
H. Central Plant: New central plant on campus dependent upon further engineering studies. Possible locations include Project A (Gymnasium / Events Center), Project B (Student Center), and/or Project D (Stem & Kinesiology).
I. Athletics: Improvements to the Athletic Facilities.
J. Northeast Parking: New front entry for Vanguard University.
K. Parking Structure: Removes Parking Lots H and G, locating a parking structure along Newport Boulevard.
L. Campus Beautification / Infrastructure: Site improvements on campus.

Appendix B includes the Vanguard University Campus Master Plan Executive Summary prepared in April 2017 by HPI Architecture. It includes an expanded explanation for Projects A – L including aerial graphics showing the location of each project on campus. Various site plan layouts and artistic renderings are included in Appendix C.

Figure 1
Project Location Map

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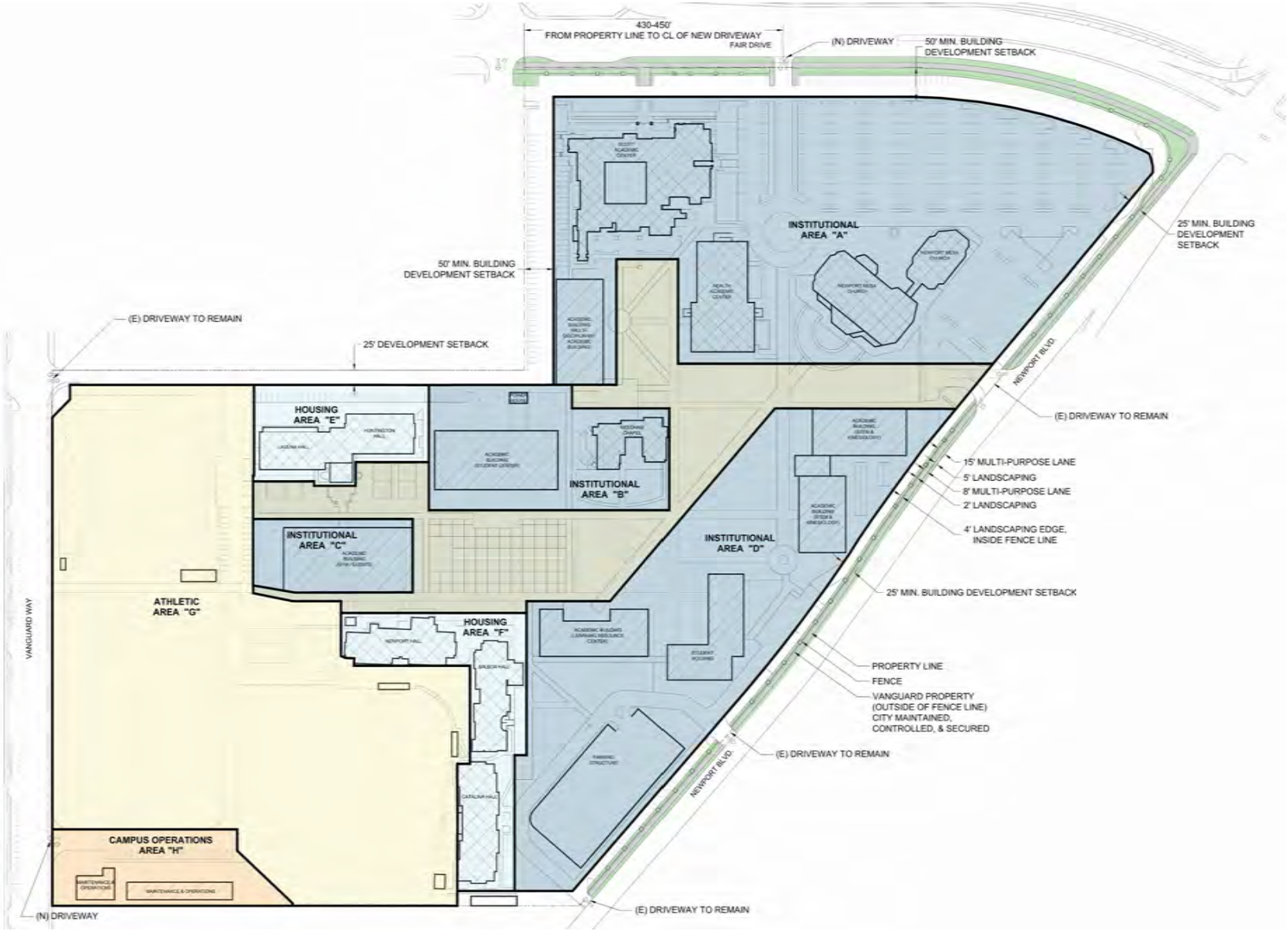
Figure 2
Site Plan



IV. EXISTING TRAFFIC CONDITIONS

The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community. Morning and evening peak hour intersection turning movement counts were taken at each project driveway to determine the existing trip generation for the existing campus. The traffic conditions as they exist today are discussed below and illustrated on Figures 3 to 12.

A. Surrounding Street System

Study area roadways that will be utilized by the development include Vanguard Way, Morristown Lane, Fair Drive, and Newport Boulevard South.

Vanguard Way: This north-south roadway currently is two lanes divided in the study area and has on-street parallel parking north of Morristown Lane and south of Morristown Lane has on-street perpendicular parking on the west side of the street and parallel parking on the east side of the street. Vanguard Way is currently not classified on the City of Costa Mesa General Plan Circulation Element. It currently carries approximately 2,600 to 3,300 vehicles per day in the study area.

Morristown Lane: This east-west roadway currently is an alleyway in the study area serving residences to the south. Morristown Lane is currently not classified on the City of Costa Mesa General Plan Circulation Element. It currently carries approximately 400 vehicles per day in the study area.

Fair Drive: This east-west roadway currently is four lanes divided to six lanes divided in the study area. Fair Drive is currently classified as a Primary Arterial on the City of Costa Mesa General Plan Circulation Element. It currently carries approximately 23,000 vehicles per day in the study area.

Newport Boulevard South: This north-south roadway currently is three lanes to four lanes and one directional southbound in the study area. Newport Boulevard South is currently classified as a Secondary Arterial on the City of Costa Mesa General Plan Circulation Element. It currently carries approximately 13,700 to 14,200 vehicles per day in the study area.

B. Existing Travel Lanes and Intersection Controls

Figure 3 identifies the Existing roadway conditions for study area roadways. The Existing number of through lanes for roadways and the intersection controls are identified.

C. Existing Average Daily Traffic Volumes

Figure 4 depicts the Existing average daily traffic volumes. The Existing average daily traffic volumes were factored from intersection turning movement counts (see Appendix D)

obtained by Kunzman Associates, Inc. in September 2017 and the Annual Traffic Volume Maps by the Orange County Transportation Authority.

D. Existing Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix E. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix E). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

The Levels of Service for the Existing traffic conditions have been calculated and are shown in Table 1. Existing Levels of Service are based upon manual morning and evening peak hour intersection turning movement counts made for Kunzman Associates, Inc. in September 2017 (see Figures 5 and 6). Intersection turning movement worksheets are provided in Appendix D.

There are two peak hours in a weekday. The morning peak period is between 7:00 AM and 9:00 AM, and the evening peak period is between 4:00 PM and 6:00 PM. The actual peak hour within the two hour period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume.

The study intersections currently operate at acceptable Levels of Service during the peak hours for Existing traffic conditions (see Table 1). Existing intersection Level of Service worksheets are provided in Appendix E.

E. Existing General Plan Circulation Element

Figure 7 shows the City of Costa Mesa General Plan Circulation Element. Both existing and future roadways are included in the General Plan Circulation Element and are graphically depicted on Figure 7. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the land use element of the General Plan. The City of Costa Mesa General Plan roadway cross-sections are illustrated on Figure 8.

F. Transit Service

Figure 9 depicts the Orange County Transportation Authority System Map. Transit service is currently provided along Fair Drive by Route 178, and along Newport Boulevard South by Route 71. The City of Costa Mesa General Plan Transit Corridors Map is graphically depicted

on Figure 10. Fair Drive is a Community Bus Route Type and Newport Boulevard South is a Local Bus Route Type.

G. Bicycle Network

The City of Costa Mesa General Plan Conceptual Bicycle Master Plan is shown on Figure 11. Fair Drive is an existing Class I and Class II facility with Newport Boulevard South north of Fair Drive also being a Class I facility.

H. Pedestrian Network

Existing pedestrian facilities adjacent to the project are shown on Figure 12.

Table 1

Existing Intersection Delay and Level of Service

Intersection	Traffic Control[4]	Intersection Approach Lanes[1]												Peak Hour			
		Northbound			Southbound			Eastbound			Westbound			Delay-LOS[2]		V/C-LOS[3]	
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Morning	Evening
Vanguard Way (NS) at:																	
Morristown Lane (EW) - #1	CSS	1	0.5	0.5	1	0.5	0.5	0	<1>	0	0	<1>	0	10.3-B	10.6-B	--	--
Civic Center (NS) at:																	
Fair Drive (EW) - #2	TS	0.5	0.5	1	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	--	--	0.453-A	0.561-A
Project Access (NS) at:																	
Fair Drive (EW) - #3	CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	2>>	24.6-C	19.4-C	--	--
Newport Boulevard South (NS) at:																	
Project North Driveway (EW) - #4	CSS	0	0	0	0	2.5	0.5	0	0	1	0	0	0	10.5-B	30.5-D	--	--
Project Central Driveway (EW) - #5	CSS	0	0	0	0	3	0	0	0	1	0	0	0	10.4-B	29.4-D	--	--
Project South Driveway (EW) - #6	CSS	0	0	0	0	2.5	0.5	0	0	0	0	0	0	0.0-A[5]	0.0-A	--	--

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; <1> = Shared Left/Through/Right Turn Lane; >> = Free Right Turn Lane

[2] Delay and Level of Service has been calculated using the following analysis software: Vistro, Version 5.00-03. Per the 2010 Highway Capacity Manual, overall average intersection delay and Level of Service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and Level of Service for the worst individual movement (or movements sharing a single lane) are shown.

[3] Level of Service has been calculated using the following software: Vistro, Version 5.00-03.

[4] CSS = Cross Street Stop; TS = Traffic Signal

[5] Level of Service = 0.0-A since the intersection is an entrance only driveway and eastbound/westbound conflicting movements do not occur.

Figure 3
Existing Through Travel Lanes and Intersection Controls

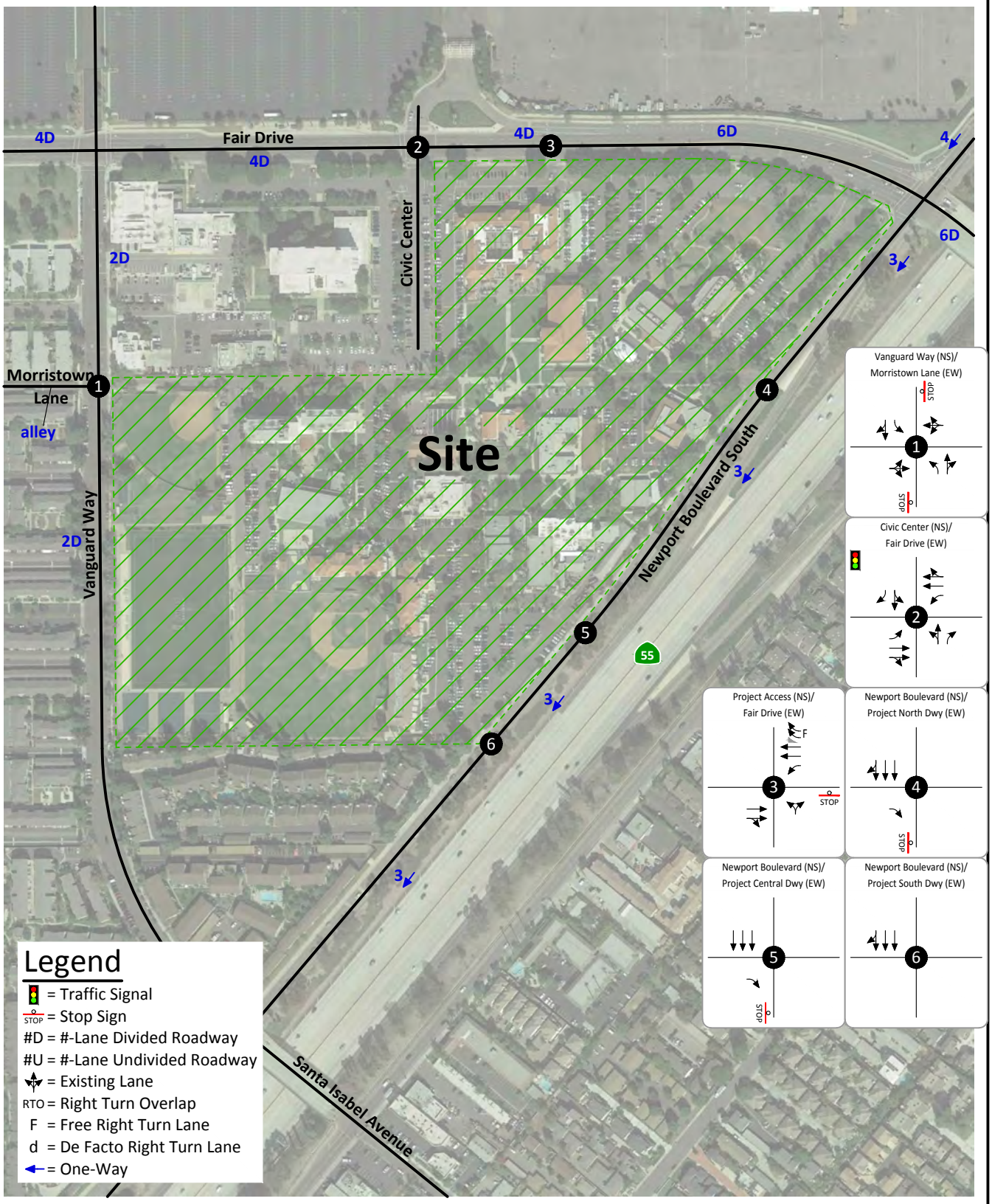


Figure 4
Existing Average Daily Traffic Volumes

Figure 5
Existing Morning Peak Hour Intersection Turning Movement Volumes

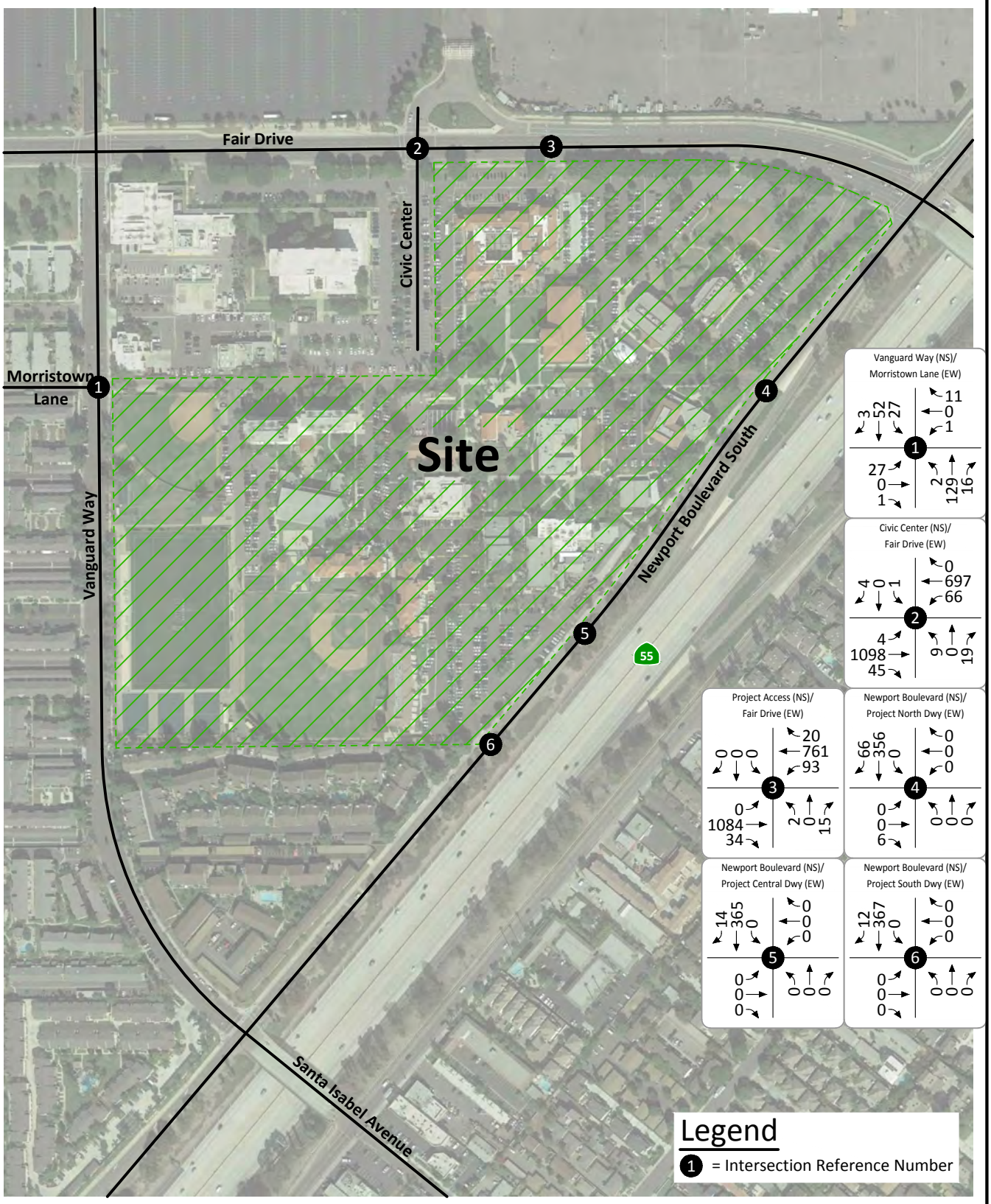


Figure 6
Existing Evening Peak Hour Intersection Turning Movement Volumes

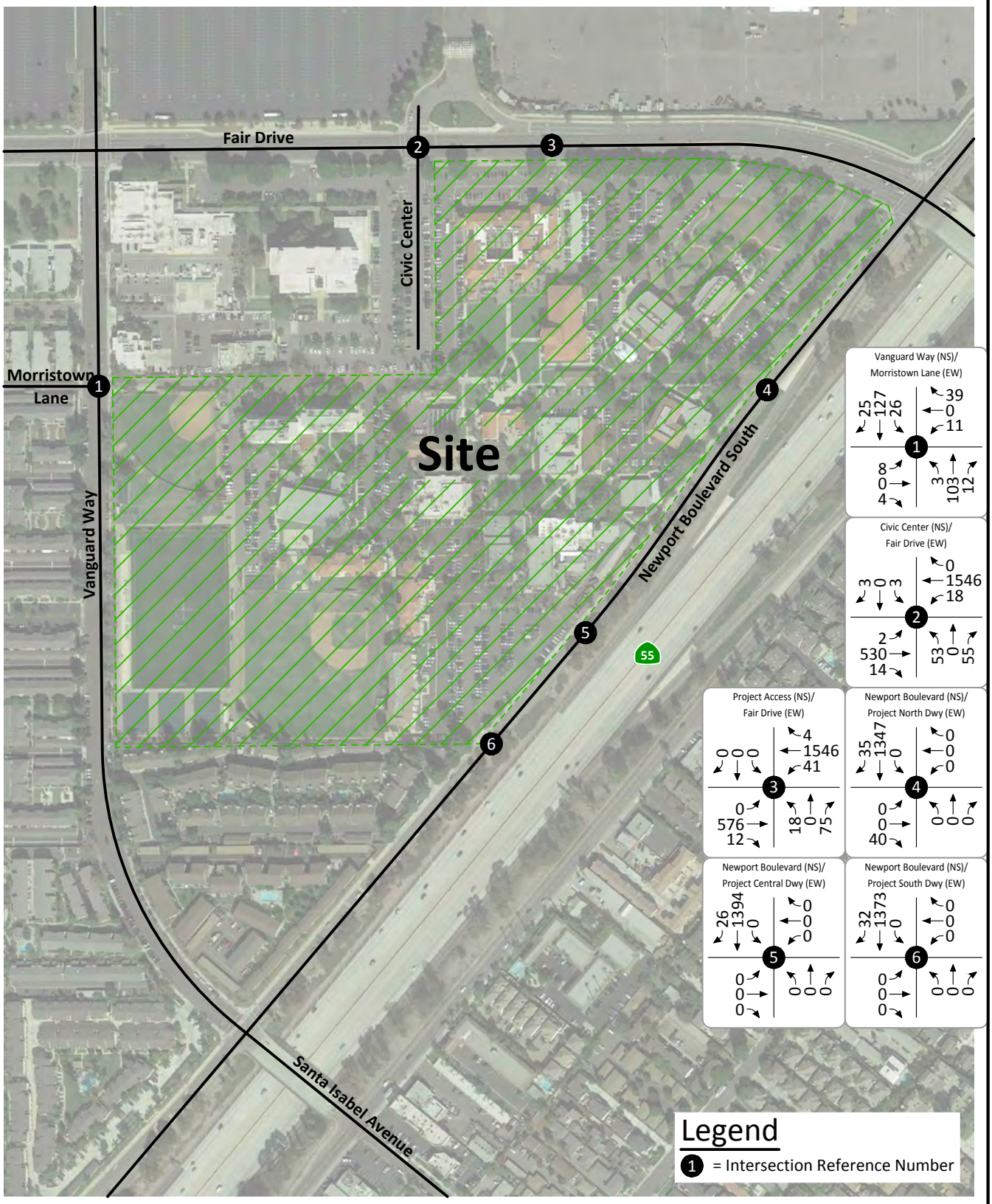
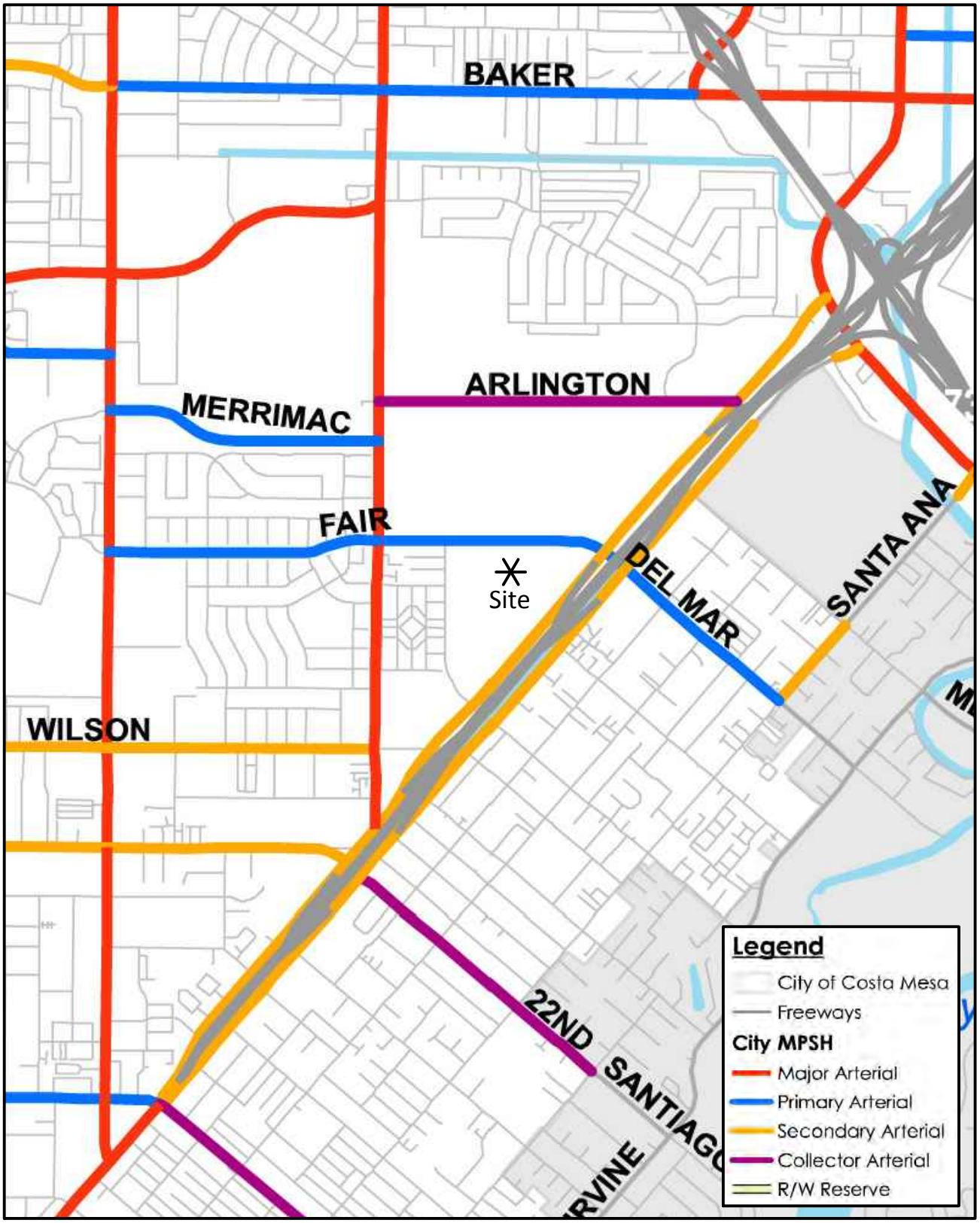
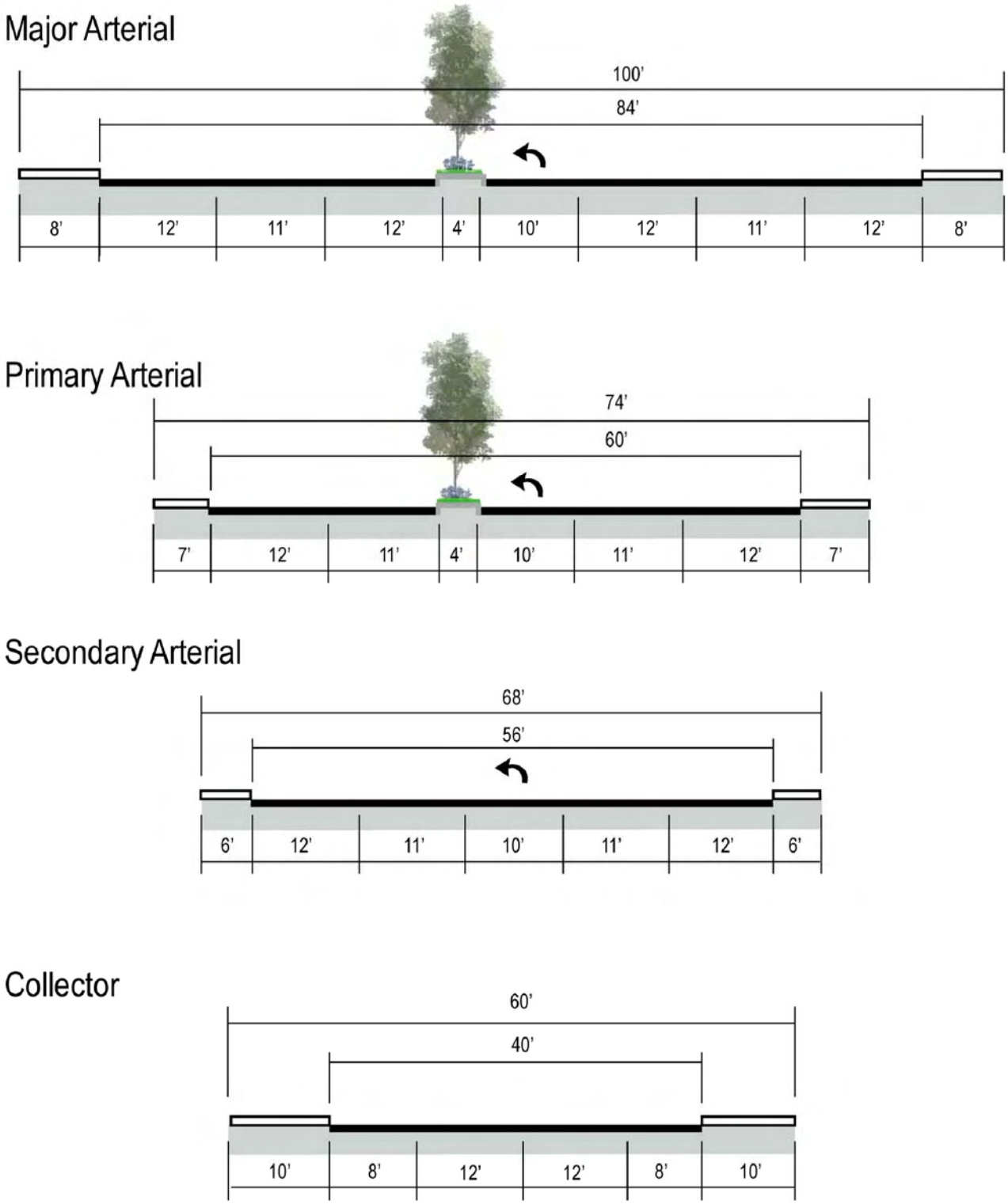


Figure 7
City of Costa Mesa General Plan Circulation Element



Source: City of Costa Mesa

Figure 8
City of Costa Mesa General Plan Roadway Cross-Sections



Source: City of Costa Mesa

Figure 9
Orange County Transportation Authority System Map

KUNZMAN ASSOCIATES, INC. Source: Orange County Transportation Authority

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Figure 10
City of Costa Mesa General Plan Transit Corridors Map

Source: City of Costa Mesa

Figure 11
City of Costa Mesa General Plan Conceptual Bicycle Master Plan

Source: City of Costa Mesa

Figure 12
Existing Pedestrian Facilities

V. PROJECT TRAFFIC

The project site is currently in operation as a university and is generating significant trips. It is proposing to redevelop the university campus as part of a master plan for the benefit of their students and surrounding community. The project site currently and is proposed to continue to provide access to Vanguard Way, Fair Drive, and Newport Boulevard South.

A. Trip Generation

The trips generated by the project are determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and life styles remain similar to what are known today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for average daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the trip generation rates by the land use quantity, the traffic volumes are determined. Table 2 exhibits the trip generation rates, project peak hour volumes, and project average daily traffic volumes for the proposed project site.

Morning and evening peak hour intersection turning movement counts were taken at each project driveway to determine the existing trip generation for the existing campus. Morning and evening peak hour project trips are generated by comparing this existing data to the existing and future full-time equivalent student information.

Daily trips equal the difference in the evening peak hour rate derived from existing traffic counts and the evening peak hour rate from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017, Land Use Code 550 and multiplied by the aforementioned Institute of Transportation Engineers daily rate.

The driveway on the southwest portion of the project site along Vanguard Way was not included in this analysis as it is for maintenance and operations vehicles only and does not allow student access.

The existing project site currently generates a total of approximately 5,208 daily vehicle trips, 436 of which currently occur during the morning peak hour and 507 of which currently occur during the evening peak hour.

The proposed development is projected to generate a total of approximately 6,569 daily vehicle trips, 550 of which will occur during the morning peak hour and 640 of which will occur during the evening peak hour.

The proposed development compared to the existing development is projected to generate a total of approximately 1,361 more daily vehicle trips, 114 more of which will occur during the morning peak hour and 133 more of which will occur during the evening peak hour.

B. Trip Distribution

Figures 13 to 16 contain the directional distributions of the existing trips for the campus. The trip distributions have been formulated for the morning and evening peak hour by inbound and outbound direction. This has been done so that the inbound and outbound turning movements directly match the intersection turning movement counts by peak hour for each existing project driveway.

Figure 17 to 20 contains the directional distributions of the project trips for the campus with master plan improvements. These directional distributions of the project trips were formulated, based on existing turning movement counts, existing parking lots, existing internal circulation, proposed parking lots, proposed new development locations, and proposed internal circulation.

C. Trip Assignment

Based on the identified trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 21. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 22 and 23, respectively. These volumes represent the net change from existing conditions to future conditions with the master plan fully built and operational.

D. Modal Split

The trip reducing potential of public transit has not been considered in this report. Essentially, the traffic volume projections are conservative in that public transit might be able to reduce the traffic volumes.

Table 2

Project Trip Generation[1]

Descriptor	Land Use	Number of Students	Units[2]	Number of FTE's[3]	Units[2]	Peak Hour						Daily
						Morning			Evening			
						Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates	University		STU			0.19	0.04	0.23	0.10	0.16	0.26	2.70
Trips Generated	Existing	2,098	STU	1,929	FTE	359	77	436	190	317	507	5,208
	Proposed	2,700	STU	2,433	FTE	453	97	550	240	400	640	6,569
	Increase	+602	STU	+504	FTE	+94	+20	+114	+50	+83	+133	+1,361

[1] Existing morning and evening peak hour (inbound and outbound) trip generation from existing intersection turning movement counts taken at project driveways. Morning and evening peak hour (inbound and outbound) trip generation rates derived from these existing intersection turning movement counts and the existing number of students converted into FTE's. Daily equals difference in evening peak hour rate derived from exisitng intersection turning movement counts and evening peak hour rate from Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017, Land Use Code 550 multiplied by the Institute of Transportation Engineers daily rate.

[2] STU = Students; FTE = Full-Time Equivalents

[3] The full-time equivalent (FTC) factor is based upon an average of the last 10 years of Spring & Fall semester quantities provided by Vanguard University.

Figure 13
Existing Outbound Trip Distribution - Morning Peak Hour

Figure 14
Existing Inbound Trip Distribution - Morning Peak Hour

Figure 15
Existing Outbound Trip Distribution - Evening Peak Hour

Figure 16
Existing Inbound Trip Distribution - Evening Peak Hour

Figure 17
Project Outbound Trip Distribution - Morning Peak Hour

Figure 18
Project Inbound Trip Distribution - Morning Peak Hour

Figure 19
Project Outbound Trip Distribution - Evening Peak Hour

Figure 20
Project Inbound Trip Distribution - Evening Peak Hour

Figure 21
Project Average Daily Traffic Volumes

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Figure 22
Project Morning Peak Hour Intersection Turning Movement Volumes

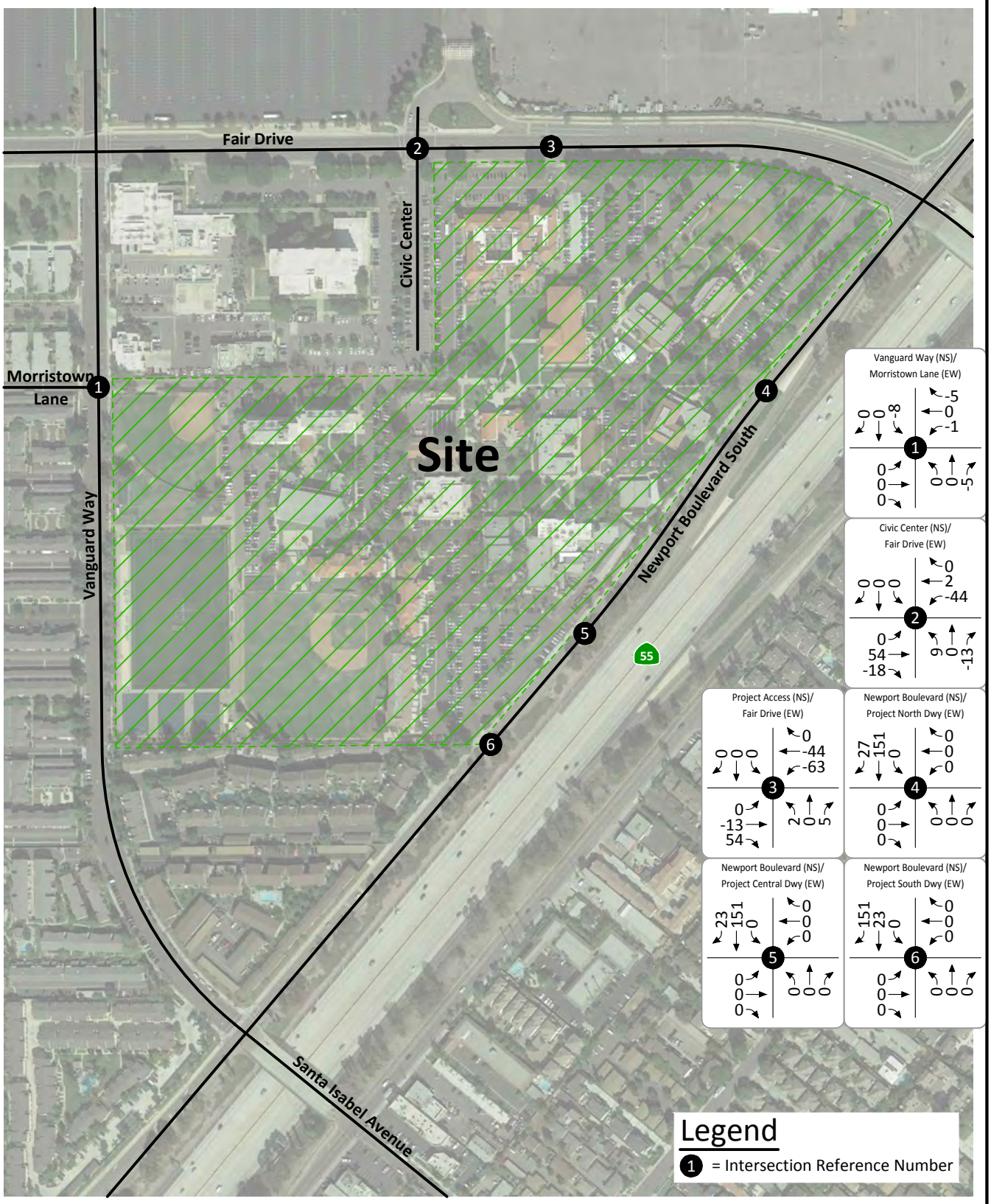
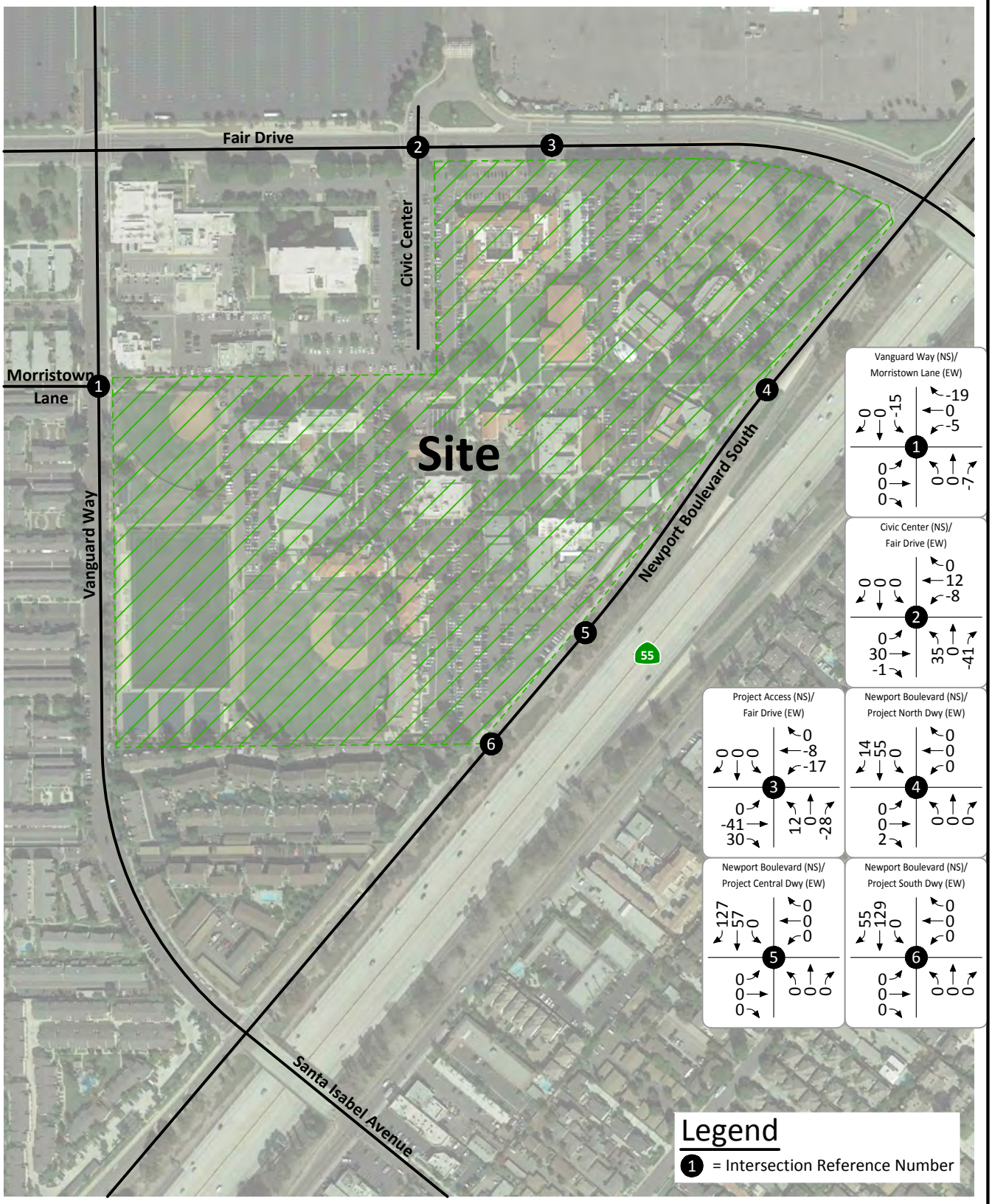


Figure 23
Project Evening Peak Hour Intersection Turning Movement Volumes



VI. EXISTING PLUS PROJECT TRAFFIC CONDITIONS

In this section, Existing Plus Project traffic conditions are discussed. Figures 24 to 26 depict the Existing Plus Project traffic conditions.

A. Method of Projection

To assess Existing Plus Project traffic conditions, existing traffic volumes are combined with the project trips.

B. Existing Plus Project Average Daily Traffic Volumes

Existing Plus Project average daily traffic volumes are illustrated on Figure 24.

C. Existing Plus Project Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix E. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix E). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

Although the following intersection is an unsignalized intersection, the intersection has been analyzed utilizing both the Intersection Delay and Intersection Capacity Utilization methodologies to show the difference between the Level of Service methodologies, when the delay methodology shows the intersection operating at an unacceptable Level of Service during either or both peak hours:

Newport Boulevard South (NS) at:
Project Central Driveway (EW) - #5

It is recommended that due to the nature of the unsignalized intersection along Newport Boulevard South, the Intersection Capacity Utilization methodology should take precedence. Due to relatively high southbound traffic volumes on Newport Boulevard South (the roadway is one-way only in the southbound direction), minimal conflicting turning movements on this roadway causes a significant delay for these traffic movements creating a situation that is not able to be mitigated without the installation of a traffic signal. This occurs even though these intersections have relatively low minor street movements that would not warrant traffic signals and the only movements consist of southbound through/right and eastbound right turning movements. The Intersection Delay methodology does not account for acceptable gaps created on Newport Boulevard South for traffic volumes to enter/exit the existing driveways due to the traffic signal located

north of these intersections on Newport Boulevard South at Fair Drive. This traffic signal produces periodic gaps in traffic volumes for downstream traffic volumes as they are fulfilling their traffic cycles which allow for the creation of gaps to occur. The intersection Capacity Utilization methodology is preferred as it does not single out the most minimalistic movements in relation to total traffic volumes utilizing that intersection to then assess the entire intersection performance.

The Levels of Service for Existing Plus Project traffic conditions have been calculated and are shown in Table 3. Existing Plus Project morning and evening peak hour intersection turning movement volumes are shown on Figures 25 and 26, respectively.

The signalized study intersection is projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions. The unsignalized intersections are projected to operate at acceptable Levels of Service during the peak hours using the Intersection Delay Method, except for the intersection of Newport Boulevard South at Project Central Driveway which is projected to operate at an unacceptable Level of Service during the evening peak hour. This unsignalized intersection is projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions using the Intersection Capacity Utilization methodology (see Table 3).

D. Traffic Signal Warrant Analysis

The California Department of Transportation provides warrant criteria for traffic signals to determine if a traffic signal is warranted at an intersection, as specified in the Manual of Uniform Traffic Control Devices 2014 Edition (Revision 1) revised December 9, 2015. An extensive analysis has been conducted regarding potential implementation of traffic signal at the intersection of Newport Boulevard South at Project Central Driveway in Section VII.D for Opening Year (2020) With Project traffic conditions and applies for Existing Plus Project traffic conditions.

According to the analysis conducted in Section VII.D, it is the recommendation of Kunzman Associates, Inc. based on the rationale presented within the aforementioned section that a traffic signal should not be considered for implementation at the intersection of Newport Boulevard South at Project Central Driveway. Instead the Intersection Capacity Methodology should be utilized for intersection analysis instead of the Delay Methodology for this intersection as explained in Section VII.C.

Table 3

Existing Plus Project Intersection Delay and Level of Service

Intersection	Traffic Control[4]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]		Peak Hour V/C-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound						
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Morning	Evening
Vanguard Way (NS) at:																	
Morristown Lane (EW) - #1	CSS	1	0.5	0.5	1	0.5	0.5	0	<1>	0	0	<1>	0	10.2-B	10.2-B	--	--
Civic Center (NS) at:																	
Fair Drive (EW) - #2	TS	0.5	0.5	1	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	--	--	0.436-A	0.585-A
Project Access (NS) at:																	
Fair Drive (EW) - #3	CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	2>>	23.3-C	18.7-C	--	--
Newport Boulevard South (NS) at:																	
Project North Driveway (EW) - #4	CSS	0	0	0	0	2.5	0.5	0	0	1	0	0	0	11.8-B	33.9-D	--	--
Project Central Driveway (EW) - #5	CSS	0	0	0	0	3	0	0	0	1	0	0	0	11.9-B	115.8-F	0.063-A	0.136-A
Project South Driveway (EW) - #6	CSS	0	0	0	0	2.5	0.5	0	0	0	0	0	0	0.0-A[5]	0.0-A	--	--

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; <1> = Shared Left/Through/Right Turn Lane; >> = Free Right Turn Lane

[2] Delay and Level of Service has been calculated using the following analysis software: Vistro, Version 5.00-03. Per the 2010 Highway Capacity Manual, overall average intersection delay and Level of Service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and Level of Service for the worst individual movement (or movements sharing a single lane) are shown.

[3] Level of Service has been calculated using the following software: Vistro, Version 5.00-03.

[4] CSS = Cross Street Stop; TS = Traffic Signal

[5] Level of Service = 0.0-A since the intersection is an entrance only driveway and eastbound/westbound conflicting movements do not occur.

Figure 24
Existing Plus Project Average Daily Traffic Volumes

Figure 25
Existing Plus Project
Morning Peak Hour Intersection Turning Movement Volumes

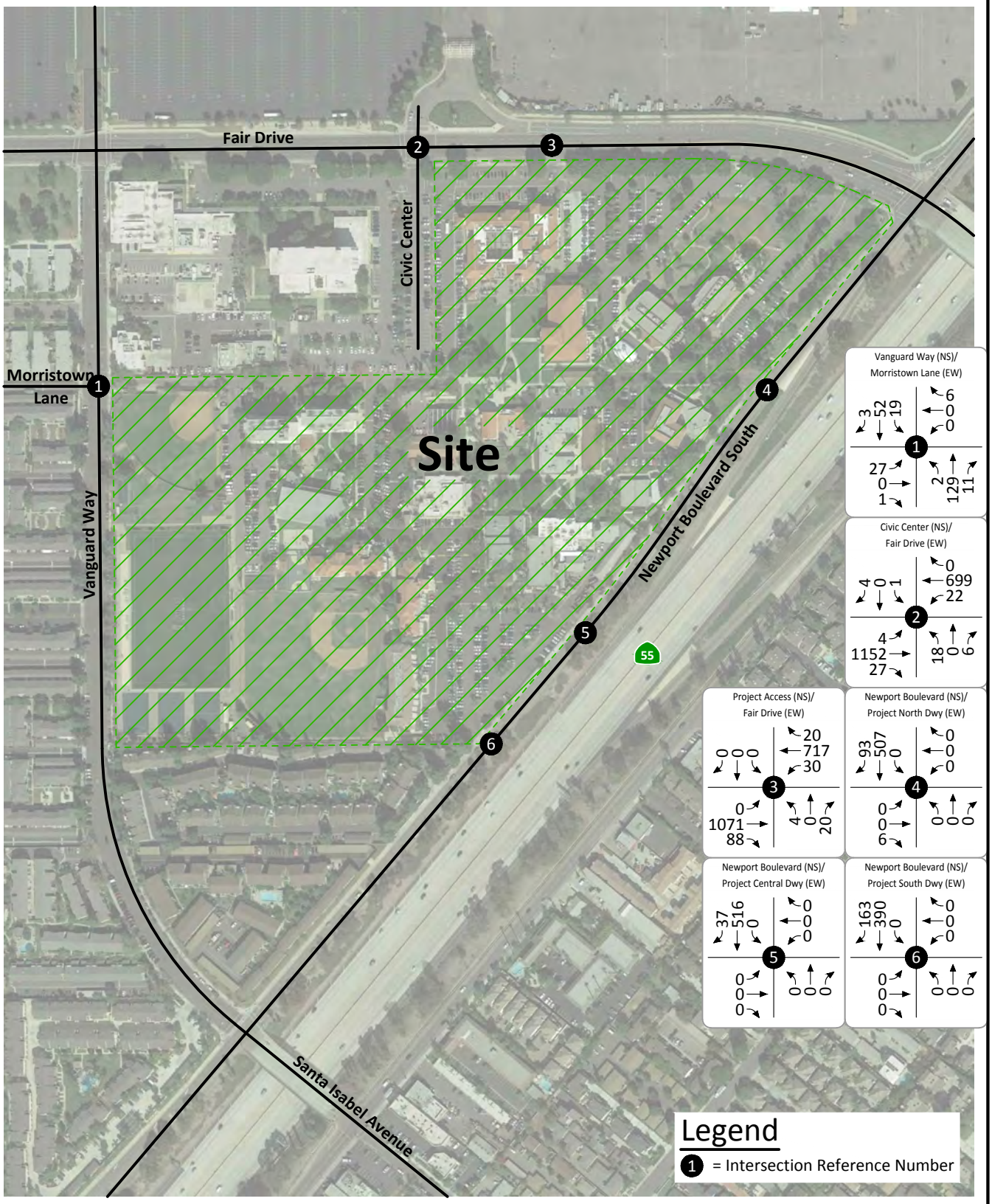
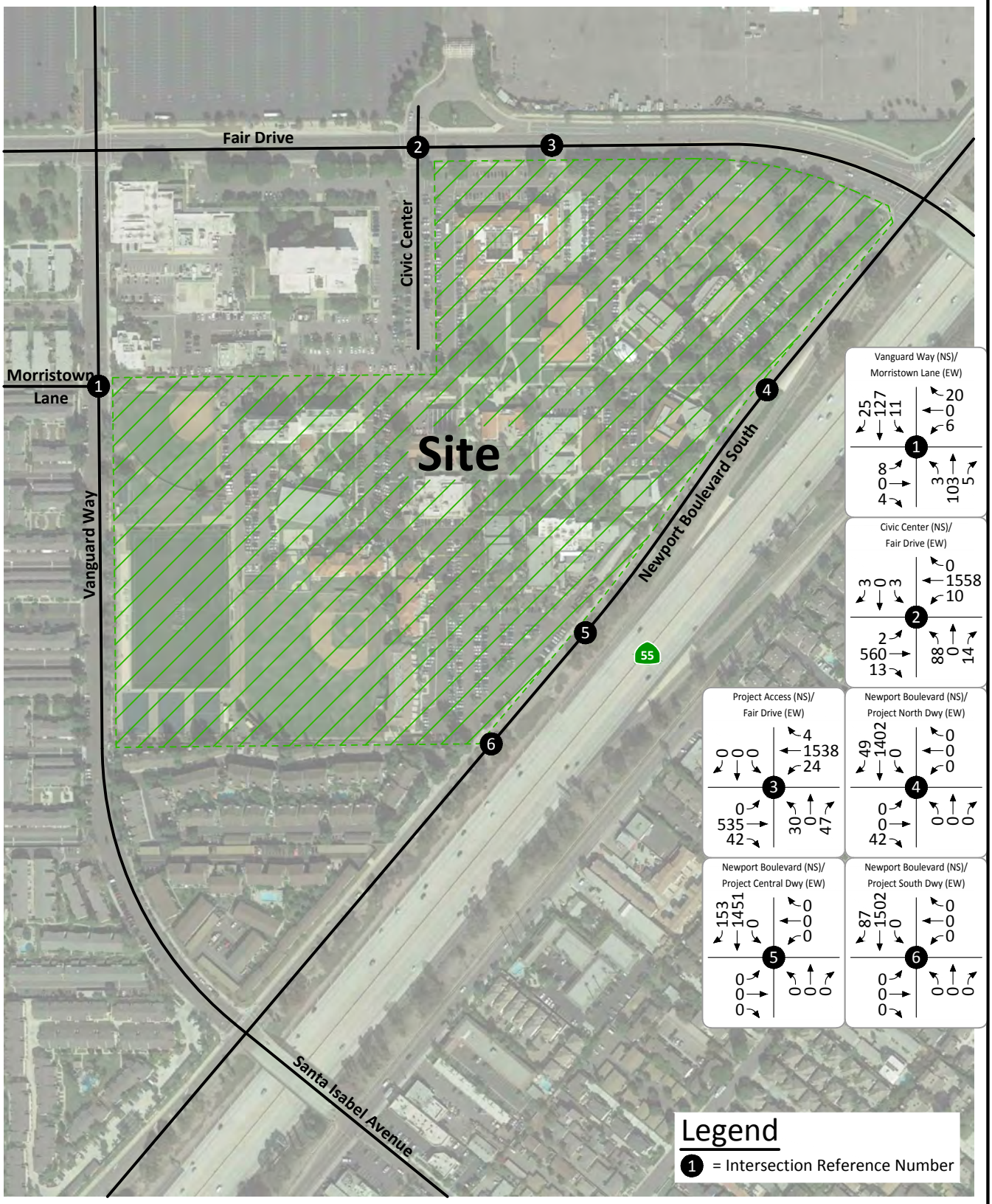


Figure 26
Existing Plus Project
Evening Peak Hour Intersection Turning Movement Volumes



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VII. OPENING YEAR (2020) TRAFFIC CONDITIONS

Figures 27 to 32 illustrate the Opening Year (2020) traffic conditions.

A. Method of Projection

For Opening Year (2020) traffic conditions, an areawide growth rate has been utilized to account for areawide growth on study area roadways. Opening Year (2020) traffic volumes have been calculated based on a 1.0 percent annual growth rate of existing traffic volumes over a three year period. The areawide growth rate has been obtained from previous traffic studies conducted in the City of Costa Mesa.

Areawide growth has been added to existing daily and peak hour traffic volumes on surrounding roadways, in addition to trips generated by the project.

B. Opening Year (2020) Average Daily Traffic Volumes

Figure 27 shows the average daily traffic volumes that can be expected for Opening Year (2020) Without Project traffic conditions and Figure 28 shows the average daily traffic volumes that can be expected for Opening Year (2020) With Project traffic conditions.

C. Opening Year (2020) Intersection Levels of Service

Level of Service at Opening Year (2020) Without Project

The Opening Year (2020) Without Project Levels of Service for the study area roadway network without the proposed project are shown in Table 4. Opening Year (2020) Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 29 and 30, respectively. Opening Year (2020) Without Project Intersection Level of Service worksheets are provided in Appendix E.

The study intersections are projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) Without Project traffic conditions.

Level of Service at Opening Year (2020) With Project

The Opening Year (2020) With Project Levels of Service for the study area roadway network with the proposed project are shown in Table 5. Opening Year (2020) With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 31 and 32, respectively. Opening Year (2020) With Project Intersection Level of Service worksheets are provided in Appendix E.

Although the following intersections are unsignalized intersections, the intersections have been analyzed utilizing both the Intersection Delay and Intersection Capacity Utilization methodologies to show the difference between the Level of Service methodologies, when the delay methodology shows the intersection operating at an unacceptable Level of Service during either or both peak hours:

Newport Boulevard South (NS) at:
Project North Driveway (EW) - #4
Project Central Driveway (EW) - #5

It is recommended that due to the nature of the unsignalized intersections along Newport Boulevard South, the Intersection Capacity Utilization methodology should take precedence. Due to relatively high southbound traffic volumes on Newport Boulevard South (the roadway is one-way only in the southbound direction), minimal conflicting turning movements on this roadway causes a significant delay for these traffic movements creating a situation that is not able to be mitigated without the installation of a traffic signal. This occurs even though these intersections have relatively low minor street movements that would not warrant traffic signals and the only movements consist of southbound through/right and eastbound right turning movements. The Intersection Delay methodology does not account for acceptable gaps created on Newport Boulevard South for traffic volumes to enter/exit the existing driveways due to the traffic signal located north of these intersections on Newport Boulevard South at Fair Drive. This traffic signal produces periodic gaps in traffic volumes for downstream traffic volumes as they are fulfilling their traffic cycles which allow for the creation of gaps to occur. The intersection Capacity Utilization methodology is preferred as it does not single out the most minimalistic movements in relation to total traffic volumes utilizing that intersection to then assess the entire intersection performance.

The signalized study intersection is projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) With Project traffic conditions. The unsignalized intersections are projected to operate at acceptable Levels of Service during the peak hours using the Intersection Delay Method, except for the intersections of Newport Boulevard South at Project North Driveway and Newport Boulevard South at Project Central Driveway which are projected to operate at unacceptable Levels of Service during the evening peak hour. These unsignalized intersections are projected to operate at acceptable Levels of Service during the peak hours for Opening Year (2020) With Project traffic conditions using the Intersection Capacity Utilization methodology.

D. Traffic Signal Warrant Analysis

The California Department of Transportation provides warrant criteria for traffic signals to determine if a traffic signal is warranted at an intersection, as specified in the Manual of Uniform Traffic Control Devices 2014 Edition (Revision 1) revised December 9, 2015. According to Chapter 4C.01, the following factors should be considered when determining whether a traffic signal is justified at a particular location:

05 A traffic control signal should not be installed unless one or more of the factors described in this Chapter are met.

06 A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection.

07 A traffic control signal should not be installed if it will seriously disrupt progressive traffic flow.

08 The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the signal warrants listed in Paragraph 2.

09 Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left-turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles.

10 Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.

11 At a location that is under development or construction and where it is not possible to obtain a traffic count that would represent future traffic conditions, hourly volumes should be estimated as part of an engineering study for comparison with traffic signal warrants. Except for locations where the engineering study uses the satisfaction of Warrant 8 to justify a signal, a traffic control signal installed under projected conditions should have an engineering study done within 1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If not justified, the signal should be taken out of stop-and-go operation or removed.

12 For signal warrant analysis, a location with a wide median, even if the median width is greater than 30 feet, should be considered as one intersection.

Based on the warrant criteria established by the California Department of Transportation mentioned above, Kunzman Associates, Inc. does not recommend the installation of traffic signals at the intersections of Newport Boulevard South at Project North Driveway or Newport Boulevard South at Project Central Driveway for the following reasons:

- In adherence to Section 4C.01.06, traffic signals at either location are not anticipated to improve overall safety and/or operation of the intersection. The SR-55 is located adjacent to Newport Boulevard South to the east running parallel with the roadway. Therefore, there is no known benefit for a crosswalk across

Newport Boulevard South for pedestrian travel since there are no destination points on the east side of the roadway. Considering that the Delay Methodology provides a Level of Service based on the worst individual movement (eastbound right for both locations) without consideration of other movements, this methodology gives preferential treatment to a movement which provides a fraction of the overall turning movements of the intersection.

For example, under Opening Year (2020) With Project traffic conditions, the intersection of Newport Boulevard South at Project North Driveway during the evening peak hour is anticipated to have 1,442 southbound through movements, 49 southbound right turning movements, and 42 eastbound right turning movements. These 42 eastbound right turning movements consist of 2.7% (42 / (1,442 + 49 + 42)) of the overall turning movements for the intersection providing a delay of 36.10 seconds (Level of Service E). The remaining 97.3% consists of southbound through and right turn movements (1,442 southbound through and 49 southbound right) do not experience any delay (0.0 seconds – Level of Service A).

However, the Delay Methodology gives preference to the overwhelming minority of the turning movements for the intersection (2.7%) with disregard for the overwhelming majority (97.3%) and states that the intersection Level of Service is E. It should be noted that the availability of acceptable gaps for these eastbound right turning movements due to the traffic signal at the intersection of Newport Boulevard South at Fair Drive to the north isn't accounted for. Also of note is that Newport Boulevard South is one-directional in the southbound direction so motorists heading eastbound can only make a right hand turn and thus only have to find an acceptable gap for southbound traffic since northbound traffic is non-existent.

The installation of a traffic signal at either location would impede on southbound flow for a considerable amount of vehicles providing no discernible safety benefit while directly degrading the operation of each intersection since a considerable amount of southbound vehicles will be forced to slow down and stop at either intersection (if signalized), thus increasing southbound vehicular delay; whereas southbound motorists currently do not experience any delay at these intersections. Therefore, a traffic signal should not be installed at either location.

- Section 4C.01.07 states that traffic signals should not be installed if they seriously disrupt progressive traffic flow. Since both intersections are one-directional for the major street (southbound) and currently provide for free-flow operations, a traffic signal would seriously disrupt progressive traffic flow for the reasons identified for Section 4C.01.05 specified above. Therefore, a traffic signal should not be installed at either location.

- Section 4C.01.08 allows for engineering judgment to determine the amount of turning movement volumes for right turning movements that may be removed on minor street approaches. The minor street approach for both intersections only consists of eastbound right turning movements. Since both intersections do not

allow for eastbound left or through turning movements, any westbound turning movements, and northbound traffic is non-existent, eastbound right turning movements only need to be aware of southbound through movements as they wait for an acceptable gap to occur and complete this movement onto Newport Boulevard South. Queuing issues are also not pervasive since eastbound right turning vehicles will stack internally within the project site.

Due to these conditions, it is the judgment of Kunzman Associates, Inc. that these eastbound right turning movements on the minor street can be either reduced significantly or removed in their entirety. As such, the minimum minor street volume necessary to warrant a traffic signal for any of the warrants provided by the California Department of Transportation is not met at either intersection. Therefore, a traffic signal should not be installed at either location.

- Sections 4C.01.09, 4C.01.10, 4C.01.11, and 4C.01.12 do not apply to this analysis.

It is the recommendation of Kunzman Associates, Inc. based on the rationale presented within this section that traffic signals should <u>not</u> be considered for implementation at neither the intersection of Newport Boulevard South at Project North Driveway nor the intersection of Newport Boulevard South at Project Central Driveway. Instead the Intersection Capacity Methodology should be utilized for intersection analysis instead of the Delay Methodology for both intersections as explained in Section VII.D.

Table 4

Opening Year (2020) Without Project Intersection Delay and Level of Service

Intersection	Traffic Control[4]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]		Peak Hour V/C-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound						
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Morning	Evening
Vanguard Way (NS) at:																	
Morristown Lane (EW) - #1	CSS	1	0.5	0.5	1	0.5	0.5	0	<1>	0	0	<1>	0	10.4-B	10.6-B	--	--
Civic Center (NS) at:																	
Fair Drive (EW) - #2	TS	0.5	0.5	1	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	--	--	0.463-A	0.575-A
Project Access (NS) at:																	
Fair Drive (EW) - #3	CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	2>>	25.5-D	19.9-C	--	--
Newport Boulevard South (NS) at:																	
Project North Driveway (EW) - #4	CSS	0	0	0	0	2.5	0.5	0	0	1	0	0	0	10.6-B	32.4-D	--	--
Project Central Driveway (EW) - #5	CSS	0	0	0	0	3	0	0	0	1	0	0	0	10.5-B	31.1-D	--	--
Project South Driveway (EW) - #6	CSS	0	0	0	0	2.5	0.5	0	0	0	0	0	0	0.0-A[5]	0.0-A	--	--

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; <1> = Shared Left/Through/Right Turn Lane; >> = Free Right Turn Lane

[2] Delay and Level of Service has been calculated using the following analysis software: Vistro, Version 5.00-03. Per the 2010 Highway Capacity Manual, overall average intersection delay and Level of Service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and Level of Service for the worst individual movement (or movements sharing a single lane) are shown.

[3] Level of Service has been calculated using the following software: Vistro, Version 5.00-03.

[4] CSS = Cross Street Stop; TS = Traffic Signal

[5] Level of Service = 0.0-A since the intersection is an entrance only driveway and eastbound/westbound conflicting movements do not occur.

Table 5

Opening Year (2020) With Project Intersection Delay and Level of Service

Intersection	Traffic Control[4]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]		Peak Hour V/C-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound						
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Morning	Evening
Vanguard Way (NS) at:																	
Morristown Lane (EW) - #1	CSS	1	0.5	0.5	1	0.5	0.5	0	<1>	0	0	<1>	0	10.2-B	10.3-B	--	--
Civic Center (NS) at:																	
Fair Drive (EW) - #2	TS	0.5	0.5	1	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	--	--	0.446-A	0.599-A
Project Access (NS) at:																	
Fair Drive (EW) - #3	CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	2>>	24.2-C	19.2-C	--	--
Newport Boulevard South (NS) at:																	
Project North Driveway (EW) - #4	CSS	0	0	0	0	2.5	0.5	0	0	1	0	0	0	11.9-B	36.1-E	0.044-A	0.066-A
Project Central Driveway (EW) - #5	CSS	0	0	0	0	3	0	0	0	1	0	0	0	12.0-B	135.1-E	0.063-A	0.136-A
Project South Driveway (EW) - #6	CSS	0	0	0	0	2.5	0.5	0	0	0	0	0	0	0.0-A[5]	0.0-A	--	--

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; <1> = Shared Left/Through/Right Turn Lane; >> = Free Right Turn Lane

[2] Delay and Level of Service has been calculated using the following analysis software: Vistro, Version 5.00-03. Per the 2010 Highway Capacity Manual, overall average intersection delay and Level of Service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and Level of Service for the worst individual movement (or movements sharing a single lane) are shown.

[3] Level of Service has been calculated using the following software: Vistro, Version 5.00-03.

[4] CSS = Cross Street Stop; TS = Traffic Signal

[5] Level of Service = 0.0-A since the intersection is an entrance only driveway and eastbound/westbound conflicting movements do not occur.

Figure 27
Opening Year (2020) Without Project Average Daily Traffic Volumes

Figure 28
Opening Year (2020) With Project Average Daily Traffic Volumes

Figure 29
Opening Year (2020) Without Project
Morning Peak Hour Intersection Turning Movement Volumes

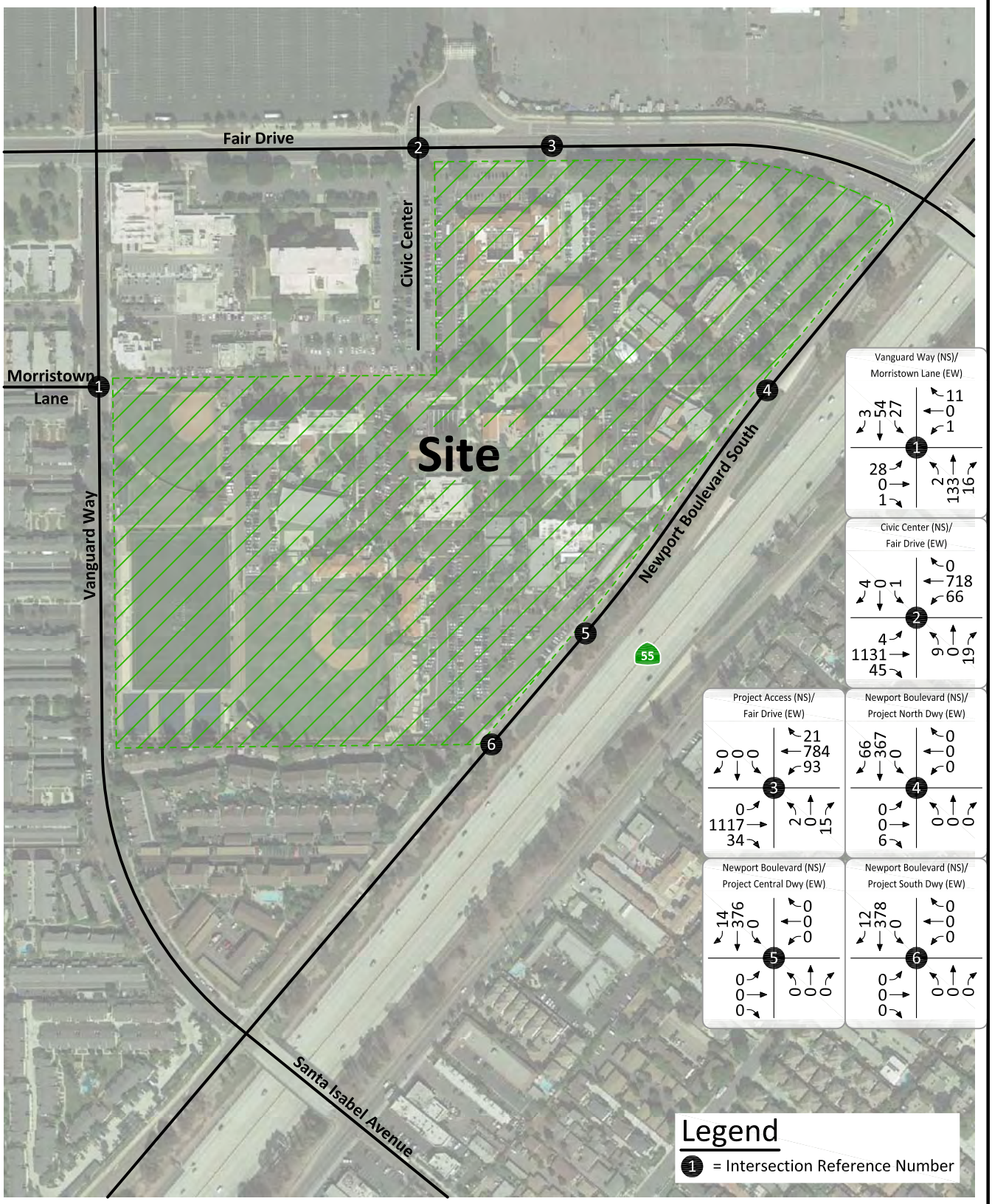

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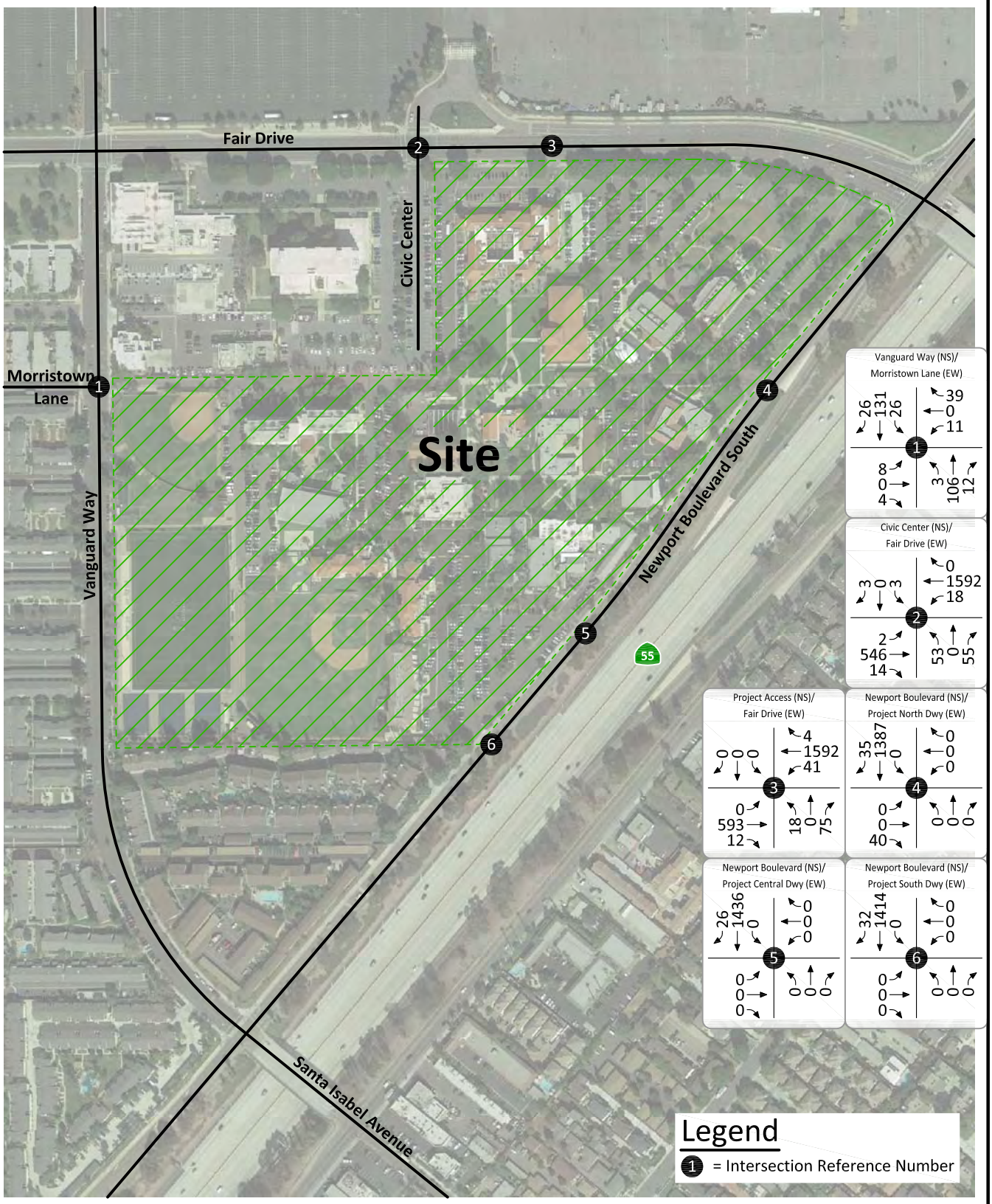
Figure 30
Opening Year (2020) Without Project
Evening Peak Hour Intersection Turning Movement Volumes

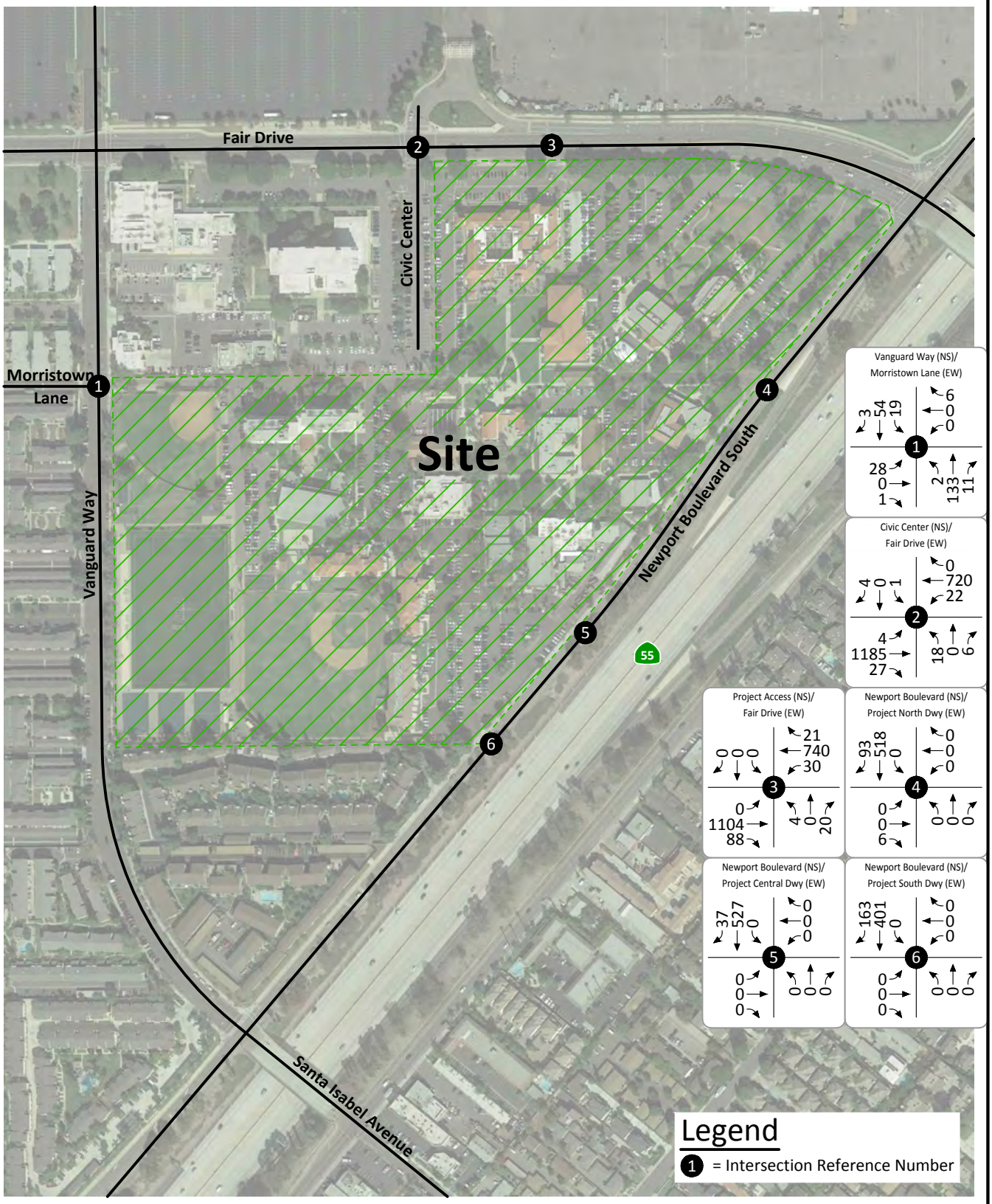


KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7003

Figure 31
Opening Year (2020) With Project
Morning Peak Hour Intersection Turning Movement Volumes

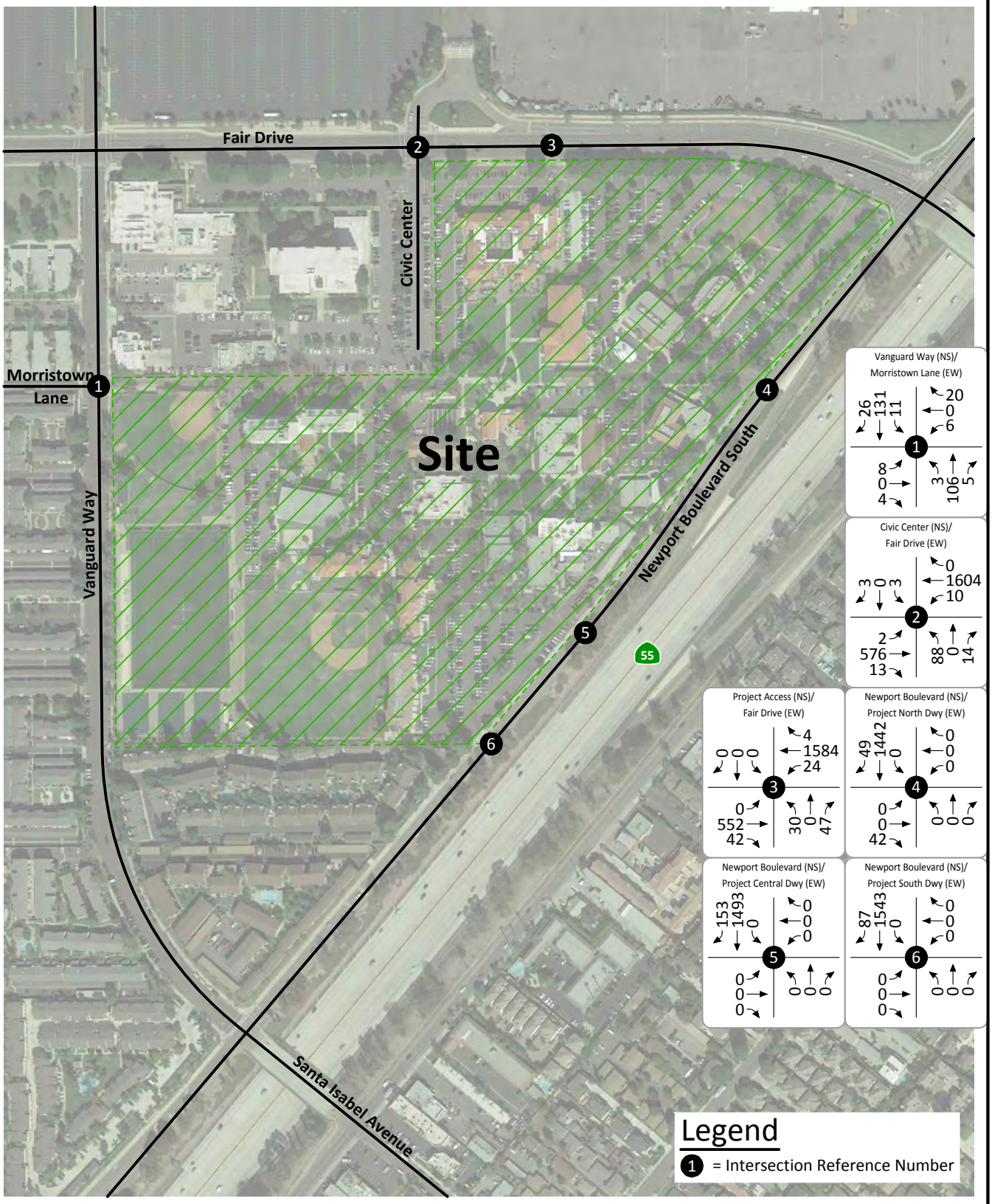


KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7003

Figure 32
Opening Year (2020) With Project
Evening Peak Hour Intersection Turning Movement Volumes



KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7003

VIII. RECOMMENDATIONS

A. Site Access

The project site will have access to Vanguard Way, Fair Drive, and Newport Boulevard South.

B. Roadway Improvements

Site-specific circulation and access recommendations are depicted on Figure 33.

Construct Vanguard Way from Morristown Lane to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

Construct Fair Drive from Civic Center to Newport Boulevard South at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

Construct Newport Boulevard South from Fair Drive to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

Sufficient on-site parking shall be provided to meet City of Costa Mesa parking code requirements.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project. Circulation within the project site should allow relatively free flow of vehicular traffic volumes with no constrictions.

Sight distance at project accesses shall comply with standard California Department of Transportation and City of Costa Mesa sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

As is the case for any roadway design, the City of Costa Mesa should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Figure 33
Circulation Recommendations

Sufficient on-site parking shall be provided to meet City of Costa Mesa parking code requirements.

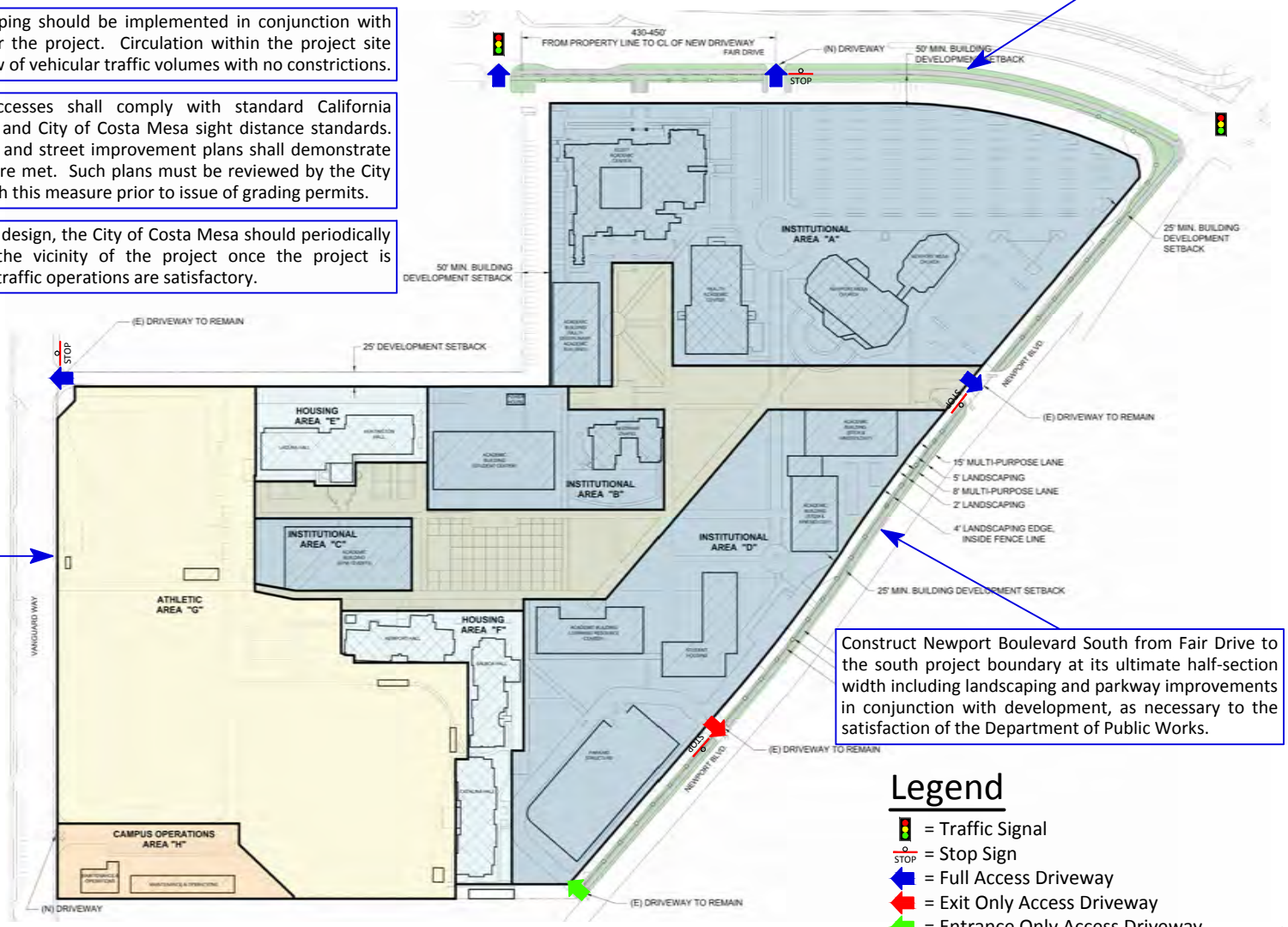
On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project. Circulation within the project site should allow relatively free flow of vehicular traffic volumes with no constrictions.

Sight distance at project accesses shall comply with standard California Department of Transportation and City of Costa Mesa sight distance standards. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

As is the case for any roadway design, the City of Costa Mesa should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Construct Fair Drive from Civic Center to Newport Boulevard South at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

Construct Vanguard Way from Morristown Lane to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.



Construct Newport Boulevard South from Fair Drive to the south project boundary at its ultimate half-section width including landscaping and parkway improvements in conjunction with development, as necessary to the satisfaction of the Department of Public Works.

Legend

- = Traffic Signal
- = Stop Sign
- = Full Access Driveway
- = Exit Only Access Driveway
- = Entrance Only Access Driveway

APPENDICES

Appendix A – Glossary of Transportation Terms

Appendix B – Vanguard University Campus Master Plan Executive Summary

Appendix C – Vanguard University Campus Site Plans and Artist Renderings

Appendix D – Intersection Turning Movement Worksheets

Appendix E– Explanation and Calculation of Intersection Capacity Utilization/Delay

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Vanguard University Campus Master Plan
Executive Summary

VANGUARD UNIVERSITY CAMPUS MASTER PLAN

Executive Summary

April 2017

VANGUARD UNIVERSITY

HPI architecture

MASTER PLAN SUBMITTAL

This Master Plan is submitted by Vanguard University. President / CEO Dr. Michael J. Beals is the responsible party, submitting on behalf of Vanguard University.

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Newport Beach, CA 92660

WHAT IS A MASTER PLAN

A master plan is a regulatory tool used by local governments to implement and guide development in a localized area. While a general plan is the overall guide to manage growth throughout the city, a master plan is able to focus on the unique characteristics of a special area, such as the Vanguard University campus, by customizing land use regulations for that area. A master plan is an important and valuable tool to allow the City to understand the vision and development direction of the campus. A master plan also helps to remove barriers and encourage development within a defined area.

Purpose and Intent of the Master Plan

The purpose of the Vanguard University (VU) Master Plan is to establish a vision and framework for future development at VU. Overall, the goal of the Master Plan is to bridge the vision of development for VU with the City's planning requirements and the larger community in which it resides. This Master Plan will be used by the University, planners, architects, landscape architects, engineers, builders, and the VU community, to implement development which supports the collegial environment that VU seeks to provide its students and community. The framework and guidelines provided within the Master Plan are intended to:

- Enhance and support the VU Community, including academics, student life and athletics;
- Establish and maintain an appropriate balance of facilities, open space and parking;
- Encourage sustainable development;
- Enhance vehicular access and safe mobility on and off campus;
- Provide pedestrian and open space amenities consistent with design quality;
- Focus on safety and security through environmental design;
- Strengthen campus identity through intelligent design, high quality development and a definition of campus edge improvements and conditions
- Streamline the entitlement and development process for individual projects within the master plan

THE MASTER PLAN

The Master Plan submittal consists of the drawings, further described below, and this project narrative. Together they are intended to establish and document for approval by the City of Costa Mesa, Development Areas and Development Guidelines for future buildings and related site improvements within a Master Plan Framework. It is intended the Development Areas (Areas) and Development Guidelines (Guidelines) remain fixed while allowing for the future development of buildings of various types (uses), size (sq. footage) and heights within these Areas, consistent with the Guidelines.

Master Plan Drawings

MP 1.0 Existing Site
- Analysis of Current FAR,
- Existing Buildings to Remain
- Existing Buildings to be Demolished

MP 2.0 Master Plan
- Development Areas and Future Facilities
- Summary of Future FAR

MP 2.1 Framework
- Pedestrian Circulation
- Open Space

MP 2.2 Framework
- Vehicular Circulation
- Parking

MP 3.0 Renderings
- Campus Visualizations

MP 3.1 Renderings
- Campus Visualizations

Supporting Documents

L 1.1	Existing Tree Inventory Plan
L 1.1A	Existing Tree Inventory List
L 2.1	Illustrative Landscape Master Plan
L 3.1	Open Space Plan
L 4.1	Site Sections
L 5.1	Fence & Wall Plan
L 6.1	Tree Imagery
L 6.2	Plant Imagery
C 0	Existing Conditions
C 1	Grading and Drainage Plan
C 2	WQMP

Development Areas and Allowable Uses

- *Institutional Areas* – academic, administrative, student life and community uses all well as all uses listed below
- *Recreational Area* – sports and recreational fields and related support facilities
- *Campus Operations Area* – maintenance shops, warehousing, shipping /receiving, administrative / office facilities
- *Housing Areas* – Student housing, student life offices and directly related support
- *Open Space* – dedicated hardscape and landscape improvements in support of academic, student life, recreation and community uses - Minimum 4 acres.

Development Guidelines

Building Floor Area Ratio (FAR)

Vanguard University is zoned "Institutional & Recreation" (I&R). The current and proposed FAR has been established at .25 FAR inclusive of all facilities excepting current and /or future Student Housing. Based on the site area, this caps the total gross square footage of institutional and recreation facilities at 413,749 GSF.

Building Height

Institutional Areas	Not to exceed 4 stories*
Athletic Area	Not to exceed 4 stories*
Campus Operations Area	Not to exceed 30 ft.
Housing Areas	Not to exceed 4 stories*

*Exclusive of Basements / Subterranean Levels and Student Housing

Building Setbacks and Campus Edge Conditions

Building Setbacks and Campus edge conditions shall be consistent those identified in Sheet MP 2.0.

Required Parking

Parking shall be provided at 1 stall per 2 On Campus Full Time Equivalent Student (On Campus FTES). Stall sizes, drive aisles and landscape improvements shall be developed consistent with City Standards.

The intent of the Master Plan is to enhance on campus pedestrian safety by removing internalized vehicular circulation and parking. VU recognizes the need to balance parking needs with enrollment as any individual project is developed and /or internalized parking is removed. Therefore, as individual projects are submitted for building department review, a parking loss / increase assessment will be providing to establish the net number of on-campus stalls in comparison to the then current on campus FTES enrollment.

Please refer to Appendix A (submitted with the application) for the parking analysis provided through the entitlement process of the Scott Academic Building.

Master Plan Statistics

1. *Lot Area:* 1,654,998 SF
2. *Number of Dwellings:* 916 On Campus Beds
3. *Number of Parking spaces:* 1,286 stalls
4. *Area & Percentage of lot devoted to open space:* 916,534 sq. ft.
5. *Total Building Area:* For individual building areas, see sheet MP 2.0
   a. *Building Foot Print Area:* 290,585 sq. ft.
   b. *Total Gross Square Footage:* 650,160 sq. ft.
6. *Area & Percentage of Lot devoted to drive & open parking:* 382,423 sq. ft.

THE MASTER PLAN VISION

The following narratives and diagrams supplement the Master Plan Drawings referenced above to address the City's Master Plan Submittal Checklist and convey the current VU campus vision for future facilities and related site improvements on a project by project basis. These documents are submitted with the understanding that the individual project representations are not engineered solutions. The actual uses of any specific site, the exact location of any specific use / facility, as well as project footprints, size and or massing are subject to change within the Master Plan Framework – consistent with the established Development Areas and Development Guidelines

PROJECT A: GYM / EVENTS CENTER

Size: approximately 60,000 GSF

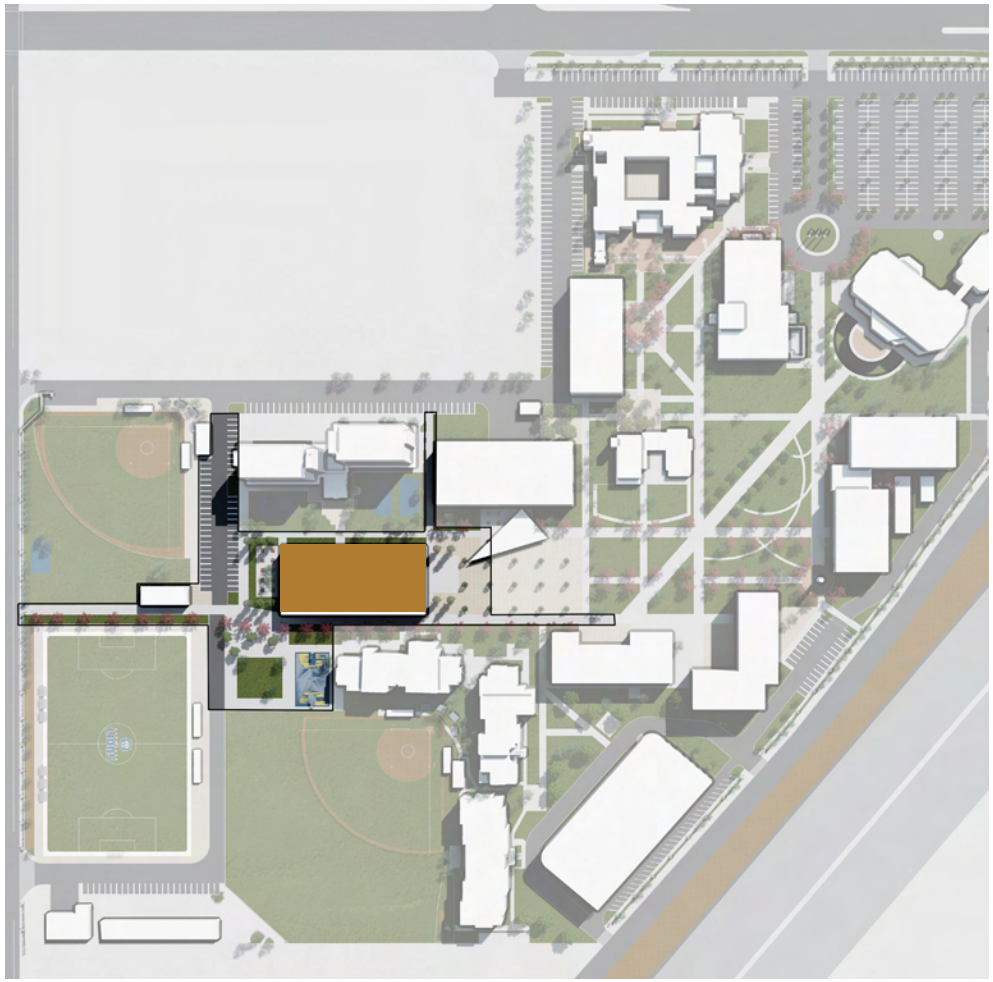
Buildings Removed: Gym

Total GSF Removed: 13,700 GSF

Parking Loss: 69

Parking Gain: 0

Summary:
This project replaces the existing gymnasium and provides adequate facilities for Vanguard's athletics' program. The center court will also transform into an events center for the campus to gather during planned events. This facility removes parking (existing Lot K) that is currently internal to campus and a safety hazard. An outdoor space / quad will be created to the east of the facility, connecting this building to the campus core and improving pedestrian circulation.



PROJECT B: STUDENT CENTER

Size: approximately 50,000 GSF

Buildings Removed: Café, Cove, Nursing Annex Modular,

Total GSF Removed: 13,900 GSF

Parking Loss: 154

Parking Gain: 20

Summary:
This project removes the existing Café and Cove / Bookstore on campus, replacing them with a Student Center. The goal of this project is to build upon the collegial atmosphere of the campus while improving the facilities for campus food service, commuters, student clubs, etc. The development area for this facility includes the removal of parking lot L. The perimeter road that connects Vanguard Way to Parking lot M will remain. This project will improve the campus quad and provide areas for students to gather, socialize and study.

PROJECT C: MAINTENANCE & OPERATIONS / WAREHOUSING

Size: approximately 20,000 GSF

Buildings Removed: M&O / Warehousing, IT

Total GSF Removed: 15,264 GSF

Parking Loss: 0

Parking Gain: 25

Summary:
This project relocates maintenance and operations to the Southwest corner of the University. This will create a new access point to the campus for deliveries. Deliveries will enter off Vanguard Way, directly to the facility. Campus vehicles will distribute materials as needed throughout the University.

This project would happen in conjunction with or previous to project D.

PROJECT D: STEM & KINESIOLOGY

Size: approximately 67,000 GSF

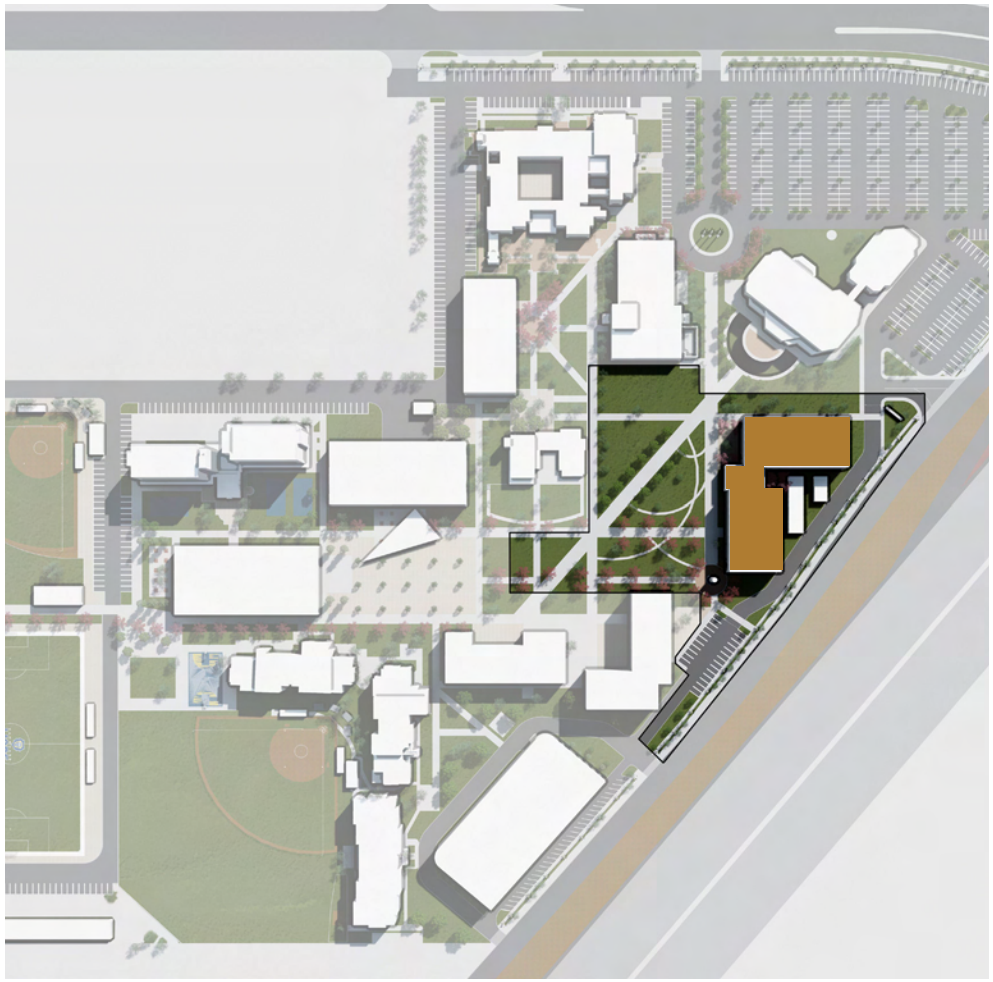
Buildings Removed: Science Labs, Science Offices, Smith, Music Offices,

Total GSF Removed: 28,100

Parking Loss: 92

Parking Gain: 26

Summary:
This project replaces antiquated Science, Technology, Engineering, Math and Kinesiology facilities on campus. The project is planned in two phases within one development area along Newport Blvd. Due to the location of the existing Smith Building, Phase 1 will ideally retain the facility, while Phase two will require Smith's demolition. In addition to the academic facilities, limited parking and a service road will connect the North and South parking lots along Newport Blvd. This project will remove parking lots E & F. Both of these lots are internal to campus and pose safety concerns.



PROJECT E: MULTI-DISCIPLINARY ACADEMIC BUILDING

Size: approximately 46,000 GSF

Buildings Removed: Social Sciences Offices (22), Psychology Offices (22a), Grad Clinical Psych (23), and Classrooms (23a), Fine Arts Offices

Total GSF Removed: 11,340 GSF

Parking Loss: 15

Parking Gain: 0

Summary:
This project locates a new academic facility South of Scott Academic Center and West of Heath Academic Center. This project will both replace existing modular offices and classrooms and provide growth for the campus (classrooms and offices).

PROJECT F: LEARNING RESOURCE CENTER

Size: approximately 45,000 GSF

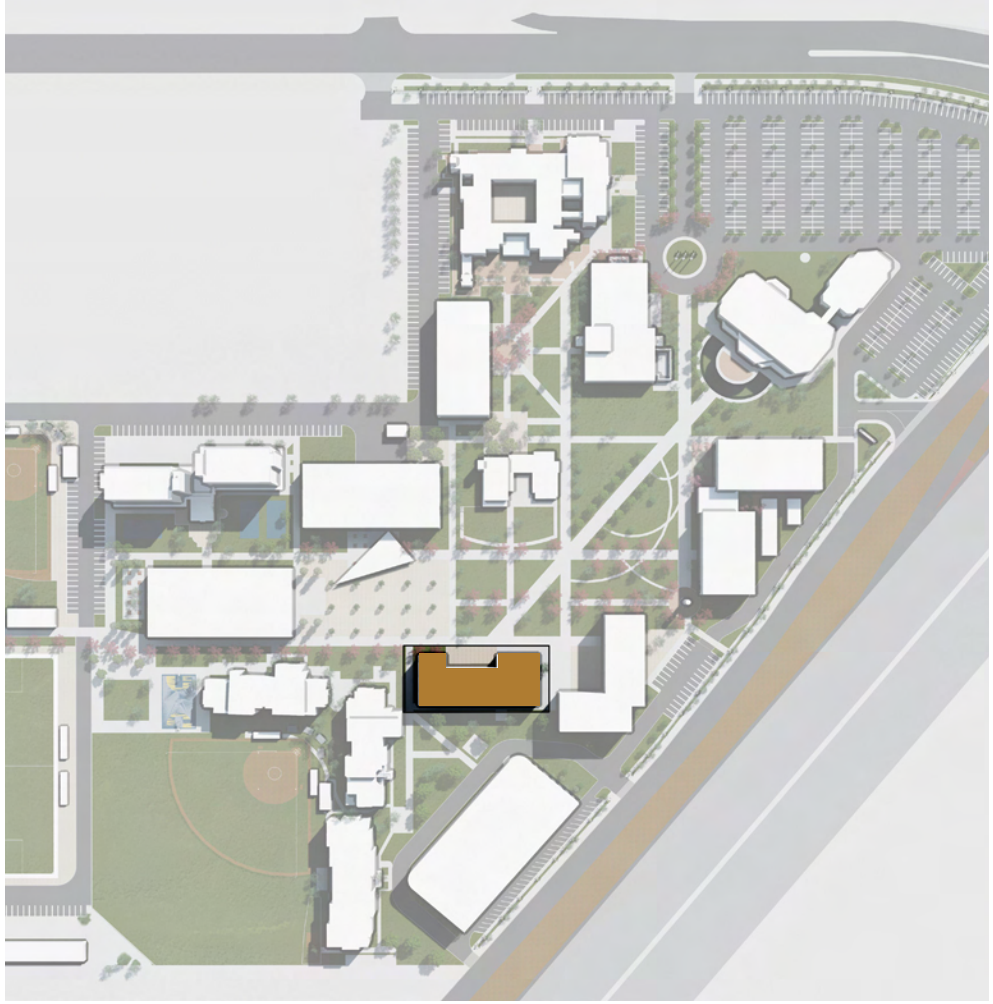
Buildings Removed: O. Cope Budge Library

Total GSF Removed: 7,500 GSF

Parking Loss: 38

Parking Gain: 0

Summary:
This project locates a new Learning Resource Center (LRC) along the South edge of the campus core. The new LRC will replace the existing Library and expand resources for all Vanguard Students.



PROJECT G: STUDENT HOUSING

Size: approximately 60,000 GSF

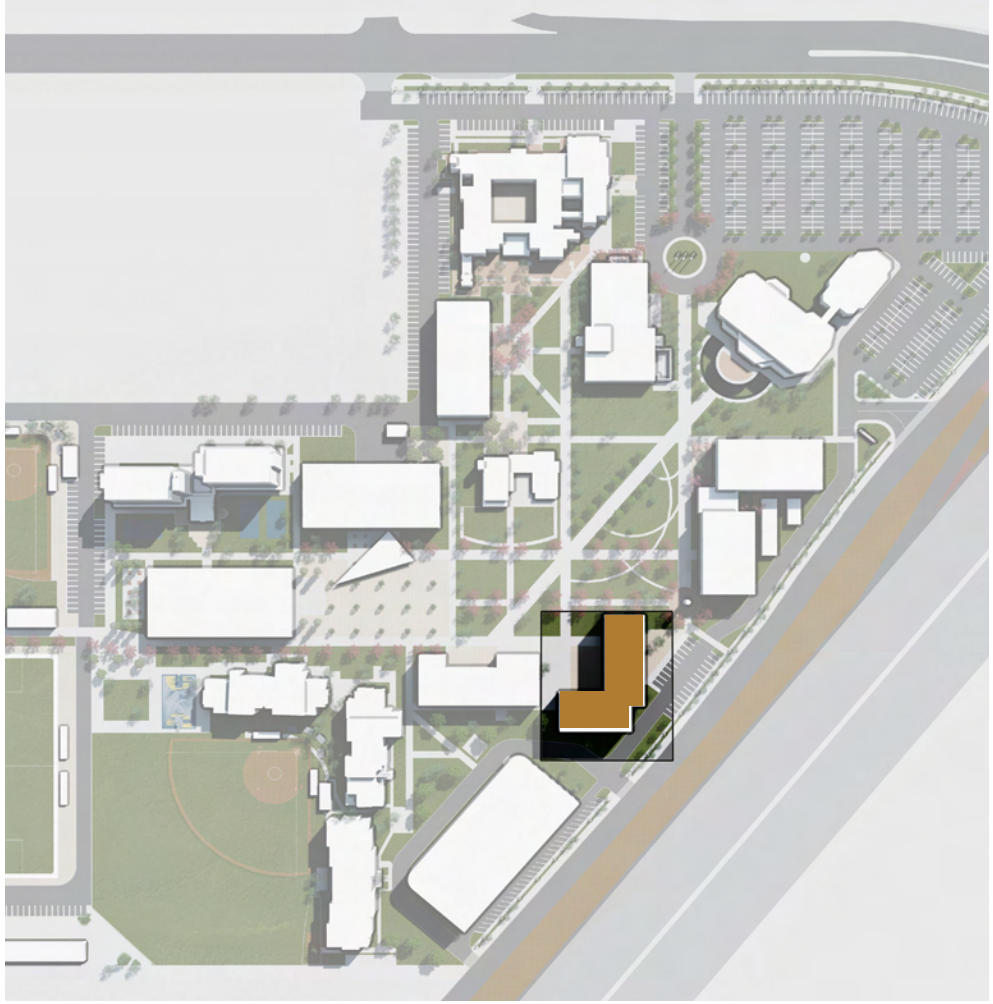
Buildings Removed: O. Cope Budge Library / Lyceum Theater

Total GSF Removed: 8,400 GSF

Parking Loss: 0

Parking Gain: 0

Summary:
This project locates a Student Housing facility east of the new LRC. This facility could accommodate approximately 300 students depending on design and room size.



PROJECT H: CENTRAL PLANT

Size: TBD

Buildings Removed: None

Total GSF Removed: None

Parking Loss: 0

Parking Gain: 0

Summary:
This project locates a central plant on campus. Dependent upon further engineering studies, the following sites within the Institutional Areas would be considered as a location: Project A (Gym / Events Center), Project B (Student Union), Project D (STEM & Kinesiology).

PROJECT I: ATHLETICS

Summary:
This project identifies ongoing improvements to the Athletic Facilities. This includes, but is not limited to the following:

- Athletic Club House / Restroom Building
- Field Lighting
- Field Repair / Turf Replacement
- Dug Out Improvements / Expansion for Softball and Baseball
- Additional / Improved Batting Cages
- Electronic Score Boards
- Spectator Bleachers

PROJECT J: NORTH EAST PARKING

Parking Loss: 493 (old Lot)

Parking Gain: 577 (New Lot)

Summary:
This project creates a new front entry for Vanguard University. Relocating the primary entry drive to the east allows direct access for vehicles to move into the parking lot and a formalized campus drop off. The project also removes open space and re-organizes lots C and D.

PROJECT K: PARKING STRUCTURE

Parking Loss: 214 (old Lot)

Parking Gain: 456 (New Lot)

Summary:
This project removes lots H and G, locating a parking structure along Newport Blvd.

PROJECT L: CAMPUS BEAUTIFICATION / INFRASTRUCTURE

Summary:

This project addresses all ongoing site improvements on campus. This includes but is not limited to:

- Perimeter Fence
- Infrastructure Upgrades
- Monument Signage
- Pedestrian Walkway improvements
- Landscaping Improvements
- Parking lot Improvements

APPENDIX C

Vanguard University Campus Site Plans and Artist Renderings

CONTRIBUTING FACILITY TO CAMPUS FAR	BUILDING	IN FAR CALC.	GSF	DEMO (-)	TO REMAIN
	SCOTT ACADEMIC CENTER	X	39,211		39,211
	GYMNASIUM	X	13,700	13,700	
	THE COVE / BOOKSTORE	X	4,000	4,000	
	THE CAFE	X	9,900	9,900	
	LIBRARY / LYCEUM THEATER / THEATER MOD.	X	15,900	15,900	
	INFORMATION TECHNOLOGY / HR	X	8,264	8,264	
	SMITH HALL	X	16,500	16,500	
	NATURAL SCIENCES OFFICES / MUSIC STUDIOS	X	4,000	4,000	
	NATURAL SCIENCES	X	7,600	7,600	
	NEEDHAM CHAPEL	X	4,737		4,737
	FINE ARTS OFFICES	X	4,000	4,000	
	NEWPORT MESA CHURCH	X	32,291		32,291
	SOCIAL SCIENCES OFFICES, PORTABLES, GRAD PSYCH , CLASSROOMS	X	11,340	11,340	
	MAINTENANCE CENTRAL PLANT	X	7,000	7,000	
	HEATH ACADEMIC CENTER	X	38,776		38,776
	TOTAL		217,219	102,204	115,015
	FAR CALCULATIONS (EXISTING PROPERTY AREA 1,654,998)		0.13		0.069

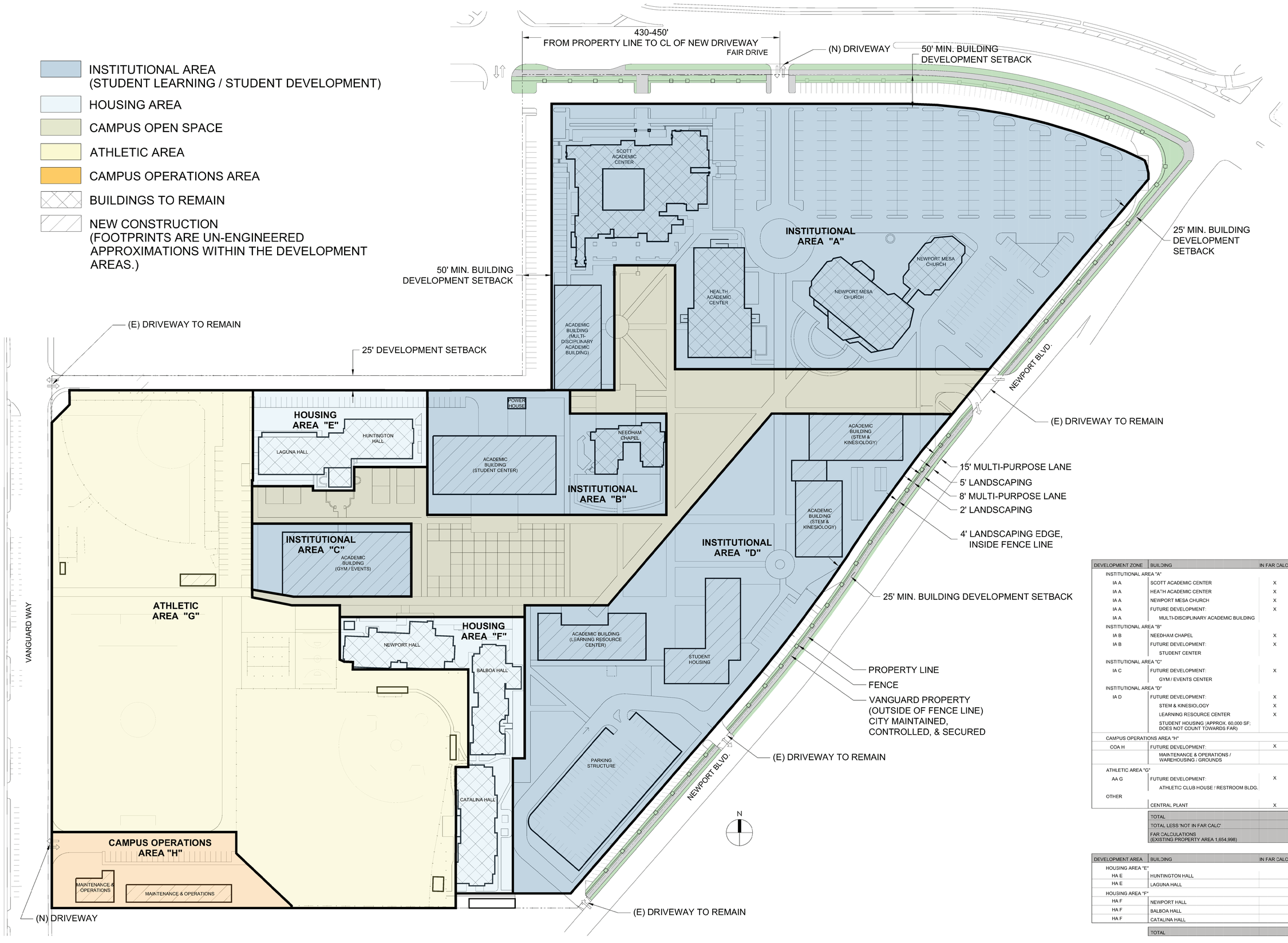
BUILDING	IN FAR CALC.	GSF	DEMO (-)	TO REMAIN
HUNTINGTON HALL		33,650		33,650
LAGUNA HALL		33,650		33,650
NEWPORT HALL		33,943		33,943
BALBOA HALL		33,943		33,943
CATALINA HALL		41,989		41,989
TOTAL		177,175		177,175

HPI architecture

1" = 60'

MP 1.0 - EXISTING PLAN

APRIL 03, 2017 | VANGUARD UNIVERSITY | VANGUARD UNIVERSITY CAMPUS MASTER PLAN



DEVELOPMENT ZONE	BUILDING	IN FAR CALC.	GSF
INSTITUTIONAL AREA "A"			
IA A	SCOTT ACADEMIC CENTER	X	39,211
IA A	HEALTH ACADEMIC CENTER	X	38,776
IA A	NEWPORT MESA CHURCH	X	32,291
IA A	FUTURE DEVELOPMENT:	X	≤46,000
IA A	MULTI-DISCIPLINARY ACADEMIC BUILDING		
INSTITUTIONAL AREA "B"			
IA B	NEEDHAM CHAPEL	X	4,737
IA B	FUTURE DEVELOPMENT:	X	≤50,000
	STUDENT CENTER		
INSTITUTIONAL AREA "C"			
IA C	FUTURE DEVELOPMENT:	X	≤60,000
	GYM / EVENTS CENTER		
INSTITUTIONAL AREA "D"			
IA D	FUTURE DEVELOPMENT:	X	≤172,000
	STEM & KINESIOLOGY	X	
	LEARNING RESOURCE CENTER	X	
	STUDENT HOUSING (APPROX. 60,000 SF; DOES NOT COUNT TOWARDS FAR)		
CAMPUS OPERATIONS AREA "H"			
COA H	FUTURE DEVELOPMENT:	X	≤20,000
	MAINTENANCE & OPERATIONS / WAREHOUSING / GROUNDS		
ATHLETIC AREA "G"			
AA G	FUTURE DEVELOPMENT:	X	≤5,000
	ATHLETIC CLUB HOUSE / RESTROOM BLDG.		
OTHER			
	CENTRAL PLANT	X	< 5,000
	TOTAL		473,015
	TOTAL LESS 'NOT IN FAR CALC'		413,015
	FAR CALCULATIONS (EXISTING PROPERTY AREA 1,654,998)		0.25

DEVELOPMENT AREA	BUILDING	IN FAR CALC.	GSF
HOUSING AREA "E"			
HA E	HUNTINGTON HALL		33,650
HA E	LAGUNA HALL		33,650
HOUSING AREA "F"			
HA F	NEWPORT HALL		33,943
HA F	BALBOA HALL		33,943
HA F	CATALINA HALL		41,989
	TOTAL		177,175

HPI architecture

1" = 60'

MP 2.0 - DEVELOPMENT AREAS

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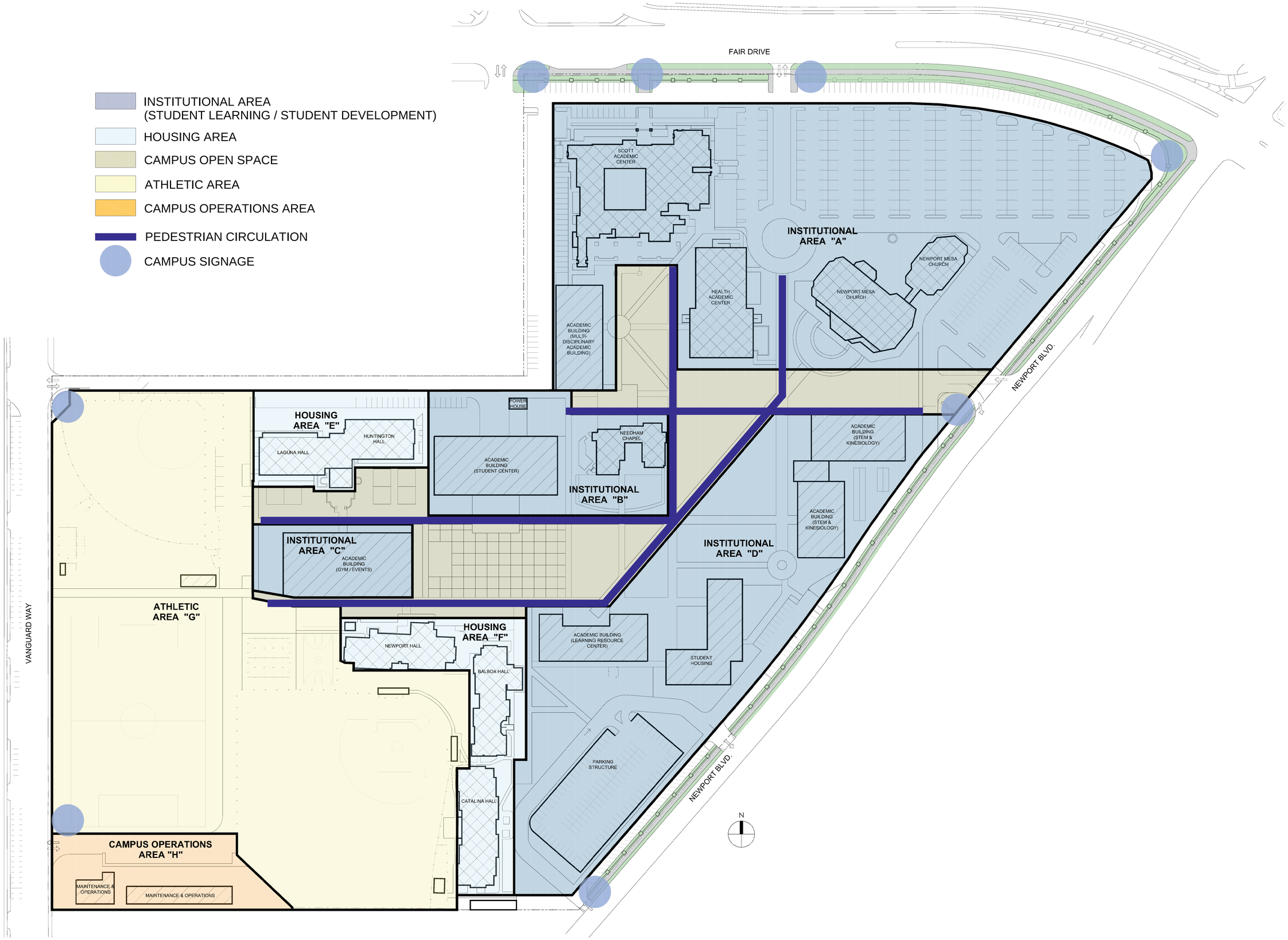

HPI architecture

MP 2.1 - FRAMEWORK: PEDESTRIAN CIRCULATION & OPEN SPACE

1" = 60'

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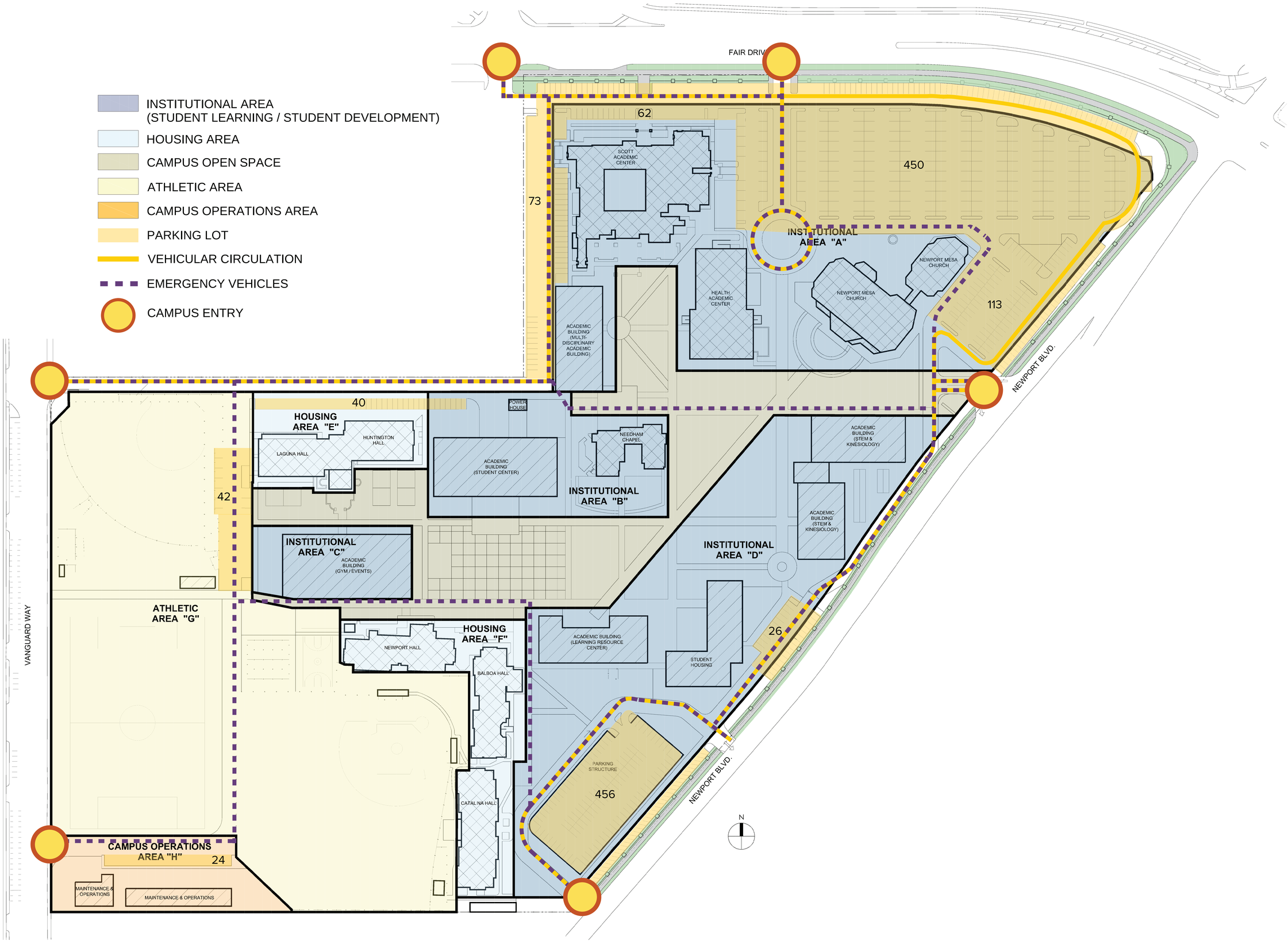

HPI architecture

MP 2.2 - FRAMEWORK: VEHICULAR CIRCULATION, PARKING, EMERGENCY VEHIC.

1" = 60'

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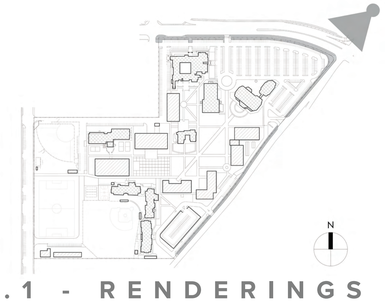
HPI architecture

MP 3.0 - RENDERINGS



HPI architecture

MP 3.1 - RENDERINGS

HPI architecture

MP 3.2 - RENDERINGS

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MP 3.3 - RENDERINGS

J:\Dwgs\HPI\Vanguard University MP\sd\van-tree-inventory.dwg Tue, 04 Apr 2017 6:02 pm Plotted by: Loren

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VANGUARD UNIVERSITY

SUBMITTALS		

PROJECT IDENTIFICATION
THE ORIGINAL SIZE OF THIS SHEET IS 30" x 42"

DATE 4/5/2017

DRAWN BY

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SHEET TITLE

EXISTING TREE INVENTORY PLAN

SHEET NUMBER

L1.1

Tree No.	Botanical Name	Common Name	To Be Removed
1	ficus benjamina	weeping fig	
2	Ficus retusa	Banyan Fig	
3	Pyrus kawakamii	Evergreen Pear	
4	Ficus retusa	Banyan Fig	X
5	Pyrus kawakamii	Evergreen Pear	X
6	Pyrus kawakamii	Evergreen Pear	
7	Ficus retusa	Banyan Fig	
8	Albizia julibrissin	silk tree	
9	Ficus retusa	Banyan Fig	
10	Ficus retusa	Banyan Fig	
11	Ficus retusa	Banyan Fig	
12	Ficus retusa	Banyan Fig	
13	Ficus retusa	Banyan Fig	
14	Ficus retusa	Banyan Fig	
15	Ficus retusa	Banyan Fig	
16	Ficus retusa	Banyan Fig	
17	Ficus retusa	Banyan Fig	
18	Ficus retusa	Banyan Fig	
19	Ficus retusa	Banyan Fig	
20	Ficus retusa	Banyan Fig	
21	Ficus retusa	Banyan Fig	
22	Ficus retusa	Banyan Fig	
23	Ficus retusa	Banyan Fig	
24	Ficus retusa	Banyan Fig	
25	Ficus retusa	Banyan Fig	
26	Ficus retusa	Banyan Fig	
27	Ficus retusa	Banyan Fig	
28	Pyrus kawakamii	Evergreen Pear	
29	Pyrus kawakamii	Evergreen Pear	
30	Pyrus kawakamii	Evergreen Pear	
31	Cinnamomum camphora	Camphor Tree	
32	Cinnamomum camphora	Camphor Tree	
33	Cinnamomum camphora	Camphor Tree	
34	Cinnamomum camphora	Camphor Tree	
35	Cinnamomum camphora	Camphor Tree	
36	Cinnamomum camphora	Camphor Tree	
37	Cinnamomum camphora	Camphor Tree	
38	Cinnamomum camphora	Camphor Tree	
39	Cinnamomum camphora	Camphor Tree	
40	Cinnamomum camphora	Camphor Tree	
41	Cinnamomum camphora	Camphor Tree	
42	Syagrus romanzoffiana	Queen Palm	
43	Syagrus romanzoffiana	Queen Palm	
44	Syagrus romanzoffiana	Queen Palm	
45	Syagrus romanzoffiana	Queen Palm	
46	Rhus lancea	African Sumac	
47	Rhus lancea	African Sumac	
48	Rhus lancea	African Sumac	
49	Rhus lancea	African Sumac	
50	Tristania conferta	Brisbane Box	X
51	Podocarpus gracilior	Fern Pine	X
52	Podocarpus gracilior	Fern Pine	
53	Podocarpus gracilior	Fern Pine	
54	Podocarpus gracilior	Fern Pine	
55	Tristania conferta	Brisbane Box	
56	Podocarpus gracilior	Fern Pine	
57	Podocarpus gracilior	Fern Pine	
58	Tristania conferta	Brisbane Box	X
59	Magnolia grandiflora	Southern Magnolia	
60	Podocarpus gracilior	Fern Pine	
61	Podocarpus gracilior	Fern Pine	
62	Podocarpus gracilior	Fern Pine	
63	Podocarpus gracilior	Fern Pine	
64	Podocarpus gracilior	Fern Pine	
65	Podocarpus gracilior	Fern Pine	
66	Podocarpus gracilior	Fern Pine	X
67	Syagrus romanzoffiana	Queen Palm	
68	Syagrus romanzoffiana	Queen Palm	
69	Syagrus romanzoffiana	Queen Palm	
70	Syagrus romanzoffiana	Queen Palm	
71	Syagrus romanzoffiana	Queen Palm	
72	Syagrus romanzoffiana	Queen Palm	
73	Syagrus romanzoffiana	Queen Palm	X
74	Syagrus romanzoffiana	Queen Palm	
75	Syagrus romanzoffiana	Queen Palm	
76	Cassia leptophylla	Gold Medallion Tree	
77	Pinus canariensis	Canary Island pine	
78	Pinus canariensis	Canary Island pine	X
79	Ficus rubiginosa	Rusty fig	X
80	Cedrus deodra	Deodar cedar	X
81	Pinus canariensis	Canary Island pine	X
82	Pinus canariensis	Canary Island pine	X
83	Cedrus deodra	Deodar cedar	X
84	Cassia leptophylla	Gold Medallion Tree	X
85	Magnolia grandiflora	Southern Magnolia	X
86	Arbutus marina	Marina Marina Strawberry Tree	X
87	Arbutus marina	Marina Marina Strawberry Tree	X
88	Magnolia grandiflora	Southern Magnolia	
89	Tristania conferta	Brisbane Box	X
90	Tristania conferta	Brisbane Box	X
91	Tristania conferta	Brisbane Box	X
92	Tristania conferta	Brisbane Box	X
93	Tristania conferta	Brisbane Box	X
94	Tristania conferta	Brisbane Box	X
95	Tristania conferta	Brisbane Box	X
96	Tristania conferta	Brisbane Box	X
97	Tristania conferta	Brisbane Box	X
98	Tristania conferta	Brisbane Box	X
99	Tristania conferta	Brisbane Box	X
100	Ficus rubiginosa	Rusty fig	X
101	Ficus rubiginosa	Rusty fig	X
102	Ficus rubiginosa	Rusty fig	X
103	Washingtonia robusta	Mexican fan palm	X
104	Washingtonia robusta	Mexican fan palm	X
105	Washingtonia robusta	Mexican fan palm	X
106	Ficus rubiginosa	Rusty fig	X
107	Pinus canariensis	Canary Island pine	X
108	Pinus canariensis	Canary Island pine	X
109	Pinus canariensis	Canary Island pine	X
110	Pinus canariensis	Canary Island pine	X
111	Tristania conferta	Brisbane Box	X
112	Pinus canariensis	Canary Island pine	X
113	Pinus canariensis	Canary Island pine	X
114	Tristania conferta	Brisbane Box	
115	Tristania conferta	Brisbane Box	
116	Tristania conferta	Brisbane Box	
117	Tristania conferta	Brisbane Box	
118	Tristania conferta	Brisbane Box	
119	Melaleuca nesophila	Pink Melaleuca	X
120	Magnolia grandiflora	Southern Magnolia	
121	Magnolia grandiflora	Southern Magnolia	X
122	Magnolia grandiflora	Southern Magnolia	X
123	Magnolia grandiflora	Southern Magnolia	X
124	Cinnamomum camphora	Camphor Tree	X
125	Pinus halepensis	Aleppo pine	X
126	Prunus cerasifera	Cherry Plum	X
127	Schinus molle	California Pepper Tree	X
128	Syagrus romanzoffiana	Queen Palm	X
129	Syagrus romanzoffiana	Queen Palm	X
130	Syagrus romanzoffiana	Queen Palm	X
131	Schinus molle	California Pepper Tree	X
132	Pistacia chinensis	Chinese Pistache	X
133	Pistacia chinensis	Chinese Pistache	X
134	Schinus molle	California Pepper Tree	X
135	Syagrus romanzoffiana	Queen Palm	X
136	Cinnamomum camphora	Camphor Tree	X
137	Cinnamomum camphora	Camphor Tree	
138	Syagrus romanzoffiana	Queen Palm	X
139	Syagrus romanzoffiana	Queen Palm	X
140	Magnolia grandiflora	Southern Magnolia	X
141	Pistacia chinensis	Chinese Pistache	X
142	Magnolia grandiflora	Southern Magnolia	X
143	Magnolia grandiflora	Southern Magnolia	X
144	Salix babylonica	Babylon weeping willow	X
145	Syagrus romanzoffiana	Queen Palm	X
146	Syagrus romanzoffiana	Queen Palm	X
147	Melaleuca nesophila	Pink Melaleuca	X
148	Eucalyptus citriodora	Lemon Eucalyptus	
149	Eucalyptus citriodora	Lemon Eucalyptus	
150	Pinus canariensis	Canary Island pine	X
151	Pinus canariensis	Canary Island pine	
152	Pinus canariensis	Canary Island pine	
153	Pinus canariensis	Canary Island pine	
154	Pinus canariensis	Canary Island pine	
155	Pinus canariensis	Canary Island pine	
156	Pinus canariensis	Canary Island pine	
157	Ficus rubiginosa	Rusty Fig	X
158	Washingtonia robusta	Mexican fan palm	X
159	Washingtonia robusta	Mexican fan palm	X
160	Washingtonia robusta	Mexican fan palm	X
161	Washingtonia robusta	Mexican fan palm	X
162	Washingtonia robusta	Mexican fan palm	X
163	Washingtonia robusta	Mexican fan palm	X
164	Washingtonia robusta	Mexican fan palm	X
165	Washingtonia robusta	Mexican fan palm	X
166	Washingtonia robusta	Mexican fan palm	X
167	Washingtonia robusta	Mexican fan palm	X
168	Washingtonia robusta	Mexican fan palm	X
169			X
170	Eucalyptus citriodora	Lemon Eucalyptus	X
171	Eucalyptus citriodora	Lemon Eucalyptus	X
172			X
173			X
174	Eucalyptus citriodora	Lemon Eucalyptus	X
175	Eucalyptus citriodora	Lemon Eucalyptus	X
176	Eucalyptus citriodora	Lemon Eucalyptus	X
177	Eucalyptus citriodora	Lemon Eucalyptus	X
178	Tristania conferta	Brisbane Box	X
179	Tristania conferta	Brisbane Box	X
180	Tristania conferta	Brisbane Box	X
181	Tristania conferta	Brisbane Box	X
182	Tristania conferta	Brisbane Box	X
183	Tristania conferta	Brisbane Box	X
184	Tristania conferta	Brisbane Box	X
185	Tristania conferta	Brisbane Box	X
186	Tristania conferta	Brisbane Box	X
187	Tristania conferta	Brisbane Box	X
188	Tristania conferta	Brisbane Box	X
189	Tristania conferta	Brisbane Box	X
190	Tristania conferta	Brisbane Box	X
191	Tristania conferta	Brisbane Box	X
192	Tristania conferta	Brisbane Box	X
193	Tristania conferta	Brisbane Box	X
194	Pyrus kawakamii	Evergreen Pear	
195	Pyrus kawakamii	Evergreen Pear	
196	Pyrus kawakamii	Evergreen Pear	
197	Pyrus kawakamii	Evergreen Pear	
198	Pyrus kawakamii	Evergreen Pear	
199	Liquidambar styraciflua	American sweetgum	X
200	Liquidambar styraciflua	American sweetgum	X
201	Liquidambar styraciflua	American sweetgum	X
202	Eucalyptus citriodora	Lemon Eucalyptus	
203	Eucalyptus citriodora	Lemon Eucalyptus	X
204	Eucalyptus citriodora	Lemon Eucalyptus	
205	Eucalyptus citriodora	Lemon Eucalyptus	
206	Ficus rubiginosa	Rusty Fig	
207	Liquidambar styraciflua	American sweetgum	
208	Liquidambar styraciflua	American sweetgum	X
209	Liquidambar styraciflua	American sweetgum	
210	Liquidambar styraciflua	American sweetgum	X
211	Ficus rubiginosa	Rusty Fig	
212	Pyrus kawakamii	Evergreen Pear	X
213	Pyrus kawakamii	Evergreen Pear	
214	Pyrus kawakamii	Evergreen Pear	X
215	Syagrus romanzoffiana	Queen Palm	
216	Pyrus kawakamii	Evergreen Pear	X
217	Syagrus romanzoffiana	Queen Palm	
218	Syagrus romanzoffiana	Queen Palm	
219	Pyrus kawakamii	Evergreen Pear	
220	Washingtonia robusta	Mexican fan palm	X
221	Washingtonia robusta	Mexican fan palm	X
222	Pinus canariensis	Canary Island pine	X
223	Washingtonia robusta	Mexican fan palm	
224	Washingtonia robusta	Mexican fan palm	
225	Pinus canariensis	Canary Island pine	X
226	Pinus canariensis	Canary Island pine	X
227	Chorisia speciosa	silk floss tree	
228	Eucalyptus citriodora	Lemon Eucalyptus	
229	Eucalyptus citriodora	Lemon Eucalyptus	
230	Eucalyptus citriodora	Lemon Eucalyptus	
231	Eucalyptus citriodora	Lemon Eucalyptus	
232	Eucalyptus citriodora	Lemon Eucalyptus	
233	Eucalyptus citriodora	Lemon Eucalyptus	X
234	Ficus rubiginosa	Rusty Fig	X
235	Ficus rubiginosa	Rusty Fig	X
236	Ficus rubiginosa	California sycamore	X
237	Juniperus torulosa	Hollywood Juniper	X
238	Juniperus torulosa	Hollywood Juniper	X
239	Syagrus romanzoffiana	Queen Palm	X
240	Syagrus romanzoffiana	Queen Palm	
241	Syagrus romanzoffiana	Queen Palm	
242	Ficus rubiginosa	Rusty Fig	
243	Syagrus romanzoffiana	Queen Palm	
244	Syagrus romanzoffiana	Queen Palm	
245	Syagrus romanzoffiana	Queen Palm	
246	Pinus canariensis	Canary Island pine	
247	Pinus halepensis	Aleppo pine	
248	Pinus canariensis	Canary Island pine	
249	Pinus canariensis	Canary Island pine	
250	Pinus canariensis	Canary Island pine	X
251	Pyrus kawakamii	Evergreen Pear	
252	Pyrus kawakamii	Evergreen Pear	X
253	Pyrus kawakamii	Evergreen Pear	
254	Pyrus kawakamii	Evergreen Pear	
255	Pinus halepensis	Aleppo pine	X
256	Pinus halepensis	Aleppo pine	X
257	Pyrus kawakamii	Evergreen Pear	
258	Melaleuca quinquenervia	broad-leaved paperbark	X
259	Melaleuca quinquenervia	broad-leaved paperbark	X
260	Pyrus kawakamii	Evergreen Pear	
261	Pyrus kawakamii	Evergreen Pear	
262	Pinus canariensis	Canary Island pine	
263	Pinus canariensis	Canary Island pine	X
264	Washingtonia robusta	Mexican fan palm	
265	Pyrus kawakamii	Evergreen Pear	
266	Pyrus kawakamii	Evergreen Pear	
267	Pyrus kawakamii	Evergreen Pear	
268	Pyrus kawakamii	Evergreen Pear	
269	Pyrus kawakamii	Evergreen Pear	
270	Pyrus kawakamii	Evergreen Pear	
271	Pyrus kawakamii	Evergreen Pear	
272	Syagrus romanzoffiana	Queen Palm	
273	Syagrus romanzoffiana	Queen Palm	X
274	Syagrus romanzoffiana	Queen Palm	X
275	Platanus racemosa	California sycamore	X
276	Lagerstroemia indica	Crape Myrtle	X
277	Lagerstroemia indica	Crape Myrtle	
278	Washingtonia robusta	Mexican fan palm	
279	Juniperus torulosa	Hollywood Juniper	X
280	Platanus racemosa	California sycamore	X
281	Syagrus romanzoffiana	Queen Palm	X
282	Syagrus romanzoffiana	Queen Palm	X
283	Syagrus romanzoffiana	Queen Palm	
284	Platanus racemosa	California sycamore	
285	Syagrus romanzoffiana	Queen Palm	X
286	Syagrus romanzoffiana	Queen Palm	X
287	Syagrus romanzoffiana	Queen Palm	
288	Lagerstroemia indica	Crape Myrtle	X
289	Lagerstroemia indica	Crape Myrtle	X
290	Magnolia grandiflora	Southern Magnolia	
291	Pinus pinea	Stone Pine	X
292	Pinus pinea	Stone Pine	
293	Eucalyptus citriodora	Lemon Eucalyptus	X
294	Eucalyptus citriodora	Lemon Eucalyptus	
295	Eucalyptus citriodora	Lemon Eucalyptus	X
296	Eucalyptus citriodora	Lemon Eucalyptus	X
297	Pinus halepensis	Aleppo pine	X
298	Pinus halepensis	Aleppo pine	X
299	Pinus halepensis	Aleppo pine	
300	Pinus halepensis	Aleppo pine	X
301	Phoenix canariensis	Canary Island Date Palm	
302	Rhus lancea	African Sumac	X
303	Rhus lancea	African Sumac	X
304	Tabebuia impetiginosa	Pink Trumpet Tree	X
305	Phoenix canariensis	Canary Island Date Palm	
306	Phoenix canariensis	Canary Island Date Palm	
307	Cinnamomum camphora	Camphor Tree	
308	Syagrus romanzoffiana	Queen Palm	
309	Syagrus romanzoffiana	Queen Palm	
310	Syagrus romanzoffiana	Queen Palm	X
311	Syagrus romanzoffiana	Queen Palm	
312	Syagrus romanzoffiana	Queen Palm	
313	Ulmus parvifolia	Chinese Elm	
314	Washingtonia robusta	Mexican fan palm	
315	Pinus halepensis	Aleppo pine	X
316	Washingtonia robusta	Mexican fan palm	
317	Ulmus parvifolia	Chinese Elm	
318	Ulmus parvifolia	Chinese Elm	X
319	Ulmus parvifolia	Chinese Elm	X
320	Alnus rhombifolia	White Alder	X
321	Ulmus parvifolia	Chinese Elm	
322			
323			
324	Eucalyptus citriodora	Lemon Eucalyptus	
325	Washingtonia robusta	Mexican fan palm	X
326	Washingtonia robusta	Mexican fan palm	
327	Eucalyptus citriodora	Lemon Eucalyptus	
328	Syagrus romanzoffiana	Queen Palm	
329	Syagrus romanzoffiana	Queen Palm	
330	Syagrus romanzoffiana	Queen Palm	X
331	Syagrus romanzoffiana	Queen Palm	X
332	Syagrus romanzoffiana	Queen Palm	X
333	Syagrus romanzoffiana	Queen Palm	X
334	Syagrus romanzoffiana	Queen Palm	X
335	Syagrus romanzoffiana	Queen Palm	X
336	Syagrus romanzoffiana	Queen Palm	X
337	Syagrus romanzoffiana	Queen Palm	X
338	Syagrus romanzoffiana	Queen Palm	
339	Syagrus romanzoffiana	Queen Palm	
340	Syagrus romanzoffiana	Queen Palm	
341	Olea europaea	Common Olive	
342	Syagrus romanzoffiana	Queen Palm	X
343	Syagrus romanzoffiana	Queen Palm	X
344	Syagrus romanzoffiana	Queen Palm	X
345	Syagrus romanzoffiana	Queen Palm	X
346	Syagrus romanzoffiana	Queen Palm	X
347	Syagrus romanzoffiana	Queen Palm	X
348	Olea europaea	Common Olive	X
349	Syagrus romanzoffiana	Queen Palm	X
350	Syagrus romanzoffiana	Queen Palm	X
351	Syagrus romanzoffiana	Queen Palm	X
352	Syagrus romanzoffiana	Queen Palm	X
353	Syagrus romanzoffiana	Queen Palm	X
354	Syagrus romanzoffiana	Queen Palm	X
355	Syagrus romanzoffiana	Queen Palm	X
356	Syagrus romanzoffiana	Queen Palm	X
357	Syagrus romanzoffiana	Queen Palm	X
358	Syagrus romanzoffiana	Queen Palm	X
359	Syagrus romanzoffiana	Queen Palm	X
360	Syagrus romanzoffiana	Queen Palm	X
361	Syagrus romanzoffiana	Queen Palm	X
362	Pyrus kawakamii	Evergreen Pear	
363	Pyrus kawakamii	Evergreen Pear	
364	Pyrus kawakamii	Evergreen Pear	
365	Pyrus kawakamii	Evergreen Pear	
366	Pyrus kawakamii	Evergreen Pear	
367	Pyrus kawakamii	Evergreen Pear	
368	Pinus halepensis	Aleppo pine	
369	Olea europaea	Common Olive	
370	Olea europaea	Common Olive	
371	Syagrus romanzoffiana	Queen Palm	
372	Syagrus romanzoffiana	Queen Palm	
373	Cinnamomum camphora	Camphor Tree	
374	Pyrus kawakamii	Evergreen Pear	
375	Pyrus kawakamii	Evergreen Pear	
376	Pyrus kawakamii	Evergreen Pear	
377	Washingtonia robusta	Mexican fan palm	
378	Washingtonia robusta	Mexican fan palm	
379	Pinus canariensis	Canary Island pine	X
380	Pinus canariensis	Canary Island pine	X
381			X
382			X
383	Pinus canariensis	Canary Island pine	X
384	Eucalyptus citriodora	Lemon Eucalyptus	X
385	Pinus canariensis	Canary Island pine	X
386	Lagerstroemia indica	Crape Myrtle	X
387	Washingtonia robusta	Mexican fan palm	
388	Washingtonia robusta	Mexican fan palm	
389	Washingtonia robusta	Mexican fan palm	
390	Albizia julibrissin	floss tree	
391	Albizia julibrissin	floss tree	
392	Albizia julibrissin	floss tree	
393	Washingtonia robusta	Mexican fan palm	
394	Washingtonia robusta	Mexican fan palm	
395	Albizia julibrissin	floss tree	
396	Washingtonia robusta	Mexican fan palm	
397	Washingtonia robusta	Mexican fan palm	
398	Washingtonia robusta	Mexican fan palm	
399	Washingtonia robusta	Mexican fan palm	
400	Washingtonia robusta	Mexican fan palm	
401	Washingtonia robusta	Mexican fan palm	
402	Washingtonia robusta	Mexican fan palm	
403	Phoenix canariensis	Canary Island date palm	
404	Populus nigra	Black poplar	
405	Washingtonia robusta	Mexican fan palm	
406	eucalyptus sideroxlon	red iron bark	X
407	Magnolia grandiflora	Southern Magnolia	X
408	Tristania conferta	Brisbane Box	X
409			X
410			X
411	Tristania conferta	Brisbane Box	X
412	Ulmus parvifolia	Chinese Elm	
413			X
414	Grevillea robusta	Silky Oak	X
415	Grevillea robusta	Silky Oak	X
416	Grevillea robusta	Silky Oak	
417	Lagerstroemia indica	Crape Myrtle	
418	Albizia julibrissin	floss tree	X
419	Albizia julibrissin	floss tree	X
420	Albizia julibrissin	floss tree	X
421	Albizia julibrissin	floss tree	X
422	Albizia julibrissin	floss tree	X
423	Albizia julibrissin	floss tree	X
424	Albizia julibrissin	floss tree	X
425	Tristania conferta	Brisbane Box	X
426	Tristania conferta	Brisbane Box	
427	Tristania conferta	Brisbane Box	X
428	Tristania conferta	Brisbane Box	X
429	Tristania conferta	Brisbane Box	X
430	Tristania conferta	Brisbane Box	
431	Tristania conferta	Brisbane Box	
432	Tristania conferta	Brisbane Box	X
433	Tristania conferta	Brisbane Box	X
434	Tristania conferta	Brisbane Box	X
435	Populus nigra	Black poplar	X
436	Washingtonia robusta	Mexican fan palm	X
437	Washingtonia robusta	Mexican fan palm	X
438	Washingtonia robusta	Mexican fan palm	X
439	Washingtonia robusta	Mexican fan palm	X
440	Washingtonia robusta	Mexican fan palm	X
441	Washingtonia robusta	Mexican fan palm	X
442	Eucalyptus citriodora	Lemon Eucalyptus	
443	Lagerstroemia indica	Crape Myrtle	
444	Lagerstroemia indica	Crape Myrtle	X
445	Populus nigra	Black poplar	X
446	Washingtonia robusta	Mexican fan palm	
447	Washingtonia robusta	Mexican fan palm	X
448	Populus nigra	Black poplar	X
449	Pinus canariensis	Canary Island pine	X
450	Geijera parviflora	Australian Willow	
451	Olea europaea	Common Olive	
452	Olea europaea	Common Olive	
453	Geijera parviflora	Australian Willow	
454	Geijera parviflora	Australian Willow	
455	Geijera parviflora	Australian Willow	
456	Geijera parviflora	Australian Willow	
457	Liquidambar styraciflua	Sweet Gum	X
458	Liquidambar styraciflua	Sweet Gum	X
459	Liquidambar styraciflua	Sweet Gum	X
460	Liquidambar styraciflua	Sweet Gum	
461			X
462			X
463	Liquidambar styraciflua	Sweet Gum	
464	Liquidambar styraciflua	Sweet Gum	
465	Liquidambar styraciflua	Sweet Gum	X
466			X
467	Liquidambar styraciflua	Sweet Gum	
468	Juniperus torulosa	Hollywood Juniper	X
469	Albizia julibrissin	floss tree	X
470	Pistacia chinensis	Chinese Pistache	X
471	Pistacia chinensis	Chinese Pistache	
472	Syagrus romanzoffiana	Queen Palm	X
473	Washingtonia robusta	Mexican fan palm	X
474	Phoenix roebelenii	Pygmy Date Palm	
475	Phoenix roebelenii	Pygmy Date Palm	
476	Populus nigra	Black poplar	
477	Eucalyptus sideroxylon	red iron bark	
478	Phoenix canariensis	Canary Island date palm	
479	Eucalyptus sideroxylon	red iron bark	X
480	Pinus canariensis	Canary Island pine	X
481	Pinus canariensis	Canary Island pine	X
482	Pinus canariensis	Canary Island pine	X
483	Pinus canariensis	Canary Island pine	X
484	Pinus canariensis	Canary Island pine	
485	Pinus canariensis	Canary Island pine	
486	Pinus canariensis	Canary Island pine	
487	Pinus halepensis	Aleppo pine	X
488	Eucalyptus polyanthemos	Red Box	
489	Eucalyptus polyanthemos	Red Box	
490	Eucalyptus polyanthemos	Red Box	
491	Eucalyptus polyanthemos	Red Box	
492	Eucalyptus polyanthemos	Red Box	
493	Eucalyptus polyanthemos	Red Box	
494	Eucalyptus polyanthemos	Red Box	
495	Eucalyptus polyanthemos	Red Box	
496	Eucalyptus polyanthemos	Red Box	
497	Eucalyptus polyanthemos	Red Box	
498	Eucalyptus polyanthemos	Red Box	
499	Eucalyptus polyanthemos	Red Box	
500	Eucalyptus polyanthemos	Red Box	
501	Eucalyptus polyanthemos	Red Box	
502	Eucalyptus polyanthemos	Red Box	
503	Eucalyptus polyanthemos	Red Box	
504	Eucalyptus polyanthemos	Red Box	
505	Eucalyptus polyanthemos	Red Box	
506	Eucalyptus polyanthemos	Red Box	
507	Eucalyptus polyanthemos	Red Box	
508	Eucalyptus polyanthemos	Red Box	
509	Eucalyptus polyanthemos	Red Box	
510	Pinus canariensis	Canary Island pine	
511	Pinus canariensis	Canary Island pine	
512	Pinus canariensis	Canary Island pine	
513	Eucalyptus polyanthemos	Red Box	
514	Eucalyptus polyanthemos	Red Box	
515	Eucalyptus polyanthemos	Red Box	
516	Eucalyptus polyanthemos	Red Box	
517	Eucalyptus polyanthemos	Red Box	
518	Eucalyptus polyanthemos	Red Box	
519	Eucalyptus polyanthemos	Red Box	
520	Eucalyptus polyanthemos	Red Box	
521	Eucalyptus polyanthemos	Red Box	
522	Eucalyptus polyanthemos	Red Box	
523	Eucalyptus polyanthemos	Red Box	
524	Eucalyptus polyanthemos	Red Box	
525	Syagrus romanzoffiana	Queen Palm	
526	Lagerstroemia indica	Crape Myrtle	
527	Lagerstroemia indica	Crape Myrtle	
528	Ulmus parvifolia	Chinese Elm	
529	Pyrus kawakamii	Evergreen Pear	
530	Pyrus kawakamii	Evergreen Pear	
531	Pyrus kawakamii	Evergreen Pear	
532	Pyrus kawakamii	Evergreen Pear	
533	Pyrus kawakamii	Evergreen Pear	
534	Pyrus kawakamii	Evergreen Pear	
535			
536	Tristania conferta	Brisbane Box	
537			X
538	Chorisia speciosa	silk floss tree	
539	Chorisia speciosa	silk floss tree	
540	Chorisia speciosa	silk floss tree	
541	Chorisia speciosa	silk floss tree	
542	Washingtonia robusta	Mexican fan palm	
543	Washingtonia robusta	Mexican fan palm	
544	Washingtonia robusta	Mexican fan palm	
545	Washingtonia robusta	Mexican fan palm	
546	Pinus halepensis	Aleppo pine	X
547	Pinus halepensis	Aleppo pine	X
548	Arbutus marina	Marina Strawberry Tree	
549	Syagrus romanzoffiana	Queen Palm	
550	Syagrus romanzoffiana	Queen Palm	
551	Syagrus romanzoffiana	Queen Palm	
552	Syagrus romanzoffiana	Queen Palm	
553	Arbutus marina	Marina Strawberry Tree	
554	Arbutus marina	Marina Strawberry Tree	
555	Arbutus marina	Marina Strawberry Tree	
556	Arbutus marina	Marina Strawberry Tree	
557	Syagrus romanzoffiana	Queen Palm	
558	Washingtonia robusta	Mexican fan palm	
559	Washingtonia robusta	Mexican fan palm	
560	Syagrus romanzoffiana	Queen Palm	
561	Syagrus romanzoffiana	Queen Palm	
562	Syagrus romanzoffiana	Queen Palm	
563	Tristania conferta	Brisbane Box	
564	Phoenix dactylifera	Date Palm	
565	Phoenix dactylifera	Date Palm	
566	Phoenix dactylifera	Date Palm	
567	Pistacia chinensis	Chinese Pistache	
568	Pistacia chinensis	Chinese Pistache	
569	Magnolia grandiflora	Southern Magnolia	
570	Magnolia grandiflora	Southern Magnolia	
571	Washingtonia robusta	Mexican fan palm	
572	Syagrus romanzoffiana	Queen Palm	
573	Syagrus romanzoffiana	Queen Palm	
574	Eucalyptus citriodora	Lemon Eucalyptus	
575	Arbutus marina	Marina Strawberry Tree	
576	Tristania conferta	Brisbane Box	
577	Syagrus romanzoffiana	Queen Palm	
578	Arbutus marina	Marina Strawberry Tree	X
579	Syagrus romanzoffiana	Queen Palm	
580	Syagrus romanzoffiana	Queen Palm	

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SHEET TITLE
EXISTING TREE INVENTORY LIST

SHEET NUMBER
L1.1A

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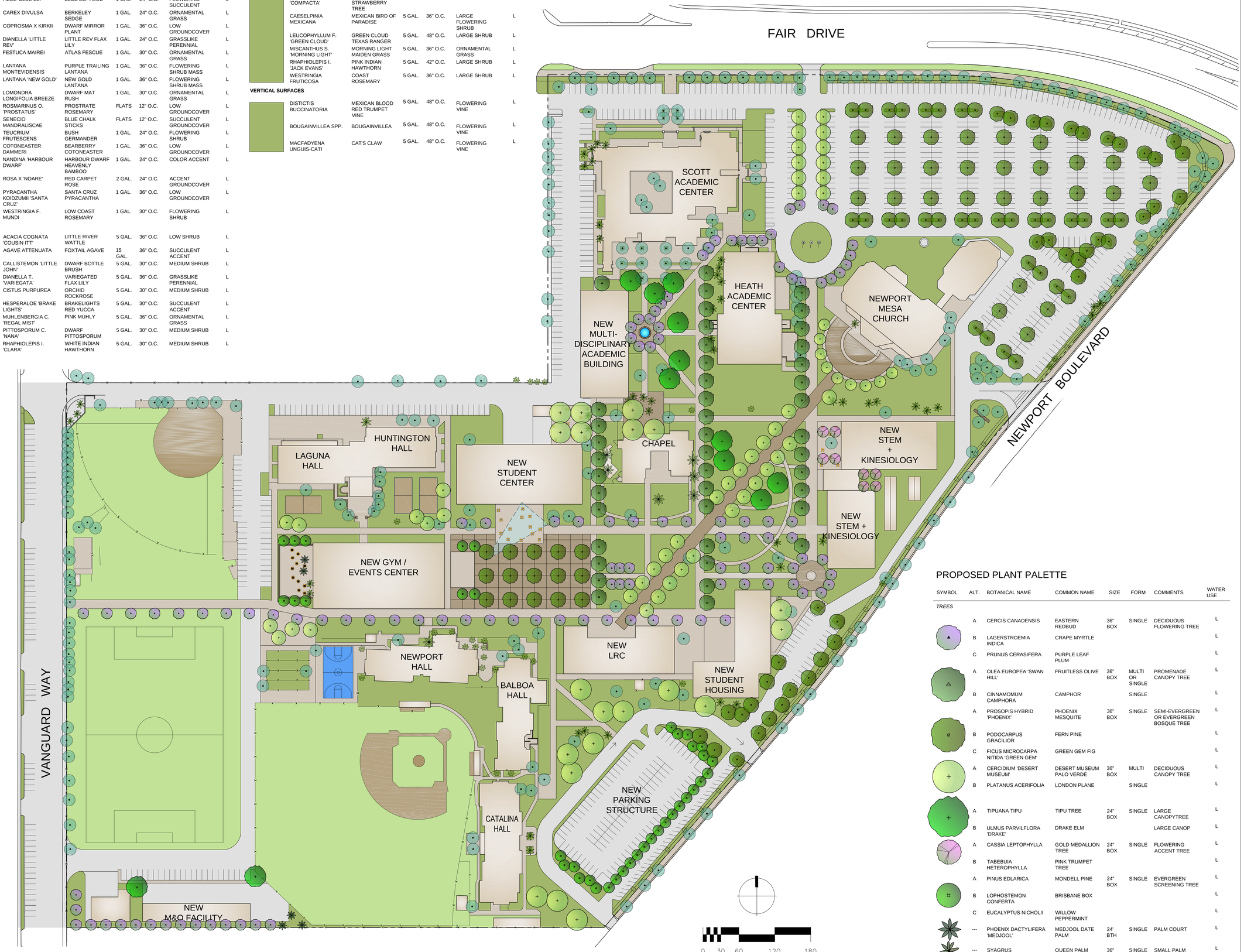
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS	WATER USE
SHRUBS AND GROUNDCOVERS						
FOREGROUND						
	ALOE 'BLUE ELF'	BLUE ELF ALOE	1 GAL.	24" O.C.	FLOWERING SUCCULENT	L
	CAREX DIVULSA	BERKELEY SEDGE	1 GAL.	24" O.C.	ORNAMENTAL GRASS	L
	COPROSMA X KIRKII	DWARF MIRROR PLANT	1 GAL.	36" O.C.	LOW GROUNDCOVER	L
	DIANELLA 'LITTLE REV'	LITTLE REV FLAX LILY	1 GAL.	24" O.C.	GRASSLIKE PERENNIAL	L
	FESTUCA MAIREI	ATLAS FESCUE	1 GAL.	30" O.C.	ORNAMENTAL GRASS	L
	LANTANA MONTEVIDENSIS	PURPLE TRAILING LANTANA	1 GAL.	36" O.C.	FLOWERING SHRUB MASS	L
	LANTANA 'NEW GOLD'	NEW GOLD LANTANA	1 GAL.	36" O.C.	FLOWERING SHRUB MASS	L
	LOMONDRA LONGIFOLIA BREEZE	DWARF MAT RUSH	1 GAL.	30" O.C.	ORNAMENTAL GRASS	L
	ROSMARINUS O. 'PROSTATUS'	PROSTRATE ROSEMARY	FLATS	12" O.C.	LOW GROUNDCOVER	L
	SENECIO MANDRALISCAE	BLUE CHALK STICKS	FLATS	12" O.C.	SUCCULENT GROUNDCOVER	L
	TEUCRIUM FRUTESCENS	BUSH GERMANDER	1 GAL.	24" O.C.	FLOWERING SHRUB	L
	COTONEASTER DAMMERI	BEARBERRY COTONEASTER	1 GAL.	36" O.C.	LOW GROUNDCOVER	L
	NANDINA 'HARBOUR DWARF'	HARBOUR DWARF HEAVENLY BAMBOO	1 GAL.	24" O.C.	COLOR ACCENT	L
	ROSA X 'NOARE'	RED CARPET ROSE	2 GAL.	24" O.C.	ACCENT GROUNDCOVER	L
	PYRACANTHA KOIDZUMII 'SANTA CRUZ'	SANTA CRUZ PYRACANTHA	1 GAL.	36" O.C.	LOW GROUNDCOVER	L
	WESTRINGIA F. MUNDI	LOW COAST ROSEMARY	1 GAL.	30" O.C.	FLOWERING SHRUB	L
MIDGROUND						
	ACACIA COGNATA 'COUSIN ITT'	LITTLE RIVER WATTLE	5 GAL.	36" O.C.	LOW SHRUB	L
	AGAVE ATTENUATA	FOXTAIL AGAVE	15 GAL.	36" O.C.	SUCCULENT ACCENT	L
	CALLISTEMON 'LITTLE JOHN'	DWARF BOTTLE BRUSH	5 GAL.	30" O.C.	MEDIUM SHRUB	L
	DIANELLA T. 'VARIEGATA'	VARIEGATED FLAX LILY	5 GAL.	36" O.C.	GRASSLIKE PERENNIAL	L
	CISTUS PURPUREA	ORCHID ROCKROSE	5 GAL.	30" O.C.	MEDIUM SHRUB	L
	HESPERALOE 'BRAKE LIGHTS'	BRAKELIGHTS RED YUCCA	5 GAL.	30" O.C.	SUCCULENT ACCENT	L
	MUHLENBERGIA C. 'REGAL MIST'	PINK MUHLY	5 GAL.	36" O.C.	ORNAMENTAL GRASS	L
	PITTOSPORUM C. 'NANA'	DWARF PITTOSPORUM	5 GAL.	30" O.C.	MEDIUM SHRUB	L
	RHAPHIOLEPIS I. 'CLARA'	WHITE INDIAN HAWTHORN	5 GAL.	30" O.C.	MEDIUM SHRUB	L

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS	WATER USE
SHRUBS AND GROUNDCOVERS						
BACKGROUND						
	ARBUTUS UNEDO 'COMPACTA'	DWARF STRAWBERRY TREE	5 GAL.	36" O.C.	LARGE SHRUB	L
	CAESELPINIA MEXICANA	MEXICAN BIRD OF PARADISE	5 GAL.	36" O.C.	LARGE FLOWERING SHRUB	L
	LEUCOPHYLLUM F. 'GREEN CLOUD'	GREEN CLOUD TEXAS RANGER	5 GAL.	48" O.C.	LARGE SHRUB	L
	MISCANTHUS S. 'MORNING LIGHT'	MORNING LIGHT MAIDEN GRASS	5 GAL.	36" O.C.	ORNAMENTAL GRASS	L
	RHAPHIOLEPIS I. 'JACK EVANS'	PINK INDIAN HAWTHORN	5 GAL.	42" O.C.	LARGE SHRUB	L
	WESTRINGIA FRUTICOSA	COAST ROSEMARY	5 GAL.	36" O.C.	LARGE SHRUB	L
VERTICAL SURFACES						
	DISTICTIS BUCCINATORIA	MEXICAN BLOOD RED TRUMPET VINE	5 GAL.	48" O.C.	FLOWERING VINE	L
	BOUGAINVILLEA SPP.	BOUGAINVILLEA	5 GAL.	48" O.C.	FLOWERING VINE	L
	MACFADYENA UNGUIS-CATI	CAT'S CLAW	5 GAL.	48" O.C.	FLOWERING VINE	L



PROPOSED PLANT PALETTE

SYMBOL	ALT.	BOTANICAL NAME	COMMON NAME	SIZE	FORM	COMMENTS	WATER USE
TREES							
	A	CERCIS CANADENSIS	EASTERN REDBUD	36" BOX	SINGLE	DECIDUOUS FLOWERING TREE	L
	B	LAGERSTROEMIA INDICA	CRAPE MYRTLE				L
	C	PRUNUS CERASIFERA	PURPLE LEAF PLUM				L
	A	OLEA EUROPEA 'SWAN HILL'	FRUITLESS OLIVE	36" BOX	MULTI OR SINGLE	PROMENADE CANOPY TREE	L
	B	CINNAMOMUM CAMPHORA	CAMPHOR		SINGLE		L
	A	PROSOPIS HYBRID 'PHOENIX'	PHOENIX MESQUITE	36" BOX	SINGLE	SEMI-EVERGREEN OR EVERGREEN BOSQUE TREE	L
	B	PODOCARPUS GRACILIOR	FERN PINE				L
	C	FICUS MICROCARPA NITIDA 'GREEN GEM'	GREEN GEM FIG				L
	A	CERCIDIUM 'DESERT MUSEUM'	DESERT MUSEUM PALO VERDE	36" BOX	MULTI	DECIDUOUS CANOPY TREE	L
	B	PLATANUS ACERIFOLIA	LONDON PLANE		SINGLE		L
	A	TIPUANA TIPU	TIPU TREE	24" BOX	SINGLE	LARGE CANOPYTREE	L
	B	ULMUS PARVILFLORA 'DRAKE'	DRAKE ELM			LARGE CANOP	L
	A	CASSIA LEPTOPHYLLA	GOLD MEDALLION TREE	24" BOX	SINGLE	FLOWERING ACCENT TREE	L
	B	TABEBUIA HETEROPHYLLA	PINK TRUMPET TREE				L
	A	PINUS EDLARICA	MONDELL PINE	24" BOX	SINGLE	EVERGREEN SCREENING TREE	L
	B	LOPHOSTEMON CONFERTA	BRISBANE BOX				L
	C	EUCALYPTUS NICHOLII	WILLOW PEPPERMINT				L
	---	PHOENIX DACTYLIFERA 'MEDJOOL'	MEDJOOL DATE PALM	24' BTH	SINGLE	PALM COURT	L
	---	SYAGRUS ROMANZOFFIANA	QUEEN PALM	36" BOX	SINGLE	SMALL PALM BACKDROP	L

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SHEET TITLE
ILLUSTRATIVE LANDSCAPE MASTER PLAN

SHEET NUMBER
L2.1

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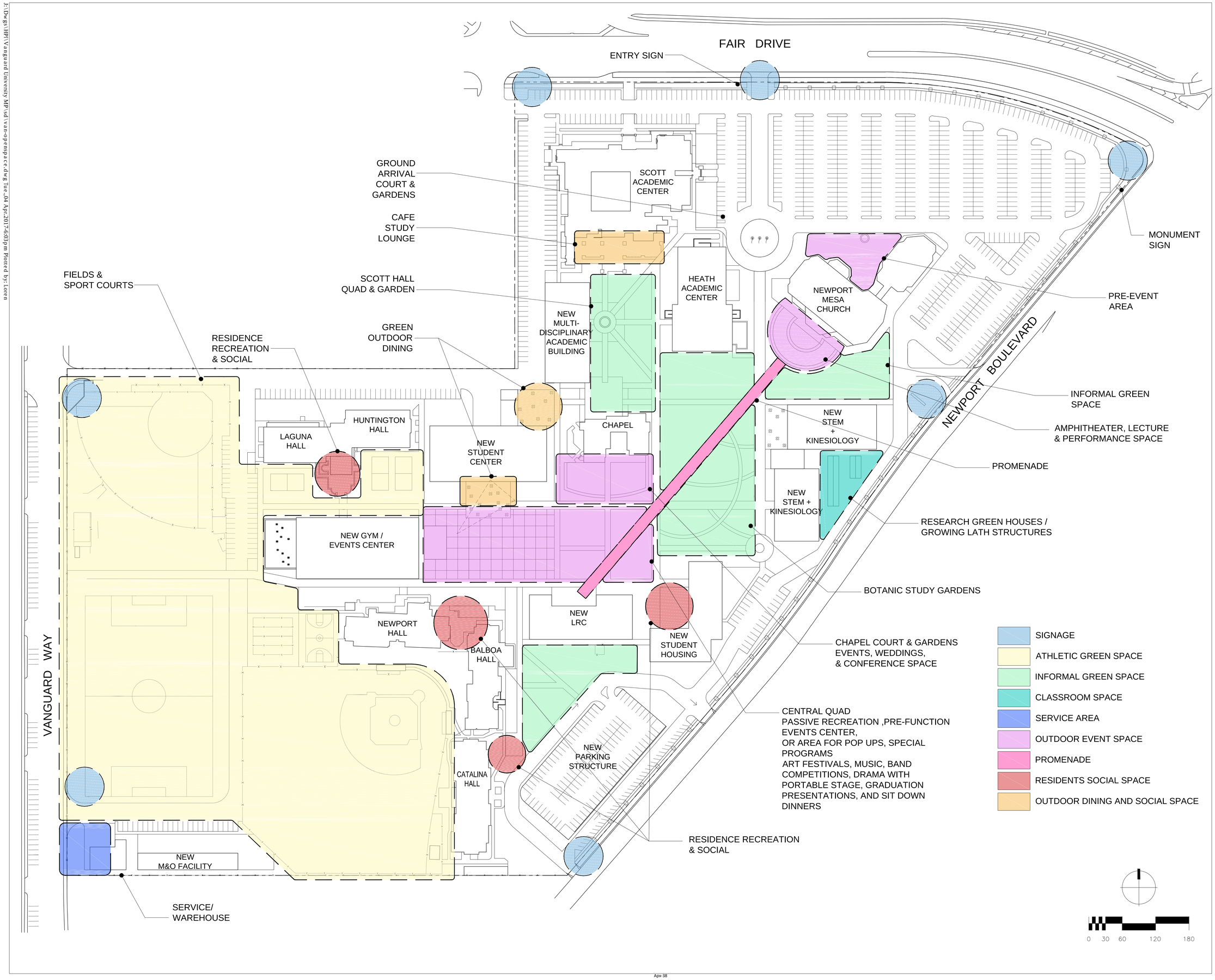

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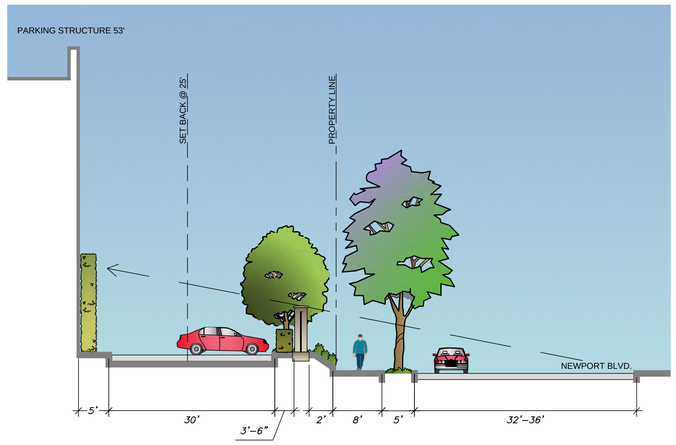
SHEET TITLE
OPEN SPACE PLAN

SHEET NUMBER
L3.1



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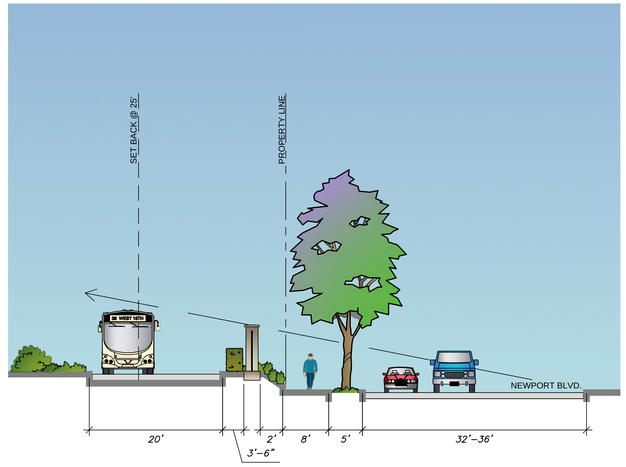

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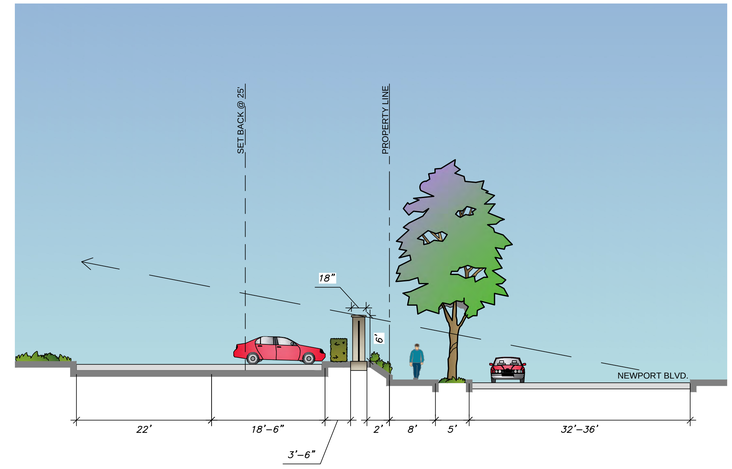

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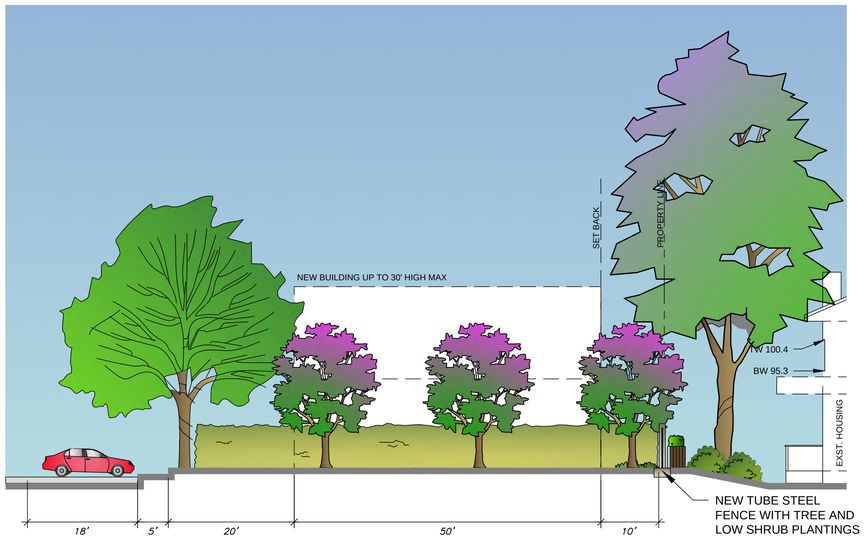

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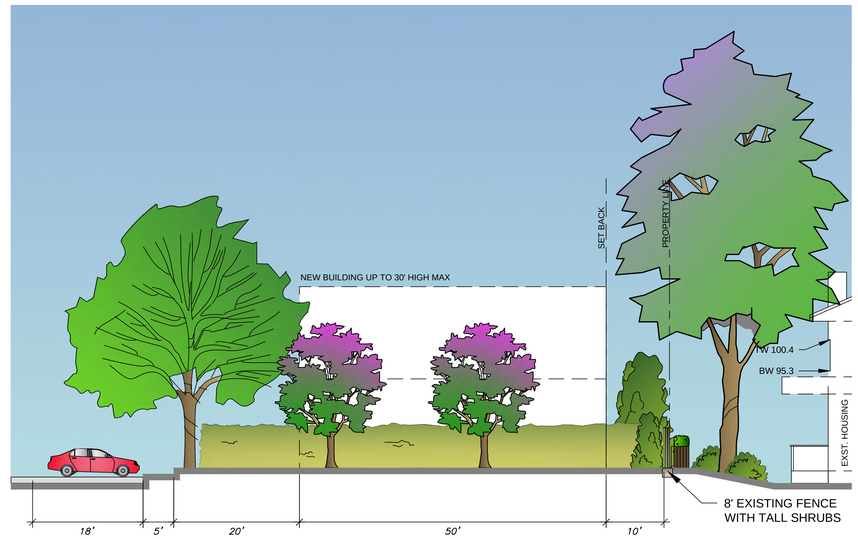

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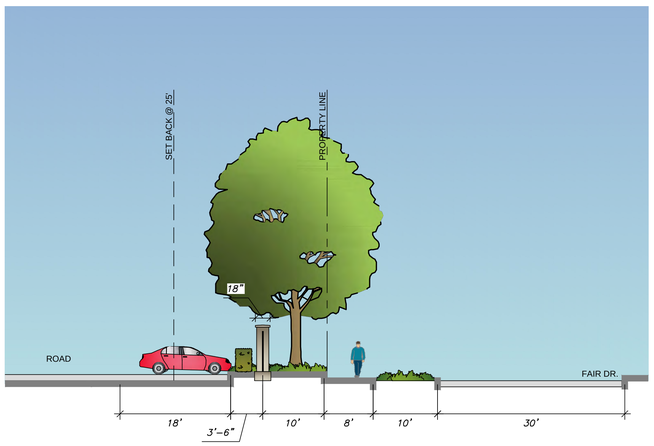

SECTION D
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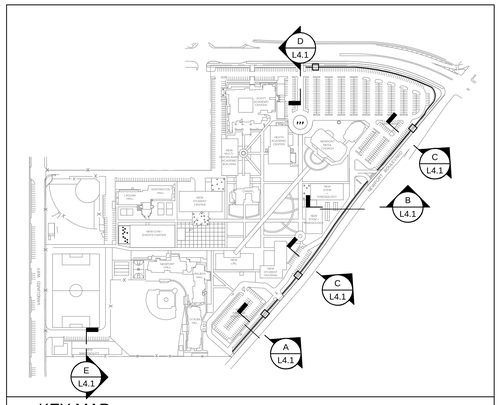

KEY MAP NOT TO SCALE

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SHEET TITLE

SITE SECTIONS

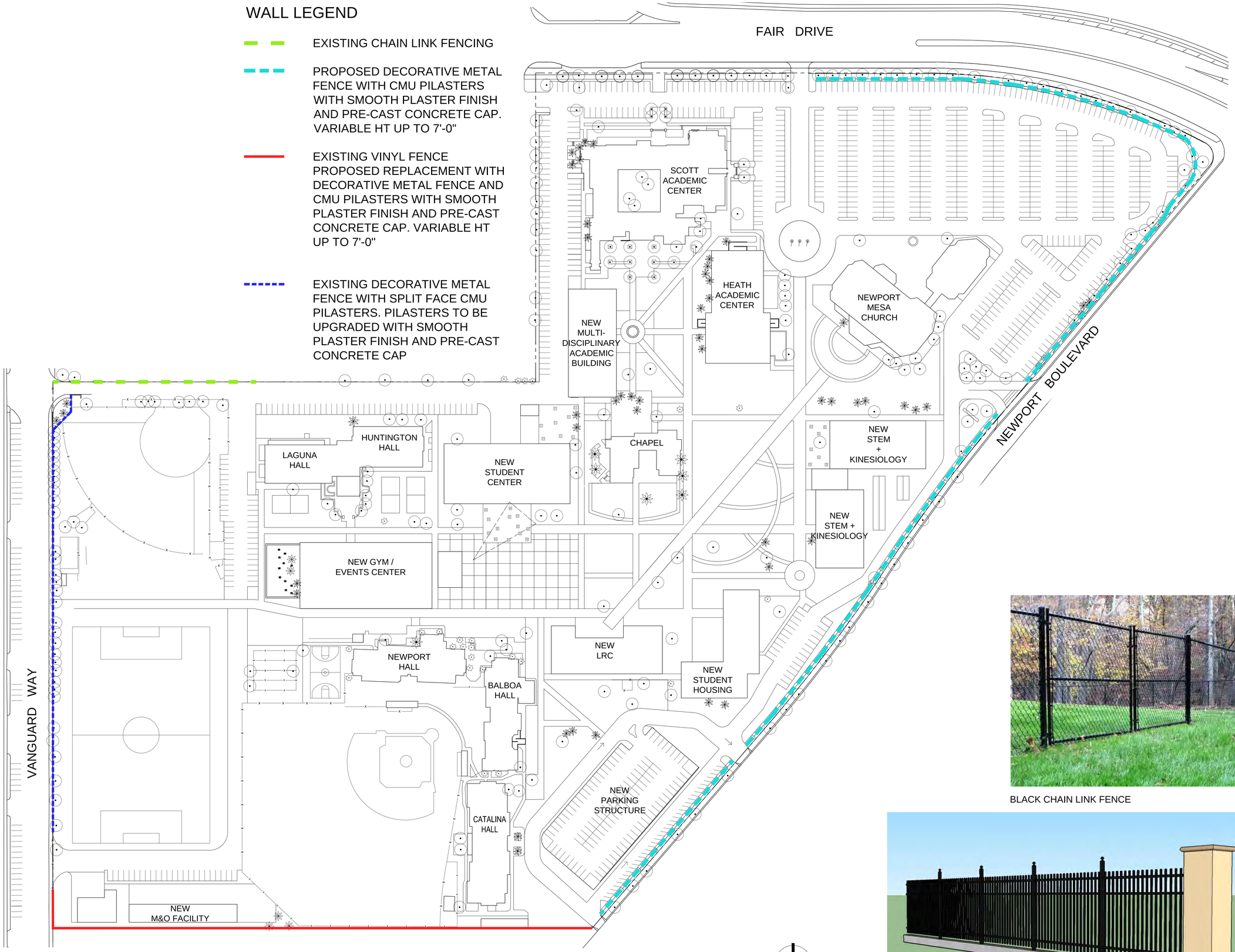
SHEET NUMBER

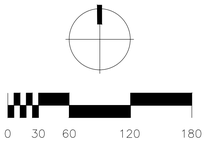
L4.1

J:\Dwgs\HPI\Vanguard University MP\sd\van-sections.dwg Tue, 04 Apr, 2017-6:03pm Plotted by: Loren

WALL LEGEND

- EXISTING CHAIN LINK FENCING
- PROPOSED DECORATIVE METAL FENCE WITH CMU PILASTERS WITH SMOOTH PLASTER FINISH AND PRE-CAST CONCRETE CAP. VARIABLE HT UP TO 7'-0"
- EXISTING VINYL FENCE PROPOSED REPLACEMENT WITH DECORATIVE METAL FENCE AND CMU PILASTERS WITH SMOOTH PLASTER FINISH AND PRE-CAST CONCRETE CAP. VARIABLE HT UP TO 7'-0"
- EXISTING DECORATIVE METAL FENCE WITH SPLIT FACE CMU PILASTERS. PILASTERS TO BE UPGRADED WITH SMOOTH PLASTER FINISH AND PRE-CAST CONCRETE CAP





BLACK CHAIN LINK FENCE

PROPOSED DECORATIVE METAL FENCE

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SHEET TITLE

FENCE & WALL PLAN

SHEET NUMBER

L5.1

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J:\Dwgs\HPI\Vanguard University MP\sd\van-plp.dwg Tue, 04 Apr 2017-6:03pm Plotted by:Loren

TREES

A: CERCIS CANADENSIS / EASTERN REDBUD

B: LAGERSTROEMIA INDICA / CRAPE MYRTLE

C: PRUNUS CERASIFERA / PURPLE LEAF PLUM

A: OLEA EUROPAEA 'SWAN HILL' / FRUITLESS OLIVE

B: CINNAMOMUM CAMPHORA / CAMPHOR

A: PROSOPIS HYBRID 'PHOENIX' / PHOENIX HYBRID MESQUITE

B: PODOCARPUS GRACILIOR / FERN PINE

C: FICUS NITIDA 'GREEN GEM' / GREEN GEM FIG

A: CERCIDIUM FLORIDUM ' DESERT MUSEUM' / DESERT MUSEUM PALO VERDE

B: PLATANUS ACERIFOLIA / LONDON PLANE TREE

A: TIPUANA TIPU / TIPU

B: ULMUS PARVIFLORA 'DRAKE' / DRAKE ELM

A: CASSIA LEPTOPHYLLA / GOLD MEDALLION TREE

B: TABEBUIA HETEROPHYLLA / PINK TRUMPET TREE

A: GEIJERA PARVIFLORA / AUSTRALIAN WILLOW

B: LOPHOSTEMON CONFERTUS / BRISBANE BOX

C: EUCALYPTUS NICHOLII / WILLOW PEPPERMINT

PHOENIX DACTYLIFERA 'MEDJOOL' / MEDJOOL DATE PALM

SYAGRUS ROMANZOFFIANUM / QUEEN PALM

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o: 949. 675. 6442

CONSULTANTS

RLA
8841 RESEARCH DR
SUITE 200
IRVINE • CA 92618
949.387.1323
RIDGELA.COM

SEALS / APPROVALS

PROJECT TITLE
VANGUARD UNIVERSITY CAMPUS MASTER PLAN
55 FAIR DRIVE
COSTA MESA, CA. 92626
T: (714) 556-3610
vanguard.edu

VANGUARD UNIVERSITY

VANGUARD UNIVERSITY

SUBMITTALS		

PROJECT IDENTIFICATION
THE ORIGINAL SIZE OF THIS SHEET IS 30" x 42"

DATE 4/5/2017

DRAWN BY

CHECKED BY

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SHEET TITLE
TREE IMAGERY

SHEET NUMBER
L6.1

FOREGROUND

ALOE 'BLUE ELF' /
BLUE ELF ALOE

CAREX DIVULSA /
BERKELEY SEDGE

COPROSMA KIRKII /
CREEPING COPROSMA

DIANELLA 'LITTLE REV' /
LITTLE REV FLAX LILY

FESTUCA MAIREI /
ATLAS FESCUE

LANTANA MONTIVEDENSIS /
TRAILING LANTANA

LANTANA 'NEW GOLD' /
TRAILING LANTANA

LOMANDRA LONGIFOLIA 'BREEZE' /
DWARF MAT RUSH

ROSMARINUS O. PROSTRATUS /
PROSTRATE ROSEMARY

SENECIO MANDRALISCAE /
BLUE CHALK STICKS

TEUCRIUM FRUTICANS /
BUSH GERMANDER

WESTRINGIA MUNDI /
MUNDI COAST ROSEMARY

MIDGROUND

ACACIA COGNATA 'COUSIN IT' /
LITTLE RIVER WATTLE

AGAVE ATTENUATA /
FOX TAIL AGAVE

CALLISTEMON 'LITTLE JOHN' /
LITTLE JOHN BOTTLEBRUSH

DIANELLA T. 'VARIEGATA' /
VARIEGATED FLAX LILY

HESPERALOE P. 'BRAKELIGHTS' /
BRAKELIGHTS RED YUCCA

MUHLENBERGIA C. 'REGAL MIST' /
PINK MUHLY

PITTOSPORUM CRASSIFOLIUM 'NANA' /
COMPACT PITTOSPORUM

RHAPHIOLEPIS INDICA 'CLARA' /
DWARF INDIAN HAWTHORNE

BACKGROUND

ARBUTUS UNEDO 'COMPACTA' /
DWARF STRAWBERRY TREE

CAESALPINIA MEXICANA /
MEXICAN BIRD OF PARADISE

LEUCOPHYLLYM FRUTESCENS 'GREEN CLOUD' /
GREEN CLOUD TEXAS RANGER

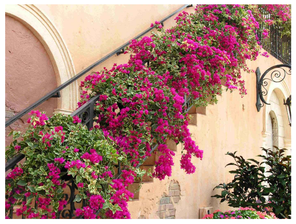
MISCANTHUS S. 'MORNING LIGHT' /
MORNING LIGHT MAIDEN GRASS

RHAPHIOLEPIS INDICA 'JACK EVANS' /
JACK EVANS INDIAN HAWTHORNE

WESTRINGIA FRUTICOSA /
COAST ROSEMARY

VERTICAL SURFACES

DISTICTIS BUCCINATORIA /
MEXICAN BLOOD RED TRUMPET VINE


BOUGAINVILLEA SPP. /
BOUGAINVILLEA

MACFADYENA UNGUIS - CATI /
CAT'S CLAW

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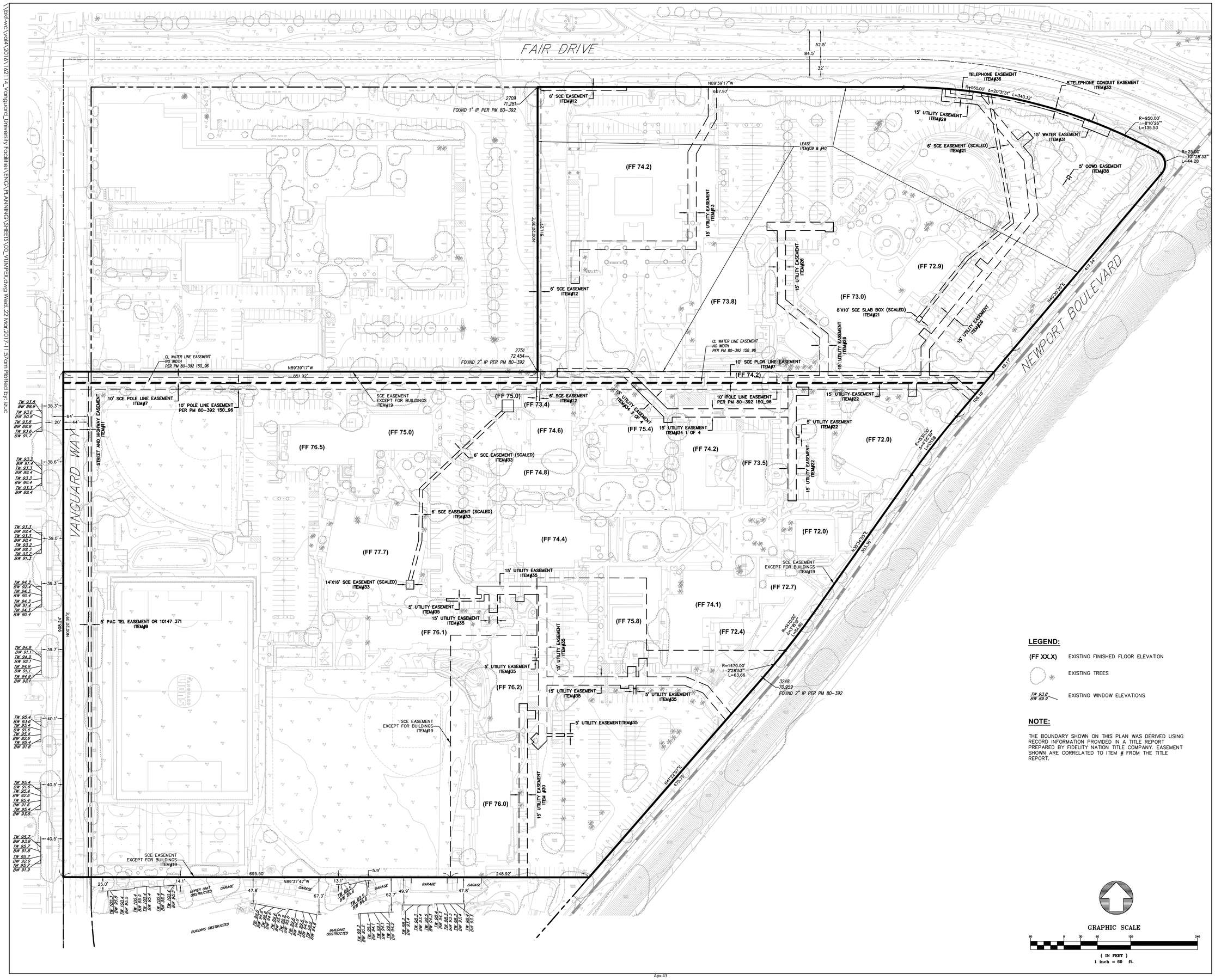
SHEET TITLE
SHRUB IMAGERY

SHEET NUMBER
L6.2

J:\Dwgs\HPI\Vanguard University MP\sd\van-plp.dwg, Tue, 04 Apr 2017-6:03pm Plotted by:Loren



LEGEND:

(FF XX.X)	EXISTING FINISHED FLOOR ELEVATION
	EXISTING TREES
TW 91.8 / BW 89.9	EXISTING WINDOW ELEVATIONS

NOTE:

THE BOUNDARY SHOWN ON THIS PLAN WAS DERIVED USING RECORD INFORMATION PROVIDED IN A TITLE REPORT PREPARED BY FIDELITY NATION TITLE COMPANY. EASEMENT SHOWN ARE CORRELATED TO ITEM # FROM THE TITLE REPORT.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

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SUBMITTALS		
	2/22/2017	CITY MASTER PLAN SUBMISSION

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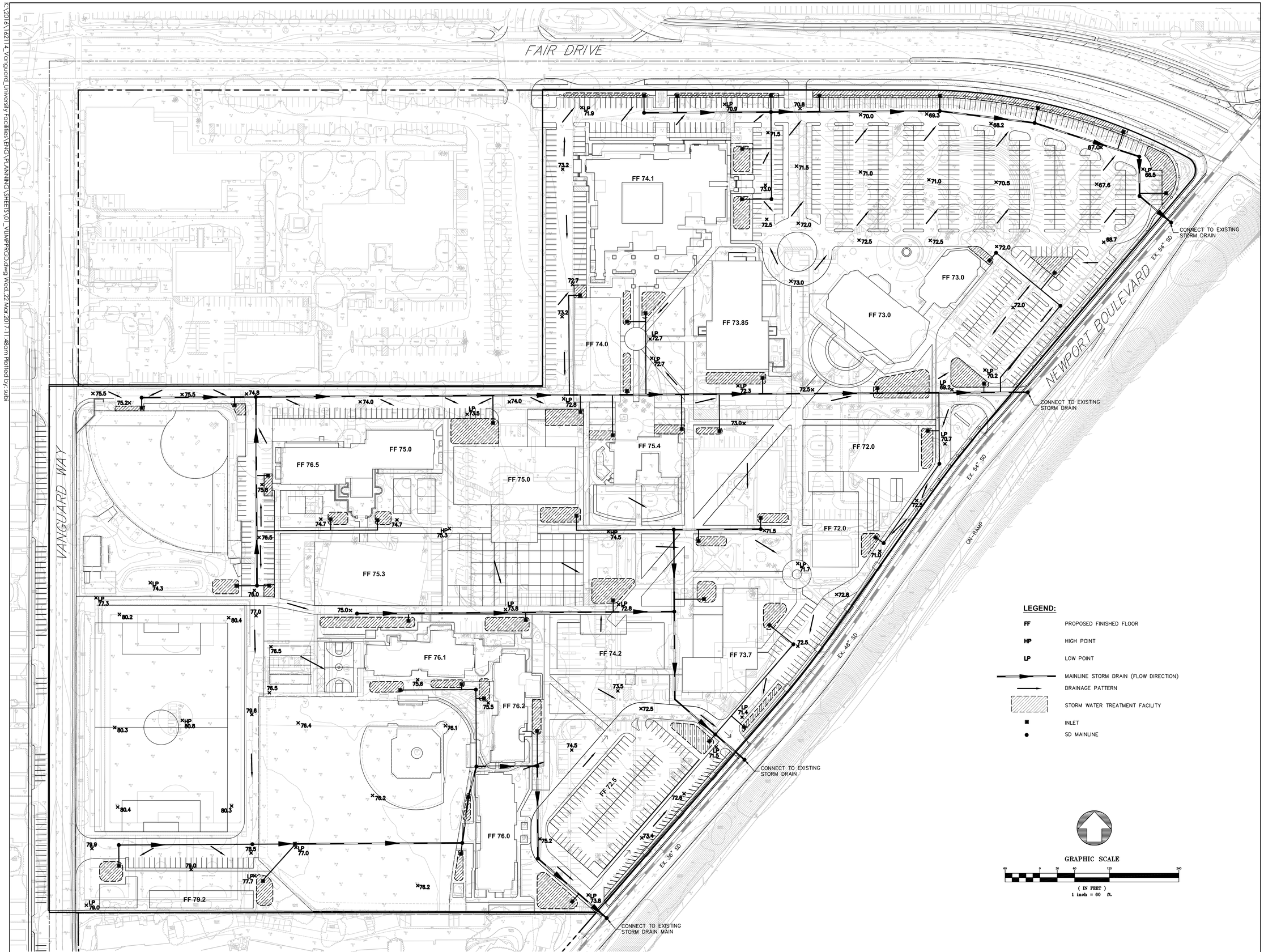
SHEET TITLE
EXISTING CONDITIONS

SHEET NUMBER
C0

K:\2016\162114_Vanguard_University Facilities\ENG\PLANNING\SHEETS\01_VUMPPRGD.dwg Wed, 22 Mar 2017-11:48am Plotted by: sub



LEGEND:

FF	PROPOSED FINISHED FLOOR
HP	HIGH POINT
LP	LOW POINT
	MAINLINE STORM DRAIN (FLOW DIRECTION)
	DRAINAGE PATTERN
	STORM WATER TREATMENT FACILITY
	INLET
	SD MAINLINE

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

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	2/22/2017	CITY MASTER PLAN SUBMISSION

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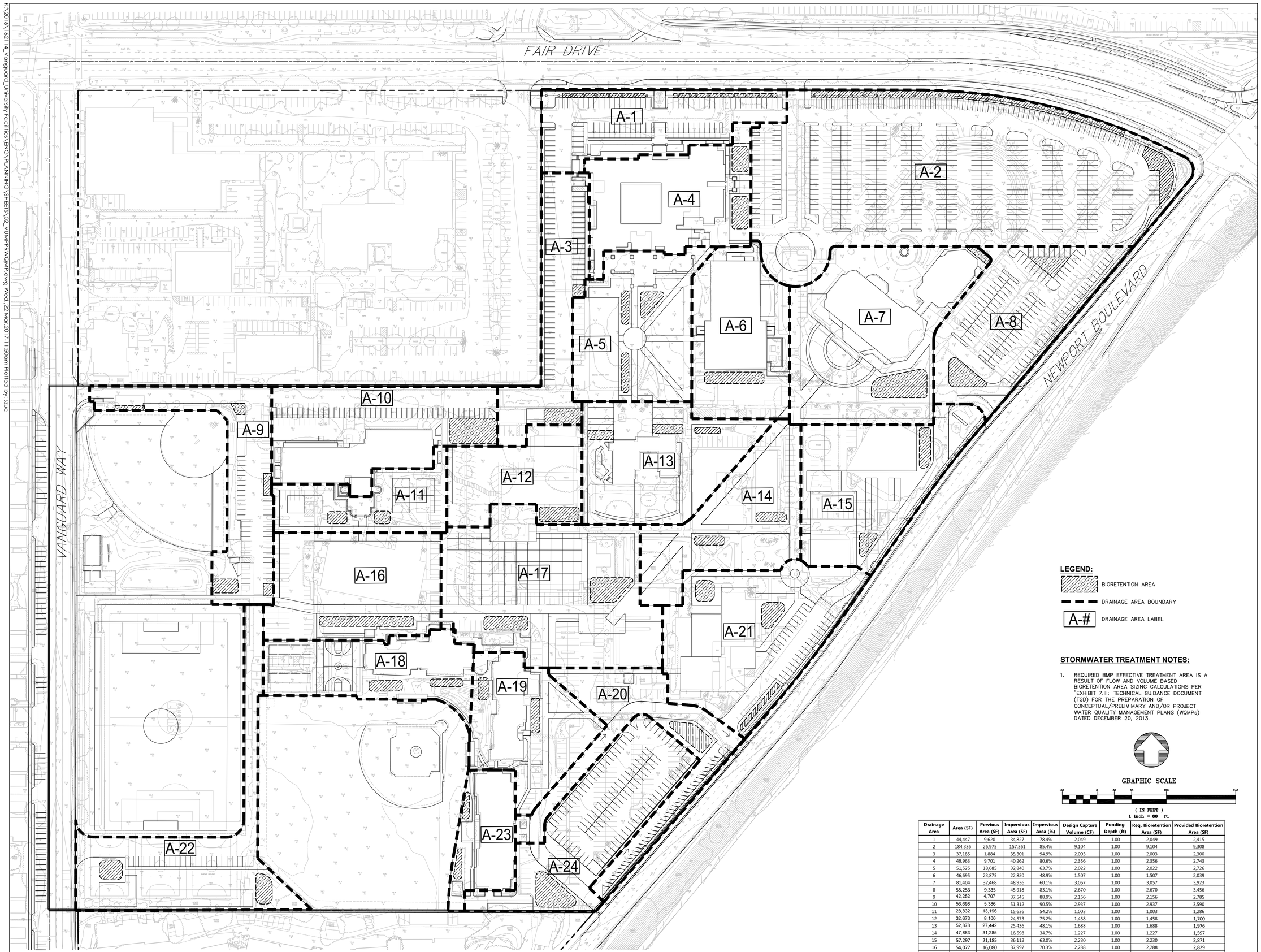
SHEET TITLE
GRADING AND DRAINAGE PLAN

SHEET NUMBER
C1

K:\2016\162114_Vanguard_University Facilities\ENG\PLANNING\SHEETS\02_VUMPPRW\QMP.dwg Wed, 22 Mar 2017-11:50am Plotted by: sauc



LEGEND:

- BIORETENTION AREA
- DRAINAGE AREA BOUNDARY
- A-# DRAINAGE AREA LABEL

STORMWATER TREATMENT NOTES:

1. REQUIRED BMP EFFECTIVE TREATMENT AREA IS A RESULT OF FLOW AND VOLUME BASED BIORETENTION AREA SIZING CALCULATIONS PER "EXHIBIT 7.III: TECHNICAL GUIDANCE DOCUMENT (TGD) FOR THE PREPARATION OF CONCEPTUAL/PRELIMIMARY AND/OR PROJECT WATER QUALITY MANAGEMENT PLANS (WQMPs) DATED DECEMBER 20, 2013.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

Drainage Area	Area (SF)	Pervious Area (SF)	Impervious Area (SF)	Impervious Area (%)	Design Capture Volume (CF)	Ponding Depth (ft)	Req. Bioretention Area (SF)	Provided Bioretention Area (SF)
1	44,447	9,620	34,827	78.4%	2,049	1.00	2,049	2,415
2	184,336	26,975	157,361	85.4%	9,104	1.00	9,104	9,308
3	37,185	1,884	35,301	94.9%	2,003	1.00	2,003	2,300
4	49,963	9,701	40,262	80.6%	2,356	1.00	2,356	2,743
5	51,525	18,685	32,840	63.7%	2,022	1.00	2,022	2,726
6	46,695	23,875	22,820	48.9%	1,507	1.00	1,507	2,039
7	81,404	32,468	48,936	60.1%	3,057	1.00	3,057	3,923
8	55,253	9,335	45,918	83.1%	2,670	1.00	2,670	3,456
9	42,252	4,707	37,545	88.9%	2,156	1.00	2,156	2,785
10	56,698	5,386	51,312	90.5%	2,937	1.00	2,937	3,590
11	28,832	13,196	15,636	54.2%	1,003	1.00	1,003	1,286
12	32,673	8,100	24,573	75.2%	1,458	1.00	1,458	1,700
13	52,878	27,442	25,436	48.1%	1,688	1.00	1,688	1,976
14	47,883	31,285	16,598	34.7%	1,227	1.00	1,227	1,597
15	57,297	21,185	36,112	63.0%	2,230	1.00	2,230	2,871
16	54,077	16,080	37,997	70.3%	2,288	1.00	2,288	2,829
17	86,801	19,640	67,161	77.4%	3,962	1.00	3,962	4,325
18	38,522	14,955	23,567	61.2%	1,466	1.00	1,466	1,761
19	40,436	21,125	19,311	47.8%	1,284	1.00	1,284	1,558
20	42,405	17,850	24,555	57.9%	1,549	1.00	1,549	1,979
21	68,547	24,785	43,762	63.8%	2,694	1.00	2,694	3,273
22	55,560	18,970	36,590	65.9%	2,236	1.00	2,236	2,632
23	21,736	6,257	15,479	71.2%	929	1.00	929	1,002
24	54,107	13,807	40,300	74.5%	2,396	1.00	2,396	2,954

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VANGUARD UNIVERSITY

SUBMITTALS

	2/22/2017	CITY MASTER PLAN SUBMISSION

PROJECT IDENTIFICATION
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SHEET TITLE
WATER QUALITY MANAGEMENT PLAN

SHEET NUMBER
C2

APPENDIX D

Intersection Turning Movement Worksheets

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:				
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #:	SC1474
	NORTH & SOUTH:	Vanguard	LOCATION #:	4
	EAST & WEST:	Morristown	CONTROL:	STOP E/W

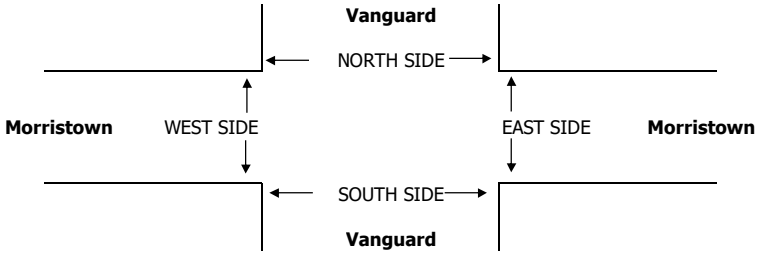
NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

☑ Dgg#K0Wkuqv#kr#Ch1#Wkuqv

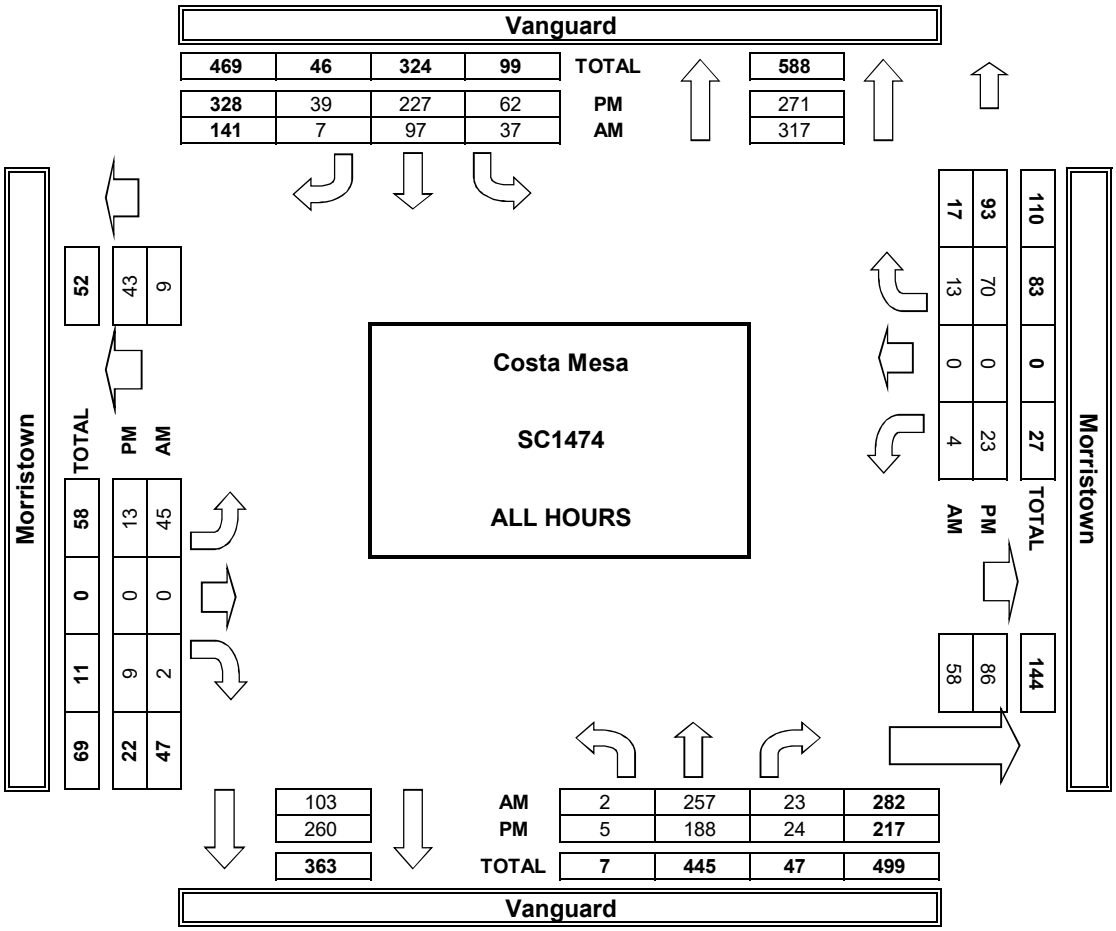
		NORTHBOUND Vanguard			SOUTHBOUND Vanguard			EASTBOUND Morristown			WESTBOUND Morristown				U-TURNS				
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	34	1	2	7	2	4	0	0	0	0	1	51	0	1	0	0	1
	7:15 AM	0	32	1	1	17	1	5	0	1	0	0	1	59	0	0	0	0	0
	7:30 AM	0	41	0	2	10	1	9	0	0	0	0	0	63	0	1	0	0	1
	7:45 AM	0	46	3	3	18	1	7	0	0	0	0	1	79	0	0	0	0	0
	8:00 AM	0	31	5	5	11	0	9	0	1	1	0	1	64	0	0	0	0	0
	8:15 AM	1	22	3	10	11	1	4	0	0	0	0	5	57	0	0	0	0	0
	8:30 AM	1	30	5	9	12	1	7	0	0	0	0	4	69	0	0	0	0	0
	8:45 AM	0	21	5	5	11	0	0	0	0	3	0	0	45	0	0	0	0	0
	VOLUMES	2	257	23	37	97	7	45	0	2	4	0	13	487	0	2	0	0	2
	APPROACH %	1%	91%	8%	26%	69%	5%	96%	0%	4%	24%	0%	76%						
	APP/DEPART	282	/	317	141	/	103	47	/	58	17	/	9	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	2	129	16	27	52	3	27	0	1	1	0	11	269					
	APPROACH %	1%	88%	11%	33%	63%	4%	96%	0%	4%	8%	0%	92%						
	PEAK HR FACTOR		0.750			0.932			0.700			0.600		0.851					
	APP/DEPART	147	/	167	82	/	54	28	/	43	12	/	5	0					
PM	4:00 PM	0	20	2	5	25	4	1	0	1	1	0	7	66	0	0	0	0	0
	4:15 PM	1	24	6	9	24	2	0	0	2	4	0	10	82	0	0	0	0	0
	4:30 PM	0	16	1	15	25	4	3	0	1	2	0	8	75	0	0	0	0	0
	4:45 PM	1	33	4	9	30	4	2	0	1	5	0	10	99	0	0	0	0	0
	5:00 PM	0	22	2	8	29	4	1	0	1	3	0	9	79	0	0	0	0	0
	5:15 PM	1	21	4	6	39	7	5	0	2	0	0	11	96	0	0	0	0	0
	5:30 PM	1	27	2	3	29	10	0	0	0	3	0	9	84	1	0	0	0	1
	5:45 PM	1	25	3	7	26	4	1	0	1	5	0	6	79	0	0	0	0	0
	VOLUMES	5	188	24	62	227	39	13	0	9	23	0	70	660	1	0	0	0	1
	APPROACH %	2%	87%	11%	19%	69%	12%	59%	0%	41%	25%	0%	75%						
	APP/DEPART	217	/	271	328	/	260	22	/	86	93	/	43	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	3	103	12	26	127	25	8	0	4	11	0	39	358					
	APPROACH %	3%	87%	10%	15%	71%	14%	67%	0%	33%	22%	0%	78%						
	PEAK HR FACTOR		0.776			0.856			0.429			0.833		0.904					
	APP/DEPART	118	/	150	178	/	143	12	/	38	50	/	27	0					

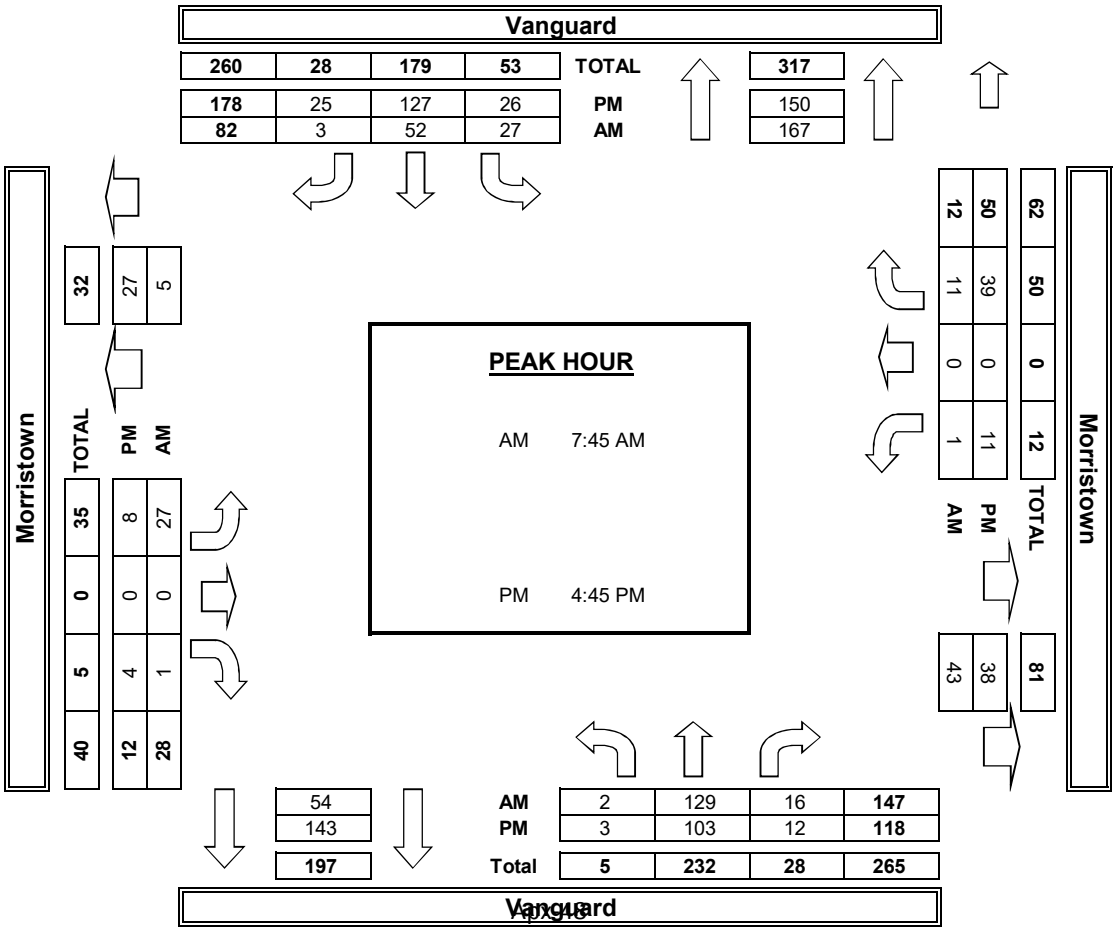


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

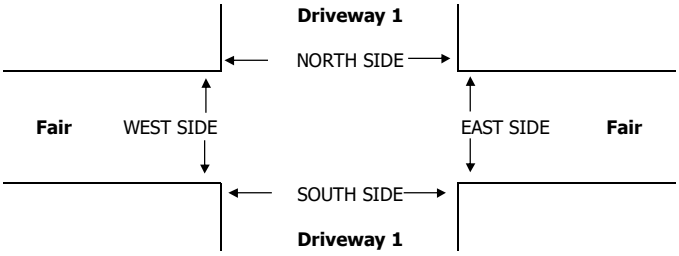
DATE:				
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #:	SC1474
	NORTH & SOUTH:	Driveway 1	LOCATION #:	1
	EAST & WEST:	Fair	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ◄ W, E ►, ▲ N, S ▼

☑ Dgg#K0Wkuqv#kr#Ch1#Wkuqv

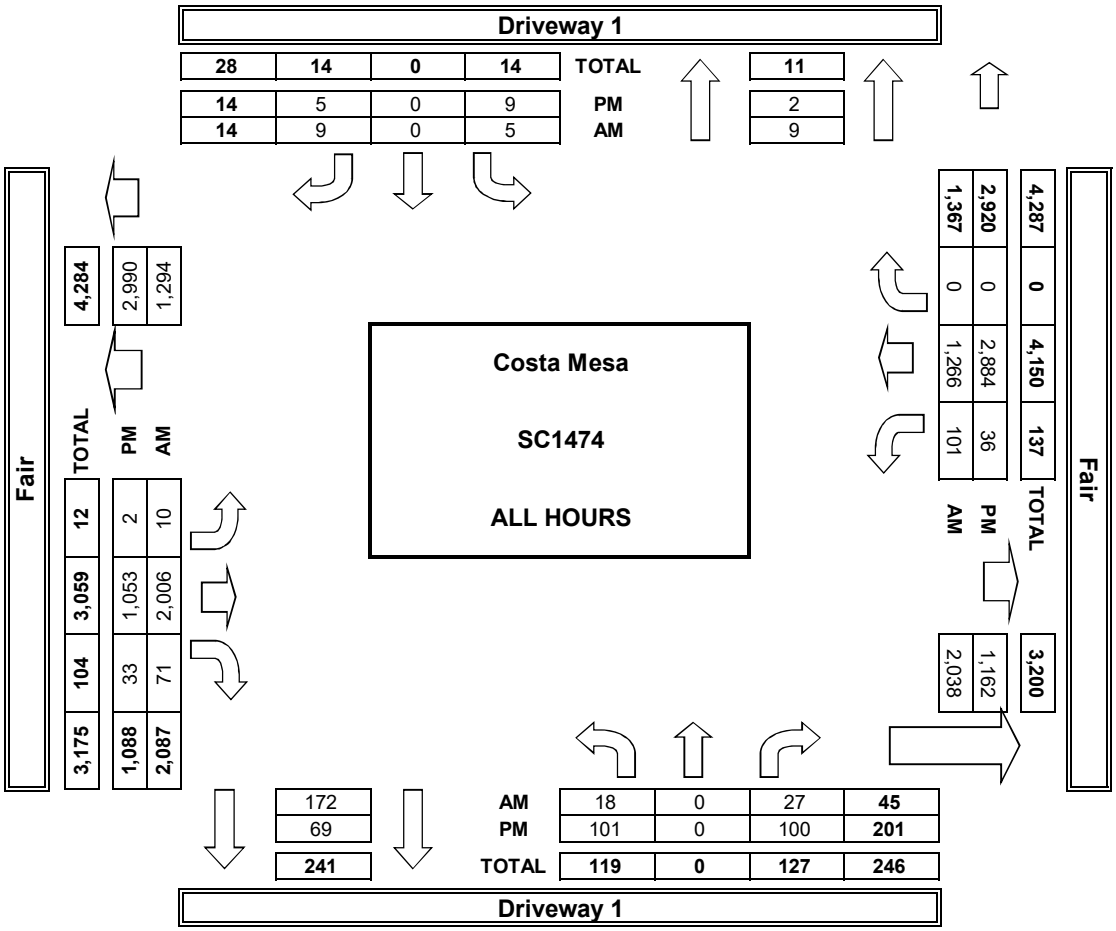
		NORTHBOUND Driveway 1			SOUTHBOUND Driveway 1			EASTBOUND Fair			WESTBOUND Fair				U-TURNS				
	LANES:	NL 0.5	NT 0.5	NR 1	SL 0.5	ST 0.5	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	1	0	3	1	0	0	0	197	5	10	125	0	342	0	0	0	0	0
	7:15 AM	1	0	4	0	0	0	1	239	8	20	164	0	437	0	0	0	0	0
	7:30 AM	3	0	3	1	0	0	1	298	9	14	184	0	513	0	0	0	0	0
	7:45 AM	4	0	4	0	0	2	1	309	18	16	204	0	558	0	0	0	0	0
	8:00 AM	1	0	8	0	0	2	1	252	10	16	145	0	435	0	0	0	0	0
	8:15 AM	3	0	2	0	0	0	2	242	10	11	127	0	397	0	0	1	0	1
	8:30 AM	2	0	2	3	0	1	1	249	5	8	141	0	412	0	0	0	0	0
	8:45 AM	3	0	1	0	0	4	3	220	6	6	176	0	419	0	0	0	0	0
	VOLUMES	18	0	27	5	0	9	10	2,006	71	101	1,266	0	3,513	0	0	1	0	1
	APPROACH %	40%	0%	60%	36%	0%	64%	0%	96%	3%	7%	93%	0%						
	APP/DEPART	45	/	9	14	/	172	2,087	/	2,038	1,367	/	1,294	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	9	0	19	1	0	4	4	1,098	45	66	697	0	1,943					
	APPROACH %	32%	0%	68%	20%	0%	80%	0%	96%	4%	9%	91%	0%						
	PEAK HR FACTOR		0.778			0.625			0.874			0.867		0.871					
	APP/DEPART	28	/	4	5	/	111	1,147	/	1,118	763	/	710	0					
PM	4:00 PM	11	0	16	5	0	0	0	136	3	7	310	0	488	0	0	0	0	0
	4:15 PM	17	0	11	0	0	1	0	144	7	3	336	0	519	0	0	0	0	0
	4:30 PM	10	0	9	1	0	1	0	154	3	2	345	0	525	0	0	0	0	0
	4:45 PM	7	0	6	0	0	0	1	122	4	6	365	0	511	0	0	0	0	0
	5:00 PM	17	0	14	2	0	2	0	151	0	4	374	0	564	0	0	0	0	0
	5:15 PM	5	0	9	1	0	0	0	130	4	5	399	0	553	0	0	0	0	0
	5:30 PM	24	0	26	0	0	1	1	127	6	3	408	0	596	0	0	0	0	0
	5:45 PM	10	0	9	0	0	0	0	89	6	6	347	0	467	0	0	0	0	0
	VOLUMES	101	0	100	9	0	5	2	1,053	33	36	2,884	0	4,223	0	0	0	0	0
	APPROACH %	50%	0%	50%	64%	0%	36%	0%	97%	3%	1%	99%	0%						
	APP/DEPART	201	/	2	14	/	69	1,088	/	1,162	2,920	/	2,990	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	53	0	55	3	0	3	2	530	14	18	1,546	0	2,224					
	APPROACH %	49%	0%	51%	50%	0%	50%	0%	97%	3%	1%	99%	0%						
	PEAK HR FACTOR		0.540			0.375			0.904			0.951		0.933					
	APP/DEPART	108	/	2	6	/	32	546	/	588	1,564	/	1,602	0					

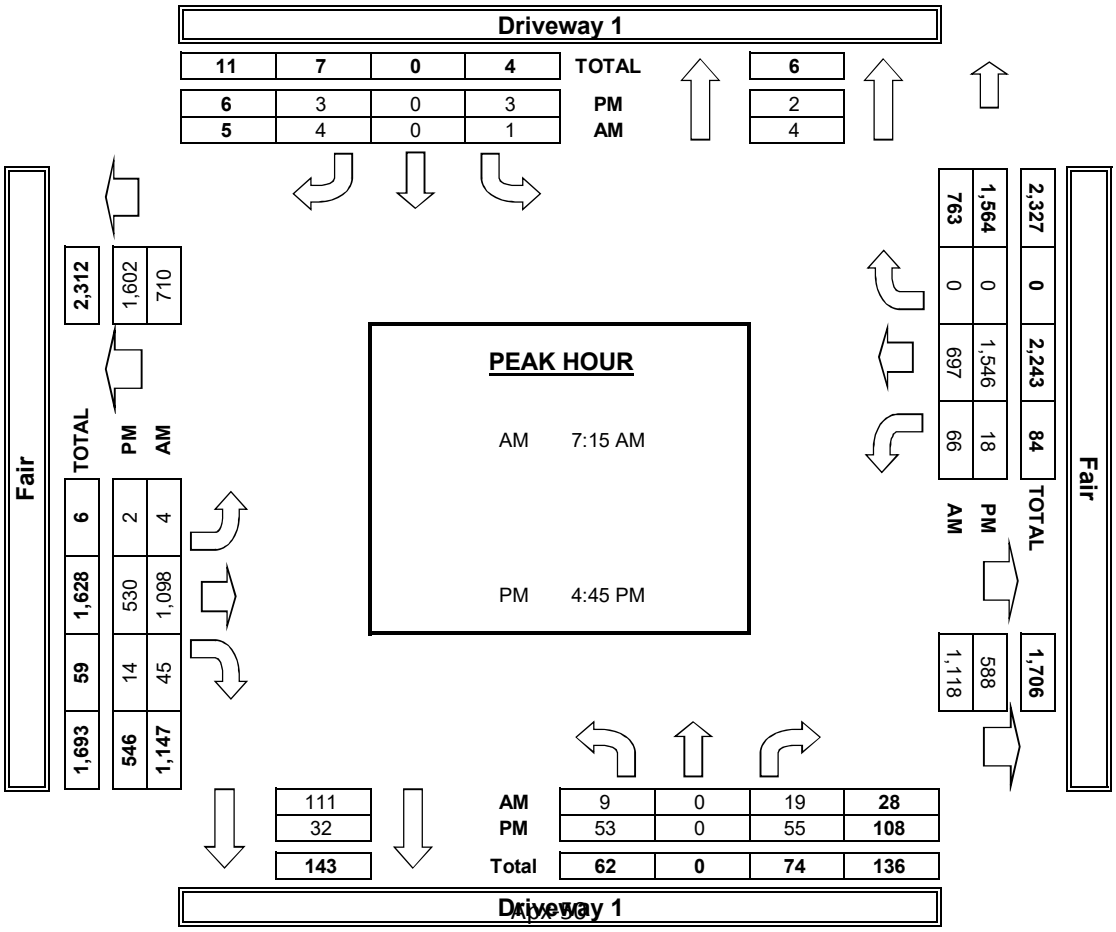


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

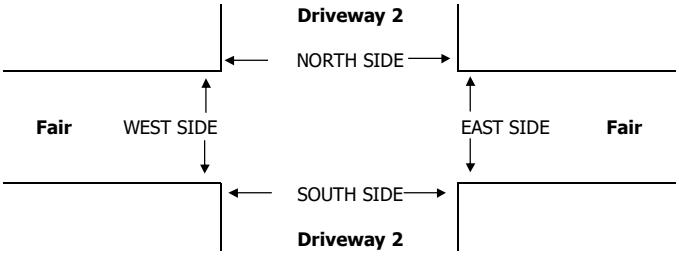
DATE:				
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #:	SC1474
	NORTH & SOUTH:	Driveway 2	LOCATION #:	2
	EAST & WEST:	Fair	CONTROL:	STOP N

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N / ◄ W / E ► / S ▼

☑ Dgg#K0Wbcuqvkc#Ch.u#Wbcuqv

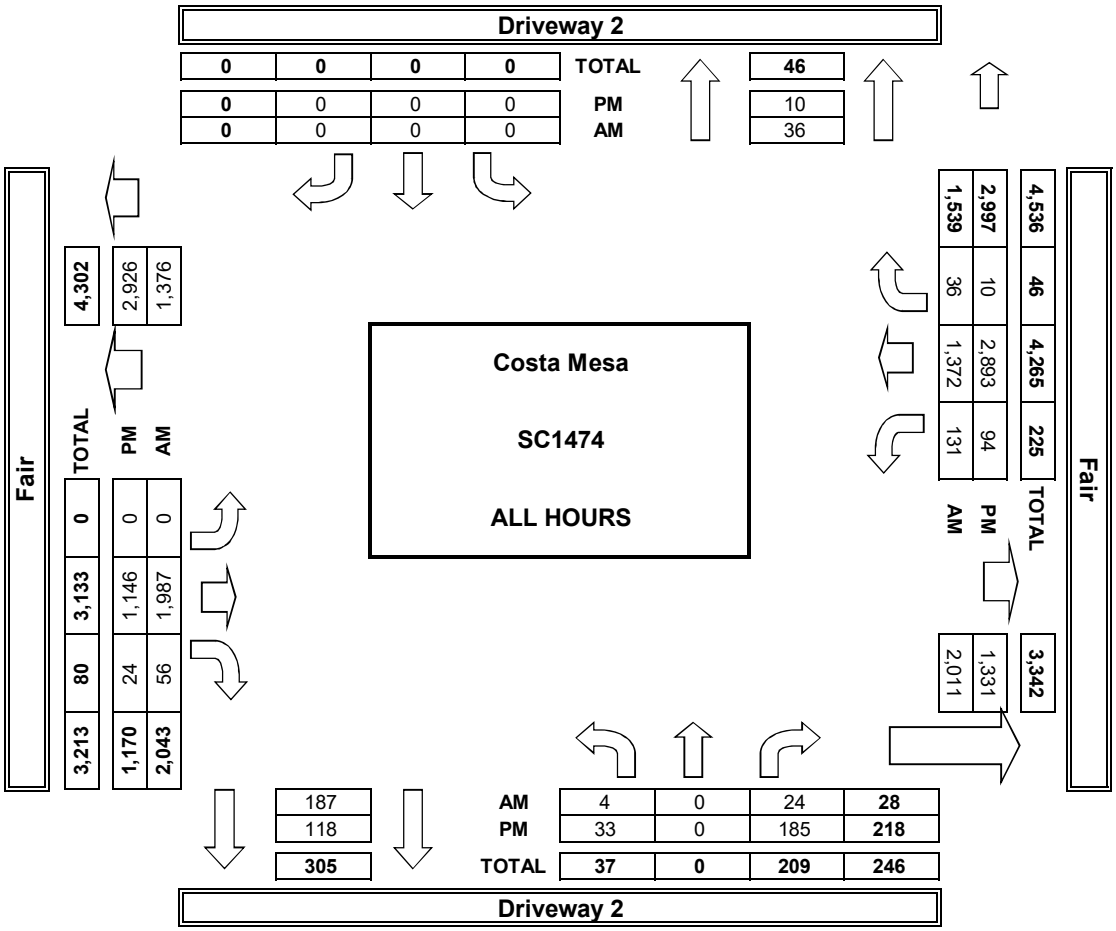
		NORTHBOUND Driveway 2			SOUTHBOUND Driveway 2			EASTBOUND Fair			WESTBOUND Fair				U-TURNS				
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 0	WT 2	WR 2	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	3	0	0	0	0	200	1	8	144	0	356	0	0	0	0	0
	7:15 AM	0	0	2	0	0	0	0	240	3	8	184	3	440	0	0	0	0	0
	7:30 AM	1	0	3	0	0	0	0	296	6	21	197	1	525	0	0	0	0	0
	7:45 AM	1	0	6	0	0	0	0	293	20	43	219	6	588	0	0	0	0	0
	8:00 AM	0	0	4	0	0	0	0	255	5	21	161	10	456	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	238	6	16	138	3	401	0	0	0	0	0
	8:30 AM	1	0	2	0	0	0	0	249	5	7	148	7	419	0	0	0	0	0
	8:45 AM	1	0	4	0	0	0	0	216	10	7	181	6	425	0	0	0	0	0
	VOLUMES	4	0	24	0	0	0	0	1,987	56	131	1,372	36	3,610	0	0	0	0	0
	APPROACH %	14%	0%	86%	0%	0%	0%	0%	97%	3%	9%	89%	2%						
	APP/DEPART	28	/	36	0	/	187	2,043	/	2,011	1,539	/	1,376	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	2	0	15	0	0	0	0	1,084	34	93	761	20	2,009					
	APPROACH %	12%	0%	88%	0%	0%	0%	0%	97%	3%	11%	87%	2%						
	PEAK HR FACTOR		0.607			0.000			0.893			0.815		0.854					
	APP/DEPART	17	/	20	0	/	127	1,118	/	1,099	874	/	763	0					
PM	4:00 PM	4	0	20	0	0	0	0	154	3	6	315	1	503	0	0	0	0	0
	4:15 PM	6	0	34	0	0	0	0	152	3	14	333	3	545	0	0	0	0	0
	4:30 PM	4	0	27	0	0	0	0	163	1	11	343	2	551	0	0	0	0	0
	4:45 PM	6	0	14	0	0	0	0	127	1	5	365	0	518	0	0	0	0	0
	5:00 PM	6	0	31	0	0	0	0	164	3	10	372	3	589	0	0	0	0	0
	5:15 PM	2	0	16	0	0	0	0	135	5	7	402	1	568	0	0	0	0	0
	5:30 PM	4	0	14	0	0	0	0	150	3	19	407	0	597	0	0	0	0	0
	5:45 PM	1	0	29	0	0	0	0	101	5	22	356	0	514	0	0	0	0	0
	VOLUMES	33	0	185	0	0	0	0	1,146	24	94	2,893	10	4,385	0	0	0	0	0
	APPROACH %	15%	0%	85%	0%	0%	0%	0%	98%	2%	3%	97%	0%						
	APP/DEPART	218	/	10	0	/	118	1,170	/	1,331	2,997	/	2,926	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	18	0	75	0	0	0	0	576	12	41	1,546	4	2,272					
	APPROACH %	19%	0%	81%	0%	0%	0%	0%	98%	2%	3%	97%	0%						
	PEAK HR FACTOR		0.628			0.000			0.880			0.934		0.951					
	APP/DEPART	93	/	4	0	/	53	588	/	651	1,591	/	1,564	0					

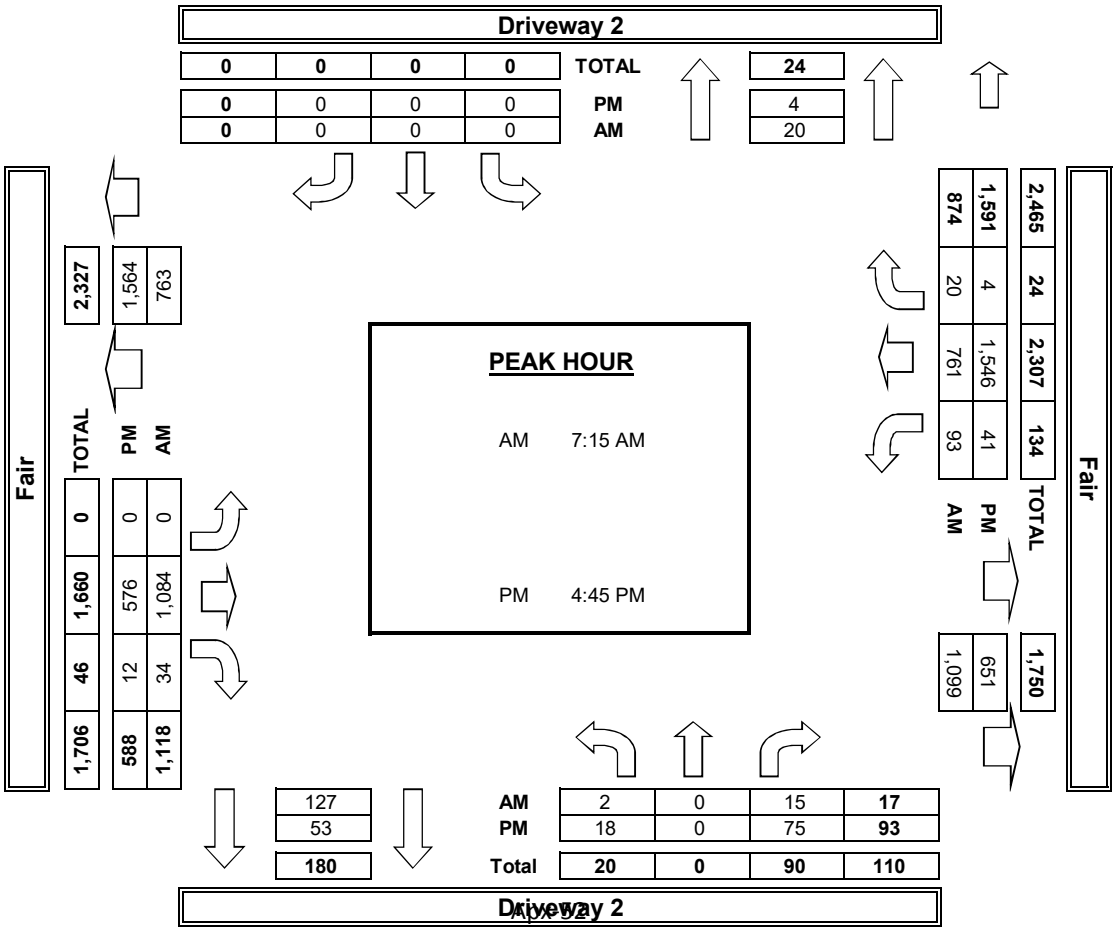


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

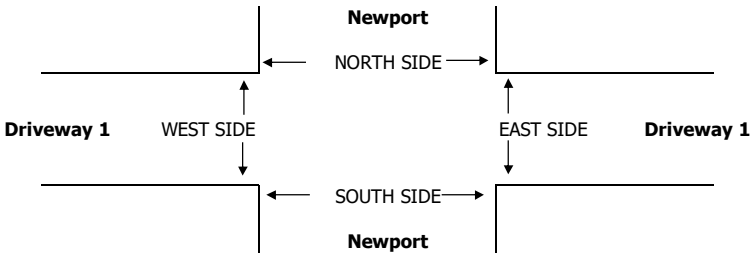
DATE:				
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #:	SC1474
	NORTH & SOUTH:	Newport	LOCATION #:	3
	EAST & WEST:	Driveway 1	CONTROL:	STOP E

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

☑ Dgg#K0Wxcurv#kc#0h1w#Wxcurv

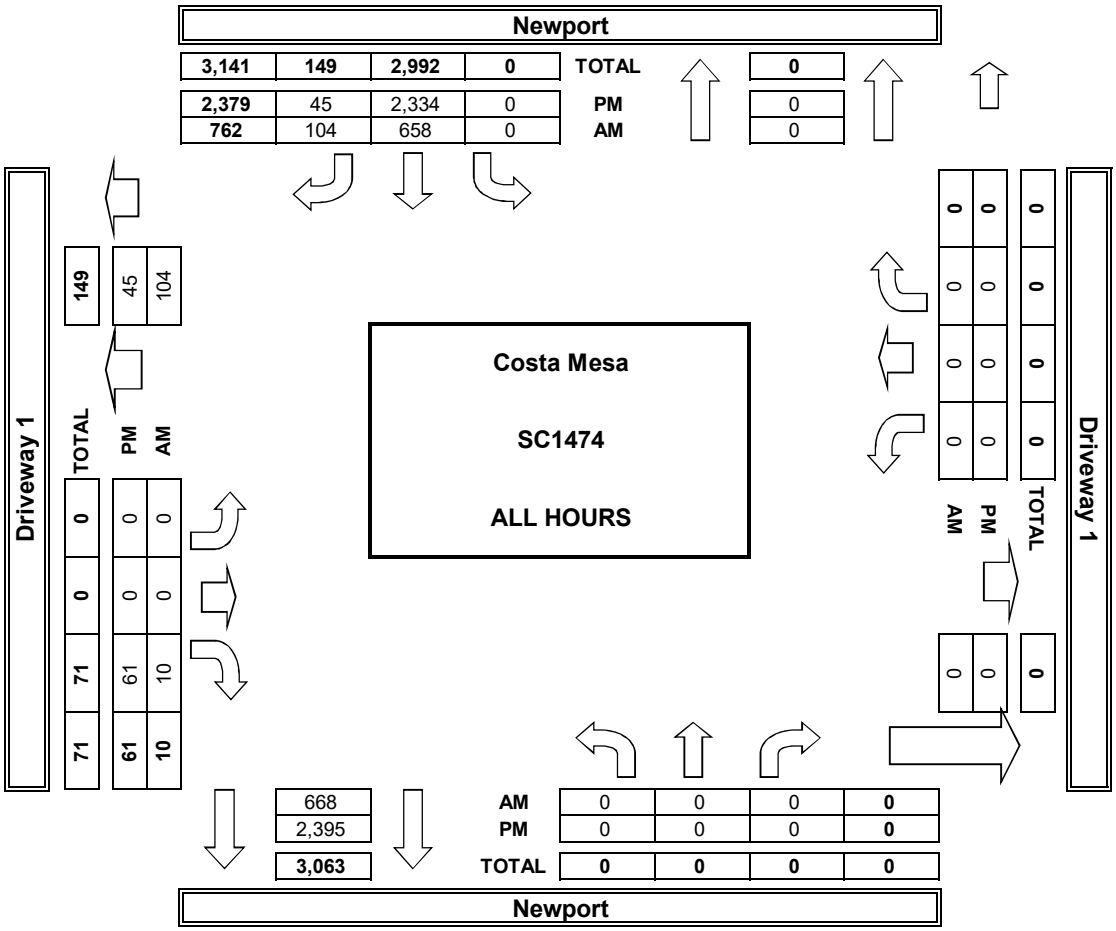
		NORTHBOUND Newport			SOUTHBOUND Newport			EASTBOUND Driveway 1			WESTBOUND Driveway 1				U-TURNS				
	LANES:	NL X	NT X	NR X	SL X	ST 3	SR 0	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	0	64	3	0	0	0	0	0	0	67	0	0	0	0	0
	7:15 AM	0	0	0	0	73	6	0	0	1	0	0	0	80	0	0	0	0	0
	7:30 AM	0	0	0	0	78	8	0	0	0	0	0	0	86	0	0	0	0	0
	7:45 AM	0	0	0	0	87	21	0	0	3	0	0	0	111	0	0	0	0	0
	8:00 AM	0	0	0	0	87	16	0	0	2	0	0	0	105	0	0	0	0	0
	8:15 AM	0	0	0	0	76	21	0	0	0	0	0	0	97	0	0	0	0	0
	8:30 AM	0	0	0	0	92	15	0	0	2	0	0	0	109	0	0	0	0	0
	8:45 AM	0	0	0	0	101	14	0	0	2	0	0	0	117	0	0	0	0	0
	VOLUMES	0	0	0	0	658	104	0	0	10	0	0	0	772	0	0	0	0	0
	APPROACH %	0%	0%	0%	0%	86%	14%	0%	0%	100%	0%	0%	0%						
	APP/DEPART	0	/	0	762	/	668	10	/	0	0	/	104	0					
	BEGIN PEAK HR		8:00 AM																
	VOLUMES	0	0	0	0	356	66	0	0	6	0	0	0	428					
	APPROACH %	0%	0%	0%	0%	84%	16%	0%	0%	100%	0%	0%	0%						
	PEAK HR FACTOR		0.000			0.917			0.750			0.000		0.915					
	APP/DEPART	0	/	0	422	/	362	6	/	0	0	/	66	0					
PM	4:00 PM	0	0	0	0	218	1	0	0	1	0	0	0	220	0	0	0	0	0
	4:15 PM	0	0	0	0	231	6	0	0	13	0	0	0	250	0	0	0	0	0
	4:30 PM	0	0	0	0	251	0	0	0	6	0	0	0	257	0	0	0	0	0
	4:45 PM	0	0	0	0	287	3	0	0	1	0	0	0	291	0	0	0	0	0
	5:00 PM	0	0	0	0	306	5	0	0	11	0	0	0	322	0	0	0	0	0
	5:15 PM	0	0	0	0	348	9	0	0	8	0	0	0	365	0	0	0	0	0
	5:30 PM	0	0	0	0	346	12	0	0	10	0	0	0	368	0	0	0	0	0
	5:45 PM	0	0	0	0	347	9	0	0	11	0	0	0	367	0	0	0	0	0
	VOLUMES	0	0	0	0	2,334	45	0	0	61	0	0	0	2,440	0	0	0	0	0
	APPROACH %	0%	0%	0%	0%	98%	2%	0%	0%	100%	0%	0%	0%						
	APP/DEPART	0	/	0	2,379	/	2,395	61	/	0	0	/	45	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	0	0	0	0	1,347	35	0	0	40	0	0	0	1,422					
	APPROACH %	0%	0%	0%	0%	97%	3%	0%	0%	100%	0%	0%	0%						
	PEAK HR FACTOR		0.000			0.965			0.909			0.000		0.966					
	APP/DEPART	0	/	0	1,382	/	1,387	40	/	0	0	/	35	0					

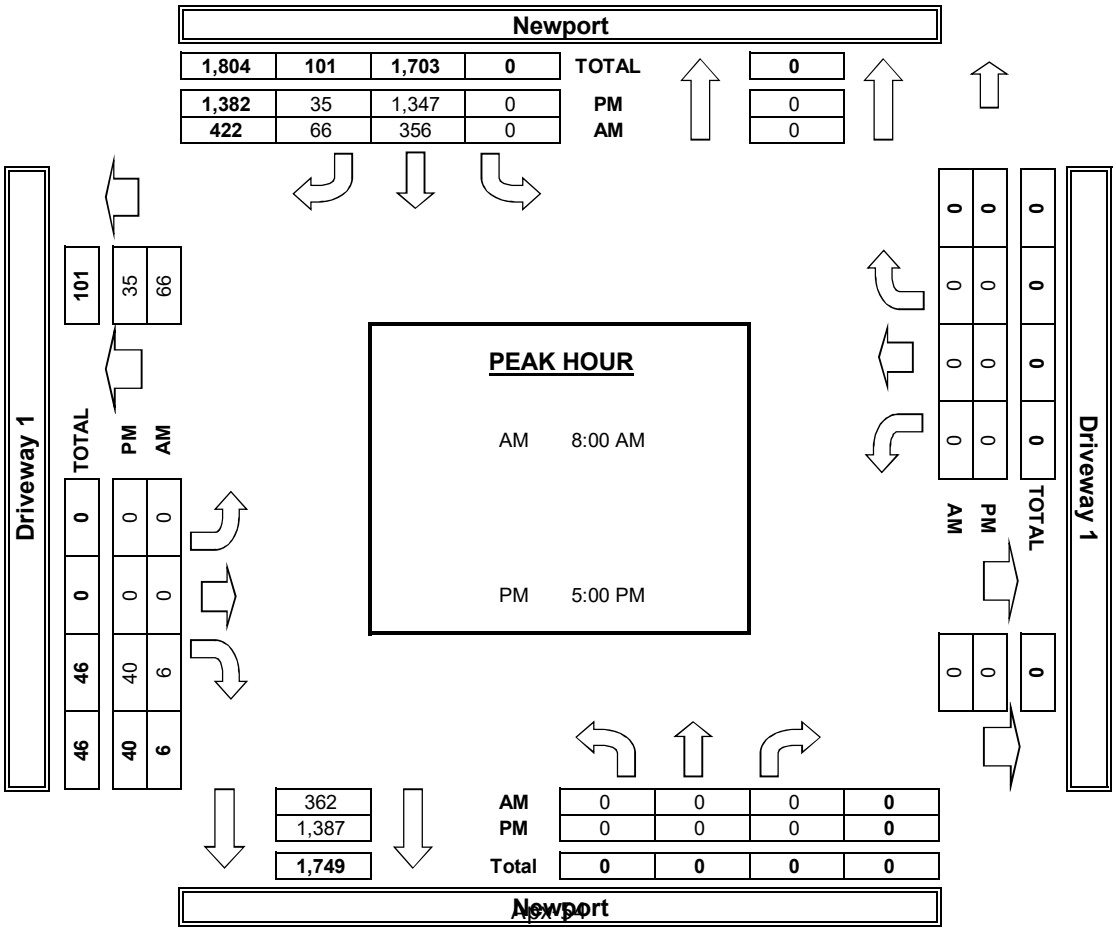


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:			
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #: SC1474
	NORTH & SOUTH:	Newport	LOCATION #: 5
	EAST & WEST:	Driveway 2	CONTROL: STOP E

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

☑ Dgg#K0WxcuqvWxc#Ch1wWxcuqv

		NORTHBOUND Newport			SOUTHBOUND Newport			EASTBOUND Driveway 2			WESTBOUND Driveway 2				U-TURNS				
	LANES:	NL X	NT X	NR X	SL X	ST 3	SR X	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	0	64	0	0	0	1	0	0	0	65	0	0	0	0	0
	7:15 AM	0	0	0	0	74	0	0	0	0	0	0	0	74	0	0	0	0	0
	7:30 AM	0	0	0	0	79	0	0	0	2	0	0	0	81	0	0	0	0	0
	7:45 AM	0	0	0	0	90	0	0	0	2	0	0	0	92	0	0	0	0	0
	8:00 AM	0	0	0	0	91	0	0	0	1	0	0	0	92	0	0	0	0	0
	8:15 AM	0	0	0	0	76	0	0	0	5	0	0	0	81	0	0	0	0	0
	8:30 AM	0	0	0	0	95	0	0	0	2	0	0	0	97	0	0	0	0	0
	8:45 AM	0	0	0	0	103	0	0	0	4	0	0	0	107	0	0	0	0	0
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	APP/DEPART	0	/	0	672	/	689	17	/	0	0	/	0	0					
	BEGIN PEAK HR		8:00 AM																
	VOLUMES	0	0	0	0	365	0	0	0	12	0	0	0	377					
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	4:30 PM	0	0	0	0	260	0	0	0	4	0	0	0	264	0	0	0	0	0
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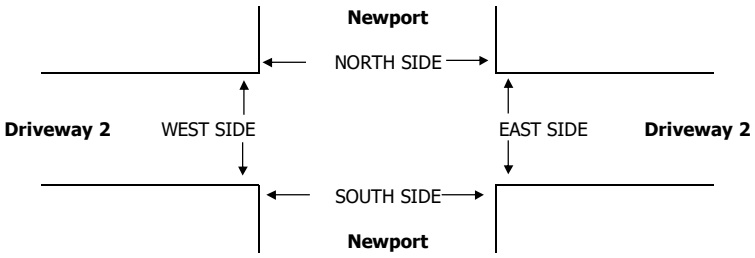

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	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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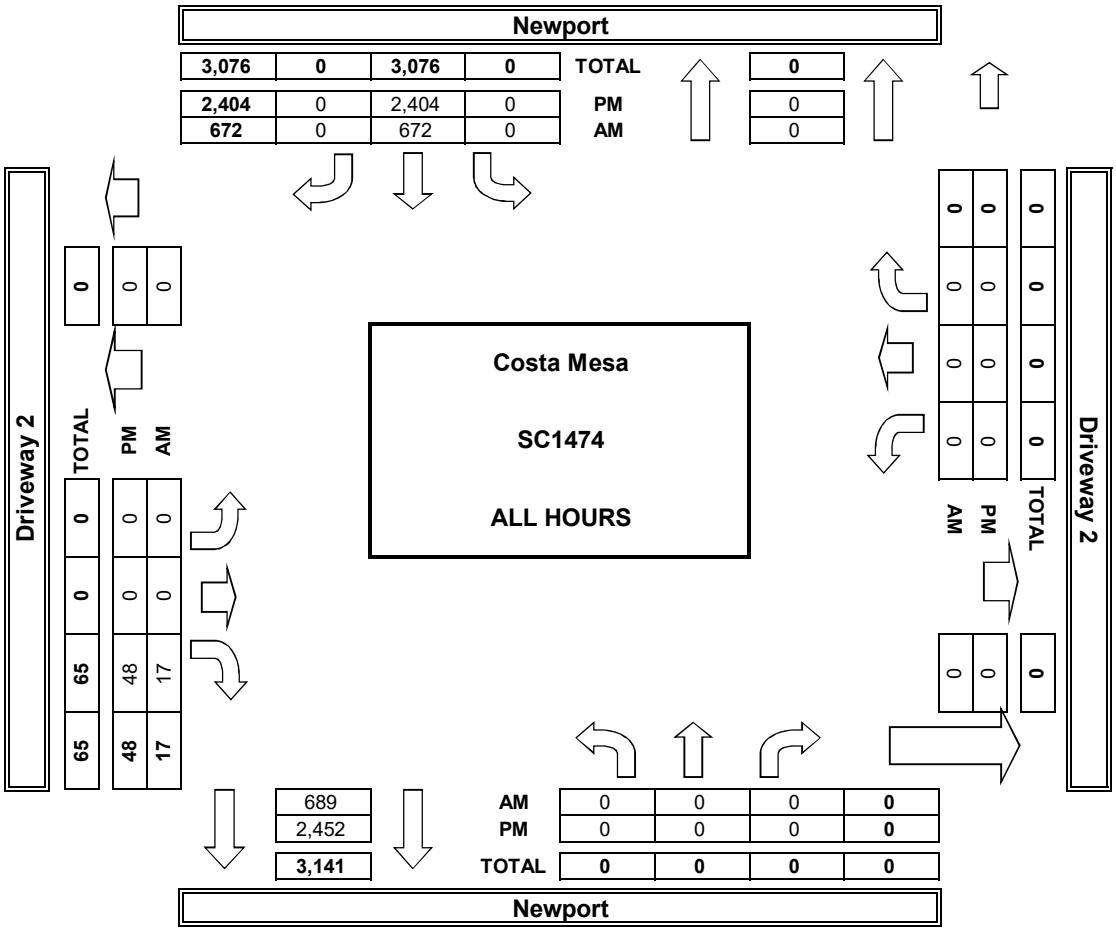
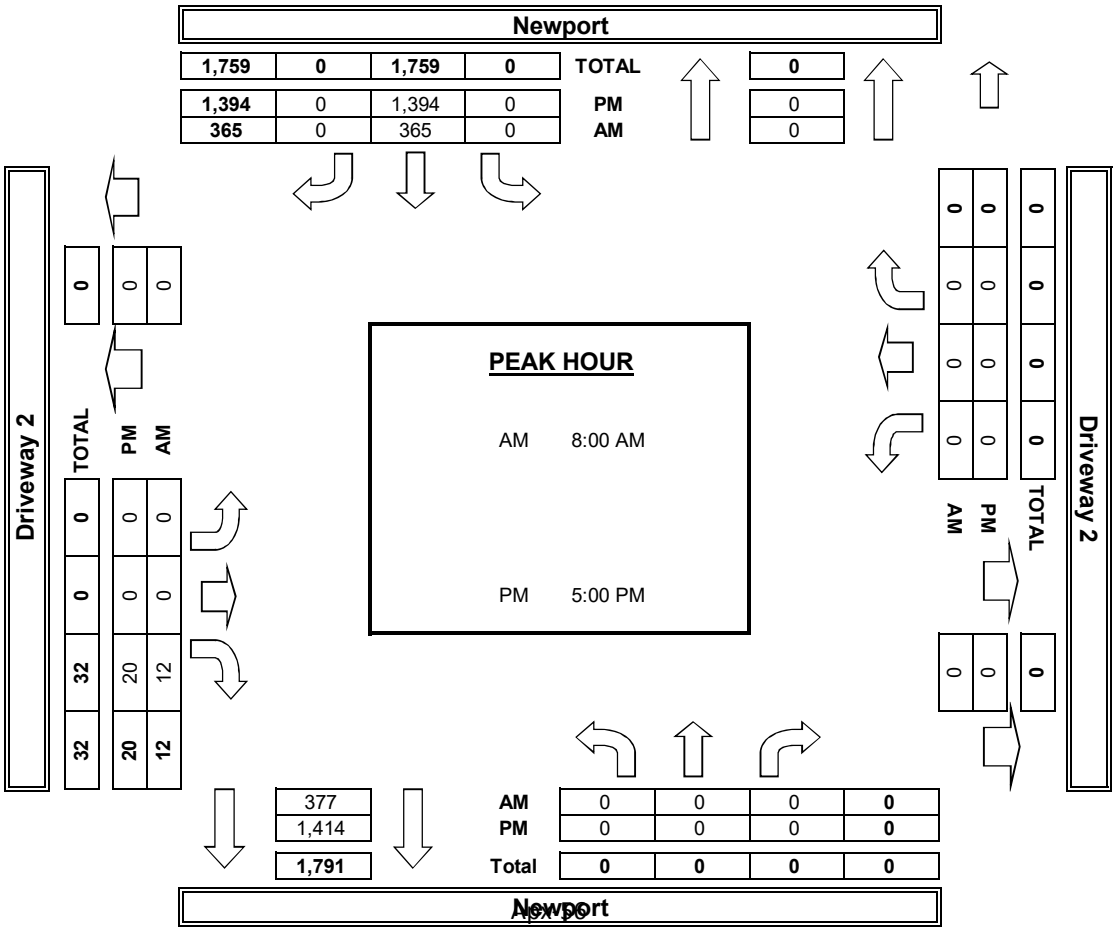
AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:				
Thu, Sep 21, 17	LOCATION:	Costa Mesa	PROJECT #:	SC1474
	NORTH & SOUTH:	Newport	LOCATION #:	6
	EAST & WEST:	Driveway 3	CONTROL:	STOP E

NOTES:

ER illegal

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

☑ Dgg#K0WxuqvWx#Ch1WWxuqv

		NORTHBOUND Newport			SOUTHBOUND Newport			EASTBOUND Driveway 3			WESTBOUND Driveway 3				U-TURNS				
	LANES:	NL X	NT X	NR X	SL X	ST 3	SR 0	EL X	ET X	ER X	WL X	WT X	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
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	8:15 AM	0	0	0	0	80	2	0	0	0	0	0	0	82	0	0	0	0	0
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	8:45 AM	0	0	0	0	110	4	0	0	0	0	0	0	114	0	0	0	0	0
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	5:30 PM	0	0	0	0	365	6	0	0	1	0	0	0	372	0	0	0	0	0
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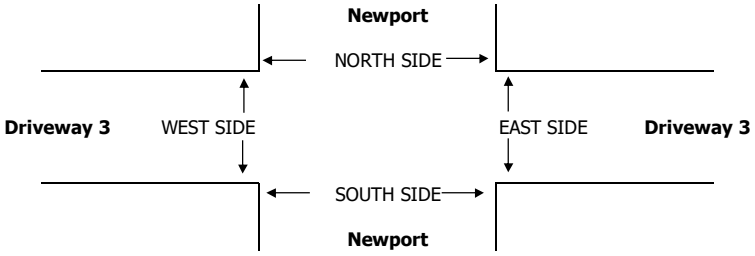

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AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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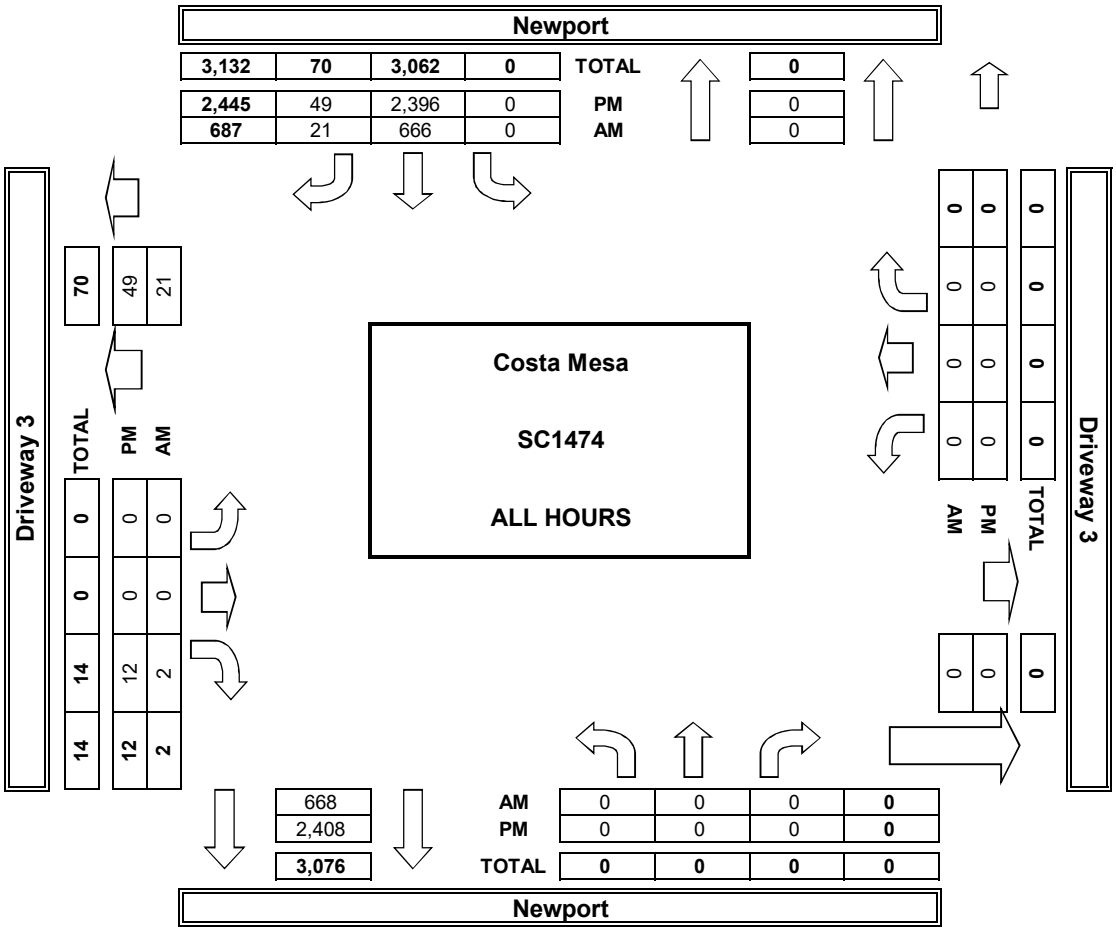
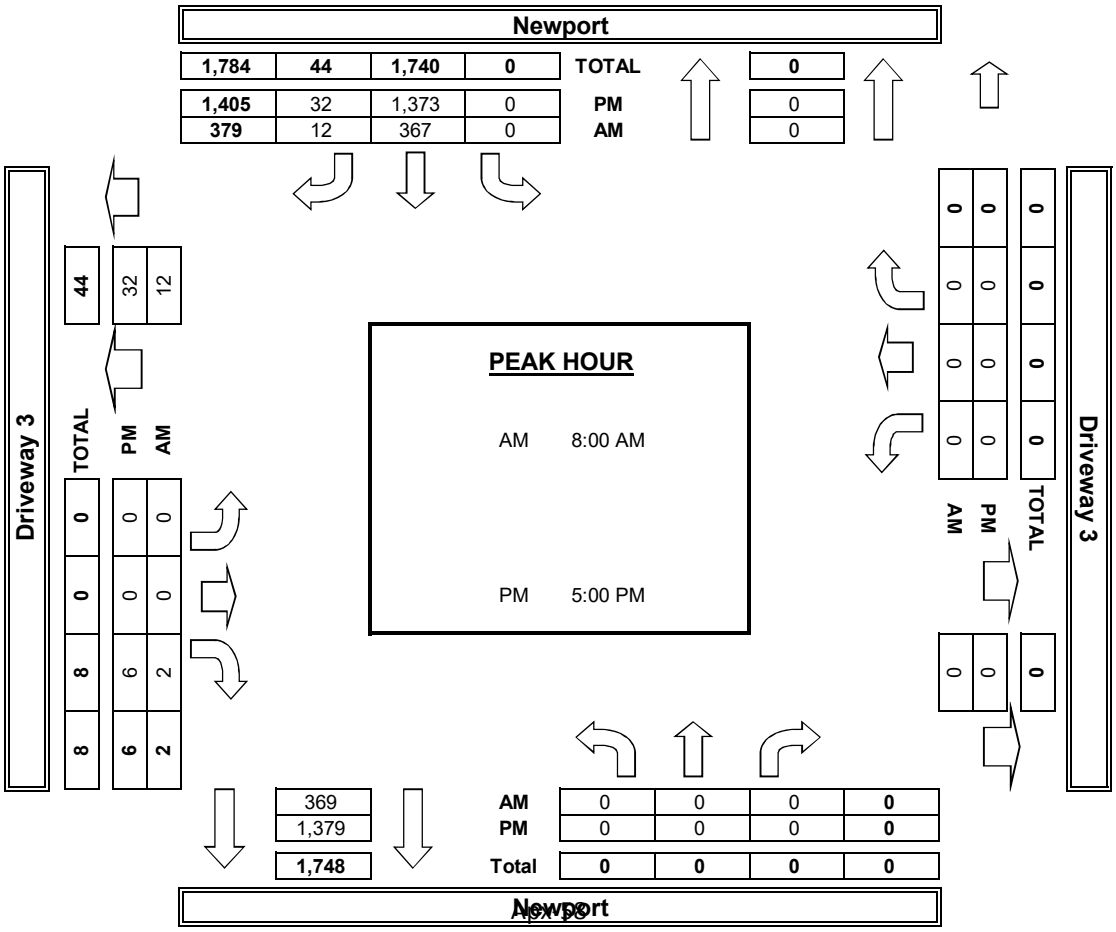
AimTD LLC

TURNING MOVEMENT COUNTS





APPENDIX E

Explanation and Calculation of Intersection Capacity Utilization/Delay

EXPLANATION AND CALCULATION OF INTERSECTION CAPACITY UTILIZATION

Overview

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually greater between intersections and less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. If capacity is 1600 vehicles per lane per hour of green, and if the green phase is 50 percent of the cycle and there are three lanes, then the capacity is 1600 times 50 percent times 3 lanes, or 2400 vehicles per hour for that approach.

The technique used to compare the volume and capacity at an intersection is known as Intersection Capacity Utilization. Intersection Capacity Utilization, usually expressed as a percent, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity (i.e., an Intersection Capacity Utilization of 80 percent), then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

Intersection Capacity Utilization analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement of traffic, (b) summing the times for the movements, and (c) comparing the total time required to the total time available. For example, if for north-south traffic the northbound traffic is 1600 vehicles per hour, the southbound traffic is 1200 vehicles per hour, and the capacity of either direction is 3200 vehicles per hour, then the northbound traffic is critical and requires 1600/3200 or 50 percent of the signal time. If for east-west traffic, 30 percent of the signal time is required, then it can be seen that the Intersection Capacity Utilization is 50 plus 30, or 80 percent. When left turn arrows (left turn phasing) exist, they are incorporated into the analysis. The critical movements are usually the heavy left turn movements and the opposing through movements.

The Intersection Capacity Utilization technique is an ideal tool to quantify existing as well as future intersection operation. The impact of adding a lane can be quickly determined by examining the effect the lane has on the Intersection Capacity Utilization.

Intersection Capacity Utilization Worksheets That Follow This Discussion

The Intersection Capacity Utilization worksheet table contains the following information:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. For right turn lanes, whether the lane is a free right turn lane, whether it has a right turn arrow, and the percent of right turns on red that are assumed.

4. Capacity assumed per lane.

5. Capacity available to serve each movement (number of lanes times capacity per lane).

6. Volume to capacity ratio for each movement.

7. Whether the movement's volume to capacity ratio is critical and adds to the Intersection Capacity Utilization value.

8. The yellow time or clearance interval assumed.

9. Adjustments for right turn movements.

10. The Intersection Capacity Utilization and Level of Service.

The Intersection Capacity Utilization Worksheet also has two graphics on the same page. These two graphics show the following:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. The approach and exit leg volumes.

4. The two-way leg volumes.

5. An estimate of daily traffic volumes that is fairly close to actual counts and is based strictly on the peak hour leg volumes multiplied by a factor.

6. Percent of daily traffic in peak hours.

7. Percent of peak hour leg volume that is inbound versus outbound.

A more detailed discussion of Intersection Capacity Utilization and Level of Service follows.

Level of Service

Level of Service is used to describe the quality of traffic flow. Levels of Service A to C operate quite well. Level of Service C is typically the standard to which rural roadways are designed.

Level of Service D is characterized by fairly restricted traffic flow. Level of Service D is the standard to which urban roadways are typically designed. Level of Service E is the maximum volume a facility can accommodate and will result in possible stoppages of momentary duration. Level of Service F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

A description of the various Levels of Service appears at the end of the ICU description, along with the relationship between Intersection Capacity Utilization and Level of Service.

Signalized and Unsignalized Intersections

Although calculating an Intersection Capacity Utilization value for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volumes with a signal. A traffic signal becomes warranted before Level of Service D is reached for a signalized intersection.

Signal Timing

The Intersection Capacity Utilization calculation assumes that a signal is properly timed. It is possible to have an Intersection Capacity Utilization well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient green time to satisfy its demand, and excess green time exists on other movements. This is an operational problem that should be remedied.

Lane Capacity

Capacity is often defined in terms of roadway width; however, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Our data indicates a typical lane, whether a through lane or a left turn lane, has a capacity of

approximately 1750 vehicles per hour of green time, with nearly all locations showing a capacity greater than 1600 vehicles per hour of green per lane. Right turn lanes have a slightly lower capacity; however 1600 vehicles per hour is a valid capacity assumption for right turn lanes.

This finding is published in the August, 1978 issue of Institute of Transportation Engineers Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. A capacity of 1600 vehicles per hour per lane with no yellow time penalty, or 1700 vehicles per hour with a 3 or 5 percent yellow time penalty is reasonable.

Yellow Time

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for approximately 10 percent of a signal cycle, and a penalty of 3 to 5 percent is reasonable.

During peak hour traffic operation the yellow times are nearly completely used. If there is no left turn phasing, the left turn vehicles completely use the yellow time. Even if there is left turn phasing, the through traffic continues to enter the intersection on the yellow until just a split second before the red.

Shared Lanes

Shared lanes occur in many locations. A shared lane is often found at the end of an off ramp where the ramp forms an intersection with the cross street. Often at a diamond interchange off ramp, there are three lanes. In the case of a diamond interchange, the middle lane is sometimes shared, and the driver can turn left, go through, or turn right from that lane.

If one assumes a three lane off ramp as described above, and if one assumes that each lane has 1600 capacity, and if one assumes that there are 1000 left turns per hour, 500 right turns per hour, and 100 through vehicles per hour, then how should one assume that the three lanes operate. There are three ways that it is done.

One way is to just assume that all 1600 vehicles (1000 plus 500 plus 100) are served simultaneously by three lanes. When this is done, the capacity is 3 times 1600 or 4800, and the amount of green time needed to serve the ramp is 1600 vehicles divided by 4800 capacity or 33.3 percent. This assumption effectively assumes perfect lane distribution between the three lanes that is not realistic. It also means a left turn can be made from the right lane.

Another way is to equally split the capacity of a shared lane and in this case to assume there are 1.33 left turn lanes, 1.33 right turn lanes, and 0.33 through lanes. With this assumption, the critical movement is the left turns and the 1000 left turns are served by a capacity of 1.33 times 1600, or 2133. The volume to capacity ratio of the critical move is 1000 divided by 2133 or 46.9 percent.

The first method results in a critical move of 33.3 percent and the second method results in a critical move of 46.9 percent. Neither is very accurate, and the difference in the calculated Level of Service will be approximately 1.5 Levels of Service (one Level of Service is 10 percent).

The way Kunzman Associates, Inc. does it is to assign fractional lanes in a reasonable way. In this example, it would be assumed that there is 1.1 right turn lanes, 0.2 through lanes, and 1.7 left turn lanes. The volume to capacity ratios for each movement would be 31.3 percent for the through traffic, 28.4 percent for the right turn movement, and 36.8 percent for the left turn movement. The critical movement would be the 36.8 percent for the left turns.

Right Turn on Red

The Kunzman Associates, Inc. software treats right turn lanes in one of five different ways. Each right turn lane is classified into one of five cases. The five cases are (1) free right turn lane, (2) right turn lane with separate right turn arrow, (3) standard right turn lane with no right turns on red allowed, (4) standard right turn lane with a certain percentage of right turns on red allowed, and (5) separate right turn arrow and a certain percentage of right turns on red allowed.

Free Right Turn Lane

If it is a free right turn lane, then it is given a capacity of one full lane with continuous or 100 percent green time. A Free right turn lane occurs when there is a separate approach lane for right turning vehicles, there is a separate departure lane for the right turning vehicles after they turn and are exiting the intersection, and the through cross street traffic does not interfere with the vehicles after they turn right.

Separate Right Turn Arrow

If there is a separate right turn arrow, then it is assumed that vehicles are given a green indication and can proceed on what is known as the left turn overlap.

The left turn overlap for a northbound right turn is the westbound left turn. When the left turn overlap has a green indication, the right turn lane is also given a green arrow

indication. Thus, if there is a northbound right turn arrow, then it can be turned green for the period of time that the westbound left turns are proceeding.

If there are more right turns than can be accommodated during the northbound through green and the time that the northbound right turn arrow is on, then an adjustment is made to the Intersection Capacity Utilization to account for the green time that needs to be added to the northbound through green to accommodate the northbound right turns.

Standard Right Turn Lane, No Right Turns on Red

A standard right turn lane, with no right turn on red assumed, proceeds only when there is a green indication displayed for the adjacent through movement. If additional green time is needed above that amount of time, then in the Intersection Capacity Utilization calculation a right turn adjustment green time is added above the green time that is needed to serve the adjacent through movement.

Standard Right Turn Lane, With Right Turns on Red

A standard right turn lane with say 20 percent of the right turns allowed to turn right on a red indication is calculated the same as the standard right turn case where there is no right turn on red allowed, except that the right turn adjustment is reduced to account for the 20 percent of the right turning vehicles that can logically turn right on a red light. The right turns on red are never allowed to exceed the time the overlap left turns take plus the unused part of the green cycle that the cross street traffic moving from left to right has.

As an example of how 20 percent of the cars are allowed to turn right on a red indication, assume that the northbound right turn volume needs 40 percent of the signal cycle to be satisfied. To allow 20 percent of the northbound right turns to turn right on red, then during 8 percent of the signal cycle (40 percent of signal cycle times 20 percent that can turn right on red) right turns on red will be allowed if it is feasible.

For this example, assume that 15 percent of the signal cycle is green for the northbound through traffic, and that means that 15 percent of the signal cycle is available to satisfy northbound right turns. After the northbound through traffic has received its green, 25 percent of the signal cycle is still needed to satisfy the northbound right turns (40 percent of the signal cycle minus the 15 percent of the signal cycle that the northbound through used).

Assume that the westbound left turns require a green time of 6 percent of the signal cycle. This 6 percent of the signal cycle is used by northbound right turns on red. After accounting for the northbound right turns that occur on the westbound overlap

left turn, 19 percent of the signal cycle is still needed for the northbound right turns (25 percent of the cycle was needed after the northbound through green time was accounted for [see above paragraph], and 6 percent was served during the westbound left turn overlap). Also, at this point 6 percent of the signal cycle has been used for northbound right turns on red, and still 2 percent more of the right turns will be allowed to occur on the red if there is unused eastbound through green time.

For purpose of this example, assume that the westbound through green is critical, and that 15 percent of the signal cycle is unused by eastbound through traffic. Thus, 2 percent more of the signal cycle can be used by the northbound right turns on red since there is 15 seconds of unused green time being given to the eastbound through traffic.

At this point, 8 percent of the signal cycle was available to serve northbound right turning vehicles on red, and 15 percent of the signal cycle was available to serve right turning vehicles on the northbound through green. So 23 percent of the signal cycle has been available for northbound right turns.

Because 40 percent of the signal cycle is needed to serve northbound right turns, there is still a need for 17 percent more of the signal cycle to be available for northbound right turns. What this means is the northbound through traffic green time is increased by 17 percent of the cycle length to serve the unserved right turn volume, and a 17 percent adjustment is added to the Intersection Capacity Utilization to account for the northbound right turns that were not served on the northbound through green time or when right turns on red were assumed.

Separate Right Turn Arrow, With Right Turns on Red

A right turn lane with a separate right turn arrow, plus a certain percentage of right turns allowed on red is calculated the same way as a standard right turn lane with a certain percentage of right turns allowed on red, except the turns which occur on the right turn arrow are not counted as part of the percentage of right turns that occur on red.

Critical Lane Method

Intersection Capacity Utilization parallels another calculation procedure known as the Critical Lane Method with one exception. Critical Lane Method dimensions capacity in terms of standardized vehicles per hour per lane. A Critical Lane Method result of 800 vehicles per hour means that the intersection operates as though 800 vehicles were using a single lane continuously. If one assumes a lane capacity of 1600 vehicles per hour, then a Critical Lane Method calculation resulting in 800 vehicles per hour is the same as an Intersection Capacity Utilization calculation of 50 percent since 800/1600

is 50 percent. It is our opinion that the Critical Lane Method is inferior to the Intersection Capacity Utilization method simply because a statement such as "The Critical Lane Method value is 800 vehicles per hour" means little to most persons, whereas a statement such as "The Intersection Capacity Utilization is 50 percent" communicates clearly. Critical Lane Method results directly correspond to Intersection Capacity Utilization results. The correspondence is as follows, assuming a lane capacity of 1600 vehicles per hour and no clearance interval.

Critical Lane Method Result	**Intersection Capacity Utilization Result**
800 vehicles per hour	50 percent
960 vehicles per hour	60 percent
1120 vehicles per hour	70 percent
1280 vehicles per hour	80 percent
1440 vehicles per hour	90 percent
1600 vehicles per hour	100 percent
1760 vehicles per hour	110 percent

INTERSECTION CAPACITY UTILIZATION
LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Volume to Capacity Ratio
A	Level of Service A occurs when progression is extremely favorable and vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0.600 and below
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.	0.601 to 0.700
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	0.701 to 0.800
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	0.801 to 0.900
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent.	0.901 to 1.000
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs when oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	1.001 and up

[1]Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council Washington D.C., 2000.

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE USING DELAY METHODOLOGY

The levels of service at the unsignalized and signalized intersections are calculated using the delay methodology in the Highway Capacity Manual. This methodology views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane time's 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking
7. Bus stops at intersections
8. Area type (CBD or other)
9. Right turns

10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length

2. Amount of red time faced by a lane group

3. Amount of yellow time for that lane group

4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1,900 vehicles per hour is used (as recommended in the Highway Capacity Manual), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay methodology is that it is possible to add traffic to an intersection and reduce the average total delay per vehicle. If the average total delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is added to a movement that has an average total delay of 15 seconds per vehicle, then the overall average total delay is reduced.

The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at Level of Service C and has an average total delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before Level of Service E is reached.

DELAY METHODOLOGY
LEVEL OF SERVICE DESCRIPTION[1]

Level Of Service	Description	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

[1] Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 2000.

Existing

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro
Report File: C:\...\AME.pdf

Scenario 1 Existing Morning Peak Hour
10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	EB Thru	0.000	10.3	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	EB Thru	0.453	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.011	24.6	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.009	10.5	B
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.021	10.4	B
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	32	4	7	13	1	7	0	0	0	0	3
Total Analysis Volume [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	7.55	0.00	0.00	9.88	10.34	8.73	9.60	10.08	9.00
Movement LOS	A	A	A	A	A	A	A	B	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.06	0.00	0.00	0.11	0.11	0.11	0.04	0.04	0.04
95th-Percentile Queue Length [ft]	0.10	0.00	0.00	1.44	0.00	0.00	2.82	2.82	2.82	1.01	1.01	1.01
d_A, Approach Delay [s/veh]	0.10			2.49			9.84			9.05		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	2.24											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.453

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	0	0	1	1	275	11	17	174	0
Total Analysis Volume [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.36	0.36	0.04	0.22	0.00
Intersection LOS	A											
Intersection V/C	0.453											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	1	0	4	0	0	0	0	271	9	23	190	0
Total Analysis Volume [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.15	0.01	0.00
d_M, Delay for Movement [s/veh]	24.55	0.00	13.02	0.00	0.00	0.00	0.00	0.00	0.00	11.82	0.00	0.00
Movement LOS	C		B					A	A	B	A	A
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00
95th-Percentile Queue Length [ft]	3.31	0.00	3.31	0.00	0.00	0.00	0.00	0.00	0.00	13.12	0.00	0.00
d_A, Approach Delay [s/veh]	14.37			0.00			0.00			1.29		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.68											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	356	66	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	356	66	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	89	17	0	2
Total Analysis Volume [veh/h]	0	0	356	66	0	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.51
Movement LOS			A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.03
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.69
d_A, Approach Delay [s/veh]	0.00		0.00		10.51	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.15					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	365	0	0	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	91	0	0	4
Total Analysis Volume [veh/h]	0	0	365	0	0	14
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.40
Movement LOS			A			B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.06
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.58
d_A, Approach Delay [s/veh]	0.00		0.00		10.40	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	367	12	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	367	12	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	92	3	0	0
Total Analysis Volume [veh/h]	0	0	367	12	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro
Report File: C:\...\PME.pdf

Scenario 1 Existing Evening Peak Hour
10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	WB Thru	0.000	10.6	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	WB Thru	0.561	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.065	19.4	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.222	30.5	D
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.150	29.4	D
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.014	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	26	3	7	32	6	2	0	1	3	0	10
Total Analysis Volume [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.04
d_M, Delay for Movement [s/veh]	7.52	0.00	0.00	7.49	0.00	0.00	10.17	10.38	9.04	10.07	10.56	9.05
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.05	0.00	0.00	0.05	0.05	0.05	0.18	0.18	0.18
95th-Percentile Queue Length [ft]	0.16	0.00	0.00	1.35	0.00	0.00	1.20	1.20	1.20	4.45	4.45	4.45
d_A, Approach Delay [s/veh]	0.19			1.09			9.79			9.28		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	2.23											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.561

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	14	1	0	1	1	133	4	5	387	0
Total Analysis Volume [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.17	0.17	0.01	0.48	0.00
Intersection LOS	A											
Intersection V/C	0.561											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.065

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	5	0	19	0	0	0	0	144	3	10	387	0
Total Analysis Volume [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.11	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	19.35	0.00	11.50	0.00	0.00	0.00	0.00	0.00	0.00	8.82	0.00	0.00
Movement LOS	C		B					A	A	A	A	A
95th-Percentile Queue Length [veh]	0.62	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
95th-Percentile Queue Length [ft]	15.38	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.00	3.26	0.00	0.00
d_A, Approach Delay [s/veh]	13.02			0.00			0.00			0.23		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.69											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	30.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1347	35	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1347	35	0	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	337	9	0	10
Total Analysis Volume [veh/h]	0	0	1347	35	0	40
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.22
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	30.54
Movement LOS			A	A		D
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.82
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	20.41
d_A, Approach Delay [s/veh]	0.00		0.00		30.54	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.86					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	29.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.150

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1394	0	0	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	349	0	0	7
Total Analysis Volume [veh/h]	0	0	1394	0	0	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.15
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	29.40
Movement LOS			A			D
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.51
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	12.87
d_A, Approach Delay [s/veh]	0.00		0.00		29.40	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.54					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1373	32	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1373	32	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	343	8	0	0
Total Analysis Volume [veh/h]	0	0	1373	32	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Existing Plus Project

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro
Report File: C:\...\AMEP.pdf

Scenario 2 Existing Plus Project Morning Peak Hour
10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	EB Thru	0.000	10.2	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	EB Thru	0.436	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.020	23.3	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.011	11.8	B
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.066	11.9	B
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	-5	-8	0	0	0	0	0	-1	0	-5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	129	11	19	52	3	27	0	1	0	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	32	3	5	13	1	7	0	0	0	0	2
Total Analysis Volume [veh/h]	2	129	11	19	52	3	27	0	1	0	0	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	7.53	0.00	0.00	9.74	10.21	8.72	9.50	9.98	8.96
Movement LOS	A	A	A	A	A	A	A	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.04	0.00	0.00	0.11	0.11	0.11	0.02	0.02	0.02
95th-Percentile Queue Length [ft]	0.10	0.00	0.00	1.00	0.00	0.00	2.74	2.74	2.74	0.50	0.50	0.50
d_A, Approach Delay [s/veh]	0.10			1.93			9.70			8.96		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	1.93											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	-13	0	0	0	0	54	-18	-44	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	0	6	1	0	4	4	1152	27	22	699	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	2	0	0	1	1	288	7	6	175	0
Total Analysis Volume [veh/h]	18	0	6	1	0	4	4	1152	27	22	699	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37	0.01	0.22	0.00
Intersection LOS	A											
Intersection V/C	0.436											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	23.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.020

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	5	0	0	0	0	-13	54	-63	-44	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	0	20	0	0	0	0	1071	88	30	717	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	1	0	5	0	0	0	0	268	22	8	179	0
Total Analysis Volume [veh/h]	4	0	20	0	0	0	0	1071	88	30	717	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.01	0.00
d_M, Delay for Movement [s/veh]	23.31	0.00	13.50	0.00	0.00	0.00	0.00	0.00	0.00	11.33	0.00	0.00
Movement LOS	C		B					A	A	B	A	A
95th-Percentile Queue Length [veh]	0.20	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
95th-Percentile Queue Length [ft]	5.05	0.00	5.05	0.00	0.00	0.00	0.00	0.00	0.00	3.95	0.00	0.00
d_A, Approach Delay [s/veh]	15.14			0.00			0.00			0.46		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	0.36											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	356	66	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	507	93	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	127	23	0	2
Total Analysis Volume [veh/h]	0	0	507	93	0	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.84
Movement LOS			A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.03
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.85
d_A, Approach Delay [s/veh]	0.00		0.00		11.84	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	0	0	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	516	0	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	129	0	0	9
Total Analysis Volume [veh/h]	0	0	516	0	0	37
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.90
Movement LOS			A			B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.21
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	5.30
d_A, Approach Delay [s/veh]	0.00		0.00		11.90	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.80					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	367	12	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	23	151	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	390	163	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	98	41	0	0
Total Analysis Volume [veh/h]	0	0	390	163	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro
Report File: C:\...\PMEP.pdf

Scenario 2 Existing Plus Project Evening Peak Hour
10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	WB Thru	0.000	10.2	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	WB Thru	0.585	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.101	18.7	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.253	33.9	D
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.954	115.8	F
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.015	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	-7	-15	0	0	0	0	0	-5	0	-19
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	103	5	11	127	25	8	0	4	6	0	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	26	1	3	32	6	2	0	1	2	0	5
Total Analysis Volume [veh/h]	3	103	5	11	127	25	8	0	4	6	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	7.52	0.00	0.00	7.45	0.00	0.00	9.81	10.15	9.03	9.76	10.24	8.91
Movement LOS	A	A	A	A	A	A	A	B	A	A	B	A
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.02	0.00	0.00	0.05	0.05	0.05	0.09	0.09	0.09
95th-Percentile Queue Length [ft]	0.16	0.00	0.00	0.56	0.00	0.00	1.14	1.14	1.14	2.22	2.22	2.22
d_A, Approach Delay [s/veh]	0.20			0.50			9.55			9.11		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	1.46											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	35	0	-41	0	0	0	0	30	-1	-8	12	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	0	14	3	0	3	2	560	13	10	1558	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	4	1	0	1	1	140	3	3	390	0
Total Analysis Volume [veh/h]	88	0	14	3	0	3	2	560	13	10	1558	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.18	0.18	0.01	0.49	0.00
Intersection LOS	A											
Intersection V/C	0.585											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	18.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.101

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	-28	0	0	0	0	-41	30	-17	-8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	47	0	0	0	0	535	42	24	1538	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	8	0	12	0	0	0	0	134	11	6	385	0
Total Analysis Volume [veh/h]	30	0	47	0	0	0	0	535	42	24	1538	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	18.71	0.00	11.65	0.00	0.00	0.00	0.00	0.00	0.00	8.72	0.00	0.00
Movement LOS	C		B					A	A	A	A	A
95th-Percentile Queue Length [veh]	0.60	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [ft]	14.91	0.00	14.91	0.00	0.00	0.00	0.00	0.00	0.00	1.86	0.00	0.00
d_A, Approach Delay [s/veh]	14.40			0.00			0.00			0.13		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.59											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	33.9
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.253

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1347	35	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	55	14	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1402	49	0	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	351	12	0	11
Total Analysis Volume [veh/h]	0	0	1402	49	0	42
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.25
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	33.92
Movement LOS			A	A		D
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.96
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	23.95
d_A, Approach Delay [s/veh]	0.00		0.00		33.92	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.95					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	115.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.954

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	57	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1451	0	0	153
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	363	0	0	38
Total Analysis Volume [veh/h]	0	0	1451	0	0	153
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.95
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	115.80
Movement LOS			A			F
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	7.13
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	178.18
d_A, Approach Delay [s/veh]	0.00		0.00		115.80	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	11.05					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1373	32	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	129	55	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1502	87	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	376	22	0	0
Total Analysis Volume [veh/h]	0	0	1502	87	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro

Scenario 3 Existing Plus Project Morning Peak Hour - With Improvements

Report File: C:\...\AMEPI.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Signalized	ICU 1	SB Thru	0.063	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.063

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	0	0	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	516	0	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	129	0	0	9
Total Analysis Volume [veh/h]	0	0	516	0	0	37
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.11	0.00	0.00	0.02
Intersection LOS	A					
Intersection V/C	0.063					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro

Scenario 3 Existing Plus Project Evening Peak Hour - With Improvements

Report File: C:\...\PMEPI.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Signalized	ICU 1	SB Thru	0.136	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.136

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	57	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1451	0	0	153
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	363	0	0	38
Total Analysis Volume [veh/h]	0	0	1451	0	0	153
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.30	0.00	0.00	0.10
Intersection LOS	A					
Intersection V/C	0.136					

Opening Year (2020) Without Project

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro

Scenario 4 Opening Year (2020) Without Project Morning Peak Hour

Report File: C:\...\AMOYWO.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	EB Thru	0.000	10.4	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	EB Thru	0.463	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.011	25.5	D
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.009	10.6	B
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.021	10.5	B
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.03	1.03	1.00	1.00	1.03	1.03	1.03	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	133	16	27	54	3	28	0	1	1	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	33	4	7	14	1	7	0	0	0	0	3
Total Analysis Volume [veh/h]	2	133	16	27	54	3	28	0	1	1	0	11
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	7.56	0.00	0.00	9.92	10.37	8.74	9.62	10.11	9.02
Movement LOS	A	A	A	A	A	A	A	B	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.06	0.00	0.00	0.12	0.12	0.12	0.04	0.04	0.04
95th-Percentile Queue Length [ft]	0.10	0.00	0.00	1.44	0.00	0.00	2.94	2.94	2.94	1.02	1.02	1.02
d_A, Approach Delay [s/veh]	0.10			2.43			9.88			9.07		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	2.23											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.463

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.03	1.00	1.03	1.03	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	19	1	0	4	4	1131	45	66	718	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	0	0	1	1	283	11	17	180	0
Total Analysis Volume [veh/h]	9	0	19	1	0	4	4	1131	45	66	718	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.37	0.37	0.04	0.22	0.00
Intersection LOS	A											
Intersection V/C	0.463											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	25.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	0	15	0	0	0	0	1117	34	93	784	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	1	0	4	0	0	0	0	279	9	23	196	0
Total Analysis Volume [veh/h]	2	0	15	0	0	0	0	1117	34	93	784	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.15	0.01	0.00
d_M, Delay for Movement [s/veh]	25.54	0.00	13.24	0.00	0.00	0.00	0.00	0.00	0.00	12.06	0.00	0.00
Movement LOS	D		B					A	A	B	A	A
95th-Percentile Queue Length [veh]	0.14	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00
95th-Percentile Queue Length [ft]	3.42	0.00	3.42	0.00	0.00	0.00	0.00	0.00	0.00	13.57	0.00	0.00
d_A, Approach Delay [s/veh]	14.68			0.00			0.00			1.28		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.67											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	356	66	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	367	66	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	92	17	0	2
Total Analysis Volume [veh/h]	0	0	367	66	0	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.59
Movement LOS			A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.03
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.70
d_A, Approach Delay [s/veh]	0.00		0.00		10.59	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	376	0	0	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	94	0	0	4
Total Analysis Volume [veh/h]	0	0	376	0	0	14
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.48
Movement LOS			A			B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.06
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.60
d_A, Approach Delay [s/veh]	0.00		0.00		10.48	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	367	12	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	378	12	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	95	3	0	0
Total Analysis Volume [veh/h]	0	0	378	12	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro

Scenario 4 Opening Year (2020) Without Project Evening Peak Hour

Report File: C:\...\PMOYWO.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	WB Thru	0.000	10.6	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	WB Thru	0.575	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.067	19.9	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.234	32.4	D
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.159	31.1	D
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.014	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.03	1.03	1.00	1.00	1.03	1.03	1.03	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	106	12	26	131	26	8	0	4	11	0	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	27	3	7	33	7	2	0	1	3	0	10
Total Analysis Volume [veh/h]	3	106	12	26	131	26	8	0	4	11	0	39
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.04
d_M, Delay for Movement [s/veh]	7.54	0.00	0.00	7.49	0.00	0.00	10.20	10.41	9.06	10.11	10.59	9.07
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.05	0.00	0.00	0.05	0.05	0.05	0.18	0.18	0.18
95th-Percentile Queue Length [ft]	0.16	0.00	0.00	1.35	0.00	0.00	1.20	1.20	1.20	4.47	4.47	4.47
d_A, Approach Delay [s/veh]	0.19			1.06			9.82			9.30		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	2.19											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.03	1.00	1.03	1.03	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	0	55	3	0	3	2	546	14	18	1592	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	14	1	0	1	1	137	4	5	398	0
Total Analysis Volume [veh/h]	53	0	55	3	0	3	2	546	14	18	1592	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.18	0.18	0.01	0.50	0.00
Intersection LOS	A											
Intersection V/C	0.575											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	0	75	0	0	0	0	593	12	41	1592	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	5	0	19	0	0	0	0	148	3	10	398	0
Total Analysis Volume [veh/h]	18	0	75	0	0	0	0	593	12	41	1592	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.11	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	19.85	0.00	11.63	0.00	0.00	0.00	0.00	0.00	0.00	8.88	0.00	0.00
Movement LOS	C		B					A	A	A	A	A
95th-Percentile Queue Length [veh]	0.63	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
95th-Percentile Queue Length [ft]	15.75	0.00	15.75	0.00	0.00	0.00	0.00	0.00	0.00	3.31	0.00	0.00
d_A, Approach Delay [s/veh]	13.22			0.00			0.00			0.22		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.68											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.234

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1347	35	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1387	35	0	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	347	9	0	10
Total Analysis Volume [veh/h]	0	0	1387	35	0	40
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.23
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	32.39
Movement LOS			A	A		D
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.87
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	21.76
d_A, Approach Delay [s/veh]	0.00		0.00		32.39	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.89					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	31.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.159

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1436	0	0	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	359	0	0	7
Total Analysis Volume [veh/h]	0	0	1436	0	0	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.16
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	31.10
Movement LOS			A			D
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.55
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	13.72
d_A, Approach Delay [s/veh]	0.00		0.00		31.10	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1373	32	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1414	32	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	354	8	0	0
Total Analysis Volume [veh/h]	0	0	1414	32	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Opening Year (2020) With Project

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro

Scenario 5 Opening Year (2020) With Project Morning Peak Hour

Report File: C:\...\AMOYW.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	EB Thru	0.000	10.2	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	EB Thru	0.446	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.021	24.2	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.011	11.9	B
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.067	12.0	B
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.004	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	129	16	27	52	3	27	0	1	1	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.03	1.03	1.00	1.00	1.03	1.03	1.03	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	-5	-8	0	0	0	0	0	-1	0	-5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	133	11	19	54	3	28	0	1	0	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	33	3	5	14	1	7	0	0	0	0	2
Total Analysis Volume [veh/h]	2	133	11	19	54	3	28	0	1	0	0	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	7.33	0.00	0.00	7.54	0.00	0.00	9.77	10.24	8.73	9.52	10.00	8.98
Movement LOS	A	A	A	A	A	A	A	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.04	0.00	0.00	0.11	0.11	0.11	0.02	0.02	0.02
95th-Percentile Queue Length [ft]	0.10	0.00	0.00	1.00	0.00	0.00	2.86	2.86	2.86	0.50	0.50	0.50
d_A, Approach Delay [s/veh]	0.10			1.88			9.74			8.98		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	1.92											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	0	19	1	0	4	4	1098	45	66	697	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.03	1.00	1.03	1.03	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	-13	0	0	0	0	54	-18	-44	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	0	6	1	0	4	4	1185	27	22	720	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	2	0	0	1	1	296	7	6	180	0
Total Analysis Volume [veh/h]	18	0	6	1	0	4	4	1185	27	22	720	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.38	0.01	0.23	0.00
Intersection LOS	A											
Intersection V/C	0.446											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	15	0	0	0	0	1084	34	93	761	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	5	0	0	0	0	-13	54	-63	-44	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	0	20	0	0	0	0	1104	88	30	740	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	1	0	5	0	0	0	0	276	22	8	185	0
Total Analysis Volume [veh/h]	4	0	20	0	0	0	0	1104	88	30	740	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.01	0.00
d_M, Delay for Movement [s/veh]	24.21	0.00	13.74	0.00	0.00	0.00	0.00	0.00	0.00	11.53	0.00	0.00
Movement LOS	C		B					A	A	B	A	A
95th-Percentile Queue Length [veh]	0.21	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
95th-Percentile Queue Length [ft]	5.22	0.00	5.22	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	0.00
d_A, Approach Delay [s/veh]	15.49			0.00			0.00			0.45		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	0.36											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	356	66	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	518	93	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	130	23	0	2
Total Analysis Volume [veh/h]	0	0	518	93	0	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.94
Movement LOS			A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.03
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.87
d_A, Approach Delay [s/veh]	0.00		0.00		11.94	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	0	0	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	527	0	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	132	0	0	9
Total Analysis Volume [veh/h]	0	0	527	0	0	37
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	12.00
Movement LOS			A			B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.22
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	5.38
d_A, Approach Delay [s/veh]	0.00		0.00		12.00	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.79					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	367	12	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	23	151	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	401	163	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	100	41	0	0
Total Analysis Volume [veh/h]	0	0	401	163	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro

Scenario 5 Opening Year (2020) With Project Evening Peak Hour

Report File: C:\...\PMOYW.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Vanguard Way (NS) at Morristown Lane (EW)	Two-way stop	HCM 2010	WB Thru	0.000	10.3	B
2	Civic Center (NS) at Fair Drive (EW)	Signalized	ICU 1	WB Thru	0.599	-	A
3	Project Access (NS) at Fair Drive (EW)	Two-way stop	HCM 2010	NB Left	0.105	19.2	C
4	Newport Boulevard (NS) at Project North Dwy (EW)	Two-way stop	HCM 2010	EB Right	0.267	36.1	E
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Two-way stop	HCM 2010	EB Right	1.010	135.1	F
6	Newport Boulevard (NS) at Project South Dwy (EW)	Two-way stop	HCM 2010	SB Thru	0.015	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Vanguard Way (NS) at Morristown Lane (EW)

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	3	103	12	26	127	25	8	0	4	11	0	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.03	1.03	1.00	1.00	1.03	1.03	1.03	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	-7	-15	0	0	0	0	0	-5	0	-19
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	106	5	11	131	26	8	0	4	6	0	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	27	1	3	33	7	2	0	1	2	0	5
Total Analysis Volume [veh/h]	3	106	5	11	131	26	8	0	4	6	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No	Yes	Yes
Number of Storage Spaces in Median	0	0	3	3

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	7.54	0.00	0.00	7.45	0.00	0.00	9.84	10.18	9.05	9.79	10.27	8.93
Movement LOS	A	A	A	A	A	A	A	B	A	A	B	A
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.02	0.00	0.00	0.05	0.05	0.05	0.09	0.09	0.09
95th-Percentile Queue Length [ft]	0.16	0.00	0.00	0.56	0.00	0.00	1.14	1.14	1.14	2.23	2.23	2.23
d_A, Approach Delay [s/veh]	0.20			0.49			9.58			9.13		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	1.43											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Civic Center (NS) at Fair Drive (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	53	0	55	3	0	3	2	530	14	18	1546	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.03	1.00	1.03	1.03	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	35	0	-41	0	0	0	0	30	-1	-8	12	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	0	14	3	0	3	2	576	13	10	1604	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	4	1	0	1	1	144	3	3	401	0
Total Analysis Volume [veh/h]	88	0	14	3	0	3	2	576	13	10	1604	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.18	0.18	0.01	0.50	0.00
Intersection LOS	A											
Intersection V/C	0.599											

Intersection Level Of Service Report
Intersection 3: Project Access (NS) at Fair Drive (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.105

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	0	75	0	0	0	0	576	12	41	1546	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00	1.00	1.03	1.03
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	-28	0	0	0	0	-41	30	-17	-8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	47	0	0	0	0	552	42	24	1584	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	8	0	12	0	0	0	0	138	11	6	396	0
Total Analysis Volume [veh/h]	30	0	47	0	0	0	0	552	42	24	1584	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No	No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	No	No	No
Number of Storage Spaces in Median	3	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	19.21	0.00	11.81	0.00	0.00	0.00	0.00	0.00	0.00	8.77	0.00	0.00
Movement LOS	C		B					A	A	A	A	A
95th-Percentile Queue Length [veh]	0.61	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
95th-Percentile Queue Length [ft]	15.35	0.00	15.35	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.00	0.00
d_A, Approach Delay [s/veh]	14.69			0.00			0.00			0.13		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.59											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	36.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.267

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1347	35	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	55	14	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1442	49	0	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	361	12	0	11
Total Analysis Volume [veh/h]	0	0	1442	49	0	42
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.27
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	36.10
Movement LOS			A	A		E
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	1.02
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	25.57
d_A, Approach Delay [s/veh]	0.00		0.00		36.10	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	0.99					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	135.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.010

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	57	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1493	0	0	153
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	373	0	0	38
Total Analysis Volume [veh/h]	0	0	1493	0	0	153
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	1.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	135.11
Movement LOS			A			F
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	7.67
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	191.84
d_A, Approach Delay [s/veh]	0.00		0.00		135.11	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	12.56					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 6: Newport Boulevard (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1373	32	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	129	55	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1543	87	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	386	22	0	0
Total Analysis Volume [veh/h]	0	0	1543	87	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane	No	No	No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No	No	No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			A	A		
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vanguard University Campus Master Plan

Vistro File: C:\...\AME.vistro

Scenario 6 Opening Year (2020) With Project Morning Peak Hour - With Improvements

Report File: C:\...\AMOYWI.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Newport Boulevard (NS) at Project North Dwy (EW)	Signalized	ICU 1	SB Thru	0.044	-	A
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Signalized	ICU 1	SB Thru	0.063	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	356	66	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	518	93	0	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	130	23	0	2
Total Analysis Volume [veh/h]	0	0	518	93	0	6
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.13	0.00	0.00
Intersection LOS	A					
Intersection V/C	0.044					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.063

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	365	0	0	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	151	0	0	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	527	0	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	132	0	0	9
Total Analysis Volume [veh/h]	0	0	527	0	0	37
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.11	0.00	0.00	0.02
Intersection LOS	A					
Intersection V/C	0.063					

Vanguard University Campus Master Plan

Vistro File: C:\...\PME.vistro

Scenario 6 Opening Year (2020) With Project Evening Peak Hour - With Improvements

Report File: C:\...\PMOYWI.pdf

10/24/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Newport Boulevard (NS) at Project North Dwy (EW)	Signalized	ICU 1	SB Thru	0.066	-	A
5	Newport Boulevard (NS) at Project Central Dwy (EW)	Signalized	ICU 1	SB Thru	0.136	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Newport Boulevard (NS) at Project North Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1347	35	0	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	55	14	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1442	49	0	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	361	12	0	11
Total Analysis Volume [veh/h]	0	0	1442	49	0	42
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.31	0.31	0.00	0.03
Intersection LOS	A					
Intersection V/C	0.066					

Intersection Level Of Service Report
Intersection 5: Newport Boulevard (NS) at Project Central Dwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.136

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	1394	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.03	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	57	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1493	0	0	153
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	373	0	0	38
Total Analysis Volume [veh/h]	0	0	1493	0	0	153
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	0	4	0	0	6
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.31	0.00	0.00	0.10
Intersection LOS	A					
Intersection V/C	0.136					

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